

Spatio-temporal Analysis of Bicycle Commuting Behavior in the Greater Tokyo Area Using a Micro-scale Persontrip Database

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Persontrip Dataset

questionnaires by Tokyo Metropolitan Area Transportation Planning Council 東京都都市圏交通計画協議会

date of query: October 1st, 2008

contains information about 587,340 individuals

synthesized to 1-minute positions by the University of Tokyo Center for Spatial Information Science (CSIS) 筑波大学 空間情報科学研究センター Center for Spatial Information Science The University of Tokyo

845,769,600 point positions in total (24 hours * 60 minutes per individual)

PostgreSQL & PostGIS database, total size: 630GB 筑波大学 University of Tsukuba

What does the data tell us?

112,286 people in total used their bikes during the sample period (24 hours), that equals 19.1% of the total sample population of 587,334 people.

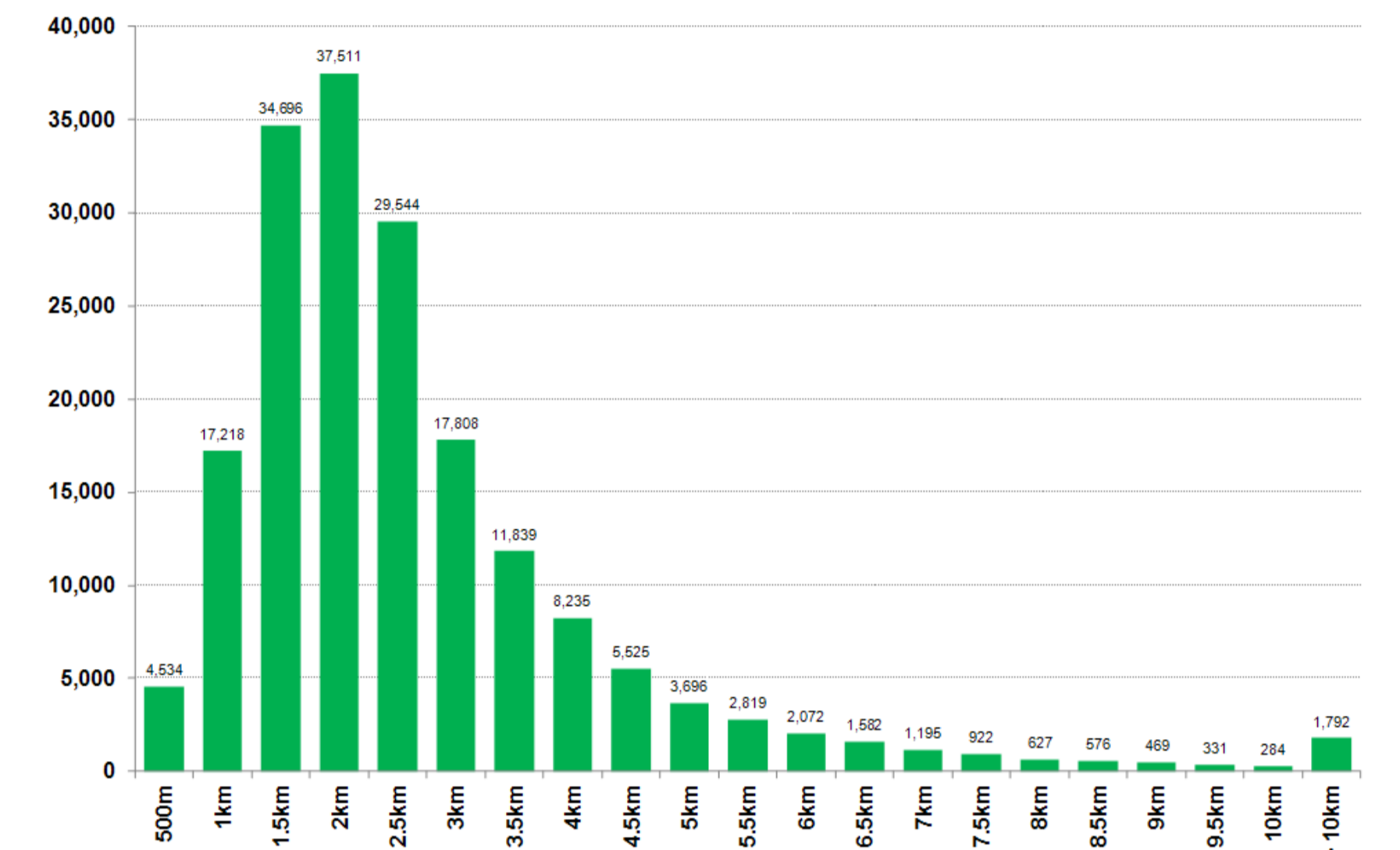
They got on their bikes 272,897 times in total, 2.4 times each in average.

Overall they used bicycles for 478,738km - that is further than the distance from the earth to the moon!

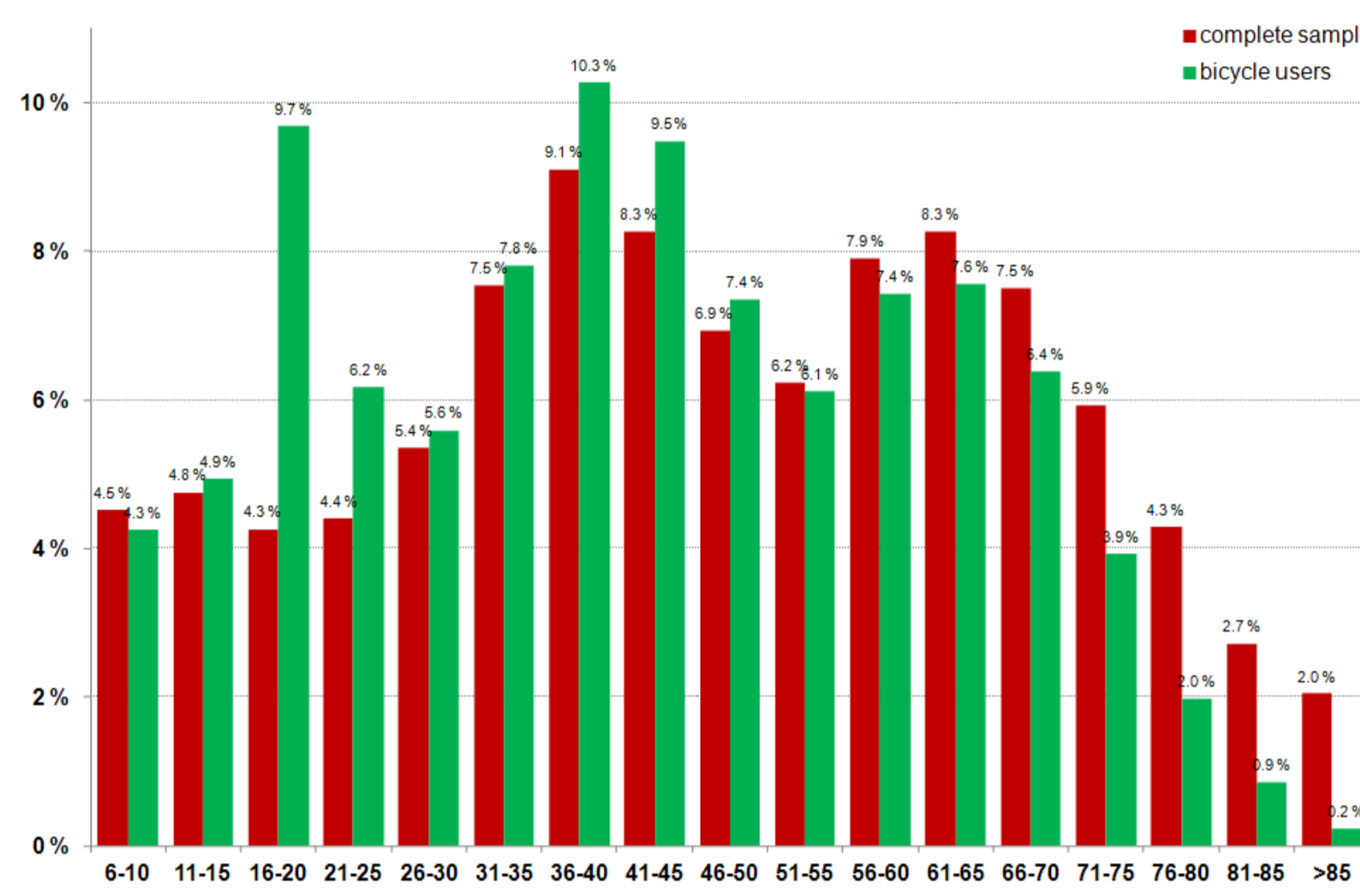
The average distance was 4.2km per person, 1.7km per subtrip.

The longest subtrip was 144km.

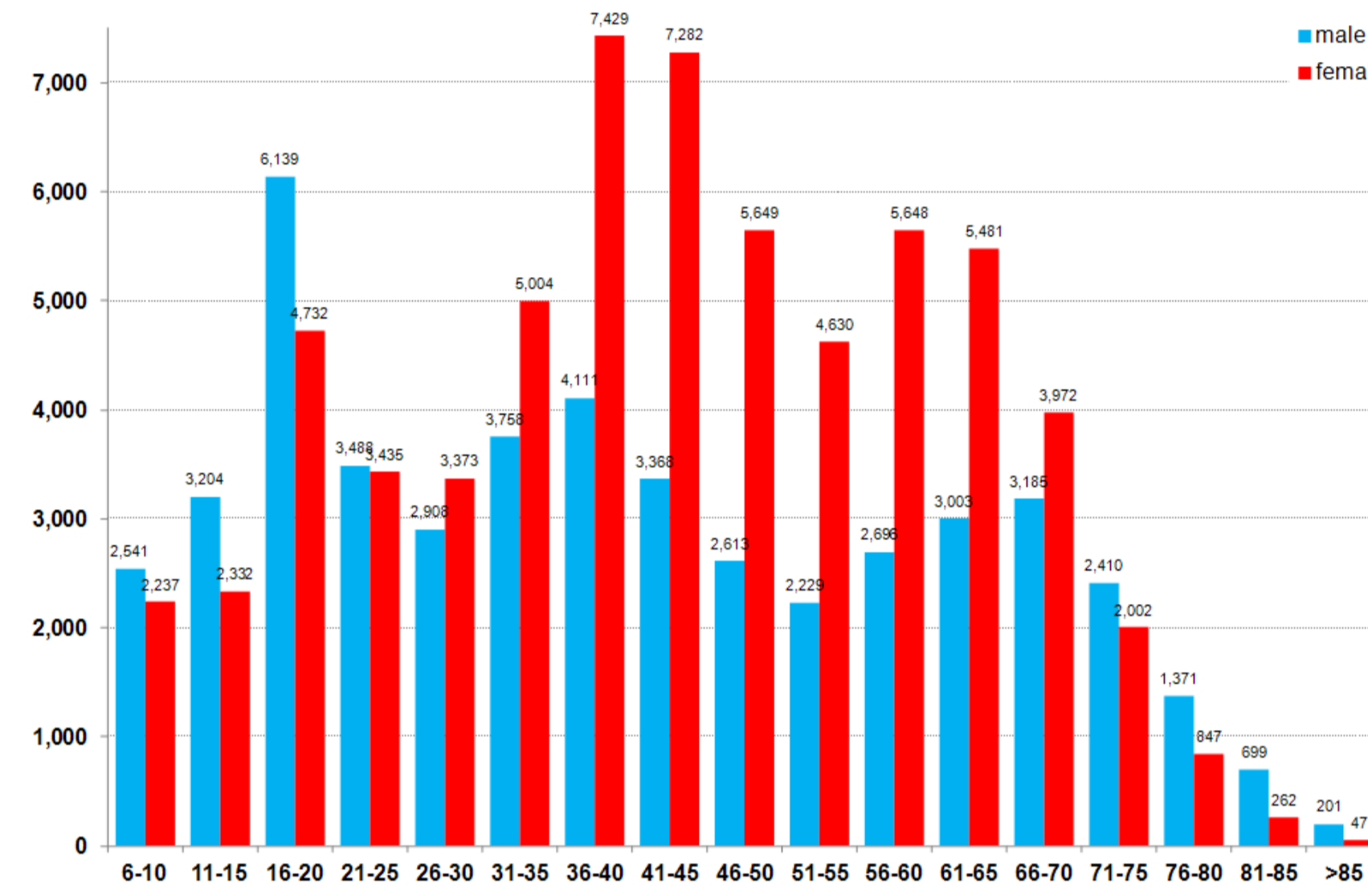
Bicycle Subtrips Distance Histogram



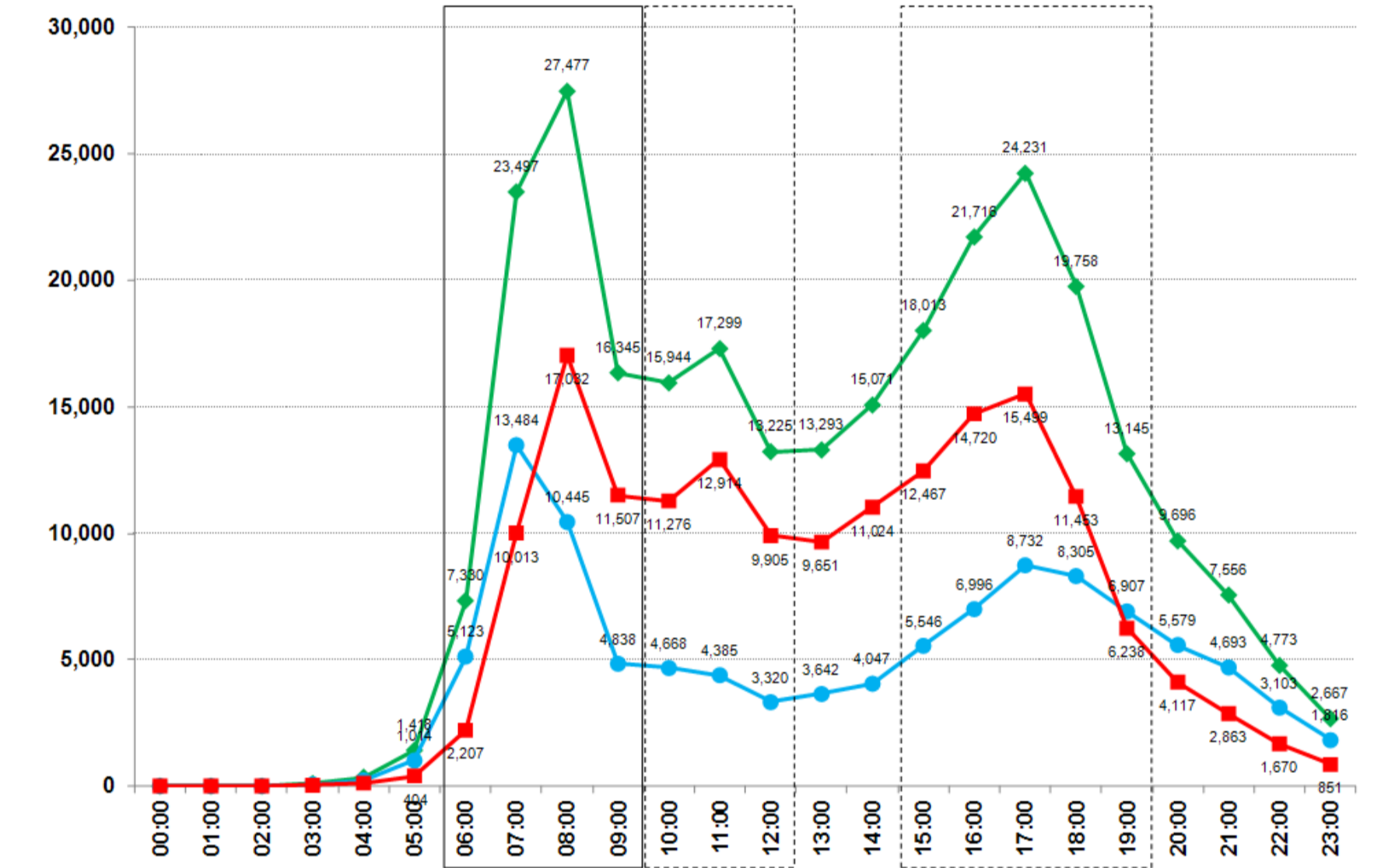
Comparison of Age Distributions (%)



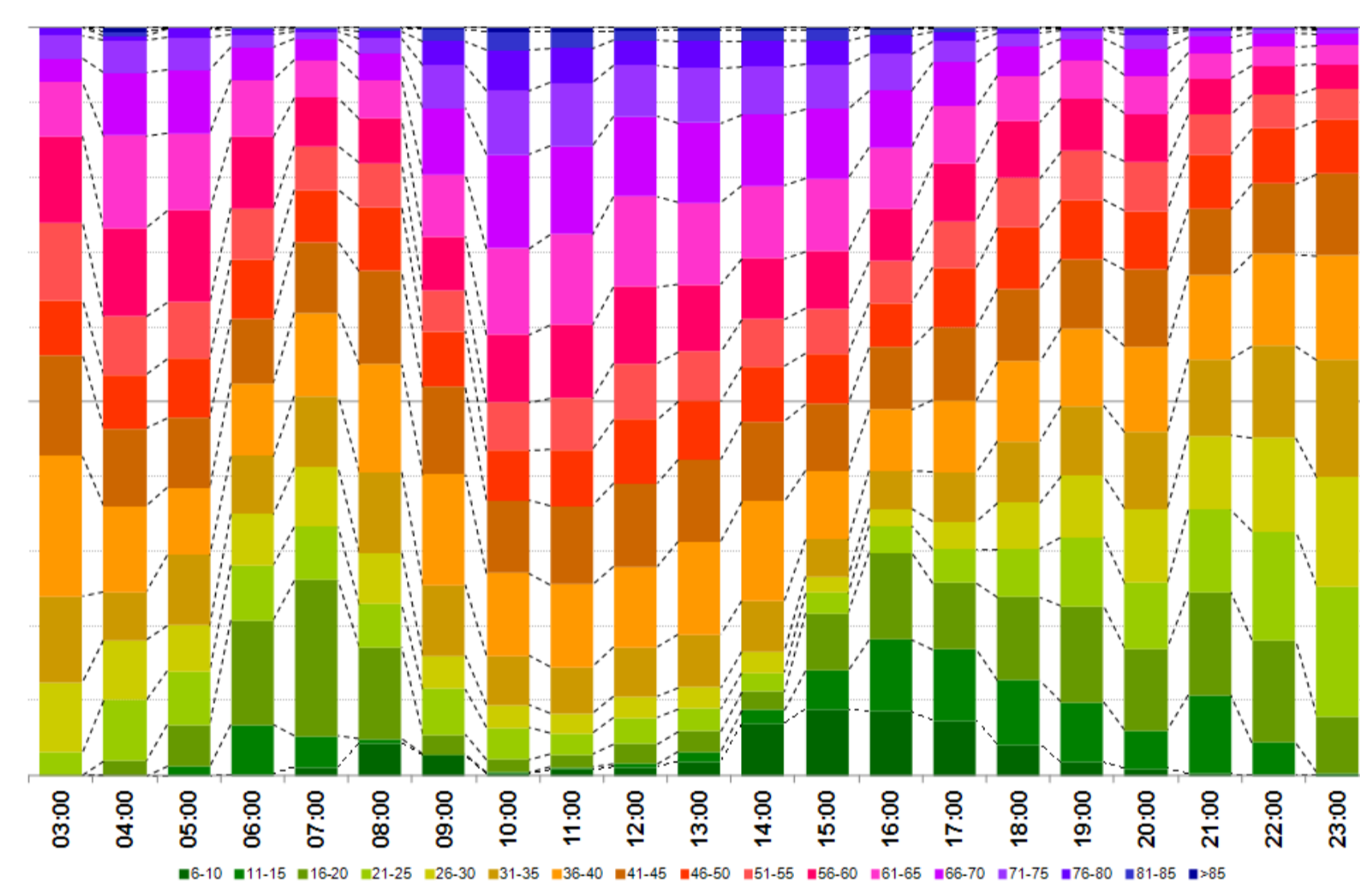
Age Distribution by Gender of Bicycle Users



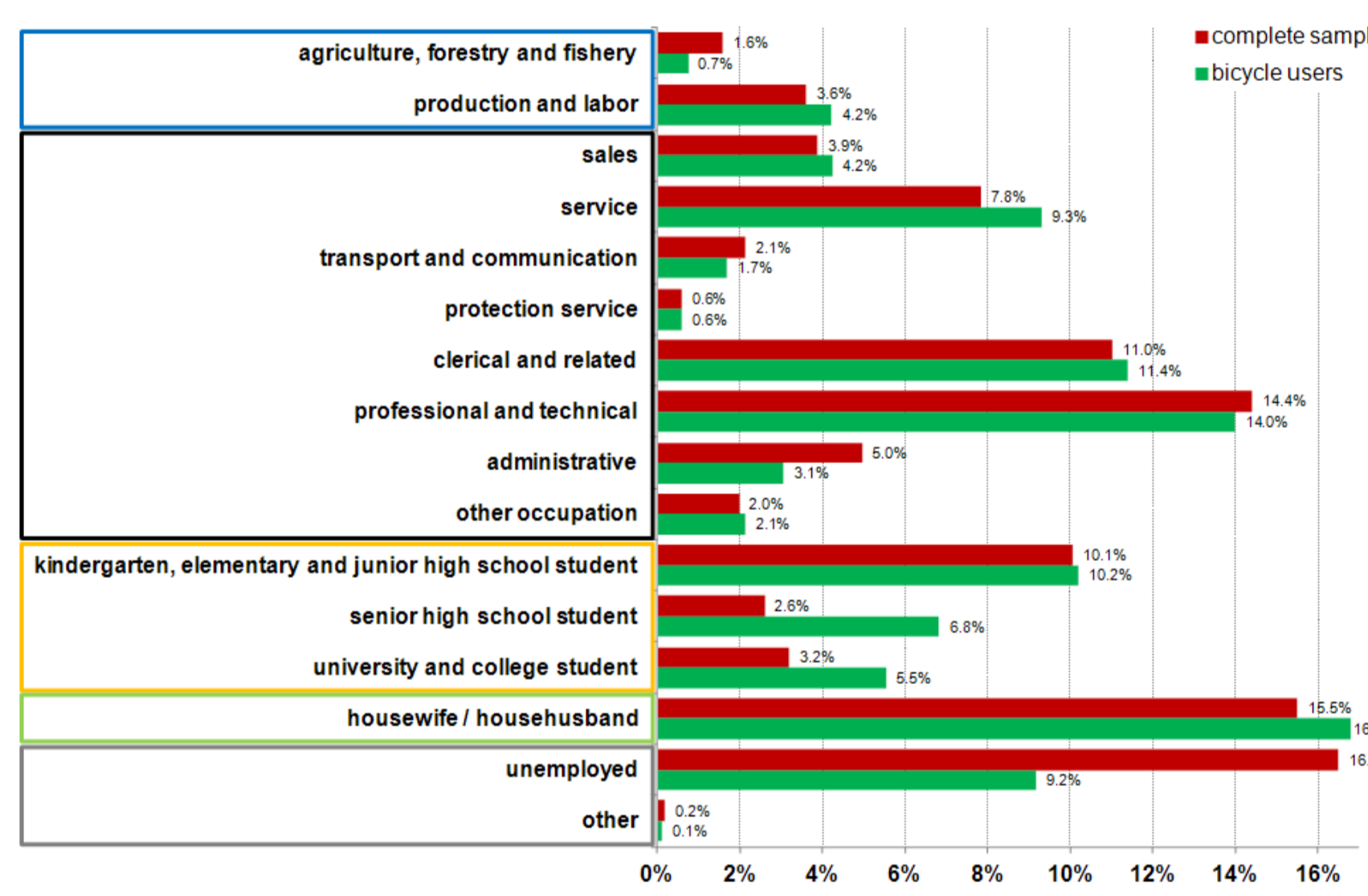
Bicycle Subtrips by Gender Over Time



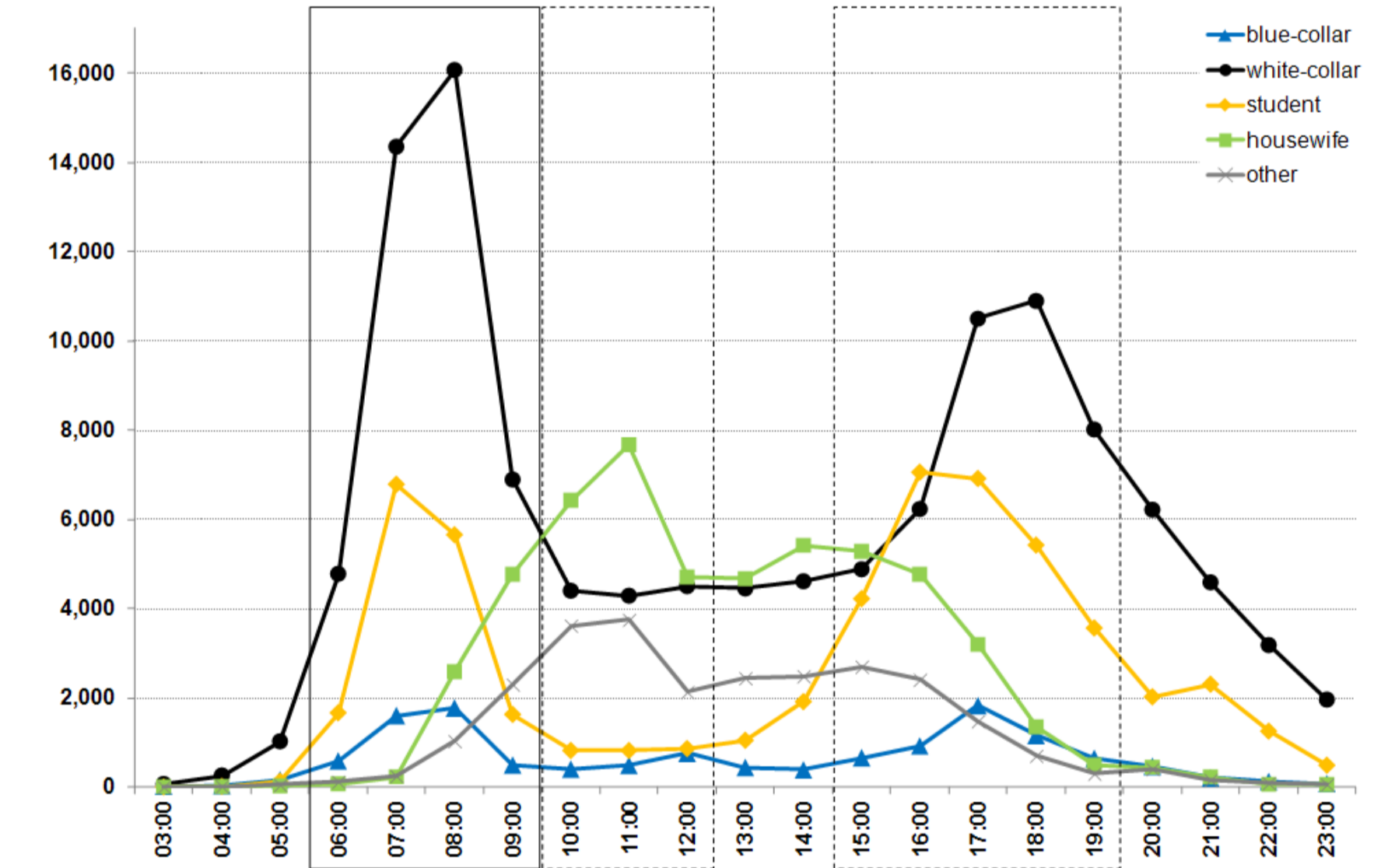
Bicycle Subtrips by Age Over Time (%)



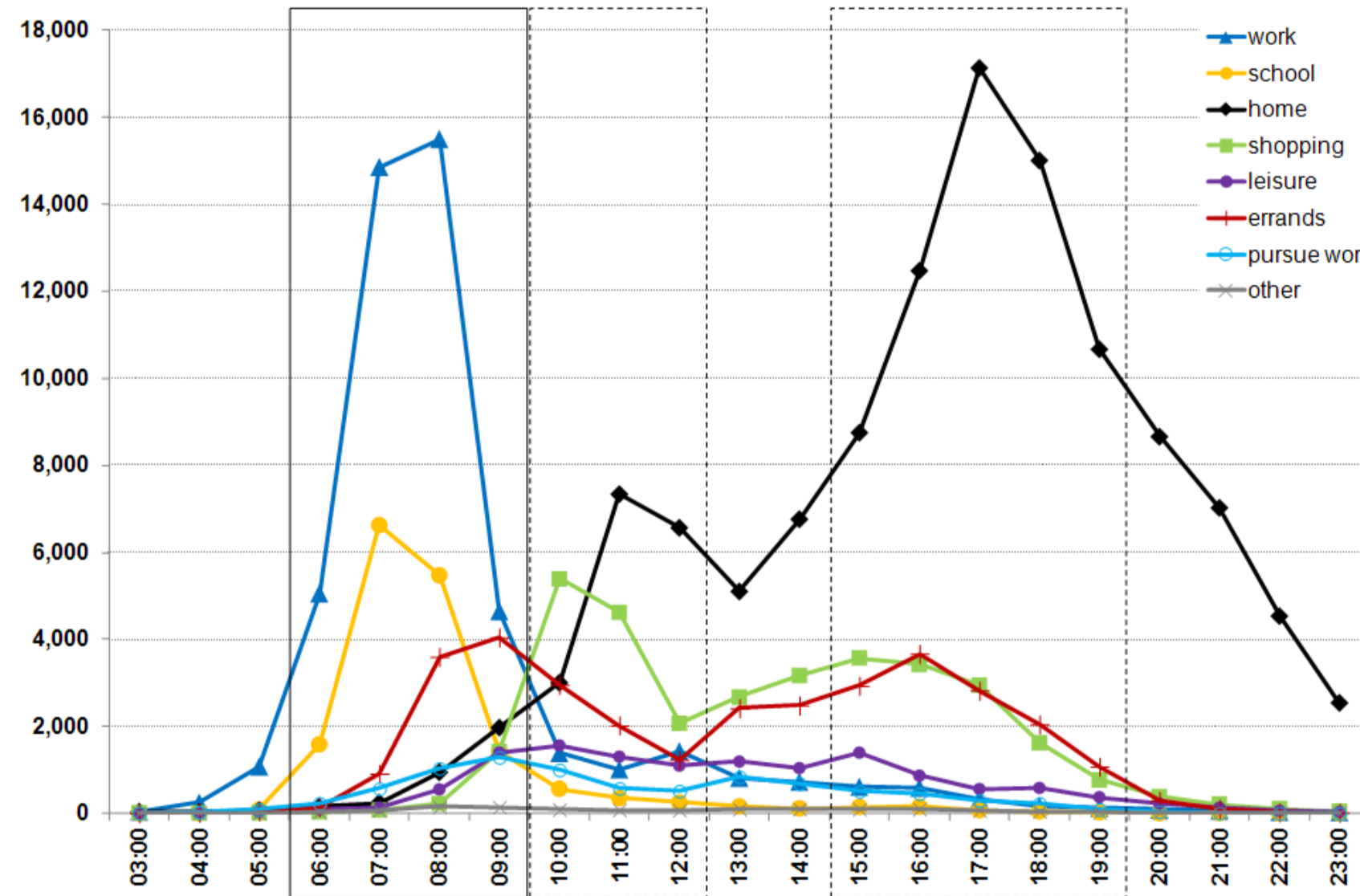
Comparison of Occupation Distributions (%)



Bicycle Subtrips by Occupation Cat. Over Time



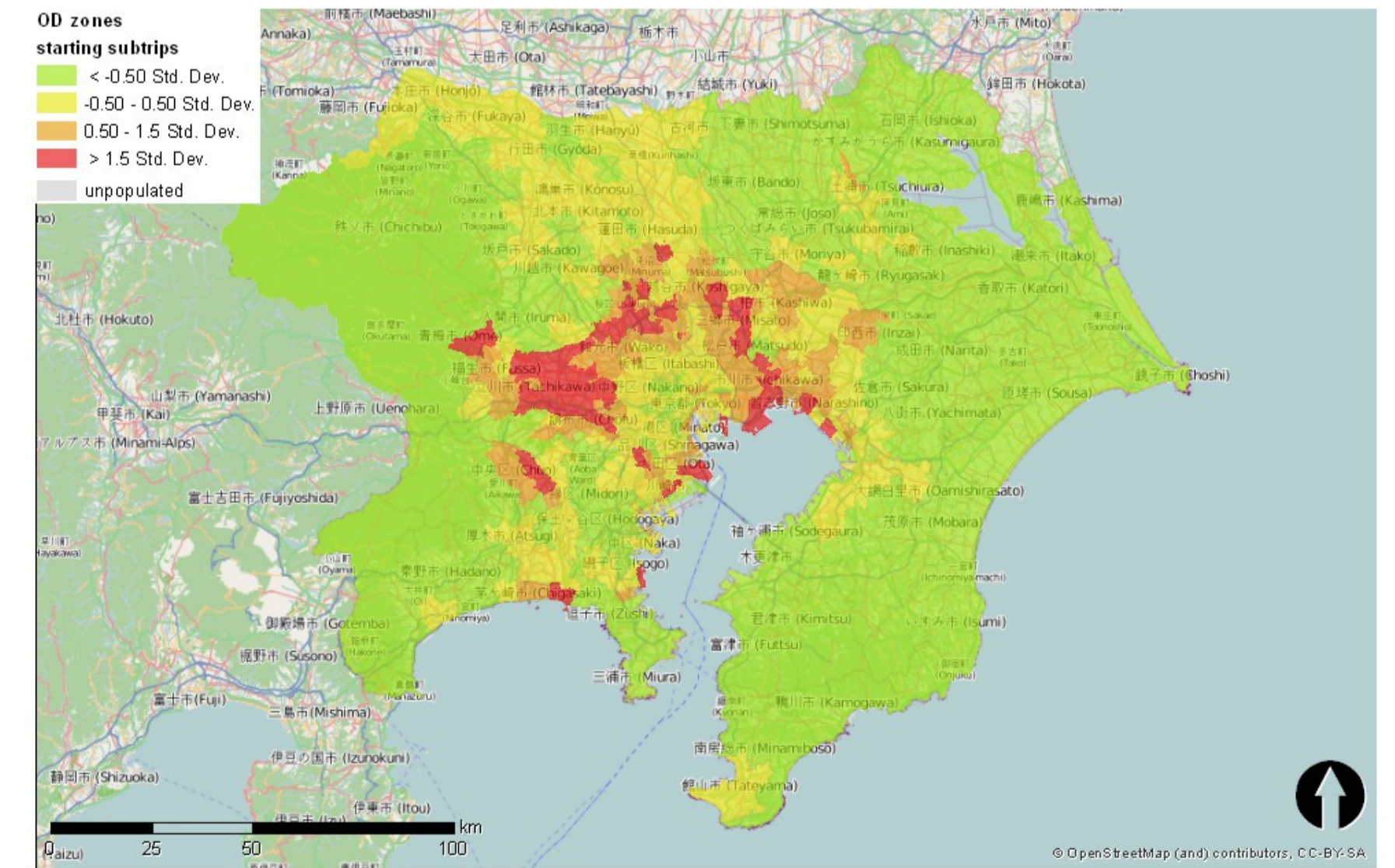
Bicycle Subtrips by Purpose Over Time



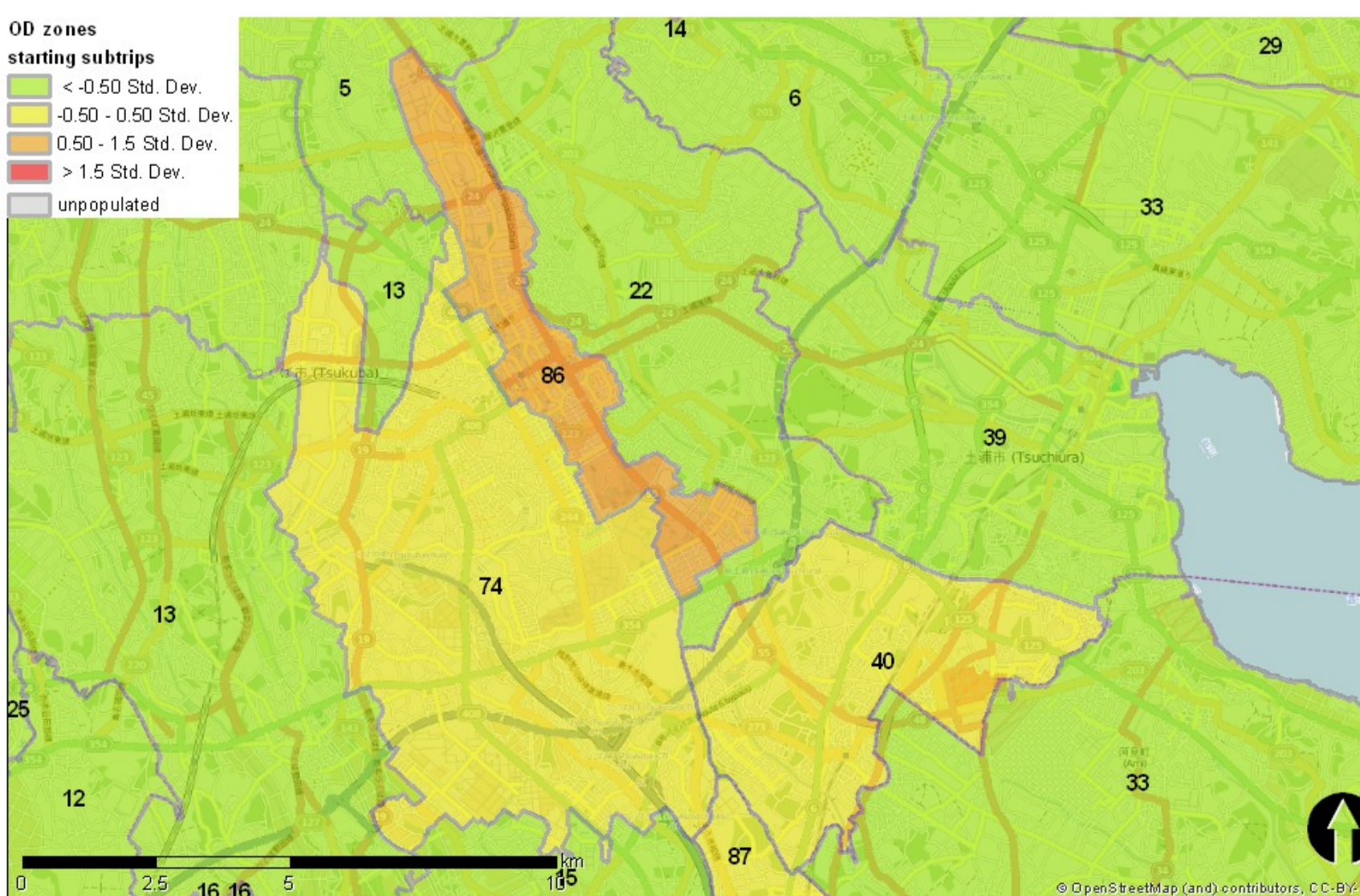
Subtrip Chain Matrix (Morning Rush Hour Period)

| from \ to | walking | bicycle | motorcycle | taxi | car | lorry | bus | railway | stationary |
|------------|---------|---------|------------|-------|--------|-------|--------|---------|------------|
| stationary | 207,483 | 71,484 | 9,418 | 1,172 | 82,681 | 9,113 | 4,971 | | |
| railway | 133,316 | 2,144 | 76 | 439 | 325 | 26 | 12,426 | 2,365 | 1 |
| bus | 17,721 | 58 | 6 | 21 | 19 | 1 | 129 | 18,271 | 8,157 |
| lorry | 21 | | 1 | 1 | 2 | | 2 | 47 | 8,488 |
| car | 1,475 | 54 | 4 | | 2 | 5 | 240 | 6,895 | 69,790 |
| taxi | 31 | | | | | | 7 | 206 | 1,293 |
| motorcycle | 128 | 4 | | | 12 | 3 | 24 | 1,929 | 7,176 |
| bicycle | 739 | | 6 | 2 | 61 | 10 | 681 | 24,612 | 45,362 |
| walking | | 116 | 13 | 56 | 450 | 33 | 27,495 | 102,407 | 222,827 |

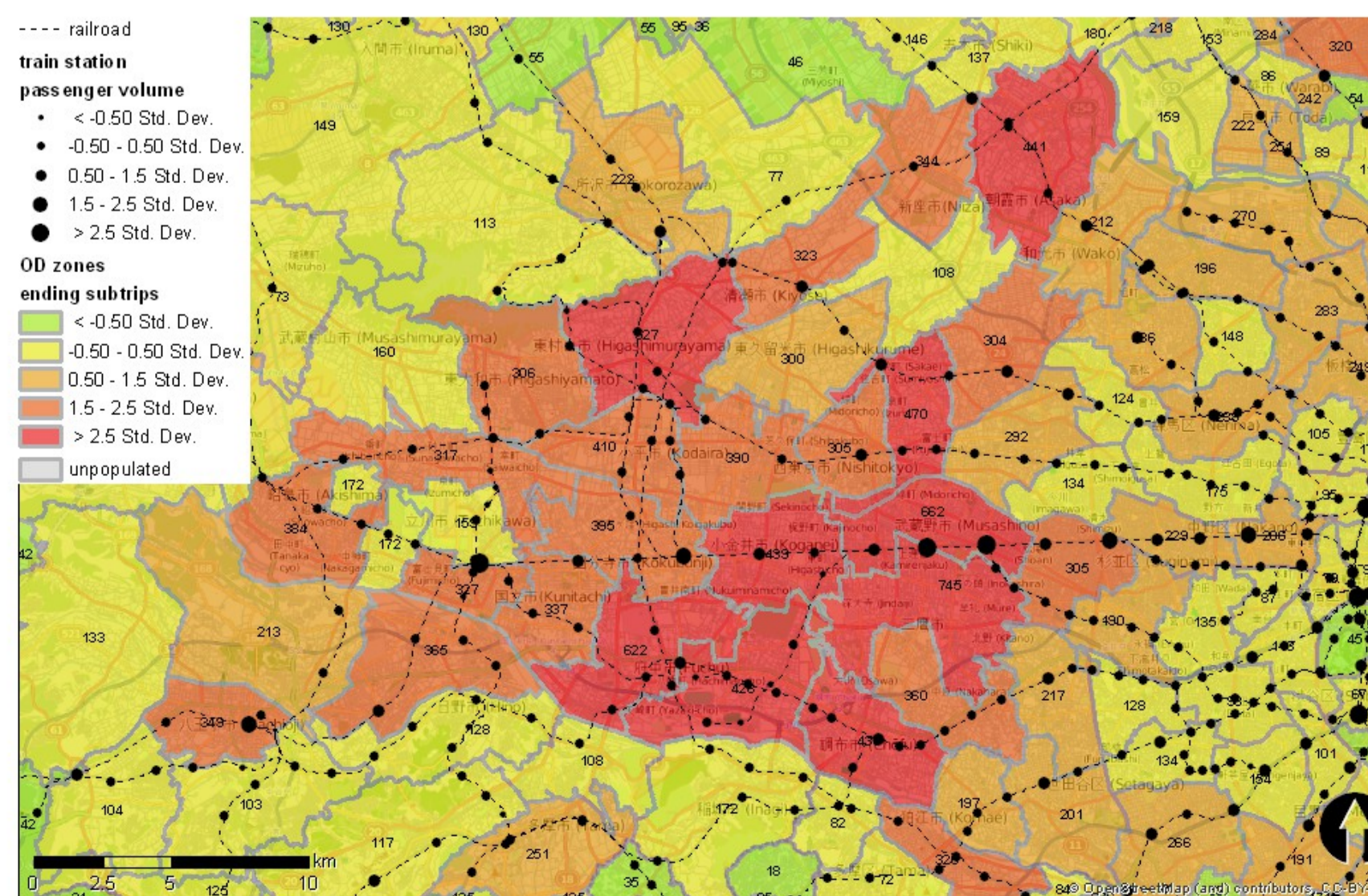
Bicycle Subtrip Locations - Study Area



Bicycle Subtrip Locations - University of Tsukuba



Bicycle Subtrip Locations - Western Tokyo



Bicycle Subtrip Locations - Western Tokyo

