

TRAVEL DEMAND MODELING TECHNICAL SUPPORT GROUP

Proposal Submitted to the Illinois Center for Transportation

By

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INTRODUCTION

Travel demand modeling is an important tool in the transportation planning community. It helps us forecast travel characteristics into the future at various planning levels such as state, region and corridor. Long Range Transportation Planning is one of the principal tasks of Metropolitan Planning Organizations (MPOs), and travel demand modeling serves as a effective tool in analyzing future conditions and what if scenarios, and thereby helps to focus transportation planning funds to the most needed efforts. In addition travel demand modeling can be used for corridor planning and other micro level planning studies. Currently, very few MPOs in the state of Illinois use travel demand modeling. The primary reasons are the lack of available resources and guidance in this field, within the state.

The intention of this research is to establish the framework necessary for the development, maintenance, and application of small and medium size MPO's urban travel demand models in several communities in Illinois, which will constitute the foundation for a Statewide Travel Demand Model. The models will help small and medium size communities to assess transportation system performance and deficiency analysis, long range plan development, corridor preservation, route diversion impacts, and systems level project analysis.

This research proposal will outline an approach for the organizational and modeling processes necessary for small/medium size MPOs in Illinois that haven't yet developed a travel demand model for their urban areas. It will also identify the source of the data to be used in model development as well as a recommended development platform in order to keep consistency thorough out the whole state and make it easier in the future to create and implement a Statewide Travel Demand Model.

OBJECTIVES

The study has the following four objectives:

- 1.** Identify the uses and benefits of travel demand forecasting on a regional basis (for small and medium size MPOs).
- 2.** Identify the level of travel demand forecasting functionality necessary to meet the needs of each MPO.

3. Identify the resources necessary to develop, validate, maintain, and operate travel demand forecasting capabilities on a regional basis.
4. Identify the resources necessary to create a statewide group/organization to support, set standards and guide the creation implementation and maintenance of transportation models in small/medium size MPOs in Illinois.

SCOPE OF WORK

The study will be conducted in a series of research tasks as follows.

Task 1: Literature Review Part I: We will review existing literature and research on statewide and regional travel demand modeling; and issues, benefits and applications of travel demand modeling specific to small and medium sized MPOs.

Deliverable #1: We will draft a report with findings from the literature and submit it to the study Technical Review Panel (TRP).

Task 2: Identify MPOs: We will identify MPOs to be actively involved in this study and the contact persons within each MPO.

Task 3: Create MPO Modeling Group: We will create a study MPO Modeling Group that can eventually lead to the formation of a statewide modeling group. We will convene an initial meeting of this group to explain the project, the outcomes and how it will benefit the MPOs in their transportation planning processes in the long term.

Task 4: Identify Modeling Needs for MPOs:

Task 4.1: Review Existing Modeling Processes: We will review existing processes used by MPOs for transportation planning needs in general and traffic forecasting in particular.

Task 4.2: Identify Travel Demand Modeling Benefit: We will identify the required functionalities of the travel demand model by each MPO based on the characteristics of their region and their needs. We will then identify how travel demand modeling can serve these MPOs in the transportation planning processes.

Deliverable #2: We will document the outcomes of Tasks 3 and 4 and submit the report to the study TRP.

Task 5: Identify Resources Needed: We will identify the resources needed to achieve the required functionalities of the travel demand model for each MPO. Resources include data, software, personnel etc.

Task 6: Literature Review Part II: We will review existing literature on support structures, maintenance, update cycles, performance standards, integration into statewide model, statewide model group organization and peer exchange.

Task 7: Implementation Plan: We will prepare an implementation plan for the development and validation of a travel demand model by each MPO. The plan will identify support structures, maintenance, update cycles, and performance standards for the travel demand model (with required functionalities) for each MPO.

Task 8: Statewide Model Issues: We will identify issues, opportunities for development of a statewide model and integration of regional model into the statewide model.

Deliverable #3: We will prepare report to document activities in Tasks 5-8 and submit to the study TRP.

EXPECTED OUTCOMES

The research team anticipates that this project will generate sufficient information to facilitate the creation of a statewide travel forecasting modeling group of professionals that would draw resources from the state's MPOs as well as IDOT. When that happens, IDOT, through the modeling group could be responsible for the coordination of the technical and planning processes in all urban areas in the state. IDOT could also be an active participant through the modeling group and work closely with the MPO staff during model development and applications. In turn, the modeling group could help set standards for model validation and act as a peer review group for the regional models.

Within such a scenario the small urban area MPOs, jointly with IDOT, would collect the data and develop the travel demand models with technical assistance from the statewide modeling group. The MPO's staff would take care of maintenance, validation, and calibration of the travel demand model whenever any changes to the model are implemented. Moreover, the small and medium size MPO's travel demand models will be structured to model travel on the major urban arterials and collectors. Once, these models are in place they would be used to create a Statewide Travel Demand Model. The Statewide Model would be used to model travel on the state trunkline roads outside of urban areas.

In this regard, the expected outcomes of this research are:

1. A common framework for the development and implementation of travel demand models in small and medium size MPOs in Illinois.
2. A set of urban travel demand models and analytical background data that would form the foundation of a Statewide Travel Demand Model for the State of Illinois.
3. Enhanced traffic forecasting factors based on region-level analysis of population, business growth, land-use, and traffic volumes.
4. A better understanding for IDOT of travel patterns within the urban areas and their relationships with state roads, which would lead to improved highway planning, and ultimately to a highway network better suited for Illinois's economic future.

The outcomes of this research will help small and medium size MPOs in Illinois to develop, maintain and apply travel demand modeling on a regular basis in their planning efforts. The framework created will help MPOs to update and maintain their model with minimal resources.

This framework and the technical support group will also provide an umbrella for the adoption of new techniques, best practices, sharing of ideas, and resources in the state. The research will help identify issues with data and resources in small and medium size MPO’s travel demand modeling efforts. It will also identify techniques and resources to overcome these issues. The outcomes of this research will also provide groundwork for the development of a statewide travel demand model and validation standards.

TIMELINE

We propose a timeline of 24 months. The effort distribution by task is shown in Table 1.

Table 1. Proposed Timeline

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Task 1	■	■	■																					
Task 2			■	■	■																			
Task 3					■	■	■	■																
Task 4.1								■	■	■	■													
Task 4.2											■	■	■											
Task 5													■	■	■	■								
Task 6																	■	■	■	■				
Task 7																				■	■	■	■	
Task 8																							■	■

BUDGET

The budget (requested by IDOT) is \$149,101 with an additional \$37,275 as the grantee’s cost share. Budget details can be seen in a separate spreadsheet.