REQUEST FOR PROPOSALS

Model Development Technical Support

The Atlanta Regional Commission (ARC) is seeking proposals for consultant services related to ARC’s activity-based model (ABM). The Scope of Service for the work is attached as Exhibit A and provides detailed information regarding the level of effort required as well as specific tasks to be accomplished.

It is anticipated that available funds for the project will be approximately $550,000. Any contract award for this study is contingent upon ARC receiving adequate funding for this purpose from the Georgia Department of Transportation. ARC intends to award the contract to cover work during CY 2020 and CY 2021. A detailed task list for CY 2020 and CY 2021 has been provided under Exhibit A.

Interested firms should submit a proposal that addresses the factors listed below and the scope of services in Exhibit A. In addition, the Consultant should provide a detailed breakdown of the proposed budget in the format of Exhibit B and a breakdown by task in the format of Exhibit B-1.

Firms or teams of firms must respond to this RFP with written proposals as well as electronic versions of their proposals in either Microsoft Word compatible word processing format or a PDF file. Proposal evaluation will focus initially on the written proposals. Should it be determined that interviews are required, a “short list” of firms will be selected from the proposals received. The shortlisted firms will be invited to participate in an interview process with the evaluation committee to be scheduled for the week of February 24, 2020. ARC will confirm an interview time with those firms selected for an interview. ARC reserves the right to award this contract based on initial proposals received without formal interviews.

ARC anticipates that a contract will be awarded in March 2020 with all work to be completed by December 31, 2021. The successful firm or team of firms should be prepared to begin work immediately. ARC reserves the right to award all or part of the available funds for this project.

ARC must receive ten (10) hardcopies of the proposal, as well as one electronic copy, no later than 4:30 p.m. on Wednesday, February 19, 2020. Proposals shall not exceed a total of 50 pages including resumes and firm experience. Font size should be at a minimum of 10 point. Please send proposals to:

Atlanta Regional Commission
ATTN: Kyeil Kim
Proposals must include the following information:

1. Name of lead firm and any sub-consultants.
2. Point of contact (name, title and phone #) at lead firm.
3. Description of relevant experience on projects of this type.
4. Qualifications and technical competence of consultant/or sub-consultants in the type of work required.
5. Description of experience on similar projects including a list of references with current contact information.
6. Listing of key project personnel and their qualifications.
7. Geographic location of the consultant’s office performing the work.
8. A detailed description of the technical approach proposed for accomplishment of the work.
9. A proposed schedule and work plan for the accomplishment of the work described in Exhibit A. The work plan should include estimated hours by task identified in Exhibit A.
10. A proposed project budget for CY 2020 and CY 2021 in the formats at Exhibits B and B-1.
11. Completed certification and DBE information at Exhibit C.
12. Any other pertinent information.

The review of written proposals will be based on the following evaluation criteria, with the relative weights in parentheses:

1. Experience in advanced modeling including activity-based model and established expertise in modeling a broad range of policy issues and emerging technologies (40%)
2. Experience, availability and ability of staff members in firm assigned to project to complete the project on the required schedule (25%)
3. Extensive experience and knowledge in the development of practical model applications and data processing (20%)
4. Demonstrated writing skills that thoroughly document and effectively communicate the project to a broad audience including transportation planners, local elected officials and citizens (10%)
5. Proposed budget (5%)

If your firm does not wish to propose on the study, please notify ARC as soon as possible. A negative response will not prejudice consideration of your firm in competition for future ARC contracts. However, failure to respond either positively or negatively will be considered a lack of interest and your firm’s name may be deleted from the agency’s prospective Consultant file.
It is the policy of ARC that Disadvantaged Business Enterprises (DBEs) (49 CFR Part 26) have the maximum opportunity to participate, either as contractors or as subcontractors, in the performance of Commission contracts to the extent practical and consistent with the efficient performance of the contract. ARC’s current DBE goal is 17.61%. Information regarding ARC’s DBE Program can be found at https://atlantaregional.org/about-arc/business-services-finance/arc-business-opportunities/.

Additional information should not be required to respond to this RFP. However, technical questions should be submitted to Kyeil Kim in writing and received no later than 4:00pm Friday, January 31, 2020. Written questions should be mailed to the address above or submitted by email to kykim@atlantaregional.org. Questions and responses will be posted on the ARC website by 4:00pm on February 5, 2020.
EXHIBIT A
SCOPE OF SERVICES

I. General: The work to be accomplished by the Consultant(s) is in support of the following ARC work program component:

Cost Center ---- 006CMS ABM Support and Development

II. Definition of study area: The Consultant shall perform all the necessary services provided under this contract within the Atlanta Metropolitan Transportation Planning Area. This includes all of the following twenty-two counties: Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Pike, Rockdale, Spalding, and Walton.

III. Categories of services that shall be performed: The Consultant shall perform and carry out the following work and services in a satisfactory and proper manner, as determined by ARC:

- **Task 1: Activity-Based Model Support.** The Consultant will provide technical services for the following tasks:

  1. Provide general activity-based modeling technical support, including the participation in bi-weekly conference calls to discuss progress-to-date, assist ARC staff in making key decisions, and coordinate amongst team members on various ABM tasks.
  2. Attend three one-day on-site interim progress meetings to report the progress to date and to plan remaining tasks. Two interim progress meetings will be held in the first year and the third meeting in the first half of the second year.
  3. Report final progress in one one-day on-site meeting in the end of the second year.
  4. Implement a schedule-based transit assignment by automating coding of pattern-based GTFS feeds from transit systems onto the ARC ABM transit network.
  5. Assist in the development of FTA’s STOPS model applications by ensuring that the ARC ABM is FTA New Starts compliant, tested and ready.
  6. Support cloud computing solutions for running the ARC ABM.
  7. Assess software platforms in landuse forecast modeling and their integration with a regional activity-based travel demand model.
  8. Assess software platforms in travel demand modeling in terms of their GIS capability, highway and transit network coding, scripting, highway and transit assignment methods, reliability, and speed.

- **Task 2: Enhancement in Toll Modeling.** The interstate highway system in metro Atlanta includes managed lanes including high occupancy toll (HOT) lanes. Currently,
the HOV (non-toll) facilities exist on the interstate highways inside I-285, while the HOT facilities serve traffic outside I-285 on I-85 north and I-75 south. In the mode choice structure of the ARC ABM, auto trips are categorized by drive alone, shared ride 2, and shared ride 3+ trips, each of which is further segmented by free and toll-eligible trips. The ABM performs a multiclass highway assignment to load each of these trips onto the highway network.

The ARC ABM employs a toll optimization process for HOT facilities to estimate tolls that are used to assign toll-eligible trips onto the managed lanes. The purpose of this process is to ensure that the HOT facilities can maintain a minimum level of service as an efficient alternative to general-purpose interstate facilities. The toll optimization process, however, is challenging in that the ARC ABM is structured with five time-of-day periods and the highway assignment for each period relies on a traditional static assignment. Also, the current optimization involves an iterative process and manual adjustments, which are time-consuming.

In this task, the Consultant will assess the current toll optimization process in the ARC ABM for its effectiveness. The Consultant will develop a methodology to overcome the challenges imposed by static assignment and to improve the process by speeding up the process while minimizing iterative and manual adjustments. The current ARC ABM will be modified and tested with these enhancements. The testing will be first performed for the base year 2015 to validate against the 2015 toll usage data obtained from the State Road and Tollway Authority (SRTA). After base year validation, a future year model will be tested to ensure reasonableness in toll assignment on planned HOT facilities in metro Atlanta.

• **Task 3: Transition to ActivitySim.** The ARC ABM is built in a framework using the CT-RAMP (Coordinated Travel Regional Activity-Based Modeling Platform) engine. The CT-RAMP is a Java-based package that consists of several choice models to generate and distribute travel demand by mode. In 2019, ARC started a process of converting the CT-RAMP to a Python-based ActivitySim platform. The main impetus of this transition is to make the ABM operate more efficiently in terms of stability, computational advantages, compatibility with modeling software and exogenous tools, and speed.

In this task, the Consultant will evaluate all conversion work performed to date, suggest a next phasing plan and execute and finalize the conversion process. The conversion work shall involve a rigorous QA/QC process by ensuring that the converted ActivitySim model can replicate the current CT-RAMP based ABM in every modeling component. After conversion, the Consultant is expected to provide a training for ARC staff and a
user guide. The training session and the user guide shall cover the new features of the converted ABM, model operation and maintenance, and scenario analysis.

- **Task 4: Model Area Expansion.** In this task, the current 21-county modeling area will be expanded to include all of Pike County. The Consultant will assist ARC staff to build transportation network, traffic analysis zones, and external stations. The existing Population Synthesizer will be revised with the added area and the associated control totals will be updated. The ARC ABM will be recalibrated and revalidated with addition of the expanded model area.

- **Task 5: Automated Vehicle Modeling.** The ARC ABM has been tested with a number of scenarios related to implementation of automated vehicles. With numerous factors affecting AV modeling, the scenario testing was limited to changes in capacity, and adjusting travel time utility, vehicle operation cost, and parking cost.

In this task, the AV modeling will be further extended by investigating other potential impacts of automated vehicle operations on metro Atlanta traffic. The Consultant will look at what other MPOs with an ABM are doing with reference to automated vehicles. The subject of the AV modeling will include, but not limited to, different market penetration levels, shared AV scenarios, varying auto ownership levels between automated vehicles and conventional vehicles, and the effect of empty vehicles on the overall VMTs and congestion level of the metro Atlanta. The Consultant will develop methodologies to reflect each of these assumptions and fit the current ABM to allow for testing of the assumptions. A series of scenario analysis will be performed for each of the assumptions made. Based on the scenario testing, the Consultant will provide ARC with its findings and present potential implications of AVs on the agency’s long-range transportation planning.

- **Task 6: Regional Travel Survey Data.** In 2019, the Regional Transit On-Board Survey was conducted to collect transit rider data and to better understand how the transit services in metro Atlanta were used. Data collected from this survey is a key input to improve transit ridership forecasting in the ARC ABM. The full dataset from the survey will be available in early 2020. At the onset of this task, observed transit trip patterns from the survey will be reviewed and summarized through a QA/QC process, then assigned to the transit network. In addition, the Consultant will ensure that the ARC ABM is in a condition where it is ready to use for transportation planning work, including, but not limited to, the following tests and checks: Evaluate ARC’s ABM outputs of district-to-district flows of linked transit passenger trips by trip purpose, mode of access, and different socio-economic market segments, and compare those to what comes from the Transit On-Board Survey-based district-to-district flows of person
travel movements and patterns. The survey data will also be compared with the data collected from the previous Transit On-Board Survey conducted in 2009 and the difference in transit travel patterns from two surveys will be reported. Then, the Consultant will calibrate and validate the ARC ABM using the information provided from the survey.

The last Regional Household Travel Survey for metro Atlanta residents was conducted in 2011. ARC is planning to update the survey to measure what has happened in travel patterns by household members in the past decade and to obtain the best travel behavior dataset that will ultimately be used to update the ARC ABM. In this task, the Consultant will provide technical assistance to ARC with the USDOT/FHWA’s NextGen NHTS core data collection with the accompanying passive origin-destination data collection, as well as the add-on purchase of the data.

- **Task 7: ABM Visualization Tool Enhancements.** The Activity-Based Model Visualization Platform (ABMVIZ) is a post-processing addition to the ARC ABM that creates standard visuals based on the model results. These visuals are used by the ARC staff to understand the model results and present them to other staff members in a more approachable way.

  In this task, the ABMVIZ will be rebuilt from the current static website to a dynamic tool that helps ARC staff understand the model results and identify potential model issues and unexpected results quickly and easily. The Consultant is expected to transition the current GitHub-based platform into the R-based RMarkdown platform to generate visuals. The new platform will feature visuals substantially similar to the existing visuals in the current ABMVIZ. Also, the new ABMVIZ should be able to facilitate the addition of new visuals by ARC staff with minimum effort.

- **Task 8: Air Quality Modeling Support.** The Consultant will support ARC staff by providing on-call assistance in processing model output data required for MOVES and provide script updates with any potential changes in MOVES.

- **Task 9: Landuse Forecast Disaggregation Application Support.** The ARC landuse forecast disaggregation tool is an ArcGIS-based application. It is used to generate input data for the ARC ABM by disaggregating regional socioeconomic forecasts to traffic analysis zones. The Consultant will work on improving ARC’s current forecast disaggregation application (TAZD), provide computer programming services to assist other ARC landuse modeling programs, and work with ARC staff to develop scenario forecasts.
### EXHIBIT B
Proposed Project Budget
CY 2020 & CY 2021

<table>
<thead>
<tr>
<th>1. Direct Labor</th>
<th>Estimated Hours</th>
<th>Rate/Hour</th>
<th>Total Est. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Direct Labor</strong></td>
<td></td>
<td></td>
<td>$__________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Overhead Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(2 CFR Part 225)</td>
<td>(Overhead percentage rate) X (Total Direct Labor)</td>
</tr>
<tr>
<td><strong>Total Overhead</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Other Direct Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(List other items and basis for computing cost for each. Examples include computer services, equipment, etc.)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Other Direct Costs</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Subcontracts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(For each, list identity, purpose and rate)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Subcontracts</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Travel</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Travel by common carrier from/to the ARC offices. (List number of trips and Economy class airfare, plus taxi and shuttle fares, etc.)</td>
<td></td>
</tr>
<tr>
<td>b. Travel by private automobile within ARC area. (List # of days x rate)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Travel</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Profit (Percentage rate X basis)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Profit</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total Estimated Cost and Profit</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Proposed Project Budget – By Task
**CY 2020 & CY 2021**

<table>
<thead>
<tr>
<th>TASK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1: Activity-Based Model Support</td>
<td></td>
</tr>
<tr>
<td>Task 2: Enhancement in Toll Modeling</td>
<td></td>
</tr>
<tr>
<td>Task 3: Transition to ActivitySim</td>
<td></td>
</tr>
<tr>
<td>Task 4: Model Area Expansion</td>
<td></td>
</tr>
<tr>
<td>Task 5: Automated Vehicle Modeling</td>
<td></td>
</tr>
<tr>
<td>Task 6: Regional Travel Survey Data</td>
<td></td>
</tr>
<tr>
<td>Task 7: ABM Visualization Tool Enhancements</td>
<td></td>
</tr>
<tr>
<td>Task 8: Air Quality Modeling Support</td>
<td></td>
</tr>
<tr>
<td>Task 9: Landuse Forecast Disaggregation Application Support</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
</tbody>
</table>
EXHIBIT C

Title VI and DBE Requirements
For Prime Contractors and Sub-grant Recipients

TITLE VI

ARC, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000D to 2000D4, and Title 49, Code of Federal Regulations, Department of Transportation Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally assisted programs of the Department of Transportation, issued pursuant to such Act, hereby notifies all Respondents that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises shall be afforded full opportunity to submit proposals in response to this invitation and shall not be discriminated against on the grounds of race, color, sex, handicap, or national origin in consideration for an award.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION

Overall DBE Goal: As part of its DBE Plan, ARC has an established overall goal of 17.61 percent.

Program Intent. ARC has established a Disadvantaged Business Enterprise (DBE) program in accordance with regulations of the U.S. Department of Transportation (DOT), 49 CFR Part 26 ("Part 26" or "DBE Regulations"). ARC has received federal financial assistance from the Department of Transportation for this contract opportunity, and as a condition of receiving this assistance, ARC has signed an assurance that it will comply with Part 26.

It is the policy of ARC to ensure that DBEs, as defined in Part 26, have an equal opportunity to participate in its DOT-assisted contracting opportunities. It is also ARC’s policy:

(a) To ensure nondiscrimination in the award and administration of DOT-assisted contracts in the Department's highway, transit, and airport financial assistance programs;
(b) To create a level playing field on which DBEs can compete fairly for DOT-assisted contracts;
(c) To ensure that the Department's DBE program is narrowly tailored in accordance with applicable law;
(d) To ensure that only firms that fully meet this part's eligibility standards are permitted to participate as DBEs;
(e) To help remove barriers to the participation of DBEs in DOT-assisted contracts; and
(f) To assist the development of firms that can compete successfully in the marketplace outside the DBE program.

**Definitions.** Disadvantaged Business Enterprise (DBE) as used in this Contract shall have the same meaning as defined in 49 CFR Part 26. A DBE is a firm in which one or more individuals who are women or eligible minorities own and control at least 51% of the firm.

**Compliance.** All Bidders/Proposers, potential contractors, or subcontractors for this Contract are hereby notified that failure to carry out the policy and the DBE obligations, as set forth above, shall constitute a breach of Contract which may result in termination of the Contract or such other remedy as deemed appropriate by ARC.

**Prompt Payment Requirement.** In the event of contract award, the prime contractor agrees to pay each subcontractor under the prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contract receives from ARC. The prime contractor agrees further to return retainage payments to each subcontractor within 10 days after the subcontractors work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of ARC. This clause applies to both DBE and non-DBE subcontracts.

Any contractor found not to be in compliance with this clause will be considered in breach of contract and any further payments will be withheld until corrective action is taken. If contractor does not take corrective action, contractor may be subject to contract termination.

**Substitution.** The Bidder shall make a good faith effort to replace a DBE Subcontractor that is unable to perform successfully with another DBE Subcontractor. Substitution must be coordinated and approved by ARC.

**Documentation.** The Bidder/Proposer shall establish and maintain records and submit regular reports, as required, which will identify and assess progress in achieving DBE subcontract levels and other DBE affirmative action efforts.

Additional information on ARC’s Disadvantaged Business Enterprise Program can be obtained from:

Brittany Zwald, Contract & Grants Officer, Financial Services Group,
Atlanta Regional Commission
229 Peachtree Street NE; Suite 100
Atlanta, GA 30303
470.378.1494
bzwald@atlantaregional.org
DBE UTILIZATION PLAN (Complete this form for each DBE firm participating in this proposal. This plan will be included in a Title VI and DBE Attachment to all USDOT funded ARC bids and proposals.

Name of bidder/offeror’s firm: ____________________________
Address: ________________________________________________
City: ____________________________ State: _____ Zip: _____

Name of DBE firm: ____________________________
Address: ________________________________________________
City: ____________________________ State: _____ Zip: _____
Telephone: ____________________________

Description of work to be performed by DBE firm:

-----------------------------------------------------------------

-----------------------------------------------------------------

The bidder/offeror is committed to utilizing the above-named DBE firm for the work described above. The estimated dollar value of this work is $______________.

Affirmation

The above-named DBE firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above.

By
(Signature)

>Title)

If the bidder/offeror does not receive award of the prime contract, any and all representations in this DBE Utilization Plan shall be null and void.

(submit this page for each DBE subcontractor)

PLEASE ATTACH A COPY OF THE OFFICIAL DBE CERTIFICATION FORM.