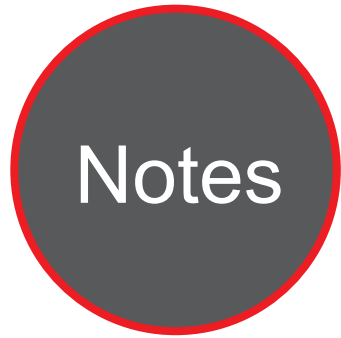




Caltrans Division of Research,
Innovation and System Information

Research



Notes

Planning, Policy,
and
Programming

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Project Title:
Traffic Analysis and Simulation, TPF-5
(176)

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Traffic Analysis and Simulation, TPF-5 (176)

A forum for public agencies to identify and address the key issues and challenges in traffic analysis and simulation studies.

WHAT IS THE NEED?

As congestion grows on our nation's roadways, increasing pressure is put on transportation professionals to find more innovative and efficient transportation solutions. Transportation professionals use traffic analysis tools to find the best transportation solutions.

However, as the transportation solutions become more sophisticated and complex, so do the traffic analysis tools. As a result, many public agencies are facing new and difficult issues regarding the usage of traffic analysis and simulation tools for transportation decision-making.

Rather than having each agency address these challenges and issues separately, they could tackle these issues in a collective and comprehensive manner through a Pooled Fund Study (PFS) process.

The Traffic Analysis and Simulation (TAS) PFS is intended to serve as a forum and provide an opportunity for the participants to identify, address, and collectively take on the key issues and challenges that are common among public agencies in conducting, managing, and/or approving traffic analysis and simulation studies. It will address key technical and programmatic traffic analysis issues through the investigation and development of best practices, lessons learned, and recommended guidelines or methodologies.

Furthermore, the TAS PFS will provide an opportunity to facilitate the interaction, sharing of information, and exchange of knowledge with a broader audience to advance and improve



DRISI provides solutions and
knowledge that improves
California's transportation system

upon the current state-of-the-practice related to the usage, management, and/or approval of traffic analysis and simulation tools.

WHAT ARE WE DOING?

The exact nature and scope of the studies will be determined through consensus of the participating agencies. However, several study themes are possible, as identified below.

Innovative and Unique Traffic Analysis Applications

Investigate innovative or unique applications of traffic analysis tools to analyze today's complex transportation solutions.

Studies could develop and report on methodologies, best practices, lessons learned, and guidance for using traffic analysis and simulation to evaluate the following innovative or unique applications:

- High Occupancy Toll lane projects
- Intelligent Transportation System strategies
- Integrated and multi-modal corridor projects
- Adverse weather conditions
- Work zone projects
- System-wide impacts of roundabout projects
- Use of simulation in support of a Safety Assessment

Application of Traffic Analysis

Many agencies are addressing new issues regarding the usage of traffic analysis and simulation in the project review and approval process.

While the Federal Highway Association (FHWA) Traffic Analysis Toolbox (<http://www.ops.fhwa.dot.gov/trafficanalysis/tools/toolbox.htm>) gives broad guidance on the selection of tools and application of traffic analysis tools, participating agencies may benefit from surveying the practices of peer public agencies and developing best practices at a more detailed level on areas, such as:

- Developing and defining the scope of work for a traffic analysis using simulation.
- Determining logical traffic analysis network termini points.
- Collecting data to support traffic analysis.
- Calibrating issues and approaches for traffic analysis.
- Compiling summary statistics and usage of multiple runs for traffic simulation analysis.
- Using performance measures from traffic analysis output to support agency's decision-making.
- Reviewing traffic analysis and simulation; and quality assurance from agency reviewer's standpoint.
- Using traffic simulation animation and output to support decision-making.
- Identifying implications of using select Measures of Effectiveness when conducting an analysis of a specific operations deficiency.

Fundamental Issues in Traffic Analysis and Simulation

There are fundamental issues that often do not have a straight-forward answer or approach when using traffic analysis and simulation tools. These issues often arise in even the most basic project analysis. Studies could develop and report on methodologies, best practices, lessons learned, and guidance for dealing with these fundamental issues:

- Using data from regional planning models and/or preparing data for use in a microsimulation/traffic analysis.
- Signal coordination issues in traffic analysis and simulation.
- Impacts of unusual or substandard geometrics (e.g., tight turning radii, short acceleration/deceleration lanes, narrow lanes) on traffic simulation analysis.
- Identifying bottleneck points in congested networks using traffic simulation.
- Quantifying performance measures in congested networks using traffic analysis.
- Networks realizing saturated conditions for extended periods of time.

WHAT IS OUR GOAL?

The goal of this study is to improve the state-of-the-practice in traffic analysis and simulation, so public agencies can make the best possible transportation investment decisions based on high-quality traffic analyses.

The objectives of this study are to assemble regional, State, and local agencies, and FHWA to:

1. Identify challenges and issues common among those responsible for conducting, managing, and/or approving traffic analysis and simulation studies;
2. Suggest approaches to addressing identified issues;
3. Initiate and monitor projects intended to address identified challenges and issues;
4. Provide guidance and recommendations and disseminate results;
5. Provide leadership and coordinate with other agencies, groups, or forums interested in traffic analysis and simulation; and
6. Promote and facilitate technology transfer related to traffic analysis and simulation issues nationally.

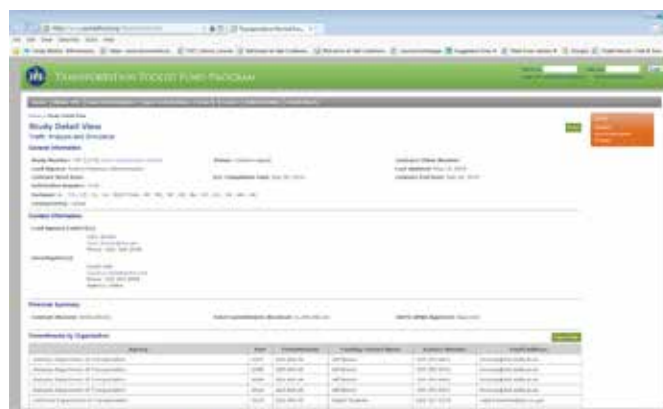
WHAT IS THE BENEFIT?

- Provide a singular reference point for simulation guidance to promote consistent and defensible analysis outputs.
- Facilitate technology transfer related to traffic analysis and simulation issues nationally and in California Department of Transportation.
- Provide guidance and resources for Transportation agencies to oversee and review its application.

WHAT IS THE PROGRESS TO DATE?

The research team completed Literature Synthesis and Site and Data Collection Mechanism Selection in November 2018. They are conducting the remaining tasks such as Data Collection and Processing, Modeling in Microsimulation, and Preparation of Final Report and Documentation.

IMAGE



Picture 1: Transportation Pooled Fund Program website
<https://www.pooledfund.org/Details/Study/403>