

# **UNIVERSAL RURAL ROAD ACCESS PROGRAM**



## **I. THE RATIONAL FOR ACTION**

### **1.1 The Current Situation in Rural Ethiopia**

The constitution of Ethiopia assigns extensive power to its eleven regional states (Addis Ababa, Afar, Amhara, Benishangul-Gumuz, Dire Dawa, Gambela, Harari, Oromiya, Somali, Southern Nations, Nationalities, and People's Region and Tigray). Each region has an elected regional council with legislative and executive power to direct the internal affairs of the region. The structure of regional government and its sectoral public institutions is replicated to the district (Wereda) level and sub-district (Kebele) levels.

Ethiopia is a country of great geographical, climatic and cultural diversity. The main climatic regions include arid, tropical rainy and temperate rainy areas. Most parts of the country consist of an enormous plateau more than two kilometres above sea level. The plateau has mountains over 4,500 meters, such as the highest peak at Ras Dejen, 4,620 meters above sea level and some of the world's deepest canyons. Ethiopia's high plateaus and mountain ranges are characterized by precipitous edges and dissection by numerous streams. These areas constitute about 45 percent of the total area and are inhabited by close to 80 percent of the population, the majority engaged in small scale farming.

The country's diverse topography, high mountains to low-lying depressions, has the effect of causing a wide variation to the country's climate. Most of the country has distinct wet and dry seasons. There are three primary climate zones differentiated by elevation, 'Degga' (above 2,500 meters and cool); 'Weina Degga' (between 1,500 and 2,500 meters and daytime temperature in the range 18 to 20°C) and the 'Kolla' (the warm low-lying eastern border region (lower than 1,500 meters). Below 1500 meters are the lowland areas, located in the north-west, east and south. The vast majority of these areas support nomadic and semi-nomadic pastoralism. The descent to the southwest and west leads to the semi-humid lowlands.

The "tablelands" provide the fertile areas used for agriculture and livestock rearing. Agriculture remains the dominant sector in the Ethiopian economy, accounting for around 50 percent of Ethiopia's GDP. Growth of the Ethiopian economy is thus highly dependent on agriculture with trade, exports and foreign exchange earning based heavily on agricultural products (including coffee, chat, hides, skins, sugar and spices).

Approximately 66 percent of the total land area of 1.1 million square kilometres is potentially suitable for agriculture. Ethiopian soils are fertile, but only around 14 percent are utilized for cultivation of cash crops. The Ethiopian highlands also provide a vast water resource potential, yet only 1 percent of the estimated annual surface water of 110 billion cubic metres is harvested for irrigation and hydropower.

Over 85% of Ethiopia's population of close to 80 Million (second most populous in sub-Saharan Africa) live in its rural areas, gaining their livelihood directly or indirectly from the agricultural sector. Per capita income growth and food security are thus highly dependent on agriculture. Growth remains central to Government's drive for sustainable economic development.

*The over-riding development agenda of the Growth and Transformation Plan is to sustain the rapid and broad-based growth path witnessed during the past several years and eventually end poverty.*

**Extract - Growth and Transformation Plan 2010-2015**

## **1.2 The importance of Rural Transport and Services in Ethiopia**

The reason for the continued prevalence of poverty with such magnitude is generally associated with low growth, low productivity of subsistence agriculture and a reliance on rain-fed cultivation vulnerable to the vagaries of weather conditions. Problems are aggravated by the country's rugged terrain, its uneven geographic distribution of population and the predominance of isolated rural settlements with poor spatial integration. Isolation and unreliable or non-existent access to markets stifles economic activity and further adds to the rural poverty burden.

Without a minimum of reliable and efficient access to locations of basic social and economic activities, rural life as a whole stagnates, local development prospects remain limited and the whole economy suffers. Drought adds a significant risk and can threaten to take the lives of millions of rural people.

Providing and maintaining a minimum level of basic access is therefore an essential element of any rural and economic development strategy. Improved logistics to support trade and communication, the location of services, and the provision of cost effective transport infrastructure and services are key.

Approximately 64 per cent of the land area in Ethiopia lies more than 5 km from an all weather road. Some 48 million people in the rural areas of Ethiopia live further than 2 km away from the nearest all weather road. On average, households are often more than 10 kilometres away from a dry-weather road and 18 kilometres away from public transport services.

Communities are often left isolated and without access, particularly during periods of rains. This excludes them from exposure to new ideas and influences<sup>1</sup>. Remoteness, isolation and lack of services increases vulnerability and severely constrains their ability to contribute to the economy and development of Ethiopia.

Investment in transport, and particularly road transport, improves the well being of the poor. Provision of all-weather roads:

- √ improves the quality of universal education – it makes it possible to recruit and retain qualified teachers and assistants;
- √ improves access by the poor to human, natural, social and financial resources that they need to raise living standards and welfare;
- √ provides opportunities for the poor to participate more fully in development opportunities – it gives access to markets, jobs, schools, social and health facilities;
- √ provides both short (road building) and long-term (road maintenance) employment opportunities; and

---

<sup>1</sup> *Illustrative facts, World Bank, January 2005*

- √ reduces the negative impacts of natural disasters and shocks and provides the links needed to manage it.

The greatest returns for agricultural productivity, food security and poverty reduction often come from appropriate investments in roads.

*“In sub-Saharan Africa the transport sector is clearly one of those that needs to be enabled to achieve the quantum leap in scale and ambition that was called for by the UN Secretary-General.....Increased effort on rural infrastructure and services to raise the overall level of maintenance and hence reliability and simultaneously, to strengthen and extend the network in close coordination with emerging agricultural potential”*

**Extract from working document for meeting of experts, African Transport Ministers Meeting, April 2005.**

### 1.3 Policy Framework

Government’s policy and action framework with regards improved rural accessibility is driven by the **Growth and Transformation Plan (2010-2015), GTP**. The Growth and Transformation Plan is underpinned by the Road Sector Development Program (RSDP IV)

The Growth and Transformation Plan constitutes Government’s guiding strategic framework for the five year period 2010-2015 and is considered to be a high growth path to build an economy which has a modern and productive agricultural sector.

The GTP is directed toward achieving Ethiopia’s long term vision of sustaining rapid and broad based economic growth, transforming the country’s economy from a subsistence-based agrarian economy towards a modern, industrialized economy underpinned by the agricultural sector. GTP is anchored on experiences drawn from earlier and successful programming and policies such as the PASDEP (2005-2010) and the process of the Agricultural Development Led Industrialization (ADLI) strategy. The over-riding aim is to sustain the current levels of growth and end poverty.

In line with the strategic objectives for Ethiopia’s economic development, the Road Sector Development Program (RSDP-IV) is closely aligned to the objectives of GTP. The roads sub-sector has targets for the improvement and expansion of the country’s road network and these targets have been influenced by the needs assessment of the required road infrastructure with respect to the Millennium Development Goals.

**Table 1: Growth and Transformation Plan Targets**

Development Objective	Indicators	Baseline 2009/10	Target 2015
Growth	Real GDP Growth	11.0	11.2 p.a
Reducing Poverty	Total Poverty Head Count, %	29.2	22.2
Improving the Food Security Situation	Food Poverty Head Count, %	28.2	21.2

An important sub-Program of the earlier phases of the Road Sector Development Program, with specific emphasis on the rural sector, was the Ethiopian Rural Travel and Transport Program (ERTTP). ERTTP explored methods, technologies and approaches for new road construction and improvement at community and village level, in the context of poverty alleviation and improving accessibility for the rural poor.

The key objective of Government, as enunciated in the GTP, is to improve peoples livelihood through sustaining higher economic growth, progress towards the MDG's and eventually to eradicate poverty.

#### **1.4 Building on Success and Progress in the Road Sector**

Successive Road Sector Development Programs (RSDP) have been successfully implemented. These RSDP have been aligned with the goals and objectives of the governing strategic development frameworks. The current RSDP-IV (2010-1015) is thus aligned fully with the objectives and targets of the GTP (2010-1015).

One of the thrusts of the GTP is the intensification of support to marketing farm produce both for the domestic and export market, and by small and large farmers. Key measures identified and intended to achieve this include:

- Construction of farm to market roads,
- Improved availability of agricultural research and extension services (access to fertilizers, seeds, pest control measures and veterinary services ) and improved marketing, and
- Promotion of high value crops for export (spices, cut flowers, fruit and vegetables, sericulture).

Between 1991 and 2004, the rate of expansion of the road network has been of the order of 8.5 per cent per annum on average. In terms of meeting the Millennium Development Goals, the required rate of expansion would need to rise by some 16 per cent per annum over the period 2004-2015.

The RSDP performance over the thirteen-year period 1997/98-2009/10 has been significant and substantial as illustrated by the increases gained on the selected target indicators, shown in Table 47.

**Table 2: Increase in Selected Indicators**

<b>Indicators</b>	<b>1997</b>	<b>2010</b>
Proportion of Asphalt roads in Good Condition	17%	70%
Proportion of Gravel roads in Good Condition	25%	54%
Proportion of Rural roads in Good Condition	21%	50%
Proportion of Total Road network in Good Condition	22%	56%
Road Density/ 1000 sq. km	24.1 km	44.4 km
Road Density/ 1000 Population	0.46 km	0.58 km
Road Density/ 1000 sq. km (including community roads)	24 km	136.6 km
Road Density/ 1000 Population (including community roads)	0.49 km	1.83 km
Proportion of area more than 5 km from all weather road	79%	64.2%
Average distance to all weather road, km	21.4	11.3

The impact of the RSDP on the expansion of the community/Wereda road network has been encouraging as outlined in Table 48.

**Table 3: Accomplishment of RSDP - Community Roads**

Period, Yr	Plan, Km	Accomplished, Km	% Target
2004/05 to 2009/10	80,000	100,384	125

The distribution of the network of rural roads, comprising those administered by the Regional Roads Authorities and the Wereda/community is shown in Table 49.

**Table 4: Rural Road Network**

Region	Total Regional Road Network (km)	Total Community Road Network (km)	Total Rural Road Stock (km)
Tigray	1,473	5,614	7,087
Afar	1,101	3,988	5,089
Amhara	3,683	22,480	26,163
Oromiya	8,354	43,974	52,328
Somali	2,137	1,351	3,488
SNNP	7,482	17,413	24,895
Benishangul-Gumuz	1,590	4,695	6,285
Gambella	846	489	1,335
Dire Dawa	278	380	658
<b>Total</b>	<b>26,944</b>	<b>100,384</b>	<b>127,328</b>

## 1.5 Building on Experience in the Road Sector

Launched in 2003 by the Government the Ethiopian Rural Travel and Transport Program worked in eight districts to build roads, expand transportation and construct essential public facilities. Wereda communities are feeling the benefits of this pioneering program that brought “new approaches” to the development of rural Ethiopia. Building the foundations for better roads in the Wereda has enhanced the ability of districts to plan, carry out and maintain a whole range of practical improvements.

The ERTTP approach demonstrated the means by which not just access, but a sustainable and reliable access, can be made universally available to all.

More than 100 Wereda now have a ten-year strategic plan and annual development plan that includes road provision and maintenance. Better local planning is having an impact on the quality of local transport and services. Sensible planning of other essential infrastructure, such as clinics,

schools and water supplies, can, when provided with reliable linkages, bring facilities ever closer to the rural poor.

The approaches demonstrated through the ERTTP can make roads accessible to all and can decrease the distances to them to within the accepted international markers of 2 km. Community roads, built without the correct technical support, are not sustainable in terms of the standard adopted, quality and maintainability. In contrast, those community roads constructed under pilot project of ERTTP can provide the needed access and have benefited the rural communities.

*“We can now get a wider range of goods at the market as the bus operates twice a week,”* says Birahan who sells ‘tella’ (local beer) for a living.

**Birahan lives in Dera, in the north west of the country, in a Wereda enriched through the ERTTP experience.**

Through the period of the ERTTP, the Federal and Regional Road Authorities have been instrumental in strengthening the ability of the Wereda authorities to carry out improvements themselves. For instance, investments made in three of the Wereda districts through the ERTTP have seen road lengths almost triple. As well as creating employment opportunities for rural dwellers, many of them women, the expansion of the local road network has encouraged the emergence of public and private transport services that didn't exist before. Trucks hauling goods to and from market, buses transporting passengers and carts and bicycles providing a local “taxi service”, are not uncommon. Whilst demand for transport services has increased there has been an attendant reduction in fares – this has meant that more people are now able to travel to markets, service centers and clinics, even during the worst of the rainy season.

The ERTTP has shown that the improvement of access to social and economic centers within Wereda and Kebele can be achieved through the appropriate development of road and other infrastructure, in tandem with making available affordable means of transport and transport services. Success of the approach can be demonstrated in all regions of the country and across a range of Wereda with differing agro-ecological and livelihoods systems.

The experience of ERTTP has provided important information, data, planning tools and implementation manuals for application at a Wereda level.

Successive external reviews of pilot projects under ERTTP have commented on the good standards and quality of the roads, drainage works and bridges constructed in the pilot Wereda. It only remains to spread the message, impact and benefits of this experience to the rest of the country.

*“I used to travel to Wukro on foot and spend more than a day bringing commodities to sell. As a result of the road that connects our village, Gebra Kidana to Atsbi, I can now pay 8 birr for the bus journey and it now just takes me one hour to get there!”*

**Words of Tesfaye, a retailer from a rural market in an ERTTP Wereda**

## **1.6 Rural Transport Services**

Importantly, access is not just a matter of providing roads. Freedom of movement depends on provision of appropriate transport services. Efficient rural transport plays a huge role in promoting

rural development by lowering transport costs, cutting travel time and improving the quality of transport services.

Most Ethiopians still rely on pack animals and carrying loads on their own heads and backs to get goods to market. The ERTTP has shown that other, more efficient; options are available at affordable cost. Animal-drawn carts are just one example.

The Growth and Transformation Plan stresses the importance of agriculture, and rural transportation infrastructure and services. As agriculture will be the most critical for sustained improvements in Ethiopia's growth performance, involving revitalization and higher productivity in traditional areas such as coffee, cereals, pulses, oilseeds, and hides and skins, as well as progress in new crops such as high – value fruits and vegetable, floriculture, rice, cotton, and agro-processing, there is the implied need for the expansion and improvement of rural transport services, as well as roads.

### ***Key Lessons from Ethiopian Rural Travel and Transport Program***

#### ***Main Message***

**“Potentially dramatic improvements to local areas in Ethiopia can be brought about improving rural access and mobility”**

#### ***Improved Access***

- *Wereda and Kebele level roads constructed or improved using the approaches developed under ERTTP have brought about substantial reductions in travel time in eight pilot Wereda.*
- *Farmers can now travel to local markets and traders deliver agricultural inputs and purchase agricultural produce from farmers*

#### ***Improved Mobility***

- *Mobility in rural areas has increased due to the introduction of new transport services. Moreover, in some Wereda, the use of Intermediate Means of Transport (IMTs), mainly animal carts, has increased due to interventions such as new credit schemes.*
- *Constructing new facilities such as health posts and schools closer to users has reduced travel time and increased usage.*

#### ***Income Generating Activities***

- *Wereda report positive changes in the socio-economic conditions in rural areas, including increases in farm production, increases in marketed output, diversification into new products, reductions of the price of manufactured goods in local shops and the increased availability of micro-credit.*
- *Labour-based methods, generating employment, have been successfully used for most road construction interventions, achieving satisfactory standards that are maintainable. is sustainable. Labour-based methods have also proved popular with local people.*
- *Farm gate and local market prices for local produce have increased.*

***Source – External Assessment of ERTTP (2008)***

Anticipated growth in industry, centering around light manufacturing, leather products, textiles, food and beverages has significant agriculture sector linkages to further increase demand. This requires the reduction of Ethiopia's transport services deficit in rural areas.

Synergy is needed between efforts to expand rural access roads and the provision of suitable and affordable transport services.

*Intermediate Modes of Transport (IMTs) can play an important role as efficient option, in terms of cost and time, particularly for short distance and low density trips relating to farm and off-farm activities. The development potential of IMTs has been underestimated, partly due to lack of awareness of available technology and its benefits, lack of policy and strategy, gaps in exploring and adopting appropriate designs for low cost motorized and non-motorized means; inadequate decentralized production capacity; insufficient attention to cost effective methods of production of, for example, Animal Drawn Carts (ADCs) and Hand Drawn Carts (HDCs); weaknesses in providing a regulatory framework and enabling environment for access to sources of finance.*

**Extract – Promoting the Use of Intermediate Modes of Transport (IMTs) in Rural Ethiopia: ERA, 2010**

Along with government's plan to improve rural road access, there is a need to embark upon interventions beyond roads that will improve rural transport and logistical infrastructure and services. The Road Sector Development Program (RSDP) Performance and Millennium Development Goals (MDGs) Transport Indicators Annual Reports show that the largest proportion of the rural population is adversely affected by poor accessibility and mobility. This is particularly evident in view of the small size of the motor vehicle fleet and the limited role, to date, of IMTs.

With the anticipated increase in agricultural productivity and production in rural Ethiopia, the demand for transport will grow. Agricultural inputs and surplus will need to be moved far more cost-effectively.

Complementary to rural road provision, it is recognized as important to:

- √ develop a series of detailed specifications for the design and manufacture of IMTs;
- √ provide guidance notes to familiarize Wereda officials and end-users on different IMT options;
- √ establish the conditions for promoting implementation and use of IMTs within Wereda; and
- √ develop a concise strategy and policy for expanding and promoting their use in Ethiopia.

## **1.7 Kebele and Wereda Access**

In response to a general lack of multi-sectoral needs based plans at the local level Government commissioned the preparation of Wereda Integrated Development Plans (WIDPs) that included both transport (Wereda Travel and Transport Plans - WTTPs ) and non-transport plans. To ensure that these were well coordinated and were harmonized with the Wereda development goals, the plans were developed using participatory approaches at all levels (consultations with communities and different stakeholders at the Wereda, Regional and Federal level).

## Impact of Improved Rural Road Provision: The case of the Daleti – Oda Bildigulu Road

*The Daleti – Bildigulu (37 km) road provides the only road link into the Wereda.*

- *Travel time by bus now only takes about 30 minutes, compared to 12 hours walk or 5-6 hours by truck previously.*
- *The road construction provided an incentive to farmers to increase the production of sesame and other products for the market (sesame production per farmer has increased from 2,000 kg in 2003/4 to 12,000 kg – a six-fold increase).*
- *New land has come under cultivation. Over the period 2004/05 to 2007/08, it is estimated that about 10,000 hectares of land had been cleared and is being used for agricultural purposes.*
- *Further agricultural diversification through the adoption of higher value crops is now a strategic objective of the woreda.*
- *Prices of manufactured goods at Bildigulu have dropped by around 20% compared to the level in 2003/04. For example, the price of 1 kg of sugar has reduced from 12 ETB to ETB 10 and 100 units of soap from 240 ETB to 200 ETB.*
- *People have better access to the vegetable market at Daleti. This has enabled them to eat a wider variety of food products, resulting in improved nutritional status.*

**Source – External Assessment of ERTTP (2008)**

Wereda plans provide the appropriate information in an integrated framework that guides the prioritization of infrastructure interventions, including roads. The plans also capture maintenance and sustainability arrangements, financing and contribution arrangements, institutional and other requirements and monitoring, evaluation and reporting arrangements.

Specifically the Wereda Travel and Transport Plans capture:

- ✓ Road network by road class, type and length including village tracks and paths;
- ✓ Location and utilization of other transport infrastructure e.g. waterways
- ✓ Road and waterway maintenance & funding arrangements
- ✓ Characteristics of travel demand and supply in the Wereda
- ✓ Characteristics of availability of intermediate means of transport, including animals
- ✓ Statistical and baseline monitoring data including Transport
- ✓ Available all weather & dry weather only road infrastructure
- ✓ Road Density statistics (Km/1000 km<sup>2</sup>) & Km/1000 Population
- ✓ Average Travel Time to an all weather road
- ✓ Average travel times to essential and other services (health centre, school, water, energy, market, mills etc)

From the information and data collected during the Wereda Integrated Development Program an assessment was made of the service levels in each region (see Table 50).

In addition to providing important baseline monitoring data the Wereda Integrated Development Plans have also provided important planning level information at Wereda, Regional and Federal level. This information, supplemented with GIS and other planning information from the regions and Wereda is used to establish regional and Wereda needs in terms of Kebele interconnectivity and access.

**Table 5: Assessment of the Service Levels - Average of all Regions**

Travel to Service	Range of Travel Time, hrs, to Services (all Regions)	Average Time, hrs	Average Distance, Km
All Weather Road	1.5 - 5.3	2.94	8.8
Health Centre	1.4 – 13.0	3.1	9.3
School	1.0 – 3.9	1.35	4.05
Water	0.7 – 4.3	1.41	4.2
Energy (Fuel)	0.9 – 2.9	1.71	5.15
Market Centre	1.4 – 1.9	4.41	13.25
Farm Area	0.9 – 2.0	1.02	3.05
Grazing Area	0.2 – 2.5	1.82	5.5
Grinding Mill	0.9 – 6.6	3.05	9.15

Table 51 provides an assessment of Kebele accessibility. Around 39% of Kebele are connected by all-weather roads.

**Table 6: Kebele Accessibility (2009)**

No.	Region	Number of Wereda	Number of Kebele	Number of Kebele connected by all weather roads	
				In number	In percent
1	Tigray	35	666	363	55
2	Afar	29	371	156	42
3	Amara	124	3234	1074	38
4	Oromya	295	6814	2575	38
5	Somali	50	401	90	23
6	Benshangul Gumuz	23	400	90	23
7	SNNP	134	3806	1473	39
8	Gambella	11	198	64	32
9	Dire Dawa	1	47	18	38
	<b>Total</b>	<b>702</b>	<b>15937</b>	<b>5903</b>	<b>37*</b>

\* This figure increased to 39% in 2010

In summary:

The total Kebele and community roads in Ethiopia are estimated at approximately 100,384 km of which around 39% provide Kebele connection to an all weather road.

Around 20% of all Kebele have community roads (about 26,000 km) providing seasonal (dry weather) access and 37% have roads giving all weather access (range 35% to 92% seasonal access and 23% to 55% all weather access respectively depending on region).

Some 43% of all Kebele do not have any motorable access and are impassable or unreachable by motorized transport in any season (range 6% to 65% depending on region). Connection to these Kebele requires construction of some 71,523 km of all weather access road.

## **II. TOWARDS UNIVERSAL RURAL ROAD ACCESS IN ETHIOPIA**

### **2.1 Background**

The Government has a set vision to make public, economic and social services physically more accessible to the rural population. There remains a critical need to provide rural communities with transportation infrastructure and services that ensures permanent accessibility to social and government services, economic and business services, and better opportunities for employment and income generation.

In response to this need, and as part of the RSDP-IV, Government is embarking on a **Universal Rural Road Access Program** (URRAP) that sets out to connect all Kebele by roads of a standard that provides all-weather, year round access, meets the needs of the rural communities, are affordable and maintainable.

As a catalyst, the URRAP is designed to improve rural livelihoods by reducing isolation for rural populations and to provide year round access to their markets, social and other services.

The program focuses on poverty reduction and is an important poverty alleviation catalyst. It is seen as an essential pillar for delivery of GTP and our MDG targets and furthermore underpins Government's actions and vision for expansion of all sectors of the economy.

The program recognizes the challenges faced by isolated communities and their constraints in trying to take part in our economic growth. The program provides a response to the voice of the rural poor who demand and have a basic right to access to transport, social and other services.

As part of the RSDP, URRAP “joins up” and harmonizes all rural road infrastructure development under a single umbrella. The program unifies all efforts that provide improved road access.

URRAP is not prescriptive in its approach. It recognizes fully the local context, local needs, local capabilities and local realities and builds on and rolls out the experiences and lessons learned on the ground in Ethiopia through a number of key pilot programs and projects implemented over the last five years or so. The program promotes application of innovation, knowledge and learning.

URRAP is realistic and achievable in that it provides the opportunity to establish sustainable road access at an appropriate standard and affordable cost. The inclusion of labour-based approaches, community contributions and an expanded participation by the private sector are key elements. The program captures the preservation of assets through streamlining of sustainable maintenance and management systems, such as implementation of length-man approaches.

The program is multi-dimensional in its outlook and inclusive in its approach. It removes barriers and promotes participation from communities, private sector and all layers of government and as such is a facilitator for development.

In its approach the program promotes road user safety, equality and protection of our environmental assets.

The **vision** for the Universal Rural Road Access Program is a clear and simple one: **To free the country's rural peoples from their access constraints, reduce rural poverty, improve welfare and opportunity, stimulate agro-productivity and share growth - a growth in which poor people benefit.**

In its **mission**, the Universal Rural Road Access Program will **connect all Kebele by all-weather roads and will provide communities year round access. Road infrastructure will be of appropriate standards to meet the needs of the rural communities and will be affordable to build and maintain.**

## **2.2 Results**

URRAP is action oriented and results based. URRAP will, in the course of its 5 year delivery expand and improve the condition of the rural and community road network in all regions by:

- i) Rehabilitation/ construction of 71,523 Km of all weather access roads to a maintainable condition,
- ii) Introduction of sustainable road maintenance regimes on improved road networks,
- iii) Developing and strengthening small and medium scale private enterprises working in support of the sector,
- iv) Creating massive employment opportunities for community and middle-level professionals, and
- v) Instituting and strengthening an appropriate and affordable institutional set-up at Wereda level that can administer and manage roads under its jurisdiction.

## **2.3 Benefits**

The benefits and beneficiaries from implementation of URRAP are many. The principle benefits are seen as:

- i) Substantial improvement and reliability of access for the rural population to markets, social and other services through reduced transport time and cost
- ii) Improved access for seriously isolated areas of the country and communities, enabling further implementation of other poverty reduction programs, such as, sector programs in agriculture, health and education – all of which require reliable transport services and all-year access
- iii) Improved administrative and economic integration of the country and facilitation of decentralization through the linking of rural communities, Wereda and Kebele centers, with the larger national economy and community
- iv) Support to the decentralization process and strengthening of public administration and planning, decision-making, implementation and progress monitoring
- v) Support to the private sector and to small-medium enterprises who contribute to sustainability and self-reliance.

## 2.4 Guiding Principles of URRAP

In rolling out the program and in safeguarding delivery and sustainable implementation, Government is convinced that URRAP is:

- Supported at all levels of Government with strong political sanction at Kebele, Wereda and Regional levels
- Socially right and environmentally acceptable
- Institutionally possible
- Technologically appropriate and practical
- Economically viable
- Financially feasible

In moving from vision to practice and to meet the challenges ahead the URRAP is underpinned by a series of guiding principles that together create an approach that is rational in its planning; practical in application, pragmatic and affordable in its approach, innovative in its techniques and methods, and is founded on sound local and regional best practice and experience.

The actions and activities of the program are guided by the following principles:

- i) Encourage Wider and Harmonized Participation in Planning, Delivery and Management*
  - a. Is led by Wereda administrations and captures full participation of the beneficiary communities
  - b. Reflects and matches the desires and plans at local level
  - c. Integrates, recognizes and complements the role of other Wereda and Kebele infrastructure investments
- ii) Establish Innovative Funding, Financing and Resource Mobilization Strategies for Provision and Maintenance of Rural Transport Infrastructure*
  - a. Adopt a network approach
  - b. Recognition and support to community based efforts
  - c. Advocate innovative financing methodologies for construction and maintenance
  - d. Channel and build on all available funding sources
  - e. Seek and promote value for money investments
- iii) Apply Appropriate Design, Construction and Maintenance Standards*
  - a. Promote efficient use of local materials and resources, including labour
  - b. Implement a range of new, innovative and appropriate road provision and water crossing technologies
  - c. Establish affordable construction and maintenance strategies
- iv) Enhance Employment Opportunities*
  - a. Encourage application of labour based, labour intensive and intermediate equipment technologies
  - b. Give wider opportunity to women and youths

- v) ***Promote Private Sector Participation and Enterprise***
  - a. Involve the private sector
  - b. Improve the environment for the establishment and operation of private companies supporting or entering the road construction and maintenance sector
  - c. Promote local equipment and tools manufacturing and those servicing equipment and supplying materials
  - d. Enhance competition in the sector and remove uncompetitive practices
  
- vi) ***Address Policy and Regulatory Gaps***
  - a. Bring clarity to road ownership and responsibility
  - b. Improve regulation and registration of small and medium sized enterprises supporting the sector
  
- vii) ***Adopt Sustainable Rural Road Maintenance Management Strategies***
  - a. Enhance management efficiency and effectiveness of governing institutions
  - b. Introduce appropriate maintenance approaches, equipment technologies and skilled human resources
  
- viii) ***Administer a stringent Monitoring & Evaluation Framework***
  - I. Introduce clear reporting structures
  - II. Regular public reporting

Integrated within all facets of the program are activities and issues that capture measures to ensure better environmental protection and management and improve road safety education, management and enforcement.

### **III. PROGRAM APPROACH**

#### **3.1 Technical Considerations**

In determining cost-effective solutions to address access problems on unpaved or unsealed roads it is important to understand the mechanics of how the road deteriorates in the first place. Deterioration of these types of roads in Ethiopia is governed by the type of material used on the surface (gravel to soil); the strength of the underlying soil (soft, erodible and/or expansive), the type and action of traffic (heavy vehicle to pedestrian) and probably most importantly, the influence of the “road environment”. The road environment would include the interacting influence of climate (wind, rainfall and intensity), local hydrology and drainage, terrain and gradient.

Surface materials, where these are present, need to resist wear and abrasion in dry weather and promote surface drainage and run-off in wet weather. Under traffic they need to resist whip off, dust generation and be stable enough when compacted to resist deformation. Similarly the compacted materials need to resist erosion and scour. The nature, strength and moisture condition of the surface soils on earth roads and the underlying formation soils on gravel roads are critical factors in determining performance, particularly in periods of wet weather.

During wet periods, perennial streams and major rivers will start to flow. Unless adequate cross-drainage structures, such as, culverts and water-crossings, such as, drifts, causeways and bridges are provided, access can be prevented and often for long periods, three months is not uncommon.

Problems are worsened in areas where there is prevalence of expansive, black cotton type soils. These soils, as their name suggests, are agriculturally potentially very productive but when roads are built on or across them the soils become very weak and slippery when wet and even the lightest of vehicles can bog down and become stuck.

In circumstances where motorized vehicles try to negotiate roads with high roughness, vehicle operating costs (which include the costs of tyres, maintenance and fuels) are correspondingly very high. As a consequence motorized vehicles and transport operators will tend to avoid roads subject to these types of defects – and no matter what time of the year. Unfortunately, this is the situation in many parts of rural Ethiopia – transport services will simply not use rough roads. Rural people thus need to walk long distances to connect to the nearest point (all weather roads) where transport services are prepared to operate.

Road maintenance aims to reduce user costs, improve safety, provide adequate drainage, maximize the service life and to keep the road open. The types of materials prevalent in Ethiopia, the nature of the climate and the terrain presents significant challenges to the operation of road maintenance activities. “Engineering challenges” are often magnified by a lack of trained personnel in the private sector who can carry out the appropriate type of maintenance works.

*The challenge faced for provision of all-weather access roads for Kebele is a complex interaction between availability of the right materials and matching traffic, climate, terrain demands and service standard demands and providing appropriate and cost effective maintenance.*

In summary, the major technical challenges are to provide durable and functional water crossings, surfacing with materials that provide the desired and necessary level of service and to provide effective maintenance management.

In its approach URRAP will balance the required service standard with the appropriate design, construction and maintenance standards.

## **3.2 Implementation Approach for Construction & Maintenance**

### **3.2.1 Focus on Labour Based Actions**

URRAP will make use of one of our country's least expensive and most abundant resources – labour. URRAP is an Employment Intensive Program and will, where possible, use employment as a first step out of poverty.

The development of locally-based (Wereda and Regional level) contractors can assist in spreading employment opportunities into all areas of the country, and can provide the capacity at the local level for the road improvement works envisaged under the program and its subsequent maintenance.

Labour-based methods<sup>2</sup> are an important entry route that allows new and emerging local contractors into the road sector market. One of the main reasons for the success of this approach is that by using labour-based methods, the level of investment required by the contractor is reduced when compared with the size of investment that would be required for a more substantial equipment intensive operation.

When labour-based methods are used, over five times more direct employment is created for the rural unskilled workers compared with using conventional equipment-based methods. This includes a substantial proportion (typically 30%) of employment for women. For these reasons, labour-based methods using local, small-scale contractors (or community contracts and agreements) will be extensively used under URRAP.

Labour-based approaches can be used to build earth, gravel and other types of roads. Tried and tested in Ethiopia over many years and in many regions, labour intensive and labour-based construction and maintenance technologies for road works has matured to the extent that work can be produced of similar quality to equipment based work at much reduced costs.

Many of the activities associated with road construction, e.g. setting out; bush clearing; obstruction removal; ditching, excavation, loading and short haul of materials; unloading and shaping; compaction; building masonry and other structures such as culverts, drifts and small bridges - are all perfectly amenable to labour. URRAP will utilize labour on these operations.

---

<sup>2</sup> There is a distinction between labour intensive and labour based approaches whereby labour intensive operations maximize the labour force's use of simple hand tools, whilst labour based approaches supplement the work of the labour force by using simple or intermediate equipment, such as tractors and trailers (with relatively low capital costs compared to conventional heavy civil engineering plant).

Similarly, road maintenance activities, cutting vegetation; repairs to structures; filling potholes and scours; maintaining road signs and marking; cleaning ditches, culverts and small bridges are achieved using labour intensive and labour based operations.

By using labour-based methods it becomes possible for contractors to enter the road sector at different levels of skill and operation. These range from petty contracting for routine maintenance, to periodic maintenance, construction of rural roads and sub-contracting on larger construction contracts. With the decentralization thrust it is important to have contractors who can operate at the local level without incurring large mobilization costs for relatively simple works, Table 52.

**Table 7: Typical Comparative Construction Costs for Labor and Equipment Based Technologies**

Unpaved roads Construction	Equipment-based option	Labour-based option
	(% of total cost)	
– cost of equipment	80 - 82 %	10 - 12 %
– cost of labour	30 - 40%	50 - 60%

Some of the important benefits of the program will only be realized if opportunities are taken to maximize local employment creation and women and youths participation. The use of labour-based methods generates a range of benefits that are well documented elsewhere.

They include skills development and job creation that are self-targeted at the rural poor who have few other wage-earning opportunities.

The scattered nature, smaller-scale and often-remote location of much of the road provision work under the program makes it particularly suitable for labour-based construction methods.

### **3.2.2 Focus on Appropriate Equipment and Tools**

Labour-based methods have also been found to be cost effective compared to the traditional heavy equipment-based methods. Conventional equipment based approaches become expensive and cumbersome for minor road works and thus is created an opening for labour-based methods using locally based contractors. At micro and macro levels, the use of a labour based approach has significant economic advantages over the use of an equipment based approach in the improvement and maintenance of roads in Ethiopia.

Motorized equipment available on the international market for grading earth and gravel roads demands foreign exchange to purchase and is generally expensive to operate and maintain. Most of this equipment is designed for operation in a high-wage, low-capital-cost environment. The need to import, the costs of purchase, ownership and operation, and the nature of the grading work make this type of equipment impractical and/or too expensive for sustainable application on rural, unpaved roads serving poor communities in Ethiopia. There is a range of intermediate equipment that is far more appropriate for use on these rural roads. Academic training of road engineers usually focuses on the use of heavy civil engineering plant, based on developed country practices. Training by demonstration and doing can be provided to emergent contractors on this simpler

equipment. There is also scope of local manufacture of tools and intermediate equipment, thus removing the import pressure.

**Labour Based Approaches for Road Works – Experience in Ethiopia - Important Conclusions:**

**Costs:** *Labour-based methods are significantly cheaper than equipment-based methods for similar types of road works (i.e. the same quality and standard) in both financial and economic terms in Ethiopia. The Regional Road Authorities using force account units, report that the average cost per kilometre for road construction using labour-based methods compared to equipment-based methods was 54% cheaper in financial terms and 60% cheaper in economic terms.*

**Based on the average financial costs for every 1 Kilometre built using equipment-based methods 2.5 Kilometres could be built using labour-based methods**

**Roads standards:** *The standard and quality of unpaved rural roads built by labour-based methods are the same as for equipment-based methods.*

**Employment creation:** *Employment created using labour-based methods was significantly higher per unit of investment compared to equipment-based methods.*

**Some 45% of the cost of labour-based roadworks goes to labour wages compared to 22% using equipment based methods.**

*The employment of rural unskilled labour using labour-based methods is over four times higher than that using equipment-based methods – 21% of total cost compared to 5%.*

*Employment creation due to multiplier effects created indirectly by the road investment exceeded the direct employment by a factor of about 10 times.*

**Macro-economic impacts:** *Labour-based methods generate nearly 70% higher national output per unit of investment compared to equipment, 80% of which is due to indirect effects.*

**Break-even wage rates:** *Because the cost advantage of using labour-based over equipment based methods is so large, the wage rate at which labour-based methods would become uncompetitive with equipment based methods (the break-even wage) is also high. Even if unskilled wages increased fairly significantly, the cost advantage of labour-based methods over equipment-based methods would remain.*

**Comparative Study of the Impact of Labour-Based and Equipment-Based Methods in Roadworks in Ethiopia – Study Rural Roads Authorities in Tigray and Amhara Regions in collaboration with the International Labour Organization (ILO)-June 2008.**

Labour, supplemented with appropriate types of low-cost intermediate equipment, such as pedestrian rollers for compaction and equipment based on tractor technology has the advantage that:

- Productivities are increased relative to utilization of labour alone and uniform works are more easily constructed.

- It can compete effectively with more traditional heavy civil engineering plant based operation and is used effectively for the construction and maintenance of roads
- It complements and extends the range of labour based technologies to include cost-effective soil stabilization techniques and even surface sealing
- Attachments of implements makes it versatile – there are a large number of implements, towed by an agricultural tractor, that have been designed for performing a variety of road works related tasks
- Savings of the order of 15-25 per cent can be effected in items of earthworks, stabilization, and sealing

Tractors are diverse and open a range of additional opportunities for contractors to engage in other types of works, apart from roads (see insert).

**Additional (non-road) Benefits of Promotion of Intermediate Equipment Based Technology for Rural Enterprises**

**Agriculture:** *Ploughing, Harrowing, Rotovating, Sub-soiling, Haulage, Land Clearance, Root removal, Planting, Seed Drilling, Fertilizer Application, Pesticide/Herbicide Application, Harvesting, Pond Construction, Dam Construction, Borehole construction, Contour drains, Fencing (post hole boring)*

**Forestry:** *Winching, Loading, Hauling, Poling, Sawing, Access Roads*

**Agro-Processors:** *Threshing, Hulling, Milling, Haulage*

**Municipal:** *Garbage collection and Disposal, Water Haulage, Night Soil Disposal*

**Water Sector:** *Pipeline excavation, Pipe Laying, Cranage, Earth Dam Construction, Irrigation Channel Construction, Water Pumping, Water Haulage, Borehole drilling*

**Building Contractors:** *Crushing and screening; Materials and personnel Haulage*

**Mining/Quarrying:** *Crushing and screening, Materials Haulage*

**Transporters:** *Short Haulage: Goods, Materials & Personnel*

**Plant Hire & Mechanical Engineering Companies:** *Hire to Others; Servicing and repair*

Towed grading of roads is but one service that a tractor-based business could provide to the rural communities in Ethiopia. In the agricultural sector, tractors are usually used principally for ploughing only. The normal single agricultural season in most of Ethiopia means that productive work in ploughing may only amount to 300 – 400 hours per tractor per year. This severely limits the productive return on the capital investment in a tractor. However (see inset) there is an enormous range of operations that an agricultural tractor can carry out in the rural economy, not just on roads. Raising utilization by carrying out various activities and services in the annual cycle lowers unit costs of tractor ownership and consequently the cost of services to the rural community.

## **Application of Tractor Based Technology for Rural Road (paved and unpaved) Construction and Maintenance**

**Haulage:** - *Gravel Haulage, Water Collection Haulage and Distribution, Bridge & Culvert Materials Haulage, Fuel Haulage, Plant Haulage (low loader trailer or semi-trailer)*

**Earthworks:** *Excavation & Haulage (towed scraper), Excavation (back hoe/ripper/scarifier/compressor & pneumatic tools), Loading (front shovel attachment)*

**Spreading and Mixing:** *Milling, Mixing with disc barrow, Towed grader, Water Distribution – Towed Bowser*

**Compaction:** *Towed Compaction (rubber tyred/steel rollers)*

**Maintenance:** *Towed Grading (heavy and light), Grass Cutting*

**Sealing:** *Brushing/Sweeping; Towed bitumen/emulsion heater/sprayer, Stone crushing (towed crusher and screens), Chippings Transport, Slurry Sealing (mixer and spreader), Premix Patching Material Production*

**Other:** *Temporary Accommodation (towed caravan/workshop); Personnel Transport*

URRAP recognizes that there will be instances where wholly labour intensive or labour based approaches are not practical or feasible, for example, in sparsely populated lowland and nomadic areas; in areas of harsh terrain where excavation is difficult, or in situations where productivity is of prime concern.

In these situations URRAP will adopt other options, such as an extended intermediate technology approach. In this case, whilst employment opportunities are still maximized intermediate equipment based operations will be expanded.

### **3.3 Opportunities for Small & Medium Enterprises**

Promoting the development and use of local resources is a central ethos of the URRAP. Local resources include the human resources in local and regional government, the private sector and community institutions, in addition to those employed through local entrepreneurs such as contractors, consultants, industrialists and artisans. Local resources also include the local skills base, fabricating, servicing or repairing locally made or intermediate equipment, as well as those supplying local materials such as timber, stone, bricks, and other materials. Locally raised finance or provision of materials or services in kind is another important element of the local resource base.

Larger construction enterprises, using capital intensive methods for construction and maintenance works, generally have high overhead costs and their mobilization to the rural areas is expensive.

In its approach URRAP will promote and support initiatives that expand service provision by Small and Medium Enterprises (SMEs).

SME's can cater for a whole range of services that support road construction and maintenance. In addition to the small and medium sized contractors involved directly on the works there are many other support services and industries on which the industry depends. Opportunities for small and medium sized enterprises expand and penetrate the market include consultancy and supervision services, provision and supply of materials (cement, steel, fuel, quarry products), hire and

maintenance of equipment, manufacture of tools, and accounting and administration services to name a few. In the works themselves, specialist SME's with carpentry, masonry, concreting and mechanical skills can perform works through sub-contracting arrangements.

In support of these enterprises establishing, surviving and delivering low cost infrastructure, Government will be proactively removing barriers and constraints that effect business. In addition to making the public more aware of the potential benefits of SME in delivering rural road and other civil works infrastructure, Government will champion making contract documentation, pre-qualification and bidding procedures less onerous. For example, requirements to access advances can be made less demanding as can the requirements for performance and other guarantees. Special dispute resolution clauses can be built into the contracts. Payment periods can be aligned to typical cash-flow constraints faced by SMEs. Tendering and award of contracts will be rational, straight forward and completely open and transparent.

Procedures and opportunities to access capital or credit for equipment purchase or to bolster cash-flow will be available. Opportunities to hire the right equipment will also be enhanced.

Access to local, low cost training and professional development opportunities will increase. Sustainable funding for maintenance and opportunity to tender on civil works programs other than roads will ensure a continuous workload.

Registration and other trading requirements will be made rational and equitable.

SME's under the program will:

- be based locally in the rural areas where mobilization costs will be lessened
- have low capital and overhead costs when compared to the traditional civil works contractor
- have an inter-sector flexibility and will be able to provide services to a range of sectors and clients outside of the road sector
- use affordable, simple equipment, (either owned or hired) and will be encouraged to maximize and utilize locally available labour
- recycle more of the project costs into the local community and country as a whole

### **3.4 Technical Options & Approaches for All-Weather Access Standard**

URRAP does not impose stringent and unaffordable standards. It recognizes that there is a natural progression in standard as traffic increases and road user costs increase. Traditional engineering approaches impose strict criteria for geometric design, materials, pavement thickness design, drainage, and surfacing. In its approach, URRAP will promote flexibility of approach, appropriateness of intervention (suited to labour), affordability (value for money) and maintainability (sustainability).

The guiding principles for adoption of appropriate road design standards under the program takes the following criteria into account:

- Kebele roads will achieve a full access, all weather standard
- Economic and financial considerations
- Road function and control of access
- Road safety considerations
- Land use and physical features e.g. special characteristics of junctions, roads passing through villages and settlements
- Design vehicle and vehicle considerations
- Using innovative techniques to deal with the engineering challenges of water crossing, drainage and terrain.

The low traffic volume requirements mean that road improvements can be planned at the lowest practicable standards, if costs are to be justified by benefits obtained.

### **3.5 Design Considerations**

The purpose of rural roads falling under URRAP is to provide communication and access over relatively short distances, their geometric design does not need to cater for high speed travel over long distances. Most of the traffic on the road will be local, and most users are presumed to be familiar with local conditions. Due attention will be given to matters of safety, particularly that of pedestrians. Delays caused by short sections of reduced geometric standard, making it difficult to easily overtake slow-moving vehicles, would be deemed acceptable under URRAP. With these factors in mind URRAP roads can be built at relatively low cost.

In those few cases where entirely new alignments are to be provided, then consideration of the existing terrain becomes more important. It may be necessary to provide an alignment that deviates from the shortest route to avoid poor ground conditions or to make use of a particular source of construction material. Such decisions would always be taken by considering the trade-off between construction costs and those of user operation. In flat undeveloped terrain, the cost of a road is almost entirely independent of its alignment, so a relatively high design standard can often be adopted with no cost penalty. Only when the road is in hilly or mountainous terrain will there be any significant costs which are attributable to the alignment chosen. A higher standard of alignment will mean that more cuts and fills are needed resulting in a higher earthworks cost. However, a shorter alignment will result in lower pavement and maintenance costs, and cost savings for road users. The objective is to produce a design such that any marginal increase in earthworks costs is more than offset by potential savings in user costs over the analysis period for the project.

For most Kebele roads an existing alignment will exist. This alignment may be an existing road, or may be just a rudimentary track. In these cases, the aim will be to provide an alignment that makes minimal improvement to that which already exists to meet minimum standards of geometric design appropriate to the class of road and the anticipated traffic level. It is anticipated, that for the most part under URRAP, that it will only be necessary to make simple improvements to drainage or stream crossings to provide the degree of passability that is required.

Roads falling under URRAP will have narrower than normal platforms. Where feasible, the minimum standard for the roads will be 6m wide. A durable 4.5m wide surfacing will be provided when required. This is similar to the standard adopted on the successful Ethiopian Rural Travel and Transport Program and set out in the Ethiopian design manual for low volume roads. Earthworks

costs can typically be over 40% of the total costs of the road provision. Design of embankments will be carefully considered in light of local hydrological demands and a need to minimize amount of earthworks and material movements. Cutting and disturbance of slopes and the generation of excess spoil will also be carefully controlled and minimized.

In hilly and mountainous terrain, even simple improvements become more difficult. Isolated and difficult sites would each be considered on their merits. Clear benefits that outweigh costs need to be identified before embarking on significant earthworks improvements. Provision of adequate warning signs may be more cost-effective in such situations.

As a general rule the Universal Rural Road Access Program will provide a guide for the minimum standards but these will remain flexible and adaptable to the local site conditions.

Drainage is critical to assure good performance and serviceability of the road. There are a whole range of methods for controlling on and off-road drainage. Camber can be varied and drainage ditches can vary in size and shape in terms of the specific need. Drains can also be lined with bricks and masonry, in short sections, depending on the demands of the terrain and rainfall intensity. Turn-outs are located at regular intervals to disperse water away from the road and houses. In areas where access to water is difficult, innovative design approaches can be used to harvest dispersal water for storage and use by the local communities.

The program will promote sufficient investment in the surface drainage. Alignments will be confirmed that maximize good drainage.

One of the main problems with drainage control, especially on areas with steep gradients is controlling or breaking the velocity of the dispersed water. The program will give special attention to this problem to avoid scouring and subsequent maintenance problems. There are a range of simple and robust techniques available such as provision of masonry, wooden and concrete scour checks.

Good surface drainage is needed to protect the road structure from run-off water entering through the side of the road, directing water from entering from surrounding areas or from the water table.

In providing adequate cross-drainage the program will promote adequate provision of culverts. These will be of sufficient type and diameter to drain surface water to dispersal or harvesting points and will be large enough to be easily maintained by hand. Culverts can be ringed or boxed, prefabricated or constructed in situ using masonry. Proper inlets and outlets, headwalls and aprons will always be provided, with additional gabion protection if needed. Further erosion protection measures will be provided for dispersed water, when this is not harvested.

When provision of a bridge is not feasible and where water flow is perennial, various water crossing structures can be considered. These include fords, bed level crossings, single and multiple-vented causeways and submersible bridges. These structures allow periodic over-topping during peak flows and are very cost effective for crossing streams and minor, shallow and wide rivers.

In rural situations pedestrians, animal-drawn carts and bicycles can be an important component of traffic mix. Designs need to cater for all road users.

When locating roads in erosion-prone regions, or areas where instability of slopes is a problem, careful attention will be given to minimizing the disturbance of the terrain caused by the road. Techniques known collectively as bio-engineering will be employed. 'Bio-engineering' uses vegetation to reduce erosion and shallow-seated instability on slopes and generally incorporate small scale engineering techniques in combination with use of the plants. Bio-engineering systems are carefully designed to make use of the plants' natural characteristics, in conjunction with the engineering component, to combat slope failure.

URRAP is based on flexibility of approach and appropriateness of intervention. A whole range of engineering techniques and solutions are available that can, when suitable, be utilized to solve or manage specific road problems. The approach is captured in the national document for design of low volume roads.

### **3.6 Making Better Use of Local Materials, Resources and Technologies**

In promoting better use of our local materials and natural resources and in developing our human resources and local technologies the program will assist the development and use of appropriate equipment and technologies for road works. At the same time the program will support the development of smaller scale contractors and SMEs that support the road construction and maintenance industry. There will also be ample opportunity for existing contractors and consultants to contribute fully to the program and where appropriate in-house units will be used to fill gaps and support more difficult parts of the program.

With the assistance of ERA, URRAP will introduce sustainable approaches for road Maintenance Management to the Wereda and regions. This will introduce programmed routine and periodic maintenance systems, appropriate maintenance techniques and will seek to strengthen the maintenance procurement and contract management (term and performance contracts may be considered).

In its approach the program will endeavour to enhance private sector participation for road construction and maintenance at all levels.

It is envisaged that the program will improve capacity and increase the numbers of available local civil works contractors, supervisors and technical support staff and consultants working and serving the sector. Local suppliers to the civil works industry (e.g. producers and suppliers of cement, aggregates, steel, and equipment) and other support services (e.g. equipment servicing, design specialists, monitoring and evaluation specialists; quality assurance services and private testing laboratories) will be actively supported and promoted through the program. The financial support services, banks and like, will also be important partners in the process.

Community involvement will be increased at all levels from administrative input to the participatory planning approaches through to increasing opportunity for community works contracts and community maintenance contracts.

In our training and other support programs we will utilize as fully as possible our existing skill base and institutions to support the program.

### 3.7 Environmental Responsibilities

The program puts a strong emphasis on protection of one of the countries most precious resources – its environment.

URRAP appreciates the vital role that the environment plays on the livelihoods of those it sets out to benefit. It is not a free resource in infinite supply. The environment provides a wide range of services which underpin all productive activities and contributes to human welfare in a number of very direct ways. Although it may not be possible to put a “price” on the environment, it has a great value to those who work and live in it.

Responsibilities for applying sound environmental screening are outlined in Table 53. In carrying out the program, staff will be guided by the over-arching objective of ensuring that road interventions are designed and implemented according to sound principles which minimize adverse impact and enhance benefits. A variety of procedures are followed at various stages of the project cycle in order to achieve this objective. These procedures normally involve an environmental impact assessment (EIA) or screening that captures identifying and quantifying the full range of potential impacts on the natural and social environments and formulates remedial procedures for avoiding, mitigating and compensating for negative impacts. Remedial measures are reflected within the project and contract documents and the Regional and Wereda Authorities monitor compliance during implementation.

Community involvement in this process is important. Information, views and concerns are fed into the Wereda plan and these are discussed at grass-roots level by the affected community.

Whilst the nature of the roads falling under the program might not, under normal; circumstances merit the same “environmental” attention as say a main road, the magnitude of the program demands a strenuous assessment for both upgrading and new construction works.

**Table 8: Environmental Screening and Management**

Project Stage	Activity	Objective	Responsible Agency
<b>Project identification</b>	Initial screening	- register “danger signals” - avoid unnecessary investigation where impacts are likely to be minimal	Wereda Development Committee & Wereda Road Office
	Environmental appraisal	- predict main impacts - assess importance of effects - indicate key mitigating actions required - present implications to decision makers	Wereda Development Committee & Wereda Road Office
<b>Feasibility</b>	Preliminary Screening	- decisions on mitigation and checklist requirements	Regional Coordination Committee & Regional Environmental Protection Office
	Environmental Checklist Assessment	- predict in detail likely impacts, including cost implications - identify specific measures necessary to avoid, mitigate or compensate for damage - present predictions and options to decision makers	Wereda Road Office and if required - Regional Roads Authority
	Selection of projects	- decisions on acceptance;	Recommendation by Regional Environmental Protection Office to Regional Coordination Committee

<b>Design</b>	Environmental Mitigation Plan	- ensure environmental mitigation measures are included in the contract documents	Wereda Road Office & - Regional Roads Authority
<b>Implementation</b>	Environmental monitoring	- ensure environmental mitigation measures are being complied with during construction	Supervisor & Wereda Road Office
<b>Operations and maintenance</b>	Environmental audit	- assess the extent of implementation of a project against the requirements derived from the checklist. - ensure lessons learned are incorporated in future projects	Regional Environmental Protection Office and Regional Coordination Committee

### 3.8 Safe Roads

The program confronts the road safety challenge in our rural areas. The program seeks to be proactive in developing and implementing strategies that can treat the root causes of road accidents and levels of severity before they occur.

*It is often possible to improve road safety characteristics markedly at little or no extra cost, provided the road safety implications of design features are considered at the design stage. Unfortunately, road design engineers are often part of the problem and their failure to take adequate account of operational use of roads often result in increased speeds and increased deaths when such roads pass through communities straddling the road.*

Road accidents are multi-causal in nature, involving human factors, the road environment and vehicle factors. They are more often caused by a combination of these factors, with human factors contributing to an estimated 65 per cent of all accidents, the road environment 28 per cent and vehicles 'only' 7 per cent.

In many cases local populations will not have been exposed to the dangers of road traffic before. The program will set out guiding principles that must be met:

- √ Designs will incorporate and reflect the needs of all road users including non-motorized vehicles, pedestrians, etc. This has implications for almost all aspects of road design, including carriageway width, shoulder design, side slopes and side drains
- √ Clear and consistent messages will be reflected to the driver and road user. Roads under the Universal Rural Road Access Program should be easily "read" and understood by drivers. The approach to design will avoid sudden surprises to the road user
- √ Appropriate speeds will be controlled by design features, providing clear visual clues and by prominent signing
- √ Conflicts will be reduced by staggering junctions, separation and protective measures where needed and channelling pedestrians to safer walking and crossing points particularly in villages
- √ Geometric design that could result in additional negative impacts on road safety for both pedestrians and other road users will be avoided.
- √ Local enforcement will be strengthened

Coupled with the above will be provision of regulatory road signs along with adequate provision of warning and cautionary signage. Warning signs, reduced speed limits or improved surfacings to reduce visibility problems with dust are particularly important near localized areas of high activity,

such as stretches of road within or close to villages and schools. Speed calming devices may also be considered if circumstances demand. Passing lanes will also be provided at regular intervals to avoid unnecessary and dangerous over-taking.

Road safety education will be an important element to be considered. The program intends to raise awareness of problems and behaviours related to traffic and road safety by teaching children, and adults, to be safer road users. Through schools and community initiatives, supported by the program, local road users will develop:

- √ knowledge and understanding of road traffic
- √ behavioural skills necessary to survive in the presence of road traffic
- √ an understanding of their own responsibility for keeping themselves safe
- √ knowledge of the causes and consequences of road accidents
- √ a responsible attitude to their own safety and to the safety of others

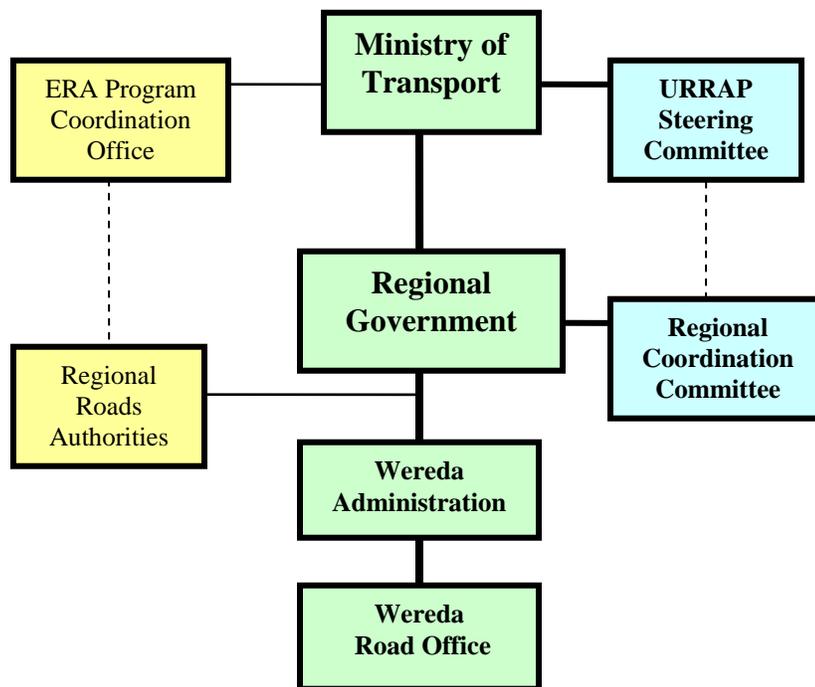
In addition to targeting trained teachers who are provided with suitable resource materials through the program, community road safety education initiatives will be supported. Road safety publicity campaigns will also be used to raise the awareness of problems and behaviour in addition to improving knowledge, shaping attitudes and behaviours, as well as stimulating discussion and debate. These publicity campaigns can include local drama performances in which local languages are used in order to reach all persons. Community workshops and radio will also be used.

## IV. MANAGEMENT AND DELIVERY

### 4.1 General

The program works within the boundaries and context of Government's decentralization process. URRAP is overseen by a National Steering Committee and Regional Coordination Committees. It builds on, utilizes and strengthens existing structures. It does not advocate introduction of new institutions or structures.

**Governance Structure for the Universal Rural Road Access Program**



### 4.2 Program Coordination and Oversight

The program oversight falls under the responsibility of the Ministry of Transport who will host and chair the National URRAP Steering Committee.

The **National Steering Committee** will provide coordination and leadership at a national level and will act as the high level decision taking body. The composition of this committee will comprise representatives from relevant Ministries and regional offices.

The principle duties and functions of the National Steering Committee would include:

- Coordination of National Program

- Review and endorsement of Annual Report
- Review of bi-annual progress and monitoring reports submitted through the Regional Coordination Committees and
- Setting direction for the next fiscal year performance.

The National Steering Committee will be supported by the Program Coordination Office.

**Program Coordination Office** - Program oversight will be the responsibility of a Program Coordination Office sitting within the Ethiopian Roads Authority. This office will be responsible for overall coordination of the program including strategic planning, compilation and consolidation of national budgeting information and data, monitoring and follow up, and oversight of the works.

The Program Coordination Office will compile drafts of annual and other high level reports for the approval of the Steering Committee. The Program Coordination Office will be the central point of contact for the program and it will provide links to and coordination with all stakeholders, funding agencies and other interested parties. It will also act as the central source for collating all monitoring and evaluation data and will also provide a knowledge sharing and information dissemination platform for the program.

**Regional Coordination Committee** - Regional Coordination Committees will be established to provide regional level leadership, coordination, steering and monitoring of the program implementation. Members of these committees will be drawn from the relevant regional offices and will be chaired by the respective Regional Presidents. The General Manager of each Regional Road Authority will serve as secretary of the committee. The Regional Coordination Committee will consolidate regional data, information and statistics for submission onto the Program Coordination Office.

**Wereda Administration** - In general, the Wereda Administration will be at the centre of the delivery and implementation of the program. Through its Wereda Road Offices the Wereda will act as employer and will be responsible for the contracting of the planning and design services, in addition to the management and administration of the construction works and maintenance contracts.

Over the period of the program it is possible that some Wereda will be responsible for contracts delivering over 200 km of road. This will be in addition to its road maintenance contract management responsibilities.

**Wereda Road Desk** - The Wereda road desk will assume the responsibility for formulating, executing and managing all aspects of the Wereda and community access roads provision contracts. Wereda will utilize their own force units and small scale contractors and SMEs in delivery of the works and may contract additional services to support supervision for some or all of the works.

The Wereda road desk will provide monitoring and other data and statistics, through the Wereda Administration to the Regional Government and Regional Coordination Committee.

In some specific situations, depending on constraints, such as, Wereda capacity, emergency situations, security issues, terrain or other difficulties, the planning, design, construction and maintenance works may be carried out for the Wereda by the Regional Road Authority.

**Technical Support** - To ensure efficient program and contract management both the Ethiopian Roads Authority and the Regional Roads Authorities will be available to provide technical, back-stopping and training support when required.

ERA will prepare design and construction manuals, draft specifications and details and model contract documentation for minor works envisaged under the program. ERA will also prepare guidelines for maintenance management of the roads at Wereda level.

In association with the Regional Road Authorities, ERA will prepare the schedule of training, other programs and training materials to assist Wereda and the training centers. These will focus on planning, contract preparation and management, financial management, maintenance planning and monitoring, evaluation and reporting issues. Training and demonstration on aspects of planning, design, construction and maintenance works will be carried out for the Wereda by both ERA or RRA in cooperation with the Ministry of Education.

To prepare and encourage emergent SME into the program and the sector ERA will make available its training centers at Alemgena, Ginchi and Chanco for contractor training. Technical Vocational Education and Training (TVET) will be targeted to provide training services for technicians, surveyors, foremen and other essential human resources.

## V. DELIVERABLES, TARGETS AND TIMETABLES

The program log frame is set out at in Annex to this document.

### 5.1 Extent and Reach

A total of 71,523 km of all-weather and year round roads will be constructed by the Wereda in the five year period of the RSDP-IV at an estimated cost of ETB 26,431.8 million, equivalent to around ETB 370,000 per kilometre. The program will be financed by the Government of Ethiopia.

Some 9,568 km of construction and upgrading of roads will be carried out during the first year of implementation with further boosts in the productivity and participation of local contractors as the training and other preparatory programs mature.

Specifically and disaggregated by region the provisional delivery targets for the Kebele and community roads to be constructed in the five years of the URRAP and under the RSDP-IV are shown in Table 54.

**Table 9: Size of Network to be Upgraded/Constructed**

Region	Annual Work Plan					
	2011	2012	2013	2014	2015	Total
Tigray	335	515	550	550	550	2,500
Afar	241	371	396	396	396	1,800
Amhara	2,408	3,708	3,963	3,964	3,960	18,003
Oromiya	4,014	6,180	6,606	6,607	6,600	30,007
SNNP	1,873	2,884	3,083	3,083	3,080	14,003
Gambella	27	41	44	44	44	200
Benshangul -Gumuz	241	371	396	396	396	1,800
Somali	401	618	661	661	660	3,001
Dire Dawa	21	33	35	35	35	159
Harar	7	10	11	11	11	50
<b>Total</b>	<b>9,568</b>	<b>14,731</b>	<b>15,745</b>	<b>15,747</b>	<b>15,732</b>	<b>71,523</b>

For prioritization, master plans are developed through a consultative process involving communities and Kebele development committees and these are brought to the Wereda administration. The regional road agencies assist the Wereda identify and prioritize low volume and community road projects from their individual master plans.

## **5.2 Streamlining and Links to Other Initiatives and Programs**

As mentioned earlier, the intention of URRAP is to “join up” and harmonize all rural road infrastructure interventions under a single umbrella. The program therefore unifies all efforts that provide improved road access or support to Wereda road offices. This would include Wereda block grants, the Productive Safety Nets Program, PBS-LIG financing and other Rural Development Programs; agricultural programs such as the Agricultural Growth Program, Regional and Local Government Rural Roads Programs, and Regional and Local Government initiatives on improved service delivery. Voluntary and community contribution will make up a substantial financial component of the program.

## **VI. REPORTING, MONITORING AND EVALUATION ARRANGEMENTS**

### **6.1 Reporting Structure**

The Universal Rural Road Access Program is a rolling program over a five year period. The first phase will run over two years and the second phase over the remaining three years. As such it is imperative that annual updating and re-programming based on achievements are made.

Wereda will provide bi-annual progress, technical and financial reports to the Regional Coordination Committees. The Regional Coordination Committees will consolidate these reports, per region, for submission to the Program Coordination Office for consolidation and reporting to the National Steering Committee.

### **6.2 Monitoring and Evaluation**

Project monitoring and evaluation will be the responsibility of the Wereda who will monitor progress against the agreed performance monitoring indicators. These benchmarks will be set by the National Steering Committee and Regional Coordination Committees, guided by the program implementation plan.

The type of indicator data that will be collected at Wereda level will include:

- i) Transport tables for goods and passengers,
- ii) Price of essential commodities,
- iii) Travel and access times from villages to markets and essential services, and
- iv) Employment statistics.

Monitoring of prices will be adjusted for fluctuations in fuel and inflation.

In addition to the above, the Wereda will be monitoring progress against program for individual works contracts or agreements. This will provide information and data on implementation progress and disbursement of funds.

All Wereda will be providing detailed bi-annual reports to the Program Coordination Office, through their respective Regional Coordination Committees. The Program Coordination Office will collate and hold all reports, data and other information emanating from the program, including updating and tracking against the program logical framework.

Reporting format for Physical / Operational and Financial Monitoring – Universal Rural Road Access Program (URRAP) and Outcome – Based Monitoring of the Universal Rural Road Access Program (URRAP) are presented below.

**Reporting Format for Physical / Operational and Financial Monitoring – Universal Rural Road Access Program (URRAP):**

1. *An Executive Summary or Abstract*
2. *A Table of Contents*
3. *Data Sheet by Project*
  - *Project Title*
  - *Project Standard*
  - *Project Location*
  - *Project Number*
  - *Reporting Period*
  - *Project Duration*
  - *Project Implementation Start Date*
  - *Anticipated Completion Date*
  - *Overall Project Budget*
  - *Expenditure for Reporting Period*
  - *Cumulative Expenditure*
4. *Progress for the Reporting Period vis-à-vis Project Implementation Plan*
  - 4.1 *A narrative summary of actual outputs in relation to scheduled activities and inputs. (With tabular presentations and charts).*
  - 4.2 *Planned and actual expenditure (for the reporting period and cumulative). Explanations to be given on deviations from planned spending.*
  - 4.3 *Planned and actual labor days worked by activity and weighted average.*
  - 4.4 *Equipment activity during the reporting period.*
  - 4.5 *Material usage during the reporting period (in comparison with supplies schedule of work plan).*
  - 4.6 *Supervision of works.*
  - 4.7 *Problems Encountered/ Resolved during the reporting period and Effects on Program/ Project Schedule.*
5. *Analysis of Progress: Success, Constraints and Lessons Learned*
6. *Conclusions and Recommendations*
  - Annex I – Indicators Matrix for Physical / Operational Performance (As Per Agreed Indicators)*
  - Annex II – Road Standards*
  - Annex III – Financial Report*
    - *Project budget by activity – reporting period*
    - *Project expenditure by activity – reporting period*
    - *Cumulative expenditure vis – a – vis cumulative budget*
  - Annex IV – Physical Status (by major activity categories) in comparison with work plan.*

**Reporting Format for Outcome – Based Monitoring of the Universal Rural Road Access Program (URRAP):**

1. *An Executive Summary*
2. *A Table of Contents*
3. *Data Sheet by Component*
4. *Background or Context of the Program*
5. *Methodology of Monitoring Performance*
6. *Brief Description of the Outcome – Based Indicators*
7. *Data Collection Against Selected Outcome – Based Performance Indicators*
  - 7.1 *Baseline*
  - 7.2 *Follow – up Surveys*
8. *Analysis of Data and Assessment of Performance*
  - 8.1 *Comparison of baseline and follow – up survey data*
  - 8.2 *Comparison of Targets and Actual Accomplishment*
  - 8.3 *Key Findings*
9. *Lessons Learned for Program Adjustment*
10. *Conclusions and Recommendations*
  - Annex I – Terms of Reference*
  - Annex II – Outcome – Based Indicators Matrix*
  - Annex III \_ Summary of Outputs and Activities*

## **VII. PROGRESS AND PREPARATION**

### **7.1 Supporting Documents**

The following separate and complementary Universal Rural Road Access Program Documentation has been prepared.

- √ Operational Manual
- √ Training Manual
- √ Small and Medium Scale Enterprise: Approach to Development
- √ Technical Standards and Specifications
- √ Model Tender and Contract Documents
- √ Environmental Checklist

### **7.2 Supporting Studies**

The following studies complement preparation of the Universal Rural Road Access Program Documentation.

- √ Wereda Development Plans
- √ Wereda and Community Road Maintenance Strategy and Policy
- √ Wereda and Community Road Maintenance Technical Manual
- √ National Design Manual for Low Volume Roads
- √ Application and Analysis of Deterioration Relationships for Unpaved Labour-Based Roads in Ethiopia
- √ Mobility and Transport Services: Promoting the use of Intermediate Modes of Transport
- √ Assessment of Intermediate Equipment Technology