

Vision 2020: Operational Plan 2007-2010

Investing in Sound Infrastructure and the Environment



Section 4



Our Goals

- **GOAL 1**
Our development efforts will be supported by modern physical infrastructure that embodies the highest standards of quality, aesthetics and functionality
- **GOAL 2**
Trinidad and Tobago will be an inter-connected, technologically advanced society with modern information and communication systems driving innovation, growth and social progress
- **GOAL 3**
The utility sector (water, sewerage and electricity) will be modern, customer oriented and technologically enabled to provide efficient, cost effective, quality services to all citizens
- **GOAL 4**
The environment will be valued as a national asset and conserved for the benefit of future generations and the wider international community

Champions

- Ministry of Public Utilities and the Environment
- Ministry of Local Government
- Ministry of Planning and Development
- Ministry of Works and Transport
- Ministry of Local Government
- Ministry of Public Administration and Information
- Tobago House of Assembly

Investing in Sound Infrastructure and the Environment



INTRODUCTION

An investment in sound infrastructure and the environment is an investment in the future of our nation. Without good quality infrastructure and a well preserved environment, our economic and social progress will be limited and our goal of improving the quality of life of all citizens will not be achievable.

Infrastructure, therefore, has a critical role to play in achieving the vision for Trinidad and Tobago. By providing inputs into all production processes and outputs for final consumption, it is an important driver of social and economic development and therefore must develop at a faster rate than all other development activities. It also promotes social growth and higher living standards by broadening access to basic services and by supporting the living environment for recreation, entertainment and enhanced social interactions. Moreover, as we move to transform Trinidad and Tobago into a knowledge society, broadband information infrastructure will contribute to bridging the digital divide, spur innovation, enhance business efficiency in the public and private sectors, and provide greater opportunities for social advancement as more citizens are able to participate in mainstream economic activity.

For these reasons, Government has a responsibility to ensure that infrastructure services are efficient and cost effective to facilitate the growth of competitive businesses; and universally available, at affordable cost, to allow the most disadvantaged groups access to, at least, a basic level of those services. The goal is to put in place the strategic infrastructure necessary to achieve the targeted growth in GNP per capita of at least 9 per cent per annum until 2020, and the social transformation that must necessarily accompany such high levels of growth.

To achieve this goal, Trinidad and Tobago must make sizeable investments in modernising and re-organising its infrastructure base. Years of underinvestment coupled with a poor maintenance culture in the context of significant demographic and economic changes, and an increasingly sophisticated population have resulted in a significant infrastructure deficit.

One of the most obvious features of a developed society is the quality of its infrastructure. Thus, in the context of Vision 2020, we must develop efficient air, land and sea transport systems for the safe and efficient movement of people and goods; a modern road network; reliable, cost-effective and universal utility services; broadband information infrastructure that promotes connectivity; and social and community infrastructure that sustains a high quality of life.

All infrastructure developments have environmental consequences. Thus, our drive to expand and modernise the infrastructure base must be tempered by the need to ensure that development unfolds in an environmentally sustainable manner. Infrastructure development often involves the alienation of significant land resources from other productive uses. As a result, and given that massive outlays of capital are often involved, infrastructure must be carefully planned and managed in the context of national physical development plans and balanced with the need for optimal resource utilisation.

As such, an equally important goal is to pursue development options that preserve our green spaces, and enrich the beauty and biodiversity of our country. Good air quality, clean water, a judicious balance between the built and the natural environments, the conservation of our rich and unique biodiversity, and the protection of our coastal zones will be tangible indicators of our attainment of developed nation status.

Therefore, an integrated planning approach must be adopted to ensure a more systematic and comprehensive treatment of infrastructure issues with a view to properly managing trade-offs among economic, social, cultural and environmental goals. Strengthening the capacity of policy makers in trend and risk analysis as well as improved communication among providers, users and regulators will better inform investment

decisions on infrastructure. A coordinated approach will also assist in identifying present and future infrastructure issues, and in optimising investment choices. Infrastructure plans must also consider the fact that Trinidad and Tobago is a twin-island economy. As such, both islands must be connected with good transport and communication systems and served with efficient utility services.

To assess the impact of infrastructure investment, a demand orientation will be adopted with built-in performance indicators that measure quality of service and user satisfaction in addition to traditional efficiency considerations. Where possible, broad generic strategies will be utilised to provide best practice solutions, while individual strategies will be pursued within and across sub-sectors to determine the best possible course of action to achieve desired outcomes.

Government will continue to move in the direction of adopting more market-based solutions for infrastructure services utilising, where and when necessary, regulatory instruments to correct market inefficiencies to ensure that outcomes are consistent with the goal of accessibility and the broader goal of sustainable development. Fiscal measures will be employed strategically to achieve desired outcomes and public/private financing options will be explored to address future infrastructure needs.

Furthermore, Government will continue to encourage private sector involvement in the provision of infrastructure services to achieve greater operational efficiency. Initiatives to deregulate the sectors and to encourage competition will be accelerated with a view to improving choices and the quality of service at affordable prices. Moreover, efforts will continue toward more efficient pricing of goods and services reflective of usage with appropriate measures to subsidise the indigent.

In respect of essential services, Government will take the lead role in areas where it is not cost effective for private sector providers. However, for those entities that remain under State ownership and management, efficiency incentives and performance targets will be introduced and carefully monitored.

An important feature of modern infrastructure systems is the ability to absorb technological changes and withstand the effects of natural disasters. Attention will therefore be paid to monitoring the emergence and adoption of new technologies that could impact on the quality and delivery of services and to addressing the vulnerability of our infrastructure systems.

Efficient maintenance of infrastructure systems and protection of the environment are critical to sustaining the benefits of these resources. This issue goes beyond the mere establishment of maintenance and preservation systems. It requires a pervasive

attitudinal shift on the part of each and every citizen and business enterprise in the country towards sustainable living that is grounded in greater respect and care for our environment and infrastructure. The private sector and civil society will have important roles to play in supporting this transformation.

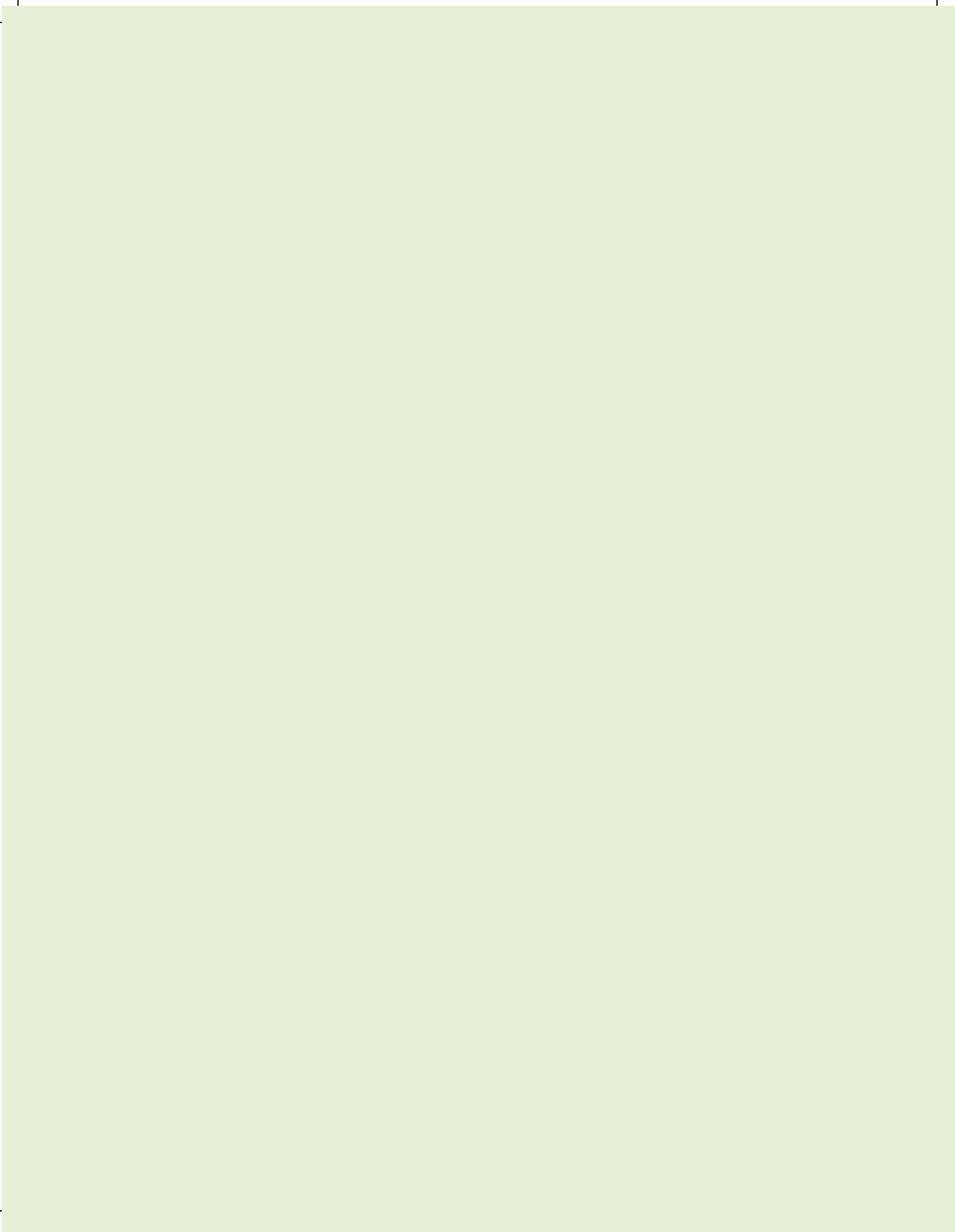
Trinidad and Tobago's performance in terms of some of the international indicators has not been satisfactory. A similar conclusion can be drawn from a review of the indicators relating to environmental regulations (Table 4.1). The data clearly indicate that we have a significant deficit when it comes to infrastructure and the environment. The fundamental task at hand over the Plan period is to reduce this deficit and improve the overall quality of Trinidad and Tobago's infrastructure and environment.

Table 4.1

**Trinidad and Tobago:
Selected Infrastructure and Environmental Indicators**

Indicator	Score	2003 -2004	2004 -2005	2005 -2006	Rank in relation to number of countries surveyed		
					2003-2004 (102 countries)	2004-2005 (104 countries)	2005-2006 (117 countries)
Overall Infrastructure quality	7 – among best in the world	4	3.6	3.3	41	54	65
Port Infrastructure quality	7- among the best in the world	4.4	4.0	3.1	38	48	77
Air Transport Infrastructure Quality	7– Extensive and Efficient	5	4.6	4.0	41	52	78
Quality of Electricity Supply	7- highest standards in the world	5.1	4.8	4.6	46	55	62
Postal Efficiency	7 – highly efficient	4.2	4.3	3.7	54	56	75
Telephones Lines	Main Telephone Lines per 100 inhabitants	24.98	25	25.0	45	47	48
Availability of mobile Phones	7 - Highly accessible and affordable	5.5	5.2	5.2	72	93	105
Internet Access in Schools	7- extensive	2.6	2.9	3.0	74	78	78
Internet Users	Per 10,000 inhabitants	1060	1060	1060	43	52	55
Personal Computers	Per 100 inhabitants	7.95	8	8	46	52	55
Laws relating to ICT	7 – well developed and enforced	3.0	3.1	2.8	80	79	92
Stringency of Environmental Regulations	7 – among the world's most stringent	2.9	3.3	3.1	84	75	85
Clarity and Stability of Environmental Regulations	7 – stable and enforced consistently and fairly	3.8	3.2	3.0	59	74	85

Source: World Economic Forum, *Global Competitiveness Reports*
2003-4, 2004-5, 2005-6



Goal 1

OUR DEVELOPMENT EFFORTS WILL BE SUPPORTED BY MODERN PHYSICAL INFRASTRUCTURE THAT EMBODIES THE HIGHEST STANDARDS OF QUALITY, AESTHETICS AND FUNCTIONALITY

Policy Context

Physical infrastructure shapes and supports the living environment and is an important determinant of the extent to which our economic, social and environmental goals can be achieved. The goal is to create high quality, functional and aesthetically appealing infrastructure that supports the economic, social, physical and cultural transformation necessary to achieve Vision 2020.

Over the past decade, there has been a dramatic transformation of the physical and economic configuration of the country. The rapid expansion of energy-based industrial activity; the mushrooming of new communities throughout the country; the growth of new commercial centres; changes in the spatial pattern of development; and the rapid rise in motor vehicle ownership have placed heavy pressures on the already limited and, in many respects, outdated physical infrastructure. Moreover, investment in new infrastructure and in the maintenance of existing infrastructure has not kept abreast of these developments. Over the medium to long-term, further changes in demographics, technology and lifestyles will exacerbate this situation.

The country, therefore, faces several infrastructural challenges which, if not addressed, can stymie the development

process. The challenges are complex, cutting across many interrelated issues, and require coordinated inter-agency responses.

The priority will be to improve the quality of the road infrastructure; air, land and sea transport; drainage and flood management systems; and building construction and maintenance, in accordance with international standards of safety, aesthetics and functionality. Road network enhancement, the increased availability of mass transit options and implementation of modern traffic management systems will have the combined effect of reducing commuter time and the transportation costs of moving people, goods and services thus enhancing productivity. As a matter of priority, a comprehensive plan will be formulated to address the high incidence of road fatalities, while programmes promoting defensive driving, responsible road behaviour and

other traffic management systems are developed.

As Trinidad and Tobago moves to become the gateway to the Americas and the financial capital of the Caribbean Region, we must ensure that our air and sea transport systems meet international standards, in order to attract businesses and investors. In addition, management of port operations will be re-engineered to maximise efficiency in the handling of cargo.

The recurring problems with the inter-island sea and air bridges affect the timely transport of persons and goods between the islands, thereby contributing to an increased cost of living to Tobagonians and causing inconveniences to business persons and leisure seekers.

Over the past decade, the level of activity undertaken by the Government Shipping Service (GSS) has recorded significant growth with the transportation of passengers, vehicles and cargo expanding by 218 per cent, 341 per cent and 91 per cent, respectively. The average daily demand for the transport of passengers between Trinidad and Tobago during peak periods is estimated at 3,250 passengers while for non-peak periods the demand falls by nearly 50 per cent to 1663 passengers. Therefore the issue of inter-island travel will be accorded high priority.

Investing in infrastructure will also mean addressing the perennial problem of flooding. For many years, due to uncontrolled

settlement on flood plains, residents and farmers experience loss of property, livestock and agricultural produce. The problem is exacerbated by heavily silted watercourses. In addition, poor waste disposal practices and unplanned development activity involving the denuding of hillsides and paving of green areas result in increased runoff. As a result, the implementation of effective flood control and drainage initiatives will continue.

Our social infrastructure will also be developed to provide citizens with sporting and other leisure facilities that contribute to their health and well-being. Investment in social infrastructure also involves the construction and maintenance of schools, community centres, hospitals, other health facilities and housing.

While Government will continue to play a major role in the development of infrastructure, new partnerships will be formed with the private sector to address the issues of financing and effective management and maintenance.

Infrastructure problems cannot be solved in isolation. They must be addressed in the context of Government's broad policy for national physical and regional development and land use. As such, plans for decentralisation and the establishment of new towns and growth centres will be taken into consideration in infrastructure investment decisions.



Objectives to 2010

1.

Develop a modern, integrated transportation network that provides for the safe, convenient and efficient movement of people and goods within, into and out of the country

2.

Provide high quality economic infrastructure that supports high levels of economic growth and the development of competitive businesses

3.

Improve the visual appeal and functionality of all public facilities and buildings

4.

Provide community infrastructure that supports a vibrant living environment throughout the country

5.

Develop drainage systems that meet ecological requirements and mitigate flooding and health hazards

6.

Instil an attitude of care and respect for public infrastructure among all citizens



Strategies

Strengthen the Institutional Capacity for Infrastructure Development

Government has taken steps to strengthen the institutional capacity for implementation of important infrastructure projects. Several Special Purpose State Enterprises (SPSEs) have been established to serve as Project Management Companies. To facilitate the work of these Enterprises, a Public Sector Project Co-ordinating Committee, with high-level representation from all the main regulatory and supporting agencies, has been established to expedite the development approval process for all major infrastructure projects.

Develop and Maintain a Safe and Efficient Road Network

The road network will be upgraded and expanded in order to facilitate Government's plans for regional development, the creation of new towns and growth centres as well as expansion of business activity into new areas. Major investments will be made in the development of new highways. In particular, highway networks will be expanded in East and South Trinidad. In 2007, construction will commence on four new highways – San Fernando to Point Fortin, San Fernando to Princes Town, Princes Town to Mayaro and

extension of the Churchill Roosevelt Highway from Wallerfield to Manzanilla.

At the same time, work will continue on the upgrading of existing highways, roads, bridges and other ancillary structures. The emphasis will be on continued improvement of the East-West and North-South Corridors, particularly the two arterial highways, the Churchill Roosevelt Highway and the Uriah Butler Highway and the construction of an interchange at the intersection of these Highways. In Tobago, the Claude Noel Highway will be extended eastward to Roxborough.

In terms of maintenance, computerised information maintenance management systems are in use for managing the condition of roads and bridges (Box 4.1). More effective maintenance of roads will also be facilitated by the use of utility corridors and greater inter-agency collaboration.

With respect to road safety, several measures will be undertaken including remedial works at locations where there has been a high incidence of vehicular accidents, the installation of New Jersey Barriers along highway medians and the implementation of public education programmes to encourage more responsible road usage. Attention will also be directed towards more stringent enforcement of traffic laws. As such, the number of police patrols will be increased

Box 4.1

Computerised Information Maintenance Management Systems

Road Maintenance Management System

used to monitor the condition of roads, and manage road maintenance works

Bridge Maintenance Management System

used to monitor the condition of bridges on the main roads network and manage maintenance works on those bridges

Pavement Maintenance Management System

used for the short and long-term planning of road resurfacing and rehabilitation works

and speed tracking devices and the breathalyzer will be introduced.

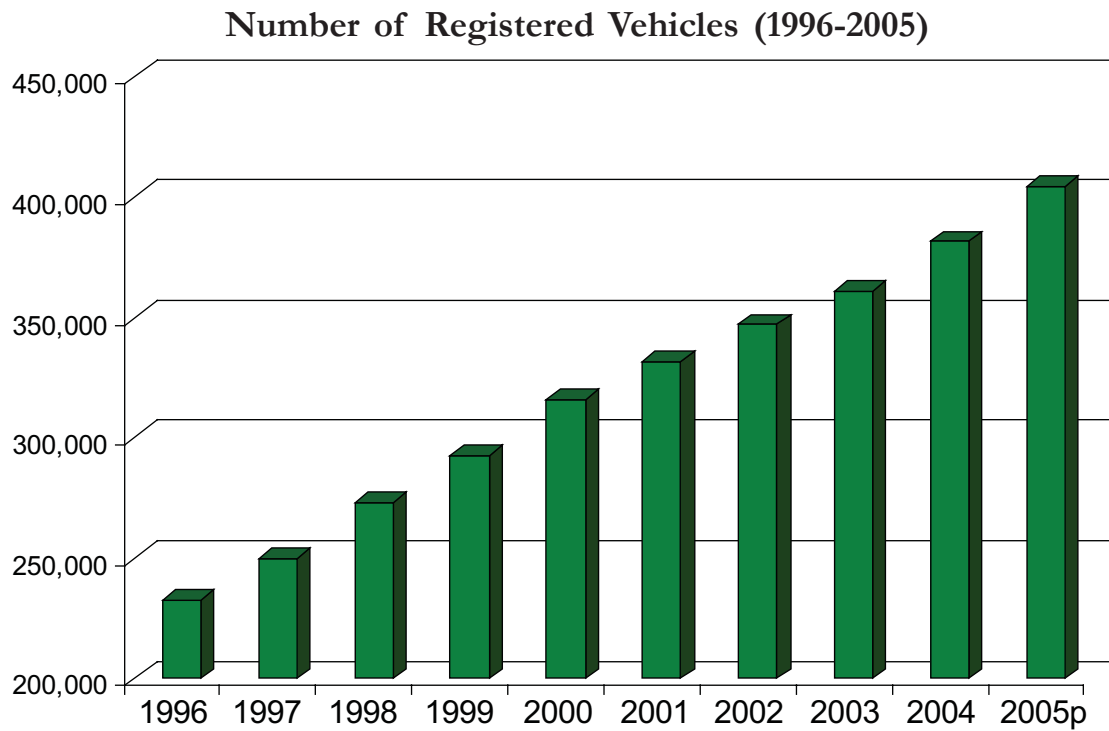
Strengthen Traffic Management Systems and Reduce Congestion throughout the Road Network

For the past ten years, the number of registered vehicles has increased by 74 per cent (Figure 4.1). This has contributed to increasing congestion along the nation's roads resulting in undue hardship and stress for the traveling public and a significant loss of productivity. While a certain amount of congestion in the urban centres is inevitable, the situation is becoming untenable. The strategy is to adopt immediate measures to reduce vehicular congestion in the short-term while a long-term plan to modernize the transportation infrastructure is formulated.

New highways, alternative accesses and bypasses are being constructed for the more congested areas and the capacity of existing highways is being increased with the creation of additional travel lanes. The construction of an overpass at the intersection of the Uriah Butler and Churchill Roosevelt Highways will be accompanied by ancillary works to the East, West, North and South of the intersection including the construction of overpasses at Aranquez, El Socorro, Curepe, Macoya and Trincity.

Expansion of the road network will be accompanied by efforts to encourage a modal shift from using private vehicles to public transport. Expanded services by the Public Transport Service Corporation (PTSC) will be complemented by the introduction of a

Figure 4.1



Source: Ministry of Works and Transport

light rail transit system and a North-South Water Taxi Service.

In addition, consideration is being given to several other measures including the introduction of flexi-time for certain areas of the public service, the operation of heavy duty vehicles outside peak traffic hours, the reduction of imported used vehicles and the provision of incentives for car pooling.

Consideration is also being given to the establishment of a regulatory agency with responsibility for bringing order and discipline into the transport system. This Agency would be required to set and maintain standards and procedures to be observed by all users of the road network system.

Within city centres, new traffic management systems are being put into operation including the timing of traffic lights to reflect the normal flows of traffic, prohibiting the entry of certain types of vehicles in specified areas and restricting vehicular turns at key intersections during peak periods. The issue of parking on city streets will also be reviewed. These measures will be complemented by new policy initiatives associated with park and ride facilities at Port of Spain, San Fernando, Chaguanas and Arima. This will involve the provision of parking facilities just outside the urban centres and a public shuttle service in and out of these centres.

Expand and Improve Public Transport System

The strategy is to create an integrated, efficient and reliable multimodal public transport system. Over the medium-term, Government will continue to focus on strengthening the operations of the PTSC and completing feasibility/preparatory work for the proposed introduction of a light rail transit system in 2009 and a North-South Water Taxi Service in 2007. In addition, the role of maxi-taxi and other taxi services will be reviewed in the context of strengthening the regulation of all public transport providers.

The PTSC is now in the process of developing an Operating Plan for an expanded fleet of some 300 buses, along with a Vehicle Maintenance Plan that is fully supportive of the new schedules being operated for existing and new routes. In the development of these Plans, issues relating to the management, administration, financing and staffing of the Corporation will also be addressed with a view towards achieving greater operational efficiency. The operations of the PTSC are being guided by certain fundamental requirements, as follows:

- the safe, convenient and efficient movement of commuters to various destinations across the country
- the provision of high levels of comfort, regularity and reliability in service delivery

- the maintenance of a fee structure that is reasonable, affordable and within the reach of all segments of the society
- the provision of services that satisfy the needs of persons with disabilities, senior citizens, school children and residents of rural communities
- the existence of a route network which reaches the vast majority of the population
- a capacity to respond to changes in the growth and spread of communities
- the ability of the system to influence user options in a manner that creates lower levels of road congestion, higher standards of road safety and passenger convenience

With the recent acquisition of 12 articulated buses (each with a passenger capacity of 115) and 25 conventional buses, (each with a passenger capacity of 60), the PTSC has been able to develop a service schedule covering 29 routes operating out of Port of Spain, San Fernando and Sangre Grande. This will contribute to an overall improvement in the reliability of the bus service.

Over the medium-term, the Corporation will continue to expand its fleet in order to improve service frequency. Increased fleet capacity will be complemented by investment in tools and equipment, the upgrading and/or construction of existing/new depots and bus shelters. In addition, consideration is being given to the introduction of electronic fareboxes on buses which would facilitate

the issue of a wide range of ticket types inclusive of transfers to any other approved mode of public transport.

At the same time, in the context of the planned redevelopment of East Port of Spain, the PTSC's South Quay Facility will be upgraded. There is a major business opportunity for the conversion of this Facility into a modern commercial mall with car parking and terminal facilities for the various modes of transport.

Commuters will also be provided with new public transport options. Government has commenced work on the following:

- a light rail transit system to provide fast and frequent service along the East-West and North-South corridors. Together the two corridors will traverse over 120 kilometres. The System will serve two-thirds of Trinidad's population and will link the two major cities – Port of Spain and San Fernando as well as several towns including Arima, Diego Martin and Sangre Grande. A central rail station will be located on Wrightson Road, near to the old Post Office. The first phase of the light rail system will be constructed between Curepe and Port of Spain
- a water taxi service plying a North-South route along the west coast of Trinidad. When fully operational, the water taxi service will allow commuters to travel by sea from Point Fortin to Carenage,

with stops at La Brea, San Fernando, Couva, Chaguanas and Port of Spain. An express service from San Fernando to Port of Spain is also envisaged

Improve the Pedestrian Environment

An important consideration in planning for cities, towns, communities and streets is the safety, convenience and comfort of pedestrians. Strategies for improving the pedestrian environment must take account of the fact that pedestrians are not a uniform group. Instead, they comprise the very young, the elderly, and persons with disabilities as well as individuals who may be unfamiliar with the environment. These groups have unique characteristics and needs which must be considered in creating a pedestrian-friendly environment.

The majority of sidewalks especially in city centres are in need of repair. Many are too narrow and have uneven surfaces and open trenches which pose serious risks to pedestrian safety. The proliferation of sidewalk vending and the increase in the number of homeless persons have added to the negative pedestrian experience. The problems of inadequate street signage, improper garbage disposal facilities and poorly lit crosswalks also persist.

A disturbing trend among motorists and pedestrians alike is the disregard for crosswalks and traffic lights. This issue will

be addressed through programmes to educate motorists and pedestrians on the importance of obeying traffic signs as well as more rigid enforcement of traffic laws.

Government will work with the business sector and Local Government Bodies to effect the required improvements to the pedestrian environment inclusive of the following:

- upgrading the surface quality of sidewalks
- improving existing crosswalks through proper maintenance of painted markings, the installation of flashing amber lights and raised sidewalk markers. The use of new technologies such as in-pavement lighting to increase visibility for both motorist and pedestrians will also be explored
- increasing the number of traffic lights and crosswalks consistent with pedestrian flows and creating pedestrian zones in city centres
- improving the design of curbs to increase accessibility by the elderly and persons with disabilities
- introducing bicycle paths and jogging/running trails especially in communities
- enhancing the visual appeal of streets and city centres through sidewalk landscaping, regular cleaning and the provision of amenities such as garbage collection bins
- installation of proper street signage

Improve Inter-Island Sea Transport

Given the success of high speed craft in improving the quality and reliability of inter-island sea transport, Government will take steps to purchase two high speed vessels. In addition, a new cargo vessel will be acquired to replace the M.F. Panorama.

To meet the increasing demand for inter-island sea transport, terminal, berthing and cargo storage facilities at the ports of Port of Spain and Scarborough will be upgraded.

Modernise and Expand Sea Port Facilities

Government remains committed to the transformation of Trinidad and Tobago into the trans-shipment hub of the Caribbean. All port facilities will be upgraded and expanded, and modern systems and practices for safety and security of passengers and cargo will be established in accordance with international safety standards. In particular, the International Ship and Port Security Code will be implemented.

The Point Lisas Industrial Port Development Corporation Limited (PLIPDECO) is in the process of developing a new strategic plan for infrastructure development at the Port of Pt. Lisas to meet the growth in import/export cargo. The priority areas to be addressed include upgrade of existing berth facilities and development of two new berths

with supporting infrastructure and utilities. It is expected that Pt. Lisas will have an annual container throughput of over 700,000 twenty foot equivalent units upon completion of expansion works.

At the same time, new port facilities and associated infrastructure will be developed at Galeota, Cap de Ville, Brighton, and Chatham to facilitate the planned expansion of activities in the energy sector in South Trinidad.

The Port of Port of Spain is to be relocated to the East Sea Lots area as part of the revitalisation of the Capital City. With limited land space in the city centre, the relocation will release real estate for business development and social activities and will give citizens and visitors to the country access to the waterfront area.

Build a First Class Air Transport Sector with Modern and Secure Airport Facilities

Government is committed to ensuring that airline travel between Trinidad and Tobago and, between this country and the rest of the world, especially travel to our key destinations, remains fully serviced at all times. As a result, it has agreed to the closure of BWIA West Indies Airways Limited and to the establishment of a new company, Caribbean Airlines Limited which will begin operations in January 2007. The new airline will operate on a business model that

combines attaining commercial viability with market competitiveness. A rationalised fleet utilising the Boeing 737 aircraft will service the New York, Toronto, Miami and Caribbean routes. The London market will be serviced by British Airways through a Code Share Agreement with Caribbean Airlines

With respect to airport infrastructure, Government has embarked on a comprehensive programme of works aimed at improving the physical infrastructure for the safety and security of passengers and cargo at the Piarco and Crown Point International Airports.

Build Institutional Capacity to Manage and Operate Transport Infrastructure

The emphasis will be on building institutional capacity to manage roads, ports and air, sea and land transport systems with a view to improving efficiency and effectiveness of service delivery and enhancing revenue earning capabilities.

The agencies involved in the delivery of transport services will be adequately equipped to deliver quality services through the modernisation of their operations, strengthening of their management capability and the introduction of performance-based assessments and competency systems.

Over the medium-term, the operations of the Transport Division of the Ministry of Works

and Transport will be modernized through the introduction of a new computerised operational system and comprehensive organisational re-engineering.

With respect to road infrastructure, a Roads Management Authority will be established in the Ministry of Works and Transport to improve the management and maintenance of all road networks.

In terms of port operations, a National Port Council is to be established in the Ministry of Works and Transport to improve the management of all ports. In addition, over the medium-term, the Port Authority will engage in a comprehensive restructuring exercise which will result in the disbanding of the Authority and the creation of three independent Units to focus on the following specialist areas of operation:

- cruise shipping and inter-island transport
- property management
- cargo handling operations

Cruise Shipping and Inter-Island Transport will be managed by the Trinidad and Tobago Inter-Island Transport Company (TITI), while Property Management will be the responsibility of the Port of Spain Infrastructure Company (PoSInCo). Cargo Handling Operations, the core activity now undertaken by the Port Authority will be managed by a privately operated company, the Port of Port of Spain Limited (PPOS) with a mandate to introduce best practices

and to attain world class standards in all areas of operation. As part of the strategy for improving standards, the focus will be on:

- reducing the cost of port services to the customer by managing work flows and processes
- improving worker well-being through continuous training in health and safety and the provision of incentive bonuses for the achievement of excellence in established health and safety standards
- the acquisition of additional equipment for container and break-bulk cargo handling
- strengthening human resource capacity through training in supervision and hard-core stevedoring and long-shoring operations
- upgrading infrastructure and the introduction of new operational systems such as the consolidation of all container-stripping activities in one warehouse, the handling of imported used vehicles in one centralised location and the upgrading of the existing computerised system for cargo handling activities
- introduction of a new tariff with competitive pricing that is reflective of the improvements in services offered

Provide Adequate Drainage and Irrigation Infrastructure

The Drainage Division of the Ministry of Works and Transport will continue to focus

on the regeneration and development of drainage systems that meet ecological requirements, settlement patterns, promote the productive use of storm water and mitigate flooding hazards. Existing dam and reservoir facilities will be upgraded and new facilities will be constructed. In addition, work will continue on coastal protection along the eastern and southwestern coastlines and the walling of main watercourses to reduce maintenance requirements.

In order to bring relief to flood prone areas in the Central Region, construction of the Mamoral Dam and Reservoir will be completed.

As part of the formulation of a new National Physical Development Plan, a hillside development policy will be developed that will also take drainage issues into consideration.

Develop Effective Partnerships with the Private Sector

Consistent with international trends, Government is committed to utilising public/private sector financing and management partnerships in the upgrade of port services and expansion of air, land, and sea transport systems. Collaboration will focus on the development of ports, water taxis, fast ferry and air-bridge services. The private sector will also be encouraged to participate in urban renewal and the redevelopment of communities.

Strengthen Inter-Agency Collaboration

In the interest of sustainable development, collaboration will be fostered among Ministries and Agencies responsible for the development of the country's economic and social infrastructure and conservation of the natural environment.

Encourage Citizens to Respect and Value Public Facilities

A series of public education programmes will be mounted to engender a sense of civic responsibility and foster nation-building attitudes among all citizens.

Facilitate the Development of New Industries

Good infrastructure promotes investment and the creation of new industries by linking firms to their customers and suppliers and by helping them to take advantage of modern production techniques and organisational structures. Government will continue to invest in the upgrading and expansion of infrastructure to facilitate economic activity. New industrial parks will be developed and existing parks will be upgraded. Furthermore, industrial estates will be developed in South Trinidad to facilitate the development of new energy-based industries while the establishment of the Wallerfield Industrial and Technology Park (Tamana InTech Park) will provide opportunities for academic

research and development activities for diversification of the energy and non-energy sectors into high value-added activities.

Strengthen the Planning and Development Framework

Infrastructural development must take place in the context of spatial development. In 2007, work will commence on the preparation of a new National Physical Development Plan for Trinidad and Tobago to guide physical development activities over the next 20 years.

Extensive consultation will take place between the Ministry of Planning and Development and other Ministries and State Agencies with a view to incorporating their long-term plans within the national spatial context. An Inter-Ministerial Oversight Team has been established to guide this exercise and to ensure that all development proposals are consistent with national priorities, and major initiatives such as the National Transportation Plan are reflected in the National Physical Development Plan.

With respect to local area plans, discussions have commenced with the Couva/Tabaquite/Talparo Regional Corporation and the Arima and Chaguanas Borough Corporations to review and update plans for these areas. Public consultations on these plans are expected to take place in 2007. Plans for Scarborough, St Helena and Chaguaramas are all nearing completion. The

preparation of local area plans will allow for the application of detailed development standards on a plot basis and will guide development in these areas for the next 10 years.

Major Projects

Modernisation of the Transport Division

This Project will have significant benefits, including the creation of a more customer friendly environment, a reduction in the time taken to conduct business, increased productivity of staff of the Transport Division, a reduction in fraudulent activities and increased Government revenue. The modernisation process will involve the following:

- computerisation and integration of the Registration, Permit and Inspection Systems
- reorganisation of inspection and testing procedures and processes

Comprehensive Drainage Development Programme

In order to alleviate the effects of flooding and mitigate existing health hazards, a comprehensive drainage improvement programme has been developed. The programme includes the construction of the Mamoral Dam and Reservoir and the upgrading of drainage channels throughout the country.

The construction of the Mamoral Dam and Reservoir represents the completion phase of the wider Caparo River Basin Flood

Mitigation and Water Resources Development Project. The major components of the Project are construction of the Detention Reservoir, closure of the Dam, construction of the confining dykes, infrastructure works, (roads, bridges and relocation of utilities) and construction of a drainage system. Since the initiation of this Project, there has been a significant reduction in the flooding of commercial and residential properties in Chaguanas.

Major Drainage Improvement Works, Trinidad

This Programme comprises major river clearing works, the preparation of coastal studies and the implementation of infrastructure upgrading and flood mitigation measures, including the construction of box drains and excavation works, at various sites across Trinidad. The major components are:

- *Manzanilla/ Mayaro Coastal Development Works*
A 2300 metre revetment wall will be constructed to protect the roadway from erosion and flooding. This will reduce the frequency and severity of coastal erosion and inundation, thereby minimising the risk to lives and preventing damage to public and private properties, and infrastructure

- *Mosquito Creek Coastal Development Works*
A revetment wall will be constructed and backfilling works will be undertaken to address the issue of erosion at the Shore of Peace Cremation Site
- *Alley's Creek Improvement Works (Bamboo Village, La Romain)*
A Rubble Masonry Wall will be constructed and damaged structures would be removed in order to alleviate flooding, further erosion and provide structural protection to adjacent residential and commercial properties along the banks of the water course
- *South Oropouche River Improvement Works (New Cut Channel)*
An embankment will be constructed and sluice gates and a pump station will be installed at the New Cut Channel which is the main drainage channel which collects the flow from all rivers (in the Oropouche River Basin) in the upper and lower catchments and exits directly into the sea near the Godineau Bridge. This initiative will alleviate flooding and increase the agricultural yield from the area

The Project also involves infrastructure and flood mitigation works on the Caroni and Vistabella Rivers.

Drainage and Irrigation Programme, Tobago

To improve the system of drainage in Tobago, retaining walls, drains, culverts and foot paths will be constructed. The areas targeted include streets of Plymouth; Carnbee Main Drain; Providence Road/Cullooden Road; Page Gully, Mason Hall; Hooglie Bush Drain, Moriah; Hampden Trace; Moriah Recreation Ground; Darrel Spring Drain, Buccoo Drain; Bacolet Point; Bamboo Gully - Plymouth Road; Union Branch Trace; Mt. Pelier Trace; Young Street Drain; Milford Court; Canaan/Bon Accord Connector; Wilson Road Drain; and Roxborough River.

Comprehensive National Drainage Study

Various areas of Trinidad have been subjected to flooding and coastline erosion. Improper use of land developments have contributed to this situation. Preventative and remedial works are necessary to arrest the existing problems. Several studies will be undertaken to determine the most feasible and economic alternative to protect the areas prone to flooding and erosion.

Comprehensive National Drainage Programme Phase 1

This Programme targets the dredging and desilting of major watercourses including: Arima River, Guaico River, North Oropouche River, Cunapo River, La Cuesa

River, Diana River, Cunupia River, Cuche River, St. Anns River, South Oropouche River, Caroni River, and Guayamare River. Other watercourses will be addressed as the need arises.

National Programme for the Upgrade of Drainage Channels

The objective of this Programme is to alleviate the flooding problem affecting adjacent residential and commercial properties along the banks of major watercourses in the country. The scope of work of the Programme includes:

- rehabilitation of damaged paved channel sections
- walling and paving
- desilting, clearing and grubbing works
- installation of water pumps
- construction of culvert crossings/access bridges
- realignment of watercourses
- construction of embankments and berms
- relocation of utilities

Roads and Bridges Development, Tobago

This Project targets improvement works on major and secondary roads in Tobago including Windward Road, Northside Road, L'anse Fourmi/Charlotteville Road, Roxborough/Bloody Bay Road, Milford Road, Store Bay Local Road and Claude Noel Highway. The improvement works include

construction of retaining walls, realignment of roads, drainage works, reconstruction of bridges, widening of roadways, and resurfacing of main and secondary roads. A consultancy will be awarded shortly for the conduct of feasibility studies and the preparation of designs for extension of the Claude Noel Highway eastward to Roxborough.

National Highways Programme (NHP)

The NHP aims to improve the road services provided by the national main roads network, reduce transportation costs through effective planning and maintenance management, and strengthen the technical and managerial capacity of the Ministry of Works and Transport (MOWT). The main activities are:

- periodic maintenance and rehabilitation of approximately 586 km of national main roads and reconstruction of approximately 65 bridges
- routine maintenance of 2,038 km of roads and 1,062 bridges
- institutional Strengthening of the MOWT
- reconstruction of 44 km of Trunk Roads

Road Infrastructure Improvement Programme

To improve the maintenance of roads and bridges, rehabilitation and/or construction of main roads and bridges and repair of landslips will continue. The Programme includes:

- the design of four new highways - San Fernando to Pt. Fortin, San Fernando to Princes Town, Princes Town to Mayaro and extension of the Churchill Roosevelt Highway from Wallerfield to Manzanilla
- dualling of the Diego Martin Highway - from Victoria Gardens to Acton Court
- improvements to Maraval Access (Saddle Road from Rapsey Street to Valleton Avenue)
- improvements to Wrightson Road
- construction of vehicular and pedestrian bridge on the Diego Martin Highway at Powder Magazine
- construction of an interchange at the intersection of the Churchill Roosevelt Highway and the Uriah Butler Highway (Port of Spain East/West Corridor Transportation Project)
- continued implementation of roads, bridges and pavement information maintenance management systems
- dualling of the Western Main Road from Morne Coco Road to Tucker Valley
- widening of the Uriah Butler Highway from Grand Bazaar to Chaguanas to three lanes in each direction

Development, Management and Maintenance of Municipal Roads and Drainage

A programme of works for the improvement and maintenance of roads, bridges, landslips and drainage infrastructure will commence in the 14 municipalities. Seventy-nine bridges have been identified for construction. GIS

software, startup maps, and a server will be purchased and staff will be trained to ensure implementation of an effective maintenance programme.

Alternative Access Routes Linking Key Population Centres

In order to ensure an efficient road network, as well as reduce commuting time, a number of alternative access routes will be developed and/or upgraded. The activities to be undertaken include:

North

- upgrading of the link between Tucker Valley, Chaguaramas and Covine Road in Diego Martin

East/West

- upgrading of the traces in Aranguez Estate in Mt. Lambert to improve the road access between Aranguez Road and the Uriah Butler Highway
- upgrading of Laventille Road from Saddle Road, Lower Santa Cruz to Lady Young Road, Mon Repos and Caledonia in Morvant
- construction of a link between Hololo Mountain Road in Santa Cruz and Lady Chancellor Road via the hills of St. Anns
- upgrading of the Hololo Mountain Road between Santa Cruz and Cascade

South

- upgrading of five km of the link road from the S.S. Erin Road, Santa Flora to

the Point Fortin Central Roundabout, Southern Main Road, through Forest Reserve Oil Road

- upgrading of the link road from Fyzabad to the Point Fortin Central Roundabout, Southern Main Road, through Forest Reserve
- upgrading of the Union Road Crossing in Gasparillo to a full diamond interchange by adding ramps to the Solomon Hochoy Highway on all four quadrants, together with the widening of existing on and off ramps at the Bonne Aventure Road Interchange
- construction of a link between Marabella and King's Wharf, San Fernando, then further to Lady Hailes Avenue, along the abandoned Railway Line

Programme for Upgrading Road Efficiency (PURE)

This Programme which started in 2002 is intended to improve the quality of roads in order to reduce travel time, vehicle operating costs, congestion, as well as to increase travel safety. Over the medium term, priority will be given to:

- widening the lanes on the Uriah Butler Highway and the Churchill Roosevelt Highway to facilitate the anticipated increased volume of traffic upon completion of the interchange at the intersection
- widening the Beetham Highway
- constructing a Pedestrian Overpass at Don Miguel Road, San Juan

- constructing a Pedestrian Overpass at Spring Village, Curepe
- developing the first phase of access roads for Brian Lara Stadium

Construction of Public Buildings, Trinidad and Tobago

New official residences will be constructed for the President, Chief Justice and Prime Minister. In addition, construction of new Administrative Complexes for the Municipal Corporations will soon commence. The first phase of construction will focus on buildings for Arima, Chaguanas and Diego Martin.

Rehabilitation of Public Buildings, Trinidad and Tobago

The 14 Local Government administrative buildings will be refurbished. Additionally, expansion works to Cipriani Labour College and the Eric Williams Finance Building will continue. Over the medium term, work on the upgrading of Riverside Plaza will commence.

Restoration of Historic Buildings

Historic public buildings will be restored to preserve their historical integrity. As such, restoration works will continue on Stollmeyer's Castle, the Red House, Queen's Royal College, Trinity Cathedral, the Mille Fleurs Building, President's House, Fort Picton, and Whitehall.

Airport Infrastructure Development

To improve facilities and services to nationals and international visitors to the islands, upgrades will be carried out at both the Piarco and Crown Point International airports. Expansion and improvement works at Crown Point are expected to meet Tobago's air transport needs for the next 15 to 20 years. Development works will involve the modification and expansion of the Crown Point Terminal, the construction of an air traffic control tower, taxiway repairs, airport landside transit mall, upgrade of the Electrical Sub Station South Terminal and emergency access roadway, the procurement of air navigation equipment and modernization of the Air Traffic Control Facility. These works will ensure that Trinidad and Tobago maintains United States Federal Aviation Administration (FAA) Category 1 status.

Relocation of the Port of Port of Spain

Plans are being developed for the relocation of the Port of Port-of-Spain to East Sea Lots. This move will offer the possibility for future Port expansion if the need arises. The relocation also offers an opportunity for the creation of a Harbour Front Development Park on the land vacated by the current Port.

Upgrading and Expansion of Government Shipping Services Facilities

The facilities of the Government Shipping Service (GSS) at the Ports of Port of Spain and Scarborough are being expanded to cater for the increasing demand for inter-island sea transport. At the Port of Port of Spain, a new Terminal Building will be constructed to accommodate a total of 1000 passengers. Phase I which will be completed in 2006 involves the construction of facilities to accommodate 500 passengers. Phase II will involve further expansion to accommodate the additional 500 passengers. The new Terminal will have an elevated passenger ramp to enable easy access to and from the vessel at deck level.

New berths will also be constructed to allow for the simultaneous berthing of three ferries. One berth will be dedicated to the inter-island high speed ferry operations, one will be for mixed berth and the third will accommodate conventional cargo vessels. To facilitate the storage and loading of cargo and vehicles, five acres of land will be reclaimed to the south of the existing Port facility in Port of Spain.

At the Port of Scarborough, the existing Terminal Building will be expanded eastwards in order to provide additional terminal space and an elevated passenger access way to the deck level of the fast ferries.

National Transportation Study

A strategic 20-year Comprehensive National Transportation Plan for Trinidad and Tobago is being developed. The objectives are to develop: (i) a National Transportation Policy that is consistent with other public policies; and (ii) coordinated National Transportation Plans for land, sea and air. This will provide the Government with a systematic decision-making tool for investment in transportation infrastructure over the next 20 years.

Trinidad Rapid Rail Project (Mass Transit System Study)

A rapid rail transit system will be developed to ensure fast and frequent service along both the East-West and North-South corridors. In addition, it will provide alternative transportation choices and reduce traffic delays. A Mass Transit System Study will also be undertaken to improve planning for future growth in traffic throughout Trinidad.

The East-West Corridor Plan will consist of three segments: Sangre Grande to Arima, Arima to Port of Spain, and Port of Spain to Diego Martin. The North-South Corridor Plan will consist of two segments; Port of Spain to Chaguanas and Chaguanas to San Fernando. The rapid rail system will provide citizens and visitors with increased mobility and access to work, school and shopping making it the backbone of Trinidad's transport system and integral to the social and economic development of the country.

It is anticipated that a Design, Build, Operate and Maintain (DBOM) contract for the System will be awarded by December 2006.

Establishment of a North-South Water Taxi Service

A Water Taxi Service will be introduced between key urban centres/towns/industrial estates on the west coast of Trinidad to offer commuters a viable alternative to vehicular modes of transportation. The Service will utilise four high-speed catamarans with a combined capacity of 1,150 passengers. The vessels have a traveling speed of approximately 30 to 40 knots, thereby reducing the travel time between Port of Spain and San Fernando to approximately 30 to 45 minutes. In a normal work day, operating between 5:30 a.m. and 8:30 p.m. approximately 8,000 to 12,000 persons are expected to use the Service.

The Service is targeted to the entire spectrum of commuters and will be designed to be fully integrated into existing transport systems and the Rapid Rail System when completed.

The proposed sites of the Port of Spain terminals are: Invaders Bay, Sea Lots and the Breakfast Shed area. These sites offer easy access to the main roads and have adequate space to construct parking facilities where required. Terminal facilities of approximately 3,000 to 5,000 square feet, with adjacent parking facilities will form part of the waterfront development plan for these areas.

The proposed site of the San Fernando terminal (approximately 5,000 to 10,000 square feet) is the undeveloped area on the waterfront known as Flat Rock. Given the lack of land availability, it is proposed that the parking facilities be provided offsite at the north-west corner of Rienzi Kirton Highway and Todd Street. Passengers using the Service would be shuttled to the departure point by bus and maxi-taxis.

The initial phase of operation will involve a service between Invaders Bay/Sea Lots in Port of Spain and Flat Rock on the San Fernando Waterfront.

Development of Terminal Facilities, Sangre Grande

A modern land transportation facility will be developed to service all modes of transport with space allocated for offices, commercial activity and underground parking. This modern transit hub with commercial facilities for passenger convenience will encourage commercial activity and lead to the further development of Sangre Grande and surrounding villages.

Fleet Renewal Programme (PTSC)

The Public Transport Service Corporation has embarked on a Fleet Renewal Programme in its continuing efforts to effectively deliver an efficient public transport system. Over the medium-term, the Corporation will further expand its fleet through the acquisition of the following:

- forty air-conditioned articulated buses to ensure substantial improvement in service frequency along the East/West and North/South Corridors. This acquisition will also result in improvements to service frequency along the Sangre Grande-Arima, Princes Town-San Fernando, and Port-of-Spain-Diego Martin-Chaguaramas routes
- twenty conventional 49-seater Units will supplement the work of the large capacity units by servicing areas inaccessible to articulated buses, and replacing them on off-peak trips, when passenger levels are best handled by the smaller units
- twelve high quality tour buses
- twelve City Service Buses. This will ensure that the increasing demand for City Service Operations in Port-of-Spain and San Fernando is adequately accommodated
- six 49-Seater Buses in Tobago. This will substantially improve the level of service delivery to the Scarborough-Blackrock-Plymouth, Scarborough-Crown Point, and the Scarborough-Mt. St. George routes
- eighty 35-Seater Rural Buses. This will significantly improve access of communities to various town centres and other districts
- twelve Purpose Built Buses for the physically challenged

Preparation of a National Physical Development Plan

The National Physical Development Plan for Trinidad and Tobago will provide a spatial illustration of all national projects and will identify a strategy for development. The Plan will address issues such as settlement, environment, transportation and economic development. The procurement of consultancy services to undertake the preparation of the Plan is in its final stages.

Development of New Parks and Upgrading and Expansion of Existing Parks

This Project involves the development of five new industrial parks and the expansion of the 19 existing parks to meet the demand for industrial facilities in the country. The new Parks are to be located at Dow Village, Tarouba, Preysal, Chaguanas, and Reform Village. With respect to the existing Parks, the first phase of expansion works will be undertaken at Morvant, Beetham, Frederick Settlement, Caroni, Debe and Point Fortin.

International Waterfront Project

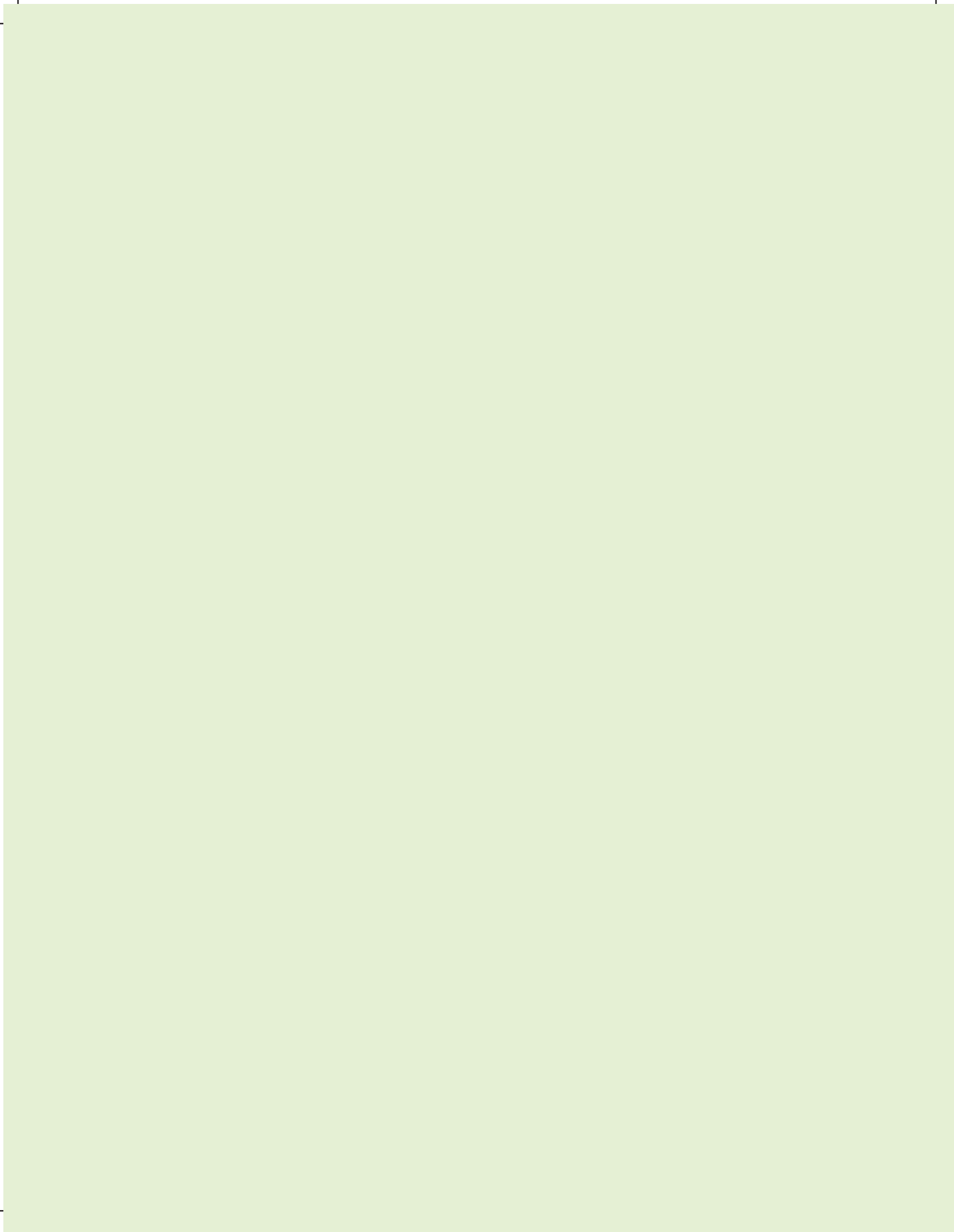
The International Waterfront Project is intended to be the main feature of the revitalisation of Port of Spain that will redefine the image of the city. Included in the Project are: a 428 room Hyatt Regency Hotel, state-of-the-art conference centre and business facilities; the headquarters of the

Association of Caribbean States, and accommodation for 1,200 vehicles and retail facilities.



Targeted Outcomes

- Four new highways constructed - San Fernando to Pt. Fortin, San Fernando to Princes Town, Princes Town to Mayaro and extension of the Churchill Roosevelt Highway from Wallerfield to Manzanilla
- Dualling of the Western Main Road to Tucker Valley Road completed
- The Claude Noel Highway extended to Roxborough
- Interchange at the intersection of the Churchill Roosevelt and Uriah Butler Highways constructed
- PTSC fleet expanded by almost 200 buses
- First phase of the light rail transit system implemented
- North-South water taxi in operation
- Improved inter-island air and sea transport in operation
- New Ports developed in Galeota, Cap-de-Ville, Brighton and Chatham
- Port of Port-of-Spain relocated to East Sea Lots
- Mamoral Dam and Reservoir constructed
- Five new industrial parks completed at Dow Village, Tarouba, Preysal, Chaguanas and Reform Village
- New industrial estates developed in Cap-de-Ville and Oropouche Bank
- Tamana InTech Park completed



Goal 2

TRINIDAD AND TOBAGO WILL BE AN INTER-CONNECTED, TECHNOLOGICALLY ADVANCED SOCIETY WITH MODERN INFORMATION AND COMMUNICATION SYSTEMS DRIVING INNOVATION, GROWTH AND SOCIAL PROGRESS

Policy Context

Information and communication technology (ICT) is one of the main drivers of change in the global environment and a major facilitator of economic and social development. The use of ICT can be a powerful catalyst for development of a sustainable learning society, the building of competitive businesses and improvement of governance and the efficiency of Government. The significance of ICTs lie less in the technologies themselves and more in their ability to facilitate better service delivery to all stakeholders. Efficient postal services also contribute to a strong communication infrastructure that promotes connectivity. The goal is to be an inter-connected society that embraces modern information and communication systems to fuel innovation, economic growth and social progress.

Trinidad and Tobago is already an active member of the global information society. It is currently ranked in the third quartile of 104 countries in the World Networked Readiness Index¹. The country's efforts to increase its position in the world ranking underscores the importance of accelerating the implementation of a co-ordinated national ICT agenda.

Fortunately, Trinidad and Tobago has many favourable characteristics for a country embarking on a major connectivity agenda. These include a good telephone infrastructure with relatively reliable and quality coverage, an informed and communicative population that is prepared and eager to learn, and a strong policy and legal framework.

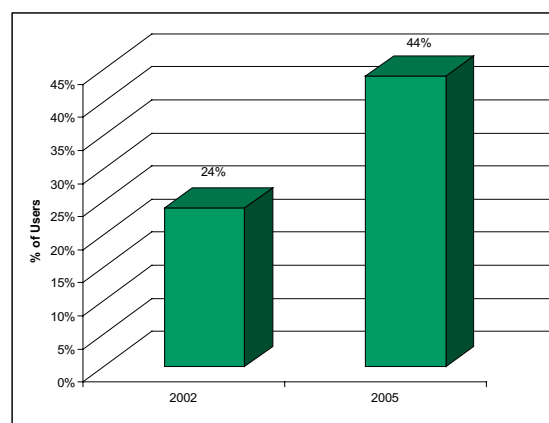
¹ Published annually by the World Economic Forum

However, while the use of cellular phones is relatively high, other modern technologies such as the computers and the Internet are not widely used (Box 4.2). This is due to several factors, including limited ownership of computers, slow network speed, the scarcity of public access centres for those who cannot purchase computers and the relatively high cost of Internet services. The use of ICT in the workplace and at educational institutions is also fairly limited.

Consequently, only a small percentage of the population are regular Internet users. This, along with the slow network speed means that there is little incentive for companies to use the Internet as a business medium. In

addition, the majority of government services are provided on a person-to-person basis and information is stored primarily in paper files.

Figure 4.2
Number of Internet Users (2002-2005)



Source:
Market and Opinion Research
International

Box 4.2 ICT Facts

1. 17 per cent of households own a computer with a modem
2. 10 per cent of households have Internet access
3. 56 per cent of the population does not use any form of ICT
4. 76 per cent of the population has never made a purchase over the Internet
5. 69 per cent of the population would like the Government to provide services online
6. 86 per cent of firms own computers
7. 89 per cent of the firms with computers have Internet access
8. 98 per cent of the firms with Internet access use it only for e-mail
9. 3,926 persons employed in ICT-related occupations

Source:

- 1 – 5 Market and Opinion Research International, Opinion Leaders' Panel Survey (2005)
- 6 – 8 Ministry of Trade and Industry, National Business Survey (2003)
- 9 Central Statistical Office, 2000 Population Census

This notwithstanding, there have already been some positive developments in the recent past, one being a 20 per cent increase in the number of Internet users (Figure 4.2). Government will play a pivotal role in stimulating ICT use in the country. In addition to providing enabling legislation and appropriate fiscal incentives, a well-designed e-Government strategy will assist by providing tailored electronic services to both individuals and businesses.

In 2003, Government developed a National Information and Communication Technology Plan (*fastforward*). The Plan addresses major challenges such as access to and affordability of ICT; the promotion of education and skills development; the creation of a robust competitive business environment; and establishment of an appropriate legal and regulatory framework to guide the activities of the sector.

To ensure universal access to high quality, diversified information and communication services, the Telecommunications Authority of Trinidad and Tobago (TATT) has been charged with the responsibility of managing universal access to basic telephony services in the first instance. This universal service obligation will be expanded to include other services such as access to the Internet which is critical to facilitate the e-Government and e-commerce initiatives. Plans are already in train to establish community access facilities across the country to increase the accessibility of Internet services to all citizens, make

available a broad range of information and services, and build new skills in the local population.

Open and effective competition in the telecommunications sector will be encouraged, and a range of fiscal incentives will be instituted to increase computer ownership by both the public and business community, to ultimately raise the level of Internet usage, especially as a business tool.

In addition, a range of initiatives such as teacher training, provision of up-to-date computers and high speed Internet access and curriculum reform will contribute directly to the development of a knowledge-based society. This will result in significant growth opportunities for local suppliers of computer software, installation and repair services and training. Small businesses will be encouraged to become e-businesses with the ability to compete in arenas that were previously open only to large firms. This will positively impact employment levels and investor confidence.

The transformation of the economy will be boosted with the shift from the traditional dial-up access to widespread availability of affordable broadband telecommunications infrastructure. The shift in technology platforms will be facilitated through a National Broadband Action Plan which will govern the regulatory and public policy frameworks and support the development of a more robust competitive environment at all levels. Broadband technology will also induce the

shift to knowledge-intensive industries and facilitate access to new markets and revenue streams for businesses, as well as enhanced delivery of e-Government services.

Overcoming the geographical barriers to trading globally is one of the primary benefits of using ICT for business transformation. Information and communication networks have the potential to re-position the business sector to compete in the global market place. Geographic location is less of a constraint and worldwide access to markets and market information is improved. This is particularly important as Trinidad and Tobago strives to widen further its market base.

There is also a growing need to determine the social impact of ICT. The recently concluded World Summit on the Information Society (2005) reiterated the need to measure the impact of technology particularly in relation to the achievement of the Millennium Development Goals (MDGs).

The goal is to position Trinidad and Tobago to take advantage of technological advancements and, overtime, to develop a culture of innovation. To this end, attention will be given to research and development, securing technology patents, financing innovation and building the innovative capacity of small and medium sized enterprises, particularly those that seek to develop the ICT manufacturing and services sector.

The telecommunications sub-sector is becoming a leading driver in the economy not only in terms of its contribution to income and employment generation but by improving the connectivity between urban and rural communities as well as between the country and the outside world. Government will move to accelerate the liberalization process with the development of a Universal Access Policy and Implementation Plan and an Advanced Automated Spectrum Management System. Concurrently, the Telecommunications Authority of Trinidad and Tobago (TATT) will continue its focus on the development of the regulatory framework and refinement of standard operating procedures.

TTPost, which is currently operated under a management contract as a first stage toward full privatisation, received international recognition for postal reform in 2004. However, in the face of the rapid increase in electronic mail and small parcel competitors, TTPost must now adopt new strategies and broaden its product base.



Objectives to 2010

1.

Develop a modern and competitive Information and Communication Technology (ICT) Sector

2.

Ensure that all citizens have access to efficient and affordable telecommunications and postal services

3.

Promote ICT acculturation among all citizens

4.

Expand the use of ICTs to modernise the operations of the public sector

5.

Increase the availability of online government information and services

6.

Promote the development of competitive ICT-based businesses

7.

Encourage greater use of ICT in business operations and market transactions

8.

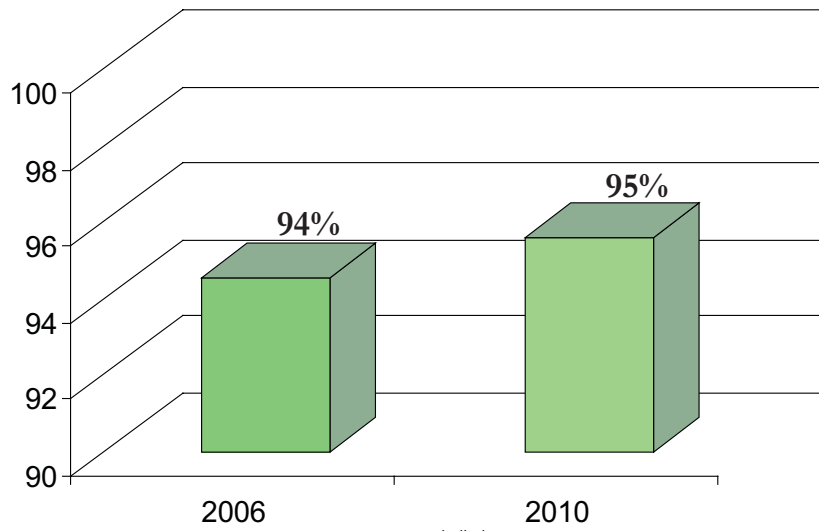
Expand high speed Internet connectivity to all schools and libraries

Specific Targets for the Postal Sector to 2010

1. Increase access to Postal Services

Figure 4.3

Percentage of Population with Access to Postal Services

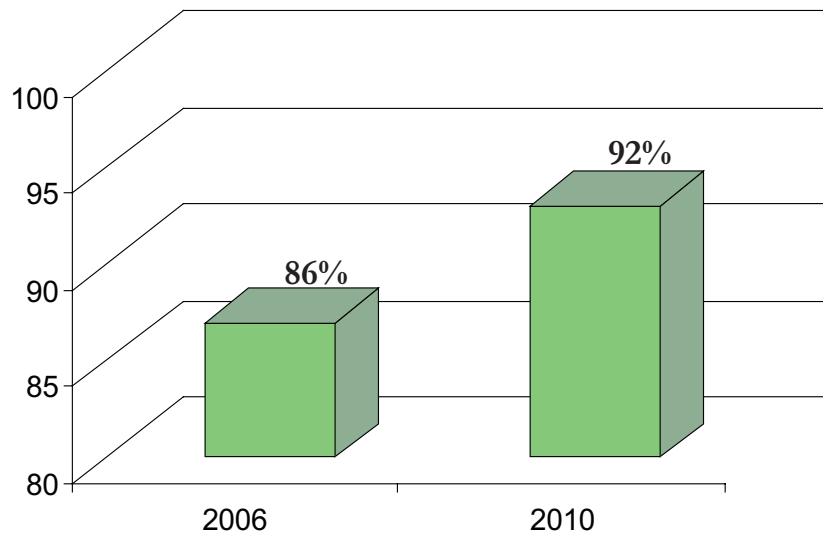


Source: TTPost

2. Increase on-time mail delivery

Figure 4.4

Efficiency of On-time Delivery



Source: TTPost

Strategies

Develop a Robust, Resilient Telecommunications Infrastructure

In order to ensure that Trinidad and Tobago has a modern technological environment on which *fastforward* can constantly evolve, a National Infrastructure Task Force will be established with a mandate to examine emerging technology options including broadband, fibre, wireless and satellite.

At present, the Internet can be accessed via dial-up and, only in certain areas, through high-speed connections. The overall slow pace of network speed is a major challenge to effective e-commerce and ease of access to online information and services. Over the medium term, the focus will be to expand existing infrastructure to make broadband services available in every home.

As such, Government will address Trinidad and Tobago's data transmission bandwidth requirements and modernise the telephony network to meet the challenges which will accompany the expected increase in Internet usage. In this regard, a National Broadband Action Plan for Trinidad and Tobago will be developed which will focus on the following: (i) development of Colocation Centres or

'Carrier Hotels'² for cost effective provision of international telecommunications services by new telecommunications service providers; (ii) establishment of an Internet Exchange Point (IXP); (iii) promotion of a domestic hosting environment; and (iv) formulation of appropriate policy measures and guidelines to facilitate a competitive environment for the provision of broadband services.

In addition, a Broadband Infrastructure Task Force will be established to identify and advise on new telecommunications technologies and issues such as online security, open source software and standards development as they affect broadband services.

Strategic partnerships between domestic and international companies will be encouraged to ensure that the telecommunications infrastructure is continuously improved and expanded allowing for greater social and economic development.

Accelerate e-Government

e-Government is the foundation upon which the Government is transforming service delivery to the population. It presents a new and innovative approach to addressing traditional challenges to the quality of delivery

² A Colocation Centre or Carrier Hotel is a type of data centre where multiple telecommunications or network service providers locate their connections adjacent at the physical layer to each other's networks. Users of these services locate network, server and storage gear here, and interconnect to network service providers with a minimum of cost and complexity.

and the reach of government services. **fastforward** will ensure that Government services and procedures are standardized, the skills of Government workers are upgraded, and that ease of access to information is realized, with the aim of providing a better quality of service to all. Some Ministries have already made significant progress in providing appropriate Government information and services online, vis-à-vis an e-Government Portal. Remaining Ministries are in the process of developing their ICT infrastructure for integration in this initiative.

Promote National Connectivity

The success of Trinidad and Tobago's ICT agenda is dependant upon the widespread adoption of ICT by the population. The benefits of ICT will not be realized if affordability factors, geographical remoteness and mobility challenges deny access to ICT to large segments of the population. Increased levels of connectivity will offer substantial social and economic benefits to everyone. As a result, measures will be taken to widen access to the Internet via initiatives that deliver connectivity in every part of Trinidad and Tobago.

Specifically, Government will expand connectivity within communities through the establishment of Community Access Centres. These Centres will provide opportunities for training in computer literacy to all citizens to ensure that no one is excluded in the move towards a knowledge-based society. Where

possible, mechanisms will be developed to encourage community ownership of the Centres. In addition, connectivity within the public school system will be strengthened.

The Ministry of Education's website will provide a window for school administrators and teachers to use online resources. In addition, it will also build a learning community whereby all teachers throughout the country will actively communicate and collaborate with each other.

Universal access will enable companies to use the Internet as a business medium, helping small businesses become e-businesses.

Create an Electronic Marketplace

Government has a key role to play in accelerating the development of an electronic marketplace and will lead by example. The Public Service will start to electronically purchase more of the goods and services which it uses. This will encourage the many hundreds of companies which do business with Government to engage in e-business. Government will initiate a reform agenda in the Public Service aimed at improving service quality, reducing bureaucracy and promoting greater efficiencies. The Public Service will become more responsive, transparent and service-oriented to the benefit of all its clients.

A thriving micro, small and medium-sized enterprises (MSME) sector is one of the key characteristics of a prosperous and growing

economy. The development of a related ICT policy will provide a framework through which assistance can be offered for MSME expansion. Our MSMEs are currently faced with many problems including limited access to finance, information and markets, trained personnel, training and technology which impose constraints to their growth and expansion. Over the medium-term, Government will introduce measures to address these problems.

In addition, an e-payment method for consumers will be established which will further reduce the need for cash-based transactions.

Expand ICT Education and Skills Development

The acquisition of appropriate skills is fundamental to the development of an innovative and entrepreneurial community that will adapt, flourish and prosper in the new global information society. Curriculum reform and teacher training are key elements of the strategy to develop an ICT culture. Government will ensure that ICT-related skills are introduced to children at the earliest possible age and formalised into the general school curriculum to ensure that a certain level of proficiency is attained at the different school levels. Educators will be trained to ensure that they have a sound understanding of ICT and can use it as an educational tool.

Providers of distance education will be encouraged to work with Government to examine the ICT architecture needed to develop a national life-long learning model for Trinidad and Tobago. A range of initiatives will focus on the development of IT skills in adults outside of the formal education system.

Promote Greater Public Awareness

Government will invest in a wide-ranging programme to increase public awareness of the benefits of increased connectivity, promote ICT usage and prepare the population for life in the global information society. The development of a national awareness campaign will facilitate the embracing of modern communications technology by the population. This will help to build the critical mass of Internet users necessary to make other electronic communications viable.

Improve Governance in the ICT Sector

Integral to the country's evolution as a knowledge-based economy is an adequate governance framework. As a result, it has become apparent that there should now be a comprehensive review of existing management structures, strengths and opportunities, with a specific focus on those related to the use of ICTs. On the basis of the review, recommendations will be made for a 'future-state' structure and policy better

suited to managing ICT in the modern environment and the key first steps will be identified to accelerate the evolution towards the new roles, structures and policies. To this end, activities over the medium-term will see the engagement of international consultants to recommend an appropriate ICT governance structure to improve policy formulation and implementation as well as service delivery.

In addition, an e-Business Roundtable will be established to assist Government with the development of e-Business in the country and will serve as a ‘think tank’ to support the implementation of *fastforward*. Specifically, the Roundtable will provide strategic recommendations in the following areas:

- e-business promotion
- business e-transformation
- e-business policy development
- human capital development
- improving the investment climate
- improving Government online services

With respect to the legal framework, the Data Protection Bill and the Electronic Transactions Bill will be introduced.

In addition, regulations will be implemented to ensure that technological development initiatives are in keeping with internationally approved standards. In this regard, the Government has introduced a planning policy for Public Mobile Telecommunications Services. The Policy seeks to facilitate the

accelerated development of the telecommunications industry without compromising the health and safety of the general public and with due regard for the need for protection and conservation of the environment.

Facilitate Open and Effective Competition in the Telecommunications Sector

Opening up of the telecommunications market to full competition will increase service quality and choice while reducing cost. The result will be faster, cheaper and easier access to the Internet and a marked increase in computer and Internet usage amongst the general public and small businesses. As more users get connected there will be a corresponding demand for products and support services which will, in turn, lead to additional employment and skills development in the ICT sector.

Develop Information Networks

The creation of a public safety information network to facilitate the rapid dissemination of information related to threats to public safety will be pursued. Any Government Ministry or Agency would be able to identify a threat and relay the information to the public using ICT applications. In this regard, an Emergency Public Warning System is being developed.

In addition, research relating to the establishment of an Integrated National Security and Justice Information Network to address the issue of the detection and prevention of crime will be conducted. The Network, which will be a secure architecture over the Government Communications Backbone, would allow information on offenders, crimes and proceedings to be accessed by duly authorised persons. It would also enable law enforcement agencies to identify patterns of criminal activities that currently go undetected.

Strengthen Data Collection and Analysis

Through a collaborative effort between the Ministry of Public Administration and Information and the Ministry of Planning and Development, the statistical database on the ICT sector in Trinidad and Tobago will be strengthened. In addition, greater emphasis will be placed on continuous economic analysis and performance review of the local and international ICT sector.

Improve Postal Service

TTPost will aggressively market new services and expand existing services to its customers. New services will include e-commerce activities, bill paying expansion and banking services. The post offices will also be equipped

with the latest technology as it expands into new areas of electronic and hybrid mail.

Upgrade Postal Services Infrastructure

To maintain and further improve the processing and delivery of the mail, as well as the level of services being offered, TTPost will embark upon system upgrades for its processing, transportation, courier and delivery operations. In addition, the security system will be upgraded.

As a result of new revenue generating services that have been introduced over the last three to five years, TTPost will also upgrade necessary infrastructure to enhance the image of retail outlets and facilitate the provision of a more timely and efficient service.

Strengthen the Policy and Legal Framework for the Postal Sector

In order to ensure that TTPost is able to meet the challenges posed by market developments, new policy and legal arrangements will be put in place for the operations of the postal sector. Specifically, TTPost will be transformed into a limited liability company which will facilitate restructuring of postal operations. This will allow the Company to engage in new business strategies involving acquisitions, joint ventures, alliances and partnerships that can lead to further growth of the Company. This transformation will also

Section 4: Investing in Sound Infrastructure and the Environment

enable the postal service to operate on a strict commercial basis.

Additionally, TTPost has now entered into the second phase of the Postal Reform Programme, which will see the establishment of a Long Term Arrangement (LTA) for the postal sector of which TTPost is a major stakeholder. A precursor to the establishment of the LTA, is the formulation of the Postal Sector Policy (PSP) which is currently in progress. The PSP will give definitive shape to the organisational structure of the LTA, ensuring that TTPost meets the challenges of the changing postal market.

Major Projects

Government Communications Backbone Project

Phase I of the Communications Backbone Project has been completed. The Backbone will provide greater connectivity amongst all Government Ministries and Departments; and an up-to-date directory of all government contacts. To date, 20 Ministries have been connected and their officers now have access to a host of services that include Internet, e-mail, e-messaging and e-scheduling and a Central Service Desk.

Over the medium-term, the focus will be on connecting the Head Offices of the five remaining Ministries, providing connectivity to additional remote sites for all Ministries and the introduction of public service wide systems for Human Resource management, payroll and electronic document management, among others.

e-Government Portal

This is a government-wide initiative that will establish a consistent enterprise approach to service delivery and customer service. It will extend the reach of Government (to foreigners, businesses, employees, visitors and the Diaspora) and will improve transparency and citizens' overall confidence and participation in Government. For the end-

user, the Portal will bring considerable benefits. It will:

- provide a single window of access to key government information and services in a standardised format that focuses primarily on the needs of users
- facilitate access to 'bundled' services, that is, combining related services for increased benefits to the users
- increase overall awareness of, and accessibility to, government information and services

Through this Project, Ministries will be able to improve service delivery and reduce administration and investment costs. The Office of the Prime Minister and the Ministries of Housing, Legal Affairs, Health, and Public Administration and Information are the agencies involved in the pilot project for the Portal.

e-Government and Knowledge Brokering Project

The efficiency and effectiveness of public services will be enhanced through the transfer of knowledge on international best practices and the effective development and implementation of e-Government solutions. Two demand-driven funds will be established and financed primarily by the IDB, one for e-Government solutions and the other for knowledge brokering. This Project represents

the first phase of the overall ICT Support Programme.

Over the medium term, implementation of the second phase will begin via a second loan that would include components addressing community access, enterprise development (e-commerce), human capital for ICT and the legal and regulatory climate for ICT. A key outcome of the Project will be the improvement to the institutional and human resource capabilities of public institutions through effective knowledge-transfer.

National Broadband Action Plan

This Plan will facilitate the provision of expanded broadband services by new telecommunications providers. It will also aid in the establishment of an Internet Exchange Point (IXP) in Trinidad and Tobago in collaboration with stakeholders. The IXP will assist in reducing the cost of international Internet bandwidth and enhance domestic Internet experience. In addition, Government will facilitate the creation of Carrier Hotels that will expand the number of fibre communication landing points/stations thereby increasing the international bandwidth capacity. Expansion of broadband services will be actively encouraged over the medium term. Connectivity between Government Ministries and Agencies will also be enhanced to allow for better service delivery and operations. Essentially, the Action Plan is based on the pillars of:

- a competitive telecoms sector appropriately managed by a robust technology neutral regulatory framework
- optimum routing of domestic and international data traffic
- the development of a competitive robust domestic content generation culture and hosting industry

Community Connection Programme

The Community Connection Programme will provide residents of rural, remote and urban communities with affordable access to computers and the Internet through the establishment of Community Access Centres (CACs) across the country. A pilot study will be conducted and stakeholder consultations will be held to inform the establishment of the CACs. At the Centres, users will be provided with access to a wide variety of online information, including:

- local and community information and services
- information regarding jobs, health, taxes and education
- government information and services such as school registration, birth certificates, passport application, and regulatory requirements
- online learning
- business information and services, especially for start-up of small businesses
- information specifically tailored to the needs of children, senior citizens and young mothers

As part of the Programme, young adults will be trained and certified to form a Youth Computer Corps. They will work alongside volunteers in each of the CACs to provide computer and Internet training and technical assistance to small business in e-commerce and website design.

Small and Medium Sized Enterprises (SME) Business to Business (B2B) e-Marketplace Project

An online home for the SME B2B e-commerce system will be established to develop a knowledge-based electronically driven environment in the business sector. The system will facilitate, among other things, business development and sharing of strategies and programmes that will contribute to sustainable growth.

e-Legislative Project

The policy and legal frameworks will be reviewed and updated to support the expected new levels of electronic interaction and to facilitate law enforcement in the electronic environment.

Additionally, the Central Bank and the Ministry of Finance will collaborate in the conduct of a review of customer protection in electronic funds transfer (EFT) and the rules relating to EFT activities undertaken by financial institutions. Relevant e-transaction and data protection legislation will be enacted.

e-National Security and Justice Programme

Emphasis will be placed on the design and implementation of an Integrated National Security and Justice Management information system and a public safety Information System with a focus on disaster preparedness and management. Co-ordination with various government agencies, notably those not under the direct purview of the Ministry of National Security will also be increased and an Early Warning System will be developed.

Establishment of the Office of the Data Commissioner

This Office will create, monitor and ensure compliance with the highest standards of data protection and personal privacy, in both the private and public sectors. Emphasis will be on defining *ex ante* rules for key industries, developing best practice standards for general application, sensitization of the public to the need for data protection, and where necessary, enforcement of the Rules as set out in the Enabling Data Protection Bill.

Knowledge, Innovation and Development (KID) Programme

The primary objective of this Programme is to provide up-to-date computers and connect all 636 of Trinidad and Tobago's schools to high-speed Internet service. The Programme will look beyond networked education on a

school by school basis and attempt, over time, to develop an interactive network of innovative schools at the national and international levels.

A major component of the KID Programme is the SchoolNet Project being implemented by the Ministry of Education. The Project will incorporate ICT to enhance access to information and to facilitate more efficient communication at all levels of the education system. Already, Secondary School Administrators are offered online access to their students' examination results from Cambridge University. In the medium-term, the System will be expanded to provide high speed Internet services to all public primary and secondary schools.

A Ministry of Education's website is being developed which will enable the teaching fraternity to access information online.

The Computers for Schools (CFS) Initiative, a subset of the Computers for Communities Programme, is another component of the KID Programme. It involves the creation of a number of computer repair laboratories to refurbish computers before they are placed in schools, and upgrade and repair of those computers that have been used in the school system for some time. This initiative is still at the conceptual stage.

Skills & Knowledge for the Information Era (SKIE) Programme

This Programme will incorporate a range of initiatives to provide training for the development of new ICT skills. It targets all persons outside the formal educational system.

One such initiative is the SkillNet project which will coordinate with existing programmes to create a network of online services and tools aimed at helping employers and job seekers use the Internet for recruitment, career, labour information and learning. The Students Connections Programme is another project component of the SKIE. Specially trained students will be paid to assist small businesses and non-profit organisations with the adoption of ICT. Companies will benefit from increased understanding and better use of ICT and students will gain job experience. This Project is still at the conceptual stage.

Administration of the .tt country code Top Level Domain (.tt ccTLD)

Policies and guidelines are being developed for the administration of the .tt country code Top Level Domain (.tt ccTLD). This is the Internet equivalent of the country's telephone numbering code (868). If managed effectively, this code can maximise the country's interaction with the Internet. An advisory committee is being established to manage and promote the more effective and efficient use

of this public resource, thus strengthening the national identity of Trinidad & Tobago electronically.

LibraryNet Programme

All libraries have been provided with computers and efforts are being made to upgrade dial-up access to high speed Internet. In addition, all librarians have received ICT related training to enable universal access to information and services. Mobile libraries equipped with wireless Internet connectivity and computers will also be introduced.

The LibraryNet Programme is being successfully implemented by the National Library and Information System Authority (NALIS). Already, all libraries in Trinidad and Tobago have been outfitted with computers and are fully utilised by library users. In addition, high-speed connectivity among the 22 public libraries has been completed and is operational. At present, NALIS is conducting a pilot project using cable connectivity between its Head Office and a couple of libraries. The National e-Heritage Project which seeks to capture valuable cultural and historical information in digital form, is an umbrella project being initiated by the Ministry of Public Administration and Information to fast track the development of national content, for example, this content may be used in the KID Programme.

Construction of a Building for the Caribbean New Media Group (CNMG)

In 2007, Administrative Headquarters for the CNMG will be constructed at Alcazar Street in Port of Spain. The CNMG was established in December 2004 to operate as a new independent, profitable, community oriented broadcasting company to inform, educate and entertain audiences with credible, balanced and innovative programming. CNMG's goal is to implement innovative, cost-effective programming with superior quality content that enlightens, enriches and entertains its customers. Leveraging the best in class technology, CNMG aims to expand coverage nationwide thereby providing service not now reached by currently available services. Its portfolio would consist of services delivered via a television station, three radio stations and new media services.

Regional Internet Exchange Points

The period 2007-2010 will see Trinidad and Tobago working closely with its CARICOM colleagues in engaging actively with the international community to ensure that domestic and regional ICT policy and programmes are optimally aligned with international developments in the ICT Sector. The first consideration will be the establishment of a regional Internet Exchange Point (IXP) which will re-route intra-Caribbean Internet traffic from heading to North America to within the Region thereby

reducing Internet costs to the various countries.

TTPost: Mail Processing, Transport/Courier and Delivery Upgrade

To improve the processing and delivery of mail, as well as the level of service being offered by TTPost Offices, new equipment will be purchased including updated scanning machines, roll cages to increase mail storage, trolleys and scales. Handheld radios will also be purchased to improve network communication coverage.

TTPost: Retail Network System Upgrade

To facilitate the introduction of revenue generating services, the Corporation will continue to upgrade the infrastructure and image of the retail outlets to facilitate timely and efficient service. The Private Boxes Facility will also be upgraded to cater to the increasing customer demand. In addition, a mobile retail post office will also be acquired and used as a marketing tool at trade shows and other international events.

TTPost: Security System Upgrade

The Corporation will upgrade the existing security systems to include a Digital Video Recording (DVR) Closed Circuit Television (CCTV) system for the Perimeter Monitoring at the National Mail Centre. The equipment

will allow for twenty-four hour monitoring from the security booth. The security upgrade will also include a five hundred foot perimeter fence to secure the western side of the facility.

Building Disaster Preparedness Capability of TTPost

TTPost will ensure that its main office, located at Piarco is outfitted with the appropriate equipment and resources to serve as a 'shelter' in times of natural disasters. Additionally, strategically located outer offices will be designated as shelters or emergency facilities and will be fully equipped to allow for quick mobilisation, in the event of a disaster.

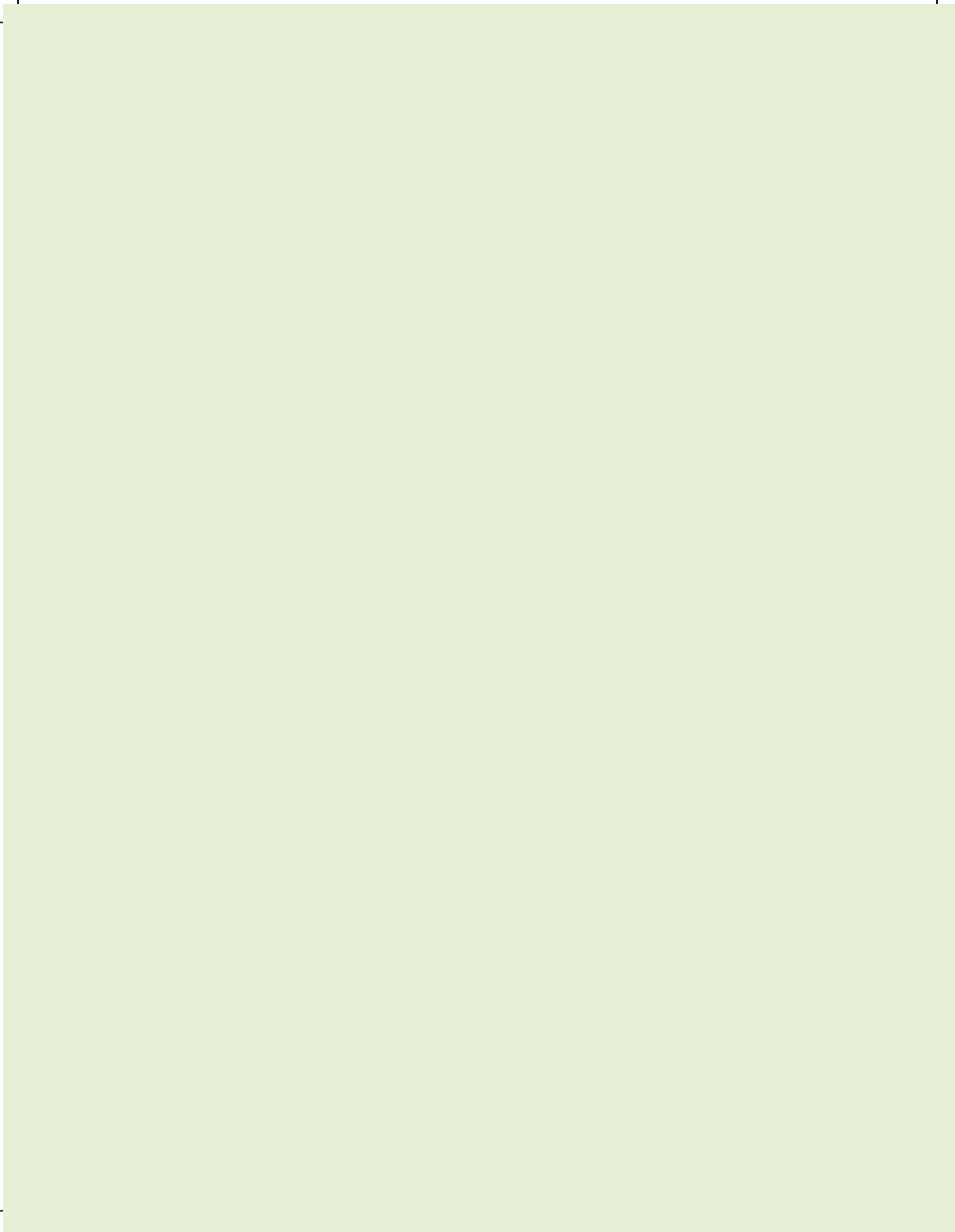
Commercialisation of TTPost Properties - Study

The commercialisation of selected properties has been identified as a major source of revenue. As such, the Corporation will commission a study of all properties to be vested in TTPost to identify business opportunities relating to the development and subsequent commercialisation of these sites. Although commercialisation of properties is seen as a major revenue generator, consideration will be given to the needs of the Corporation relating to staff and the expansion of its operations.



Targeted Outcomes

- At least 50 per cent of households have computers and Internet access
- The Internet is used regularly by at least 50 per cent of the population.
- All schools and libraries connected via high speed Internet
- The Internet is used as a business tool by at least 50 per cent of the businesses in the country
- All appropriate Government information and services available online
- More than 10,000 ICT professionals employed in the country
- Broadband Services available to at least 80 per cent of the population at the lowest unit cost in the Caribbean Region
- Community Access Centres in operation
- All Government Ministries connected to the Government Communications Backbone
- School-Net operational and used as a teachers' development tool
- e-Commerce (B2B) System being used by SME's
- At least 95 per cent of the population has access to Postal Services
- On Time Mail delivery increased to over 90 per cent



Goal 3

THE UTILITY SECTOR (WATER, SEWERAGE AND ELECTRICITY) WILL BE MODERN, CUSTOMER ORIENTED AND TECHNOLOGICALLY ENABLED TO PROVIDE EFFICIENT, COST EFFECTIVE, QUALITY SERVICES TO ALL CITIZENS

Policy Context

Adequate and reliable utility services are essential for development. Water and electricity are critical determinants of the quality of life of the population and are major components of the infrastructure base that supports industrial development for economic growth and expansion. The goal is to develop a modern utility sector that effectively uses technology to provide all citizens with efficient, cost effective and quality services.

Policy makers are faced with the challenge of catering to the basic needs of the population on the one hand, and the increasingly sophisticated demands of a dynamic and expanding economy on the other. In the context of its social obligations, the Government's policy has been to subsidise the cost of essential services to the population. At present, tariff structures for water and electricity are the lowest in the Region but should become more reflective of the economic costs of providing the services with special provisions for the indigent. Parallel measures must be taken to improve operational efficiencies of the Water and Sewerage Authority (WASA) and the Trinidad and Tobago Electricity Commission (T&TEC) with a view to improving their financial viability and self sustainability.

In respect of water and sewerage, the urgent requirements are:

- upgrading/replacement of the water distribution network
- extending the water distribution network to improve the supply to rural communities
- increasing the reliability of supply
- reducing the amount of unaccounted for water
- ensuring an adequate supply of water for fire fighting, particularly in urban areas
- refurbishment and upgrading of existing sewage treatment plants with a view to enhancing their functionality as well as minimising the negative impact on the environment in terms of contamination

of water sources and pollution of water courses

- expanding the centralised sewerage networks

In the case of electricity, there is a need for system expansion to cater for future industrial growth and to extend the network to meet the needs of rural communities.

Efforts to improve the efficiency and quality of services of WASA and T&TEC, utilising various forms of public/private sector arrangements for management and ownership have failed to transform them into viable self sufficient entities. Burdened with problems of operational inefficiency, these utilities continue to be a financial strain on the State.

In spite of initiatives to improve service delivery, large segments of the population still do not have access to a reliable and high quality service. While 92 per cent of the population has access to potable water, only 16 per cent receives a 24/7 supply; and a mere 30 per cent is served by central sewerage systems. The problem is more acute in rural communities as many in these areas are still, comparatively speaking, underserved with water and sewerage services as well as an electricity supply.

In light of the Government's Accelerated Housing Programme, massive proposed investment in the energy sector and industrial expansion, the existing distribution system for electrical power must be upgraded, especially

with respect to the supply to Port-of-Spain and the Northern parts of Trinidad. In addition, the major industrial developments in areas such as Wallerfield in the East and La Brea and Cap de Ville in the South will require significant investment in generation, transmission and distribution of water and electrical power in coming years.



Objectives to 2010

1.

Improve the financial viability and operational efficiency of WASA and T&TEC

2.

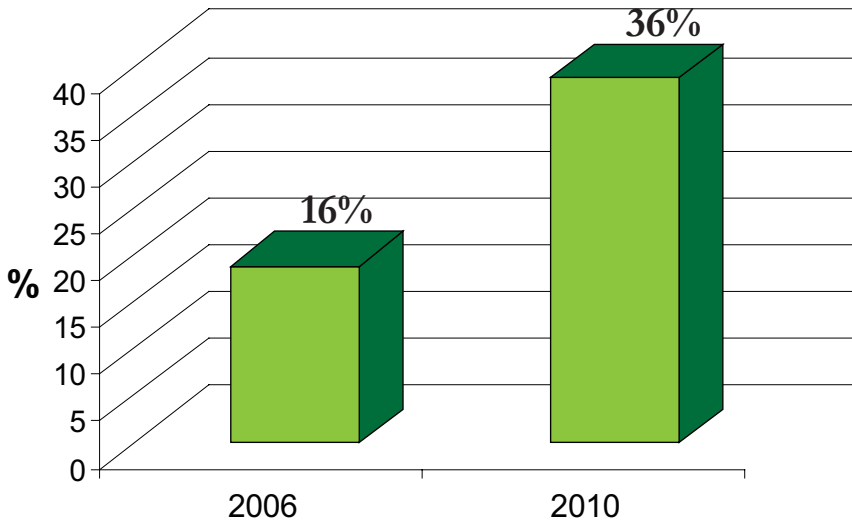
Expand the coverage and improve the quality of public utility services

Specific Targets for WASA to 2010

1. Increase access to a 24/7 water supply

Figure 4.5

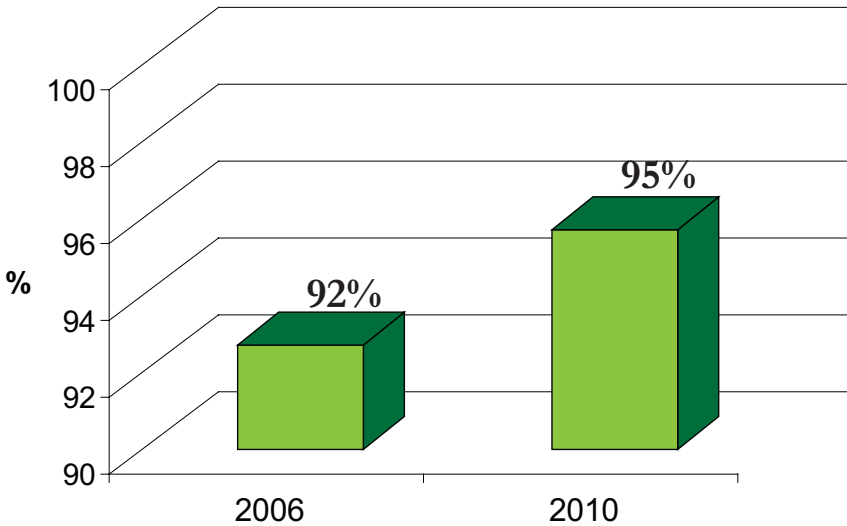
Percentage of Population with access to 24/7 water supply



2. Increase access to potable water

Figure 4.6

Percentage of Population with Access to Potable Water

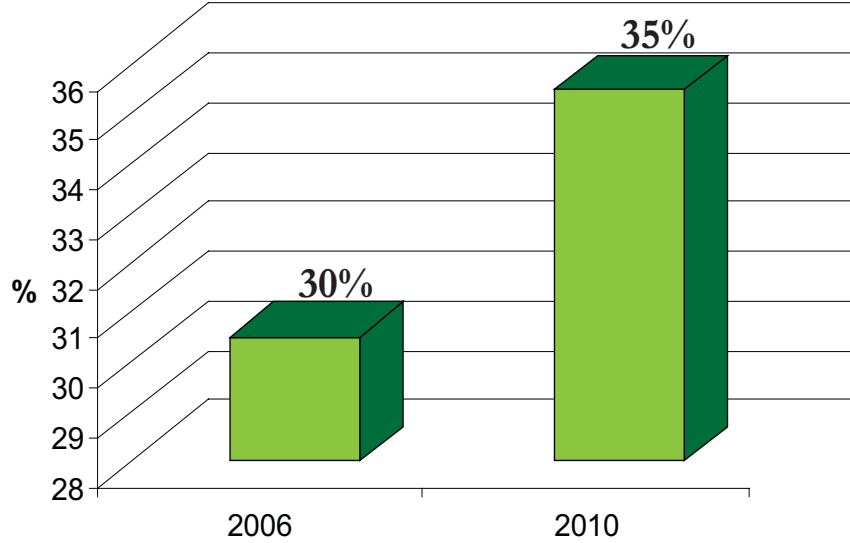


Source: WASA

3. Increase access to central sewerage services

Figure 4.7

Percentage of Population with Access to Central Sewerage Services

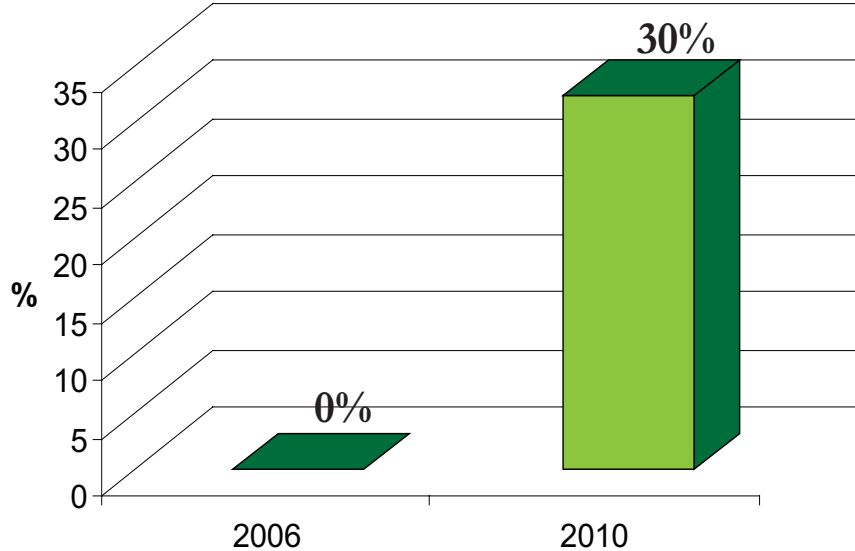


Source: WASA

4. Increase the number of households metered

Figure 4.8

Percentage of Households Metered

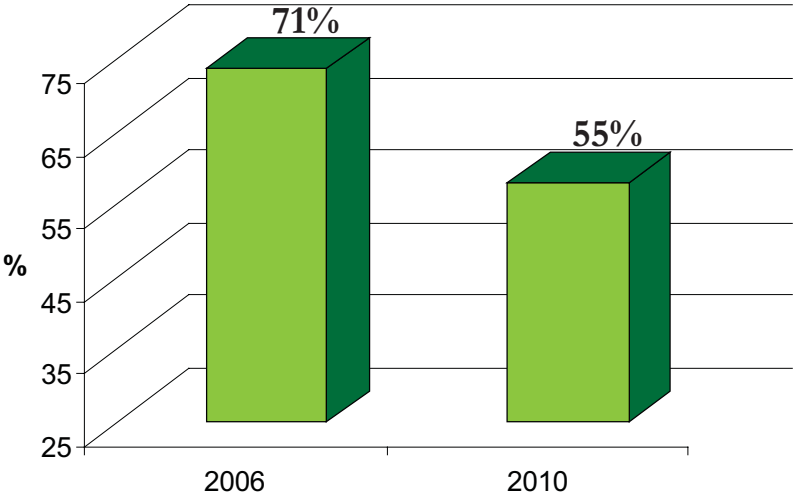


Source: WASA

5. Reduce unaccounted for water

Figure 4.9

Percentage of Unaccounted for Water



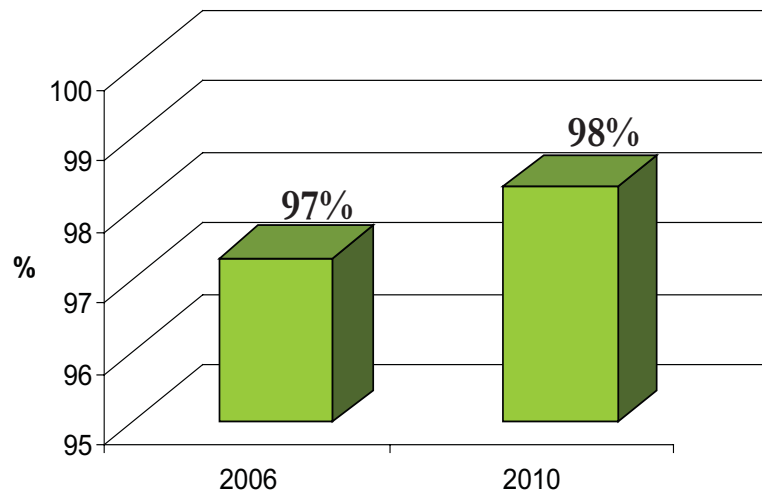
Source: WASA

Specific Targets for T&TEC to 2010

1. Increase access to an electricity supply

Figure 4.10

Percentage of Population with Access to Electricity

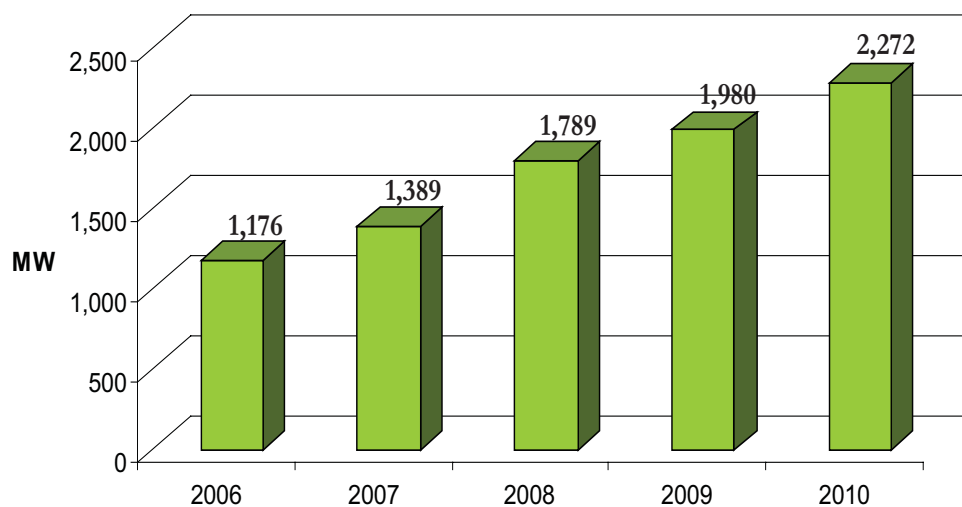


Source: T&TEC

2. Increase Bulk power

Figure 4.11

Bulk Power Requirements



Source: T&TEC

Strategies

Increase Water Production

Rehabilitation of wells will enhance production capacity. Leak detection programmes and replacement of damaged water mains will be implemented to significantly reduce unaccounted for water. In addition, new sources of water will be developed to, *inter alia*, meet the increased demand in areas identified for industrial development including La Brea, Mayaro, Wallerfield, Pt. Lisas and Tobago as well as increase production from sources capable of withstanding dry season fluctuations. In the context of optimising the use of water resources, a study will be commissioned to determine the costs and benefits of alternative water systems for special customer classes for example, non-potable water for wastewater systems.

Strengthen Water and Wastewater Quality Control Systems

Monitoring and control systems will be improved with the assistance of the Environmental Management Authority (EMA). A comprehensive management information system will be developed. To complement these efforts, wastewater treatment plants will be rehabilitated and modernised and measures will be taken to protect reservoirs and dams from contamination during the wet season.

Upgrade Sewerage Systems

In addition to the construction of new facilities, Government will rehabilitate existing private non-compliant facilities to bring them into compliance with approved environmental standards. In respect of new housing developments, developers will be required to ensure that appropriate and functional sewerage facilities are in place. Regulations governing development and operation of sewerage systems will be updated and strictly enforced.

Expand Power Generating Capacity

The growing demand for electrical power as a result of an expanding digital economy, new housing developments and industrial expansion throughout the country will cause electricity demand to surpass existing generating capacity over the Plan period. As a result, bulk power will be increased. In Tobago, plans are being formulated for the establishment of a new power station at Cove Estate to improve the reliability of supply to meet the development needs of the island. The electricity generated from that plant will also serve to reinforce the supply to North East Trinidad. Expansion of the transmission grid will be planned, financed and constructed in accordance with industry 'best practice'.

Increase Reliability and Quality of Electrical Power Supply

The use of live line work will be expanded to reduce/eliminate planned maintenance outages. In addition, the underground distribution network will be upgraded via utility corridors, especially in industrial parks to improve system reliability. Premium Power Parks will be established in industrial zones to generate ultra high power and reliability to industrial businesses at economic rates. The implementation of a system-wide Advanced Metering Infrastructure (AMI) System will provide, *inter alia*, continuous power quality monitoring.

Improve Street Lighting and Rural Electrification

To improve visibility and help in the reduction of night time accidents as well as provide a heightened sense of security and safety for citizens, T&TEC will continue to install new and upgraded street lights on primary and secondary roads and highways throughout the country under its National Street Lighting Programme. Particular attention will be paid to providing electrical power to poorly serviced areas. In this respect, the Rural Electrification Programme will be expanded and fifty-seven communities, mainly in the East, Central and South are targeted to receive a supply of electricity.

Modernize Distribution Networks in accordance with International Methods and Standards

The sector will be modernised through the introduction of state-of-the-art technologies. Programmes to effect all necessary upgrades to existing physical and plant infrastructure and equipment will be continued and new programmes will be initiated during the Plan period. In addition, new technologies will be monitored with a view to introduction where feasible thus enabling more efficient use of resources and the provision of better quality services.

Under its three-year Water Sector Modernization Programme (WSMP), WASA will expand and modernize its transmission and distribution system using island grids with robust transmission capacity and effective dedicated fire fighting mains. State-of-the-art water and wastewater treatment plants will ensure quality and reliable service.

Supply side programmes and systems will be implemented to ensure more effective distribution of water. WASA is moving toward the provision of 24 hour water service through network expansion. The development and implementation of the *Strategic Water Supply Grid* will improve transmission.

In respect of the power sub-sector, T&TEC proposes to replace the existing meter reading system with the Advanced Metering

Infrastructure (AMI) System, which is a centralised remote meter reading system designed to provide load profile data for planning, continuous power quality monitoring and accurate billing. In addition, modernization requirements dictate that the fibre optic network be expanded to (i) interconnect all substations, thus making operating data from the field available to operators at the System Control Centre and (ii) support broad band applications such as video for security systems and the backhaul system for the proposed AMI.

In its efforts to modernise the utilities sector, Government has initiated preparatory work to determine the feasibility of introducing a utility corridor³ in the country as a solution to improving the operational efficiency of the public utilities as well as the quality of the physical landscape. As part of the feasibility analysis, a pilot project will be developed for implementation in the City of Port of Spain that will involve establishing, on an entire street, a utility corridor comprising water, electricity and sewer lines.

Trinidad and Tobago already has some experience in the installation and maintenance of cabled underground systems. Both T&TEC and Telecommunications Services of Trinidad and Tobago Limited (TSTI) have invested in these structures at various locations throughout the country, each to facilitate its organisational operations. A

critical issue in the design phase of the utility corridor is the compatibility of utilities to be included. While telecommunications, power, cable and similar utilities are compatible and can be co-located within a multi-duct conduit, they are not inherently compatible with other utilities such as water, sewer, natural gas and petroleum. Another critical element in the design must be the inclusion of physical limitations to access. Moreover, a specific strategy will have to be developed to treat with flood prone areas.

Over the medium-term, a Utility Corridor Policy will be needed to set the broad parameters for the establishment and operation of such a facility. Emanating from the Policy Framework, a legal framework and/or a memorandum of understanding among all relevant agencies will be required to address issues such as the standards for materials used in the Corridor, the cost of establishment and maintenance, occupational, health and safety standards for workers functioning within the corridor, the location of the Corridor and disaster planning and management. Inter-agency collaboration will continue on the development and use of these corridors.

Ensure More Effective Management of the Utilities

Efforts will be initiated to improve the self-sufficiency and financial viability of the utilities. Measures to bring about internal

³ A Utility Corridor is a joint use facility or conduit constructed or installed within an access road/right-of-way that can accommodate a variety of utilities to minimize congestion of utilities and facilitate co-location, maintenance and access.

efficiencies that are in line with international 'best practice' for the sector will be instituted with the dual objective of increasing revenues as well as reducing operating costs.

Over the Plan period, investment in the sector will be informed by systematic programme development and implementation with built-in mechanisms for monitoring and evaluation of the performance of the sector. Collaboration with other agencies and Local Government Bodies as an integral part of business planning will also be implemented. Individual assessments will be undertaken to determine the most suitable public/private partnership arrangements for effective management and financing of the development initiatives for the utilities.

The recently approved Water Resources Management Policy has set the framework for promoting prudent and cost effective management of the country's natural water resources. Over the medium-term, the Water Resources Management Unit will focus on implementation of the Water Resources Management Action Plan, capacity building for an integrated water resources management system and the development of the legal and regulatory framework for the Water Resources Management Unit.

The Water Sector Strategic Plan and the related Water Sector Modernisation Programme (WSMP) provide WASA with the framework for the rehabilitation,

reconstruction and extension of the water and wastewater infrastructure.

Operational efficiency will be enhanced through reformation of systems, processes and procedures as well as the application of appropriate technology. Systems modernisation will include, *inter-alia*, the installation of inventory management and supervisory control and data acquisition systems to promote integration of customer information systems and computerised maintenance management systems.

Improve Accessibility for Vulnerable Groups

The Ministry of Public Utilities and the Environment will continue to implement its social intervention programmes which are designed to improve the quality of life of vulnerable families and communities through initiatives in the water and electricity sub-sectors. The National Social Development Programme (NSDP), implemented by both WASA and T&TEC to provide water and electricity or improve existing supplies to rural communities which are outside of the main distribution systems, will continue to fund infrastructural services to socially depressed communities including the construction and rehabilitation of wells and booster stations and the installation of pipelines. The Hardship Relief Programme will continue to provide financial relief to persons who are recipients of income support from the State through

the grant of an annual credit of \$70 to \$100 toward their water bills.

Institutional Strengthening of Stakeholder Agencies for Disaster Preparedness

Institutional strengthening of agencies in the sector and development of a plan of action for coordinated inter-agency collaboration for crisis management is a priority. Given the importance of functioning utilities to disaster recovery efforts, a combined approach to disaster preparedness has been formulated by T&TEC and WASA. Both utilities have implemented measures that are critical to systems reliability and the ability to maintain continuous service. These include upgrading and equipping Emergency Operating Centres (EOC) at WASA and T&TEC to meet emergency demands and developing systems for rapid response, emergency handling and recovery, establishment of safe shelters to house equipment and personnel and procurement of mobile plant and standby generating facilities for timely restoration of the water supply. To support these efforts, personnel will be trained in emergency response and a public education and communication plan will be implemented. Coordinated agency responses will also be developed for crisis management for example, in the case of fire fighting. Furthermore, the elimination of overhead electricity lines would reduce the vulnerability of the power supply to natural disasters.

Given the importance of early and accurate weather forecasts for disaster preparedness and management, the Meteorological Services Division will be utilising High Resolution Satellite Receiving Equipment in weather forecasting and the Doppler Radar and Automatic Weather Stations in weather monitoring.

Establish Appropriate Legal and Regulatory Frameworks for the Sector

The regulatory framework will be strengthened for more effective regulation of the sector with a focus on protection of consumers. This strategy involves the introduction of new quality management systems and standards for service delivery. Monitoring systems for service delivery failures will also be established to allow for the timely implementation of corrective measures.

In April 2004, new Quality of Service Standards came into effect for the Electricity Sub-Sector in a range of areas including: the response and restoration time after unplanned outages; billing punctuality; timeframes for connection to supply and for addressing high/low Voltage complaints, and the frequency of meter reading and testing. In the case of the supply and distribution of water and wastewater services, draft service standards are being prepared and will be implemented during the Plan period.

Major Projects

Repairs/Upgrade to Navet Water Supply System

The Project involves the replacement of a 35km main, the upgrade of the distribution network and the installation of meters at the Navet Water Works. Upon completion of work to the Navet Trunk Main, replacement of the distribution system along the trunk main and installation of the storage distribution reservoirs will be undertaken. This Project will reduce the loss of water from the pipeline network and improve the reliability of the water supply to customers in South Trinidad.

Three-year Water Sector Modernization Programme (WSMP)

The Programme will meet the current urgent demand for an increased water supply and arrest the degradation of the country's sewerage systems. The main components are:

- expansion and modernization of the Transmission and Distribution System through the use of island grids with robust transmission capacity and effective and dedicated fire fighting mains
- establishment of a Comprehensive Leak Management System to address the high level of water loss in the existing

distribution system. The focus will be on water mains with more than seven leaks per km per year (four breaks /km/year is the utility standard)

- development of new water sources to:
 - immediately meet the increased demand in areas identified for industrial development (La Brea, Mayaro, Wallerfield, Pt. Lisas and Tobago)
 - increase production of water from sources capable of withstanding dry season fluctuations
 - provide localised water supply infrastructure needed to improve reliability
- development of the Wastewater Sector to:
 - expand public sewage treatment coverage
 - rehabilitate existing malfunctioning private-packaged plants and NHA wastewater treatment plants

Rehabilitation work will be undertaken to WASA's wastewater treatment plants in Arima, Penco, Techier, Trincity, Santa Rosa, Lange Park, Chaguaramas, St. Joseph, Piarco and Scarborough. Priority will be given to rehabilitation work at the Lange Park Facility and its integration with the plant at Edinburgh.

In addition, seven private wastewater treatment plants at Palmiste, Sunkist, Paradise Gardens, Gulf City, Ridgewood Heights, La Resource and La Florissante will be rehabilitated. Priority will be given to the rehabilitation of plants at Palmiste, Sunkist and Gulf City

- remove potential threats to public health caused by the contamination of both surface and groundwater

The development of the Matura/Salybia Water Source is another key project under this Programme. It involves the construction of water treatment plants in Salybia and Matura; a reservoir at Matura; and a network of transmission pipelines from Salybia to Matura.

The Programme also involves the commissioning of the Water and Wastewater Master Plan which will prioritise the initiatives for the long-term to achieve the goals of 24/7 water supply to 100 per cent of the population and centralized sewerage services to 75 per cent by the year 2020.

Moruga Water Supply Project

The Project comprises the following activities:

- construction of a dam in the Iniss River and a treatment plant below the Dam with a clear water storage reservoir
- building of a barrage on the Moruga River

- construction of a pumping station at the treatment works site to supply areas in St. Patrick, Naparima and Moruga, and reservoirs in Basse Terre and La Lune
- laying of transmission mains from the treatment plant to serve Point Fortin and to service reservoirs in Penal and Siparia
- building of service reservoirs at Penal, La Lune and Basse Terre

The Project will improve water distribution in the South East, South West and Central regions. Specifically, it will (i) increase supply to the industrial estates within Point Fortin and Cap de Ville; (ii) improve the domestic supply to La Romain, Moruga, Barrackpore, Penal, Siparia, Fyzabad, La Brea and Point Fortin; and (iii) redistribute supply to the Navet and Caroni Systems to better serve communities within Central and South East Trinidad.

Upgrade of Water Distribution Systems

To upgrade existing water distribution systems the following will be undertaken:

- improvement works to water treatment plants located in the Heights of Aripo, Caura Valley and Maracas Valley
- reconstruction and rehabilitation works to service reservoirs at Matura, Mohammed Trace, St. Augustine, at Ghandi Village and Puzzle Island

- construction/rehabilitation of booster pumping stations in Biche, Rich Plain, Dades Trace and adjacent areas
- refurbishment of water treatment facilities at Petrotrin

Short Term Water Investment Programme

This is an ongoing Project that focuses on pipeline replacement, installation and rehabilitation/construction of booster stations throughout the country. Over the medium-term, defective and undersized mains at Vessigny and Point Fortin will be replaced and a pipeline will be installed in Maracas Valley to improve service to these areas.

Paramin Water Supply Project

This Project focuses on the development of new water sources in Paramin and the rehabilitation of existing booster stations and storage tanks to serve the more elevated regions. The current pumping capacity at each level is inadequate to meet the total demand of the areas served so that disruptions in the operation of the pumps at any level affect the operation of all boosters at higher levels. These new watersources are necessary because of the fluctuating water supply caused by the breakage of a twelve inch main resulting in low water pressure and frequent disruption of supply for the mostly agricultural community. This Project will

provide a reliable water supply to some 2,174 residents at high elevations

Construction of New Water Supply Facilities - Mamoral Dam and Reservoir Project

New water supply facilities at Caparo and Mamoral will be constructed to trap excess water that causes flooding and to treat and redistribute water to Navet and other areas. The Project involves the following: (i) preparation of detailed studies relating to water supply development; and (ii) construction of Mamoral Flood Retention Facility and water supply network.

Rehabilitation of the San Fernando Wastewater Treatment Plant and Integration of Sewerage Areas

Wastewater and sewerage systems in San Fernando and environs will be improved. New facilities will be constructed and integrated with the San Fernando Wastewater Treatment Plant while existing facilities will be rehabilitated. The main components of the Project are:

- construction of a lift station and support works in Tarouba and the construction of sewers between the Tarouba and San Fernando Wastewater Treatment Plants
- reconstruction of the existing Wastewater Treatment Plant in Palmiste and the integration of the Sunkist Facility

- upgrading of the Lift Station at Pleasantville and the construction of trunk sewers between Pleasantville and San Fernando
- reconstruction of the San Fernando Wastewater Treatment Plant

Over 55,000 individuals will benefit from these improvements.

South West Tobago Environment and Wastewater Project

The overall objective of the Project is the improvement of wastewater management in Tobago. The major components are:

- *Facilities Rehabilitation*
Facilities for the collection, treatment and disposal of wastewater in South West Tobago will be rehabilitated and the Scarborough Wastewater Treatment Plant will be fully utilised
- *Coastal Zone Management Initiatives for Tobago*
A number of initiatives will be undertaken to address coastal management in Tobago. They include:
 - development of a Master Plan for Coastal Management in Tobago
 - development of a public awareness and education campaign
 - watershed management
 - addressing environmental issues at Charlotteville and Speyside

- establishment and enforcement of a regulatory framework to govern waste disposal from ships

Development of Disaster Preparedness Capabilities of WASA

The disaster preparedness capabilities of WASA will be developed to ensure that contingency plans and crisis management systems are in place for continuous water provision or immediate restoration of water services to residents across the country following disasters.

This will involve the acquisition of back-up equipment and emergency spares, establishment of emergency centres, installation of communications systems, the conduct of vulnerability risk assessments, equipping of wells, and the provision of training and proper storage facilities for fuel.

The procurement of a mobile plant and standby generator facilities is an integral part of emergency planning. This mobile facility will provide for the timely restoration of a water supply to rural communities in the event of a loss of service.

Expansion of T&TEC Infrastructure for Bulk Power Requirements

In order to provide a reliable and adequate supply of power and to support the ageing

transmission infrastructure, the bulk power capacity of T&TEC will be expanded through the implementation of development plans for North, East and South Trinidad.

North Development Plan

The transmission and substation works involve the establishment of the following:

- 132 Kilovolt (kV) Tower Line at Bamboo-Sealots
- 132kV Cable Circuit at Sealots/Gateway
- 132kV Tower Line at Bamboo/Mt. Hope
- 66kV Overhead Line at Mt. Pleasant/Diamond Vale
- 66kV Overhead Line at Carenage/Mt. Pleasant
- 132/33kV Substation at Gateway
- 132/33/12kV Substation at Mt. Hope
- 33/12kV Substation at Edward Street
- 33kV GIS at Invaders Bay
- 33kV Substation at St. James

The Bamboo 132kV Substation will also be upgraded.

East Development Plan

This Plan involves the establishment of tower lines and substations as follows:

- San Rafael/Wallerfield - 132kV Tower Line
- Pinto Road/ Wallerfield - 66kV Tower Line
- Wallerfield - 220/132/66/12kV Substation
- Upgrade Pinto Rd - 66kV Substation

- Macoya - 66/12kV Substation

South Development Plan

This Plan involves reinforcement and extension of the existing transmission network and establishment and upgrade of substations, as follows:

- Reform/Debe - 220kV Tower Line
- Debe/ Union - 220kV Tower Line
- Debe/Penal - 132kV Tower Line
- Chatham/Union #1 and #2 and the Union/Reform#1 and #2 - 132kV circuits
- B.C./ Reform#3 and #4 - 132kV Circuits
- Union 132kV - (220kV) Substation
- Reform - 132kV Substation
- Debe - 132kV Substation
- Brighton - 66/12kV Substation
- Upgrade - Galeota Substation
- Upgrade - Santa Flora 33kV Substation
- Tarouba - 66/12kV Substation

National Street Lighting Programme

This is an ongoing Project. To ensure public safety and security, at least 82,000 new streetlights will be installed, about 36,000 lamps will be upgraded from 70W to 150W luminaries, and approximately 80 km of new highways and primary roads will be illuminated. Street lighting for new housing developments and areas prone to criminal activities will also be addressed. The new street lights will be distributed across the country as follows, Central 7,960, East

4,600, North 9,020, South 47,500 and Tobago 12,920.

Development of Disaster Preparedness Capabilities of T&TEC

A disaster preparedness plan will be developed to aid in the minimisation of disorder and the early restoration of an electricity supply in the event of natural and man-made disasters. The Plan will also foster speedier response to loss of key public services.

The Project has several components, including the purchase of plant/special equipment; implementation of public education and communication programmes; training of personnel for emergency efforts during and after a disaster; conduct a vulnerability assessment; establishment of an emergency operational centre; designating of safe shelters; and acquisition of inventory stores and supplies.

Illumination of Recreation Grounds and Parks

This Project involves the illumination of recreation grounds and parks in order to create a safe environment where citizens can become involved in sports and other community activities


New Building for Meteorological Services

A two-storey facility will be constructed at Piarco to house the Observatory and Forecast Office of the Meteorological Services Division. This facility will enhance the Division's capabilities to adequately monitor weather and climate changes.

National Social Development Programme

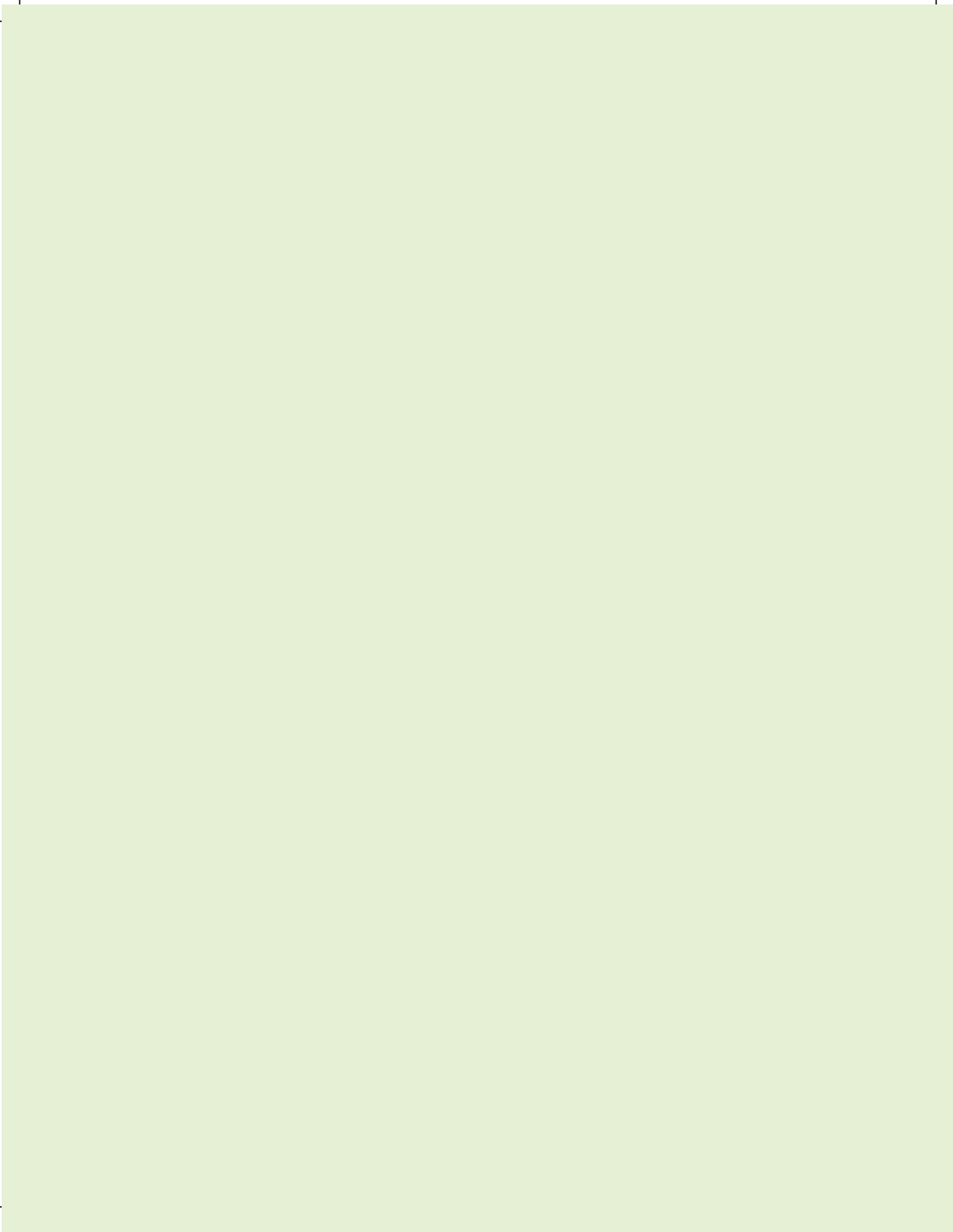
This Programme which is being implemented by the Ministry of Public Utilities and the Environment will continue to bring relief to deprived and underdeveloped communities by the following:

- improving the water supply, street lighting and electrification of residences and community facilities
- funding infrastructure developments such as construction and rehabilitation of wells and booster stations and installation of pipelines
- encouraging and complementing self-help initiatives aimed at improving community centres, sporting and recreational facilities and other community amenities



Targeted Outcomes

- At least 36 per cent of the population has access to 24/7 water supply
- At least 95 per cent of the population has access to potable water
- At least 35 per cent of the population has access to central sewerage coverage
- At least 30 per cent of households metered
- Unaccounted for water reduced to less than 55 per cent
- At least 98 per cent of the population has access to electricity
- Quality of Service Standards for WASA established and maintained
- Financial performance of WASA and T&TEC improved
- Bulk Power increased to at least 2,272 MW
- Wastewater treatment plants established in San Fernando and Southwest Tobago
- At least 82,000 new street lights installed and 80 km of new highways and primary roads illuminated
- New power station established at Cove Estate, Tobago established



Goal 4

THE ENVIRONMENT WILL BE VALUED AS A NATIONAL ASSET AND CONSERVED FOR THE BENEFIT OF FUTURE GENERATIONS AND THE WIDER INTERNATIONAL COMMUNITY

Policy Context

The environment is an important component of the wealth of the country and is inextricably linked to the health and wellbeing of citizens. In many ways, it is also inseparable from our distinctive culture and sense of identity. The goal is to ensure sustainable development by balancing development and conservation needs to create a strong economy and a clean and healthy environment.

Like other small island states, Trinidad and Tobago has a fragile natural resource base which allows limited room for error in its utilisation and management. Most economic activity in the country depends on the use of natural resources. As such, continued expansion of the energy, tourism, agriculture and manufacturing sectors will have implications, direct and indirect, for the state of the environment.

The current state of the environment is a cause for concern. As one of the most industrialised countries in the Caribbean, Trinidad and Tobago experiences some of the environmental problems of the industrialised world while still having to deal with the issues that characterise developing countries as well

as those peculiar to small island states. Overexploitation of resources, pollution, insufficient watershed management, inadequate waste and wastewater systems, deforestation of hillsides, degradation of marine ecosystems and loss of wetlands and biodiversity are conditions that challenge the sustainability of the country's environmental resources. Moreover, the increasing frequency of storms and hurricanes in the Caribbean Region poses additional challenges. Without proper systems and mechanisms to deal with these matters, sustainable development will not be attainable.

A survey of communities, the public, environmental experts and non-governmental

organisations undertaken in 2001⁴ identified the environmental priorities of Trinidad and Tobago as the following:

- water pollution
- sewage and industrial effluent
- waste management, inclusive of domestic, commercial, hazardous and solid waste
- litter
- coastal zone degradation
- watershed management/deforestation
- air pollution
- vehicular and industrial emissions
- public participation, awareness and education

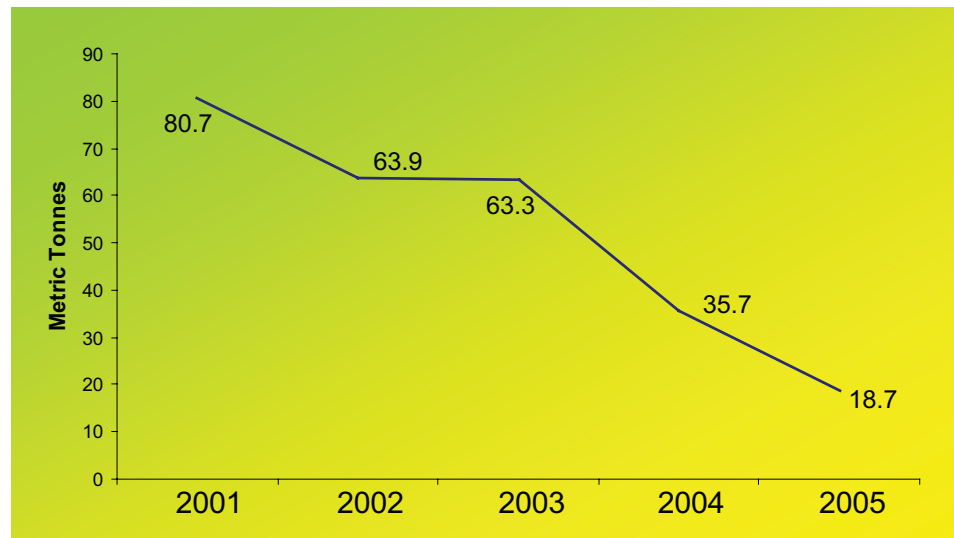
In addition, some of the environmental problems the country faces are global in nature and require collaboration at the

regional and international levels. The generation of greenhouse gases, the increasing trade in biological species, transboundary movement of toxic and hazardous waste, the rights to and ownership of biological resources have all led to negotiations among countries and the adoption of agreements in the form of conventions and protocols. Trinidad and Tobago is committed to fulfilling its obligations under the various agreements. As an example, the consumption of chlorofluorocarbons has declined significantly in keeping with the target of a complete phase out by January 1, 2008 (Figure 4.12).

Environmental literacy surveys conducted by the Environmental Management Authority (EMA) have indicated that there

Figure 4.12

Trinidad and Tobago: Consumption of Chlorofluorocarbons



Source: Environmental Management Authority

⁴ Sustainable Economic Development Unit, Department of Economics, Faculty of Social Sciences, UWI, St. Augustine. "Environmental Priorities in Trinidad and Tobago", Report to the Environmental Management Authority, October 2001.

is a widespread lack of awareness of environmental issues among the population. As a result, a priority must be to change behaviours and attitudes towards the environment by fostering greater public awareness through education campaigns at all levels. A culture of shared responsibility and respect and care for the environment through our personal behaviour and professional conduct must be promoted.

In 2006, a revised National Environmental Policy was approved by the Government. Implementation of the Policy is being guided by five basic principles:

- respect and care for the community of life
- keep within the country's carrying capacity
- empower communities to care for their own environments
- polluter pays principle
- precautionary principle⁵

One of the key challenges is to ensure that environmental considerations are consistently made an integral part of the policy design and decision making processes. The implications of all policies for the environment must be carefully analysed prior to implementation.

This approach has been embraced in the Comprehensive Economic Development

Plan (CEDP) for Tobago (2006-2010). Inspired by the natural resources and environment of Tobago, a major goal of the CEDP is the branding of Tobago as **'Clean, Green, Safe and Serene'**.

As we move toward developed nation status, we must conserve and wisely use our environmental resources to provide for the needs of present and future generations and to enhance the quality of life of all citizens. This means that we must improve governance arrangements for the environment, strengthen the enforcement of environmental laws and regulations and promote sustainable development principles and attitudes.

Government will address the environmental challenges we face through continuous proactive planning and re-assessment of management methods along with legislative, educational and programme intervention strategies. Practices that create environmental deficits need to be mitigated and reversed where possible, so that future generations will not inherit an environmental debt that can impair their quality of life. Since most economic decisions have environmental consequences, we must ensure that rapid growth does not come at the expense of the environment.

⁵ The Precautionary Principle will ensure that if there are threats of serious irreversible environmental damage, lack of full scientific certainty will not be used as a reason for postponing measures to prevent environmental degradation.



Objectives to 2010

1.

Prevent, reduce or where possible recycle all forms of waste

2.

Treat wastewater in accordance with world standards

3.

Conserve and enrich the vitality and diversity of our natural environment

4.

Create environmental infrastructure that enhances the quality of life of all citizens

5.

Promote judicious national physical development and the sustainable use and management of environmental resources

6.

Instil an attitude of care and respect for the environment among all citizens

7.

Empower stakeholders including communities to care for their own environments

8.

Integrate the principles of sustainable development into national policies and programmes

Strategies

Strengthen the Institutional, Legal and Regulatory Framework.

Over the medium-term, Government will continue to implement the National Environmental Policy and to update all relevant legislation. In addition, the monitoring and enforcement of laws and regulations will be strengthened.

Pollution control will be enforced through a system of permits or licenses, which will set pollution limits or performance standards for air, noise, water, waste water and hazardous substances. The system of permits will also include environmental monitoring and reporting requirements.

Among the specific initiatives that will be undertaken to treat with environmental concerns are:

- implementation of the Draft Water Pollution Rules and the Water Pollution Regulations and enactment of legislation relating to Beverage Containers
- development of an Ambient Air Quality Index, a Noise Level Index, Water Quality Standards, Wastewater Treatment Plant Standards, Vehicle Emissions Standards, and implementation of Rules for the Handling and Disposal of Hazardous Wastes

- implementation of the National Action Plan to Combat Land Degradation
- implementation of a permitting system which will require industries to upgrade pollution control, in the first instance, to the Best Practicable Technology (BPT), significantly upgrade existing plants to the Best Available Techniques Not Entailing Excessive Costs (BATNEEC) and utilise Best Available Techniques (BAT) in the establishment of new plants.
- implementation of an Integrated Water Resources Management Policy
- amendment of the Motor Vehicle and Road Transport Act to provide for mandatory testing of exhaust emissions as part of the Vehicle Inspection Programme and for the implementation of vehicle emissions standards
- control of emissions of toxic wastes from industrial sources through the introduction of environmental management systems and the auditing of industrial emissions

Legislation is also being developed to deal with the illegal trade in forest products and other biological resources. The approval requirements for logging will also be streamlined.

In terms of land use planning, the emphasis will be on the following:

- preparation of an updated National Physical Development Plan

- development of local area plans for the cities, boroughs and towns that will make provision for more green recreational spaces in the urban centres
- update of the policy for hillside development with a view towards limiting disturbance of vulnerable slopes and minimising alteration of the natural topography and land-form
- revision and updating of existing land use plans and polices that would segregate land use activities in such a manner as to reduce the negative impact of nuisance uses upon human activities
- development of integrated coastal zone management plans to protect the sensitive coastal and marine environments especially in Tobago and the north and east coasts of Trinidad

With respect to the institutional framework, efforts will be made to strengthen the resource capability of the Town and Country Planning Division of the Ministry of Planning and Development, the Environmental Management Authority, the Forestry Division and the Local Government Bodies.

Furthermore, a National Council for Sustainable Development will be established that will bring together different groups within the society to ensure that an agreement is reached on policies and activities for sustainability. The formation of this Council

will also serve to bring together, under one umbrella organisation, the work of the smaller Ministerial and Cabinet Intersectoral Committees already established to address environmental issues.

Protect Natural Resources and Sensitive Species of Flora and Fauna.

One of the major threats to this country's biodiversity is deforestation, which results from poor agricultural practices, illegal logging, quarrying, and forest fires. This denudation has contributed to land erosion, watershed degradation, a significant reduction in the wildlife population and the overall degradation of the forest ecosystem.

The country's natural resources will be protected and the diversity of the natural environment preserved through several initiatives. These include management of parks and wildlife, continuation of the National Reforestation Programme, development and implementation of management recovery plans for environmentally sensitive species and the identification and designation of Environmentally Sensitive Areas⁶. Specifically, emphasis will also be placed on the following:

⁶ Designated areas that are significant to the country's national heritage and are of great importance to the sustenance of life, science, the country or the international community.

- development and implementation of integrated programmes emphasizing watershed, wildlife and wetland management
- optimisation of timber production from natural forests and commercial timber plantations
- provision of incentives and other support to encourage private landowners and community groups to undertake reforestation and other forest management programmes
- the conduct of a national forest inventory
- implementation of the National Biodiversity Strategic Action Plan
- updating of the system of National Parks and Protected Areas Plan of 1980
- designation of Environmentally Sensitive Areas and implementation of co-management plans with local communities for Matura National Park, Buccoo Reef, Nariva Swamp, Aripo Savannah and Speyside
- designation of environmentally sensitive species under the Environmentally Sensitive Species and Implementation of Species Recovery Plans

Improve Waste Management

The Solid Waste Management Company Limited will continue to work on the establishment of a National Integrated Waste Management System (NIWMS). Where possible, satellite systems to support the National System will be established to reduce the strain on the landfills and promote

nationwide acceptance of waste separation. These support systems will include community composting facilities, as well as storage facilities for other valuable non-biodegradable wastes such as metals, plastics and glass. The development of an Integrated Waste Management System would significantly reduce the number of dumpsites in the country as well as lessen citizens' inclinations to engage in illegal dumping.

To address the problem of hazardous waste management, the EMA is in the process of drafting the Hazardous and Non-Hazardous Waste Rules. Additionally, a national inventory of hazardous waste will be prepared to determine the amount and type of hazardous waste generated in the country and how such waste is currently treated. The results of the study will provide the information necessary to plan a management system for hazardous waste. The EMA will also continue the remediation of lead contaminated sites throughout the country.

Promote a Clean, Green and Environmentally Sensitive Trinidad and Tobago

The adoption of clean and safe environmental practices at both the community and business levels is essential. In an effort to foster a greater sense of care and respect for the environment, environmental programmes will be organised and implemented by communities.

Businesses will be encouraged to become 'Green Businesses' and to support the conservation of the environment by complying with environmental regulations, reducing waste, preventing pollution and conserving water and energy resources.

Government will also take steps to encourage 'greening' of public spaces and communities through the planting and maintenance of trees and other suitable vegetation along streets and at sites allocated for this purpose in residential, commercial and industrial areas. In addition, denuded watersheds such as the Northern Range in Trinidad and Courland in Tobago will be reforested.

Regulate and Control Outdoor Advertising

The proliferation of outdoor advertisement and the display of billboards in prominent locations along highways and major arterial roads, on bus shelters, on boundary walls and fences and within the boundaries of residential properties has resulted in visual clutter. Furthermore, billboards distract drivers' of vehicles, obscure scenic views and detract from the character and attractiveness of an area. As part of the strategy to improve the condition of the environment, the Advertisement Policy will be stringently enforced to regulate and control the erection of structures for and the display of outdoor advertisements in the country. Specifically, the Policy:

- details the areas where erection of billboards/hoardings and the display of outdoor advertisements will be permitted
- outlines the circumstances under which such displays will be permitted
- identifies the types of signs and advertisements that will be permitted or prohibited in specified areas
- identifies the areas where erection of billboards/hoardings and the display of advertisements will be prohibited and the reasons for their prohibition
- facilitates the orderly placements and aesthetic design of outdoor advertisements in the interest of public safety and visual amenity
- provides guidelines for a consistent approach to regulating outdoor advertising

Promote Greater Environmental Awareness

A major challenge is the need to change the perception that the Government has sole responsibility for protecting and preserving the environment. To address this issue, Government will mount a comprehensive initiative to promote sustainable use of environment resources.

This will include programmes to build environmental awareness and improve environmental education to achieve a change in culture towards the environment. Environmental education will be introduced at every level of the school system including

specially designed programmes at the pre-school level. A broad spectrum of approaches and activities will be embraced including both formal and informal methodologies. In order to facilitate these efforts, teachers will have access to environmental education, training and resource materials. In addition, workshops and training programmes will be conducted to educate community groups.

An important element of the National Environmental Policy is the application of economic instruments and market incentives to encourage sustainable use of resources and the reuse and recycling of waste. In order to address the issue of the improper disposal of beverage containers, the EMA has finalized a Draft Beverage Containers Bill, which is intended to encourage the reuse and/or recycling of container waste and to discourage the wasteful, unsanitary and environmentally degrading practice of improper disposal of empty beverage containers. Incentives will be offered to manufacturers, vendors and consumers to reuse or recycle these containers, including a deposit and refund system. In addition, a waste sorting system will be introduced which will require all households and business places to separate their waste according to material (paper, glass, aluminium etc.), before it can be processed.

In terms of water and electricity, demand side management programmes will be implemented to educate consumers and encourage conservation and wise use of

resources. Government will also implement measures to promote conservation by encouraging the installation of water pressure limiting and power saving devices in homes and offices, water reuse or recycling wherever possible and paper recycling.

Build Strong Partnerships among Environmental Stakeholders

Preserving the environment is a shared responsibility involving all citizens. As a result, co-management of natural resources by the Government, private sector, communities and non-governmental organisations will be promoted.

Develop Renewable Sources of Energy

Environmental quality, climate change, energy access and security, and sustainable development are among the factors propelling the search for renewable energy applications. Trinidad and Tobago, with an abundant supply of hydrocarbons, is currently dependent on traditional sources of energy such as natural gas for energy generation. However, this resource is limited. Over the medium-term, Government will support the development of new cleaner renewable energy sources particularly those that capture energy from on-going natural processes such as sunshine, wind, flowing water (hydropower), and biological processes such as anaerobic digestion.

Reform Policy Making

Government policy has a major impact on economic activity, and by extension impacts the environment, directly and indirectly. Managing interrelationships among economic, social and environmental objectives is complex, especially when long-term sustainability is taken into consideration. The policy making process must therefore be comprehensive to ensure that environmental considerations are incorporated consistently in all plans, programmes and projects and that the principle of sustainability is not compromised.

Strengthen Capacity for Environmental Data Management and Develop Environmental Measurement Indicators and Tools

Limited and outdated environmental statistics fail to provide insight into Trinidad and Tobago's present environmental condition in comparison to that of other countries. Further, there is insufficient data to determine the effectiveness of national strategies and interventions.

As such, a comprehensive data collection system will be developed to monitor several important indicators including cumulative greenhouse gas emissions, recyclable waste, forest cover, pollutant levels, the status of threatened plant and animal species and compliance with international agreements.

The development of a compendium of environmental statistics forms an integral part of the data collection initiatives.

Introduce Environmental Accounting

Environmental performance is increasingly becoming one of the yardsticks to measure both a nation's and its companies' performance, complementing the traditional income-centred measures. Companies will be encouraged to implement environmental accounting systems, which will make related environmental costs more transparent and provide the opportunity to find ways to reduce or avoid these costs. Since sustainable development includes economic and environmental dimensions, it is essential that national accounts reflect the use of natural assets. Conventional national accounting focuses on market activity. For a more comprehensive assessment of sustainability, the use of non-market assets, resource depletion and the cost of environmental degradation must also be included. Over the medium-term, an Environmental Unit will be established in the Central Statistical Office to develop an integrated system for 'greening' of the national accounts, consistent with internationally accepted standards.

Participate in Protecting the Global Environment

The commitment to protect and conserve the environment is also driven by the country's

obligations to adhere to several international conventions and agreements to which it is Party. The Ministry of Public Utilities and the Environment is responsible for monitoring and reporting on the implementation of several agreements and conventions (Box 4.3).

Box 4.3

International Conventions and Protocols Related to the Environment

The Ministry of Public Utilities and the Environment is the focal point for the following:

- United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol
- Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer
- Convention on Wetlands of International Importance especially as waterfowl habitats (Ramsar)
- Convention on Biological Diversity (CBD)
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity
- Convention for International Trade in Endangered Species of Wild Flora and Fauna (CITES)
- United Nations Convention to Combat Desertification (UNCCD)
- Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region and its Protocols Concerning Pollution from Land Based Sources and Activities (LBS), and Specially Protected Areas and Wildlife (SPAW)
- The United Nations Convention to Control of Transboundary Movement of Hazardous Wastes and their Disposal (Basel Convention)
- Stockholm Convention on Persistent Organic Pollutants (POPs)

Major Projects

Study for the Rehabilitation of Closed Landfills

Six closed landfill sites at Toco Road; Cedros; Shipping Road, Chaguaramas; Cushe, Rio Claro; Parry Lands, Siparia; and Friendship, Tobago, are situated in environmentally sensitive areas. To eliminate public health risks, these sites will be assessed to determine the best course of action for their remediation. In addition, protection of surface and ground water systems from potential contaminants in leachate from these sites and conversion of remediated landfills for alternative uses within the community will be initiated.

Creation of an Ambient Air Quality Monitoring Network in Trinidad and Tobago

To facilitate the gathering of information regarding air quality, two additional monitoring stations will be installed. These stations will assist in assessing probable health impacts of air quality and formulating measures to reduce air pollution and protect human health. This information will inform public advisories leading to the prevention of exposure to damaging substances.

Drafting of the Waste Management Rules

Many of the problems associated with the improper handling, storage and disposal of wastes can be avoided by implementing more effective waste management controls. As such, Waste Management Rules will be formulated and implemented to ensure that the management of waste is undertaken in an environmentally sound manner. Implementation will be facilitated by the provision of supporting infrastructure and conduct of educational awareness programmes.

Development of a Database - Marine Environment

In order to facilitate timely reporting on the state of the marine environment, a system of reliable data collection and management will be implemented. Such a system will support scientific investigation of the marine environment. The Project involves the collection and collation of all available data on physical oceanographic conditions and resource-use activities in the marine environment.

Sustainable Management of the Wildlife Resources in Trinidad and Tobago

This Project will be undertaken to promote the sustainable management of the wildlife

resources in Trinidad and Tobago. It is scheduled to cover a ten-year period with implementation on a phased basis. A training component for research activities will first be undertaken followed by a six-month pilot study to assess the widespread applicability of the research methodologies. The five major components of the Project are:

- rehabilitation of wildlife resources
- development and implementation of co-management programmes for the protection of the endangered leatherback turtle and enhancement of the manatee population and habitat
- conduct of research studies to assess the status of wildlife resources and habitats
- development and implementation of management plans to promote sustainable use of wildlife
- implementation of a national awareness programme on the importance of wildlife resources

Development and Implementation of Management and Recovery Plans for Environmentally Sensitive Species

The pawi, manatee, the sabre wing hummingbird and identified species of marine turtles have been labelled as environmentally sensitive species. To ensure the protection and survival of these species, the development of management and recovery plans along with the associated research will be undertaken. Through

collaborative approaches, linkages with local and foreign research organisations will be developed to provide up-to-date information on the status of the country's endangered species.

Lead Remediation in Trinidad and Tobago

Two lead contaminated sites, one in La Chance Trace, Arima and the other in Nurse Trace, Guayaguayare pose a serious threat to the overall health and well-being of citizens in these areas. Groundwater sources that may be located in the area are also threatened with contamination. To properly sanitize the area and restore these sites to an acceptable standard, the contaminated soil will be removed in keeping with environmentally sound methods.

Biodiversity Assessment of Trinidad and Tobago

To enable integration of biodiversity conservation objectives in the national planning of Trinidad and Tobago, a biodiversity assessment will be conducted. Government Ministries and State Agencies will use the information derived from this assessment in their annual planning activities.

Design and Implementation of an Education and Public Awareness Campaign to Achieve Waste Management Objectives

To raise public awareness of the effects of indiscriminate and irresponsible disposal of solid waste and its contribution to other environmental and health problems in the country, a public education and awareness campaign will be implemented. The Project will also involve the production of a five-minute documentary focusing on waste management as well as relevant media advertisements.

National Reforestation and Watershed Rehabilitation Programme (NRWRP)

This is an ongoing Programme involving the reforestation of 5,000 acres of State lands over a period of five years as well as the maintenance of these acreages for a further five years. Community groups are contracted to undertake site preparation, replanting and maintenance works.

Re-afforestation of the Denuded Northern Range

In order to restore this important watershed, and address the problem of flooding and landslides, trees will be replanted in denuded areas of the Northern Range under this Project.

Improvement of Forest Fire Protection Capability

To control the spread of forest fires, a fire patrol system will be developed and implemented along with support services. Vehicles will also be purchased to strengthen capacity to deal with forest fires. Additionally, educational documents will be published to educate the public on the dangers of forest fires and the damage to watersheds.

Establishment of a Statistical Database

Developing a statistical database will facilitate the improved management of the country's natural resources thereby ensuring conservation of the environment. It will also strengthen the Government's capability to make informed policy decisions. Existing data bases will be reviewed to identify data gaps and data collection activities will be initiated. The exercise will improve communication and data exchange among relevant agencies which collect and analyze statistical data, network the existing sources of data into one comprehensive database as well as lay the foundation for the development of a Geographical Information System relating to the country's natural resources.

National Parks and Watershed Management

This Project focuses on maintenance and construction work on recreational and

environmental sites as well as the planting and tending of seedlings. In addition to the aesthetic benefits, the Project will impact positively on watershed levels.

Community Based Environmental Protection and Enhancement Programme

This Programme will continue to allow for greater involvement of communities in improving the state of the environment. It includes the collection, sorting and removal of garbage from public roadways, water courses and coastal areas inaccessible to other waste collectors and beautification of existing dumpsites. It also involves the development of yard waste composting facilities and recycling centres and the restoration and maintenance of open spaces.

Feasibility Study – Used Oil Management in Tobago

The feasibility study on the collection, storage and transportation of used oil from Tobago to Trinidad for reprocessing will be continued. The Study targets public and private garages throughout Tobago and has been extended to include the collection and disposal of used oil filters. It involves the collection of used engine oil from private garages throughout Tobago using custom built, 200-gallon holding tanks and the temporary storage of the used oil from commercial generators in the holding tank located at the Studley Park landfill. The oil is then transported to the

Petrotrin Refinery for reprocessing. Similarly, the filters will be collected from the garages and transported to Trinidad for disposal. At least 48 garages are targeted. The Study will be continued over an additional nine-month period.

Closure of and Rehabilitation of the Beetham Landfill

A transition plan will be developed to address closure of the Beetham Landfill as well as the design and acquisition of an alternative site and disposal system. The plan will meet international best practices governing gas emissions, leachate control, odour control, and public access. To complement this plan, a transfer station system will be designed to address the minimization of haulage costs, maximization of waste diversion, improved efficiency of the handling of waste, and the safety of users.

Preparation of a Forest Cover Map for Trinidad and Tobago

A forest cover map for Trinidad and Tobago will be prepared using satellite images to illustrate land use as well as natural vegetation across the country. Ground surveys will be conducted by the Forestry Division, Ministry of Public Utilities and the Environment, while data interpretation and the actual preparation of the map will be undertaken by the International Institute for Tropical Forestry (IITF).



Targeted Outcomes

- Solid waste reduced by at least 10 per cent
- Forest cover increased by at least 5 per cent
- Number of threatened animal and plant species reduced by at least 5 per cent
- At least 30 per cent of wastewater being treated in accordance with international standards
- Use of Ozone Depleting Substances phased out by January 1, 2008
- Water and air pollution rules in effect
- Waste sorting and recycling system introduced
- Beverage Containers legislation in effect
- Standards in effect for wastewater treatment plants and vehicle emissions
- National Integrated Waste Management System in operation
- Environmental Management Systems established in industries
- National Council for Sustainable Development established
- Mathura National Park, Buccoo Reef, Nariva Swamp, Aripo Savannah and Speyside designated as environmentally sensitive areas
- 'Greening' of cities and communities ongoing