

VT 105 Corridor Analysis

Introduction:

VT 105 traverses the northern part of Vermont with approximately 93 miles through 17 towns. During the first 9 months of 2021 there have been 6 fatal crashes that tragically took the lives of 7 people. The Vermont Agency of Transportation Operations & Safety Bureau – Data Analysis Section reviewed crashes, traffic volumes, traffic speeds, and current infrastructure projects to proactively look at causes and possible reasons for the rise in fatal crashes and identify areas with elevated crash rates.

Through this analysis we reviewed all crashes as well as major crashes. A major crash is identified as a crash where at least one person was fatally or seriously injured. The major crashes make up just 5% of all crashes on VT 105 for the time period analyzed. The bulk of the crashes are property damage or non-reportable, which are lower damage crashes that do not meet a reporting threshold for law enforcement to engage in a full investigation.

Key Takeaways:

- The crash data shows some prevalent, key behavioral issues in the fatal crashes but also in all crash types. Specifically, speeding, occupants who are unbelted and driver impairment. The prevalent driver demographics are males between the ages of 16 and 29.
- From the traffic data, Sheldon has the most mileage of all towns and the highest Annual Vehicle Miles Traveled (AVMT). At the one Road Weather Information Station (RWIS) site on VT 105 in Jay there has also been an increase in the speeds recorded.
- Newport City, Troy and Sheldon are highest for crash rates and crashes per mile.

VT 105 Total Crashes by Crash Type 2016-2021						
Year	Fatal Crashes	Injury Crashes	Property Damage Only Crashes	Non-Reportable Crashes	Total by Year	Major Crashes
2016	2	35	40	30	107	2
2017	0	30	53	23	106	3
2018	1	25	44	4	74	7
2019	1	32	45	53	131	3
2020	3	15	33	40	91	7
2021*	6	6	6	19	37	7
Grand Total	13	143	221	169	546	29
<i>*2021 data incomplete; as reported by law enforcement as of 9/30/21</i>						

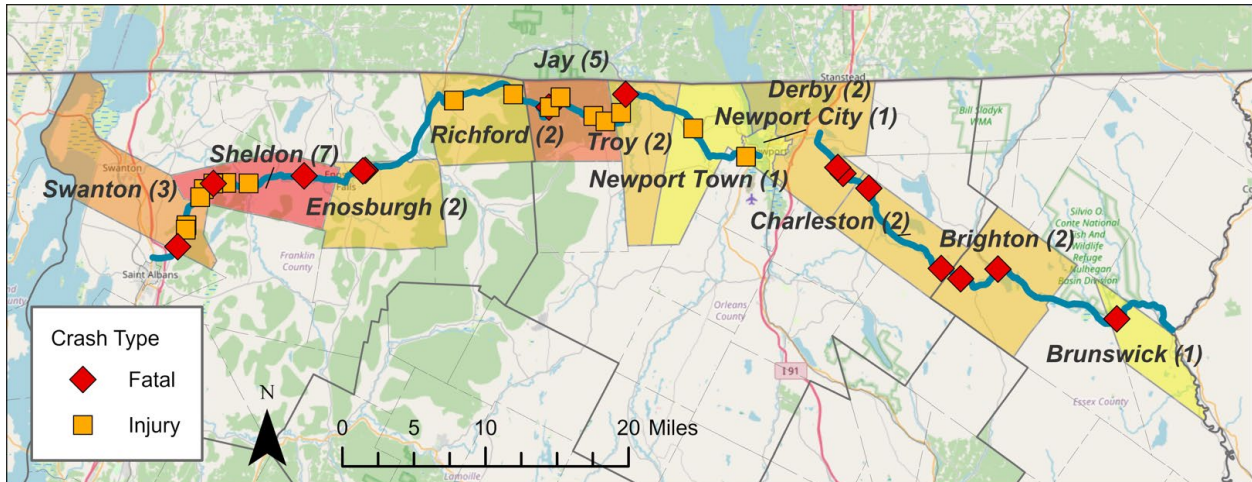
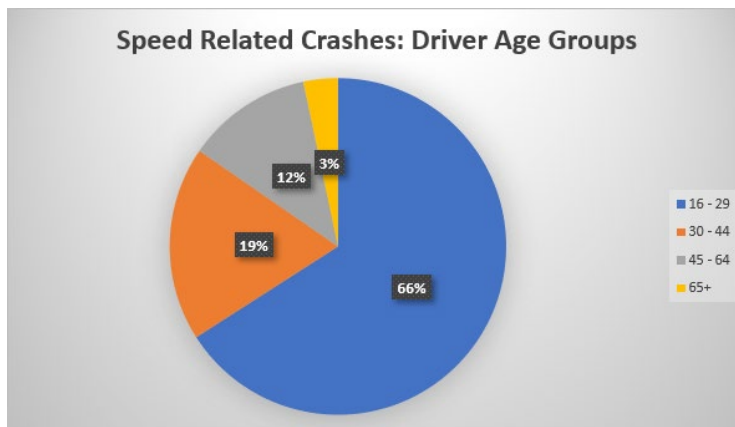
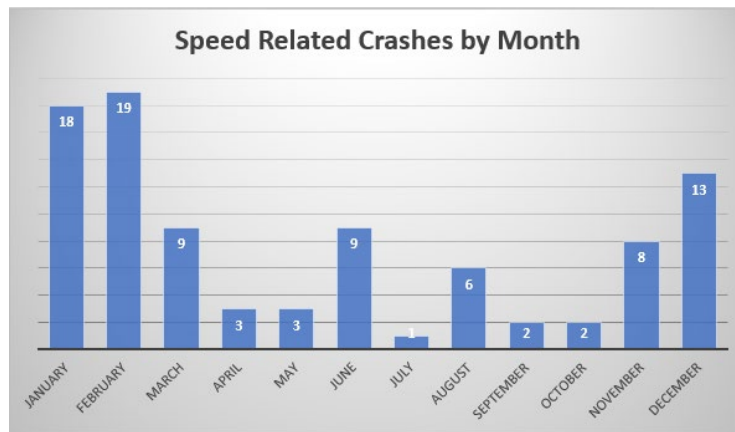


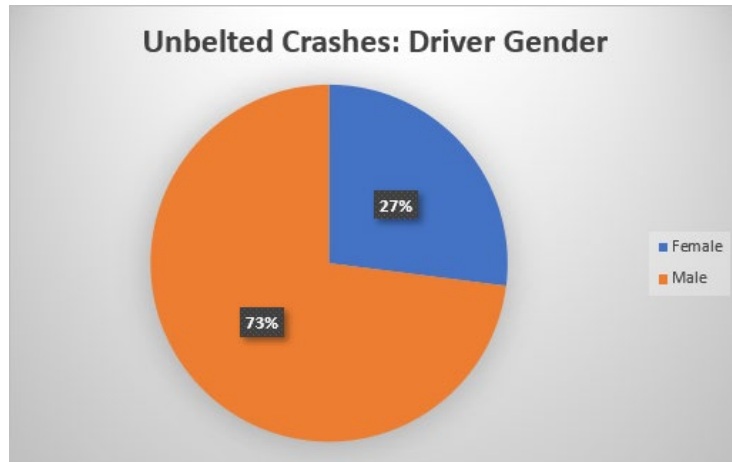
Chart 1. Count of major crashes on VT-105 by town and injury type (fatal or serious injury) for years 2016 through Q3 of 2021.

Web Map Link: Use [this link](#) to get to a web map that can be toggled to look at the crashes as shown above as well as other data. Other data to include projects, rumble stripes, and traffic volumes.

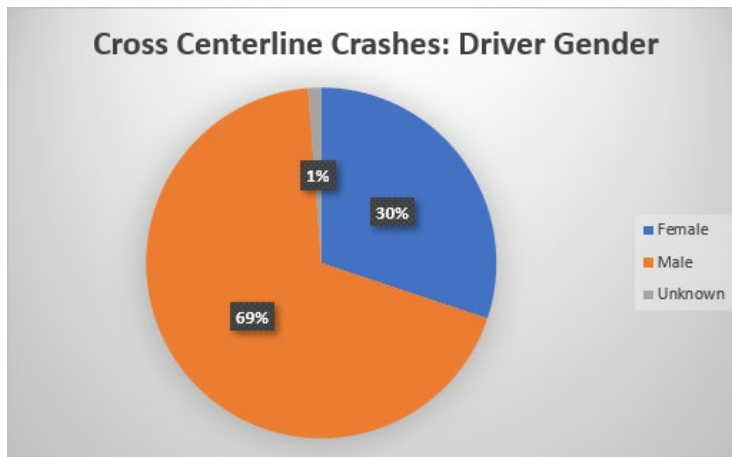
Speed Related Crashes: There have been 93 speed related crashes over the 5.5 years (2016-2021), representing 17% of all crashes. 54% of speed related crashes occur in the winter months (December, January, February). The number of crashes where the driver was between 16 – 29 was the highest as well.



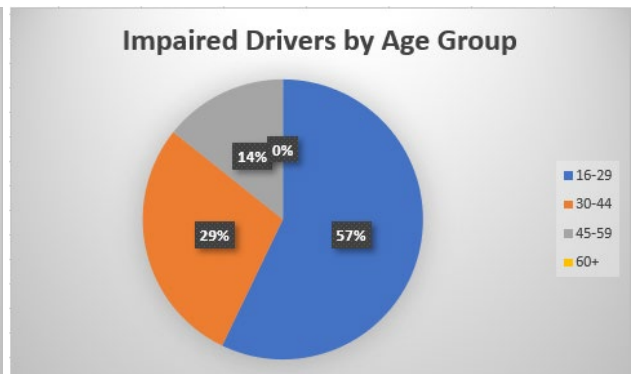
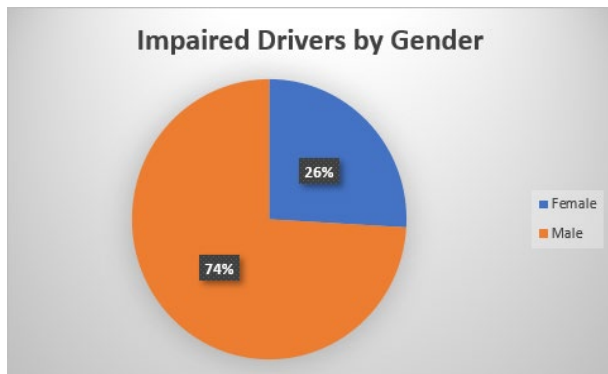
Vehicle Occupants Unbelted: There have been 44 crashes where at least one occupant was unbelted during this time. The most significant information in this dataset is that 73% were male. Nearly half of the occupants were under the age of 30.



Cross Centerline Crashes: There were 49 cross centerline crashes. Of these, 69% of the drivers were male.



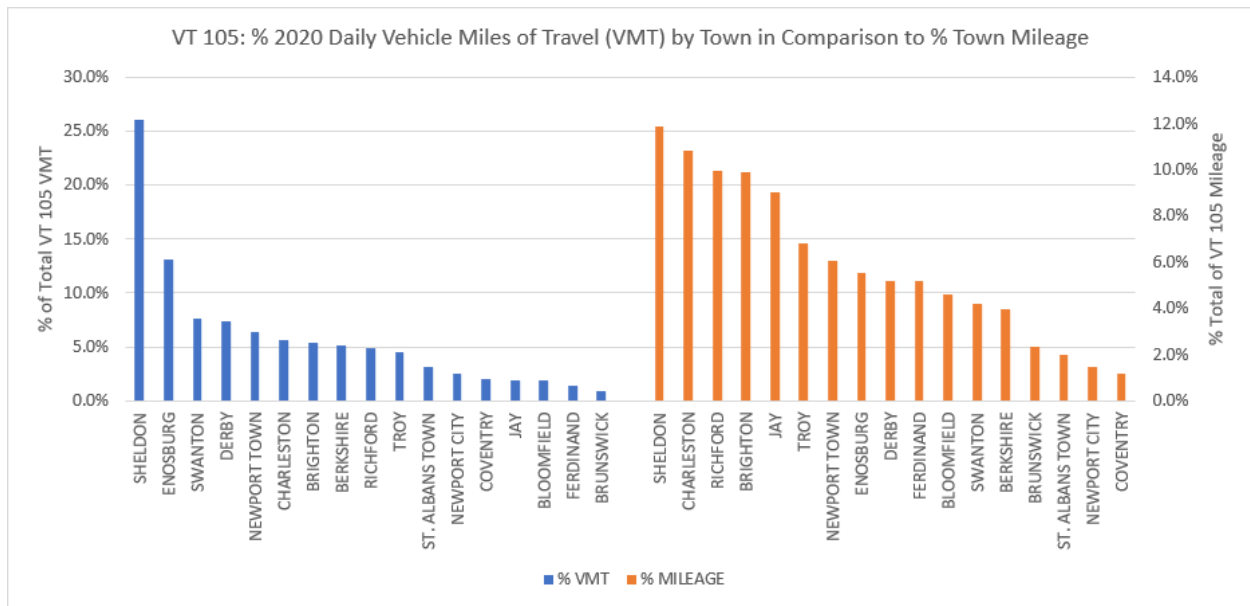
Impaired Crashes: During this period, there were 23 crashes where a driver was impaired by alcohol, drugs, or both. Of these drivers, 74% were male and 57% were between the ages 16 and 29.



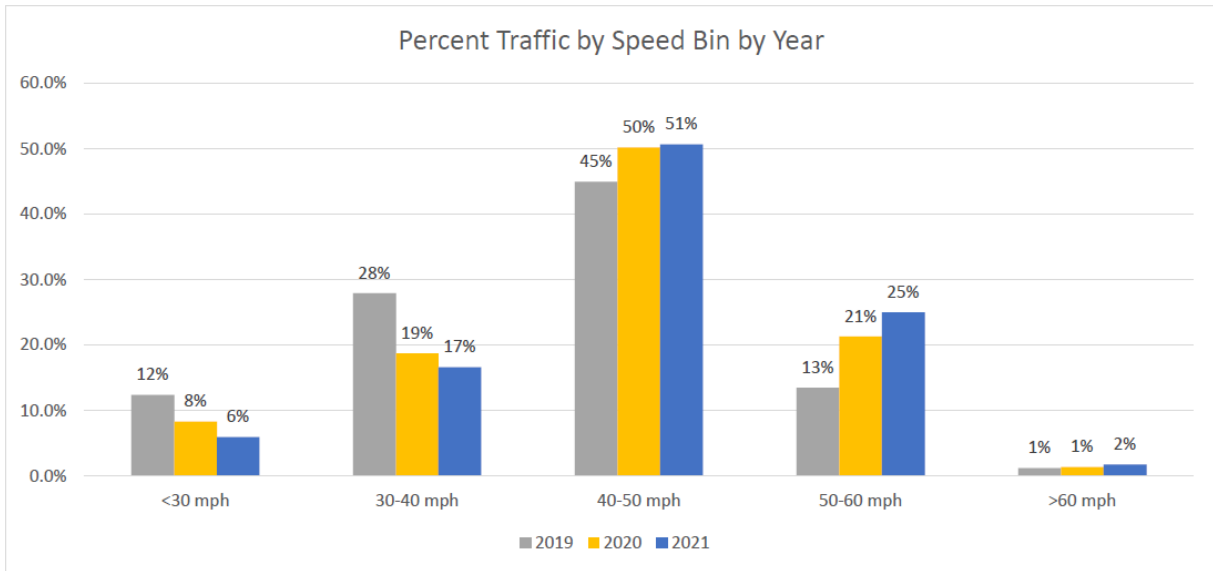
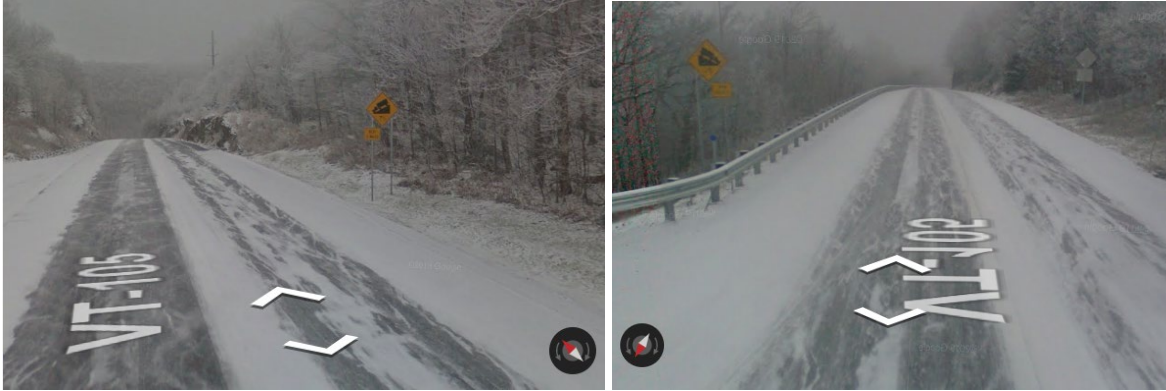
Traffic Data:

The left side of the chart below (in blue) shows the daily vehicle miles of travel by town as a percent of all the vehicle miles of travel on VT 105. Sheldon carries the largest percentage with 26% and Brunswick carries the least with less than 1%. In terms of the length of VT 105 within each town (in orange on the right side of the chart below), the largest percentage of VT 105 is within Sheldon (12%), and the smallest percentage is within Coventry (1.2%).

This chart shows that although the length of VT 105 is longest within Sheldon, it is not longest by much, whereas the VMT in Sheldon is the largest by a considerable amount. In other words, in Sheldon, we are cramming more trips into the same length of roadway and thus creating more opportunities for conflict and potential crashes.



VTrans operates an RWIS site on VT 105 in Jay at the crest of a hill on the west side of Jay. The pictures below show photos looking both east and west from the RWIS site. Data collected at the RWIS site indicates that average travel speeds have increased slightly since 2019. The largest percent of recorded speeds have consistently fallen between 40 and 50 mph, but the percent of traffic traveling at less than 40 mph has decreased and the percent of traffic travelling at greater than 50 mph has increased, up 12% from 2019 to 2021. The chart below compares 8-week data sets from 2019 through 2021.



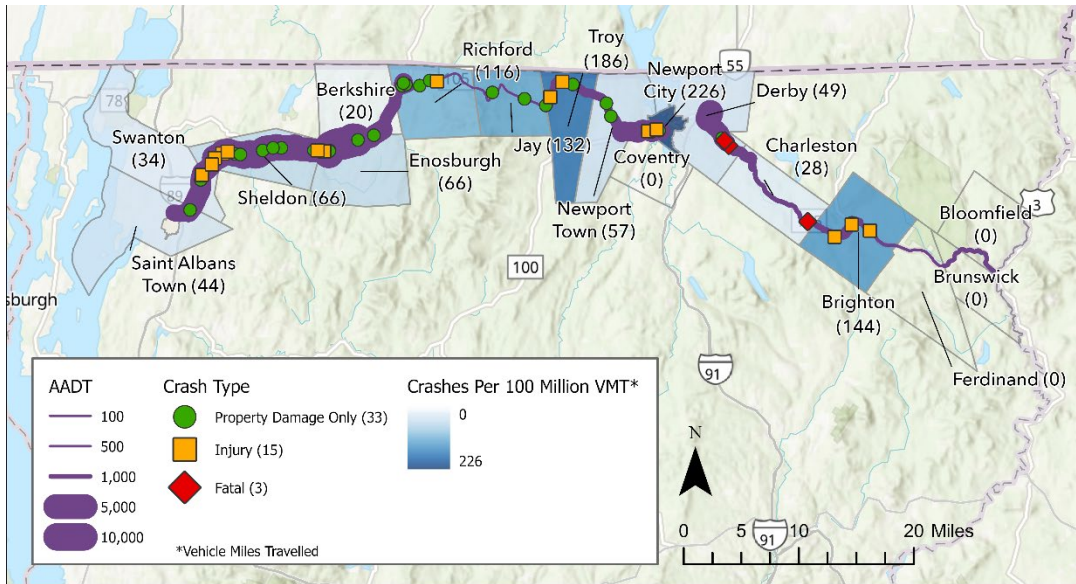
Crash Rates:

Two crash rates were calculated for each town along VT 105 using two different formulas. First, crashes per 100 million vehicle miles travelled was determined using the formula below using the 2020 AADT and crash data.

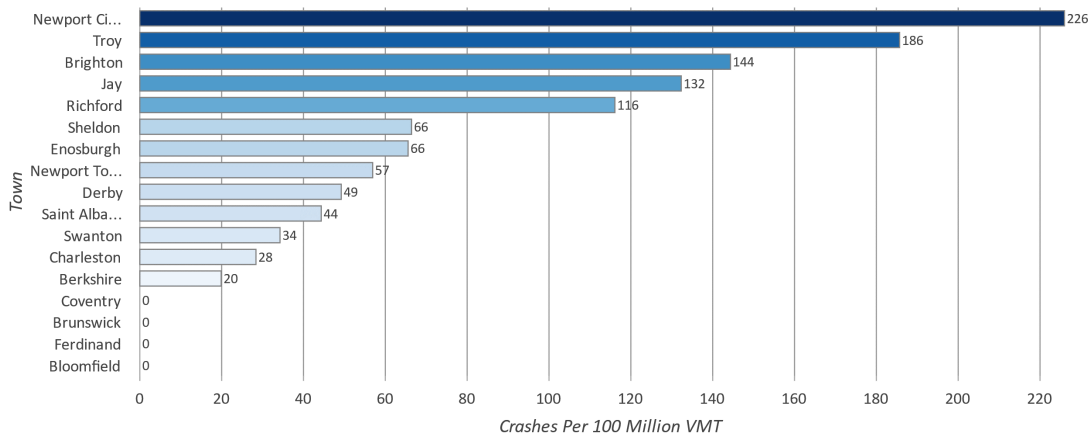
$$R = \frac{C \times 100,000,000}{V \times 365 \times N \times L}$$

C = Crashes
 V = AADT
 N = Years
 L = Segment Length

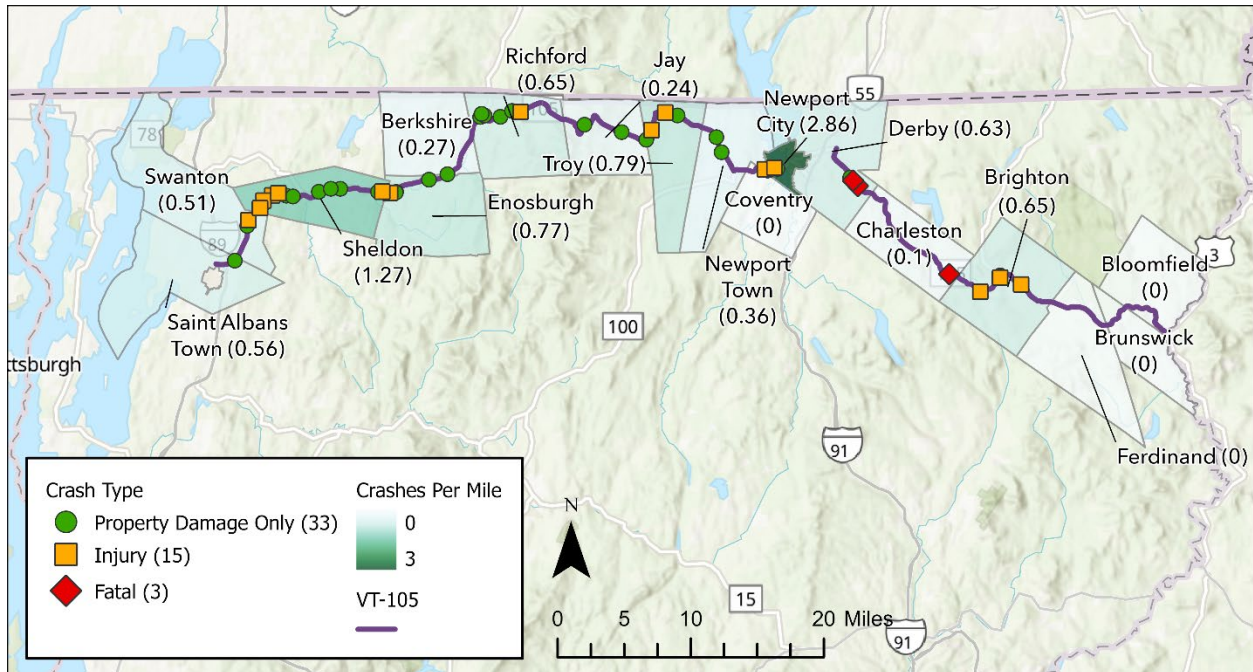
In the first map Newport City and Troy present as having the highest crash rates based on their miles, the Annual Average Daily Traffic (AADT) and number of crashes. The chart below the map shows the crashes per 100 million VMT by town.



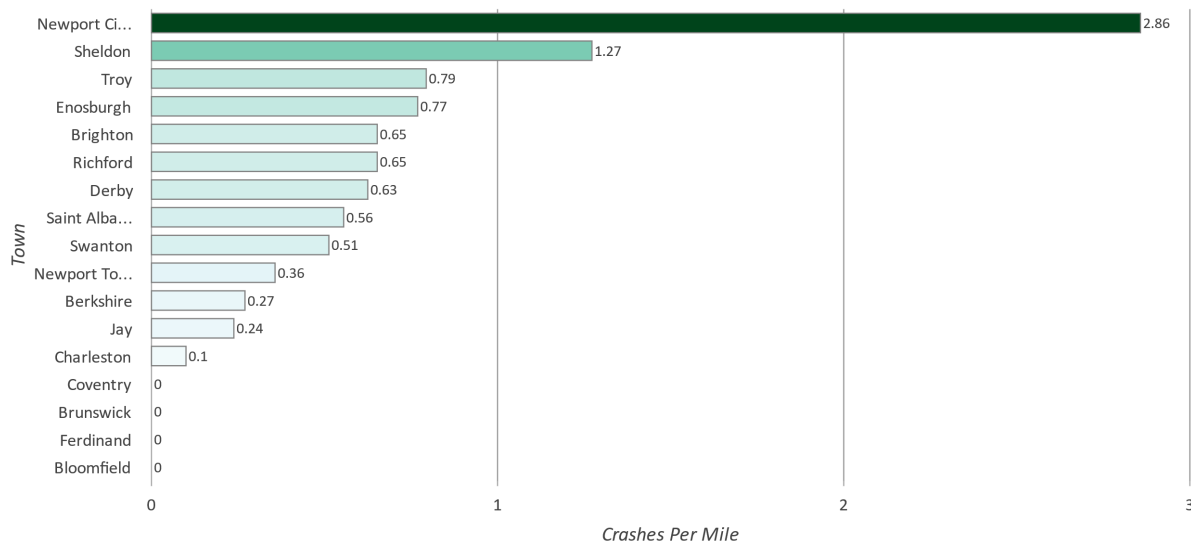
Crashes Per 100 Million VMT By Town



The map below shows the crashes per mile by town where Newport City is at the top of the list with Sheldon in a distant second. The map and subsequent chart show that for every mile, there are a certain number of crashes. Like a heat map, this shows where the most crashes are happening by town. Despite having the highest mileage out of all the town, Sheldon ranks second in crashes per mile indicating higher crash activity in this area.



Crashes Per Mile By Town



Conclusion:

As stated above, there have been 545 crashes on the entirety of VT 105 over the past 5.5 years. Of those crashes only 5% were major crashes. The 6 fatal crashes showed some significant behavioral issues, so we broke out three of the most prevalent ones above. The findings are that male drivers tend to speed more, drive impaired more and cross center more. In most of these categories, the age of drivers involved in these behaviors are higher in the 16–29-year-old groups. The speed issue was further recognized in the traffic data where we saw that overall speeds are trending up over the past three years, especially in the higher speeds (over 40). Finally, the crash rates brought Newport City up as the town with the highest number of crashes per mile and also by vehicle miles traveled.