San Francisco Bay Area Data For

The Analysis of Non-Motorized Travel

USER'S GUIDE

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1. INTRODUCTION

This user's guide will illustrate how to access the GIS-based data compiled for the San Francisco Bay area and will provide a basis for conducting an analysis of non-motorized travel behavior use the data set.

It is assumed that you have TransCAD installed before you proceed with carrying out the exercises in this document. You also need to have the entire */Data* folder copied from the accompanying CD onto your hard drive.

The remainder of the user's guide is organized as follows. Section 2 describes the source and the content of each of the datasets provided with this tutorial. Section 3 presents a set of exercises designed to familiarize you with the different geographical layers that are available and to expose you to some examples of mapping analysis. Section 4 focuses on the attribute tables provided and describes a set of statistical analysis exercises which you can perform with the data.

2. DESCRIPTION of DATASETS

This spatially referenced data base provides TransCAD files describing the zonal configuration, zonal land-use and demographics, urban form, and the network for the San Francisco Bay area. It also includes the travel and demographic information collected from the 2000 Bay Area Travel Survey.

The datasets are:

Dataset	Description
/Survey/Households	Feature dataset displaying point locations of surveyed households
/Survey/Persons	Feature dataset displaying point residential locations of surveyed individuals
/Survey/Trips	Feature dataset displaying point locations of surveyed trip destinations
/Network/Bikeways	Feature dataset displaying linear bicycle network
/ Network /Highways	Feature dataset displaying linear highway network
/ Network /LocalRoads	Feature dataset displaying linear local road network
/Polygons/County	Feature dataset displaying polygon definitions of counties
/Polygons/TAZ	Feature dataset displaying polygon definitions of TAZs
/UrbanForm/QuarterMiBands	Feature dataset displaying ¼ mile bands constructed around point locations of surveyed households

/UrbanForm/OneMiBands	Feature dataset displaying 1 mile bands constructed around point locations of surveyed households
/UrbanForm/FiveMiBands	Feature dataset displaying 5 mile bands constructed around point locations of surveyed households

2.1. Survey Data

The three datasets under the */Survey* directory have been compiled from the 2000 Bay Area Transportation Survey (BATS), originally conducted by MORPACE International Inc. for the Metropolitan Transportation Commission (MTC), California. The survey collected information on all activity and travel episodes undertaken by individuals over a two-day period from over 15,000 households in the nine counties in Bay Area. The information collected on activity episodes included the type of activity, start and end times of activity participation, and the geographic location of activity participation. Travel episodes were characterized by the mode used, and the start and end times of travel. Furthermore, data on individual and household socio-demographics, individual employment-related characteristics, household auto ownership, household location, and internet access and usage were also obtained.

The *Trips* table contains, in each record, the attributes describing each travel episode, including purpose, mode, time of day, day of week, number of stops made, and longitude and latitude of the destination location. The *Persons* table contains, in each record, each trip makers' attributes, such as socio-demographics, employment-related characteristics, study-related characteristics, internet access and usage, and geographic coordinates of the home location. It includes also the aggregate trip counts by mode and by trip purpose for each surveyed individual. The *Households* table includes, for each surveyed household, attributes such as household structure, auto ownership level, bicycle ownership level, and geographic coordinates. It also includes aggregate descriptors about the individuals in each household (such as household structure and age composition) and their trip counts.

For details about the *Households*, *Persons*, and *Trips* tables, please refer to Appendix I, II, and III, respectively.

2.2. Transportation Network Data

Two of the three datasets under the */Network* directory, *Highways* and *LocalRoads*, were extracted from the Census 2000 TIGER files. The *Highways* network file contains all interstate, toll, national, state and county highways in the Bay area. The *LocalRoads* network file contains the local, neighborhood, and rural roads in the region.

The *Bikeways* network was provided by MTC. It describes all existing bicycle facilities in the Bay Area region, including class 1 (separate paths for cyclists and pedestrians), class 2 (painted lanes solely for cyclists), and class 3 (signed routes on shared roads) facilities.

2.3. Polygon Layers

Two additional geographic layers were provided by the MTC. The *County* dataset defines the nine counties in the region. The *TAZ* dataset provides, for each of the 1099 internal and external Traffic Analysis Zones, the following information: (1) area coverage by land-use purpose, (2) number of housing units, (3) employment levels by sector, (4) zonal population, income and age distribution of the population, and (5) area type of the zone (central business district, urban, suburban, or rural).

2.4. Urban Form Measures

Bands of 1/4, 1, and 5 mile width have been constructed around the point features in */Survey/Households* and stored in */UrbanForm/QuarterMiBands*, */UrbanForm/OneMiBands*, */UrbanForm/FiveMiBands*, respectively. Data from */Polygons/TAZ*, */Network/Bikeways*, */Network/Highways*, and */Network/LocalRoads* were overlaid onto these bands by:

1. Assuming that the TAZ attributes follow a uniform distribution within each zone, so that data for a given zone can be disaggregated uniformly over the zone. For instance, if the number of service employment centers a 10 square-mile zone is 100, then every square-mile area in the zone is assumed to have 10 service employment centers. The disaggregated data are then projected onto, and re-aggregated over, the circular buffers created around the geo-coded location of each household to produce the corresponding measures for the circular units.
2. Projecting each of the network layers onto the circular units and summing up the lengths of the line segments falling within each circular unit.

A number of additional variables were also computed for each band layer. These included land-use composition measures (percentage of coverage by land-use type) and a more complex measure of land-use diversity defined by:

$$LUMIX_i = 1 - \frac{\left|\frac{R_i}{T_i} - \frac{1}{3}\right| + \left|\frac{CI_i}{T_i} - \frac{1}{3}\right| + \left|\frac{O_i}{T_i} - \frac{1}{3}\right|}{\frac{4}{3}}$$

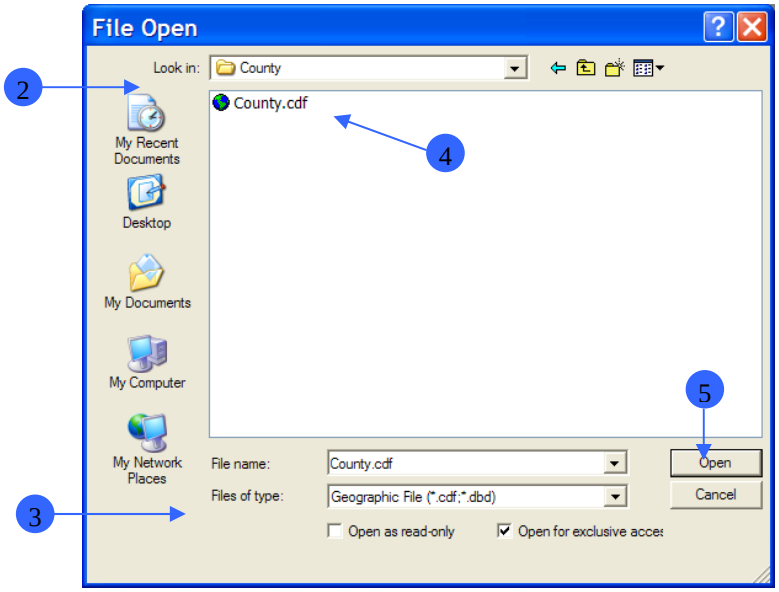
where T_i is the total area of the circular unit i; and R_i, CI_i, and O_i are the acreages of residential, commercial and industrial, and other land use types, respectively. This land-use mix index takes a value between 0 and 1, where 1 indicates perfect mixing of land uses and 0 indicates that the land in a particular area is completely dedicated to a single land use.

The outcome of the above-described process is three sets of urban form measures computed using three band widths around each residence. These band-based urban form measures are better than the TAZ-based measures for the purpose of analyzing the influence of environmental factors on non-motorized travel behavior. This is because the band-based measures represent the quality of the environment within explicitly defined walking or cycling distances from each residence, while the spatial extent of the TAZ-based measures would vary from zone to zone due to the irregularity of the zones.

3. MAPPING ANALYSIS

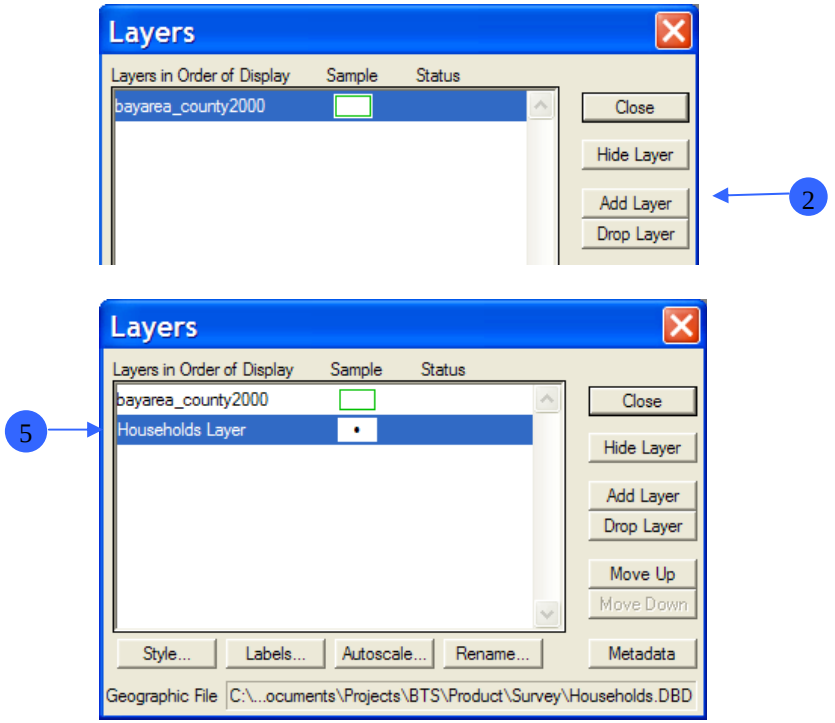
3.1. Opening the County Map

1. In the TransCAD main menu, choose *File-Open* or click  on the toolbar, to access the File Open dialog box.
2. Navigate to the */Polygons/County* directory.
3. Choose Geographic File from the Files of Type drop-down list.
4. Choose *County*.
5. Click Open to open the file and display the map. TransCAD displays a map of the nine counties in the Bay area



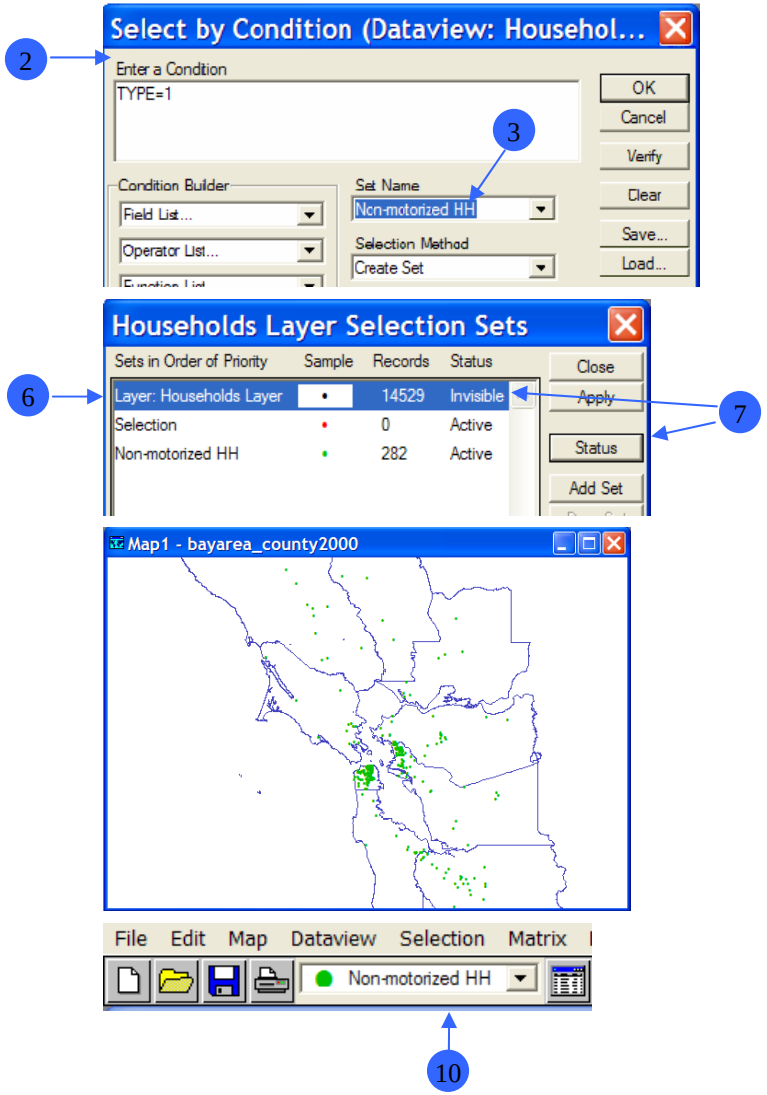
3.2. Adding the Household Layer

1. Choose *Map-Layers* or click  on the toolbar. TransCAD displays the Layers dialog box.
2. Click Add Layer to display the File Open dialog box.
3. Navigate to the /Survey directory.
4. Choose Geographic File from the Files of Type drop-down list.
5. Choose Households from the list and click Open. TransCAD adds the Households Layer in the Layer dialog box.
6. Click *Close* to exit the Layers dialog box. TransCAD displays the household point locations in the county map.



3.3. Locating the Households tha Use Only Non-Motorized Modes

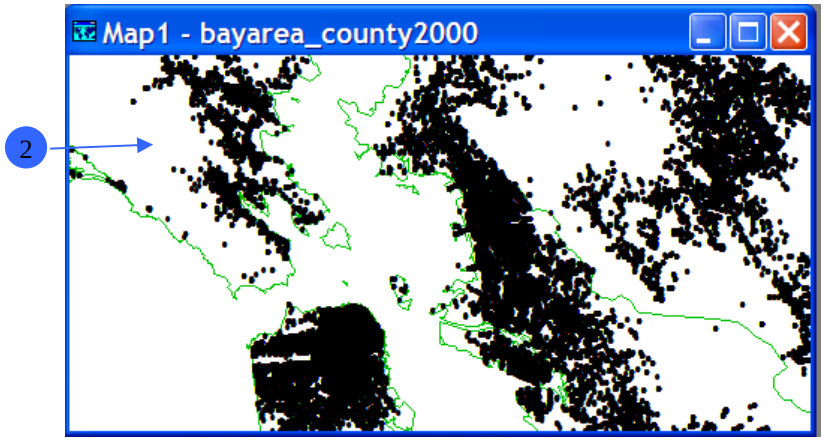
1. Choose *Selection-Select by Condition* from the main menu. TransCAD displays the Select by Condition dialog box.
2. Type *TYPE=1* in the Condition box.
3. Type *Non-motorized HH* in the Set Name box.
4. Click OK. The households using only non-motorized modes are highlighted in the map.
5. To show only the *Non-motorized HH* set of the Households layer, choose *Selection-Settings* from the main menu.
6. Make sure that the Households layer is highlighted.
7. Click *Status* so that the Households layer is set to invisible. Then click Close.
8. TransCAD displays a map as the one shown on the right.
9. You can examine the characteristics of these households by clicking  on the toolbar. TransCAD displays the Dataview for the household layer.
10. From the toolbar, set the Dataview to the selected households only.

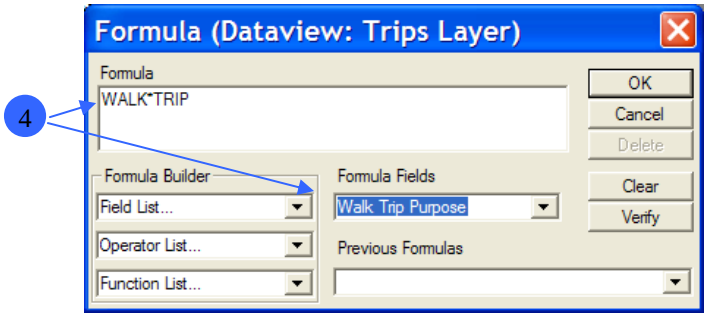


3.4. Thematic Mapping of Walk Trips

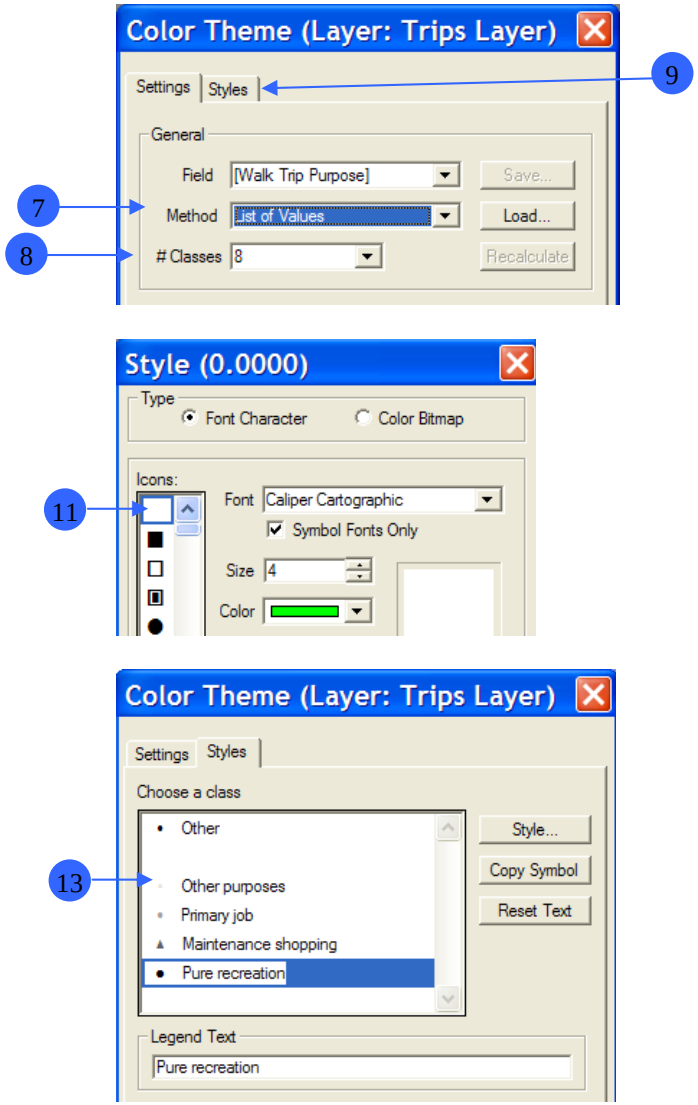
Thematic maps are maps constructed to emphasize the spatial pattern of one or more spatial variables. You choose the theme types based on the number of variables you want to show and the types of variables you wish to present. Please consult the TransCAD Help file for the different themes available and how these themes from a dataview. Below, we describe the construction of a color theme to show the spatial distribution of walk-trip ends by trip purpose.

1. Open another county map by repeating Exercise 3.1.
2. Follow the steps in Exercise 3.2 to add the *Trips* layer onto the map.
3. Open the Dataview corresponding to the *Trips* layer by clicking  on the toolbar.
4. From the main menu, choose *Dataview-Formula Fields*. TransCAD displays the Formula dialog box.
5. Enter *WALK*TRIP* in the Formula box and *Walk Trip Purpose* in the Formula Fields. And click OK.
6. Choose *Map-Color Theme* from the main menu.

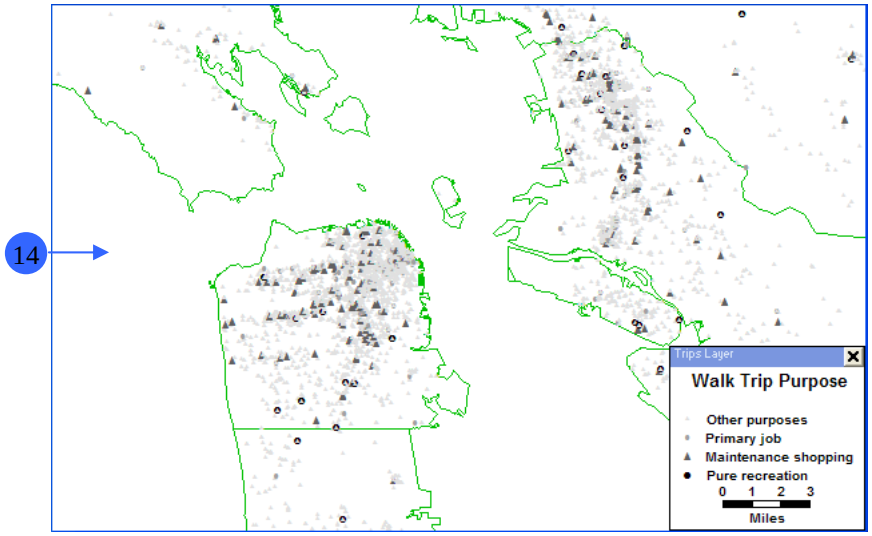




7. In the Color Theme dialog box, select *Walk Trip Purpose* from the Field list.
8. Select *List of Values* from the Method list.
9. Click the Styles tab. TransCAD will take a second to perform some computation in the background.
10. To change the display of any class, simply choose it from the Class list and edit the corresponding style by clicking the Style button. For example, in order to hide the non-walk trips, select the second item • 0.0000 from the Class list and click Style.
11. In the Style dialog box, select the empty icon and click OK.
12. With the second class selected, remove *0.0000* from the Legend Text field.
13. Go through the remaining items in the Class list and change their corresponding style and legend text as shown in the diagram to the right.



14. Click OK. TransCAD will display the thematic map of the walk trips, with the four trip purposes (primary job, maintenance shopping, pure recreation, and other) color coded (as shown on the right). This allows you to examine the spatial distribution of different types of walk trips in the study region.



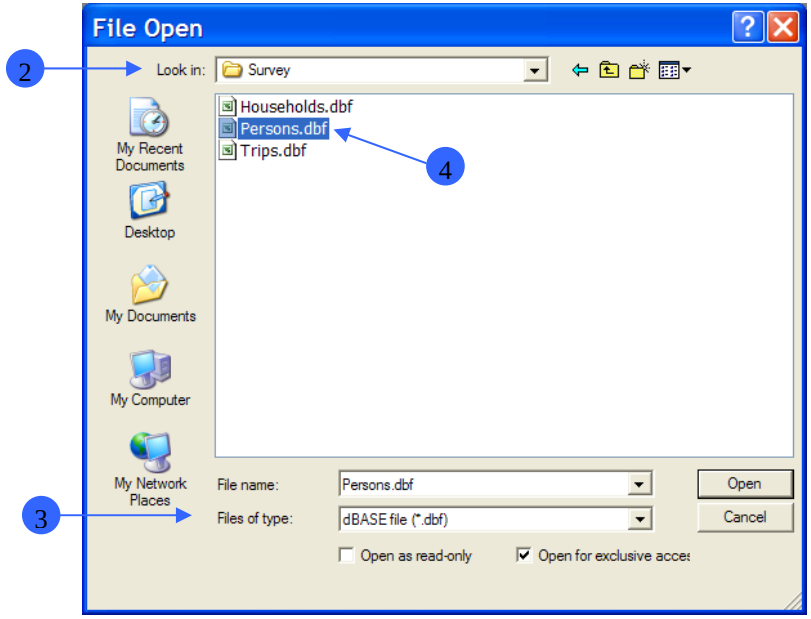
4. STATISTICAL ANALYSIS

In TransCAD, the data tables associated with the geographical layers can be used for statistical analysis without involving their geographic definitions. In this section, we provide a few examples of how to conduct such analysis.

4.1. Basic Descriptive Statistics

The first example involves examining the attributes in the Persons table.

1. Choose *File-Open* from the main menu to access the File Open dialog box.
2. Navigate to the /Survey directory.
3. Choose dBase File from the Files of Type drop-down list.
4. Choose Persons.dbf and click Open .
5. Click No if you see a confirmation box asking whether you want to creat a geographic file.
6. TransCAD displays the Persons table in a dataview window.



7. Choose *Dataview-Statistics* or click  on the toolbar. TransCAD displays the Save Statistics Table As dialog box.

8. Type a file name for the statistics table and click Save. TransCAD computes the statistics and displays the results in a new dataview as shown on the right.

9. The statistics table shows the range of values corresponding to each variable in the Persons table. For example, the number of bicycle trips per person (BIKEPER) ranges from 0 to 13.

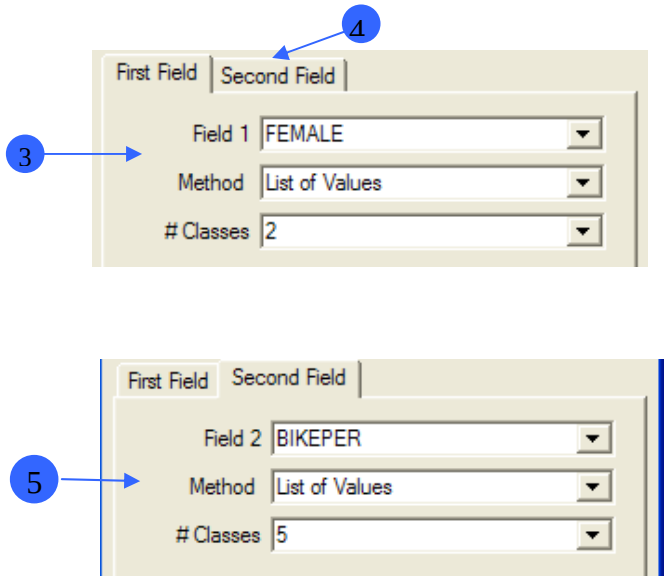
Dataview6 - Persons Statistics

Field	Count	Sum	Minimum	Maximum	Mean	[Std. Dev.]
NBANFIN	33402	1341.00	0.00	1.00	0.0401	0.1963
NTRAVEL	33402	438.00	0.00	1.00	0.0131	0.1138
NSTUDY	33402	487.00	0.00	1.00	0.0146	0.1199
NCDVIDEO	33402	221.00	0.00	1.00	0.0066	0.0811
MOTORPEF	33402	181182.00	0.00	28.00	5.4243	3.9746
BIKEPER	33402	2693.00	0.00	13.00	0.0806	0.5602
WALKPER	33402	17656.00	0.00	19.00	0.5286	1.3177
MOTORMS	33402	8465.00	0.00	8.00	0.2534	0.5565
BIKEMS	33402	96.00	0.00	3.00	0.0029	0.0599
WALKMS	33402	568.00	0.00	3.00	0.0170	0.1391
MOTORPJ	33402	2891.00	0.00	9.00	0.0866	0.4817
BIKEPJ	33402	54.00	0.00	5.00	0.0016	0.0547
WALKPJ	33402	288.00	0.00	4.00	0.0086	0.1181
MOTORPR	33402	93.00	0.00	3.00	0.0028	0.0581
BIKEPR	33402	11.00	0.00	1.00	0.0003	0.0181
WALKPR	33402	66.00	0.00	3.00	0.0020	0.0507

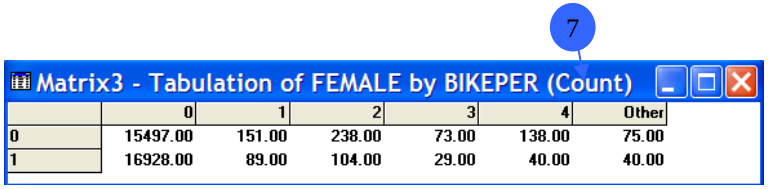
4.2. Cross-Tabulation Analysis

Below, we show an example of using the Persons table to examine the relationship between gender and the use of the bicycle mode.

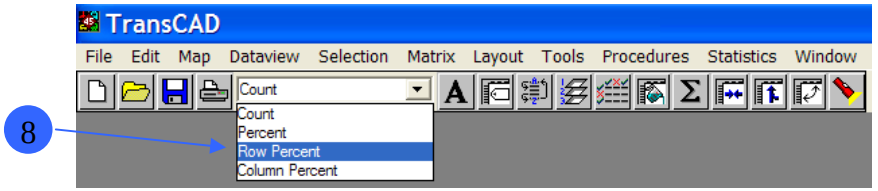
1. Open the Persons dataview following the steps 1 to 5 in Exercise 4.1.
2. Choose *Statistics-Tabulations* from the main menu.
3. In the Tabulations dialog box, set Field 1 to *FEMALE* and Method to *List of Values*. Also, set #Classes to 2 (this is because *FEMALE* is a dummy variable which takes the value of either 0 or 1).
4. Click the Second Field tab.
5. Set Field 2 to *BIKEPER* and Method to *List of Values*. Also, set #Classes to 5. (As we find from Exercise 4.1, the variable BIKEPER takes a value from 0 to 13. By setting the number of classes to 5 and the aggregation method to *List of Values*, you aggregate the values into five classes: 0, 1, 2, 3, 4, and >4.)

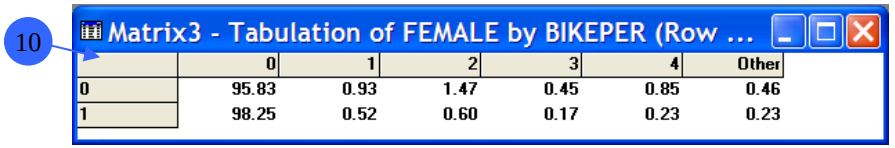


6. Click OK. TransCAD will bring up a Save As dialog box, in which you should specify the path where you would like the tabulation result be stored.
7. After clicking Save, you will see the tabulation result displayed in a matrix window. By default, TransCAD shows he counts layer. You can choose the other layers by going to the layers drop down list.
8. Go to the toolbar and select *Row Percent* from the list of available layers.
9. The cells in the matrix now sum up to 100% row-wise.
10. The Row Percent view shows that men are more likely to undertake bicycle trips than women.



	0	1	2	3	4	Other
0	15497.00	151.00	238.00	73.00	138.00	75.00
1	16928.00	89.00	104.00	29.00	40.00	40.00

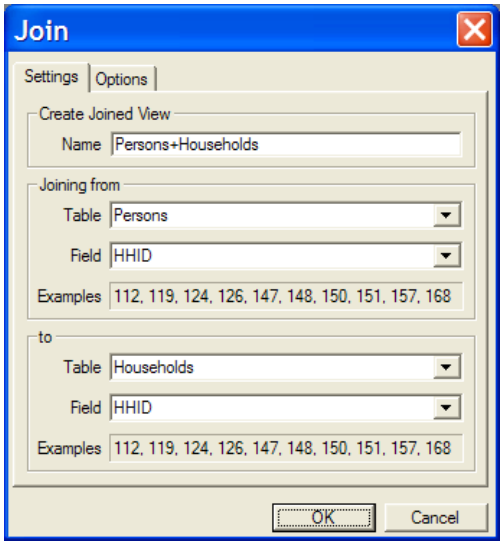


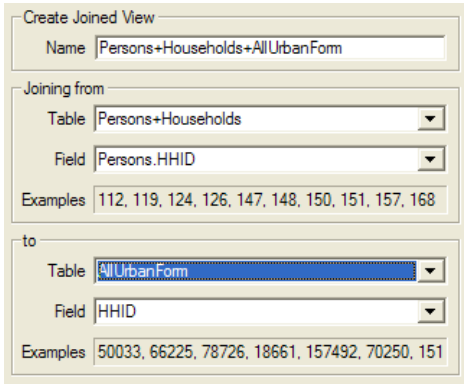


	0	1	2	3	4	Other
0	95.83	0.93	1.47	0.45	0.85	0.46
1	98.25	0.52	0.60	0.17	0.23	0.23

4.3. Joint-Table Analysis

1. Follow Steps 1-5 in Exercise 4.1 to open the *Households.dbf* file under */Survey*. Similarly, open the *AllUrbanForm.dbf* file under */UrbanForm*.
2. From the main menu, choose *Dataview-Join*. TransCAD displays the Join dialog box.
3. In the Join From area, set Persons table and HHID field. In the To area, set Table to Households and Field to HHID.
4. Click OK. TransCAD will display the Persons+Households dataview.
5. Now, go to *Dataview-Join* again. This time, join the Persons+Households table and the AllUrbanForm table based on the HHID field.
6. Click OK. You will now see a Persons+Households+AllUrbanForm dataview table.
7. You can now proceed with statistical analysis using all the fields in this joint table.





Appendix I. Data Dictionary for the *Households* Dataset

Variable	*Type*	*Description*
hhid	Numeric	Household ID
zone	Numeric	MTC Regional TAZ Code
x_gcs	Numeric	Latitude
y_gcs	Numeric	Longitude
x_utm	Numeric	UTM x-coordinates
y_utm	Numeric	UTM y-coordinates
rcounty	Numeric	County id
famtype	Numeric	5 category aggregated family type
famtype1	Numeric	10 category aggregated family type
hhsize	Numeric	Number in household
nkids	Numeric	Total number of kids
nkid04	Numeric	Number of kids between the age of 0 to 4
nkid510	Numeric	Number of kids between the age of 5 to 10
nkid1115	Numeric	Number of kids between the age of 11 to 15
nkid1617	Numeric	Number of kids between the age of 16 to 17
nactadul	Numeric	Number of active adults
nsenadul	Numeric	Number of senior adults
nemp	Numeric	Number of employed members
nprivp	Numeric	Number of privately employed members working for a pay
nprivnp	Numeric	Number of privately employed members without a pay
ngovt	Numeric	Number of members employed in the government
nself	Numeric	Number of self employed
nnopay	Numeric	Number of members working without pay
nftime	Numeric	Number of full-time employees
nptime	Numeric	Number of part-time employees
nmales	Numeric	Number of males

nfemales	Numeric	Number of females
nlic	Numeric	Number of licensed drivers
ndisable	Numeric	Number of individuals with disability
nftstud	Numeric	Number of full-time students
nptstud	Numeric	Number of part-time students
nnoflex	Numeric	Number of employees with inflexible work schedule
npflex	Numeric	Number of employees with partially flexible work schedule
nfflex	Numeric	Number of employees with fully flexible work schedule
hhveh	Numeric	Number of vehicles in household
hhbicyc	Numeric	Number of bicycles in household
hhmcycle	Numeric	Number of motorcycles/mopeds in household
hhincome	Numeric	15 category aggregated household income
catinc	Numeric	4 category aggregated household income
continc	Numeric	Continuous value of household income
tenure	Numeric	Variable indicating the tenure of household
user	Numeric	Dummy for users of non-motorized modes
type	Numeric	Variable indicating to which class does a HH belong

County ID (rcounty)

Value	*Description*
1	San Francisco
2	San Mateo
3	Santa Clara
4	Alameda
5	Contra Costa
6	Solano
7	Napa
8	Sonoma
9	Marin

5 category aggregated family type variable (famtype)

Value	*Description*
1	Couple, two adults, married or unmarried
2	Nuclear Family, two adults and all kids <18 years
3	Single parent, one adult and all kids < 18 years
4	Single individual households, only one adult
5	Other family types

10 category aggregated family type variable (famtype1)

Value	*Description*
1	Couple
2	Nuclear Family, two adults and all kids <18 years
3	Young adult(s) with two parents with or without siblings
4	Single parent, one adult and all kids < 18 years
5	Young adult(s) with single parent with or without siblings
6	Single individual households, only one adult
7	Roommate households
8	Related individual households
9	Atleast one unrelated individual in household
10	Other family types

15 category aggregated household income variable (hhincome)

Value	*Description*
1	Below $10000
2	$10000 to below $15000
3	$15000 to below $20000
4	$20000 to below $25000
5	$25000 to below $30000

6	$30000 to below $35000
7	$35000 to below $40000
8	$40000 to below $45000
9	$45000 to below $50000
10	$50000 to below $60000
11	$60000 to below $75000
12	$75000 to below $100000
13	$100000 to below $125000
14	$125000 to below $150000
15	$150000 or more
98	Don't know
99	Refused

4 category aggregated household income variable (catinc)

Value	*Description*
1	less than $50,000
2	$50,000 to below $75,000
3	$75,000 to below $125,000
4	$125,000 or more

Tenure

Value	*Description*
1	Rented house
2	Owned house

Type

Value	*Description*
0	Other (did not travel)
1	Non-motorized households

2	Mixed households
3	Motorized households

Appendix II. Data Dictionary for the *Persons* Dataset

Variable	*Type*	*Description*
ID (personid)	Numeric	Key for person and HH(hhid*100+person)
hhid	Numeric	Household ID
person	Numeric	Person No.
female	Numeric	Gender
age	Numeric	Age of person
catage	Numeric	Categorized age
licdrive	Numeric	Variable indicating whether person is licensed to drive
disable	Numeric	Variable indicating whether person has a disability
ethncity	Numeric	7 category aggregated ethnicity variable
ethnbg	Numeric	5 category aggregated ethnicity variable
employed	Numeric	Variable indicating whether person works for pay
employer	Numeric	Variable indicating employer type
empstat	Numeric	Variable indicating employment status
numjobs	Numeric	Number of jobs
empfre	Numeric	Work frequency out of home
flexible	Numeric	Variable indicating flexibility of working hours
school	Numeric	Variable indicating whether person is a student
studstat	Numeric	Variable indicating student status
ninfo	Numeric	Variable indicating use of internet for browsing/information seeking
nshop	Numeric	Net use for browsing/shopping
nentgame	Numeric	Net use for entertainment and games
nsochat	Numeric	Net use for social purposes - e-mail/chat rooms
nbanfin	Numeric	Net use for banking and financial transactions/information
ntravel	Numeric	Net use for travel information and reservations
nstudy	Numeric	Net use for studying and/or on-line courses
ncdvideo	Numeric	Net use for CDs and Videos

motorper	Numeric	Number of motorized trips made by a person
bikeper	Numeric	Number of bicycle trips made by a person
walkper	Numeric	Number of walk trips made by a person
motorms	Numeric	Number of motorized trips for maintenance shopping trips
bikems	Numeric	Number of bicycle trips for maintenance shopping trips
walkms	Numeric	Number of walk trips for maintenance shopping trips
motorpj	Numeric	Number of motorized trips for prime job trips
bikepj	Numeric	Number of bicycle trips for prime job trips
walkpj	Numeric	Number of walk trips for prime job trips
motorpr	Numeric	Number of motorized trips for pure recreational trips
bikepr	Numeric	Number of bicycle trips for pure recreational trips
walkpr	Numeric	Number of walk trips for pure recreational trips
weekmot	Numeric	Number of motorized trips on weekday
weekbike	Numeric	Number of bicycle trips on weekday
weekwalk	Numeric	Number of walk trips on weekday
wkenmot	Numeric	Number of motorized trips on weekend
wkenbike	Numeric	Number of bicycle trips on weekend
wkenwalk	Numeric	Number of walk trips on weekend
user	Numeric	Dummy variable indicating that the person uses non-motorized modes
x_utm	Numeric	Home UTM x-coordinates
y_utm	Numeric	Home UTM y-coordinates

Age

Value	*Description*
997	Less than 1 year

6 category aggregated age variable (catage)

Value	*Description*
1	Kid between 0-4 years
2	Kid between 5-10 years
3	Kid between 11-15

4	Kid between 16-17
5	Active adult
6	Senior adult

7 category recoded ethnicity (ethnicity)

Value	*Description*
1	Caucasian
2	African American
3	Hispanic
4	Asian/ Pacific Islander
5	European
6	Bi-racial, with one race being Caucasian
7	Other

5 Category recoded ethnicity (ethnbg)

Value	*Description*
1	Caucasian
2	African American
3	Hispanic
4	Asian/ Pacific Islander
5	Other

Variable indicating employer type (employer)

Value	*Description*
0	Other
1	Privately employed working with pay
2	Privately employed but working without pay
3	Government employed

4	Self employed
5	Work for no pay

Employment status (empstat)

Value	*Description*
0	Unemployed/Other
1	Full-time employee
2	Part-time employee

Flexibility of working hours (flexibility)

Value	*Description*
0	Other
1	No flexibility
2	Partially flexible
3	Fully flexible

Student Status (studstat)

Value	*Description*
0	Non-student/Other
1	Full time student
2	Part time student

Appendix III. Data Dictionary for the *Trips* Dataset

Variable	*Type*	*Description*
customid	Numeric	Key (hhid * 10000 + person * 1000 + day * 100 + activity)
personid	Numeric	Key for person and HH(hhid*100+person)
hhid	Numeric	Household ID
person	Numeric	Person ID
day	Numeric	Travel day
activity	Numeric	Activity number
startime	Numeric	Start time of trip
endtime	Numeric	End time of trip
duration	Numeric	Duration of trip
ttravdur	Numeric	Total travel time on trip (including change of transportation stops) to activity episode from previous activity episode
travdur	Numeric	Travel time on last leg to participate in an activity episode from previous episode or duration of pure recreation episode
trip	Numeric	Variable indicating trip purpose
mode	Numeric	Mode used on last leg to participate in an activity episode from previous episode
modenu	Numeric	4 category aggregated mode variable
newmode	Numeric	3 category aggregated mode variable
motor	Numeric	Motorized trips
bicycle	Numeric	Bicycle trips
walk	Numeric	Walk trips
changmod	Numeric	1 if there is a change of mode during travel to the activity episode
stops	Numeric	Variable indicating number of changes of transportation stops during the trip
chaining	Numeric	Variable indicating number of stops during the trip
stopmins	Numeric	Stop minutes
fixeds	Numeric	Dummy variable indicating if stop timing was fixed
locnewpr	Numeric	Location where activity occurred
location	Numeric	General location of activity participation
locname	String	Name of location where activity occurred

loctype	String	Type of location where activity occurred (example church, bank, grocery, residential etc.)
locnum	Numeric	Location type number
loccity	String	City
locstate	String	State
loczip	Numeric	Zip
x_gcs	Numeric	Longitude of location
y_gcs	Numeric	Latitude of location
locgeo	String	Geographical result - TGEO
homeepis	Numeric	Indicator for home episode and relative location in individuals pattern
phyact	Numeric	Level of physical activity
physical	Numeric	Dummy variable for full physical activity
dayofwk	Numeric	Day of week of episode
weekend	Numeric	Dummy for weekend
month	Numeric	Month of travel
distim	Numeric	Discrete time of day
drivepas	Numeric	Variable indicating whether the individual was a driver or passenger during the trip
noinveh	Numeric	Number of individuals in the vehicle
uhhveh	Numeric	Dummy variable indicating whether vehicle from HH
notravel	Numeric	No travel before activity or pure recreation travel episode

Variable indicating trip purpose (trip)

Value	*Description*
0	Other
1	Prime job trip
2	Maintenance shopping trip
3	Pure recreational trip

4 categories trip purpose (trip)

Value	*Description*
0	Other
1	Commute to primary job

2	Maintenance Shopping
3	Pure recreation

4 category aggregated mode variable (modenu)

Value	*Description*
1	Bicycle
2	Car/van/motorcycle/moped
3	Walk
4	Other

3 category aggregated mode variable (newmode)

Value	*Description*
0	Motorized
1	Bike
2	Walk

Variable indicating number of change of transportation stops during tip (stops)

Value	*Description*
0	No change
1	One change of transportation stop
2	Two change of transportation stop
3	Three change of transportation stop

Variable indicating number of stops during trip (chaining)

Value	*Description*
0	No stops
1	One stop sequence
2	Two stop sequence

3	Three stop sequence

Location where activity occurred (locnewpr)

Value	*Description*
1	Home
2	Previously reported
3	New location
4	Don't know
5	Refused

General location of activity participation (location)

Value	*Description*
1	In or around home
2	Known out-of-home location
3	Is a trip to participate in an activity so location
4	Unknown location
5	Out-of-home location with unknown latitude/longitude
6	Is a pure recreation activity beginning and ending at home

Location type number (locnum)

Value	*Description*
0	Not known
1	AA Meeting (Substance Abuse)
2	Alteration
3	Accountant
4	Acupuncture
5	Acoustical Engineering Firm
6	Activity Center

7	Ad/ Marketing Agency
8	Administration Office
9	Adoption agency
10	Adult day care / Nursing home
11	Adult entertainment
12	Aerospace engineering business/ firm
13	Aerobics
14	Military center/ base
15	Agriculture
16	Air freight/ cargo
17	Airport
18	Airline consulting
19	Airport parking
20	Alarm company
21	Amusement Park
22	Animal care (hospital/store)
23	Animation company
24	Antique shop
25	Apartments
26	Appliance store
27	Aquarium
28	Aquatics center
29	Architecture firm
30	Arcade
31	Archery
32	Arena
33	Army
34	Arts center/ studio
35	Art gallery
36	Art store

37	Assisted living
38	ATM
39	Attorney/ Law firm
40	Auction
41	Audio Production Company
42	Audiologist
43	Auditing firm
44	Auditorium
45	Auto dealer/ repair
46	Auto club
47	Auto insurance
48	Aviation
49	Bagel shop/ Bakery
50	Bail Bonds
51	Ball park
52	Ballet class
53	Bank
54	Banquet Hall
55	Bar/ Night club
56	Barber/ Beauty/ Nail Saloon
57	Barn/ Stable
58	BART station
59	Baseball card sales
60	Basketball arena
61	Batting cages
62	Beach
63	Bed and breakfast
64	Beverage company
65	Bicycle shop/ repair
66	Bike trail

67	Billiard hall
68	Billiard store
69	Bingo
70	Biotech company
71	Blood bank
72	Blueprinting
73	Boarding home
74	Boat Harbor
75	Boat repair store
76	Book publisher
77	Book store/ library
78	Bookkeeper
79	Bowling
80	Box office
81	Boy/ Girl scout camp/ center
82	Brewery
87	Bridal shop
88	Bridge
89	Bridge club
90	Brokerage firm
91	Builders
92	Building/ gardening
93	Bus stop/ station
94	Business/ commercial
95	Cabinet/ Countertop shop
96	Cable TV /services
97	Camera shop
98	Camp
99	Camping supply store
100	Cannery

101	Candle store
102	Candy store
103	Canoe rental
104	Carpool stop
105	Car rental
106	Carwash
107	Card shop
108	Career services
109	Carpentry
110	Carpet store
111	Catalog sales
112	Catering services
113	Cellular store
114	Cemetry
115	Ceramic studio/ store
116	Charity organization
117	Cheese factory
118	Chemical plant
119	Child care center
120	Children’s entertainment
121	Chiropractor
122	Chocolate mfg/ store
123	Christmas tree farm
124	Church
125	Cigarette store
126	Circus
127	City
128	Civic center
129	Civil Engineering
130	Clinic/ hospital

131	Clothing mfg/ store
132	Club
133	Coast guard
134	Coffee shop
135	Collectible shop
136	Collection agency
137	Coliseum
138	Communication business
139	Community center
140	Company
141	Computer industry
142	Computer consulting
143	Computer engineering
144	Computer repair/ sales
145	Computer software
146	Computer training
147	Concert hall
148	Concrete company
149	Conference center
150	Construction company
151	Construction site
152	Consultant
153	Consumer product company
154	Contractor
155	Convenience/ drug store
156	Convent
157	Convention center
158	Copy/ printing service
159	Cork company
160	Corner

161	Corporate office
162	Costume shop
163	Counseling
164	Country club
165	Craft store
166	Crane services
167	Credit card company
168	Credit counseling
169	Credit union
170	Cultural center
171	Customer service center
172	Dairy Products distribution center
173	Dairy ranch
174	Dam
175	Dance Concert/ Hall
176	Dance school/ club
177	Data Center
178	Data marketing systems
179	Day care
180	Defense
181	Deli
182	Delivery services
183	Dental office
184	Department store
185	Design Business
186	Development center
187	Diagnostics mfg
188	Diet center
189	Direct sales
190	Discount store

191	Distribution center
192	District attorney’s office
193	DK
194	Doctor
195	Donation Center
196	Downtown
197	Drilling company
198	Driving range
199	Driving school
200	Drug rehab
201	Drug manufacturing
202	Dry cleaner/ laundry
203	Dump
204	E-commerce
205	Education
206	Electric contract
207	Electricity production
208	Electronic industry
209	Electronics store
210	Elevator company
211	Employment service
212	Energy industry
213	Engineering
214	Engraving store
215	Entertainment
216	Environmental company
217	Equipment design87/ mfg
218	Errands
219	Event planning
220	Exhibit hall

221	Expo center
222	Export/ import sales
223	Exterminator
224	Eye care
225	Fabric store
226	Factory
227	Fair grounds
228	Family fun center
229	Farm/ ranch
230	Farmers market
231	Fax services
232	Ferry building/ dock
233	Festival/ parade
234	Fiber optics industry
235	Field
236	Field trip
237	Film lab
238	Film production
239	Film store
240	Financial services/ investing
241	Fitness class/ center
242	Fire protection company
243	Fire station
244	Fish store
245	Fishing
246	Flea market
247	Flight school
248	Flooring company/ contract
249	Flooring store
250	Florist

251	Flying club
252	Foam products store
253	Food bank
254	Food distribution center
255	Food manufacturing
256	Football stadium
257	Forest
258	Forestry Business
259	Forklift store/repair
260	Foundation
261	Frame shop
262	Freight company
263	Fraternity
264	Friend’s house
265	Fruit stand
266	Fund raising
267	Funeral home
268	Fur store
269	Furniture store
270	Gallery
271	Gambling
272	Game developing
273	Garage company
274	Garbage collection company
275	Garden hardware supply company
276	Gas company
277	Gas/ electric utility
278	Gas station
279	Geotechnical firm
280	Gift shop

281	Glass company
282	Golf club/ course
283	Golf supply store
284	Government/ Municipality/ City offices
285	Grandparents home
286	Graphic design firm
287	Grinding machine shop
288	Grocery
289	Gymnastic lessons
290	Hazardous waste
291	Health care
292	Heating/ air conditioning
293	Hi-tech industry
294	Historical place
295	Home improvement
296	Hotel/ Motel/ Inn
297	House
298	Housekeeping
299	Housing development
300	Human resources
301	Hunting club
302	Ice cream shop
303	Ice rink
304	Import business
305	Indoor rec/ sports
306	Industrial business
307	Internet
308	Insurance
309	Interior design
310	Intersection

311	Iron working
312	Janitorial services
313	Jewelry store
314	Junk yard
315	Karate/ martial arts classes
316	Labor organization
317	Lab research
318	Lake
319	Landscaping firm
320	Landfill
321	Laser industry
322	Learning center
323	Leasing center
324	Locksmith
325	Machine shop
326	Magazine shop
327	Mail services/ post office
328	Maintenance
329	Management services
330	Manufacturing
331	Marina
332	Meeting
333	Mortgage
334	Movie theatre
335	Movie rental
336	Moving company
337	Museum
338	Music hall
339	Music lessons/ school
340	Music store

341	Networking company
342	Non-profit org.
343	Nursery (plants)
344	Office
345	Office supply
346	Oil/ petroleum industry
347	Open space
348	Out of town/ state
349	Outdoors
350	Paint store
351	Park/ community garden
352	Parking (cars)
353	Party supplies
354	Payroll services
355	Pension services
356	Pharmacy
357	Phone call
358	Phone company/ store
359	Pick-up someone
360	Plastic industry
361	Plaza
362	Pool/swim center
363	Private property
364	Production
365	Professional services
366	Property management
367	Public relations
368	Public utility company
369	Publisher
370	Race track

371	Radio station
372	Railroad station
373	Real estate
374	Recording company
375	Recreation
376	Recruiting
377	Rental store
378	Repair business
379	Research
380	Reservoir
381	Resort/ spa
382	Residential
383	Rest area
384	Restaurant
385	Retail
386	Running/walking
387	RV sales/ repair
388	Satellite company
389	School
390	School supply
391	School district offices
392	Science industry
393	Security offices
394	Senior community
395	Shelter
396	Shopping
397	Sign company
398	Skating/ skiing
399	Soccer
400	Social activity

401	Sporting event
402	Sporting / outdoor goods
403	Storage
404	Steel/ Building material
405	Street
406	Swimming lessons
407	Swimming pool supply store
408	Tax service
409	Taxi
410	Technology industry
411	Telecommunication
412	Tennis
413	Testing
414	Theatre
415	Therapy
416	Title company
417	Tour/ Tourist attraction
418	Tow trucking
419	Trading
420	Training company
421	Transit agency/company
422	Transportation stop
423	Travel agency
424	Trucking company
425	Utilities company
426	Veterans hall
427	Vineyard
428	Volunteer work
429	Voting
430	Warehouse

431	Waste management
432	Wedding
433	Welding
434	Wholesale industry
435	Wireless communication
436	Wood working
437	Work
438	Yacht
439	YMCA/ youth club
440	Zoo
441	Plumbing services
442	Plumbing supply

Indicator for home episode and relative location in individuals pattern (homeepis)

Value	*Description*
1	Episode is the first episode of the day
2	Episode is preceded y a return home trip
3	Episode preceded by another home episode
4	Does not apply because it is a trip episode
5	Does not apply because it is an out-of-home episode
6	Does not apply because is a stop or change of mode episode

Level of physical activity (phyact)

Value	*Description*
0	No physical activity or not a recreational activity
1	Fully physical activity (gym/fitness classes etc.)
2	Partially physical activity (being outdoors, going to the beach)

Day of the week of episode (dayofwk)

Value	*Description*
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

Dummy for weekend (weekend)

Value	*Description*
0	Weekday
1	Weekend

Month of travel (month)

Value	*Description*
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November

12	December

Discrete time of day (distim)

Value	*Description*
1	3:01 to 4 am
2	4:01 to 5 am
3	5:01 to 6 am
4	6:01 to 7 am
5	7:01 to 8 am
6	8:01 to 9 am
7	9:01 to 10 am
8	10:01 to 11 am
9	11:01 to 12 pm
10	12:01 to 1 pm
11	1:01 to 2 pm
12	2:01 to 3 pm
13	3:01 to 4 pm
14	4:01 to 5 pm
15	5:01 to 6 pm
16	6:01 to 7 pm
17	7:01 to 8 pm
18	8:01 to 9 pm
19	9:01 to 10 pm
20	10:01 to 11 pm
21	11:01 to 12 am
22	12:01 to 1 am
23	1:01 to 2 am
24	2:01 to 3 am