Does environment affect mode choice of Yokohama citizens?

- Looking from a point of slope of the city

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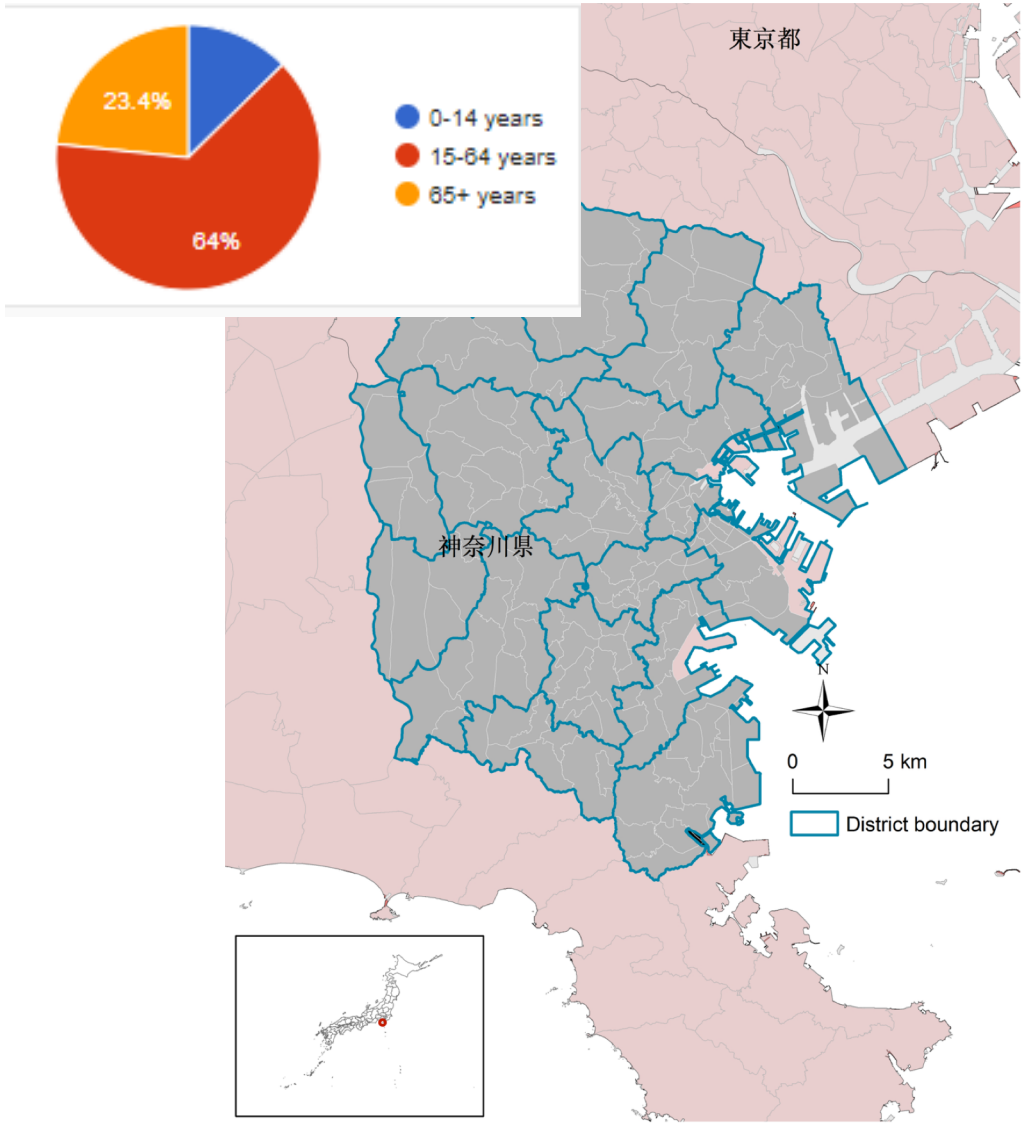
INTRODUCTION

- Yokohama (横浜) is Japan's second largest city and the most populous municipality of Japan.
- Area : 437.4 km²
- It lies on Tokyo Bay, south of Tokyo, in the Kantō region of the main island of Honshu. It is a major commercial hub of the Greater Tokyo Area.
- Even this city is very large city, the portion of elderly people is about 24%

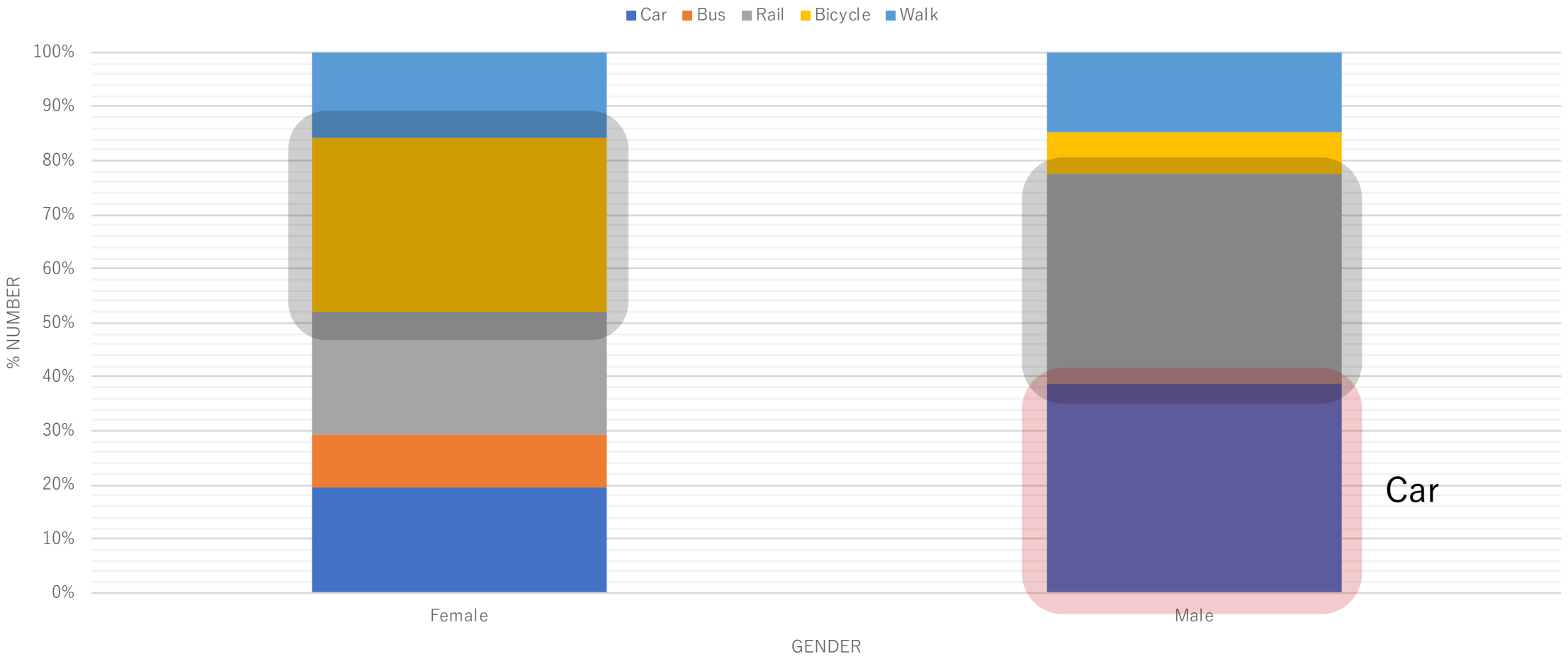


INTRODUCTION

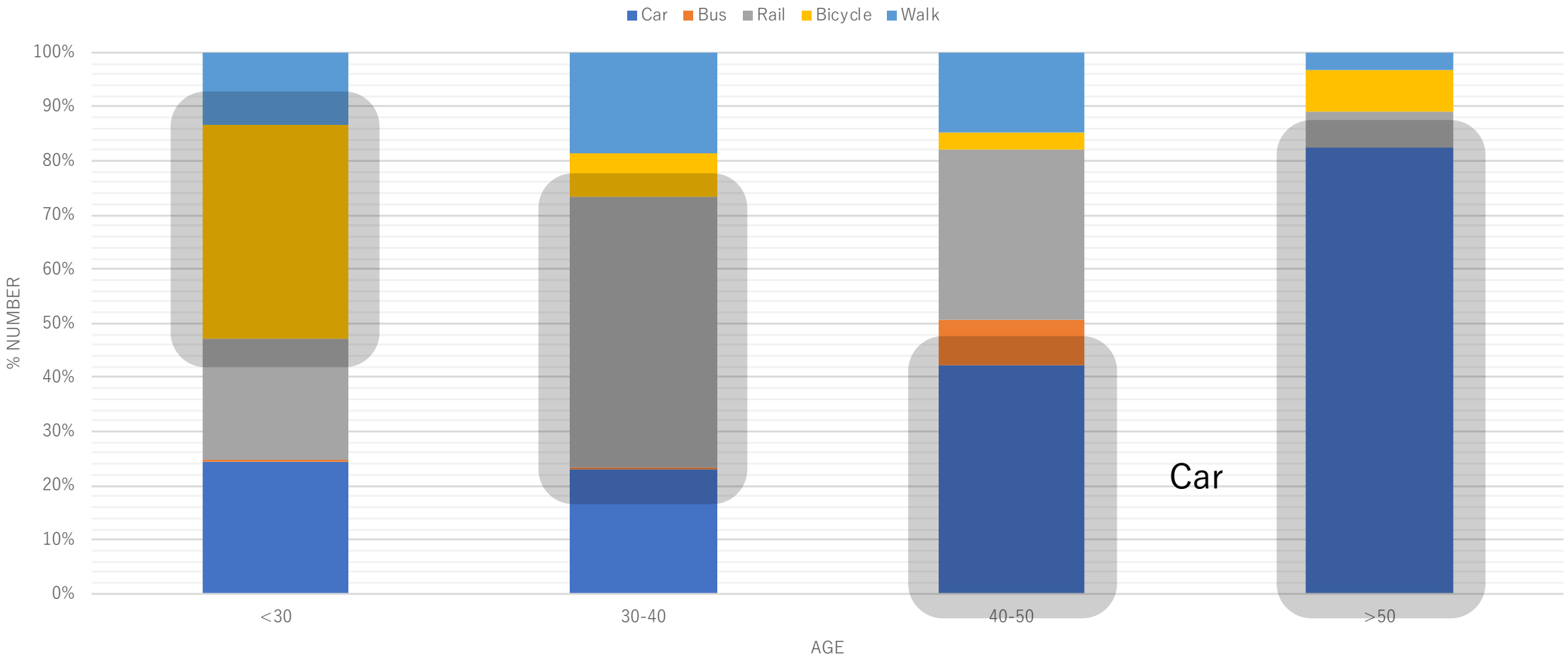
- To make a sustainable city, new policy for the city is needed

- Understand the transportation behavior of the residents
- Also understand the environment factor and people's mode choice and their actual utility of the mode

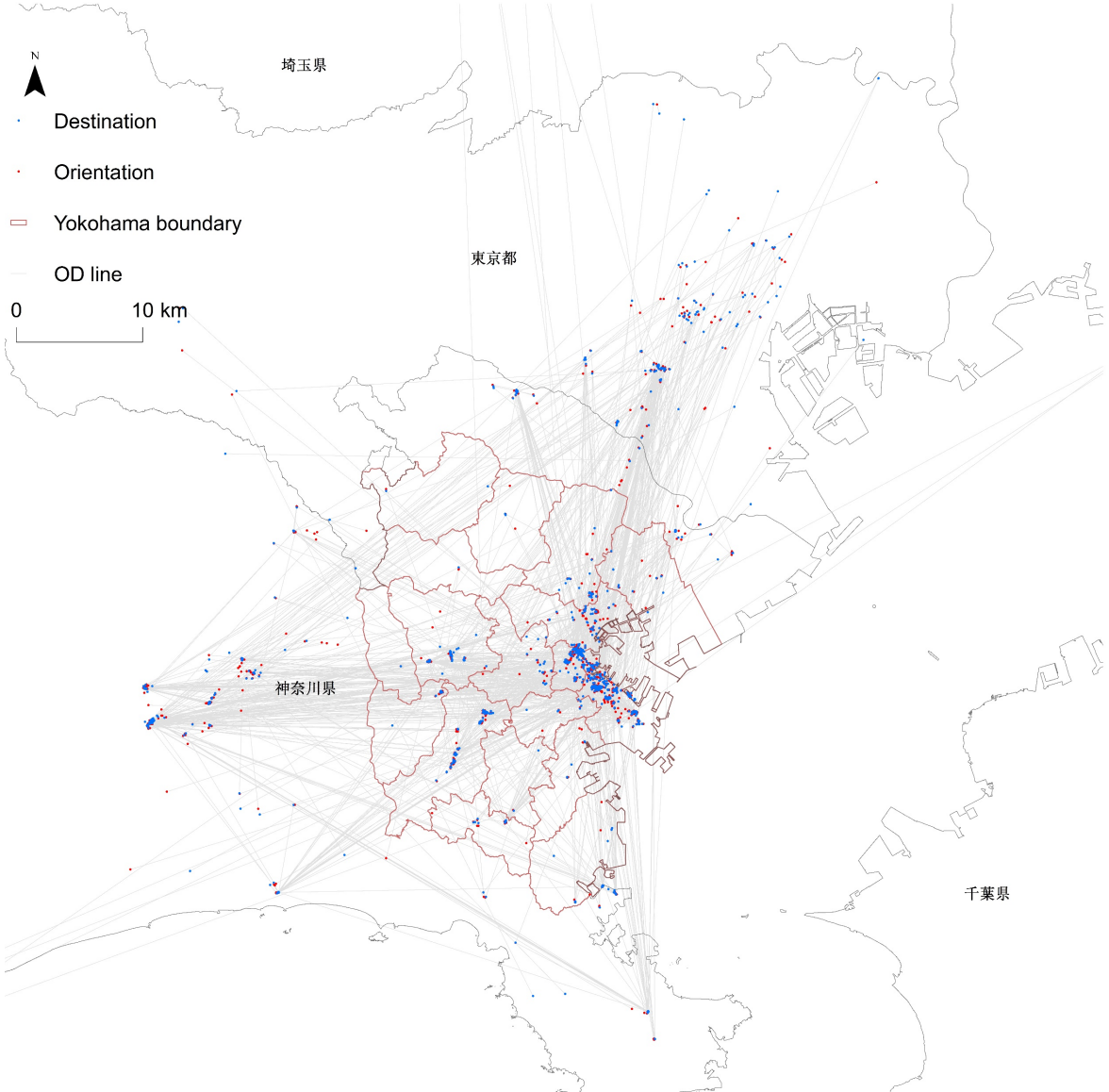
MODE CHOICE BY GENDER



MODE CHOICE BY AGE



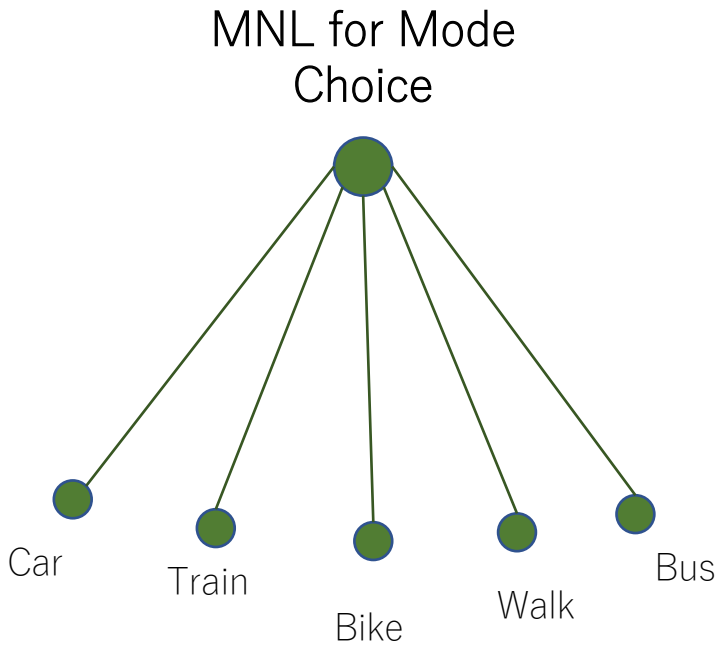
OD of Yokohama residents



OBJECTIVE

Objective:

- To determine travel behavior between actual and predicted behavior.



Variable	Description
Age	1 = > 40 years old; 0 = others
Male	1 = male; 0 = others
Travel Time	Continuous variable
Slope	Continuous variable
Fare	Continuous variable

MNL

Model Equation (Overall):

Vcar = 0.0572 - (0.0101*Xtime) + (0.1030*Xmale)

Vtrain = 0.0410 - (0.0101*Xtime) + (0.0669*Xmale) + (0.0015*Xfare)

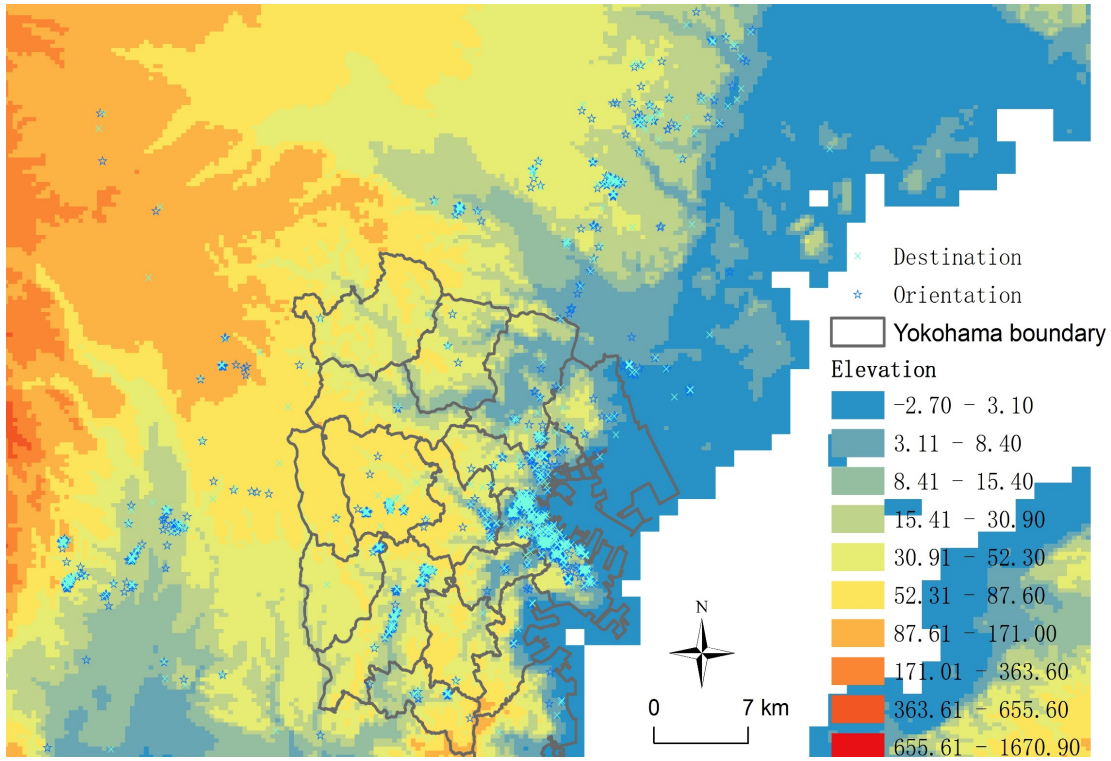
Vbike = 0.7424– (0.0101*Xtime) + (0.5174*Xmale) - (0.0013*Xslope) - (0.0003*Xdistance)

Vbus = -0.6951 – (0.0101*Xtime) + (0.0015*Xfare)

Vwalk = -(0.0101*Xtime) - (0.1076*Xmale) - (0.0299*Xslope)

Deviation of Predicted and Actual Mode

Mode	Predicted	Actual
Car	74	512
Bike	499	211
Rail	528	528
Bus	0	41
Walk	89	230



MNL

	ALL			AGE >40			AGE <=40		
	Estimate	t value		Estimate	t value		Estimate	t value	
C1 Constant (Car)	0.0572	0.6110		-0.1630	-0.7225		-0.9781	-2.2335	*
C2 Constant (Train)	0.0410	0.4007		0.5468	2.3650	*	-0.7863	-1.8081	.
C3 Constant (Bike)	0.7424	6.9113	***	1.7937	7.4835	***	0.9928	1.9348	.
C4 Constant (Bus)	-0.6951	-8.7955	***	-6.3777	-98.6128	***	-0.4896	-1.2920	
Time	-0.0101	-9.3909	***	-0.0476	-12.7132	***	-0.0087	-5.9679	***
Male (Car)	0.1030	0.9546		1.9375	13.8583	***	3.2638	6.5235	***
Male (Train)	0.0669	0.6093		1.9562	14.4814	***	1.8074	3.5273	***
Male (Bike)	0.5174	4.5696	***	0.7754	4.7963	***	0.7793	1.4604	
Male (Bus)	-0.1076	-1.1333		3.1749	16.7980	***	1.6211	3.4820	***
Slope (Bike)	-0.0013	-0.4127		0.0021	0.4720		0.0026	0.3154	
Slope (Walk)	-0.0229	-6.8366	***	-0.0022	-0.5229		-0.0090	-2.0493	*
Distance (Bike)	-0.0003	-8.1438	***	-0.0005	-6.0517	***	-0.0007	-3.7428	***
Fare	0.0015	6.4888	***	0.0003	1.1650		0.0007	1.6338	
Sample size	1522			564			958		
LL0	-2449.57			-1541.84			-907.723		
LL1	-1977.83			-911.572			-601.806		
rho-square	0.193			0.409			0.337		
adjusted rho-square	0.187			0.400			0.323		

Conclusion and Future work

- Slope of the roda really affects to the mode choice, especially for walking
- Especially, middle age or older are affected more
- Therefore, it would be important to see older people’s aspect toward slope change and their mode choice
- Also, as the residents show high actual utility in walking, need to make a walkable environment in the city

Thank you