## Scope of Services:

## Incorporating Time-of-Day into FSUTMS: Phase 2 - Time-of-Day Choice Sub-Model

### Background:

The Florida Standard Urban Transportation Modeling Structure (FSUTMS) is used by Metropolitan Planning Organizations (MPO) and Florida Department of Transportation (FDOT) Districts for modeling travel demand. Time-of-Day (TOD) modeling is currently not incorporated in FSUTMS and is therefore not the standard practice in Florida. Currently, only one District has implemented TOD procedures in their travel model to satisfy their particular planning needs. There is however an increasing need by the transportation planning agencies to understand the impacts of time-of-day on trip making.

In 2008, the Model Task Force identified TOD modeling as one of its top short-term priorities and in November 2009, incorporating TOD modeling into the FSUTMS framework was identified as the top short-term priority of the Florida modeling community.[[1]](#footnote-1) The resulting project to incorporate TOD modeling into FSUTMS was divided into two phases: 1) TOD Factoring and Procedure Development and 2) Development and implementation of an econometric TOD model

Phase 1 was executed by Cambridge Systematics Inc, and includes:

* Development of Constant TOD Factors.
* Identification of data elements for an econometric TOD model.
* Development of empirical methods to compute travel time skims.

The remaining of this document discusses the scope of services for Phase 2.

### Objective

The implementation of fixed TOD factors would be an improvement over the current practice of daily travel forecasting. However, fixed TOD factors do not provide the model with sensitivity to time of day for travel with respect to changes in network level of service and the consequent effects on trip making. The objective of Phase 2 is to implement a Time-of-Day choice sub-model that is sensitive to changes in network Level of Service.

PB Americas Inc. has previously developed a TOD choice sub-model that is driven by difference in travel impedance for the modeled (future) year versus the base (calibration) year. The FDOT TOD choice sub-model will be calibrated to observed local conditions from the NHTS FDOT Add-on data and then used to predict future changes in TOD travel.

### Approach:

 The proposed tasks for Phase 2 are as follows:

1. TOD Choice Sub-Model Implementation.
2. TOD Choice Sub-Model Calibration and Validation.

### Scope Tasks:

#### Task 1: TOD Choice Sub-Model Implementation

In Task 1 we will integrate a TOD choice feedback sub-model into the FSUTMS model stream. The sub-model will be implemented for each trip purpose independently and will feedback travel impedance changes by iterating through trip distribution, mode choice, assignment, and TOD choice until the convergence criteria is met.

*Deliverable:*

* 1. Technical Memorandum describing the changes made to the structure of the test travel model.
	2. Updated Cube/Voyager code for the test model.

#### Task 2: TOD Choice Sub-Model Calibration and Validation

In Task 2 we will use the 2009 NHTS FDOT Add-on data to develop calibration targets for the TOD choice sub-model. These calibration targets will be the number of trips, stratified by trip purpose, within a time period. We will also use traffic counts and on-board transit ridership counts, where available, to validate the base year model.

*Deliverable:*

* 1. Technical Memorandum describing the results of TOC choice sub-model calibration and validation.
1. Model Task Force Priorities Survey, November 2009. http://www.fsutmsonline.net/images/uploads/MTF\_Priorities.pdf [↑](#footnote-ref-1)