The Effectiveness of Trams
~A Case Study of Matsuyama~

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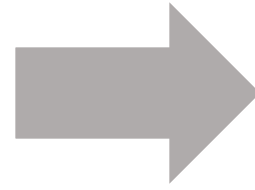Toshimitsu Nishikiori

Aira Bando

Motoki Takai

Background

Tramway

Motorization

Automobile Society

Problems in Automobile Society

Decline of Central District

Congestion

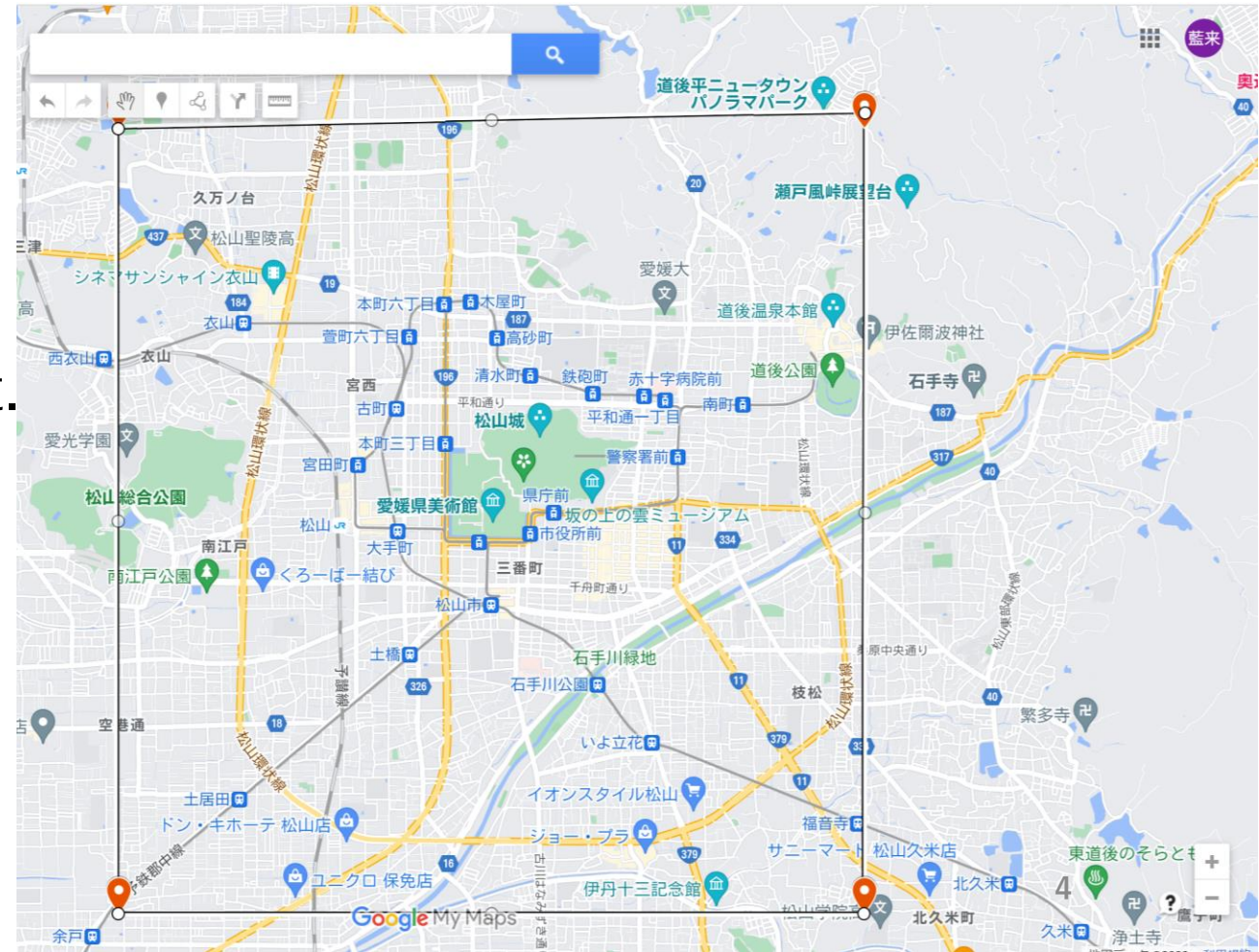CO_2 emissions

Data

Matuyama

- [UserInfo.xls - Google スプレッドシート](UserInfo.xls)

- [松山2007 - Google ドライブ](松山2007)
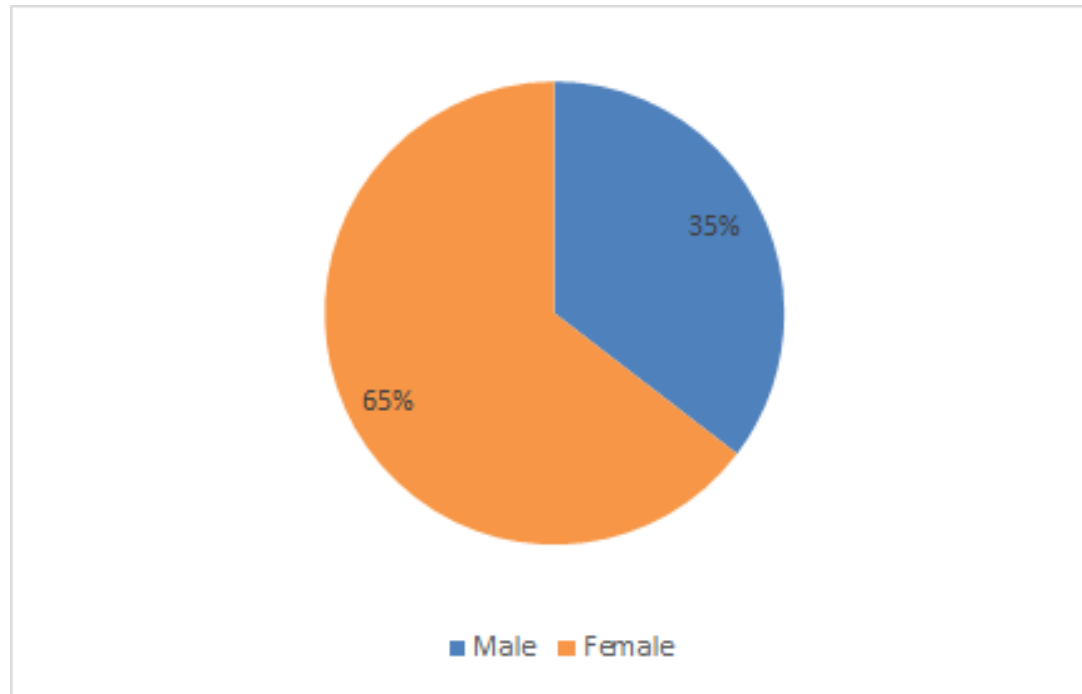
    Number of Data: Over 7000

    →Extract data only for central
    Matsuyama City as the starting point.
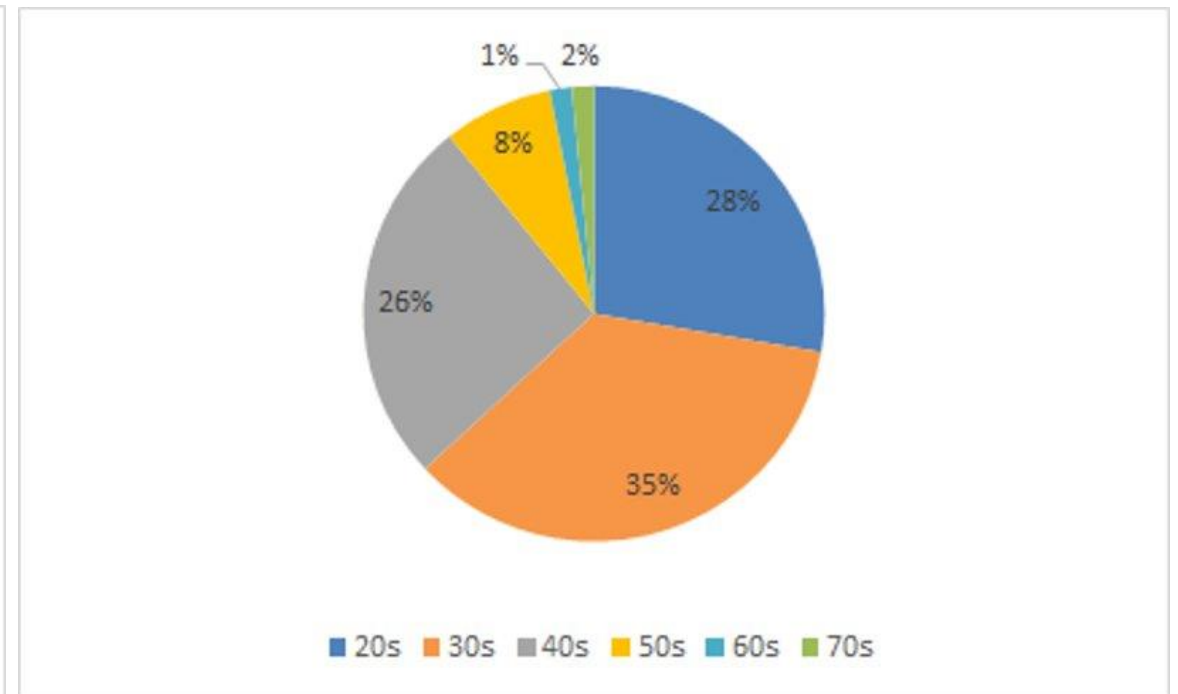   Number of Data: 4017

Basic Aggregation
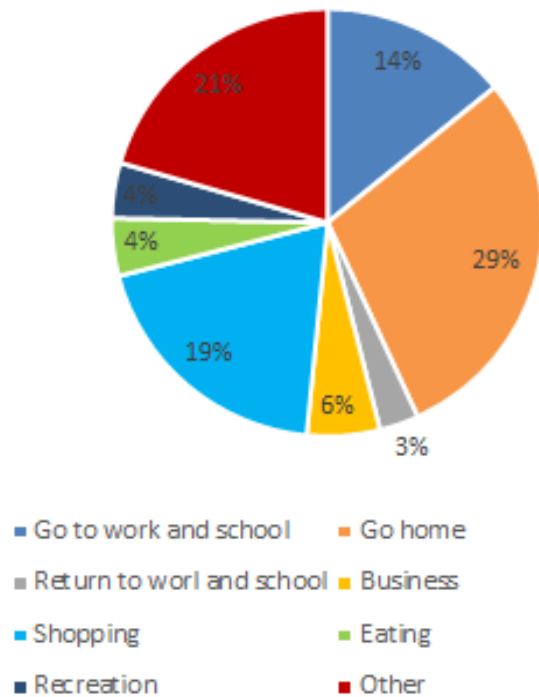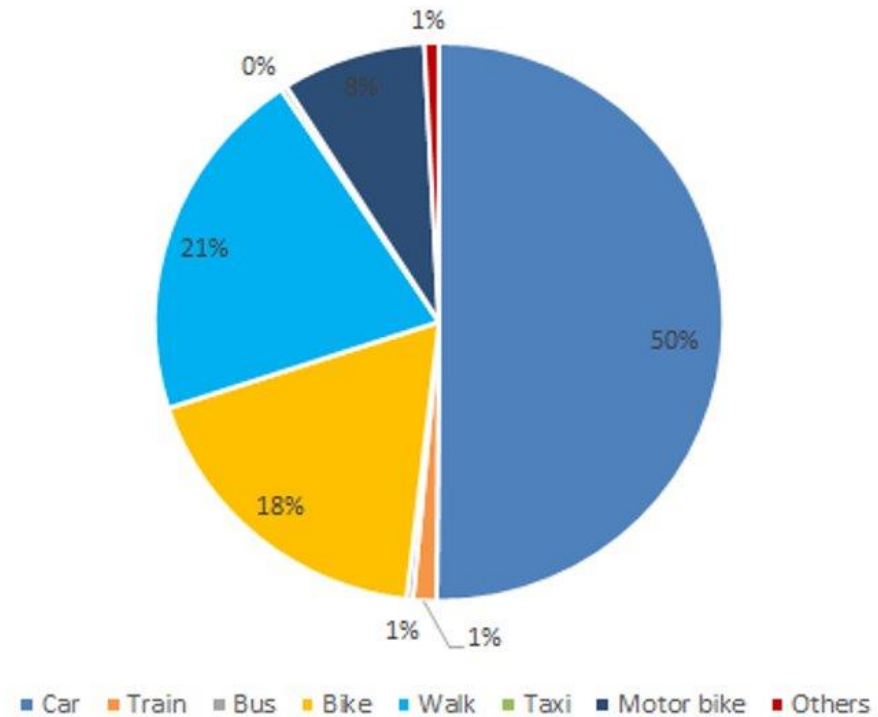
Gender
N=65

Age
N=65

Basic Aggregation

Purpose
N=5929

Transportation
N=5970

Model Estimation

Transportation Selection
  :Car, Tram, JR, Bus, Motorcycle, Bicycle, Walk, Taxi

Tram 180 Yen, JR 360 Yen, bus 160 Yen (each fare is fixed)

Model Estimation Results

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-0.8204	nan	nan	nan	nan	nan
CAR_TIME	-35.7876	8.056	-4.443	0.000	-51.576	-19.999
CAR_COST	-40.4450	24.406	-1.657	0.097	-88.280	7.390
TRAM_TIME	0.1273	11.184	0.011	0.991	-21.792	22.047
TRAM_DISTANCE	-0.0276	0.978	-0.028	0.978	-1.944	1.889
TRAM_COST	-2.6726	2.831	-0.944	0.345	-8.221	2.876
JR_TIME	-0.7058	33.650	-0.021	0.983	-66.658	65.247
JR_DISTANCE	0.0073	4.490	0.002	0.999	-8.793	8.808
JR_COST	-1.4628	6.373	-0.230	0.818	-13.954	11.029
BUS_TIME	0.0379	3.436	0.011	0.991	-6.696	6.772
BUS_COST	-1.8769	7.508	-0.250	0.803	-16.593	12.839
BIKE_TIME	0.0240	2.405	0.010	0.992	-4.690	4.738
BIKE_COST	1.5859	21.003	0.076	0.940	-39.580	42.752
BICYCLE_TIME	6.7071	4.697	1.428	0.153	-2.498	15.912
BICYCLE_DISTANCE	1.5370	0.556	2.763	0.006	0.447	2.627
WALK_TIME	9.4996	3.520	2.699	0.007	2.601	16.398
WALK_DISTANCE	2.1107	0.945	2.233	0.026	0.258	3.963
TAXI_TIME	5.1160	6.184	0.827	0.408	-7.003	17.235
TAXI_DISTANCE	0.4301	nan	nan	nan	nan	nan
TAXI_COST	-0.0364	nan	nan	nan	nan	nan
SEX	0.1195	0.630	0.189	0.850	-1.116	1.355
AGE	-0.2356	0.317	-0.744	0.457	-0.856	0.385

Discussion

- (CAR_TIME): The more time required by car, the less the probability of selecting a car. This is reasonable.
- **However, the other explanatory variables were not reasonable or statistically significant.   Likelihood ratios were not obtained in the first place.**

We were unable to determine the cause because the initial likelihood was too high.

Subject

- Cross-tabulations and analysis with less data were not possible.
    →We will analyze the data more than this time and grasp the characteristics of the data.

- I could not analyze with a small number of explanatory variables, or add or delete explanatory variables through trial and error.
- The original plan was to examine the effectiveness of streetcars in Yokohama City based on the analysis of Matsuyama City.
    →As for the analysis, we will try to start the analysis with a firm schedule.