

**CNCMP**

Comprehensive  
National Coastal  
Monitoring  
Programme



## The Comprehensive National Coastal Monitoring Programme (CNCMP)

Trinidad and Tobago must face the undeniable truth that its coastline is at risk. In a twin-island state with limited land mass, the coastal zone forms the backbone of innumerable aspects of life. The value of the coast connects to livelihoods, leisure, recreation, security, protection, spiritual expression and aesthetic beauty. Consequently, the harsh realities of coastal erosion and flooding present overwhelming threats to the economy as well as the ecology, social well-being and quality of life of the nation. These risks are exacerbated by the aggregate effects of climate change and sea level rise coupled with geographical and human factors such as ad hoc development along the coast. Additionally, with the increasing and inevitable effects of climate change, the vulnerabilities posed by coastal erosion and flooding are projected to multiply significantly over the next 20-year period.

The Government of the Republic of Trinidad and Tobago (GORTT) is taking a strategic step toward mapping a sustainable solution to combat the problem of coastal erosion and flooding. Through the Ministry of Works and Transport (MOWT), Coastal Protection Unit (CPU), the Comprehensive National Coastal Monitoring Programme (CNCMP) has been initiated. The programme will support the monitoring of the state of Trinidad and Tobago's coastal areas and serve as a central repository for coastal data. Ultimately, the CNCMP will promote the adoption of environmentally and economically sustainable solutions to preserve and protect the coast. To this end, the programme will equip coastal managers with relevant information to assess overall risk and to inform sustainable shoreline management decision and policy making thereby mitigating the risks of coastal erosion.

The CPU, in partnership with the Tobago House of Assembly (THA), Division of Infrastructure, Quarries and the Environment (DIQE), and the Institute of Marine Affairs (IMA), will achieve innovation by providing a tangible and efficient service that delivers value to a wide cross-section of Trinidad and Tobago's society. From the university student seeking research data to the policymaker seeking constituent information based on coastal metrics, the CNCMP will store information that will be easily accessible at the click of a button. In so doing, the vision is to establish Trinidad and Tobago as one of the regional leaders in shoreline management practices.

In January 2019, the CPU commenced implementation of Phase 1, Establishment of a Framework for the CNCMP, of the programme's three-phase implementation plan. This phase will include:

- Engaging key stakeholders in a National Coastal Assessment (NCA)
- Designing a Coastal Information Management System (CIMS)

The CPU through the National Infrastructure Development Company Limited (NIDCO) has engaged Coastal Dynamics Limited (CDL) for the execution of Phase 1 of the CNCMP. CDL is an environmental consulting firm based in Trinidad and Tobago with over twenty years of experience in delivering innovative environmental solutions. The team's capacity is enhanced by its collaboration with DHI (Denmark), Infotech Caribbean Limited and estuary PR Limited.

## National Coastal Assessment (NCA)

The NCA will give a rapid overview of the current coastal situation in Trinidad and Tobago including the identification of shortcomings and gaps in information. As the foundation of the CNCMP data repository, the NCA will benefit relevant government agencies, across multiple ministries, in making informed decisions as it pertains to shoreline management. The wealth of coastal information held within governmental agencies and other entities will serve as a rich source of information and data for building the NCA. In the data collection process, stakeholders at all levels of Trinidad and Tobago's society will be engaged to provide feedback via a Coastal Social Survey.

## Coastal Information Management System (CIMS)

A Coastal Information Management System (CIMS) will be designed to gather, analyse and share data. Expert knowledge on coastal behaviour will be built into the system to ensure that data and information on coastal erosion is physically sound, qualified, quantified and relevant to the key objectives of the CIMS. The CIMS will be developed in close collaboration with the IMA, the DIQE and relevant stakeholders to ensure that the system is tailored for relevance and usability.

## Trinidad and Tobago's Coast at Risk

The effects of coastal erosion and flooding coupled with extreme weather events associated with climate change, have been felt throughout Trinidad and Tobago. Coastal erosion and flooding undermine residential homes, personal properties, beaches and coastal infrastructure such as roads, bridges, commercial jetties and buildings. Communities face the harsh reality of being isolated and having their livelihoods and quality of life compromised. Simultaneously, damage to coastal infrastructure may result in millions of dollars in repairs while destruction of recreational areas and habitats may put tourism at risk.

Along Trinidad's east coast, high energy waves of the Atlantic Ocean beat the coastline causing rapid rates of erosion. Vulnerable areas include Manzanilla, Cocos Bay, Mayaro and Guayaguayare. In some of these areas, up to 300 metres of coastline have been lost. In the south-west of Trinidad, villages such as Icacos, Cedros, Cap de Ville, Granville and Shore of Peace have experienced significant effects of coastal erosion and flooding. Communities in Cap de Ville have faced loss of homes and wastewater facilities. In Granville, exposed coconut tree roots, fallen trees and vertical cliff faces are evidence of an eroding beach. While observations dating back to 1998, confirm that approximately four hectares of land have been lost in Shore of Peace. Villages of the south coast, which feature easily erodible sediment, endure threats to agricultural lands and public infrastructure.



In Tobago, with its smaller land mass, there is a greater dependence on the coast to support the livelihood of people in communities. As a result, the risks of coastal erosion and flooding and climate change and sea level rise are magnified. The south-west coast, which is low lying, suffers coastal erosion and some incidents of coastal flooding. The Windward Road was jeopardised when a seawall failed severely challenging the connectivity of Roxborough and surrounding villages. In Lambeau, waves batter the land washing onto the road endangering villagers, passers-by, vehicular traffic and the fishing facility. Progressing along the coast to the north-east, the issues of coastal erosion are heightened by cliff failures.

Since the 1990s, consultants hired by the MOWT have emphasised the fact that a shoreline management strategy does not exist for Trinidad and Tobago. Consequently, inconsistencies in coastal policy decision making exist. Public and private entities have undertaken numerous coastal studies and investigations, which have highlighted opportunities for the use of coastal data in supporting shoreline management. In light of Trinidad and Tobago's current focus on integrated coastal zone management, the CPU's introduction and implementation of the CNCMP is timely. This initiative exemplifies the MOWT's commitment to the management of coastal erosion and flooding with the integration and support of other stakeholder agencies.

## Climate Change

Climate change describes variations in the climate system resulting in changing weather patterns that persist for at least a few decades. The earth's climate is influenced by the sun. For past centuries, this influence has been constant due to the balance of solar radiation entering and leaving the atmosphere. Since the late 19th century, however, humans have been releasing excessive amounts of greenhouse gases (most notably CO<sub>2</sub>), which trap solar radiation in the earth's atmosphere. As a result, it has been observed that the atmosphere is warming at an accelerated rate. The warming ripples through the earth's components such as the land and ocean, which interact with the atmosphere creating an overall climate change. This pattern is expected to continue unless drastic actions are taken.

Small island developing states (SIDS) are especially vulnerable to the effects of climate change. Generally, SIDS make low contributions to global greenhouse gas emissions and share similar characteristics of small size; high population density along coasts; limited land, funding and human resources; a dependency on tourism; and a high vulnerability to natural hazards.

Impacts of climate change on the Caribbean region include increases in air and ocean temperatures, ocean acidification, changes in rainfall and wind patterns, regional sea level rise and increased frequency of extreme weather events, especially tropical cyclones. Along the coastal zones, sea level rise poses a major threat that contributes to accelerated erosion and increased coastal flooding.

## Coastal Erosion

Coastal erosion is the net loss of sediment from coastal regions due to natural coastal processes or anthropogenic activities. Examples of coastal processes include waves, currents and tides, which are continually occurring within the coastal zone. When these coastal processes are altered, it creates an imbalance in coastal dynamics and may result in the removal of sediment leading to shoreline retreat. Anthropogenic activities, such as construction of hard engineering structures on the shoreline, can also lead to erosion either immediately at the site or at areas further along the coastline. Erosion occurs when hard engineering structures modify the natural environment as a result of changing coastal processes or blocking sediment from entering the coastal system. While coastal erosion may result in retreat of the shoreline and ultimately, loss of land, it is an important process that also supplies the beach with sediment.

Coastal erosion is an on-going issue in Trinidad and Tobago. Along the eastern coast of Trinidad, high wave energy causes the coastline to erode. The southwestern coast of Trinidad, however, experiences very low wave energy; but is prone to erosion due to the easily erodible sediment type. In Tobago, the southwestern coast has been noted to be impacted by erosion, which is evident by undercutting of the soft limestone sediment within this region.

## Coastal Zone Flooding

Flooding in the coastal zone is the temporary intrusion of water from the sea or the temporary submergence of dry land areas along coastal regions due to heavy rainfall. Coastal processes such as waves, tides and storm surges can result in the inundation of low-lying coastal areas during extreme weather events. Heavy rainfall from coastal storms can also cause coastal flooding due to increased surface run-off and the overflowing of rivers or streams. During high tide or storm surges, the sea surface water level rises, which can result in water entering river mouths. When this is combined with the river already at its carrying capacity, rivers can burst their banks resulting in flooding.

Flooding in coastal regions is a major concern in low lying regions of Trinidad and Tobago. The east coast of Trinidad and the windward side of Tobago are open to the Atlantic Ocean, which experience extreme weather events typically during October to November.

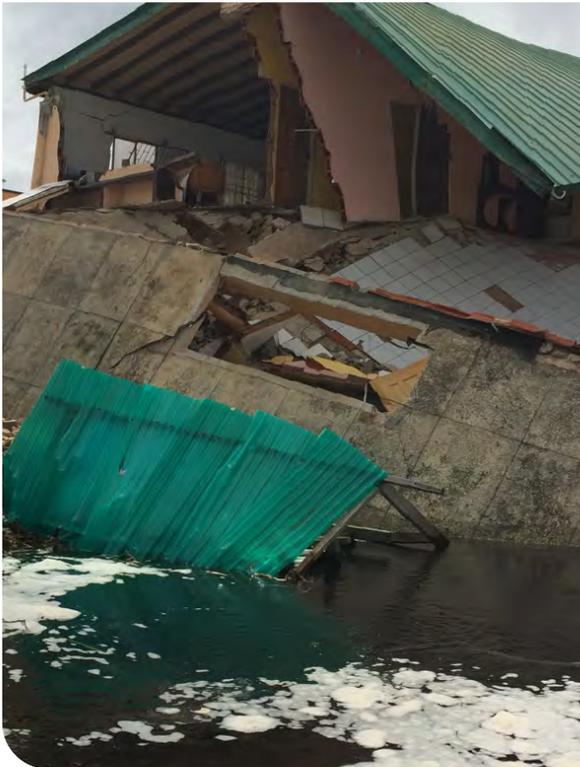
## Facts About Trinidad and Tobago

The coastal zone includes:

- 70% of the population
- 80% of energy-based industries
- 50% of roads and bridges
- 90% of tourist facilities
- 90% of annual fish production
- 3 Ramsar sites (Caroni Swamp, Nariva Swamp and Buccoo Reef/Bon Accord Lagoon Complex)

## Have Your Say

The Ministry of Works and Transport (MOWT), Coastal Protection Unit (CPU), has positioned engagement of coastal communities and stakeholders as important in the implementation of the Comprehensive National Coastal Monitoring Programme (CNCMP). With this aim, the CPU has launched the 'Have Your Say' campaign as an integral engagement initiative of the CNCMP. The campaign aims to engage members of Trinidad and Tobago's coastal communities and stakeholders including beachgoers, environmental activists, landowners and residents, hoteliers and tour operators as well as the general public by encouraging them to share their views, experiences, thoughts and vision about coastal erosion and flooding and the value of the coast to their livelihoods.



Coastal communities and stakeholders are called to have their voice heard by visiting the CPU web page on the MOWT website to:

- Register to participate in relevant CNCMP Stakeholder Engagement Activities at [bit.ly/CNCMPRegister2HaveYourSay](https://bit.ly/CNCMPRegister2HaveYourSay)
- Complete the CNCMP General Public Coastal Social Survey at [bit.ly/CNCMPCoastalSocialSurvey](https://bit.ly/CNCMPCoastalSocialSurvey)





## #CoastalWatchTT

The Ministry of Works and Transport (MOWT), Coastal Protection Unit (CPU), has launched the national coastal monitoring initiative, #CoastalWatchTT. The initiative calls members of Trinidad and Tobago's coastal communities and stakeholders including beachgoers, environmental activists, landowners and residents, hoteliers and tour operators as well as the general public to make shoreline management and preservation a priority by joining in the effort to monitor the nation's coasts.

The general public may monitor coastal areas that are susceptible to coastal hazards such as fallen trees, land slippage, cliff failure, retreating shorelines, threats to coastal infrastructure and assets, and coastal erosion and flooding, to become a #CoastalWatchTT Reporter via either:

- Posting photo and/or video content on social media networks using the hashtag #CoastalWatchTT
- Submitting email reports to CoastalWatchTT@mowt.gov.tt
- Submitting telephone reports to the CPU at (868) 623-6797

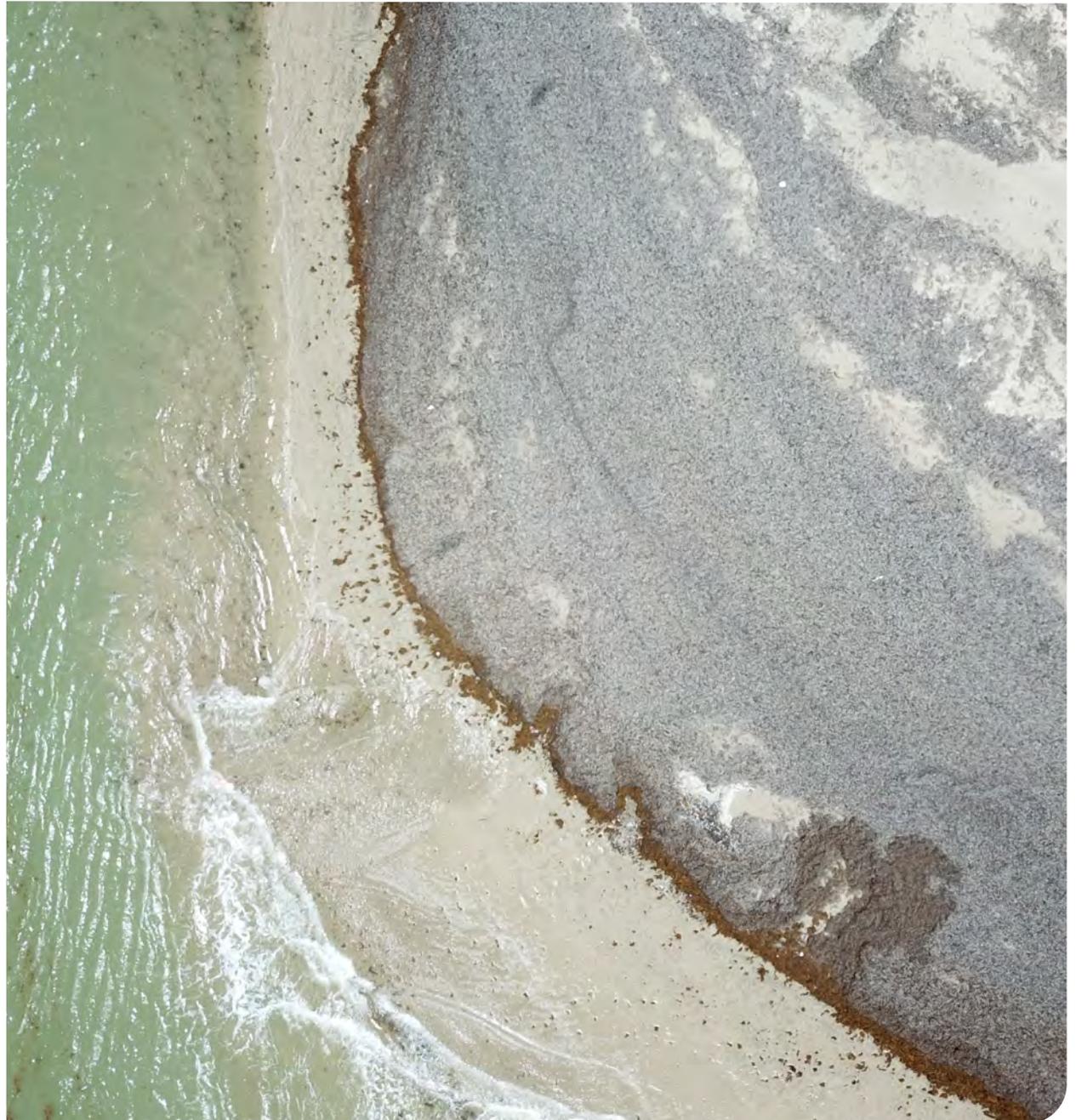
## #CoastalErosionFacts

The Ministry of Works and Transport (MOWT), Coastal Protection Unit (CPU), has launched the social media campaign, #CoastalErosionFacts. This campaign will raise awareness about the critical state of Trinidad and Tobago's coastline and educate Trinidad and Tobago's coastal communities and stakeholders including beachgoers, environmental activists, landowners and residents, hoteliers and tour operators as well as the general public about coastal erosion and flooding, and climate change. The MOWT will engage its social media followers weekly with content across its social media platforms including Facebook, Twitter and Instagram.

Trinbagonians may follow the #CoastalErosionFacts hashtag weekly and join in to grow the conversation nationally, regionally and internationally.

Follow the MOWT:

-  Ministry of Works and Transport Trinidad & Tobago
-  @mowtgovtt
-  @mowtnews



## Coastal Protection Unit (CPU)

The Coastal Protection Unit (CPU) was established in August 2014 with a mission to deliver sustainable coastal management strategies to protect Trinidad's vulnerable coastal communities, and built and natural coastal environment from increasing risks due to coastal erosion and flooding. As a unit of the Ministry of Works and Transport (MOWT), the CPU is charged with realising the MOWT's mandate through the implementation of the Critical Coastal Protection Programme (CCPP).

The CCPP is a multiphase strategy that aims to create a world class national coastal defence system to mitigate against shoreline erosion and inundation, and other coastal health and environmental hazards. The programme comprises multiple projects and components employing hard and soft coastal engineering techniques and management methodologies that ultimately aim to raise the standard of living and the quality of the lives of Trinidad and Tobago's citizens.

The CPU works to develop long-term policy towards preservation, rehabilitation and management of the coastal zone as a model for sustainable development. The strategic intentions of the unit are:

- To execute the MOWT's coastal protection mandate
- To deliver critical coastline defence engineering works
- To continuously monitor the coastline to identify issues that affect its stability
- To assist in the development and implementation of the Government of the Republic Trinidad and Tobago's (GORTT) policies regarding coastal zone management and climate change shoreline adaptation
- To recommend a lasting course of action for the sustained delivery of the MOWT's coastal protection mandate

## The #CPU4YOU

The CPU is focused on serving the people of Trinidad and Tobago by addressing the potential effects of coastal erosion and flooding on coastal communities, environments and infrastructure. Through the CCPP, the unit strives to promote an understanding of the central role of the coast in securing the survival and future of coastal communities and the nation as a whole. To this end, the CPU has engaged selected vulnerable coastal communities in understanding shoreline changes as a result of continuous long-term coastal erosion while involving these communities in the planning and development of coastal protection works.

In its implementation of the CCPP, the CPU has developed the following projects:

### Completed Projects

- Manzanilla Beach Facility Seawall Stabilisation Works (completed in July 2015)
- North Cocos Bay Shoreline Stabilisation Works (completed in 2015)
- Shore of Peace Coastal Cliff Stabilisation Works (completed in 2016)
- Quinam Coastal Protection Works (completed in December 2018)
- Mayaro/Guayaguayare Coastal Study

### On-Going Projects

- Sans Souci Shoreline Stabilisation Works
- Matelot Shoreline Stabilisation Works Phase I
- Matelot Shoreline Stabilisation Works Phase II
- Cocos Bay Shoreline Stabilisation Works
- South Cocos Bay Shoreline Stabilisation Works
- Shoreline Management Plan for Manzanilla Beach (Manzanilla Point to Point Radix)
- Comprehensive National Coastal Monitoring Programme (CNCMP)
- Cap de Ville Shoreline Stabilisation Works

## Future Projects

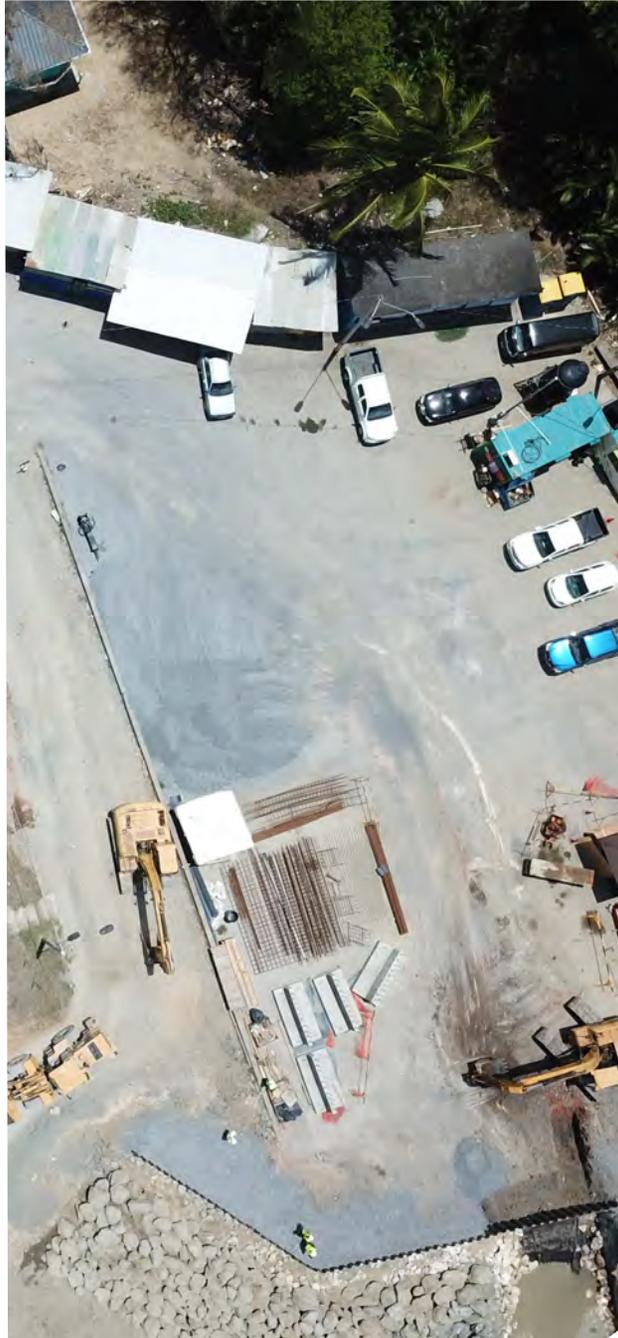
- Mayaro/Guayaguayare Management Programme
- San Fernando Waterfront Redevelopment – rehabilitation of the existing seawall
- Construction of fishing port and associated facilities at Grand Chemin, Moruga
- Little Rockly Bay Stabilisation Works
- Construction of a breakwater system at the Magdalena Grand Beach and Golf Resort, Tobago
- Comprehensive National Shoreline Management Strategy
- Southwestern Peninsula Study



**The Ministry of Works and Transport (MOWT)**  
**Connecting People. Connecting Communities.**  
**Connecting a Nation.**

The Ministry of Works and Transport (MOWT) of the Government of the Republic of Trinidad and Tobago (GORTT) is a large sector ministry that comprises statutory authorities, state enterprises, and administrative/technical divisions. Originally established in 1956 as the Works and Hydraulics Department, the Ministry has evolved to become one of the largest ministries of the GORTT with a workforce of over 7000. The MOWT provides and maintains a government infrastructure and a working public transport system for Trinidad and Tobago that encompasses:

- Planning for roads, drainage and transportation (air, sea and land)
- Construction and maintenance of highways, major and secondary roads, dams and drainage systems, land reclamation, and coastal management in collaboration with stakeholders
- Providing advice on, as well as the construction and maintenance of government buildings and facilities
- Providing advice on maritime and aviation-related matters
- Providing advice on the purchase, repair and maintenance of the transport fleet of state agencies
- Traffic management
- Registration, classification, licensing and inspection of vehicles
- Issuance of drivers' permits
- Enforcement of laws under the Motor Vehicle and Road Traffic Act
- Management and control of shipping within Trinidad and Tobago waters
- Registration, licensing, surveying, inspection and certification of ships
- Enforcement of maritime laws, and negotiation and monitoring of air service agreements



**MOWT's Statutory Authorities:**

- Airports Authority of Trinidad and Tobago
- Pilotage Authority
- Port Authority of Trinidad and Tobago
- Public Transport Service Corporation
- Transport Board
- Trinidad and Tobago Civil Aviation Authority

**MOWT's State Enterprises:**

- National Infrastructure Development Company Limited (NIDCO)
- The Vehicle Management Corporation of Trinidad and Tobago (VMCOTT)
- Point Lisas Industrial Port Development Corporation Limited (PLIPDECO)
- National Helicopter Service Limited (NHSL)

**MOWT's Administrative and Technical Divisions:**

- Coastal Protection Unit
- Central Planning Unit
- Environmental, Health and Safety Unit
- Drainage Division
- Bridges, Landslips and Traffic Management Division
- Construction Division
- Heritage Buildings Maintenance Division
- Mechanical Services Division
- Highways Division
- Traffic Warden Division
- Maritime Services Division
- The Transport Division

**MOWT's Programmes:**

- Programme for Upgrading Roads Efficiency (PURE)
- Unemployment Relief Programme (URP)

## Institute of Marine Affairs (IMA)

The Institute of Marine Affairs (IMA) is a multi-disciplinary research organisation that has been mandated to collect, analyse and disseminate information, and to formulate and implement programmes/projects relating to economic, technological, environmental, social and legal developments in marine affairs. The mission of the IMA is to conduct and foster research and to provide advice for the sustainable management of the coastal and marine areas and resources of Trinidad and Tobago. As an independently operated state enterprise, the line ministry of the IMA is the Ministry of Planning and Development.

Over the last 40 years, the IMA has expanded its operational research programmes to include:

- Oceanography
- Environmental Quality
- Aquaculture and Fisheries Research
- Biodiversity and Ecological Research
- Geomatics

## Division of Infrastructure, Quarries and the Environment (DIQE), Tobago House of Assembly (THA)

The Tobago House of Assembly (THA), Division of Infrastructure, Quarries and the Environment (DIQE), manages the policy and planning for the sustainable development of Tobago's infrastructural network, natural resources and space. Its foci therefore are:

- To ensure the delivery of infrastructure and systems that are safe, robust, intelligently designed and environmentally sensitive
- To respond to local needs and enhance economic and social growth in Tobago
- To promote the sustainable use and preserve the quality of air, land and water resources

DIQE's core responsibilities are as follows:

- Construction, development and maintenance of road networks and drainage systems
- Construction and maintenance of public buildings and facilities
- The production and sale of quality volcanic rock products, concrete and asphalt
- Transport and traffic management
- Environmental management and protection including coastal zone monitoring





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