Office of Highway Safety

Road Safety Audit Review

Town:	Lowell	**Date Reviewed:**	September 10, 2015
Route:	VT 100 and VT 58 Intersection	**Mile points:**	VT 100: 4.39, VT 58:0

Location Map

Office of Highway Safety

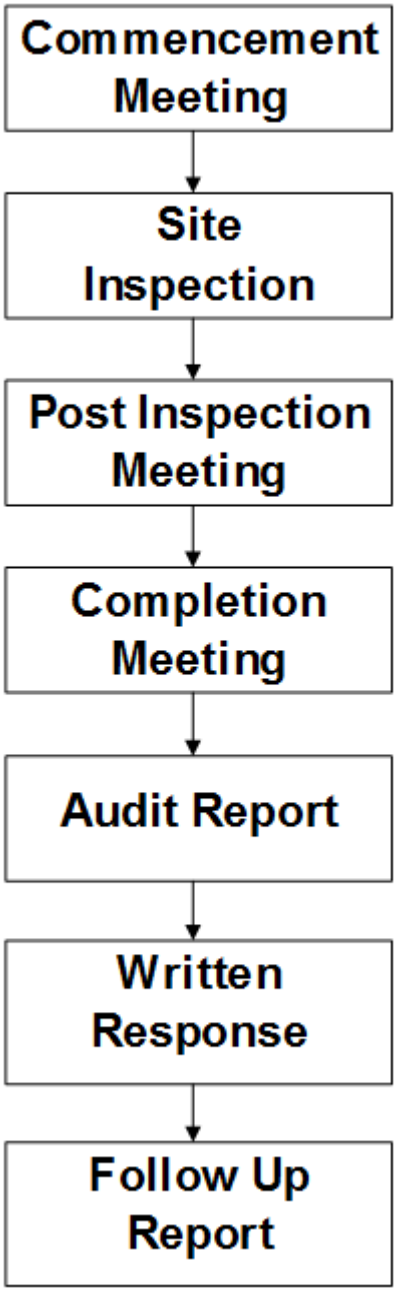
Road Safety Audit Review

RSAR Process

A ***Road Safety Audit Review*** (RSAR) is a formal examination of an existing road in which an independent, multi-discipline team (the Audit Team) reports on potential safety issues.

According to the Federal Highway Administration (FHWA), the purpose of a RSAR is to determine which elements of the road may present a safety concern, to what extent and under what circumstances as well as to identify opportunities to mitigate the identified safety concerns.

Figure 1 - Road Safety Audit Process



The RSAR process is composed of several steps as shown in Figure 1. The process starts with a ***Commencement Meeting*** during which the Audit Team reviews data and gathers community concerns. A ***Site Inspection*** is then performed by the Audit Team. The site visit involves the identification of safety deficiencies as seen in the field. The Audit Team will usually drive through the location of interest to "get a feel" for the area, traveling through each approach in the case of intersections. The team is to then drive at a slower speed to make observations. If needed, the team will also walk the location. Following the site inspection, the Audit Team holds a ***Post Inspection Meeting.*** It is during this meeting that the team members discuss their observations and identify safety issues. The team is to reach a consensus on the importance of each safety issue mentioned. Only those issues for which a consensus is reached are included in the RSAR findings. A RSAR report (Written Report) is prepared.

The ***Written Report*** identifies safety concerns and proposes guidance. These issues and solutions are presented in a tabular format associated to each Responsible Entity for ease of reporting. The ***Responsible Entities*** are any groups who own a roadway

feature or who are responsible for making an improvement or for initiating further studies. These could include for example, the VTrans design section, the local town, the local police or the local RPC.

Location

The location of this RSAR is the intersection of VT 100, VT 58 and Hazen's Notch Road in Lowell.

Purpose of the RSAR

This RSAR was conducted as part of a Vermont Highway Safety Alliance effort lead by the Enforcement Focus Group. The locations selected for this effort were originally identified as high crash locations and ranked high in terms of fatal and injury crashes. In addition, the final locations were further selected for their potential of reducing crashes through enforcement.

The RSAR herein has sought to identify potential safety hazards and physical features which may affect road user safety. However, it is possible that not every deficiency has been identified. It should further be recognized that the implementation of the guidance in this report may contribute to improve the level of safety of the facility reviewed but not necessarily remove all the risks.

RSAR Participants

Mario Dupigny-Giroux from the Office of Highway Safety, VTRANS, was the RSAR coordinator.

The other participants were:

Tom Fields,	Office of Highway Safety, VTRANS
John Filipek,	Office of Highway Safety, VTRANS
Shane Morin,	District 9, VTRANS
Pat McManamon,	DMV Enforcement, VTRANS
Eric Pope,	District 9, VTRANS
Reginald Pion,	Town of Lowell
Richard Pion,	Town of Lowell
Dwight Richardson,	Town of Lowell
Alden Warner,	Town of Lowell

Doug Morton, Northeastern Vermont Development Association

Information Reviewed

Geometry

This is a four-way intersection with roads that meet at 90 degrees. This intersection is controlled with gate posted (left and right sides of the road) stop signs on VT 58 and Hazen's Notch Road.

VT 100 has eleven-foot lanes with four-foot shoulders (source: project 91b258).

There is a 6 percent downgrade traveling south along VT 100 and similarly, there is an 8 percent downgrade on VT 58 towards the intersection.

The sight distance along VT 100 towards the intersection was measured by VTrans to be 343 feet in the northbound direction and 341 feet in the southbound direction.

The corner sight distance when stopped on the Nazen's North Road approach and looking to the right was measured to be around 380 feet while it was measured to be around 300 feet when looking to the left.

Speed Limit

The posted speed limit on VT 100 is 35 mph in the area of the intersection. It is also 35 mph on Hazen's Notch Road and 50 mph on VT 58.

Traffic Volumes

The 2012 Average Annual Daily Traffic on VT 100 was 2400 vehicles per day south of the intersection and it was 1800 vehicles per day north of the intersection. On VT 58, the Average Annual Daily Traffic was 1100 vehicles per day.

The latest 12-hour turning movement count was done in August of 2015.

Seventy-three percent of the traffic traveling from the north from VT100 is continuing through the intersection while twelve percent is turning left on VT 58 and fourteen percent is turning right on Hazen's Notch Road.

From the south on VT 100, fifty-nine percent of the traffic is continuing north on VT 100, while thirty-three percent is taking a right on VT 58 and only one percent is continuing on Hazen's Notch Road.

From the east on VT 58, the majority of the traffic is turning left on VT 100 (65%), while nineteen percent is continuing straight on Hazen's Notch Road and sixteen-percent is turning right on VT 100.

From the West on Hazen's Notch Road, the majority of the traffic is making a left turn onto VT 100 (43%), while thirty-four percent is continuing straight onto VT 58, and twenty-four percent is taking a right onto VT 100.

The 2015 Turning Movement Report is provided at the end of this report.

Signs and Markings

On VT 100 traveling northbound, there is a 35 mph reduced speed limit ahead sign located at about mile point 4.06, followed by the 35 mph speed limit sign at mile point 4.24. This is then followed with the junction VT 58 signs, destination boards and route markers. Across the intersection, there is a fire truck sign followed by a VT 100 confirmation marker.

Southbound on VT 100, the same typical set of intersection related signs are present with the destination boards located near mile 4.45 followed by the junction VT58 signs, the directional route markers and the VT 100 confirmation marker across the intersection.

The intersection is controlled by stop signs that are located on Hazen's Notch Road and on the approach of VT 58. On both approaches, these stop signs are gate posted, meaning that there is one stop sign located on the left hand side of the approach and one on the right hand side of the approach. There are stop ahead signs on both approaches. In addition, on VT 58, the stop ahead sign is followed with a junction VT 100 sign, destination boards and directional route markers.

There is a stop bar and the stop word markings on the VT 58 approach. There is no stop bar on Hazen's Notch Road and there is also no double yellow center line.

Pavement Conditions

Pavement conditions on VT 100 are rated as very poor by VTrans. VTrans rates the conditions on VT 58 as fair. These ratings are based on 2015 data.

Past Projects

VTrans Traffic Design & Safety reviewed this intersection under the Highway Safety Improvement Program in 2011. As a result of this review, a new stop ahead sign was installed closer to the intersection on Hazen's Notch Road (from mile point 4.078 to 4.095, about 40 feet). In addition, a second stop sign, 36" by 36" in size, was added on the left hand side of the Hazen's Notch Road Approach. The regular stop sign on this approach was replaced as were the two stop signs on VT 58.

Future Projects

Project LOWELL-TROY STP 2934( ) with PIN 10B274 will be for the paving of VT 100. It is anticipated that this project will be in the preliminary engineering phase in 2019 with funding for construction in calendar year 2021.

Traffic Studies

The Technical Services Section of the VTrans Maintenance and Operation Bureau performed a speed study in October 2015. Speeds for traffic traveling on VT 100 were measured at a distance of approximately 500 feet from the intersection on both approaches. Only the speeds of the vehicles that were continuing through the intersection on VT 100 were recorded.

The results showed that the 85th percentile speed of the traffic traveling in the northbound direction approaching the intersection was 46 mph. Approaching the intersection from the north, the 85th percentile speed of the traffic in the southbound direction was 44 mph.

The results of this study also showed that the 10-mph pace, which is defined as the range of speeds that encompasses the highest proportion of vehicles, was between 32 and 41 mph for southbound traffic with sixty-nine percent of all vehicles. In the northbound direction, the range of the 10-mph pace was between 36 and 45 mph with a proportion of seventy-seven percent.

The Northern Vermont Development Area contracted Dubois & King in 2012 to conduct a safety study along VT 100 in the village area, with focus on the intersection of Hazen's Notch Road, VT 100 and VT 58. The study identified several safety concerns and suggested a number of alternatives for improvement. The report can be viewed here: http://www.nvda.net/files/VT%20100%20Village%20Safety%20Study%20-%20Lowell_final.pdf

Crash History

Crash history was reviewed at the intersection for the five-year period covering the years 2010 to 2014. A collision diagram and the crash narratives for each of the crashes are provided at the end of this report.

Five crashes occurred at this intersection between 2010 and 2014. All five crashes were right angle crashes.

Three of the five crashes involved a vehicle that was traveling southbound. Three of the crashes also involved a vehicle that was crossing VT 100 from Hazen's Notch Road.

Three of the five crashes involved a motorist that ran the stop sign. One crash involved a motorist who said he had stopped but had not seen any oncoming vehicles.

Four of the five crashes happened in the afternoon between 1:00 pm and 6:00 pm. One of the crashes took place in the evening, around 22:00 pm.

Historically, crash data for the 2007-2010 period showed right angle crashes as also being the main predominant crash pattern at this intersection with six right angle crashes out of a total of eight crashes. For this reporting period, four of the right angle crashes involved a vehicle that

was traveling from Hazen's Notch Road and three of the crashes involved a vehicle that was traveling southbound on VT 100.

Citizen' s Complaints

January 2010: District 9 received a request from Alden Warner, selectman from the Town of Lowell, install a flashing light at this intersection in light of the several crashes that had taken place. Mr. Warner felt that the light would help eliminate the problem since the intersection was blind from all corners.

Identified Safety Concerns

This section lists the areas of safety concern identified by the audit team during the site inspection and from the analysis of available data. This section also reports the potential safety enhancements suggested by the audit team. The concerns are not listed in order of importance.

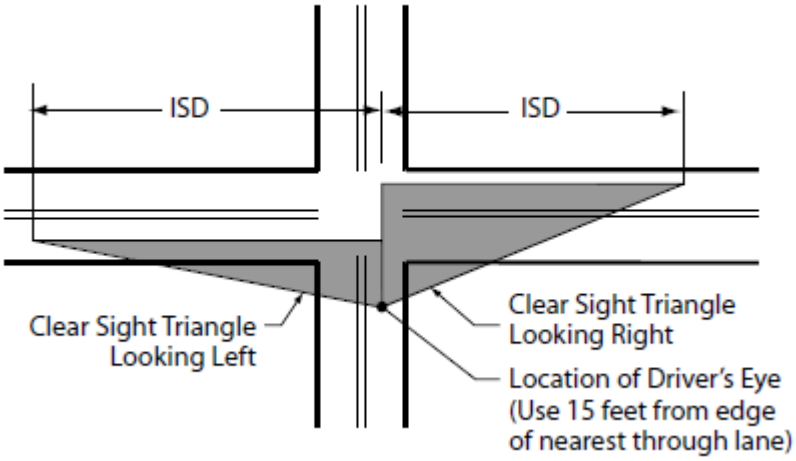
Concern: Corner Sight Distance Issue, Southwest Quadrant

The corner sight distance when stopped on Hazen's Notch Road and looking to the right (south) is marginal *(it was measured at about 380 feet. This is about right for the 35 mph posted speed limit, but the 85th percentile speed is 46 mph, and about 500 feet is required at that speed).* The embankment on the west side of VT 100 contributes to this issue.

Safety Enhancements:

Evaluate what gain in corner sight distance could be achieved by cutting back the bank on the west side.

Note, Intersection Sight Distance (ISD) for 35 mph is 390 ft, for 40 mph, 445 feet and 555 ft for 50 mph as per AAHSTO.



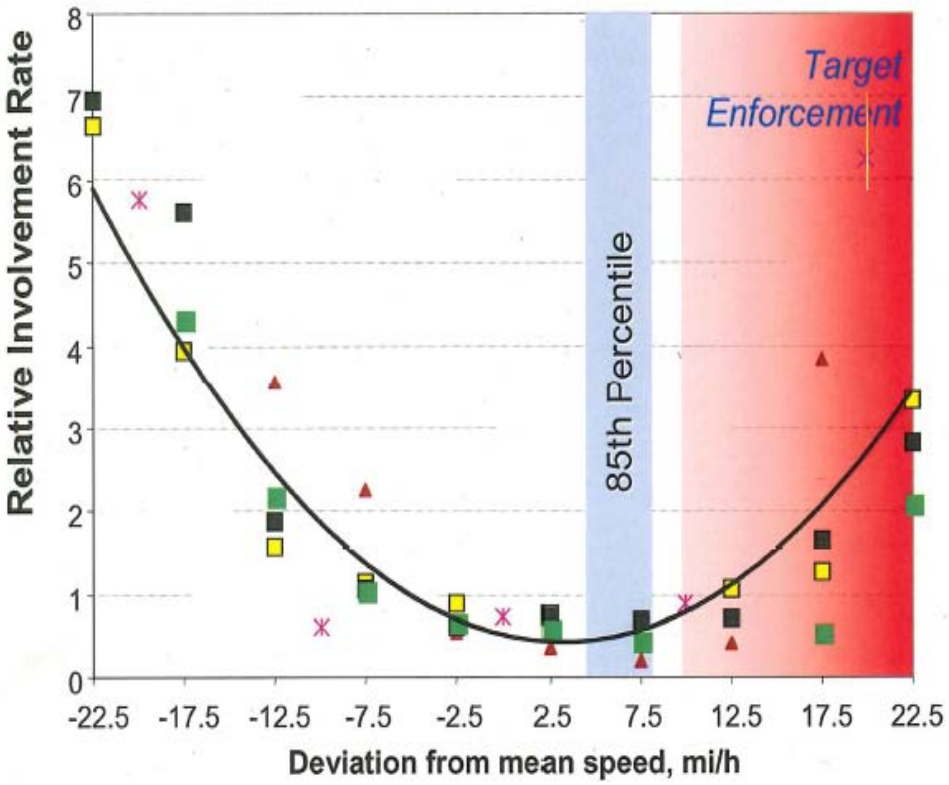
Ensure that the stop bar and the STOP word markings are located four feet from the edge of the road to maximize corner sight distance and that they are visible and refreshed on a yearly basis as needed.

Install permanent stop bar and STOP word markings as part of the upcoming paving project.

Conduct recurring speed limit enforcement campaigns for the high-risk drivers who are traveling northbound and approaching the intersection.

In doing this, consider targeting drivers who are traveling at or above the 90th percentile speed as per the following concept suggested by NHSTA. The next graph shows that the crash involvement rate increases as traveling speeds deviate from the 85th percentile speed. This means that targeting motorists that are traveling above the 85th percentile speed will apprehend motorists that are more likely to cause a crash. Crash involvement starts to increase more drastically 5 mph above the 85th percentile speed or around the 90th percentile speed. Applying this concept to this section of VT 100 in the northbound direction just south of the intersection means that the focus should be put on vehicles that are traveling above 47 mph (90th percentile).

Targeted Enforcement Concept



Install a radar speed feedback sign south of the intersection where the 35 mph speed zone begins.

Concern: Corner Sight Distance Issue, Northwest Quadrant

The corner sight distance when stopped on Hazen's Notch Road and looking to the left (north) is poor *(measured at 300 feet, which is below the required 390 feet value for the 35 mph posted speed limit and below the value needed for the 85th percentile speed of 44 mph)*. The crest of the road on VT 100 contributes to this issue.

Safety Enhancements:

Evaluate what gain in corner sight distance could be achieved by lowering the road.

Evaluate if a roundabout or a mini roundabout could be constructed at this intersection.

Install a radar speed feedback sign north of the intersection with a new 35 mph speed limit sign (*a location could be by the utility pole at about mile marker 4.534, just north of the white church*).

Conduct recurring speed limit enforcement campaigns for the high-risk drivers who are traveling southbound and approaching the intersection. As per the concept explained previously, target vehicles that are traveling southbound towards the intersection above 45 mph (90th percentile).

Summary of Safety Enhancements

The safety concerns and potential actions that were identified in the previous sections are further summarized in the next table. These potential enhancements will be presented to the Director of the Office of Highway Safety for further consideration.

Safety Concern	Safety Enhancement	Responsibility	Safety Payoff	Time Frame	Cost
The corner sight distance when stopped on Hazen's Notch Road and looking to the right (south) is poor. The embankment on the west side of VT 100 contributes to this issue	Evaluate what gain in corner sight distance could be achieved by cutting back the bank on the west side	VTrans (Paving, because of paving project)	High	Mid	Med ($230,000 for B/C>=1)
	Ensure that the stop bar and the STOP word markings are located four feet from the edge of the road on Hazen's Notch Rd to maximize corner sight distance and that they are visible and refreshed on a yearly basis as needed	Town of Lowell	Med	Annually	Low
	Install permanent stop bar and STOP word markings as part of the upcoming paving project	VTrans (Paving)	Med	Mid	Low
	Conduct recurring speed limit enforcement campaigns for the high-risk drivers who are traveling northbound and approaching the intersection at above 47 mph	Area Law Enforcement (via GHSP?)	High	Short/Mid	Low/Med
	Install a radar speed feedback sign south of the intersection where the 35 mph speed zone begins	VTrans (TSMO)	Low (5% reduction)	Short/Mid	Low ($5000)
The corner sight distance when stopped on Hazen's Notch Road and looking to the left (north) is poor	Evaluate what gain in corner sight distance could be achieved by lowering the road	VTrans (Paving, because of paving project)	Med	Mid	High
	Evaluate if a roundabout or a mini roundabout could be constructed at this intersection	VTrans (AMP)	High (71% Reduction)	Mid/Long	High ($395,000 for B/C>=1))
	Install a radar speed feedback sign north of the intersection with a new 35 mph speed limit sign (a location could be by the utility pole at about mile marker 4.534, just north of the white church)	VTrans (TSMO)	Low (5% reduction)	Short/Mid	Low ($5000)
	Conduct recurring speed limit enforcement campaigns for the high-risk drivers who are traveling southbound and approaching the intersection at above 45 mph	Area Law Enforcement (via GHSP?)	High	Short/Mid	Low/Med

In general, right angle crashes due to not stopping for the stop sign	On both approaches, install a flashing beacon above the right hand stop sign or LEDs around the same stop sign.	VTrans (TSMO)	High (41% reduction right angle)	Short	Low ($1,700 each)
	Ensure that the stop bar and the STOP word markings are visible and refreshed on a yearly basis as needed.	VTrans (District), VT 58 Town of Lowell, TH	Mid	Annually	Low

COLLISION DIAGRAM

Key Number =

MUNICIPALITY: *Lowell* COUNTY:

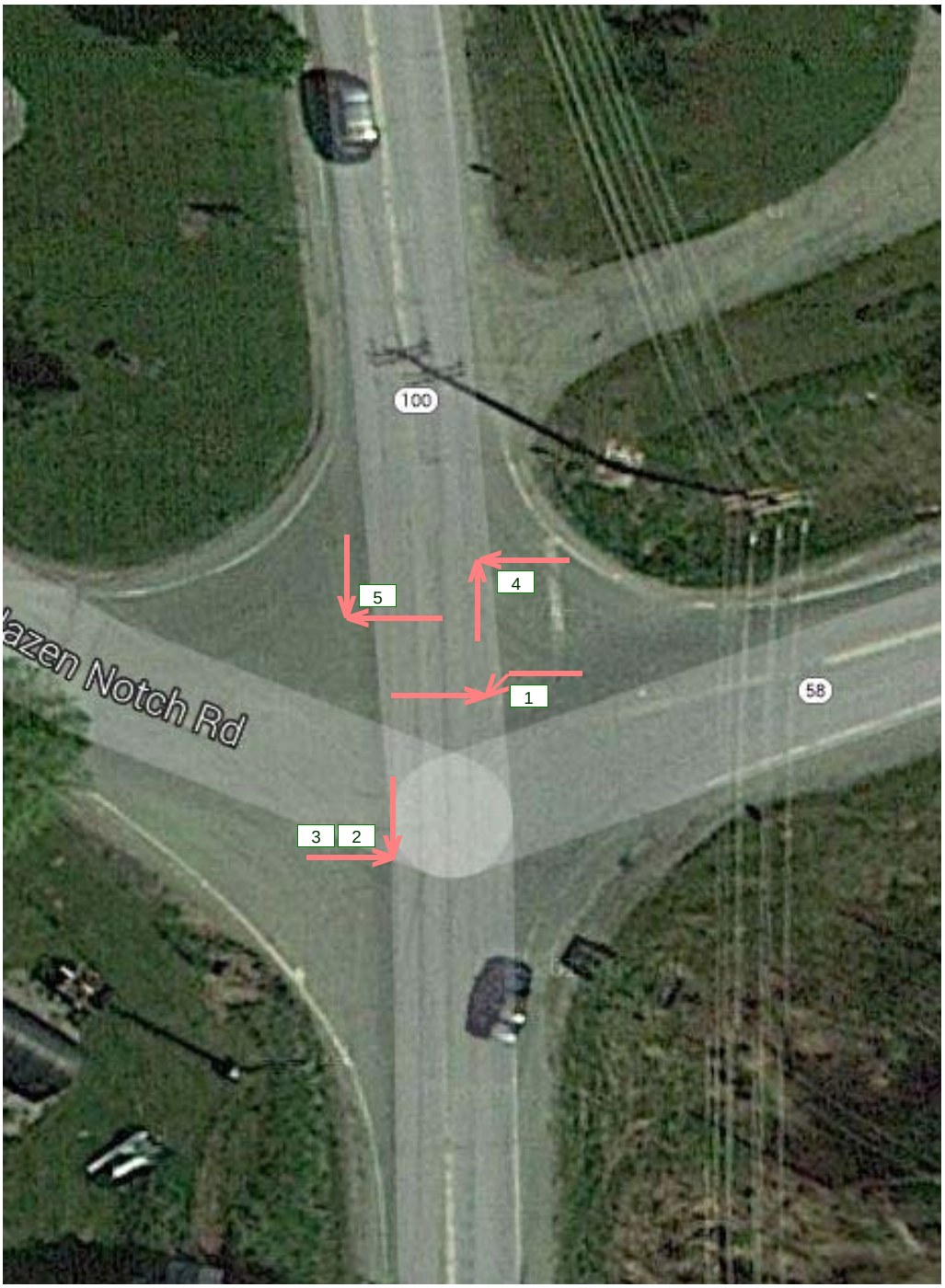
INTERSECTION: *VT 100*

PERIOD: *5* YEARS *0* MONTHS FROM *1/1/2010* TO *12/31/2014*

FILE: *enflowell*

CASE # :

BY: DATE: *3/30/2015*



SYMBOLS

- MOVING VEHICLE
- TURNING VEHICLE
- BACKING VEHICLE
- PARKED VEHICLE
- 999 RECORD NUMBER
- P PEDESTRIAN
- B BICYCLIST
- A ANIMAL
- FIXED OBJECT
- Fatal

MANNER OF COLLISION

- REAR END
- LEFT TURN
- LEFT TURN
- OVERTAKE
- OUT OF CONTROL
- HEAD ON
- RIGHT TURN
- RIGHT TURN
- RIGHT ANGLE
- SIDE SWIPE

Crash Number	Road	Marker	Date	Time	Weather	Injuries	Fatalities	Type	Description
1	VT-100	4.38	12/19/2013	22:00	Cloudy	1	0	Left Turn and Thru, Angle Broadside -->v--	The highway at the scene is straight and is at the bottom of a hill when traveling west on VT RT 58. The weather at the time of the crash was cloudy. Operator #2 advised he was traveling east on VT RT 58 towards the intersection with VT RT 100 before coming to a stop at the intersection. Operator #2 advised he had is turn signal on to show his intention to turn left onto VT RT 100. Operator #2 advised he saw Vehicle #1 approaching the intersection from the opposite side of VT RT 58. Operator #2 advised he began making the turn when he realized that vehicle #1 was not slowing down or going to stop at the intersection. Operator #2 advised vehicle #1 then went through the intersection colliding with the passenger side of the vehicle. Witness advised he has security cameras outside his residence and one of them was able to capture the crash on video. The video captured Vehicle #2 traveling east on VT RT 58, approach the intersection with VT RT 100, and come to a stop at the stop sign. Vehicle #1 is seen traveling west on VT RT 58 and fails to stop at the intersection. The video captures Vehicle #1 collide with the passenger side of Vehicle #2, as Vehicle #2 was attempting to make a left turn onto VT RT 100. Vehicle #1 is seen leaving the scene shortly after the collision, traveling east on VT RT 58.

2	VT-100	4.39	4/6/2012	12:54	Clear	0	0	No Turns, Thru moves only, Broadside ^<	The weather was clear and cool, the road was dry and clear. Op 1 advised that she was traveling east on VT 58 and had stopped at the stop sign. She advised that she looked both north and south on VT 100 and did not see any approaching vehicles. She advised that she did not see any vehicles approaching, including VH#2. Op 2 advised that he was traveling south on VT 100 and saw vh#1 at the stop sign on VT 58. He advised that he did not expect her to pull out in front of him. He advised that as he began to pass VT 58 he saw vh#1 pull out into the roadway and the left front of vh#1 impacted the passenger side of his vehicle. Investigation, VH#1 was traveling east on VT 58. VH#2 was traveling south on VT 100. VH#1 stopped at the marked stop sign on VT RT and then proceeded into the southbound lane of VT RTE 100 in an attempt to travel east across both lanes of VT 100.
3	VT-100	4.39	6/27/2012	18:09	Rain	3	0	Other - Explain in Narrative	The weather at the time of the collision was cloudy and the road surface was wet and slippery. Op 1 advised he was traveling east on Hazens Notch Rd. Operator #1 stated he slowed down as he approached the intersection of Route 100 but that he did not see nor did he remember there being a stop sign at that intersection. Operator #1 advised he did not stop as he attempted to cross Route 100 at which time he collided with a black, Nissan, traveling south on Route 100, at which time he continued south side swiping a red, Chevrolet Operator #2 advised she was traveling south on Route 100 when Operator #1 failed to stop for the stop sign and collided with her front end causing her to cross the northbound lane as Operator #1 side swiped another vehicle traveling north on Route 100. Operator #3 advised he was traveling north on Route 100 when he observed Operator #1 fail to stop for the stop sign and collide with a vehicle traveling south on Route 100. Operator #3 stated he was unable to get out of the way before Operator #1 collided with his driver's side.

4	VT-100	4.42	8/14/2010	16:20		0	0	No Turns, Thru moves only, Broadside ^<	Roadways and weather at the time of the crash were clear. Witness advised he saw Vehicle #1 run the stop sign. He advised it did not stop. He estimated the speed of Vehicle #1 at 25 mph. Op 1 advised he was on VT 58 and proceeding through the intersection. He advised he saw the other vehicle and thought he had time. OP 2 was traveling north on VT 100 at approximately 40 mph. He advised the other vehicle entered his lane and he tried to swerve away from it.
5	VT-58	0	12/29/2012	14:34	Snow	0	0	No Turns, Thru moves only, Broadside ^<	No Narrative. Box P1 = driving too fast. Snow covered and snowing.

The Vermont Agency of Transportation

Traffic Research/Highway Division
Turning Movement Report

Counter: TU 1172
Counted by: S Gardner
Weather: Rainy
Town: 58-1 Lowell

File Name : 58-1merged15
Site Code : 31013805
Start Date : 8/3/2015
Page No : 1

Groups Printed- Auto - Medium - Heavy

	VT 100 from Westfield From North				VT 58 from Irasburg From East				VT 100 from Eden From South				VT 58 from Montgomery From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:00 AM	1	13	2	0	0	2	15	0	6	5	0	0	0	2	6	0	52
06:15 AM	0	19	1	0	0	0	5	0	2	5	1	0	2	3	1	0	39
06:30 AM	0	14	0	0	0	5	7	0	6	15	0	0	5	0	3	0	55
06:45 AM	0	12	1	0	1	2	14	0	5	10	1	0	0	3	3	0	52
Total	1	58	4	0	1	9	41	0	19	35	2	0	7	8	13	0	198
07:00 AM	0	17	2	0	0	1	6	0	2	5	0	0	0	1	1	0	35
07:15 AM	1	15	1	0	4	1	17	0	8	7	1	1	3	1	0	0	60
07:30 AM	1	18	0	0	2	2	16	0	4	13	1	0	3	1	2	0	63
07:45 AM	2	7	3	0	3	3	16	0	9	5	0	0	1	0	5	0	54
Total	4	57	6	0	9	7	55	0	23	30	2	1	7	3	8	0	212
08:00 AM	0	18	0	0	3	0	11	0	4	5	2	0	1	0	6	0	50
08:15 AM	1	12	6	0	3	0	9	0	7	16	2	0	1	0	4	0	61
08:30 AM	3	21	2	1	2	2	9	0	7	13	0	1	2	1	2	0	66
08:45 AM	7	15	2	0	3	0	5	0	7	8	0	0	1	2	1	0	51
Total	11	66	10	1	11	2	34	0	25	42	4	1	5	3	13	0	228
09:00 AM	2	12	3	0	1	2	7	0	6	13	0	0	0	1	2	0	49
09:15 AM	7	11	2	0	2	1	4	0	6	8	0	0	0	6	3	0	50
09:30 AM	2	16	5	0	2	0	11	0	6	16	2	0	0	3	5	0	68
09:45 AM	1	8	1	0	2	4	4	0	7	10	4	0	3	2	5	0	51
Total	12	47	11	0	7	7	26	0	25	47	6	0	3	12	15	0	218
10:00 AM	2	13	3	0	2	1	8	0	9	8	1	0	3	4	3	0	57
10:15 AM	2	10	2	0	1	5	5	0	10	9	3	0	2	1	2	0	52
10:30 AM	2	10	0	0	2	1	7	0	9	12	2	0	1	3	2	0	51
10:45 AM	4	11	3	0	2	1	12	0	7	10	0	0	1	1	3	0	55
Total	10	44	8	0	7	8	32	0	35	39	6	0	7	9	10	0	215
11:00 AM	4	8	0	0	0	0	8	0	5	8	1	0	2	0	2	0	38
11:15 AM	2	12	2	0	8	1	6	0	5	14	3	0	0	1	2	0	56
11:30 AM	2	18	2	0	0	2	13	0	6	18	0	0	0	0	5	0	66
11:45 AM	2	18	3	0	5	2	6	0	4	13	5	0	2	2	6	0	68
Total	10	56	7	0	13	5	33	0	20	53	9	0	4	3	15	0	228
12:00 PM	4	6	2	0	0	3	8	0	3	10	2	0	3	3	1	0	45
12:15 PM	0	7	1	0	7	0	9	0	6	12	1	0	0	5	3	0	51
12:30 PM	1	13	3	2	3	1	11	0	11	13	1	0	1	2	1	2	65
12:45 PM	5	10	2	0	0	3	11	0	9	16	4	0	1	1	2	1	65
Total	10	36	8	2	10	7	39	0	29	51	8	0	5	11	7	3	226
01:00 PM	6	10	4	0	2	3	7	0	6	14	0	0	1	2	3	0	58
01:15 PM	6	20	0	0	4	3	5	0	4	9	1	0	0	3	3	0	58
01:30 PM	0	4	0	0	3	5	6	0	8	14	0	0	4	2	0	0	46
01:45 PM	0	9	3	0	2	2	6	0	6	7	3	0	2	0	2	0	42
Total	12	43	7	0	11	13	24	0	24	44	4	0	7	7	8	0	204
02:00 PM	1	10	4	0	0	4	5	0	2	9	1	0	1	0	1	0	38
02:15 PM	2	9	1	0	0	5	6	0	7	13	4	0	2	5	2	0	56
02:30 PM	2	13	4	0	4	2	6	0	6	15	1	0	1	2	3	0	59
02:45 PM	2	11	1	0	2	1	10	0	7	14	1	0	1	2	0	0	52
Total	7	43	10	0	6	12	27	0	22	51	7	0	5	9	6	0	205

The Vermont Agency of Transportation

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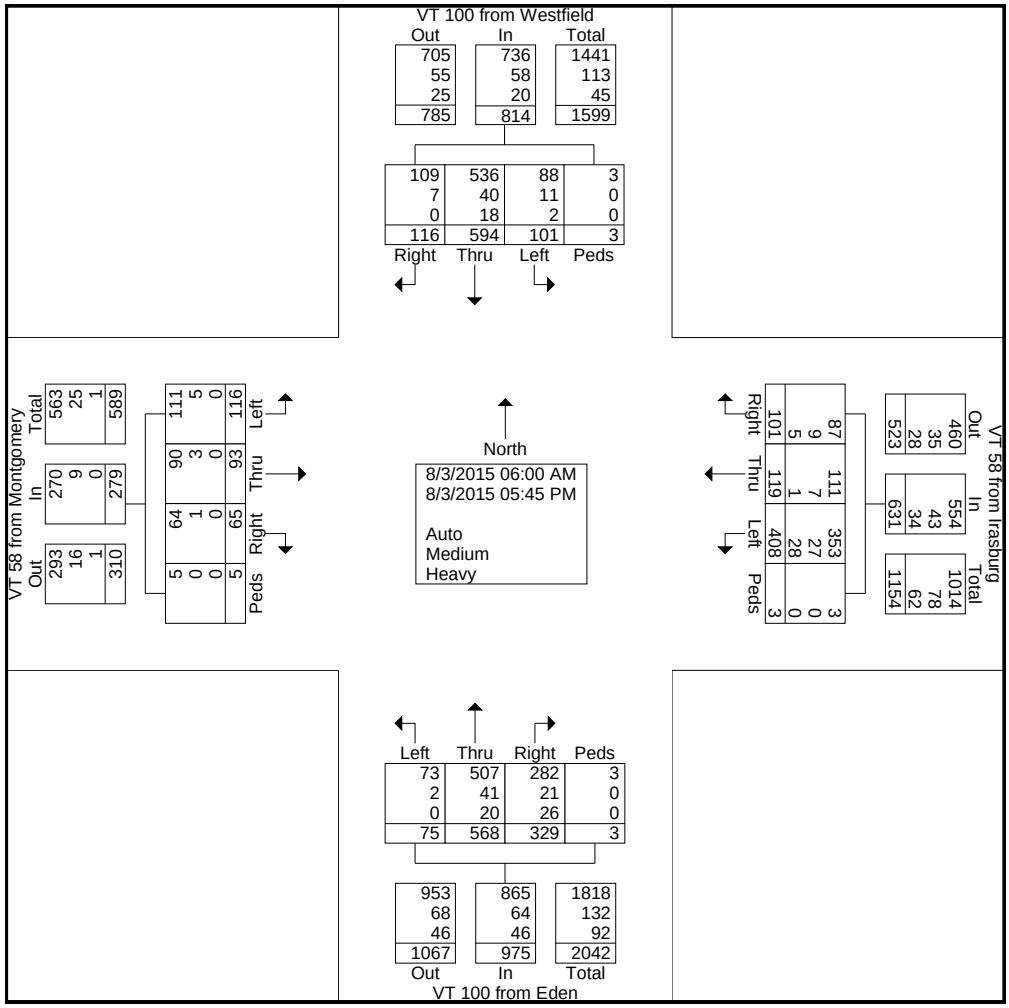
03:00 PM	4	12	4	0	0	4	6	0	5	8	6	0	3	3	2	2	59
03:15 PM	1	16	0	0	3	1	11	0	4	11	2	0	4	2	0	0	55
03:30 PM	2	16	1	0	3	7	7	0	5	5	1	0	0	3	0	0	50
03:45 PM	2	6	3	0	2	1	8	0	10	20	0	0	0	2	0	0	54
Total	9	50	8	0	8	13	32	0	24	44	9	0	7	10	2	2	218
04:00 PM	5	4	4	0	1	10	6	0	4	10	3	0	0	4	3	0	54
04:15 PM	2	12	3	0	0	5	10	0	10	10	5	0	2	1	3	0	63
04:30 PM	4	14	8	0	2	3	8	0	18	24	3	0	1	4	1	0	90
04:45 PM	8	13	3	0	3	3	8	3	12	12	1	0	2	3	5	0	76
Total	19	43	18	0	6	21	32	3	44	56	12	0	5	12	12	0	283
05:00 PM	2	12	0	0	2	4	7	0	13	16	3	1	0	2	1	0	63
05:15 PM	3	15	0	0	5	2	10	0	9	22	0	0	0	1	1	0	68
05:30 PM	4	10	3	0	2	6	11	0	11	19	3	0	0	1	3	0	73
05:45 PM	2	14	1	0	3	3	5	0	6	19	0	0	3	2	2	0	60
Total	11	51	4	0	12	15	33	0	39	76	6	1	3	6	7	0	264
Grand Total	116	594	101	3	101	119	408	3	329	568	75	3	65	93	116	5	2699
Apprch %	14.3	73	12.4	0.4	16	18.9	64.7	0.5	33.7	58.3	7.7	0.3	23.3	33.3	41.6	1.8	
Total %	4.3	22	3.7	0.1	3.7	4.4	15.1	0.1	12.2	21	2.8	0.1	2.4	3.4	4.3	0.2	
Auto	109	536	88	3	87	111	353	3	282	507	73	3	64	90	111	5	2425
% Auto	94	90.2	87.1	100	86.1	93.3	86.5	100	85.7	89.3	97.3	100	98.5	96.8	95.7	100	89.8
Medium	7	40	11	0	9	7	27	0	21	41	2	0	1	3	5	0	174
% Medium	6	6.7	10.9	0	8.9	5.9	6.6	0	6.4	7.2	2.7	0	1.5	3.2	4.3	0	6.4
Heavy	0	18	2	0	5	1	28	0	26	20	0	0	0	0	0	0	100
% Heavy	0	3	2	0	5	0.8	6.9	0	7.9	3.5	0	0	0	0	0	0	3.7

The Vermont Agency of Transportation

Traffic Research/Highway Division
Turning Movement Report

Counter: TU 1172
Counted by: S Gardner
Weather: Rainy
Town: 58-1 Lowell

File Name : 58-1merged15
Site Code : 31013805
Start Date : 8/3/2015
Page No : 3



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Counted by: S Gardner
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File Name : 58-1merged15
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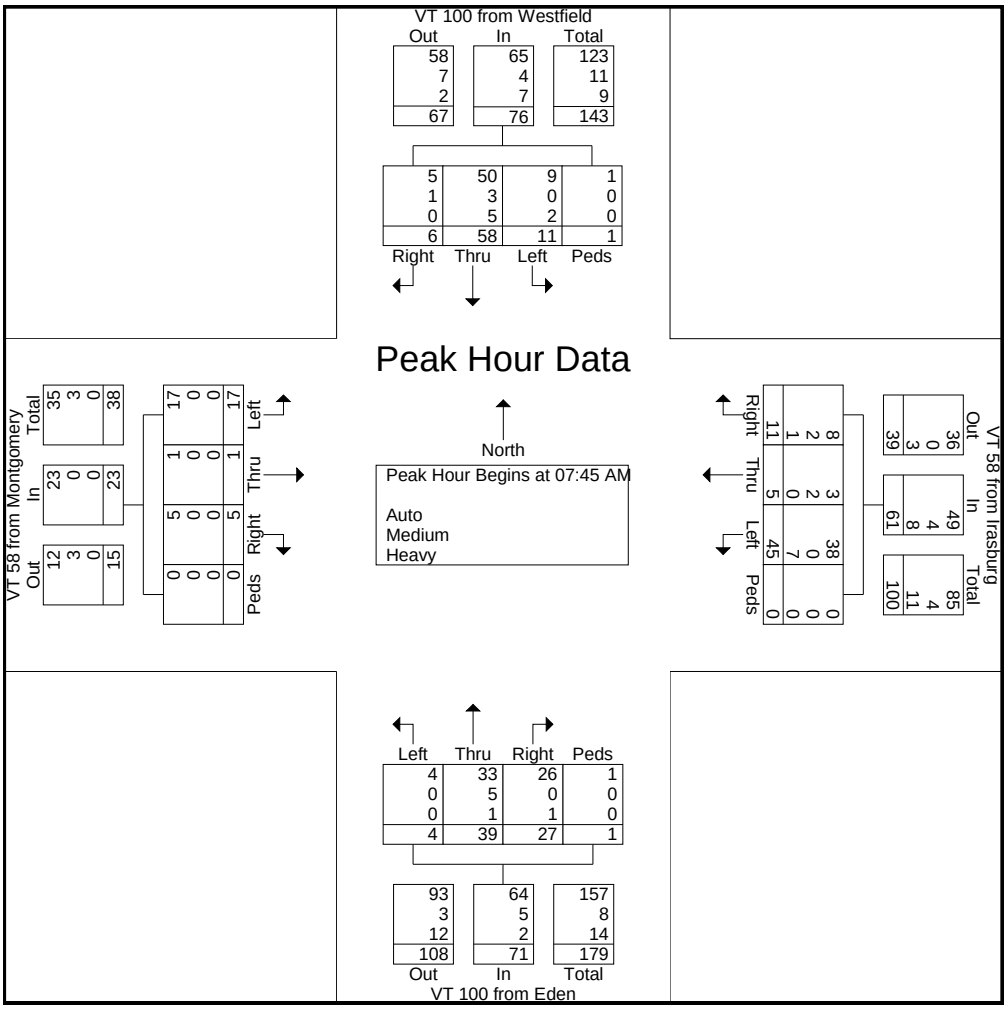
Page No : 4

	VT 100 from Westfield From North					VT 58 from Irasburg From East					VT 100 from Eden From South					VT 58 from Montgomery From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	7	3	0	12	3	3	16	0	22	9	5	0	0	14	1	0	5	0	6	54
08:00 AM	0	18	0	0	18	3	0	11	0	14	4	5	2	0	11	1	0	6	0	7	50
08:15 AM	1	12	6	0	19	3	0	9	0	12	7	16	2	0	25	1	0	4	0	5	61
08:30 AM	3	21	2	1	27	2	2	9	0	13	7	13	0	1	21	2	1	2	0	5	66
Total Volume	6	58	11	1	76	11	5	45	0	61	27	39	4	1	71	5	1	17	0	23	231
% App. Total	7.9	76.3	14.5	1.3		18	8.2	73.8	0		38	54.9	5.6	1.4		21.7	4.3	73.9	0		
PHF	.500	.690	.458	.250	.704	.917	.417	.703	.000	.693	.750	.609	.500	.250	.710	.625	.250	.708	.000	.821	.875
Auto	5	50	9	1	65	8	3	38	0	49	26	33	4	1	64	5	1	17	0	23	201
% Auto	83.3	86.2	81.8	100	85.5	72.7	60.0	84.4	0	80.3	96.3	84.6									
Medium	1	3	0	0	4	2	2	0	0	4	0	5	0	0	5	0	0	0	0	0	13
% Medium	16.7	5.2	0	0	5.3	18.2	40.0	0	0	6.6	0	12.8	0	0	7.0	0	0	0	0	0	5.6
Heavy	0	5	2	0	7	1	0	7	0	8	1	1	0	0	2	0	0	0	0	0	17
% Heavy	0	8.6	18.2	0	9.2	9.1	0	15.6	0	13.1	3.7	2.6	0	0	2.8	0	0	0	0	0	7.4



The Vermont Agency of Transportation

Traffic Research/Highway Division
Turning Movement Report

Counter: TU 1172
Counted by: S Gardner
Weather: Rainy
Town: 58-1 Lowell

File Name : 58-1merged15
Site Code : 31013805
Start Date : 8/3/2015
Page No : 5

	VT 100 from Westfield From North					VT 58 from Irasburg From East					VT 100 from Eden From South					VT 58 from Montgomery From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	4	14	8	0	26	2	3	8	0	13	18	24	3	0	45	1	4	1	0	6	90
04:45 PM	8	13	3	0	24	3	3	8	3	17	12	12	1	0	25	2	3	5	0	10	76
05:00 PM	2	12	0	0	14	2	4	7	0	13	13	16	3	1	33	0	2	1	0	3	63
05:15 PM	3	15	0	0	18	5	2	10	0	17	9	22	0	0	31	0	1	1	0	2	68
Total Volume	17	54	11	0	82	12	12	33	3	60	52	74	7	1	134	3	10	8	0	21	297
% App. Total	20.7	65.9	13.4	0		20	20	55	5		38.8	55.2	5.2	0.7		14.3	47.6	38.1	0		
PHF	.531	.900	.344	.000	.788	.600	.750	.825	.250	.882	.722	.771	.583	.250	.744	.375	.625	.400	.000	.525	.825
Auto	16	49	10	0	75	9	12	29	3	53	50	70	7	1	128	3	10	8	0	21	277
% Auto	94.1	90.7	90.9	0	91.5	75.0	100	87.9	100	88.3	96.2	94.6									
Medium	1	3	1	0	5	3	0	3	0	6	2	1	0	0	3	0	0	0	0	0	14
% Medium	5.9	5.6	9.1	0	6.1	25.0	0	9.1	0	10.0	3.8	1.4	0	0	2.2	0	0	0	0	0	4.7
Heavy	0	2	0	0	2	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	6
% Heavy	0	3.7	0	0	2.4	0	0	3.0	0	1.7	0	4.1	0	0	2.2	0	0	0	0	0	2.0