STATEMENT OF NEED:
The 1991 Intermodal Surface Transportation Efficiency Act of 1991, (ISTEA) placed new requirements on transportation planning in state departments of transportation and Metropolitan Planning Organizations (MPOs) for addressing congestion at a regional level. Initial efforts employed the tools at hand, daily travel demand models and roadway inventory databases to identify congested areas and evaluate the congestion related impacts of transportation improvements. Micro-simulation packages were limited in size and required time consuming complex coding making them unsuitable for regional analyses. However, because these tools were created with a different purpose in mind, they were somewhat insensitive to time of day, intersection and signal improvements, and incidents. Therefore, they did not account for things such as the effects of queues backing up and blocking other roadways. One possible solution to properly address congestion mitigation strategies was to modify travel demand models to include a more dynamic trip assignment method.

RESEARCH OBJECTIVES:
The objective of this research was to examine the capabilities of dynamic traffic assignment and its potential to play a role in congestion management. It was intended to provide a better understanding of what is expected from a congestion management system (CMS), identify the limitation of static models related to CMS, demonstrate the feasibility of dynamic traffic assignment, and outline the data requirements associated with using dynamic traffic assignment for CMS.

RESEARCH TASKS:
• Compare congestion management strategies using static and dynamic traffic assignment models to demonstrate the strengths and weaknesses of both approaches.
• Review the congestion management system functional requirements in connection with the static and dynamic modeling methods.

RESEARCH DELIVERABLES:
The researcher was required to deliver a final report summarizing the findings
RESEARCH RECOMMENDATIONS:
It was shown that if special consideration is given to the implementation issues, existing DTA models could be used for practical transportation applications. The presented DTA model was applied to a large regional model, the Mid-Ohio Regional Planning Commission’s model that was in use at the time. Evaluation of infrastructure improvements, congestion pricing, and effectiveness of information provision systems was demonstrated.

PROJECT PANEL COMMENTS:
There was no project panel. Mark Byram commented that due to the then current model platform, the DTA cannot feasibly be implemented immediately but when the travel models are updated in the near future, inclusion of DTA methods may be viable and should be considered. Due to federal government relaxed CMS requirements incorporation of DTA can wait for a time when it will be more cost effective to implement.

IMPLEMENTATION STEPS & TIME FRAME:
The research project was completed in 2002. The Modeling & Forecasting Section, Office of Technical Services, initiated statewide model development in 1995 and initiated urban area travel demand model updates in 1999.

- Consultants were hired to develop the statewide model. The contract scope of services for the statewide model included consideration of incorporating DTA. Now, in 2005, the consultants are working on the portions of the model where DTA may be included. The consultant plans on incorporating DTA methods. If it is found to be functional and practical, DTA will be incorporated to the statewide travel demand model. The statewide model is expected be ready for use in December 2006.

- Consultants working on the urban area travel demand model in consultation with Modeling & Forecasting chose not to utilize DTA for time and budget reasons. It is possible that DTA would be implemented in some urban models but there is no existing plan to implement it.

EXPECTED BENEFITS:
Expected benefits are those identified in the statement of need. In addition, due to the structure of the statewide model and hardware and software requirements for running the model on a server cluster, cost savings realized from reduced number of copies of TRANSCAD software make it a more attractive alternative. It will save over $80,000 if successful.

EXPECTED RISKS, OBSTACLES, & STRATEGIES TO OVERCOME THEM:
DTA is not currently in use in the production environment of modelers. Therefore, it is not yet widely accepted. Also, it was tested for use in regional models, not statewide. So, there are some performance unknowns that could potentially make in impractical. This obstacle is being partially addressed by employing advanced computer technology. The research was done using slower microcomputers than available today. The computer system that will be purchased for the statewide model will contain dual 64 bit processors with much more memory and disk space over the existing single 32 bit processors used for the research. In addition, the model will employ distributed processing to spread the problem to run on 8 computers simultaneously.

OTHER ODOT OFFICES AFFECTED BY THE CHANGE:
There is no real impact on other offices except that we will be better able to meet our customers’ needs. Our customers that will be better served include ODOT Office of Geometrics, ODOT Office of Urban & Corridor, ODOT Safety, ODOT Systems Office, Director, District Offices, and Metropolitan Planning Organizations. Technical Services Systems Section will be impacted by the need to maintain the server cluster.
PROGRESS REPORTING & TIME FRAME:
Progress will be reported upon delivery of the final statewide model product. Delivery is expected December 2006.

TECHNOLOGY TRANSFER METHODS TO BE USED:
• The Final Report of the research has been distributed to 49 state transportation departments, different FHWA offices, selected national libraries, and others.
• ODOT’s statewide model has been included in several conference presentations including TRB. The implementation of DTA in the final statewide model will be presented to Ohio Travel Demand Model Users Group, probably at OTEC, probably at the annual TRB conference, and Statewide Model Conferences. The authors of the research have already published at least one paper on the use of DTA in Ohio.

IMPLEMENTATION COST & SOURCE OF FUNDING:
Implementation costs can not be quantified since the tasks for model development are not broken out in a way to capture that specific element. The statewide model contract funding comes from ODOT SPR.

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Approved By: (attached additional sheets if necessary)
Office Administrator(s):

Signature:       James McQuirt     Office: Technical Services     Date:   9/6/2005

Division Deputy Director(s):

Signature:       Howard Wood       Division: Planning     Date:   9/6/2005