

## QUARTERLY PROGRESS REPORT

For 1st Quarter, Fiscal Year 2015/16

Caltrans Task Manager: Frank Law

Project ID:

Task Order No.: TO 012

Contract No.: 65A0529

- Task Title: Demand forecasting and activity-based mobility modeling from cell phone data
- Describe last quarter's tasks/deliverables:

In this quarter, following the pre-processing and homogenization of data on home and work locations of the population (corrected for biases), we formulated and implemented in software a non-parametric hidden semi-Markov transition model (HSMM) to infer a sequence of activities within a day for each user. This model learns a sequence of most likely activities of a user and their durations from historical mobility data and spatial contextual data. Inferring the purpose of these secondary trips was our next goal. Spatial distribution of services and land use data was used to assign most likely trip purpose categories to the inferred activities.

Initial studies on identifying mode were carried out. The idea we exploited was to apply exploratory (clustering) and discriminative (classification) models to the sequences of cellular antenna IDs.

- Describe next quarter's tasks/deliverables and their due dates:

Next quarter deliverable (Deliverable 3) is to apply the activity/locations sequences within a micro-simulation. Our initial results have been presented at Caltrans seminar on 11/30 and the current goal is to carry out a thorough validation of the simulation results on PEMS data.

Describe Project Status:

The project is on schedule.

Andrew Campbell resumed his GSR work starting 09/15.

Sudatta Mohnaty has taken 1 year internship with Apple Inc traffic modeling group.

Are you on time with your schedule?

YES  
 NO

Are you on budget? A method to correct for spatial coverage and demographic biases in cell phone records based on census data, implemented in software and described in a technical report.

YES  
 NO

Are you on scope?

YES  
 NO

4.0 If the answer to any of the above is NO, please explain below:

5.0 Estimated percent of work completed: 5 %  
Estimated percent of budget expended: 0 %

6.0 What are your expenditure projections for the next two (2) quarters?

\$ 16000	\$ 16000
FY 15/16; Q 2	FY 15/16; Q 3

Use this area for additional information. Clearly identify which Section this information applies to.

Submitted By: Date: 10/30/15

Prof Alexey Pozdnukhov