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帰宅時間選択モデル
Home time selection model

東京海洋大学 地域計画研究室
Tokyo University of Marine Science and
Technology

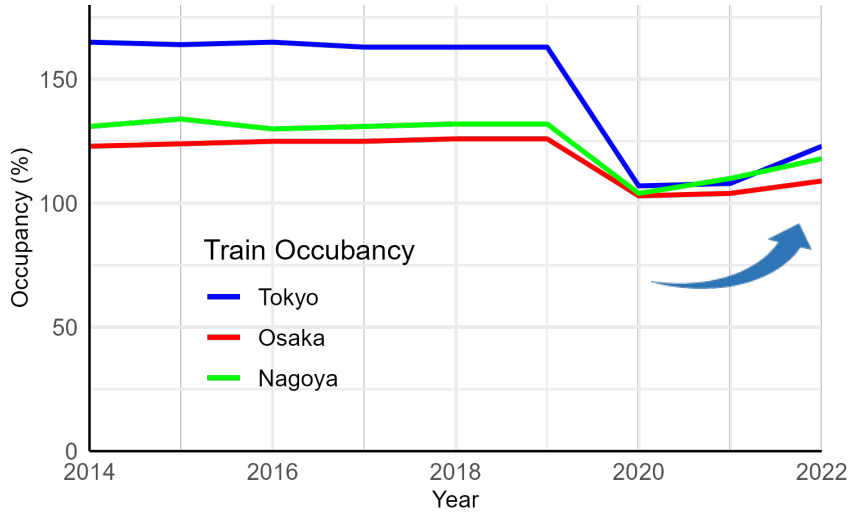


1. Backgrounds
2. Results of basic aggregation
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4. Estimation results
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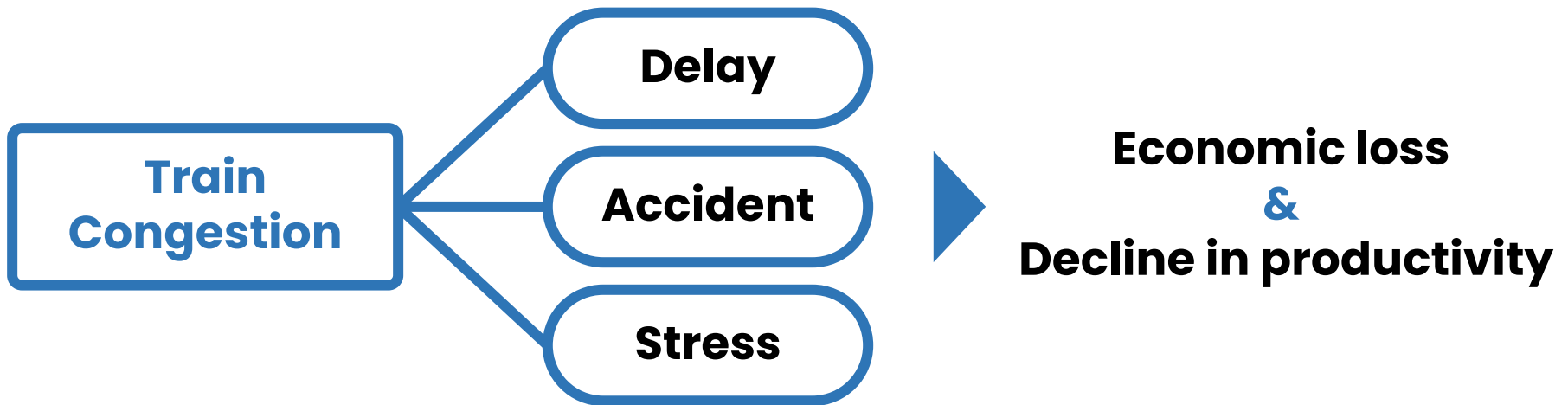


Backgrounds

Train occupancy in urban areas of Japan



- **High train occupancy in urban areas of Japan**
- **After the COVID-19, it is on the rise**





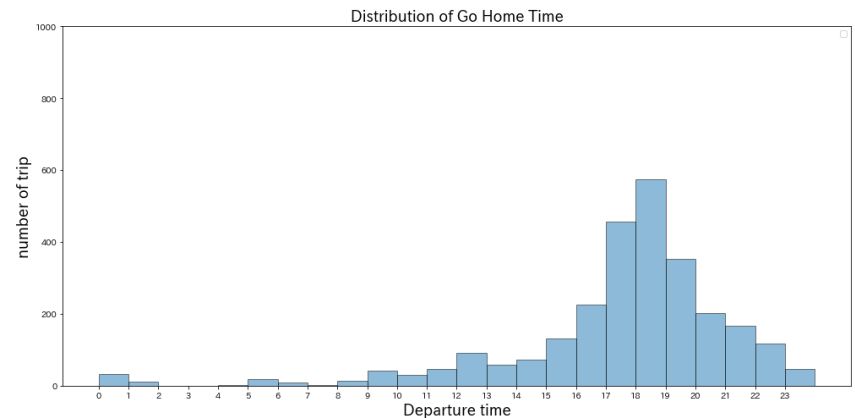
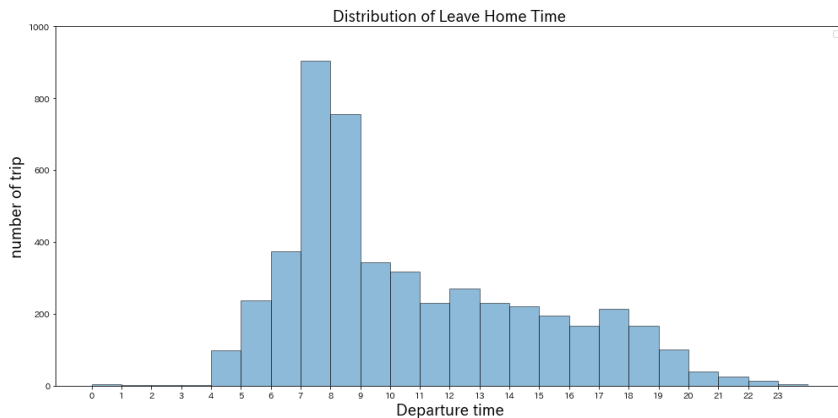
Results of basic aggregation_1

Data Specification

PP Toyosu, 2020 Trip Data.

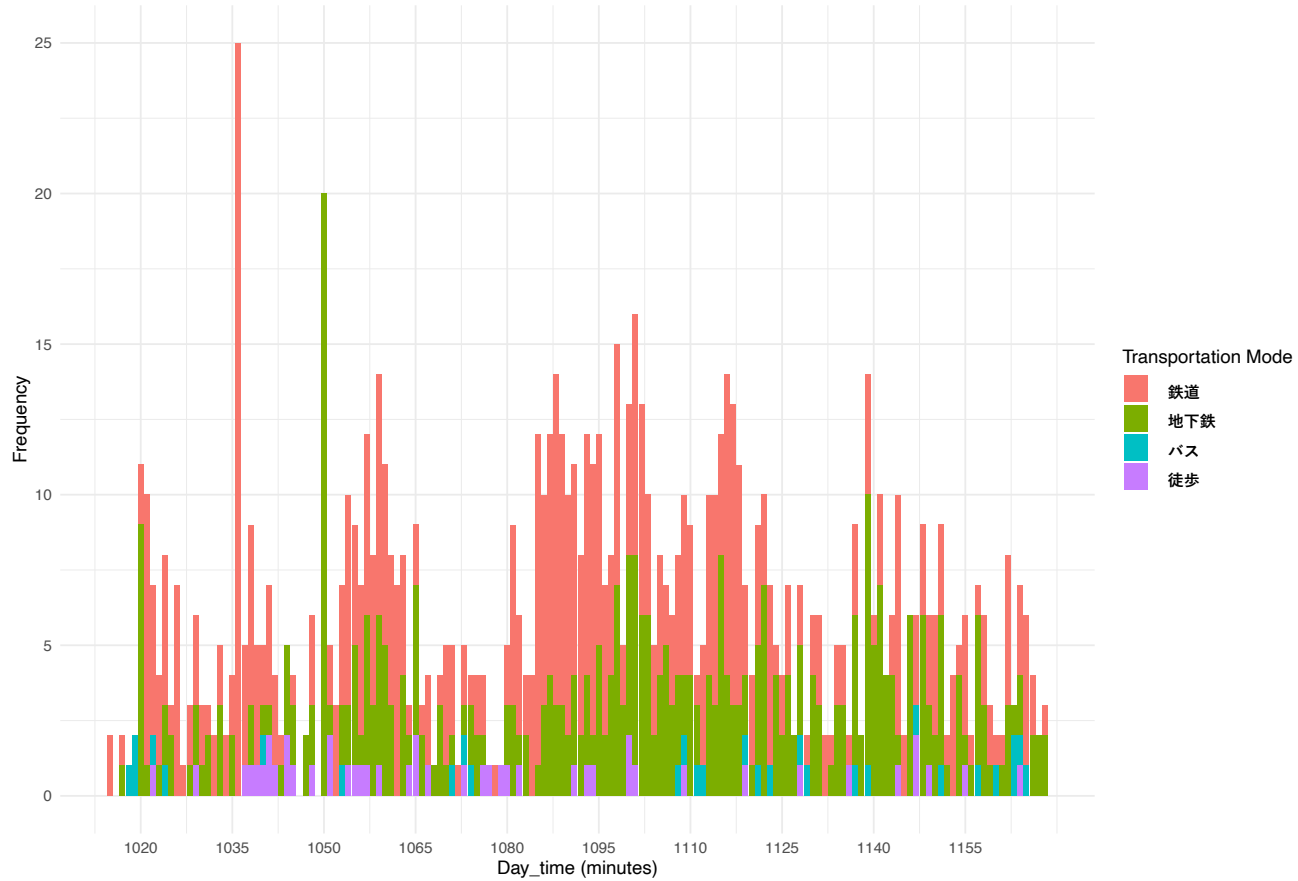
We merged the personal specification with Trip Data.

Concentrated at certain times of the day.





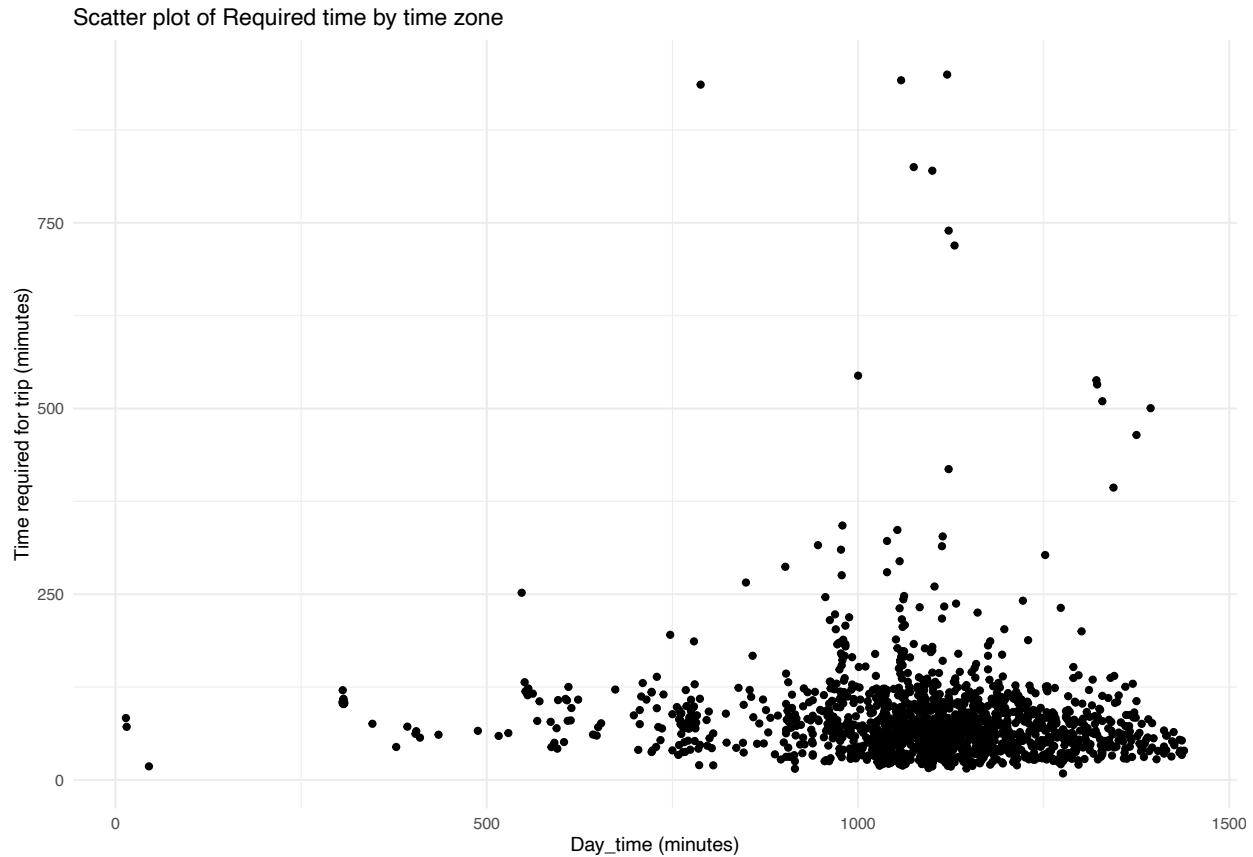
Results of basic aggregation_2



Predominance of train usage.



Results of basic aggregation_3



The variation in trip times over time is small.



Model Specification

$$V = \beta_{11} * \log(\text{Distance train}) + \beta_{12} * (\text{Number of Child}) + \beta_{13} * (\text{Marrige}) \\ + \beta_{14} * (\text{Igres distacne}) + \beta_{15} * (\text{Number of transit}) + \beta_{16} * (\text{Female dummy}) + \beta_{17}$$

The Definition of Time Table.

00:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
19:00 - 20:00
20:00 - 21:00
21:00 - 22:00
22:00 - 24:00



Estimation Result and Conclusion

time	alternative	estimation	T-value
-16	dist	0.008261	0.08
-16	child	0.218521	0.73
-16	marr	-0.28831	-0.83
-16	igress	2.273095	10.51
-16	transit	-0.5646	-2.05
-16	women	0.125257	0.44
-16	safe	-0.85448	-2.28
-17	dist	-0.08825	-0.68
-17	child	1.329045	3.25
-17	marr	-0.96103	-2.16
-17	igress	1.988895	7.69
-17	transit	-0.27938	-0.93
-17	women	0.510865	1.7
-17	safe	-1.02946	-2.67
-18	dist	0.597384	8.17
-18	child	0.130648	0.41
-18	marr	-0.14245	-0.43
-18	igress	0.901915	4.4
-18	transit	-0.95035	-3.76
-18	women	1.040778	4.68
-18	safe	-0.67145	-2.22
-19	dist	0.181121	2.44
-19	child	0.70366	2.24
-19	marr	-0.39839	-1.16
-19	igress	1.405724	7.66
-19	transit	0.411529	1.82
-19	women	1.002635	4.32

time	alternative	estimation	T-value
-19	safe	-0.36797	-1.22
-20	dist	0.123803	1.26
-20	child	2.074597	5.36
-20	marr	-1.55453	-3.79
-20	igress	0.740985	3.44
-20	transit	0.721555	2.88
-20	women	0.900553	3.09
-20	safe	-0.90655	-2.57
-21	dist	0.151647	1.35
-21	child	0.60068	1.66
-21	marr	-1.06428	-2.79
-21	igress	0.405097	1.25
-21	transit	0.380381	1.36
-21	women	0.086543	0.24
-21	safe	-0.40172	-1.03
-22	dist	0.218511	1.59
-22	child	0.951958	2.85
-22	marr	-1.48158	-3.3
-22	igress	0.04797	0.1
-22	transit	0.432607	1.27
-22	women	-0.99185	-2.51
-22	safe	-0.1162	-0.28

The cost variable was assumed to be constant no matter what time of day it was. If we could have assumed sensible costs that took into account congestion rates at different times of the day, we might have been able to create a model that would have allowed us to choose actions that would have avoided the peaks.



Thank you for listening.