REQUEST FOR PROPOSALS

Atlanta Regional Activity-Based Travel Demand Forecasting Model Technical Support RFP

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. A detailed task list 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-1 and a breakdown by task in the format of Exhibit B-2.

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 October 31, 2022. 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 November 2022 with all work to be completed within two years of the award date. 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 Friday, October 14, 2022. 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: Steve Lewandowski
229 Peachtree St. NE, Suite 100
Atlanta, GA 30303

Proposals must include the following to be considered responsive:

1. Name of lead firm and any sub-consultants.
2. Point of contact (name, title, phone number, mailing address, and email address) 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 at least 3 references within the past 5 years, 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 and by task for two years after contract award in the formats at Exhibits B-1 and B-2.
11. A DBE Utilization Plan in the format 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 Steve Lewandowski in writing and received no later than 4:00 pm Wednesday, September 28, 2022. Written questions should be mailed to the address above or submitted by email to slewandowski@atlantaregional.org. Questions and responses will be posted on the ARC website by 4:00 pm on October 3, 2022.

EXHIBIT A
SCOPE OF SERVICES

I. General:

The work to be accomplished by the Consultant is in support of the following ARC work program component:

Cost Center 006CMS - ABM Support and Development

II. Definition of Study Area:

All the necessary services provided in this contract will support the 21-county ARC modeling domain, including the current Metropolitan Atlanta Transportation Planning Area. This includes area within all the following counties: Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Rockdale, Spalding, and Walton.

III. Goal:

The Regional Activity-Based Travel Demand Forecasting Model Technical Support program was established to ensure that model development and applications meet the needs of the ARC. This model technical support program is a key tool in maintaining the Atlanta Regional Commission's (ARC) commitment to creating world class transportation infrastructure and travel demand modeling technical tools. This is accomplished through the maintenance and support of currently existing models needed to develop ARC's long-range transportation plan updates. These models, while focused on forecasting travel demand, also serve as the foundation for local and regional planning efforts to win the future, led by the Atlanta Regional Commission.

Coordination with the regional transportation planning process will help ensure ARC develops plans that rely upon the latest and greatest trends in travel behavior & models and are based upon sound technical analysis.

IV. Background:

The regional activity-based travel demand forecasting model technical support program will assist ARC by clearly defining model development goals, needs, and priorities. While ARC typically completes needs assessments and transportation plans focusing on regional needs and solutions, a successful travel demand technical support program is also critical. It is a critical program objective that these model updates and enhancements will form the basis for future model run requests during Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP) update cycles. No RTP can be successfully implemented without a well maintained and calibrated travel demand model.

Transportation plans resulting from model runs will also inform existing county and city comprehensive plans, thereby strengthening the connection between land use and transportation planning, via a fully integrated transport / land use modeling approach. Technically sound and robust models supporting plans must address all Federally mandated Planning Factors as outlined by the FAST Act, as well as Section 11205 of the Bipartisan Infrastructure Bill, the Infrastructure Investment and Jobs Act (IIJA), including "to support more accurate travel demand forecasting", and to enhance ARC's capacity "to forecast travel and track observed travel behavior".

All work tasks refer to the development of the ARC model. Comprehensive progress reports detailing progress on each task will be submitted to ARC with each invoice, which will occur monthly.

V. Work Tasks:

Task 1 – Model Support Project Management and Overall Technical Assistance

The Project Management task will identify those steps and model updates which must be involved in the overall direction of the ARC model development process due to the critical nature of their technical support, including the maintenance of the currently existing Atlanta regional STOPS model application developed for ARC. The Project Management will establish protocols for communicating and sharing data, drafting materials for review, and developing other resources within the Project Management Team. A schedule for bi-weekly meetings of the team with ARC modeling staff will be established and preliminary dates for key work task milestones, contractual deliverables and decision-making points will be defined.

Contractual deliverables will include a thorough documentation of meetings, metadata, and model documentation associated with work products, as currently maintained in ARC Model Documentation (atlregional.github.io).

Task 2 – Supply Side Data: Roadway and Transit Network Coding Enhancements

This task will initially explore an agile, platform-agnostic approach to roadway and transit network coding, akin to a geodatabase, but with all the hooks necessary to be easily portable into any of the currently existing travel demand model software, within the context of a multi-resolution modeling (MRM) approach.

The starting point for this task is the ARC regional roadway and transit network from the ABM. This provides basic roadway alignment, through lanes, centroids, and centroid connectors locations. Traditionally, the ARC static assignment regional network does not include intersection details such as turn lanes and turn lane pockets, which is usually found in a mesoscopic, regional dynamic traffic assignment network. For transit, when available (especially for the baseline network year), GTFS info will drive transit network coding decisions. The resulting imported network will include the true shape of the links, not a "stick" network, and will be consistent with OSM. Lane use restrictions, such as those applied to reversible lanes for Express Toll Lanes, HOV and HOT lanes geometric configurations will be obtained from the operating agency, in this case SRTA. The portfolio of GIS techniques employed will be designed to maximize the potential for a broad range applicable to any travel demand modeling software. Efforts to emphasize seamless portability will be most directly impacted by recommendations. This task will maintain the geospatial accuracy and reliability of the baseline networks, while leveraging a variety of sources to create updated versions of the roadway and transit networks. The development of the baseline network for use in ARC's model calibration represents a major step forward in the creation and maintenance for both existing and future transportation networks. However, the next step is a geodatabase and maintenance system that allows users to build and maintain multi-year networks over multiple existing and forecast network-years. Ultimately, this task will provide ARC the ability to support multi-resolution modeling, including the integration with macroscopic, mesoscopic and microsimulation traffic analysis in a consistent manner, all while leveraging ARC's Signalized Intersections Geodatabase. In addition, this task will improve the speed and accuracy of roadway and transit network coding via effective user interfaces, to facilitate regional macro-scale network coding and true-shape alignment details. Considerations will be given to GMNS (General Modeling Network Specification) to facilitate regional scale, sub-regional scale and corridor level traffic analysis.

Contractual deliverables will include a strategic plan aimed at accomplishing this task, as well as all accompanying datasets and data dictionaries.

Task 3 – Regional Activity-Based Travel Demand Forecasting Model Calibration & Validation

As data from the NextGen NHTS becomes available (from both the passively collected origin-destination data via NHTS NextGen OD Data (ornl.gov) and Planned Passenger Travel Origin

Destination Zone Information - Policy | Federal Highway Administration (dot.gov) as well as the 2023-2024 local add-on traditional household travel survey, for more info see TPF - Solicitation Details (pooledfund.org), ABM calibration will take place in a multi-phased strategic model development approach. NPMRDS and INRIX data (including INRIX Trips Origins-Destinations Analytics) will be available. In addition, the 2019 and 2020 Atlanta/Georgia local add-on passenger origin-destination dataset from NextGen NHTS will be at the 2020 Census block group level. The calibration baseline year will be 2019/2020, while also considering pre-pandemic and post pandemic (2020X) travel conditions. Calibration will focus on the CT-RAMP ABM currently in production mode, including the recently re-calibrated mode choice model based upon the 2019 regional transit on-board survey, the accompanying 2019 regional one-day transit rider tour diary survey, as well as the 2019 ARC Regional Commuter Survey - ARC (atlantaregional.org), in addition to CTPP, ACS and LEHD-LODES data. A parallel, dual model calibration effort will also be explored with the ActivitySim Atlanta model prototype recently developed.

Contractual deliverables will include a model calibration strategic plan, calibration report, "Big Data" analytics featuring CSV files in an R-studio environment, cutlines and screenlines analysis, and travel survey results analysis specific to the Atlanta region.

Task 4 – Ancillary Models Update

This task will focus on updating and calibrating ARC's ancillary models, such as the externals model, the trucks model, and the air passenger model (including, but not limited to, the Atlanta airport ground access mode choice model update with data from the airport master plan update ATLNext). In addition, this task will design a college & university students travel model from local available survey data, to better represent and account for travel from this market segmentation, in relation to their group quarters characterization. The currently available university students travel behavior survey (conducted at Georgia Tech in 2017-2018-2019-2020-2021 and available in an anonymized CSV format) would allow to better characterize students' commute choices from a pre-pandemic and post-pandemic perspective, and revisit certain aspects of the ARC ABM, such as University Location Choice Model Parameters, University Tour Time-of-Day Choice Model Parameters, University Tour Mode Choice Model Parameters, University Tour Stop Frequency Model Parameters, and University Trip Mode Choice Model Parameters.

Contractual deliverables will include ancillary model development documentation, ancillary model applications procedures, and all accompanying data analysis reports.

Task 5 – Transport / Land Use Model Integration

This task will support the necessary data exchange protocols between ARC's ABM and ARC's Production, Exchange, and Consumption Allocation System (PECAS) land use model, including ArcGIS based Traffic Analysis Zone Disaggregator (TAZD), and feedback loops between the transport and land use models. In addition, it will support any other integration, such as the ABM with REMI TranSight, as necessary. Considerations will be given to current and future land use planning to update ARC's demographic projections, as part of ARC's major plan update.

Contractual deliverables will include data exchange protocols, model scripting necessary to accomplish the proper integration between the transport model and the land use model, and all accompanying datasets, documentation, and metadata.

Task 6 – Travel Demand Modeling Software Scripting Assistance

This task will assist ARC staff with model software scripts as needed, including, but not limited to, Bentley's CUBE / Emme, PTV's VISUM, and Caliper's TransCAD. Select link analysis, select zone analysis, regionally significant corridor analysis reporting, are examples where scripting assistance will be needed. This task also includes toll optimization streamlining and model run-times assessment, in the spirit of more efficiently represent and account for Express Toll Lanes and various pricing algorithms in the Atlanta region. In addition, this task will re-evaluate the need to include toll and non-toll nests within mode choice (as well as toll and non-toll eligibility in mode choice to determine toll facility usage with a generalized cost function for toll eligible trips), as compared with using willingness-to-pay curves for each traffic assignment iteration to generate toll probabilities to split demand tables into toll and non-toll traffic. Also consider adding light commercial vehicles, with passenger cars, as toll eligible in the express lanes vehicle classification model operations, all in conjunction with GDOT and SRTA/GRTA policies.

Contractual deliverables will include all model scripts deemed necessary by ARC staff, as well as a series of re-evaluation reports re-assessing ARC's approach to express toll lanes modeling and necessary model re-estimation reports (mode choice, route choice, etc.).

Task 7 – ActivitySim Technical Support & Assistance

This task will assist ARC modeling staff with the ongoing deployment & development of ARC's draft / work-in-progress ActivitySim prototype model implementation https://github.com/ActivitySim/activitysim/tree/master/activitysim/examples/example_arc, along with accompanying Python scripting, Quality Assurance / Quality Control, and troubleshooting. In addition, this task will assist ARC staff specifically with the testing of ActivitySim, in parallel with CT-RAMP, for ARC's major plan update, and accomplish the

necessary comparative analyses and sensitivity testing of model results, including stress-testing under extreme conditions. For instance, test to evaluate if in-vehicle coefficients are set at a high order of magnitude, making the model overly sensitive to in-vehicle time changes. This task will also determine the level of readiness of the ARC ActivitySim prototype, in the spirit of a parallel / dual track of model development featuring a strategic phase-out of CT-RAMP, and a phase-in of ActivitySim into a sustainable production model for the ARC planning activities.

Major ActivitySim deployment considerations will include but are not limited to: Transparency and replicability of the model structure and accompanying user-interface scripting, model documentation, core functionality of the roll-out deployment, required inputs and format of outputs for exporting model results into visualization tools, user-friendliness of the model's GUI, run-time performance monitoring and enhancements. A major focus will be placed upon upgrading from one version of ActivitySim to another version, in terms of model stability and consistency, especially as it pertains to overall model calibration sustainability.

Contractual deliverables will include a thorough documentation of the ARC ActivitySim model development and applications procedures, model users guide, accompanying Jupyter notebooks, and various training sessions aimed at ensuring a smooth transition to ActivitySim from CT-RAMP.

Task 8 – Air Quality & Climate Change Modeling Technical Assistance

This task will support ARC modeling staff with EPA's air quality models, including the recent MOVES3 model. This task will also assist ARC staff working with Georgia's Environmental Protection Division on air quality budgets as needed, as well as all model scripting necessary to ensure proper integration between the ABM and the air quality model.

In addition, this task will assist ARC modeling staff with developing the proper climate change modeling analysis tools, including methods to best quantify the Atlanta region transportation-related carbon footprint and related GHG emissions, based upon daily commute patterns. For instance, metrics such as tons of CO2 per person per year will be explored.

Contractual deliverables will include all model scripts necessary to run the different versions of air quality models, and ABM scripts needed to transfer data from the ABM to the air quality models, as well as an exploratory prototype model-based Atlanta regional carbon footprint calculator and mapping system, including all detailed built-in assumptions for scenario planning.

Task 9 – Travel Demand Model Data Visualization & Mapping

This task will support ARC staff with the maintenance of its visualization tools, dashboards, and interactive mapping. It will also assist with the development of new visualization tools for ARC's major plan update. This task will continue to leverage ARC's existing visualization tools such as ABMVIZ ARC ABMVIZ (atlregional.github.io) and ActivityViz https://atlregional.github.io/ActivityViz/, as well as the suite of visualization tools being developed as part of ActivitySim.

Contractual deliverables will include all necessary programming script for visualization, as well as documentation detailing the various visualization enhancements, including assistance in the maintenance of ARC's visualization tools in GitHub.

VI. Schedule:

Model development updates and calibration, depending upon data availability, take up to 24 months to complete. The main scheduling consideration within this model support program is to ensure coordination with GDOT, USDOT / FHWA and other planning partners and stakeholders to meet timelines and deadlines associated with ARC's major plan update, future Transportation Improvement Programs (TIP) and Regional Transportation Plans (RTP).

EXHIBIT B-1
Proposed Project Budget

1. Direct Labor	Estimated Hours	Rate/Hour	Total Est. Cost
(List by position all professional personnel participating in project)			
Total Direct Labor			**$_____**
2. Overhead Cost			
(OMB circulators A-87 and A-122) (Overhead percentage rate) X (Total Direct Labor)			
Total Overhead			**$_____**
3. Other Direct Costs			
(List other items and basis for computing cost for each. Examples include computer services, equipment, etc.)			
Total Other Direct Costs			**$_____**
4. Subcontracts			
(For each, list identity, purpose and rate)			
Total Subcontracts			**$_____**
5. Travel			
a. Travel by common carrier from/to the ARC offices. (List number of trips and Economy class airfare, plus taxi and shuttle fares, etc.)			
b. Travel by private automobile within ARC area. (List # of days x rate)			
Total Travel			**$_____**
6. Profit (Percentage rate X basis)			
Total Profit			**$_____**
Total Estimated Cost and Profit			**$_____**

EXHIBIT B-2
Proposed Project Budget by Task

Task	Amount
Task 1 – Model Support Project Management and Overall Technical Assistance	
Task 2 – Supply Side Data: Roadway and Transit Network Coding Enhancements	
Task 3 – Regional Activity-Based Travel Demand Forecasting Model Calibration & Validation	
Task 4 – Ancillary Models	
Task 5 – Transport / Land Use Model Integration	
Task 6 – Travel Demand Modeling Software Scripting Assistance	
Task 7 – ActivitySim Technical Support & Assistance	
Task 8 – Air Quality & Climate Change Modeling Technical Assistance	
Task 9 – Travel Demand Model Data Visualization & Mapping	
TOTAL	

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, Contracts and Grants Officer, Financial Services Group, Atlanta Regional Commission, 229 Peachtree Street Suite 100, Atlanta, GA 30303. 470-378-1494, bzwald@atlantaregional.org.

DBE UTILIZATION PLAN

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 $_____. 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 OFFICAL DBE CERTIFICATION FORM