

Yemen Transport Sector

**Input to the Yemen Policy Note no. 4. on
Inclusive Services Delivery**



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Acknowledgements

This Note has been prepared in the context of Yemen's Policy Note on Economic and Sector Topics led by Mr. Wilfried Engelke, Senior Economist. The outcome of the note draws on a wide pool of expertise from inside of the World Bank, as well as sector works throughout many years of the World Bank's constructive engagement and partnership in the transport sector in Yemen. The note offers an extensive analysis of Yemen's transport sector, identifies immediate and short terms priorities and presents a set of recommendations to address the sector's needs.

The outcome of this note has been a collective work produced through insightful reviews, advices and guidance received from colleagues inside the Bank. Most notable, Mr. Olivier Le Ber, Practice Manager-Pakistan, Afghanistan, Middle East and North Africa Global Practice Transport & ICT, Mr. Wilfried Engelke, Sr. Economist and Mr. Balakrishna Menon Parameswaran, Lead Urban Specialist, GSU12 and others including the Peer Reviewers. The author is most grateful for their valuable comments and contributions.

The author is also grateful to Ms. Dina Al Abd for her offer to help in reviewing the first drafts, and for her excellent ideas and suggestions that brought the document to its final shape. A word of thanks and gratitude is also due to Ms. Suhair Murad Al-Zubairi and Ms. Fowzia Yahya Musleh Al-Qobi for their excellent typesetting.

Acronyms

MPWH	Ministry of Public Works and highways
Km	Kilometer
RAP	Rural Access Program
RAI	Rural Accessibility Index
RAPCMO	Rural Access Program Central Management Office
UN	United Nations
MOT	Ministry of Transportation
CAMA	Civil Aviation and Metrological Authority
GAMA	General Authority for Maritime Affairs GAMA
FFPMU	Foreign Funded Project Management Unit
GCRB	General Corporation of Roads and Bridges
RMF	Road Maintenance Fund
LIG	Low Income Groups
BPL	Below Poverty Line
GoY	Government of Yemen
DNA	Damage Needs Assessment
PMS	Pavement Management System
HDM4	.Highway Development and Management System-Version 4
RUC	Road User Charges
MOF	Ministry of Finance
RAMP	Rural Access Management Project
WHO	World Health Organization
GDP	Gross Domestic Product
IDA	International Development Association
TMC	Term Maintenance Contracts

Introduction

1. The Transport sector policy note is part of a series of comprehensive economic and sectoral policy notes designed to address issues facing Yemen in an early post-conflict phase as a consequence of the on-going armed conflict impacting the economy of Yemen. Improving connective infrastructure helps promote job creation, increase rural accessibility to services, and enhance social/economic integration. The note elaborates on policy issues to facilitate quick reconstruction of physical transport infrastructure and restoration of the supportive institutional set-up. The focus of this note is more on the short-term, the first 18-24 months after the conflict ends. It is targeted to address, among other sector priorities, the need to provide for post-conflict, quick interventions to create employment opportunities for semi-skilled and skilled labor in rural areas; and' at the same time, preserve rural roads assets, improve mobility, access and restore service delivery in the road transport sector. Areas of interventions will include the maintenance and rehabilitation of damaged road transport infrastructure in areas most impacted by the conflict. The note will also detail specific policy dialogue issues with client in order to facilitate the achievement of the targeted policy objectives in the medium term.

1. The Current Situation

1.1 Background

2. Yemen is predominantly rural country with 26.5 million inhabitants.

Seventy-five percent of the total population live in rural areas out of which 84 percent are poor. Road transport is by far the most important form of transportation, especially for seventy percent of the population living in rural areas who need to access markets, health and education services, and employment opportunities. Nearly, 50 percent of Yemen's rural poor live in twelve governorates (Saadah, Amran, Hajjah, Taiz, Lahj, Abyan, Hodeidah, Mahweet, Raimah, Hadramout, Ibb and Mahrah). Yemen has around 140,000 population settlements, the majority of which are located in the western mountainous region of the country in isolated rural communities difficult to access. The Ministry of Public Works and Highways (MPWH) estimates that only a quarter of rural households lives within 2 Km of all all-weather paved roads-this estimate is consistent with World Bank's rural access index¹, which was estimated to be 21 percent of the population of Yemen in 1999.

3. Yemen has approximately 50,000 km of roads, of which only about 14,000 km are all-weather paved roads. The remaining 36,000 km are rural dirt/earth roads in bad to fair condition due to poor geometric design and low maintenance. Rural roads in Yemen have been neglected in the past due to limited fiscal resources available for this task with more focus on new investments, and on the development and rehabilitation of the main road network, thereby imposing significant limita-

¹ Rural Accessibility Index (RAI) is the percentage of rural population who live within 2-Kilometer of an all-weather road as a percentage of the rural population. Typical, equivalent to a walk of 20 minutes.

tions on growth and development of rural communities. However, the creation of the Rural Access Program (RAP) in 2001, saw an increased interest in rural roads investment, and more than 5,500 kilometers of new rural have been built. This is mainly due to the need for development of rural areas as well as the positive impact that rural road investments could generate on rural communities. As often the case in Yemen as well as in many developing countries, rural poor are required to walk longer distances to access social services and markets, and use a large proportion of their income for transport and mobility. For rural poor communities, social services and markets are often out of reach and this has economic and social implications. Rural girls in poor households are adversely affected because their parents are not allowing them to walk long distances to access health and education services. Prior to the conflict, the MoPWH, RMF and RAPCMO had many highway development, rehabilitation and maintenance projects. Some of these projects were government and donor funded, including high profile World Bank's Road Asset Management Project RAMP and RAP financed projects, and many more were government funded. Sana'a Municipality, Aden's Local Council had several urban development projects financed out of government budget and

foreign- financed, including projects financed through loans from the Arab Fund for Social and Economic Development AF-ESD.

4. In Yemen, access is a key constraint to rural development. Lack of access is also a factor when conflict in Yemen is analyzed due to its adverse impact. Therefore, the provision of better access becomes a key element in a post-conflict strategy to alleviate the suffering of internally displaced people, reduce poverty, and to provide desperately needed employment opportunities for the rural population, especially the youth. The potential benefits also include better connectivity, mobility and improved access to markets and services, reduced travel time, reduced costs of transport and basic commodities. Improved access for isolated rural communities in Yemen has contributed to enabling the implementation of various poverty reduction programs and of sector programs in agriculture, health and education, all of which require reliable and year-round access; it has also contributed to economic integration, strengthening of public institutions and decentralized decision-making.

**Table 1: Impact of rural roads improvements –
Data from 6-completed rural roads (2007-2010)**

Indicator	Target	Achieved
1. Decrease price of basic commodities	15%	4-20%
2. Decrease of individuals Transport cost to Health centers, School and market	30%	25-33%
3. Decrease travel time	30%	65-70%

Source: RAPCMO

1.2. Damages and the current status

5. The on-going country-wide armed conflict has severely impacted the country's transport infrastructure.

Major roads and bridges were destroyed and damaged during the current conflict. The extent of the damages ranges from partial impacts requiring little intervention to total destruction requiring major repair works or even total reconstruction. Roads and bridges connecting Sadaa, Amran, Sana'a, Taiz and Aden have been extensively damaged. The Aden-Taiz road, linking the port city of Aden with the Taiz Governorate and its population of 4 million, has been severely damaged and two major bridges have been destroyed. The conflict inflicted damages to bridges and culverts, and caused craters on the roads surface. Movements of heavy military equipment damaged long sections of road pavements.

6. Apart from physical damage to the road network, mobility and access to markets and services remain limited due to fuel shortages and high fuel prices in the black market.

Transport costs have increased, often by a factor between three and five. Furthermore, the conflict has caused the stoppage of all road projects, and the normal maintenance of roads and bridges operations, thus eliminating income-earning opportunities for thousands of workers throughout the country.

7. The Road Maintenance Fund's damage assessment report indicates that at least 1,241 km of roads have been extensively damaged in Sadaa, Amran, Sanaa, Taiz, Abyan and Lahj governorates. Sixty-two bridges have

been targeted by the airstrikes causing damages that range from partial to total structural damages. Three major bridges between Aden and Taiz have been completely destroyed. The conflict has caused the stoppage of many rural roads projects, and bridge maintenance contracts causing the loss of jobs and income earning opportunities for many work-age youth population. Overall, damage costs are conservatively estimated at approximately US\$500 million. As a consequence of the on-going conflict, the physical damages to roads infrastructure, access and mobility have been seriously affected.

8. The conflict has also severely impacted other transport modes. Airports and Ports need urgent rehabilitation and repairs. Aden's airport suffered the highest levels of destruction.

Aden's ports, Aden Refinery and Aden Container Terminal have also sustained extensive damage. Aden Airport suffered from damages to its terminal building, control tower, runway, taxiways, and support facilities, while the ports, the Aden free zone, and the Aden Refinery suffered damage to their storage facilities and support buildings. The facilities were forced to close for several months as a result of shelling and airstrikes. Aden Airport suffered the most, with visible damages to its terminal building, control tower, runway, taxi and support facilities. The Al Ma'alla Port, Aden Free Zone and the Aden Refinery also suffered damages to their storage facilities and support buildings. It worth noting that due to the continued conflict little is known about the extent of the damages to airports, ports and other key infrastructure, especially, in Hodeidah and Tiaz.

9. Sana'a International Airport has sustained severe damages to its runway, taxiways, apron, electrical and ventilation systems. Al Ma'alla Port, Aden Container Terminal, and Aden Refinery need urgent infrastructure repairs to their facilities and support buildings. Hodeidah port, Airport and Taiz airport have also sustained heavy damages to their buildings, support facilities and infrastructures to the extent that these airports are either non-functioning or operating at very low capacity. The Sana'a International Airport sustained significant damage. Collateral damages were incurred on its runway, taxi, apron, doors and windows glass, false ceiling, electrical and internet wiring, air-conditioning and ventilation ducts and systems.

10. The port of Hodeidah is considered the largest sea port in Yemen. Its importance comes from the magnitude of goods imported through the port into the country and the revenues generated by the port. Custom duties from all ports in Yemen generated approximately 70% of the total custom revenues in Yemen. Hodeidah port accounted for 50% of the total sea ports revenues, and 40% of the total revenues from custom duties and taxes generated by the Customs Authority in 2013, which amounted to more than US\$1.0 Billion. The Hodeidah port has sustained direct attacks during the conflict causing massive damages to its cranes and facilities. The port now operates at less than 50% of its capacity before the conflict, handling mainly, pre-inspected vessels by the UN, carrying fuel and food supplies to Yemen². Port of Hodeida serves as the main sea port for Yemen's northern region where most of the population

² Source: Yemen Customs Authority, 2015 Annual Report

lives. The port was affected in its operations in 2015. As a result, cranes and critical infrastructure of the port became in-operational reducing port's capacity. Since then, the port is struggling to handle ships carrying urgently needed necessities such as food (wheat), fuel supplies, medicine and humanitarian relief operation. Vessels calling the port of Hodeida take several days or weeks to unload cargo that used to take several hours to handle. Ships carrying commercial and humanitarian goods to Hodeida, Mokha, As Saleef Ports need to apply for permits upon departure from the port of origin. All humanitarian vessels going to any Yemeni port, and all commercial vessels calling the ports of Aden and Mukalla also need to apply for entry permit through the Ministry of Transport prior to the vessel's arrival. The conflict is exerting enormous pressure on the ports' technical and institutional capacity at a time when it is most needed to cope with the growing demand for humanitarian relief operations and food supplies.

2. Transport Sector Management

11. Traditionally, the road network and the transport infrastructure sectors in Yemen are managed by two line ministries: (i) the Ministry of Public Works and Highways (MPWH) and (ii) the Ministry of Transport (MOT). The MPWH manages the road network through its HQ office in Sana'a and the regional offices in 18 governorates. It has overall responsibility over the road infrastructure, including its development strategies, expenditure programs, maintenance, and rehabilitation activities.

12. The MOT has overall control over Yemen's ports and airports. And, it has

the authority to make major decisions, such as approving annual budgets, investing in new facilities and equipment, and appointments of senior staff positions within its agencies such as the Civil Aviation and Metrological Authority (CAMA) and the General Authority for Maritime Affairs (GAMA).

1.1.The Ministry of Public Works and Highways(MoPWH)

13.The MoPWH is responsible for development of the entire road network in Yemen. The organization of the ministry comprises four main units: The Road Sector, the Road Maintenance Fund (RMF), the Rural Access Program Central Management Office (RAPCMO) and the Foreign Funded Project Management Unit (FFPMU). In spite of its large mandate, MPWH is also involved in the development of urban roads, except in the capital Sana'a and Aden. Although the General Corporation of Roads and Bridges, (GCRB) State Owned Enterprise, is by and large now operating as an autonomous organization, it is still awarded large maintenance contracts by Road Maintenance Fund RMF every year on a sole source basis. The Ministry also has a Housing Sector, which looks after housing needs of the population and develops strategies to meet these needs, including Low Income Groups LIG housing and the housing needs of marginalized population below poverty line (BPL) living in slums and streets. The Ministry does make both 5-year and Annual Plans

1.2.Ministry of Transport (MOT)

14.The Ministry of Transport is responsible for the development of

ports, airports, land and sea transportation needs of Yemen. The MOT works within the State's general policy framework in a number of directions to achieve the strategic objectives included in the organizational regulations of the Ministry contained in the Republican Decree No. (427) of 2002.

15.The major tasks and functions of the MOT are broadly summarized below:

- Draw the general policy for transport, prepare plans, systems and legislations and supervise implementation in coordination with the relevant agencies;
- Improve the performance and increase the capacity of the existing seaports and airports;
- Develop, improve and organize land, sea and air transport services to meet the economic development needs of the country;
- Follow up application of international legislations and standards in management of air and maritime navigation's safety;
- Carry out socio-economic feasibility study and detailed engineering for setting up new air and sea ports;
- Link Yemen with air and sea routes, at both regional and international levels, as per the Government's plan and strategy;
- Coordinate with the relevant authorities for developing traffic safety program and improve means of land transportation to minimize vehicle emissions;

3. Road Sector Issues

16. In Yemen, road development has become a national priority to promote social and economic integration and development. Between 1990 and 2015, the length of the paved road network (rural and others) grew more than three-fold, from 4,500 km to about 14,000 km. Despite remarkable achievement, serious issues remain. Yemen's rural roads network is far from serving all of the rural population scattered over more than 140,000 villages, and small rural settlements. Only 5,500 km of rural roads (11%) are all-weather and paved roads. Most of the unpaved rural roads are essentially dirt/earth motorable tracks in very poor condition, allowing travel only under exhausting and dangerous conditions at extremely low speeds, entailing high vehicle operating costs and accidents.

17. The road sector issues can be divided into the following:

1.1. Road Planning and Budgeting

18. MPWH has made remarkable institutional progress in the last few years, but its role and responsibilities in the Road Sector are far too wide³ and overstretched. About 90% of its budget is earmarked for the road sector. About two third of its total budget is spent on various road construction projects. The planning and budgeting process is weak and underdeveloped. Plans for construction of new roads or upgrading existing roads and for maintenance are done

³ MoPWH is also responsible for housing and municipalities; responsibilities that should have been transferred to governorates as part of the government plans for decentralization process.

separately without optimizing expenditure for the entire sector. As a result, there is mismatch between the plan and the budget in any given year, resulting in delay in payment to the contractors. Also, inadequate and unreliable database and lack of proper road map make the long term planning process difficult. There is no proper institutional arrangement for procurement of contracts. And, the system of classification of the contractors by MPWH, needs to be rationalized keeping in view the capabilities of the existing firms and the availability of engineers and trained workforce in the country.

19. Yemen is confronted with a very difficult economic and security situation. This situation is complicated with dwindling public resources requiring necessary changes to investment planning and prioritization in the road transport sector. Generally, both major and minor projects in the Public Sector are taken up without adequate planning, detailed study and project preparation, presumably due to urgent need of these projects resulting in time and cost overruns.

20. Road planning in general is weak and budget process is not properly developed. The sector planning and budgeting is done by MPWH and no identification and evaluation are done in respect of medium to long term expenditure needs. Planning for construction of new roads, upgrading of existing roads and for maintenance are done separately without optimizing the expenditure for the entire road sector.

21. Various plans like the National Highway and Rural Accessibility

Master Plan, the Public Investment Program, the National 5-year Investment Plan and the short-term priorities for foreign funded projects have been prepared by the GoY at different times, but no single strategy has been adopted so far. Another important factor affecting the planning and budgeting process is inadequate and unreliable database in the road sector. Lack of a proper roadmap makes it difficult to prepare a “vision” document for road network and monitor of ongoing road construction and maintenance activities.

22. Generally, the planning process in Yemen is not adequately developed to steer the country to a path of sustained economic development. Public finance aims to achieve a greater role in providing basic social services, particularly education, health, water and sanitation in addition to fulfilling the needs of social equity and improving infrastructure and other basic services. In the recent years, the Government of Yemen has taken steps towards decentralization, and has decreed the Local Administration Law No. 4 of 2000, as well as the State’s administrative divisions. Also, a number of line ministries and other institutions have established offices in the governorates granting governors, local councils and executive branches the necessary authority for managing, implementation and monitoring of tasks and responsibilities related to investments and development in their governorates.

23. Given the current fiscal situation Yemen is facing and the outcome of the DNA, it is proposed the existing institutional arrangements, implementing capacities at the central and regional level are reviewed exten-

sively by the relevant line ministry, the Ministry of Local Administration, in the context of post-conflict decentralization plans by governorates. The purpose of the review would be to formulate a balanced methodology and work programs for prioritizing the maintenance and development of the National-level and Governorate-level primary and secondary rural roads rehabilitation, reconstruction and recovery plans. The objective is to increase efficiency in resource allocation through improved and rationalized planning and budgeting by modernizing the current Pavement Management System (PMS) and migrate to the more efficient and cost effective Highway Development and Management HDM4 model. The system is used widely by road agencies for evaluating options for investing in road transport infrastructure. It is commonly used as a basis for analyzing the economic feasibility for a given road project, or to assesses an entire road network to help decision makers in their strategic investment planning at the network-level with or without budget constraints.

1.2. Roads Maintenance and Underfunding

24. Despite the establishment of an autonomous Road Maintenance Fund (RMF) in 1996 with its own revenue source and maintenance planning capability, the road sector still suffers from inadequate road maintenance funding and management. At about US\$40 million a year, funding for road maintenance is still insufficient; and, the planning of maintenance needs strengthening. The annual budget allocations for road maintenance is partly coming from fuel levies (Road User Charges or RUC) through a surcharge on diesel and gaso-

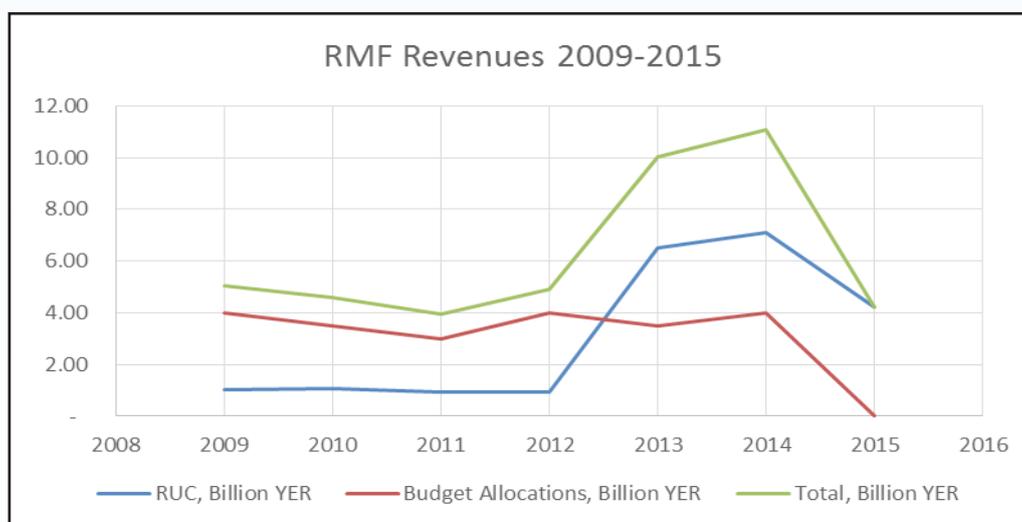
line sales approximately (US\$30) million annually, of which a third is transferred to the governorates for local roads), and general budget allocations (US\$10 million) from the Ministry of Finance.

25. Adequate funding for road maintenance is an essential condition for the support by the World Bank and other donors to Yemen's road sector. In April 2012, Cabinet Decision No. 41/2012 on Road Maintenance Funding was issued which established, temporarily, that 3 % of the pump price of diesel and gasoline fuel is to be transferred to the Road Maintenance Fund. The collection of fuel levy was suspended for few months following

nance to keep Yemen's paved network in satisfactory condition.

26. Once peace and stability are restored in Yemen, and in continuation of the constructive dialogue on road sector related issues over the past years, the World Bank plans to engage relevant line ministries and agencies MOF, MPWH and the RMF in a dialogue aimed at the implementation of the Road Maintenance Fund law, and the resumption of the collection mechanism as set by law, in order to ensure the continued support and cooperation of donor partners involved in Yemen's road sector.

Figure 1. Road Maintenance Fund-Road User Charges (RUC) 2000-2015



Source: RMF-RAMP PIU. 2016

the political and security disturbances on September 2013, now resumed starting from January 2016, and the Road Maintenance Fund is working with authorities to open an account in commercial Bank to deposit their revenues into that commercial Bank account. An estimated US\$100 million is probably needed for the annual routine and periodic mainte-

1.3. Poor coverage of axle load controls

27. Overloading accelerates deterioration of roads and increases road maintenance costs as well as vehicle operating costs. Trucks are allowed to continue with the excessive loads after paying a nominal fine. Relatively low

penalties for small overloading unrelated to distance cause a systemic overloading of trucks which damages the road pavements. Law No.23/95 on Axle Load Control and its Regulation are designed to limit the damages of axle overloading to the road network in Yemen. The legislation limits axle loads to 13 tons for single axles and 21 tons for tandem axles.

28. The RMF has been assigned the responsibility of operating and financing the operation and management of the weighbridges in Yemen. The RMF has rehabilitated aging weigh stations in Hodeidah, Taiz and Harad to enforce axle load limits. Under the RAMP project, the RMF plans to build four new permanent weigh stations located in roads with high volume of truck traffic. In addition, two mobile axle load control units will be financed to provide random controls of truck overloading.

29. The RMF has made several attempts to issue fines, leading to protests by the truckers. However, it has proven very difficult to control axle loads in Yemen, due to the tariff controls on trucking operations, which is under the responsibility of the Ministry of Transport. With respect to the challenges in enforcement of trucks overloading, it is the GoY's policy to effectively revise the current law, without any relaxations and to maintain adequate facilities to effectively enforce the law of trucks overloading.

1.4. Road Safety

30. Yemen has one of the poorest traffic safety records in the world with 5,200 deaths every year on the road

accidents. Following the unification of Yemen in 1990, and the rapid urbanization, growth of vehicle ownership and the emergence of high risk driving behaviors have all contributed to the increase in road accidents and road accidents fatalities of the road network. The poorly maintained road network, especially mountainous roads, pose major challenges to road safety even to experienced drivers, and contribute to numerous road accidents. The traffic police record 13,000 accidents with injuries each year affecting about 17,000 people and their families. The most common causes of road accidents as reported by the police are speeding and reckless driving. According to the WHO, road accidents in Yemen constitute 12% of the total deaths in 2006. The number of deaths per 100,000 people of the population is 21.5 deaths. According to the World Bank's estimates, road accidents constitute a 5% loss of GDP.

31. The backlog of maintenance works due to under-funding of regular maintenance for many years is a factor that contribute to poor road safety. And, the fact that the core road network is suffering from truck overloading, and an aging trucks fleet, not only affects the cost of transportation, but also endangers roads users. The road safety strategy in Yemen would require enabling traffic police and concerned public and private institutions to contribute to boosting road safety education programs to limit traffic accidents and raise traffic safety awareness. It would also require law enforcement and the adherence to traffic laws, coordination among government and private institutions concerned with traffic safety and accidents, and creating education programs for roads' users.

1.5.Rural Roads

32.The GOY's strategy is to improve the provision of rural roads through the Rural Access Program (RAP), with the objectives of improving the livelihood of rural population by reducing their isolation and creating job opportunities for working-age rural youth. Rural roads play a major role in improving the living conditions of the rural population by creating employment opportunities, facilitating the social and economic integration and poverty alleviation.

33.Rural communities in the project road area are impacted positively by rural road projects through improved mobility, access to public social services and job opportunities and markets. The benefits include self-employment opportunities among men and women. Rural roads investments create short-term employment opportunities through road construction, and also long term employment opportunities through continuous road maintenance throughout the lifespan of the road.

34.The benefits also included the following:

- Improved access to schools and health centers, reduce the gender gap in education among boys and girls, increased access to childhood-motherhood services and health facilities and improved mobility, which are important for social and economic integration and development.
- Improved access to markets by reducing transport costs, with the potential to increase income and employment opportunities generated from more profit and an improved marketability of perishable goods and market-oriented cash crops, fisheries and agriculture products.

35.The RAP has been highly successful since its creation in 2001. It has already upgraded about 5,500 km of rural roads serving nearly 2.00 million people in 17 governorates. These changes have also improved trade in rural areas, allowing the rural population to have access to public services, markets, and food imports. The RAP's achieve-

Table 2: The rural Access Program-Sources of Financing. 2001-2016

Donor	Amount US\$	% of Total
Arab Fund for Economic and Social Development	136.00	24.68
EU	11.60	2.11
GoY's Share	120.00	21.78
IDA's 1, 2 & 3	132.00	23.96
Islamic Bank for Development	11.20	2.03
Italian Debt Swap	5.00	0.91
Kuwait Fund	50.00	9.07
Omani Grant	10.00	1.81
Saudi Fund for Development	50.00	9.07
UAE Grant	20.00	3.63
USAID	5.20	0.94
Total	551.00	100.00

Source: RAPCMO 2016. (MPWH)

ments are based on efficient management, appropriate technical standards and rationale investment priorities. The RAP's ability to efficiently deliver rural roads has attracted the interest of many external donors besides the World Bank. The RAP's main goal is to upgrade 10,000 km of rural roads during the next 10 years.

1.6. Institutional issues

36. The organization of MPWH comprises five main agencies: the Road Sector Department, Road Maintenance Fund (RMF), the Rural Access Program-Central Management Office (RAPCMO), the Foreign Funded Project Management Unit (FFPMU) and the General Corporation for Roads and Bridges GCRB. Each of these agencies need to be developed to assume a larger role and responsibility, given their capabilities.

37. The sector monitoring is done by the Information Technology Directorate that need to be strengthened with adequate staff, resources and equipment to carry out its functions more effectively. In spite of its large mandate, MPWH is also involved in the development of urban roads, except in the capital Sana'a and Aden. As per the practice followed in most countries, urban road network management is left to the local authorities, since it involves issues related to urban planning and transportation needs and land use management.

38. Although the General Corporation of Roads and Bridges (GCRB) is by and large now operating as an autonomous organization, it is still awarded large routine maintenance

contracts by RMF every year on a sole-source basis. This policy does not provide grounds for fair competition with the private contractors. Ideally, GCRB should operate as a commercial business entity and should have full financial autonomy from MPWH. However, with the support of the World Bank through the IDA's RAMP project, the RMF has been enabled to improve the maintenance management effectiveness, and now able to pilot four Term Maintenance Contracts (TMCs) totaling 1,358Km of regular road maintenance in three governorates to private contractors on multi-year Term Maintenance Contracts.

1.7. Human Resources

39. The shortage of qualified and experienced engineers, supervisors and skilled workmen is a major factor responsible for the institutional deficiencies of the road sector, national consultants and private contractors. This is in spite of the fact that Yemen produces about 300 graduate engineers every year from the Universities and other Technical Institutes.

40. The success and sustainability in the road sector, at the central and local level, will depend on the capacity and incentive of its human resources. The civil service in Yemen suffers from both low pay and a low skill base. Therefore, the reform in the sector is needed. Sustainability of both civil service reform and the decentralized management of the road sector are interdependent. The lack of qualified and experienced engineers and planners is likely to put a limit to efficiency and speed of the decentralization of the planning, decision making and management of the road sector.

41. While some governorates will be able to set up their own capacity in the area of rural roads planning and management, others will not. There are significant socio-economic differences among the 18 rural governorates, and even more so between the 301 rural districts in Yemen. All of them will not have the necessary human and financial resources to create the technical capacity for road management and maintenance of rural and local roads under their jurisdiction. One option is to pilot the creation of regional management offices which could combine two or more governorates under one regional unit responsible for a large regional rural road network. These regional rural road administration units would fall under the control of a local representative from the relevant governorates for roads under the authority of the Governorates. This option of decentralized/regional management of the rural road network is necessary to absorb and retain qualified professionals, and create employment opportunities for rural youth in road investment projects.

3. Civil Aviation-Sector Development Issues (pre-conflict)

42. Prior to the conflict, Yemen's civil aviation sector was facing a number of operational, financial and institutional issues. Yemen's air transport is relatively small compared to other countries with similar population and GDP size. Yemen has 18 airports, only three are open to international flights, with Sana'a International Airport having almost 80% of the total international and domestic passengers. The national carrier, Yemen Airways, operated all domestic routes until 2008 when Felix was established with the aim to take over the

domestic market passengers.

43. According to the Republic of Yemen's Air Transport Sector Strategy Note, September 2011, the air transport sector was facing several institutional, governance and operational problems. The main sector issues the sector was facing are summarized below:

- **Infrastructure Development:** there was no overall clear strategy for airports infrastructure development. Many of the infrastructure projects were premature or unsuited for Yemen's needs.
- **Airline Development:** Yemen Airways's development strategy was risky and heavily dependent on public funds. The strategy was high risk because of high degree of competition by regional airlines
- **Institutional Capacity:** The Ministry of Transport MOT had limited institutional capacity, and its role in managing the sector's policies and priorities needs to be clarified. At the same time, the dual functions of the Civil Aviation and Metrological Authority CAMA to operate all airports, assures the safety and security of all airports, provides air traffic control and maintains the metrological services makes oversight for the sector difficult. However, despite its limitations, the air sector in Yemen had some important strengths. The sector complies with international standards and Yemen Airways is respected for its safety records and performance. Yemen Airways links Yemen well with most of economic partners, and the sector's infrastructure has been adequately developed and has been

considered adequate for current and future air traffic.

44. The current conflict in Yemen has impacted the air transport sector's ability to operate normally because of the devastating impact of the conflict. Sana'a, Aden, Taiz and Hodeidah airports have been targeted and the devastation to their buildings, facilities and infrastructures have been so severe that all these airports either non-functioning or operating at very low capacity.

45. Since the start of the armed conflict on March 2015, all regional and international carriers suspended their operations to Yemen. Emirates, Etihad, Qatar Airways, Gulf Air, Fly Dubai, Saudi Airlines, Egypt Air and the Royal Jordanian airlines all have suspended their flights to Yemen. The national carrier, Yemenia is operating a number of scheduled flights, and are limited to four weekly flights between Sana'a, -Amman-Sana'a and Sana'a-Cairo-Sana'a. For more than two months, Sana'a airport is closed, and Yemenia is operating limited scheduled flights from Aden and Sayeoun to Amman and Cairo. All Yemenia Cargo operations have been suspended indefinitely since the conflict started. Yemenia fleet consists of: 2-airbus A310-300, 2-Airbus A320-300, 2-Airbus A330-200 and 3-Boeing B737-800 that joined Yemenia Fleet in November 2007.

46. In post-conflict Yemen, the findings of the 2011 Strategy Note will have to be updated and a comprehensive review of the sector's institutional, infrastructure and operational capacities will have to be revisited. The status of the civil aviation and the roles

of its institutions, MOT and CAMA, that provide technical and oversight will have to be reviewed, and possibly redefined, to take into account for the impact of the conflict on the infrastructure, operational and governance of the sector., in post-conflict Yemen, the priority is to strengthen the role of MOT's ability to develop short-term and long-term strategies for civil aviation masterplan that foster private sector involvement in the civil aviation industry in Yemen, including Public Private Partnership to enhance private involvement in air transport. This could strengthen the sector's attractiveness for private investors to bring much needed financing, expertise and capacity to develop the sector.

4. Suggested Policy Actions and Priority Needs

4.1. Road sector

47. There are several institutional, financial and technical challenges facing the restoration of service delivery in the road sector in post-conflict Yemen. Post-conflict priorities and needs are divided into immediate and short-time; and medium to long term priorities. Immediate and short-term interventions to be targeted towards the implementation of labor-based maintenance and rehabilitation interventions aimed to improve mobility and access, restore service delivery and create employment opportunities for the rural population, particularly, in poverty-ridden rural areas. Medium to long term reconstruction priorities, including the institutional set-up of the sector's line ministries and their organizations, need to be addressed in the context of a more stabilized political and security situations.

4.2. Immediate to short-term priorities-rural roads maintenance

48.In *the* immediate post-conflict Yemen, at least 5,000-6,000 kilometers of high priority rural roads need to be maintained and rehabilitated. Funds need to be mobilized from various sources, including donor's contributions. To implement such plan, there are a number of operational and institutional issues that need to be addressed, particularly, at the regional (governorate-level) and local level, as outlined below:

- Clear roles and responsibilities conducive for rural roads maintenance strategies as well as guidelines for maintenance planning, operation monitoring and evaluation should be established and strengthened.
- Policies related to rural roads maintenance should include the devolution of rural roads maintenance programs to the regional authorities and governorates.
- Different road maintenance models and standards will need to be developed for different road standards and conditions to allow for communities to contribute within their capacity.
- Governorate and districts authorities should be empowered and strengthened to implement their maintenance plans and operations with appropriate training, knowledge transfer, institutional strengthening and technical capacity-building.
- Emphasis on rural roads maintenance during post-conflict strategies and programs should focus on

the promotion of a participatory and transparent planning approach utilizing the prioritized methodology, already in-place, and adapted by the Rural Access Program in the implementation of the governorate-level maintenance masterplan.

- Funds need to be mobilized to finance the maintenance and rehabilitation works of rural roads utilizing labor-intensive technologies thus maximizing job creation for rural youth population.
- No rural road maintenance should be implemented unless it is included in the approved governorate-level maintenance masterplan, and should have adequate operation and maintenance funds for timely maintenance.
- Maximize road benefits to other sectors such as agriculture and other sectors (health, education, etc.) should be part of the road maintenance design, so that benefits from the road maintenance are enhanced to their full potential.

4.3. Medium to long-term priorities

- On the institutional side, the normal function of the MPWH and its organizations need to be reestablished. Work contracts need to be validated and contract update and modifications need to be agreed upon with contractors. New contracts need to be established under emergency procedures and the overall sector planning and budgeting need to be revised to eliminate non-performing contracts due to funding constraints. To eliminate the accelerated damage of the road

network, the GoY needs to enforce legislation on axle loading to avoid rapid deterioration of the road network.

- The balance of road expenditures needs to be revised with a shift from new construction towards maintenance and rehabilitation of the most impacted roads, especially, rural roads that have high visibility in terms of restoring access and keeping the country united. The priority should also shift to developing rural roads to include rural populations in mainstream economic activity.
- Apply existing Law on Road Maintenance Funding to restore the RMF's financial revenues from RUCs, set at 5% of the pump price of fuel sold in Yemen, to meet the needs for losses associated with the elimination of the fuel subsidies during the conflict.
- On the technical side, using capable, local contractors and enhance the capacity of the national engineering consulting firms to handle reconstruction operations in the road transport sector.
- Introduce capacity building and training programs, at the governorate and regional levels, for local contractors and local consulting firms to develop their technical skills in areas of preparation of bids, pricing, contract management and environmental management to support Yemen's plans for post-conflict reconstruction and socioeconomic recovery.
- Promote community-based contracting in rural roads maintenance using micro-enterprises to maximize employment opportunities among rural youth.

4.4. Airports, Ports and Free Zone

49. Aden Airport, Aden Port (Al Mukalla Port), the Aden Container Terminal, Aden Free Zone and Aden Refinery Company were facing enormous challenges prior to the conflict. In December 2014, the World Bank concluded a high-level workshop in Cairo, Egypt, attended by major stakeholders from the government and private sector discussing the findings of the World Bank-funded Advisory Services for the development of Aden as an economic capital for Yemen.

50. The most recent, "Aden Development Study" provided detailed strategies for achieving the technical, infrastructure rehabilitation and institutional reforms of Aden's economic facilities. The outcome of the National Dialog Conference was giving Aden the potential to convert into an economic capital of new Yemen. In the context of the post-conflict, and in continuation of the Aden study's findings and action plans, the GoY and the World Bank could work on a strategy to support the GoY's efforts to promote the economic and social development of Aden and revive specific economic activities. The strategy would draw an action plan to allocate specific tasks and responsibilities to agencies involved in the process of developing Aden as an economic capital in post-conflict Yemen. The strategy would build on the advantages that would be gained from reforms aimed to give Aden given new power to operate under new national laws and under governance and institutional structures that follow international "best practice".

51. The study provided detailed evaluations of the legal and institutional

framework under which Aden Airport, Ports, Aden Container Terminal and Aden Free Zone currently operate.

The study examined potentials for Aden and the risks facing the development of Aden. Challenges identified include, among many other issues, institutional challenges in the form of autonomy and decision making by the central government, competition from regional ports, airports and free zones, and the overall security situation in Yemen.

52. Below is an outline of the challenges and immediate, short to medium terms actions:

Challenges Facing the transport sector:

1. Service delivery restoration, Roads, bridges, ports and airports.
2. Securing sources of funds for immediate and short terms post-conflict rehabilitation and reconstruction programs in the transport sector.
3. Strengthening the resilience of local partners, and restoring the institutional and technical capacities at the central and regional levels.

Priorities:

A. Immediate term (3 months):

1. Inventory damages to roads, ports and airport infrastructures, using DNA studies and ground partners.

B. Short term (1 year):

1. Review the institutional capac-

ity, at the central and regional levels, of the Ministry of Public Works and Highways and its agencies including (the RFM and RAPCMO) and the Ministry of Transport and its agencies including (The Maritime Affairs and Civil Aviation and Metrological Authority-CAMA).

2. Identify medium-term, 3-5 years' high priority rehabilitation and reconstruction plans (Roads, Ports, Civil Aviation), including sources of funds.

C. Medium term (5 years).

1. Sector reviews (Roads, Maritime and Civil Aviation), building on previous works including the Transport Sector Note, Road sector Review, updating the Rural Roads and Highway Masterplan, the Aden Study and the Bank's study on Civil Aviation in Yemen.
2. Develop high priority rehabilitation and reconstruction schemes throughout the sector including sources of funds.
3. Develop 5-10 years' reconstruction and rehabilitation masterplan
4. Identify sources of funds for peace and post-conflict reconstruction, including PPPs for high profile strategic projects aimed at restoring regional integration and regional trade facilitation.
5. Identify sources of funds for emergency interventions using labor-intensive technologies to

restore service delivery using community-based and microenterprises and the regional and village-level, specifically in the road transport sub-sector.

The sequence and order of selected priorities will be based on:

(i) High priority to the sector's service delivery, (critical road sections and bridges for mobil-

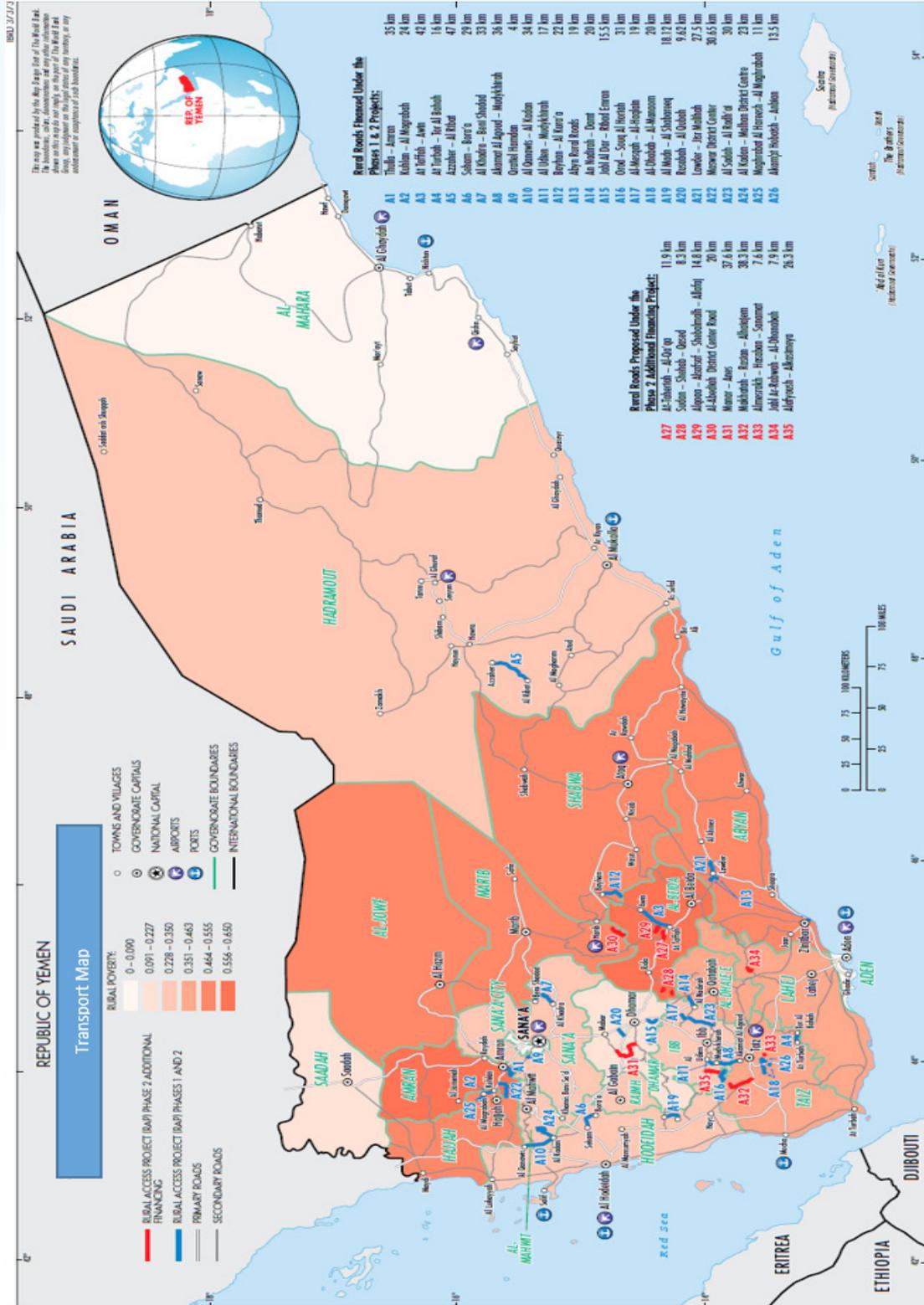
ity and access to services and markets)

(ii) High social and economic impact projects, (job creation, value for money)

(iii) Optimizing use of scarce funds from various sources, (road user charges, government allocation and donor's funds)

(iv) contribute to peace-building, restore social fabric and Yemen's unity.

Annex 1. Transport Map-Yemen



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