Statewide Travel Demand Model Update

Request for Proposal

Iowa Department of Transportation

Introduction

The Iowa Department of Transportation’s (Iowa DOT) Office of Systems Planning is interested in entering into a professional services contract to update our statewide travel demand model. The Iowa Travel Analysis Model (iTRAM) is built using the 4-step travel demand modeling process and also incorporates freight/passenger rail and commodity flow analysis capabilities.

If your firm is interested in providing the described services, please submit a proposal stating your ability and availability to complete this work.

Project Background

The Iowa DOT is responsible for major transportation investment projects located throughout the state. These projects are of a wide variety and consist of stewardship, capacity expansion, road diet, and construction of new roads. Analysis of these projects considers a multi-modal approach and a focus on ongoing performance measures. With the continuing situation of increasing needs and limited financial resources, the decisions concerning which projects to construct and in what priority are critical to the future economic vitality of Iowa.

Urban areas such as those encompassed by Metropolitan Planning Organizations (MPOs) use travel demand models to support corridor planning studies, major investment studies, long-range transportation plan alternatives analyses, estimation of future travel patterns for roadway design, interchange justification studies and much more. The U.S. Department of Transportation and Federal Highway Administration (FHWA) place a great deal of emphasis on the development and use of travel demand models to support planning and transportation decision making in metropolitan areas.

Similar to MPO models, a statewide model can have an impact on a State DOT’s core business activities such as planning and programming, design, construction and maintenance, safety and performance monitoring. A statewide model can provide unbiased information that can be used as the basis for making tough decisions when allocating scarce resources. The development and use of statewide models has been increasing significantly over the last decade. NCHRP Synthesis Report 514 indicates that as of 2017, 39 states are using statewide models as compared to 19 a decade ago.

In 2006, the Iowa DOT started development of iTRAM. That effort focused on a simple, yet robust model, that consisted of a dense highway network and zone structure with quality input data. Focusing only on passenger cars and trucks allowed for more time and effort to be spent on model calibration and validation.
In 2012, the Iowa DOT received a grant from the Federal Railroad Administration to expand iTRAM to include freight/passenger rail and commodity flow analysis. This version of the model has proven to be a useful tool by assisting the Iowa DOT on many projects.

Travel demand models are updated on a regular basis to utilize the most recently available input data, to reflect changes in land use development, allow for model re-calibration using new data sets, achieve a higher level of validation and expand the analytical capabilities of the model if desired. The next State Long Range Transportation Plan (SLRTP) will be due in May of 2022, and iTRAM will provide significant quantitative analysis to support the plan update.

The project will be guided by a Steering Committee assembled by the Project Manager.

The intent of this RFP selection is to secure a Consultant with expertise in statewide travel demand modeling to update the Iowa DOT’s iTRAM.

**Project Scope**

Following is a brief overview of the major work tasks to be covered under this proposal.

1. **Existing iTRAM Evaluation and Recommended Improvements**
   a. The Consultant will provide a full evaluation of the existing iTRAM and provide a list of recommendations for potential improvement. The Consultant will complete a literature review of other statewide models to determine different approaches and data sets that will improve iTRAM. The Iowa DOT prefers to maintain the current 4-step modeling process.

2. **Software Platform and Compatibility**
   a. The software platform for iTRAM will be based in TransCAD version 8.0. The current iTRAM was built and operates in TransCAD version 6.0. All products, programs, code or scripts, graphic user interfaces (GUI’s) or other model components must be built using TransCAD version 8.0 and be compatible with future versions and Builds of TransCAD. Compatibility with the Windows operating system is also required. Use of any additional software or program languages will be at the discretion of the Project Manager.

3. **Base, Interim and Forecast Years**
   a. The base model year is suggested to be 2015 and the goal will be to replicate Average Annual Daily Traffic in 2015. The iTRAM Steering Committee may agree upon a base year more recent that 2015 if the availability of newer data sets will be beneficial to the model.
   b. Interim forecast years will be in 5-year increments starting with the 2015 base and continuing to the forecast year of 2050. The socioeconomic zonal data will be interpolated between the base (2015) and the forecast year (2050). Interpolation will take the form of linear (straight-line) interpolation.
4. Highway Network
   a. The highway network for iTRAM shall be updated using several data sources. The primary sources of network data for Iowa will be the Iowa DOT’s Roadway Asset Management System (RAMS) and other adjacent states’ road file information. Also included will be portions of the existing MPO model networks, the National Highway Planning Network from FHWA, and TransCAD or other GIS software’s data bases as identified by the Consultant to fill in any gaps in the network.

5. Rail
   a. The current iTRAM has a GIS based rail network with attribute data for the state of Iowa. The Consultant will utilize this existing rail network and incorporate any updates from the Office of Rail Transportation as needed to make the network current.

6. Traffic Analysis Zones (TAZ)
   a. The size of the zone system is typically based on two factors. The first factor is the level of aggregation of the socioeconomic data. The zonal system must be compatible with the Census geography since much of the zonal information will come from the Census. The second factor is based on the desired level of granularity of the roadway network. The Iowa DOT will use the statewide model to supplement rural traffic forecasting and the roadway network and zonal system should be dense enough to consider corridor details such as secondary roads and interchange locations. A denser zonal system and detailed roadway network will also have the benefit of smoothing out the assignment results and better reflect actual traffic conditions.
   b. Initial iTRAM development resulted in approximately 3,000 traffic analysis zones that makes up the state of Iowa and the adjacent buffer area. Evaluation of the granularity of the current zonal system will be completed and a recommendation on the need to increase the number of zones will be made by the Consultant.
   c. As a consideration to minimize computing time, a limit of approximately 5,000 total zones will guide TAZ expansion.

7. External Networks and Stations
   a. iTRAM will use a combination of a national network and external stations to represent external travel origins and destinations. Evaluation will be done on the existing iTRAM external station and national network framework and recommendations made by the Consultant to keep the existing setup or take a different approach.

8. Socioeconomic Data Collection and Forecasting
   a. Data requirements will be dependent on the method of trip generation that is recommended for iTRAM. Additional zonal data will include, at a minimum:
      ♦ Population
9. **Trip Generation**
   a. The structure of the iTRAM trip generation model is currently based on cross-classification for trip productions and regression equations for trip attractions. The Consultant will evaluate the iTRAM trip generation methodology, compare and contrast with other statewide models and make recommendations on retaining the existing process or moving to a different approach. The Consultant will provide detailed explanation of the benefits and costs (including any additional data needs or data processing) of adopting a new trip generation methodology.

10. **Trip Distribution**
   a. The Consultant will evaluate the trip distribution processes used in other statewide models (such as the gravity model and a destination choice model) and make a recommendation on what to proceed with. The Consultant will provide detailed explanation of the benefits and costs (including any new data requirements) of adopting a new trip distribution methodology.

11. **Mode Split**
   a. The Consultant will evaluate the mode split processes used in other statewide models and make a recommendation how to proceed with integration into iTRAM and its current passenger rail component. Consideration will be given to adding short and long-distance bus, short distance commuter rail and air travel.

12. **Traffic Assignment**
   a. iTRAM development will use a capacity restrained assignment procedure. Capacity will be based on the standard practice for statewide models using the Highway Capacity Manual as a basis and represent a Level of Service F as the maximum. The Consultant will specify the assignment methodology available in TransCAD to be utilized in iTRAM.

13. **Truck Model**
   a. The iTRAM truck model is currently built using the procedures as outlined in FHWA’s, Quick Response Freight Manual. The Consultant will provide a recommendation to continue with this methodology or an enhanced method based on the literature review from other statewide models. Consideration shall be given to model functionality that allows for tradeoff analysis between truck and rail freight.
14. Commodity Flow Tool
   a. The current commodity flow tool will be updated with the most recent Freight Analysis Framework dataset or as recommended by the Consultant and accepted by Iowa DOT Steering Committee.

15. External Trips
   a. Separate external-external (E-E) and external-internal (E-I) passenger car and truck trip tables will be developed. The trip tables will be based on national databases as available and determined by project budget such as the National Household Travel Survey (NHTS), TranSearch, Streetlight Origin/Destination, and the most current Freight Analysis Framework dataset. Although from 2009, the Iowa DOT possesses a rural based NHTS Add-on dataset. Additionally, MPOs in Iowa have also invested in NHTS Add-on surveys that may be available for use with iTRAM. Those MPOs consist of Des Moines, Waterloo/Cedar Falls, Cedar Rapids, and Omaha/Council Bluffs. The Bi-State MPO in the Quad Cities completed their own household travel survey and that data may be available for use as well.

16. Calibration and Validation
   a. iTRAM will undergo model calibration and validation throughout the update process. Model calibration and validation procedures will be applied to each individual step in the model update process. The Consultant will recommend and discuss with Iowa DOT staff their proposed validation standards. The Consultant will utilize published statewide model validation standards if available or utilize to the most reasonable extent possible the urban model validation standards.

17. Post Processing
   a. Post-processing is a procedure that will be incorporated directly into the model to correct for over or under assignment of traffic volumes. iTRAM will use NCHRP 255 methods for developing adjusted future year volumes.

18. Graphical User Interface
   a. A critical element for making the iTRAM user friendly is a graphical user interface (GUI). The current version of iTRAM has a GUI that allows for model scenario management and ability to run model steps individually or all at once. The Consultant will evaluate the current GUI and provide recommendations for improvement.

19. Model Documentation
   a. Model documentation and a User Guide will be provided for the iTRAM. The documentation process will be organized to provide a stand-alone final report at the end of each of the main model development tasks. The review process for these documents will take place on a rolling schedule (as each step is completed and validated) allowing for a measured effort by the Iowa DOT instead of all review taking place at the end of the project. The sections will be assembled into the final model documentation.
20. Status Reports
   a. Monthly status reports must be submitted by e-mail to the Iowa DOT Project Manager to provide information concerning the project status and progress.

21. Ownership
   a. All delivered proposals, documents, reports, model files, data, programs/scripts and GUI’s will become property of the Iowa DOT.

22. Administration
   a. Consultant performance will be monitored by the Steering Committee and the Iowa DOT Project Manager. Failure of the Consultant to adhere to the deliverable schedule shall render the Consultant in default. The Iowa DOT Project Manager has the right to terminate the contract with the Consultant should such a default occur.
   b. The Iowa DOT Project Manager has the right to approve all changes in key staff listed in the original Proposal and has the right to terminate the contract with the Consultant if suitable replacements of key staff are not found in a timely manner to keep the project on schedule.
   c. The Consultant shall disclose any of its work for other clients that may affect work on the proposed contract, to avoid a potential conflict of interest.
   d. The Consultant shall identify the project manager and all key staff that will be working on the contract and provide their individual contact information. The address location where most work will be performed shall also be identified.

Request for Proposals Time Schedule

Following is a list of the activities relevant to the RFP process. The Iowa DOT reserves the right to change these dates and will notify respondents in such a case. It is anticipated the contract will be initiated in early 2019 and is estimated to take up to 24 months for project completion which includes 6 months of use and testing by the Iowa DOT. The Consultant will be available to provide guidance on use of the model and fix any found issues with the model during the Iowa DOT use and testing period. The Iowa DOT anticipates contracting for services using a lump sum method of reimbursement.

- ♦ January 18, 2019  Deadline for RFP questions
- ♦ February 1, 2019  Deadline for proposals to be submitted
- ♦ February 15, 2019  Proposal evaluations completed
- ♦ March 15, 2019  Contract awarded
- ♦ March 15, 2019  Begin of Project
- ♦ September 15, 2020  All models (base, interim, horizon years) delivered for DOT use and testing
- ♦ March 15, 2021  Final models and documentation due
Project Cost Proposal

The Iowa DOT will not consider cost as a part of the evaluation criteria. If costs are submitted, they will not be considered as part of the proposal.

General Requirements

The Consultant is required to have experience in the following work categories:

111 – Statewide Regional Systems Planning
112 – Urban Area Transportation Planning
113 – Local/Regional Systems Planning

It is the policy of the Iowa DOT that Disadvantaged Business Enterprises (DBEs) and Targeted Small Businesses (TSBs) shall have the maximum practicable opportunity to participate in the performance of Iowa DOT contracts. Funding of the work under this contract is not expected to involve federal-aid highway funds, so the Department does not have a DBE goal for this contract. When a DBE goal is not established, the Department still encourages the spirit of the program to be incorporated in the proposed contract whenever possible. A list of certified DBE firms may be found at https://secure.iowadot.gov/DBE/Directory/Index/. A list of TSB firms may be found at https://www.iowaeconomicdevelopment.com/tsb.

Selection Information

Emphasis should be placed upon providing information concerning your proposed project approach, similar projects your firm has recently performed and the availability and qualifications of your key staff. The proposal may include additional information, as deemed appropriate, subject to the overall length restriction established in Proposal Requirements.

The selection committee will review and evaluate the proposals submitted based on the following criteria and the weighted value assigned to each. Include a detailed statement for each evaluation criterion.

♦ Consultant proposed statement of work. (35%) Emphasis will be on the Consultant grasp of the project, the soundness of the approach, the ability to complete the work in a timely fashion, and the quality of the recommendations for modification (if any) in the tasks to be performed.

♦ Background and previous experience of personnel (35%), including consultant and sub-consultants (if any), to be assigned to the project and their demonstrated competence in the type of work each is to perform, including the quality of previous reports and work products. Consultant should demonstrate expertise in urban and statewide travel demand modeling.

♦ Proposed work plan and schedule (20%) broken down by the appropriate personnel and timetable to complete each task. Consideration will be given to management and project
control, ability to commit staff within time requirements and relevant performance record.

♦ Proposed work relationships and communication (10%) between the Consultant and Iowa DOT steering committee.

As part of its final evaluation process, the Iowa DOT may request oral presentations from the highest ranked Consultant if there is no clear choice. Those selected will be provided with no less than seventy-two (72) hours’ notice. Presenters must include the proposed project manager and other key members of the proposed study team. There shall be no cost to the Iowa DOT for oral presentations.

Contacting any selection team member other than the RFP contact person is inappropriate.

**Proposal Requirements**

Please provide the following information in the order listed:

1. Include your firm’s approach to addressing the identified tasks, your understanding of the project’s scope, key issues and relevancy to Iowa’s transportation system. Briefly discuss similar projects the members on your team have completed in the past five years. This listing should be limited to the three most applicable projects.

2. Include the name, qualifications, experience, office address and availability of the contract manager as well as the manager in charge of each major work task. This information should include the identification of similar projects managed or participated in by this individual. The selection of a contract manager and work task managers by a firm will constitute a commitment by that firm and NO substitute managers will be allowed without prior written approval by the Iowa DOT.

3. Include experience and qualifications for any sub-consultants to be used and work they will perform.

4. Include a detailed resume, summary of current workload and a time commitment for each professional or technical person to be assigned to the project. Identify the principal or manager who will serve as the project manager.

5. A project schedule outlining the timeline and estimated completion date of each major task identified in your scope of work. This should include a schedule with a description of all deliverable products throughout the period. A graphical representation of the proposed schedule should be included.

6. The location of the office where the majority of work will be performed.

7. A disclosure of all work for other clients that may affect work on the proposed contract to avoid a potential conflict of interest.

The proposal may include additional information, as deemed appropriate, subject to the overall length restriction established in Proposal Requirements.

Cost information should not be submitted as part of the proposal.
The proposal must be submitted as a single electronic PDF and be formatted to print on 8.5” x 11” pages. The proposal must be limited to 25 single-sided pages. All pages will be counted including: proposal covers, cover letter, dividers, etc. The maximum size limit of a proposal is 7 megabytes.

On the cover page of the proposal, please include title of the RFP for which the proposal is submitted and the email address of the person who should receive the results of the selection. Inclusion of promotional literature of a general nature will not be considered in the selection process.

The electronic proposal must be submitted via email to jacqui.digiacinto@iowadot.us. An email will be sent confirming receipt of the proposal within 30 minutes or by 1:00 p.m. on the submittal deadline date, whichever is later.

Proposals are due by 3:00 pm on February 1, 2019.

Any technical questions or questions regarding this RFP shall be submitted via email to jacqui.digiacinto@iowadot.us. Any questions about this RFP must be received by noon on January 18, 2019. Questions and answers regarding this RFP will be posted with the RFP on the Consultant Utilization website, http://www.prof-tech-consultant.dot.state.ia.us.

Any proposal not complying with all requirements stated in the RFP may not be accepted.

Public Records Law

The Iowa DOT will treat all information submitted by a Consultant as open records following the conclusion of the selection process. Open records are public records that are open for public examination and copying. The Iowa DOT's release of records is governed by Iowa Code Chapter 22 and 761 IAC Chapter 4. Consultants are encouraged to familiarize themselves with these laws before submitting a proposal.

Statement of Non-Discrimination

The selection and contract are subject to the provisions of Executive Order 11246 (Affirmative Action to Insure Equal Employment Opportunity). Federal and state laws prohibit employment and/or public accommodation discrimination on the basis of age, color, creed, disability, gender identity, national origin, pregnancy, race, religion, sex, sexual orientation or veteran’s status. If you believe you have been discriminated against, please contact the Iowa Civil Rights Commission at 800-457-4416 or Iowa DOT’s affirmative action officer at 515-239-1399. If you need accommodations because of a disability to access the Iowa Department of Transportation’s services, contact the agency's affirmative action officer at 515-239-1399.