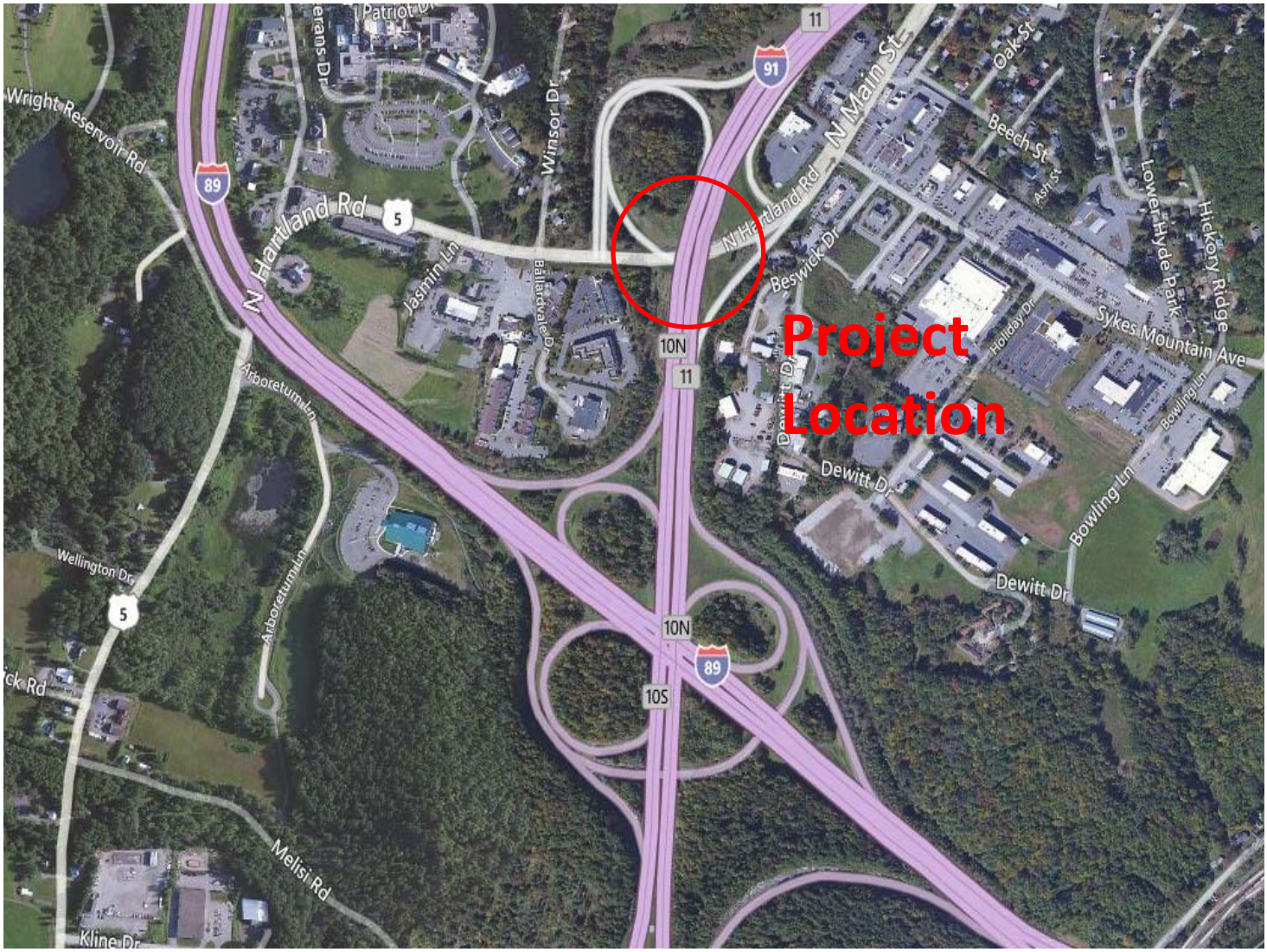
TRANSPORTATION MANAGEMENT PLAN (TMP)

FOR

Hartford IM 091-2(79)

I-91, Bridge 43N & 43S over US-5
Hartford, Vermont



VERMONT
AGENCY OF TRANSPORTATION

Revised March 9, 2015

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1.0 Project Description

The Hartford IM 091-2(79) project consists of the replacement of Bridges 43N & S on I-91. These bridges carry I-91 over US-5 in an urban area of Hartford, VT between Sykes Mountain Avenue and Windsor Drive. Bridges 43N & S will each be replaced utilizing the innovative accelerated construction technique of Slide-In bridge construction. A significant portion of the new bridge abutments will be constructed under the existing structures while traffic is maintained on I-91 and US-5. New superstructures will be constructed adjacent to the existing structures; and over the course of one weekend per bridge the existing bridges will be removed, the new bridges slid into place, approach work completed, and traffic restored. The construction is scheduled to start March 23, 2015 and end by October 30, 2015.

There is a significant amount of traffic on I-91over the bridges as well as on US-5 below the bridges (see section 2.0 for traffic volumes). While there are trees and grass buffers within the State Right of Way adjacent to the bridges, the site is surrounded by a commercial district composed of service related businesses a hospital and several hotels.

This project will have direct impact on I-91 and US-5 traffic. Secondary impacts will occur to Sykes Mountain Avenue east of the project, Windsor Drive, Ballardvale Drive and Veterans Drive west of the project and I-89 south of the project. Signed detours will be in place on I-89, US 4 and US-5. See Appendix B and C.

The traffic pattern on US-5 will be reconfigured to two lanes at the start of the project to allow room for constructing the new structures. US-5 will be restricted to one lane with alternating traffic or completely stopped for short durations with the use of flagging operations between April and October to accommodate certain construction activities. Activities having the greatest impact on the traveling public such as steel girder erection and concrete placement are being scheduled between 9:00 PM and 6:00 AM to avoid delays. See Section 5.1 Temporary Traffic Control for restrictions of delays and other additional information.

I-91 at the bridge locations will be closed for two weekends to slide the new bridges into place (one weekend for the northbound bridge and the second for the southbound bridge). Two days prior to each closure, I-91 will be reduced to one lane to accommodate pavement removal and other preparation for structure demolition.

The contractor will select a separate Bridge Closure Period (BCP) for each bridge and provide written notice two weeks in advance so the public can be warned accordingly. The BCP will begin at 6 pm on the Friday of the closure weekend and traffic will be restored on the new bridge on I-91 by 6 am the Monday of the same weekend. Approved closure dates are as follows:

August 7 – August 10
August 14 – August 17
August 21 – August 24
August 28 – August 31
September 11 – September 14
September 18 – September 21

Hartford-Sharon IM SURF(46) is a resurfacing project on I-89NB beginning at the Vermont/New Hampshire line and continuing north to Sharon. The project has a completion date of July 24, 2015. The Alternate Route to I-91 utilizes I-89 to Exit 1 and will only be activated if extreme backups occur at exit 11 on I-91.

No other identified projects are scheduled that would have traffic impacts on/from this project.

This is classified as a significant project based on the criteria in the Vermont Agency of Transportation *Work Zone Safety & Mobility Guidance Document* and the Federal Highway Administration *Developing and Implementing Transportation Management Plans for Work Zones*. As such, this Transportation Management Plan (TMP) contains the following work zone impact management strategies:

1. Temporary Traffic Control Plan (TTC)
2. Public Information and Outreach (PI)
3. Transportation Operations (TO)

These strategies are outlined in section 5.0

2.0 TMP Team—Roles and Responsibilities

This section includes contact information and roles and responsibilities for major personnel involved in the project

TMP Development Managers	
Vermont Agency of Transportation (VTrans)	**Consultant**
Name/Title: Kristin Higgins, Project Manager Unit: VTrans – Structures Section Phone: (802) 828-0053, (802) 498-3398 cell Email: Kristin.higgins@state.vt.us	Name/Title: Jeremy Mackling, Project Manager Unit: PCL Civil Constructors, Inc. Phone: (813) 810-1142 cell Email: JMackling@pcl.com
Roles and Responsibilities: Agency/Contractor personnel with the primary responsibility for developing this TMP.	

TMP Implementation/Monitoring Managers	
VTrans	**Contractor**
Name/Title: Chris Barker, Resident Engineer Unit: VTrans - Construction Phone: (802) 279-8161 cell Email: chris.barker@state.vt.us	Name/Title: Erich Heymann, Project Engineer Unit: PCL Civil Constructors, Inc. Phone: (407) 235-5843 cell Email: EWHeymann@pcl.com
Roles and Responsibilities: Agency/Contractor personnel primarily responsible for implementing the TMP.	

TMP Implementation Task Leaders	
VTrans	**Contractor**
Name/Title: Nate Dagesse, Chief Inspector Unit: EIV Technical Services Phone: (802) 683-9967 cell Email: ndagesse@eivtech.com	Name/Title: Ron Gibbons, Superintendant Unit: PCL Civil Constructors, Inc. Phone: (727) 224-2324 cell Email: RRGibbons@pcl.com
Roles and Responsibilities: Implement detour around project site in the event there is an incident at the project site causing traffic restriction	

VTrans TOC	Regional Traffic Manager (RTM)
Name/Title: Transportation Operations Center Unit: VTrans - Operations Phone: (802) 828-2648, (802) 250-4668 pager Internal Email: AOT.OPSTOC@state.vt.us	Name/Title: Nancy Avery Unit: VTrans – Traffic Operations Phone: (802) 279-5991 Email: nancy.avery@state.vt.us
Roles and Responsibilities: Emergency VTrans resource request, social media and PCMS activation.	**Roles and Responsibilities:** Coordinates traffic management efforts.

Public Information Officer	
VTrans	**Consultant (POC)**
Name/Title: Erik Filkorn, Public Outreach Manager Unit: VTrans – Public Outreach Phone: (802) 498-5988 Internal Email: erik.filkorn@state.vt.us	Name/Title: Jill Barrett, Public Outreach Coordinator Unit: Fitzgerald & Halliday, Inc. Phone: (802) 272-1248 cell Email: jbarrett@fhiplan.com
Roles and Responsibilities: Agency personnel who provide real-time public awareness of the work zone, including detection, prevention, and response to incidents.	

Emergency Service Contacts	
Fire and Emergency Medical Services (FEMS)	**Police Department (PD)**
Name/Title: Steven Lock, Fire Chief Unit: Town of Hartford Fire Department Phone: NON-EMERGENCY (802) 295-3232 Email: slocke@hartford-vt.org	Name/Title: Leonard Roberts, Deputy Chief Braedon Vail, Deputy Chief Unit: Town of Hartford Police Department Phone: NON-EMERGENCY (802) 295-9425 Email: lroberts@hartford-vt.org; bvail@hartford-vt.org
Fire and Emergency Medical Services (FEMS)	**Vermont State Police**
Name/Title: Scott Smith, Director Unit: Town of Hartford Emergency Communications Center Phone: (802) 295-9425 Email: ssmith@hartford-vt.org	Name/Title: Lt. William Jenkins Unit: Vermont State Police, Royalton Barracks Phone: (802) 234-9933 Email: William.Jenkins@state.vt.us
Roles and Responsibilities: Resource contacts in the event of an emergency.	

Emergency Service Contacts Continued	
VTrans Maintenance District 4 – White River Jct.	**Windsor County Sheriff**
Name/Title: Melvin Darling, Maintenance Sup. Unit: VTrans- Operations Phone: (802) 777-4909 cell Email: melvin.darling@state.vt.us	Name/Title: Michael Chamberlin, Sheriff Unit: Windsor County Sheriff Phone: (802) 457-5211 Email: Michael.Chamberlain@state.vt.us
Roles and Responsibilities: Resource contacts in the event of an emergency.	

Additional Key Personnel	
Town of Hartford, VT	**Public Works Dept., Hartford, VT**
Name/Title: Hunter Rieseberg, Town Manager Unit: Town of Hartford Phone: (802) 295-9353 Email: hrieseberg@hartford-vt.org	Name/Title: Richard Menge, Director Unit: Town of Hartford Dept. of Public Works Phone: (802) 295-3622 Email: rmenge@hartford-vt.org
New Hampshire Department of Transportation	**Hartford-Sharon IM SURF(46)**
Name/Title: Alan Hanscom Unit: District 2 Engineer Phone: (603) 448-2654 Email: ahanscom@dot.state.nh.us	Name/Title: Sandra Schmitt, Resident Engineer Unit: VTrans- Construction Phone: (802) 249-2564 cell Email: sandra.schmitt@state.vt.us
White River Junction VA Medical Center	**Town of Hartland, VT**
Name/Title: Mary Hamisevicz, Emergency Management Coordinator Unit: White River Junction VA Medical Ctr. Phone: (802) 295-9363 x5976, (774) 641-2253 Email: mary.hamisevicz@va.gov	Name/Title: Robert (Bob) Stacey, Town Mgr. Unit: Town of Hartland Phone: (802) 436-2119 Email: bstacey@hartlandvt.org
Dartmouth-Hitchcock Medical Center	**New Hampshire State Police**
Name/Title: Dan Dahmen, Director Unit: DHMC - Security Phone: (603) 650-7896 Email: Daniel.k.dahmen@hitchcock.org	Name/Title: Troop D Unit: NH State Police Phone: (603) 271-1162 Email: TroopD@dos.nh.gov

Lebanon, NH Police Department	Vermont State Police
Name/Title: Gary Smith, Chief Unit: Lebanon Police Department Phone: (603) 448-1212 Email: gary.smith@lebcity.com	Name/Title: Lt. Garry Scott Unit: Vermont State Police, Traffic Operations Phone: (802) 872-4056; (802) 238-3042, cell Email: Garry.Scott@state.vt.us

Roles and Responsibilities: Contact if the opening of I-91 is delayed or in the event sudden closure of US Route 5 or I-91.

Public Transportation Organizations:

• Advance Transit	(802) 295-1824	chrisa@advancetransit.com
• Connecticut River Transit	(802) 376-3043	etarvit@crtransit.org
• Stagecoach Transportation Services	(802) 728-3773	dferris@stagecoach-rides.org
• Greyhound Lines, Inc.	(802) 295-3317	Brian.Barrow@greyhound.com

Local Media Outlets:

• Valley News	(603) 298-8711	newseditor@vnews.com
• Caledonian Record	(802) 748-8121	grayd@caledonianrecord.com
• Brattleboro Reformer	(802) 254-2311	**news**@reformer.com

Trucking Organizations:

• VT Truck and Bus Association	(802) 479-1778	paula@vtba.org

3.0 Existing Conditions

3.1. Roadway Characteristics

Roadway Classification	Rural Principal Arterial - Interstate
Year of Construction	1966
Bridge Type	3 span rolled beam bridge
Bridge Length	202’
Width of Bridge	37.3’ (43N) & 42’ (43S)
Width of Roadway Approach	39’ (43N) & 47’ (43S)
Ownership	State of Vermont

3.2. Traffic

A traffic study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected for the years 2015 and 2035.

Bridge	AADT		DHV		%T		%D		ADTT		ESALs	
	2015	2035	2015	2035	2015	2035	2015	2035	2015	2035	(2015 ~ 2035)	(2015 ~ 2055)
43N	7600	9100	1200	1500	10.0	14.8	100	100	1000	1800	7,165,000	17,331,000
43S	11,500	13,900	1500	1900	10.5	15.5	100	100	1200	2200	7,704,000	18,573,000

US-5 traffic data were procured from the 2010 Route Log AADT. Between Sykes Mountain Avenue and Veterans Drive there was an AADT of 14,900 in 2008 and 13,200 in 2010.

3.3. Traffic Operations

I-91 has no traffic control signing other than a posted 55 MPH speed limit and 40 MPH speed minimum for the two through lanes in each direction.

US-5 in the immediate project area consists of a northbound and southbound through lane. There is a dedicated right hand turn lane for southbound US-5 traffic to I-91 northbound onto Ramp "D" prior to the bridges. Under the bridges there is also a dedicated right hand turn lane for southbound US-5 traffic to I-91 southbound via Ramp "A". Northbound US-5 traffic has a dedicated left hand turn lane for I-91 southbound via Ramp "B", prior to the bridges; and, a dedicated left hand turn lane for I-91 northbound via Ramp "D". The speed limit on US-5 within the project work area is 35 MPH, 40 MPH beyond the project work area.

Ramp A from US-5 onto I-91 SB has a yield with Ramp B. There is a dedicated left- hand turn lane from US-5N to Ramp B for I-91 SB. Ramp C, Exit 11 from I-91 NB splits into a slip lane with an added lane condition to US-5N and a stop condition to turn left onto US-5S. Ramp D from US-5S is a dedicated right-hand turn lane. Traffic from US-5N enters I-91 NB via Ramp D from a dedicated left-hand turn lane, crossing US-5S. I-91 SB Exit 11 Ramp F traffic stops at the end of the ramp and turns right onto US-5S or left onto US-5N.

A traffic signal is located at the intersection of US-5 and Sykes Mountain Avenue, approximately 800 feet north of I-91. Currently there is no coordinated signal timing for this signal.

3.4. Crash Data

The intersection of US-5 and Sykes Mountain Avenue is listed in the *VTrans High Crash Report Sections and Intersections 2006-2010*. Over the 5 year reporting period there were 28 crashes resulting in no fatalities, 3 injuries and property damage averaging $14,511.

According to the *General Yearly Summaries – Crash Listing* for the period of January 2008 through December 2012 there were 19 crashes with no fatalities and only 1 injury in the vicinity of the project area. The majority of these crashes were left turn and thru broadside, and rear end collisions.

3.5. Pedestrian/Bicycle and Transit Facilities

There are no sidewalks or dedicated bicycle facilities within the project limits or adjacent to the project. There is a well-worn path behind the guardrail on the south side of US-5 under the I-91 overpasses. According to *Draft Scoping Study Hartford EH11(5)*, dated September 18, 2012; over 170 pedestrians were observed walking along US-5 during a pedestrian count conducted by VTrans from 6 am to 6pm in June 2010. Very little bicycle traffic was observed.

There are several transit providers serving the I-91/US-5 area. Stagecoach Transportation Services stops at the White River Junction VA Medical Center (WRJ VAMC). Connecticut

River Transit serves the WRJ VAMC and points north on their Upper Valley Commuter line. Advance Transit has stops north of the project in White River Junction and the WRJ VAMC.

There are no transit stops within the project limits.

3.6. Truck Routes

Although I-91 and US-5 receive moderate truck traffic, neither are considered a major truck route.

3.7. Local Community and Business Concerns/Issues

- Bob Stacey, Hartland Town Manager. Communicated the possibly that the town center reconstruction project would be happening this spring/summer. He did not think this would be a problem on detour weekend. However, the intersection project was not funded and will not be under construction this summer. The town center comes up quickly and is over the crest of a hill. For people unfamiliar with the area, variable message signs or other measures alerting drivers to slow down ahead should be considered. The town manager wondered about the need for a police officer in the town center.
- Pedestrian and bicycle passage
- Covered Bridge Half Marathon (in Woodstock to Quechee) – Sunday June 7, 2015 - http://cbhalfmarathon.blogspot.com/p/course-map.html
- Dartmouth College Commencement Weekend, June 12-14, 2015
- Quechee Hot Air Balloon Festival, June 19-21, 2015 https://www.quecheeballoonfestival.com/
- The Prouty, Friday July 10-11, 2015 http://theprouty.org/
- Harpoon Championships of New England Barbecue, July 25-26, 2015 http://www.harpoonbrewery.com/events-and-festivals
- The statewide VT swim meet at the upper Valley Aquatics Center is Aug 4th weekend
- Quechee Scottish Fair Saturday, August 22, 2015, http://www.quecheescottishfestival.com/
- Vermont Overland Grand Prix Bike Race, August 23, 2015 http://www.vermontoverland.com/vogp/
- North Branch Bluegrass Festival of Bridgewater – August 28 – Aug 31, 2015 http://www.nbbluegrass.com/
- Vermont State Fair, August 29-September 7, 2015 www.vermontstatefair.net
- Tunbridge World's Fair, September 10-13, 2015 http://www.tunbridgeworldsfair.com
- Glory Days of Railroad, September 12 – 13, 2015
- Dartmouth College Fall term move-in weekend, September 12-13, 2015

4.0 Operational Analysis

This section is intended to provide information on safety and mobility aspects within the project influence area, including traffic safety, data collection and modeling approach, traffic analysis, and other issues and concerns. This operational analysis will help identify potential work zone impacts and guide selection of TMP strategies.

4.1. Safety Analysis

A specific Safety Analysis was not completed for this project due to the limited project area. Please refer to 3.4 Crash Data for existing conditions at the site. It is anticipated that this project will not cause an increase in crashes in this segment – it is the intention of the TTC plan to manage traffic through the area in a manner that will decrease the likelihood of accidents. This should be accomplished by clear TTC signage, reduced speeds through the construction site, and the installation of the two temporary traffic signals coordinated with the existing signal at Sykes Mountain Avenue and Route 5. Ongoing monitoring of any increase in crashes is important while the TTC, TO, and PI&O are implemented to help determine if the project is negatively impacting safety.

4.2. Traffic Analysis and Modeling

In anticipation of changing traffic patterns for this project, Vanasse Hangen Brustlin, Inc. (VHB) evaluated traffic operations associated with placing two temporary traffic signals along US-5 during the construction of this project. The project study area was limited to US-5, the intersections with the I-91 southbound and northbound ramps, and Sykes Mountain Avenue. VHB evaluated traffic operations during the bridge construction period.

Based on recommendations from VHB, two temporary traffic signals are being used throughout the duration of the project. A signal will be installed at the intersection of Exit 11 NB ramp with US-5 with another installed at the intersection of Exit 11 SB ramp and US-5. These two temporary signals will be coordinated with the existing traffic signal at the intersection of US-5 and Sykes Mountain Avenue, which will be upgraded with a GPS clock and re-timed for the project. According to the results of VHB's study, some vehicle queues are expected to exceed available storage, but the proposed coordinated signal timing should prevent queues from backing up onto I-91

VHB provided signal timing for the Bridge Closure Period which may be adjusted based on the site specific TCP provided by the contractor or actual traffic patterns. The resident engineer will be involved in determining proper signal timing to ensure minimal backups occur.

4.3. Alternatives/Impact Assessment

This Project is being constructed utilizing the Accelerated Bridge Construction technique of Slide-in Bridge construction. This technique was identified during the project scoping phase as the preferred alternative. With this construction method the new substructures will be constructed in-place, working between the existing piers and abutments; and the new superstructure will be constructed adjacent to their final locations on temporary supports. During

a weekend closure (one for each bridge), the existing I-91 bridge will be removed, approach work completed, and the new superstructure slid into place.

It was identified early on in the project, that traffic must be maintained on US-5 under the I-91 bridges, including during the BCP.

Additional Concerns that this TMP is intended to address:

- Emergency Personnel – Emergency personnel will have access through the project site at all times outside of the BCP. The Hartford Police and Fire Departments are listed in this TMP and will be kept informed by the contractor's staff of the project schedule with regards to traffic management and will be notified immediately if through traffic is not possible for emergency vehicles on US-5 or I-91. The Hartford Police and Fire Departments have been involved in discussions about the project and are aware they may need to be prepared to take alternate routes during construction, particularly during the BCP. See 5.3.4 for more information regarding notification.
- Community Accessibility—this project is localized in the area immediately adjacent to the bridges and I-91 Exit 11. As such direct impacts will be to through traffic on I-91 and US-5. Commercial access adjacent to the project is from Ballard Drive and Sykes Mountain Avenue to the west and east of the project, respectively. The nearest residential access is Windsor Drive west of the project. Veterans Drive access to the The VA Medical Center is just beyond Windsor Drive. Impacts to these points will be caused by any queuing that occurs along US-5. In order to address this, two-way traffic must be maintained on US-5 during the morning peak and afternoon peak; and a Uniform Traffic Officer will be stationed at the intersection of Veterans Drive and US-5 from 4:00 to 5:00 pm weekdays. A Uniform Traffic Officer will stationed as directed by the Engineer at the intersection of I-91 Northbound ramps and US-5 during daylight hours for construction season to clear any queues on the I-91 Exit 11 North off-ramp. The VTrans Resident Engineer will evaluate the need for any adjustments to the temporary traffic signals throughout the project construction.
- Pedestrians and Bicyclists—this project will not impact any existing dedicated pedestrian or bicyclist facilities. Accommodations for this constituency are discussed in Section 6.0 Work Zone Impact management Strategies.
- Public Transportation—existing bus stop locations will not be impacted by this work zone. Public Transportation operations will be affected by delays from queuing along US-5. Public Transportation may also experience delays during the BCP. Alternate bus routes will be at the discretion of each organization providing services.
- Commercial Vehicles—Through public outreach, commercial vehicles shall be advised to avoid the project area during each BCP.

5.0 Work Zone Impact Management Strategies

This section provides an overview of various strategies deployed to improve the safety and mobility of work zones and reduce the work zone impacts on the road users, community, and businesses.

The strategies are grouped according to the following three categories.

1. Temporary Traffic Control (TTC)
2. Public Information and Outreach (PI&O)
3. Transportation Operations (TO).

5.1. Temporary Traffic Control (TTC)

The Temporary Traffic Control Plan for this project specifically addresses traffic on I-91, US-5 and that originating from Sykes Mountain Avenue and I-89. A copy of the TTC plan is included as Appendix A. The plan covers the two major project phases – construction of the new substructure in place and the superstructure on temporary supports; and each BCP.

To limit impact to travelers, the Contractor shall maintain a minimum of:

Two way traffic always during peak hours

- 6:00 AM -9:00 AM
- 3:00 PM -6:00 PM

Delays not to exceed 10 minutes

- 9:00 AM – 3:00 PM
- 6:00 PM – 9:00 PM

Delays exceeding 10 minutes but not to exceed 20 minutes

- 9:00 PM – 6:00 AM

Prior to and following the end of the Northbound BCP, the Contractor shall maintain a minimum of two-lanes, one-way traffic for I-91 North during the peak hours of 6:00am and 6:00pm and shall maintain one-lane, one-way traffic during non-peak hours. All traffic shall be maintained on the existing structure prior to the BCP. The Contractor shall only be allowed to reduce northbound traffic to one-way, one-lane during peak hours two days prior to the BCP.

Prior to and following the end of the Southbound BCP, the Contractor shall maintain a minimum of two-lanes, one-way traffic for I-91 South during the peak hours of 6:00am and 6:00pm and

shall maintain one-lane, one-way traffic during non-peak hours. All traffic shall be maintained on the existing structure prior to the BCP. The Contractor shall only be allowed to reduce southbound traffic to one-way, one-lane during peak hours two days prior to the BCP.

5.1.1. Traffic Control During General Construction

During construction, the speed limit on I-91 North will be temporarily reduced from the existing 55 MPH to 45 MPH.

Two traffic lights will be installed as part of the TTC for the project: one at the intersection of I-91 southbound Ramp "F" and US-5; and one at the intersection of I-91 northbound Ramp "C" and US-5.

To align traffic for the new temporary traffic light at the end of Exit 11 northbound, the configuration of this ramp will be temporarily changed, within the existing pavement, to accommodate two lanes of exiting traffic. The existing dedicated spur ramp for vehicles to turn onto US-5 southbound will be barricaded. Both lanes of traffic will be addressed by a temporary traffic light. The left-hand lane of the ramp will be for left-hand turn only to US-5 southbound and the right-hand lane will proceed onto US-5 northbound.

A dedicated right-hand turn lane will be constructed south of Ramp "A" to allow traffic from US-5 southbound heading to I-91 southbound to turn right onto Ramp "B". Ramp "A" will be closed after this new configuration is in place.

US-5 will be reconfigured to allow construction activities to take place adjacent to US-5. The existing raised islands will be removed, temporary pavement installed, and traffic will flow in two lanes (one in each direction). The intersection of Ramp "C" and US-5 will be reconfigured to allow the traffic lights to function effectively with dedicated turn lanes from US-5 northbound and southbound onto Ramp "D".

A temporary five-foot (5') wide pedestrian walkway will be constructed along the south side of US-5 separated from the US-5 northbound travel lane by temporary traffic barrier and the southerly abutment construction locations by temporary traffic barrier and construction fencing.

5.1.2. Northbound Closure

During the northbound BCP traffic patterns will be modified. Prior to Exit 11, the I-91 northbound passing lane will be closed and traffic will be channelized to the northbound travel lane. Separation from traffic entering from I-89 will be maintained with barrels for approximately 400 feet. The lanes will be able to intermingle, and two lanes will continue down the temporary widened exit ramp. Multiple message boards will instruct drivers the left lane will be a left turn only to US-5 South. Additional message boards will instruct drivers the right lane traffic can proceed to either cross US-5 to the I-91 northbound on ramp or bear right to US-5 North. During the daylight hours a UTO will be stationed at the intersection to address concerns with the additional traffic from the project detour. See Appendix B-1.

5.1.3. Southbound Closure

During the southbound BCP, I-91 southbound traffic will take Exit 11 Ramp "F" to US-5 South to Exit 9 I-91 Hartland. During daylight hours, two UTOs shall be stationed at the intersection of VT 12 and US-5. See Appendix B-2.

Traffic destined for I-89 will take I-91 Exit 12; follow US-5 South to US 4 West to I-89 Exit 1, North or South. Ramp "A" and Ramp "B" will be closed, preventing traffic from US-5 from entering I-91 southbound. During Daylight hours one UTO will be stationed at the Junction of US 4 and I-89 Exit 1 South ramps to address concerns with the additional traffic from the Project detour. See Appendix B-3.

5.1.4. Alternate Route to I-91

The alternate route to I-91 will be activated as part of the Smart Work Zone when extended queues are detected at the I-89/I-91 interchange. I-89 northbound or southbound traffic destined to I-91 northbound will proceed to Exit 1 I-89 off-ramp, turn right at the end of the ramp and follow US 4 East to US-5 North to I-91 Exit 12 North. See Appendix B-4.

5.1.5. Control Strategies

During the course of the Project from Conceptual planning on, Temporary Traffic Control strategies were continually evaluated and improved to provide for a safe, cost-effective project while minimizing disruption to the travelling public. This evaluation process led VTrans to elect to use the full roadway closure of I-91 to replace the two deficient structures over separate weekend BCPs. To manage traffic travelling through the site prior to and during the BCP, the below traffic control techniques will be employed and continually evaluated during the Project:

A key aspect of the TTC plan is the installation of two temporary traffic lights and coordination with the existing traffic light on US-5 at Sykes Mountain Avenue.

Lane shifts or closures are primarily employed on US-5 from Ramp "C" to Ramp "B" to align traffic with the two temporary traffic lights, channelize traffic away from the substructure work just off the existing travel ways and simplify the flow of traffic through the project site.

During certain operations, such as placing the girders on the temporary supports, placing deck panels, and pouring the concrete deck, one-lane, two-way controlled operation is permitted through the project area. One-lane traffic will be limited to those times outside of the A.M and P.M. rush hours to accommodate peak travel. These activities have been scheduled to occur during night time hours.

As discussed in 5.1.4 Alternate Route to I-91 N, freeway-to-freeway interchange diversion will be employed automatically as part of the SWZ developed for this project. This will prevent traffic from backing up at the I-89/I-91 interchange, improving traffic through time, by diverting traffic from the project site when necessary. This Alternate Route will be signed as an option during the normal course of construction for traffic wishing to avoid the project area altogether.

Night work and weekend work will be allowed during the project within the limitations discussed elsewhere. The BCPs are each scheduled for a weekend so as to have the least traffic impact.

Pedestrian and bicycle traffic will be accommodated with the temporary facility constructed for this project. Restrictions similar to those for vehicular traffic on US-5 will occur, such as not being able to move under the new bridge during certain operations. Pedestrian and bicycle traffic will be accommodated during each BCP by means of a temporary shuttle paid for as part of this project.

5.1.6. Project Coordination, Contracting, and Innovative Construction Strategies

This project has been developed from conceptual to contract plans via the Construction Manager/General Contractor (CM/GC) contracting method. This process has allowed VTrans to develop contract plans, including the TTC plan and this TMP with the input of the likely General Contractor constructing the project. Utility coordination for this project has resulted in the identification of utilities in the area and the scheduled, coordinated relocation of a Town of Hartford water line. Construction of this project is occurring entirely within the State Right of Way. This project will not have impacts on other transportation infrastructure such as rail or air.

5.2. Public Information and Outreach (PI&O)

5.2.1. Public Awareness Strategies

A public awareness campaign has been initiated by VTrans working through a contracted Project Outreach Coordinator (POC). Project related information will be available on the Hartford Lateral Bridge Slide Project website: http://www.i91wrj.vtransprojects.vermont.gov. Ongoing coordination between the VTrans Resident Engineer, Contractor Superintendent, VTrans Project Manager, and POC will occur during the project will ensure the timely dissemination of information that may affect the travelling public.

The POC will maintain a list of local and regional contacts to provide timely updates regarding traffic delays, changes in patterns or closures though email. Additional contacts can be added to this list by visiting the Stay Informed link on the Project website: http://www.i91wrj.vtransprojects.vermont.gov/stay_informed.html, emailing jbarrett@fhiplan.com or calling (802) 272-1248.

In order to raise public awareness of the Project and listen to community concerns and comments, VTrans held a series of meetings in White River Junction. A public meeting was held on May 20, 2014. On October 9, 2014 the VTrans Project Manager and POC met with the VA Medical Center to provide them with current information regarding the Project. On February 3, 2015 there was an informational meeting with the Ambulance providers to the VA Medical Center. Documents related to these meetings can be accessed from the Project website. Another public meeting is planned for April 7, 2015 and will include the contractor. Pre-closure meetings and other informational meetings will be held throughout the construction of the project.

The POC will also coordinate outreach through various local media outlets.

5.2.2. Motorist Information Strategies

This project is implementing a Smart Work Zone (SWZ) system to assist in managing traffic flow in and around the project site; address undesirable traffic conditions as they occur; and provide the travelling public with time-sensitive information regarding delays and alternatives.

The SWZ includes the use of two (2) closed-circuit video cameras, 12 portable changeable message signs, and six (11) queue sensors.

5.3. Transportation Operations (TO)

5.3.1. Corridor/Network Management Strategies

To facilitate the smooth flow of traffic through the worksite, US-5 is being temporarily reconfigured; two temporary traffic signals are being installed and timed with the existing traffic light at the intersection of US-5 and Sykes Mountain Avenue. Ramp "C" is being reconfigured temporarily to allow for effective control with one of the proposed temporary traffic lights. Ramp "A" is being closed to avoid the merge with Ramp "B" traffic and to allow traffic at this side of the project to be controlled by the temporary traffic light at US-5 and Ramp "B" and "F".

Since one of the proposed alternate routes for the Project involves detouring I-91N traffic further up I-89 to Exit 1, the VTrans Resident Engineer will maintain contact with Sandra Schmitt for the Hartford-Sharon resurfacing project.

5.3.2. Work Zone ITS Strategies

The PCMS will also advise of slow or stopped traffic ahead. CCTV monitoring will be available via portable video trailers with pan/tilt/zoom cameras to monitor critical traffic locations. A real-time detour will be employed as described in 5.3.5 Contingencies.

5.3.3. Work Zone Safety Management Strategies

Work zone safety for the travelling public and workers will be improved by reducing the speed limit on I-91 northbound and US-5; reconfiguring traffic on US-5 and installing temporary traffic barrier to move it away from active construction activities; installing two temporary traffic signals to manage turning movements; and providing advanced warning via the Smart Work Zone PCMS.

PCL will have a dedicated on-site construction safety supervisor identified. This TMP will be monitored by PCL and VTrans to ensure that it is meeting the goals of the safe and efficient flow of traffic through the project area. Adjustments to this TMP will be made as necessary.

5.3.4. Traffic/Incident Management and Enforcement Strategies

During each BCP a tow truck will be onsite to immediately remove any disabled vehicles within the project area.

Planned Event Protocol

- The contractor shall provide the POC by noon each Thursday project updates with planned closures for the upcoming week. The POC will inform all stakeholders of any activities scheduled that may impede traffic flow. These updates will be distributed weekly and will include those emergency services personnel.
- POC will actively seek out information about planned events likely to impact traffic, including date/time, duration, peak travel times, expected volumes, and previous experiences with congestion due to event (anything the event planner might know about the expected traffic) and communicate this information to the Regional Traffic Manager
- POC will communicate with event planner to try to mitigate traffic impacts through demand management strategies (for example, event planner could encourage attendees to seek alternate routes, or encourage car-pooling, or could try to stagger arrival/release times to reduce peak flows)
- The RTM will assess expected traffic impacts and coordinate implementation of applicable contingency plan with the TOC. POC will coordinate with VTrans Public Outreach staff on public messaging in advance of planned events, including but not limited to immediate notification on project social media pages, and delivery of same notice to VTrans for posting to their social media pages.
- The RTM will perform “after action” assessment to improve response for future events.

Unplanned Event Protocol

Procedures for managing incidents will vary, depending on the level of incident. The

Chapter 6I of the MUTCD identifies three levels of incident:

A. Major – expected duration of more than 2 hours
B. Intermediate – expected duration of 30 minutes to 2 hours
C. Minor – expected duration under 30 minutes

Law enforcement officials will be the first entity contacted for all incidents within the Work Zone. The Resident Engineer will be notified (immediately during business hours) of any incident occurring in the project after law enforcement and emergency services has been contacted. Depending on the severity of the incident, other entities such as VTrans Transportation Operations Center (TOC), local officials, and media outlets may be contacted to respond or disseminate information. The contractor will contact law enforcement and the Resident Engineer directly, while additional notifications to media will be performed by the Public Outreach Coordinator.

Minor Incidents
Minor incidents typically involve disabled vehicles and minor crashes and last less than 30 minutes.

On-scene response will consist of contacting law enforcement officials and a local towing company if necessary. The appropriate PCMS within the SWZ will be activated to alert motorists of an accident ahead, and will indicate a message such as CRASH AHEAD and BE PREPARED TO STOP. Diversion of traffic onto other routes will not be required for minor traffic incidents. Incident traffic control will be the responsibility of on-scene responders. For minor incidents the Resident Engineer (RE) or Contractor may contact the Transportation Operations Center (TOC) who will then disseminate any necessary information as with an intermediate incident, but the short duration of the incident may not allow for this.

Intermediate Incidents
Intermediate incidents are typically vehicle crashes, usually blocking travel lanes, and can require traffic control on the scene to divert road users past the blockage and the duration can last up to 2 hours. Full roadway closures may be needed for short periods to allow traffic incident responders to clear the scene. However, establishing a detour to another facility is not expected. The same measures that will be employed for minor incidents will also be implemented for intermediate incidents, with the exception that traffic may need to be stopped for longer periods of time.

On-scene response will consist of contacting emergency first responders via 911 who will contact a local towing company if necessary to prevent major traffic backups or subsequent crashes. PCMS in the SWZ will be activated to alert motorists of a crash ahead, and will indicate a message such as CRASH AHEAD and BE PREPARED TO STOP. Traffic control will be the responsibility of on-scene personnel. For intermediate incidents, the RE will notify the TOC upon initial incident occurrence and also when incident has been cleared.

Major Incidents
Major incidents typically involve hazardous materials, fatal crashes, crashes involving numerous vehicles, and other natural or man-made disasters and typically last more than 2 hours. These traffic incidents typically involve closing all or part of a roadway facility. In the event of a major incident, depending on where the incident occurs traffic will be temporarily detoured based on the included contingency plan.

On-scene response will consist of contacting emergency first responders via 911 who will contact a local towing company if necessary to prevent major traffic backups or subsequent crashes. PCMS in the SWZ will be activated to alert motorists of a crash ahead, and will indicate a message such as CRASH AHEAD and BE PREPARED TO

STOP. Traffic control will be the responsibility of on-scene personnel. For major incidents, the RE will notify the TOC upon initial incident occurrence and also when incident has been cleared.

After Action Review
Each incident will be reviewed with responding agencies, within week, in an after action meeting run by the TMP Management to determine if any deficiencies in the traffic control measures are perceived and to determine if changes to the TMPs are needed to avoid recurrences in the future.

Incident Protocol - During hours of Operation
Incident detection and verification

1. **Call 911 to report any incident that may include injuries, hazardous materials, fire or other life-safety threats**. Provide the 911 operator with the following information, if known:

   • Location – including closest mile marker, cross-street, and direction of travel
   • Number and type of vehicles involved
   • Extent of damage or injury
   • Number of patients involved
   • Any hazardous conditions
   • The placard number on any hazardous materials placarded vehicles
   • Number of lanes impacted and extent of closure

   The 911 operator may ask for additional information that will help responders, including your name and phone number as a contact.

2. **Call or email the Transportation Operations Center (TOC):802-828-2648 or** AOT.OPSTOC@state.vt.us

Level	Impact to Roadway	Actions to be Taken

Minor	Impact to traveled roadway estimated to be **less than 30 minutes with no lane blockage.** --Or-- Impact to traveled roadway is estimated to be **less than 30 minutes with lane blockages.**	• Call **911 or (802) 295-9425 Non-Emergency** • Dispatch will call towing truck company • RE or Contractor contacts the VTrans Transportation Operations Center (TOC) 802-828-2648 • If at all possible move the vehicle(s) out of travel way • Utilize contingency plan sign packages as needed • VTrans TOC may: o Contact : ▪ VTrans District 4 Maintenance Supervisors for resources o Update Vermont 511/Social Media o Activate Message Boards
Intermediate	Impact to traveled roadway estimated to be **greater than 30 minutes, but less than 2 hours with lane blockages, but not a full closure of the roadway.**	• Call **911 or (802) 295-9425 Non-Emergency** • Dispatch will call towing truck company • Establish Incident Command o First qualified on scene responder is Incident Commander until police or fire arrive on scene o Consider designating staging area • RE or Contractor contact the VTrans Transportation Operations Center(TOC) 802-828-2648 • Utilize contingency plan sign packages as needed • Consider implementing alternate routes • VTrans TOC will: o Contact: ▪ Other Area Residents Engineers ▪ VTrans District 4 Maintenance Supervisors ▪ Public Outreach Coordinator ▪ New Hampshire 511 o Update Vermont 511/Social Media o Activate Message Boards

Major	Congestive impact to traveled roadway is estimated to be **greater than 2 hours or roadway is fully closed in any single direction.**	• Call **911 or (802) 295-9425 Non-Emergency**
		• Dispatch will call towing truck company
		• Establish Incident Command
		  o First qualified on scene responder is Incident Commander until police or fire arrive on scene
		  o Consider designating staging area
		• RE or Contractor contact the VTrans Traffic Operations Center(TOC) 802-828-2648
		• Utilize contingency plan sign packages as needed
		• Consider implementing alternate routes
		• VTrans TOC will:
		  o Contact:
		  ▪ Other Area Residents Engineers
		  ▪ VTrans District 4 Maintenance Supervisors
		  ▪ Public Outreach Coordinator
		  ▪ New Hampshire 511
		  ▪ Federal Highways
		  o Update Vermont 511/Social Media
		  o Activate Message Boards

Incident Protocol - after hours of Operation

1. **Call 911 or (802) 295-9425 (Non-Emergency) to report any incident that may include injuries, hazardous materials, fire or other life-safety threats**. Provide the 911 operator with the following information, if known:
   • Location – including closest mile marker, cross-street, and direction of travel
   • Number and type of vehicles involved
   • Extent of damage or injury
   • Number of patients involved
   • Any hazardous conditions
   • The placard number on any hazardous materials placarded vehicles
   • Number of lanes impacted and extent of closure

   The 911 operator may ask for additional information that will help responders, including your name and phone number as a contact.

2. **Call or email the Transportation Operations Center (TOC):802-828-2648 or (802) 250-4668 (Major Incidents Only) or** AOT.OPSTOC@state.vt.us

911 dispatch operators will contact necessary first responders including tow truck companies. Dispatch will also send an internal email to the TOC and depending on the incident level the communication protocol as during operating hours will still take effect and if necessary to

prepare for commuting traffic by notifying the media and possible implementation of traffic control or detours.

5.3.5. Contingency

Whenever traffic is queued at the interchange of I-89 and I-91, traffic will be diverted to an alternate route. When triggered by the queue sensors, the appropriate PCMS will automatically show "USE I-89 EXIT 1 WOODSTCK"/"FOR ALT ROUTE TO I-91N". Traffic on I-89 South will be advised to take Exit 1; traffic in I-89 will continue north to Exit 1; both will follow US 4 East to US-5 North to Exit 12 I-91North. See Appendix B-4.

Should US-5 be closed beyond the allowable delays, through traffic shall be detoured around the project area via the VA Cutoff Road and US Route 4. This will require the use of three UTOs positioned at the following locations US-5/VA Cutoff Road, US 4/TH 132 and US 4 / US-5. See Appendix B-5.

6.0 Notes

7.0 TMP Implementation/Monitoring

This TMP needs to be implemented in the field, as specified, unless any changes have been approved by VTrans. To help ensure appropriate implementation, 23 CFR 630 Subpart J §630.1012(e) requires that the State/Agency and the contractor each designate a trained person at the project level who has the primary responsibility and sufficient authority for implementing the TMP and other safety and mobility aspects of the project.

Monitoring the performance of the TMP during the construction phase is important to establish whether the predicted impacts closely resemble the actual conditions in the field, and whether the TMP strategies are effective in managing the impacts. TMP monitoring is needed for both oversight and evaluation purposes, such as:

- Monitoring and documenting TMP changes during construction.
- Preparing an evaluation of the TMP, including lessons learned.
- Refining work zone impact analysis processes and models based on outcomes.

TMP monitoring includes details of any specific observational, logging, and/or recording activities conducted during the project for work zone performance measurement purposes. Examples of possible performance measures for TMP monitoring include:

- Volume
- LOS
- Queue length
- Delay
- Travel time
- Number of crashes/incidents
- Incident response and clearance times
- Type and frequency of legitimate complaints received.

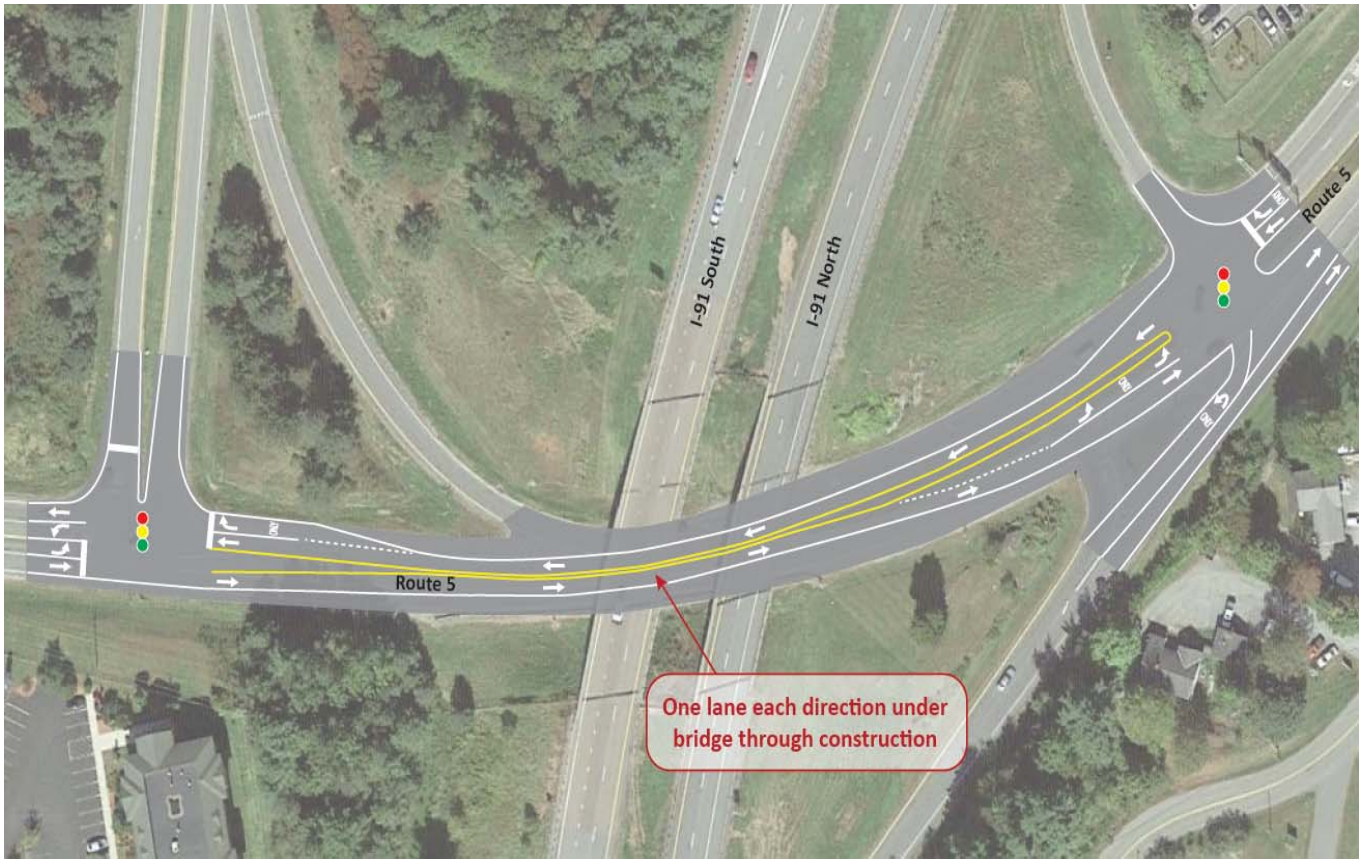
The TMP Implementation/Monitoring Managers shall meet in-person or via teleconference acceptable with the Project Manager on a regular basis to discuss and assess the safety and mobility impacts of the project work zone to date. This helps to assess how well the TMP is managing the project impacts, and can help identify and address issues before they become problems. It also provides the opportunity to verify that all key stakeholders and project officials have been receiving timely notifications where required.

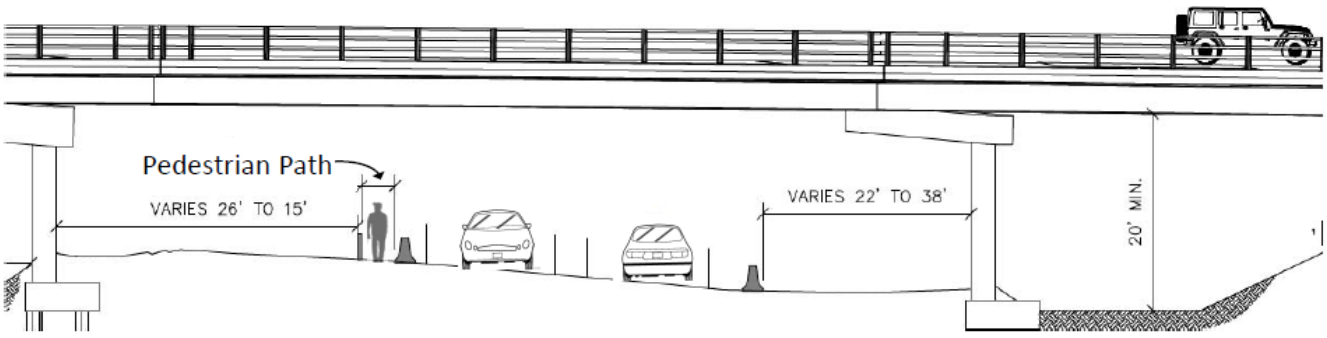
8.0 TMP Review/Approvals

This TMP, and any significant changes, must be approved by the VTrans Traffic Operations Engineer and Project Manager before they are implemented.

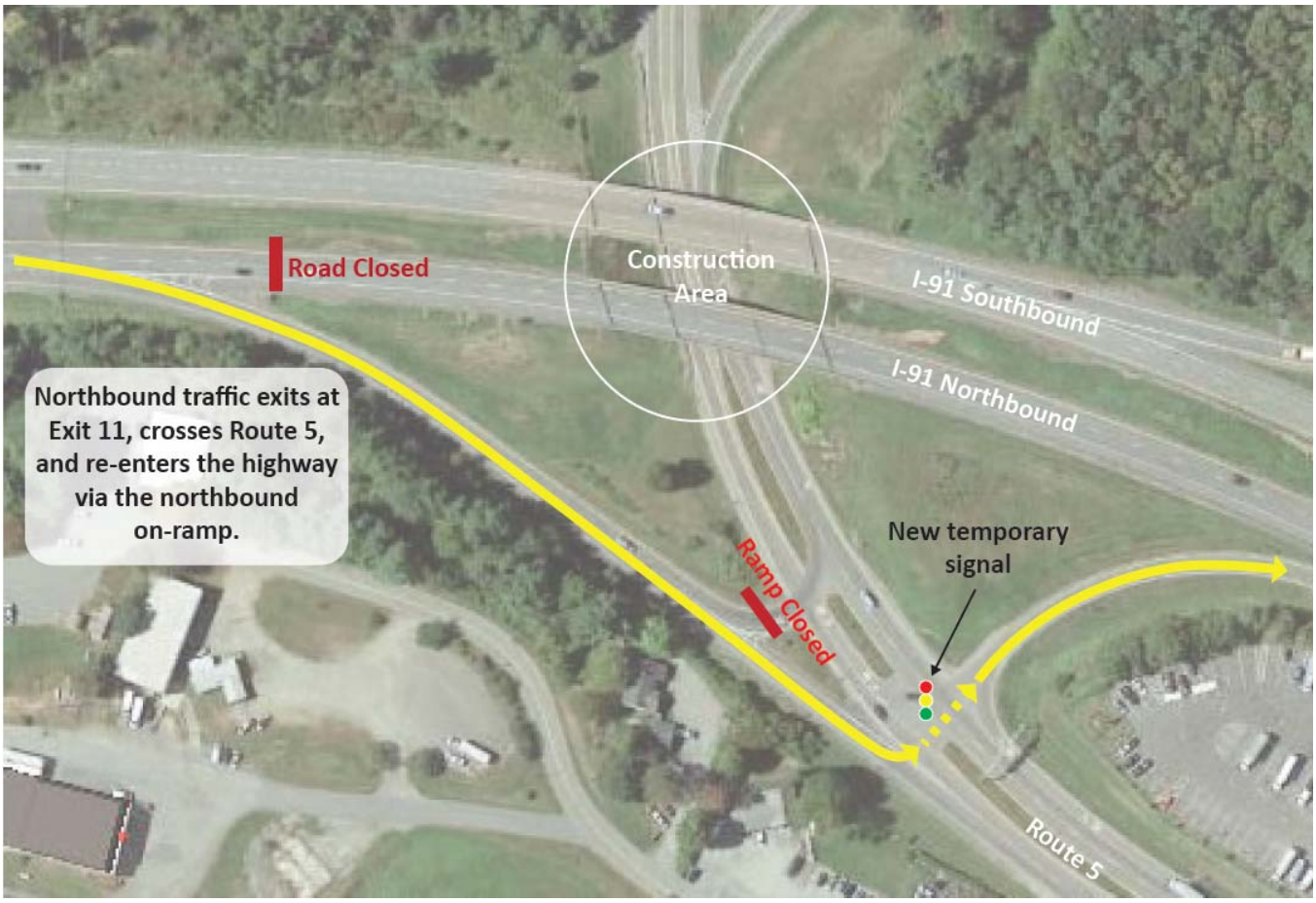
VTrans Traffic Operations Engineer			**VTrans Project Manager**		
All approvals must be obtained prior to the start of work					
Signature: Name: Amy Gamble, PE Date:			Signature: Name: Kristin Higgins, PE Date:		
Revision#	Initials	Date	Revision#	Initials	Date
1					
2					

Appendix A
Temporary US-5 Traffic Control Plan

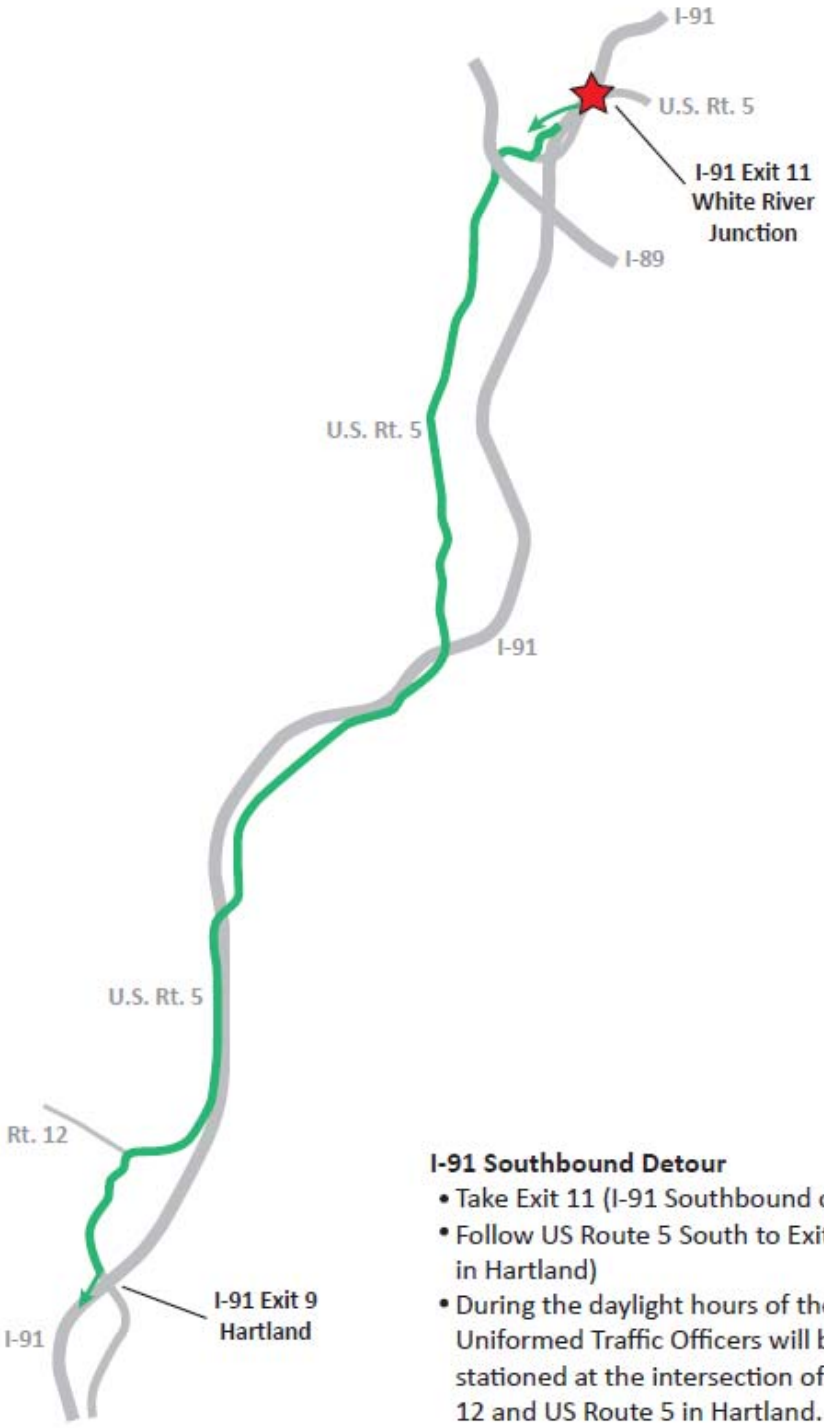




Appendix B-1
I-91 Northbound Detour



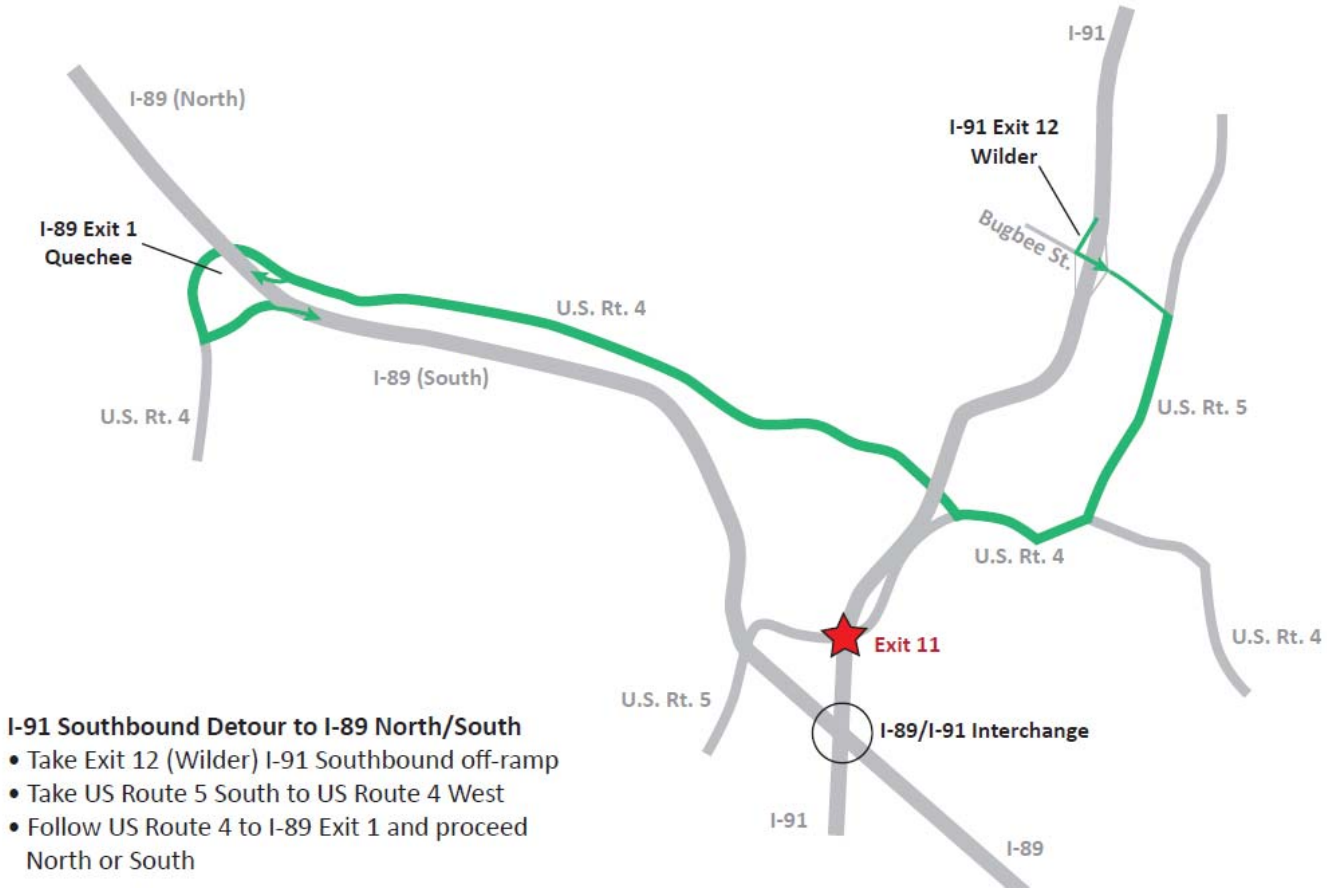
Appendix B-2
I-91 Southbound Detour



I-91 Southbound Detour

- Take Exit 11 (I-91 Southbound off-ramp)
- Follow US Route 5 South to Exit 9 (I-91 in Hartland)
- During the daylight hours of the closure, Uniformed Traffic Officers will be stationed at the intersection of VT Route 12 and US Route 5 in Hartland.

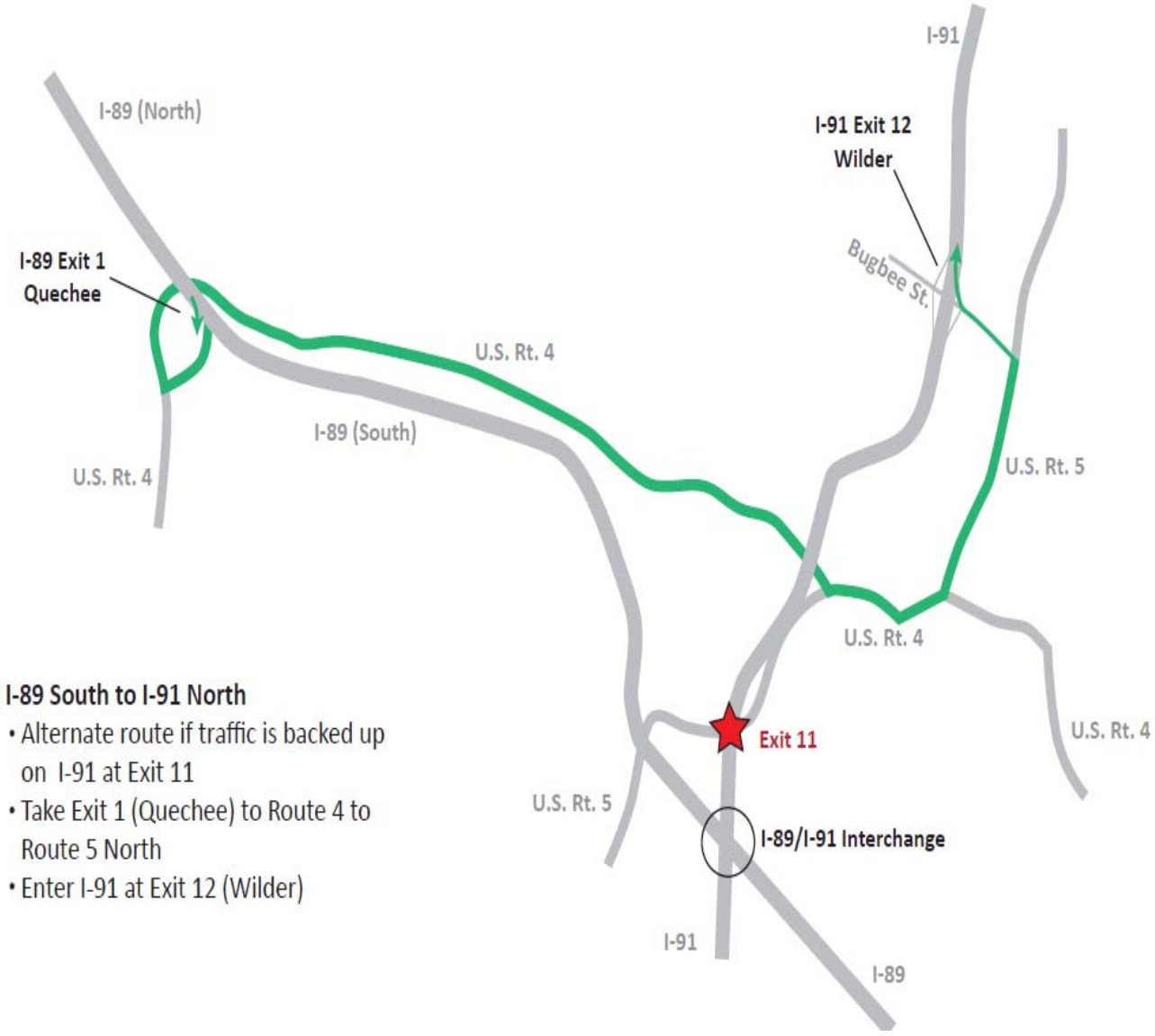
Appendix B-3
I-91 Southbound Detour to I-89 North/South



I-91 Southbound Detour to I-89 North/South

- Take Exit 12 (Wilder) I-91 Southbound off-ramp
- Take US Route 5 South to US Route 4 West
- Follow US Route 4 to I-89 Exit 1 and proceed North or South

Appendix B-4
Alternate Route to I-91 Northbound



Appendix B-5
US-5 Contingency Detour