Project Name: Tools for Operational Planning (TOPL)

OCIO Project #:
Department: Transportation
Revision Date: 9/20/10

Concept Statement

Description

Brief description of the proposed project:

Tools for Operational Planning (TOPL) Project seeks to provide quick quantitative assessment of congestion relief strategies for freeways and urban arterials. Strategies include:
• demand management - focuses on reducing "excess demand";
• incident management - targets resources to alleviate accident hot spots;
• traveler information - seeks to reduce traveler buffer time; and
• traffic control - implements aggressive ramp metering or additional management strategies at locations where maximum reductions in congestion are likely to occur once the strategies are implemented.
An existing TOPL application has been developed through a research study by the U.C. Berkeley California Partners for Advanced Transit and Highways (PATH). Over the past three and one-half years, the TOPL project has produced a suite of tools for the specification and performance assessment of freeway operational improvements.

Need Statement

High Level Functional Requirements:

"TOPL" is proposed as a companion to the PeMS which will simply and comprehensively perform the macro-meso-micro model function.

TOPL will employ an inherent demand table. TOPL will be able to infer impedances. TOPL will predict, based upon facility characteristic and imposed demand, the resulting service quality MOEs. TOPL will be adaptable to different scenarios requiring trivial coding, i.e. editing lane configurations. Coding triviality, to wit operationally expedient accounting for geometric design configuration, that is no grades, no sight distance, etc., is similar to Trafficware Synchro/Sim Traffic.

All responsible sources stress the importance of land use in generating travel demand. The TOPL view on land use, in theory, could infer land use using trip generation rationality from 5 minute linkflows, limited by aggregation.

What is Driving This Need?

Freeway performance measuring and monitoring has long been a line task of the state department of transportation. Analytical tools, which are subject more to politics than actual data and scenario, demand a rational alternative beyond “performance measurement.”

Therefore TOPL was initiated -- a tool that can be used to quickly forecast the impact of congestion relief strategies. TOPL is intended to serve as a tool for testing the impact of potential improvement projects and strategies during the project planning phase of the project development process. TOPL is also intended to serve as a tool for testing the impact of congestion relief strategies in real-time at individual TMCs. This would assist in the real time management of the transportation system.

Currently scenario testing during the planning phase is conducted using micro-simulation models such as Paramics. Paramics modeling is very time consuming and very costly. TOPL is far less expensive and is estimated to take one third to one quarter of the time necessary to create and run vs. a comparable Paramics model. Modeling is a routine step used for traffic analysis during development of capital improvement projects.

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Risk to the Organization if This Work is Not Done:
The Department of Transportation is charged under Streets & Highways Code Section 90, inter alia, with stewardship of the State Highway System (SHS). In addition, failure to implement TOPL modeling will: 1) fail to benefit from emergency management system opportunities resulting from performance management; 2) fail to benefit from the improved performance resulting from improved emergency management; 3) move California behind other jurisdictions who manage emergencies better than they measure performance; and 4) fail to leverage performance measurement apparatus against dispersed land use entitlement authority. This is not negligence now, but not implementing TOPL after 5 years may constitute failure to exercise reasonable care.

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Benefit Statement

Intangible Benefits

Process Improvements (describe the nature of the process improvement):

1. Construction and operational improvements are expensive. TOPL will test projects and strategies for effectiveness removing congestion in real time.
2. Fast analysis applies to any case when events occur that require a rerouting of traffic.
3. Caltrans freeway performance measurement builds a formidable code and demand base of information from which TOPL will be sole beneficiary. This will allow a "meso" model to be built.
4. It will allow the potential of the PeMS Data Warehouse.

Other Intangible Benefits:

To Be Determined in the Feasibility Study.

Tangible Benefits

Revenue Generation (describe how revenue will be generated):

To Be Determined in the Feasibility Study.

Cost Savings (describe how cost will be reduced):

To Be Determined in the Feasibility Study.

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Cost Avoidance (describe the cost and how avoided):
To Be Determined in the Feasibility Study.

Risk Avoidance (describe the risk and how avoided):
To Be Determined in the Feasibility Study.

Improved Services:
The ability to use "meso" models.

Consistency

"No" Responses →		Rationale	Action Required
Enterprise Architecture	Yes		
Business Plan	Yes		
Strategic Plan	Yes		

Impact to Other Entities

Nature of Impact to Other Entities

Entity: To Be Determined in the Feasibility Study
Describe the nature of the impact:

Entity:
Describe the nature of the impact:

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Entity:
Describe the nature of the impact:

Entity:
Describe the nature of the impact:

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Solution Alternatives

Alternative 1:
To Be Determined in the Feasibility Study.

Technical Considerations for Alternative 1:		
ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Alternative 2:

Technical Considerations for Alternative 2:		
ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Alternative 3:

Technical Considerations for Alternative 3:

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ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Recommendation

Comparison:

Alternative 1	ROM Cost			Risk
To Be Determined in the Feasibility Study.	$0	-	$0	
Alternative 2	**ROM Cost**			**Risk**
	$0	-	$0	
Alternative 3	**ROM Cost**			**Risk**
	$0	-	$0	

Conclusions:

1	
2	
3	
4	

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Recommendation:

Project Approach *(if known)*

System Complexity:				System Business Hours: *(e.g., 24x7, 9am-5pm) :*	To Be Determined in the Feasibility Study.	
Architecture	☐ Mainframe	☐ Client Server	☐ Web Based		Num. of New Databases:	
Technology	☐ New	☐ New to Staff	☐ In-House Experience		Interfaces:	
Implementation	☐ Central Site	☐ Phased Roll-out			Num. of Sites:	
M & O Support	☐ Contractor	☐ Data Center	☐ Project	☐ In House		
Procurement Approach:					Number of Procurements:	
Open Procurement?		Delegated Procurement?				
Scope of Contract	☐ Development	☐ Implementation	☐ M & O	☐ Other:		
Anticipated Length of Contract:		Years /	extensions for	years		