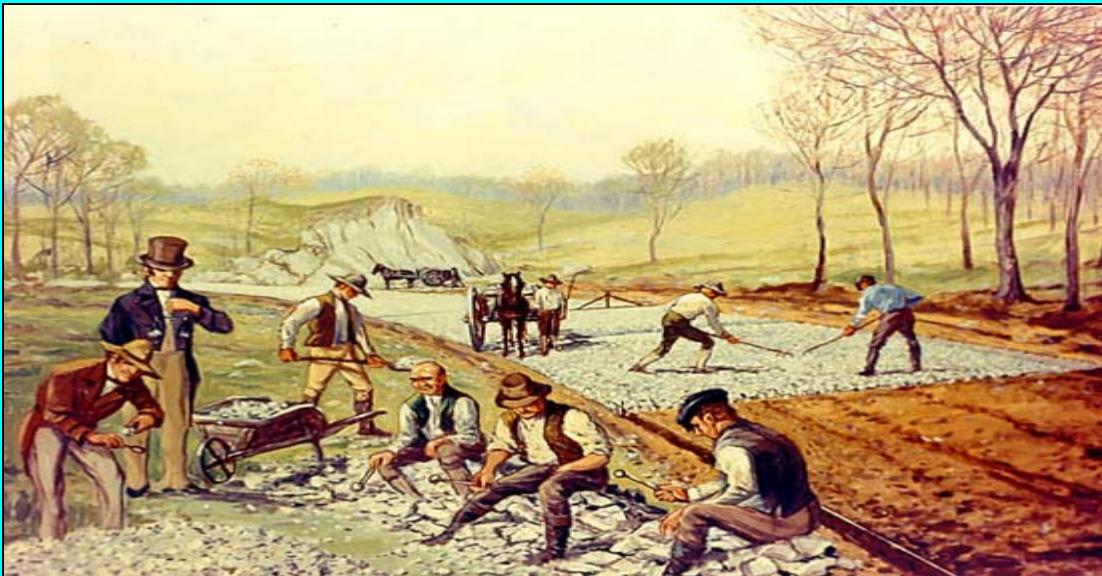


# REGIONAL SYMPOSIUM

## ON SERVICES

SECTOR - TRANSPORT SERVICES – ROAD and RIVER  
TRANSPORT in the Caribbean Single Market and Economy



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## **ABSTRACT**

It is evident that the Caribbean region has become highly dependant on services for its economic growth. Road transport is a crucial component for trade and development of the services sector within and between the Caribbean region.

Most Caribbean countries have fairly moderate condition roads that provide easy transport of goods and people to their required destinations. Agricultural goods such as rice, sugar, ground provisions, peas, coconuts are planted in rich agricultural lands on the islands. Some of these agricultural goods, however have to be transported long distances either to factories for further processing, to the consumers within the islands or for export. As a first step towards improving transport in the region, road rehabilitation and expansion needs must be determined. Since improved transport will reduce the cost of producing and exporting goods, thereby increasing profits.

All the territories are highly dependent on road transport either for the transport of people or goods. However there are primarily four countries in the Caribbean region that have road and riverrain transport systems that are inextricably linked. These countries are;

- Suriname
- Guyana
- Belize
- Trinidad and Tobago

Enhancing competitiveness within and among sectors is a very important for the development of any society.

The road and riverrain transport sector is a very important link with many other sectors such as Agricultural Sector, Mining Sector, Fishing Sector, Tourist Sector and Housing sector.

Once the road networks in the various Caribbean territories are adequately maintained and are capable of supporting the territories road transport needs, then the cost for transport goods and services required by the other sectors will be cheaper. Once there will also be a proper road network there will be savings in time, vehicle operating costs and reduction of accidents when transporting goods and people services.

Therefore the prices of commodities produced by other sectors such as agricultural products, minerals would be dependent to some extent on the road transport network.

As we are aware the Caribbean region is separated primarily by the Caribbean Atlantic Ocean/Sea. However road and river/rain transport in the individual territories is crucial for the further development of the economies of the Caribbean regions.

The importance of the road and river/rain networks affects to some extent many of the sectors that are important if the individual territories of the region is to develop and meet or surpass its potential.

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## **1.0 CHAPTER 1. Overview of the Regional Sector**

### **1.1 The Caribbean Community (CARICOM)**

The Caribbean Region comprises several islands. Several countries are members of CARICOM. The **Caribbean Community (CARICOM)**, is an organisation of 15 Caribbean nations and dependencies. CARICOM's main purposes are to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy. Its major activities involve coordinating economic policies and development planning; devising and instituting special projects for the less developed countries within its jurisdiction; operating as a regional single market for many of its members (Caricom Single Market); and handling regional trade disputes. The Secretariat headquarters is based in Georgetown, Guyana



**Figure 1 Map of the Caribbean Region (Source: Internet)**

The **Caribbean Community (CARICOM)**, originally the **Caribbean Community and Common Market**, was established by the Treaty of

Chaguaramas which came into effect on 1 August 1973. The first four signatories were Barbados, Jamaica, Guyana and Trinidad and Tobago.

CARICOM superseded the 1965–1972 Caribbean Free Trade Association (CARIFTA), which had been organised to provide a continued economic linkage between the English speaking countries of the Caribbean following the dissolution of the West Indies Federation which lasted from 3 January 1958 to 31 May 1962.

A Revised Treaty of Chaguaramas establishing the Caribbean Community including the CARICOM Single Market and Economy (CSME) was signed by the CARICOM Heads of Government of the Caribbean Community on 5 July 2001 at their Twenty Second Meeting of the Conference in Nassau, The Bahamas.

Currently CARICOM has 15 full members: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

## **1.2 The History of Caribbean Trade**

The sugar plantations of the Caribbean region in the eighteenth and early nineteenth centuries that were supported by the slave trade met high demand for their product from countries like Spain, Portugal, Britain, and the Netherlands. Many sugar plantations were burned in Jamaica in 1831 during a slave uprising and three years later, the British Parliament set forth the Emancipation Act which called for all British colonies of the West Indies to end slavery, however slaves were not emancipated until 1838.

The sugar beet became part of European agriculture when slavery was abolished, and the Caribbean sugar industry was neither able nor required to yield such high supply, and therefore the islands' financial growth slowed considerably for more than a century.

However, the Caribbean region's dry economic spell ended with the influx of tourism in the 1990s. While sugar is still an agricultural export, the economy of the islands is not nearly as dependent on sugar production as it once was. The rise of tourism sparked an indirect growth in many other domestic industries such as construction and many other service and tourism related enterprises.

The individual economies of the Caribbean islands are generally open to free trade. While their export bases are fairly limited, many islands are beginning to diversify their industries. Sugar, bananas, eggplant and flowers are exported from many islands and other crops are still grown exclusively for domestic use. The distillation of and large scale export of rum, a well known island product, takes place on most islands where sugarcane is grown.

St. Croix has one of the world's largest petroleum refinery facilities, as does Aruba. Mostly all of these industries, however, rank below tourism in profitability. In the U.S. Virgin Islands, for example, tourism provides 70 percent of the island's jobs and accounts for more than 70 percent of the Gross Domestic Product (GDP).

Other islands supplement their tourism dollars as follows:

<b>Table 1 How Caribbean Islands Supplement Tourism Dollars</b>	
<b>Island(s)</b>	<b>Major Export(s)</b>
Antigua, Barbados, and Guadeloupe	bedding, handicrafts, textiles, electronic components
Dominican Republic	coffee, tobacco
Jamaica	bauxite
Grenada	nutmeg
Puerto Rico	dairy, livestock, coffee, tobacco
Source : Bacchus, 2007	

Bharrat Jagdeo, President of the Republic of Guyana and Chairman of the Conference of Heads of Government referred to the challenges in the Tourism and Financial Sectors at the CARICOM Heads of Government Meeting in Guyana, 2009. He stated that in particular.

“Several of our countries have been faced with devastating consequences because of this global financial crisis. Many of the sectors that we have encouraged in the past, particularly our Services Sector, have been decimated by the global events. Tourism, which provides a significant part of our income; financial services because of what’s happening with the CLICO and Stanford situations have taken tremendous hits,” President Jagdeo noted

### **1.3 Natural Resources**

Bacchus (2007) “By international standards, the nations of the Caribbean are not rich in natural resources. The resources that make significant contributions to domestic economies and regional job sectors include, but are not limited to: fisheries, bauxite, iron, nickel, petroleum and timber. It has been noted by some that the Caribbean’s most important resource is its tropical island setting, which has generated a unique tourism sector. The greatest concentrations of minerals most valuable on the international market are found in: Cuba, Jamaica, and Trinidad and Tobago. In fact, Cuba’s economic rebound in the early 1990s is often associated with increased production in tourism, oil, and nickel, spurred by foreign investment in these primary industries. However, it can be noted that a drop in international prices has since reduced Cuba’s earnings. Notably, most new resource expansion in Cuba has concentrated on petroleum deposits, including offshore fields. Jamaica’s bauxite and alumina industry are second only to Trinidad’s petroleum sector as the leading export within CARICOM. Jamaica’s bauxite and alumina industry is dominated by North American firms, and hence these resources have traditionally been exported northwards. The leading Caribbean export comes from Trinidad and Tobago, which possesses substantial petroleum reserves, and is regarded as the richest country in terms of natural resources. As a result of this, Trinidad also maintains the regional role of producer of heavy industrial products, such as asphalt, ammonia, and iron.”

### **1.4 Agriculture**

Bacchuss (2007) “Along with contributing to the Caribbean’s GDP, agriculture also contributes to domestic food supply, and provides employment. While agriculture is the major economic land use activity in most Caribbean countries, agriculture accounts for less and less of most islands’ GDP. However, unlike many developed countries, this trend may be accounted for by a growing tertiary sector, as opposed to industrial growth (with the exception of Trinidad and Tobago, and Puerto Rico)”

### **1.5 Caribbean Single Market and Economy (CSME)**

In the Grande Anse Declaration and Work Programme for the Advancement of the Integration Movement, Heads of Government expressed their determination to work toward establishing a single market and economy. The CARICOM Single Market and Economy is intended to benefit the people of the Region by providing more and better opportunities to produce and sell our goods and services and to attract investment. It will create one large market among the participating member states.

The main objectives of the CSME are: full use of labour (full employment) and full exploitation of the other factors of production (natural resources and capital); competitive production leading to greater variety and quantity of products and services to trade with other countries. It is expected that these objectives will in turn provide improved standards of living and work and sustained economic development.

Key elements of the Single Market and Economy include:

Free movement of goods and services:- through measures such as eliminating all barriers to intra-regional movement and harmonising standards to ensure acceptability of goods and services traded;

Right of Establishment:- to permit the establishment of CARICOM owned businesses in any Member State without restrictions;

A Common External Tariff:- a rate of duty applied by all Members of the Market to a product imported from a country which is not a member of the market;

Free circulation - free movement of goods imported from extra regional sources which would require collection of taxes at first point of entry into the Region and the provision for sharing of collected customs revenue;

Free movement of Capital - through measures such as eliminating foreign exchange controls, convertibility of currencies (or a common currency) and integrated capital market, such as a regional stock exchange;

A Common trade policy - agreement among the members on matters related to internal and international trade and a coordinated external trade policy negotiated on a joint basis;

Free movement of labour - through measures such as removing all obstacles to intra-regional movement of skills, labour and travel, harmonising social services (education, health, etc.), providing for the transfer of social security benefits and establishing common standards and measures for accreditation and equivalency.

Harmonisation of Laws: such as the harmonisation of company, intellectual property and other laws.

There are also a number of economic, fiscal and monetary measures and policies which are also important to support the proper functioning of the CSME.

These include:

Economic Policy measure: coordinating and converging macro-economic policies and performance; harmonising foreign investment policy and adopting measures to acquire, develop and transfer appropriate technology;

Monetary Policy measures: coordinating exchange rate and interest rate policies as well as the commercial banking market; Fiscal Policy measures: including coordinating indirect taxes and national budget deficits.

### **1.6 Overview of the Road and Riverrain Transport Sector in the Caribbean Region**

It is evident that the Caribbean region has become highly dependant on services for its economic growth. Road transport is a crucial component for trade and development of the services sector within and between the Caribbean region.

Most Caribbean countries have fairly moderate condition roads that provide easy transport of goods and people to their required destinations. Agricultural goods such as rice, sugar, ground provisions, peas, coconuts are planted in rich agricultural lands on the islands. Some of these agricultural goods, however have to be transported long distances either to factories for further processing, to the consumers within the islands or for export. As a first step towards improving transport in the region, road rehabilitation and expansion needs must be determined. Since improved transport will reduce the cost of producing and exporting goods, thereby increasing profits.

All the territories are highly dependent on road transport either for the transport of people or goods. However there are primarily four countries in the Caribbean region that have road and riverrain transport systems that are inextricably linked. These countries are;

- Suriname
- Guyana
- Belize
- Trinidad and Tobago

**Table 2 GROSS DOMESTIC PRODUCT (GUYANA) AT CURRENT  
FACTOR COST (GSM)**

SECTOR	2006	2007	2008
<b>Agriculture, Forestry &amp; Fishing</b>	40,864	39,371	44,892
<b>Mining &amp; Quarrying</b>	15,786	13,622	11,442
<b>Manufacturing</b>	12,577	10,388	11,778
<b>Engineering &amp; Construction</b>	6,840	8,015	9,297
<b>Services</b>	54,466	58,485	64,750
<b>Total</b>	130,533	129,881	142,159

For example in Guyana the Linden / Lethem Road is a crucial road transport link to the Interior Regions. Along the road there are several river crossings that are necessary when transporting Goods and People.

The attempts to create and improve a land transport link between Guyana's coastal region and the Rupununi savannah region have a long history. Early attempts to create a land transport route involved the creation of a trail to move cattle from Rupununi to Canister Falls. The use of this trail continued from the 1920s up to 1953 when it was rendered obsolete by the construction of an abattoir at Lethem and the introduction of cheaper air transport of carcasses to Georgetown. Unfortunately, the unsatisfactory operation of the air service led to the running down of the Rupununi cattle ranching activity resulting in the social discontent in the Rupununi which eventually prompted a renewed effort to establish a land transport link between Georgetown and Lethem. This took the form of a penetration trail which was established by the Ministry of Works and Hydraulics in 1971-73.

The Soesdyke / Linden section of road was completed in 1968. Further south, the first major development of the road in the late 1970's was designed to provide access to the Upper Demerara Forestry Complex. In

1978-79, the Caribbean Development Bank provided financial assistance for the Ministry of Works to upgrade the section of road between Wismar (Linden) and Mabura Hill to all-weather gravel standard.

In the early 1980s, a group of cattle ranchers from Surama formed the Trail to Rupununi Association which opened up a dry season route through what is now the Iwokrama Rain Forest Reserve linking Annai and Kurupukari on the Esequibo River. Also in the early 1980s the Home Oil company developed the road from Lethem to the northern limit of its concession at Meritizero (55km from Lethem). This was further upgraded and extended to Point Ranch by the Brazilian company Paranapanema.

Vehicle Type	AADT					Overall Traffic Structure (%)
	Jct.-end Paved Section	End Paved Mabura Hill Section - Mabura Hill	Mabura Hill Kurupukari Ferry	Kurupukari Ferry - Annai	Annai - Lethem	
	Paved Section	Mabura Hill	Ferry	Annai	Lethem	
4WD Station Wagon	30	16	2	2	2	6.7
Pickup	75	57	40	40	43	51.1
Minibus	32	18	4	4	4	8.9
Bus	3	2	1	1	1	1.4
Truck 2-axle	34	26	20	20	23	25.2
Heavy rigid truck	8	5	1	1	1	2.4
Articulated Truck	20	11	1	1	1	4.3
<b>TOTAL</b>	<b>202</b>	<b>135</b>	<b>69</b>	<b>69</b>	<b>75</b>	<b>100.0</b>
Weighted Average			99			

**Figure 2 AADT by Vehicle Type for the Linden Lethem Road**

Currently the Linden / Lethem road transport link is in need of rehabilitation. With a better road network there might be increased production in the interior because transport costs would decrease.

In Guyana several major rivers are linked by floating bridges that accommodate both vehicle and riverain transport. The Demerara Harbour Bridge spans for approximately 1.6 KM across the Demerara River. 4,000 vehicles cross the river every day headed for work, school, transport of goods, or to transact business in Georgetown and other parts of Guyana. The Berbice River Bridge was recently completed in December 2008 and

currently accommodates 200 vehicle a day. Previously all transport was done by the ferry service.

Thus Regionally the transport of goods and people between the region must be made simple and cost effective if the Caribbean region is to be fully integrated into the Caribbean Single Market and Economy.

As a first step the expansion and rehabilitation of the internal road network in the Caribbean region will reduce the cost of producing and exporting goods, thereby increasing the islands' profitability.

Secondly the region is generally separated by the waters of the Caribbean Sea, there must be interconnection between the countries. Countries such as Guyana, Suriname and Trinidad could be connected by road and riverrain transport systems. Other islands in the region may have the same potential to be linked by an interconnected road and riverrain network.

The Ports and Ferry Service must be improved or developed to support cost effective trade between the region. Once this transport link is fully established and the legislation enacted to facilitate it then the benefits of this undertaking will be tremendous. Trinidad and Tobago has tremendous oil reserves that could provide oil and bituminous products to other Caribbean countries. Guyana has a vast abundance of timber which could be used in the building industries of the Caribbean. Jamaica has rice and sugar that could be traded within the region.

## **1.7 Definition, Scope and Coverage of the sector**

### **1.7.1 Definition of Road Transport**

According to Kutz (2003) "Road transport is transport on roads of passengers or goods. "

Kutz (2003) 'The first forms of road transport were horses, oxen or even humans carrying goods over dirt tracks that often followed game trails. As

commerce increased, the tracks were often flattened or widened to accommodate the activities. Later, the travois, a frame used to drag loads, was developed. The wheel came still later, probably preceded by the use of logs as rollers."

Kutz (2003) "With the advent of the Roman Empire, there was a need for armies to be able to travel quickly from one area to another, and the roads that existed were often muddy, which greatly delayed the movement of large masses of troops. To resolve this issue, the Romans built great roads. The Roman road used deep roadbeds of crushed stone as an underlying layer to ensure that they kept dry, as the water would flow out from the crushed stone, instead of becoming mud in clay soils."

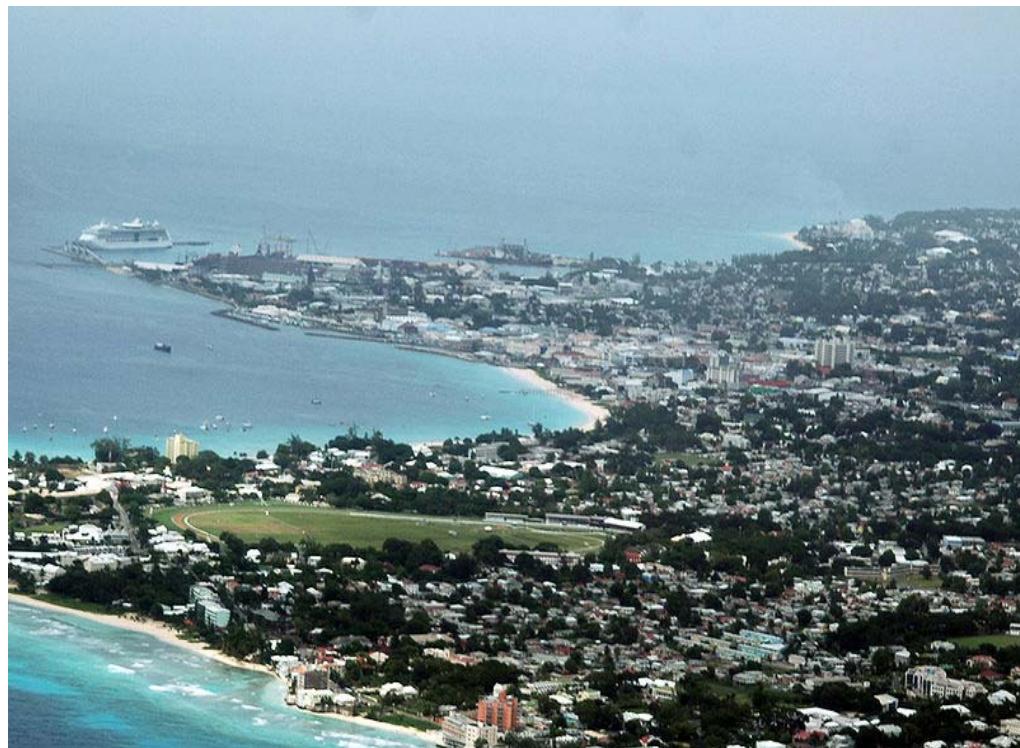
Kutz (2003) 'During the Industrial Revolution, and because of the increased commerce that came with it, improved roadways became imperative John Loudon McAdam (1756-1836) designed the first modern highways. He developed an inexpensive paving material of soil and stone aggregate (known as macadam), and he embanked roads a few feet higher than the surrounding terrain to cause water to drain away from the surface. At the same time, Thomas Telford, made substantial advances in the engineering of new roads and the construction of bridges, particularly, the London to Holyhead road.'

Kutz (2003) "Various systems had been developed over centuries to reduce bogging and dust in cities, including cobblestones and wooden paving. Tar bound macadam (tarmac) was applied to macadam roads towards the end of the 19th century in cities such as Paris. In the early 20th century tarmac and concrete paving were extended into the countryside."

According to Kutz (2003) "Transport on roads can be roughly grouped into two categories: transportation of goods and transportation of people. In many countries licensing requirements and safety regulations ensure a separation of the two industries."

Kutz (2003) stated that the nature of road transportation of goods depends, apart from the degree of development of the local infrastructure, on the distance the goods are transported by road, the weight and volume of the individual shipment and the type of goods transported. For short distances and light, small shipments a van or pickup truck may be used. In some countries cargo is transported by road in horse drawn carriages, donkey carts or other non motorized mode. Delivery services are sometimes considered a separate category from cargo transport. In many places fast food is transported on roads by various types of vehicles. For inner city delivery of small packages and documents bike couriers are quite common."

Kutz (2003) stated that "People (Passengers) are transported on roads either in individual cars or automobiles or in mass transit / public transport by bus / Coach / veile. Special modes of individual transport by road like rikshas or velotaxis may also be locally available."



**Figure 3 Aerial View of Caribbean Island showing Network**



**Figure 4 Road Network in Guyana**



**Figure 5 Mara Road used to transport Ground Provisions to Georgetown, Guyana for export**



**Figure 6 Black Bush Polder Road used to Transport Paddy to Factories for milling and packaging**



**Figure 7 Bridge that facilitates Transport of Agricultural Goods, Guyana**



**Figure 8 Road Transport on the Linden Lethem Road in Guyana**



**Figure 9 Linden Lethem Road, Guyana**



**Figure 10 Private Transport by Bus\**



**Figure 10 Private Transport by Bus**



**Figure 11 Caribbean Highway**

#### **1.7.2 Definition of Riverrain Transport**

Riverrain transport is the transport of goods and people across rivers. Goods are transported in boats and barges across rivers in several CARICOM Countries such as Guyana and Suriname. The road network in these countries is inextricably linked to the riverrain transport system.



**Figure 12 The Berbice River Bridge, in Guyana, SA**



**Figure 13 Demerara Harbour Bridge in Guyana, S.A**



**Figure 14 Bridge at Annai along the Linden / Lethem Road in Guyana**



**Figure 15 Barge at Kurupukari used to Transport Vehicles over the River**



**Figure 16 Barge at Takatu River, Guyana, SA.**

### **1.7.3 Scope and Coverage of the Road and Riverrain Sector in the Caribbean Region**

The transport of goods and people within the islands must be made simple and cost effective if the Caribbean region is to be fully integrated into the Caribbean Single Market and Economy. The Transport on roads as was previously mentioned can be grouped into two categories: transportation of goods and transportation of people. Most Caribbean countries have fairly moderate condition roads that provide easy transport of people and goods. Agricultural goods such as rice, sugar, ground provisions, peas, coconuts are planted in rich agricultural lands on the islands. Some of these agricultural goods, however have to be transport long distances either to factories for further processing, to the consumers within the islands or for export.

The expansion and rehabilitation of the internal road network will reduce the cost of producing and exporting goods, thereby increasing the profits.

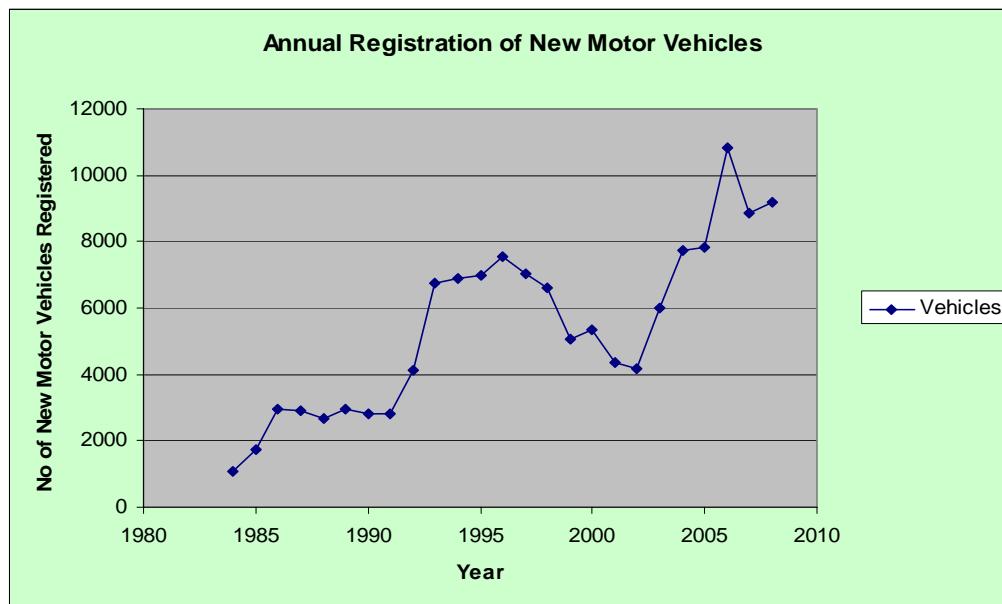
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- Suriname
- Guyana
- Belize
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### **1.8 Brief Situational Analysis**

Road and Riverrain Transport has a major impact on the spatial and economic development of cities and regions. It is widely argued that major new transport infrastructure has a substantial impact on the local economy and the development potential of an area.

At a national level improving the road network will enable islands to reduce production cost and increase productivity. Guyana is one of the regions countries whose present and anticipated opportunities from the development of the road sector will be tremendous. According to Khan (2006) “Over the last two decades, Guyana has been engaged in a medium term economic Recovery Program (ERP) aimed at addressing serious domestic and external imbalances in the economy and establishing a basis for renewed and sustained growth. Significant emphasis has been put on the rehabilitation and construction of infrastructure. However Guyana’s public road network is still in need of significant upgrading. For example the Linden to Brazil road when completed will positively impact on Guyana’s GDP by providing jobs, increase trading, reduce transport cost of goods and savings in vehicle operating costs.” Guyana’s geographic structure necessitates having a large network of roads so as to interconnect villages, farms and towns in order to fully realise its massive agricultural and natural resources potential. In fact, inadequate road access has held back the development of this potential and today several areas remain untapped. In recent years, because of the upswing in living standards, the number of vehicles in the country has seen a sharp rise and this has now caused the need for more and larger road networks. According to the Traffic Department of the Ministry of Public Works and Communications in Guyana, the total length of paved and unpaved roads in Guyana is 1912 miles or 3059 kilometers. This consists of 700 miles of declared public roads, 101 miles of city roads, 567 miles of feeder and interior roads, and 544 miles of hinterland trails.



**Figure 16 Guyana Motor Vehicle Registration**

At the regional level, much infrastructure investment is justified on the basis of regional development benefits which accrue directly from improved accessibility. Generally the present and future anticipated opportunities for the development of the sector based on demand both regional and global can be tremendous. Once the Road Network and Riverrain Network is fully established the Caribbean region will be able to attract new investment firms, have cheaper distribution of goods throughout the region and there will be a general expansion of the labour market areas.

Globally the transport sector is an important component of the economy, impacting on development and the welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multiplier effects, such as better accessibility to markets and additional investments. When transport systems are deficient, in terms of capacity or reliability, they can have an economic cost, such as reduced or missed opportunities. Transport also carries an important social and environmental load, which cannot be neglected.

Transportation accounts, on average, for between 10% and 15% of household expenditures, while it accounts around 4% of the costs of each

unit of output in manufacturing, but this figure varies greatly according to sub-sectors."

## **2.0 CHAPTER 2. Policy Framework**

The region must ensure that there are proper policies in place to sustain achievements and promote improvements in road and riverrain transport. More research has to be done to determine if there are policies in the various Caribbean countries that deal with road and riverrain transport. Some of the policies should focus on environmental issues, safety of people, how to transport hazardous goods, weight control and so on.

Policies must be so structured to ensure that the environment is conducive to facilitate the growth and development of the road and riverrain transport sector. The observation that investments in transportation infrastructure generate accessibility, economic, environmental and social impacts, is hardly news for transportation economists and planners. Numerous studies have documented these impacts and, in general, have classified them as being adverse ones (e.g. air pollution, community displacement) or positive ones (e.g. job creation and economic growth). While it is generally agreed that improved accessibility should be the prime objective of transportation investments (Mohring, 1993), in many cases the presumed capability of a project to generate other positive impacts is regarded as the main motivation for undertaking the investment. Presently, in many countries, the alleged ability of transport infrastructure investment to enhance employment and promote economic development constitutes a major driving force behind governments' propensity to allocate funds for such purposes.

## **2.1 Human Resource Requirements**

The Human resource requirements for the road and riverrain transport system may be as follows:

- Civil Engineers, technicians for the designs and supervision of new and rehabilitated road and riverrain infrastructure.

- Foremans, Skilled and Unskilled labour for construction works
- Maintenance personnel for routine and periodic maintenance of road and riverrain transport infrastructure.
- Taxi Drivers and Bus Operators
- Skilled Truck Drivers and Operators

For the transport of passengers there will be need for taxi drivers, bus drivers, operators. In Barbados there is a public transport system, however in many other countries in the Caribbean the transport of passengers is undertaken by the private sector.

The Caribbean region is endowed with a unique opportunity to use resources that are available in individual territories regionally. For example when there is a construction boom in Trinidad, human resources from Guyana, Barbados etc can be used through the Free Movement of Skills among the Caribbean Region.

## **2.2 Access to and use of Technology and Innovations**

The expansion and maintenance of the road and riverrain sector is a very expensive undertaking. Therefore the Caribbean region must also invest in state of the art technologies and innovations that will reduce cost to construct road and riverrain transport.

For example in Trinidad and Guyana Pilot projects have been undertaken using an engineered material that increases the structural properties of laterite or silt based materials. This new technology will eliminate the need for conventional construction methods where excavation has to be done, followed by the placement and compaction of construction materials such as sand, white sand- sand clay, crusher run. This new technology will significantly reduce the cost of road construction allowing faster expansion.

## **2.3 Financing the sector's needs**

In the Caribbean region the Legislative Framework for the various islands and countries may be different. The road sector in the Caribbean can be bolstered by the fiscal support.

### **Commercial Banking Sector**

Financing for the expansion of the road sector can be obtained from the commercial banking sector in the Caribbean region. As discussed previously the expansion of the road network offers numerous opportunities for trade, transport and growth of the society. The commercial banking sector can seize the opportunity to invest in the sector to increase profits for its customers.

### **Venture Capital**

Financing for the expansion and integration of the road sector across the region can also be obtained from several ventures within the Caribbean and around the world.

## **2.4 Opportunities from Trade Agreements**

The road sector will benefit from opportunities made available from trade agreements. There will be more money available once trade is booming to facilitate road expansion and linkages within territories and between other countries.

## **2.5 Institutional Requirements**

### **Government Structures**

Improving road and riverain transport in the Caribbean region requires support from the government in the respective territories. Road Transport must be seen as an important tool in the development of individual economies first. The Government of each territory must try to ensure that its road network is adequately expanded to support its population needs and also adequate for the transport of goods and services. Government of the various territories must develop the appropriate structure to allow for the

projection of future expansion if needed and also the maintenance of its current road infrastructure.

It is well known that the islands of the Caribbean are separated by water and it will be difficult to build road and bridges from island to island, however the road infrastructure up to the ports must be adequate so that the goods can then be transported by ships to the various islands.

### **Industry**

The industries in the Caribbean region are in some way dependent on road transport. Raw materials used by many industries need to be transported from their source to the factories where they are processed into finished goods.

It is therefore important that the various industries follow the laws as relates to the weight limits on various road throughout the Caribbean region.

### **3.0 CHAPTER 3. Cross-Sectoral Linkages**

Enhancing competitiveness within and among sectors is a very important for the development of any society.

The road and riverrain transport sector is a very important link with many other sectors such as Agricultural Sector, Mining Sector, Fishing Sector, Tourist Sector and Housing sector.

Once the road networks in the various Caribbean territories are adequately maintained and are capable of supporting the territories road transport needs, then the cost for transport goods and services required by the other sectors will be cheaper. There will also be savings in time, vehicle operating costs and reduction of accidents when transporting goods and people.

Therefore the prices of commodities produced by other sectors such as agricultural products, minerals would be dependent to some extent on the road transport network.

## **4.0 CHAPTER 4.. Constraints**

As we are aware the Caribbean region is separated primarily by the Caribbean Sea. However the benefits of road and riverain transport in and between the region are tremendous.

The importance of the road and riverain networks affects to some extent many of the sectors that are important if the region is to develop and meet or surpass its potential.

The main constraint is

- Lack of Funding
- Lack of Knowledge / Expertise regionally
- Lack of Training / Brain drain

In Trinidad and Tobago approximately 57,000 thousand vehicles enter the capital everyday. Some traffic issues identified in Trinidad are:

- On street Parking
- Indiscriminate public transit stopping
- Signal timings / network system optimisation.
- Because of the lack of real estate available rapid rail transport seems to be the best option.

## **5.0 CHAPTER 5.Recommendations**

- Interconnection of Region by road and riverain transport such as Guyana, Suriname and Trinidad and Tobago.
- More funding for the sector
- Body Set up to deal with the vision for road and riverian transport in the region.
- More Training for the sector
- Research on state of the art technology that are cost effective

- Improve Data Collection
- More collaboration between territories on experiences

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