



Systemic Noteworthy Practice

Kansas City Vision Zero Action Plan

Introduction

Vision Zero is a plan to eliminate all serious and fatal injuries on roadways. This approach rejects the idea that these types of injuries are unavoidable and works to implement a plan of action to create a roadway network safe for all users. The systemic approach to safety is often used to inform Vision Zero planning.

Kansas City's Vision Zero Approach

In May of 2020, the City of Kansas City, Missouri passed the "Vision Zero resolution" to achieve their goal of eliminating all fatal and serious injuries by 2030, while increasing safe, healthy, equitable mobility. Kansas City decided to make this commitment because of the number of lives lost and serious injuries that were occurring on their roadways. Kansas City developed an action plan to detail the steps they would need to take to accomplish their vision and to set expectations for everyone involved.

With the help of a Vision Zero Task Force, Kansas City identified high-priority locations based on historical crashes, high-risk roadway characteristics, and input gathered through public engagement. The data analysis focused on fatal and serious injuries crashes by looking at crash summary statistics, systemic risk analysis, and crash maps. These three components provided an understanding of where the crashes are occurring, why they are occurring there, and if there are any other conditions or factors that were involved in the crash.

Integrating Systemic Analysis

When conducting data analysis on fatal crashes, one component that cannot be overlooked is systemic safety analysis. Systemic analysis identifies the features most associated with the frequency and severity of select crash types. Historically, critical locations in need of improvements were determined by examining

historic crash data and finding locations with a high number of crashes. The systemic approach is particularly well suited to overcome data limitations and address safety issues related to low frequency, high-severity crash types, especially those involving vulnerable road users. Both historic crashes and risk factors are important when determining critical locations and what countermeasures would be effective.

Data Collection and Analysis

The systemic analysis utilized a combined dataset of crash, roadway, and demographic data. The City first established "Representation Ratios"—a value that describes the overrepresentation—for different locations within the transportation network. The representation ratio is a ratio of the number of crashes to the miles of roadway associated with the characteristic of interest. A location with a high representation ratio is more likely to experience a crash than a location with a low representation ratio. The different characteristics analyzed using the systemic approach were land use, disadvantaged areas, traffic volume, roadway configuration, and intersection control.

Outcomes

Once the data were analyzed, Kansas City was able to identify conditions with a higher representation ratio. The analysis included charts such as Figure 1 that detailed the findings.

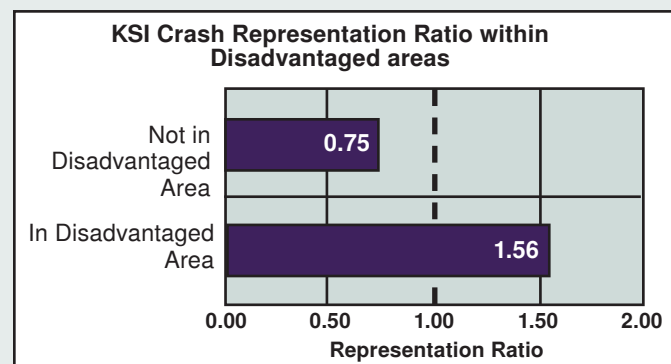


Figure 1. Overrepresentation ratio for crashes in disadvantaged areas. Source: City of Kansas City.

Disadvantaged areas were identified using the Transportation Disadvantaged Census Tracts from USDOT. Overall, crashes were twice as likely in disadvantaged areas as compared to non-disadvantaged areas. Crashes were also 1.6 times more likely to occur in disadvantaged urban areas than the baseline.

Overall, the results showed:

- Roads in urban areas had a higher risk of crashes than non-urban areas.
- Roads in disadvantaged areas had a higher risk of crashes than non-disadvantaged areas.
- The more lanes a roadway has, the higher the risk of crashes.
- Two-way undivided multilane roads had a higher risk of crashes than their divided counterparts.
- In general, the higher the speed limit is on a roadway, the higher the risk of crash.
- The more vehicles that travel on a roadway, the higher the risk of crashes.
- The lower the volume-to-capacity ratio of a roadway, the higher the risk of crashes.
- Signalized intersections had a higher risk of crashes than stop-controlled and roundabout intersections.

Systemic analysis identified variables that can be applied to all intersections and roadways to assess the risk of crash, which supplements use of historical crash-based measures in identifying priority locations. Using these variables, Kansas City determined which roadways and intersections have the highest risk and which characteristics are contributing to the risk at each location. This will allow Kansas City to allocate funding to high need areas and have a better understanding of what countermeasures will be the most beneficial. Not only can this analysis be used for safety, but it can also increase equity by defining areas that are disproportionately affected by fatal and serious injuries and provide funding to improve the safety and treatment of those areas.

References

(n.d) *What is Vision Zero?* Vision Zero Network. <https://visionzeronetWORK.org/about/what-is-vision-zero/>

WSP. (2022, August). *Kansas City Vision Zero Action Plan*. Kansas City Missouri. <https://www.kcmo.gov/home/showdocument?id=9018>.

Implementation

Kansas City used a quick build approach to implement several systemic safety projects, including neighborhood level traffic calming, leading pedestrian intervals, and protected bike lanes. Figure 2 is an example quick-build application. The City also used more traditional delivery approaches for larger projects.

Summary

Kansas City's Vision Zero Action Plan identified high-priority locations for potential safety improvements based on systemic safety analysis, public engagement, and input from input from the Vision Zero Task Force. Kansas City used crash data to establish a high-injury network (HIN) and high-priority intersections. Kansas City also performed a systemic safety analysis, using overrepresentation to identify high-risk features used to identify high-priority locations for improvements. Results of the data analysis showed disadvantaged communities are disproportionately affected by fatal and serious injury crashes, presenting the opportunity for the city to advance towards safer, more equitable transportation outcomes for all road users. Kansas City plans to use the results of these analysis to implement safety countermeasures at high-priority locations, evaluating their effectiveness to refine their program with the goal of eliminating fatal and serious injuries on all roadways for all users.

Contact

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Figure 2. Example traffic calming improvements as part of the Vision Zero program. Source: Kansas City Vision Zero Plan; Street Smarts Design & Build.