DRISI
Caltrans Division of Research, Innovation and System Information

Research Results

Evaluate adding bicycle infrastructure data to TASAS

A relational database was developed to store information on bicycle infrastructure and volume. This database is designed to be linkable to the existing Caltrans Traffic Accident Surveillance and Analysis System (TASAS) - Transportation System Network (TSN) database.

Transportation Safety and Mobility

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Project Title:
Evaluate adding bicycle infrastructure data to TASAS

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WHAT IS THE NEED?

Caltrans currently maintains such data for motor vehicles in the Traffic Accident Surveillance and Analysis System - Transportation System Network (TASAS-TSN) database, the agency does not keep records on bicycle facilities. This information is crucial for improving the safety of these vulnerable road users.

WHAT WAS OUR GOAL?

Design a flexible database to store bicycle infrastructure and volume data to be queried in safety analyses, for network deficiencies, and any other uses. Also, to determine an efficient method of collecting data that can be scaled for use across the entire state highway system; then to pilot test the data collection process and ensure that all data can be feasibly collected and stored within the database framework, and then to estimate the total time-cost of collecting this data across the entire state highway system.

WHAT DID WE DO?

After reviewing the existing bicycle inventory, safety studies and relative manuals, a list of items to be collected along the State Highway System was generated. Next the research team proposed to develop an “add-on” database, parallel to TASAS with key links to connect the two together. Bicycle infrastructure and volume data will be stored in two separate databases with the same key fields to connect to each other and to the TASAS database.

The database and measuring methods were tested in a pilot data collection effort. In the pilot, 50 miles of state highways were selected for computer-based data collection, of which approximately one tenth were also used for field data collection. The computer and field data collection procedures are developed and documented in the data collection manual and tutorial to guide data collection work in the future. The databases were developed in Microsoft Excel spreadsheet format to store the bicycle infrastructure data and to import volume data from files produced by Miovision.

WHAT WAS THE OUTCOME?

- Results indicate that the computer time cost will be approximately 4,500 working hours, which is no more than 40% of the time cost estimated for field data collection.
- The database developed in this project offers flexibility in its ability to connect to TASAS, is easy to update and maintain, and allows new records and measurements to be added without any changes to TASAS. The procedure for data collection defined in this report will be useful for future implementation of the data collection plan. Caltrans will decide whether the bicycle infrastructure and volume database is going to be merged into TSN or developed as a separate database with links to TSN.
- The measurements suggested for inclusion in the database adequately cover bicycle related facilities to help Caltrans track facility coverage. In addition, these measurements are useful for bicycle safety analysis and can offer critical information for safety investigations and countermeasure selection.
- The time estimates for collecting bicycle infrastructure and volume data indicate that the computer data collection is more durable than the field data collection. Use of Google Maps is much less costly (more than 40% less) in terms of time than performing field data collection, even without considering site access time. Although field data collection offers the advantage of data collectors being able to see every corner of a street, the accuracy of the measurements based on computer data collection appears to be fairly high.

WHAT IS THE BENEFIT?

New bicycle data fields can form the foundation of a database including bicycle crash, bicycle exposure, and detailed bicycle infrastructure information. Combining these three main types of data makes it possible to track bicycle crash risk over time, analyze roadway features associated with bicycle crash risk, develop bicycle crash modification factors, and conduct other useful analyses. This rich set of information will help Caltrans select the most effective engineering, education, and enforcement treatments to reduce bicycle injuries on the State Highway System and other roadways in California.

IMAGES

FIGURE 1: Measurements for Outside Vehicle Lanes

FIGURE 2: Bikeway Type