

GOVERNMENT OF TRINIDAD AND TOBAGO

**NATIONAL INTERNAL
TRANSPORTATION
POLICY**

DRAFT FINAL REPORT

**MINISTRY OF WORKS AND TRANSPORT
NOVEMBER 1996**

1. INTRODUCTION

In April 1996, the Honourable Minister of Works and Transport appointed a committee to review and amend as necessary the National Internal Transportation Policy for Trinidad and Tobago dated April 26, 1988. Appointments were made based on nominations by the Permanent Secretary (Transport) and the first meeting was held on April 26, 1996. The membership was as follows:

- (a) Mr. Peter Forde, Acting Chief Technical Officer, Ministry of Works and Transport (Chairman), until the committee was informed on May 21, 1996 that he had proceeded on vacation leave.
- (b) Dr. Rae Furlonge, Project Manager, Highways Division, Project Implementation Unit, Ministry of Works and Transport; appointed Chairman from May 21, 1996.
- (c) Mr. Hilton Charles, Director, Highways Division, Ministry of Works and Transport.
- (d) Mr. Roger Israel, Chief Traffic Engineer, Traffic Management Branch, Ministry of Works and Transport.
- (e) Mr. Alvin Seereeram, Acting Chief Planning Officer, Ministry of Works and Transport, until June 11, 1996, when Mr. Robert Robinson assumed duty as Chief Planning Officer.
- (f) Dr. Trevor Townsend, Chief Executive Officer, Public Transport Service Corporation.
- (g) A representative of the South Trinidad Chamber of Industry and Commerce: Ms. Diane Seukeran, President.
- (h) A representative of the Town and Country Planning Division: Ms. Lynn Hilaire, Town Planner II.
- (i) A representative of the Transport Division, Mr. Wayne Richards, Licensing Officer
- (j) A representative of the Trinidad and Tobago Chamber of Industry and Commerce: Mr. Glenn Billouin.
- (k) A representative of the Ministry of Public Utilities, Ms. Gail Ann Rampersad, Senior Economist.

During the course of our deliberations we have had participation by invitation from the following persons:

- Chairman of the Tobago House of Assembly, Mr. Lennox Denoon, for a full-day session on the Trinidad-Tobago air and sea linkage.

- Airports Authority of Trinidad and Tobago, General Manager, Mr. George Leid, for a full-day session on the Trinidad-Tobago air and sea linkage.
- Vice-president of the Tobago Hoteliers Association, Mr. Allan Clovis, for a full-day session on the Trinidad-Tobago air and sea linkage.
- Specialist on transportation for the elderly and disabled, Mr. Anton La Fond.
- Port Authority of Trinidad and Tobago, Civil Engineer, Mr. Narine Singh, for discussions on freight services and the Trinidad-Tobago sea linkage.
- President of the Trinidad and Tobago Haulers Association, Mr. Keith Lutchmansingh, for discussions on freight services.
- Representatives of the Trinidad and Tobago Haulers Association, Mr. Kamal Maharaj and Mr. Curtis Seepersad, for discussions on freight services.
- Representative of the Freight Forwarders Association of Trinidad and Tobago, Mr. Ivan Tang, for discussions on freight services.
- Representative of the Environmental Management Authority, Dr. Ahamad Aly Khan, for discussions on environmental matters, including fuels, and air and noise pollution.
- Representatives from the Maritime Services Division, Commander L. Roach, Ms. Dywnette Eversley, and Ms. Diane Hector, for discussions on the organisational structure of the marine sector.
- Representative from the Civil Aviation Division, Mr. George Livingston, for discussions on the organisational structure of the air sector.

A transportation policy document sets the framework and philosophy for decision making in the transport sector. The establishment of such a framework provides a context for choosing among the various options for infrastructure development, ownership, regulation and operation of services provided by both the public and private sectors.

2. THE ROLE OF TRANSPORTATION

Travel is derived demand brought about by a desire to move goods or people between spatially separated activities. As such transportation should not be seen as an end itself, but rather as a means of linking these activities. The observed traffic on a road network is a function of the interaction among activities which are geographically dispersed. The role of transport is thus to ensure that citizens enjoy adequate access to activities which make up a social system. Traditionally, a good transportation system is considered to be one which efficiently and effectively serves the existing pattern of activity location.

In societies where there is no need for significant structural transformation, and thus where only marginal readjustments are required to maintain an orderly system, it would be sufficient to evaluate the transportation system in this manner. In Trinidad and Tobago, however, the transportation system evolved in response to a set of activities and their locations which are not necessarily compatible with the development goals of this newly emerging nation. Thus, in this situation where gross structural transformation of the economy is necessary, it is not sufficient for the transportation system merely to serve existing demands. To quote the Republic of Trinidad and Tobago Medium Term Policy Framework 1993 - 1995:

“Government is fully cognisant of the need for an efficient and reliable transportation Link. This requirement has been made more urgent by the increased integration and globalization of markets, the new focus on export led growth, the removal of major trade restrictions, the need for the country’s products to be internationally competitive and the need to enhance the overall investment climate. A sound infrastructural base to facilitate transport is therefore considered a fundamental necessity.”

The existing transportation network and settlement pattern in Trinidad and Tobago are rooted in a colonial pattern of economic and spatial organisation which the country cannot afford to prolong. The plantation based economy was fragmented and lacking in internal integration with very poorly developed lateral linkages among sectors. This is

readily evident in the numerous single purpose-oriented ports, for example, for sugar, asphalt, petroleum and the linear corridors linking such ports to what were plantations or mining areas. Since the overriding objective of the Government is to transform the economy into one of greater interdependence, it will be necessary to develop greater internal linkages and by combining more local raw materials and labour, create a greater local value-added content to our exports.

In such a perspective, it is not sufficient to ask whether the transportation system adequately serves the present location of activities. One must further enquire whether it will adequately serve the activities and developments which the country wishes to encourage. The settlement strategy adopted by the government is a dispersed concentration strategy which seeks the extension of the intermediate centres and regional towns. This will give effect to the government's policy of decentralisation, redress the imbalance of spatial development and redevelop and upgrade other existing urban areas whilst at the same time addressing the problem of rural settlement. The strategy is intended to attract population, economic activity and social services to the intermediate regional centres. This would separate the effect of development while maintaining the economic advantages of urban locations.

The areas identified for growth are Sangre Grande, Couva, Point Fortin, Rio Claro, and the sub-region of South West Tobago. The transportation system should seek to open up the rural two-thirds of the country by linking intermediate regional towns more efficiently with their rural catchment areas and by linking each regional town into a properly articulated system of settlements.

The role of the transportation system is therefore to

- Provide for the safe, efficient and economical movement of people and goods;
- Address regional economic development objectives of government (regional disparities); and,
- Support government priorities as they relate to tourism, industry agriculture, education and settlement.

The decisions with respect to investment in transport and infrastructure should be prioritised on the basis of maximisation of net social benefits.

3. THE ROLE OF PUBLIC TRANSPORTATION

Even though private car ownership is fairly high in this country, the reality is that the majority of the population do not have access to a private car. The most recent National Transportation Study has shown that, excluding trips by walking and bicycles, 60% of all trips are made by public transportation means and 35% by private cars. Clearly therefore, private cars do not satisfy all the needs of the traveling public, nor is it either expected or desirable for them to do so. Even those persons who have access to private cars, depend upon public transportation services for some of their transportation needs. Public transportation therefore makes a valuable contribution to the total transportation services in the country.

The first desired objective of public transportation is to be an efficient mover of people. Thus, emphasis should be placed on utilising vehicles which provide the highest capacity at the lowest unit cost contingent, of course, on the level of demand for services. Furthermore, the overall supply of public transportation should be such that there is enough capacity available for all those who need and desire to use it. Given the limited availability of state resources for the development of transportation infrastructure and services, the government's policy should be to encourage the services which (i) make the maximum use of limited physical infrastructure, and (ii) maximize the use of private funding. Finally, in the public interest, there should be minimum safety and environmental standards which must be adhered to by public transportation providers.

Consequent on the above, the general policy guidelines which should govern the development of public transportation services can be summarized as follows:

- Where a need for public transportation has been identified, priority should be given to the provision of these services by private operators.
- In attempting to influence modal choice of passengers as well as the operation policies of private suppliers, the government should rely as much as possible on market forces and positive incentives rather than strict regulation and legislation.

- The provision of public transportation services should be self financing as far as possible. The government should not as a transportation policy commit itself to provide free public transportation to any group or sector.
- Notwithstanding the above and consistent with its overall policies on national development, the government should, where social necessity requires it and market failure exists, retain the right and hence the capacity for the supply of public transport to specific groups such as senior citizens, the handicapped, school children and residents of remote areas. Furthermore, where there are significant positive externalities to particular trips, some level of subsidy might not be inappropriate.

4. THE PROVISION AND MANAGEMENT OF ROAD TRANSPORTATION INFRASTRUCTURE

4.1 Classification of Roads

The road network is the lifeline of the nation. In order to adequately serve this function, it is necessary that both the users and those responsible for the maintenance and administration of the network understand the relative importance and functions of various roads. The proposed tourism drive makes it even more important that the roads are classified in a manner that is intuitive and easily understood by those unfamiliar with particular regions. Similarly, the allocation of resources in annual maintenance as well as land development control decisions and decisions about the level and kinds of access and roadside activities should all be based on the class to which a road belongs.

The current road hierarchy is defined in the Highways Act chapter 48:01. Six categories of roads are defined. These are (a) main roads, (b) special roads, (c) secondary roads, (d) local roads, (e) streets and (f) development roads. According to the Act “main road” means a highway that - (i) in the opinion of the Minister is of prime importance by reason of being a main channel of communication throughout Trinidad and Tobago; and (ii) is classified as such by Order made under the Act. Secondary roads are considered of “secondary importance”. Special roads are main roads reserved for special classes of traffic and development roads are traces or trails constructed for agricultural or other development. Streets are not defined by function, design or usage but are just “classified as such” and “local roads” are defined as none of the above.

The definitions are clearly inadequate and cumbersome. One obvious flaw is that only main and development roads are really defined by their function. Also, there is nothing within the definitions which would indicate the level of jurisdiction or the level of design and construction of the roads. One result of this is that the Highways Division is responsible for some roads which mainly serve an access function, while conversely local government bodies are responsible for roads which serve mainly a movement function.

A road hierarchy should be defined according to the functions the roads will serve. The main basis for classification is whether the road is to be used primarily for movement or for access. In the absence of a clearly defined road hierarchy, the typical problems which arise include:

- Congestion occurs with slow and fast vehicles using the same road and inadequate provision for frontage access activities in locations where high pedestrian activity occurs (e.g. shopping streets).
- Through-traffic passing through residential and shopping areas incurs economic losses due to hazards on roads not suited to carry such traffic.
- Whilst the main role of arterial roads is to carry fast moving, longer distance motorised traffic, there are situations where these roads also provide the main route for local traffic. Due to its relative attractiveness, the growth of development along such roads is inevitable. This can increase road safety problems when stopping, turning, servicing and pedestrian movements become more frequent.
- Collector roads provide for movement between arterial roads and local roads, and can be subject to high concentrations of commercial and/or commuter traffic, particularly in urban areas. They tend to have the worst accident potential at intersections or where parking and roadside development encroach upon the highway.
- Local roads link collectors and provide for access to activity areas. In residential areas, the needs of the non-motorised user should predominate, but this is usually not so. In industrial areas the road geometry requires greater clearances to accommodate large vehicles, and there is a tendency for the speeds of cars to be higher than desired.

It is important to ensure that roads are assigned to the appropriate level in the hierarchy on the basis of their proposed (or desired) functions rather than their existing functions which may or may not be the same as those required for safe, efficient and economic operations. Key points to consider are:

- Each class of road should clearly convey to the road user its role in the hierarchy by appearance and related design standards.
- Also, each road should intersect only with roads in the same class or one immediately above or below it in the hierarchy, so that change in operating conditions is gradual.

4.1.1 Arterial Roads

These are the main transport routes within the road hierarchy. The main elements to consider when planning arterial roads include:

- No frontage access;
- Development set well back from the highway;
- All access to premises provided via collectors;
- Number of intersections to be minimised;
- Suitable at-grade channelised intersections for minor flows;
- Pedestrian and slow-moving vehicles clearly segregated wherever possible;
- Parking on the road should not be permitted or necessary;
- Where necessary, parking/stopping to be provided clear of main carriageway(s);
- Bus stops and other loading areas (only permitted in exceptional circumstances) should be in separate well designed laybys;
- Grade separated intersections for extremely high flows (when there is no at-grade intersection these are known as freeways; when there are limited at-grade intersections these are called expressways); and,
- Suitable for all heavy goods vehicle (HGV) movements especially through-trips.

4.1.2 Collector Roads

These roads form the next level below arterial roads in a road hierarchy. The needs of moving traffic still predominate but they also contribute to access requirements. They serve to feed traffic onto and off the main road network at the beginning and end of journeys. The main elements to consider when planning collectors include:

- Frontage access may be allowed but individual vehicle accesses should be avoided from adjacent buildings, except where large traffic generators exist;
- These roads will be within or close to residential areas and motorists need to be aware of pedestrians, especially young children; adjacent areas alongside such roads can become play areas unless careful consideration is given to ensure that open areas between routes do not develop in that way;

- The road is only for local traffic; through-traffic is more adequately accommodated on an alternative, more direct road;
- Where possible, an industrial traffic route should not pass through a residential area;
- Vehicle speeds should be kept low, so long straight roads should be avoided;
- Parking may be allowed, but alternative off-road provision should be made if possible;
- Non-motorised traffic is of equal importance to motor traffic and separate routes should be provided if possible;
- Dependent upon the traffic flows the road width can be varied to provide for parking or to give emphasis to crossing points;
- Bus stops can be located on the carriageway but should be near well-defined crossings;
- Through-movements should be made awkward and inconvenient to discourage them; and,
- Minimum HGV through-trips.

4.1.3 Local Roads

These roads are for access only. The main elements to consider when planning locals include:

- Vehicle flows to be kept to a minimum;
- All unnecessary traffic eliminated;
- Vehicle speeds to be kept low by careful and deliberate inclusion of obstructions to create meandering alignments;
- Access roads kept short where possible;
- Cul-de-sac and loop roads to be used wherever possible to deter through-traffic;
- Intersections to be three rather than four leg and kept compact to aid pedestrian movement;
- Pedestrians and vehicles can share space;
- Carriageway width can be reduced to emphasise pedestrian priority;
- Entrance/exit points of access should be clearly identified by threshold treatments, e.g. changes in geometric layout, landscaping, building or even gateways and signing;

- Parking and stopping within the street is permitted although, adequate provision should be provided within individual properties or separate garage areas; and,
- HGV activity: only related-activity permitted in residential areas; delivery of goods and services permitted in other areas.

4.1.4 Road Characteristics Relative to Road Classification

The following road characteristics should be included when designing for arterials, collectors and locals:

- Number of lanes;
- Design speed (kph);
- Access control;
- minimum intersection spacing;
- parking, pedestrian traffic along road;
- crossing pedestrian traffic;
- minimum width of median island;
- road reserve;
- stopping sight distance;
- bus stops;
- design volume (veh/day);
- lane width;
- Shoulder width;
- Minimum radius of horizontal curve;
- Vertical curve;
- Maximum gradient on links; and,
- Maximum gradient at junctions.
- road crossfall
- shoulder slope
- side-slope
- Vertical clearance
- Lateral clearance
- Roadside drainage
- Street lighting

- Pavement structural design
- Shoulder structural design

4.2 Access Requirements

4.2.1 Agricultural Roads

The Government has begun to develop a system of agricultural access routes. This is considered to be a crucial element in the thrust to create self-sufficiency in food production, save foreign exchange and create productive employment.

The decisions about the particular regions and locations of these roads would have to be made by the Ministry responsible for agriculture in conjunction with local authorities and, where required, the Town and Country Planning Division. The Maintenance policy recommended in section 4.4 below should also be extended to these roads so that adequate levels of annual maintenance can be determined.

High standards for roads intended as agricultural access roads tend to speed up urbanization in an area. The quality of the constructed agricultural access road should not be used as the basis for changing the use of the land surrounding this road in order to rationalize the urbanization process.

4.2.2 Commercial and Retail Areas

Commercial and retail areas may vary from isolated stalls or street sellers to major shopping centres and office developments covering large areas of land. Their transport needs can therefore be very mixed. The main points to consider in the planning of such areas are:

- All commercial and trading areas should be away from the through-traffic network. If alongside, then service roads should be provided to service the development;
- Rear servicing separate from pedestrian access should be provided whenever possible;
- Adequate parking and loading facilities for operational use should be provided within the site of individual premises if possible;

- Visitor and customer parking should be provided off the road, possibly on a communal basis;
- On-street parking should be discouraged and only permitted where it does not obstruct general traffic movements or conflict with pedestrians;

4.2.3 Recreational and Tourism Areas

Since tourist or leisure related activities are encouraged and have become a necessary part of the economy, safe access to them and appropriate parking facilities at them can form an important part of their success. The main considerations to bear in mind are:

- All recreational generators should be given access from locals or collectors, depending on their scale;
- Recreational land uses should be separated from residential areas, but they may be on the fringes provided recreational traffic is directed away from dwellings;
- Certain recreational uses may be acceptable within commercial or industrial areas, although this should be done with care;
- Adequate provision of public transport is essential;
- All participant and spectator parking should be provided separately within or near each facility and be sufficient to accommodate peak demands;
- Pedestrian routes between entrances/parking areas and venue should be free of vehicular traffic and clearly sign-posted.
- Where events necessitate use of public highways they should be clearly segregated from general traffic (periodic closures may be justified)
- Service areas and facilities should be segregated from general traffic and if possible should operate at different times to public use; and,
- Certain facilities such as car parks could be shared with other uses.

4.2.4 Industrial Areas

Land intended for industrial use must be physically separated from residential or similar land uses where the presence of high traffic levels or heavy goods vehicles will not be tolerated. In locations where industries already exist amidst residential areas and such

segregation is not possible, serious consideration needs to be given to relocation as a long term aim. The important access factors are:

- Land zoned for industrial purposes should have access directly from the collector network whenever possible;
- Each site should have sufficient off-road parking and loading areas to accommodate all its operational, staff and visitor requirements within the site boundary;
- Roads and footpaths should provide a safe and efficient means of access for workers, visitors and the range of vehicles which can be anticipated when a number of different industries are grouped together;
- The internal circulatory system (to at least collector standard) should ensure that no traffic queues form on the network in normal circumstances; and,
- Networks of safe cycle/footpaths should be created between the industrial area and the main areas where employees live.

4.2.5 Residential Areas

In order to provide a safe environment for vehicles and pedestrians in residential areas:

- Residential roads longer than 100 metres should be meandering and should have tight horizontal curves to encourage low speeds;
- Non-access traffic needs to find it impossible, or highly inconvenient, to use residential roads as a short cut;
- Pedestrians must be given priority, especially close to buildings and in play areas;
- Direct access to dwellings should be provided from access ways rather than collector roads;
- Where dwellings have vehicular access onto collector roads, alternative pedestrian access should be provided via segregated footpaths onto access ways;
- Pedestrian crossings of traffic routes should be convenient and safe;
- Parking should be ample and convenient but located away from where children play;
- Drivers need to be made aware of the priority for pedestrians on entry and throughout the area by the overall geometry, surface texture and threshold treatment as they enter the area;
- Large developments should be sub-divided to minimise traffic on internal roads;

- Existing grid-iron networks should be modified by closures or restrictions to create internally or externally-fed systems;
- Inter-visibility between drivers and pedestrians should be sufficient to minimise the risk of accidents; and,
- Overnight parking of goods vehicles, especially those with hazardous loads, should be actively discouraged.

4.2.6 Pedestrianised Areas

These are areas from which all motorised vehicles are excluded. Pedestrian routes or areas should not be planned in isolation because motor traffic still has to be accommodated somewhere. In planning new pedestrian networks and areas the key points to consider are:

- Residential, industrial and commercial areas should be linked by footpaths providing the most direct and pleasant route between destinations. Use of trees to provide shade can encourage use;
- Any deviation from the direct route should be more attractive than a less safe option;
- All crossings with main routes should be grade separated wherever possible and if not possible additional at-grade facilities (e.g. refuges) should be provided to minimise crossing problems;
- Vertical rerouteing (via overbridge or underpass) is much less attractive to pedestrians than at-grade facilities;
- In shopping and commercial areas priority needs to be given to pedestrians;
- Where motor vehicles are displaced, adequate capacity (for loading, parking and movement) needs to be available elsewhere on the surrounding roads but such facilities should always be within easy walking distance;
- If no alternative provision can be made for motor traffic, consideration may be given to pedestrianisation by time of day, i.e. vehicle access allowed only when pedestrian flows are light (e.g. very early in the morning or late at night);
- Connections to bus stops, parking areas and stations are vital and should be convenient; and,
- All pedestrianised areas must have provision for access of emergency and refuse collecting vehicles.

4.3 The Provision of Road Infrastructure

It is the responsibility of the Government to ensure that transportation infrastructure is developed and managed consistent with long-term national development aims and that the road infrastructure costs associated with any future land development be explicitly considered when the feasibility of such development is being determined. Whenever there is any proposed land development which is not consistent with the approved land-use plan, the developer must conduct and submit a traffic impact study. As part of the approval process, any development project that places unplanned demands on public infrastructure would incur an impact fee. The impact fee is required for the additional roadway capacity needed to meet the increased traffic generated by the project, in order to maintain the designated level-of-service of the roadway; the fee is based on average construction costs.

The Government should be responsible for the provision of all road infrastructure except that provided by private developers as local access within housing or industrial settlements. Even in these cases the Government must set the necessary minimum design standards and they must be built in accordance with guidelines fixed by the state. Furthermore, in instances where a development would require hitherto unplanned or unscheduled infrastructure, the state must ensure compliance with standards, and the cost of infrastructure at the time of the development must be borne by the developer.

In addition, the Government should not be expected to provide, as a matter of policy, free terminal facilities for privately-owned public transportation services. It should, however, as a part of its management of the overall transportation infrastructure reserve the right to govern the operations of such facilities to the extent that they affect the road system. Similarly, it is the responsibility of private owners of businesses and establishments to ensure that approved parking facilities are provided for their customers and approved off-street loading facilities for their goods. These facilities should also be provided in accordance with Government-regulated guidelines.

If the government in its developmental plans has a desire to develop land for road infrastructure in the future and is not prepared to give approval for private development,

then the government should purchase this land so that the private owners would at least be able to enjoy the benefits of their land. Upon notification by the road authority to the Town and Country Planning Division of their developmental plans, the government should acquire the land within 5 years. No private development should take place within this period. If the state has not acquired the land after the 5 years, then the land should be released to the owners.

4.4 Establishment of an Operations and Maintenance Policy

4.4.1 General

Road expenditure falls into the following categories:

- Operations
 - Traffic management (guidance, control, etc.)
 - Facilities management
 - Administration
 - Policing
 - Incident management (accidents, hazards, etc.)

- Maintenance
 - Routine maintenance:
 - Pavement and shoulder (localized repairs including patching, crack sealing, etc.)
 - Road reserve and drainage (vegetation control, drainage cleaning and repair, etc.)
 - Appurtenances (signs, lighting, pavement, markings, barriers, etc.)
 - Structures (minor repairs to bridges, tunnels, etc)
 - Emergency work (landslides, washouts, catastrophic damage, removal of hazardous materials, etc.)

 - Periodic maintenance:
 - Restoration
 - Resurfacing (surface treatment, thin asphalt overlays)
 - Rehabilitation (shape correction and/or strengthening by overlay, etc.)

- Reconstruction (replacement, recycling)
- Structures maintenance

- Improvement
 - Incremental capacity increases (alignment, widening, additional lanes, etc.)
 - Facility upgrading (dualization, paving)
 - Safety enhancement (barriers, intersection improvement, etc.)
- Expansion
 - New construction
 - Land acquisition

This section seeks to establish a policy that governs the first two items of operations and maintenance. Inadequate road operations and maintenance results in an unnecessary increase in annual transportation costs and substantial annual loss of highway patrimony. The solution lies not only in the allocation of adequate financing, because this does not necessarily guarantee that funds will be efficiently applied. The other objectives for solving this problem are an appropriate organisational structure and an efficient form of management. The committee recommends that accounting systems within the public service be changed to focus on achievement rather than on allocation of resources. Further, the committee recommends that road maintenance not be used just to provide employment, but also to provide well maintained roads for the benefit of the nation. The organisational structure is discussed later in this document.

The policy would be linked to the classification of roads and would specify detailed minimum and desirable standards for the components involved in operations and maintenance. The following Indicators could be used to monitor the performance of the system:

- Physical condition
 - Index of condition (e.g. pavement serviceability rating)
 - age of facilities
 - expenditures per unit of system
- Activity levels
 - traffic volumes
- Safety
 - Number of accidents, deaths, and injuries per kilometre and per capita
- Level of service
 - average delays

- Cost - cost per trip and unit of travel

The Committee also recommends that the Ministry explore legislative changes which would be necessary to ensure that other utilities which need to dig roads in order to carry out their own maintenance or development works are mandated to carry out the necessary repairs to the standards determined by the Ministry. If the utility is unable to meet the standards required for reinstatement, then they should give the money to the road authority and let them do the job.

4.4.2 Dedicated Road Fund (Road Improvement Fund)

Revenues for the Road Improvement Fund (RIF) should not be treated as taxes paid to government, but as user charges or rates paid to road providers. They should be lodged in special bank accounts, not in government treasuries. The criteria for distributing the revenues must be clearly specified. The simplest would be to base the allocations on vehicle-kilometres of travel, with special care being taken to ensure that monies paid to cover the damage caused by heavy-axle vehicles should be credited to the areas where the damage occurs. But other criteria could also be agreed, for example, focussing the distribution of funds in favour of rural areas to make more of their roads financially viable.

If financial distributions are to be made on traffic counts, the counts would have to be of unchallengeable accuracy. Therefore, it may not be adequate to use only human or mechanical counters on the ground, which can be subjected to cheating; and, aerial photographs could provide reliable counts to any desired degree of accuracy.

Various studies show that including the user rate in the fuel price is by far the most economical method of charging because the collection cost is less than 1 percent of the amount collected. This mechanism also has an additional advantage in that it is almost impossible to evade; that it covers the entire network and that it is based on the close relationship between the amount of fuel consumed and the amount of road service used. The main drawback of the fuel charge is that it cannot be varied much by time of travel or by place of travel, and therefore it cannot be used to charge for congestion.

Diesel surcharge has an additional drawback as a source of funding for roads: it is used in industry, as well as for transport. To surcharge diesel as a source of funding for roads, it is necessary to distinguish it from diesel fuel used for other purposes. The standard approach is to apply a dye to non-road diesel, and to exempt the dyed product from the road charge, while ensuring that it is not used on the road. This is not easy. Further, the issue of a diesel surcharge would have to be considered in the light of Government's policies towards freight and public transportation, since both of these modes are heavy users of diesel, and any surcharge would impact the cost of these services.

Toll collection is a much less efficient method of road user charging than fuel charge because of the very high collection costs, as well as the inability to apply them over the entire network. It, however, can include congestion pricing. In this country, tolls should only be considered on an existing road segment provided that

- at least one other non-tolled route exists; and,
- the road segment must have heavy traffic.

4.4.3 Road User Fuel Rate

Traditionally, no allowance is made for the progressive depreciation of such capital assets as bridges and roads. Reserves are not usually established for the orderly maintenance of facilities. Consequently, as roadways near the end of their design life, there are rarely sufficient funds for replacement or restoration. Hence, the recurring crises in infrastructure finance. What should be clearly understood is that the allocation of funds for construction of any type of infrastructure has consequences on the budget, in terms of annual operations and maintenance costs, for as long that infrastructure may last.

Road management experts throughout the world agree that, as a general rule, adequate road operations and maintenance activity has an annual cost of between 2.5 percent and 3.5 percent of the replacement value of the road, depending on climate and traffic volumes. The user rate to be charged for a certain year is simply the result of dividing the total amount of funds needed for operations and maintenance during the year by the

quantity of vehicle fuel expected to be sold in the country over the same year. Thus, the rate is an amount of money for each litre of fuel sold.

4.5 Efficiency of Infrastructure Development and Usage

The development of roads infrastructure requires considerable land and material resources. Furthermore, the local experience has been that the actual cost of road building more often than not exceeds preliminary estimates. This unplanned expenditure places an even greater burden on the public purse. The committee strongly recommends that priority be given to ensuring greater value from any road infrastructure expenditure. In order to do this a careful study must be done of the entire process of road planning, design and construction to identify and rectify the bottlenecks and sources of error which significantly affect the final cost of road construction. Some of these are delays in acquisition, inadequate soil and site surveys, material shortages, inadequate supervision, and delays caused by bureaucracy or political considerations in decision-making.

Even when a road is built within the planned cost, the maximum benefits may not accrue because of improper usage. In particular, it is necessary to have strict land development control adjacent to roadways to ensure that other activities do not encroach on the transportation function. In particular the establishment of unauthorised advertising boards, market stalls and illegal accesses all significantly degrade the safety and capacity of the roadway system and negate the expected benefits of the construction. Similarly, inadequate traffic control and enforcement results in severe misuse of the road network and decreased efficiency. It is strongly recommended that the evaluation of proposed alternative road development plans realistically consider the expected road user behaviour in determining how much benefit would actually accrue.

The time is now opportune to do some research on road design and construction methods, including the materials used, based on the historical data. Furthermore, in order to improve the maintenance and minimise costs, the government should implement utility corridors outside the carriageway, but within the road reserve.

4.6 Enforcement Policy

The Minister responsible for highways has absolute power covering all aspects of road use, management, control and construction. The main problem of enforcement in practice is the concentration of discretion and power which rests in the hands of the Minister by virtue of the right of appeal to him. It is a common occurrence that appeals are never determined.

Increased cooperation between the road authority, the traffic police, and the Transport Division officers can make a marked difference to the degree and effectiveness of enforcement. Enforcement should be highly visible in order to deter and act as a warning and reminder to others.

5. THE PROVISION OF PASSENGER TRANSPORTATION SERVICES

5.1 Privately Supplied Services

Private operators carry the majority of public transport passengers at this time. It is not expected or even desirable that this should change within the time frame under consideration. These operators have the classical advantages on owner-operated businesses in terms of a high utilisation of capital equipment and strong incentives to provide economical services responsive to customer needs. However, the Committee recognises that in their attempts to maximize revenue private operators currently cause severe disruption of the traffic system and their behaviour leads to very inefficient usage of road space. Furthermore, the pricing policy of these operators on any given route is not necessarily marginal cost pricing. Prices are set by associations and the decision-making is more like a cartel than a free market.

No agency of the government currently monitors, controls or co-ordinates the operations of these suppliers. Given the Government's overall responsibility of ensuring adequate levels of safe public transportation and that the private operators will be continuing to supply services, there is an urgent need for administration, rationalization and control of the industry. This would include contracting services, organizing and administering routes and terminals, the collection and analysis of data pertaining to passenger demand and potential suppliers and an ongoing monitoring of the industry, including vehicle standards. The proposed administration arrangement will be detailed in a later section.

While it will be up to the administrative agency to determine the details of regulations governing the industry there are certain areas in which some policy recommendations can even now be made. The first of such areas is in vehicle seating capacity. Currently the largest privately-owned public transportation vehicle allowed is a 25 seater. The Committee is of the view that there is no benefit in regulating the sizes of vehicles so that only the current Public Transport Service Corporation can run buses which seat up to 40 passengers. By deregulating vehicle seating capacity (consistent with regulations on overall vehicle size) operators will have the flexibility to take advantage of any scale

economies which might exist on particular routes. In this manner, a likely mix of vehicles would range from buses and other large carriers on high density routes to 4/5 passengers taxis on the lower density services. A primary consideration, prior to determining the appropriate vehicle size, must be the expected modus operandi. Thus if vehicles as large or larger than the current 25-seater maxi-taxis are operated under the same conditions, as currently hold, the congestion cost on the system may well outweigh any efficiency benefits of seating capacity.

The second area of concern is the question of fleet ownership of maxi-taxis. The Committee is of the view that there are no transportation objectives which are served by any restrictions on fleet ownership. It, however, recognises that there might be broader social objectives which can be aided by such limits. Furthermore, in the event that some relaxation is made on the current regulations, the regulatory agency would have the responsibility to ensure that this does not lead to the formation of monopolies or oligopolies which would be to the disadvantage of transportation users.

The final area of concern is the role of the unions or associations or owners. Notwithstanding the above mentioned need for a regulatory agency, the Committee recommends that associations like the Trinidad and Tobago Unified Maxi Taxi Drivers' Association be encouraged and nurtured. This would assist in preventing monopolistic behavior by the owners of capital, as well as help in the formation of cooperatives. These cooperatives could pursue group insurance, and help set appropriate standards for behaviour and operation of their members.

The Committee also examined the possibility of the agency responsible for public transportation regulation directly controlling fares charged by private-operators. However, notwithstanding the Committee's view that the Government should reserve the right to influence, where necessary, the price of privately provided transportation seats, it is felt that market forces should be responsible for pricing, in the main.

5.2 Publicly Supplied Services

Policy guidelines concerning the involvement of the Government to the public transportation sector were proposed in Section 3. Further to these, it is recommended that the agency responsible for the administration of privately supplied services be responsible for the administration of publicly supplied services as well. The Committee does not recommend that the Government as a policy commit itself to owning and operating a bus company. Instead the public transportation administration agency should explore all the possible options of ensuring that the Government meets its responsibility for ensuring adequate public transportation services, especially to targeted users. Alternatives include partial state ownership of an operating agency, “wet” leasing vehicles, contracting several small suppliers, franchising certain routes or owning vehicles and renting them out to operators. The important thing would be to have the most economical long term arrangement which ensures an adequate level of service, both in terms of stability of supply and safety of operations.

The philosophy guiding the state’s decision to supply public transportation services should be compatible with the Government’s stated objectives of increasing self-reliance and self-employment. Although the question of subsidy is a fiscal rather than a transportation one, the Committee recognises the existence of groups within the society for whom purchasing of public transportation seats at their true economic cost would present hardship. In the event that the social decision is made to subsidise such groups, the Committee strongly recommends that users subsidies rather than operator subsidies or cross-subsidies be implemented after a rational identification of the affected parties.

5.3 Private Vehicles

In order for most efficient usage of transportation resources the Government’s policy should be one of encouraging public rather than private transportation. Transportation infrastructure investment should be used to encourage public transportation as opposed to private car usage. It is within this context that it is not recommended that the Government see itself as responsible for the provision of either off or on street parking facilities. It may, however, wish to supply some facilities either at full user cost or when the supply of such is compatible with the overall objective of encouraging public

transportation usage. An example of the latter is a park-and-ride facility linking private car users to the transit system.

It is recommended that the Government should explore avenues to reduce the usage of private vehicles, especially at times and in locations where a high demand for road space imposes congestion costs on road users. Possible measures can range from differential pricing of licenses and fuel for transit vehicles as opposed to private cars; to the use of priority lanes or streets for transit vehicles only. Such measures seek to influence the modal choice of commuters and would normally only be successful if the transit service were adequate enough for all captive riders.

5.4 Accessibility for the Elderly and Disabled

The elderly and disabled must be made to feel a part of society and should be integrated as far as possible. In the pedestrian mode, the following should be considered when providing for their accommodation:

- Sidewalks;
- Traffic control devices - communication aids; and,
- Terminals/ stops - ramps, escalators, communication aids, special service persons, seats, toilets, and parking stalls.

In the vehicle mode, they are as follows:

- Vehicle specification - seating availability, door width, and height of steps;
- Licensing of a particular style/design of vehicle;
- Call buttons conveniently located;
- Bus stops signs; and
- Storage for wheel-chairs/ space for wheel-chaired person.

The committee is of the view that the basic level of access should allow for wheel-chair access, and that there should be two such reserved spaces. Maxi taxis, sedan taxis or the PTSC buses cannot be adapted for a wheel-chair-bound person. However, sedan taxis could accommodate such a person through assistance to place the wheel-chair in the trunk. Special buses could be bought for easy access by the disabled. The committee also feels that the current requirement of yearly driving tests should be removed for persons who have afflictions that are not degenerative.

The funding of any facilities for the elderly and disabled should be considered as part of Government's social obligation. Facility design codes should include minimum standards of accessibility for the elderly and disabled.

5.5 Financial Health of the Maxi-Taxi Industry

There is in circles a perception that the maxi-taxi industry is a lucrative business opportunity and that the "average" maxi taxi operator is enjoying a significant return on investment. There really have been no studies which focus on the economic health of the industry. Furthermore, the anecdotal evidence of individual maxi-taxi operators does not itself provide sufficient evidence.

What are the factors which may lead to a conclusion of the industry being a lucrative one with room for more expansion. The main factor is the apparent demand for additional maxi-taxi authorizations especially in Routes 1 and 2. The intuitive assessment is that this demand reflects the opportunities for earning income in the industry.

There are, however, a few signs which point to problems. Firstly, apart from the height of the peak period, there is a very large surplus of maxi-taxis. This has resulted in fares remaining relatively stagnant notwithstanding increases in the costs of inputs. Operators have compensated by (i) decreasing their hourly pay (that is, working longer hours for the same return), (ii) delaying or shortchanging maintenance, and (iii) increasing lawlessness behaviour, such as driving on the shoulders.

Another sign is the apparent anomaly of artificial shortages during peak periods. Given their traditional mode of operation many maxi-taxi drivers wait several hours before making a return journey. The Chaguanas-Port of Spain route is an example of a route where passengers on one end must wait for hours for transportation because the maxi-taxi operators cannot afford to "dead-head" in the off-peak direction.

A third sign of the problems within the industry is the increasing percentage of the new maxi-taxis which are not owner operated. The industry is changing from one where an

individual could be truly “self-employed” to one where the driver “leases” the vehicle for the day or half day from an owner. The driver must pay for fuel, pay his lease cost and then pay himself (and his conductor). This exacerbates the lawless behaviour identified above.

The problems in the industry are compounded by the refusal of some banks and credit unions to lend money for purchasing maxi-taxis and the reported difficulties in insuring the vehicles with reputable insurance companies. The image and loss history of the industry is so bad that even the lure of “group” business is insufficient to attract reputable companies.

What does the future hold for this industry? Given the current scenario, any further increase in the supply of maxi-taxis without concomitant increases in market-driven demand (as opposed to demands by those who cannot afford to pay) will lead to a worsening of the problems identified above and a further deterioration in the health of the industry. One does not have to look very far to see the para-transit systems which are in a very poor state.

5.6 The Priority Bus Route

The Priority Bus Route is an extremely valuable asset whose capacity should not be jeopardized by illegal or inappropriate use. Since its primary function is to move people, other non public transport uses should be prioritized and only be granted a pass when they will not impact on the primary function.

It is suggested that emergency vehicles such as ambulances, police on call, and fire engines on call be treated as top priority uses and be given passes. However, other existing users such as doctors, government officials, firemen, etc., should have their passes revoked unless they can demonstrate a unique requirement.

6. THE PROVISION OF INLAND FREIGHT SERVICES

6.1 General

The only mode of inland freight transportation in Trinidad and Tobago is truck and this section deals with measures to improve the safety and efficiency of truck operations in the country. Freight services and infrastructure which complement the physical development strategy should be encouraged. Currently the Government is not directly involved in the provision of freight transportation services. The Committee can see no justification for Government's direct involvement as a supplier of inland freight services. The question of the services between Trinidad and Tobago will be discussed in a separate section.

6.2 Vehicle Roadworthiness

There is an unsatisfactory number of vehicles operating that are unworthy to be on the roads. The Trinidad and Tobago Haulers Association, which was registered in November 1995, complains that the Transport Division does not provide enough officers or accommodation to conduct vehicle inspections efficiently. The committee suggests that Government considers extending these services on Saturdays and Sundays. In addition, the committee suggest that the Transport Division and the Haulers Association exchange the relevant information for setting up mutually-agreed occasional sites for conducting inspections.

The incidence of used-vehicle importation as related to the lack of provision of appropriate spare parts is dealt with in a separate section.

6.3 Vehicle Loading

6.3.1 Axle Configuration

Roads are designed to accommodate a projected number of axle load repetitions of a specific magnitude for a projected service life. The damage created by traffic loads is expressed in terms of a reference axle load. Projected axle loads from different vehicle configurations are converted into an equivalent number of 8,000-kg single axle loads. These equivalent single axle loads (ESALS) are the basis for determining the thickness of the road structure required to provide the desired design life and thus its cost. The effect of a single axle load on a road increases as approximately a fourth-power of axle load. For example, although a 16,000-kg single axle load is only twice as large as an 8,000-kg single axle load, it causes 17 times more loss in life of a road. In addition to the impacts on road service life, increasing axle loads may also increase the level of maintenance required between major resurfacings. As expected, using tandem axles rather than single axles reduces the damage to the pavement.

The committee suggests that Government consider a system of varied license fees based on the number of axles and axle configuration. Lower fees would be applied for the vehicles with higher number of axles, with particular advantage being applied to the usage of tandem axles.

6.3.2 Overloading

The recent weigh-in-motion study by Government shows that there is a significant amount of vehicle overloading on the nation's roadways. The incidence of overloading is greatest on the Churchill-Roosevelt Highway, the Uriah Butler Highway, and the Eastern Main Road in Valencia. The main offenders are overwhelmingly semi-trailers with 3 or 4 axles, while straight trucks with double wheels on the rear axle follow closely.

Eighty percent of the imported cargo is containerized, which contributes positively towards standardization of weight measurement in the industry. The port at Port of Spain has installed a sensor on the port cranes that release a container that is above a specific weight. The device is not meant as a weigh scale but as a protection for the service life of the crane. The movement of a container is independent of its weight, and exporters seek to maximise the loads placed in a container. However, the port charges are dependent on the weight of the container, and so fraudulent practice within the various groups may lead to the documentation of weights for loaded containers that are

less than the actual. This overloading could only be identified if it exceeds the port sensor load limit. If it falls within the sensor load limit and the permitted road load limit, then there is currently no way of detecting the overload.

There is an assumption that containers entering the country are within the accepted limits as restrictions are properly enforced in their country of origin. The committee does not support this.

Haulers of aggregates and hardware material often install a “greedy bar” in order to extend the truck’s capacity beyond the stipulated maximum gross weight. The “greedy bar” is removed whenever the truck has to be inspected by the Transport Division.

The committee recommends

- The placement of permanent weight-restricted bridges at the terminal gates of all ports;
- The acquisition by the Transport Division of portable weigh bridges; and,
- The enforcement of vehicle weight regulations in a consistent and effective manner.

6.4 Congestion

Truck routes are very often congested. The increased traffic adds to travel times and costs for trucks serving ports, which ultimately leads to higher transportation costs, and so higher prices for consumers.

6.4.1 Local Access

Access between ports and intercity corridors is provided by local streets that also serve commercial and tourist traffic. City managers often put greater emphasis on developing tourism than on addressing the needs of freight transportation. Land surrounding these local access routes become very attractive and land values rise tremendously. Some ports are unable to source the funds to acquire these lands for expansion and/or zoning of port activities, and so, incompatible land use is permitted with congestion being the result. In the highly competitive port industry, the congestion costs could mean the

transfer of commerce to ports where there is less access delay. It is critical that the land-use in the surrounding areas be zoned for compatibility with port activities.

6.4.2 Traffic Engineering

There are very few alternative road corridors for intermodal freight transportation. Trucks require greater manoeuvring space for operations. A variety of traffic engineering changes can be made to individual corridors that become congested. Traffic throughput can be increased by such procedures as designating one-way streets, increasing roadway turning radii, widening roads to add extra lanes, flaring and widening entrances to off-street terminals.

6.4.3 Information Technology

Dramatic changes have occurred in the shipping practices of major industries and among the transportation carriers as a result of deregulation. Industries are focusing more on reduced inventory and lower distribution times, and that puts great burdens on the transportation system for timely deliveries ("just-in-time). Congestion can be reduced through applying improved information technology in transportation logistics which includes the capacity of the road system to handle the port cargo traffic.

6.4.4 The Impact of Heavy trucks on Highway Capacity

Large trucks have a more adverse impact on traffic flow on two-lane roads than on multilane highways because of their effect on overtaking behaviour. Heavy trucks can reduce the lane capacity by more than two-thirds.

6.4.5 Off-street Loading Facilities.

In urban areas like Port of Spain and even along heavily commercial corridors like some parts of the Eastern Main Road the lack of a sufficient number of off-street loading facilities contributes significantly to traffic congestion. Furthermore, should there be an upswing in the economic activity, then parked containers littering streets and main roads can be expected.

In general, trucks use the same entrances to a site as do employee vehicles and other traffic. The entrances must be designed to accommodate the largest truck expected to visit the site. It may also be necessary to recess the entrance gates so that sufficient storage space will be available for one, preferably two trucks, without encroaching on the street. Wherever possible, truck traffic should circulate clockwise, as the right turn is easier with large commercial vehicles because the driver's position is the right side of the vehicle.

6.5 The Transport of Hazardous Materials

There are currently no institutional arrangements for ensuring the safe transport of hazardous materials. The Environmental Management Authority (EMA) Act authorizes the EMA to regulate the transport of hazardous materials from generation to disposal, however, neither the regulatory framework or administrative structure is in place. Guidelines are needed in terms of the particular routes to be used, the protection of communities, and liability in the event of an accident.

6.6 Data on Freight Movement and Costs

There is generally a scarcity of data on national cargo movement and costs. There is hardly any information on the types and amount of commodities moved, how they are distributed through the country, and the costs of transporting these materials. Government should setup a freight survey and database with similar determination to that with which they usually collect automobile and passenger information.

7. TRINIDAD AND TOBAGO LINKAGE

7.1 General

Currently, only sea linkage between Trinidad and Tobago is provided by the state. The air linkage is regulated by Government through the Civil Aviation Division. They have

allowed for both freight and passenger movement and have provided Tobago with indirect access to the wider international community. The Committee proposes that Government's policy towards freight and passenger movement between the two islands should be one of ensuring an adequate level of service given the demand, and should be flexible enough to respond to possible changes in this demand with infrastructure development in Tobago, given the present tourism thrust.

The committee believes that the introduction of the element of competition into the services would improve efficiency and reliability. Competition may be introduced in two forms: several operators on the route, or one operator selected through the bidding process. The duration of each contract should be long enough to permit the operator to make a profit on the route. The choice and form of the competition must be carefully determined so as to ensure the stability of this vital linkage, and the adherence to minimum safety standards.

The question of subsidies can only be addressed after the assessment of the needs for these services and the alternative mechanisms for delivering them. The Committee recommends that fare levels and subsidies for both air and sea services be examined jointly in order to ensure consistency in the application or whatever subsidy arrangements are deemed necessary. Here again, emphasis should be on subsidising targeted users, as opposed to suppliers. While this may be difficult to implement in practice, the focus on user subsidy would assist in ensuring a more rational approach.

7.2 Marine Transport

The current agency agreement between the Port Authority of Trinidad and Tobago and the Government, embroils the Government Shipping Service in the existing port management and labour practices and is not necessarily in the best interest of an efficient service. The Committee recommends that the government explore alternative arrangements for the management of the Government Shipping Service.

The hours of arrival and departure for the current ferry service work well for the nationals wishing to conduct business, but for tourist transport the accommodation may

not be suitable given the length of the journey. What is needed is a mix of both the existing ferry services and a fast ferry service for pleasure seekers.

7.3 Air Transport

Domestic air transport passengers have declined because of the unavailability of accommodation on the existing aircrafts. Government's current arrangement with Air Caribbean has created a monopoly and this has resulted in a suppression of passenger travel between the islands. Competition is needed in the market. Contracted airlines should be responsible to maintain a scheduled flight plan and would not only take-off when fully booked. This proposal may require state subsidy, but would improve the level of service, which is likely to result in an increase in travel and business between the islands.

The hotel industry in Tobago is now expanding to meet the tourist demand which is surging with the landing of the wide-bodied aircrafts. Airport service industries are needed to service both the passenger and cargo expansion. New companies are now desperately seeking to catch up with these developments. Because of the rate and arbitrary manner in which these developments are taking place, the committee feels there would be a social fallout, and that there should be an ordered expansion to suit the people of Tobago.

7.4 Road Transport Licensing

As far as road transport operations are concerned, the committee is of the view that the only problem peculiar to Tobago is the fact that the licensing of maxi-taxis has to take place in Trinidad.

7.5 The Toco to Tobago Linkage

The idea to improve the east-west corridor in Trinidad eastwards to Toco via the Churchill-Roosevelt Highway, and the construction of a jetty at Toco for sea linkage to Tobago, has often been suggested. The committee is of the opinion that before any

such decision is taken, a detailed feasibility study should be conducted, and should include the following:

- The cost of improving the road segment;
- The cost of transporting goods via truck overland to and from Toco;
- The roughness of the waters in the Toco area; and,
- The level of comfort of the overland ride between Toco and Port of Spain.

8. PLANNING FOR THE FUTURE

8.1 New Modes and Services

The Government's policy should be to encourage the development of new modes of transportation to supplement the existing road network. One example of this is the possibility of a Port of Spain to Chaguaramas ferry either as an alternative to or complementary with an improved Western Main Road. Similarly, contingent on an analysis of the characteristics of the freight and transportation systems and the future economic development of the country, it might be feasible to introduce a mixed rail transportation system.

Apart from the potential Port of Spain to Chaguaramas ferry service and the existing water taxi services between Trinidad and the Five Islands there appears to be little scope for new ferry routes which would not need significant infrastructure improvement. In particular, the San Fernando harbour and wharf facilities would require extensive renovation and upgrading to accommodate a ferry service.

Another mode which may come into prominence could be intra-island air services, for example, private helicopters. The Civil Aviation Division currently has certain institutional arrangements to deal with the air safety aspects of these developments. In terms of heliports, however, the Committee recommends that as a matter of policy, the Town and Country Planning Division be involved in the vetting of any proposal for terminal facilities for air services since these could significantly impact the land use pattern of surrounding areas and must therefore be compatible with the development strategy of the country. Furthermore, the Ministries of National Security and Works and Transport would need to be involved.

Although the Committee recommends that generally private developers should be able to invest in transportation services and infrastructure as freely as possible, it recognises that there are some instances where higher level of approvals must be sought. The development of an additional airport is one of these. Quite apart from the question of whether a proposed airport fits into the governments land use strategy is the question of allocation of scarce national resources. The Committee therefore recommends that the

economic and environmental feasibility of such developments be determined prior to any approval even when the project is wholly privately financed.

8.2 Alternative Fuels

Movement towards the use of alternative fuels should be encouraged and could result in reduction in air pollution and increased foreign exchange earning capabilities, the latter by decreasing local gasoline consumption.

8.2.1 The Environmental Management Authority (EMA)

One of the goals of the recently formed Environmental Management Authority (EMA) is to deal with vehicle emission control systems. The two aspects of vehicle emission control identified so far by the EMA surround the development and/or introduction of (i) appropriate vehicle(s), and (ii) appropriate technologies. EMA is significantly different from the Environmental Protection Agency (EPA) of the US, the latter having the responsibility for testing and other major functions, while the former is only limited to coordination, under their Act. Alliances with Ministries could be obtained via memoranda of understanding. The World Bank, the United Nations and the Government contribute to the financial needs of the EMA, and so influence the extent of consideration of standards and control measures that the EMA could allow itself.

The State is the largest polluter of vehicle emissions. The EMA is coordinating the establishment of groups or agencies that would be needed to “green” government operations, thereby setting the appropriate example for others to follow. The EMA believes that the private sector would not be cooperative if the state fails to accept its own environmental protection responsibility. The Committee supports this view.

The enforcement of EMA regulations (when instituted) will be pursued through the establishment of a special court and system of arbitration whereupon breaches could be quickly dealt with effectively. An environmental commission will be established with enforcing and appeal powers. Currently, the EMA uses moral suasion.

8.2.2 Compressed Natural Gas (CNG)

The National Petroleum Company (NP) is seeking to increase its number of CNG outlets. They are also examining the possibility of producing greater compression of the CNG, as it takes more than ten minutes to fill a vehicle with CNG because of pressure limitations. Users of CNG also have to refill more often than gasoline users. The EMA is looking at measures or incentives whereby increased usage could be made of the CNG technology. These include reduction of the startup price for new vehicle conversions, concessions on the import of anything related to this technology or even a moratorium on related payments.

8.2.3 Unleaded Gasoline

Unleaded gasoline consumption results in cleaner vehicle emissions than leaded fuels. The local refinery cannot supply the current demand for unleaded gasoline for the next ten years. Leaded gasoline is marketed mainly to the Caribbean because there is little market for that product in the huge emission-conscious US market. Vehicles manufactured after 1985 are capable of unleaded gasoline use. Some vehicles cannot use unleaded gasoline, others cannot use leaded gasoline. There are, as yet, no subsidies on unleaded gasoline. The EMA suggests that subsidies on leaded gasoline ought to be removed to encourage the use of unleaded gasoline. The committee agrees.

8.3 Imported Used Car Industry

8.3.1 Background

Until 1990, the foreign used car industry did not exist. In 1992, Government stopped the import of foreign used cars, and the dealers reacted by importing cars in two parts. They joined the two parts and indicated to the Transport Division licensing authority that they were “locally assembled”. Inland Revenue Department started questioning the prices of these vehicles as compared to the standard assemblies, and that import process was stopped. Since that time they have begun importing vehicle shells, that is, vehicle bodies which includes all internals except the suspension, engine, wheels and other mechanical parts. The customs duty on a locally assembled vehicle is two and a half percent of the

CIF value, while that on a foreign assembled vehicle is twenty percent of the CIF value. The question may be asked: what is the difference between a foreign used knocked-down vehicle for local assembled, and a foreign completely-built-up vehicle? In January 1996, Government legalized the import of knocked-down vehicles. As a result, used vehicles in Trinidad and Tobago are currently receiving preferential treatment: almost anybody could disassemble abroad, then assemble here, and pay local taxes.

8.3.2 Consumer Protection

The vehicles imported from Japan are usually six (6) years old and over, are no longer considered to be legally roadworthy in Japan, do not incorporate the most recent fuel efficiency technology and no longer meet the new emission standards defined for Japan. These models are built to Japanese domestic market specifications, which are different from Japanese export vehicles imported into Trinidad and Tobago. Spare parts, catalogues, and service manuals for the domestic models are only available in Japanese, with the result that sourcing the correct spare parts and technical assistance for local consumers would be difficult.

Foreign used vehicles are less expensive than imported new units, and so there is a saving for the consumer, which is only short term because of the age of the vehicle. The useful life of the vehicle would have almost been used up at the time of purchase, resulting in high maintenance costs in the long term.

From exterior appearance many foreign used vehicles look similar to previously imported models. However, they may not be, since all car manufacturers specify their vehicles for local conditions in terms of safety regulations, tyres, suspension, seating, engine tuning, fuel type, etc.

8.3.3 The Consequences

The consequences of the above are:

- Vehicle safety and fuel standards are impossible to monitor;
- Negative environmental effects from scrapping of these vehicles and breakdowns, as a result of faster depreciation;

- Increased demand for foreign exchange due to the increased turnover of used imports;
- Accelerated vehicle theft as a source of supply of spares.

8.3.4 Recommendations

The Committee recommends:

- Establishment of clearly defined local vehicle standards;
- No differential tax rates between new and used vehicles;
- No change of engine size within 2 years without payment of appropriate taxes;
- Maintain the term “Foreign Used” or “FU” in the certified copy of vehicle ownership;
- The provision of an official stamped copy of the certificate of cancellation of registration, from the country of origin; and,
- A specified period of after sales service for all vehicles.

8.4 Disposal of Scrapped Vehicles and Tyres

There is a growing population of scrapped vehicles and tyres. The committee is of the view that appropriate technologies need to be applied to ensure that this population does not contribute further to the solid waste disposal problem and environmental degradation. While the mechanisms for disposal of vehicles and tyres may be beyond the purview of this committee, two alternatives that should be considered are:

- The use of the disposed vehicle bodies at the steel mills; and,
- The use of disposed tyres in road construction and maintenance.

8.5 Noise Impact

Noise may be described as unwanted sound, sound without value, or vibrational energy out of control. Noise is capable of producing both physical and psychological damage, and is of concern in the environment. Because of its annoyance and disturbance implications, noise adds to mental stress and hence the well-being of those that are exposed to it. There are currently no noise standards. Government should pursue objective standards and measurement procedures for excessive transportation noise.

8.6 Visual Impact

The problems of poor visual impacts are ugly, unplanned, and uncoordinated street furniture; ineffective traffic signing; littering; and, general visual disunity. One reason for the poor visual appearance of roadways is the fragmented type responsibility of agencies for various aspects of the road. Typical agencies responsible are

- Highways Division for road structure and drainage;
- Traffic Management for traffic signs and signals;
- Trinidad and Tobago Electricity Commission (T&TEC) for electricity posts and lines;
- Telecommunications Services of Trinidad and Tobago Ltd (TSTT) for telephone lines and junction boxes; and,
- Outdoor advertising hoardings - uncontrolled.

There is need for coordination between agencies. The overall aim should be to integrate the architecture and landscape of an area so as to achieve visual unity and individual identity, while being able to guide the motorist and pedestrian through the area efficiently.

8.7 Road Safety

Road fatalities rose steadily from 139 in the year 1968 to a peak of 266 in 1982, with an average annual increase of about 9 deaths. Thereafter, it has decreased rapidly at a rate of about 22 fewer deaths to 129 in 1988. It has begun a fluctuating, gentle rise again. It is well accepted that the Traffic Management Branch which began its operations 1980 is largely responsible for the drastic reduction in road deaths, through its aggressive campaigning and road safety awareness programmes in the 1980s. Their programmes are no longer continued. Road safety is critical to transportation policy. Government should feel responsible for road safety education. There is an urgent need for persistent and consistent education and enforcement.

Agencies involved in road safety education have fragmented responsibilities, and very little coordination between them occurs. Efforts should be made to get the key agencies to collaborate so that they reinforce each other's efforts. Further, road safety standards

cannot be conducted without funding, the amount should be based of the quality of standards desired. The issue of Standards is discussed in the next section.

8.8 Implementation of Standards

The focus of Government should be for implementation of the highest standards. The achievement of standards is constrained by limited resources. The economics of the engineering, education, enforcement and encouragement requirements of any traffic safety or environmental control measures must be evaluated prior to any implementation of standards. Minimum or necessary standards must be established, and sufficient resources allocated. Thereafter, standards should only be increased as additional resources are appropriated.

9. ORGANISATIONAL STRUCTURE FOR TRANSPORTATION MANAGEMENT, REGULATION AND PLANNING

9.1 General

Almost all previous studies on road transport have examined the question of the administration of the transport system. In particular they have noted, not only the large number of organisations involved in transportation management and regulation and their overlapping functions, but also the separate ministerial arrangements. A common theme in the recommendations from these studies has been the need to have all the agencies and functions brought under single administration. The Committee recommends that because of the size and multiplicity of the transportation sector there is a need to establish a Department of Transportation.

This department would be charged with the responsibility for planning, administering and developing the internal transportation system for the nation. It could be conveniently divided into four sectors namely (a) Roads, (b) Marine, (c) Air and (d) Strategic Planning.

The Committee recognises that being in one department does not guarantee a more co-ordinated approach within the transportation sector. However, it is of the view that the Permanent Secretary, who is responsible for managing the ministry can and should take the necessary internal decisions to ensure that such coordination does occur.

9.2 The Sectors within the Department of Transportation

9.2.1 Roads Sector

The agencies within this sector would be:

- The Highways Division - responsible for the design, construction and maintenance of the major road network;
- The Transport Division - responsible for the registration and licensing of motor vehicles, the licensing of drivers and the enforcement of regulations under the Motor Vehicles and Road Traffic Act;

- The Traffic Management Branch - responsible for traffic planning and control, the design and implementation of traffic management schemes and road safety education; and
- The Public Transport Service Corporation - responsible for the transportation of passengers.

The Committee is aware that overlapping functions that still exist among the various divisions, as well as between different Ministries. For example, the legal control for traffic signs and traffic lights lies with the Transport Division whereas actual implementation and administration is done by the Traffic Management Branch. Another case is the functioning of PTSC within the Ministry of Public Utilities, while responsibility for public transportation rests with the Ministry of Works and Transport. The Committee recommends that rationalisation of overlapping functions between various divisions and Ministries be pursued as a matter of urgency.

One area of concern is the confusion concerning the role and function of local government bodies as opposed to the Central Government. The Committee proposes that responsibility for maintaining local access roads as defined in the proposed hierarchy should rest with the local government bodies although the Highways Division should recommend the minimum standards to which these should be built. However, it recognises that in order for these bodies to function effectively at these tasks there is need for significant improvement of both the physical and human resources of the local agencies as well as clearer administrative arrangements between them and the Central Government agencies. Currently, no local government body can adequately deal with the maintenance of local roads.

The Public Transport Service Corporation Act allows for the PTSC to be responsible for the administration of all public transportation including private suppliers. The Committee recognises, however, that the current management, organisational structure and corporate culture of the PTSC are geared towards bus operations only. As such, it might be necessary to develop a separate public transportation administration. One mechanism for this could be to coordinate the activities of the PTSC, Traffic Management Branch and the Transport Division which affect the public transport sub-sector. The functions of this administration have been indicated in Section 3.

9.2.2 Marine Sector

The agencies within this sector would be:

- The Port Authority of Trinidad and Tobago - responsible for the development and administration of the ports of Port of Spain, Scarborough and Chaguaramas and currently agent for the Government Shipping Service.
- The port department of the Point Lisas Industrial Port Development Corporation Ltd.
- The Maritime Services Division - responsible for the administration of the Shipping Act, the maintenance of shipping to international standards, and the maintenance of waterways, pilotage and safety

9.2.3 Air Sector

The agencies within this sector are as follows:

- The Civil Aviation Division - responsible for the administering and regulating of Civil Aviation in accordance with standards, recommended practices and procedures established under the Convention on International Civil Aviation.
- The Airports Authority - responsible for the planning, development and administration of the nations public airports.

The internal air services are currently undertaken by Air Caribbean Ltd, but the airline is a private supplier. The department responsible for transportation would need to have a greater input into the service and subsidy decisions affecting the airbridge.

9.2.4 Strategic Planning

There is currently no agency or group of agencies responsible for strategic transportation planning. In fact, the closest organisation to a strategic planning agency is the Trinidad Transport Board. The Board's function are wide ranging including the mandate to advise the President on all aspects of transportation, to act as an appeal board against the decisions of the Transport Commissioner.

The committee is of the view that the Transport Board is an anachronism, whose regulatory and advisory functions dates back to the pre-independence era when the then Governor would have a select group of advisors. It was one of many such boards. With the post-independence Cabinet system and the creation of civil service machinery to deal with all administrative and regulatory functions and reporting to a responsible Minister there was no need for such bodies and most were disbanded. The Transport Board should also be disbanded. Its appeal function can be dealt with by either the Minister directly or by a committee appointed by him, comprising stakeholders.

Strategic Transportation Planning should be carried out on a continual basis within the Ministry. The data to be used would come from the various agencies as well as be collected by those responsible for strategic planning. The main function of the planning unit would be to plan the transportation development of the country on a system wide basis and thus to determine the appropriate distribution of resources within the transportation sector. This unit might be in the form of a standing grouping of planning officers from the agencies within the Ministry and should be able to contract services as required.

9.3 Institutional Strengthening

Managers in both the public and private sectors are forced to think in terms of efficiency, that is, obtaining the best product with the least input and meeting the challenge of the competitive environment in which society finds itself. This situation requires the rethinking of the organisation and management of infrastructure maintenance and operating procedures, as well as of the delivery of services by searching for alternatives to the methodologies that prevailed until recently.

According to the World Bank, in a report on Infrastructure and Economic Development, if we analyse characteristics of efficient companies, whether public or private, we find that they have a number of characteristics in common, such as:

- They are guided by commercial principles.
- They have clear and coherent objectives based on their fundamental tasks.
- They rely on the twin principles of the delegation of powers and accountability for results.

- They are financially independent.

While these characteristics may seem obvious in the context of private companies, they are hardly common in the public sector. The public sector is overwhelmed by a series of problems arising out of a diverse multitude of its economic, social, and political objectives. Frequently, the solutions to its problems impact very negatively on the productivity of the agencies responsible for infrastructure and the delivery of services, and thus on the country's productive apparatus as well.

Employees of public agencies may exert collective pressure for salary increases not necessarily associated to any increase in productivity. Political groups may lobby to have the problem of unemployment solved by swelling the ranks of the public work force. At the same time, service providers must receive a return on their investment in order to grow, make reinvestments to modernise, carry out maintenance to preserve their assets, and gain access to new technologies. These needs require the availability of financing all too often earmarked for other uses under public policies. In such a scenario, the results are high transportation costs and rates as well as investment difficulties. All these elements combine with each other and tend to conspire against the sound management of the public agencies.

In view of this situation, it is imperative to transform public agencies by making them market-oriented, by stimulating competition, and by increasing user participation. The errors of the past and the prospects of current opportunities are forcing us to take a hard look at the functions of government and of public agencies, as well as those of the private sector, so as to determine ways of providing more efficient infrastructure and services in response to demand. The difficulty lies in determining which activities can be delegated to the private sector in a competitive environment and which ones require the intervention of the public sector.

Within these broad outlines, there is a series of institutional options that will enable the public and private sectors to assume responsibility for various aspects of service delivery. These options are discussed in the next section.

9.4 Options for Institutional Structures

It is anticipated that the assessment as to the best institutional configuration for carrying out state functions will continue notwithstanding decisions taken in this regard in the past. It is a part of Government's responsibility to always pursue the most economical, expedient and efficient means by which it may provide its services and develop and maintain its infrastructure.

There are probably three distinct types of organisational structure that can be adopted. They represent three distinct approaches to the carrying out of tasks. In an absolute sense, therefore, the state could elect to:

- I. Perform all its functions within a central body which relies on its salaried or career staff to, not only, ensure that the work is done, but carry it out as well. This is the Public Service option;
- II. Execute works through a Statutory Body which is governed by a board made up of representatives from select interest groups. Such a body will be expected to operate within a given budget and, in the appropriate circumstances, raise revenue itself. A Public Service department will monitor its activities, ensuring administrative support on behalf of the Central Government; or
- III. Delegate and empower a Private Sector organisation (either of Government's making or otherwise) to carry out state functions. Private sector incentive will come via profits earned by virtue of the operator's efficiency. Funding may be by budget allocation and/or revenue generation. A Public Service department will supervise the activities of this body.

These alternatives are not mutually exclusive and can be combined in any proportion suitable to the nature of the particular area of Government activity. In fact, the current structural configuration may be mainly type I, but there are many examples of type II in existence, with consideration being given to creating more.

The most popular argument for converting Public Service activity into a Statutory or Private Sector one (even if only to a limited degree) is that greater efficiency would be possible and that the many constraints of the Public Service bureaucracy would be avoided. It is always assumed that the relatively independent nature of non-Public Service bodies (which lends to faster decision making and a control over hiring and

firing, discipline and reward) is what guarantees such efficiency. However, it is possible, and this country's experiences with its attempts at new structures suggests, that closer examination is warranted as benefits have not been as might have expected.

Although the review of Public Service architecture is an undertaking, the scale and nature of which cannot be addressed in a policy document on only one of the state's areas of responsibility (in this case, Internal Transportation), the factors to be considered are common to all. As a matter of policy, therefore, any assessment of proposed organisational structures must include the following:

- Private sector efficiency is driven by a desire for profit and expansion. Functions which have set budgets or fees (for example, road and drainage infrastructure maintenance; the issue of permits and licenses) may not satisfy such a desire and, therefore, may not be appropriate. Experience shows, in fact, that the Public Service budgets for these types of activities must be increased to attract Private Sector involvement, monetary increases which, if applied strategically in the Public Service could achieve even greater economic benefits overall. On the other hand, profit-driven activities are indeed best suited to the Private Sector psyche (for example, parking meters, transit and parking complexes, etc.).
- The very bureaucracy that slows down the functioning of the Public Service also slows down the rate at which the misappropriation of funds can occur. Experiences with the National Secondary Roads Company should serve to inform that the Public Service wastage and poor investment can easily be multiplied a hundredfold when basic checks and balances are removed. Furthermore, and ironically, it is the Public Service which is required to salvage when such occurs, even though its resources may be significantly less.
- The relative autonomy enjoyed by Statutory or Private Sector agencies can be granted to the Public Service. It is the absence of such a reform that continues to stifle Public Service potential and that lures organisational planners towards the false promise of other structures. In fact, it may be wise to deal with the limitations of the Public Service before the large scale pursuit of other options. For example, the fundamental Private Sector principle of reward-by-merit could easily change Public Service achievables. In addition, the removal of outdated documentation requirements and systems of budgeting also demand to be addressed. Public Service reform should, however, be performed incrementally, allowing for

modification to the reform process as experiences dictate. Such reforms deserve to be entertained before any other, especially those with proven disastrous track records.

- Redundancy in the Public Service is a main constraint to the economics of improving conditions for employees. The size of the Public Service needs to be reduced in accordance with the functions it carries out, such functions being those which, after careful assessment, are best suited to its advantages. All other functions should be reassigned to the other organisational options. It is, however, imperative that, as a matter of policy, no one option is assumed to be inherently better than another. Selection should always be made on the basis of suitability.

10. CONCLUSION

This document has elucidated the role of transportation in the realisation of the government's goals of structural transformation of the socio-economic fabric of the country. It seeks to place the provision of transportation infrastructure and services within the context of the move to increased self-reliance and self-employment and decreased reliance on the public purse.

Nevertheless, it recognises that the government cannot abdicate its responsibility to ensure that adequate levels of transportation at a reasonable cost are available for citizens. A country cannot develop without a good transportation system. The general approach recommended is one of encouraging to as great extent as possible, the participation of private citizens in the provision of transportation services.

The Committee has stressed the need to encourage the use of public transportation which represents a more efficient allocation of resources rather than attempt to supply facilities for a private car oriented road transport system. It also recognises the need for a rational approach to the maintenance and administration of the road network and recommends both a maintenance policy based on a proposed road hierarchy.

The committee has recommended that given the size and complexity of the transportation sector, there should be the creation of a Department of Transportation. This will allow for a more effective and co-ordinated approach to the development and management of the transportation system.