Transportation
Safety and Mobility

Evaluate Bicycle Performance Measures for suitability in California

Evaluated the level of effort required for data collection two widely used performance measures, Highway Capacity Manual bicycle level of service (BLOS) and level of traffic stress (LTS). Also, perform a pilot study to perform a proof of concept for a customized California-specific performance measure.

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Project Title:
Evaluate Bicycle Performance Measures for suitability in California

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WHAT IS THE NEED?

The California SHS contains more than 10,000 miles of roadway that are accessible to bicycles. This huge network necessitates adoption of a performance measure that is feasible to apply at such a scale, while also capturing the meaningful variation among facilities. Ninety percent of the bicycle-accessible network is rural highways, mostly 2-lane roads, while most existing performance measures were developed on urban roads.

WHAT WAS OUR GOAL?

The purpose of this research is to recommend the best methodology to use in California as a quantitative measurement for how well the roads support bicycling.

WHAT DID WE DO?

- Identified two widely used performance measures, Highway Capacity Manual bicycle level of service (BLOS) and level of traffic stress (LTS), for evaluation. BLOS is an empirically derived measure with intense data requirements, while LTS is based on expert opinion, but is more simple to apply and intuitive to interpret. First, we evaluated the level of effort required for data collection.
- Performed a pilot study to perform a proof of concept for a customized California-specific performance measure, incorporating the superior elements of established measures, accounting for the variety of features present on California roads, and taking advantage of existing data sources. We

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Research Results

used a latent class choice model based on a bicyclist user experience survey to show the different facility preferences for different types of riders.
• Compared BLOS, LTS, and user survey ratings of 38 road segments.

WHAT WAS THE OUTCOME?

• Time cost estimates for the application of the measures, 4,300 hours for BLOS and 4,400 hours for LTS, but the BLOS estimates represent the time required assuming the availability of motorized traffic flow and running speed from a traffic study, which was outside the scope of this study.
• Comparison of BLOS, LTS, and user survey ratings of 38 road segments yielded the inability of existing performance to capture impact of newer bicycle facility designs, such as protected bicycle lanes with physical barriers. BLOS was weakly correlated with the survey ratings ($\rho=0.29$), while LTS had a moderate correlation ($\rho=0.60$).
• A pilot latent class choice model demonstrated the feasibility of applying this methodology to bicyclist performance measures.
  • Due to the limited validity of using existing performance measures for the California state highway system, we recommend further development of a California-specific performance measure. In the interim, LTS presents a better performing and likely lower cost option than BLOS

WHAT IS THE BENEFIT?

Caltrans wants to increase bicycle safety by identifying quantifiable performance measures that relates to how "shareable" or "bicycle friendly" roads are. This will increase ridership and help with planning future routes.

IMAGES

Screen capture from the video of a two-lane road near a regional park in Berkeley, CA