Singapore’s travel demand management in a dead end?

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A model of Singapore‘s travel demand and traffic
Some numbers first
Some numbers: Mode choice

- Taxi
- Car, motorcycle, light truck passenger
- Car, motorcycle, light truck driver
- Company, school, shuttle bus
- MRT, LRT, bus

Mode share of trips
Some numbers: Mode shares by income 2008

Income [kSG]

- 8k+
- 7k
- 6k
- 5k
- 4k
- 3k
- 2k
- 1k
- no income

Mode share of trips

- MRT, LRT
- Bus
- Company, school, shuttle bus
- Car, motorcycle, light truck driver
- Car, motorcycle, light truck passenger
- Taxi
Current problems
Bus speeds in Singapore by time of day
Bus occupancy and bus bunching during the evening peak

Rotary West

Sun, 2013
Headways along a bus line in Singapore
Occupancy and MRT bunching during the morning peak
Constraints
Macroscopic fundamental diagram (Yokohama; loops)
Macroscopic fundamental diagram (Yokohama; taxis)
Analysis of the COE Category B prices since 2001

[Graph showing the relationship between COE/Mean income and Quota with different growth rates indicated by different markers.]
Development of km driven per car and year (CH, 1960-)

Cars per 1000 Adults (20 years and over)

Annual kilometers per car
What can we do?
A simplified model of the transport market

Generalized costs $k$

- Road now
- Public transport

Share Road

Generalized costs $k$

- Road
- Public transport

Rotary West
After building more roads: Downs-Thompson Paradox

Generalized costs - Road

Generalized costs - Public transport

Share Road

Road now

Road after

Public transport

Rotary West
After improving public transport/removing road capacity

![Graph showing the impact of improving public transport on generalized costs compared to road capacity. The graph illustrates the change in costs for road now, road after, public transport, and public transport after varying share of road usage.](image-url)
Land use: Estimated number of work places
Questions?

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