

## Department of Mathematics and Statistics Colloquium

### *Data To the Rescue: JMU Partnering with Harrisonburg City Fire Department*

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**Abstract:** The Harrisonburg Fire Department is one of the city's most valuable resources, and optimizing their performance is crucial in maintaining the safety, well-being, and livelihood of the citizens of Harrisonburg.

Recently, the Fire Department has obtained \$4.9 million funding to build their fifth fire station. We, as students at James Madison University, have been working during Spring 2022 semester to help the fire department determine the optimal location for Fire Station 5 based on the department's incident and response data. We joined the incident data provided to us with population, social vulnerability, and property value data. In this talk, we present our journey with the data, along with multiple approaches to locating the fifth fire station, including Monte Carlo simulations, machine learning techniques, and geospatial analysis. We also outline the next steps where data driven analysis will improve the performance of the Fire Department. This is an ongoing partnership, with both short and long term goals. The colloquium presentation at the Department of Mathematics and Statistics is our practice talk, before our presentation at the Fire Department Head Quarters on Thursday April 28.

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**Monday, April 25<sup>th</sup> at 3:10 pm via Zoom**