

Speed Studies for Bolton Valley Access Road and Duxbury Road

Supporting Document for Bolton Town Traffic Ordinance

Introduction

As a part of the CCRPC FY16 Unified Planning Work Program, the town of Bolton requested a traffic speed ordinance for two town highways: Bolton Valley Access Road and Duxbury Road. In order for a Legislative Body to determine a safe and reasonable speed on town highways, a traffic engineering investigation (speed study) is required by Vermont Statutes Annotated Title 23, § 1007. This document provides supporting findings that were used to develop a traffic ordinance for these town highways.

A windshield reconnaissance survey was conducted on both the Bolton Valley Access Road and Duxbury Road to identify safety related issues, roadway and land use characteristics, limited sight distance locations and roadside safety hazards. Automatic Traffic Recorders (ATR) were installed to collect traffic volumes and speeds on these roads. Figure 1 and 2 show the study area and ATR locations on Bolton Valley Access Road and Duxbury Road, respectively.

Figure 1: Bolton Valley Access Road Study Area and ATR Locations

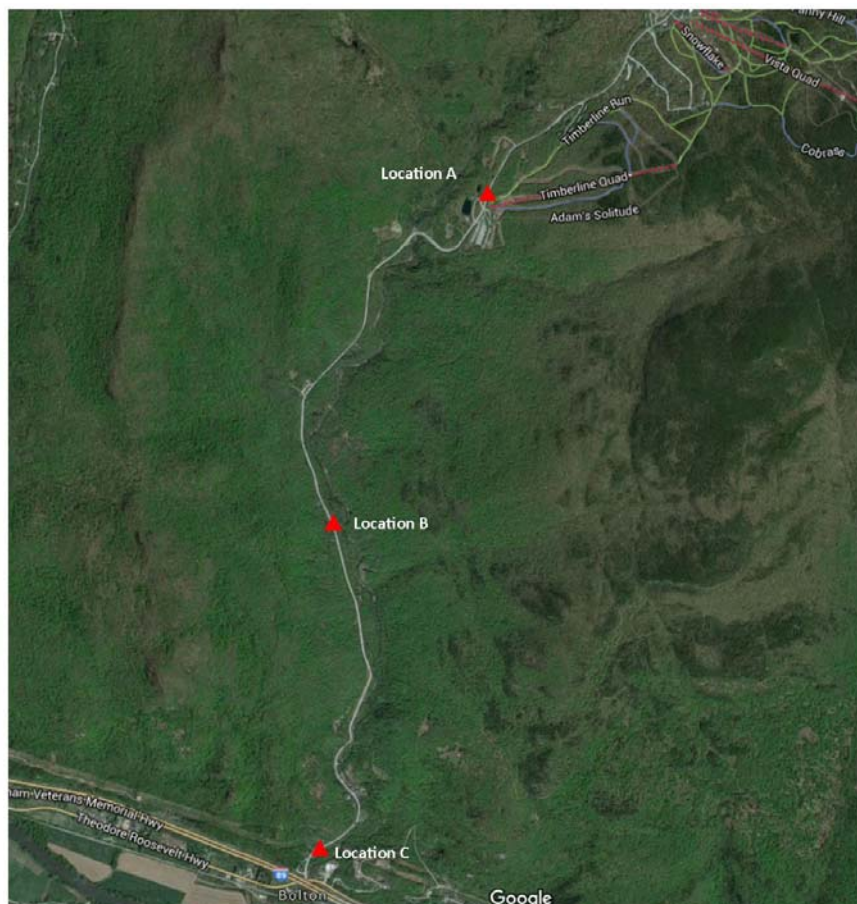


Figure 2: Duxbury Road Study Area and ATRs Location



Existing Conditions

Bolton Valley Access Road

Bolton Valley Access Road primarily serves the Bolton Valley Resort in Chittenden County. This road connects US Highway 2 and Bolton Valley Resort. The road surface is paved and it is classified as a state Class II Town Highway and functionally classified as a Major Collector. The CCRPC installed 3 Automatic Traffic Recorders (ATRs) to collect traffic counts for a week. The average daily traffic (ADT) at Location A was 582 vehicles per day, 670 vehicles per day at Location B, and 756 vehicles per day at Location C.

Duxbury Road

Duxbury Road runs east-west parallel with Interstate 89 and along the south side of Winooski River in Bolton. The road is paved and it is classified as a state Class II Town Highway and functionally classified as a Minor Collector. The CCRPC installed 2 ATRs along this road to collect traffic counts for a week. The ADT at Location A was 520 vehicles per day and 332 vehicles per day at Location B.

Speed Data Analysis

A widely used metric in setting speed limits is the 85th percentile speed. This is defined as the speed in which 85% of motorists are traveling at or below. Based on the best available evidence and previous research, speed limits set using the 85th percentile speed data are not only acceptable by the majority of motorists, but also fall within the speed range where crash risk is lowest¹. The Manual on Uniform Traffic Control Devices (MUTCD), which is adopted as the standard for all traffic control devices in Vermont (Title 23 V.S.A. Section 1025), recommends setting speed limits within 5 mph of the 85th percentile speed while taking into consideration other factors such as roadway characteristics, shoulder condition, grade, the speed pace, land uses, development setbacks, parking, crash history, and bicycle/pedestrian activity.

¹ Synthesis of Speed Zoning Practice, FHWA-RD-85-096, Technical Summary.

The following table shows the 85th percentile speed associated with traffic counts on Bolton Valley Access Road and Duxbury Road.

Table 1: 85th Percentile Speeds

| | Bolton Valley Access Rd | Duxbury Road |
|------------|--------------------------------|---------------------|
| Location A | 49 mph | 41 mph |
| Location B | 56 mph | 43 mph |
| Location C | 43 mph | |

Findings of Windshield Survey

A windshield survey was conducted in both travel directions on Bolton Valley Access Road and Duxbury Road to identify potential safety hazards, sight distance and roadway safety issues. The following are findings from the windshield survey:

Bolton Valley Access Road

1. The roadway width varies between 20 ft. and 24 ft. Shoulders are not marked along the roadway.
2. The total length of the road from US 2 to the Bolton Resort is approximately 4.5 miles. This roadway traverses a significantly rolling/mountainous terrain with horizontal curves. The difference in elevation between the two termini (intersection with US 2 and end of the road at the Resort) is approximately 1750 ft.
3. There is limited sight distance at curves due to the roadway's horizontal and vertical alignment and line of sight obstructions due to vegetation along the road side which can pose safety hazards to motorists.
4. There are 2 posted speed limits on this road; 35 mph and 40 mph. A section of roadway approximately 1.5 miles from US 2 is posted as 35 mph then changes to 40 mph for approximately 2.2 miles and changes back to 35 mph for approximately 0.8 miles to the Resort.

Duxbury Road

1. The roadway width varies between 18 ft. and 22 ft. Shoulders are not marked along the roadway.
2. The total length of the road from the Richmond Town line to the County line is approximately 3.8 miles.
3. There is limited sight distance at curves due to the roadway's horizontal and vertical alignment and line of sight obstruction due to vegetation and hidden driveways which can pose safety hazards to motorists.
4. The posted speed limit on this road is 35 mph.

Crash History

Bolton Valley Access Road

There were 5 crashes reported on Bolton Valley Access Road in the last 5 years (2010-2014). Out of the 5 crashes, 2 were injury and 3 were reported as property damage only. Driving too fast for given conditions was major contributing factor in 3 crashes. Due to the rolling terrain characteristics, motorists tend to drive at higher speeds than posted speed limits in the southbound direction.

Duxbury Road

There was a fatal crash reported on Duxbury Road on July 20, 2014. Reckless, negligent and/or aggressive driving conditions were major contributing circumstances for the single vehicle fatal crash. There were no other crashes reported on this road in the last 5 years (2010-2014).

Table 2: Technical Summary

| | | |
|--|---|--|
| Municipality: | Town of Bolton | |
| Road Name: | Bolton Valley Access Road | Duxbury Road |
| Location: | From US 2 to Bolton Valley Resort | From Richmond Town line to County Line |
| Recommended Speed Limit: | Retain Existing Speed limit | 35 mph |
| Evaluation By: | Sai Sarepalli, P.E. Transportation Planning Engineer | |
| | Bolton Valley Access Road | Duxbury Road |
| 85th Percentile Speed (mph): | Location A: 51 MPH : Northbound 48 MPH : Southbound | Location A: 39 MPH : Eastbound 43 MPH : Westbound |
| | Location B: 53 MPH : Northbound 59 MPH : Southbound | Location B: 42 MPH : Eastbound 45 MPH : Westbound |
| | Location C: 40 MPH : Northbound 47 MPH : Southbound | |
| 10 mph Pace Speed (mph): | Location A: 41-50 MPH : Northbound 36-45 MPH : Southbound | Location A: 31-40 MPH : Eastbound 31-40 MPH : Westbound |
| | Location B: 41-50 MPH : Northbound 51-60 MPH : Southbound | Location B: 31-40 MPH : Eastbound 36-45 MPH : Westbound |
| | Location C: 31-40 MPH : Northbound 36-45 MPH : Southbound | |
| Average Test Car Speed (mph) | 35 MPH | 35 MPH |
| Safe Speed at Curves and/or Intersections: | N/A | N/A |
| Safety problem related to speed: | Horizontal curves, rolling terrain and limited sight distance can pose safety hazards for motorists | Horizontal curves and limited sight distance can pose safety hazards for motorists |
| Average Daily Traffic (Vehicles per Day) | Location A: 582 ADT Location B: 670 ADT Location C: 756 ADT | Location A: 520 ADT Location B 332 ADT |
| | | |
| Town Highway and Functional Classification | Class II Town Highway - Major Collector | Class II Town Highway - Minor Collector |
| Road Surface | Paved | Paved |
| Road Width | Varies between 20 and 24 ft. | Varies between 18 and 22 ft. |

| | | |
|---------------------|--|--|
| Shoulder Surface | Grass/Gravel | Grass/Gravel |
| Shoulder Width | Varies between 0.5 and 2.0 ft. | Varies between 0.5 and 1.0 ft. |
| Parking | No Parking | No Parking |
| Pedestrian/Bicycles | No marked shoulders for bike and pedestrian activities | No marked shoulders for bike and pedestrian activities |
| Adjacent Land use | Residential and Forest | Residential and Agricultural |

Recommendations and Conclusion

Based on the 85th percentile speeds recorded at 3 ATR locations along Bolton Valley Access Road and taking into account adjacent land uses, roadway characteristics, rolling terrain and crash history, **it is recommended to continue to maintain existing posted speed limits along Bolton Valley Access Road.**

Based on the 85th percentile speeds recorded at 2 ATR locations along Duxbury Road and taking into account roadway, adjacent land use characteristics and hidden driveways, **it is recommended to continue to maintain 35 mph posted speed limit along Duxbury Road.**