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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Identify Quantified Safety and Traffic Calming Benefits of Trees

Quantifiable safety and traffic-calming benefits of trees and landscaping in the Traffic Calming Guide and the Safety Performance Estimation Tool

Design/ Construction

MAY 2026

Project Title: Identify Quantified Safety and Traffic Calming Benefits of Trees

Task Number: 4570

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Task Manager:
Akber Ali
Transportation Engineer (Civil)
Akber.Ali@dot.ca.gov

DRISI Division Chief:
Prakash Sah, PE
Prakash.Sah@dot.ca.gov

WHAT IS THE NEED?

The California Department of Transportation (Caltrans) is seeking information on quantifiable safety and traffic calming benefits associated with trees in the roadside. Caltrans currently uses the Traffic Calming Guide and the Safety Performance Estimation Tool to evaluate the appropriateness of safety and traffic calming measures for inclusion in projects, which rely on quantifiable benefits, measured either in reduction in fatal and serious injuries, or reduction in speed, to evaluate the relative effectiveness of various countermeasures. The Traffic Calming Guide includes trees and landscape as a potential measure, but data is unavailable to provide a comparable quantifiable benefit. Trees are not included as a measure in the Safety Performance Estimation Tool. This investigation supports the development of quantifiable traffic calming and safety benefits in a format comparable to the metrics used in each of these tools. The primary objective is to gather data to support the inclusion of quantifiable safety and traffic calming benefits of trees and landscape in the Traffic Calming Guide and Safety Performance Estimation Tool, and other manuals, policies, and guidance documents.

Existing evidence and conventional wisdom support the proposition that landscaped and treelined streets can provide safety benefits. However, legitimate safety concerns exist regarding trees along a roadway acting as fixed objects and potentially contributing to negative crash outcomes. In understanding potential risks or benefits of tree-lined roadways, key differences in context must be considered. The type of roadway (i.e. functional classification as a freeway or expressway versus a conventional highway), the posted speed limit (Caltrans distinguishes “low speed” environments with

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posted speed limits of less than 45 miles per hour, and "high speed" environments above that speed), adjacent place type (rural, urban, suburban), and the presence of roadside features such as guardrail, barrier, curb and gutter, and/or sidewalk, and type of landscape should be considered.

WHAT ARE WE DOING?

The success of this effort requires the expertise and involvement of Caltrans Headquarter staff, with District Subject Matter Experts (SME) consultation. The primary objective is gathering data on quantifiable safety and traffic calming benefits of trees and landscape in the Traffic Calming Guide and Safety Performance Estimation Tool, and other manuals and guidance documents. District staff, as primary users, will be impacted and consultation and training is imperative to implementation of this research.

WHAT IS OUR GOAL?

The research will culminate in implementation-ready guidance, updated evaluation tools, and demonstrated field applications that support both Vision Zero safety goals and California's climate adaptation strategies. The outcome of this research will provide Caltrans with concrete, quantifiable data to update its Traffic Calming Guide, Safety Performance Estimation Tool, and other relevant manuals, policies, and guidance documents. This will enhance Caltrans' ability to make evidence-based decisions that align with its climate goals by promoting nature-based solutions.

WHAT IS THE BENEFIT?

Nature-based solutions (NBS) harness the power of nature to build California's resilience to future climate-driven extremes, support communities in the climate crisis, and remove carbon from our atmosphere. California State leaders recognize that expanding NBS is essential to meeting California's core climate goals. Trees and vegetation are a multi-benefit NBS, which include providing reduced urban heat island effect, improved air and water quality, wildlife habitat, sequestration of carbon, and reduction of human stress and anxiety. Recognition of these benefits counters existing Caltrans policies that identify trees as a discretionary fixed object. This research would assist Caltrans in meeting and accelerating priorities outlined in California's Climate Adaptation Strategy, while assisting in identifying the safety benefits of well-placed and well-spaced trees in the highway system.

WHAT IS THE PROGRESS TO DATE?

The contract package has been submitted to Caltrans Division of Procurement and Contracts (DPAC) for review and is currently awaiting contract execution.