



To: Vermont Agency of Transportation

Date: 9/18/2023

Memorandum

Project #: 58926.06

From: Evan Haugh
Joe Vanacore

Re: LYNDON IM 091-3(53) Evaluation of Detour Routes

Vanasse Hangen Brustlin (VHB) has been asked by the Vermont Agency of Transportation (VTTrans) to prepare a Base Technical Concept and bid documents for Lyndon IM 091-3(53). The project involves replacement of the culvert structures under both northbound and southbound interstate barrels. While the BTC presumes two-way traffic is maintained on I-91 throughout construction, bidders may wish to propose an Alternate Technical Concept with a full closure of I-91. VHB investigated two potential detour routes, and this memo will be included in the RFP Information Package and provides some information to consider for each route.

Detour Routes

Two potential detour routes are presented. **Figure 1** shows a map of these routes.

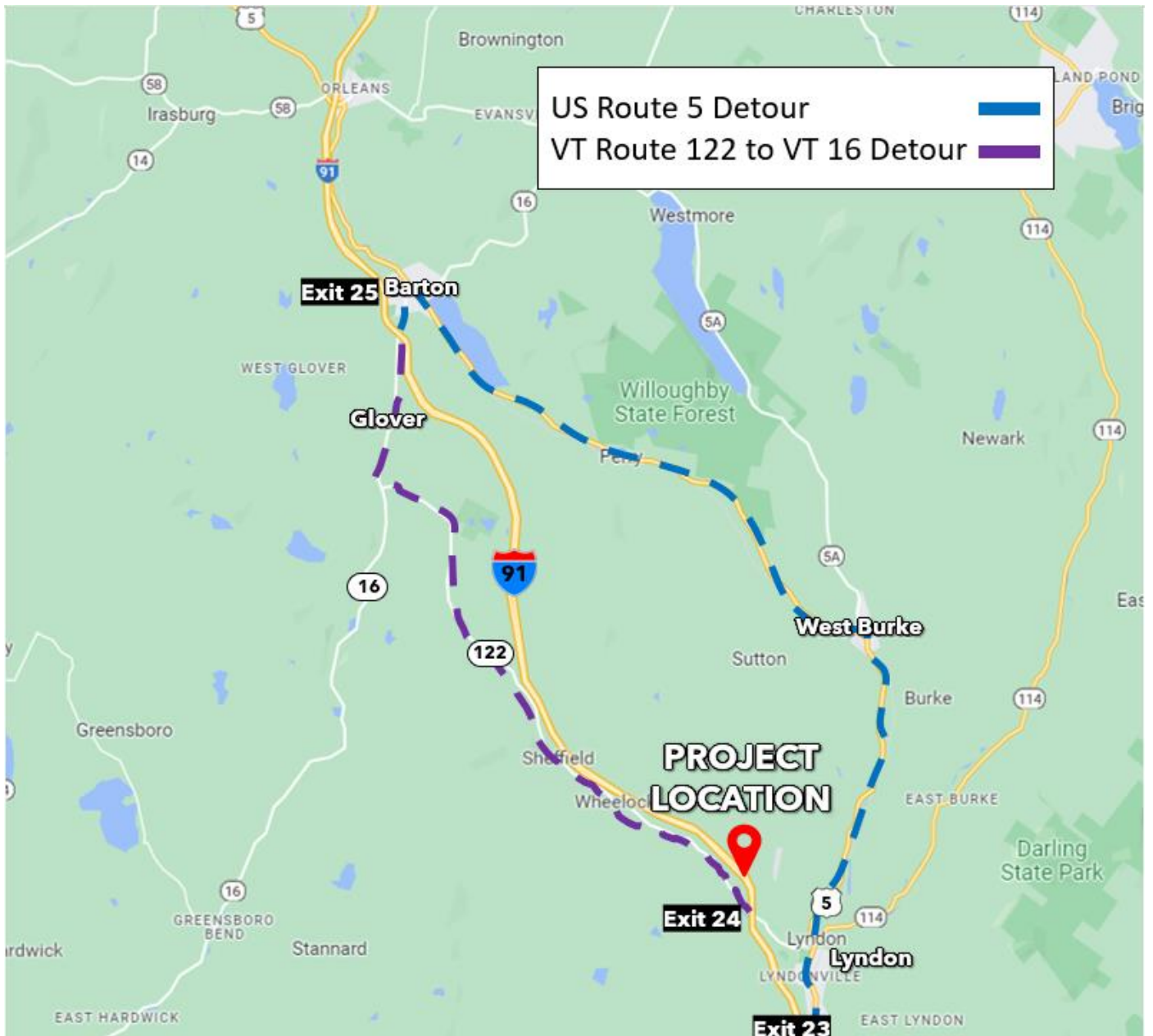
US Route 5 Detour

One potential routing is along US Route 5. From south to north, this detour begins at Exit 23 and follows Route 5 through Lyndonville, Lyndon, West Burke, Sutton, and Barton before turning left on VT-16 and returning to I-91 at Exit 25. This route is 24 miles with a travel time under ordinary conditions of approximately 35 minutes. This represents a delay of 20 minutes for through traffic.

VT Route 122 to VT Route 16 Detour

From south to north, this detour begins at Exit 24 and follows VT-122 north through Lyndon, Wheelock, and Sheffield. In Glover, drivers turn right onto VT-16 and return to I-91 at Exit 25. The total distance is 19 miles with a travel time under typical traffic of approximately 25 minutes. This represents a delay of 10 minutes for through traffic.

Figure 1 Detour Maps



US Route 5 Alternative Review

One important consideration is that this detour uses local roads. Portions of US Route 5 in Lyndon and Barton are Class 1 Town Highways. This option would require coordination with both villages. This detour is also 5 miles and 10 minutes longer than the VT Route 122 option.

By passing through Lyndonville, this route sends traffic through a larger village center with heavier pre-existing traffic than the alternative. US Route 5 in Lyndonville includes a jog at Depot Street with one all-way stop, which may cause queuing in the village center during the highest-volume periods. This route passes only one school, Barton Academy, in a low-speed village center. Although it avoids signed bike routes, the portions of US-5 in Lyndon, Burke, and Barton were identified as medium bicycle use/priority in the VTrans On Road Bicycle Plan (US-5 in Sutton is low use/priority).

About half of the pavement on this portion of US Route 5 is rated "poor", with the remainder rated "very poor". The average shoulder width is four feet, with only two feet on many sections. This provides little recoverable area for errant drivers. Another concern are the three at-grade rail crossings, one in Burke and two in Lyndon. All three crossings are equipped with warning lights, and one has a crossing arm. All crossings have significant skew. An ATC should consider how to mitigate these safety concerns and potential for additional delays.

In a recent safety screening project, VTrans found that many of the curves (totaling 1.5 miles) between Lyndonville and West Burke are primary (highest) risk for fixed object crashes. While many of these are treated with guardrail, an ATC should consider how to mitigate exposure to fixed object strikes along this portion of the route.

The Average Annual Daily Traffic (AADT) in 2022 between Lyndonville and West Burke is 2,235 vehicles, with 7% heavy vehicles. Between West Burke and Barton, the AADT is 715 vehicles, with 5% being heavy vehicles. The detour would add 2,700 vehicles, including 675 trucks, in each direction per day.

VT Route 122 to VT Route 16 Alternative Review

This detour is shorter in distance and travel time. Like the US Route 5 detour, it passes through several village centers, though none as large as Lyndonville. Other than Glover, the village centers it passes (Wheelock and Sheffield) do not have sidewalks or generous shoulders. In Sheffield, this detour passes the Miller's Run school with a marked school crossing across VT-122. There are no signed bike routes along this route. The VTrans On Road Bicycle Plan categorized the portion of the detour on VT Route 122 as low use/priority for cycling and VT-16 as medium use/priority.

Pavement condition is generally better than on Route 5, with less rutting and a lower roughness index. Pavement is rated "poor" and "good" for approximately equal lengths of the detour. Shoulder width is only two feet for most of VT-122 and four feet for most of VT-16. There are no rail crossings along this detour.

Base traffic volumes are significantly lower along this detour. VT 122 has an AADT of only 560 vehicles, with 5% heavy vehicles. The northmost 3.5 miles of the route on VT 16 have an AADT of 2,307 vehicles, with 11% classified as heavy vehicles. Both detours are on similar facilities (two-lane rural highways) with similar capacities, however the VT-122 to VT-16 detour has more unused capacity available.

Recommendations

As with any detour, the primary concerns are travel time (delay), safety impacts, and coordination with concurrent projects. In preparing a traffic control plan, bidders should review the [VTrans Work Zone Safety and Mobility Policy](#),

particularly sections 2B (corridor management strategies), 2D (incident management), 2F (performance monitoring) and 3 (public outreach and motorist information). If bidders chooses to submit an ATC with an interstate closure, they should address these in their detour plan along with the specific concerns described above. They should also account for and mitigate impacts on communities along the detour route when proposing the timing and duration of the closure. Key components of an ATC include:

- Account for delay, both of detoured traffic and local traffic and identify means (e.g., timing of closure, duration of closure, temporary traffic control/patterns) they will use to minimize delay. Note that average daily traffic on this part of I-91 peaks in August, but the busiest hours of the year occur during September and October.
- Assess traffic capacity through pinch points along the detour route and propose congestion mitigation strategies where appropriate. Headways and gaps can be estimated using base plus detoured traffic volumes provided above. These pinch points may include:
 - All-way stop at Depot St and Broad St in Lyndonville
 - Left turn to/right turn from the minor stop-controlled approach to VT-122 & VT-16 in Glover
 - Queuing potential at the Barton Village triangle
 - Rail crossings on US Route 5
 - Traffic signal at VT-122 and US-5 in Lyndon
 - Movements on and off I-91 at ends of closure
 - Areas with on-street parking
- Plan for pedestrian and bicycle safety, particularly in proximity to recreational, tourism, and school facilities
- Plan clear and consistent signage throughout the length of the detour

Bidders should consider any factors that could affect mobility and safety – the list above is not inclusive. The extent to which these issues are addressed and mitigated may be part of the criteria for evaluation of alternate technical concepts presented by bidders.