cycleparking

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Read me

input data

census.rda: A census data of 2011 subsetting by Greater London. route.rda: route data obtained from PCT. parking.rda: parking data merged from CID and OSM. lsoa_msoa.rda: LSOA and MSOA link.

Load data

Join MSOA code to census

[1] FALSE

[1] FALSE

Join MSOA code to parking

[1] FALSE

Aggregate census' all and bicycle by MSOA.

```
## 'summarise()' regrouping output by 'omsoa' (override with '.groups' argument)
```

[1] TRUE

Add distance and hilliness to census2.

[1] FALSE

[1] 308782

[1] 308782

[1] 617564

Join distance and hilliness to census2.

[1] TRUE

```
## # A tibble: 219,452 x 6
## # Groups:
               omsoa [7,147]
##
                             all bicycle rf dist km rf avslope perc
      omsoa
                dmsoa
##
      <chr>
                <chr>
                                   <int>
                                               <dbl>
                                                               <dbl>
                           <int>
##
   1 E02000001 E02000509
                               1
                                       0
                                                  NA
                                                                  NA
    2 E02000002 E02000053
                               2
                                       0
                                                  NA
                                                                  NA
   3 E02000002 E02000093
                               3
                                       0
                                                  NA
                                                                  NA
  4 E02000002 E02000106
                               2
                                       0
                                                                  NA
                                                  NA
   5 E02000002 E02000116
##
                               1
                                       0
                                                  NA
                                                                  NA
##
   6 E02000002 E02000119
                               2
                                       0
                                                  NA
                                                                  NA
  7 E02000002 E02000150
                                                 NA
                                                                  NA
                               1
## 8 E02000002 E02000220
                                       0
                                                                  NA
                                                  NA
                               1
## 9 E02000002 E02000225
                                       0
                                                  NA
                                                                  NA
## 10 E02000002 E02000244
                                       0
                                                  NA
                                                                  NA
                               1
## # ... with 219,442 more rows
```

Check census data.

[1] 601902

```
## # A tibble: 601,902 x 7
## # Groups:
               omsoa [7,189]
                             all bicycle rf dist km rf avslope perc First3D
##
      omsoa
                dmsoa
##
      <chr>
                <chr>>
                                   <int>
                                              <dbl>
                                                               <dbl> <chr>
                          <int>
   1 E02000001 E02000001 1506
                                      33
                                               1.05
                                                                1.64 E02
##
    2 E02000001 E02000014
                              2
                                       0
                                              19.1
                                                                0.77 E02
  3 E02000001 E02000016
                              3
                                       0
                                              13.9
                                                                0.87 E02
  4 E02000001 E02000025
                              1
                                       0
                                              19.4
                                                                1.66 E02
## 5 E02000001 E02000028
                              1
                                       0
                                              18.5
                                                                1.58 E02
##
  6 E02000001 E02000051
                                              13
                                       0
                                                                1.87 E02
                              1
## 7 E02000001 E02000053
                              2
                                              15.8
                                                                2.34 E02
## 8 E02000001 E02000057
                                       0
                                              12.8
                                                                2.28 E02
                              1
## 9 E02000001 E02000058
                              1
                                       0
                                              12
                                                                2.31 E02
## 10 E02000001 E02000059
                                       0
                                              14.8
                                                                1.6 E02
                              1
## # ... with 601,892 more rows
```

'summarise()' ungrouping output (override with '.groups' argument)

```
## # A tibble: 2 x 4
## First30 'n()' 'sum(all)' 'sum(bicycle)'
## <chr> <int> <int> <int> (int>
## 1 E02 598276 3711412 147102
## 2 W02 3626 4570 97
```

[1] 983

Check how many trips are excluded and how many are intra/inter zonal trips. (Table 6. Number of Commuters in/to Greater London)

```
## [1] 3715982
## 'summarise()' ungrouping output (override with '.groups' argument)
## # A tibble: 2 x 4
     intra 'n()' 'sum(all)' 'sum(bicycle)'
     <lgl> <int>
                      <int>
                                      <int>
## 1 FALSE 600919
                     3589916
                                     143899
## 2 TRUE
                                       3300
              983
                      126066
## 'summarise()' ungrouping output (override with '.groups' argument)
## # A tibble: 2 x 4
    excluded 'n()' 'sum(all)' 'sum(bicycle)'
     <1g1>
              <int>
                       <int>
                                         <int>
## 1 FALSE
              382450
                        3145728
                                        143182
## 2 TRUE
              219452
                         570254
                                          4017
## 'summarise()' regrouping output by 'excluded' (override with '.groups' argument)
## # A tibble: 3 x 5
## # Groups: excluded [2]
    excluded intra 'n()' 'sum(all)' 'sum(bicycle)'
             <lgl> <int>
    <lgl>
                               <int>
                                               <int>
## 1 FALSE
             FALSE 381467
                              3019662
                                              139882
## 2 FALSE
                       983
             TRUE
                              126066
                                                3300
## 3 TRUE
             FALSE 219452
                               570254
                                                4017
## [1] 36.45976
## [1] 15.34598
## [1] 2.728959
```

BCG construction Step 1: Eliminating >30km od and CalculateGoDutch propensity

BCG construction Step 2: Calculate GoDutch number of cycle commuters for each OD pair.

BCG construction Step 3: Aggregate by destination MSOA.

BCG construction Step 4: Construct BCG by mean values

Parking 1: Aggregate parking space for each MSOA

Parking 2: Join parking space to census

Parking Occupancy Rate: por

4 Categories: Surplus : Less than 50% occupancy rate Ideal : 50% and more and 80% and less occupancy rate Threshold: More than 80% and 100% and less occupancy rate Shortage : More than 100% occupancy rate

Examples: Surplus: bicycle= 30, parking=100 - Less than 50% occupancy rate Ideal: bicycle= 70, parking=100 - 50% and more and 80% and less occupancy rate Threshold: bicycle= 90, parking=100 - More than 80% and 100% and less occupancy rate Shortage: bicycle=110, parking=100 - More than 100% occupancy rate

Exceptions: Case 1 : bicycle= 0, parking=100 -> Surplus (n = 22 current) Case 2 : bicycle=10, parking=0 -> Shortage (n = 1 current) Case 3 : bicycle= 0, parking=0 -> Shortage (n = 0 observation)

Current Occupancy Rate and Category

Future Occupancy Rate and Category

por checking

Reorder factor of por categorisation

Figures

Figure 9 Histogram of Current and Future Share of Cycle Commuter

Figure 14 Histogram of Growth Share of Cycle Commuter

Figure 16 Scatter Plot of Growth and Current Share of Cycle Commuter

Figure 17 Violin Plot of Growth and Current Share of Cycle Commuter

Figure 20 Histogram of Parking Space per MSOA

Figure 21 Breakdown of Parking Space by No. of Cycle Commuter (left) and Area (right)

Figure 24 Histogram of Current Parking Demand per MSOA (>500 excluded)

Figure 27 Histogram of Future Parking Demand per MSOA (>1,000 excluded)

Figure 31 Breakdown of Parking Occupancy Category based on No. of Cyclist for Current Scenario (left) and Future Scenario (right)

Figure 32 Percentage Breakdown of Parking Occupancy Category based on No. of Cyclist for Current Scenario (left) and Future Scenario (right)

Figure 33 Scatter Plot of Parking Space and No. of Cyclist by MSOA for Current Scenario

Figure 33-1 Scatter Plot of Parking Space and No. of Cyclist by MSOA for Current Scenario LOG SCALE!

Figure 34 Scatter Plot of Parking Space and No. of Cyclist by MSOA for Future Scenario

Figure 34-1 Scatter Plot of Parking Space and No. of Cyclist by MSOA for Future Scenario