

# Safe Travels: Are Rural Roads or Highways Safer for Motorcyclists?

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## Abstract

Motorcycle crashes are an unfortunate occurrence that some do not walk away from. In Massachusetts alone, 5,579 fatalities occur involving a motorcycle in 2020. Understanding the context around motorcycle fatalities aids future endeavors in increasing survivability. The goal of this project is determining whether interstate highways or rural roads have higher fatality rates.

## Methods

### Spatial Analysis

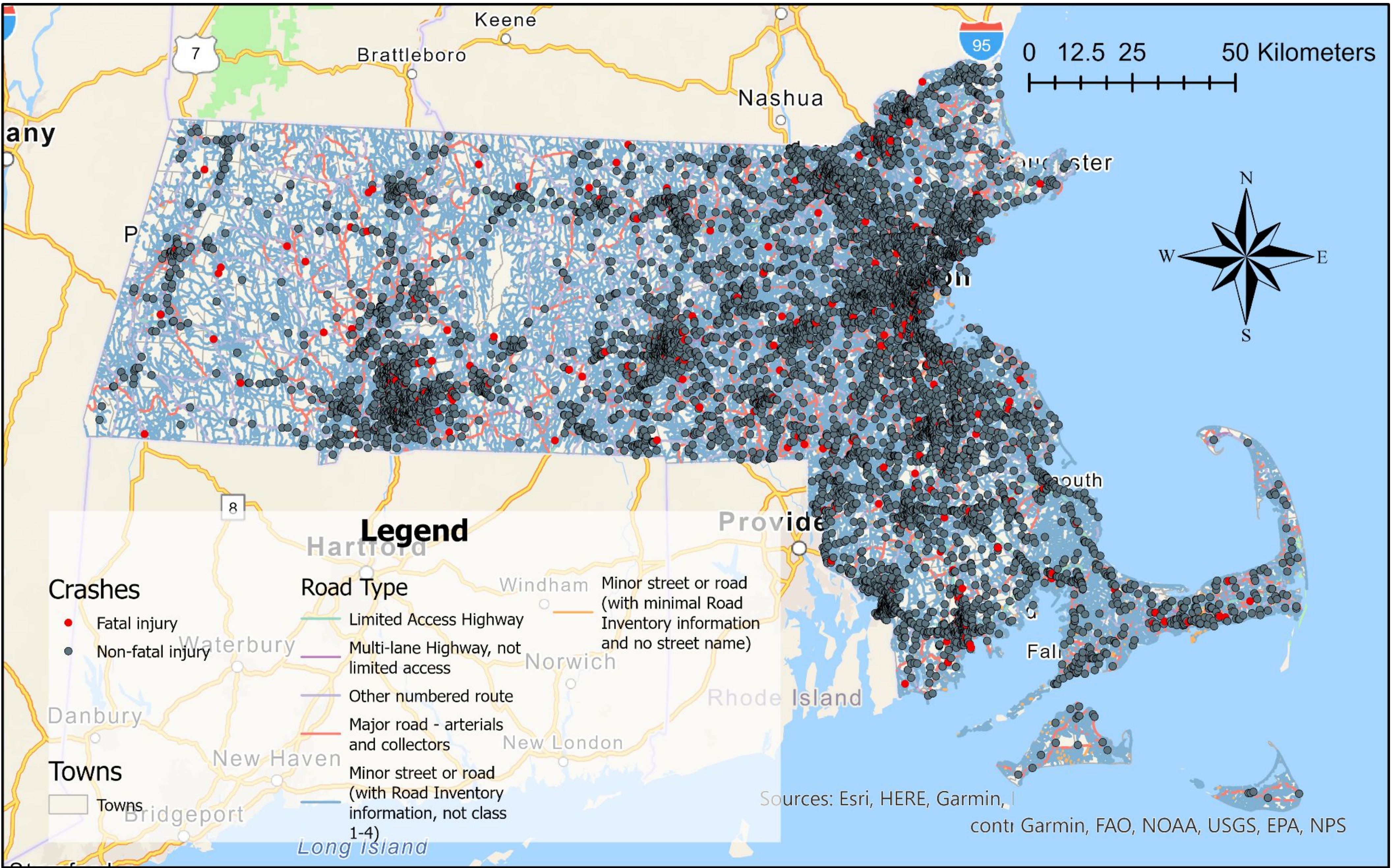
Using base map and layers from MassGIS, the data was transformed into vector points. Then a spatial join of the towns to the crash data was performed for summarizing the data. To account for population differences, the rates of fatal and non-fatal accidents to population were calculated. All variables cleaned up to only include relevant types.

### Statistical Analysis

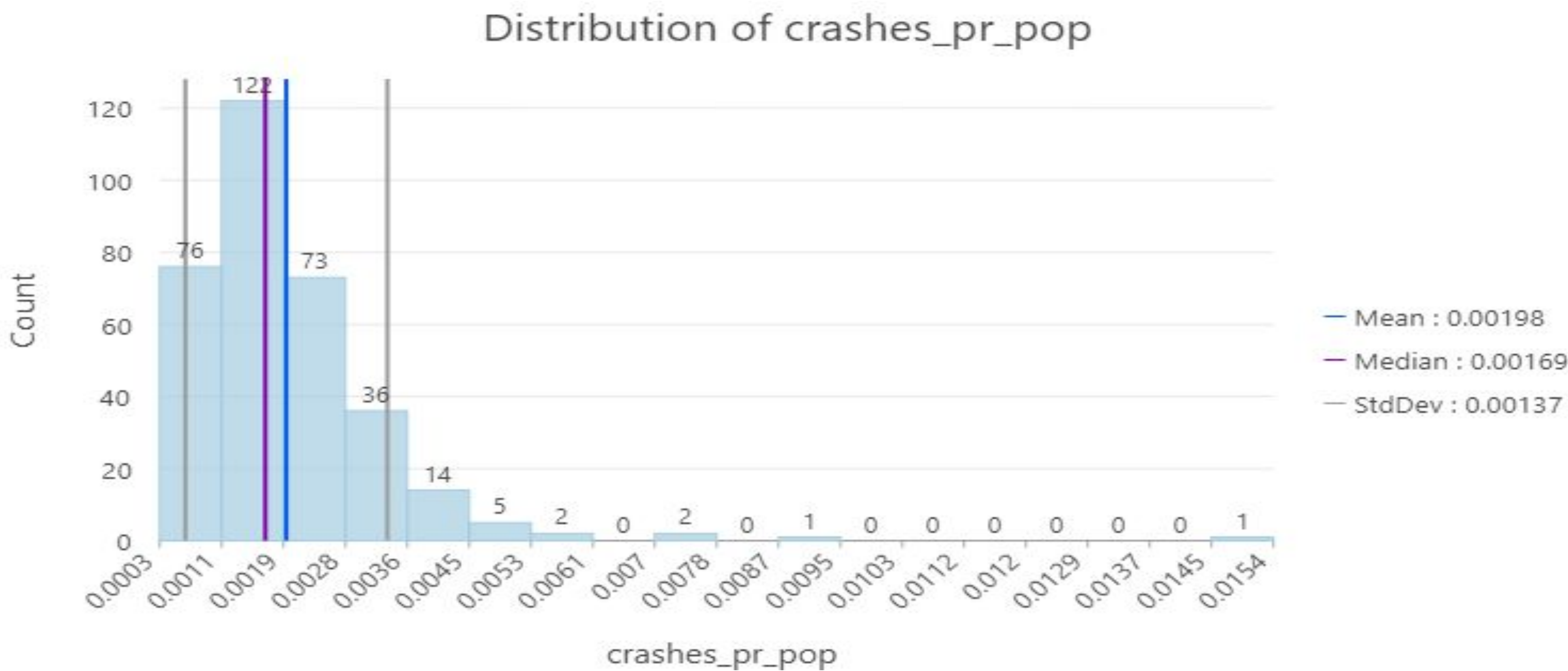
A independent samples t-test was run to determine if the difference between highway and rural road accidents were significant.

## Results

There was a significant difference between highway and rural road fatality rates. Rural had higher fatal crashes when population is accounted for. Even with non-fatal crashes, rural roads are even more clearly & sigificantly different than highways.



In this map shows the locations of the fatal and non-fatal craahes and different road types



## Table

Crash Severity	Road Type	Frequency
Fatal injury	Interstate	19
Fatal injury	Local	32
Fatal injury	Rural minor arterial or urban principal arterial	50
Fatal injury	Rural or urban principal arterial	39
Non-fatal injury	Interstate	431
Non-fatal injury	Local	905
Non-fatal injury	Rural minor arterial or urban principal arterial	2011
Non-fatal injury	Rural or urban principal arterial	724

## Conclusions

Contrary to popular belief, rural roads had a higher fatality rate for crashes involving a motorcyclist. This could be because rural roads have more blindspots, intersections, & sense of safety that highways do not have.

## Future Research

Future research could investigate further the environmental factors that make rural roads less safe. One could analyze the actions taken prior to the crash or road conditions where the crash occurred.

### References:

<https://www.iihs.org/topics/fatality-statistics/detail/motorcycles-and-atvs>  
<https://www.mass.gov/info-details/massgis-data-municipalities>

### Acknowledgements

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