VT 22A Truck Route Study
Addison County, Vermont

Existing Conditions Report

Stantec

Prepared for:

Addison County Regional Planning Commission

Vermont Agency of Transportation

October 5, 2018

DISCLAIMER

This document presents draft materials for the Existing Conditions chapter of the full report being prepared as part of the *VT 22A Truck Route Study*. Information presented herein will be amended and updated as the study progresses. Updates will include new information responding to public comments received at the September 26, 2018 Local Concerns Hearing held for this study.

VT 22A Truck Route Study

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Text to be added.

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4.0 EXISTING CONDITIONS

Exiting conditions for the study area were established creating a baseline for the evaluation of alternative actions. The study area includes portions of VT 22A, VT 17 and US 7 connecting Addison, Ferrisburgh and New Haven. Also included is the new alignment corridor passing to the west and north of Downtown Vergennes. Traffic volume, traffic operations, vehicle crash, and transit system data for the entire study area are first presented. Roadway conditions, land use data, environmental and cultural resource data are then presented for five separate subareas. The five subareas are identified in Figure 4.1. The three primary subareas include Downtown Vergennes, the new alignment corridor, and the VT 17 corridor as these will be directly and significantly impacted by at least one of the three actions under consideration. Two other subareas are documented including VT 22A outside of the downtown area and a section of the US 7 corridor. These secondary subareas are relevant in terms of understanding the regional impacts of the alternatives under consideration. The VT 22A subarea data is also needed to develop conceptual plans for connections to VT 22A for the new alignment alternative.

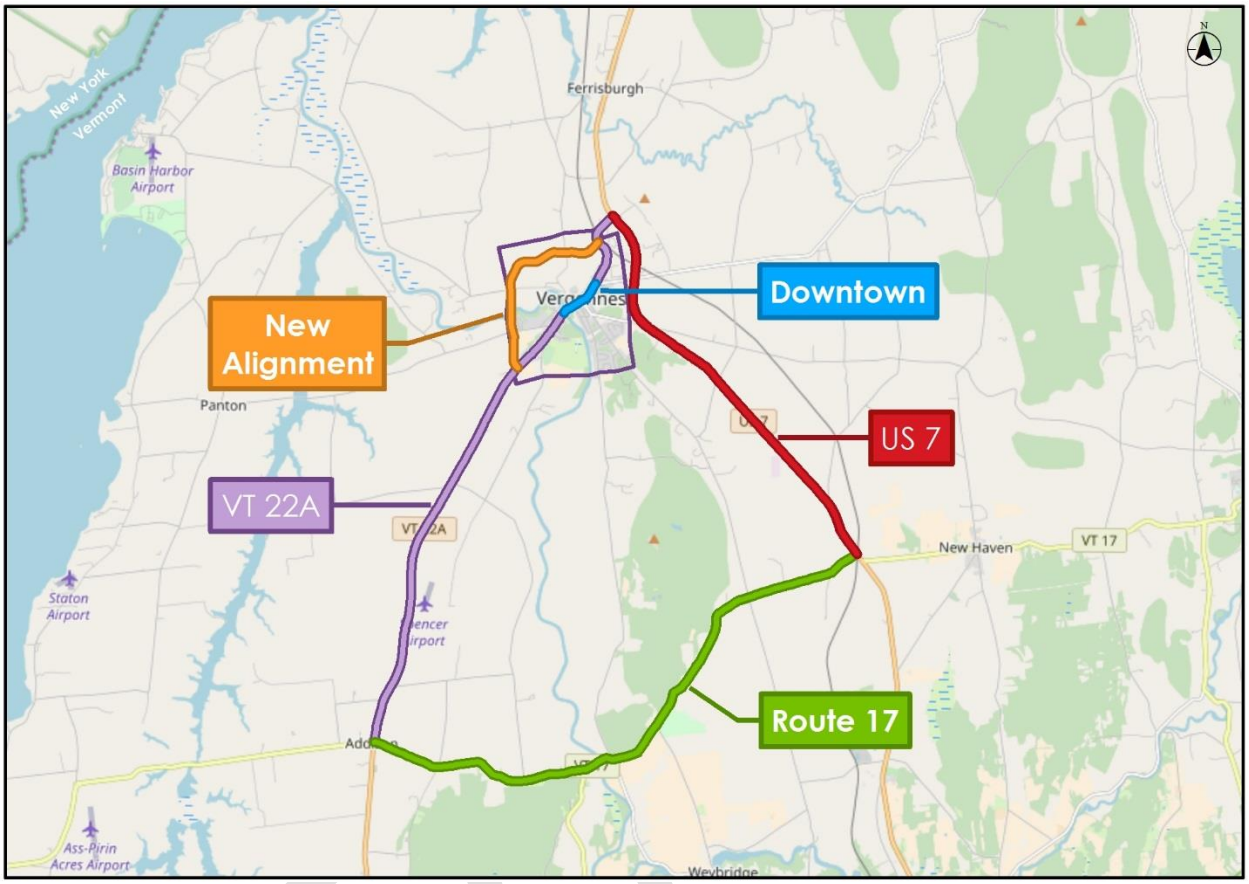

Figure 4-1 - Project Subareas

4.1 ENTIRE STUDY AREA

Certain existing conditions data were collected and examined over the entire project study area. The data relate principally to vehicular traffic volumes, vehicle crashes, traffic operations, and transit services.

4.1.1 Traffic Volumes

Traffic volume data collected for the study area includes daily traffic volumes on roadway links and peak hour volumes for intersections. Generally, vehicle classification counts were examined such that truck volumes could be evaluated separate from other traffic. Also, field surveys were conducted to estimate the volume on through trucks passing through Downtown Vergennes.

4.1.1.1 Daily Traffic Volumes

Vehicular traffic volumes for the study area roadways were collected from the VTrans traffic volume database and other recent studies. Figure 4.2 shows the existing daily traffic volumes on the study area roadways. (The daily volumes are based on 2017 traffic counts at most locations.)

As shown, the highest volume roadway segment in the study area is US 7 north of VT 22A which carries 12,900 vehicles per day. South of the VT 22A/US 7 intersection this volume splits with approximately 5400 vehicles per day using VT 22A and 7400 vehicles per day on US 7. VT 17 carries a relatively modest volume of only 1800 vehicles per day east of VT 22A. West of VT 22A it carries 3100 vehicles per day. Daily truck volumes, for large (tractor trailer) trucks, are provided in Figure 4.3. Truck traffic volumes are heaviest on US 7 north of Vergennes. There are 725 large trucks per day on US 7 north of VT 22A. South of the VT 22A/US 7 intersection VT 22A carries 510 large trucks per day and US 7 carries 270 large trucks per day. VT 17 east of VT 22A carries only 60 large trucks per day.

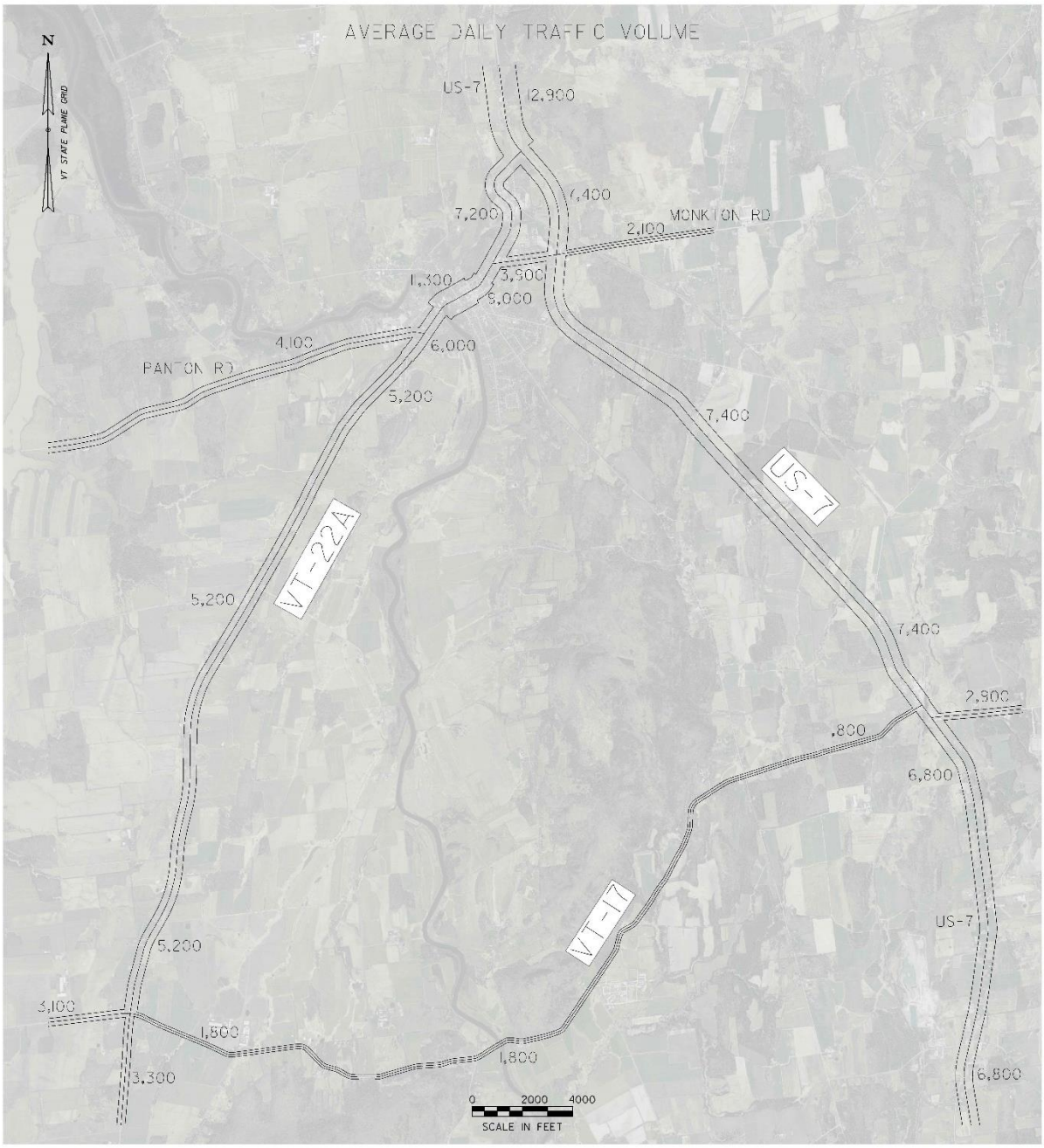

Figure 4-2 Daily Traffic Volumes

Figure 4-3 Daily Large (Tractor Trailer) Truck Volumes

4.1.1.2 Vehicle Turning Movement Counts

Vehicle turning movement counts were also compiled for commuter peak hour conditions for each of the major intersections in the traffic study area. These volumes are reported in Figures 4.4 and 4.5 for the AM and PM peak commuter hours, respectively. The data indicate 565 vehicles on Main Street just north of Green Street during the AM peak hour and 905 vehicles at this location during the PM peak hour. Further south on VT 22A just north of VT 17, VT 22A carries 365 AM peak hour vehicles and 465 PM peak hour vehicles.

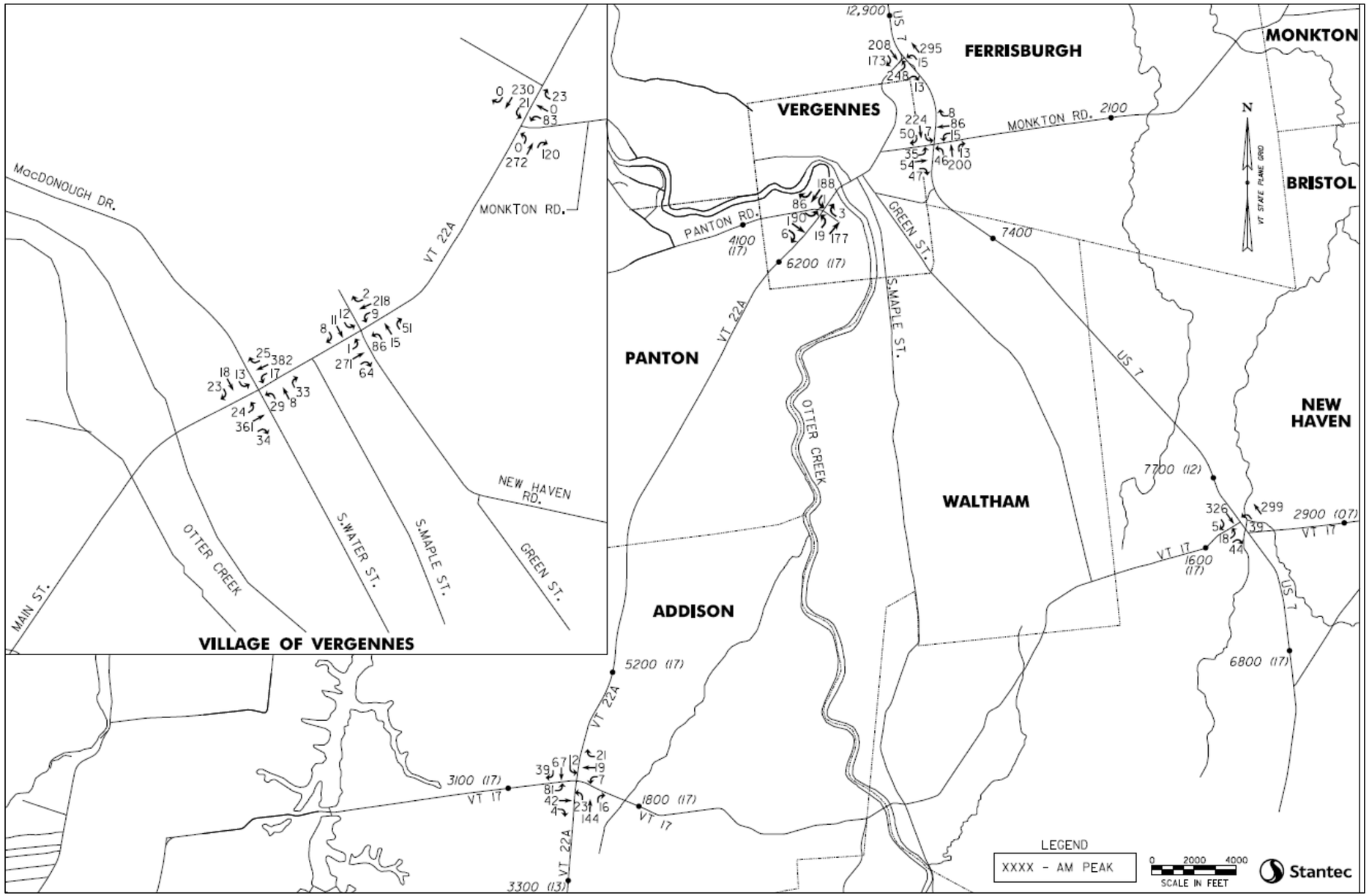

Figure 4-4 AM Peak Hour Traffic Volumes

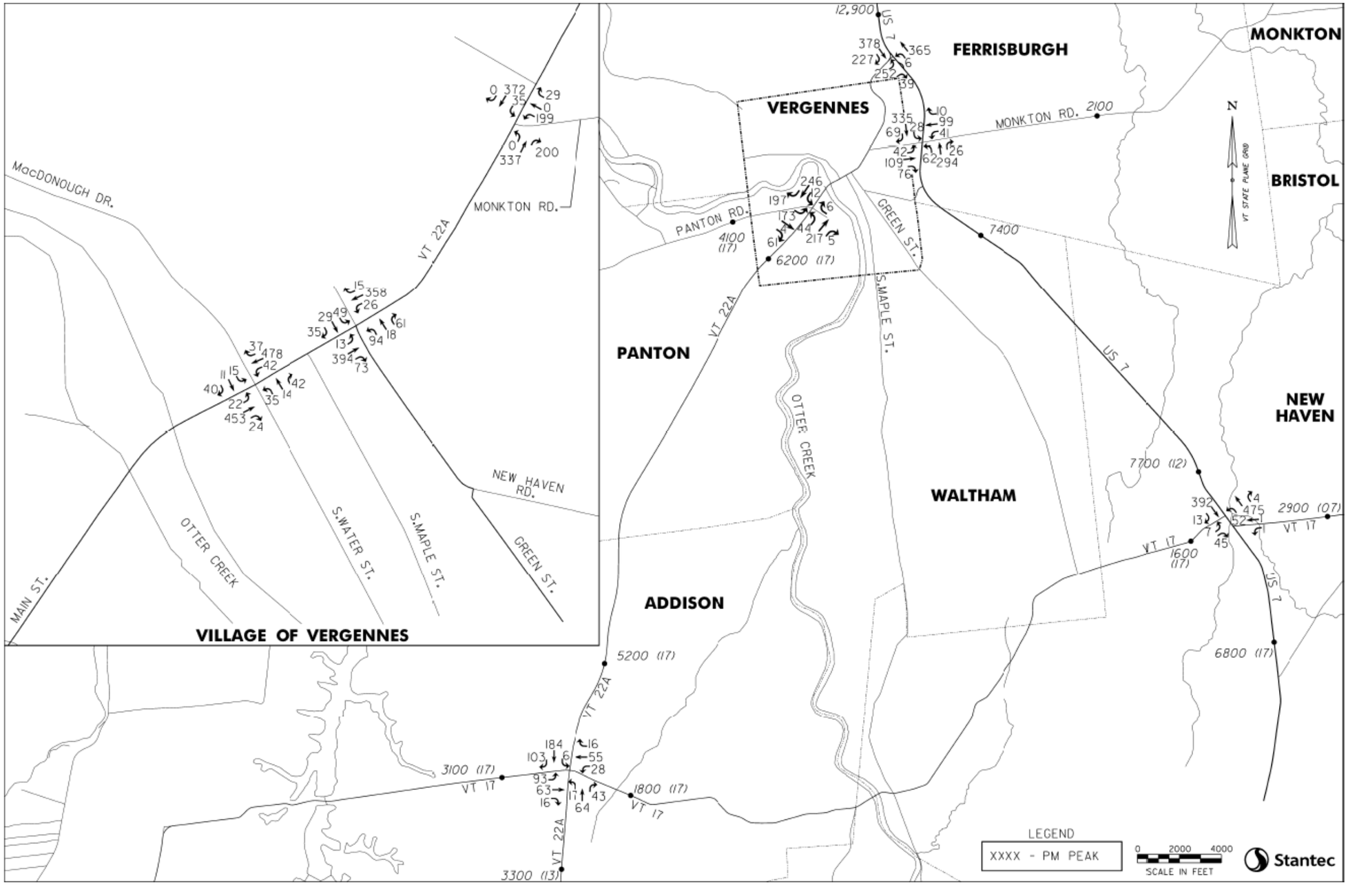

Figure 4-5 PM Peak Hour Traffic Volumes

4.1.1.3 Through Truck Traffic

A license plate matching survey was conducted by VTrans staff in July 2018 to determine the volume of trucks on VT 22A that are through trucks passing through Vergennes without stopping. The surveys were conducted from 12 PM to 6 PM on separate dates for each direction of travel. On July 19, 2018 northbound trucks were recorded at three locations: on VT 22A just north of VT 17 (approaching Vergennes); on VT 22A at US 7 (leaving Vergennes); and, on Monkton Road at US 7 (leaving Vergennes). Southbound truck movements were recorded on July 31, 2018 at the same locations. The collected vehicle identification data were sorted and compared to look for matches between trucks entering Vergennes and trucks exiting Vergennes. Any truck reported leaving the survey area within 20 minutes of entering the survey area was identified as a through truck that presumably passed through Downtown Vergennes without stopping. As shown in Table 4.1, 131 northbound truck movements were recorded and 90 percent of these were through trucks. Large trucks, tractor trailer units, are even more likely to be through trucks. Approximately 97 percent of the large northbound trucks were identified as through trucks. Similar results were reported for southbound travel. Consequently, approximately 90 percent of the trucks recorded on VT 22A south of Vergennes pass through Downtown Vergennes without stopping. Similarly, approximately 98 percent of the large trucks recorded at this location also pass through Vergennes without stopping.

Table 4-1 Truck License Plate Matching Survey Results

	All Trucks			Large Trucks		
Direction	**Total**	**Through Trucks**		**Total**	**Through Trucks**	
Northbound	131	118	90%	94	91	97%
Southbound	130	115	88%	95	93	98%

Note: Survey data collected by VTrans on July 19, 2018 and July 31, 2018.

4.1.2 Traffic Operations

Peak hour traffic volumes were considered in combination with intersection geometry and traffic control data to determine intersection operating levels of service. Level of service (LOS) is a term used to describe the quality of the traffic flow on a roadway facility at a particular point in time. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience, and safety based on a comparison of roadway system capacity to roadway system travel demand. Operating levels of service are reported on a scale of A to F, with A representing the best operating conditions with little or no delay to motorists, and F representing the worst operating conditions with long delays and traffic demands sometimes exceeding roadway capacity.

Intersection operating levels of service are calculated following procedures defined in the *Highway Capacity Manual*, published by the Transportation Research Board. For signalized intersections the operating level of service is based on travel delays. Delays can be measured in the field but generally are calculated as a function of traffic volume; peaking characteristic of traffic flow; percentage of heavy vehicles in the traffic stream; type of traffic control; number of travel lanes and lane use; intersection approach grades; and, pedestrian activity. Through this analysis volume-to-capacity ratios can be calculated for individual movements or for the intersection as a whole. A volume-to-capacity ratio of 1.0 indicates that a movement or intersection is operating at its theoretical capacity. The specific delay criteria applied per the *2010 Highway Capacity Manual* to determine operating levels of service are summarized in Table 4.2.

Table 4-2 Intersection Level of Service Criteria

	Average Delay per Vehicle (Seconds)	
Level of Service	**Signalized Intersections**	**Unsignalized Intersections**
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F[1]	>80.0	>50.0

[1]Level of Service F is also assigned to movements if the volume-to-capacity ratio exceeds 1.0.

Source: *HCM 2010 Highway Capacity Manual*, Transportation Research Board, National Academy of Sciences, Washington, DC, 2010.

Capacity analysis results for the major intersections in the study area under existing PM peak hour conditions are presented in Table 4.3 and in Figure 4.6. As shown, the signalized intersections in the study area operate at LOS C or better. The Panton Road intersection approach to VT 22A has the worst operating level of service, LOS E during the PM peak hour. This critical approach however, operates well below capacity at 71 percent of capacity.

Table 4-3 Existing PM Peak Hour Intersection Level of Service

Intersection/Approach(es)	LOS[1]	Delay[2]	V/C[3]
Signalized Locations:			
US 7/VT 22A			
All	B	10	0.49
Monkton Road/Main Street			
All	B	18	0.63
Green Street/Main Street			
All	B	16	0.74
Monkton Road/US 7			
All	C	23	0.55
Unsignalized Locations			
S. Water St./MacDonough Dr./Main St.			
Eastbound (MacDonough)	C	24	0.27
Westbound (S. Water)	D	29	0.37
Panton Road/VT 22A			
Eastbound (Panton Road)	E	36	0.71
Westbound (Elm Street)	A	10	0.01
VT 17/VT 22A			
Eastbound (VT 17)	C	18	0.41
Westbound (VT 17)	B	15	0.24
VT 17/US 7			
Eastbound (VT 17)	B	13	0.11

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] V/C = Volume-to-capacity ratio

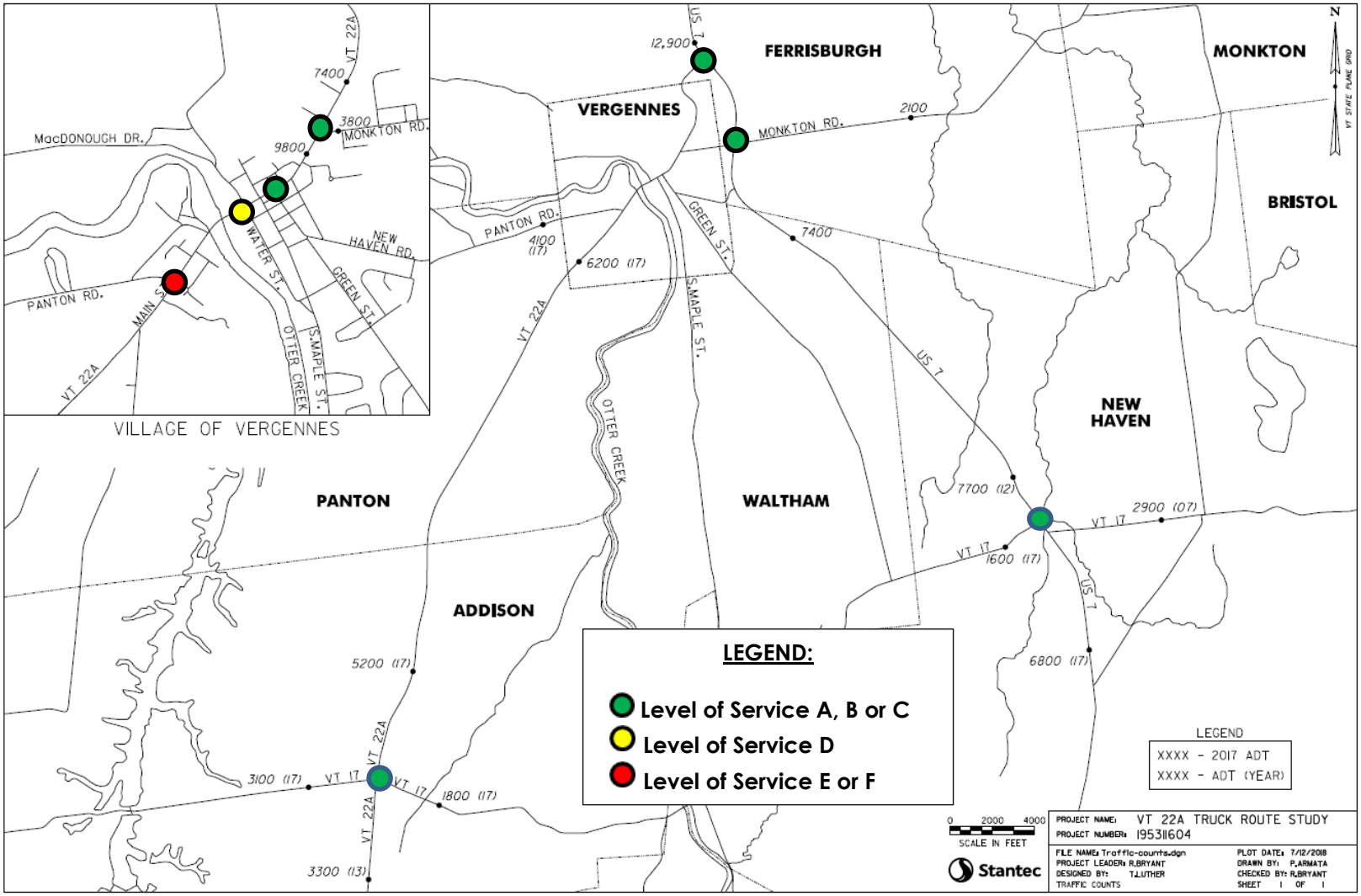

Figure 4-6 Intersection PM Peak Hour Operating Levels of Service

4.1.3 Crash History

Vehicle crash data for the study area is reported in Figure 4.7. This figure locates crashes listed in the VTrans Crash Database for a five-year period, 2013-2017. Figure 4.8 locates crashes involving trucks in the overall study area. Crash counts on roadway segments were compared to the traffic volumes on those segments to calculate crash rates. These crash rates are reported in Table 4.4. As shown, 54 crashes occurred on Main Street in the Downtown, Vergennes subarea and this subarea has the highest crash rate. This is due to the multiple active intersections along this segment and the conflicts associated with turning and crossing traffic streams at these intersections. No crashes involving pedestrians of bicyclists were reported in the study area.

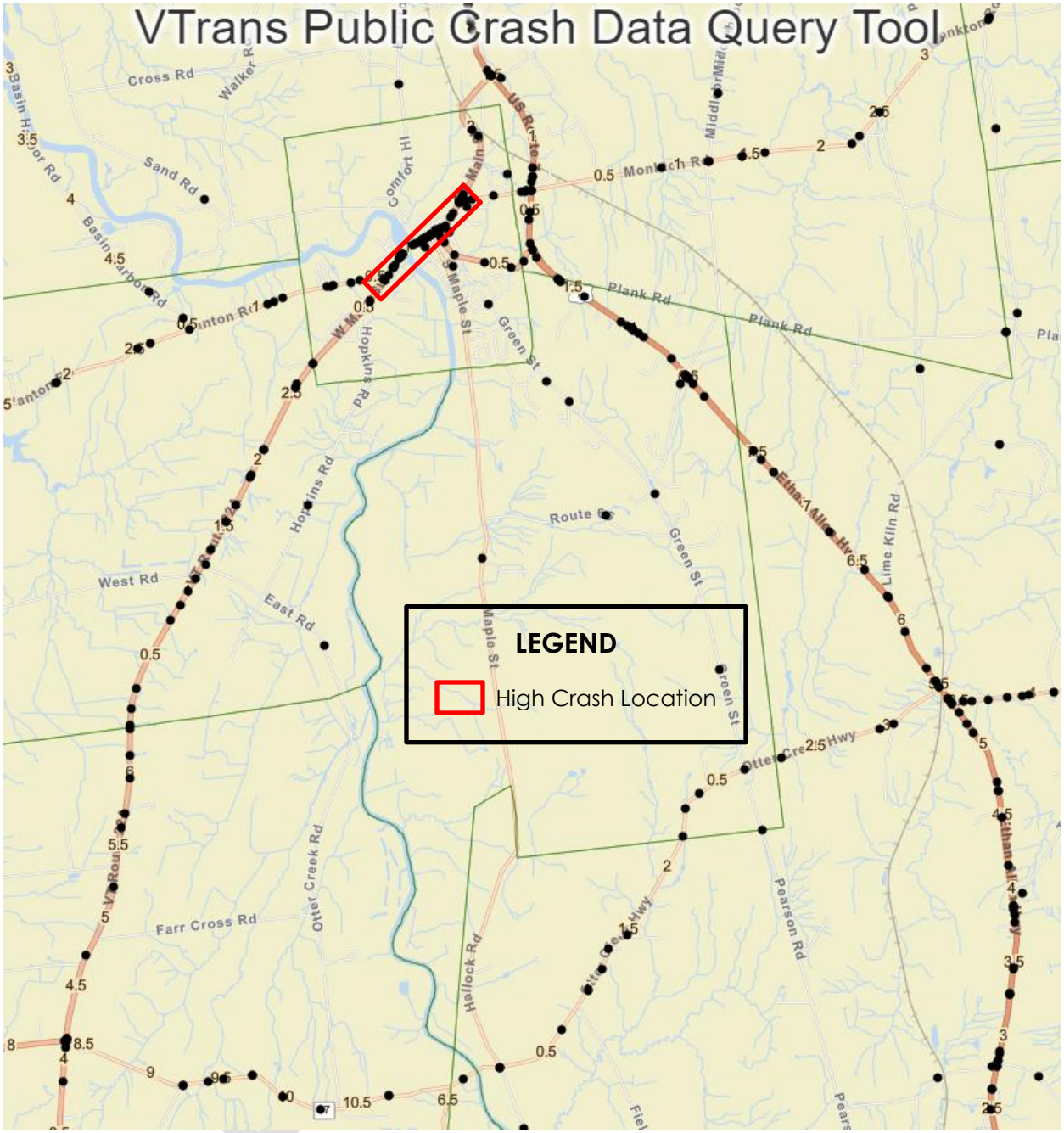

Figure 4-7 Vehicle Crashes (2013 -2017)

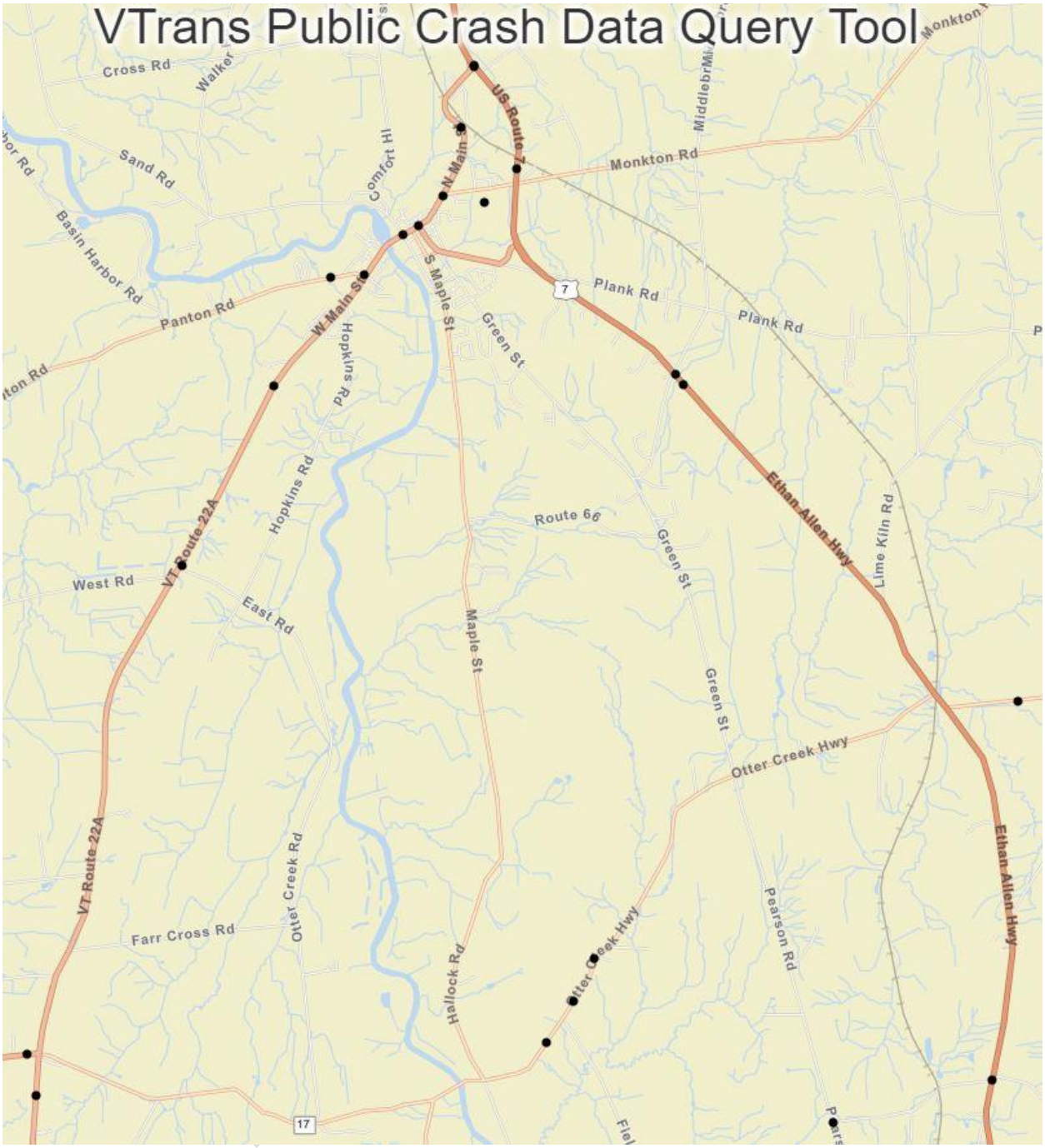

Figure 4-8 Crashes Involving Trucks (2013-2017)

Table 4-4 Crashes and Crash Rates by Subarea

Subarea	Length (miles)	2017 AADT	Crashes (2013 - 2017)	Crash Rate[1]	Crashes Involving Trucks	Crashes Involving Pedestrians or Bicyclists
Downtown Vergennes (Main Street)	0.5	9800	54	8.61	3	0
VT 17	7.4	1700	29	3.68	3	0
VT 22A South of Downtown	5.9	5600	54	0.59	1	0
VT 22A North of Downtown	1.0	2500	6	0.22	1	0
US 7	5.4	7550	62	0.84	4	0

1Crashes per million vehicle miles traveled.

As noted in Figure 4.7 the Downtown Vergennes subarea contains the only High Crash Location (HCL) in the study area. To qualify as an HCL a highway segment or intersection must have at least five crashes over a five-year period and the actual crash rate must exceed a critical crash rate calculated for that type of roadway facility based on statewide data. The HCL shown is based on data for 2012 through 2016. The HCL in Downtown Vergennes includes three overlapping 0.3-mile roadway segments. The crash severity indexes for these three segments range from $13,000 to $36,000. The severity index indicates the average cost per crash with property damage only crashes valued at $11,300 per crash, injury crashes valued at $88,500 per crash, and fatal crashes valued at $1,500,000 per crash. Three of the crashes in the Downtown Vergennes subarea involved trucks.

4.1.4 Transit

Vergennes and the study area are served by two bus routes operated by two different transit service providers. Green Mountain Transit (GMT) operates a regional route connecting Burlington and Middlebury principally via US Route 7 with stops in Vergennes and Ferrisburgh. The Ferrisburgh stop is at the Park and Ride lot on VT 22A just south of its intersection with US 7. Southbound buses also stop at the Opera House on Main Street in Vergennes. The northbound stop is at Main Street and Green Street. Green Mountain Transit provides weekday service with two round trips made during the morning commuter period and two round trips made during evening commuter period.

Addison County Transportation Resources (ACTR) operates the above GMT route on Saturdays with three round trips provided: one in the morning; one at midday; and, one in the late afternoon. ACTR also operates the Tri-Town Shuttle service connecting Vergennes, Bristol and Middlebury. The Vergennes link connects Downtown Vergennes with the New Haven Park and Ride lot on North Street. This route uses US 7 and VT east of US 7. On morning runs buses enter downtown Vergennes by way of New Haven Road and Green Street and then return by way of

Monkton Road. In the afternoon the buses make the loop in the opposite direction. One morning trip and one evening trip also extends out and back from Downtown Vergennes to the UTC Systems facility on Panton Road. Other trips can be extended upon request. There are four round trips made between Middlebury and Vergennes in the morning and five round trips made in the evening.

4.1.5 Natural and Cultural Resources

A desktop review was completed to identify and characterize wetlands, streams, Rare, Threatened or Endangered (RTE) species, agricultural land, 4(f) and 6(f) public lands, and hazardous waste sites in the study area. The Vermont Agency of Natural Resources (ANR) Natural Resources Atlas mapping program[1] was used to evaluate known natural resources within the three primary subareas. The Addison County Regional Planning Commission GIS data was used to identify archeological overlay areas and buildings on the National Registry of Historic Places[2]. Findings are presented by subarea below.

4.2 DOWNTOWN VERGENNES SUBAREA

The downtown Vergennes study area would be directly and significantly impacted by each of the alternative actions under consideration. This area includes VT 22A and adjacent land uses through downtown Vergennes between Canal Street (Otter Creek) to the south and Monkton Road to the north. (Main Street has a southwest/northeast orientation in Downtown Vergennes however, VT 22A generally has a south/north orientation from a regional perspective. Consequently, a south/north orientation for Main Street is used in this report.) This area would be physically altered under Alternative A and experience significant changes in through truck traffic volumes under Alternatives B and C.

4.2.1 Roadway Conditions

VT 22A, also known as Main Street in Downtown Vergennes is classified as a Rural Minor Arterial under State jurisdiction. At one time it was designated, along with all of VT 22A, as a truck route for western Vermont under the state's Freight Transportation Plan. This designation no longer applies. It is considered a primary bike route under the state's Master Bicycle Plan. It is a two-lane roadway with a posted speed limit of 25 miles per hour (mph). The roadway right of way is approximately 66 feet wide. The roadway cross section varies by location in terms of the accommodation of on-street parking and pedestrians. As shown in Figure 4.9, in the core of the commercial district, from just north of MacDonough Drive to East Street, parallel parking is allowed on the west (southbound) side of the road and head-in, angle parking is allowed on the east (northbound) side. Sidewalks are provided on both sides of the road in this area. Building facades are located to within 30 feet of the edge of the traveled way in the core. North and

[1] http://anrmaps.vermont.gov/websites/anra/
[2] http://geodata.vermont.gov/datasets/a6041c19b39d4357b30dc13f9a5fe2bc_0

south of this core area there is no angle parking and on-street, parallel parking is more limited. South of MacDonough Drive there is only a sidewalk on the east side of the roadway. There are no designated bicycle accommodations (bike lanes or sharrow markings) in the Downtown Vergennes subarea.

As shown in Figure 4.9, the horizontal roadway alignment in the Downtown Vergennes subarea is generally tangent. There is an angle point at the Main Street intersection with East Street and a slight curve to the bridge over the Otter Creek. The roadway profile shown Figure 4.10 indicates a northbound upgrade of approximately 11 percent for 900 feet between Otter Creek and Maple Street. The upgrade continues at three percent from Maple Street to East Street.

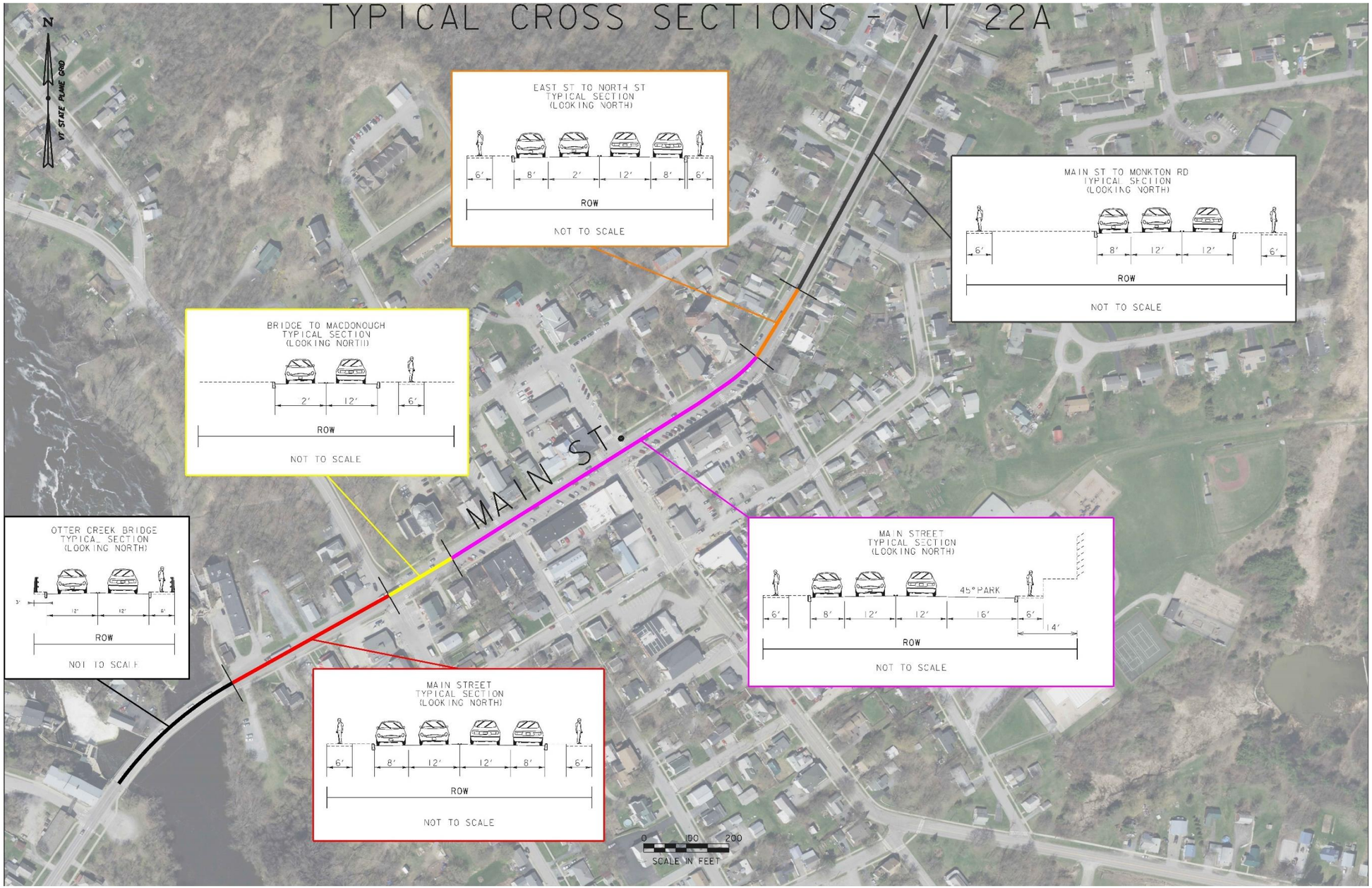

Figure 4-9 Downtown Vergennes Subarea and Roadway Cross Sections

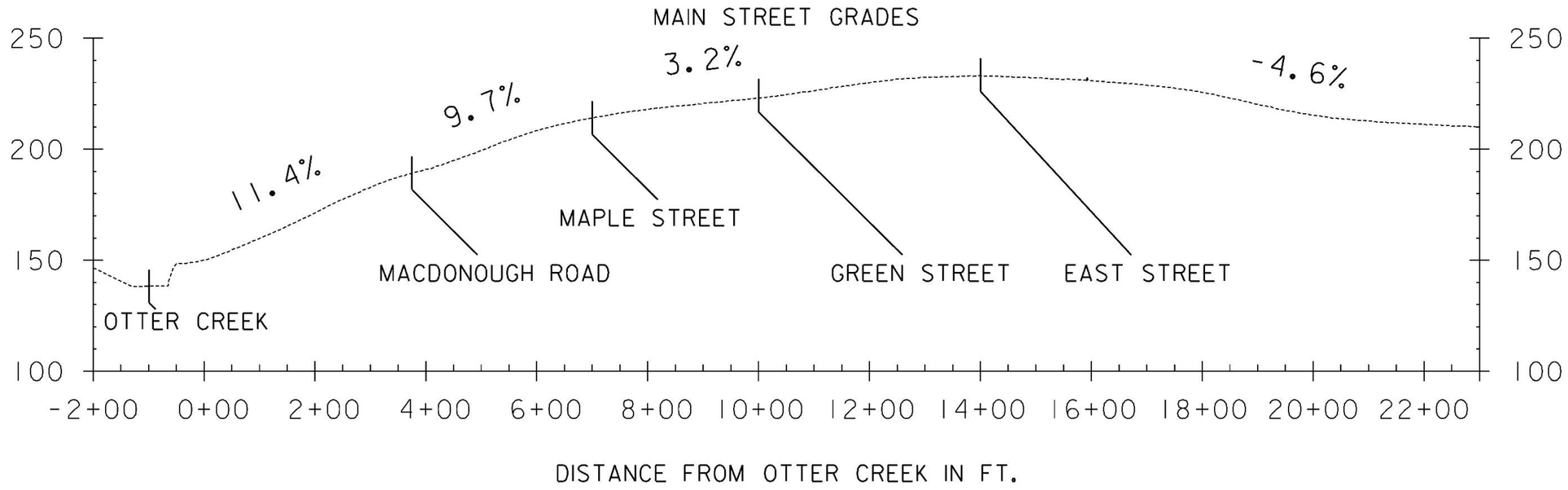

Figure 4-10 Main Street Grades

Within this subarea there are five major intersections along Main Street. Numerous private driveways enter Main Street outside of the core area. Roadway and traffic control conditions at the five major intersections are described below.

4.2.1.1 MacDonough Drive/South Water Street/Main Street

An aerial image of the four-way MacDonough Drive/South Water Street/Main Street intersection is provided in Figure 4.11. As shown, Main Street provides one travel lane in each direction at this intersection with on-street, parallel parking along the southbound approach. The MacDonough Drive approach (from the west) is under STOP sign control and includes one approach lane. The South Water Street, westbound approach, is also under STOP sign control with a shared through/left-turn lane and a dedicated right-turn lane. An overhead flashing beacon, red on Main Street and yellow on the side streets, reinforces the STOP-control condition. Head-in, 90-degree parking is allowed for commercial uses on both sides of South Water Street. Crosswalks are provided on the north and east intersection legs. Per Table 4.3 above, this intersection operates at LOS D during the PM peak hour with the longest delays experienced on the South Water Street approach.

Figure 4-11 MacDonough Drive/South Water Street/Main Street Intersection

4.2.1.2 Maple Street/Main Street

An aerial image of the four-way Maple Street/Main Street intersection is provided in Figure 4.12. As shown, Main Street provides one travel lane in each direction at this intersection with angle parking on the northbound side of the street and parallel parking on the southbound side. The South Maple Street approach is a single lane approach under STOP sign control with parallel on-street parking permitted on the south side of the roadway. North Maple Street is one-way westbound with parallel parking on the north side of the street. Crosswalks are provided on the south, west and east intersection legs.

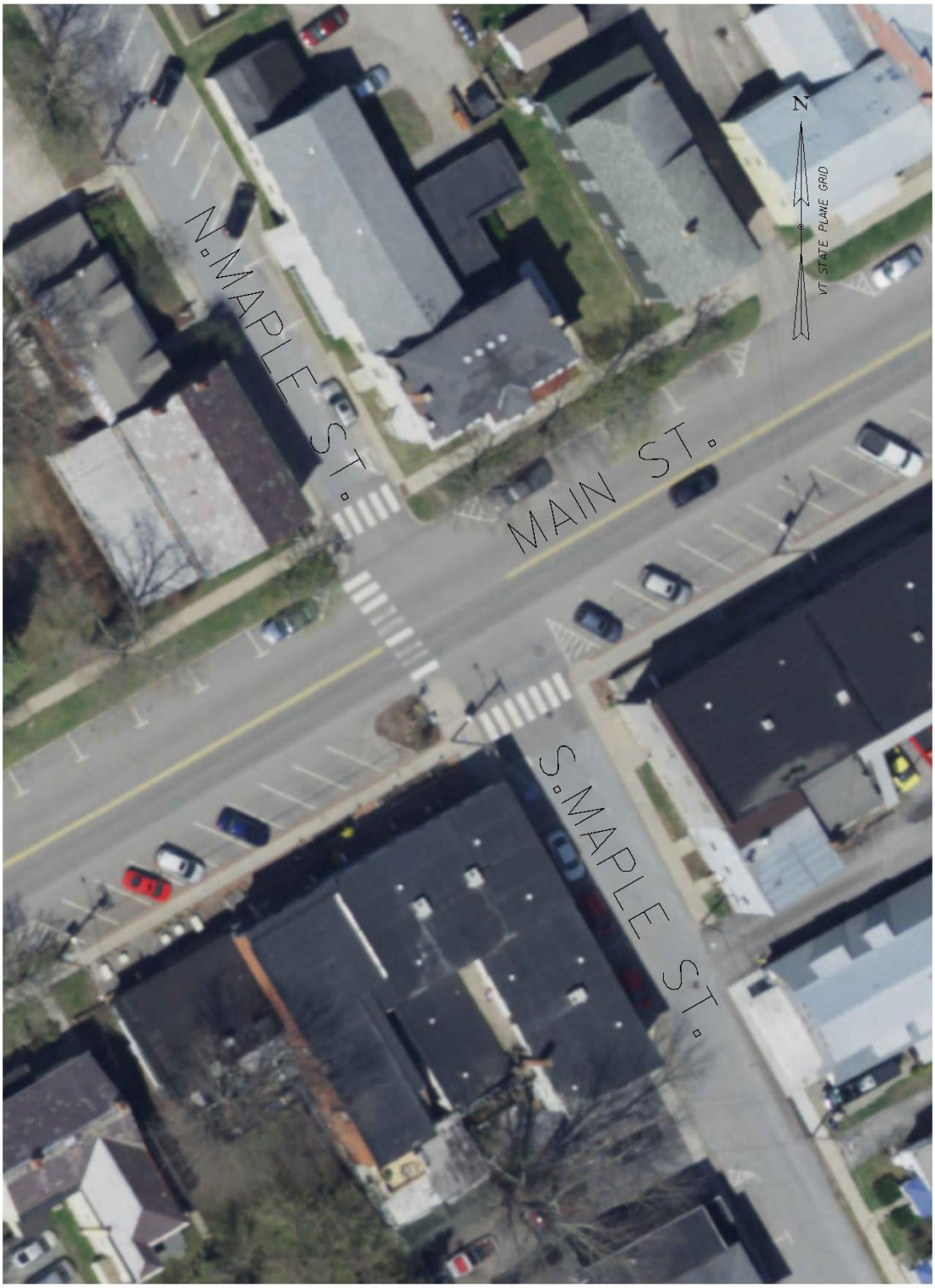

Figure 4-12 Maple Street/Main Street Intersection

4.2.1.3 Green Street/Main Street

An aerial image of the four-way Green Street/Main Street intersection is provided in Figure 4.13. As shown, Main Street provides one travel lane in each direction at this intersection with angle parking on the northbound side of the street and parallel parking on the southbound side. Green Street west of Main Street is a two-lane, two-way road with angle parking on the westbound side and parallel parking on the eastbound side. Green Street east of Main Street is also a two-lane, two-way roadway with parallel parking on the south side and a Green Mountain Transit bus stop on the north side. The intersection is under traffic signal control. The signal operates with two phases separately serving: north/south vehicular traffic and east/west vehicular traffic Crosswalks on all intersection legs. Per Table 4.3 above, this intersection operates at LOS B during the PM peak hour.

Figure 4-13 Green Street/Main Street Intersection

4.2.1.4 East Street/Main Street

An aerial image of the East Street/Main Street intersection is provided in Figure 4,14. As shown, East Street enters Main Street from the east to create a T-type intersection. East Street is a one-way roadway and provides one travel lane westbound with parallel parking permitted on the south side. The East Street approach is under STOP sign control. Main Street provides one travel lane in each direction. South of the intersection there is angle parking permitted in the northbound direction and parallel parking in the southbound direction. North of the intersection parallel parking is permitted on both sides. A crosswalk is provided across East Street.

Figure 4-14 East Street/Main Street Intersection

4.2.1.5 Monkton Road/Main Street

An aerial image of the three-way Monkton Road/Main Street intersection is provided in Figure 4.15. As shown, Main Street provides one travel lane in each direction at this intersection. No parking is allowed on the intersection approaches. Similarly, Monkton Road provides one travel lane in each direction with no parking allowed. The intersection is under traffic signal control. The signal operates with two phases separately serving: Main Street vehicular traffic and Monkton Road westbound vehicular traffic. Crosswalks are provided on the south and east intersection legs. Per Table 4.3 above, this intersection operates at LOS C during the PM peak hour.

Figure 4-15 Monkton Road/Main Street Intersection

4.2.2 Traffic Volumes

Daily traffic and peak hour traffic volumes in the Downtown Vergennes subarea were presented above. A closer view of the data is provided in Figure 4.16. It shows the highest volume segment on Main Street is between Otter Creek and Green Street as this segment carries all through traffic plus traffic circulating within the downtown area. This segment carries approximately 11,300 vehicles per day. This volume includes 566 large trucks.

Figure 4-16 Daily Traffic Volumes on Main Street

4.2.3 Crash History

Figure 4.17 provides a more detailed view of the crash experience in Downtown Vergennes. As noted, most of the crashes occurred at intersections or on the approaches to intersections. As reported earlier, no crashes involved pedestrians or bicyclists. Trucks were involved in only one crash.

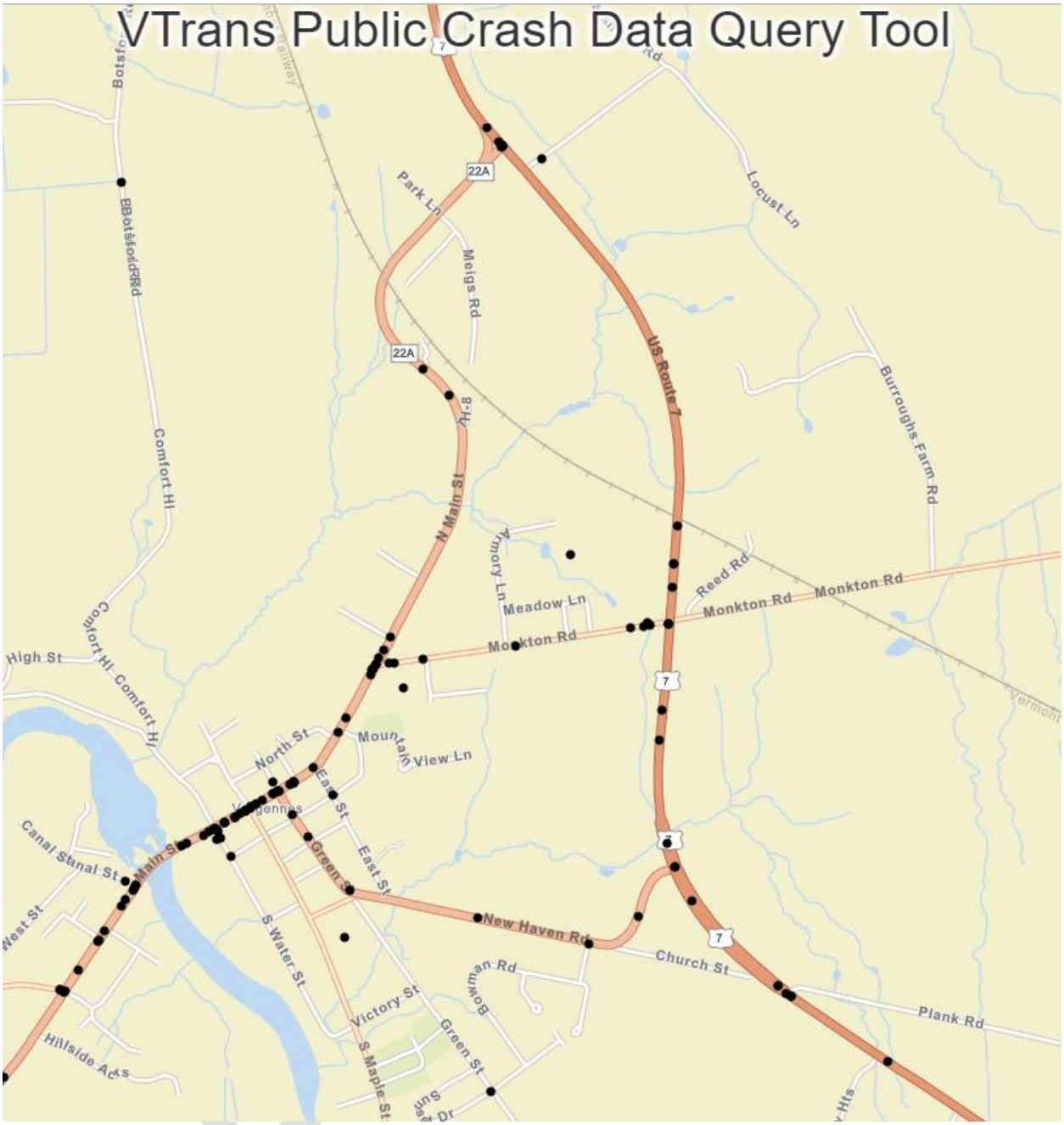

Figure 4-17 Vehicle Crashes on Main Street (2013 – 2017)

4.2.4 Economic Factors/Land Use

Text and Table 4-5 to be added.

Table 4-5

4.2.5 Natural and Cultural Resources

Land within the Downtown Vergennes subarea is heavily developed with limited natural areas. The land along Otter Creek abutting the Downtown Vergennes subarea is within range of two rare bat species. Hazardous waste sites are identified adjacent to Main Street. These sites are mapped in Figure 4-18. Also, structures along Main Street and parcels adjacent to Otter Creek have historic and archeological significance.

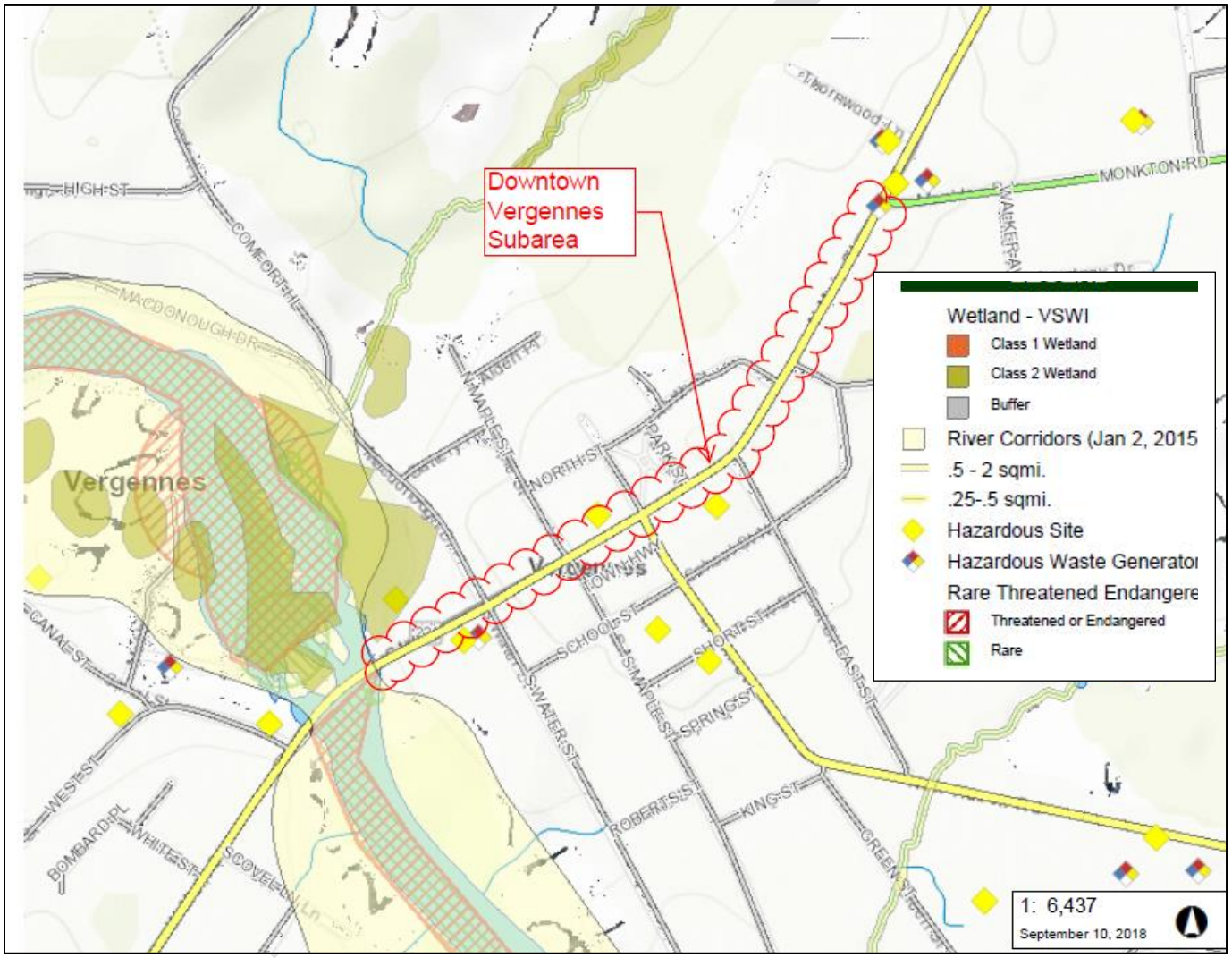

Figure 4-18 Natural and Cultural Resources – Downtown Vergennes Subarea

4.2.5.1 Wetlands

As developed land, the only areas mapped in the Vermont Significant Wetland Inventory (VSWI) wetlands in the subarea are comprised of Otter Creek and adjacent wetlands.

4.2.5.2 Rare or Endangered Species

The Northern Long-eared Bat (*Myotis septentrionalis*) is a Federally and State listed species known throughout Vermont. No known hibernacula or maternal roosts are known within one mile of the subarea. In addition, the subarea is also within the observed summer range of the Indiana bat (*Myotis sodalis*), another Federally and State listed species. Several additional rare aquatic and terrestrial species are mapped within or along Otter Creek just outside of the subarea.

4.2.5.3 Farmland Soils of Statewide Importance

According to the ANR program, there are soils within the Downtown Vergennes subarea mapped as Farmland Soils of Statewide Importance. State policy applying to these soils, the Farmland Policy Protection Act, does not apply to projects within existing roadway right-of-ways or urbanized areas. If any work is proposed outside of existing Main Street right-of-way, authorization from the Natural Resource Council may be required.

4.2.5.4 Historic Resources

According to the 2014-2019 Vergennes Municipal Development Plan, the Vergennes Main Street Historic District is listed in the National Register of Historic Places. It includes archeologically sensitive areas of 18th and 19th century military occupation, including parcels along Otter Creek known as MacDonough's Shipyard and Fort William, as well as locations significant from the War of 1812.

4.2.5.5 Public Lands

The Downtown Vergennes Study Area does not include public lands developed with Land and Water Conservation Funds (LWCF, a Section 6(f) resource), but the Vergennes Falls Park adjacent to Otter Creek just downstream of the dam and VT 22A was developed, in part, with LWCF funds.

4.2.5.6 Hazardous Waste Sites

The ANR mapping program was reviewed for information on Hazardous Waste Sites. A few locations adjacent to the Main Street are considered Hazardous Sites or Hazardous Waste Generators. In urban areas these sites are typically associated with gas stations or other uses featuring hazardous chemicals.

4.3 VT 22A SUBAREA (OUTSIDE DOWNTOWN VERGENNES)

The VT 22A Subarea includes sections of VT 22A outside Downtown Vergennes as noted in Figure 4.19. As shown, it includes a one-mile segment between US 7 and Monkton Road and six-mile segment between Otter Creek and VT 17. The north segment is relevant to this study as it is expected that for the New Alignment alternative, the northern terminus of the new roadway will intersect this section of VT 22A. Similarly, the southern terminus of the new alignment roadway will intersect the southern segment of this subarea. Additionally, the southern segment of this subarea can serve as a baseline for analyzing the VT17 Truck Route alternative.

4.3.1 Roadway Conditions

The northern section of the VT 22A (Outside Downtown Vergennes) subarea is a two-lane, two-way roadway classified as a minor arterial. The roadway cross section show in Figure 4.19 is approximately 30 feet wide with 12 feet wide travel lanes and three feet wide paved shoulders. The posted speed limit is 30 mph. There are sidewalks on both sides of the roadway for approximately 1100 feet north of Monkton Road. North of this location the sidewalk continues on the east side of the roadway for another 1600 feet to an enhanced crosswalk at the police station. The vertical alignment is relatively level. The horizontal alignment is straight for approximately 1400 feet north of Monkton Road and for approximately 1200 south of US 7. In between an "S-Turn" brings the roadway under the Vermont Central Railroad.

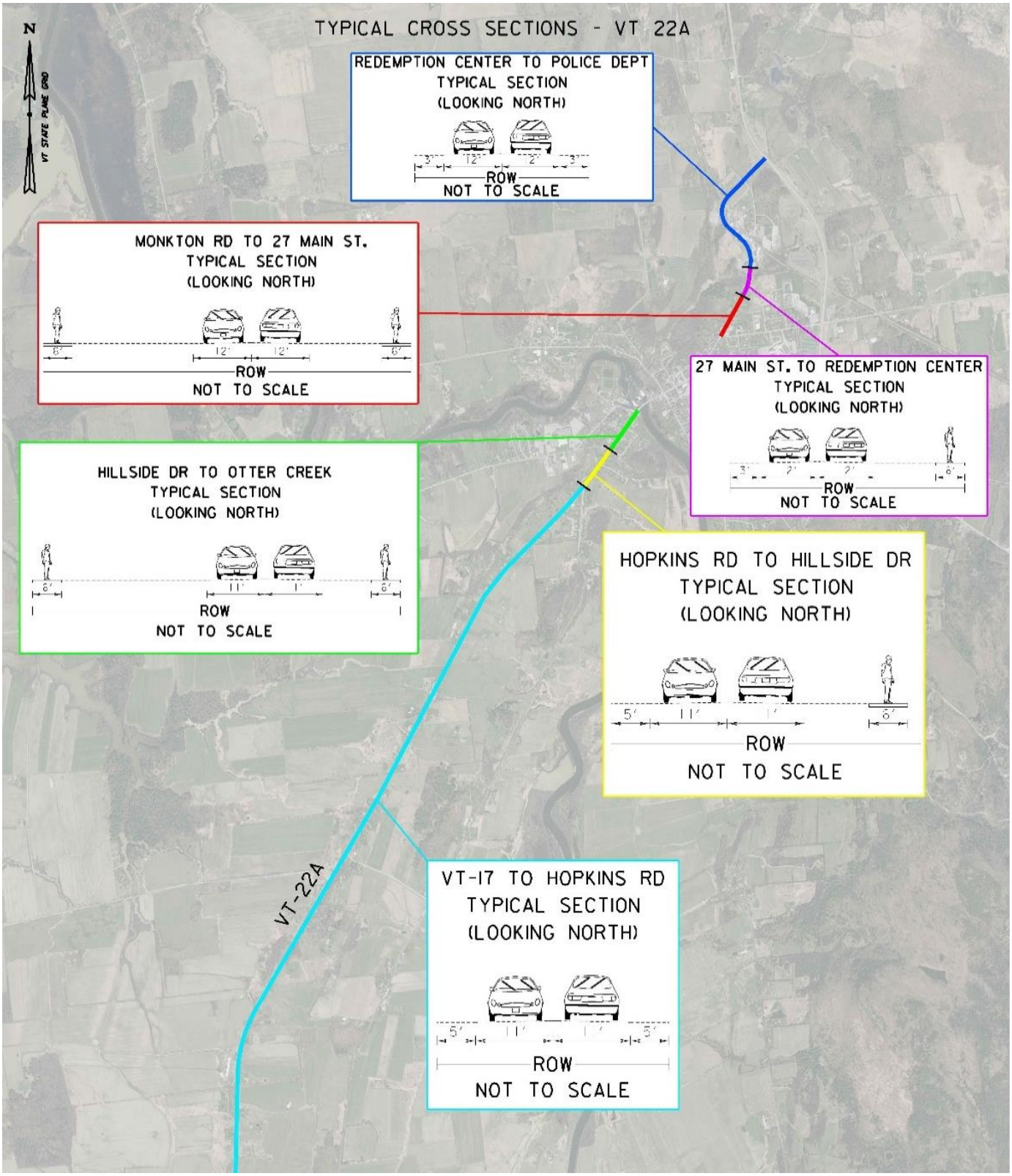

Figure 4-19 VT 22A Subarea and Roadway Cross Sections

Several residential streets intersect this roadway as do numerous commercial and residential driveway. The Ferrisburgh Park and Ride driveway meets VT 22A north of the railroad underpass and opposite Meigs Road at a two-way, STOP-control intersection.

The southern section of the VT 22A subarea is also a two-lane, two-way roadway classified as a minor arterial. The roadway cross section varies as noted in Figure 4.19. Within Vergennes the roadway is typically 24 feet wide with no paved shoulders. The posted speed limit is 30 mph and abutting land uses are residential. There are sidewalks on both sides of the roadway from Otter Creek south to Panton Road. South of Panton Road the sidewalk continues on the east side only to Hopkins Road. This segment is on a long northbound downgrade leading to Otter Creek. South of the Vergennes City limit the roadway widens to approximately 32 feet with 11 feet wide travel lanes and five feet wide shoulders. The speed limit increases to 50 mph. The alignment is generally tangent through rolling terrain. Abutting land uses are low density residential and agricultural.

4.3.1.1 US 7/VT 22A

The VT 22A intersection with US 7 is the only major intersection located in the northern segment of this subarea. An aerial image of the intersection is provided in Figure 4.20. The VT 22A intersection with US 7 is under traffic signal control. This intersection includes separate lanes for all turning movements: one left-turn lane and one right-turn lane on VT 22A; one left-turn lane and one through lane on US 7 northbound; and, one channelized right-turn lane and one through lane on US 7 southbound. The signal operates with two phases serving US 7 and VT 22A approaches separately. There are no sidewalks or pedestrian signal indicators at this intersection. Per Table 4.3 above, this intersection operates at LOS B during the PM peak hour.

Figure 4-20 VT 22A/US 7 Intersection

4.3.1.2 Panton Road/VT 22A

Panton Road enters VT 22A from the west approximately 1200 feet south of the Otter Creek and opposite Elm Street to form a four-way intersection. There are single approach lanes on each leg of the intersection as shown in Figure 4.21. The Panton Road and Elm Street approaches are under STOP sign control. An overhead beacon provides a flashing red indication for the side streets and flashing yellow for VT 22A. There are sidewalks on at least one side of each leg of the intersection and crosswalks on the east, north and west legs. A sidewalk on the north side of Panton Road continues west approximately 2000 feet to First Street passing the UTC Aerospace Systems facility. This is a major employer in the area and major traffic generator. Per Table 4.3 above, this intersection operates at LOS E during the PM peak hour with the longest delays experienced on the eastbound approach.

Figure 4-21 Panton Road/VT 22A Intersection

4.3.1.3 VT 17/VT 22A

Approximately six miles south of the Otter Creek, VT 17 crosses VT 22A in Addison. At this four-way intersection STOP sign control is provided on the VT 17 approaches reinforced with overhead flashing red beacons on VT 17 and flashing yellow beacons on VT 22A. All intersection approaches have a single lane as shown in Figure 4.22. There are no sidewalks or crosswalks present at this intersection. Abutting land uses include a church and a general store. Per Table 4.3 above, this intersection operates at LOS C during the PM peak hour with the longest delays experienced on the eastbound approach.

Figure 4-22 VT 17/VT 22A Intersection

4.3.2 Traffic Volumes

The turning movement counts at the two intersections in the south section of this subarea, see Figures 4-4 and 4-5, indicate a similar pattern. At both the Panton Road and VT 17 intersections, the heaviest side street volumes are on the eastbound approaches where most eastbound traffic turns left to head north. The reverse routing is evident for southbound traffic on VT 22A turning right to head west. At US 7 in the northern end of this subarea, most northbound traffic on VT 22A turns left to head north on US 7. Similarly, most traffic headed southbound on VT 22A from US 7 originates from US 7 North.

4.3.3 Economic Factors/Land Use

Text and Table 4-6 to be added.

Table 4-6

4.4 VT 17 SUBAREA

The VT 17 Subarea includes the 7.3-mile section of VT 17 between VT 22A in Addison and US 7 in New Haven. Under Alternative Action C, this roadway section would carry the through truck traffic that now passes through Downtown Vergennes on VT 22A. The roadway would also be upgraded to accommodate the truck traffic.

4.4.1 Roadway Conditions

VT 17 is a two-lane, two-way roadway classified as a minor arterial. The typical roadway section as noted in Figure 4.23 includes two 11-feet wide travel lanes and two to three feet wide paved shoulders. The bridge over Otter Creek is being reconstructed. The bridge will include 11-feet wide travel lanes and four-feet wide shoulders. The roadway is generally posted for 45 mph however, lower, advisory speed limits are posted at six sharp horizontal curves. The locations of horizontal curves that do not meet standards for a 45-mph design speed are noted in Figure 4.24. Locations where vertical curves do not meet the 45-mph design standard are also noted. Seven locations are noted where vertical grades along the roadway exceed six percent. Finally, there are four cross streets noted where a combination of vertical grades, horizontal curvature and/or roadside obstructions result in unsafe sight lines for a 45-mph driving speed.

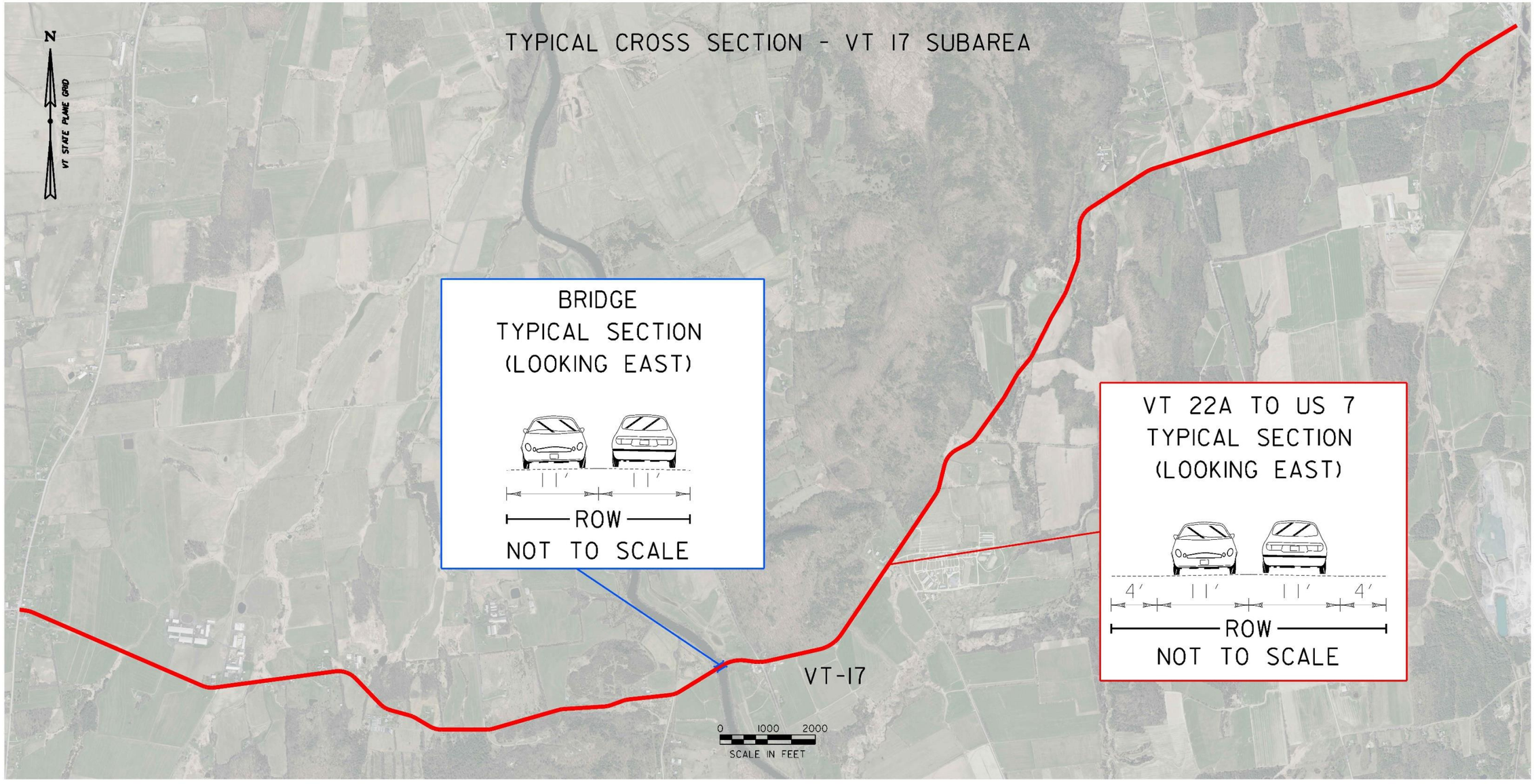

Figure 4-23 VT 17 Subarea and Roadway Cross Section

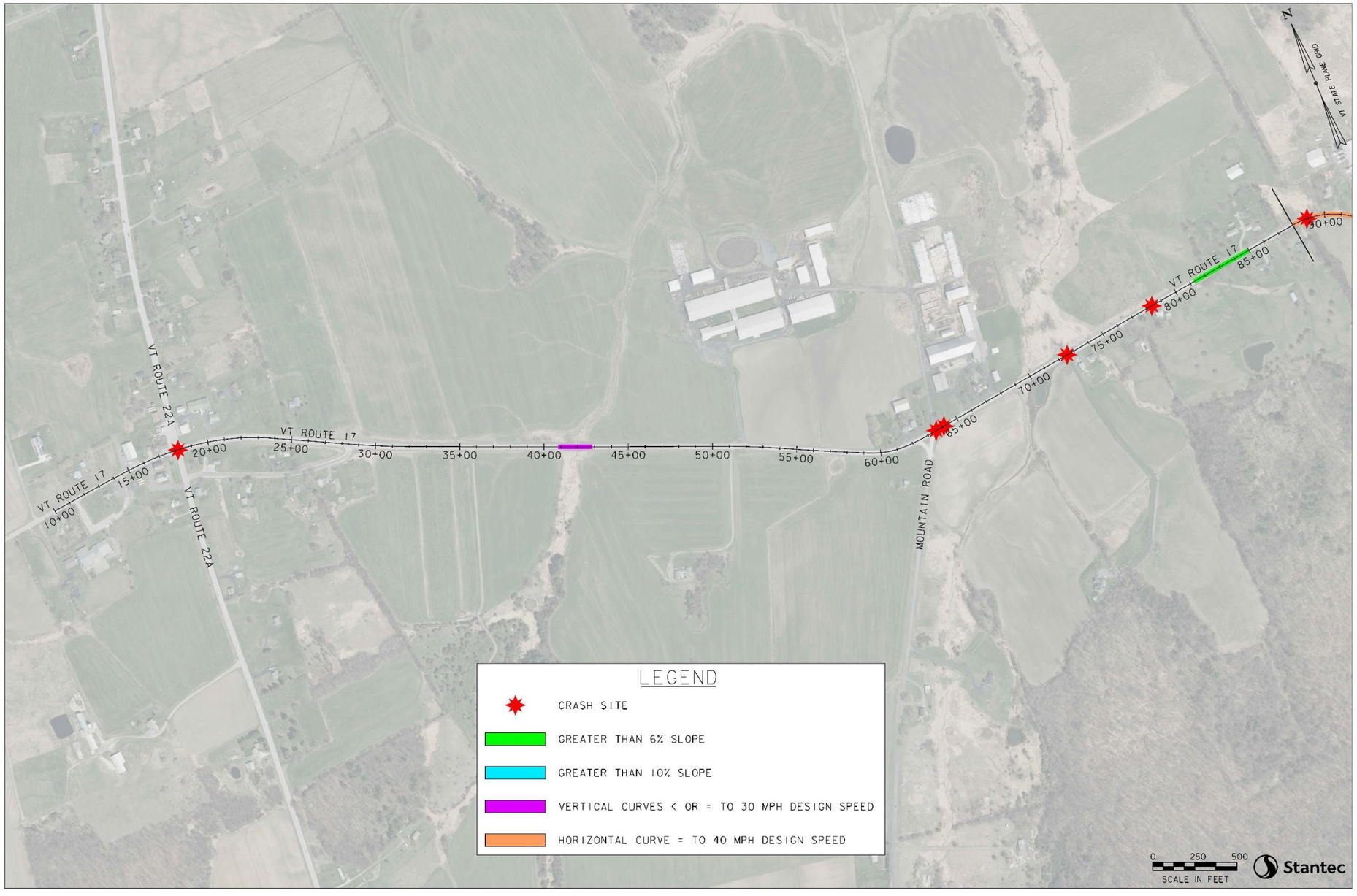

Figure 4-24a VT 17 Design Deficiencies

Figure 4-25b VT 17 Design Deficiencies

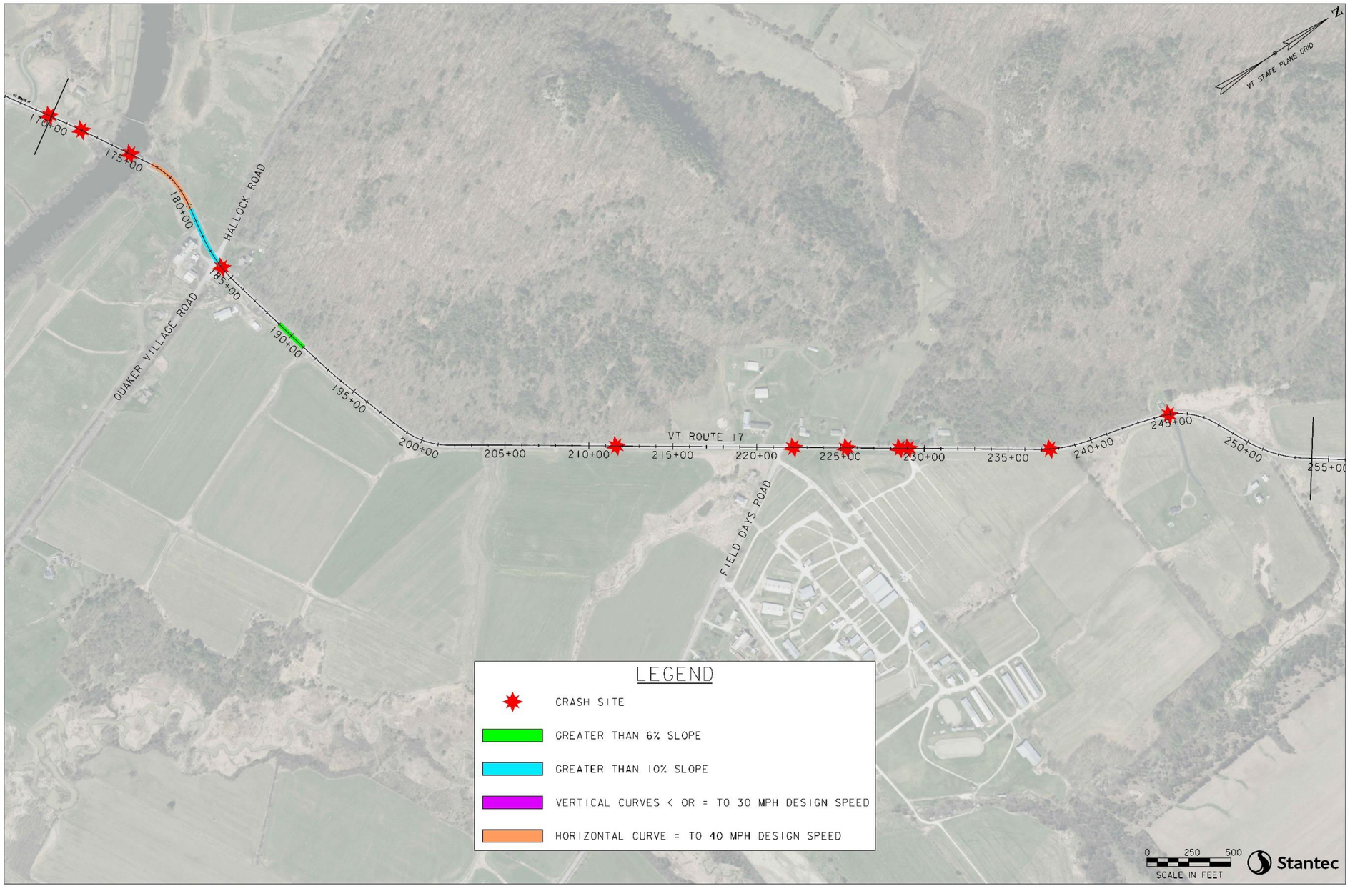

Figure 4-26c VT 17 Design Deficiencies

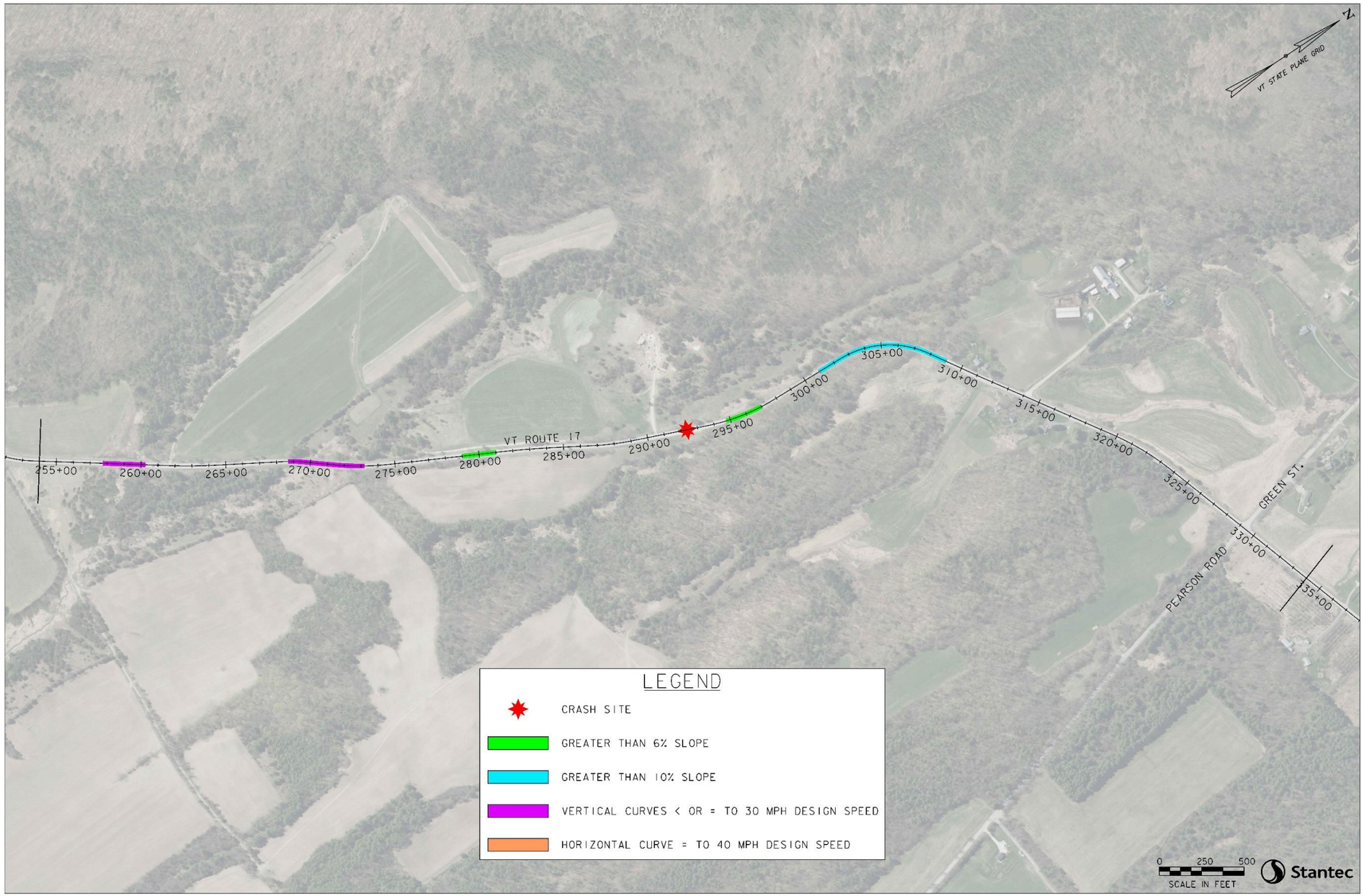

Figure 4-27d VT 17 Design Deficiencies

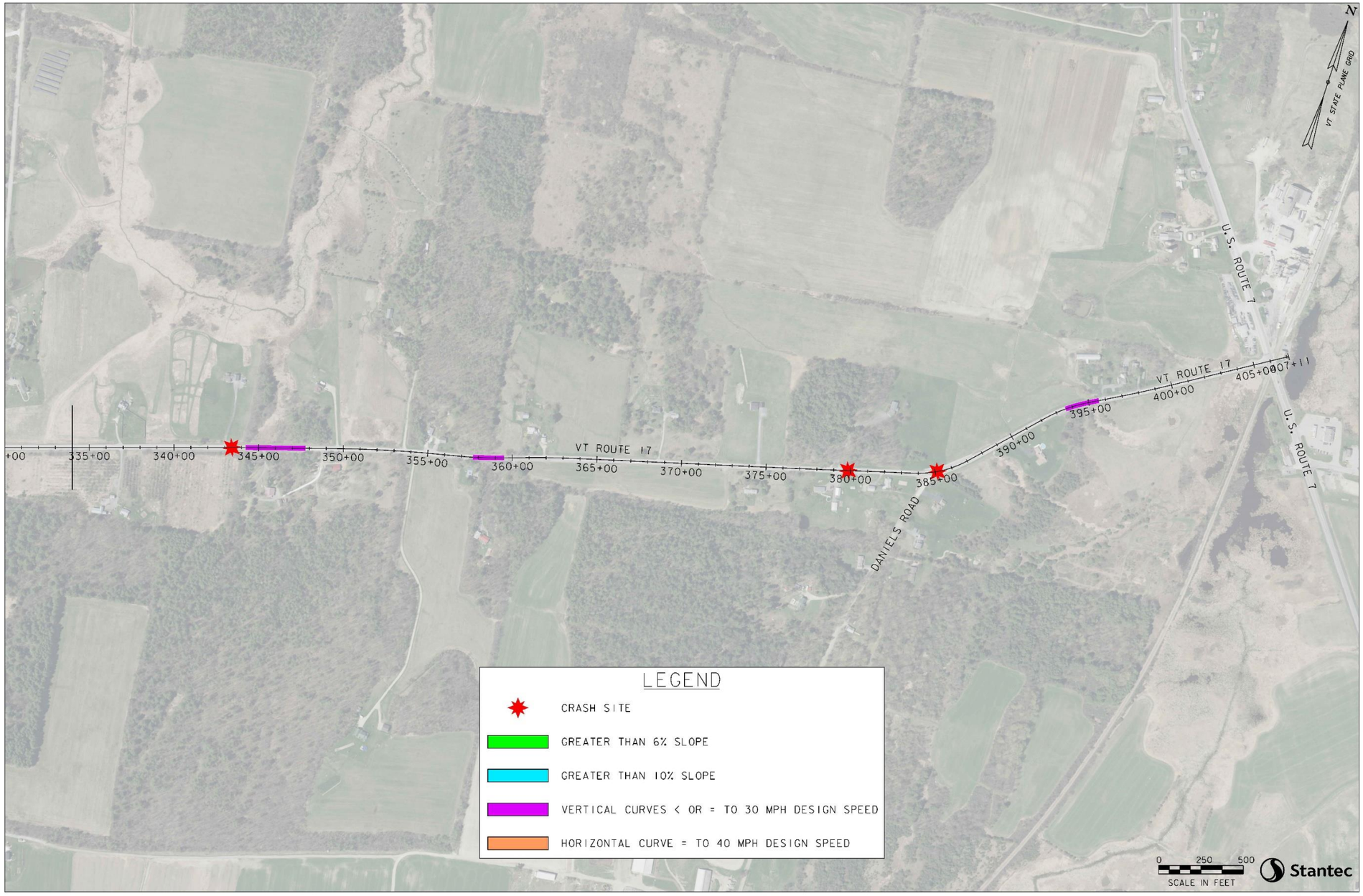

Figure 4-28e VT 17 Design Deficiencies

4.4.1.1 VT 17/US 7

The VT 17 enters US 7 from the east to form an unsignalized T-type intersection. The VT 17 approach is under STOP sign control. There is a railroad crossing on the US 7 South leg of the intersection as shown in Figure 4.25. All approaches have overhead railroad warning lights. The westbound and southbound approaches are single lane approaches. The northbound US 7 approach has a through lane and a dedicated left turn lane for traffic destined to VT 17. There are no sidewalks or crosswalks at this intersection. Abutting land uses include a former railroad depot on the east side of the intersection, an auto repair center north of VT 17 and undeveloped land south of VT 17. Phoenix Feeds operates from the former railroad depot and generates significant truck traffic. Per Table 4.3 above, this intersection operates at LOS B during the PM peak hour.

Figure 4-29 VT 17/US 7 Intersection

4.4.2 Economic Factors/Land Use

Text and Table 4-7 to be added.

Table 4-7

4.4.3 Natural and Cultural Resources

The Route 17 subarea includes VSWI wetlands and streams. Several rare species have been identified within this subarea, and it is within range of two rare bat species. In addition, the subarea includes Prime Agricultural Soils and Agricultural Soils with Statewide Significance. Finally, this subarea includes mapped Hazardous Waste Sites. Natural and cultural resources located within or adjacent to this subarea are mapped in Figures 4.26 and 4.27.

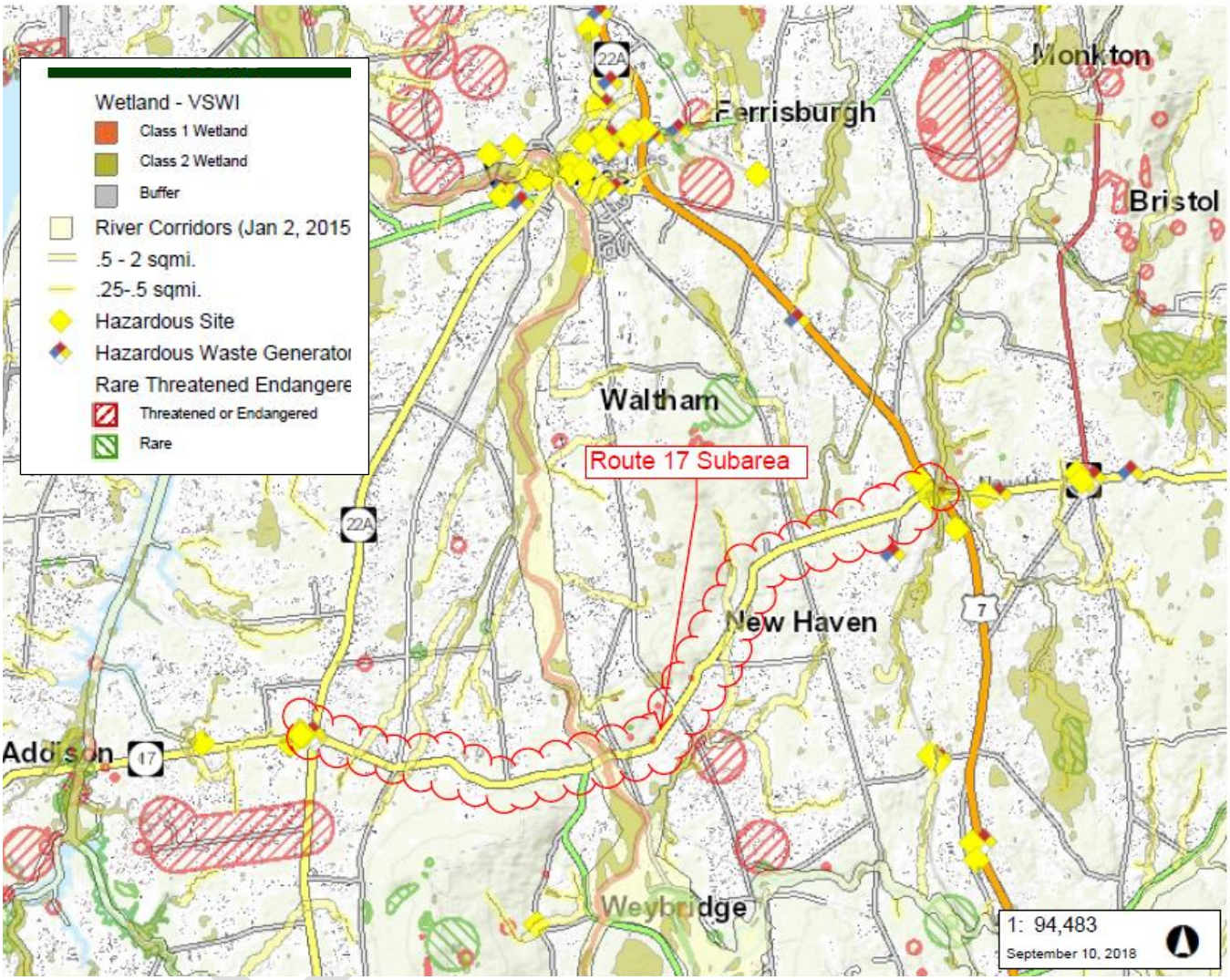

Figure 4-30 Natural and Cultural Resources – VT 17 Subarea

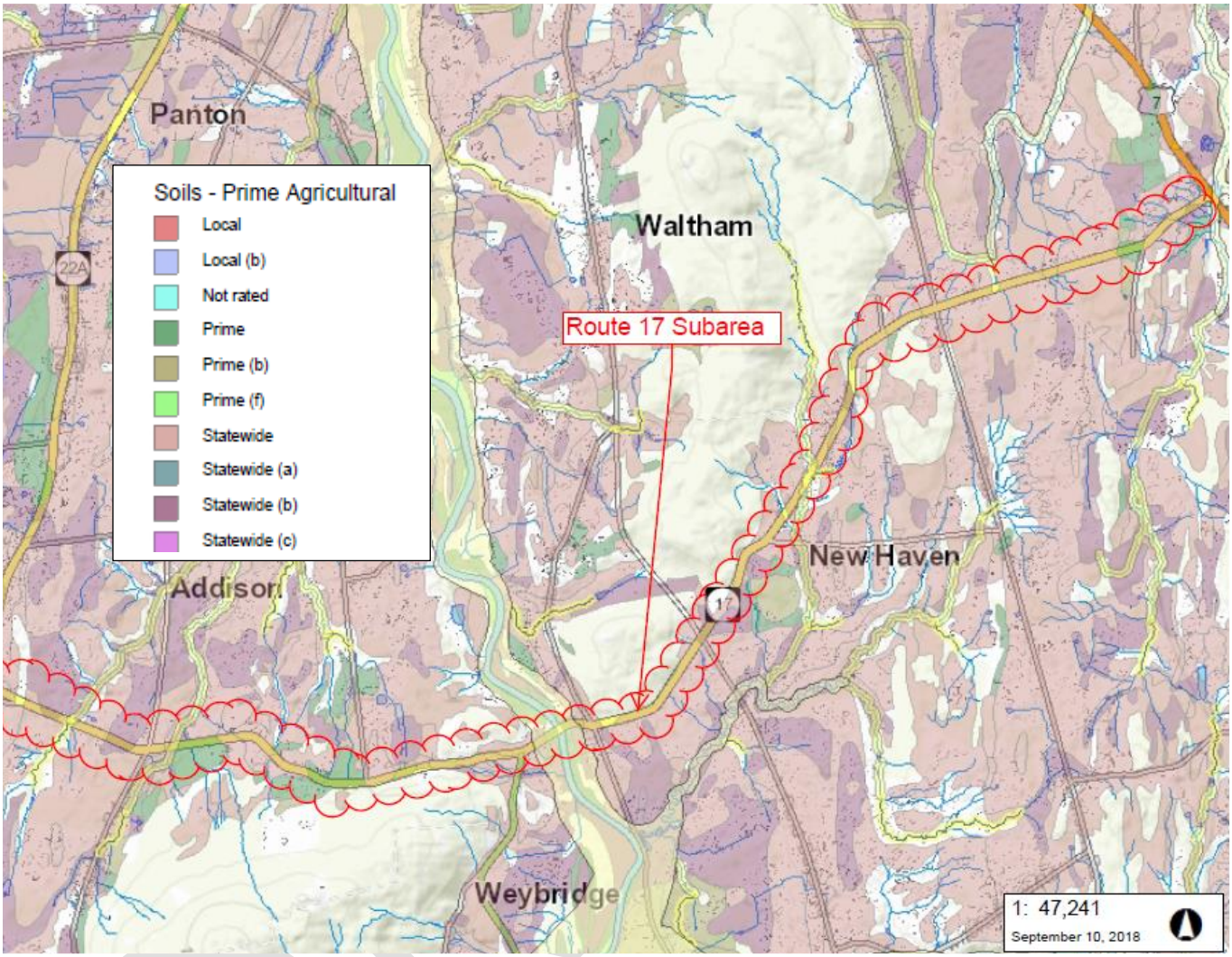

Figure 4-31 Agricultural Soils Mapping – VT 17 Subarea

4.4.3.1 Wetlands

The Route 17 subarea is sparsely developed with farms and residences. There are several VSWI wetlands adjacent to Route 17 in the subarea. In addition, Route 17 crosses over Otter Creek and wetlands adjacent to it. Several other streams and tributaries cross under Route 17, including tributaries to Otter Creek, Mud Creek, and Little Otter Creek.

4.4.3.2 Rare or Endangered Species

Several rare species are mapped within the subarea. The Northern Long-eared Bat is a Federally and State listed species known throughout Vermont. No known hibernacula or maternal roosts are known within one mile of VT 17. This subarea is also within the observed summer range of the Indiana bat, another Federally and State listed species, and this species was historically found in this area. Several rare species are mapped within or along Otter Creek in the subarea.

4.4.3.3 Farmland Soils of Statewide Importance

There are soils within the subarea mapped as Prime Agricultural Soils and Farmland Soils of Statewide Importance. The Farmland Policy Protection Act does not apply to projects within existing highway right-of-way. If any work is proposed outside of existing right-of-way, authorization from the NRCS via form CPA-106, the Farmland Conversion Impact Rating form for corridor projects, may be required.

4.4.3.4 Historic Resources

Just to the west of this Subarea is the Addison Baptist Church, which is on the National Registry of Historic Places (a Section 4(f) resource).

4.4.3.5 Public Lands

The Route 17 subarea does not include known historic or public recreation lands (a Section 4(f) resource) or public lands developed with Land and Water Conservation Funds (a Section 6(f) resource).

4.4.3.6 Hazardous Waste Sites

A few locations at the west and east ends of the VT 17 subarea are considered Hazardous Sites or Hazardous Waste Generators.

4.5 US 7 SUBAREA

US 7 between VT 17 in New Haven and VT 22A in Ferrisburgh would carry through truck traffic that now passes through Downtown Vergennes on VT 22A under Alternative Action C. This is a 5.3-mile roadway segment.

4.5.1 Roadway Conditions

US 7 is a two-lane, two-way roadway classified as a major arterial. The typical roadway section as noted in Figure 4.28 includes two 12-feet wide travel lanes and five-feet wide paved shoulders. The terrain is generally rolling and climbing lanes are provided on steeper sections as noted in Figure 4.28. One such section is on US 7 northbound just north of its intersection with VT 17. The roadway is generally posted for 50 mph however, lower speeds are posted in advance of major intersections. The major intersections along the roadway include junctions with VT 22A at the northern end of the study area and VT 17 at the southern end of the study area. (These two intersections were described above.) Monkton Road crosses US 7 at a signalized intersection near the northern end of the study area. The roadway passes through a rural area. Abutting land uses including agricultural land, low-density residential development, undeveloped land, and commercial properties.

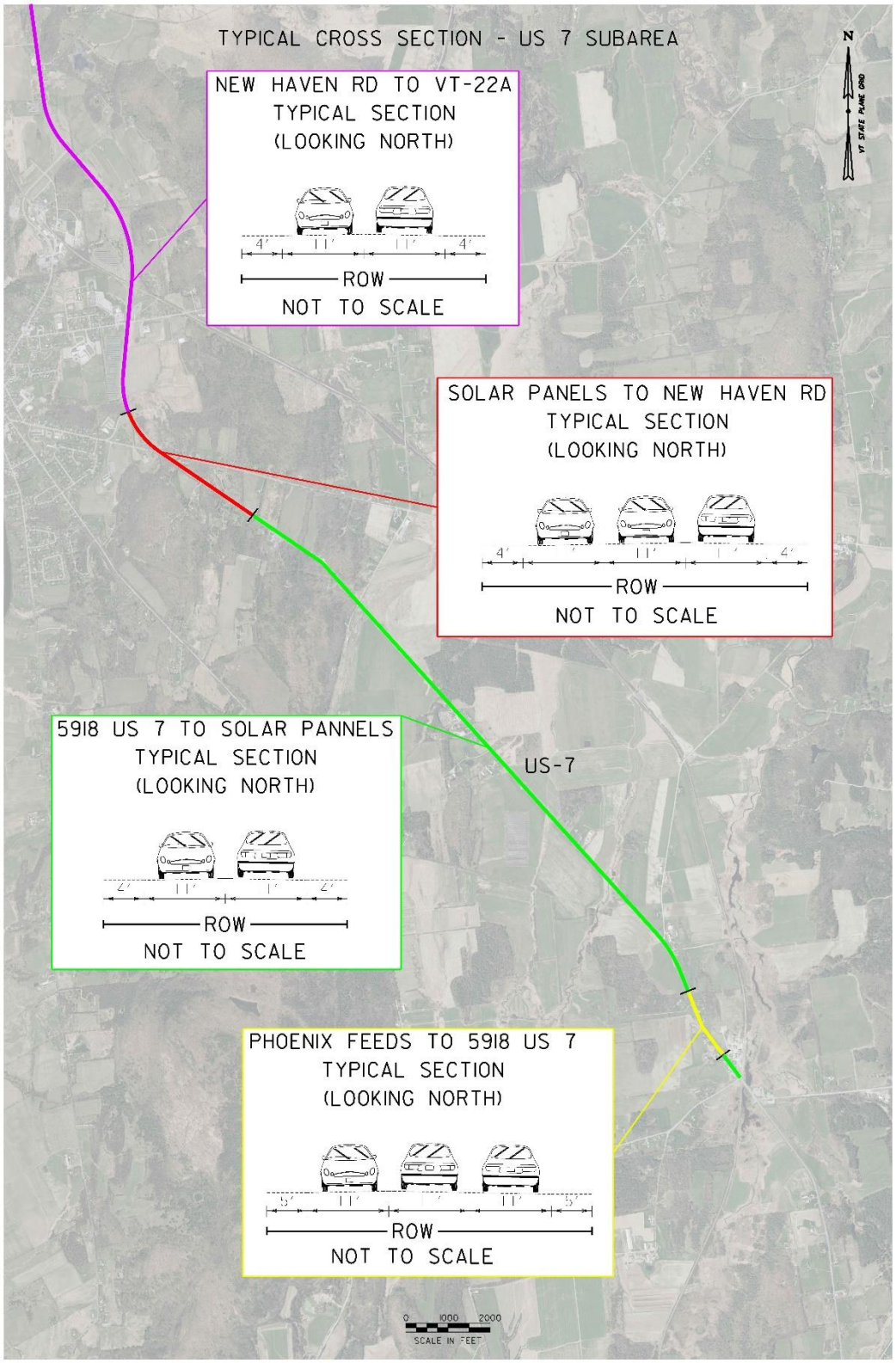

Figure 4-32 US 7 Subarea and Roadway Cross Sections

4.5.1.1 Monkton Road/US 7

Monkton Road crosses US 7 approximately 0.9 miles south of the VT 22A/US 7 intersection. The intersection is under traffic signal control. As shown in Figure 4.29, the eastbound and westbound Monkton Road approaches are single lane approaches. The northbound US 7 approach has a through lane and a dedicated left turn lane. The southbound US 7 approach has three lanes with a right-turn lane, a through lane and left-turn lane. The signal provides protected intervals for US 7 left turn movements. There are no sidewalks or crosswalks at this intersection. Abutting land uses are commercial in all four quadrants including a solar farm in the southwest quadrant. Per Table 4.3 above, this intersection operates at LOS C during the PM peak.

Figure 4-33 Monkton Road/US 7 Intersection

4.6 NEW ALIGNMENT SUBAREA

An alignment for a new roadway that would circumvent Downtown Vergennes to the west and north has been assumed for analysis purposes. The assumed alignment, shown in Figure 4.30 would leave VT 22A near the Vergennes/Panton municipal boundary to the south and rejoin VT 22A just south of the existing railroad underpass. The roadway would cross over the Otter Creek and have at-grade intersections with Panton Road, MacDonough Road and Comfort Hill Road. A 32-feet wide roadway cross section is assumed, matching the US 7 cross section. The roadway would be constructed within a minimum 60-feet wide right-of-way. The assumed roadway alignment indicates a 2.6-mile long new roadway. The assumed roadway alignment is just one of several alignments that could be considered and does not represent a recommended alignment. It is presented and analyzed to help quantify the costs and benefits that would be associated with such a roadway.

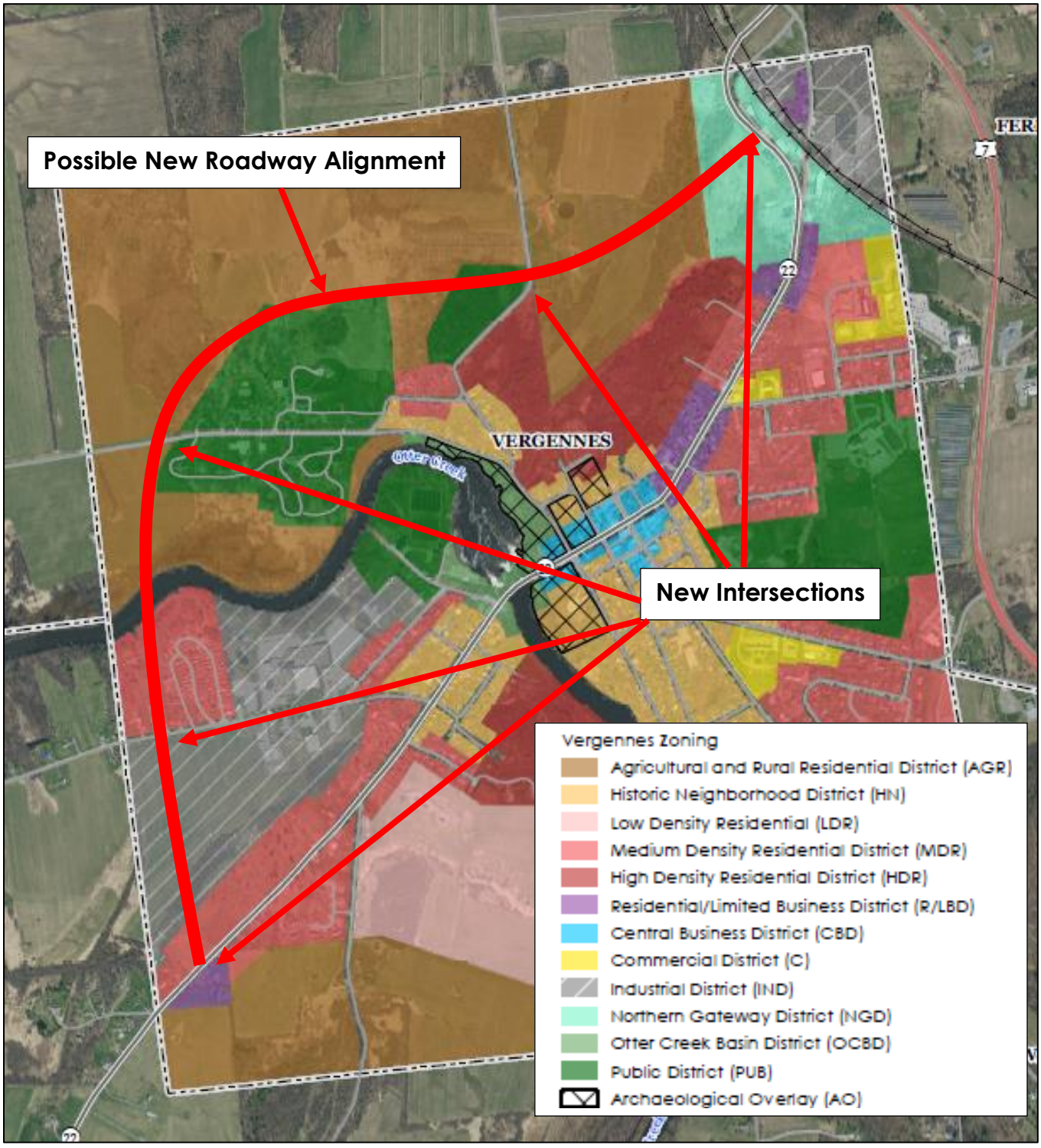

Figure 4-34 New Alignment Subarea and Land Use Conditions

4.6.1 Roadway Conditions

As noted above, a 32-feet wide roadway is assumed. It would be designed to VTrans standards for a major arterial with a design speed of 45 mph. By design, the posted speed limit, roadway length, and traffic controls at proposed intersections, would result in a longer travel time for passenger cars relative to travel on VT 22A through Downtown Vergennes. New intersections would be constructed at the three roadway crossings referenced above.

4.6.2 Traffic Volumes

Vehicular traffic volumes on Panton Road, MacDonough Drive and Comfort Hill Road will influence the design of the intersections of these roadways with the New Alignment roadway. As presented above, the daily traffic volume is 4100 vehicles on Panton Road. Intersection turning movement counts for the MacDonough Drive/Main Street intersection indicate a daily volume of approximately 600 vehicles on MacDonough Drive in the vicinity of the proposed New Alignment crossing. Traffic count data are not available for Comfort Hill Road. Volumes on this roadway are assumed to be comparable to the volumes on MacDonough Drive.

4.6.3 Economic Factors/Land Use

Figure 4.30 shows the proposed New Alignment roadway passing through multiple zoning districts. The Industrial District and two medium density residential districts are crossed at the southern end of the alignment, south of Otter Creek. North of Otter Creek the roadway would pass through the Agricultural and Rural Residential District and could have contact with the Public District. The northern terminus of the New Alignment Roadway is in the Northern Gateway District. As shown, the assumed roadway alignment purposely avoids developed parcels to the extent possible. However, it is likely that several residential properties would be impacted south of the Otter Creek. The New Alignment abuts the state-run jobs training center on MacDonough Drive.

Aligning the roadway through undeveloped land creates the opportunity for new development to occur should the roadway be built and access to these parcels enhanced. Parcels that would experience enhanced access were identified and Table 4.8 provides a summary of the land areas by zoning district represented by these parcels. As noted, the assumed New Alignment roadway would provide direct access to parcels representing 23 acres of industrial land, 646 acres of Agricultural and Rural Residential Land,26 acres of Medium Density Residential land and 23 acres of Northern Gateway District land. Another 78 acres of public land comprised primarily of the Northland Job Corps Center site would also have enhanced access. Data from the Vergennes Grand List was used to determine the assessed value of these properties. Text and Table 4-8 to be added.

Table 4-8

4.6.4 Natural and Cultural Resources

The New Alignment subarea is principally undeveloped or farmland. The Alternative Alignment subarea includes VSWI wetlands and streams. Several rare species have been identified within this subarea, and it is within range of two rare bat species. In addition, the subarea includes Prime Agricultural Soils and Agricultural Soils with Statewide Significance. Finally, this subarea includes

conserved lands purchased with Vermont Land Trust funds. Natural and cultural resources located within or adjacent to this subarea are mapped in Figures 4.31 and 4.32.

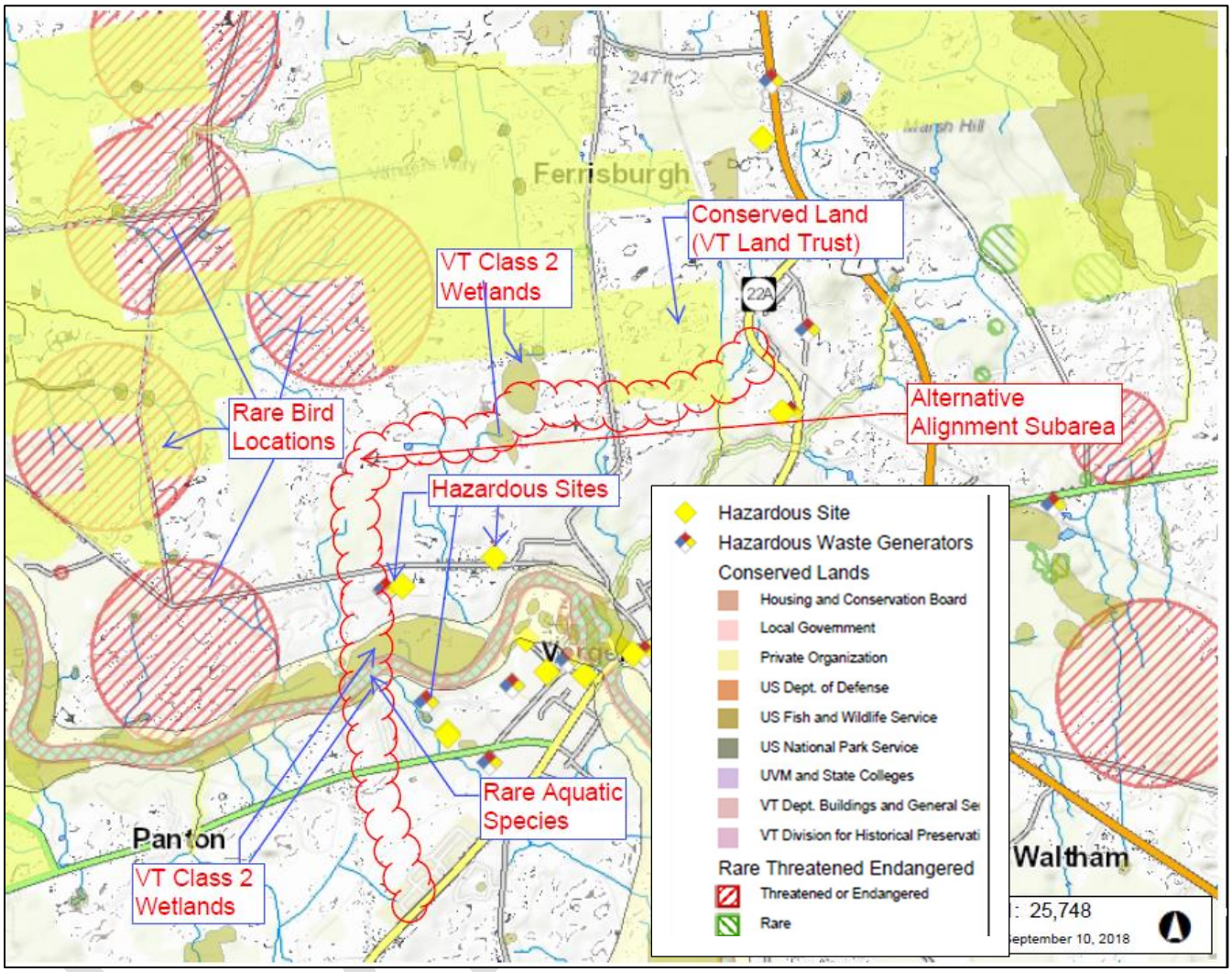

Figure 4-35 Natural and Cultural Resources – New Alignment Subarea

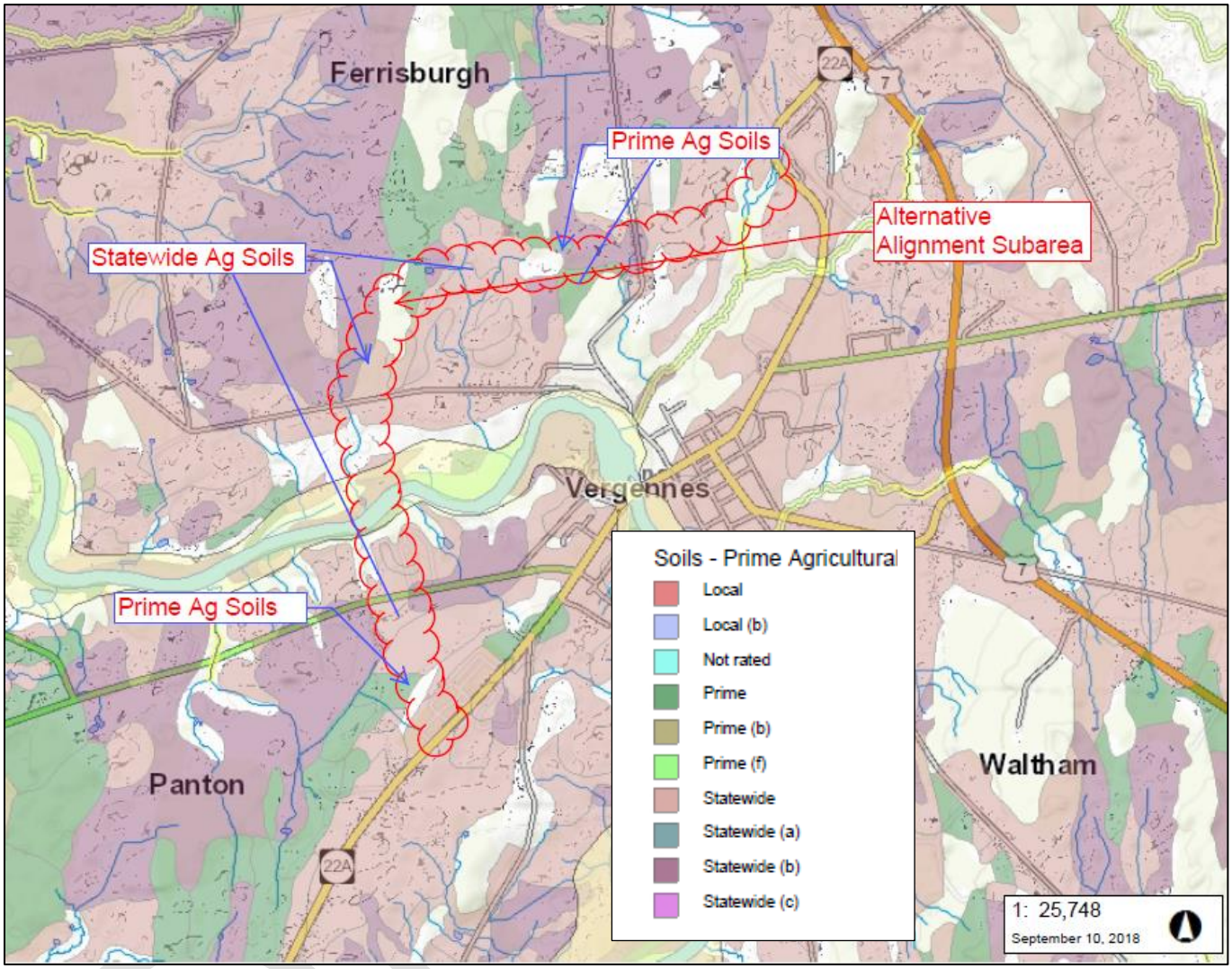

Figure 4-36 Agricultural Soils Mapping – New Alignment Subarea

4.6.4.1 Wetlands

The Alternative Alignment subarea is sparsely developed with farms and residences. The undeveloped areas include a mixture of farmland, forest, shrub, and grass habitats, as well as the Otter Creek floodplain. There are several VSWI wetlands within the subarea. In addition, this alignment crosses over Otter Creek and wetlands adjacent to it. Several other streams and tributaries cross this alignment.

4.6.4.2 Rare or Endangered Species

Several rare species are mapped within or along Otter Creek in the subarea. In addition, the Northern Long-eared Bat is a Federally and State listed species known throughout Vermont. No known hibernacula or maternal roosts are known within one mile of the subarea. The subarea is also within the observed summer range of the Indiana bat, another Federally and State listed species.

4.6.4.3 Farmland Soils of Statewide Importance

There are soils within the subarea mapped as Prime Agricultural Soils and Farmland Soils of Statewide Importance. For this proposed new alignment, authorization from the NRCS via form CPA-106, the Farmland Conversion Impact Rating form for corridor projects, will likely be required.

4.6.4.4 Historic Resources

There are no historic resources mapped in the New Alignment subarea.

4.6.4.5 Public Lands

The Alternative Alignment subarea does not include known public recreation lands (a Section 4(f) resource) or public lands developed with Land and Water Conservation Funds (a Section 6(f) resource). However, it does cross conserved lands purchased with Vermont Land Trust Funds.

4.6.4.6 Hazardous Waste Sites

There are no Hazardous Waste Sites mapped within the Alternative Alignment subarea.

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