

Sidewalk and Bridge Modification Feasibility Study

City of Vergennes

Final Report



August 14, 2007

Stantec Consulting Services Inc.
55 Green Mountain Drive
South Burlington, VT 05403
(802) 864-0223

**SIDEWALK AND BRIDGE MODIFICATION FEASIBILITY STUDY
CITY OF VERGENNES**

Table of Contents

1.0 PROJECT BACKGROUND/HISTORY.....	1
2.0 EXISTING CONDITIONS.....	2
2.1 EXISTING PEDESTRIAN FACILITIES.....	2
2.2 EXISTING BICYCLE FACILITIES.....	2
2.3 EXISTING VT 22A CHARACTERISTICS.....	2
2.4 TRAFFIC VOLUMES.....	2
2.5 CRASH HISTORIES.....	2
2.6 SIGHT DISTANCES.....	2
2.7 BRIDGE CHARACTERISTICS.....	2
2.8 PEDESTRIAN ACTIVITY.....	2
2.9 NATURAL RESOURCES.....	2
2.10CULTURAL RESOURCES.....	2
2.11LAND AND WATER CONSERVATION FUND (LWCF) SITES.....	2
2.12HAZARDOUS MATERIAL SITES.....	2

3.0 PURPOSE AND NEED.....	2
4.0 DESIGN CRITERIA.....	2
5.0 ALTERNATIVES.....	2
5.1 SIDEWALK ALTERNATIVES.....	2
5.1.1 Alternative 1: Curb/Greenbelt/Sidewalk.....	2
5.1.2 Alternative 2: Curb/Sidewalk.....	2
5.2 BRIDGE ALTERNATIVES.....	2
5.2.1 Alternative 1: New Sidewalk/Narrower Roadway.....	2
5.2.2 Alternative 2: New Sidewalk/Widened Bridge.....	2
5.2.3 Alternative 3: Pedestrian Bridge.....	2
5.2.4 Alternative 4: Cantilevered Pedestrian Way.....	2
5.3 ALTERNATIVE EVALUATION MATRIX.....	2

6.0 PUBLIC INFORMATIONAL MEETING/PREFERRED ALTERNATIVE:	2
----------------------------------------------------------------------	----------

APPENDICES

A.	MEETING NOTES / MINUTES / CORRESPONDENCE
B.	RESOURCES
C.	BRIDGE INSPECTION REPORT
D.	COST ESTIMATE

1.0 Project Background/History

The purpose of this study is to determine the preferred alternative to better accommodate pedestrians along VT 22A (Main Street) from Canal Street to MacDonough Drive/Water Street in the City of Vergennes. The project area is approximately 900 feet long and includes a crossing of Otter Creek, at the Otter Creek Falls Bridge. This is the only Otter Creek crossing within 7 miles.

This area provides the southern gateway to Vergennes and contains one of Vergennes' most valuable recreation and historic assets, the Otter Creek Falls Basin. Due to the area's importance and potential for improvements, it has been the subject of numerous studies, projects, and planned development. These include:

- The Gateway Project – Master plan for the project and basin area.
- VT 22A / South Water Street / MacDonough Drive intersection study.
- Settler's Park – Park area and boat launch.
- Basin Walkway and Stairs – West side of VT 22A.
- Grist Mill Renovations – History property conversion to four apartments and offices.
- Roller Shade Building Reuse Plan – Historic industrial building renovation.
- Otter Creek Falls Bridge Evaluation – Determine structural feasibility of adding a sidewalk.

These plans have included the need for pedestrian facility improvements. One mentioned needed improvement is a sidewalk on the west side of VT 22A from MacDonough Drive to Canal Street, crossing the Otter Creek Falls Bridge. The sidewalk is to support the redevelopment of the Otter Creek Falls Basin Area and to provide a safer access to the increasing activities on the west side properties on VT 22A, such as Long Trail Physical Therapy, the Grist Mill complex, Pumphouse Island and Roller Shade Building reuse. Currently pedestrians accessing west side facilities need to use the west side VT 22A shoulder or cross VT 22A mid-block at unmarked crossings.



Project Location Plan

In February 2007, the City of Vergennes contracted with Stantec to work with a project committee, establish the project purpose and needs, develop and evaluate alternatives, and involve the community in the process. The project committee consisted of: Renny Perry, City of Vergennes; Jon Kaplan, VTrans; Pedro Zevallos, Birchfield Resources; and Bill Benton, Benton Appraisers, Inc.

2.0 Existing Conditions

2.1 EXISTING PEDESTRIAN FACILITIES

Currently there is a five foot sidewalk on the east side of VT 22A for the length of the project area. This includes a sidewalk on the bridge. North and south of the project area there are sidewalks on the west side of VT 22A, but not through the project area. East side pedestrians are required to cross VT 22A to the west side facilities. Marked crosswalks crossing VT 22A exist on the south side of the Canal Street intersection and on the north side of the MacDonough Drive intersection. These are approximately 900 feet apart.

A marked crosswalk is planned at the north end of the bridge. This is part of the “Basin Walkway and Stairs” project currently under construction. This crosswalk connects the west side walkway with the east side sidewalk. This crosswalk will be approximately 500 feet from the existing Canal Street crosswalk and 400 feet from the existing MacDonough Drive crosswalk.



VT 22A- South Approach

2.2 EXISTING BICYCLE FACILITIES

The Lake Champlain Bikeways signed route is along VT 22A in the project area. Bicycle facilities are the on-road type. Generally there is a shoulder separated from the travel lane with a white stripe.

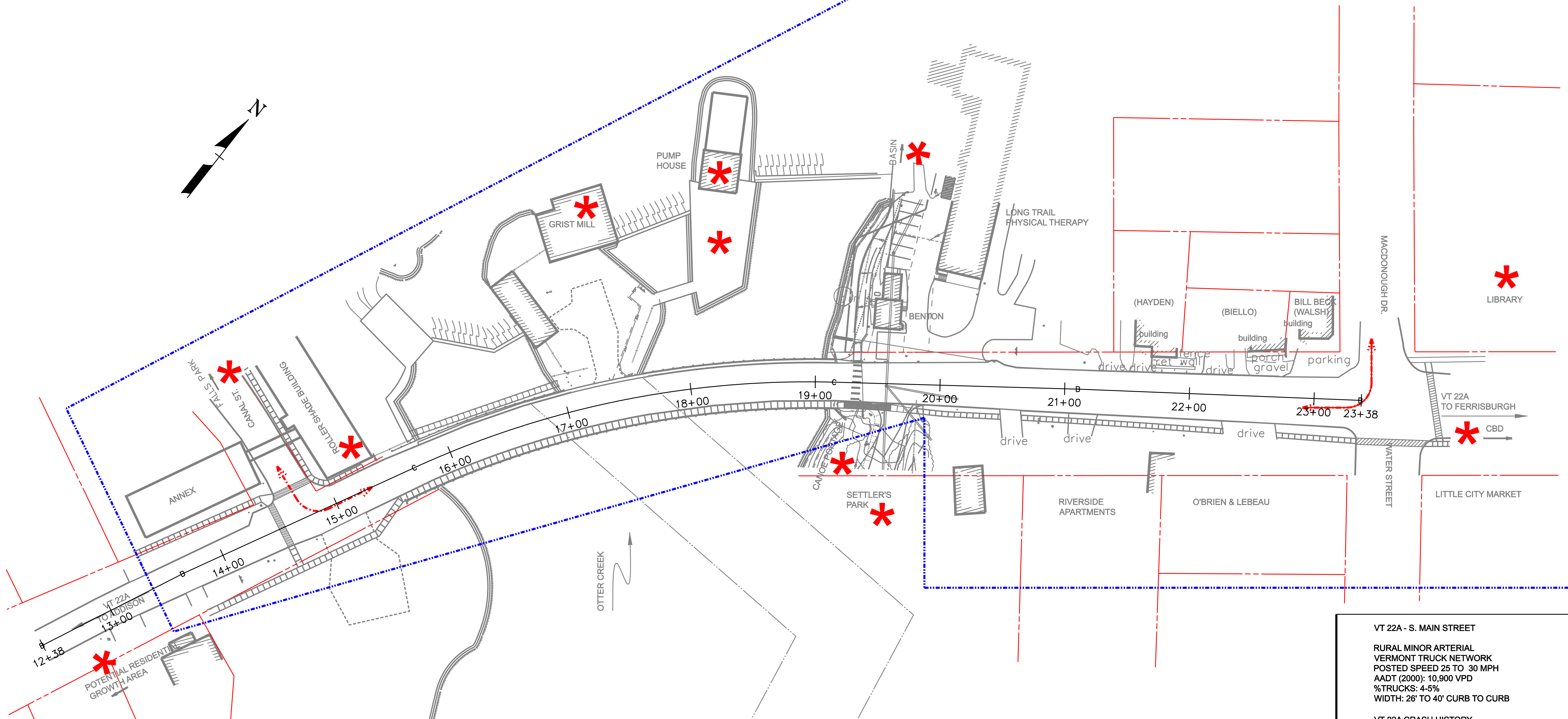
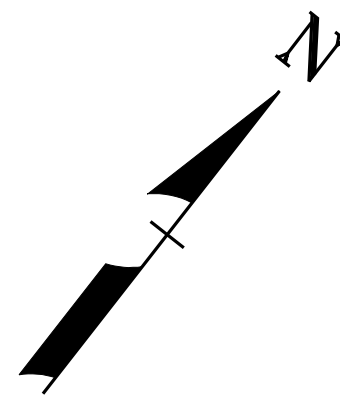
2.3 EXISTING VT 22A CHARACTERISTICS

VT 22A is classified as a rural arterial but has many characteristics of an urban arterial. The roadway includes curb on both sides for the length of the project area. Roadway widths vary. The south approach was reconstructed in 2000 and varies from 26 to 28 feet curb to curb width including 2 to 3 foot shoulders. The bridge curb to curb width is 30 feet with 11 foot travel lanes and 4 foot shoulders. The northern approach widens from 30 feet at the north end of the bridge to 38 feet as it approaches MacDonough Drive.

VT 22A is part of the Vermont Truck Network established in 2000 by the Vermont Legislature. This allows trucks with overall lengths less than 72 feet to travel without permits.



VT 22A- North Approach

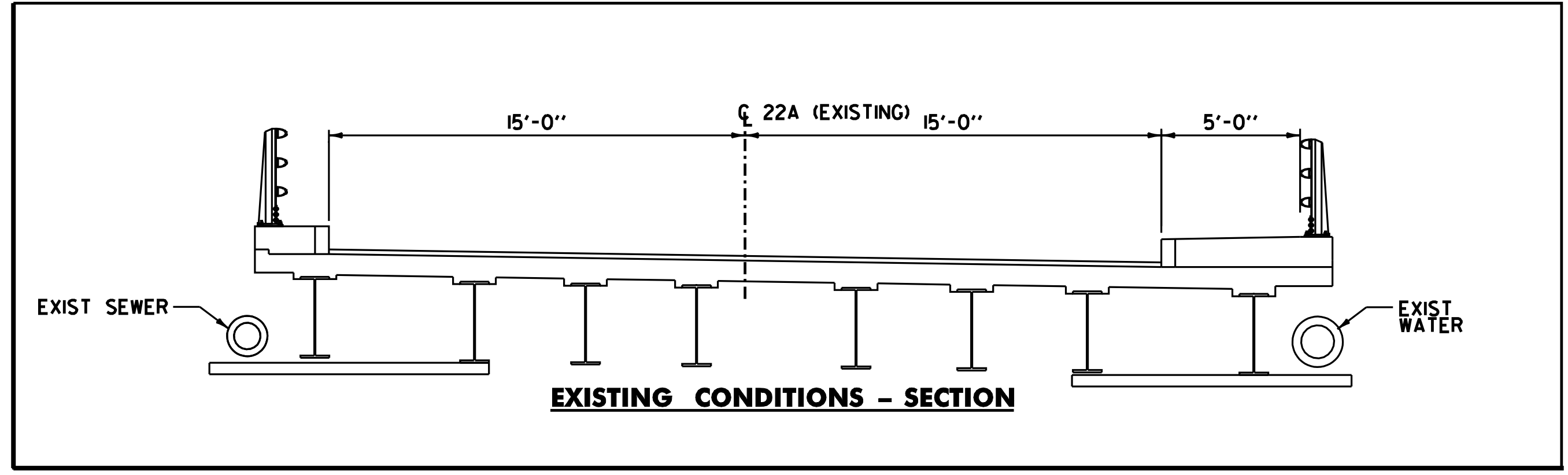


VT 22A
TO ADDISON
13+00
12+38
POTENTIAL RESIDENTIAL
GROWTH AREA

VT 22A - S. MAIN STREET
 RURAL MINOR ARTERIAL
 VERMONT TRUCK NETWORK
 POSTED SPEED 25 TO 30 MPH
 AADT (2000): 10,900 VPD
 %TRUCKS: 4-5%
 WIDTH: 26' TO 40' CURB TO CURB

VT 22A CRASH HISTORY
 CANAL STREET: 1
 WATER TO CANAL: 4
 WATER SREET: 1
 TOTAL: 6

- ORIGINS/DESTINATIONS
- LAKE CHAMPLAIN BIKEWAY
- VERGENNES HISTORIC DISTRICT



PROJECT NAME: VERGENNES SIDEWALK & BRIDGE
MODIFICATION FEASIBILITY STUDY

FILE NAME: ...drawing\Vergennes_Alt0.PTF **PLOT DATE:** 6/13/2007

PROJECT LEADER: G. EDWARDS **DRAWN BY:** STANTEC

DESIGNED BY: **CHECKED BY:**

EXISTING CONDITIONS **PAGE 3**

This section of VT 22A is classified as a Class I Town Highway. This identifies the level of jurisdiction. As a Class I Town Highway, VT 22A is subject to concurrent responsibility and jurisdiction between the City of Vergennes and VTrans (Vermont Agency of Transportation). Typically, VTrans is responsible for surface maintenance and resurfacing and centerline markings, while municipalities are responsible for the pothole repairs, crack sealing, sidewalks, crosswalks, and parking.

The posted speed varies from 25 to 30 mph in the project area. It is 30 mph south of the mid-point of the bridge and 25 mph north of the bridge's mid-point.

2.4 TRAFFIC VOLUMES

Based on data collected by VTrans, the 2000 average annual daily traffic (AADT) in the project area is 10,900 vehicles per day. The projected 2007 AADT is 11,500 vehicles per day. A twelve hour count at the VT 22A /MacDonough Drive/Water Street intersections by VTrans indicated peak traffic volumes occur from 4:00 to 5:00 pm with 1100 vehicles per hour. This count indicated truck volumes account for approximately 5% of the AADT and hourly truck volumes range from 70 to 100 trucks per hour throughout the day from 7 am to 6 pm.

2.5 CRASH HISTORIES

Crash histories were collected from VTrans for the 5 year period from January 1, 2001 to December 31, 2005. VTrans maintains a statewide database of all reported crashes along state highways and federal aid road segments. A reportable crash is a collision with at least one of the following causes: property damage exceeding \$1,000, personal injury, and fatality. Six reported crashes occurred in the project area from January 1, 2001 to December 31, 2005. One crash was at the VT 22A/Canal Street intersection. Four crashes occurred on VT 22A between Canal and Water Street. One crash occurred at the VT 22A/MacDonough Drive/Water Street intersection. This number of crashes is not sufficient to indicate a deficiency.

To be classified as a high crash location (HCL), an intersection or road section (0.3 mile section) must have at least 5 crashes over a 5 year period and the actual crash rate must exceed the critical rate. Based on the obtained crash data from VTrans, this section of VT 22A is not a high crash location.

2.6 SIGHT DISTANCES

In the project area the posted speed varies from 25 mph to 30 mph. For a design speed of 35 mph (posted speed plus 5 mph) a stopping sight distance of 225 feet and a corner sight distance of 385 feet is recommended. Based on field observations no stopping sight distances less than 225 feet were noted. Corner sight distances less than 385 were noted at the following locations:

- The MacDonough Drive approach to VT 22A looking south when vehicles are parked in front of Bill Beck Realty.
- The Grist Mill Drive approach to VT 22A looking north and south due to existing bridge rail.

2.7 BRIDGE CHARACTERISTICS

The Otter Creek Falls Bridge is a 38'-10" wide, 338' long five span bridge circa 1934 that was widened to accommodate a five foot wide sidewalk on the east fascia in 1969. The resulting curb to curb width is 30'-0" consisting of 11 foot travel lanes and 4 foot shoulders. The bridge was most recently rehabilitated in 1998 with a concrete overlay that replaced the bituminous wearing surface.

The superstructure consists of a horizontally curved concrete deck supported by steel wide flange beams that are tangent to the curve between substructure elements. The three southern spans are approximately 79' long and the two northern spans are approximately 50' long. The substructure consists of cantilevered reinforced concrete abutments, and wall piers founded on ledge. It was widened on the east side to accommodate the 1969 bridge widening. Pier 2 is intersected by a retaining wall that runs parallel to the west fascia. This wall retains the fill from the parking lot for the Grist Mill Island.

VTrans inspection reports from October 18, 2005 indicate that the structure is in fair to good condition. The deck received a rating of 7 (good) and the beams received a rating of 6 (satisfactory), with heavy rust scaling in the webs adjacent to the leaking expansion joints at

substructure elements. It was noted that the troughs at the expansion joints need to be repaired or replaced. The inspection report also noted that bridge railing and approach guardrail do not meet current standards. Given the bridge's age, condition and uses, it is likely a major rehabilitation will be required in the next 10 to 20 years. For bridges of this age and type, major rehabilitation typically includes deck and rail replacement, beam painting or replacement, and substantial repairs. A major bridge rehabilitation may replace any sidewalk improvements installed by this project.



Otter Creek Falls Bridge

2.8 PEDESTRIAN ACTIVITY

To obtain a better project understanding, team members met with the project committee, reviewed numerous studies, reports and plans, and field reviewed the project area. Due to the significant study and input already completed, it was determined a local concerns meeting would be substituted with this previous input and information.

The Otter Creek separates approximately the southern third of Vergennes from the Downtown Business District to the north. The only connecting feature is the Otter Creek Falls Bridge. All pedestrians, school children, and bicycles originating from the south and accessing the Downtown Business District and beyond need to cross the bridge. Origins and destinations from the south include:

- Residential development along VT 22A and side streets.
- A planned residential growth area east of VT 22A.
- Pantan Road, commercial and industrial development including B.F. Goodrich.

- The Falls Park on Canal Street

Origins and destinations to the north include:

- The Downtown Business District
- The Bixby Library
- Elementary and High Schools

The area adjacent to the bridge is known as the Otter Creek Falls Basin Area. This area, once the site of great industrial activity, is being redeveloped. This redevelopment includes the following pedestrian generators:

- Improving Settlers Park and boat launch on the north shore of Otter Creek.
- Creating a west side walkway and stairs connecting VT 22A to the lower basin.
- Redeveloping the Grist Mill to residential and office use.
- Redeveloping the south side Roller Shade building to residential use.
- Renovations to the island Pump House.
- Providing interpretive uses at the Pump House Island Park.
- Converting the north side, Benton Property, former industrial/commercial space, to partial residential use.



Pump House Island

As the Otter Creek Falls Basin area redevelops, the pedestrian activity is increasing. All pedestrians originating from the west side of VT 22A now need to eventually cross VT 22A to access the east side sidewalk. Currently, pedestrian access to the Grist Mill and Pump House Island on the west side requires crossing VT 22A in the middle of the bridge.

It was pointed out, due to the volume and speed of traffic, and the height and location of the existing west side bridge rail, the safety and visibility of pedestrians crossing the middle of the bridge is a concern.

The redevelopment of the Roller Shade building will add to the west side pedestrian activity and demand. For Roller Shade building occupants to access the Grist Mill and Pump House Island, they will need to cross to the east side of VT 22A, walk along the existing sidewalk and cross VT 22A to the west side. An alternative is to use the west side shoulder, shared with bicycles and traffic.



VT 22A – Looking South

Given the basin's great potential for recreation for expanding recreation activities, it is envisioned pedestrian activity will continue to increase. The vibrant downtown district is increasingly becoming an expanding destination. Its connection to the basin area will contribute to its expansion and success.

2.9 NATURAL RESOURCES

A field review and document research was completed for the project. This was to identify any existing environmental resources and to support an evaluation of alternatives from an environmental impact point of view. A summary is as follows:

- **Rare, Threatened, or Endangered Species:** No rare, threatened or endangered species are known from the immediate project area, however, the Significant Habitat Map for Vergennes indicates one site for rare, threatened or endangered species in the City – several mollusks have been reported from an area downstream of the dam. Habitat for these species will not be affected by any of the proposed alternatives.
- **Wetlands:** There are no naturally vegetated communities or wetlands at the project site. Woody growth is limited to the fringe of riverbank trees, mostly boxelder (*Acer negundo*), silver maple (*A. saccharinum*) and elm (*Ulmus Americana*) over thickets of honeysuckle (*Lonicera tartarica*). Fragments of lawn and other landscaped areas occupy the remaining unpaved sections. These areas support a mostly weedy community, with no uncommon species.
- **Wildlife and Wildlife Habitat:** Wildlife expected to occur in this urban setting include common species adaptable to human presence and activities, including small mammals (raccoons, skunks, rodents) and birds of urban and suburban parks, gardens and orchards. No Wildlife species now found in the area are likely to be displaced by the project.
- **Streams:** The most significant natural feature in the area is Otter Creek and the falls. The natural falls (before the addition of dams, mills, etc.) was about 35 feet, and represented the upstream limit for fish passage. Hence, the falls represents a boundary between two aquatic communities – the purely riverine area upstream, the lake-influenced area downstream. Alternatives 1, 2 and 4, being modifications of the existing bridge without new or widened substructure, will have no impact on natural communities found at the site. Alternative 3 calls for new substructure to support the new sidewalks on the downstream side of the bridge. Assuming the footprint of any additional structures in the river is minimized, there should be no adverse impact on any natural resources.

2.10 CULTURAL RESOURCES

The project alignment is within the National Register Listed Vergennes Historic District and is boarded by several important late 19th - to early 20th- century historic structures.

Site visit observations indicated substantial disturbance to the project area of potential effect (APE) due to filling and construction of various kinds. There is no indication of buried historic features being located in the APE that would be disturbed. The bridge crossing Otter Creek is of recent construction, so it does not contribute to the National Register Vergennes Historic District. However, there is one area of concern for historic preservation in the eastern half of the APE. In front of the c. 1920 bungalow or craftsman style house is a cobble and concrete retaining wall that may be replaced. The wall is constructed in a style that is typical of the bungalow or craftsman style, adds to the historic character of the property and contributes to the National Register Vergennes Historic District.

2.11 LAND AND WATER CONSERVATION FUND (LWCF) SITES

No LWCF sites in the project area are listed in the Vermont Agency of Natural Resources list. The Vermont Agency of Natural Resources hazardous material site list includes two sites in the project area: the Roller Shade building and the O'Brien and LeBeau gas station on the corner of VT 22A and Water Street.

2.12 HAZARDOUS MATERIAL SITES

The Vermont Agency of Natural Resources hazardous material site list includes two sites in the project area – The Roller Shade building and the O'Brien and LeBeau gas station on the corner of VT 22A and Water Street.

3.0 Purpose and Need

The purpose of this project is to improve the safety and mobility for pedestrians along VT 22A from Canal Street to MacDonough Drive and providing a connection to the historically significant commercial and public areas of the upper Otter Creek Falls Basin Area of Vergennes. There is a continuous east side sidewalk, including across the bridge, from Canal Street to Water Street. There is no sidewalk on the west side, where the origins and designations typically are. Due to this the project needs include:

- **Provide a safe pedestrian access to Pump House Island.** Pump House Island features a public park and a building that is planned to be a historic interpretive facility. It is only accessible by pedestrians. Patrons are required to park to the north or south of the bridge, such as at Settler's Park, to the north. Access is typically by walking on the east side sidewalk and crossing VT 22A mid-block to west side at the Grist Mill Drive and in the middle of the bridge.
- **Provide a safe pedestrian access to the renovated Grist Mill.** The Grist Mill was recently renovated and now contains four (4) apartments and office space, and private parking for 11 vehicles. For walking residents, employees, visitors, or customers to access this facility, or to access the downtown facilities from this site, they must cross VT 22A in the middle of the bridge or walk on the west side shoulder.
- **Provide a west side pedestrian connection to the basin's walkway and stairs and the Shade Roller building.** At the south end of the bridge, on the west side, is the Shade Roller building. Currently this is planned to be redeveloped to 12 residential units. This will add to the pedestrian activity and create a greater demand for a sidewalk connection on the west side. At the north end, a walkway and stairs are proposed on the west side. Current pedestrian access is limited to crossing VT 22A at the north end of the bridge from Settler's Park. There is no west side sidewalk connecting to this facility.
- **Provide a continuous west side pedestrian way connecting the existing and proposed uses.** West side facilities including ones beyond the project limits include Long Trail Physical Therapy, Falls Park, B.F. Goodrich, the library and the downtown business district. Pedestrians connecting to these origins and destinations need to cross VT 22A to the existing east side sidewalk. A continuous west side sidewalk facility would reduce the required crossing and improve pedestrian safety.
- **Maintain the mobility of VT 22A recognizing it serves as a Vermont Truck Network facility and is part of the Lake Champlain Bikeway.** VT 22A services as an important north to south transportation corridor. The projected 2007 AADT for this area of VT 22A is 11,500 vehicles per day. Approximately 5% are trucks. Alternatives need to consider their effects on the operation and safety of VT 22A.

4.0 Design Criteria

Based on pertinent standards and references, applicable design criteria are tabulated below. These references include:

- Vermont State Standard for the Design of Transportation Construction, Reconstruction and Rehabilitation on Freeways, Roads and Streets (VSS).
- A Policy on Geometric Design of Highways and Streets (AASHTO).
- Vermont Pedestrian and Bicycle Facility Planning and Design Manual.

Parameter	VT 22A	Reference
Functional Classification	Rural Minor Arterial	
AADT (2007)	11,500 vpd	
Design Vehicle	WB-62	
Posted Speed	25-30 mph	
Design Speed	35 mph	
Stopping Sight Distance	225 ft.	VSS Sect. 4.4.1
Corner Sight Distance	385 ft.	VSS Sect. 4.4.2
Roadway Widths		
Travel Lane Width		
Minimum	10 ft.	VSS Sect. 4.5
Existing	11 to 12 ft.	
Proposed	11 ft.	
Shoulder Width (Urban)		
Existing	2 to 4 ft.	
Shared use with Bicycles	4 ft.	VSS Sect. 4.14
Shared use curb lane with Bicycles	13 ft.	VSS Sect. 4.5
Proposed	2 to 4 ft.	
Clear Zone		
With Vertical Curb	1.5 ft.	VSS Sect. 4.9
Without Vertical Curb	14 to 16 ft.	VSS Sect. 4.9
Horizontal Alignment		
@ e _{max} = 0.04	440 ft.	AASHTO, Table III-8
@ sensitive resources (DS-10 mph)	215 ft.	AASHTO, Table III-8
@ intersection approach (DS-15 mph)	130 ft.	AASHTO, Table III-8 & III-7
Bridge Widths		
Existing	30 ft. curb to curb With 5' sidewalk	
Rehab / Replacement	Match existing bridge width or existing street width (28-34 ft)	VSS Sect. 4.7
Bicycles on new bridges	Match roadway	

5.0 Alternatives

Using collected information, past studies, and public input, the project committee discussed numerous alternatives. Alternatives considered and discarded from further detailed review were:

- **Removing the sidewalk on the east side and constructing a sidewalk on the west side.** This was viewed as creating pedestrian access issues on the east side. It would create a large gap in the sidewalk system on the east side and would require the existing east side development and planned east side growth area pedestrians to cross VT 22A. It would also require some Settler's Park users to cross VT 22A.
- **Installing a marked VT 22A crosswalk in the middle of the bridge, connecting the east side sidewalk to Grist Mill Island.** This installation does not meet VTrans' "Guidelines for the Installation of Crosswalk Markings and Pedestrian Signing at Marked and Unmarked Crossings". It would create a mid-block crossing within 200 feet of adjacent marked crosswalks. In the past, VTrans had expressed concern with this installation.

The project committee did decide to advance numerous alternatives for public review and comment. For clarity, the alternatives are split into two categories: the sidewalk alternatives and the bridge alternatives. The sidewalk alternatives are the area from the north end of the bridge to MacDonough Drive. The bridge alternatives are for accommodating a sidewalk on or along the bridge from the south end to the north end.

5.1 SIDEWALK ALTERNATIVES

Two alternatives of constructing a west side sidewalk along VT 22A from the north end of the bridge to MacDonough Drive were evaluated. These two sidewalk alternatives are compatible with all four bridge alternatives and they compliment the proposed VT 22A/MacDonough Drive intersection improvements mentioned in a previous study.

5.1.1 Alternative 1: Curb/Greenbelt/Sidewalk

This alternative provides a five foot wide sidewalk from the north end of the Otter Creek Falls Bridge to the VT 22A/MacDonough Drive intersection. The southern end connects to the various bridge alternatives described in subsequent sections. The north end connects to an existing marked crosswalk crossing MacDonough Drive. A plan of this alternative is shown on page 14.

Alternative 1 has the following features and impacts:

- Proposes to replace the existing west side concrete curb with a new one approximately four feet in front of the existing one. This narrows the road to a minimum 30 feet curb-to-curb. This width matches the existing bridge curb-to-curb width.
- Creates a four foot wide greenbelt in back of the new curb. This serves as a pedestrian buffer, and a place for signs and snow storage.
- Constructs approximately a five foot concrete sidewalk that has its roadside edge at approximately the existing curb location. The back edge of the new sidewalk is approximately five feet behind the existing curb. It is set back 4 feet from the new concrete curbs.

- Crosses numerous drives. All existing drives are maintained. The Benton/Long Trail Physical Therapy drive is narrowed to 40 feet. Two parking spaces adjacent to the Benton Appraisal Office Building are maintained. The Bill Beck Realty, VT 22A access is consolidated to a twelve foot wide drive.
- Replaces gravel and paved areas in front of Biello and Bill Beck Realty with green areas.
- Retains the existing retaining wall at the Hayden property. Since this is considered a contributing historic feature, its repair should be considered.
- Increases curb radius for right turning vehicles from MacDonough Drive.
- Does not require relocation of aerial or underground utilities. Does require relocating an existing damage inlet.
- Provides west side connection to the “Basin Walkway and Stairs”, currently under construction.
- Eliminates need for west side pedestrians to cross VT 22A at the MacDonough Drive intersection crossing.
- Has a total estimated project cost of \$117,000.

5.1.2 Alternative 2: Curb/Sidewalk

This alternative also provides a five foot sidewalk along the west side of VT 22A from the northern end of the Otter Creek Falls Bridge to MacDonough Drive. The sidewalk location is similar to Alternative 1. The major difference is there is no greenbelt between the curb and sidewalk and the proposed curb is at the existing curb location. Many of this alternative’s features are similar to Alternative 1. A plan of this alternative is shown on page 15. Features and impacts are as follows:

- Proposes to replace the existing curb with a new concrete curb at the existing location. The existing roadway widths are maintained.
- Does not include a greenbelt separating the curb and sidewalk. No pedestrian buffer or snow storage area is provided.
- Locates the new sidewalk at the back of the existing curb and extends five feet behind the existing curb.
- Impacts drives the same as Alternative 1.
- Replaces gravel and paved areas in front of Biello and Bill Beck Realty with green areas.
- Requires relocation or removal/replacement of the retaining wall at the Hayden property. This is considered a contributing historic feature and should be avoided if possible. Avoidance would require narrowing the sidewalk to four feet and the adjacent sidewalk snow plowing operations have a greater potential to damage the wall. Therefore relocation or replacement with a replicating wall is suggested.
- Increases curb radius for right turning vehicles from MacDonough Drive.
- Does not require relocation of aerial or underground utilities. Does require relocating an existing damage inlet.
- Provides west side connection to the “Basin Walkway and Stairs”, currently under construction.
- Eliminates need for west side pedestrians to cross VT 22A at the MacDonough Drive intersection crossing.
- Has a total estimated project cost of \$109,000.00.

5.2 BRIDGE ALTERNATIVES

Four alternatives to accommodating a west side sidewalk on the Otter Creek Falls Bridge were evaluated. This west side sidewalk connects to existing west side sidewalks on the south side of the bridge and to the proposed sidewalk alternative mentioned in the previous section. A description of these follows.

5.2.1 Alternative 1: New Sidewalk/Narrower Roadway

This alternative provides a five foot wide (west side) sidewalk within the limits of the existing rail-to-rail width of the bridge. No bridge widening is required. The new sidewalk is constructed in front of the existing bridge rail and has an appearance and function much like the existing east side sidewalk. A plan of this alternative is shown on page 14.

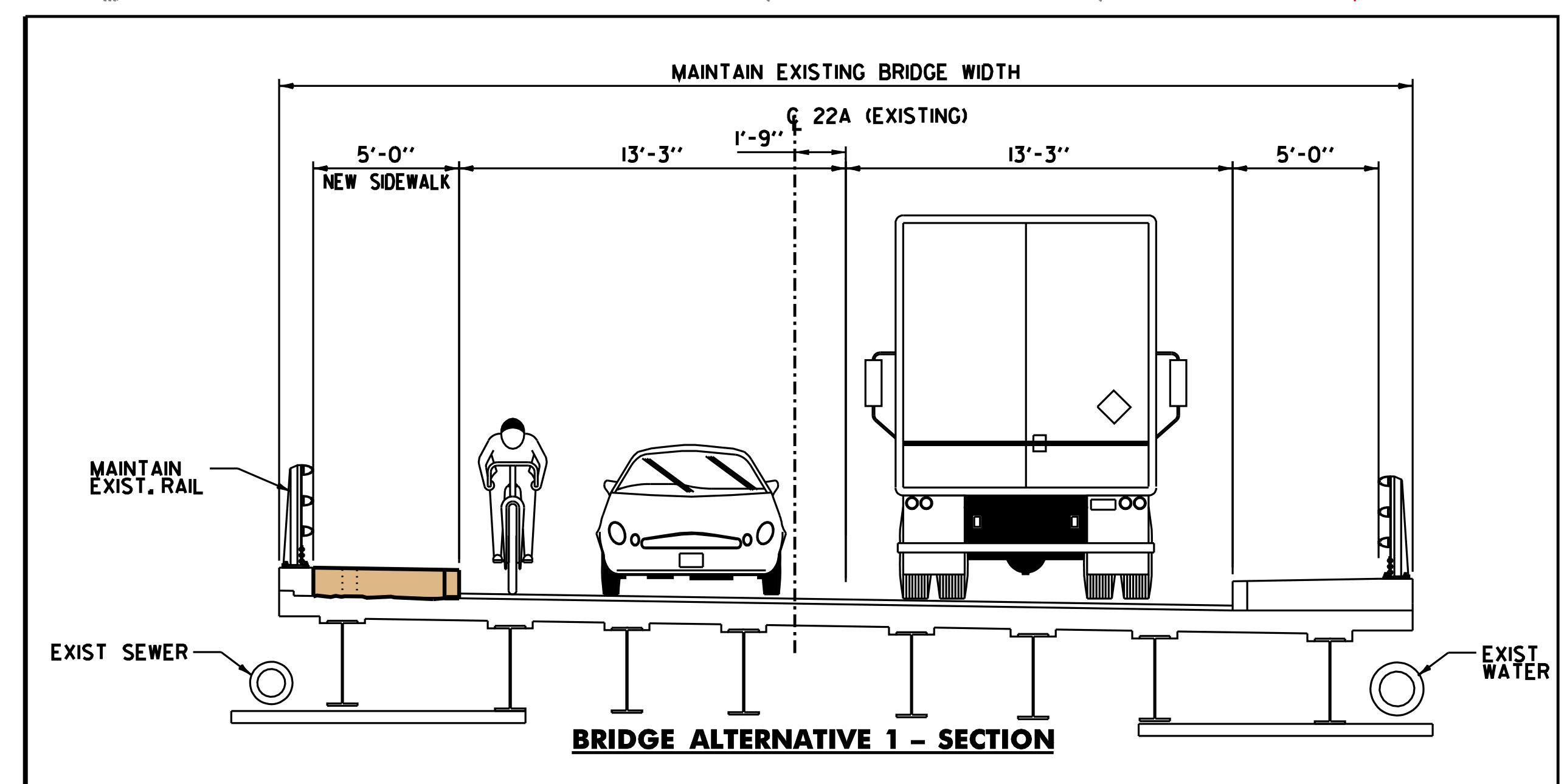
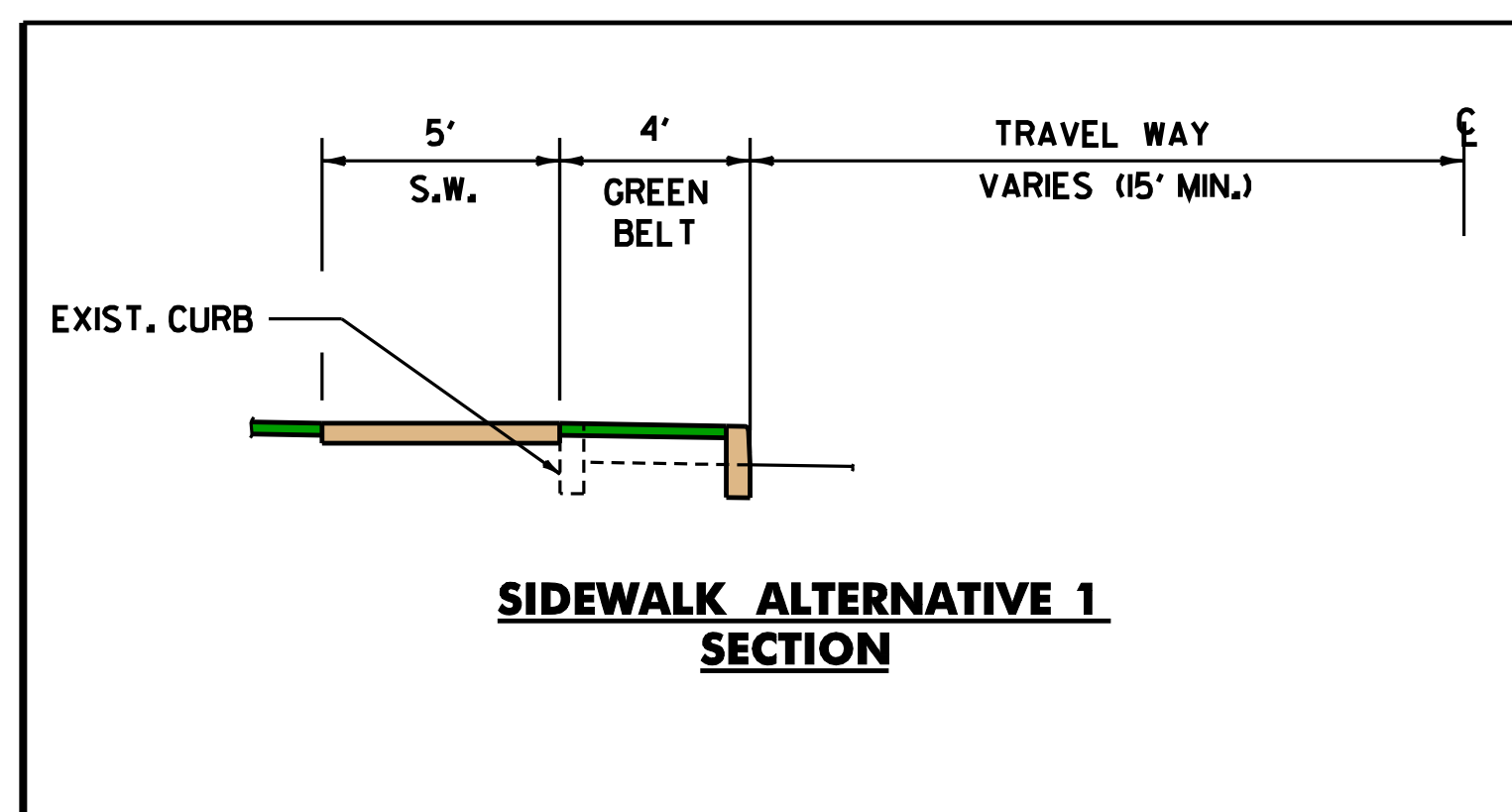
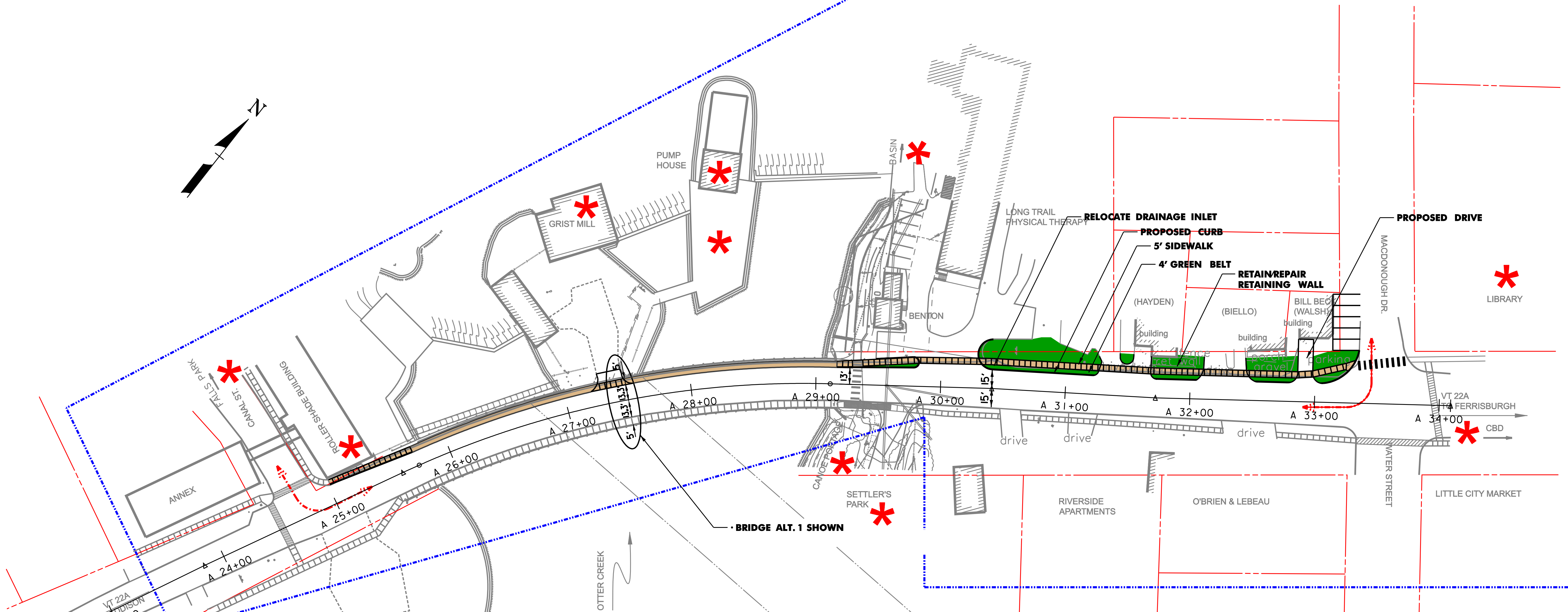
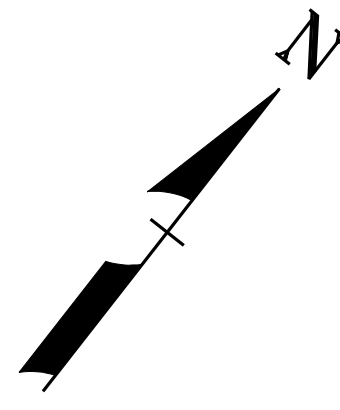
This alternative has the following features and impacts:

- Reduces the roadway curb-to-curb width to 26'-6" and creates 13'-3" shared use curb lanes for cars, trucks, and bicyclists. This width does not strictly meet Vermont State Standards for Bridges.
- Requires a VTrans Design Exception subject to VTrans approval.
- Meets some of the project's purpose and needs, including pedestrian access to west side facilities and provides a continuous connection.
- Creates narrower lanes and promotes slower vehicle speeds. Does slightly reduce the mobility of VT 22A with narrower lanes.
- Does improve the sight distance at the Grist Mill Drive by moving southbound VT 22A vehicles further away from the existing bridge rail.
- Improves pedestrian safety including reducing the need for crossing VT 22A.
- Reduces the safety for bicycles by reducing the roadway lane widths.
- Provides an adequate bridge inventory rating when the new sidewalk is added.
- Requires minor environmental permitting.
- Has a total estimated project cost of \$145,000

5.2.2 Alternative 2: New Sidewalk/Widened Bridge

This alternative provides a five foot wide concrete sidewalk on the west side by widening the bridge by approximately 5'-11". This construction includes replacing the existing bridge rail, adding a new bridge beam, extending the existing concrete bridge deck, and modifying the bridge piers and abutments. The existing pier caps have adequate space to accommodate the new beams and modifications to these piers are limited. A plan of this alternative is shown on page 15. This alternative has the following features and impacts:

- Maintains the existing bridge curb-to-curb width of 30'-0" and meets Vermont State Standards for Bridges.



VT 22A - S. MAIN STREET
 RURAL MINOR ARTERIAL
 VERMONT TRUCK NETWORK
 POSTED SPEED 25 TO 30 MPH
 AADT (2000): 10,900 VPD
 %TRUCKS: 4-5%
 WIDTH: 26' TO 40' CURB TO CURB

VT 22A CRASH HISTORY
 CANAL STREET: 1
 WATER TO CANAL: 4
 WATER STREET: 1
 TOTAL: 6

***** ORIGINS/DESTINATIONS
 - - - LAKE CHAMPLAIN BIKEWAY
 - - - VERGENNES HISTORIC DISTRICT

PROJECT NAME: VERGENNES SIDEWALK & BRIDGE MODIFICATION FEASIBILITY STUDY

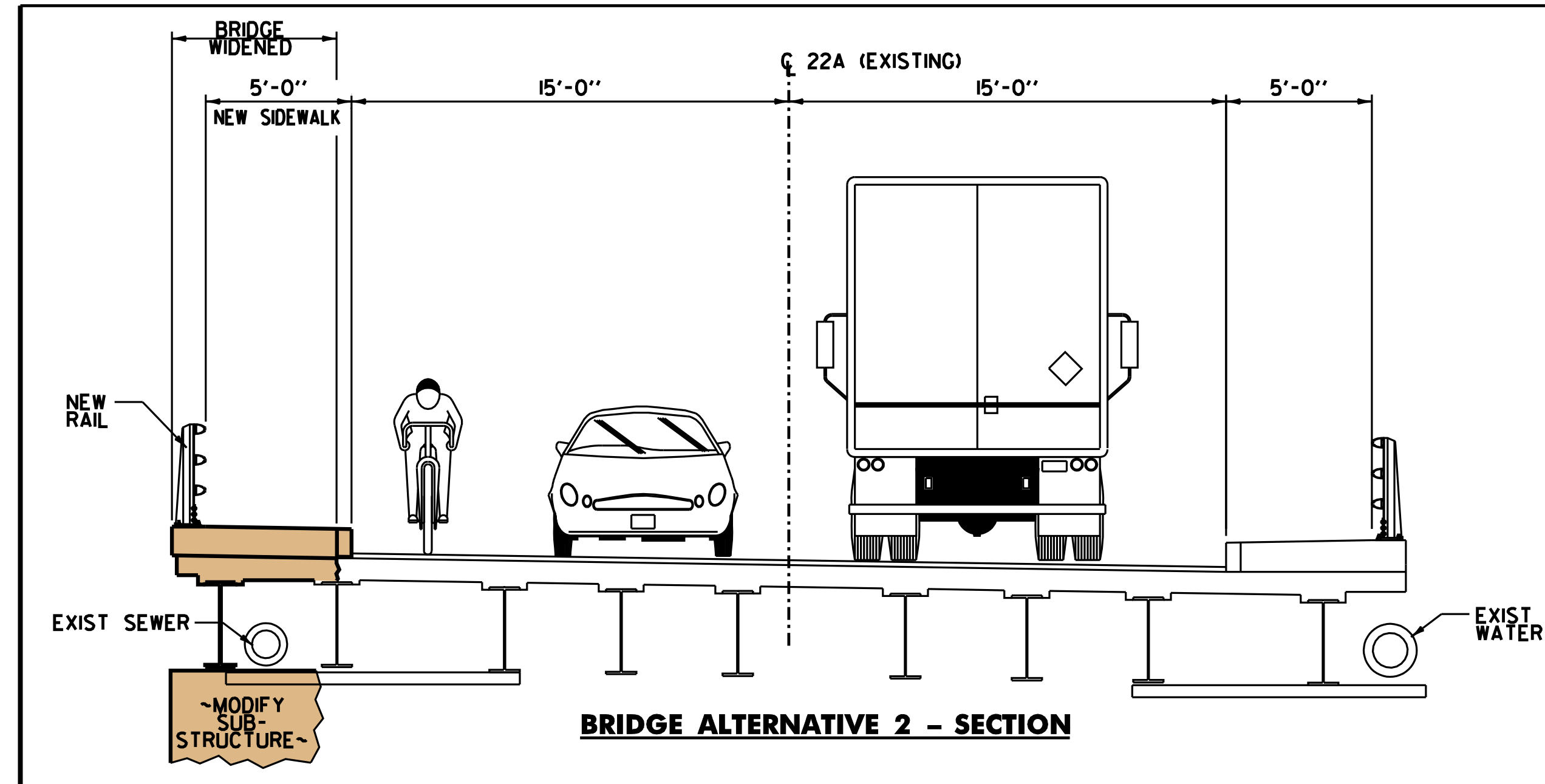
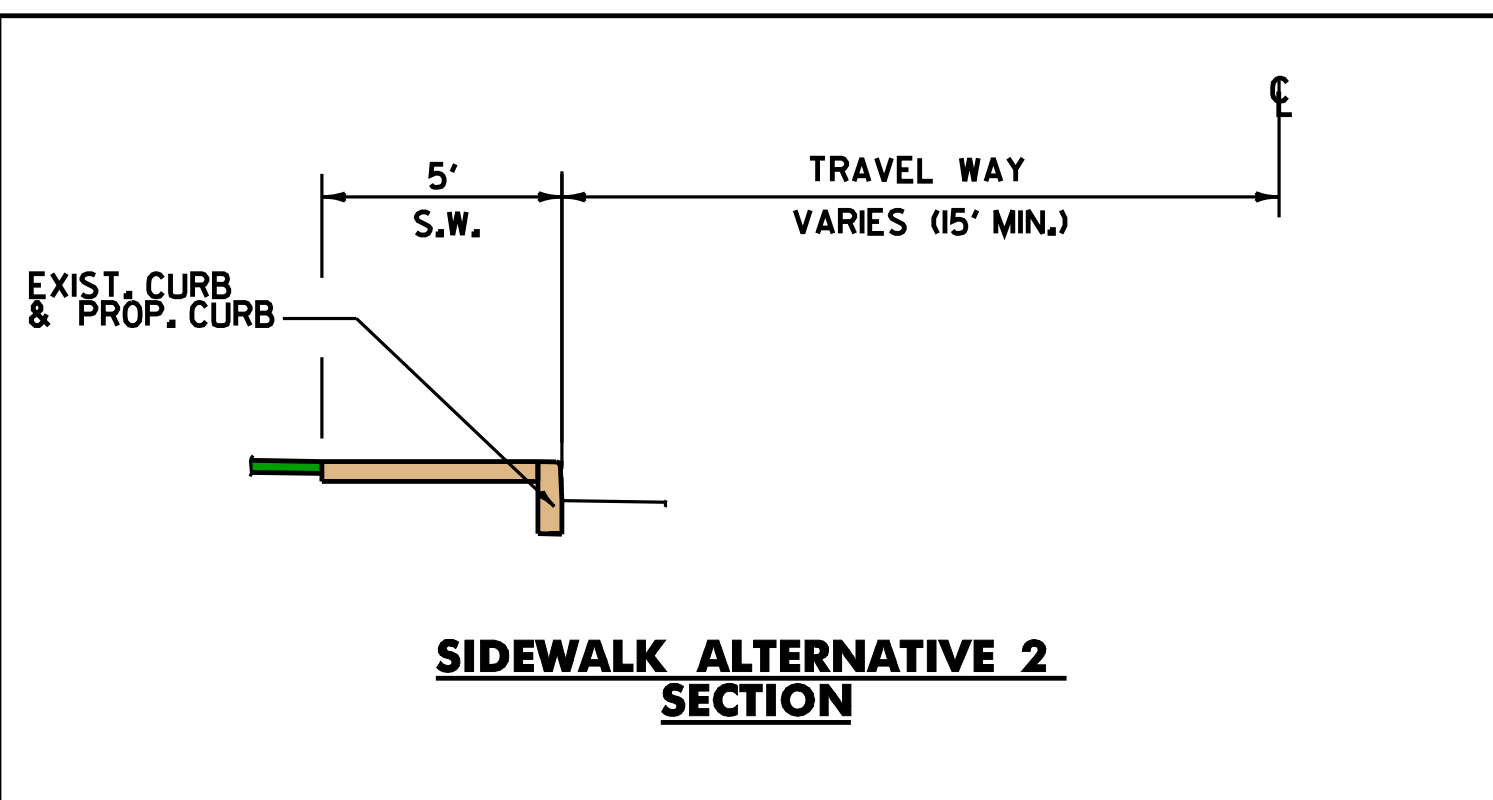
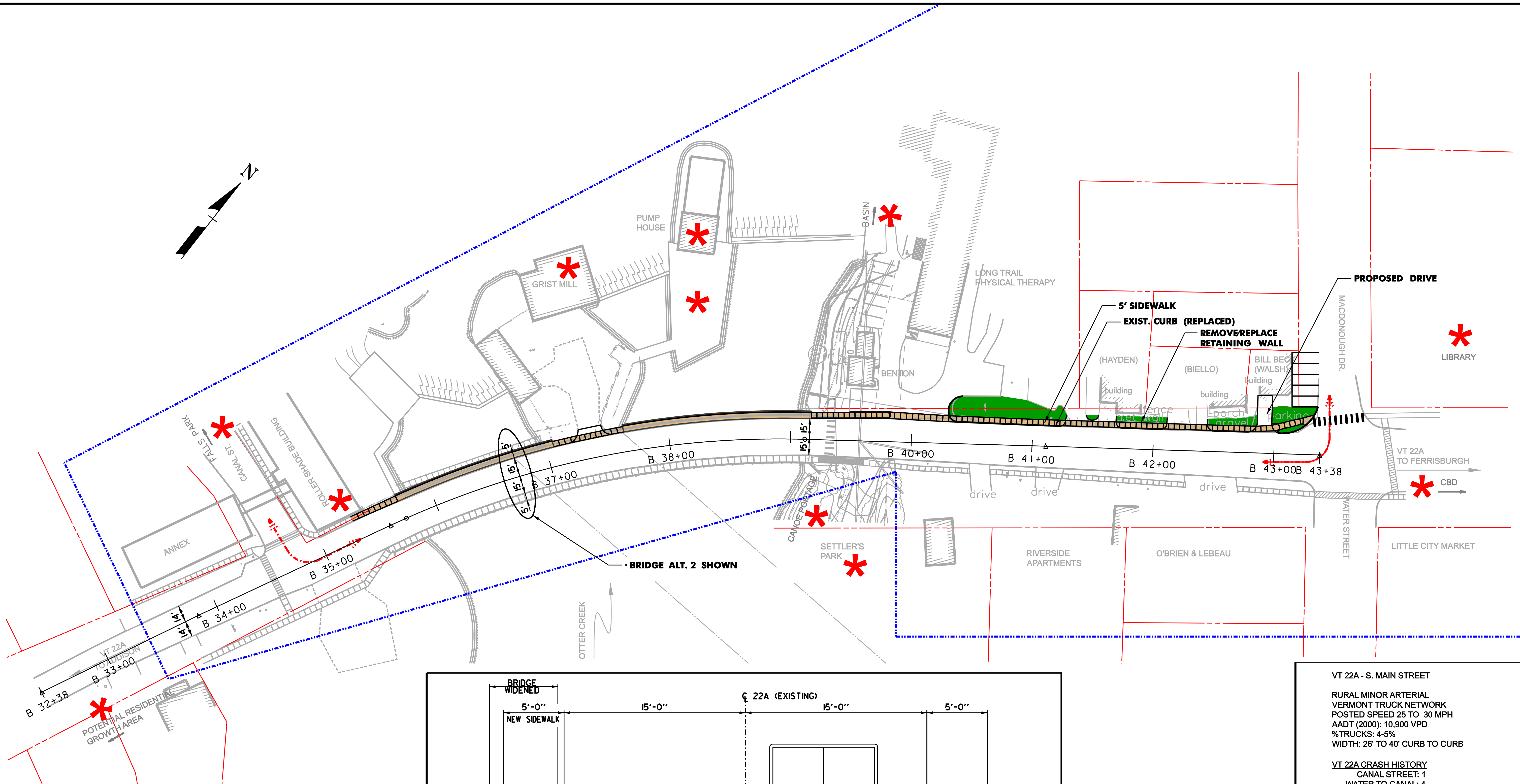
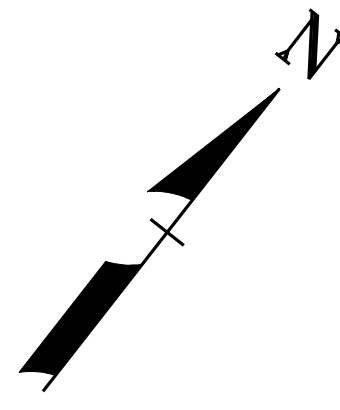
FILE NAME: ...Vergennes_Alt1_COLOR.dgn **PLOT DATE:** 6/14/2007

PROJECT LEADER: G. EDWARDS **DRAWN BY:** STANTEC

DESIGNED BY: **CHECKED BY:**

ALT. 1 - NEW SDWLK / NARROWER RDWY **PAGE 14**





VT 22A - S. MAIN STREET
 RURAL MINOR ARTERIAL
 VERMONT TRUCK NETWORK
 POSTED SPEED 25 TO 30 MPH
 AADT (2000): 10,900 VPD
 %TRUCKS: 4-5%
 WIDTH: 26' TO 40' CURB TO CURB

VT 22A CRASH HISTORY
 CANAL STREET: 1
 WATER TO CANAL: 4
 WATER SREET: 1
 TOTAL: 6

***** ORIGINS/DESTINATIONS
 - - - LAKE CHAMPLAIN BIKEWAY
 - - - VERGENNES HISTORIC DISTRICT



PROJECT NAME: VERGENNES SIDEWALK & BRIDGE MODIFICATION FEASIBILITY STUDY

FILE NAME: ...Vergennes_Alt2.COLOR.dgn PLOT DATE: 6/14/2007
 PROJECT LEADER: G. EDWARDS DRAWN BY: STANTEC
 DESIGNED BY: CHECKED BY:
 ALT. 2 - NEW SDWLK /WIDENED BRIDGE PAGE 15

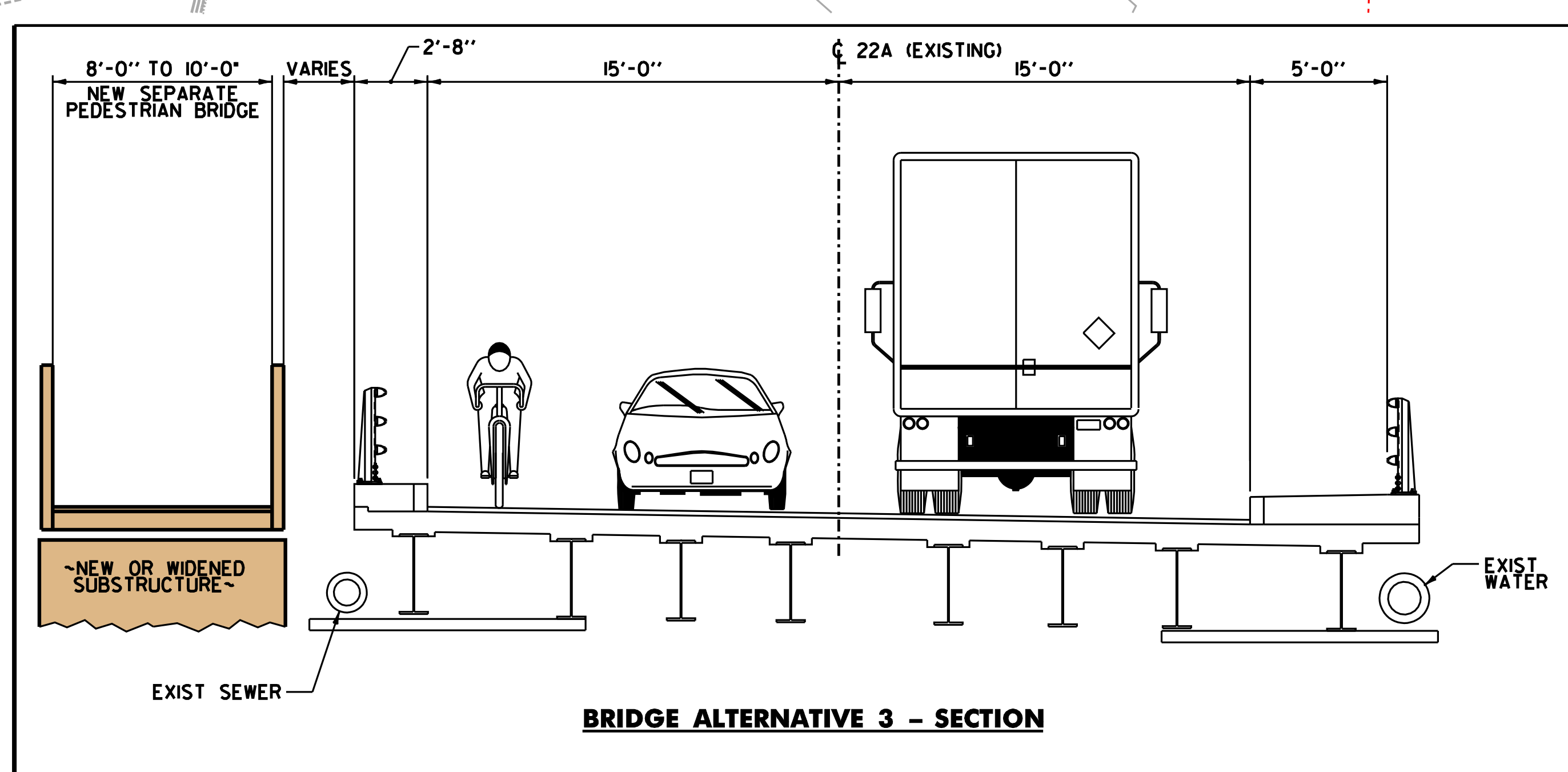
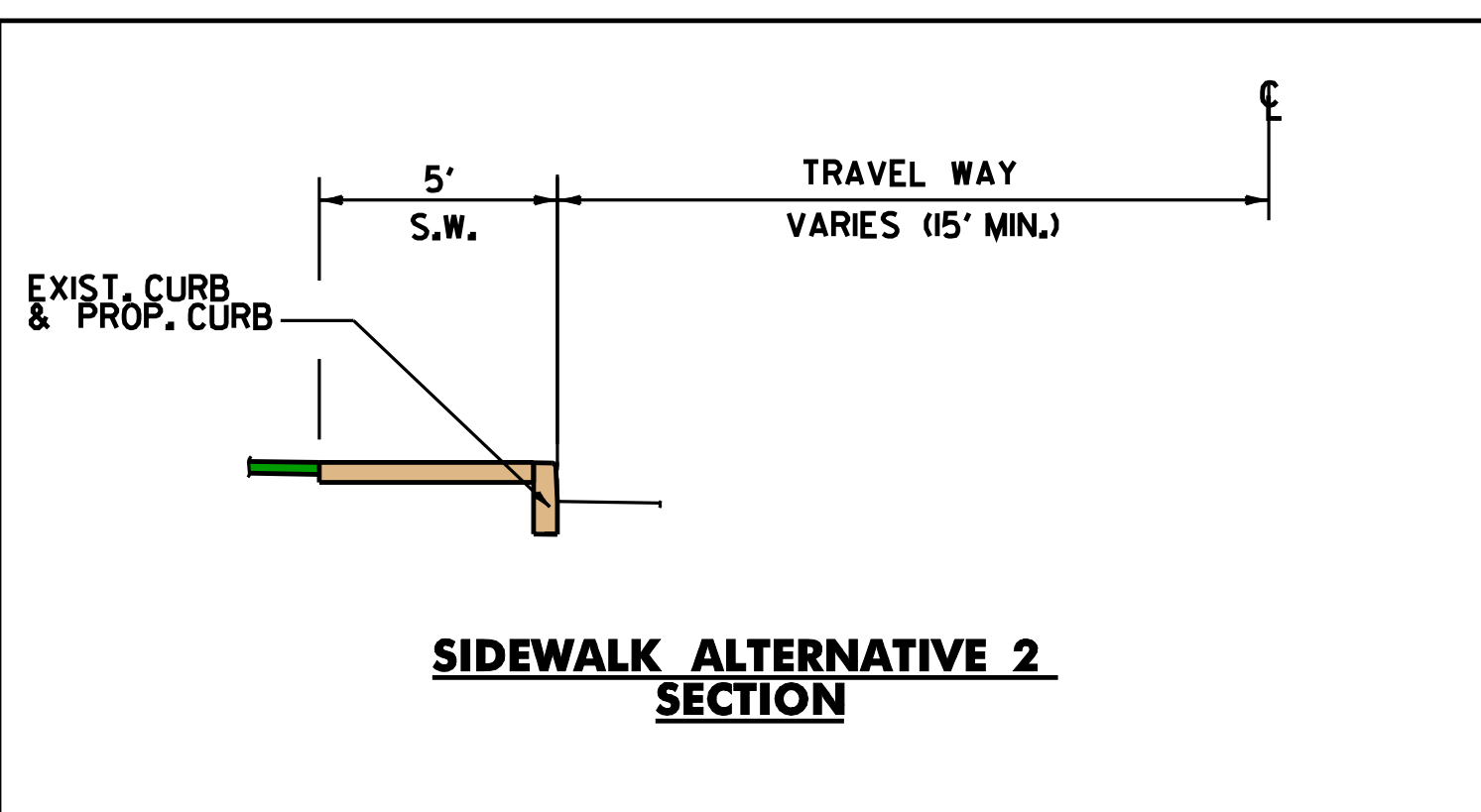
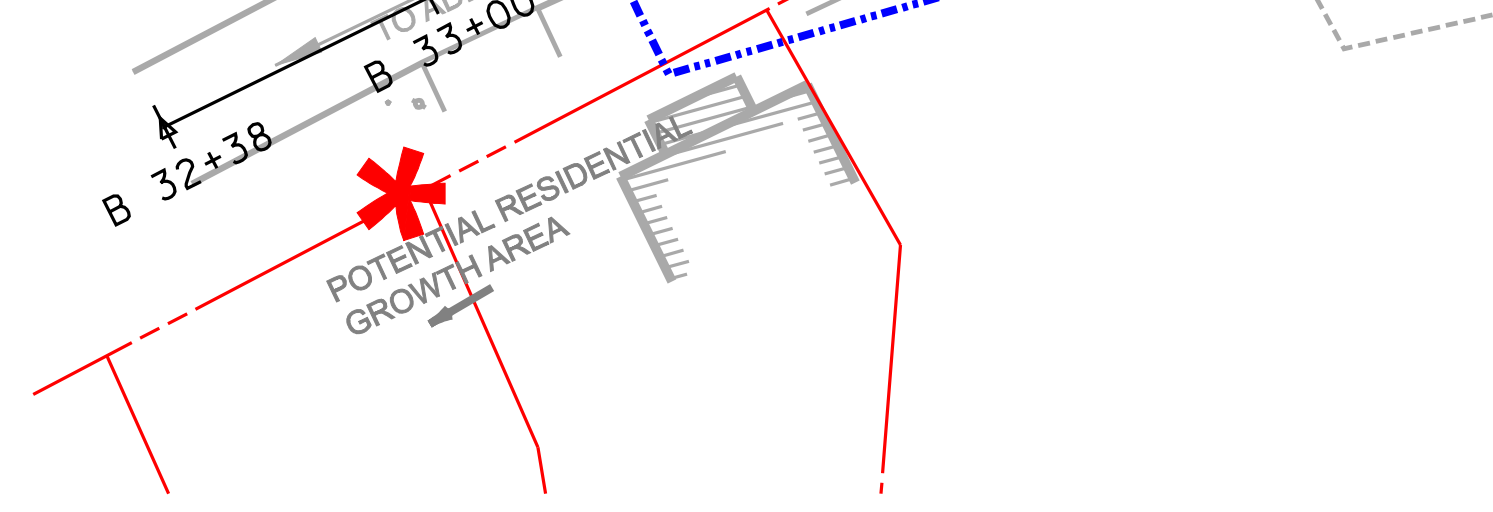
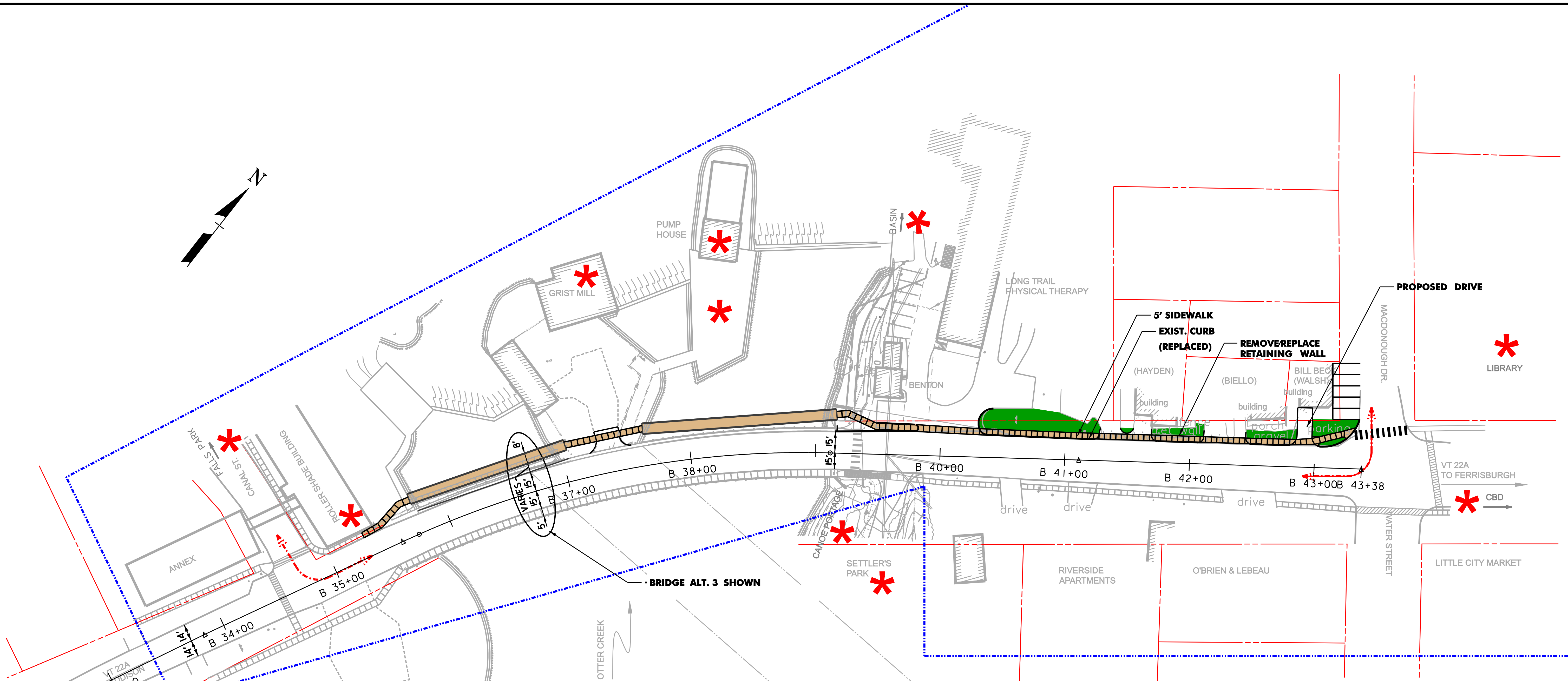
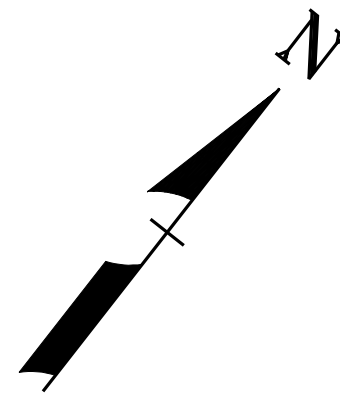
- Meets the project's purpose and needs, including pedestrian access to west side facilities, a continuous west side pedestrian connection and mobility maintained on VT 22A.
- Improves the corner sight distance of the Grist Mill Drive.
- Provides an adequate bridge inventory rating, greater than HS-20.
- Maintains existing facilities for bicyclists
- Has minor property and environmental impacts associated with abutment modifications.
- Requires modifications to the existing sewer line on the bridge.
- Requires relocation of an existing aerial utility pole on the north approach.
- Requires stream alteration and water quality permits. These maybe required due to the potential abutment modifications during final design, details may be developed to avoid needing the permits.
- Has a total estimated project cost of \$725,000

5.2.3 Alternative 3: Pedestrian Bridge

This alternative provides a separate pedestrian bridge adjacent to the west side of the existing bridge. The pedestrian bridge consists of two spans, approximately 150 feet each. Construction includes modifications and/or extensions to the existing abutments and connecting sidewalks across Grist Mill Island and on the south shore adjacent to the Roller Shade building. A plan is shown on page 17.

This alternative includes the following features and impacts:

- Maintains the existing bridge and lane widths.
- Meets the project's purpose and needs including pedestrian access to west side facilities, a continuous west side pedestrian connection and mobility maintained on VT 22A
- Has the potential for greater maintenance costs associated with an additional structure.
- Improves pedestrian operations safety with a positive barrier and separation between pedestrians and traffic, and a wider pedestrian area.
- Maintains existing facilities for bicyclists and the 8 foot to 10 foot wide pedestrian facility may encourage bicycle use.
- Requires greater expansion of existing abutments with additional environmental and adjacent property impacts.
- Requires relocation of an existing aerial utility pole on the north approach.
- Maintains the existing sewer line on the existing bridge.
- Requires a stream alteration and water quality permit.
- Has a total estimated project cost of \$870,000.



VT 22A - S. MAIN STREET
 RURAL MINOR ARTERIAL
 VERMONT TRUCK NETWORK
 POSTED SPEED 25 TO 30 MPH
 AADT (2000): 10,900 VPD
 %TRUCKS: 4-5%
 WIDTH: 26' TO 40' CURB TO CURB

VT 22A CRASH HISTORY
 CANAL STREET: 1
 WATER TO CANAL: 4
 WATER SREET: 1
 TOTAL: 6

- ORIGINS/DESTINATIONS
- LAKE CHAMPLAIN BIKEWAY
- VERGENNES HISTORIC DISTRICT



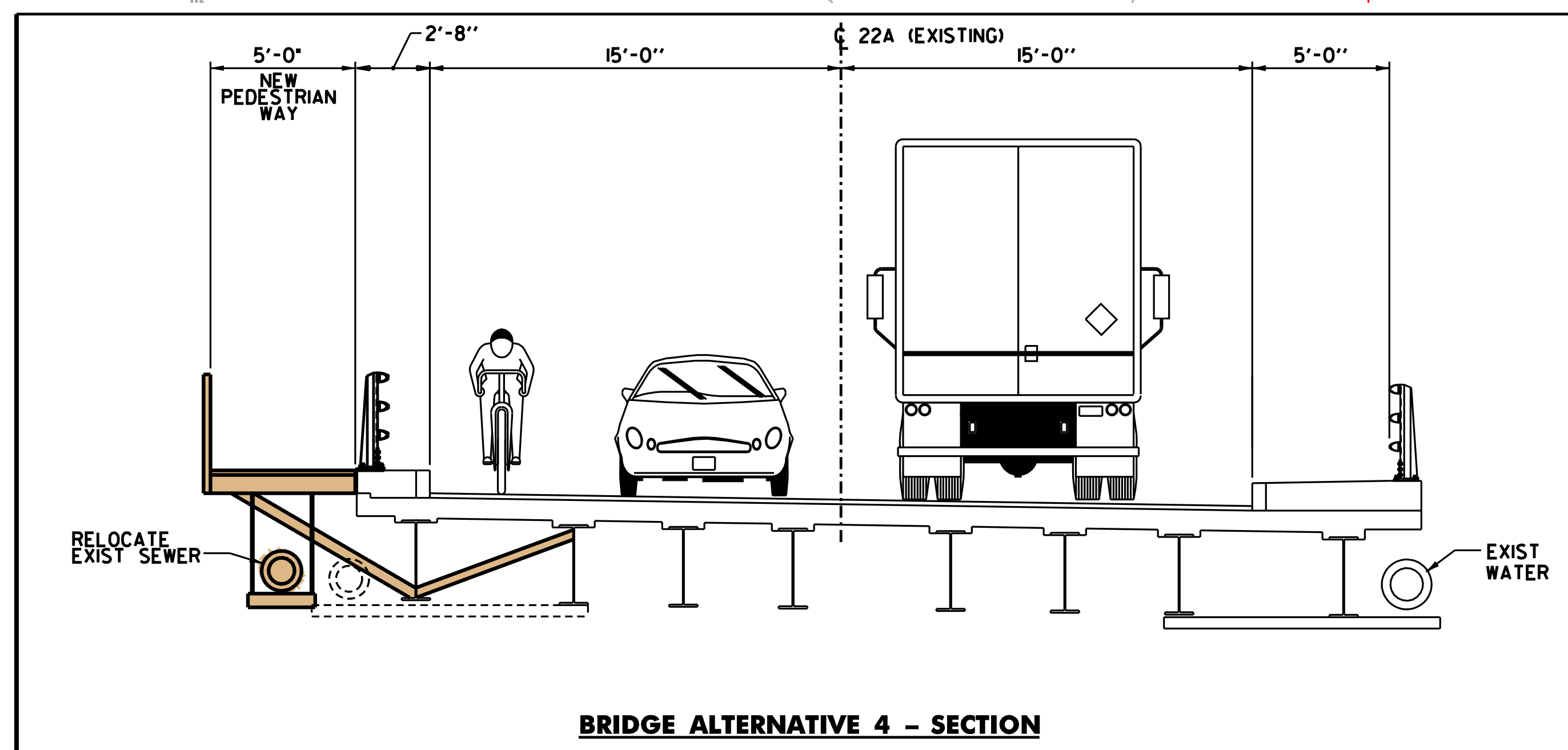
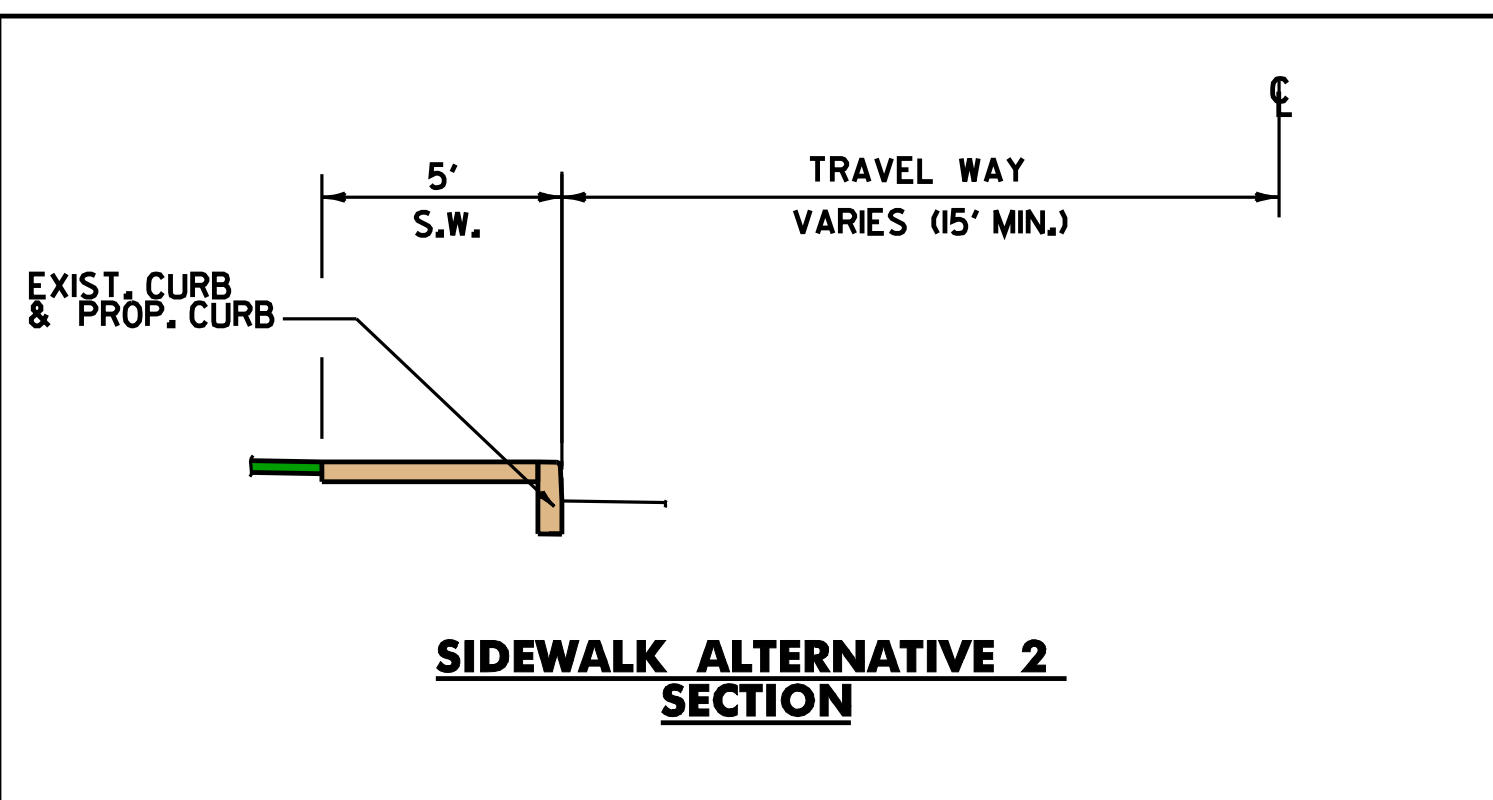
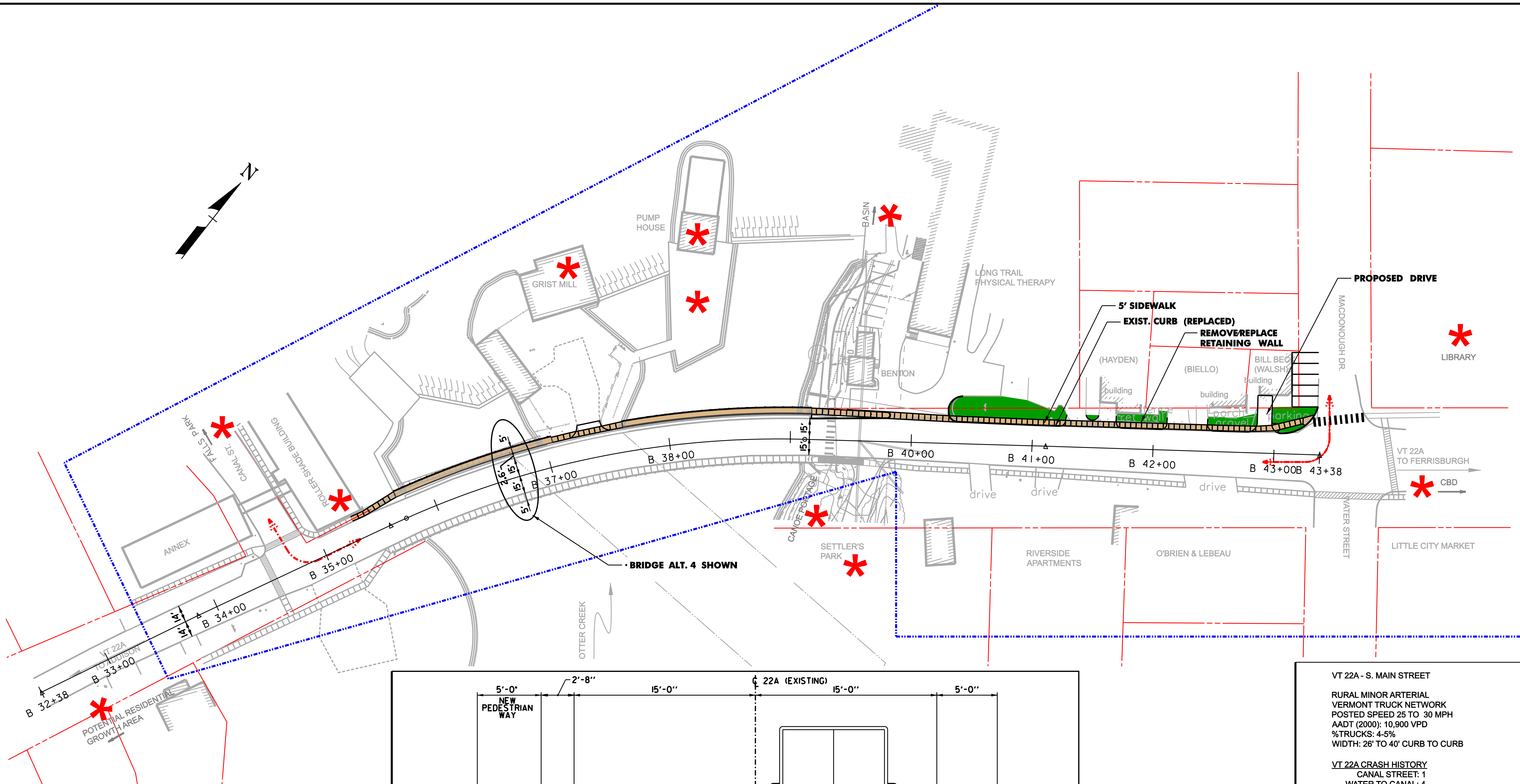
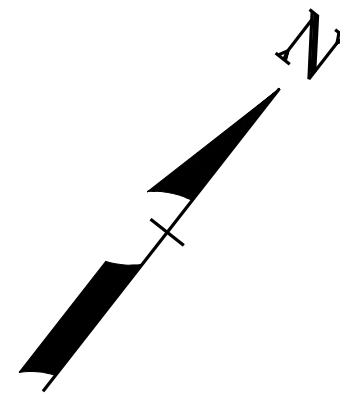
5.2.4 Alternative 4: Cantilevered Pedestrian Way

This alternative is a five foot wide bracket mounted pedestrian walkway located outside the existing bridge rail. This pedestrian way is supported off the existing bridge and requires minor modification of the existing abutments. This design relies on the strength of the existing bridge fascia beam. Initial analyses suggest the additional load on the existing fascia beam reduces the bridge inventory rating to a HS-19 (posted rating¹ of HS-31). On rehabilitation projects, the VTrans Structures Manual defines a goal of designing to achieve an inventory rating of HS-25, however, the load rating shall at least be a posted rating³ of HS-20.

This alternative includes the following features and impacts:

- Maintains the existing bridge and lane widths.
- Meets the project's purpose and needs including pedestrian access to west side facilities, a continuous west side pedestrian connection and VT 22A mobility.
- Has greater long term maintenance cost, although it is likely to be replaced during future bridge rehabilitations.
- Does not require additional strengthening of the existing fascia beam to meet HS-20 posted rating.
- Requires relocating the sewer line on the existing bridge.
- Requires relocation of an aerial utility pole on the north approach.
- May require a stream alteration and water quality permit.
- Has a total estimated project cost of \$435,000.

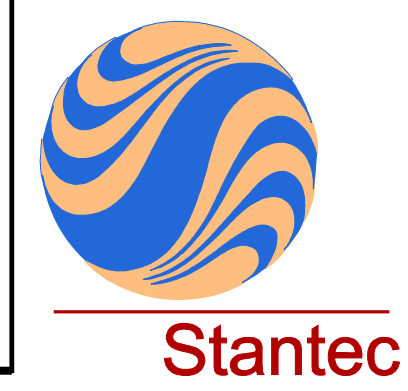
¹ As defined by AASHTO, inventory rating is the load which can safely utilize the existing structure for an indefinite period of time and the operating rating is the maximum permissible load to which the structure may be subjected. VTrans defines the posted rating which is between the operating and inventory level.



VT 22A - S. MAIN STREET
 RURAL MINOR ARTERIAL
 VERMONT TRUCK NETWORK
 POSTED SPEED 25 TO 30 MPH
 AADT (2000): 10,900 VPD
 %TRUCKS: 4-5%
 WIDTH: 26' TO 40' CURB TO CURB

VT 22A CRASH HISTORY
 CANAL STREET: 1
 WATER TO CANAL: 4
 WATER SREET: 1
 TOTAL: 6

- ORIGINS/DESTINATIONS
- LAKE CHAMPLAIN BIKEWAY
- VERGENNES HISTORIC DISTRICT



5.3 ALTERNATIVE EVALUATION MATRIX

ALTERNATIVE EVALUATION MATRIX						
ITEM	SIDEWALK ALTERNATIVES		BRIDGE ALTERNATIVES			
	Alternative 1 Curb/Greenbelt/ Sidewalk	Alternative 2 Curb/Sidewalk	Alternative 1 New Sidewalk/Narrower Roadway	Alternative 2 New Sidewalk/ Widened Bridge	Alternative 3 Pedestrian Bridge	Alternative 4 Cantilevered Pedestrian Way
PROJECT COSTS						
Construction Costs (estimated)	\$80,000	\$75,000	\$100,000	\$500,000	\$600,000	\$300,000
Preliminary Engineering (20%)	\$16,000	\$15,000	\$20,000	\$100,000	\$120,000	\$60,000
Project Management (10%)	\$8,000	\$7,000	\$10,000	\$50,000	\$60,000	\$30,000
ROW Costs (estimated)	\$1,000	\$1,000	\$0	\$0	\$0	\$0
Construction Engineering (15%)	\$12,000	\$11,000	\$15,000	\$75,000	\$90,000	\$45,000
TOTAL PROJECT COSTS	\$117,000	\$109,000	\$145,000	\$725,000	\$870,000	\$435,000
PURPOSE AND NEED						
Pedestrian Access to West Side Facilities	Improved	Improved	Improved	Improved	Improved	Improved
Continuous West Side Pedestrian Connection	Improved	Improved	Improved	Improved	Improved	Improved
VT 22A Mobility	Slightly	Unchanged	Less	Unchanged	Unchanged	Unchanged
MAINTENANCE						
Long Term Costs	Minor	Minor	Minor	Minor	Greater	Greater
Snow Removal	Accommodated	More Difficult	More Difficult	More Difficult	Similar	More Difficult
SAFETY						
Vehicle speeds	Similar	Similar	Less	Similar	Similar	Similar
Sight distance (corner)	Similar	Similar	Slightly Improved	Improved	Similar	Similar
Pedestrians	Improved	Improved	Improved	Improved	Improved	Improved
Bicycles	Similar	Similar	Less	Similar	Similar	Similar
Structural Inventory Rating			HS-20	HS-20	N/A	HS-19
IMPACTS						
Design Exception Required	No	No	Yes	No	No	No
Environmental	None	None	None	None	Greater	Minor
Adjacent Properties/Driveways	2 (Benton, Beck)	2 (Benton, Beck)	0	2 (Benton, Roller Shade)	2 (Benton, Roller Shade)	0
Existing Landscaping	Retaining wall	Retaining wall	None	None	None	None
Utilities	Drainage	None	None	Sewer Modifications	None	Sewer Relocation
PERMITS						
ACT 250	No	No	No	No	No	No
NEPA	CE	CE	CE	CE	CE	CE
401 Water quality	No	No	Possible	Yes	Yes	No
404 COE	No	No	No	No	No	No
CUD – ANR Wetlands	No	No	No	No	No	No
Stream alteration	No	No	Possible	Yes	Yes	No
Stormwater Discharge	No	No	No	No	No	No
Archaeology – Phase IB	No	No	No	No	No	No
Section 106 / Historic	No	Possible	No	No	No	No
NEPDES	CGP	CGP	CGP	CGP	CGP	CGP

6.0 Public Informational Meeting/Preferred Alternative:

At the Vergennes City Council meeting on June 26, 2007, the alternatives were presented and questions and comments were solicited. The project committee indicated the preferred sidewalk alternative was to construct the sidewalk from the bridge to Macdonough Drive using City forces and/or funds. This can likely be done more efficiently and at less cost than using State and Federal funds. This construction will provide an important link from Macdonough Drive to the new River Walk.

For the bridge sidewalk, the proposed preferred alternative was Alternative 4 - Cantilevered Pedestrian Way. This was primarily due to its cost and low impact. If funding is limited, the project could be done in phases. The first phase would span from the north side to the Grist Mill Island; providing a link from the downtown area to the Grist Mill and Pump House Island. The approximate cost would be \$250,000, about half the total project cost estimate.

This falls within the current maximum of \$300,000 per year per project for the Transportation Enhancement Grant program. Other grants or funds are possible such as Scenic Byways and Downtown Revitalization.

It was also pointed out, due to the age of the existing bridge, constructed in 1934, and its last major rehabilitation in 1969, there may be a need for major bridge rehabilitation in the next 10 to 20 years. The rehabilitation will likely involve removing and/or replacing the bridge sidewalk alternatives. This suggests minimizing the current investment by providing Alternative 4.

Regarding this approach the following questions or concerns were expressed:

- The life span of Alternative 4 was questioned. It is anticipated this alternative would exceed the remaining life of the existing bridge.
- The effects of Alternative 4 on the existing beams were questioned. Initial structural analysis indicates the existing beams are sufficient to withstand the loads of Alternative 4. In the instance, it was a structural issue; the beams could be strengthened with additional steel.
- It was also pointed out Alternative 4 did little to calm traffic. This project is just one component of the 1999 Vergennes Gateway Plan and supports the pedestrian improvements mentioned in the plan. The 1999 plan did recommend defining the intersections at each end of the bridge and installing lighting, banner poles, landscaping and signage to reduce traffic speeds. Provided adequate funding, these could be a portion of this project and are not precluded by the proposed bridge improvements.

Other improvements to consider for future traffic calming installations include:

- Durable white edge lines delineating shoulders and 11 foot travel lanes,
- Signing, pavement markings and/or colored pavement indicating the shoulder areas are used by bicycles

Based on this input, the following steps are suggested for consideration and further discussion:

- Initiate discussions with VTrans regarding planning for the eventual rehabilitation of the existing bridge
- Pursuing funding sources for Alternative No. 4
- In the interim, install pedestrian warning signs indicating an unmarked crossing connecting the east side sidewalk with Grist Mill Island.
- Pursuing additional traffic calming components of the 1999 Vergennes Gateway Plan.