Development of Operations Planning Toolbox (OPT) Software

The objective of this research is to produce a practical tool with a simple interface that can accept multiple data sources.

WHAT IS THE NEED?

This project will support the development of the Operations Planning Toolbox (OPT), a user-friendly, well-documented, open-source, multi-modal transportation modeling software for quick quantitative assessment of operational scenarios. It will be provided as a desktop application for Windows, Mac, and Linux, developed and supported by the University California (UC) Berkeley’s Partners for Advanced Transportation Technology (PATH) program.

This new software, a macroscopic/mesoscopic simulator, will support the fast execution of the analysis of freeway and corridor operations as well as highways and multi-lane road analysis. The OPT will be simple to learn and use, and serve to replace the legacy simulation application FREQ12, also developed by UC Berkeley.

Popular for its simplicity and efficiency, FREQ12 is a legacy simulation application that transportation professionals use both in the United States and internationally to model traffic operations in freeway systems. However, FREQ12 is no longer under development or supported, and is not able to simulate advanced system management strategies.

WHAT ARE WE DOING?

The OPT will be free of charge. It is designed within the Transportation Open Environment for Data and Simulation (TOEDS) paradigm that enables easy sharing and exchange of
input and simulation data between transportation practitioners. TOEDS ensures that OPT is fully extensible and scalable.

Deliverables for this project will include:
1. OPT 1.0 (describing its capabilities);
2. An openly available user guide;
3. Instructional videos; and
4. A hands-on demonstration of OPT 1.0 at an open webinar.

Details are as follows:
1. OPT 1.0 will have a clean, accessible, and self-explanatory user interface.
2. OPT 1.0 will provide an easy and efficient way of building and modifying road networks.
3. OPT 1.0 will provide calibration capability for easy and efficient tuning of simulation parameters (e.g. freeway capacities) according to established criteria.
4. OPT 1.0 will be based on TOEDS – an open and extensible environment for processing heterogeneous traffic data and building hybrid transportation simulation models. TOEDS will include procedures for dealing with gaps and inaccuracies in data sources.
5. The user group will include Traffic Operations engineers and Transportation Planners from the California Department of Transportation (Caltrans), engineers and/or planners from Caltrans’s partner agencies, transportation researchers from UC Berkeley and practitioners from the consultant - System Metrics Group.

WHAT IS OUR GOAL?

This is a study to improve operational analysis tools. The goal is to produce a practical tool with a simple interface that can accept multiple data sources.

WHAT IS THE BENEFIT?

OPT 1.0 will be a revolutionary new product, developed with input from the transportation community, leveraging UC Berkeley’s previous work effort with Caltrans and taking emerging transportation technologies into account. It will be a fully open source, allowing for community support and upgrades, and UC Berkeley PATH has made a strong commitment to work with public agency users to ensure overall support.

WHAT IS THE PROGRESS TO DATE?

The researchers:
• Created project website: https://opt.ucbtrans.org/
• Released first module of test software for download on August 19, 2019
• Conducted first hands-on webinar on August 21, 2019