

In [79]: *# Mode shares to Seattle RGCs*

```
import pandas as pd
```

```
pd.options.mode.chained_assignment = None # default='warn'
```

In [83]: *# import data (release 3)*

```
trip_file = r'J:\Projects\Surveys\HHTravel\Survey2014\Data\Export\Release 3\General Release\Unzipped\2014-pr3-hhsurvey-trips.csv'
```

```
trips = pd.read_csv(trip_file)
```

In [156]: seattle\_rgcs = ['Seattle CBD', 'First Hill/Capitol Hill', 'Northgate',

```
                    'South Lake Union', 'University Community', 'Uptown Queen Anne']
```

```

In [273]: def format_pivot(df):
    '''
    Format pivot table results to include Seattle RGCs, select modes
    '''
    # select only trips to seattle locations
    df = df[seattle_rgcs]

    df.fillna(0,inplace=True)

    # Add another columns for Seattle City Center, which includes multiple RGCs
    df['City Center'] = df['Seattle CBD']+df['First Hill/Capitol Hill']+
df['South Lake Union']\
    +df['Uptown Queen Anne']

    # Save total trips by RGC for later use
    sum_row = df.sum()

    # Redefine modes (note: loc[] refers to mode number, iloc[] is an index)

    # SOV: includes "Drive alone"
    df.loc['SOV'] = df.loc[1]

    # HOV: includes "Drove/rode ONLY with other hh members,"
    # "drove/rode with people not in hh," and vanpool
    df.loc['HOV'] = df.loc[2]+df.loc[3]+df.loc[5]

    df.loc['Bike'] = df.loc[6]
    df.loc['Walk'] = df.loc[7]
    df.loc['Bus'] = df.loc[8]
    df.loc['Train'] = df.loc[9]
    df.loc['Ferry'] = df.loc[10]
    df.loc['Streetcar'] = df.loc[11]

    df = df.loc[['SOV','HOV','Bike','Walk','Bus','Train','Ferry','Streetcar']]

    # Calculate "other" as the sum of all trips to RGC minus sum of selected modes
    # Other includes all other modes such as taxi, motorcycle, school buses,
    # and also 'other', which falls outside even those categories
    df.loc['Other'] = sum_row - df.sum()

    return df

```



### All trips to/within Seattle RGCs

```
In [215]: all_trips_to_rgc = pd.pivot_table(data=trips, cols='d_rgc_name', index
      = 'mode',
      values='expwt_final', aggfunc='sum')

df = format_pivot(all_trips_to_rgc)
df.to_clipboard()
```

### All Commute Trips to/within Seattle RGCs

```
In [221]: # Filter for commute trips

# Since we are concerned with trips to/within RGCs, consider commute tri
p as home->work trips only
commute_trips = trips[(trips['d_purpose'] == 2) & (trips['o_purpose'] ==
1)]
```

```
In [222]: commute_trips_to_rgc = pd.pivot_table(data=commute_trips, cols='d_rgc_name', index='mode',
                                                values='expwt_final', aggfunc='sum')

df = format_pivot(commute_trips_to_rgc)
df.to_clipboard()
```

## Non-commute Trips to/within Seattle RGCs

```
In [241]: # filter for non-work trips ending in RGC zone

# exclude all trips with destination of work
non_commute = trips[-((trips['d_purpose'] == 2) & (trips['o_purpose'] == 1))]
```

```
In [242]: # non-commute trips should be any trip that wasn't defined as a commute trip
len(non_commute)+len(commute_trips)==len(trips)
```

Out[242]: True

```
In [244]: non_commute_to_rgc = pd.pivot_table(data=non_commute, cols='d_rgc_name', index='mode',
                                                values='expwt_final', aggfunc='sum')

df = format_pivot(non_commute_to_rgc)
df.to_clipboard()
```

## All Trips, for Households living in Seattle RGCs

```
In [250]: # Select only households that live within the Seattle RGCs
# need the household info to join with trip data
hh_file = hh = r'J:\Projects\Surveys\HHTravel\Survey2014\Data\Export\Release 3\General Release\Unzipped\2014-pr3-hhsurvey-households.csv'
hh = pd.read_csv(hh_file)
```

```
In [257]: trip_hh = trips.merge(hh,on='hhid')
```

```
In [258]: seattle_rgc_trip_hh = trip_hh[trip_hh['h_rgc_name'].isin(seattle_rgc)]
```

```
In [259]: rgc_hh_mode_share = pd.pivot_table(data=seattle_rgc_trip_hh, cols='d_rgc_name', index='mode',
                                             values='expwt_final', aggfunc='sum')

df = format_pivot(rgc_hh_mode_share)
df.to_clipboard()
```

## Non-Work Trips for Households Living in Seattle RGCs

```
In [260]: # This query is for households living in seattle rgcs, but targeted for non-commute trips only
```

```
In [270]: # Since we are no longer considering trips by the destination location, # we should filter out all commute trips -> this includes home-work and work-home
```

```
# First filter out the home->work trips
sea_noncom = seattle_rgc_trip_hh[-((seattle_rgc_trip_hh['d_purpose'] == 2) & \
                                   (seattle_rgc_trip_hh['o_purpose'] == 1))]
print len(sea_noncom)
```

4796

```
In [271]: # Next filter those results to remove all work->home trips too!
sea_noncom = sea_noncom[-((sea_noncom['d_purpose'] == 1) & \
                          (sea_noncom['o_purpose'] == 2))]
print len(sea_noncom)
```

4349

```
In [274]: noncommute = pd.pivot_table(data=sea_noncom, cols='d_rgc_name', index='mode',
                                       values='expwt_final', aggfunc='sum')

df = format_pivot(noncommute)
df.to_clipboard()
```

Sample Count: to count samples, do the following for each category

```
In [184]: # Change aggfunc='sum' to aggfunc='count' in the pivot_table method
all_trips_to_rgc = pd.pivot_table(data=trips, cols='d_rgc_name', index
='mode',
                                   values='expwt_final', aggfunc='count')

df = format_pivot(all_trips_to_rgc)
df.sum()
```

```
Out[184]: d_rgc_name
Seattle CBD                2874
First Hill/Capitol Hill    2126
Northgate                  416
South Lake Union           583
University Community       1208
Uptown Queen Anne          566
City Center                6149
dtype: float64
```

```
In [ ]:
```