



MINISTRY OF WORKS & TRANSPORT

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Road Maintenance Strategy Belize

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1. INTRODUCTION

1.01 Developing countries the world over have traditionally paid scant attention to the maintenance of their assets, particularly their road infrastructure, despite the overwhelming evidence that the cost of rehabilitation or reconstruction can be as much as four times greater. The 1988 World Development Report, *Public Finance in Development*, indicates that in the developing countries surveyed a quarter of paved roads and a third of the un-paved roads outside urban areas were in need of rehabilitation or reconstruction. The report also points out that the cost of operating vehicles on deteriorated paved roads can be 20 to 50 percent higher than the cost on roads in good condition. As vehicle operating costs constitute the major share of total road transport costs it can be seen that insufficient road maintenance exacts hidden costs, borne primarily by road users, which can become a heavy burden on commercial users with consequent impacts on economic growth and revenue from corporate taxes. The analysis of the Belize Road Network Study on Maintenance Needs (BRNSMD)¹, funded by the Inter-American Development Bank (IDB) in 2010 estimates that in Belize US\$60 million are being used unnecessarily in the road transport system (road rehabilitation and reconstruction costs, vehicle operating costs and travel time) due to the lack of optimal maintenance of roads.

1.02 Unfortunately, spending on operations and maintenance (O&M), particularly spending on materials and supplies as opposed to personnel, is generally undervalued and underfunded in developing countries. It is undervalued because the benefits are often hard to measure precisely and may lack political visibility. The benefits of increased operational spending in education and health, for example, tend to be subtle ones relating to quality rather than quantity, once the bare minimum necessary to keep schools and clinics open has been allocated. The benefits of maintenance — particularly routine as opposed to periodic maintenance — are often not clearly visible at all. They consist merely of costs avoided in the relatively distant future. O&M is underfunded not only because it is undervalued, however, but also because other spending demands — interest, subsidies, civil service wages, investment projects, and so on — exert stronger pressure on decision makers or lead to more visible disruption if not met. Too often, governments pressed for budgetary resources reduce the roads maintenance budget first, and the capital budget second, when the call comes for expenditure cuts. Furthermore, bureaucratic incentives may provide few rewards for efficient O&M once funds have been allocated. Additionally, in the developing countries there may be little incentive to provide maintenance, if they think a donor will always come along to rescue them.

1.03 While the comments above are general in nature there is a similarity to the situation in Belize. Even though in recent years funding levels for the road sector have increased, the funds were and still are mainly used for new road construction and road rehabilitation; only a fraction of these funds are being spent for the more cost effective routine and periodic maintenance activities. Actually, to raise funds for road rehabilitation is much easier than for road maintenance, due to the fact that loans to finance rehabilitation are (still) readily available from international donors, while funding for road maintenance is subject to the political debate and normally loses ground to other politically more attractive issues. The Ministry of Works and Transport (MWT) is mainly responsible for the management of road infrastructure. While most of the actual construction, rehabilitation and reconstruction of major roads is being contracted out, the planning, contracting, supervision and most of the road maintenance works are still being undertaken by MWT itself, which faces the typical challenges of all public administrations, such as inadequate budgets and equipment, weakness regarding control procedures, ineffective staffing, and lack of incentives among others.

¹ IDB-MOW, Abraham, 2010

1.04 Given the constrained financial situation in the country it is difficult to secure an adequate and stable flow of funds for road maintenance through the actual government budget financing procedures. Generally, rules and regulations of the public administrative system do not allow for an effective and efficient management of road maintenance, in spite of the good will of MWT staff responsible for road maintenance. It is imperative therefore that a means be found to address the main causes of inadequate maintenance, namely:

- Money is not allocated in a timely manner and in sufficient amounts.
- Money is not spent efficiently.
- Money is not spent effectively.

Consequently, the main aim of this Road Maintenance Strategy Document (RMSD) is to provide guidelines and to identify the procedures necessary to perform the following:

- 1) Institutional Reform of Road Maintenance;
- 2) Financial Reform of Road Maintenance;
- 3) Legal Reform of Road Management and Maintenance
- 4) Provide information to stakeholders about the above mentioned reforms, necessary to implement the changes.

2. ROAD MANAGEMENT IN BELIZE

Belize Road Network

2.01 Belize's road network has a length of 2,806.1 miles and is classified functionally as follows:

- Arterial Roads:** Main highways carrying relatively high traffic volumes, usually paved.
- Distributor Roads:** Secondary roads linking into the Arterial Road network carry varying traffic volumes and can be paved or unpaved.
- Feeder Roads:** Also called Farm or Sugar Roads, carrying low traffic volumes from agricultural areas to join the distributor or Arterial network, always unpaved.
- Village Streets:** Village streets under MWT coverage account for 602.8 miles within villages. These roads carry varying traffic volumes and can be paved or unpaved. These streets are included in the graph below under Feeder roads.

The network length in miles divided by districts is detailed below.

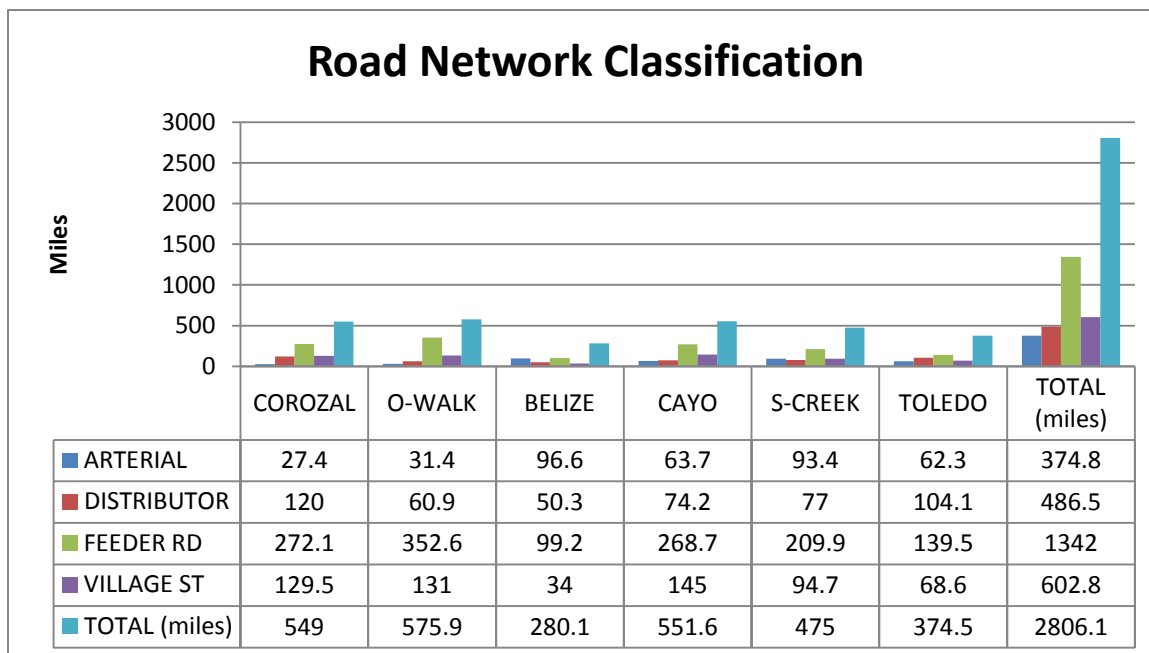


Chart 1: Belize Road Network by District (miles)

2.02 According to the type of surface, the road network is classified as 492.5 miles (17.5%) in surface treatment, 2097.01 miles (74.7%) of unpaved roads with marl wearing course and 216.59 miles (7.7%) are of simple earth construction. The chart following shows the distribution of roads by surface type for each district.

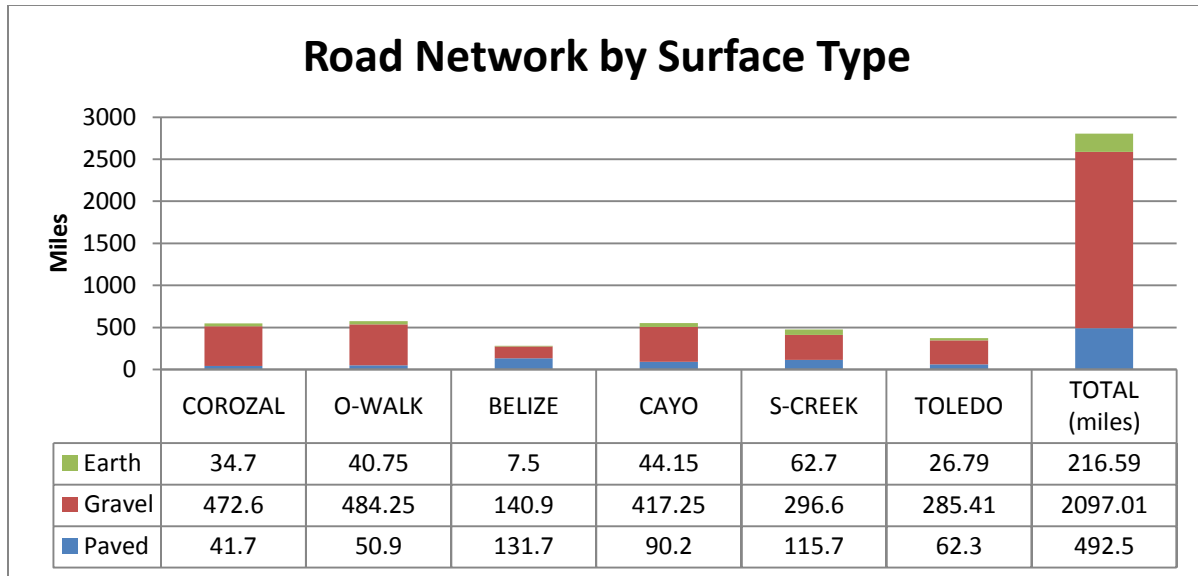
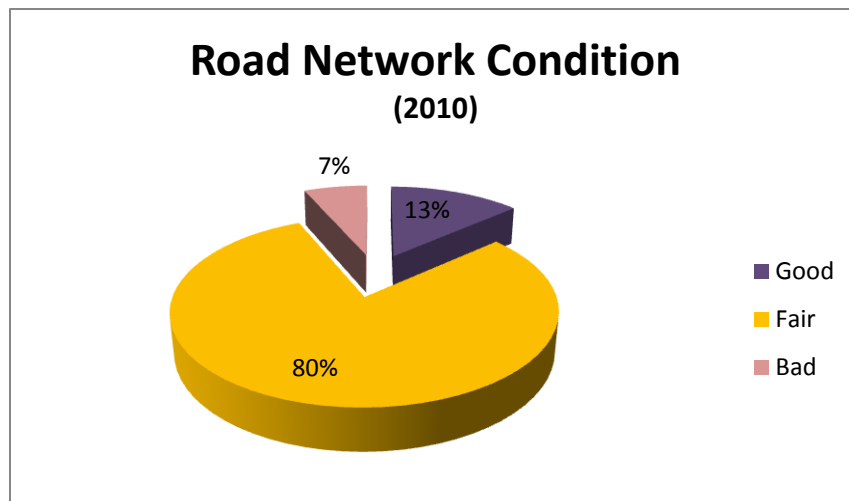


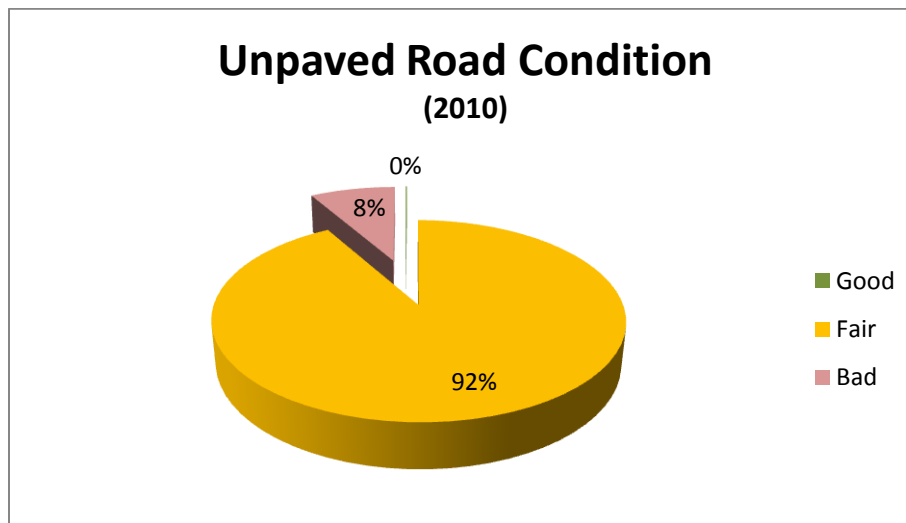
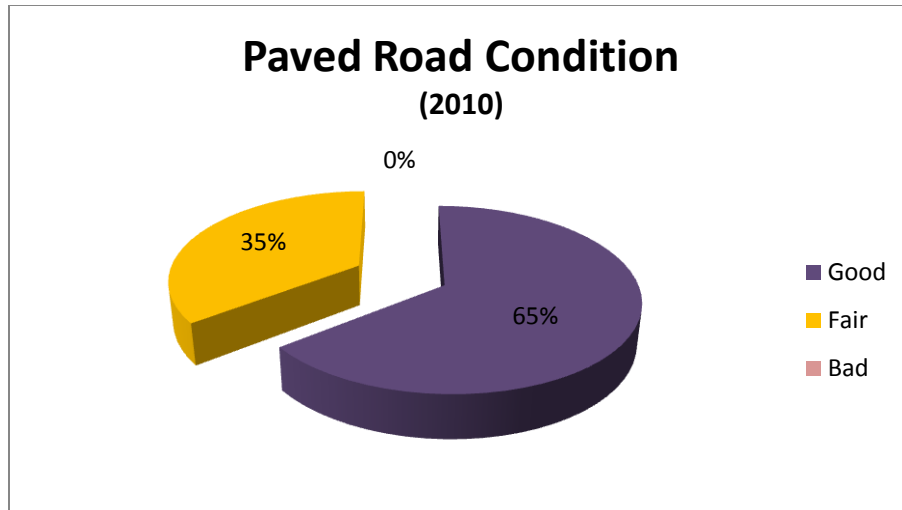
Chart 2: Belize Road Network by Surface Type (miles)

Road Network Condition

2.03 The BRNSMD found that the state of the road network is as shown in the chart below.



As can be seen, only 13% of the network is in good state, while 80% are in fair condition. The road network condition, by type of surface is shown in the charts below.



2.04 From the graphs above it follows that 65% of the paved road network was in good condition in 2010, a situation that has since changed considerably due to the lack of proper maintenance. If this situation continues in the same way, it will lead to accelerated deterioration, changing the status of these roads from good or fair into poor condition in a relatively short time as has been evidenced by the rapid deterioration of the Hummingbird Highway over the last two years. Unpaved roads are in the same situation, where 92% are in fair condition. This situation will be greatly magnified by the effects of climate change if annual rainfall increases, since this contributes significantly to the deterioration of roads especially where the drainage is inadequate.

Road Network Maintenance Needs

Types of Maintenance

2.05 Road maintenance is divided into four main types: Routine, Recurrent, Periodic and Emergency.

- (i) **Routine maintenance** is work which is required on a continual basis and includes: grass cutting, removing small landslips, drain cleaning / re-shaping, culvert and channel de-silting, among others.

Carried out on:

- Paved and Un-paved Arterial and Distributor Roads which are in good or fair condition.
- Feeder roads according to available funds and a prioritisation of this network based on traffic, condition and population data.

- (ii) **Recurrent maintenance** is work which is required at intervals throughout the year and is usually dependent on weather conditions and traffic volumes. Recurrent maintenance includes: repairing potholes, grading/blading /dragging (gravel and earth roads), premix patching and sealing of cracks (paved roads).

Carried out on:

- Arterial roads and all Paved Distributor roads which are in good condition.
- Un-paved Distributor roads and Feeder roads according to available funds and a prioritisation of this network based on traffic, condition and population data.

- (iii) **Periodic maintenance** is work which is required at intervals of several years and includes:

- a) Re-gravelling (gravel roads), this would be termed upgrading on an earth road;
- b) Re-sealing or surface dressing (paved roads);
- c) Overlay (asphaltic concrete roads).

Carried out on:

- Paved Arterial roads which are in good condition
- Distributor and Feeder roads according to available funds and a prioritisation of this network based on traffic, condition and population data.

- (iv) **Emergency maintenance** is work which is only required in response to a particular unforeseeable event: e.g. flood, land slip, major washouts etc. The work required varies in accordance with the event but is usually needed immediately to reopen the road which will be blocked or cut.

Applied on:

As and when required on all classified roads irrespective of their importance or current condition

MOWT Maintenance Budget

2.06 A road network is sustainable when it is in satisfactory condition¹ and does not, as a whole, deteriorate over time. Individual roads do not remain static: paved roads go through a cycle of

accumulating roughness, despite routine and periodic maintenance, until they are restored to their original smoothness by rehabilitation. Since a network is made up of roads that individually are at all points in this maintenance cycle, the condition of the network as a whole does not change year by year unless completely neglected or experiences an extreme disaster event. On this basis we are able to predicate that, based on the last information provided by MWT's maintenance management system, ROMAPS, using the Ministry's human and equipment resources, an annual amount approximating BZ\$33.19 million (mn) is needed to carry out proper routine and recurrent maintenance on the country's roads which are in a maintainable condition. The required budgetary allocation of \$33.19 mn comprises some BZ\$4.19 mn for paved roads; BZ\$24.4 mn for gravel roads; and BZ\$4.6 mn for earth roads.

This cost would undoubtedly increase in the initial stages of outsourcing maintenance works by an additional 21% (\$41.89 mn) to allow for taxes and profit margin for private contractors. In both cases, the assumption here is that the roads are in "good" condition at the commencement of routine and recurrent maintenance practices since a clear distinction should be made between road network maintenance and road network improvement.

It is therefore emphasised that the quantification of these funds does not include backlog maintenance, periodic maintenance and emergency maintenance; all of which can be markedly influenced by the effects of climate change and would undoubtedly increase the necessary financing requirement.

2.07 The amounts allocated for road maintenance over the recent past are as shown in the table below.

YEAR	PAVED ROADS/ HIGHWAYS	VILLAGE ROADS	VILLAGE STREETS	FEEDER ROADS	*BRIDGES/ FERRIES/ INLAND WATERWAYS	RECURRENT BUDGET	TOTAL (Roads Only)
2008	\$1,320,000.00	\$3,048,480.00	\$1,190,000.00	\$800,000.00	\$1,145,000.00	\$7,993,784.00	\$14,352,264.00
2009	\$3,600,000.00	\$0.00	\$1,000,000.00	\$0.00	\$825,000.00	\$8,556,397.00	\$13,156,397.00
2010	\$1,620,000.00	\$1,125,000.00	\$1,300,000.00	\$100,000.00	\$945,000.00	\$8,670,202.00	\$12,815,202.00
2011	\$1,083,559.00	\$1,761,829.00	\$3,155,447.00	\$0.00	\$2,147,541.00	\$8,717,874.00	\$14,718,709.00
2012	\$5,910,000.00	\$1,177,000.00	\$1,300,000.00	\$0.00	\$1,020,000.00	\$9,244,938.00	\$17,631,938.00
TOTAL	\$13,533,559.00	\$7,112,309.00	\$7,945,447.00	\$900,000.00	\$6,082,541.00	\$43,183,195.00	\$72,674,510.00

*denotes cost not considered under maintenance of roads

Table 1: MOW Annual Budget for Maintenance (BZ\$)

The continuous need to allocate an amount in excess of the predicated requirement for the paved roads is an indication that these roads cannot be considered to be in "good" condition, most likely due to the neglect of proper maintenance practices in years past. Alternatively, one may infer that the allocation for paved roads was not spent as allocated or was not spent effectively and efficiently. A deficit of approximately **BZ\$18mn** is established by comparing the routine and recurrent maintenance needs (BZ\$33.19 mn) with the average of budgets allocated for the years 2010 -12 (BZ\$15.06 mn). This means that currently only 45.3 % of the required resources for routine and recurrent maintenance are considered in the annual budget. Taking into account the current practice of the budget being also used to meet backlog maintenance, emergency maintenance and the need for new feeder roads and village streets, this percentage is significantly lower and points to a situation where deterioration will certainly continue.

Ministry of Works and Transport

2.08 The Works portfolio of MWT has ample institutional responsibilities regarding maintenance as indicated in its Mission Statement which reads in part:

“Works is principally commissioned to maintain all national assets comprising the transportation network, such as roadways, bridges, culverts, drainage channels and safety appurtenances with a view to providing good riding quality, all weather road upgrading, appropriate user safety and general access to enable transit activity, urbanization, agricultural and commercial development. This charge includes the preservation of civic buildings, sea defence structures and other municipal chattel”.

Other important institutional responsibilities of the Works portfolio of MWT are:

- to be the authority to superintend national mechanical maintenance services;
- to assist with disaster alleviation by emergency response to relieve obstructions or perils;

Considering this very wide scope of responsibilities delegated to MWT and accepting the limiting fact that all pressing needs cannot be attended at once but in a prioritized sequence, this document focuses its content specifically on road maintenance.

It needs to be emphasized that additional resources will therefore be required for the remaining responsibilities of the MWT, which are exclusive of road maintenance and depicted below as follows:

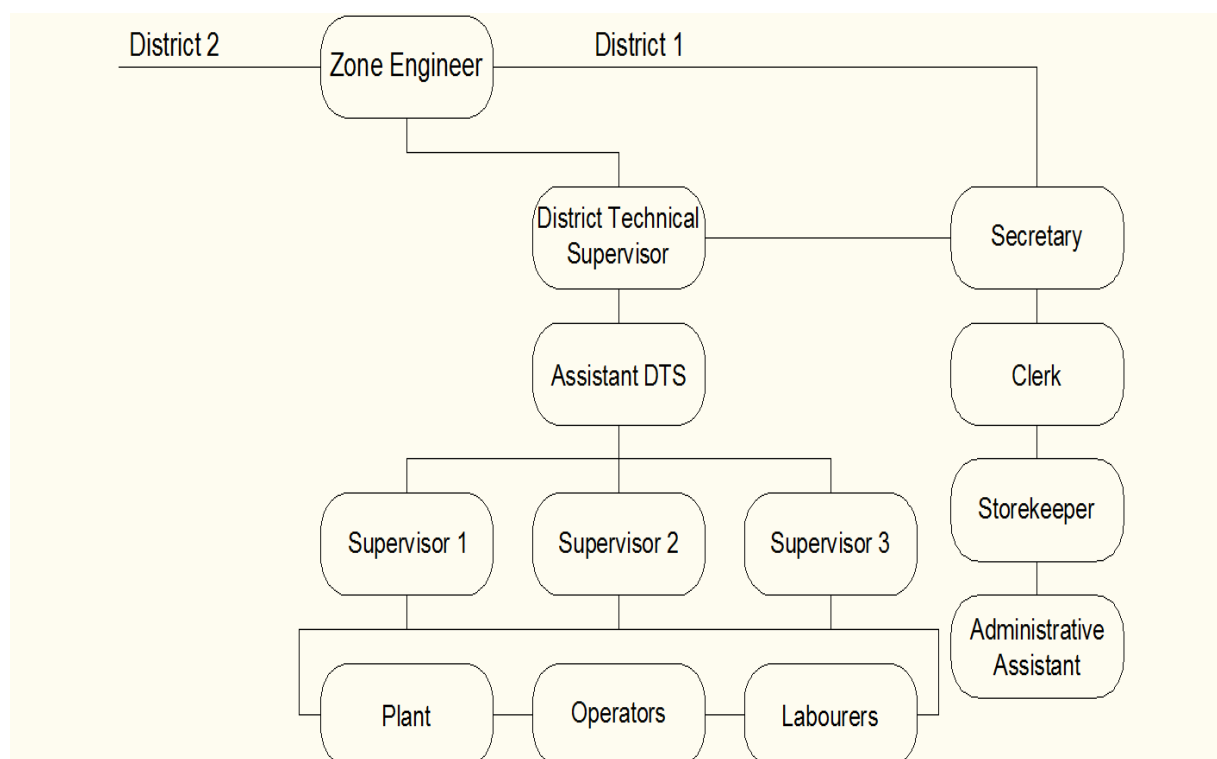
- Construction of new Village Streets
- Construction of new Farm Roads
- Construction and Maintenance of Bridges and Ferries
- Cleaning of Inland Waterways
- Maintenance of Buildings

2.09 For administrative purposes, Belize is divided into three zones: North, Central and South. Each zone has a Zone Engineer and covers two districts:

- **Northern Zone;** Corozal and Orange Walk Districts
- **Central Zone;** Belize and Cayo Districts
- **Southern Zone;** Stann Creek and Toledo Districts

Each district has provision for a staff complement which comprises a District Technical Supervisor (DTS), Assistant DTS, 3 Supervisors, a number of Operators and Labourers and a support staff of Secretary, Clerk, Storekeeper and Administrative Assistant. In most districts some key supervisory positions are not all filled especially at the Assistant DTS and Supervisor levels.

The following diagram shows the planned organization of a typical district.



2.10 The majority of district personnel have received little or no formal technical education. Most of them have learned road maintenance techniques on the job and very few have received more technical training. Consequently the coordination and planning of maintenance activities resides at the level of the Zone Engineers and Chief Engineer resulting in some ad hoc arrangements due to the numerous other duties delegated to them.

2.10 According to assessments by the mechanical maintenance staff, approximately 57 % of the necessary equipment to undertake maintenance activities is idle due to repair needs. This situation is exacerbated by the unfortunate lack of availability of spare parts, primarily due to budget constraints, that make the equipment often spend many days in the workshop. The table following provides the present status of the major equipment required for maintenance activities in each district that is in working and (repairable) condition.

Equipment \ District	Tipper	Backhoe	Roller	Loader	Grader	Bulldozer	Bush Hog/Tractor	Water Bowser
Corozal	2 (1)	(1)	1	1	2	1(1)	1	0
O. Walk	3 (1)	1	(2)	(1)	2	1	1	(1)
Belize	3 (2)	1 (1)	1	0	1 (1)	1 (1)	1	0
Cayo	1 (3)	0	(1)	(1)	1 (1)	1 (1)	1	0
Stann Creek	3 (1)	(2)	(2)	(1)	(1)	1	1	0
Toledo	4	1	2	2	1 (1)	1 (1)	2	0
TOTAL	16 (8)	3 (4)	4 (5)	3 (3)	7 (4)	6 (3)	7	1

Table 2: Working and (Repairable) Equipment by District

2.11 A road maintenance database, ROMAPS, which contains information on all the roads and their condition was established in the late 1980's. It is now in need of updating and the information contained therein needs to be verified. This database is a useful tool to record road conditions and plan routine and recurrent maintenance needs countrywide given the input of current and valid data. The data is based on visual inspection of the roads by the DTS and includes the costs of executing routine/recurrent maintenance activities. The ROMAPS database, however, does have its shortcomings since it cannot carry out appraisals of road maintenance investment schemes without the current database being further augmented with field survey data involving traffic census, axle load survey, pavement deflection and roughness surveys which would provide the basis for a more scientific approach to prioritizing road maintenance on clearly defined technical and economic criteria. There is therefore need to upgrade the ROMAPS by linking it to an appraisal software such as HDM IV or equivalent and providing resources for procurement of same and training of in-house technicians for conducting the surveys identified. The recent work carried out by iRAP on the primary roads can also be used to identify needed maintenance and safety improvements but additional staff needs to be trained in analyzing the data gathered.

2.12 In light of the discussion above it can be easily seen that there is an urgent need for a road maintenance strategy that will address the concerns enumerated if Belize is to halt the rate of deterioration of the road network and substantially improve its condition to satisfy stakeholders/road users. A possible scenario is discussed in the next chapter.

3. Policy Objectives, Targets and Strategies

3.01 The primary objective of a road maintenance strategy is to develop a sustainable means of ensuring that all activities needed to keep the roads operating indefinitely and to clear up any existing maintenance backlog are done on a timely basis. To achieve this objective a number of things have to be in place:

- I. an up-to-date database of the road network and its condition;
- II. prioritization of necessary maintenance works on the basis of defined technical and economic criteria;
- III. availability of the required equipment and human resources; and
- IV. adequate funding.

The first three concerns can be addressed through institutional reform while the fourth requires the identification of means of generating and collecting the necessary funding and legal reform of the management and maintenance of the road network.

Temporary /Short Term Intervention

3.02 Road network management is basically an intellectual activity: it involves planning (identifying and programming physical work); arranging for the physical work to be done; supervising the quality and volume of work executed; and evaluating the results of the management to optimize methods and techniques as they evolve. The persons involved are primarily specialized professionals and technicians with the manual labour restricted to what is necessary to collect data and generate information related to the planning process. As in all planning and coordinating activities it is necessary that a focal point or group be established to firstly analyze all the data provided, secondly make recommendations for activities to be undertaken and finally, ensure that the agreed activities are undertaken. It is recognized that this group is not necessarily the decision making body as their function is to rank and demonstrate the impact of undertaking any of the multitude of road segments requiring maintenance.

3.03 As set out in paragraph 2.09 the management of maintenance activities in MWT is shared among the zones and coordination on a national basis is difficult for a number of reasons. The first step in addressing this issue would be the establishment of a focal point in MWT. This can be accomplished by the secondment of a few existing staff members to a dedicated unit, PEU- Maintenance, which will be supervised by the Chief Engineer – MWT. The PEU will be charged with the responsibility of analyzing the available data (see paragraph 2.11), prioritizing the maintenance needs on the basis of objective criteria, preparing estimates of cost for these works and arranging and supervising the works carried out by private contractor or MWT personnel in some cases. Initially this PEU would comprise of one senior engineer, an executive engineer and an experienced site/works inspector. In its formative years, the PEU would be supported by technicians from the Soils Laboratory, Survey Section, the MIS along with an Administrative and Finance Officers from the existing MWT staff.

Given the fledgling nature of the PEU, and the limited funds available (discussed below), its activities would be concentrated on 330 miles of the National Highway System and 67.8 miles of newly rehabilitated donor-funded roads. The mileage of roads will increase with time as donor funded roads which are on-going are completed and handed over to the PEU as part of its obligation.

It is recognized that the establishment of the PEU is a temporary solution and will remain in existence until the outcome and findings of the technical assistance study are accepted by the Government of Belize. The PEU therefore would not provide a long term solution to the challenges of maintaining the road network as the maintenance obligations of the MWT increases annually with continuing growth of the national road network and as ‘mission creep’ and bureaucracy introduce themselves with time especially if the Unit is successful.

3.04 Given the constraints listed above, the most appropriate option to initiate the necessary reforms may well be that in the initial period, when the dedicated focal point in MWT is assigned responsibility for road maintenance and the necessary technical and legislative requirements for a RMF are being formulated, it be operationalised through a combination of funds allocated to MWT for maintenance of the paved roads under the Capital II section of the budget along with a supplemental of BZD \$1.5 million. This supplemental would be required annually to ensure sustainability of the PEU maintenance obligations during the transition period until a stable source of funding is determined and the RMF is fully established. The Ministry’s fleet of equipment will be an integral part of the support system relied upon by the PEU, in its initial stages, since the thrust of the maintenance program will be based on mainly force account means and gradually transition to performance based contracts as a stable source of funds is determined.

The concept of utilizing in-house funds, for the most part, will require executing a planned works program based on clearly defined technical and economic criteria as well as the timely de-reservation of funds to ensure optimisation of the limited resources.

For the Fiscal Year 2012/13 the funds which can be identified as relating to maintenance of paved roads amount to approximately BZD \$3.5 million and it is strongly advised that in fiscal year 2013/14 this sum is increased by an additional BZD \$1.5 mn specifically to assist with establishment of the PEU, backlog maintenance and repairs of MWT equipment. An approach similar to that being undertaken on the Hummingbird Highway, utilising a combination of hired equipment and MWT existing staff resources, is proposed. The PEU would however identify the priority areas on the targeted roads and monitor and report on the results achieved and commence the compilation of a comparison of the relative costs of out-sourcing all the works versus the combination approach proposed above. Established staff costs would partly offset by MWT from existing resources but other costs, such as materials, fuel, motor oils, spares, subsistence and overtime (in exceptional cases), would be identified against the specific job to provide a data base for the estimation of costs for the preparation of future budget exercises and the identification of the quantum of additional fees that would be required to adequately fund road maintenance.

3.05 The proposed short term approach, if adopted, would provide essential data for the needed reforms while at the same time focus the use of the available resources to obtain maximum benefits.

Long Term Solution

3.06 One possible solution that has found favour in many jurisdictions has been the establishment of a more autonomous body, commonly called a Road Maintenance Fund (RMF), to manage the collection and the expenditure of revenue to be derived through the introduction of user charges.

The RMF can take many forms and in the case of Belize, given the need to develop funding mechanisms and enact enabling legislation, it will be necessary to seek technical assistance to review existing models that are relevant to the situation in Belize as part of the comprehensive review of Belize Road management and maintenance practices. It is anticipated that technical assistance can be obtained from one of the multi-lateral funding agencies for this exercise.

This technical assistance would focus on the following aspects, the most important being:

Institutional Reform

1. Review the existing institutional framework relating to the construction and maintenance of roads, including the MWT and any other participating entities;
2. Evaluate the advantages and disadvantages of the framework, as well as the responsibility, authority and functions of the MWT and other participating entities in the construction and maintenance of roads;
3. Determine the need for change in the institutional framework for road construction and maintenance;
4. Determine the institutional capability required for effective regulation at the national level, and define the appropriate organisational structure and legal framework which will enable it to engage in the long term planning for effective road management and maintenance;
5. Based on the results of work on the tasks 1-4 above, design the most appropriate institutional structure, including a strengthening programme that will enable the proposed structures to operate effectively. Particular emphasis should be given to personnel needs, training and other factors which will impact the successful long term operation of the recommended alternative; and
6. Initiate implementation of the institutional strengthening programme.

Legal Review of Existing Legislation

1. Review the present legislation and regulations as they relate to road management and maintenance, concentrating on institutional and operating provisions; and
2. Make necessary recommendations for amendments that would update and unify the existing legislation as it relates to road management and maintenance, and where necessary, prepare comprehensive draft legislation that specifically relates to implementing the recommended alternative for road management and maintenance.

Financial Reform

1. Review and evaluate the present practice of using the general tax base and borrowing to support road Management, construction and maintenance and its applicability to present conditions;
2. Assess the financial situation of MWT, the degree of coverage of the financing system (administration, operation, maintenance), and ability to contribute to the expansion of the system.

3. Analyse the establishment of a Road Maintenance Fund (RMF) as a possible mechanism for financing road construction and maintenance and identify revenue sources for the fund; and
4. Analyse and propose possible mechanisms through which investment and maintenance costs can be recovered, taking into account the present system and the selected alternative for road management and maintenance.

Preparation of Plan

1. Develop a methodology for the evaluation of the most cost effective institutional arrangements; and
2. Based on the outputs from the activities described above, prepare a comprehensive plan and budget encompassing the organisational and legal framework, structure and institutional and financing mechanisms, operating guidelines, systems and control for the restructuring or enhancing of the existing structures in road management and maintenance in Belize; and

Workshops

Facilitate a series of workshops with various stakeholders to present the comprehensive plan and garner buy in from stakeholders and road users.

Possible Funding Sources

3.07 The financial constraints facing the Government of Belize make the provision of dedicated funding for maintenance of the primary network something of a challenge. However, given the deteriorating pavement condition of sections of primary roads and the continuing annual growth in mileage of the road network, the problem of underfunding of road maintenance in the long term is a certainty and alternatives sources need to be explored to generate the required financing and implement new management practices.

Generally Road Funds obtain their financing from a combination of “access” and “user” fees. Access fees are defined as those charges related to the issue of motor vehicle licenses and drivers’ permits; in Jamaica, for example, the existing legislation requires that thirty-three and a third percent of “the amount paid pursuant to the Road Traffic Act or Regulations made there under as licence duties on motor vehicles” be deposited to the Road Fund. In Belize, besides the Department of Transport, these fees are collected by the individual municipalities and form an integral part of their revenue stream and therefore such a formulation may not be readily accepted.

It is estimated that a full transition to an autonomous RMF could be accomplished over a 4 – 5 year period, and that the PEU would be gradually phased into the agreed structure of the implementing agency with possible separation from MWT. In effect the PEU would become the operative arm of the RMF in charge of providing the technical information (road studies and diagnosis, maintenance designs, maintenance manuals updates, condition indexes, etc.) on which maintenance priorities are determined, managing the performance based maintenance contracts from tender to completion, including supervision of contractors, performance evaluation as well as assuming other operating responsibilities as directed by the RMF.

User fees which merit consideration as sources of generating a stable income flow for sustainability of the Road Fund can take several forms as indicated by the following examples:

Levies on consumables – the most common normally takes the form of a surcharge on motor vehicle fuel and is used in the Caribbean Region, Central America and the United States. Given the efforts of the Government of Belize to keep the price of fuel at an affordable level the imposition of this type of additional charge may not be realistic at this time. Fuel is not the only consumable that can be levied however and part of the revenue could be raised by levies on lubricants, tires, and spare parts. In principle, a levy could also be applied to the purchase of new vehicles.

The imposition of tolls on specific roads – it is generally accepted that tolls are only imposed on roads where there is an alternate (free) means of access between two points; again a challenge given the existing road network. One must also weigh the cost of collecting the toll versus the revenue obtained in cases where traffic volumes are not sufficient to make toll collection economic.

Supplementary heavy vehicle fees – annual vehicle license fees also have another purpose. They can be used to refine use-related charges. The weight of a heavy vehicle may be offset by the number of axles that spread the load on the pavement; more axles mean less pavement wear. There may be a case for a reduction of a levy on diesel, which could be a benefit to commercial vehicles, if a supplementary annual fee for heavy vehicles that reflects both vehicle weight and number of axles is introduced.

Fines for overloaded vehicles – an overloaded heavy vehicle causes dramatically more pavement wear; a revision of the schedule of fines for such offenses to more accurately reflect repair costs and consequent enforcement of the weight restrictions could provide some additional revenue for the maintenance of roads if paid to a RMF.

International transit fees – vehicles entering from neighbouring countries should face costs of road use equivalent to those of domestic road users where appropriate. A comparison of the fees charged by neighbouring countries for commercial and tourist vehicles operating in those countries would provide a basis for determining appropriate fees.

Head Tax on Visitors – this option would involve a head tax on all visitors to Belize via the International Airport, Ports of Entry and land border entry points at the George Price and Phillip Goldson Border. This would be an option that would contribute a relatively stable flow of funds to the RMF and could be justified on the basis that they are also users of the road system while in Belize.

The exact nature of the fees that would be appropriate, acceptable and affordable could be investigated and recommendations made as part of the technical assistance proposed in paragraph 3.06.

3.08 The proposed short term approach, if adopted, would provide essential data for the needed reforms while at the same time focus the use of the available resources to obtain maximum benefits.

4.0 IMPLEMENTATION SCHEDULE

CURRENT SITUATION	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18
Submit draft Road Maintenance Strategy to CEO Caucus (Feb 25, 2013).	Budget passed in House & allocation of \$1.5 mn approved (1 st Quarter)	Budget Allocation of \$1.5 mn is passed by House. (1 st Quarter)	Budget Allocation of \$1.5 mn is passed by House. (1 st Quarter)	Budget Allocation of \$1.5 mn is passed by House. (1 st Quarter)	Implementation of Study Findings which were accepted by GOB. (1 st Quarter)
Submit final draft of Road Mtce Strategy to Cabinet for review. (1 st March, 2013)	PEU established with 3 staff member of MWT seconded to Unit. (1 st Quarter)	PEU prepares templates of contracts for PBC (1 st Quarter)	PEU prepares templates of contracts for PBC	PEU prepares templates of contracts for PBC	
	Road Inventory updating commences (1 st – 4 Quarter)	Mtce works on 330 miles of Highways and 97 miles of Donor funded roads supervised by PEU.	Mtce works on 330 miles of Highways and 115 miles of Donor funded roads supervised by PEU.	Mtce works on 330 miles of Highways and 115 miles of Donor funded roads supervised by PEU.	
	Training Workshops are conducted For PEU/MOW staff on RMF and PBC (3 rd Quarter)	Training Workshops continue for PEU/MOW staff And contractors (2 nd Quarter)	Training Workshops continue for PEU/MOW staff and contractors (2 nd Quarter)	Findings of Study presented to MOW and GOB for review.	
	Technical criteria for prioritizing mtce is established (2 nd Quarter)	Funds Identified and Agreement for Technical Assistance signed off.(2 nd Quarter)	Consulting Firm continues with study/review . Liaise with Sol Gen on draft legislation and also stakeholders. (1- 4 th	Study findings are accepted by GOB	
	Review of Annual Mtce Program is done by PEU. (1-2 nd Quarter)			Consultations with MOW Staff for buy – in is done.	
	PEU Supervises	Procurement			

	<p>mtce on 330 miles of Highway & 67.8 miles of donor funded roads. (1st – 4th quarter)</p> <p>Axle load, Traffic Census And other field surveys are conducted for data gathering by PEU</p> <p>Annual Work Program prepared for FY 2014/15(3rd – 4th quarter)</p> <p>TOR for Technical Assistance Study prepared by PEU.(3rd Quarter)</p> <p>TOR approved by GOB and request for funding made. (3rd-4th quarter)</p>	<p>of consulting firm for study commences. (3rd Quarter)</p> <p>Sol Gen Office informed of proposed Legal Review/Reforms of current laws</p> <p>Consulting Firm selected and commences study/review (4th Quarter)</p> <p>Axle load, Traffic Census And other field surveys are conducted for data gathering by PEU</p> <p>Annual Work Program prepared for FY 2015/16</p>	<p>Quarter)</p> <p>Axle load, Traffic Census And other field surveys are conducted for data gathering by PEU</p> <p>Annual Work Program prepared for FY 2016/17</p>	<p>Consultations with stakeholders are held for buy-in.</p> <p>Annual Work Program prepared for FY 2017/18</p>	
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ANNEX A

BREAKDOWN OF REQUESTED \$1.5 MN ALLOCATION FY 2013/14

ANNEX B

Cost of Backlog Maintenance (Highways)

ANNEX C

Estimated cost of Maintenance of Highway System

