ROAD MAINTENANCE IN UGANDA - CHALLENGES AND WAY FORWARD

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1. Purpose of the Paper

The paper presents a case for road maintenance in Uganda, the historical challenges it has faced and opportunities available for improved performance.

2. Overview of road maintenance

A road is a long narrow stretch with prepared smoothed or paved surface (paved, gravel, earth) built for passage of vehicles, people and animals. It's a high value asset in the socio-political and economic life of a country. Uganda's road network of 140,000 km has a replacement value of USD6.2bn, which is nearly 24% of GDP. Comparatively, asset to GDP ratio for Ghana's is 33%, South Africa it is 16%, Chile 5%; Thailand 8%, and Jordan 10%. Maintenance comprises activities to keep the pavement, shoulder, slopes, drainage facilities, appurtenant structures and properties within a road margin as near as possible to their "as constructed" or "renewed" condition as possible. It includes repairs and improvements to eliminate causes of deterioration and avoid wasteful over-repetition of maintenance efforts.

Routine maintenance are regular treatments applied to a road to keep it functioning properly and is required on every road whatever its engineering characteristics, traffic volume and classification. It comprises small scale dispersed activities performed mainly using unskilled/semiskilled manual labour augmented with simple tools and light equipment. It can be cyclic (e.g. grass cutting) or reactive (drainage cleaning). It can also be categorized as on-carriage (pothole or crack repair) or off-carriage (shoulder charging). Conventional or community contracting may be appropriate. Routine maintenance provides opportunity for identifying periodic maintenance needs.

Periodic maintenance refers to significant activities carried out regularly according to predetermined schedules to improve the condition and operational status of a road and improve its structural integrity. Works are large scale and require specialist equipment and skilled labour. Types include re-gravelling, resealing, resurfacing, repairs to structures.

There are also urgent, unplanned maintenance works, also termed emergency works that are required in response to severe weather, accidents, floods and others.

Major bridges and structures on a road require similar maintenance attention but customized to the individual needs of each structure based on its configuration, age and functional circumstances. A bridge structure will undergo a spectrum of maintenance that comprise cyclic works (e.g. river training, cleaning joints), minor works (painting and rust protection), equipment/ parts replacement (restoration of guard rails, replacement of steel members), major works (replacement/strengthening of structural parts such as decks, piers, abutments, columns, beams) and out right replacement of structure. Delivery of works may be scheduled within a road maintenance program or separately in a specialized bridge maintenance program depending on approach adopted by the agency.

3. Purpose of timely road maintenance

Investments in roads are colossal capital undertakings and therefore need protection. Timely maintenance sustains the quality and safety of a road in a condition close to original design and minimizes user costs. A well-designed and timely road maintenance program dampens the impact of deterioration agents (traffic and water) and prolongs pavement life. Pavement damage is proportional to the axle weight of a vehicle under the fourth power law which states: damage to a road pavement by a vehicle is equivalent to its weight to the fourth power i.e. a 2000 pound (0.91 tons) axle causes 16 times of damage as a 1000 pound (0.454 tons) axle. Repeated pounding of a road by multitudes of these axle loads over the life of a road fatigues the structure which needs to be relaxed through maintenance. Prolonged soaking of road pavements by water ingress exacerbates the impact of axle damage and is a cause for many pavement defects such as potholes, cracks, edged failures and embankment collapse. The impact of inadequate maintenance can be felt almost immediately on safety of roads and vehicle performance. Left unchecked minor maintenance problems become more serious backlog issues requiring expensive repairs, including rehabilitation or reconstruction. It's estimated that repair cost can rise to six times maintenance cost after three years of neglect and to 18 times after five years of neglect.

4. Importance of timely road maintenance and management system

Road maintenance is a continuous all year round activity with highly variable costs that depend on road characteristics (type, condition, surface type and construction quality, heavy vehicles traffic volume), organizational/logistics arrangement, technology choice, equipment type and cost, cost of input labour and materials, quality and timeliness of previous maintenance. The central cause of problems in road maintenance arises when cost is improperly estimated and/or insufficient financial provision made. Successful road maintenance has to be implemented under guidance of a Road Management System (RMS). This can be any system used to store and process road and/or bridge inventory, condition, traffic and related data for planning and programming with associated business processes to execute the business needs of the agency. The key functions of such a system are needs assessment, planning/budgeting, developing multi-year expenditure programs, data collection.

Success lies on four pillars: Processes: An active RMS that is an integral part of monitoring and planning process where outputs should regularly inform annual reporting; People: An organization unit staffed with suitable well trained qualified and experienced staff to manage monitor and continually improve the RMS. Technology: Appropriate IT components backed by an institutional IT function replete with an IT strategy with which the RMS fits. Funding: Predictable funding that responds to the multiyear expenditure program while still being able to absorb spikes in expenditure needs occasioned by emergency maintenance needs. The key assumption is that there is a maintainable road network with a minimal amount of back logged length and that a distinct line of funding is available to treat that backlog.

5. Key Road Statistics and Information on Uganda

The public road asset is 140,000 km categorized as 20,500km national roads (4257km paved, 16,250km unpaved) under management of UNRA; 2110km (580km paved, 1520 km unpaved) City roads under KCCA; 30,000km district roads under 121 District Local Governments; 3800km urban roads under 41 Municipalities; 7700km urban roads under 214 Town Councils and an estimated 60,000 - 80,000km of Community Access Roads under 1155 Sub Counties. The replacement value of the asset is USD 6.2 Billion. There is maintenance backlog estimated at USD 1.25 billion covering 51,000km of total network (7000km on national road, 700km on KCCA roads, 2000km on municipality roads, 3500km on Town Council roads, 8000km on district roads and the rest on CARs). There is presently an estimated motorized traffic of 8,500 million veh-km per year from 3,755 million veh-km in 2003, 80% of which is on national roads. Average travel time has peaked at 2.02 min/km up from 1.83min/km in 2015. Congestion in Kampala city has increased journey time from 2.4 min/km in 2014 to 2.9 min/km today. Road fatalities now are nearly 3,500 persons, one of the highest in Africa. There are an estimated 550 bridges on the national network, in fairly good condition, with an estimated replacement value of USD 2.0bn. On DUCAR network there exists more than 300 bridges most of which are in poor condition. There are 1500 sites identified for bridging which have no structures at the moment (or are temporarily bridged) on the network requiring new bridges.

The road maintenance budget has stagnated at UGX 417bn per year from FY 2015/16 and is still sourced from the Consolidated Fund contrary to intentions set out in the URF Act, 2008. Even then actual realization is only up to 80% due to sudden budget cuts and year-end recall to consolidated fund of unspent balances. The funds are allocated by the road fund designated agencies based on a formula that caters for condition, maintenance requirement, length of roads, traffic volume among others as scheduled under S.22(2) of the URF Act. Accordingly national roads take 64.1%, districts take 11.53%, municipalities 6.19%, Town Councils 4.73% and CARs 1.88%, mechanical imprest 2.87%, special project 1.36%, City roads at 4.67%, URF Secretariat 2.65%. In real terms the funding to each agency keeps going down owing to increasing number of agencies and inflation.

Routine manual maintenance on national roads is undertaken by labour based contractors, each engaged on a length of 4-10km working with simple tools and paid on task rates and/or set performance targets. Routine mechanized and periodic maintenance are undertaken by a mix of force account (using heavy equipment deployed in UNRA's 23 stations) and contracting. All along national roads there are sub county-based road committees made up of LC3 chairpersons, community development officers and district administrative leaders. Their main work is to sensitize communities about roads and act as a link between communities and the works.

On DUCAR network, routine manual works are undertaken by labour gangs engaged on fixed wage per month on basis of one man per 2 km (unpaved) and 4 men per km (paved). For routine mechanized and periodic maintenance, all works are undertaken by force account and for this USD153 million worth of equipment have been procured and are being distributed to the DUCAR agencies such that each beneficiary district shall possess a full unit. Every district has a constituted District Roads Committee in response to section 25(2) of the URF Act. These committees provide oversight over planning and implementation, accounting and reporting of road fund resources.

Table 1 shows the unit costs for DUCAR road maintenance for the period FY 2015/16 and FY 2016/17. The general increase in unit costs observed could be attributed to inflationary pressures affecting construction inputs.

Table 1: Road Maintenance Unit Costs in the period FY 2015/16 – FY 2016/17

Indicator	FY 2015/16	FY 2016/17	Notes
	1,000 USD/km		
1.1 District Roads – Periodic Maintenance	4.7	4.9	
1.2 District Roads – Routine Maintenance	0.4 - 1.3	0.5 – 1.4	1
1.3 Urban Roads – Periodic Maintenance, paved	12.9	13.1	
1.41 Urban Roads – Routine Manual Maintenance, Paved	1.5 – 2.0	1.6 – 2.1	2
1.5 Urban Roads – Routine Mechanized Maintenance, Paved	3.5 – 4.6	3.6 – 4.6	3
1.6 Urban Roads – Periodic Maintenance, Unpaved	6.4 – 13.1	6.6 – 13.3	4
1.7 Urban Roads – Routine Maintenance, Unpaved	0.5 – 1.8	0.5 – 2.0	5

Notes

1. *Lower end of range for manual works; higher end for mechanized*
2. *Lower end of range for town councils; higher end for municipal councils*
3. *Lower end of range for low traffic; higher end for high traffic urban roads (KCCA and Mukono MC).*
4. *Lower end of range for town councils; higher end for municipal councils*
5. *Lower end of range for manual works; higher end for mechanized*

6. Road maintenance in the context of reforms during the period 1996-2016

Road deterioration started to receive serious attention of sub Saharan governments in the 1980s from realization that failure to maintain roads is tantamount to an act of disinvestment, for it erodes the sacrifice of past investments in roads. The regional losses in the value of infrastructure in the 1970s/1980s were in the order of $45 billion, which could have been averted by preventive maintenance expenditure of only $12 billion. For Uganda, by 1986 90% of feeder roads, 350km of the then 2000km of paved national roads, and the entire 6000km gravel national roads were in state of disrepair. The main problem had been outmoded maintenance practice combined with minimal funding leading to progressive decline in stock of good roads. The rehabilitation program of government up to 1992 was geared towards reclaiming a sizable portion of this "lost" network. The reforms adopted in 1992 were within the World Bank supported Road Management Initiative (RMI) for the wider sub-Saharan Africa and were based on the four building blocks i.e. funding, management, responsibility and ownership of roads. The principle objective was to commercialize road management by moving them out from the bureaucratic civil service setting, injecting market principles in their management and charging a fee-for-service for their use. These were meant to cure a host of legacy problems associated with the traditional approach to road maintenance. Force account could not deliver to expectation given the frequent equipment breakdown and a lowly paid demotivated in-house workforce. Road programs tended to be crowded out in the stiff competition for prioritization within the general bureaucracy of Ministry of Works. Local governments were significantly ill-equipped and understaffed to deliver effective maintenance on rural roads. The private sector and local communities were minimally involved in road issues. By 1992 (the year of the Road Maintenance Awareness Seminar), government was meeting only 1/3rd of the maintenance funding needs of the network. Between 1992 and 2007 there were a number of donor supported rehabilitation/maintenance programs on all major networks (EU supported program in Southwest, DFID program in Bunyoro/Toro, KFW program in the east, World Bank supported TRP in northern and central regions and JICA on feeder roads). There was also DANIDA supported labour-based programs in six districts in northern Uganda in the period. Their effectiveness was blunted by fossilized institutional setting, outmoded technology and inadequate counterpart staffing. The real move towards reforms came with the commencement of the Road Sector Development Program (USD1.5bn RSDP1 1996-2006 and USD 2.28bnRSDP2 2006-2016). New institutions were created i.e. transitory RAFU in 1996 later transforming into UNRA in 2007, Road fund in 2008 and a reformed Ministry for Works. A number of national roads were rehabilitated and upgraded; management of DUCAR roads was institutionalized within district/urban local governments as part of the decentralization policy. In agreement with donors, financing road maintenance was ceded 100% to government with the setting up of a 2G road fund leaving room for donor support only on road development. In preparation for force account sunset, contractors and consultants were given increasing amount of road maintenance work on both national and DUCAR networks. A DFID funded Cross Roads program in Ministry of Works in 2011 to 2015 worked in this respect including starting a guarantee funding scheme for local contractors.

The above progress notwithstanding, the reforms have not progressed as intended at the beginning putting at stake sustainability of the progress registered so far. Road fund and UNRA are set up by law and are in place but both not fully operationalized as per the founding Acts. UNRA was meant to be a project procurement and management entity outsourcing physical implementation of road maintenance to the private sector but this has not been fully achieved. The private sector to which UNRA was supposed to outsource instead concentrated on tender fights amongst themselves inflaming corruption in the process. The capacity of the Contractors to deliver contracts to time, cost and quality were never achieved in these areas. This paralyzed the procurement system in UNRA thereby preventing them from satisfying a key plank of its calling. Force accounts with all its wastefulness and inefficiencies was instead expanded with no sunset in sight. In 2009, UNRA's road asset size was doubled from 11,000km to 21,000km overnight by Ministerial Proclamation but without matching resources. Most of the new roads were from rural class with huge backlog problems that needed to be dealt with first before upgrading to national status. Many road development programs were mired in corruption allegations (Mukono-Katosi road), administrative reviews (Kigumba-Bulima road) contractual disputes (Northern bypass), late delivery (Kabale-Kisoro road), commencement without design (Tororo-Mbale road), quality questions (Kampala-Masaka road).

Road fund has not fared any better on its path to full operationalization as a 2G fund able to harness resources from allowed road use charging instruments (fuel levy, transits fees, distance charges, annual licenses, traffic fines and others) and plough proceeds into road maintenance undertaken by implementing agencies. Instead it has since operationalization in 2009 received funding from the consolidated fund. This money has increased from UGX 113bn in FY 2009/10 to UGX 417bn in FY 2015/16 where it has since stagnated. Even then this growth in real terms and in the absolute has not kept pace with the ever increasing needs of the network maintenance. The number of implementing agencies looking after the DUCAR network has continued to grow implying the need for additional resources which has not happened. In 2009 the road fund agencies comprised of 86 districts, 22 municipalities, 174 Town Councils, 1050 sub counties and 2 authorities. To date districts, municipalities and Town Councils have increased to 121, 41, and 214 respectively. The strategy adopted by road fund to cater for the needs of the new agencies is to share resources of the mother agencies, which in essence depresses the available budget for the mother agency.

There is a lacuna between the URF Act 2008 and the URA Act S.14 Cap 196 that constraints URF's access to road user charges. Essentially a 2G Fund should harness road user resources from applicable road use charging instruments and deploy proceeds to road maintenance. Operationally, it entails the Minister for Finance declaring levies on applicable instruments during the reading of the national budget. For petroleum products the levy is a percentage over and above the normal excise duty on each liter. In no way does it involve diversion of excise duty taxation from financing normal government work. The collection agent is Uganda Revenue Authority (URA) under a performance agreement with the Fund. Proceeds are banked on an independent URF account monthly. The monies are disbursed to implementing agencies as and when they requisition and funds so disbursed do not go back to Treasury at the end of the financial year. Evidence from countries that have fully operationalized road funds show that such road funds have reduced underfunding of maintenance, reduced cost, improved absorption of funds and reduced decline in road quality. Overall they have not undermined fiscal flexibility and instead improved execution capability of road funding and its output.

Since 2010, URF has made relentless effort to articulate and prepare for attainment of such a 2G fund. It has made submissions to Parliament, Cabinet, Kyankwanzi Leaders Retreat, Transport Sector forum and others. It prepared a Road User Charges (RUCs) framework way back in 2014/15 and a raft of Regulations to its law in readiness for 2G. As this dilly dallying goes on, the priorities of government is slowly shifting to oil and standard gauge railway, which is a risk to road fund with implication that roads will slide down the policy priority list leaving little hope for completion of the reforms.

The residual Ministry for Works has also not progressed much on the reform path as had been intended. For one its policy, standard, regulations and monitoring roles have not been strengthened enough. It is also evident that the residual Ministry for Works has still held unto some residual implementation functions on rural bridges and roads, which roles should rightfully be ceded to the DUCAR agencies. Other Ministries and departments of government have also encroached on the mandate of the Ministry, sometimes with negative consequences. Ministry of Lands is implementing an urban roads program in many municipalities under USMID without delegation of mandate from the Ministry of Works. Districts and Unban local governments are routinely upgrading road classes from community to district/urban status and declaring such to road fund for funding without Ministerial instrument.

7. Road Users' Perception vide 2016 RUSS

Uganda road fund last July released results of the Road User Satisfaction Survey (RUSS) for 2016 which showed a marked decline over similar findings in 2015 in the general satisfaction of road users with our roads. Previous such studies conducted annually from 2012 had shown increasing level of satisfaction by road users, 27% in 2012, 22% in 2013, 32% in 2014, 53% in 2015 and 37% in 2016. This time users fault roads on many aspects that constrain their enjoyment, notably narrowness, dustiness, inadequate maintenance, poor drainage, congestions and accidents. The most dissatisfied category of road users was pedestrians who felt the least catered for and most disenfranchised in road programs. The most satisfied category was cyclist and bodaboda who felt the least pinch with poor condition of roads. Congestion in Kampala city was a major concern to city road users of all categories. In the perception of road users, UNRA and KCCA were two agencies singled out as performing well above all other agencies. These concerns are signals of bigger historical problems which roads accumulated over many years of network underfunding and neglect.

Amongst the priorities set by the road users for government, ranking from the top are: widening roads, tarmacking roads, better road maintenance, improving road drainage, improving road safety (by conducting road safety audits and ensuring road signs are in place), filling potholes, building longer lasting roads and pathways.

8. Opportunity for action

From the foregoing, it is evident that huge amount of work still remains to be done in order to improve the condition of roads through proper maintenance.

8.1 Completion of the reforms of road sector

All the four aspects of the reforms in road sector i.e. funding, management, responsibility and ownership of roads need to be completely achieved so as to fully commercialize road management as a central objective of the reforms.

Building Block	What Is it?	Achievement To date	Required Action
Ownership	Involve road users in the management of roads	• Road user groups on Boards of UNRA and URF • Road Committee on all networks • Sector Working group forum • RUSS feedback • Active Civil Society	• Institutionalize road users forum • CAR maintenance through self-help efforts • Streamline Public/private information flow
Financing	Secure a stable flow of funds for adequate road maintenance	A road fund set up by law, URF Act 2008, with private sector majority board	Address lacuna in law to fully operationalize the road fund.
Responsibility	Ensure all parties know their responsibilities and are given corresponding authority	• Responsibility over road classes have been assigned to agencies set up by laws • Annual performance agreements between road fund and agencies • MoWT responsible for plans; MoFPED responsible for accountability over road maintenance	• Empower MoWT as sector leader through Roads Act • Do not duplicate road programs and funding in other organs of government • Stick to original mandates of URF and UNRA as per founding laws

Building Block	What Is it?	Achievement To date	Required Action
		• Greater level of outsourcing works to private sector on national and city roads	• Regulate authority of local governments over DUCAR network • Clarify roles of Ministry and agencies on axle load control and road safety
Management	Introduce sound business practices and managerial accountability	• Maintenance performance targets for agencies set, monitored and audited for maintenance agencies • Road fund resources allocated through a rational approach based on formula in S.22 of the URF Act • URF annual report and audited accounts regularly published • PPP law (2015) in place	• MoWT to set, monitor and audit sector targets • Institutionalize systems wide planning and management of roads • Mainstream business principles into the force account approach to maintenance • Introduce long term PPP-based performance based maintenance of roads • Institutionalize efficiency and transparency in procurement systems of agencies • Carry out road classification comprehensively

8.2 Road Master Plan for the Next Decade to 2030

Design and launch a major road plan for the next decade themed on modernization and upgrade of infrastructure to suit infrastructure for emerging technological advances, notably as rapid transport and smart signals to control congestion in urban areas, wider expressways between major cities, modern long span bridges at major crossings including ferry crossings, smart roads for upcoming automation and autonomous cars and others.

8.3 Attract and retain rare engineering skills and experience into roads

As road works get more modernized and complicated requiring multi-skilled experienced engineers, Government should design a scheme to attract experienced team of engineers with rare skills to drive the next phase of road modernization program. Engineering training and experience is a rare resource accumulated over many years of practice and cannot be easily obtained. Those nurtured and trained by Ministry of Works over the last 40 years have either retired or been restructured out of the sector in numerous tumultuous episodes that rocked the sector lately. There is a national deficit in specialized skills such as bridges, asphalt, foundation, traffic, designers, contract specialists, materials, transport economist an other areas that can be filled using this retention approach.

8.4 Balance between road development and maintenance in budget framework

Road maintenance presently gets only UGX417bn of the UGX3trillion annual roads budget leaving a big chunk for road development. This is way below the optimum required UGX800 – 1,000million required annually to achieve minimum standards of maintenance. In essence Uganda is spending just 0.55% of its GDP on road maintenance against a minimum recommended of 0.85% to just about arrest spiraling buildup of backlog.

8.5 Complete the current raft of legislations at various stages of completion

Propel to enactment and /or operationalize the various legislations drafted to empower the sector variously. There is the Construction Industry legislation, the Roads Bill, the PPP Policy, the Engineers' Registration Amendment Act and other to give effect to the powers and authority of the sector.

9.0 Conclusions and recommendations

The following are the key conclusions and recommendations emanating from the presentation herein:

9.1 Conclusions

i. Roads are colossal capital investments constituting as much as 30% in asset to GDP ratio and require well financed timely maintenance to avoid disinvestment and erosion of value.

ii. The road sector reforms Uganda undertook in the mid 90's based on the four building blocks of financing, management, responsibility and ownership have not been completely achieved as intended. While significant aspects of the reforms have been achieved, there are remaining issues in each of the four building blocks notably: full operationalization of the resultant institutions of UNRA and URF, stabilising road maintenance funding, empowering Ministry of Works as sector leader, institutionalisation of road user engagements and Public Private Partnerships.

iii. Successful maintenance has to be implemented under guidance of a Road Management System backed by a mature well established IT system and Policy.

iv. The purpose of timely road maintenance is to limit the damaging impact of axle load (to the 4^{th} power), and prolonged soaking by water and actions of various environmental forces so as to prolong the pavement life.

v. The road maintenance budget under URF has stagnated at UGX 417bn per year from FY 2015/16 and is still sourced from the Consolidated Fund. Actual realization is only up to 80% owing to budget cuts and returns to treasury of unutilised balances at the end of the FY. Actual road maintenance funding under constraint of existing absorption capacity of agencies is in the order of UGX 800bn to UGX 1,000bn. Because of consistent underfunding of road maintenance for many years, the existing road maintenance backlog is estimated at 51,000km (US$ 1.25bn). This was further compounded by the unplanned upgrading in 2009 of nearly 11,000km of extremely poor condition local roads to national status under UNRA management in the process doubling UNRA asset to 21,000km without matching financial resources. Consequently, road user satisfaction with the condition of Uganda's roads has hardly gone beyond 50% on account of narrowness, dustiness; inadequate non-motorised user facilities and poor maintenance.

vi. The traditional Force Account system bereft of commercial elements especially in procurement and supply chain has been found wasteful and inefficient. The new approach adapted for district roads since 2011 should be imbued with commercial elements and even then a sunset program ought to be put in place even if with a longer time horizon. The time period would assist in preparation for greater outsourcing to the private sector as was the case with the Cross Roads program which provided a construction guarantee fund to nurture private sector and grow the local construction industry.

vii. Most Engineers nurtured and trained by Ministry of Works over the last 40 years have either retired or been restructured out of the sector in numerous tumultuous episodes that rocked the sector and this has created a major technical capacity gap for the road sector which requires addressing.

9.2 Recommendations

i. UNRA and URF need to be brought back on track to operate and function as intended in the reform process and as documented in law (i.e. project procurement and management agency for UNRA and a Second Generation Fund for URF).

ii. All the four aspects of the reforms in road sector i.e. funding, management, responsibility and ownership of roads need to be completely achieved so as to fully commercialize road management as a central objective of the reforms.

iii. Government should design and launch a major road plan for the next decade (2020 to 2030) themed on modernization and upgrade of infrastructure to suit road infrastructure requirements for emerging technological advances.

iv. Government should design a scheme to attract (from retirement and private practice), retrain and retain experienced team of engineers with rare skills to drive the next phase of road modernization program.

v. At a policy level, a fair balance in the share of available road sector resources should be struck between development (new road construction) and road maintenance with a view to satisfy as much as possible the existing annual road maintenance funding requirements of between UGX 800bn to UGX 1,000bn.

vi. Ministry of Works should be realigned to the role intended for it under the road sector reforms: i.e policy, standards, monitoring and sector regulation. All necessary pending legal instruments should be enacted to empower the reformed ministry and be seen to effectively take on the lead role.

vii. As much as possible, the reintroduced Force Account should be clothed with appropriate business practices to ensure efficiency, effectiveness and economy in delivering road works and avoid wastefulness associated with traditional approach of yester years.

viii. A proactive program to enhance capacity of agencies and render them to deliver programs should be designed and implemented in line with qualified human resources, systems and integrated IT based Road Management Systems.