The traditional transportation safety management approach involves the identification of crash hotspots, in which public agencies prioritize locations eligible for safety improvements based on historical collision concentrations. This project presents an enhanced approach that consists of targeting systemic improvements at high-risk sites across a road network based on specific roadway features that are associated with a particular crash type.

Using such a matrix provides agencies with a snapshot of systemic problems within their networks, which is both easy to assemble and to interpret, thus overcoming potential barriers to changes in road safety management due to limited institutional capacity or financial means. The framework is flexible enough to allow agencies different safety priorities and with varying degrees of data availability to implement it. The report includes background principles, detailed guidance on data management, analysis, and interpretation, and a case study using California crash data.

For this study, researchers developed a method for agencies to conduct a systemic safety analysis that takes the form of a transparent systemic crash matrix and shows what types of crashes occur on what types of facilities, with rows representing crash characteristics and columns corresponding to facility types.

Example systemic pedestrian matrix illustrating what types of crashes are happening on what type of facilities, using California data.

Continuum of reactive to proactive approaches to injury prevention.