Potential of On-demand Mobility and Real-time Trip Planning in Yokohama City

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Basic Analysis on PP Data
If there is a problem, there is demand.

We can't force people to choose public transit, but situation like this only stop them from doing so.
Further analysis shows a serious problem. Arduous effort is needed just to get to the rail station.

People who choose RAIL

AccessTime+EgressTime: 9014 min
Time on the train: 15000 min
Total Time: 24014 min
Percentage of trip time: 38%

People who choose CAR, but if they choose RAIL

AccessTime+EgressTime: 18016 min
Time on the train: 17061 min
Total Time: 35077 min
Percentage of trip time: 51%

Do these people choose CAR instead of RAIL because of this reason?
Our assumption: Is Out-of-Rail time truly a factor that hinders people choosing subway? Needs to be justified by Behavior Choice Model.

MNL Model:

\[ V_{car} = \beta_1 \cdot \text{travel time}_{\text{car}} + \beta_2 \cdot \text{travel cost}_{\text{car}} \]
\[ V_{rail} = \beta_1 \cdot \text{travel time}_{\text{rail}} + \beta_2 \cdot \text{travel cost}_{\text{rail}} + \beta_3 \cdot \text{gender} + \beta_4 \cdot \text{purpose} + \beta_5 \cdot \text{out of vehicle time}_{\text{rail}} + \beta_6 \]
\[ V_{bike} = \beta_1 \cdot \text{travel time}_{\text{bike}} + \beta_2 \cdot \text{travel cost}_{\text{bike}} \]
\[ V_{walk} = \beta_1 \cdot \text{travel time}_{\text{walk}} + \beta_2 \cdot \text{travel cost}_{\text{walk}} \]
\[ V_{bus} = \beta_1 \cdot \text{travel time}_{\text{bus}} + \beta_2 \cdot \text{travel cost}_{\text{bus}} + \beta_3 \cdot \text{out of vehicle time}_{\text{bus}} + \beta_4 \]

Message: NLL

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Another NL model is conducted.
2 model results are compared.

NL Model:

\[ U_{\text{car}} = V_{\text{car}} + V_{\text{pr}} + \varepsilon_{\text{car}} + \varepsilon_{\text{pr}} \]
\[ U_{\text{walk}} = V_{\text{walk}} + V_{\text{pr}} + \varepsilon_{\text{walk}} + \varepsilon_{\text{pr}} \]
\[ U_{\text{bike}} = V_{\text{bike}} + V_{\text{pr}} + \varepsilon_{\text{bike}} + \varepsilon_{\text{pr}} \]
\[ U_{\text{bus}} = V_{\text{bus}} + V_{\text{pt}} + \varepsilon_{\text{bus}} + \varepsilon_{\text{pt}} \]
\[ U_{\text{rail}} = V_{\text{rail}} + V_{\text{pt}} + \varepsilon_{\text{rail}} + \varepsilon_{\text{pt}} \]

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<th>ω</th>
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<tr>
<td>L0</td>
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Adjusted rho

square= 0.391

Scale parameter= 1

0.868
A Case Study-Policy Proposal.

- Suitable size.
- Frequent and punctual service.
- Trackable bus.
- Smart route based on real time demand.
- Shared vehicle, thus environment friendly.
- Pay-as-you-go based.
A Case Study-Implement Locations.
A Case Study-Implement Locations.
A Case Study-Simulation of Mode Share.

Before

- 34% Walk
- 15% Rail
- 14% Bus
- 3% Bike
- 3% Car

After

- 11% Walk
- 16% Rail
- 15% Bus
- 3% Bike
- 54% Car