Competition in Public Transport Sector in Singapore: Is there room for more than one operator?

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Outline

1. What’s the issue?
2. What others have to say on economies of bus operations?
3. What have cities done to enhance efficiency and welfare of users and results?
4. What should Singapore do? Room for 1 more?
5. What are the conditions for successful competitive environment?
What’s the issue?

- Myth: Viable public transport requires high population densities

- Fact: Public transport runs successfully in many cities with similar or lower population densities. Any city with sufficient population density to cause traffic congestion has sufficient population to support a first-rate public transport alternative.
What's the issue?

**FIG. 4.2**
Vehicle growth and road development

<table>
<thead>
<tr>
<th>Year</th>
<th>Electricity Generation</th>
<th>Industry</th>
<th>Transport</th>
<th>Buildings</th>
<th>Cars per Household</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>19,315 (48%)</td>
<td>13,465 (33%)</td>
<td>7,096 (17%)</td>
<td>325 (1%)</td>
<td>216 (1%)</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>13,465 (33%)</td>
<td>7,096 (17%)</td>
<td>5,010 (15%)</td>
<td>3,415 (8%)</td>
<td>732 (2%)</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>21,703 (54%)</td>
<td>7,096 (19%)</td>
<td>5,235 (15%)</td>
<td>3,631 (9%)</td>
<td>732 (2%)</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** National Environment Agency

Figure 5.3 Key CO₂ contributors in 2005 (kilo tonnes)

- **Primary Consumption (combust fuel):**
  - Electricity Generation: 19,315 (48%)
  - Industry: 13,465 (33%)
  - Transport: 7,096 (17%)
  - Buildings: 325 (1%)
  - Cars per Household: 216 (1%)
  - Others: 0

- **Secondary Consumption (use of electricity):**
  - Electricity Generation: 8,328 (21%)
  - Industry: 900 (2%)
  - Transport: 5,010 (15%)
  - Buildings: 3,415 (8%)
  - Cars per Household: 732 (2%)
  - Others: 0

- **Overall:**
  - 21,703 (54%)
  - 7,096 (19%)
  - 5,235 (15%)
  - 3,631 (9%)
  - 732 (2%)

Total CO₂ = 40,377 kilo tonnes
What’s the issue?

Greater contestability will be introduced in the public transport industry to encourage greater efficiency and service improvements for the benefit of commuters. The licence period for future RTS operating licences will be shortened while the basic bus service market will be opened up gradually to allow greater competition.

LAND TRANSPORT MASTERPLAN 2009
What’s the issue?

- Two major categories of direct benefits of efficient transit services:
  - Mobility benefits result from increased travel by people who are economically, physically and socially disadvantaged.
  - Efficiency benefits result from reduced vehicle traffic when inefficient automobile travel shifts to more efficient transit travel.
What’s the issue?

- **Competitive tendering (CT) versus deregulation (DR)**
  - CT by route ala London/Scandinavian-style: Operator no power routes and transport services
  - CT by network ala Dutch/French Style: Operator has to determine transport services or helped to do so
  - DR in GB and NZ: where the operator is free to provide whatever services are profitable and authority orders additional (non-profitable) services through CT.
What’s the issue?

- “The threat of competition forces firms to be efficient; continue to look for opportunities, innovate to maintain if not expand markets.”

- Deregulation of the bus industry in Britain in 1985/86 was aimed at bringing about a competitive structure which would is capable of supporting a variety of firms from large enterprises to owner drivers.
What’s the issue?

- In 1985 London Transport (LT) introduced competitively tendering of bus services allowing both private operators and its own subsidiaries to bid for services.
- LT prescribes routes, frequencies, fares, capacity and vehicle standards.
- London's bus routes were put out for competitive tender, with London Transport retaining the power to regulate service and fare levels.
- In the rest of the country, in contrast, the new bus operators were allowed to compete freely for passengers without the residual controls retained by LT in the capital.
What’s the issue?

- British bus deregulation: Free competition since 1986 only outside London, often many operators in one city but almost never direct competition.
- 85% of services are commercially viable including compensation for fare rebates and free travel for elderly.
- 15% is subsidized. These are primarily evening services, rural routes or no exclusivity.
What’s the issue?

- **Results of British bus deregulation**
  - Indexed passenger journeys: London=180, GB=70, UltsterBus=79 in 2006
  - PT Support:
    - GB: £750 million in 1986 to £300 million in 2003
  - Operational costs in pence per vehicle kilometre in 2007 price levels:
    - GB: 249 in 1986 to 120 in 2007
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Economies of scale?

- Results are at best mixed!
- Economies of scale supports the merger of small transit agencies into one larger agency, while diseconomies of scale implies that it is more efficient to have multiple smaller agencies serving one area (Williams, 1979).
- Performance indicators based on average costs can be comparable among agencies in different sizes only when constant returns to scale can be assumed (Berechman and Giuliano, 1985).
- While marginal cost pricing should be set to cover the total costs under the condition of constant returns to scale, no simple pricing strategy exists under the condition of increasing returns to scale (Mohring, 1976; Berechman and Giuliano, 1985).
- Furthermore, the subsidization of transit service is necessary to provide the optimal level of output with marginal cost pricing when economies of scale exist (Berechman and Giuliano, 1985).
- Despite these important policy implications, findings vary significantly depending on the particular data sets and regression equations used in past studies, and the literature on the subject has been inconclusive.
Cost per Vehicle hour vs. agency size by level of contracting

Diseconomies

- Cost per VH increases at a decreasing rate, but may not be able to determine whether it starts declining to show economies of scale.

- Small agencies that contract out all service experience a significant diseconomy of scale, and have higher costs per VH compared to agencies that contract out no service.

- These small agencies, under the jurisdiction of city and county governments, often contract out all service in order to get expertise in transit operation.

- This means that small agencies may contract out administrative tasks in addition to operation. Therefore, the higher cost per unit of service for agencies that use full contracting may be attributed to additional costs to contract out more tasks than just operation.
Economies of Scale and Scope?

- In the presence of economies of scope a multi-output firm is more economical than separate specialized firms. Scope economies can result from sharing or the joint utilization of inputs (Baumol, Panzar et al. (1982) and Bailey and Friedlaender (1982)).
- For public transport such sharable inputs are labor, capital and energy.
- Public transport companies which combine several transport modes use similar equipment such as wires, overhead line and similar skills such as driving, management and network maintenance. Such synergies also apply to activities like R&D, advertising and ticketing.
- Another source of cost savings is due to economies of massed reserves (Waldman and Jensen (2001)). Multi-output transportation companies can make use of the same reserve capacity for maintenance and buildings.
Economies of Scale and Scope?

- “Local transportation sector is characterized by the existence of increasing returns to scale and by economies of scope. Therefore, an unbundling of a multi-output company into single-output companies leads to higher costs in the market as the synergies in the joint production are no longer exploited.”

- “On the other hand the benefits from the introduction of a tendering procedure (competition for the market) are higher when this procedure is implemented for single lines as the barriers to entry are lower compared to a tendering procedure for a multimode network.” (Mehdi Farsi, Aurelio Fetz, Massimo Filippini, 2008)

- Cambini and Filippini (2003) network tendering is more complex than line tendering and the number of potential bidders is lower. Therefore, the trade-off from unbundling between the loss of economies of scope and the gain of higher cost efficiency from the introduction of competition for the market exists.

- An alternative to the introduction of competitive tendering procedures could be the introduction of incentive regulation instruments such as yardstick competition.
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## Some elasticities

<table>
<thead>
<tr>
<th></th>
<th>Market Segment</th>
<th>Short Term ( \varepsilon )</th>
<th>Long Term ( \varepsilon )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit ridership WRT transit fares</td>
<td>Overall</td>
<td>(-0.2) to (-0.5)</td>
<td>(-0.6) to (-0.9)</td>
</tr>
<tr>
<td>Transit ridership WRT transit fares</td>
<td>Peak</td>
<td>(-0.15) to (-0.3)</td>
<td>(-0.4) to (-0.6)</td>
</tr>
<tr>
<td>Transit ridership WRT transit fares</td>
<td>Off-peak</td>
<td>(-0.3) to (-0.6)</td>
<td>(-0.8) to (-1.0)</td>
</tr>
<tr>
<td>Transit ridership WRT transit fares</td>
<td>Suburban Commuters</td>
<td>(-0.3) to (-0.6)</td>
<td>(-0.8) to (-1.0)</td>
</tr>
<tr>
<td>Transit ridership WRT transit service</td>
<td>Overall</td>
<td>0.50 to 0.7</td>
<td>0.7 to 1.1</td>
</tr>
<tr>
<td>Transit ridership WRT auto operating costs</td>
<td>Overall</td>
<td>0.05 to 0.15</td>
<td>0.2 to 0.4</td>
</tr>
<tr>
<td>Automobile travel WRT transit costs</td>
<td>Overall</td>
<td>0.03 to 0.1</td>
<td>0.15 to 0.3</td>
</tr>
</tbody>
</table>
### Level of Service Ratings

<table>
<thead>
<tr>
<th><strong>Transit Vehicles</strong></th>
<th><strong>Transit Waiting Areas</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability (daily service hours).</td>
<td>Ease of access (walking conditions) to transit stops and stations.</td>
</tr>
<tr>
<td>Frequency (trips per hour or day).</td>
<td>Security.</td>
</tr>
<tr>
<td>Speed (particularly relative to automobile travel).</td>
<td>Shade and weather protection.</td>
</tr>
<tr>
<td>Reliability (how well service follows schedules).</td>
<td>Lighting quality.</td>
</tr>
<tr>
<td>Comfort (whether passengers have a seat and adequate space).</td>
<td>Seat comfort and crowding.</td>
</tr>
<tr>
<td>Stop/station quality.</td>
<td>Cleanliness and aesthetics.</td>
</tr>
<tr>
<td>Fare payment convenience.</td>
<td>Services (such as washrooms and refreshments).</td>
</tr>
<tr>
<td>Security (feelings of safety).</td>
<td></td>
</tr>
<tr>
<td>Affordability (user costs relative to incomes, and other travel options).</td>
<td></td>
</tr>
<tr>
<td>User information availability.</td>
<td></td>
</tr>
<tr>
<td>Cleanliness and aesthetics.</td>
<td></td>
</tr>
</tbody>
</table>

(Phillips, Karachepone and Landis, 2001; VTPI, 2006)
Comfort not just speed!

[Chart showing hourly costs relative to prevailing wages for different modes including personal vehicle driver, bus passenger, adult car passenger, child passenger, and pedestrians and cyclists, with categories for LOS A-C, LOS D, LOS E, LOS F, Waiting - Good, Waiting - Average, and Waiting - Poor.]
### Travel Time Values Relative To Prevailing Wages

<table>
<thead>
<tr>
<th>Category</th>
<th>LOS A-C</th>
<th>LOS D</th>
<th>LOS E</th>
<th>LOS F</th>
<th>Waiting Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial vehicle driver</td>
<td>120%</td>
<td>137%</td>
<td>154%</td>
<td>170%</td>
<td>170%</td>
</tr>
<tr>
<td>Comm. vehicle passenger</td>
<td>120%</td>
<td>132%</td>
<td>144%</td>
<td>155%</td>
<td>155%</td>
</tr>
<tr>
<td>City bus driver</td>
<td>156%</td>
<td>156%</td>
<td>156%</td>
<td>156%</td>
<td>156%</td>
</tr>
<tr>
<td>Personal vehicle driver</td>
<td>50%</td>
<td>67%</td>
<td>84%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Adult car passenger</td>
<td>35%</td>
<td>47%</td>
<td>58%</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td>Adult transit passenger – seated</td>
<td>35%</td>
<td>47%</td>
<td>58%</td>
<td>70%</td>
<td>35% 50% 125%</td>
</tr>
<tr>
<td>Adult transit passenger – standing</td>
<td>50%</td>
<td>67%</td>
<td>83%</td>
<td>100%</td>
<td>50% 70% 175%</td>
</tr>
<tr>
<td>Child (&lt;16 years) – seated</td>
<td>25%</td>
<td>33%</td>
<td>42%</td>
<td>50%</td>
<td>25% 50% 125%</td>
</tr>
<tr>
<td>Child (&lt;16 years) – standing</td>
<td>35%</td>
<td>46%</td>
<td>60%</td>
<td>66%</td>
<td>50% 70% 175%</td>
</tr>
<tr>
<td>Pedestrians and cyclists</td>
<td>50%</td>
<td>67%</td>
<td>84%</td>
<td>100%</td>
<td>50% 100% 200%</td>
</tr>
<tr>
<td>Transit Transfer Premium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-min. 10-min. 15-min.</td>
</tr>
</tbody>
</table>

(Litman, 2008)
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CT in Practice

- Are there Scale Economies in Bus Operations in Singapore? YES
- Are there Scale and Scope Economies? yes
- Competition can 3 forms:
  - route / service
  - market / network
  - alternative modes
- Tension between economies from innovation, scale and scope (size of the market) versus social obligations
- Can CT work in Singapore? Yes
Population per hectare by planning region in Singapore

![Population per hectare by planning region in Singapore](image)
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Conditions

1. Careful identification of networks and bundling of routes;
2. Provisions on mitigation of operational risks such as recession or oil increase;
3. Knowledge on cost centre behavior (economies of scope and scale) and implication on unbundling;
4. Creation of level playing field for potential entrants;
5. Potential for a hybrids such as introduction of yardstick competition;
6. Strong and efficient authority.
"There can be little doubt that well-ordered, managed competition in London has been better for the bus market than outright deregulation and may have helped to slow the growth of car ownership and use.”

LT Planning Director David Bayliss
Tongue in cheek!

- “I apologise for the delay but the computer controlling the signalling at Holland Village and Macpherson has the Monday Morning Blues.”
- “Sorry for the delay ladies and gentlemen but there is a queue of trains ahead of us so I have decided to wait here, because I’m sure you don’t want to sit in a tunnel getting hot and sweaty.” ….. NEL between Chinatown and Clarke Quay.
- “The train at platform three is not going to Harbour Front but to Kovan. The train approaching platform two is also not going to Harbour Front but to Punggol. These trains are not going to Harbour Front despite what is on the board!”