

## Transportation System of Singapore

### Extract 1: Singapore reveals 3 economic solutions to traffic congestion for Asian peers

Traffic congestion reduces a country's potential for creating prosperity. Singapore identified this early in the piece and was able to create an effective system of incentives and constraints, so traffic wasn't a hindrance to economic growth.

It's always a shock when people first hear about how much it'll cost to get behind the wheel of a brand-new Honda Jazz in Singapore. After hitting a low of S\$3,864 in March 2011 the Certificate of Entitlement (COE) for a new car will now set you back over S\$70,000. When you add on the additional registration fee, the level of which ratchets up to 180 per cent of the Open Market Value of the vehicle, you end up paying 2-3 times the regular price of the car.

#### **(COE – controls car population but it will not control route and time usage – use more car ride to lower COE cost per ride)**

By increasing the price of vehicles, the COE system restricts the amount of people that want or are able to buy a car. Twice a month, the Singapore Land Transport Authority runs an auction process for the available COEs. The amount of COEs is determined by a quota system.

#### **(ERP – solve route allocation – time and route of road usage)**

Further to the quota system and additional registration fees that new car owners need to pay, there's also the Electronic Road Pricing (ERP) system that incentivizes drivers to avoid certain areas at peak times. Costing about the same as a cup of coffee, passing underneath an ERP gantry can cost a normal car up to S\$5 during peak hours. If drivers aren't in a rush they'll think twice before turning down a road that could lead them to an ERP gantry.

*Source: Singapore Business Review, 24 July 2013*

1 Land Transport Authority (LTA) has conducted the Public Transport Customer Satisfaction Survey since 2006. The annual survey measures regular commuters' satisfaction with Singapore's mass public transport services, namely bus and Mass Rapid Transit (MRT) services.

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### Reflective Information

#### COE (quota scheme)

##### Advantages

- directly regulate car population – reduce road usage
- strong financial deterrence -huge ownership cost

##### disadvantages

- increase car and road usage – reduce COE cost per ride
- controlling car population does not control route and time usage of road – PED for that particular route and time usage is price-inelastic

#### **ERP – congestion tax (specific tax)**

Advantages – can conduct route and time allocation of road usage  
tax revenue for the government to raise funds for road development

Disadvantages – may divert the congestion to other areas

- cannot deter the high degree of necessity of demand (PED is price- inelastic)- tax occupies small proportion of income spent on it

#### Public transport

- mass transit of passengers – ease the demand for road usage
- spare our fund for other usage and reduce government expenditure on building roads

#### disadvantage

- subjected to the issue of substitutability
- huge initial cost of investment

#### **Extract 2: Despite push for public transport, a love for cars endures**

The Government has invested huge amounts of money to improve public transport as it seeks to wean Singaporeans off their cars. There will be 99 new trains by 2019, and 450 new buses by 2017

— on top of the 550 already added in recent years. By 2030, there will be new rail lines, more covered walkways, and a 700km cycling network.

Non-constituency Member of Parliament Gerald Giam, 38, in a Facebook post last month said that he had given up his car. He told TODAY that he did so after the COE for his second-hand 2005 Toyota Corolla Altis expired. With the duration of his journeys now two to three times longer compared to when he drove, Mr Giam said that advance planning is essential before he and his family leave home.

But people like Mr Giam are the exception, not the norm. Transport analysts noted that Singaporeans' soft spot for automobiles is tough to eradicate.

*Source: Today, Singapore, 17 July 2015*

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**Questions**

- (a) Is public transport in Singapore is a public good. [2]
- (b) Using a diagram, explain why there is need for the government to intervene in the market for private transport in Singapore. [6]
- (c) Explain whether COE is a better approach than ERP in solving market failures due to transport congestion. (10)

**More questions will be listed in our regular Economics Tuition classes.**

**If you are interested, Call Simon @ 96890510 for a trial class.**

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**Suggested Answer****(a) Explain whether public transport in Singapore is a public good. [2]**

Public transport in Singapore is not a public good as it is excludable. If commuters do not pay the corresponding fares, they can be excluded from consuming public transport services.

Public transport in Singapore is not a public good as it is rival in consumption. The consumption of public transport services by one commuter reduces the number of seats or space available for another commuter.

**Extra qn: why the features of public good will lead to market failures?**

- significance of non-rival and non-excludable – leads to free ridership – no profit incentive for private producers to produce the good – How? – non rival – allows sharing – MC is zero, while non-excludable – cannot charge –  $P=0$  – therefore no production and complete market failure – complete loss of welfare

**significance of loss of welfare due to absence of public goods**

- undermine the welfare of the lower income group
- undermine the efficiency of the industry
- the whole society is compromised in terms of convenience and comfort

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**(b) Using a diagram, explain why there is need for the government to intervene in the market for private transport in Singapore. [6]**

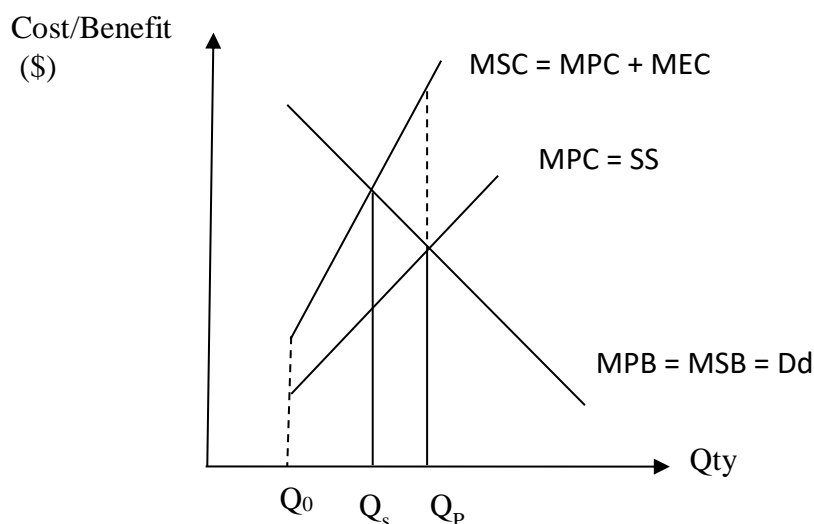
**explain why market failures occur bec of negative externalities**

**1)Introduction / 2) economics causation (Demerit good, negative ext, external cost/ DWL) / 3) draw diagram / 4) describe diagram / 5) analysis – key factor**

The consumption of private transportation in Singapore generates negative externalities in the form of traffic congestion, which refer to the adverse spillover effects imposed on third parties from the production or consumption of a good. This will lead to market failures and thus, requiring government intervention.,

When a person drives his car during peak periods on a busy road, he slows down traffic and causes delay to other road users. The cost of such delays is then borne by third parties like their employers as their workers turn up late for work and the delivery of their goods are delayed.

As traffic congestion disrupts economic activity hence adversely effects economic growth, curbing such congestion “could reduce a country’s potential for creating prosperity” (extract 1)



As seen from the diagram, there are no traffic jams and hence no external costs generated up to  $Q_0$  without the consideration of negative externality. Beyond  $Q_0$ , congestion sets in and worsens, so the MPC for each driver rises as he wastes increasingly more time and fuel being stuck in a worsening traffic jam which is external marginal cost. With increasing delays imposed on employers and businesses, MEC also rises and MPC diverts to MSC. From  $Q_s$  to  $Q_p$ , as  $MSC > MSB$  (over-production and over-consumption), the deadweight loss of the shaded area is generated. Since  $Q_p > Q_s$ , the road is over consumed so there is a need for the government to intervene to reduce the traffic congestion.

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\*the impact of negative externalities in terms of traffic congestion is severe as it determines the country's economic efficiency and productivity – this calls for intervention\*

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**(c) Evaluate the relative effectiveness of the COE system and Electronic Road Pricing in managing traffic congestion in Singapore. [10]**

- how the road congestion will contribute to market failures (presence of negative externalities)
- state that ERP and COE can solve the market failures
- Explain how COE works
- Explain how ERP works
- Evaluate why COE is more effective than ERP
- Evaluate why ERP is more effective than COE
- Your judgement

Why manage traffic congestion in Singapore? [Brief] (1)

- How traffic competition leads to market failure in road industry
  - Road usage → negative externalities (road congestion)
  - ↑rise of external cost → overproduction → rise of DWL
- Correct market failure due to congestion

Explain how COE and ERP work (3)

i) COE:

- **Quota system** which limits the growth of the car population based on the number of vehicles taken off the road in the preceding six-month period (Extract 3)
- Targets at **car ownership** to reduce traffic congestion → reduce Qty of road usage from  $Q_m$  to  $Q_s$  (↓size of car population)
- It is a **lump-sum payment to increase the fixed cost of driving**. It does not vary with number of trips made.

ii) ERP

- ERP raises the cost of road usage → ↓SS of road usage → ↑P → ↓Qty dd from  $Q_m$  to  $Q_s$
- Works by charging drivers an amount when they enter congested areas/roads during peak hours
- Targets at **car usage** as it allows people to own cars but only penalises those who enter congested roads
- It is a **pay-per-use principle to increase the private marginal cost of driving**
- Illustrate with externalities diagram how ERP works to bring the level of road usage closer to the socially optimal level

COE is more effective than ERP in managing traffic congestion

- COE directly controls the car population in Singapore which will manage the number of cars using the road and enabling the government to control road usage while ERP merely directs the traffic congestion to alternative routes
- Setting the size of car population will make it easier for the government to see the output of road usage at social optimal level while the ERP is unable to ensure that road usage is at social optimal level since the tax duty may not

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adjust to internalize the external cost as the governments can estimate the extent of external marginal cost

- COE can be a strong deterrence to car ownership and thus reduces the size of car population which will lower demand for road usage especially after the introduction of huge percentage upfront cash payment which will raise the financial cost for car ownership. On the other hand, ERP may not be effective to reduce demand for road usage as ERP charge occupies only a small percentage of proportion of consumers' income (demand for road usage is price-inelastic)

#### ERP is more effective than COE in managing traffic congestion

- ERP can conduct allocation of road usage based on time and route allocation but COE cannot control the allocation. ERP is more effective as it tackles the root cause of traffic congestion
- ERP can be adjusted to the external marginal cost as it is a variable cost that adjusts to the nature of demand. However, COE will only encourage more road usage as it is a fixed charge whereby drivers will drive more to reduce the average COE charge per trip

#### Evaluation

- Both methods have their strengths and weaknesses. But in controlling congestion, it would be more effective if we were to target car usage and to reduce the incentive for commuters to travel by car or if they still wish to travel by car, to choose to go by a different route instead. Moreover, as mentioned in Minister's speech, ERP is the only one that deals directly with the problem by requiring individuals to take account the costs of congestions.
- However, this does not mean that these are the only methods to manage traffic congestions. The government needs to supplement these with road building/widening and better public transport system.

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