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I. GENERAL

The Iowa Department of Transportation (Iowa DOT) is inviting consultants to develop the second phase (Phase II) in the development of a Statewide Travel Demand Model for the State of Iowa. The Iowa DOT has available $375,000 for this project and consultants are invited to prepare proposals considering this constraint.

A. Introduction

The Iowa Department of Transportation is requesting a technical proposal from consultant engineering/planning firms concerning their qualifications, experience and availability to complete Phase II of a two-phase process that will deliver a fully operational Statewide Travel Demand Model for the state of Iowa.

It is essential that the appropriate groundwork be conducted before a model is actually developed. The now completed Phase I of this project focused solely on this groundwork. Phase I consisted of three major parts. Part 1 focused on educating a Steering Committee and Iowa DOT staff in current statewide modeling practices. The Consultant Team provided information and examples concerning how other states are using and applying statewide travel demand models. This education process, as intended, facilitated ideas from the Steering Committee and Iowa DOT staff for applications of a statewide model to our current business practices.

Part 2 was essentially a Needs Assessment that determined specifically what components the statewide model should contain. The Consultant Team worked with Iowa DOT staff and a Steering Committee to determine appropriate applications of a statewide model to accommodate the various types of analyses desired by the Iowa DOT and Steering Committee representatives. The needs determined are a function of both benefit/utility and cost to include in the model architecture.

Part 3 entailed the development of a detailed model architecture designed to support the various types of analyses identified in the Needs Assessment. The architecture identifies all model specifications, data requirements and sources, user interfaces, batch routines and information post processing methodologies. The deliverables for Phase I are now the basis for construction of the model. These documents coupled with ongoing work sessions with key Iowa DOT modeling staff ultimately guide the development of the project.

As in Phase I, the Iowa DOT has assigned a Project Manager for this contract. The Project Manager will be the main contact for the Consultant Team and responsible for final approval of all products of this contract.
B. Project Background

The Iowa DOT is responsible for major transportation investment projects located throughout the state. 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. Currently, the prioritization of highway and modal construction projects is based on a variety of technical and non-technical performance measures.

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

However, the Iowa DOT does not have this type of tool available for use in the rural areas of the state or to supplement the MPO urban models. With highway and modal construction projects often costing hundreds of millions of dollars, more informed decisions are part of Iowa DOT’s accountability for efficiently investing public funds.

As proven in the metropolitan areas, a travel demand model is a tool that can offer information in a consistent and timely manner to decision-makers and provide a robust technical process to support decision-making. Similarly, a statewide model can have an impact on the Iowa DOT’s core business activities such as planning and programming, design, construction and maintenance and safety. A statewide model can provide unbiased information that can be used as the basis for making tough decisions when allocating scarce resources.

A few capabilities of a statewide model include, but are not limited to, analysis of rural travel patterns, examination of long-distance interstate travel, determination of the impacts of improvements to parallel facilities, forecast of VMT (vehicle miles of travel), identification of deficient routes, facilitation of work zone and detour analysis, bypass studies and identification and prioritization of projects.

The Iowa DOT is committed to providing the best analytical tools to support the decision-making process and thus is interested in the development of a statewide travel demand model.
II. SCOPE OF SERVICES

A. Phase II, – Statewide Travel Demand Model

This project is entitled *Phase II, Tier I—Model Development*.

Phase II, Tier I – Model Development will be based on and guided by the Needs Assessment and the Model Architecture documents that were produced as a part of Phase I of the Iowa Statewide Model project. Please refer to these documents for specific guidance for the model development criteria. They have been included with this RFP document. The Iowa DOT project manager will be responsible for final interpretation and guidance of the model development.

Based on the recommendations from the Phase I Needs Analysis document, Phase II will be divided into two specific tiers of development. Tier I will entail the development of both passenger car and truck sub-models and Tier II will focus on adding Commodity/Freight and Rail/Freight Flow sub-models. Due to constrained financial resources Tier I and Tier II will be completed under separate contracts, however, it is expected that the consulting team winning this contract will handle both projects as they will be closely related and dependent upon each other. The final decision to proceed with the same consulting team is at the discretion of the Iowa DOT Project Manager and may be subject to a separate Request for Proposal and the normal Iowa DOT process for consultant selection.

As noted in the Model Architecture document, passenger car and truck sub-models will be the foundation for developing additional model components such as the commodity flow and freight flow sub-models which can be developed at later stages. These Tier II model components will provide a good, solid, four-step statewide model that is practical to use and consistent in producing reliable forecasts. As financial resources become available a second tier in Phase II (Phase II, Tier II) will be initiated to develop a Statewide Rail/Freight sub–model and a Commodity/Freight Flow sub-model. While detailed commodity movements (air, rail, truck, and barge) do handle large volumes of traffic and involve long distance trips, they can be complex to model and can require extensive resources and data to implement. Nevertheless, it is recommended this be the second set of sub-models to be developed in Phase II, simply because of the large volumes of commodities that are involved.

The focus of Phase II, Tier I is the actual construction of the passenger car and truck sub-models and will be based on the specifications laid out in the Needs Assessment and the Model Architecture documents as developed in Phase I. The Needs Assessment Report recommended that the Iowa Statewide Model be able to perform the following analyses to meet the initial uses previously identified, as part of the Phase II model development: 
Tier I
1. Traffic Forecasting (Automobile and Truck)
2. Statewide and Regional Corridor Analysis
3. Policy Evaluations (Finance, Funding, and Project Prioritization)
4. Rural Freeway Interchange Evaluations
5. MPO External and Through Trip Analysis
6. Major Stateline Crossing Analysis (Bridge and Highways)
7. Special Generators
8. Safety Analysis (investigate the use of PLANSAF)

Brief overviews of the major work tasks to be covered under this proposal are included in the following list. Please refer to the Needs Assessment and Model Architecture documents for specific guidance in these areas.

1. Software Platform
   a. The software platform for the Iowa Statewide Model will be based in TransCAD version 4.8 or 5.0. Currently it appears that version 5.0 will be available for use in the development of this model.

2. Base, Interim and Forecast Years
   a. The base model year will be 2005 and the goal will be to replicate traffic on an average weekday in 2005.
   b. For interim forecast years (2010, 2015, etc.), the socioeconomic zonal data will be interpolated between the base (2005) and the forecast year (2035). Interpolation may take the form of linear (straight-line), or non-linear (polynomial or logarithmic) interpolation.
   c. The forecast year will be 2035, so that there will be a minimum 20 year forecast available at the completion of the model development.

3. Highway Network Development
   a. It is recommended that the highway network for the Iowa Statewide Model be built from several data sources. The primary sources of network data will be Iowa’s and the adjacent states’ road file information, the existing MPO model networks, the National Highway Planning Network from FHWA, and TransCAD or other GIS software’s data bases.

4. Traffic Analysis Zone Development
   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 proposed uses for the statewide model. For example, if the model will be used to evaluate an intercity corridor, then the network and zonal system should be dense enough to consider corridor details such as...
secondary roads and interchange locations. A more dense zonal system and detailed network will also have the benefit of smoothing out the assignment results and better reflect actual traffic conditions.

b. The zonal boundaries will typically be consistent with Census geography, political boundaries, and where feasible, the highway network.

c. The total number of zones is estimated to be from about 2,000 to approximately 3,000.

5. **External Networks and Station Development**
   a. For the Iowa Statewide Model a combination of a national network and external stations will be used.

6. **Socioeconomic Data Collection and Forecasting**
   a. The zonal data that will be used as part of the trip generation modeling process will include, at a minimum:
      - Population
      - Household Size
      - Employment (Retail/Non-Retail)
      - Auto Ownership

7. **Trip Generation**
   a. The basic structure of the trip generation models will be cross-classification for trip productions and regression equations for trip attractions.

8. **Trip Distribution**
   a. The traditional gravity model will be the technique used for distributing the trips developed by the trip generation process.

9. **Mode Split**
   a. Since the initial model in Phase II (Phase II, Tier I) will only have two modes – auto and truck – logit functions to establish other mode trips such as rail, bus, and air will not be necessary. However, the model will be designed so that in the future other modes such as rail may be added to the model as efficiently as possible.

10. **Traffic Assignment**
    a. The Iowa Statewide Model development will use a capacity restrained assignment procedure.
11. Truck Model
   a. The truck model will follow the procedures as outlined in FHWA’s, “Quick Response Freight Manual”.

12. External Trips
   a. Separate external-external (E-E) and external-internal (E-I) automobile and truck trip tables will be developed. The trip tables will be based on national databases such as the National Household Travel Survey, TranSearch, and the Freight Analysis Framework (FAF and FAF2). The possibility exists that an NHTS Add-on sample for the State may be available within the next couple of years to complement these databases.

13. Calibration and Validation
   a. The Iowa Statewide Model will undergo both a calibration and validation effort. The calibration procedure will be applied to the individual steps of trip generation, distribution, and traffic assignment sequentially, so that each step is calibrated before proceeding onto the calibration phase of the next one. Specific calibration targets (for example, in Trip Generation, overall Attractions should be within 10% of Productions) will be determined in Phase II.
   b. The validation process will compare the overall traffic assignments with the model simulation for the base year. Whereas calibration looks at the individual components of the planning process, the validation process will evaluate the overall capability of the model to replicate ground counts.

14. 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. The Iowa Statewide Model will use NCHRP 255 methods for developing adjusted future year volumes.

15. Graphical User Interface
   a. A critical element for making the Iowa Statewide Model user friendly is the development of a graphical user interface (GUI). The GUI will be designed so that individual scenarios, data files, and model steps may be mixed and matched within the Interface. The specific design of the Interface should be designed at the conclusion of the model development. Consistency of inputs and parameters across the various stages will be achieved and file management will be easier, allowing multiple scenarios to be evaluated with minimal additional effort.
   b. Caliper Corporation has a sample GUI designed for the Amarillo, Texas MPO. A GUI of similar fashion and function is what will be used for the Iowa Statewide Model.
16. Model Documentation
   a. Model documentation will be provided for the Iowa Statewide Model. The documentation process will be organized to provide a stand-alone draft final report at the end of each of the main model development tasks. These reports will include, at minimum: (1) TAZ and Network Structure, (2) Trip Generation, (3) Trip Distribution, (4) Truck Model, (5) Traffic Assignment, (6) Base Year Validation, and (7) Future Year Approach. The submitting and 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 travel model report.

17. Sensitivity Analysis
   a. Once the validated 2005 Iowa Statewide Model is in place, it will be available for use in sensitivity analysis on policy issues within the state.
   b. The model scenario preparation steps are:
      1. All relevant 2005 highway links in the travel model will have a new speed field inserted into the network;
      2. The new truck speed will be translated into minutes and truck skims updated using the new times on the link;
      3. Truck distribution will be rerun;
      4. Truck traffic will be assigned using the identical assignment approach used in the base.
      5. The total truck minutes for this truck speed adjustment test will be summarized by facility name, Iowa DOT district, external or internal trip, and other stratifications and compared to the base.
      6. Analysis of the results will be performed.

B. Status Reports

Biweekly status reports must be submitted in writing via hard copy or e-mail to the Iowa DOT Project Manager to provide information concerning the project status and progress.

C. Future Compatibility

Caliper Corporation’s TransCad is the chosen software platform for this project and GISDK is the supporting programming language. The current TransCad version for Iowa DOT is 4.8 Build #470 8/9/2006. All products, programs, code or scripts, graphic user interfaces (GUI’s) or other model components must be built using this or the most recent version and be compatible with future versions and Builds of TransCad. Correspondence with Caliper Corporation indicates that TransCad version 5.0 will be available to the Iowa DOT for this project. It is anticipated that TransCad version 5.0
will be the standard platform for the Iowa Statewide Model. 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.

D. Ownership

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

E. Administration

Consultant Team performance will be monitored by the Steering Committee and the Iowa DOT Project Manager. Failure of the Consultant Team to adhere to the deliverable schedule shall render the Consultant Team in default. The Iowa DOT Project Manager has the right to terminate the contract with the Consultant Team should such a default occur.

The Iowa DOT Project Manager has the right to approve all changes in key staff listed in the original Proposal. The Iowa DOT Project Manager has the right to terminate the contract with the Consultant Team if suitable replacements of key staff are not found in a timely manner to keep the project on schedule.

The Consultant Team shall disclose any of its work for other clients that may be affected by work on the proposed contract, to avoid a potential conflict of interest.

The Consultant Team 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 the majority of the work will be performed shall also be identified.

F. Miscellaneous

It is anticipated that the Consultant Team will consider state-of-the-art modeling techniques wherever possible.

The specific elements and order of Phase II components are recommended by the Iowa DOT; however, modifications to Phase II are a possibility if the Consultant Team, Steering Committee and Project Manager are in agreement and the result is an overall benefit to the entire project.

For all documents and reports, ten (10) copies will be delivered to the Project Manager.

G. Phase II – Model Development

A requirement for Phase II includes Iowa DOT staff working as an integral partner with the Consultant Team throughout the effort; providing data, conducting analyses, hosting
discussion workshops, and heavily participating in each work task element. Specifics on Phase II are outlined in the Model Architecture document.

The Consultant Team submitting on this RFP should have the resources and experience necessary to complete Phase II and also be willing to execute a future contract for Phase II, Tier II which focuses on commodity and freight components of the model. Award for Phase II, Tier II will be at the discretion of the Iowa DOT Project Manager and subject to a separate Request for Proposal and the normal Iowa DOT process for consultant selection.

H. Phase II – Request for Proposals Time Schedule

The 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 applicants in such a case. It is expected the duration of the Phase II study will take a maximum of fifteen months.

- June 29, 2007   Post RFP
- July 11, 2007   Deadline for Questions
- July 27, 2007   Deadline for Proposals to be submitted
- August 10, 2007 Proposal evaluations completed.
- August 13, 2007 Contract awarded
- August 13, 2007 Begin of Project
- November 14, 2008 Final Calibrated and Validated Base Model Due

I. 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.

III. PROPOSAL REQUIREMENTS

A. Proposal Contents

Proposals must include complete and accurate information.

*The proposal should include, but not be limited to:*

1. Describe how the Consultant Team will address each item outlined in the tasks described in the Scope of Services Section of this Request for Proposal.
2. Set forth a work plan specifying the tasks to be performed, when the actual work will begin if the contract award is received and the completion date. Include a preliminary work plan and schedule.

3. Include a detailed resume 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 and their office address. Provide a list of sub-consultants and the work they will perform. The Iowa DOT reserves the right to approve sub-consultants employed by the principal consultant.

4. Include final reports or work products from other projects undertaken by the personnel to be assigned to this project, with particular emphasis on projects of similar scope and effort. It is desirable that a summary of the projects be included in the proposal. These reports or work products may be attached as an appendix to the proposal. Multiple copies of the reports or products are not required. The names, addresses, and telephone numbers of agencies for which the consultant has previously conducted similar efforts, including projects in progress, may be included. Iowa DOT will contact the Consultant Team’s listed references. References will be questioned on technical capabilities, level of creativity, and project management skills.

B. Consultant Selection

Proposals will be evaluated by a selection committee (established by the Iowa DOT), which will select the proposal deemed most appropriate. In selecting a proposal, the committee shall consider, but not be limited to, each of the following factors: (factor weights are in parenthesis)

- Consultant Team’s proposed statement of work. (35%) Emphasis will be on the Consultant Team’s 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, 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 Team 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 Iowa DOT staff and the Consultant Team.
As part of its final evaluation process, the Iowa DOT may request oral presentations from the highest ranked Consultant Team 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.

C. Proposal Submission

Ten (10) copies of each proposal must be received on or before 3:00 PM July 27, 2007. Proposals are limited to twenty pages, double sided, between proposal covers, not including blank dividers. Example work can be included in an appendix and does not count towards the page limitation. Send proposals to:

Phil Mescher, AICP
Statewide Travel Demand Model Project Manager
Office of Systems Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa

Iowa DOT is not responsible for any costs incurred in the preparation of proposals.

D. Proposal Inquiries

Questions concerning this RFP should be directed only to: phil.mescher@dot.iowa.gov. Contacting individual selection team members is considered inappropriate. The deadline for inquiries is July 11, 2007. Any questions and corresponding answers will be posted with the RFP on the consultant utilization web site.

E. Consultant Team Selection

The selection committee will evaluate proposals and the Consultant Team selected for the project is anticipated to be notified no later than August 13, 2007.

No oral presentations are expected.

F. Notice of Award

Notice of the Award is anticipated to be issued on or before August 13, 2007.

G. Contract Period

Consultant Team shall begin work on date of agreement with the DOT, with completion of the project no later than November 14, 2008.
H. Pre-Qualification

Pre-qualification information can be obtained at the Iowa DOT Consultant Utilization website http://www.prof-tech-consultant.dot.state.ia.us

Selected pre-qualified categories for this project include:
   111 – Statewide Regional Systems Planning
   112 --Urban Area Transportation Planning
   113 – Local/Regional Systems Planning

IV. GENERAL REQUIREMENTS

A. Upon Submission of Proposal

1. Disclosure of Proposal Content

The Iowa DOT will treat all information submitted by a consultant as open records following the conclusion of the selection. 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.

B. Disadvantaged Business Enterprises (DBE)

It is the policy of the Iowa DOT that Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with federal funds. However, for this project there is no specific goal for DBE participation. When a DBE /TSB goal is not established, the department still encourages the spirit of the program be incorporated in the proposed contract whenever possible. A list of certified DBE/TSB firms may be found at http://www.dot.state.ia.us/contracts/contracts_eoaa.htm.