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Technical Case Study

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# San José Leverages Data Science to Understand the Anatomy of Roadside Fatalities



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In 2017, a total of 37,133 people died in vehicle crashes, according to the National Highway Traffic Safety Administration. In an effort to reduce the number of fatalities and severe injuries occurring on the roadway, communities across America have begun adopting Vision Zero initiatives. Vision Zero was founded in Sweden in 1997, and aims to focus strategies and efforts to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. There are currently over 40 Vision Zero cities within the U.S.; the City of San José became a Vision Zero city in 2015.

Although the City of San José became a Vision Zero city in 2015, the Department of Transportation has always prioritized roadway safety and sought to better understand the nature of fatal crashes. In 2008, the Department of Transportation and the San José Police Department collaborated to streamline data sharing between departments in an effort to more objectively drive the decision making behind transportation safety. By collecting rich, descriptive data about every street-related crash that has occurred within its jurisdiction, the Department of Transportation is able to perform analysis and take action to make San José's streets safer for all modes.

From individual data components such as time, weather, location, and resulting injuries, the Department of Transportation is able to look at different indicators that may contribute to a collision. A quick analysis of the data collected over the past 10 years reveals that most crashes did not result in a fatal or life-threatening injury. Only 11% of crashes resulted in an injury of any kind. However, of the 11,000 streets in San José, just 37 accounted for 30% of the fatal crashes in 2017. From these stats, a question that emerges is, what makes some streets so dangerous, and how San José can reduce the severity of crashes on those streets?



Figure 1: Car crashes in 2017. Blue dots are accidents with minor or no injuries. Red dots are crashes with a life-threatening injury or fatality.

In September of 2018, the City of San José partnered with UrbanLogiq, a data analytics company, to apply data science in an effort to identify key components of risky streets. Leveraging the data collected over the past 10 years by the City, UrbanLogiq developed a machine-learning algorithm to validate the data components that contribute to the likelihood of a collision at a particular intersection. Future efforts look to fine-tune the algorithm to incorporate additional datasets such as vehicle counts and movements of street users to better inform the model. By unlocking the power of machine learning and data analytics, the Department of Transportation hopes to unlock knowledge that will help them achieve their Vision Zero commitment.

### What makes a street dangerous?

In addition to data points such as speed limits and street design, UrbanLogiq's research found that surrounding, or contextual factors, such as tall buildings, sidewalks, and intersections contribute to the nature of collisions. By plugging this data into the model, UrbanLogiq was able to more accurately predict which streets were likely to experience a collision.

### Conclusion

As the City of San José continues to partner with innovative companies like UrbanLogiq, the hope is to move the needle closer to achieving Vision Zero goals. By prioritizing the importance of data collection and standardization, the Department of Transportation is able to share rich datasets that can train machine learning algorithms on the components that contribute to a collision. This comprehensive approach to combat traffic fatalities can significantly improve the accuracy of the crash predictions, enabling the City of San José to advance its work in pursuing policies to eliminate traffic fatalities and severe injuries.

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