**Survey-based method R script instruction**

The start\_Portland2011.R applies survey-based method at Portland with 2011 Oregon Household Activity Survey data. Running this R script file will calculate and plot travel cost.

This script defines project name, method name and data year first, then several R script files are sourced calculate and plot travel costs:

1. **settings.R**

This file defines common settings for all projects and methods:

* abbreviation

Income groups, trip purposes, travel modes, time periods and calculation methods

* unit name

Unit name is defined for converting travel cost measurement between minutes and dollars. Through changing unit name definition, travel costs are calculated by minutes or dollars. When line 22 code[[1]](#footnote-1) is used and line 23 code[[2]](#footnote-2) is commented, travel costs are calculated by dollars; when line 22 code is commented and line 23 code is used, travel cost is calculated by minutes.

* directories

Define input directory, intermediate directory, output directory based on method, project and data year.

1. **settings\_OHAS.R**

This file defines unit costs by modes and unit, including travel time costs, operation costs and constant cost. Constant cost represents fixed cost here, and fixed costs can be added according to local transportation cost. Now it is assumed to be zero.

For travel time costs, if travel costs are measured by minutes, travel time costs are the same as travel time; if travel costs are measured by dollars, travel time are converted to dollars based on household hourly wage and transformation parameters by mode.

Operation costs are calculated by multiplying travel distance by miles and the monetary costs per mile (mcpm) of transportation mode. If travel cost measured by minutes, mcpm measured by cent per mile is converted to minute per mile through dividing mcpm by minutes.per.cent[[3]](#footnote-3).

1. **functions.R**

This file defines all functions utilized for all projects and methods. More details about each functions can be found in this script file.

1. **prepare\_Portland2011.R**

This file reorganizes OHAS data to prepare data for calculating travel costs:

* identify four trip purposes lined trips : home-based work (HBW), home-based shopping (HBS), home-based recreation (HBR) and home-based other (HBO)
* calculate trip duration by hour and trip distance by mile
* reclassify income categories (low income: $0- $24,999; mid income: $25,000 - $49,999; high income: $50,000 or more)
* identify Transportation Analysis Zone (TAZ) and geographical districts of household through household geographical coordinate information

1. **compute.R**

This file computes trip-level travel costs, and then aggregate by household, trip purposes, income groups, TAZs and districts.

1. **plot.R**

This file plots travel cost results, including density line plot, boxplot, line chart plot and map.

1. unit.name <- ifelse(exists('unit.name'), unit.name, 'dollars') [↑](#footnote-ref-1)
2. unit.name <- ifelse(exists('unit.name'), unit.name, 'minutes') [↑](#footnote-ref-2)
3. minutes.per.cent = minutes.per.hour / (hourly.wage \* cents.per.dollar)=60/(24.77\*100)=0.024 [↑](#footnote-ref-3)