

PREDICTIVE SAFETY ANALYSIS BRIEFING



Description

Between 2015 and 2019, there were over 59,000 crashes in Montgomery County, resulting in over 1,200 severe injuries and nearly 150 fatalities. As part of Montgomery County’s Vision Zero goal to eliminate traffic deaths and severe injuries by 2030, Montgomery Planning is using a new strategy to improve road safety for drivers, bicyclists and pedestrians called the Predictive Safety Analysis. This proactive data-driven approach works to prevent severe and fatal crashes before they happen. This briefing will summarize the key findings and applications of the Predictive Safety Analysis.

STUDY INFORMATION

Study Name

Predictive Safety Analysis

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PREDICTIVE SAFETY ANALYSIS

Between 2015 and 2019, there were over 59,000 crashes in Montgomery County, resulting in over 1,200 severe injuries and nearly 150 fatalities. There is an element of randomness to where individual severe injury and fatal crashes occur, but there is much less randomness to the types of streets and intersections where these crashes occur. As part of Montgomery County's Vision Zero goal to eliminate traffic deaths and severe injuries by 2030, Montgomery Planning is using a new strategy to improve road safety for drivers, bicyclists and pedestrians called the Predictive Safety Analysis. This proactive data-driven approach works to prevent severe and fatal crashes before they happen.

The Predictive Safety Analysis estimates the expected number of crashes at a given roadway segment or intersection through Safety Performance Functions (SPFs). SPFs are equations (or models) that predict the number of crashes on roadway segments and at intersections based on exposure (the amount of walking, bicycling and driving), roadway characteristics, and other variables. This analysis then allows the county to prioritize where and how to most effectively invest in safety improvements through capital projects, development approvals, and master planning.

KEY FINDINGS

Through this analysis, a few key findings emerged:

- **Prioritization needs to look beyond crash history.** In the past, Montgomery County has sometimes taken a reactionary approach to transportation safety, implementing site-specific improvements in the aftermath of a fatal crash. The results of this analysis show that prioritizing safety treatments based solely on locations with a history of severe injury and fatal crashes could result in unaddressed crash risk. From 2015 to 2019, only 55% of fatalities and 46% of severe injuries occurred in top 200 locations identified in the Predictive Safety Analysis.
- **As a suburban county, much of Montgomery County's crash risk is in the suburbs.** The county's suburban areas and the high-speed, high-volume suburban Boulevards that run through them have the highest concentration of crash risk in the county for most crash types. To reach Vision Zero, safety improvements must address these locations.
- **Yet Downtowns and Town Centers have the highest average crash risk.** On a per-intersection or per-roadway segment basis, crash risk is highest in the county's urban areas, particularly for pedestrian and bicycle crash types. Systemic improvements on Downtown Boulevards (for example, Georgia Avenue in Downtown Silver Spring) and Town Center Boulevards (for example, Veirs Mill Road in the vicinity of the Randolph Road intersection) – and more broadly in Downtown and Town Center areas – would yield the greatest benefits per location improved.
- **Safety improvements in Equity Emphasis Areas (EEAs) should be prioritized.** Across all metrics, crash risk is disproportionately concentrated in EEAs. More than half of the top 200 locations for pedestrian crash types are located within EEAs, and the average crash risk in EEAs far exceeds that for non-EEAs for five of the six crash types. This disparity is greatest for

the pedestrian crash types, where EEAs have over 200% higher average crash risk than non-EEAs. Focusing investments in EEAs can mitigate this disparity and balance crash risk in the county.

A map showing the locations of the top 50 and 200 highest risk locations for six crash types is located [here](#).¹

Based on these findings, the project provides a countermeasure evaluation tool for planners, engineers, and decisionmakers to assess different investment scenarios based on their goals and priorities. The tool can be used to determine which countermeasures to implement and how many locations to improve, and it evaluates the effectiveness of different countermeasures in several ways: potential crash reduction, potential crash reduction per location, cost per crash reduced, and percent of locations in Equity Emphasis Areas. This report does not provide a prescriptive recommendation of capital improvements to address the areas and street types with high crash risk; it does not recommend which safety treatments should be implemented at which locations.

Each countermeasure is associated with a ranked list of locations for systemic implementation.

APPLICATIONS

The Predictive Safety Analysis is the first step towards implementing a proactive approach to safety. It is now incumbent upon planners, engineers, and decisionmakers to apply the findings of this analysis. There are several uses of the results of the Predictive Safety Analysis:

- **Apply Data-Driven Planning:** The Predictive Safety Analysis provides the data, analysis, and tools to shift the county’s approach and implement improvements where they are needed and more equitably. These data can combat the “squeaky wheel” by distributing resources equitably and to where they are most needed. In addition, the data can support funding requests, both as part of the local or state budgeting process as well as through grant applications.
- **Identify Locations with High Crash Risk:** The results can be used to identify location types that are likely to experience a high number of crashes. These data can be used to inform Capital Improvement Program (CIP) project prioritization, prioritization of off-site mitigation for new developments, a focus for transportation improvements within master planning areas, and Mandatory Referral comments.
- **Prioritize Safety Improvements:** The tools allow implementing agencies to prioritize where to implement systemic safety treatments as well as to assess which safety treatments may be the most effective at reducing crashes. This information can make the case for additional funding for CIP level-of-effort programs, inform master plan recommendations, and support updates to the Growth and Infrastructure Policy.

¹ <https://mcplanning.maps.arcgis.com/apps/instant/basic/index.html?appid=e098e5d417744973aee13cf3c97fa3b1>

- **Determine Locations with Similar Conditions:** The databases developed include hundreds of variables related to the transportation, land use, and demographic context in which the crash occurred. In the wake of future severe or fatal crashes, these data can help identify other “like” locations to the crash and inform a more systemic response to the incident.

The Planning Department, Montgomery County Department of Transportation, and the County Council can use this information in a variety of ways to inform future recommendations, priority projects, and funding allocations. Taking a more proactive, data-driven approach to transportation safety impacts all facets of the transportation planning process.

RELATIONSHIP TO VISION ZERO WORK PLAN

The Predictive Safety Analysis ties directly and in multiple ways to the Planning Department’s Vision Zero Work Plan. The below list identifies each of the tasks included in the Work Plan. Those that are underlined have been completed through the Predictive Safety Analysis. Those that are *italicized* can be addressed or updated with the findings of the Predictive Safety Analysis. Tasks that have not been started are noted with an asterisk (*).

Building Knowledge and Partnerships

- *Develop Resources for Community Organizations*
- Engaging Hard-to-Reach Communities
- *Educate Community, Agency Staff, & Decisionmakers*
- Vision Zero E-Newsletter

Problem Verification

- Develop a Severe and Fatal Crash Dataset
- Develop a Multimodal Volumes Data Collection Plan
- Collect Multimodal Counts and Traffic Speed Data
- Estimate Volumes Countywide
- Create a Dataset to Store Counts and Speed Data
- GIS Layers of Variables Associated with Crashes
- Develop Safety Performance Functions
- Create a Pedestrian Level of Comfort Map

Develop Solutions

- Identify Best Practices for VZ in the Suburbs*
- Develop Policies for Street Types*
- Develop Complete Streets Design Guide

Incorporate Solutions into Work Program

- *Educate Staff on Vision Zero*
- Continuing Education

- Incorporate Corridor Master Plans into Work Program*
- *Changes to State and Local Policies & Regulations*
- Develop Pedestrian Master Plan
- *Incorporate Vision Zero into Master Plans*
- *Incorporate Vision Zero into Development Review*
- *Incorporate Vision Zero into the GIP*
- *Capital Project Review*

ATTACHMENTS

Attachment A. Predictive Safety Analysis Final Report

Attachment B. Planning Department's Vision Zero Work Plan