Transportation and Crime
Influences and Deterrence Measures
By
Rae J. Furlonge
Where are we now?
Our National Constitution

- **Chpt 1 Pt 1 Sec 4:** It is hereby recognised and declared that in Trinidad and Tobago there have existed and shall continue to exist, without discrimination by reason of race, origin, colour, religion or sex, the following fundamental human rights and freedoms, namely: (a) the right of the individual to life, liberty, security of the person and enjoyment of property and the right not to be deprived thereof except by due process of law; ... (d) the right of the individual to equality of treatment from any public authority in the exercise of any functions; ...
1967 National Transportation Study

- Develop bus service as the primary mode of public transport;
- Starting with a required fleet size in 1968 of 360, flood the market with new buses every year from 1969 to the study year 1985 with additional buses totalling 1,540;
- Do some slight bus terminal improvements at Port of Spain and San Fernando to facilitate these measures; and,
- There was no analysis or description of the geographic distribution of these services and their phasing, nor was there any explanation of the operational and management issues.
Current Management of Public Transport

• Since 1967 to now, no agency of Government has been responsible for monitoring, controlling or coordinating the operations of the public transport industry.
• The Public Transport Service Act, which created the PTSC, the stated-owned bus company, in 1965, did not give them responsibility for regulating taxis, or maxi-taxis.
• The Transport Division of the Ministry of Works was responsible for (and still is) the licensing and inspection of taxis, and later, maxi-taxis.
• The 1967 study just forecast the traffic and planned the roads for the projected traffic capacity.
• There was no plan for the development of public transport. Small wonder we are in the crisis we are in today!
What is the transportation situation now?

• Even though private car ownership is high in this country, the reality is that the majority of the population do not have access to a private car.
• Evidence of this may be seen every morning and evening with persons, particularly women and children, desperately awaiting some form of public transportation, including PH taxis and PH vans.
• In other words, access to transportation is difficult for non-car owners, and made increasing more so by the traffic congestion caused by car owners.
Grenada
Basic Components of the Transport System, and Their Components

- People
- Vehicles
- Routes
- Terminals
- Maintenance
- Information and Control
Some Definitions

• Public transport, public transit, mass transit, and mass transportation mean the same thing, and operate on established routes and fixed schedules, serving prescribed stops at prescribed rates of fare.
• Paratransit is the term applied to public transport vehicles smaller than large buses, and which operate informally, without schedules
• Therefore, transit includes paratransit, and in TnT, the PTSC is a publicly-owned public transport operator, while maxi-taxis, taxis, and even illegal PH taxis are privately-owned public transport operators.
• Only the PTSC buses operate on fixed schedules, serving prescribed stops.
What are we trying to achieve?
What do the transit users want?

• The voiceless, car-less, captive-to-any-type-of-transport persons in T&T have never demanded rapid rail, mass transit, or any exotic transport.

• They are into the basics, including:
  (a) minimizing their limited disposable income on travel,
  (b) frequent and reliable with published schedules,
  (c) available for all classes of user-disability,
  (d) effective, serving a wide range of origins and destinations,
  (e) responsive to changing travel needs and patterns of activity,
  (f) safe and secure, especially at terminals and waiting areas,
    providing a travel experience that is not blighted by fear of assault, attack or other anti-social behaviour throughout the journey.
Crime Prevention Through Environmental Design

- **Surveillance** refers to improving visibility and observation, e.g. CCTV, automatic fare collection system, minimizing hiding places, easy observation of the platforms, passenger alarm plungers on onboard, limited number of access points, and proper lighting.

- **Territoriality** is a design concept that produces a sense of ownership and proprietary concerns for a territory. Public transport facilities located in the areas with high crime concentration face higher crime rates. Bus shelter damage frequency is found high in areas with high levels of antisocial behaviour.
Crime Prevention Through Environmental Design

- Access Control /Target Hardening implies deterring access to potential targets and places by applying various security measures. It escalates the perception of risk in offenders and thus deters crime. Introducing target hardening strategies like alarm systems and alarm buttons, protective enclosure for bus driver, bulletproof screen for taxis, formal police checking, electronic locators, etc.

- Cleanliness and proper maintenance of the public transport facilities is also an important factor to deter crime and improving perception of safety of users.
8. (1) Subject to this Act, it shall be the duty of the Corporation to carry on the business of operating public service vehicles under this Act, so as to ensure the provision of a safe, adequate, economic and efficient public transportation system, adapted to the needs of the country ...
and in particular, the Corporation shall have the power
  ▪ to carry goods and passengers by rail and road;
  ▪ to store goods;
  ▪ to consign goods on behalf of other persons from any place in Trinidad and Tobago to any other place therein;
  ▪ to provide such amenities and facilities for passengers and other persons making use of the services provided by it as appears to it requisite or expedient to provide.
8. (3)... the powers conferred by subsection (1) are ...

- to construct, manufacture, purchase, maintain and repair anything required for the purpose of any of the activities of the Corporation;
- to hold inquiries and conduct studies respecting economy and efficiency in the transport service.
Chapter 48:02 Public Transport Service Act (cont’d)

8. (4) Nothing in subsection (3) shall apply to the carrying of passengers by road in a hiring car (within the meaning of the Motor Vehicles and Road Traffic Act) adapted to carry less than six passengers and used for plying or standing for hire in the street, or to the carriage of goods by any other person for hire or reward or otherwise,
but the Corporation may, in its discretion, authorise any person to operate public service vehicles of any special class or description upon such terms and conditions, including payment of any such fee thereof as may be prescribed, in any area or district where the Corporation on economic or any other grounds does not consider it suitable or expedient to operate its own service.
Section 3. (2) states “The [Trinidad Transport] Board shall act in an advisory capacity and shall advise the President on all matters appertaining to road traffic and in particular as to the following matters: … (c) the needs of areas as a whole in relation to traffic (including the provision of adequate suitable and efficient services and the elimination of unnecessary or unremunerative services) and the co-ordination of all forms of passenger and goods transport, including transport by rail and sea; … and (f) any other matter affecting traffic or transport that the President may refer to the Board.”
Travel Demand Patterns in T&T
Desire Lines of Person Work Trips from Parish of St Andrew 2005

Caribbean Sea

St. David
St. John
St. Paul
St. Mary
St. George
St. Patrick
Atlantic Ocean
St. Andrew

Scale: 500 person trips
Desire Lines of Person Work Trips from Parish of St John 2005

Caribbean Sea

St. David
St. John
St. Paul
St. Mary
St. George
St. Patrick
Atlantic Ocean

Scale: 500 person trips
Desire Lines of Person Work Trips from Parish of St Mary’s 2005

Scale:

500 person trips
Desire Lines of Person Work Trips from Parish of St Patrick 2005

Atlantic Ocean

Caribbean Sea

St. David

St. John

St. Paul

St. Mary

St. George

St. Andrew

St. Patrick

Scale: 500 person trips
Desire Lines of Person Work Trips from Parish of St Paul 2005

Scale: 500 person trips
Desire Lines of Person Work Trips from City of Port of Spain 2005

Scale: 500 person trips
Desire Lines of Person Work Trips from City of San Fernando 2005
Desire Lines of Person Work Trips from Borough of Chaguanas 2005
Desire Lines of Person Work Trips from Borough of Point Fortin 2005
Desire Lines of Person Work Trips from Tunapuna / Piarco 2005
Desire Lines of Person Work Trips from Mayaro / Rio Claro 2005

Scale: 500 person trips
Desire Lines of Person Work Trips from Princes Town 2005

Scale: 500 person trips
 Desire Lines of Person Work Trips from Penal / Debe 2005

Scale: 500 person trips
Desire Lines of Person Work Trips from Siparia 2005

Scale: 500 person trips
First World Transit Specifications
## Urban Scheduled Service LOS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Headway (min)</th>
<th>Frequency (bus/h)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&lt;10</td>
<td>&gt;6</td>
<td>Schedules not needed</td>
</tr>
<tr>
<td>B</td>
<td>10-14</td>
<td>5-6</td>
<td>Riders consult schedule</td>
</tr>
<tr>
<td>C</td>
<td>15-20</td>
<td>3-4</td>
<td>Maximum desirable wait time</td>
</tr>
<tr>
<td>D</td>
<td>21-30</td>
<td>2</td>
<td>Unattractive to choice riders</td>
</tr>
<tr>
<td>E</td>
<td>31-60</td>
<td>1</td>
<td>Service provided during hour</td>
</tr>
<tr>
<td>F</td>
<td>&gt;60</td>
<td>&lt;1</td>
<td>Unattractive to all riders</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
Access Time Para-transit LOS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Access Time (h)</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.0-0.5</td>
<td>Fairly prompt response</td>
</tr>
<tr>
<td>B</td>
<td>0.6-1.0</td>
<td>Acceptable response</td>
</tr>
<tr>
<td>C</td>
<td>1.1-2.0</td>
<td>Tolerable response</td>
</tr>
<tr>
<td>D</td>
<td>2.1-4.0</td>
<td>May require advance planning</td>
</tr>
<tr>
<td>E</td>
<td>4.1-24.0</td>
<td>Requires advance planning</td>
</tr>
<tr>
<td>F</td>
<td>&gt;24.0</td>
<td>Service not offered every weekday</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
### Intercity Service LOS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Trips Per Day</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&gt;15</td>
<td>Numerous trips throughout day</td>
</tr>
<tr>
<td>B</td>
<td>12-15</td>
<td>Midday and peak hour service</td>
</tr>
<tr>
<td>C</td>
<td>8-11</td>
<td>Midday or peak hour service</td>
</tr>
<tr>
<td>D</td>
<td>4-7</td>
<td>Provides choice of travel times</td>
</tr>
<tr>
<td>E</td>
<td>2-3</td>
<td>Round trip in one day possible</td>
</tr>
<tr>
<td>F</td>
<td>0-1</td>
<td>Round trip in one day not possible</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
# Hours of Service LOS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Hours Per Day</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>19-24</td>
<td>Night or owl service provided</td>
</tr>
<tr>
<td>B</td>
<td>17-18</td>
<td>Late evening service provided</td>
</tr>
<tr>
<td>C</td>
<td>14-16</td>
<td>Early evening service provided</td>
</tr>
<tr>
<td>D</td>
<td>12-13</td>
<td>Daytime service provided</td>
</tr>
<tr>
<td>E</td>
<td>4-11</td>
<td>Peak hour or midday service</td>
</tr>
<tr>
<td>F</td>
<td>0-3</td>
<td>Very limited or no service</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
## Service Coverage LOS

### Transit-Supportive Area: area within walking distance of transit with minimal density of 3 households per gross acre, 4 employees per gross acre

### LOS based on the percentage of the system’s transit-supportive area served

<table>
<thead>
<tr>
<th>LOS</th>
<th>% Transit-Supportive Area Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90.0-100.0</td>
</tr>
<tr>
<td>B</td>
<td>80.0-89.9</td>
</tr>
<tr>
<td>C</td>
<td>70.0-79.9</td>
</tr>
<tr>
<td>D</td>
<td>60.0-69.9</td>
</tr>
<tr>
<td>E</td>
<td>50.0-59.9</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50.0</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
# Bus Passenger Load LOS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Load Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.00-0.50</td>
<td>Need not sit next to another</td>
</tr>
<tr>
<td>B</td>
<td>0.51-0.75</td>
<td>Can choose where to sit</td>
</tr>
<tr>
<td>C</td>
<td>0.76-1.00</td>
<td>All passengers can sit</td>
</tr>
<tr>
<td>D</td>
<td>1.01-1.25</td>
<td>Design load for standee comfort</td>
</tr>
<tr>
<td>E</td>
<td>1.26-1.50</td>
<td>Maximum schedule load</td>
</tr>
<tr>
<td>F</td>
<td>&gt;1.50</td>
<td>Crush load</td>
</tr>
</tbody>
</table>

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting
# On-Time Performance LOS

Adapted from Danaher, A. R. (2000) Transit Quality of Service Evaluation, ITE Annual Meeting

<table>
<thead>
<tr>
<th>LOS</th>
<th>On-Time Percentage</th>
<th>Passenger perspective, based on 5 round trips / week on a single route (headways &gt;10min):</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>97.5-100.0</td>
<td>1 late vehicle / month</td>
</tr>
<tr>
<td>B</td>
<td>95.0-97.4</td>
<td>2 late vehicles / month</td>
</tr>
<tr>
<td>C</td>
<td>90.0-94.9</td>
<td>1 late vehicle / week</td>
</tr>
<tr>
<td>D</td>
<td>85.0-89.9</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>80.0-84.9</td>
<td>1 late vehicle / direction / week</td>
</tr>
<tr>
<td>F</td>
<td>&lt;80.0</td>
<td></td>
</tr>
</tbody>
</table>
Transit Performance: Overcrowding

If more than two or three buses, or 15 minutes, pass before boarding is possible, this can be considered overcrowding at that location at that time.

If such a condition extends over several kilometres of the route and lasts more than an hour, serious overcrowding exists.
Transit Performance: Excessive Travel Time

When many transit journeys including a reasonable amount of walking (say 2 km) and waiting consistently exceed 40 min for a door-to-door trip of 6 km, 60 min for a 10-km trip, and 90 min for a 16-km trip.

This may arise when transit journey speeds, including stops, are less than 12 kmph.

Transit Performance: Discriminatory Fares

If the week’s transit fare for trips to work exceeds 10% of total weekly income of the household for more than 15% of the population, the fare structure can be considered to be discriminatory.

Transit Performance: Poor Transit Operations

The average revenue-service distance for each transit vehicle should be at least 150 km per day. The goal should be 230 to 260 km per bus per day.

A further indication is the percentage of vehicle fleet available for service; less than 70% during peak periods is unsatisfactory. 80 to 90% is desirable.

Towards a Public Transport Policy

- For mobility to be sustainable, transport should be understood as a mechanism to maximise access and not as a mechanism to just move vehicles themselves.
- Public transport is the only form of transport available to all citizens.
- Transport planning cannot determine the transport policies of Government; it can only recommend which transport options best achieve the specifically established goals and objectives that result from the application of government policies.
What are the steps for immediate action?
Transit Authority

- A special purpose agency to plan, oversee and control transit system development, and provide adequate coordination mechanisms.
- Seeks primarily the needs of the consumer
- Regulatory arrangements
- Operator contractual arrangements
- Standards and monitoring
The Next Generation of Transit

- A privately operated system through a system of competitively tendered concessions can provide the right set of incentives for profit and customer service.
- In conjunction with a strong oversight role by a public agency, this type of system can deliver a high-quality product to the customer.
- Typically, concessioned operators may be paid by the number of kilometres travelled rather than by the number of passengers.
- Further, operators can be penalised or awarded depending on their performance levels.
- Such incentives do much to focus operator efforts on providing a quality service.
The Next Generation of Transit

• For a successful transit system in T&T, suitable provision has to be made for at least 360,000 persons (excluding secondary school children).
• This would require the overhauling of the arbitrary operations of buses, maxis, taxis, and PH cars
• It would mean the introduction, planning and scheduling, and management of 15,000 to 40,000 transit vehicles of a mix of modes suitable to the demands and communities served.
Off-Street Taxi and Maxi-Taxi Stands

- Taxis and Maxi-Taxis occupy terminals that have out-grown the capability of holding the numbers required, resulting in spill-over.
- This cannot be sustained, and in many cases utilise valuable on-street parking space.
- Any plan for public transport must provide off-street facilities in a reorganised fashion.