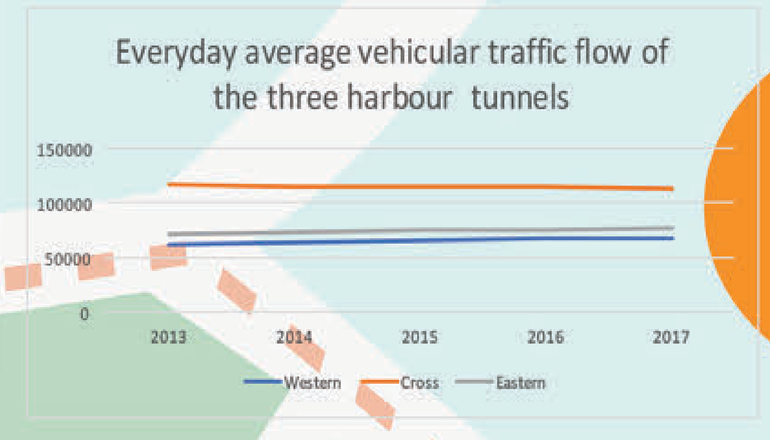
Could Toll Adjustment Policy solve the traffic jam problem?

三隧分流

	Western Harbour Crossing (WHC)	Cross Harbour Tunnel (CHT)	Eastern Harbour Crossing (EHC)
Price（$）	50	40	40
Traveling capacities	22%	73%	38%
Average traveling time in rush hour (mins)	3	33	14

Spare Design capacity vs
Exceeded design capacities



Current situation

Economic Concept

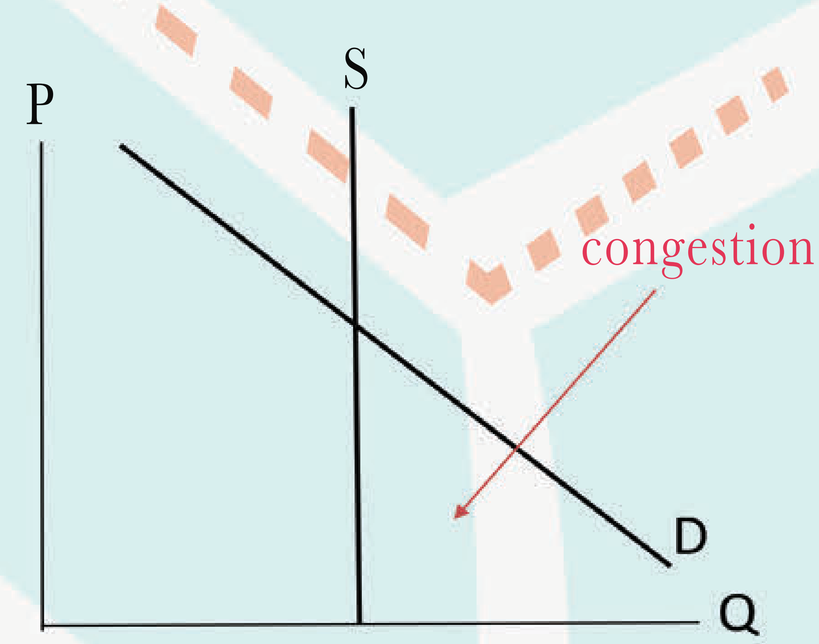
Opportunity Cost Theory

Total Cost = Money cost + time cost

*Money Cost: money used for crossing tunnel (e.g. toll, fossil fuel)
Time Cost : Opportunity cost of the time used (e.g. wage forgone, value of leisure time)

-Perfectly inelastic (fixed) supply
When tolls are too low, there will be an excess demand
i.e. the traffic jam problem will exist

Question: However, Can tolls adjust freely?



Rationalisation of Traffic Distribution:

↑ the tolls of CHT & EHC and ↓ the toll of WHC

the consumer preference changes:
from CHT & EHC ⟶ WHC
Reason: they are substitutes
*When CHT, EHC and WHC are substitues, tolls of one tunnel increase, the demand for another two tunnels will increase, vice versa

↑ the quantity of cars crossing WHC

↓ the quantity of cars crossing CHT & EHC

Therefore, there are Substitution and Income effects

Proposed Solution

Harbour Crossing Tunnel
Year2017: 113775

Eastern Harbour Tunnel
Year2017: 77188

Western Harbour Tunnel
Year2017: 67580

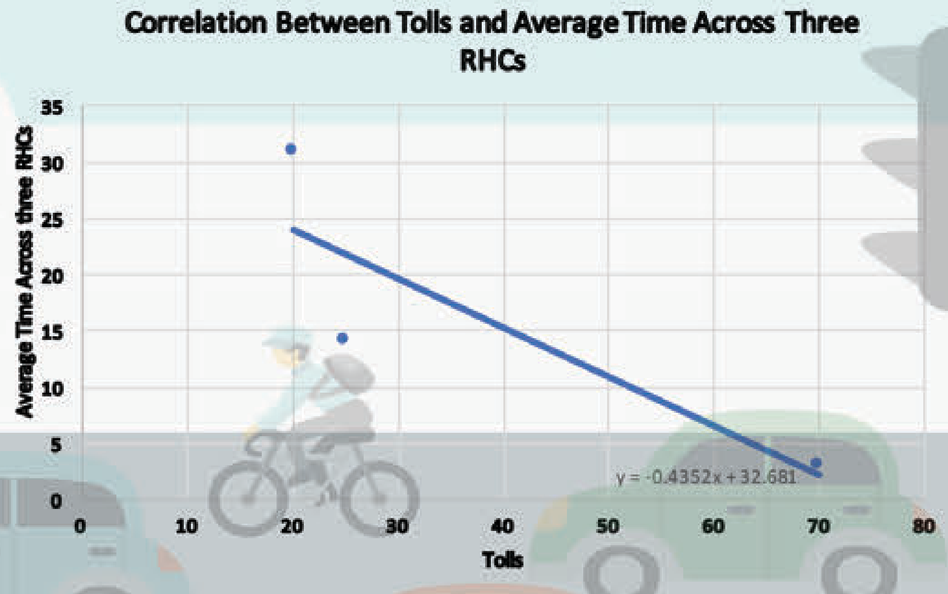
After implementation of policy

Conclusion

Negative Correlation

When tolls increase, average time of crossing the tunnels decrease

Less drivers will use the tunnels if tolls increase



A more better way if we combine with...

Even-odd License Plate Plan

The right to use CHT is given according to the final digit of license plate numbers in some particular day, the demand for CHT will be reduced by half and within the limit of the design capacity of CHT.

RELIEVE TRAFFIC PRESSURE