

Project Description

The RPC desires to update its travel demand model (model) used for long-range strategic planning, project/sub-region/corridor-based analyses, and other transportation and land use related tasks. Requirements for the model are outlined under Project Requirements and Specifications, and high-level tasks are provided under Project Scope of Services. Respondent’s approach should be structured around these tasks. The Consultant, at a minimum, must satisfactorily meet the Project Requirements and Specifications, but may also propose additional elements to add value or achieve goals beyond those minimally required. Other components of this effort include developing the integration of base year, horizon year, and milestone year demographics to support the model, along with training of RPC staff on the use of the model.

Project Background

The current RPC model, the Southeast Louisiana Travel Model (SELATRAM v9.3) encompasses a nine-parish geographic area in and around the New Orleans region, with 1,000 traffic zones and 34 external stations. The model was developed in the TransCAD 7.0 environment using TransCAD’s GISDK scripting language with JAVA, Python, and R subroutines embedded in the model stream.

A regional map depicting the current boundaries of the model and its TAZ structure is shown below in Figure 1.

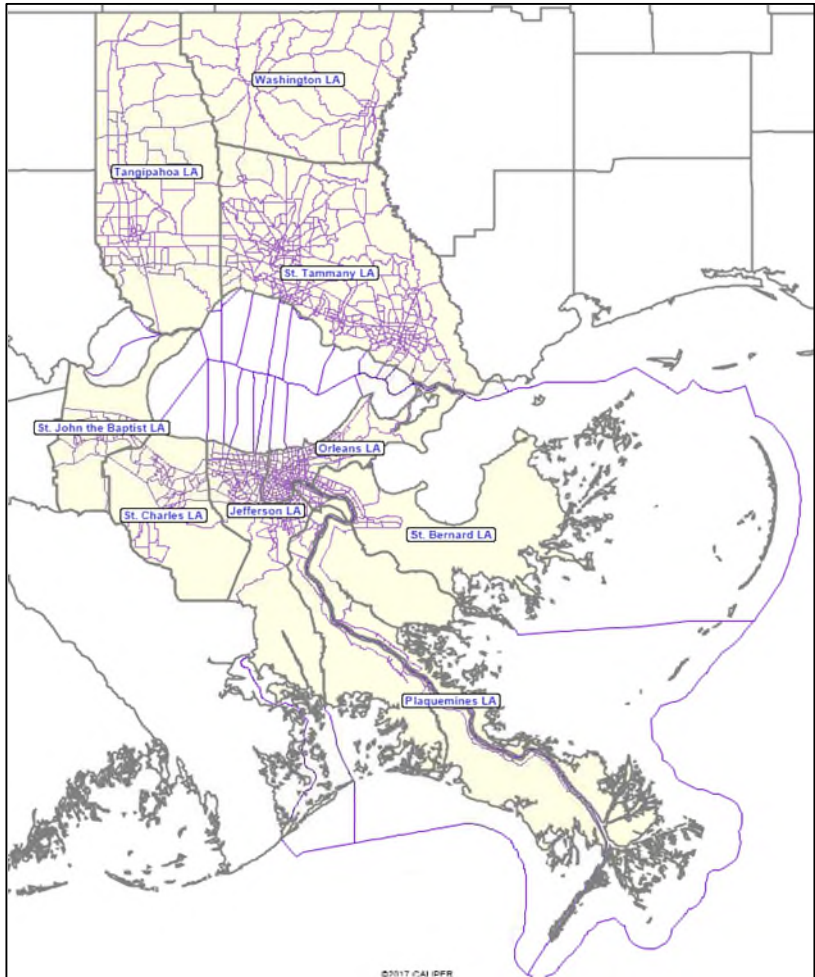


Figure 1, Model Area

The SELATRAM is a trip-based model, typical of most state of the practice models, but with several uncommon features. The model produces traffic flows and transit ridership through the typical four-step

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process. The model also utilizes a feedback loop from traffic assignment to trip generation where trip generation, distribution, mode choice and highway assignment are repeated until convergence is reached. The model identifies and analyzes person trips, but only those engaged in vehicular travel. Non-motorized trips are not specifically addressed. On the advanced side, the model produces SKIMs before the trip generation step and uses them to produce land use variables, terminal time and other variables that measure accessibility to feed into trip generation.

Major data sources that the SELATRAM v9.3 is based upon include:

- Trip generation production rates were transferred from the 2009 NHTS add-on from the Maricopa Association of Governments.
- External auto trip models were estimated from AirSage data for average weekdays in October 2015.
- 2019 Transit on-board survey.
- FAF3.4 commodity flows and 2007 and 2010 county employment data from the Bureau of Labor Statistics.
- Traffic Counts – 2015 base year counts with supplemental counts for years between 2013 and 2018.
- FAA enplanement data (historical 2008 to 2011, and forecasts from 2012 to 2040).

Project Components

The purpose of this RFP is to select a Consultant to develop, estimate, calibrate, and validate a new travel demand model. This RFP provides the relevant operational, performance, and service requirements to align prospective Consultants with the RPC's needs. The expectations and assumptions of this RFP are:

1. Develop a base model package for the RPC satisfying the project requirements and specifications.
2. Supplemental components that may or may not be added to the project include the following:
 - a. Supplemental Task 1- Non-Motorized Project Evaluation Requirements
 - b. Supplemental Task 2 - Household Travel Survey Requirements

Project Requirements and Specifications:

The following business and technical requirements have been identified for the SELATRAM v10. Consultant responses should address each requirement and specification in their proposed approach to the development of the SELATRAM v10 (model) as a work program that corresponds to tasks included in the preliminary scope of services section. The model shall be fully functional and meet the requirements and specifications shown in this section without any supplemental tasks.

Business Requirements

- Support regional transportation planning for highway and transit modes.
- Accurately forecast and analyze local bus, express bus, high-capacity, and fixed-guideway (BRT, Streetcar, and Rail).
- The model should be calibrated and validated to existing toll facilities and be capable of high-level evaluation of new toll facilities and tolling structures.
- Adaptable to model area boundary changes in an efficient manner.
- Allow for maintenance and operation by RPC staff that have other responsibilities and are not full-time travel demand modelers.

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Data and Survey Requirements

- Review available data, assess the quality of available data, and identify data gaps and proposed an approach for filling gaps.
- Identify how any data proposed for use in or with the RPC model is to be acquired and the party responsible for payment if there is a charge for the data.
- Describe how proposed data supports estimation of the model and the transportation planning needs of the RPC.

Software Requirements

- Deliver source codes for all custom and reuse software programs developed under this project. Deliver all documentation concerning protocol for reuse and custom software, source code, commented listings, descriptions of software structure, database utilization, and instructions necessary to convert the source code into an operational system.
- The Model shall be based in TransCAD with a specific version of the software recommended in the model architecture.
- All programs, code or scripts, and Graphic User Interfaces (GUIs) implementing the model shall be built using TransCAD's GISDK scripting language. Compatibility with the Windows operating system is also required. The use of any additional software or programming languages will be at the discretion of the RPC Project Manager.

Model Functionality and Capability Requirements

- Model forecast years shall include scenario years at 5-year intervals between selected base year and 2055.
- Assigned traffic volumes shall include AM and PM peak period detail at a minimum and shall automatically summarize and store the 24 hour total volume in a copy of the roadway network.
- Model shall account for passenger vehicles, trucks, and transit trips through the full model, including the traffic assignment step.
- Trucks shall be define in a way that allows for some level of validation to vehicle classification counts.
- Ability to forecast truck trips associated with the port as well as truck traffic in general.
- Ability to account for the usage of toll facilities.
- Make use of a master roadway network that includes all scenario years.

Validation Requirements

- Establish candidate criteria based on accepted published standards from reliable sources, such as the DOT guidelines, FHWA/FTA minimum requirements, NCHRP 716, and Travel Model Improvement Program Model Validation and Reasonableness Checking Manual (FHWA, September 2010).

Testing and Acceptance Requirements

- Perform quality control and quality assurance checks for each dataset used and model estimated.
- Provide testing and acceptance criteria for delivered model components at a level of detail that the proposing firm believes is adequate to ensure the delivery of quality products and a fully functional and reliable model that meets or exceeds the requirements of this RFP.
- Perform quality control and quality assurance checks for each dataset used and model estimated.

Training Requirements

- Training shall be provided in person at the RPC office.
- Consultant shall provide up to 5 TransCAD training keys for the duration of the training sessions.

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- Provide hands-on training to a minimum of two but no more than four RPC staff members including the RPC PM.

Documentation Requirements

- The model, its data sources, estimation procedures used, its validation, and its operations shall be fully documented.
- Reports provided in MS Word format.
- Update the documentation as necessary based on the results of training and feedback on the material used during training including all model documentation.

Supplemental Task 1- Non-Motorized Trips

- Provide a mechanism to support the computation of performance measures of non-motorized modes.
- The mechanism to support the computation of performance measures of non-motorized modes shall use non-motorized trip information from the model (SELATRAM v10).

Project Scope of Services

Consultants should present a proposed approach to the development of the SELATRAM v10 as a work program that corresponds to tasks included in the following preliminary scope of services.

Task 1 – Project Management

A kick-off meeting will be held by the consultant and the RPC. A Project Management Plan shall be developed by the consultant for the RPC's review. The consultant shall be required to develop a schedule to complete each task that is acceptable to the RPC.

Describe submitter's quality control process and how they will apply it to deliverable products identified in the proposal.

Deliverables:

- Ongoing, comprehensive project management and communication
- Project Management Plan
- Kickoff Meeting and Meeting summary
- Monthly project progress meetings / conference calls
- Monthly Progress Reports
- Monthly invoices in the required format
- Archive of project files and information used in the creation of model

Task 2 – Model Architecture

In collaboration with the RPC, the selected consultant will finalize the proposed structure and content of the proposed model before starting model development. This task will describe the model development so that all data collection, socio-economic data development, and model components are fully defined. The quantity and types of data and surveys shall be defined as part of this task. The model architecture shall include proposed validation criteria to be used.

Deliverables:

- Draft and Final Model Architecture Report
- Presentation covering the model architecture

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Task 3 - Aggregation or Purchase of Surveys and Data for Model Estimation

This task shall collect applicable information and data relevant to the modeling effort, including but not limited to the following:

- Aggregation of any survey data proposed,
- Purchase of any data sets proposed,

- Aggregation of public transit service data or routes and ridership,
- Aggregation of traffic count data, and
- Purchase or aggregation of demographic datasets required in addition to the TAZ level households and employment data provided by the RPC.

Deliverables:

- All datasets purchased or aggregated under this contract and associated license for use. Exceptions are allowable for providing the license and data if noted ahead of time in the model architecture.
- Raw and processed survey data collected or purchased

Task 4 - Demographic Data Estimation and Forecasting

Land use, demographics and socioeconomic data serve as the basis for the model's ability to produce and forecast informed travel demand patterns. Services being carried out under this task should support the development of demographic and socioeconomic data for the model base year and all future scenario years. All Land use, demographics and socioeconomic data required by the proposed model should be identified and produced under this task.

Deliverables:

- Integration of draft base and forecast Year TAZ level demographic and socioeconomic data in an Excel file for RPC review
- Final Base and forecast Year TAZ level demographic and socioeconomic data in TransCAD bin file format consistent with the requirements of the interface
- An inventory of base year Special Generators assigned to the appropriate TAZ along with a database of required special generator data attributes for use in calculating special generator productions and attractions submitted in Excel format

Task 5 – Geographic Layer Inputs

Update existing roadway network, transit network (route system), traffic analysis zone (TAZ) structure to support the proposed model structure. The geographic layers shall be populated with all attributes required for the model to function including traffic counts on the network layer needed for model validation. These layers shall cover the expanded model area in St. James Parish. RPC will provide TAZ structure based upon Census geography for St. James Parish.

Revise screenlines for use in model validation based upon available count data and to capture key or major trip movements.

Deliverables:

- Draft and final model base year and forecast year modal networks in TransCAD format with associated TransCAD route system. Revised screenlines as a sperate layer and denoted on roadway network as an attribute
- Draft and final model traffic analysis zones (TAZ) layer in TransCAD format

Task 6 – External Trips

Construct required external trip inputs to support the proposed model structure. External trip inputs

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shall be developed for all required model years. Note that model area expansion will change the location of some external stations.

Deliverables:

- Draft and final external trip tables formatted for use in model

Task 7 - Model Interface

The objective of this task is to streamline and optimize model operation by developing and implementing a user interface. The focus of the effort shall be on an interface that implements all components and functionality of the model, while also reducing run time with efficient file handling and input/output protocols between modules.

Deliverables:

- Draft fully functional model interface with initial model parameters
- Template scenarios for testing model function
- Draft Model User's Guide
- Final fully functional model interface with model parameters
- Final fully validated scenarios for model
- All source code necessary to modify, compile, and operate the model
- Validated model and all components that comprise the model
- Final model scenarios for each model year

Task 8 – Model Estimation and Development

This task shall conduct the model estimation work necessary to support the model structure proposed in the model architecture. The consultant shall develop and implement model components to represent all proposed trip purposes and modes of travel included in the architecture. The consultant shall calibrate each model component to the targets proposed and agreed upon with the RPC.

Deliverables:

- Model estimation results shall be covered in model documentation and shall include indications of the quality of the estimation and what assumptions were made.
- Data sets processed and formatted to support model estimation.

Task 9 – Model Validation

This task will validate the model and provide the RPC a complete tool for conducting planning tasks. Consultant shall describe their validation process and proposed validation criteria.

Deliverables:

- Draft validation report documenting the agreed upon final validation parameters and validation comparison submitted electronically in Microsoft Word format
- Final validation report documenting the agreed upon final validation parameters and validation comparison submitted electronically in Microsoft Word format

Task 10 – Training

Provide training and related technical assistance to RPC staff in the use of SELATRAM v10. Select DOTD staff may participate. A model user manual will be produced to guide the user's operation of the model.

Deliverables:

- A PowerPoint presentation presenting an overview of the model, and its uses

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- A PowerPoint presentation presenting information on how to setup and operate the model
- Training sessions for RPC staff and select DOTD staff
- Draft SELATRAM Model User's Guide

Task 11 - Model Documentation

A complete model report will be produced to document the development of the model. The model user manual will be updated based on feedback received while training RPC staff.

Deliverables:

- Draft and Final Model Development documentation that covers model estimation and development for the full model stream.
- Final SELATRAM Model User's Guide

Task 12 - Model Support

Consultant proposals should state proposer's warranty policies related to curing defects and correcting errors at no cost to the RPC.

Consultant proposals should include a specified number of hours of included technical support for the model, data, and documentation, to be expended within one year after the model is accepted by the RPC.

Deliverables:

- Documentation of support provided – summary memo
- Updated documentation