



Congestion Levels at intersections along the VT-30 Corridor from Brattleboro to Winhall: 2019 and 2039

An analysis was composed at the various intersections along VT-30 from Brattleboro to Winhall for both present volumes as well as volume growth over the next 20 years. The purpose of this analysis was not only to find which intersections are at a congested level at present and identify what if any mitigation has been proposed but to also analyze intersection volumes along the corridor 20 years into the future to see if any new congestion hot spots occur. This analysis was composed with traffic simulation software evaluating intersection congestion using a value known as Level of Service.

Intersection Level of Service is a measure of the operational conditions within a traffic stream as well as the perception of delay by motorists and passengers. Level of Service is influenced by a variety of factors, including intersection controls, intersection geometry, traffic levels, and incidents that impede traffic flow. There are six levels of service, characterized by letter designations A through F with A symbolizing the lowest level of congestion with minimal traffic delay and F symbolizing the highest level of congestion with potentially long traffic delays.

For Vermont state roads, VTTrans has adopted a Level of Service Policy for the state highway system. Level of Service (LOS) C is designated as the desired design target for signalized intersections and LOS D is designated as acceptable for side street approaches on stop-controlled intersections. Reduced LOS may be acceptable on a case-by-case basis, particularly within densely settled areas where further intersection improvements that are required to achieve LOS C would create negative cultural and environmental impacts. In cases where the existing LOS is less than desired and where the necessary intersections improvements are not feasible, a lower LOS may be acceptable, provided that the impact of future traffic can be effectively mitigated by implementing other congestion management strategies.

Table 1 - Signalized Intersection Level of Service Criteria

LOS	Avg. Delay (sec/veh)	Quality of Service
A	≤10	Free flow with little or no queuing
B	≤20	Low delays with short queues – reasonably unimpeded operation
C	≤35	Moderate delays and queues with occasional cycle failures*
D	≤55	Moderate delays and queues with noticeable cycle failures
E	≤80	Long delays and queues with frequent cycle failures
F	>80	Very long delays and queues with continued cycle failures

* a cycle failure occurs when a vehicle has to wait more than one traffic signal cycle to pass through the intersection

Table 2 – Stop Controlled Intersection Level of Service Criteria

LOS	Avg. Delay (sec/veh)	Quality of Service
A	≤10	Free flow with little or no queuing
B	≤15	Low delays with short queues – reasonably unimpeded operation
C	≤25	Moderate delays and queues but stable operation
D	≤35	Less stable condition -delays and queues are noticeable
E	≤50	Longer traffic queues and delay is more significant
F	>50	Very long delays and extensive queuing

Should an individual lane group or approach experience LOS F or a volume/capacity ratio greater than 1.0, the intersection is considered to have failed. In cases where an intersection fails, mitigation may be required, if reasonably possible, in order to mitigate a future traffic impact. Mitigation could include but is not limited to improvements such as extra left turn lanes, right turn lanes, through lanes, new traffic signals, existing traffic signal improvements, or roundabouts.

In reviewing the 20-year volume projections based on the annual average daily traffic volume trend from the previous 20 years, the corridor volumes would actually decrease by 4 percent over the next 20 years. However, to remain conservative a 20-year growth factor of 9 percent was used from the 2017 VTrans Continuous Counter Report for rural roads.

VT-30 corridor: Congestion Hot Spots 2019 and 2039 (All intersections analyzed are Stop Controlled)

VT-30 and Cedar Street:

- The Cedar Street stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Upper Dummerston Road (south):

- The Upper Dummerston Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Upper Dummerston Road (north):

- The Upper Dummerston Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and East-West Road:

- The East-West Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Williamsville Road:

- The Williamsville Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Radway Hill Road:

- The Radway Hill Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and VT-35 Grafton Road:

- The Grafton Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Windham Hill Road:

- The Windham Hill Road stop-controlled approach to VT-30 has a Level of Service value of A for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and VT-100 (south) Road:

- The VT-100 stop-controlled approach to VT-30 has a Level of Service value of A for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Pikes Falls Road:

- The Pikes Falls Road stop-controlled approach to VT-30 has a Level of Service value of A for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and VT-100 (north) Road:

- The VT-100 stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and Stratton Mountain Road:

- The Stratton Mountain Road stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.

VT-30 and VT-11:

- The VT-11 stop-controlled approach to VT-30 has a Level of Service value of B for both 2019 and 2039. This is an acceptable Level of Service for a stop-controlled intersection.