Southeast Michigan Council of Governments

Request for Proposal
Activity Based Model Development

RFP#19-002
March 25, 2019

SECTION I. GENERAL CONDITIONS AND PROVISIONS

A. Objective

The Southeast Michigan Council of Governments (SEMCOG) is requesting proposals from consultants to develop an Activity-Based Model system (ABM) for the SEMCOG region. The development of an ABM continues SEMCOG's efforts in improving the region's travel behavior analysis tools. This new ABM system is anticipated to replace SEMCOG's current trip-based four-step regional travel demand model (TDFM).

B. Issuing Office

This RFP is being issued by SEMCOG, the Southeast Michigan Council of Governments. Technical inquiries concerning the project should be directed to Jilan Chen (Chen@semcog.org). Questions regarding the administrative procedures should be directed to Margaret Warner (Warner@semcog.org).

Questions from consultants must be submitted by Friday, April 26, 2019. Staff answers to these questions will be posted online @ www.bidnetdirect.com//southeastmichigancouncilofgovernments.

C. Proposals

This procurement is subject to a financial assistance contract between SEMCOG, the Federal Highway Administration (FHWA), the Federal Transportation Administration (FTA), and the Michigan Department of Transportation (MDOT). The consultant will be required to comply with all terms and conditions under the provisions of Federal Procurement Regulations, 48 CFR Part 31- Contract Cost Principles and Procedures.

The proposal should include the proposed scope of work, consultant qualifications and experience, a timeline, and costs. Please provide a one page executive summary.

The cost information requested in this section is required to support the reasonableness of your proposal and is for internal use only. The data will be held in confidence and will not be revealed to or discussed with competitors. Costs should be presented in cost plus fixed fee format (governmental regulations require fixed fee to be limited to 11%). Specifically, the cost proposal should include the job titles of positions that will complete the work, including hours and hourly rates.

Present cost by task at a level of detail corresponding to the Work Plan. Clearly articulate all one-time implementation and recurring costs. See Attachment A available at www.bidnetdirect.com//southeastmichigancouncilofgovernments for price proposal format instructions.

SEMCOG anticipates the contract amount not to exceed $800,000

D. Selection Criteria

The contract shall be awarded to the consultant whose proposal offers SEMCOG the greatest advantage for the project - technical, economic, and other factors considered by SEMCOG, as specified in Section II. Consultants may propose additional ideas and recommendations not stated in the scope of services. SEMCOG has a fiduciary responsibility to consider cost when deciding on a consultant. Accordingly, cost is a determining factor in the selection process. SEMCOG seeks to choose the consultant that provides the most value at a reasonable rate. SEMCOG reserves the right to reject any or all proposals, or parts thereof, and to negotiate the requested services and contract terms with the selected consultant.

E. Proposal Receipt

All proposals become the property of SEMCOG and will not be returned. SEMCOG is a public body as defined by Michigan's Freedom of Information Act (FOIA). Upon receipt by SEMCOG all technical proposals become "public records open to disclosure" under FOIA.

Proposals must be received by SEMCOG no later than Friday, May 3, 2019 by 5pm at www.bidnetdirect.com//southeastmichigancouncilofgovernments).

F. Type of Contract

Contract will be executed on SEMCOG Standardized Contract Form (Attachment B) available at www.bidnetdirect.com//southeastmichigancouncilofgovernments). Submission of a proposal by a consultant will be understood as acceptance by that consultant of the contract language.

G. Non-Discriminatory Practices

SEMCOG policies encourage participation by disadvantaged business enterprises (DBE). Please include certification(s) in proposal. SEMCOG, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C 2000d to 2000d-4 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 bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration of this award.

H. Selection

The Selection Committee will make a recommendation to SEMCOG's Executive Director consistent with SEMCOG's procurement process. The Selection Committee is composed of SEMCOG and MDOT staff.

I. Schedule

The proposed schedule for this procurement is as follows: Dates*

RFP Issued	*3/25/19*
Proposals due to SEMCOG	*5/3/19 by 5pm*
Internal review and scoring	*Done by 5/24/19*
Interviews (if necessary) and selection	*Week of June 17th*
SEMCOG Finance & Budget Committee Approval	*Week of July 8th*
SEMCOG Executive Committee Approval	*7/25/19*
Contract Executed and Notice to Proceed upon	*MDOT approval*

**Dates are approximate*

J. Cost Liability

All costs incurred in the submission of proposals or in making necessary studies, designs, or computer benchmarks of estimates for preparation of the proposals are the sole responsibilities of the consultant.

SECTION II. SELECTION CRITERIA

1. Demonstrated understanding of the project 25%
2. Project approach including technical strength and comprehensiveness 25%
3. Overall work plan and schedule 20%
4. Experience of the consulting team 20%
5. Cost consideration 10%

SECTION III. INTRODUCTION AND SCOPE OF SERVICES

Introduction

The Southeast Michigan Council of Governments (SEMCOG) is requesting proposals from consultants to develop an Activity-Based Model system (ABM) for the SEMCOG region. The development of an ABM continues SEMCOG's efforts in improving the region's travel behavior analysis tools. This new ABM system is anticipated to replace SEMCOG's current trip-based four-

step regional travel demand model (TDFM). This project is motivated by the need to develop a new travel demand model system that better supports the region's current and future planning needs by providing rich and detailed information regarding travel patterns under a wide variety of scenarios. These scenarios include the aging of our population, as well as the introduction of new modes that are expected to change travel behavior within the region.

The SEMCOG region consists of the seven counties: Wayne, Oakland, Macomb, Washtenaw, Livingston, St. Clair and Monroe. The city of Detroit is part of Wayne county, but is separated from the rest of Wayne county in SEMCOG's regional model. The entire region has around 4.7 million population in 2015. The current trip-based four-step model runs on personal computers using the TransCAD software platform. The zonal system used by the regional TDFM consists of 2,811 internal zones and 88 external stations. The highway network consists of 35,000 roadway links. SEMCOG's regional TDFM simulates intra-regional travels of persons, commercial vehicles and transit users, as well as external travels with at least one end outside of the SEMCOG region.

In 2018, SEMCOG completed its latest model updates (version E7) which focused on the personal travel portion with calibration/validation year of 2015. Several model enhancements were made, including the usage of disaggregate population synthesis data in the Auto Ownership model. The technical document of SEMCOG's E7 model is listed in Reference Section [1] of this RFP.

However, the four-step model is insensitive to many key policy variables such as age, income, and fuel price. The model is not able to answer many new questions that are being asked in addressing future planning needs, such as the impacts of Autonomous/Connected vehicles (AV/CV), tele-commuting and e-commerce. Over the past several years, SEMCOG has been exploring various options in transitioning regional TDFM to a more advanced model system. In March 2018, SEMCOG joined five other planning partners to develop a common ABM platform, which is called ActivitySim. ActivitySim is currently undergoing the Phase 4 development and anticipated to have a full version release in June of this year. ActivitySim is an open source platform, with technical documentation available online and listed in Reference Section [2] of this RFP.

In order to take advantage of the collaboration efforts from the ActivitySim partners, the Consultant is encouraged to develop an ABM system based on the ActivitySim platform and to a maximum reasonable extent to use the model components from the ActivitySim software. Should non-ActivitySim based model platform or components be proposed, the Consultant needs to provide enough detail in their proposal to justify their choices.

General Requirements

The selected Consultant shall be experienced in the development and application of large-scale ABM systems. The Consultant should be familiar with metropolitan planning and have experience in developing ABM systems that meet all applicable federal, state and local requirements. SEMCOG's current regional travel demand model utilizes the software package TransCAD. The consultant should be familiar with the TransCAD modeling software package and have the ability to integrate the final ABM application within this platform. A prime Consultant may assemble a team of sub-consultants who can conduct these services in accordance with the scope of work

described in this RFP. The prime Consultant shall be required to organize, manage, and direct the work of the sub-consultants.

Project Tasks Description

Outlined below are the suggested nine (9) major tasks of this project to be completed over an anticipated 30-month period. The Consultant is to provide, as part of its proposal, a proposed project work plan, detailed schedule with key milestones, staff commitment and budget for each task, and a cost proposal for completion of the entire project. The Consultant is encouraged to suggest modifications to these tasks outlined in the section under Project Tasks Description to facilitate a successful work program within the allowable resources. Any innovative recommendations, beyond our basic needs, could be included as optional tasks with associated costs.

Task 1 – Project Management and Coordination

This task ensures that there is direction and coordination during the project between SEMCOG staff and the Consultant.

Project Management

The Consultant will prepare a project management plan (PMP) that outlines the project production work plan and quality control procedure for each task. The PMP will delineate roles and responsibilities for the various team members and establish communication protocols including face-to-face meetings, tele-conferences, and web-meetings. The Consultant will prepare and submit monthly progress reports, task-based invoices, and billings with supporting documentation, if applicable.

The project work plan should consider SEMCOG staff's involvement in each major task to support a smooth transition to a new modeling paradigm from the current trip-based model. Consultant effort will focus on helping SEMCOG expand its capability to maintain and update the modeling system in the future. To achieve this goal, the Consultant, in coordination with SEMCOG, should identify a model estimation/calibration task from each major model component for SEMCOG staff to perform, but with the Consultant as task leader. This capacity enhancement plan shall be developed by the Consultant, keeping in mind the project schedule and critical tasks.

In addition to other communication methods, such as web conference, conference calls, e-mail, etc., the Consultant is expected to schedule three on-site face-to-face meetings at SEMCOG. These face-to-face meetings include:

- One project kickoff meeting to review data, project tasks, schedule and other project coordination related topics.
- One meeting after the completion of Task 4 to conduct a workshop on initial ABM system, to present the findings of initial model development, and/or to review the scope of work included in the remaining tasks.
- One meeting at the end of the project to make the final presentation of the project, and to conduct a workshop for final ABM training and transitioning.

Schedule Coordination

Last fall, SEMCOG started to conduct an on-board transit survey of riders on fixed line-haul routes operated by the eight transit providers in the region. The on-board transit survey has two components: on-to-off passenger count survey for routes with over 1,000 riders for at least 20% of all trips and on-board Origin-Destination (O-D) interview survey targeting about 8-10% of total system riders by specific time periods of a weekday. The data collection part is anticipated to be completed by July 2019. Information regarding the 2019 on-board survey is listed in Reference Section [3] of this RFP. The survey results and final reports will be made available to the Consultant once it's completed.

In January 2019, SEMCOG released an RFP, listed in Reference Section [4] of this RFP, seeking consultant assistance to develop a tour-based commercial-vehicle model (CVM) to update its existing conventional trip-based CVM. This new CVM project is currently in the consultant selection process, and the project is anticipated to be completed by the end of 2020. Any coordination required between the ABM and CVM projects should be addressed in the ABM project work plan. The completed CVM should be integrated into the final ABM model system developed by this project.

SEMCOG plans to start its 2050 Regional Transportation Plan (RTP) development in the fall of 2022, with adoption of the plan by the spring of 2024. Considering this schedule, the new developed ABM system will be used for policy and scenario analysis (at a minimum) for the 2050 RTP, the project must be completed within 30 months to meet this schedule.

Task 1 Deliverables

1.1 Project management plan including project schedule, meeting summaries, monthly progress reports, invoices and billings with supporting documentation, if applicable.
1.2 Technical memo that outlines the staff capacity enhancement plan identifying model estimation/calibration tasks estimated with SEMCOG-Consultant joint effort.
1.3 Proposed meeting agenda and materials for the first face-to-face meeting at SEMCOG.

Task 2 – Model Design Approach

The designed new model system should be flexible and include model specifications and/or features that would allow the system to be sensitive/responsive to policies, trends, scenarios which are listed below.

- Travel demand management such as managed lanes, parking pricing, transit availability, etc.
- Scenario analysis such as aging population, telecommute, fuel prices, e-commerce, etc.
- Addressing parking and transit fare policies such as explicit choice of personal pass holder, individual fare discounts for different group of travelers, etc.
- Responding to the roadway and transit network improvement/conditions.
- Having the ability to model the travels of group quarters (GQ) population especially the travels related to university students in the region.

- Having the ability to analyze the impacts of emerging technologies such as AV/CV, TNC, etc.
- Supporting other analysis such as equity concerns, air quality analysis, land use & transportation system interaction, etc.

These are policies/trends/scenarios that are currently known to SEMCOG but are open to hear from the consultant on other scenarios that should be considered. Additionally, SEMCOG is exploring the ability to better forecast non-motorized travel within the region. With the knowledge of the new ABM being developed with SEMCOG's existing zonal structure and may not be able to take advantage of the multiple zone system of ActivitySim, SEMCOG is open to discussions on how to improve the forecast ability of non-motorized travels in the region. The Consultant is also encouraged to recommend the data items needed for future model improvements to address non-motorized travels. The new model system also must be designed to integrate with all other existing SEMCOG model components such as: Commercial Vehicle Model, Airport Model, External Model, Highway and Transit Assignment Model.

SEMCOG prefers to split the ABM development into two phases: Phase I - short term ABM model development and Phase II - long-term ABM model development. The intent is to get a working, calibrated and validated "transferred" version of ActivitySim up and running for the SEMCOG region prior to embarking on developing a version that includes SEMCOG-specific customization and component estimation.

- Phase I - short-term model design approach - This phase involves reviewing SEMCOG's existing model structure and all data used in the E7 trip-based model. To the extent necessary, these items include, but are not limited to, social economic data files, network assignment, skimming procedures, synthetic population of the land use model, etc. The Consultant will propose an approach for translating these into formats and contents required for ActivitySim implementation. This phase, at a minimum, covers the scope of work described in Task 3 and 4. In order to ensure initial ABM model is operable and helps to inform model revisions in Phase II, the Consultant can propose any necessary initial model sensitivity tests and application development described in Task 7 and 8 to be included in this phase. The completion of this phase should be within 9 to 15 months.

- Phase II - long-term model design approach – Informed by the findings from Phase I, this phase involves taking a big picture look at the longer term SEMCOG needs and developing a plan for implementing these changes. This might include changes to specifications of existing component models, or identification of new model components. This task would also include a proposed approach for any associated data development. The detail scope of work for this phase is described in Task 5 to Task 9.

SEMCOG staff and the Consultant will work together to identify SEMCOG's short-term and long-term needs; ensuring that designed models are capable of addressing regional high priority transportation analysis needs.

Task 2 Deliverables

2.1 A detailed model design approach of the proposed short-term model structure, model specification, and a flowchart of model components.

2.2 A detailed model design approach of the proposed long-term model structure, model specification, and a flowchart of model components. For every new or modified model component, the plan must describe its methodology, theory, the data needed for estimation, input variables, and the expected results.

Task 3 – Data Development

This task is to develop the datasets required for ActivitySim and the calibration/validation targets using SEMCOG's survey and observation data. The Consultant will develop a detailed plan to calibrate/validate the initial ABM with "transferred" coefficients/constant from similar region. The validation plan should propose the validation tests and describe and/or list the desired level of match to the observed/measured data. The Consultant should identify whether the developed data items will be used in the model development of Phase I or Phase II or both. The following sub-tasks are listed based on SEMCOG's knowledge of the ActivitySim software. The Consultant is encouraged to make any necessary changes to guarantee a successful ABM development.

- Population synthesis revision - This task involves revising the existing SEMCOG population synthesis model process or outputs into the formats required for ActivitySim. The Consultant shall address any required input variables not present in current synthesized households and population including group quarters (GQ) population. The documentation describing the SEMCOG population synthesis model process is listed in Reference Section [5] of this RFP.

- Network assignment/skimming revision (if necessary) - This task involves revising the network assignment and skimming procedures to provide the ActivitySim-required data items (specific modal measures such as time, cost, transfers, etc. by origin, destination, and time-of-day), as well as formatting ActivitySim outputs to be aggregated to feed into the assignment model.

- Household survey estimation file and ABM target development - SEMCOG conducted a regional household travel survey in 2015. The household travel survey sampled a total of 12,394 households across the SEMCOG region for one-day tour activities. In addition, 1,106 households carried a GPS unit for a three-day period to collect their travel movements. Its technical and methodology reports are listed in Reference Section [6] and [7] of this RFP. The household survey data will be used for two purposes: to estimate SEMCOG-specific coefficients, and to provide calibration targets for individual model components. This task involves building the estimation files, as well as developing a set of calibration targets for each ActivitySim model component.

- Onboard survey processing and household survey merging - This task involves processing the on-board transit survey, and potentially merging with the household survey. The 2019 on-board survey, in conjunction with the 2015 household survey, can potentially be used

for both model estimation and model calibration. For the needs of the ABM development, a possible additional data collection could be conducted to survey one-day "tour" travel diary by transit riders who completed the full O-D interview survey in the 2019 on-board survey. The Consultant is encouraged to provide suggestions on this additional data collection effort, as well as additional values and cost this data collection might add to the ABM development.

- Roadway count, and transit boarding database development - The roadway volumes and transit boardings are critical to the model validation process and would be developed as part of this task. SEMCOG has an extensive traffic count database for the counts collected and provided (around 3,000 counts yearly) to SEMCOG by MDOT and various local agencies. In addition, SEMCOG collects specific cutline counts (about 600 directional classification counts) every five years. The latest one was collected between 2014-2016 and SEMCOG has planned for the collection efforts for the years 2019-2021.

- Roadway speed, and other "big data" target development – This task involves exploring and comparing SEMCOG's existing observed data sources with other new "big data" sources such as StreetLightData, AirSage, INRIX, HERE, etc. The Consultant is encouraged to propose innovative approaches on data infusion to benefit the calibration/validation of ABM model.

The data development should be focused on the ability to support implementation, estimation, calibration, and validation of the SEMCOG ABM model with the characteristics described in this scope of work. The Consultant will identify data not currently available and categorize this as critical, desirable, or convenient for use in model development, calibration, or validation. For those items deemed critical to support one or more desired aspects of the ABM model, the Consultant will estimate the associated costs.

Task 3 Deliverables

3.1 Technical memo that assesses the available data against data that is needed or typically used for the development, calibration and validation of an ABM model with the general characteristics as expressed in the scope of work. This memo will also evaluate the impact of not acquiring critical data to the capabilities of the model. It could identify new data needed and estimate the cost obtaining the new data.

3.2 Processed database of each data item for model estimation, calibration, and validation; along with a technical memo describing the procedure of each data process, listing various calibration/validation targets of each model component.

3.3 Revised processes or scripts for skimming procedures and population synthesis if applicable.

Task 4 – Initial Model Implementation

The Consultant will assemble, test, calibrate and validate the "transferred" ActivitySim model. The initial coefficients and constants can be borrowed from similar region (ARC model could be one of the candidates) before being calibrated and validated using SEMCOG's local data.

- Assemble and test inputs - Once all the inputs are developed, they need to be assembled and tested in the initial model implementation. The purpose of the initial model implementation is to have a functional, reasonably well calibrated/validated version of ActivitySim.
- Initial model component calibration - All the individual model components will be calibrated. The constants and other parameters need to be adjusted in order to match the calibration targets established in Task 3.
- Initial network assignment validation - The estimated roadway volumes and estimated transit boardings will be validated in this task. There will be an iterative process of adjusting the calibration and the validation.
- Initial model integration and setup – The "transferred" ActivitySim model will be integrated with other model components of SEMCOG's regional TDFM and the integrated model system will be configured on the number and type of global iterations to be performed, the model system convergence and/or the measure of model stability.

Any model sensitivity tests and application development proposed in Phase I work plan should also be implemented in this task. SEMCOG staff can begin to use the initial ABM model immediately after the completion of this task. This will help SEMCOG staff understand the model's performance and sensitivities, and identify improvements desired for the revised model implementation. A face-to-face meeting will be scheduled at SEMCOG to conduct a workshop for SEMCOG staff and to have a Consultant-SEMCOG joint review of the remaining scope of work.

Task 4 Deliverables

4.1 Technical memo documenting the purpose, the methodology, input variables, the mathematical formula, calibrated parameters, constants, and results of each initial ABM model component.
4.2 A calibrated/validated ABM model including model scripts, procedures, inputs.
4.3 Proposed meeting agenda and materials for the second face-to-face meeting at SEMCOG and meeting minutes from the meeting.
4.4 A revised long-term model design approach based on the findings from initial model implementation and the discussions with SEMCOG.

Task 5 – Model Estimation

This is the first task of the Phase II model development. Informed by the long-term design approach, as well as any initial findings from Phase I model development, this task involves developing any required new data items, updating estimation and target files, re-estimating existing and/or any new model components based on SEMCOG specific data.

- Identification/development of new data – This task involves identifying/developing any required new data items as necessary.
- Updating survey estimation and target files – This task involves revising the estimation and target files to reflect any new data, as well as addressing any implications of the proposed new models and adjustments to existing model specifications.
- Re-estimating existing model components - In this task, existing models will be re-estimated to reflect SEMCOG specific data.

- Estimating new model components - In this task, new models will be estimated based on the availability of SEMCOG specific data.

Task 5 Deliverables

5.1 Technical memo describing the model estimation process for proposed new models or adjustments to existing model specification.
5.2 Processed database of each new data development; along with a technical memo describing the procedure of the new data process, listing revised and/or new targets of each model component.
5.3 Any estimation datasets, and estimation scripts, and with estimation results coded into ActivitySim coefficient file format.

Task 6 – Revised Model Implementation

This task involves implementing the new and/or updated model components in the ActivitySim framework and calibrating the model to match observed targets. Included in this task, the Consultant will also develop a validation plan to calibrate each individual model components and validate overall model system performance for both base year and future year.

The Consultant will document all model modification and re-calibrated parameters. The validation results should match the desired level of observed/measured data. Should modification of the validation tests and/or targets be deemed necessary, these deviations from validation plan must be approved by SEMCOG. There will be an iterative process of adjusting the calibration and the validation. The estimated roadway volumes and estimated transit boardings will be re-validated in this task to reflect the updated model.

Task 6 Deliverables

6.1 Technical memo describing the validation plan, and the comparison between the model results and the calibration/validation targets. It should document all model modifications that occurred during this task and list all re-calibrated parameters and/or constants.
6.2 A fully validated regional ABM model system ready to use in regional Transportation Planning Process including model scripts, procedures, inputs.

Task 7 – Model Sensitivity Testing

In this task, SEMCOG staff and the Consultant will work together to perform model sensitivity tests. The Consultant should develop a sensitivity testing work plan to ensure behavioral integrity of the model system, and to demonstrate reasonable model performance under various policy contexts. The Consultant shall be responsible for proposing sensitivity tests, preparing inputs, creating required summary scripts, debugging the model while SEMCOG staff could perform model runs, and analyzing model outputs. SEMCOG staff and the Consultant will work together to develop test scenarios, criteria and attributes for model sensitivity test evaluation. These tests will involve both base year and future year scenarios, adjustments to core model inputs, and potentially comparisons to the trip-based model.

Task 7 Deliverables

7.1 Technical memo outlining sensitivity testing scenarios, testing criteria and attributes for evaluation. This memo will also report on the results of sensitivity testing analysis, model sensitivity, and model performance.

Task 8 – Model Application/Software Development

In this task, SEMCOG staff and the Consultant will work together to design the model application framework. The Consultant will modify the existing or develop new application code to facilitate the model operation and application. The developed application should have a Graphical User Interface (GUI) and the sufficiently easy-of-use functionality for novice analyst to operate. The application code should include comments to understand the model computation. The model application will at a minimum cover the following three categories of model operation and application.

- Model runs - confirming model input data integrity, running the model and generating model output summary reports.
- Model dashboard – visually tracking, analyzing and displaying key model performance indicators, metrics and data points.
- Supporting other analysis – data exchange between travel model and land use model, environmental justice/equality concerns, transportation activities for conformity analysis.

The model run time is also a big concern of maintaining and operating an ABM. SEMCOG's current trip-based model run time ranges between 12 hours and 24 hours depending on computer specifications. SEMCOG's desire is to keep the run time of the ABM model system under 17 hours on a single local machine. This includes whatever procedures are required to converge towards equilibrium. The Consultant will identify the hardware requirements or cloud solutions and associated cost estimates in order to meet this performance requirement. The Consultant is also encouraged to list any particularly critical trade-offs needed to meet this requirement.

Task 8 Deliverables

8.1 Technical memo describing the proposed application framework, model operation and application procedure.
8.2 Technical memo describing the hardware recommendations, as well as the critical trade-offs for model run time concerns.
8.3 Regional model implementation code or model software.

Task 9 – Model Documentation & Application Guide

The Consultant will develop two categories of model documentation: a technical report intended for model developers and a model user's guide intended for model appliers. A technical report will emphasize technical details about the entire model development process including the data utilized in the model, the estimation and calibration of the ABM model components, the validation and sensitivity tests of the entire model. The reports can be compiled from the technical memorandums developed in previous tasks, with introductory and summary sections added. The technical report should also outline the model's strengths and limitations, including recommendations for potential

future model enhancements in the context of the evolving nature of transportation modeling methodology and technology. A separate detailed user's manual, intended to guide model users, should be developed to document procedures for model operation and application.

A final face-to-face meeting at SEMCOG should also be included in this task for the Consultant to make final presentations of the ABM system and any necessary training for SEMCOG staff. The completion of this task must include approval and acceptance by SEMCOG staff. All documents must be delivered as both electronic copies and paper copies. Electronic copies are delivered in .pdf and Word formats.

Task 9 Deliverables

9.1 One paper copy and one electronic copy of the model technical report.
9.2 One paper copy and one electronic copy of the application guide.
9.3 Proposed meeting agenda, meeting minutes, and materials for the third face-to-face meeting at SEMCOG

Reference Section

[1] SEMCOG E7 Travel Model Improvement and Update – Technical Report
[2] ActivitySim –Activity-Based Travel Behavior Modeling Software
[3] SEMCOG 2019 Onboard Survey Initial Report
[4] SEMCOG's Commercial Vehicle Model Development - RFP
[5] SEMCOG's Population Synthesizer – General Description
[6] SEMCOG 2015 Household Survey – Travel Characteristics Technical Report
[7] SEMCOG 2015 Household Survey – Final Methodology Report