

# RFQ

Request for Qualifications for  
CHATS TRAVEL DEMAND FORECASTING MODEL UPDATE

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Release Date: September 19, 2016

**Due Date: Friday, October 14, 2016**

(No later than 3:00 P.M.)



The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG), in association with the Charleston Area Transportation Study (CHATS) Metropolitan Planning Organization (MPO), is soliciting qualifications from transportation planning consultants to assist with incorporating key updates to its current regional travel demand forecasting tool. The selected firm must be experienced in travel demand modeling and have adequate qualifications and expertise to undertake the required tasks in a timely and efficient manner in close coordination with the BCDCOG staff. **ANY RESPONSE RECEIVED AFTER THE SPECIFIED TIME ON THE DUE DATE WILL BE REJECTED, CONSIDERED NONRESPONSIVE, AND WILL NOT BE OPENED.**

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## I. OVERVIEW

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) is an association of local governments and one of South Carolina's 10 Regional Planning Councils that assists in planning for common needs of the three counties and 27 municipalities. BCDCOG in conjunction with the Charleston Area Transportation Study Metropolitan Planning Organization (CHATS MPO) is responsible for the development, maintenance, and application of the travel demand forecasting tool known as the CHATS Travel Demand Model (TDM) for the Charleston metropolitan area.

The TDM provides local staff and elected officials with current and future traffic forecasts necessary for guiding and developing federally-mandated long-range transportation plan (LRTP), transportation improvement plan (TIP), congestion management process (CMP) and comprehensive plan; supporting key studies with regional significance such as traffic impact studies, traffic operations analyses, alternatives analysis, and transit service analysis; and providing key inputs necessary for air-quality conformity analyses and environmental impact statements as required by the National Environmental Policy Act (NEPA). Forecasts derived from the TDM also enable local policy makers to make informed decisions on investments and in drafting policies relating to the regional transportation systems.

The existing study area of the TDM is approximately 2,300 square miles and encompasses an area that is equivalent to 84 percent of the tri-county region. It excludes sparsely populated northern parts of Berkeley County and Dorchester County but accounts for all land swathes that are potentially developable and anticipated to be urbanized within the next 20 years. It is an aggregate trip-based model and incorporates a traditional 4-step process with a travel time feedback loop. The TDM uses Census 2010 demographics as the basis to represent its base conditions while Year 2040 is designated to represent its horizon year conditions with Year 2020 and Year 2030 as its interim conditions. It is implemented using state-of-the-art Geographic Information System (GIS)-based transportation planning software: TransCAD® 6.0 with an in-built user interface for ease of application and analysis of results.

## 2. NEED FOR UPDATE

The CHATS TDM is used primarily by BCDCOG for purposes of preparing and updating the LRTP and TIP documents. It is also often used by consultants for conducting specific traffic impact studies and analyzing other transportation infrastructure projects. Over the years, BCDCOG has continually undertaken a series of updates to the TDM in an effort to maintain and operate a good working model. However, the agency recognizes that the model in its current form falls short of holistically capturing travel behavior and traffic impacts of local demographic characteristics and economic drivers thus warranting critical enhancements to the TDM in the near-term.

In an extension of its progressive policy to build and apply a more sophisticated model for planning projects, BCDCOG has identified immediate opportunities for transportation planning consultants to incorporate additional enhancements to the model. These enhancements have been identified based on several recommendations put forth by the Federal Highway Administration (FHWA)- administered Travel Model Improvement Program (TMIP) Peer Review conducted between February and June 2015. Although the recommendations are wide-ranging in nature, it is important to note that the BCDCOG, at this juncture, intends to systematically and incrementally incorporate only select enhancements that will allow the agency to fully leverage the existing resources of the model and further build upon the model's current structure.

The intended model enhancements, prioritized by degree of improvement and time sensitivity, are highlighted in the following section.

### 3. OBJECTIVE

The underlying objective for seeking professional services to update the current TDM is to maintain a robust and an effective in-house travel demand forecasting tool for the CHATS planning area that is up-to-date and provides the ability to perform traffic simulations and scenario planning on an ongoing basis. To further enhance the model's capabilities and improve its overall acceptability and applicability as state of the practice, the following additional enhancements need to be implemented:

- A. Revise model base scenario to reflect Year 2015 conditions;
- B. Refine current socio-economic forecasting methodology and integrate it in to the overall modeling process;
- C. Capture trip-making characteristics and traffic impacts of resident retirees and college/university students;
- D. Revise trip generation module to account for tourist-/visitor-related activity and its seasonal variations;
- E. Implement destination choice trip distribution method to better replicate observed trip patterns that is reflective of local travel behavior across geographic (i.e. water) barriers;
- F. Incorporate non-motorized mode(s) of travel to account for bike and pedestrian trips in downtown area;
- G. Improve existing model interface to be more intuitive, savvy, and user-friendly; and
- H. Provide modeling support for LRTP and CMP Update process to aid in project selection and prioritization

### 4. SCOPE OF WORK

The following scope of work is inclusive of all enhancements presented in the preceding section and highlights the broader services expected of the consultant.

#### Task 1 Update Base Conditions to Year 2015

The current model encompasses all high-growth areas and roadway network geography reflective of conditions that existed in Year 2010. During the last several years, the tri-county region with its improved and favorable business environment has witnessed significant growth in terms of both population figures as well as economic opportunities. Several jurisdictions and unincorporated areas have experienced increases in their local workforce and new housing developments, invariably contributing more traffic to an already congested transportation infrastructure. Hence it is critical the current model be updated to account for all the unexpected and fast-paced growth of the last five years and replicate the most-current traffic conditions as closely as possible. The consultant shall update demographics, socio-economic data, transportation networks, and all other key input data items of the model as appropriate to reflect Year 2015 conditions.

#### Task 2 Update Socio-Economic Forecasting Methodology

The existing setup of developing regional population, household, and employment forecasts under interim and horizon year conditions is a manual process performed externally using spreadsheets and imported in to TransCAD®. Although, the process in itself is acceptable in principle, the database manipulation and translation actions are considered to be very tedious and convoluted in nature. BCDCOG is of the opinion that the present methodology employed is challenging to navigate via the use of multiple spreadsheets and formulations, and is prone to potential errors.

In addition, the land use forecasts developed through the application of GIS-based land use planning and analysis software: CommunityViz® is not fully integrated in to the modeling process. The result is a weak

representation of an otherwise symbiotic relationship between land use and accessibility – an interaction that is inherent to modeling traffic conditions. Therefore, the consultant shall develop a methodology that sufficiently addresses the above challenges and integrates and automates the forecasting procedure in a way that is transparent and straight-forward to apply without the active or direct use of spreadsheets.

### **Task 3 Update Trip Generation Functionality**

The consultant shall review and revise existing parameters of trip generation functionality to account for three distinct population groups: retirees, college students, and tourists. These groups, especially predominant in Charleston County, are observed to have unique trip-making characteristics and are currently considered to be under-represented in the TDM. It is imperative that the present cross-classification method of trip production be appropriately revised to potentially include age as one of the criteria in order to adequately capture travel behavior of retirement and college-going student communities. In addition, the current trip segmentation representing four generic trip purposes warrant further classification to include home-based *college* (HBC) and non-home-based *work* (NHW) purposes.

The consultant shall also research and incorporate techniques to account for tourist trip generation and its seasonal variations in annual flows. BCDCOG will facilitate the consultant in obtaining any tourist-related data collected by other third-party organizations to successfully implement this vital component. In the absence of any data, the consultant shall employ acceptable method(s) of tourist trip generation or as recommended in the ITE Trip Generation Manual. It should be noted that no new surveys of any type shall be carried out as part of this task and only past survey records shall be made available to the consultant.

### **Task 4 Update Trip Distribution Module**

Given the regional topography comprising several water bodies and bridges, it is important that the model mimics or at least attempts to account for psychological effects of choosing destinations that involve crossing a large geographic barrier. Based on recent research, it is widely perceived that the traditional gravity model technique is not the preferred distribution model to produce the best possible predictions of travelers' destination choices between origin-destination pairs, especially in the context of accounting for natural barriers such as rivers and bays. The consultant shall propose an appropriate approach to seamlessly transition from the current gravity model trip distribution method to a destination choice method but within the context of utilizing available resources in the model.

### **Task 5 Update Mode Split Structure**

BCDCOG has concerns that the present mode split function is overstating the motorized trips for short distances by way of overlooking travel by non-motorized modes. Given the central business district of the City of Charleston (peninsula area) has a high concentration of educational institutions, there is a pressing need to incorporate a non-motorized alternative to account for mobility by college students and others who prefer or tend to walk and bike. The consultant shall closely review the current mode split structure and determine the most-appropriate approach that allows for representation of non-motorized trips in the TDM.

Since the local transit ridership has experienced a two-fold increase during the course of the last decade and Charleston Area Regional Transportation Authority (ARTA) has continued to expand its transit services, BCDCOG expects the consultant to also incorporate two critical updates to the current mode split function: (1) represent peak and off-peak period transit characteristics; and (2) generate transit access paths by using the actual (GIS) roadway network and allow for trade-offs between walk and drive options.

### **Task 6 Perform Model Re-Calibration**

The consultant shall perform model calibration and validation as necessary post incorporating the preceding updates. The current measures-of-effectiveness (MOEs) shall be employed in addition to any potentially new ones that the consultant deems necessary to verify the reasonableness and efficacy of the TDM. The reasonableness checks shall focus on calibrating and validating both highway assignment and transit assignment model results as compared to the observed data (i.e. Year 2015 ground counts).

### **Task 7 Improve User Interface**

The existing user-interface warrants a major overhaul both in terms of appearance and functionality. The newer updates proposed to be implemented shall be the basis and driver of the new interface design. However, the current basic functionalities will continue to remain in order to facilitate performing base and future model applications for TIP and LRTP update processes. The consultant shall coordinate and work closely with BCDCOG on every aspect of the design and individual features that constitute the new user-interface. The interface shall be tested and debugged prior to delivering it to BCDCOG.

### **Task 8 Support LRTP and CMP Update Process**

BCDCOG is the designated staff for the CHATS Policy Committee and is also embarking on updating the regional LRTP as well as CMP in tandem with updating the CHATS TDM. The CHATS LRTP sets priorities for spending federal funds on transportation projects in the region while the CMP includes developing cost-effective methods to monitor and evaluate the existing performance of the regional transportation systems. The consultant shall provide technical support as necessary in the form of interfacing with the updated TDM for generating and simulating transportation scenarios to aid in the project selection and prioritization process and overall development of the LRTP vision as well as that of the CMP. The model update consultant is expected to coordinate closely with the consultant selected for the LRTP/CMP update and as instructed by the BCDCOG planning staff directly associated with that update process.

At the conclusion of the TDM update efforts, the consultant will appropriately document all key changes and enhancements incorporated in the forecasting tool and prepare a draft technical report for submission to BCDCOG. Any comments and suggestions by the agency staff to the draft report shall be fully addressed and incorporated in the final technical report. The consultant will also submit all electronic files associated with this effort in an appropriate storage device along with the final report or alternatively transmit them via FTP site to BCDCOG. In addition, the consultant shall organize and conduct one hands-on training class for agency staff to learn and apply the new updated TDM.

## **5. SCHEDULE**

Responders to this RFQ are invited to submit a detailed flow diagram of tasks, milestones and schedules as part of this RFQ. Detailed scheduling of the project tasks may be negotiated during the contract discussions by the selected consultant and the BCDCOG staff. The contract for the scope of work will be based on a fee schedule with a not-to-exceed amount. Project fee and cost estimates are not considered binding evaluation criteria. Notice to Proceed (NTP) for this project will be given as soon as a contract with the consultant has been executed and all state and federal requirements are met. The consultant must agree to begin work upon issuance of the NTP by the BCDCOG.

## 6. QUALIFICATIONS

The consultant must demonstrate qualifications in the area of travel demand / traffic modeling including data collection, model development, model calibration and validation, model application, updating and re-calibrating older models, and use of geographic information systems. The staff assigned to the project must have sound knowledge and experience in urban transportation modeling, specifically working with TransCAD® software system. The qualifications should provide specifics on the experience of the staff assigned to key tasks including level of involvement and names of contact persons in similar or comparable projects.

## 7. SELECTION CRITERIA & PROCESS

All qualifications received shall be evaluated against established criteria by a Consultant Selection Committee at the BCDCOG, assisted by other technical personnel as deemed appropriate for the purpose of selecting the consultant with whom a contract will be executed. The BCDCOG reserves the right to reject any and all qualifications in whole or in part if in the judgment of the Consultant Selection Committee the best interest of all parties will be served.

The following are the criteria and weight of consideration in evaluating the qualifications:

**Understanding the Need / 15 Points** – The consultant must demonstrate a clear and thorough understanding of the need to undertake the aforementioned enhancements to the CHATS TDM.

**Method of Approach / 25 Points** – The consultant must include a detailed methodology and the type of deliverables under each task presented in the RFQ. Evaluation will be based on comprehensiveness and completeness of the proposed approach and deliverables.

**Technical Expertise / 20 Points** – The consultant must demonstrate past performance and provide specific examples of similar or comparable projects that either met or exceeded industry standards.

**Key Staff / 15 Points** – The consultant must highlight relevant experience and qualifications of key personnel to be assigned to this particular effort and their degree of availability and involvement in each task.

**Cost and Schedule / 20 Points** – The consultant must provide a time and cost estimate for each task based on the services enumerated and the assumed project time frame

**DBE Participation / 5 Points** – Evaluation shall be based on extent and participation of certified Disadvantaged Business Enterprises (DBEs) that the consultant plans to involve to perform the tasks of this RFQ.

## 8. SUBMITTAL FORMAT

The submittal of technical qualifications from the consultant shall include the following elements at a minimum. However, the consultant is permitted and encouraged to include any additional material that is deemed appropriate and pertinent to assist the BCDCOG in its decision.

- a) Letter of Interest
- b) Qualifications of Firm
- c) Understanding of Project
- d) Method of Approach

- e) Key Personnel including CVs
- f) Relevant Project Material
- g) Cost and Schedule

Changes in the consultant key personnel during the 90 days following the date of receipt from what is identified in the RFQ will be considered a change of scope and will be grounds for rejection of the qualifications. The consultant is requested to list all current or anticipated assignments of the staff proposed for this effort and their individual percent availability. BCDCOG reserves the right to contact a firm to obtain written clarification of information submitted and to contact any references to obtain information regarding performance reliability and integrity.

All qualifications shall be submitted in a sealed envelope. The outside of the package shall be marked "Request for Qualifications – CHATS Travel Demand Forecasting Model Update". **The consultant must mail one (1) original and four (4) hard copies of the final submittal to:**

ROBIN MITCHUM  
Finance Manager  
BCD Council of Governments  
1362 McMillan Ave., Suite 100  
North Charleston, SC 29405

An electronic copy of the final submittal (preferably in PDF format) must be included in an acceptable storage device and transmitted along with the hard copies to the address above. **All submittals must be received no later than 3:00 PM on Friday, October 14, 2016.** Any submittal received after the date and time specified will be rejected, considered non-responsive, and will not be opened.

All questions and requests for clarification must be submitted in writing no later than end of Friday, September 30, 2016 addressed to Shivaprasad Shivananjappa (Shiv) by mail to BCDCOG, 1362 McMillan Ave., Suite 100, North Charleston, SC 29405, via email to [shivs@bcdcog.com](mailto:shivs@bcdcog.com), or by facsimile to: (843) 529-0305. Addenda to this RFQ, including responses to questions and any modifications will be posted on the BCDCOG website at [www.bcdcog.com](http://www.bcdcog.com)

## 9. ADDITIONAL INFORMATION

The consultant will coordinate with the BCDCOG staff in identifying and obtaining all relevant datasets and files related to this effort after formally executing the contract and issuing an NTP. BCDCOG will make concerted efforts to ensure all input model files especially traffic analysis zones, master highway network, and master transit network are accurate and compatible to the extent possible. However, the consultant will be obligated to undertake additional quality control checks of all model files as warranted prior to implementing the enhancements full swing as part of this effort. BCDCOG staff will be available to work closely with the consultant to rectify any potential errors identified by the consultant in the input model files.

BCDCOG retains the right to reject all qualifications received and to re-solicit if deemed to be in its best interests. Selection is also dependent on the execution of a mutually acceptable contract with the successful consultant. Each consultant shall state that its qualifications are valid for a period of not less than ninety (90) days from the date of receipt. All plans, calculations, maps, digital files, reports, correspondence, minutes of meetings, and related data generated during this project will be transmitted to and owned by the BCDCOG.

Final payment will not be made to the consultant until the initiative is completed to the satisfaction of the BCDCOG staff. The type of contract is a cost plus fixed fee with a contract maximum with all costs subject to pre-award and final audits.

All responders must visibly mark as “CONFIDENTIAL” each part of their submission that they consider to contain proprietary information the release of which would constitute an unreasonable invasion of privacy. All unmarked pages will be subject to release in accordance with law. Proposer should be prepared, upon request, to provide justification of why such materials should not be disclosed under the South Carolina Freedom of Information Act, S.C. Code Section 30-4-10, et seq.

Federal funds received by the BCDCOG will be used as a component of the overall funding of this project. Accordingly, the selected consultant will be required to comply with all applicable Federal regulations and contracting provisions required by the federal funding authority, including 49 CFR Part 31 – Allowable Costs, Civil Rights, Minority Business Enterprise, and other applicable assurance provisions. Consultants and sub-consultants shall comply with FHWA Order 4470.1A “Certification of Indirect Costs” in Accordance with FAR. Additionally, the procurement must comply with state and local requirements applicable to such procurement process and contracts. BCDCOG strongly encourages the use and involvement of DBEs on this project.

## **10. SIGNATURE REQUIREMENTS**

Qualifications must be signed by a duly authorized official of the responder. Consortia, joint ventures, or teams submitting qualifications, although permitted and encouraged, will not be considered responsive unless it is established that all contractual responsibility rests solely with one contractor or one legal entity, which shall not be a subsidiary or affiliate with limited resources. Each response should indicate the entity responsible for execution on behalf of the proposed team.