Integration Safety Assessment and Web-Based Visual Analytics

Xiao Qin
Department of Civil and Environmental Engineering
University of Wisconsin, Madison
B239 Engineering Hall
1415 Engineering Drive
Madison, WI 53706-1691
xqin@engr.wisc.edu

Shuguang Hao
Department of Civil and Environmental Engineering
University of Wisconsin, Madison
4161 Mechanical Engineering Building
1513 University Ave.
Madison, WI 53706-1691
hao2@wisc.edu

ABSTRACT

The keys to a successful safety program are to identify the locations exhibiting an abnormally high number of crashes with integrated information of highway safety and to disseminate the results to safety stakeholders. This paper reports the development and user interface of a web-based application for highway crash analysis and safety decision support.

Using web 2.0 technologies, this state-of-the-art application not only provides a comprehensive collection of query functionalities, which can help the users search for crashes using a variety of crash attributes, but also enables users to explore interactively between crashes and roadway network in the spatial context. The query results can be summarized online by injury severity. In addition, to aid the local agencies and practitioners to efficiently locate hazardous intersections in relation to other highway attributes, different layers of information available in Wisconsin Information Systems for Local Roads (WISLR) can be presented simultaneously with the crash information. The synthesis of crash information and highway inventory as well as traffic condition empowers the users to review crashes and recognize crash patterns from various perspectives. This application is developed based on the framework of ArcGIS Server, one of the most sophisticated geoprocessing platforms; yet, it is also very user-friendly to GIS application novices. The application through a combination of safety assessment with visual analysis is accessible through the Internet, thus providing maximum accessibility to a wide range of safety stakeholders.

Key words: safety program—web-based—WISLR