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Report No: ICR00004205

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-45610)

ON A

CREDIT

IN THE AMOUNT OF SDR 166 MILLION
(US$245 MILLION EQUIVALENT)

TO THE

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

FOR A

ETHIOPIA-ROAD SECTOR DEVELOPMENT PROGRAM APL4 (P106872)

May 31, 2018

Transport and Digital Development Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective June 30, 2017)

Currency Unit =	Ethiopian Birr (ETB)
ETB 23.23 =	US$1.00
US$1.39 =	SDR 1

FISCAL YEAR

July 8 – July 7

ABBREVIATIONS AND ACRONYMS

AM	Aide Memoire
APL	Adaptive Program Lending
BPR	Business Process Reengineering
CAS	Country Assistance Strategy
CPI	Consumer Price Index
DB	Design and Build
DBB	Design, Bid, and Build
DCI	Domestic Construction Industry
DMO	District Maintenance Organization
EOT	Extension of Time
ERA	Ethiopian Road Authority
ERCC	Ethiopia Road Construction Corporation
ERTTP	Ethiopia Rural Travel and Transport Program
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FGD	Focus Group Discussion
FM	Financial Management
GIZ	German Agency for Technical Cooperation *(Deutsche Gesellschaft für Internationale Zusammenarbeit*)
GOE	Government of Ethiopia
GRM	Grievance Redress Mechanism
GTP	Growth and Transformation Plan
HDM-4	Highway Development and Maintenance Management System
HRC	Highway Research Center
ICB	International Competitive Bidding
ICR	Implementation Completion and Results Report
ICT	Information and Communication Technology
IEC	Information, Education, and Communication
IRR	Internal Rate of Return
JV	Joint Venture
KII	Key Informant Interview

M&E	Monitoring and Evaluation
MNAURF	Maintenance Needs Assessment and Updating of Road Financing
MTR	Midterm Review
NCB	National Competitive Bidding
NPV	Net Present Value
PAD	Project Appraisal Document
PAP	Project-affected People
PDO	Project Development Objective
PEC	Procurement Endorsing Committee
PPPAA	Public Procurement and Property Administration Agency
QCBS	Quality- and Cost-Based Selection
RAP	Resettlement Action Plan
ROW	Right-of-Way
RRA	Regional Road Authority
RSDP	Road Sector Development Program
TA	Technical Assistance
TPO	Transport and Poverty Observatory
TTL	Task Team Leader
URRAP	Universal Rural Roads Access Program
WIDP	Woreda Integrated Development Plan
ZORI	Zone of Road's Influence

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P106872	Ethiopia-Road Sector Development Program APL4
Country	**Financing Instrument**
Ethiopia	Adaptable Program Loan
Original EA Category	**Revised EA Category**
Full Assessment (A)	Full Assessment (A)

Organizations

Borrower	Implementing Agency
Federal Ministry of Finance and Economic Cooperation (MoFEC)	Ethiopian Roads Authority

Project Development Objective (PDO)

Original PDO

Strengthening and increasing road transport infrastructure and its reliability

PDO as stated in the legal agreement

The objective of APL4 was not revised

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
IDA-45610	245,000,000	204,920,973	206,283,547
Total	**245,000,000**	**204,920,973**	**206,283,547**
Non-World Bank Financing			
Borrower	63,230,000	0	0
Total	**63,230,000**	**0**	**0**
Total Project Cost	**308,230,000**	**204,920,973**	**206,283,547**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
02-Jun-2009	14-Sep-2009	10-Feb-2015	30-Jun-2016	30-Jun-2017

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
25-Dec-2015	199.14	Change in Loan Closing Date(s) Reallocation between Disbursement Categories
10-May-2017	213.21	Change in Results Framework Change in Components and Cost Cancellation of Financing Reallocation between Disbursement Categories

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Moderately Satisfactory	Moderately Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	18-Nov-2009	Satisfactory	Satisfactory	12.50
02	10-Jun-2010	Satisfactory	Satisfactory	12.55
03	28-Jun-2010	Satisfactory	Satisfactory	12.55
04	04-Jan-2011	Satisfactory	Satisfactory	12.61
05	27-Jun-2011	Satisfactory	Satisfactory	12.68
06	28-Dec-2011	Satisfactory	Satisfactory	47.38
07	31-May-2012	Satisfactory	Moderately Satisfactory	51.19
08	03-Jan-2013	Moderately Satisfactory	Moderately Unsatisfactory	68.43
09	24-Jun-2013	Moderately Satisfactory	Moderately Unsatisfactory	86.73
10	15-Dec-2013	Moderately Satisfactory	Moderately Unsatisfactory	101.87
11	03-Jun-2014	Moderately Satisfactory	Moderately Satisfactory	134.89
12	15-Aug-2014	Moderately Satisfactory	Moderately Satisfactory	144.95
13	12-Jan-2015	Moderately Satisfactory	Moderately Satisfactory	152.60
14	26-Jun-2015	Moderately Unsatisfactory	Moderately Satisfactory	188.48
15	28-Dec-2015	Moderately Satisfactory	Moderately Satisfactory	199.14
16	30-Jun-2016	Moderately Satisfactory	Satisfactory	212.96
17	24-Jan-2017	Satisfactory	Moderately Satisfactory	219.78
18	23-Jun-2017	Satisfactory	Moderately Satisfactory	213.21

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Transportation	**100**
Public Administration - Transportation	3
Rural and Inter-Urban Roads	97

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)
Private Sector Development	**13**
Jobs	13
Job Creation	13
Urban and Rural Development	**86**
Urban Development	33
Urban Infrastructure and Service Delivery	33
Rural Development	53
Rural Infrastructure and service delivery	53

ADM STAFF

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. By the late 1990s, the road infrastructure of Ethiopia had deteriorated such that it was a serious hindrance to the efforts of the Government of Ethiopia (GOE) for reviving the economy toward achieving sustained poverty reduction. In response, the GOE, through the Ethiopian Road Authority (ERA) with the support of its development partners[1] undertook a study to diagnose the situation and make appropriate recommendations. The study led to the launch of the Road Sector Development Program (RSDP) in 1997 aimed at (a) providing a coordinating framework for interventions to improve critical road links and (b) undertaking associated policy, institutional, and regulatory reforms.[2] The first implementation support by IDA to the RSDP was a Specific Investment Lending grant of US$538.0 million, of which 92.2 percent and 7.8 percent were, respectively, for (a) road rehabilitation of trunk roads and upgrading of gravel roads to asphaltic pavements and (b) institutional strengthening targeted at improving managerial capacity to implement road expenditure programs. The World Bank's Board of Directors approved the RSDP financing under the Adaptive Program Lending (APL) instrument on January 15, 1998. The proposed structure included four interdependent and overlapping operations, with agreed triggers between operations. The four operations (Ethiopia-Road Sector Development Phase 1–4) were conceived as having the scope that would allow the successful addressing of the following main sector issues identified at the time of the conception of the RSDP:

(a) Very low road density of Ethiopia, either by road-kilometer per square kilometer or kilometer of road per capita

(b) Inadequate management capacity linked to inadequate autonomy to ERA

(c) Manpower shortages, both professional and skilled labor

(d) Widespread poverty in the country linked to, among others, the constraint imposed by the poor road network on economic and social development and the creation of local employment opportunities

(e) Ineffective road maintenance planning and budgeting

2. The World Bank's Country Assistance Strategy (CAS), at the time of project preparation, focused on helping reduce poverty both directly and by promoting sustained economic growth, by creating an environment conducive to rapid sector and export development. It had the following four clusters:

[1] Principally IDA, European Union (EU), and German Agency for Technical Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit,* GIZ), German Development Agency.
[2] Foreword to the report 'Road Sector Development Program II (2002–2007)'.

(a) Policy and capacity

(b) Infrastructure

(c) Sources of growth

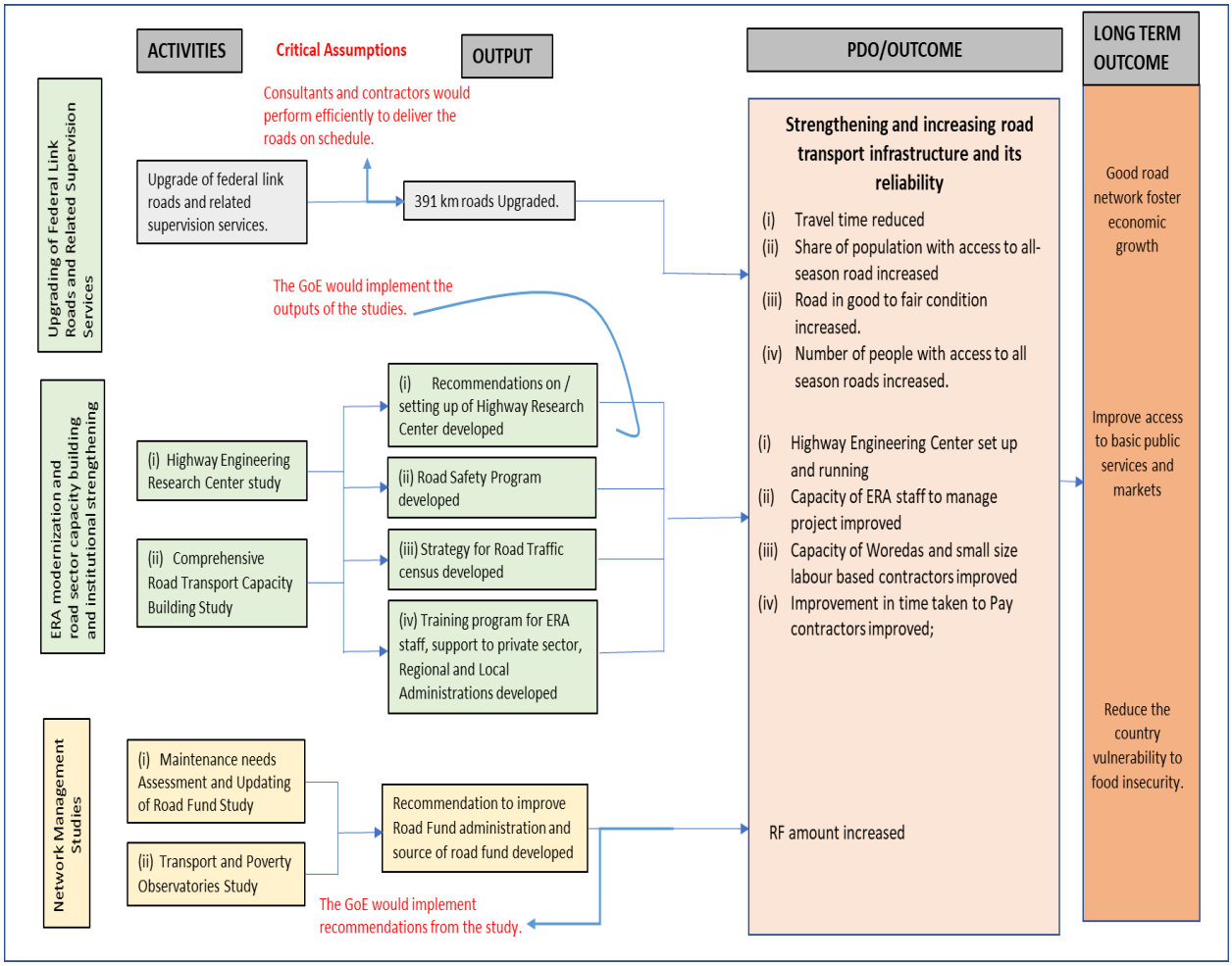
(d) Poverty and human development

3. Details on the implementation of the RSDP through APLs and its contribution to ease the severe constraint that the road sector posed to the development of these pillars can be found under annex 7. This Implementation Completion and Results Report (ICR) addresses the results of investments provided under APL4.

Theory of Change (Results Chain)

4. The key assumption underlying the design of APL4 is that the implementation of the activities would facilitate and contribute to economic and social development of Ethiopia. This supports the objectives of the GOE of reducing poverty by providing employment and income-generating opportunities to generally improve the economic and social well-being of Ethiopians. Therefore, the road links to be improved under APL4 in support of the RSDP would need to (a) contribute to the social and economic integration of the country; (b) be undertaken such as to support the planned institutional reform of the road sector, capacity development of ERA, and required increase in knowledge on maintenance technology, road safety management, and understanding of traffic pattern for improved planning and management of the national road network; (c) ensure the sustainability of the roads network, supported by significant increase in funds available for road maintenance; and, finally, (d) provide income and employment-generating opportunities in the project areas. The project's activities were to lead to such outcomes as reduction in travel time, increase in proportion of roads in fair and good condition, increase in number of people with access to all-season roads, improvement in the capacity of road agencies to manage the national road network, and increase in funds for road maintenance, among others. The other short-term outcome is the strengthening and increasing of road transport infrastructure and its reliability, while the long-term outcomes include growth in the national economy, improved access to public service (roads), and reduction in the country's vulnerability to food insecurity. The critical assumptions include consultants and contractors' capability to deliver the road contracts on schedule, and the GOE will implement recommendations from institutional studies aimed at improving the sector. The different APLs had been focusing on different aspects of the overall program. For APL4, the project chain can be depicted as shown in Figure 1.

. Figure 1: Theory of Change of Road Sector Development Stage IV (APL4) Project Development Objectives (PDOs)



5. **The objectives of APL4 (the project)[3] as outlined in the Project Appraisal Document (PAD) is to assist the GOE in strengthening and increasing its road transport infrastructure and its reliability.** This objective should lead to improved road conditions by strengthening the existing road pavement structures, expanding road access to rural areas, and improving maintenance works to enhance the efficiency of the existing main road network. Information on the components is described below. APL4 has clearly defined outcomes and indicators. The main PDO outcome indicator was the reduced travel time on the project road corridors. According to the PAD, other project indicators against which the project was to be measured were the following:

(a) Roads upgraded (non-rural), from 0 km in 2009 to 391 km in 2016.

(b) Contracts completed within contract period and budget, from 0 percent in 2009 to 100 percent in 2016.

[3] PAD, Federal Republic of Ethiopia, Road Sector Development Phase IV (APL4) April 30, 2009.

(c) Preparatory study for Highway Engineering Research Center completed and implementation of agreed organization option commenced, none in existence in 2009 but implementation to commence in 2014.

(d) Road traffic census program and comprehensive road safety program established. No program in 2009 but should be established by 2012.

(e) Comprehensive capacity-building activities implemented. There was no program in 2009, but implementation of 25 percent was expected in 2016.

(f) Road maintenance and financing needs for the coming 10 years projected. It was ETB 1070 million in 2009, but expected to increase to ETB 1720 million. An annual increase of 7 percent was expected.

(g) Poverty impact assessments implemented. There were three roads being monitored/ assessed in 2009, but should increase to five in 2016.

6. Three core transport indicators were added to the main PDO indicator at implementation stage as part of World Bank-wide sector reform on how it measures the impact of road works funded in its projects. They include the following:

(a) Share of rural population with access to an all-season road

(b) Number of rural population with access to an all-season road

(c) Roads in good to fair condition as a share of total classified roads

Components

7. APL4 had the following three components clearly linked to the PDO and key indicators:

- **Component 1: Upgrading of Federal Link Roads and Related Supervision Services (total US$253.16 million of which US$202.63 million IDA).** This was to upgrade two link roads from a gravel surface to an asphalt surface, and one road from an existing earth road to a gravel surface, including civil works supervision and technical and environmental studies. Roads of 391 km length were planned on the project.

- **Component 2: ERA Modernization/Sector Capacity Building (total US$3.10 million of which US$1.55 million IDA).** This component was for institutional strengthening and capacity-building activities for sustainable road sector management. It included a preparatory study toward establishing a Highway Engineering Research Center and technical advisory services to prepare and conduct harmonized 'Comprehensive Capacity Building'.

- **Component 3: Network Management Studies (total US$4.37 million of which US$3.67 million IDA).** It comprised technical assistance (TA) for road sector improvement, including (a) Maintenance Needs Assessment and Updating of Road Financing Study, (b) Transport

and Poverty Observatories (TPOs), and (c) preparatory studies for the next phase of the RSDP and Universal Rural Roads Access Program (URRAP).

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

8. The objective of APL4 was not revised.

Revised PDO Indicators

9. APL4 updated the Results Framework to include core indicators (M&E Design section). The outcome indicator was slightly revised to reflect the dropped road from the project. The Ankober-Dulecha-Awash Arba Link Road initially included in the project was dropped due to delays in implementation. Consequently, the project PDO indicator 'average travel time for Ankober-Awash Arba' was dropped. Furthermore, the target of intermediate indicator 'Roads rehabilitated' was changed to 302 km from the original target of 391 km, accordingly. The remaining PDO and intermediate indicators were retained.

Revised Components

10. There was a change in the scope of Components 1 and 3. For Component 1, its subcomponent 'Upgrading of Ankober-Dulecha-Awash Arba Link Road (89 km asphalt) (estimated cost of US$56.54 million of which US$45.65 million IDA)' was dropped from the project financing due to delays in implementation. The dropped road section is currently under execution with funding from the GOE; therefore, it could be viewed that its dropping did not affect the achievement of the PDO in the broad sense. Furthermore, the study to prepare a follow-on project under Component 3 was not undertaken because the Government preferred using its own resource to prepare follow-on road projects.[4]

Other Changes

11. **Restructuring.** The project was restructured twice. The first Level 2 restructuring approved on December 20, 2015, was for (a) reallocation of credit proceeds and (b) 12-month extension of project closing date from June 30, 2016, to June 30, 2017. The extension was to allow the completion of civil works, which were delayed due to slow progress of works, resulting from an extended rainy season and insufficient contractors' management. Although the GOE had requested to drop the Ankober-Dulecha-Awash Arba road from the project as part of the first restructuring, this could not be done to allow fulfilment of contractual remedies and obligations on ongoing contracts on the road.

12. The second Level 2 restructuring approved in May 2017 was to (a) drop the Ankober-Dulecha-Awash Arba road sections (89 km), (b) revise the PDO indicator and an intermediate indicator to reflect the dropped road, and (c) cancel the corresponding funds from the credit.

[4] It is noted however that had these additional GOE expenditures been captured in the second restructuring, this statement would be more valid.

Rationale for Changes and Their Implication on the Original Theory of Change

13. The dropped Ankober-Dulecha-Awash Arba Road led to revision of indicator targets which was not detrimental to the original theory of change. The road construction was designed to be procured in two lots. The lowest bidder for Lot 1 could not provide an acceptable performance guarantee leading to retendering of the works. The retendering process was later jettisoned due to inability to conclude the process on time. While the contract for Lot 2 was awarded, the contractor performed poorly and its contract was terminated after a long delay of more than 18 months without progress. Thus, the expected output reduced the road length from 391 km to 302 km, a reduction of 22 percent. Consequently, the people living along the road corridor did not get the benefits expected from the rehabilitated road under the APL4. Nonetheless, the upgrading of the Ankober-Dulecha-Awash Arba Road is ongoing with Government funding and would be completed by September 2018.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

14. Infrastructure development continues to be high priority for the GOE, and the PDO remains closely aligned with the GOE's Growth and Transformation Plan (GTP II)[5] that has the overall goal of Ethiopia attaining lower-middle-income status by 2025. The investments in road infrastructure, institutional and policy reforms, and enhanced road sector management activities under APL4 are strategically supporting the attainment of the GTP II targets under its Section 5.2 - expansion and ensuring the qualities of road infrastructure development.[6] The PDO also supports the Country Partnership Framework (FY18–FY22)[7] objectives in Areas 1 and 3. The Country Partnership Framework Objective 1.4 'Improved connectivity and enhanced regional growth and secondary cities' is supported by the project's contribution to rehabilitation of roads critical to national and regional integration; and Objective 3.1 'Increased capacity and improved governance in service delivery', is supported by the project's capacity building to ERA and the *woreda* on improving service delivery. The APL4 supported the upgrade of transport infrastructure and road connectivity to reduce travel times, and enhance connectivity between markets and secondary cities, improve capacity to management public infrastructure (roads), and increase funding for the growing road network.

15. For the reasons above, the relevance of the project is rated High.

[5] http://dagethiopia.org/new/images/DAG_DOCS/GTP2_English_Translation_Final_June_21_2016.pdf
[6] Targets for expansion and quality of road infrastructure are: total road length is planned to increase from 110,414 km in 2014/15 to 220,000 km by 2019/20. It is planned to upgrade 560 km trunk roads, 3,765 km of link roads and 15,000 km of rural roads.
[7] https://hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=27966152.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

16. The objective of the project, which was strengthening and increasing road transport infrastructure and its reliability, was fully achieved. Upgrading 302 km narrow gravel roads to standard asphaltic surface roads contributed to improve the density of national road network by 6 percent. The new wider asphalt roads are stronger, require less frequent maintenance, and are more durable than the narrow gravel roads. The traffic on Mekenajo-Dembidolo increased by 330 percent and on Wolkite-Hossaina by 773 percent after completion of the upgrading. Also, the travel time along the upgraded Mekenajo-Dambidolo linked road reduced from 2.5 minutes per kilometer to 1 minute per kilometer, while on Welkite-Hosaina linked road, the travel time reduced from 3.0 minutes per kilometer to 1 minute per kilometer (average of 60 percent reduction in travel time), as detailed in annex 1. There is correlation between reliability of transport infrastructure and travel demand, travel time[8] & costs, and economic activities along a road corridor. Quality of road is related to its reliability. The upgraded roads on APL4 trigger more traffic on the roads because of free flow of traffic, which reduces journey time; road conditions are better, which can reduce vehicle maintenance cost; and generation of more social and economic activities along the road corridors. The TPO study on Mekenajo-Dembidolo shows that the road improvement has increased the reliability of transport services, reflected through the dramatic decrease of waiting time for transport from 112.6 min in 2012 to 23.5 m 2016 for mini buses (TPO, p.24.). Therefore, number of traffic and travel time are good indicators of road reliability.

17. APL4 funded institutional reforms and capacity-building activities in the road sector. The project supported the establishment of Highway Research Center (HRC) for ERA, which laid the foundation and framework for building a comprehensive road research center in the country. The concept developed for the center identified six focus research areas and developed a five-year rolling business plan. The GOE was encouraged by the quality of the concept and the planned HRC and thereby used its resources to establish the HRC by providing laboratory equipment, research materials, and training of staff to bring the center to international standards. This center will continue to improve knowledge in design, construction, and maintenance of roads for a reliable and sustainable road network in the country. Road Safety was also a priority for the HRC. A road traffic census was carried out on major corridors to better understand the composition of traffic and analysis carried out to prepare a comprehensive road safety program. Although ERA does a regular traffic count quarterly as part of the asset management work, the activity supported under the project was specifically designed for heavily traffic roads. In addition, several research activities, including low-cost pavement, the use of locally available materials for pavement, works related to landslides were commenced soon after the establishment of the HRC. A sector-wide capability needs the assessment of stakeholders was prepared and monitored as part of the Results Framework. This evaluation guides the training of ERA staff and other related transport ministries, departments, and agencies (MDAs). In this regard, several ERA staff have undertaken both local and international trainings, including three engineers trained overseas at Master of Science (MSc) level, while three other staff studied up to Master of Philosophy (MPhil) level. These are efforts to increase knowledge to effectively provide reliable and sustainable road network in the country.

[8] https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/ttr_brochure.pdf.

18. Under the APL4 Project, ERA undertook an update of road maintenance needs and funding arrangement. The update provided ERA and the GOE a holistic understanding of the annual road maintenance needs and identifying sources of funds capable to meet these needs. After a long bureaucratic process, the GOE finally considered the recommendations to other sources of road fund, and its implementation is gradual. The first of the recommendations implemented was the inclusion of the vehicle registration fee as part of the road fund revenue in 2015. The initial source of funds to the road fund was largely from fuel levy in the amount of about US$75.5 million collected annually. The additional source of revenue from vehicle registration fee was increased to US$90 million per year (an approximate rise of 15 percent per year). Efforts are ongoing to implement the remaining recommendations even when the project has closed because the GOE understands the need for funding the maintenance of the road network adequately.

19. The upgraded 302 km roads affected positively the socioeconomic activity of the people living along the road corridors. According to the Transport and Poverty Observatory (TPO) report[9], the distance between household homes and all-season roads in the Zone of Road's Influence (ZORI) areas reduced by 53 percent; there has been 250 percent increase in the number of public transport, passengers, and freight vehicles. Furthermore, the upgrading of the road projects created significant economic and social benefits to the population residing in the project areas, including creation of employment opportunities, increased business activities, improved transport services, and ease of access to social services (see Poverty Impact and Gender Aspect paragraph 24).

Justification of Overall Efficacy Rating

20. The overall achievement is Substantial based on the evidence provided in the preceding paragraphs.

C. EFFICIENCY

Assessment of Efficiency and Rating

21. The efficiency of APL4 is rated Substantial. Traffic counts as part of the economic analysis show a trend of rapid increase in traffic along the project roads (see annex 4), and the ex post economic analysis confirmed that the roads upgraded under APL4 have significantly higher economic returns than calculated at appraisal. At project appraisal, an economic analysis was conducted using the Highway Development and Maintenance Management System (HDM-4) economic analysis tool to determine the economic benefits of roads planned for upgrading under the project. ERA has undertaken an ex post analysis using the same tool. The economic analysis was done using standard methodology[10]for the two roads separately completed on the project to determine their investment and benefits. Because analysis was done for each of the roads separately at appraisal, the result for each road would not be affected by the investment of third road dropped on the project. The economic analysis did not include the dropped road as all the resources used under the project supported the GOE investment to the rehabilitation of the road with their own resources, therefore outside the project financing. Table 1 shows the results of the appraisal

9 http://wbdocs.worldbank.org/wbdocs/viewer/docViewer/indexEx.jsp?objectId=090224b08590f746&respositoryId=WBDocs&standalone=false

10 HDM4 is a software package and associated documentation recommended by the *World Road Association (PIARC)* to serve as the primary tool for the analysis, planning, management and appraisal of road maintenance, improvements and investment decisions.

and ex post analysis for a base case of improving the road. All roads show positive internal rate of return (IRR) and net present value (NPV), with the ex post results significantly higher than those at appraisal. Furthermore, the other benefits that accrue from the road investment are mostly from increased traffic, savings in vehicle operating cost, reduced road maintenance cost, and travel time.

Table 1. Results of Appraisal and Ex Post Economic Analysis

Road Project	Length (km)	At Appraisal		Ex Post	
		Base Case		Base Case	
		IRR (%)	NPV (US$, thousands)	IRR (%)	NPV (US$, thousands)
Mekenajo-Dembidolo	188.1	14.8	491	21.5	2,655.5
Wolkite-Hossaina	125.5	13.7	246.5	24.4	3,092.9

Source: APL4 Borrower's Implementation Completion and Results Report, August 2017

22. Further to the IRR and NPV computed in paragraph above, the overall project EIRR was computed using the average of the roads sections EIRR using the project cost as the weight. The result is presented in table 2 below.

Table 2. Results of Appraisal and Ex Post Economic Analysis

Road Project	Ex Ante Cost (EBT, million)	Ex Ante EIRR (%)	Ex Post Cost (EBT, million)	Ex Post EIRR (%)
Mekenajo-Dembidolo	1,951.23	14.8	2,350.8	21.5
Wolkite-Hossaina	1,338.64	13.7	1,932.89	24.4
Overall Project	3,289.87	14.4	4,283.69	22.8

23. The road contracts awarded were completed before closing of the project, but overran their original time and budget. The cost overruns and delays, averaging 30 percent and 140 percent, respectively, were attributed to poor performance of contractors, price escalation of construction materials, variations due to increase in quantities, claims arising from delay in the right-of-way (ROW) clearance and shortage of construction materials (cement and fuel). The project team was proactive to undertake project restructuring to extend the project closing date to ensure completion of contracts before close of the project. However, the overruns did not have significant effect on the efficiency of the project. Therefore, based on ex post EIRRs (22 percent and 24 percent) which are higher than the appraisal EIRRs (15 percent and 14 percent), the efficiency is rated Substantial

D. JUSTIFICATION OF OVERALL OUTCOME RATING

24. Based on the relevance, efficacy, and efficiency analysis, the overall outcome of the project is rated Moderately Satisfactory.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Poverty Impacts and Gender Aspects

25. The rehabilitation of the roads improved the social economy of the people around the project corridors. The TPO study (see annex 10) carried out surveys in urban and rural households and service provides involved shops, pharmacies, hotels/restaurants, kebele administrators, cooperative managers, school directors, and health centers or hospital administrators among other along the project corridors. The TPO provides evidence of poverty impact and gender aspects following the upgraded roads on the project, indicating that APL4 contributed to reduction of poverty in the project areas. Household walking distance to all-season roads reduced by 75 minutes. The improved roads provide easy accessibility that contributed to improved health services reported over the period (2012–2016) through the reported increased number of health staff, availability of medical supplies, and drugs as well as reduced cost of health services in ZORI. These could have contributed to improved health by 13 percent in the project areas over the period[11]. Quality of health services is a main factor to improve health quality of people using the health facilities. The main indicators to assess the contribution of road infrastructure to quality of health services include number of health facilities, number of health professionals, quality of health services, time spent to travel to the nearest health facility, awareness about HIV/AIDS, immunization program for under-5 children and child delivery. These indicators were increased at the upgraded road corridors during the evaluation period (2012-2016). However, the people interviewed indicated that the improved roads shortened travel time to health facilities was a major contributor to using health facilities. Furthermore, road construction works in project areas provided job opportunities for men and women, of which 8.5 percent was the share of female employment opportunities. Provision of walkway in major towns along the upgraded roads improved road safety for pedestrians. Passenger waiting time to catch public transport, big capacity buses and minibuses, along the completed road corridors decreased by 80 percent and 5 percent, respectively. Furthermore, the improved roads provided better accessibility to markets and other social facilities by 42 percent.

26. The upgraded roads are reported to contribute to improved health of residents along the road corridors. A survey of the project corridors indicated that these indicators improved over the period 2012-2016. For instance, the number of clinic, usually associated with urbanization, increased by 50 percent. This rise could be due to increase in population normally associated with provision of infrastructure. Furthermore, time spent to travel to health facilities improved due to better condition of roads. The delivery of children in health clinic increased by 50 percent within the study period (2012-2016). This increase could be attributed to the improved services at health facilities, availability of ambulance services, improved roads, availability of trained birth attendants at the health facilities, and level of awareness by women, in particular pregnant mothers. The upgraded roads improved the supply and accessibility of farm inputs in project locations, enabling more farmers to have access to farm inputs such

[11] http://wbdocs.worldbank.org/wbdocs/viewer/docViewer/indexEx.jsp?objectId=090224b08590f746&respositoryId=WBDocs&standalone=false

as seeds and fertilizer. The TPO report indicated that the numbers of farmers that use improved seeds increased marginally by 4 percent from 23 percent in 2012 to 27 percent in 2016**Error! Bookmark not defined.**. Availability of fertilizer to farmers increased by over 115 percent after the roads were upgraded. The use of agriculture inputs such as seeds and fertilizers also increased, which have induced crop production to rise along the upgraded road corridors.

Institutional Strengthening

27. APL4 brought to fruition the institutional changes and strengthening activities implemented under the APLs, which successfully transformed ERA from a purely public sector organization into a semiautonomous entity employing modern management practices to undertake most of its activities. The reforms initiated under previous APLs were largely successfully carried forward into APL4. Among the new major establishments are a well-functioning HRC.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

28. **Assessment of project design.** The APL4 design is considered realistic, while lessons learned in the three preceding projects (APL1–APL3) were incorporated in the design. APL4 focused on activities that could reasonably be completed within the planned project period. The activities in each component were drawn from the original template for the Program (APL) and the critical gaps remaining from the preceding projects (APL1–APL3) to be achieved in the institutional strengthening and technical assistance. The linked roads on APL4 were selected from the RSDP because they (a) connect areas of great potential to alleviate poverty and (b) provide the missing road links important to the national economy for growth and promoting regional equity. Consequently, the upgrade of the roads was expected to enhance rural development by linking rural areas/*woredas* to the main roads network, thereby enabling the rural population to benefit from the improved main road network. Institutional strengthening activities addressed critical issues, such as (a) maintenance of the expanded network of roads, (b) improvement in capacity building, and (c) knowledge generation in the maturing road sector. The project design was simple, focusing on the upgrading of road sections along clearly contiguous road corridors thus easing project supervision.

29. **Adequacy of Government commitment.** Both the GOE and ERA exhibited adequate commitment throughout the preparation stage. Following the World Bank guidelines, ERA undertook project preparation, including preparation of the engineering design and bidding documents, safeguard management plans with participatory processes, and suggested institutional arrangements.

30. **Assessment of risks.** Analysis of risks during the project and their mitigation efforts were appropriate. The overall risk rating of the project at approval was Moderate. Specific risks identified as High or Substantial include those related to the macroeconomic framework due to the expansionary economic development program of the GOE and the emerging external debt trend. Risk to the project of ERA management capacity was correctly rated Substantial given the anticipated scale of the implementation workload that would require further capacity enhancement, especially considering the historical high turnover of ERA staff. During the implementation, the project established mitigation measures to address risks identified, including (a) training of ERA staff in project management and

procurement process, design reviews, quality assurance, contractor/consultant's performance monitoring, and so on; (b) strengthening the capacity of the Regional Road Authorities (RRAs) and *woredas* to improve the decentralized delivery of rural travel and transport services. A comprehensive training program was developed and implemented under the project. The implementation of the training program is a continuous process and should help ERA meet the emerging increase in the workload in the development of a national road network. The number of civil works contracts increased exponentially due to a scaled-up RSDP while some staff changed jobs. The GOE is responding to the challenge by recruitment of new staff and improvement in staff remunerations. Furthermore, a full-fledged Environment and Safeguards Unit was created in ERA to improve capacity of manage environmental and social issues that could emerge on the project. All these measures were to address the project implementation risks identified at project preparation.

31. APL4 is judged to have been ready for implementation at approval measured against World Bank readiness criteria. The three triggers agreed for APL4 appraisal were substantially met. These included (a) 60 percent disbursement of Grant proceeds from APL1 (completed); (b) management of equipment including plant-leasing arrangements implemented (completed); and (c) 100 percent of district maintenance organizations (DMOs) functioning as commercial units, delivering cost-effective maintenance services within the framework of an internal performance agreement (was ongoing), which was completed before the close of the project. While most of the project preparation studies were ready before project approval, the low quality of the design of the project roads was an issue, which affected some bid packages[12] and affected implementation. Addressing these design lapses was carried over to project implementation.

B. KEY FACTORS DURING IMPLEMENTATION

32. **Procurement and contract management.** The procurement process for selection of consultants and contractors took a longer time to complete for all-works contracts. Five out of the seven works contracts planned under APL4 project were delayed and cost overrun, on average, of 140 percent and 30 percent respectively of original contract requirements. The delay was due to ERA's slow process in handing over the ROW to contractors, poor performance of contractors and supervising consultants, increase in scope of works arising from requests from local authorities, and lack of construction materials within the vicinity of construction sites. The delay in procurement process and poor performance of contractors warranted dropping one of the roads (Ankober-Dulecha-Awash-Arba road) from the project. The initial delay in awarding the contracts for this road was due to the consultant's inability to complete the design review in good time. Lot 1 was bid twice due to poor response during the first bidding process. The contract for Lot 2 was cancelled due to significant delays in its execution. The road, in two lots, was eventually dropped from the project, at the request of the Government, when it realized that the works might not be completed before the project closing date. Nonetheless, works for the rehabilitation of the Ankober-Dulecha-Awash-Arba road are currently ongoing with the GOE's own funds. ERA is managing the implementation of the works.

[12] On the Ankober-Dulecha road section, a design review contract had to be established to address high gradients and tight curves in the original design, which the World Bank team considered to be inadequately taken care of in the design and which posed significant safety risk.

33. **Midterm review (MTR)**. The MTR was conducted in November 2014 after the lapse of 75 percent of the project implementation period. The MTR rated the project implementation progress as Moderately Satisfactory. It was observed that all project activities were behind schedule for various reasons. One of the roads (Ankober-Dulecha-Awash-Arba road) was at bidding stage. It was noted that civil work contracts were too large for domestic contractors to participate, whereas, the international contractors that won such contracts performed poorly. Nonetheless, the capacity building and institutional strengthening components were making good progress because all the studies were at an advanced stage of completion. The MTR noted that the GOE had not started implementing the recommendations from the Maintenance Needs Assessment and Updating of Road Financing (MNAURF) study, even after two years of study completion. The report noted that ERA seemed overwhelmed by the scale up of the RSDP, with detrimental impact on the implementation of APL4. To overcome such occurrences in future projects, the study recommended that a dedicated Project Management Unit in ERA should be created for future World Bank funded projects. It was also recommended that modest contract sizes be considered for future work contracts to allow national contractors participation.

34. The MTR also noted the deficiencies in the implementation of safeguards instruments, Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP), on the project. The APL series had supported ERA to establish the Environmental and Social Management Unit to look at development and implementation of safeguards instruments on RSDP and other works under the authority. The unit had a high turnover and it was understaffed to manage all ongoing projects in ERA, including APL4, and the few staff in the unit were just undergoing training on the job. Further, the implementation of safeguards was not effective due to inability of contractors to implement the ESMP, despite comments and advice provided by the World Bank team. These lapses were also reported in the MTR report. After a prolonged delay, ERA and contractors started effective implementation of the ESMP, and the lapses were gradually corrected before the project closed.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME[13]

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

35. **The M&E framework designed for APL4 included various indicators to monitor the achievement of the PDO.** There were two M&E frameworks in the PAD—one for the program (APL1–APL4) and the other for the project (APL4). It was a challenge to differentiate between the indicators for the program and the project. The Results Framework for APL4 included one PDO outcome indicator and seven intermediate indicators intended to measure achievement of the components. During the restructuring, three mandatory core transport indicators were included in the M&E framework. The indicators guided the project to measure and monitor activities during implementation through the respective project components. The indicators were precise, measurable, and closely linked to the project components. The PDO indicator 'reduced average travel time on project corridor' was a good matrix for reflecting the impact of upgrading of the roads and improves the ability to maintain the roads over time, thus assuring sustainability. Good and appropriate intermediate indicators were identified to measure the achievement

[13] The World Bank team during preparation and information on staff costs are provided in annex 2.

of activities on other components. ERA was assigned the responsibility for data collection and updating of respective indicators. Thus, the quality of the design of the M&E system was largely Substantial.

M&E Implementation

36. **M&E was implemented adequately.** ERA carried out data collection regularly and updating of respective indicators. The baseline was established for APL4 at the beginning of the project. ERA's road asset management tool was able to capture progress and monitoring of the indicators. This notwithstanding, the design allowed for progress in achieving both the primary and project-specific indicators to be monitored and evaluated. ERA has also developed an information and communication technology (ICT) platform to enhance monitoring of road infrastructure projects.

M&E Utilization

37. ERA had no difficulties in monitoring the civil works, because they were linked to specific outputs that were easy to measure. The indicators were consistently tracked and reported in the system. However, the indicator for monitoring contract performance (contract completed within contract period and time) by its construction did not indicate direction for seeking remedies for persistent delays and cost overrun on civil works contracts. A more disaggregated indicator related to a specific task or stage in contract execution for example, time for completion of pavement structure and/or the amount disbursed, would have informed on the areas of delays during contract execution and allowed for remedies to be taken. As observed in the MTR report, no contractual remedial measures were taken with regard to the observed delays and cost overruns. However, ERA has recently started monitoring the performance of contractors and consultants using a systematic monitoring system called ERAMS: ERA Performance Monitoring System supported under APL3. The results of this emulation would inform future procurement process.

Justification of Overall Rating of Quality of M&E

38. The overall quality of M&E is rated Moderately Satisfactory. This is due to the deficiency in the design and utilization of the M&E indicators.[14]

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

39. The Safeguards Implementation Status and Results Report rating was Moderate at the close of the project. The project was classified as Category 'A' and the safeguards policies triggered included Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Physical Cultural Resources (OP 11.03 or OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12). In compliance with these policies, the environmental and social impact assessment was carried out while a RAP was prepared, and both were disclosed on time. Project implementation processes at all stages incorporated environmental and social considerations.

40. **Environment. The Environmental Assessment studies completed during project preparation provided a good background for implementation of safeguards on the project but its implementation was a challenge.** The Environmental and Social Impact Assessment (ESIA) and Resettle Action Plan (RAP)

[14] See annex 1 for the Results Framework Analysis for the project.

studies were completed at the design stage, and legal provisions and institutional arrangements were indicated to implement the ESIA and RAP reports during project implementation. There was an appropriate Strategic Action Plan for Environmental and Social Management as well as a Quality Manual for Environmental and Social Management of road projects used to ensure that the quality of study documents and implementation procedures are standardized. An Environmental and Social Safeguards Unit was created in ERA to show the seriousness attached to safeguards on the project. ERA ensured that all contractors prepared Site-specific Environmental Management Plans. Despite these efforts, there was delay in implementing the plan, which started more than 10 months after construction commenced, as against the contract requirement of within 28 days from contract commencement. ERA quickly recovered from delays by addressing the mitigating measures, especially those included in the bill of quantities as paid items (replacement tree planting, grassing of cut slopes, and HIV/AIDs alleviation programs). HIV/AIDs alleviation program were implemented satisfactorily. ERA has been doing commendable efforts, backed by intensive World Bank support, in addressing safeguards issues on the roads as ongoing commitment.

41. **Social safeguards.** The project carried out a comprehensive assessment of project-affected people (PAP) before commencement of road construction. ERA ensured that all PAPs were compensated following ESIA recommendations. Social safeguards implementation in Ethiopia is multisectoral involving many institutions, which makes coordination challenging. While ERA is responsible for payment of compensation to PAP, it is the responsibility of the Regional Rural Authority (RRA) and *woredas* to provide land for relocation. Despite access to the safeguard documents in the local language, the *woredas* had little knowledge of safeguard compliance and its importance. The process of providing lands to PAPs by the RRA was slow, but with great advocacy by ERA, both the RRA and *woredas* were responding to the needs, with more than 90 percent of PAPs being relocated. ERA, working with the *woredas*, has completed the relocation of the remaining PAPs shortly after closure of the project.

42. **ERA could streamline ROW management to improve project management**. Securing and handling over ROWs to contractors by the employer could accelerate the road construction process. Acquiring a ROW required relocation of utilities. Utilities such as pipeline, electric poles, and removal of building within the ROW was a challenge for road contracts in the project. Despite ERA having paid for relocation of utilities, the agencies responsible for such relocation delayed removing them. This prolonged the road construction period, especially within built-up areas. ERA was very innovative in using specialized agents to ensure relocation of utilities were done on time. While this approach was helpful, there was still some delays and conflict between PAPs and the contractors, which were eventually resolved over the project implementation period.

43. **Procurement.** Most of the procurement activities under APL4 were completed successfully, significant overruns (time and cost) were experienced both on the procurement of works and services. The delays were in areas of review of prequalification applications, preparation of a Bid Evaluation Report, and obtaining the World Bank's no-objection. Seven works contracts were planned on the project but only five were completed. The five contracts were delayed and had cost overruns (Section III, Procurement and contract management). The other two contracts for the construction of Ankober-Dulecha-Awash Arba road section (89 km) were terminated due to protracted delay caused by procurement and implementation challenges. The increase in scope of the RSDP and the resulting pressure it placed on ERA staff and the Ethiopian construction industry as a whole resulted in insufficient availability of professional personnel (especially mid-level) and experienced firms (construction and consultants) to support the size

of the RSDP. This situation allowed the entry of new contractors and consultants with little to no experience of operating in Ethiopia and knowledge of the national procurement regulations and requirements. Following the observation in the delay in procurement infrastructure in the country, the World Bank Ethiopia Office in collaboration with the GOE commissioned a study on Procurement Value Chain Analysis. The overall aim of the analytical work was to improve the quality and efficiency of procurement and contract administration. The main findings and recommendations (see annex 8) are being implemented by ERA, these would continue to improve procurement and contract management.[15]

44. **Financial management (FM).** There were no significant issues in the operation of the FM system for the project. The ERA FM system was adequate in reporting utilization of the loan proceeds according to the World Bank's requirements. Financial reports were provided on time and assisted in the good monitoring of fund flows and payments. During project implementation, ERA improved greatly on (a) transaction-level budget monitoring, (b) internal audit oversight, (c) preparation of action plans to address identified FM-related weaknesses, and (d) prompt preparation of audit reports. This said, in continuation of its FM system, the World Bank team saw the need for ERA to (a) update the FM manual; (b) improve internal control of fixed assets; and (c) continuously build capacity of the internal audit unit: while the APL4 supported some training of its staff, the GOE should support continuous training of FM staff. All FM issues were addressed progressively to the end of the project

C. BANK PERFORMANCE

Quality at Entry

45. The APL4 was consistent with the World Bank's program (APL) in supporting the Government's program, RSDP, and incorporated lessons from previous APL1–APL3. The choice of roads on the project—major link roads connecting federal roads—was very strategic to the economic development of the country. It, therefore, supported well the achievement of the development priorities of the GOE. Its institutional activities provided opportunities to continue the capacity building of ERA and the wider road sector stakeholders. The design of the M&E was tailored to monitor achievement on the project components. Indicators to monitor the achievement of institution building within ERA and the road sector as well as the reliability of road network through improved maintenance financing from the road fund were lacking. This notwithstanding, the major technical and institutional studies were completed and their recommendations were continuously implemented. Therefore, the rating for Quality at Entry is Moderately Satisfactory.

Quality at Supervision

46. The World Bank team offered extensive support on engineering designs, procurement, environmental, social, and FM. The team closely monitored project implementation through twice yearly

[15] One of these findings is that from its review of the World Bank data for the transport sector in Ethiopia, excluding the bid submission period, the share of overall procurement time from first submission of documents to the World Bank to the award of contract was 77 percent to the GOE and 23 percent to the World Bank in consultancy services and 65 percent and 35 percent, respectively, for works. This finding is attributed largely to capacity shortages within ERA. See Annex 8: Summary of Value Chain Report, section 3.5 Procurement Process.

implementation support missions (18 altogether)[16] with their findings and recommendations consistently documented in mission Aide Memoires (AMs) and Implementation Status and Results Reports. Field visits were part of the missions.[17] Discussions and mission findings were properly documented in the AM. Technical advisory support provided by the World Bank team and its consultants were useful and well appreciated by the client, as indicated in the borrower's report. The strong support from the World Bank resulted in a strong institution left behind after the project closing. Nonetheless, the World Bank team could have been more persuasive to issues on safeguards implementation and advice to ERA on procurement activities, which could have minimized delays on civil works activities. Furthermore, the World Bank could have used high-level consultation with the GOE to implement more of the recommendations from the road fund study to increase road maintenance funds. Therefore, the quality of supervision is considered Moderately Satisfactory.

Justification of Overall Rating of Bank Performance

47. Based on the justifications above, the overall rating of World Bank performance is Moderately Satisfactory.

D. RISK TO DEVELOPMENT OUTCOME

48. The potential risks to the outcome of APL4 is Moderate, based on these two dimensions: (a) the sustainability of achieved improvements in road conditions and (b) sustainability of the achieved institutional strengthening of ERA. On the first dimensions, there is inadequate funding of road maintenance at the current high rate of road construction.[18] The annual maintenance needs on the network is ETB 3.2–ETB 3.6 billion (US$285.7 million to US$421.4 million) annually over the next 10 years, excluding *woreda* roads, whereas the current road fund collection is 50 percent short of the required amount despite addition of vehicle registration fee as part of road fund revenue. Therefore, it would be necessary for the GOE to expedite the implementation of other recommendations from the road fund study (see paragraph 20) to expand the road fund. Otherwise, the GOE will need to continue providing the shortfall from budgetary allocations. On the second dimension, the GOE needs to continue to improve on remuneration of ERA staff to retain the most important resource of the institution, its staff. Further, the GOE should continue to improve the newly created Engineering Research Center to take it to a high-level standard.

V. LESSONS AND RECOMMENDATIONS

49. The specific lessons emerging from APL4 are outlined below:

Related to Project Preparation

[16]With the notable exception of APL1 which had only 14 supervision missions. Despite this, it is noted that APL1 had an overall rating of 'Satisfactory'.
[17] The declaration of state of Emergency is some part of the country by the GOE has sometimes affected the scope and timing of the field visits associated with these missions.
[18] According to the MNAURF, the road fund is currently only funding about 70 percent of need.

(a) An information, education, and communication (IEC) strategy is necessary for a large program such as the RSDP. A robust IEC strategy for a program such as the APL is necessary in support of the design and implementation of a large civil works expansion and policy and institutional reform programs such as the RSDP. Such an instrument would have provided a framework for assessing the impact of strategic elements/decisions on the various stakeholders at the different Government levels and outside of the Government, and have led to a better understanding their evolving roles in the changing ERA.

(b) Road designs and related standards, construction specifications, and contract provisions need to be better adapted to land use along the subject road section. In APL4, and the program, this was particularly important with regard to urban sections in relation to drainage structures, traffic management, provision of parking areas, and access connections and, on rural sections, to the location of guardrails.

(c) Urban sections should be treated as a separate design and/or civil works contract. This would allow for the design approach to be more responsive to the needs of the urban areas where the roads pass. Congestion and degradation of design provisions such as for drainage and access to properties may quickly lead to inappropriate use of urban road sections leading to increased delays to traffic and thus reduction of attributed travel time savings from the physical improvements. Yet, as happened from the variations to the works arising from the request of *woredas* along the Mekenajo to Dembidolo road corridor, significant social benefits can arise from appropriate connection of the project road sections to the local road network.

Related to Project Implementation

(a) ROW management and slope protection requires greater attention for long-term performance of the roads corridor. ROW management is the responsibility of the road authority, lower level of governments (*woredas*), and communities along the roads, who are critical stakeholders. They need to understand the importance of preserving the ROW for safety and high performance of road corridors. There seems to be inadequate coordination within ERA between those in charge of construction projects and those in its regional offices. The ROW management activities need the participation of *woredas*, which do not seem to have enough incentive to proactively cooperate with ERA in its road projects. Furthermore, road slope protection by grassing should be done on time to ensure the grasses are well rooted before contractors demobilize from sites. For instance, in some sections on Mekenajo to Dembidolo road corridor, trees and grass that had been planted were yet to take root in many places even well after the handing over of the project road. The risk is that they would not subsequently be given due attention and thus leave the slopes unprotected.

(b) It seems that the use of a ‘mile post’ to define the road’s ROW was not known to local communities and therefore inadequate. A more prominent physical demarcation such as a fence (low cost) that is visible to local communities, especially in approaches to towns and settlements, would have been more effective in preventing encroachment. This may cost road agencies such as ERA a little more, but it is possible to reduce or prevent encroachment

and enhance safety of people and properties along the road corridors. This is something road agencies need to consider in the management of ROWs across national road networks.

(c) It is important to effectively manage resettlement, land acquisition, and grievances redress on road projects to minimize disruption in construction works and conflicts between parities. The main challenge on resettlement and land acquisition in Ethiopia as in other countries has been the involvement of multiple institutions, which requires greater coordination. In Ethiopia, early discussion and consultations with the different agencies, such as Regional Road Authorities and *woredas,* and with PAPs, over land acquisitions and resettlement could help to minimize delay during project implementation. Furthermore, a road authority, such as ERA, may wish to consider an advance works contract approach in which land acquisition and securing of the ROW is achieved during an advance works contract following which the main civil works contract is awarded. Effective design and implementation of safeguards measures including an appropriate Grievance Redress Mechanism (GRM) represent a must to reduce the likelihood of tension between the communities, implementation agency, contractors, and consultants.

(d) Price adjustment is a contractual issue, the provision of which, needs to be provided in civil works contracts. Prices of materials are likely to change in an unstable macroeconomic environment. Furthermore, a standard contract document recognizes that civil works contract that spans above a specific number of years would require price adjustment. In Ethiopia, however, while the provision is included in civil work contracts, the GOE does not allow contingency in contracts to offset such a likely provision. This would usually result in overrun of the awarded contracts if price adjustment become necessary. Theretofore, contingency allowances for price adjustments should be part of the contractual documents.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: The objectives of the Project are to assist the Recipient in strengthening and increasing its road transport infrastructure and improving the reliability thereof.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average travel time (minutes/km)	Number	2.50 01-May-2009	1.00 30-Jun-2016	1.00 30-Jun-2017	1.00 30-Jun-2017
Welkite - Hosaina	Number	2.50 01-May-2009	1.00 30-Jun-2016	1.00 16-Jun-2017	1.00 30-Jun-2017
Mekenajo - Dembi Dolo	Number	3.00 01-May-2009	1.00 30-Jun-2016	1.00 16-Jun-2017	1.00 30-Jun-2017

Comments (achievements against targets): Welkite-Hosiana road target was 100% achieved. Mekenajo-Dembidolo road target was 150% achieved. The Ankoker-Awash Arba road was dropped.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Share of rural population	Percentage	20.00	30.00	57.00	57.00

with access to an all-season road		01-Jun-2009	30-Jun-2016	16-Jun-2017	30-Jun-2017
Number of rural people with access to an all-season road	Number	12580000.00 01-Jun-2009	1892900.00 30-Jun-2016	43525200.00 16-Jun-2017	43525200.00 30-Jun-2017

Comments (achievements against targets): The target was 129% achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads in good and fair condition as a share of total classified roads	Percentage	65.00 30-Jun-2008	80.00 30-Jun-2008	80.00 16-Jun-2017	86.00 30-Jun-2017
Size of the total classified network	Kilometers	14363.00 30-Jun-2008	71150.00 30-Jun-2008	113213.00 16-Jun-2017	113213.00 30-Jun-2017

Comments (achievements against targets): Target 106% achieved. Road in good and fair condition was 86% of the total classified road network. The size of total classified network revised target was 100% achieved.

A.2 Intermediate Results Indicators

Component: • Component 1: Upgrading of Federal Link Roads and Related Supervision Services.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads rehabilitated, Non-	Kilometers	0.00	391.00	302.00	302.00

rural		01-May-2009	30-Jun-2016	16-Jun-2017	30-Jun-2017

Comments (achievements against targets): The targets for: Wolkite-Hossaina (126 km) and Mekenajo-Dembidolo (181km) were 100% achieved. The Ankober- Awash Arba (89km) was dropped.

Component: ERA Modernization and Sector Capacity Building

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Preparatory study for a Highway Engineering Research Center completed and implementation of agreed organizational option commenced	Text	not yet started 01-May-2009	Study completed 30-Jun-2016	Implementation commenced 16-Jun-2017	Implementation of research programs commenced in 2013 30-Jun-2017

Comments (achievements against targets): Target 100% achieved. The Highway Research Center study was completed. The GOE has established the Center, which has started functioning. Furthermore, the GOE recruited qualified and competent staff to run the Center, as well as provision of modern road laboratory equipment and research materials to support research and learning.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Road traffic census program and comprehensive road safety program established	Yes/No	N 01-May-2009	Y 30-Jun-2016	Y 16-Jun-2016	Y 30-Jun-2017

Comments (achievements against targets): Target 100% achieved. Traffic census and road safety program has been streamlined under ERA's work program.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Comprehensive Capacity Building Program activities implemented	Percentage	0.00 01-May-2009	25.00 30-Jun-2016	100.00 16-Jun-2017	100.00 30-Jun-2017

Comments (achievements against targets): Target 100% achieved. Three ERA engineers was sent to overseas at MSc program; three at MPhil level (blended course), and for a consultancy service for a sector wide capacity needs assessment. ERA developed needs assessment, and based on the recommendations, a comprehensive five years sector capacity building program is under implementation.

Component: Network Management Studies

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Road traffic census program and comprehensive road safety program established	Yes/No	N 01-May-2009	Y 30-Jun-2016	Y 16-Jun-2016	Y 30-Jun-2017

Comments (achievements against targets): Target 100% achieved. Traffic census and road safety program has been streamlined under ERA's work program.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Road maintenance and financing needs for the coming 10 years projected	Number	1070.00 30-Jun-2008	1720.00 30-Jun-2016	1720.00 30-Jun-2016	1450.00 30-Jun-2017

(ETB million)					

Comments (achievements against targets): Target 84% achieved. The study was completed in 2012, while the GOE started its implementation gradually by including vehicle registration fees as part of the road fund revenue starting from July 2015.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Poverty impact assessments implemented	Number	3.00 01-May-2009	5.00 30-Jun-2016	4.00 16-Jun-2017	4.00 30-Jun-2017

Comments (achievements against targets): Target 100% achieved. The Poverty Impact Assessment was carried out in four roads during the period of four years. the final report was completed December 2016, which was discussed in stakeholders workshop in May, 2017.

Unlinked Indicators

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Contracts completed within contract period and budget	Percentage	0.00 01-May-2009	100.00 30-Jun-2016	60.00 16-Jun-2017	60.00 30-Jun-2017

Comments (achievements against targets): Sixty percent of project works contracts were completed within the contract period and budget. However, all civil works contracts were completed by project closing date, except for the dropped road.

B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Assist the GOE in strengthening and increasing its road transport infrastructure	
Outcome Indicators	1. Reduced average travel time on the three project roads (minutes per km) Final 1.0 minute per km from baseline of 2.5–3.0 minutes per km
Intermediate Results Indicators	*Component 1* 1. Roads rehabilitated, non-rural (km): Target - 391 km. Actual - 302 km. While the target is not achieved under the project, the shortfall is under execution by the GOE. 2. Contracts completed within contract period and budget (%): Target - contract completion 100%. Actual - 60%. This reflects the delays principally on the road upgrading contracts. Actual contract budget - 100%, within acceptable limits of not greater than 15% of signed contract price. Not achieved as cost overruns were well over acceptable range.
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	*Component 1* 1. Wolkite-Hossaina road (126 km) was upgraded from gravel to asphaltic concrete. Achieved. 2. Mekanajo-Dembidolo (181 km) was upgraded from gravel to asphaltic concrete surface. Achieved. Thus, 302 km was achieved out of the planned 391km because of the dropping of the 89 km Ankober-Dulecha-Awash Arba road, which is now being executed (30% completion as of June 2017) from GOE funds.
Objective/Outcome 2: Assist the GOE to make road transport infrastructure reliable	
Outcome Indicators	
Intermediate Results Indicators	*Component 2* 1. Preparatory study for a Highway Engineering Research Center completed and implementation of agreed organizational option

	commenced. Actual - implementation commenced. Target achieved. 2. Road traffic census program and comprehensive road safety program established. Completed but as part of Highway Engineering Research Center study. 3. Comprehensive capacity-building program activities implemented (%). Based on study recommendations, a comprehensive five-year sector capacity-building program is under way. Achieved. *Component 3* 1. Road maintenance and financing needs for the coming 10 years projected (ETB, million). Target - 1,720. Actual - 1,450. However, once the agreed additional source of revenue is implemented, the road fund would increase to ETB 2.1 billion. Considered achieved. 2. Poverty impact assessments implemented (number of roads monitored/assessed). Target roads - 5. Actual - 4. Target wrongly stated in the PAD as the named number of roads is 4. Achieved.
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	*Component 2* 1. ERA modernization and sector capacity building. Comprised (a) TA to support establishment of a Highway Engineering Research Center - completed with six research areas identified, concept design for the center buildings and so on done, five-year business plan developed, and staff capacity-building activities including overseas training financed; and (b) capacity assessment study which produced a sector-wide training program in different areas for sector stakeholders. Number of ERA and Ministry of Transport and Communications staff at the MPhil level received overseas training. 2. Network management studies. (a) Maintenance needs assessment study. Completed in 2012, produced recommendations for diversifying and increasing road fund revenue. Vehicle registration has been accepted by the GOE and increases the road fund by about 15%. Other recommendations remain to be acted upon leaving the road fund below what is needed for maintenance; (b) TPO study. Completed and its findings have provided evidence of the positive

	economic and social impacts of the project roads on their users and of their contribution to poverty reduction; and (c) Preparatory studies for follow-on project. Not completed due to procurement delays.

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Haileyesus Adamtei	Senior Highway Specialist (Task Team Leader [TTL])
Yoshimichi Kawasumi	Senior Highway Engineer (TTL)
Mesfin Wadajo Jijo	Highway Engineer
John Hine	Senior Rural Transport Specialist (Transport Economist)
Aurelio Menendez	Lead Transport Specialist
Cecile Ramsay	Operations Advisor
Nevena Alexieva	Senior Operation Officer
Victoria Gyllerup	Operations Officer
Mitsuyoshi Asada	Senior Transport Specialist
Nicolas Peltier	Senior Infrastructure Economist
Jonathan D. Pavluk	Senior Counsel
Evarist F. Baimu	Counsel
Deepak K. Mishra	Lead Economist
Mirafe Marcos	Economist
Edeltraut Gilgan-Hunt	Environmental Specialist
Edward Felix Dwumfour	Senior Environmental Specialist
Antoine Lema	Senior Social Development Specialist
Richard Olowo	Senior Procurement Specialist
Tesfaye Ayele	Procurement Specialist
Abiy Admassu Temechew	Procurement Analyst
Luis M. Schwarz	Senior Finance Officer
Tafesse Freminatos Abrham	Senior Financial Management Specialist
Janelle Plummer	Governance Advisor
John Riverson	Consultant - Highway Engineer, Policy/Institution
Farida Khan	Operations Analyst
Ann Raynal May	Information Specialist

Shalonda Robinson	Program Assistant
Nina M. Jones	Program Assistant
Yeshi Gizaw	Program Assistant
Supervision/ICR	
Olatunji Ahmed	ICR Team Leader
George A. Banjo	ICR Consultant
Binyam Bedelu Mekbib	Senior Procurement Specialist
Abiy Demissie Belay	Senior Financial Management Specialist
Asferachew Abate Abebe	Senior Environmental Specialist
Azeb Afework	Team Assistant
Bereket Belayhun Woldemeskel	Consultant
Chukwudi H. Okafor	Senior Social Development Specialist
James Markland	Senior Transportation Specialist
Messeret Marcos	Procurement Assistant
Shimelis Woldehawariat Badisso	Senior Procurement Specialist
Yalemzewud Simachew Tiruneh	Social Development Specialist

B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY08	5.069	39,329.40
FY09	53.480	285,909.37
FY10	0	0.00
Total	**58.55**	**325,238.77**
Supervision/ICR		
FY10	33.370	145,646.06
FY11	27.370	96,856.79
FY12	22.213	80,357.39

FY13	33.545	99,327.73
FY14	24.199	67,166.83
FY15	20.192	38,013.44
FY16	18.071	81,960.61
FY17	20.037	75,048.07
FY18	12.050	81,476.63
Total	**211.05**	**765,853.55**

ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$, millions)	Actual at Project Closing (US$, millions)	Percentage of Approval (%)
Component 1: Upgrading of Federal Link Roads and Related Supervision Services	253.16	221.37	87.44
Component 2: ERA Modernization/Sector Capacity Building	3.10	3.10	100.00
Component 3: Network Management Studies	4.37	4.37	100.00
Contingency	0	26.06	0
Price escalation	0	21.54	0
Total	**260.63**	**276.44**	**287.44**

ANNEX 4. EFFICIENCY ANALYSIS

Introduction

1. The civil works under APL4 comprised the upgrading to asphaltic concrete of three roads: (a) Wolkite-Hossaina (121 km); (b) Mekanajo-Dembidolo (181 km); and (c) Ankober-Awash Arba (89 km), a total length of 391 km. The total length constructed under the project was however 302 km as the third road was dropped from the project (though now under execution [30 percent completion as of June 2017] with funding from the GOE). All the roads were fully open to traffic by project closure. This annex provides a description of the impact of the road improvements on mobility and economic and financial benefits as well as of the time and cost overruns experienced in implementing the related road contracts.

Mobility

2. Improvements to the project roads led to a significant increase in the traffic using them once opened to traffic as follows: (a) traffic on Mekenajo-Dembidolo increased by 330 percent and (b) on Wolkite-Hossaina by 773 percent in 2017 after completion of the upgrading of the roads. The increase in traffic on Mekenajo-Dembidolo and Wolkite-Hossaina roads after upgrading can be attributed to their improved riding quality (improvement in roughness), which led to significant reduction in travel time and costs for the traffic using them. The increase in traffic is reflective of increased mobility for road users.

Table 4.1. Comparison of Traffic on Project Roads at Feasibility and Appraisal and after Upgrading

Road Section	Year	Car	L/R	Small Bus	Large Bus	Small Truck	Medium Truck	Heavy Truck	Truck and Trailer	Total
Mekenajo-Dembidolo	2006	0	31	7	16	27	24	34	3	142
	2013	0	27	49	32	40	45	34	22	249
	2016	3	58	136	25	75	104	101	113	615
Wolkite-Hossaina	2006	3	34	55	27	13	78	45	12	267
	2013	10	121	244	50	148	219	155	27	974
	2016	61	292	641	135	347	534	282	39	2,331

Source: ERA Traffic Count and Feasibility Study.

Economic and Financial Benefits

3. At project completion, ERA undertook an economic analysis and financial analysis of the upgraded roads under the project. As with the appraisal economic analysis, it was carried out using the HDM-4 model, the same tool used for the appraisal analysis. It was based on determining benefits to traffic (savings in vehicle operating, road maintenance, and travel time) compared with the costs of the upgrading and maintenance with discounted benefits compared with discounted costs to determine net benefits. Table 4.2 shows the results of the appraisal and ex post analysis for a base case of improving the road and a sensitivity test −20 percent of reduction in benefits. All roads show

a positive IRR and NPV, with the ex post results significantly higher than those at appraisal. The time delay was also considered in the ex-post economic analysis

Table 4.2 Results of Appraisal and Ex Post Economic Analysis

Road Project	Length (km)	At Appraisal		Ex Post	
		Base Case		Base Case	
		IRR (%)	NPV (US$, thousands)	IRR (%)	NPV (US$, thousands)
Mekenajo-Dembidolo	188.1	14.8	491	21.5	2655.5
Wolkite-Hossaina	125.5	13.7	246.5	24.4	3092.9

Source: APL4 borrower's ICR August 2017.

Time and Cost Overruns

4. All contracts were not completed on original contract time and experienced significant time overruns. Major reasons for request for extension of time (EOT) by contractors and consultants were rainfall and shortage of construction materials such as cement, shortage of construction engineers, and design problems. Time overrun accounts for 143 percent on average for all contracts.

5. The time overruns contributed to significant price escalation and delayed materialization of benefits from the road improvements. Table 4.3 shows the time overruns on the project road contracts.

Table 4.3. Time Overruns on Project Road Contracts

Contract Road	Original Contract Duration (Days)	Revised Contract Time (Days)	Time Elapsed (Days)	Time Elapsed (%)
Mekenajo-Ayra	910	1,264	354	139
Ayra-Chanka	910	1,531	621	168
Chanka-Dembidolo	910	1,193	283	131
Wolkite-Arekit	913	1,200	287	131
Arekit-Hossaina	913	1,321	408	145

Source: ERA borrower's ICR July 2017.

6. Cost overrun in the project was on average about 30 percent, the key reasons being (a) price escalation due to rising road constructions, (b) variations due to increase in quantity of work, (c) claims due to delay in ROW clearance, (d) shortage of cement and fuel, and (e) shortage of key professionals.

Table 4.4. Financial Cost of the Civil Works (as Signed and Actual Disbursement) as of May 2017

Contract Road	Length (km)	Cost on Signing (ETB, millions)	Actual Disbursement (ETB, millions)	Increase in Cost (%)
Mekanajo-Ayra	52.06	633.53	71.82	12.52
Ayra-Chanka	70.60	669.10	937.65	40.13
Chanka-Dembidolo	65.50	648.60	700.32	7.98
Subtotal	**188.16**	**1,951.23**	**2,350.80**	**20.50**
Wolkite-Arekit	60.00	717.44	1,105.70	54.12
Arekit-Hossaina	65.50	621.20	827.19	33.16
Subtotal	**125.50**	**1,338.64**	**1,932.89**	**44.39**
Total/average	**313.66**	**3,289.87**	**4,283.68**	**30.21**

Cost Overrun for Supervision

7. The cost overrun under the project roads specific to their supervision contracts is as shown in Table 4.5. In percentage terms, they are higher than for civil works for most of the contracts. However, it is noticeable that some show reductions over the contract period.

Table 4.5. Financial Cost of Supervision Contracts for Project Roads (Original Contract and Actual Disbursement) as of May 2017

Contract Road	Length (km)	Cost on Signing (ETB, millions)	Actual Disbursement (ETB, millions)	Increase in Cost (%)
Mekenajo-Ayra	52.06	26.19	37.19	42.00
Ayra-Chanka	70.60	20.88	34.70	66.10
Chanka-Dembidolo	65.50	22.60	38.30	69.30
Wolkite-Arekit	60.00	26.19	23.86	−8.90
Arekit-Hossaina	65.50	26.19	23.86	−8.90
Total	**313.61**	**122.05**	**157.85**	**29.34**

ANNEX 5. BORROWER, CO-FINANCIERS AND OTHER PARTNERS/STAKEHOLDERS COMMENTS

ETHIOPIAN ROAD AUTHORITY (ERA)

As we have seen the ICR report, it is well prepared and addressed most of the issues.

Hoping that you have already received some project specific comments, we have no major comment on the revised report you forwarded to us except the following minor issues.

1. Design changes are encountered but presented more pronounced in the report;
2. Procurement case of Ankober-Dulecha, the successful bidder withdrew when called for Negotiation and not due to the noncompliance of the Performance Bond, as depicted in the report;

As per your request, I have also attached summary of Borrowers ICR.

ANNEX 6. SUPPORTING DOCUMENTS

1. Project Appraisal Document - Road Sector Development Stage IV Project (APL4) (P106872)
2. Implementation Status and Results Reports APL4 (from 1 to 18) - World Bank
3. Aide Memoires of Missions from 2009 to 2017 - World Bank/ERA
4. Project Agreement of the Loan (including First Amendment) - World Bank
5. Borrower's Project Completion Report (APL4) - ERA
6. Restructuring Papers 2015 and 2017 - World Bank
7. Road Sector Development Program II (2002–2007), ERA, March 2003
8. Road Sector Development Program - 19 years Performance Assessment - ERA
9. Project Appraisal Documents - APL 1–3 - World Bank
10. Implementation Completion and Results Report (ICR) Reports for APL I-III – World Bank
11. Project Reports - ERA
12. Safeguards Documents ESMF, RAP, and so on – World Bank
13. Contract Documents - ERA
14. Country Partnership Strategy 2013–2016
15. Transport and Poverty Observatories Reports
16. Procurement Value Chain Analysis Report
17. Review of Existing Road Revenue and Recommendation for New Sources of Revenue (Final Report September 2011), Intercontinental Consultants and Technocrats Ethiopia Private Limited Company Limited
18. Review of Costs of Road Construction Projects in Ethiopia, Transport and ICT Global Practice, World Bank June 2015
19. Maintenance Needs Assessment and Updating Road Financing Study 2012

ANNEX 7: REVIEW OF PERFORMANCE OF THE PROGRAM (APL1–APL4)

Background

1. By the late 1990s, the GOE identified the road sector as a significant constraint to achieving its overall economic development program and poverty reduction strategy. In concert with the donor community, including the World Bank IDA, GTZ,[19] and EU, the GOE undertook a study that revealed the road sector as having the following critical issues:

(a) Very low road density, whether measured by kilometer of roads per square kilometer or kilometer of roads per capita

(b) Inadequate management capacity linked to inadequate autonomy to ERA

(c) Manpower shortages, both professional and skilled labor

(d) Widespread poverty in the country linked to, among others, the constraint imposed by the poor road network on economic and social development and the creation of local employment opportunities

(e) Ineffective road maintenance planning and budgeting

2. A key outcome of the study was the development of a coherent network-based approach to improving federal road planning and management in the country. The approach had the following three objective criteria: (i) a need to be responsive to food security and poverty alleviation objectives, (ii) a need to improve internal connectivity within the country, and (iii) a need to strengthen key export-import corridors. The resultant RSDP was initially conceived as a 10-year road rehabilitation program for implementation in two phases. It thus had a focus on addressing issues (a) and (d). The RSDP was later extended to include two additional phases of five years focused on continuing improvements to the road network and institutional and organizational reforms to address issues (b), (c), and (e) above.

3. More specifically, each phase of the RSDP had the following primary focus:

(a) **RSDP1 - July 1997 to June 2002.** The focus was on the rehabilitation and upgrading of over 1,500 km of trunk roads and the construction or upgrading of over 800 km of link roads.

(b) **RSDP2 - July 2002 to June 2007.** The focus was on continuation of elements of unfunded parts of RSDP1 especially improvements to the road network, deepening of institutional development and capacity-building efforts, and linking of physical results to the achievement of wider development goals and poverty reduction toward the achievement of the Millennium Development Goals. Moreover, it emphasized improved

[19] German Agency for Technical Cooperation (*Deutsche Gesellschaft für Technische Zusammenarbeit*, GTZ).

project and results monitoring, strengthened, and in some cases restructured Government institutions, further development of the domestic construction capacity, and better environmental and social management of road construction projects. About 40 percent of its US$1.5 billion financing need was provided by the GOE and the remainder by the donor community with roughly 25 percent (US$425 million) from IDA.[20]

(c) **Phase 3 - July 2007 to June 2010.** The focus was on continued improvements to the road network including rural travel and transport services and implementation of institutional and organizational reforms.

(d) **Phase 4 - July 2010 to June 2015.** The focus was largely similar to APL3 with greater emphasizes on rural link roads, URRAP and on accomplishing institutional and organizational reform objectives and conduct of studies.

4. Toward the end of Phase 4, the GOE added Phase 5 for implementation over 2015–2020 with a primary focus of continued rehabilitation of federal and regional trunk and link roads, continued implementation of the URRAP, and the financing of some strategic urban road corridors as well as continuing implementation of recommendations from the various studies yet to be implemented.

5. **Institutional reform activities.** The main strategies for strengthening the reform program and investment allocation priorities identified in RSDP2 included[21]

(a) Setting up a more commercially oriented ERA organization;

(b) Commercializing and decentralizing DMOs;

(c) Strengthening the capacity of the RRAs and *woredas* to improve the decentralized delivery of rural travel and transport services;

(d) Strengthening the domestic construction industry (DCI) and increasing their participation in road contracts;

(e) Strengthening resource mobilization by widening the financial base of the road fund and enhancing community participation in road construction and maintenance, implementing road safety measures, and axle load regulations and compliance; and

(f) Enhancing the focus on social and other development impact of transport investment.

6. **Financing.** The RSDP has been financed from its inception from domestic sources (the GOE and road users through the road fund and community contributions) and significant contributions from the donor community. Table 7.1 presents the contributions of the different financiers of the RSDP as of 2016. The relatively high level of financial support by the donor community, particularly during the early phases of the RSDP, was the result of the strong commitment of the GOE to the RSDP

[20] ICR for APL1, p1.
[21] PAD for RSDP Stage II (APL3) (P091077).

and agreement to an implementation framework that included strong donor coordination and mutually agreed program objectives.

Table 7. 1. RSDP - Disbursements by Financiers (1997–2016) (ETB, millions)

Financiers	RSDP1	RSDP2	RSDP3	RSDP4	RSDP5[a]	Total RSDP1 to RSDP5[b]	Percentage
GOE	3,455.5	8,056.7	20,584.5	1,21,817.6	41,212.2	195,126.5	73.3
Road fund[c]	978.2	2,555.8	5,030.1	6,383.6	1,262.7	16,210.5	6.1
Community	—	884.8	683.5	2,748.7	–	4,317.1	1.6
World Bank	1,432.9	3,135.3	2,544.2	8,648.2	2,084.4	17,844.9	6.7
European Union[d]	678.1	1,662.6	3,255.2	3,612.2	0.0	9,208.1	3.5
China	—	—	1,252.7	8,558.2	1,405.0	11,215.9	4.2
African Development Bank	506.4	517.8	496.4	3,787.9	1,045.9	6,354.3	2.4
Japan	164.9	380.0	307.1	1,317.7	0.0	21,69.7	0.8
OFID	0.3	293.3	213.6	108.7	178.4	794.3	0.3
Germany	27.7	302.6	67.0	45.2	0.0	442.5	0.2
BADEA	—	59.9	175.2	457.1	108.5	800.7	0.3
Saudi Fund for Development	—	39.3	123.2	199.7	117.3	479.4	0.2
Kuwait Fund	—	—	49.9	437.1	80.9	567.9	0.2
Abu Dhabi	—	—	—	4.5	24.4	29.0	0.0
Various[e]	40.6	224.8	175.1	207.0	0.6	648.1	0.2
Total	**7,284.6**	**18,112.9**	**34,957.8**	**158,333.5**	**47,520.3**	**266,209.0**	**100.0**

Source: RSDP 19 Years Performance Assessment, October 2016, ERA.
Note: a. Amount only for first year (2016) of implementation.
b. Includes only the amount for the first year of implementation of RSDP5.
c. ETB 281.1 is disbursement for the municipality from the road fund.
d. Includes sector budget support amount.
e. These include bilateral agencies such as the U.K. Department for International Development and the Nordic Development Fund.

IDA Support to RSDP

The Road Sector Development Program Support Project (RSDPSP - ET-PA-755)

7. IDA's first support to the RSDP (RSDP1) was through the Road Sector Development Program Support Project (RSDPSP), a credit of US$309.2 million. Approved in December 1997, its primary aim was to contribute to Ethiopia's economic development by (a) improving trunk and regional rural road access and utilization to meet the agricultural and other economic needs, (b) building up the institutional capacity in both the public and private sectors for sustainable road development and maintenance, and (c) providing economic opportunity for the rural poor both through increased employment in rural road works and development of appropriate and affordable means of transport

and services.[22] Its key performance indicators included improvements to traffic flow, journey time, pavement roughness, maintenance expenditure, pavement loading, and road freight prices, reflecting the need to demonstrate improvements to road conditions and improved utilization of the road network.

8. The major achievements of the RSDPSP included the rehabilitation and upgrading of 1,380 km of federal roads and the conduct of capacity-building activities, mainly training, for ERA staff. As a result, there was an overall increase in the road network in good condition: asphalt roads improved from 17 percent to 35 percent, gravel from 25 percent to 30 percent, and rural roads from 21 percent to 28 percent. Average road density by land area had increased as well from 24 percent to 30 km per 1,000 km^2, and the average distance to access an all-weather road had declined from 21 km to 17 km.

9. With the closing of RSDP1 on June 30, 2002, the Government prepared RSDP2 to build on the achievements of RSDP1. RSDP2 continued and enhanced the pace of road network rehabilitation, with more emphasis on institutional development, capacity building, and poverty reduction, through reference to the Millennium Development Goals.

Adaptive Program Lending

10. The World Bank continued to support the RSDP with APL instrument approved on January 15, 1998, following the request of the GOE/ERA that subsequent IDA support to the RSDP be in the form of an APL instrument. The APL was designed and implemented in overlapping stages. Initially, it was designed as a three-stage operation but was later revised to a four-stage (APL1–APL4) one on availability of additional funds from a grant fund available to the country. The long-term commitment of IDA to the RSDP implied by the APL instrument was seen by the GOE/ERA as important in encouraging increased support from other donors. The request was approved given (a) ERA's experience in managing the RSDP; (b) the need to ensure step-by-step achievement of key policy and institutional reforms critical for the success of the RSDP, the systematic buildup of institutional capacity, and M&E of achievements at the different implementation levels; and (c) the APL facilitated the quick transfer of lessons of experience from one operation to the next. Therefore, the APL instrument became the basis for follow-up credits to the RSDPSP in support of RSDP2 and other stages of RSDP. IDA's support to the RSDP2 was agreed at roughly 25 percent (US$425 million) of the budget presented by the GOE, to be provided through the APL instrument. However, during the preparation of APL1, the grant envelope of US$126.80 million was allocated to the transport sector. The APL amount therefore increased to about US$651.8 million and was redesigned as a four-stage APL (APL1–APL4) program with the components of the originally envisaged APL1 split into two, APL1 and APL2.[23]

APL Programmatic Objectives, Triggers, and Project Stage Objectives

11. **Programmatic objectives.** The primary objective[24] of the APL operations was to restore and expand Ethiopia's road network to reduce poverty and increase employment through promoting growth and mobility in a socially and environmentally sustainable manner. The APL also supported

[22] PAD, RSDPSP (ET-PA-755), page 2, Block1: Project Description.
[23] ICR for APL1, section 1.1, para 4.
[24] PAD, RSDP (APL2), Program Development Objective.

the GOE in increasing the efficiency of the road sector through sector reform, especially by providing capacity building and TA for ERA's institutional reform to a commercially oriented entity.

12. **Performance triggers.** The APL financing mechanism required that to have the subsequent operation approved a set of 'triggers' should be met. The triggers (table 7.2) were agreed between the GOE and the World Bank during the appraisal of APL1. Each of the projects met the 'triggers' before commencement.

Table 7.2: Performance Triggers for Each Stage of the APLs

Stage	Trigger/Indicator
APL1	1. Overall average completion of at least 55 percent of the ongoing civil works under IDA-financed RSDPSP (Cr.3032-ET)
	2. Design and contract documents for civil works components completed
	3. Up to 6 percent of the Grant proceeds disbursed and US$40 million equivalent of works contracts awarded under APL1
APL2	1. Contract awarded for urban transport study
	2. Contract awarded for setting up independent technical and financial audit of the road fund
	3. Certain functions of ERA DMOs have been devolved to (a) the District Engineering Division and (b) each DMO, for its remaining functions including contractor activities, operates as a separate cost center
APL3	1. Pilot routine maintenance activities undertaken by contractors through a competitive process, with 10 percent of works under tender
	2. Poverty/social criteria established and used in assessing road investment needs (including for regional and community access roads)
	3. Overall average disbursement of 35 percent of the ongoing civil works under APL1 and APL2
APL4	1. 60 percent disbursement of Credit proceeds from APL1
	2. Management of equipment including plant leasing arrangements implemented
	3.100 percent of DMOs function as commercial units, delivering cost-effective maintenance services to program within a framework of internal performance agreements

Overview of Activities under the APL

13. **Introduction.** The main activities selected from the RSDP that were implemented under the APLs to contribute to the achievement of RSDP objectives included the following:

(a) Construction and rehabilitation of key road links to (i) eliminate constraints to growth and access, (ii) expedite exploitation of Ethiopia's vast natural resources, (iii) integrate the country, (iv) provide access to marginal and drought-prone areas, and (v) reduce transportation cost

(b) Strengthening of the road management and financing reform program to ensure sustainability

(c) Development of capacity, increase in the participation of domestic consultants and contractors in the implementation of road contracts in the country

(d) Development of a network-based approach and addressing social, environmental, and development issues comprehensively

(e) Road maintenance planning and budgeting

14. **Project Objectives.** Each operation of the APL had the following specific objectives:

- **APL1 (P044613).** To assist the recipient in increasing its road transport infrastructure and improving the reliability thereof, strengthening the capacity for road construction, management and maintenance, and enhancing the financing program in relation thereto to ensure sustainability, and creating conditions conducive to private sector participation in the road transport sector (2003–2005).

- **APL2 (P082998).** To increase the road transport infrastructure and improve its reliability, strengthen the capacity for road construction, management and maintenance, and create conditions conducive to private sector participation in the road transport sector (2004–2010).

- **APL3 (P091077).** To support the GOE's RSDP in restoring and expanding Ethiopia's road network to reduce poverty and increase employment through promoting growth and mobility in a socially and environmentally sustainable manner (2007–2015).

- **APL4 (P106872).** Strengthening and increasing road transport infrastructure and its reliability (2009–2017).

15. **Project components.** The type and scope of the different activities under the APL are described in box 7.1 while the specific components are outlined in table 7.3. From these, the linkage between the activities of succeeding operations is evident.

Box 7.1. Broad Description of Activities Under the APL

Road network development. All operations provided funding for road rehabilitation and upgrading, and two provided funding for new links. In many cases, financing from APL2 and 3 was used to extend and, in some cases, complete the links invested under APL1.

Development of the Ethiopia Rural Travel and Transport Program (ERTTP). APL1 funded the development of 64 *Woreda* Integrated Development Plans (WIDPs). APL2 provided further support to the ERTTP in the form of funding for 40 additional WIDPs, and institutional support to ERA to enable it to facilitate implementation of the WIDPs. Further support to the ERTTP in Stages 3 and 4 were not included, however, because of the backlog within ERA associated with management of the already submitted WIDP reports. The original program phasing of the APL anticipated implementation of at least some of the developed WIDPs, but this did not take place. However, the U.K. Department for International Development -financed implementation of eight pilot WIDPs and this yielded encouraging results. However, priorities for later APL stages did not include implementation of these programs, because the GOE decided to use its findings and recommendations as the basis for creating and implementing URRAP. The GOE has so far built about 80,000 km of rural community roads under URRAP, a clear indicator of the success of the ERTTP.

Institutional support to ERA. APL1 placed a great emphasis on improvements (rehabilitation and upgrading) and enhancing involvement of local domestic contractors in road works and maintenance. APL1 to APL4 included important institution- and capacity-building components that build on related initiatives under APL1, taking advantage of the overlapping implementation design. For example, APL2 further developed ERA's capacity in specific core functions. APL3 focused on enhancing ERA's ability to monitor and control quality

and costs of contractors, as well as supporting ongoing efforts to commercialize the DMOs. Finally, APL4 provided resources to help ERA expand its capacities and core mandate to also assist the regions and possibly lower levels of Government involvement in the road sector in the future. This included the establishment of an HRC; importantly, it also included review of maintenance approaches and financing needs.

Road network planning and management. All the operations included interventions to improve ERA's project management capabilities by means of the review and updating of its business processes, with development of project management tools and training to improve procurement and FM, and created an Environmental and Social Safeguards Unit that contributed to improve the way roads are planned and financed in Ethiopia. A methodology, TPO, was developed and implemented that provided a mechanism by which ERA was able to monitor and evaluate the social and economic impact of its road improvement activities. The 2005 road financing study was also updated in the context of a greatly expanded network and its greatly increased maintenance needs.

Support to Addis Ababa on urban transport and traffic management. APL3 provided additional funding to the Addis Ababa transport branch, initially intended to support implementation of the urban transport strategy developed under APL1. Because of institutional and political challenges following the national and municipal elections of 2005, this activity was reoriented to support general traffic management needs in the city.

Source: Adapted from ICR for APL1, p10.

16. **Key indicators and M&E.** Each phase of the program (APL1–APL4) had its indicators that were independently reviewed after completion. However, the programmatic indicators were (a) reduction in freight and passenger tariff, (b) reduction in travel time, (c) reduction in vehicle operating costs, (d) number and value of contracts awarded to domestic contractors, (e) number of people employed (by gender) in road works, (f) total annual payments made to domestic contractors, (g) ratio of road fund annual collection against total annual maintenance needs, and (h) maintenance expenditure as percentage of needs of maintenance network.

Table 7.3. Description of Components in APL Phases

Component	Phase/Component Description			
	APL1	APL2	APL3	APL4
Component 1	Rehabilitation and Upgrading of Federal Roads (413 km) (a) Nekempt-Mekenajo Road (upgrading 127 km) (b) Nazareth-Assela Road (rehabilitating 79 km) (c) Wereda-Gob Gob Road (upgrading 99 km) (d) Adi Abun-Adigrat Road (upgrading 108 km)	The Upgrading of Federal Trunk and Link Roads (a) Assela-Dodola-Goba and Shashemene-Dodola section (316 km) (b) Gob Gob-Weldiya section (194 km) of the Woreta-Weldiya federal link	The Upgrading and Rehabilitation of Federal Trunk and Link Roads (a) Upgrading of Gondar-Debark gravel road (100 km) (b) Upgrading of Aposto-Bore-Negele federal link road (268 km)	Upgrading of Federal Link Roads (391 km) and Related Supervision Services (a) Upgrading of Mekenajo-Dembidolo link road subproject (181 km asphalt concrete) (b) Upgrading of Wolkite-Hossaina link

Component	Phase/Component Description			
	APL1	APL2	APL3	APL4
		road (c) Shire-Adwa-Adiabun section (83 km) of the Adigrat-Shire federal link road (d) Consultancy services	(c) Rehabilitation of Gedo-Nekempte section of the Addis-Nekempte asphalt-paved federal link road (134 km) (d) Technical advisory services	road subproject (121 km asphalt concrete) (c) Upgrading of Ankober-Awash Arba link road subproject (89 km)
Component 2	Construction of Federal Link Road Dera-Magna section of Dera-Mechara Road (119 km)	Construction of Federal Link and Regional Rural Roads (a) Construction of Magna-Mechara section (119 km) (b) Assosa/Sherkole-Guba regional road to a gravel road surface standard (137 km) (c) Consultancy services	Construction of Regional Rural Road (a) Yalo-Nehile road (70 km: part of Yalo–Dalol road) construction (b) Construction supervision	ERA Modernization/Sector Capacity Building (a) Preparatory study toward establishing a HRC (b) Technical advisory services to prepare and conduct harmonized comprehensive capacity building
Component 3	Construction Supervision	Support to the ERTTP	Institutional strengthening of ERA through Provision of TA	Network Management Studies (a) Maintenance needs assessment and updating of road financing study (b) TPOs (c) Preparatory studies for the next

Component	Phase/Component Description			
	APL1	APL2	APL3	APL4
				phase of RSDP and URRAP.
Component 4	Rural Travel and Transport Program (a) Preparation of travel and transport plans for 100 *woredas* (b) Development of Information, Education, and Communication Strategy (c) Capacity building for the ERTTP structures at the national, regional and *woreda* levels	Support to ERA to Enhance its Capacity to Plan Road Network Maintenance and Improvements (a) By integrating pavement management system with HDM-4; (b) Refining ERA's FM and management information systems; (c) Technology transfer to and training of ERA staff in the relevant fields to further enhance ERA's capacity.	TA to support accomplishment of program objectives (a) Design review of the Yalo-Dalol road (b) Design of a pilot project of output- and performance-based road contract (c) Support to the ERTTP coordination and implementation (d) Technical and management study and support in capacity building to improve urban transport management	

Component	Phase/Component Description			
	APL1	APL2	APL3	APL4
Component 5	TA support services for ERA (a) HIV/AIDS control and prevention syndrome. (b) TA services for ERA in project planning and implementation and social impact monitoring.	Preparation of follow-up operations in APL3 or APL4,		
Component 6	Road Financing Study and Technical Auditing			
Component 7	Planning Activities (a) Urban transport study (b) Preparatory activities for future stages			
Credit Amount	**US$126.8 million**	**US$348.2 million**	**US$225.0 million**	**US$245.0 million**

Outputs from the APL Operations

17. **The context—accomplishments under RSDP as a whole.** Before presenting outputs from the APL operations, it is important to put these against the background of the outputs from the RSDP as a whole. Table 7.4 presents a summary of the physical outputs from the RSDP over its 19 years of implementation (1997–2016). It also shows the level of financing used to achieve the indicated outputs. Overall, 34,195 km of federal roads, 26,239 km of regional roads and 68,035 km of *woreda* roads were constructed or improved under the RSDP as a whole. Comparing the planned against the actual length of roads improved the level of achievement varies between 84 percent and 112 percent for federal roads resulting in an average of 86 percent, 99 percent for regional roads, and 88 percent for *woreda* roads giving an overall average of 86 percent for all road types. The inability to achieve the target was due to increase in cost road beyond the original budget.

18. **With regard to financing, about ETB 198,966, 321,435, and 31,974 million (US$8.6 million, US$13.8 million, US$1.4 million equivalent, respectively)** were used to financing federal, regional and *woreda* roads under the RSDP over 19 years of its implementation period (1997–2016). These levels of expenditures represent 119, 117, and 92 of planned expenditure, respectively. The above physical and financing achievements under the RSDP suggest a successful program implemented with a relatively high level of commitment and efficiency.

Table 7.4. Summary of Accomplishment of 19 Years of RSDP

Type of Work	Length of Roads in km/percentage			Financing in ETB millions/percentage		
	Planned	Actual	Percentage	Budget	Disbursement	Percentage
A. Federal Roads						
Rehabilitation of trunk roads	3,282	2,979.4	91	13,930.2	17,153.6	123

Upgrading of trunk roads	4,827	4,492.9	93	22,901.9	30,013.8	131
Upgrading of link roads	6,837	5,742.9	84	45,689.0	53,414.9	117
Construction of new link roads	8,684	7,752.4	89	60,599.5	78,898.2	130
Construction of expressway roads[a]	5	1.7	34	2,225.8	867.2	39
Federal roads periodic maintenance	11,840	13,226.0	112	8,673.9	6,114.2	70
Routine maintenance[b]	0	0	—	5,376.3	5,778.8	107
Performance-based[c] maintenance	0	0	—	931.2	73.4	8
Others[d]	—	—	—	6,301.4	6,652.0	106
Sub-Total Federal Roads	***35,475***	***34,195.0***	***96***	***1,666,629.1***	***198,966.07***	***119***
Regional Roads						
Construction	26,401	26,239.0	99	4,231.4	28,921.1	119
Maintenance	—	—	—	2,961.0	3,107.0	105
Others	—	—	—	203.0	115.4	57
Sub-Total Regional Roads	***26,401***	***26,239.0***	***99***	***27,395.4***	***32,143.5***	***117***
C. *Woreda* Roads						
Construction of URRAP	87,757	68,035.0	78	33,148.4	31,885.2	96
Maintenance	—	—	—	1634.5	88.9	5
Sub Total Woreda Roads	***87,757***	***68,035.0***	***78***	***34,782.9***	***31,974.1***	***92***
D. ERTTP/Community Road						
Community roads	—	—	—	***2,642.9***	***2,295.9***	***87***
Sub Total Community Roads	—	—	—	***2,642.9***	***2,295.9***	***87***
E. Urban Roads	—	—	—	***1,006.6***	***829.3***	***82***
Sub Total Municipalities Maintenance		—	—	***1,006.6***	***829.3***	***82***
TOTAL	**149,633**	**128,470.0**	**86**	**232,456.9**	**266,208.8**	**115**

Note: a. Note that these express and *woreda* road types roads were not funded under the APL operations.
b. These are regular maintenance on the road network, and the length is not measured.
c. The disbursed amount was on studies to introduce PBC, and there was no physical work at this stage.
d. This not physical work but the fund was for studies.

19. **Overall impact of investment under the RSDP on the road network.** The cumulative impact of implementation of the RSDP on Ethiopia' road network over the 19 years[25] of implementation of RSDP (from 1997 when RSDP1 started to 2016 to the first year of implementation of RSDP5) is shown in table 7.6. It includes the following: the Ethiopia' road network[26] increased from 26,550 km in 1997 to 113,066 km in 2016, a 326 percent increment. Thus, the road density per 1,000 km^2 increased from 24.1 km in 1997 to 102.8 km in 2016. Furthermore, the condition of the country's road network has improved with the proportion of road network in good condition increased from 22 percent in 1997 to 72 percent in 2016. Overall total investment is ETB 266.2 billion (US$ 9.66 billion).

Table 7.5: Change in Some Performance Indicators During 19 years of RSDP Implementation

Indicators	1997	2016
Proportion of asphalt roads in good condition	17%	73%
Proportion of gravel roads in good condition	25%	59%
Proportion of rural roads in good condition	21%	55%
Proportion of *woreda* roads in good condition	—	83%
Proportion of total road network in good condition	22%	72%
Road density per 1,000 km^2	24.1 km	102.8 km
Road density per 1,000 population	0.46 km	1.23 km
Proportion of area more than 5 km from all-weather road	79%	35.80%
Average distance to all-weather road	21km	4.9 km
Road network length (in km) including URRAP and municipality roads	26,550	113,066

20. **Roads constructed and financed under the APL.** The investment in physical infrastructure under the program (APL) contributed to increasing the road density and the condition of good roads in Ethiopia. Table 7.6 presents the total length of roads (federal and link roads) planned and achieved under each of the operations and the financing contribution by IDA and the GOE. Of the total length of roads planned (2,471 km), 2,161 km was achieved (87.5 percent) at a total cost of US$1,389 of which IDA financed US$976.3.

[25] These figures reflect the impact. This period includes completion of RSDP1, RSDP2, RSDP3, RSDP4 and the first year of implementation of RSDP5.
[26] RSDP 19 Years Performance Assessment, ERA, October 2016.

Table 7.6. Plan Against Actual Kilometer of Roads and Financing of the APLs

Stage	Length of Roads (km)			Financing (US$, millions)			
	Planned	Actual	Achieved (%)	IDA	GOE	GOE as % IDA	Total
APL1	652	512	78.5	126.8	92.5	72.9	219.3
APL2	849	849[a]	100.0	160.9	113.3	32.5	274.2
				187.3[b]	—		187.3
APL3	579	498	86.0	225.0	143.7	63.9	368.7
APL4	391	302	77.2	276.3	63.2	31.1	275.2
Total	**2,471**	**2,161**	**87.5**	**812.00**	**412.7**	**50.7**	**1,325**

Source: MTR report for APL4 adjusted.
Note: a. Includes those under Additional Financing
b. Additional Financing.

Improvements to the Road Network under APL

21. The APL contributed to the achievements reflected in the value of the performance presented in table 7.6. Of the total GOE investment in RSDP over 19 years period, IDA invested US$812 million between 2009 and 2017, which is about 8 percent of the GOE's investment. Of the 128,470 km roads financed by GOE, 27 percent (34,548 km) are upgraded trunk and link roads. IDA financed 2,161 km roads, thus IDA' contribution to proportion of asphalt roads in good condition is about 6 percent. This is comparable with the ratio of IDA financing to GOE financing on RSDP. Through the length of roads upgraded, the APL operations contributed to improving overall road conditions in Ethiopia from 58 percent at the end of APL1 to 86 percent at the end of APL4 (table 7.7). Road density also increased from 43 percent at the end of APL1 to 87.3 percent at the end of APL3 (comparative figure for end of APL4 is not available).

Table 7.7. Performance Indicators of the APLs

Indicator	APL1	APL2	APL3	APL4
Proportion of roads in good /fair condition	58.0	88.0	91.0	86.0
Increase in road density	43.0	48.1	87.3	n.a

Source: Respective ICR Results Framework analysis.

22. **Institutional reform and ERA capacity-building activities**. The main outputs contributed to by the APL are briefly outlined below.

23. **Reform of ERA.** The APL supported the reform of ERA over its implementation period. ERA's operations department, which was responsible for carrying out routine maintenance of federal roads and construction of road projects was established as an independent public contractor and named Ethiopia Road Construction Corporation (ERCC), while DMOs were similarly created. Thus, ERA became a smaller and efficient entity responsible for administration, road asset management, and road network planning. The functional separation of ERCC/DMO from ERA was achieved in 2010. Furthermore, ERA has been reorganized to six contract administration directorates to enhance its new functions. ERA is now a more professional and focused road agency with enhanced focus on customer satisfaction. Through the above activities under the APL, ERA as an organization and its staff became more results focused and were transformed to a capable regulatory institution.

24. **Training and capacity development of ERA staff.** This was an important element of APL operations. Over 48,850 technicians were trained in ERA's training centers and technical vocation Education and Training Centers, funded both by the APL operations and GOE resources. Many of the technicians were certified, making them competitive in the market. Many other engineers also attended both local and international trainings. The resulting enhanced technical capacity contributed to more efficient and effective management of the road network. Furthermore, APL supported the ERCC by providing necessary technical advisory services on business planning and management.

25. **Advisory technical assistance services and studies.** The APL supported a review of ERA's business processes which led to improvement in the management of its road network. ERA now has a pavement management system, an improved FM system, management information system, and procurement management systems that have contributed toward improving ERA' contract management capabilities. Quality assurance and performance monitoring have significantly improved in ERA's operations as a result of the business processes review. Available evidence from the study of procurement services experience within ERA indicates that there has been improvement in contract processing and service delivery with contractors' invoice now routinely approved and paid within the allowable 28 days specified in contract agreements. It is now also easier for ERA to track contract performance through a web-based Asset Management System that is used to monitor progress of works on project sites. All the above are good indicators of the improved project management capacity delivered by implementation of the APL.

26. **Development of domestic construction capacity.** While domestic consultants and contractors participated significantly, as prime service providers in RSDP activities funded by the GOE, this was not so with activities funded by the APL, particularly civil works contracts. This was due largely to the works being large packages with attendant use required procurement methods compliant with IDA requirements which tend to preclude small firms. This notwithstanding, APL civil contracts provided opportunities for domestic consultants to participate in joint venture (JV) partnerships with international consultants in all the APL series. While the number of domestic consultants and contractors participating in APL was not monitored in each of the operations, available information confirms that no less than five JV consultancies occurred under the APL. Though there was no local contractor participation throughout APL period, ERA used some resources from the program to organize capacity building for local consultants and contractors. These capacity-building activities contributed to the achievement of more than 75 percent of road contracts awarded by ERA under the RSDP being undertaken by domestic contractors.

27. **Better environmental and social management of road contract projects.** APL2 supported ERA to create an Environmental and Social Management Branch to oversee improved incorporation of environmental and social issues in the planning and implementation of road projects. Staff training and institutional capacity building provided to staff of the unit under the program much strengthened their ability to discharge their functions. One of the noteworthy achievement on the program (APL) was the incorporation of the monitoring of the impact of road projects on HIV/AIDS prevalence and incorporation of contract resources for doing this in IDA road works contracts. This was a best practice that was adopted throughout the World Bank. Thus, ERA can now organize, coordinate, and supervise RAPs and ESIAs. These achievements notwithstanding, ERA needs to employ more staff to cope with the increase in the number of road projects.

28. **A methodology, TPO, for establishing the social and economic impact of road improvements.** This was developed under APL2 for use to establish the socioeconomic impact of road improvements under the APL.[27]. The TPO findings confirm that roads upgraded under the APL improved the social and economic status of people living along them: (a) the distance between household homes and all-season roads in ZORI[28] areas reduced by 53 percent; (b) there was about 250 percent increase in the number of public transport passenger and freight vehicles; (c) contributed to improve the quality of health services offered to people in the project areas in the nearby facilities by 13 percent; and (d) the road projects created significant economic and social benefits to the population residing along their corridor including (i) creation of employment opportunities, (ii) increased business activities, (iii) improved transport services, and (iv) ease of access to social services.

Consolidated IDA APL1–APL4 Performance and Result Monitoring

29. **Ratings summary.** The performance rating for each of the operations from their respective ICR is shown in table 7.7: It shows that the operations had Moderately Satisfactory rating for outcomes and World Bank and borrower performance, except for APL1 that had a Satisfactory rating in each of the criteria. It is noticeable that the 'risk to development outcomes' increased during the successive operations, from 'low' for APL1, 'Moderate' for APL2,' 'Substantial' for APL3 and 'Moderate' APL4. This is somewhat reflective of the pressure that the rapid expansion of the RSDP by the GOE imposed on the implementation capacity of ERA.

Table 7.8. Key Ratings of the APLs

Item	APL1	APL2	APL3	APL4
Outcomes	Satisfactory	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Risk to development outcomes	Low	Moderate	Substantial	Moderate
World Bank performance	Satisfactory	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Borrower performance	Satisfactory	Moderately Satisfactory	Moderately Satisfactory	n.a.

Source: Respective ICRs.

30. **Results outcome.** The PAD for APL4 contained a consolidated Results Framework arrangement for monitoring the APL. It contained 13 indicators. The following observations may be made with regard to the outcome of the results achieved (table 7.9):

(a) Of the 13 indicators, three were able to be monitored only for APL1 and APL2 because the roads relating to APL3 and APL4 were dropped from these projects without replacement roads being identified. These three indicators were (i) Indicator 5 - reduction in average travel; (ii) Indicator 6 - decrease in freight tariff in real terms; and (iii) indicator 13 - average household income increased (real terms). The implication of the above observation is that the consolidated monitoring arrangement should have

[27] More information on the TPO and its findings are contained in annex 9.
[28] Area of 12 km corridor on either side of the intervention road.

been amended to reflect the dropping of the respective roads by substitution of other roads from the operations.

(b) Of the 11 indicators that were fully monitored, 10 were fully achieved and 1, increase in road fund, was partially achieved (6 percent annual increase instead of the target of 7 percent).

(c) From the consolidated Results Framework, the following conclusions are made:

(i) The road network was expanded significantly such that it has significantly reduced average travel time and improved mobility across a significant part of the country thus contributing to economic and social integration of the country.

(ii) The upgraded roads have been completed to a generally high standard that will help to reduce their future maintenance cost.

(iii) The road fund has increased significantly almost to the extent planned thus improving the financing of road maintenance.

(iv) Sustainability of the road network has improved through the achievement of (ii) and the increased organizational capacity of ERA to plan and manage the road network through employment of road management tools developed under the APL. Sector wide capacity-building plan developed under APL4 has provided the sector with a road plan for improving its overall capacity for managing the sector.

(v) The APL has contributed to the review of obtaining road safety practices which now need to be employed more appropriately in new road works, including application of road safety audits as part of design and construction practices.

(vi) The various studies conducted under the APL and the establishment of the HRC are important sources of knowledge in the sector and its management and an important instrument for further expanding this knowledge base.

(vii) The TPO has proved to be a useful tool for monitoring the social and economic impact of road improvements. Its use to monitor the impact of some of the link roads upgraded under the APL has demonstrated that these roads have contributed to increasing income and employment opportunities (for both men and women) along the road corridors. Quite importantly, the TPO has indicated that the upgraded roads had beneficial health benefits and improved equality.

31. On the basis of the above analysis, overall achievement under the APL is rated Moderately Satisfactory.

Table 7.9. Consolidated Arrangements for IDA APL 1–4 Result Monitoring

Indicator	Unit of Measurement	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Project Development Objective Indicators					
Indicator 1:					
Increased Road Density	Number (km/1000 km^2) Date:	0.11 May 01, 2009	0.47 June 30, 2016	0.36 June 30, 2017	0.36 June 30, 2017
Comments (achievements against targets):	The revised target was achieved by the closing date.				
Indicator 2:					
Increased proportion and length of federal paved roads in good/fair condition	Number (% and km) Date:	(6.4/0.8) (387 km/49 km) May 01, 2009	(8.3/6.5) (743 km/580 km) June 30, 2016	(8.3/6.5) (743 km/580 km) June 30, 2017	(8.3/6.5) (743 km/580 km) June 30, 2016
Comments (achievements against targets):	The target was achieved by the original closing date.				
Indicator 3:					
Increased proportion and length of Federal gravel roads in good/fair condition	Number (% and km) Date:	(0.77/0.07) (110/10 km) May 01, 2009	(0.75/0.71) (160 km/151 km) June 30, 2016	(0.75/0.71) (160 km/151 km) June 30, 2017	(0.75/0.71) (160 km/151 June 30, 2016
Comments (achievements against targets):	The target was achieved by the original closing date.				
Indicator 4:					
Increased proportion and length of rural/ regional roads in good/fair condition	Number (% and km) Date:	0 May 01, 2009	(0.08/0.05 (35 km/24 km) June 30, 2016	(0.08/0.05 (35 km/24 km) June 30,2017	(0.8/0.05) (35 km/24 km) June 30,2016
Comments (achievements against targets):	The target was achieved by the original closing date.				
Indicator 5:					

Indicator	Unit of Measurement	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Average travel time on: Woreta-Woldiya - APL1 and APL2 (ii)Aposto-Negele - APL3 (iii)Ankober-Awash Arba - APL4	Number (minutes/km) Date:	(i) 2.5 (ii) 2.5 (iii) impassable May 01, 2009	(i) 1.8 (ii) 1.8 (iii) dropped June 30,2016	(i) 1.8 (ii) 1.8 (iii) dropped June 30,2017	1.8 1.8 Dropped
Comments (achievements against targets):	The target was achieved for two roads completed. The third road was dropped from the project due to procurement and implementation delays (and the sub-indicator was also dropped).				
Indicator 6:					
Decrease in freight tariff in real terms: (i) Woreta-Woldiya - APLI 1 and APL2 (ii)Aposto-Negele-APL3 (iii)Ankober-Awash Arba - APL4	Number (Birr/ton/km) Date:	(i) 0.52 (ii) n/a(*)b (iii) n/a(*)	(i) 0.50	—	n.a.
Comments (achievements against targets):	The ICR team could not obtain data that monitor this indicator.				
Indicator 7:					
Total vehicle mileage on the main (federal) roads	Number (million/km) Date:	9.7(**[c])	13.6	-	18.9[a] 2015
Comments (achievements against targets):	Target was achieved.				
Indicator 8:					
Share of rural population with access to all-season roads within 2km	Number (%) Date:	20 May 01, 2009	30.1 June 30, 2016	30.1 June 30, 2017	57.0 January 6, 2017
Comments (achievements against targets):	Target was achieved				
Indicator 9:					
Number of contracts completed with EMPs and RAPs implemented with no reported negative post-works impacts	Number (No) Date:	0 May 01, 2009	28 June 30, 2016	28 June 30, 2017	28 June 30, 2016

Indicator	Unit of Measurement	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (achievements against targets):	While the target of the number of contracts completed were met, they had some negative post-works impacts reported throughout the APL operations. These were addressed during project implementation.				
Indicator 10:					
ERA modernization progress	Number (No) Date:	DRMC as cost center	ERA as a regulatory body	ERA as a regulatory body	ERA as a regulatory body
Comments (achievements against targets):	The target was achieved.				
Indicator 11:					
Road fund revenue annual growth rate	Number (%) Date:	7 May 01, 2009	7 June 30, 2016	—	6
Comments (achievements against targets):	The GOE is the process of implementing MNAURF study recommendations that could lead to substantial growth in road fund revenue. However, the only recommendation implemented led to increase of the road fund by 6 percent.				
Indicator 12:					
Increase in share of total amount of contracts awarded to DCI	Number (%) Date:	50 May 01, 2009	70 June 30, 2016	70 June 30, 2017	69.3% 2016
Comments (achievements against targets):	The target was achieved. Over 70% of contracts are being awarded to DCI (contractors and consultants).				
Indicator 13:					
(a) Average household income increased (real terms) on targeted roads (i) Woreta-Woldiya_APL1 and APL2 (ii) Aposto-Negele - APL3 (iii) Ankober-Awash Arba-APL4 (b) Employment generated	Number (ETB)(No) Date:	(i) 4,700 (ii)4,486 (iii)11,806 (b) 37,010 2012	(i) 5780 (ii) (iii) (b) 72,100 June 30, 2016	n/a	(i) 5780 (ii) 24,342 (iii) 22,531 (b) 72,100 June 30, 2017

Indicator	Unit of Measurement	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (achievements against targets):	The TPO study was the main instrument for obtaining this data. However, of the three roads in the indicator, only one was actually included in the TPO since Woreta-Wodiya was not included and Ankober-Aliyu was dropped from APL4. While the final report of the TPO indicated increases income and employment generation along project roads, they cannot be stated with the precision required by the Results Framework.				

Note: a. From RSDP: 19 Years Assessment, Table 21, p 46.
b. Information not available as it was expected to be available when TPO study for APL3 and APL4 projects started. However, the roads were dropped from projects.
c. Source, first and second survey cycle conducted in 2008.

Overview of Lessons from Implementation of the APL

32. A review of all the lessons identified by the ICRs of APL1, APL2, and APL3 (annex 11)[29] reveals that, generally, the identified lessons were addressed in the follow-up APLs. The APL series provided great lessons to improve ERA operations, including the lessons on technical, safeguards, M&E, procurement, and overall project management. These are well documented in the various ICRs for the APLs.

33. Precontract activities are critical to successful implementation of road contracts. Low quality of engineering design and scope definition led to delays and cost overruns. While the delays and overruns were improved over the APL implementation, the importance of giving quality time to prepare engineering design and bidding documents before road contracts are awarded cannot be overemphasized. ERA has established a Quality Control Unit and staff were trained on project management to strengthen review of engineering design documents from consultants. Continuous education and training of staff should be provided to refresh knowledge and provide current industry standards.

34. **Implementation and management of safeguards issues are critical to road construction.** Road construction is to ease movement of goods and people. The construction process has effects on the people and the environment. Discussion with the stakeholders from the beginning of project planning is critical to successful implementation of the project. The discussion should continue to be with the multiple Government agencies responsible for implementing safeguards measures. This is to ensure that all parties play their parts as when due. This process will help to manage expectation and minimize friction between ERA, contractors/consultants, and PAPs.

35. Improved remuneration and condition of service are key to retain and attract quality staff to ERA. Based on the high priority accorded development of road network across all the level, there has been increased activities at ERA and other lower road authorities. The road construction industry in Ethiopia is getting bigger due to increased activity in the sector. Thus, ERA would need to compete

[29] Lessons specific to APL4 are in the main text of this ICR.

with the private sector in attracting quality staff. Remuneration and condition of service are major factors in considering where high-quality staff in the industry work. It is good that the GOE has recognized the need to give appropriate rewards to ERA staff. The improvement of ERA staff remuneration and condition of service should be a continuous exercise to attract and retain quality staff in ERA. The recent review of ERA staff salary is a good step that should be carried out regularly. ERA will need to invest more management and staff resources to achieve an acceptable level of compliance.

36. ROW management affects implementation of construction works and safety of roads when open to traffic. ERA should continue to engage relevant agencies in management of utilities along the ROW, especially at the preliminary installation of such utilities to be outside the ROW. Clear and timely notification of each respective authority would ensure that utilities are relocated quickly, minimizing delay handling the ROW to contracts. This will go a long way to ensure that the road project projects are delivered within the contract period and budget.

This APL series is an excellent example of strong country commitment, and donor support, of a well-designed investment program linked to sector reforms and institutional capacity building. The world should take note.

ANNEX 8. REVIEW COSTS OF ROAD CONSTRUCTION PROJECTS IN ETHIOPIA-FINDINGS AND CONCLUSION

1. The objective of this study is to assess the impact of the various phases in the project cycle on road construction costs in Ethiopia from project identification to hand over to (a) identify the drivers for increasing costs and delays in contract completion, (b) assess whether these trends are national or regional in nature, and (c) prepare recommendations to improve road sector outcomes in the future.

2. The data collection has been performed through (a) the compilation of data on road projects implemented by ERA in a specialized data set; (b) collection of summarized cost data from Malawi, Zambia, and Tanzania; and (c) a series of interviews with sector stakeholders. Although limited in scope, the data collected from other countries serve to provide benchmarks for the cost of roadworks in Ethiopia.

3. Data have been collected for 90 completed or ongoing road contracts in Ethiopia implemented between 2003 and 2014. Out of these, procurement data were available for 81 contracts, and construction data were available for 70 contracts. In addition, 6 contracts from Malawi, 5 contracts from Zambia, and 10 contracts from Tanzania were assessed. The interviewed stakeholders comprised local and international consultants, local and international contractors, senior managers from ERA, and representatives from development partners.

4. Indicators were developed to perform comparative assessments of the procurement and implementation processes. The indicators included (a) bid analysis, (b) historical price changes, and (c) variations occurring during contract implementation. Costs from different times were converted to January 2015 values using the Consumer Price Index (CPI) for Ethiopia and then converted to U.S. dollar values for comparison.

5. The bid analysis found that the level of competition for roadworks contracts in Ethiopia is fair. The number of bidders has increased slightly over time for both the GOE-funded and donor-funded contracts. Local and Chinese contractors dominate the market with local contractors awarded half of the tendered contracts.

6. The bid range[30] for road contracts is very high, whether for all the bidders in a tender or for the top three bidders. The bid range in Ethiopia is much wider than for Europe or Central Asia.

7. For most contracts, the bid validity period has to be extended due to delays in the evaluation, approval, and award stages. The time elapsed between bid opening and contract signature ranges between 20 days and 759 days, with the overall average of 190 days.

8. For more than half of the reviewed contracts, the contract price is within ±10 percent of the engineer's estimate. On average, contract prices are 1.6 percent higher than the engineer's estimates.

[30] Difference between the winning and the highest bids for a particular contract.

9. The cost of roadworks per kilometer has remained constant or slightly decreased over time when corrected for inflation and expressed in real terms. The average cost for upgrading a gravel road to asphalt concrete standard in January 2015 terms is US$710,000 per kilometer, with maximum and minimum values of US$1.04 million and US$504,000, respectively. The costs of design and build (DB)[31] contracts appear to be in the upper range when compared to design, bid, and build (DBB)[32] contracts.

10. The unit rates for the majority of types of work have also decreased over time when corrected for inflation and expressed in real terms. There is no significant evidence of bidders targeting unit rates for items where increases in quantities might be expected.

11. The total contract cycle needs to be taken into account in selecting the procurement method because contracts using post qualification were found to have larger time and cost overruns than those using prequalification despite the reduction in time to the commencement of works that can be achieved using post qualification.

12. Extensions of time rather than contract variations have led to cost increases during contract implementation. Time control is therefore key to limiting cost increases.

13. Cost increases during contract implementation due to variations or claims, although not including price escalation, are restricted to 20 percent of the signed contract value for almost 80 percent of contracts. For 60 percent of contracts, the revised cost is either below or within 10 percent of the signed contract value although there are cases where the revised cost is 50 percent or more than the contract value. Most DBB works contracts had one or more variation orders, and for more than 75 percent of contracts, variation orders were issued due to design modifications. Requests from local administrations to modify the road design in towns or modifications in scope initiated by the client were the other major causes of contract variations.

14. There was minimal cost increase for DB contracts. The analysis found that the number of bidders, pavement type, financier, contract length, contract amount, percentage of structures, and percentage of mountainous and rolling terrain were statistically significant determinants of cost overrun.

15. The contractual provision for price adjustment gives rise to a substantial cost increase in nominal Ethiopian birrs in roadworks contracts in Ethiopia. For projects completed on time, the increase due to price adjustment is about 20 percent of the initial signed contract value, while for projects with time overruns, the price adjustment shows an increasing trend and values reach 40 percent of the signed contract value. The price adjustment is higher for contracts performed by foreign contractors. However, the price adjustment for contracts that are partially paid in foreign currency appears to decrease as the proportion of foreign currency payment in the contract increases.

[31] DB contract format, in which the contractor is responsible for preparing the final design and the construction of the civil works.
[32] DBB; the conventional admeasurement contract format.

16. The increase in contract cost due to price adjustment during implementation has been found to be lower than the increase in contract value that would result from the application of CPI inflation over the contract period.

17. Some contracts have particularly long extensions of their completion dates, and for 16 percent of contracts, the delay in completion of the works is longer than the original contract duration. Contracts financed by the GOE and performed by local contractors have longer time overruns than those contracts financed by donors. The time overrun for contracts with foreign currency payments tends to be lower. Time overruns are reducing over time, with more recent contracts showing shorter time overruns. Time overruns for recent DB and DBB contracts appear to be similar. More than 90 percent of contracts include one or more EOT requests. The main reasons recorded for EOT requests are: additional works, adverse weather, shortage of materials, and delay in approval of design/design changes. However, stakeholder feedback indicates that obstruction of the ROW is also a major contributing factor to delays.

18. Based on comparisons with a limited number of contracts from elsewhere in the region, the unit rates for roadworks in Ethiopia are generally similar to unit rates in Malawi and Zambia. The costs of earthworks activities in Ethiopia are comparable to those in Malawi, but higher than the corresponding costs in Zambia. The unit rates for base and sub-base pavement layers in Ethiopia are comparable to those in the other two countries. The average unit rate for double bituminous surface treatment in Ethiopia lies between the averages for Malawi and Zambia, while the rate for asphalt concrete in Ethiopia is comparable to the one sample contract from Zambia.

19. The average cost per kilometer for the new construction of paved roads in Ethiopia is 37 percent higher than the cost for the one comparable contract from Malawi, and 18 percent higher than the cost of projects in Tanzania.

20. The overall conclusion that can be drawn from the analysis is that the road sector in Ethiopia is in a relatively healthy state in terms of costs trends. The findings from the study will provide a sound base for planning future work to enhance the performance of the road sector in Ethiopia.

21. The study made the following recommendations to improve the efficiency of roadworks projects in Ethiopia:

- Continue to build the capacity of clients, consultants, and contractors in the road construction sector in Ethiopia. The general lack of capacity has been identified as a critical issue by all stakeholders and at all phases, from planning to implementation.

- Improve project planning and the time allocated for the feasibility, design, and implementation stages. The time should reflect the specificities of each project, including site accessibility, security, weather conditions, terrain, and complexity of works.

- Early consultation with local administrations to agree the scope of the design where roads pass through towns is crucial to avoid delays in project implementation.

- Timely relocation of electrical utilities. Agreement is needed on the most effective process for the timely relocation of electrical services that block the ROW.

- Improved quality of designs and design reviews. Poor designs caused variation orders in 70 percent of contracts. This was confirmed by stakeholders, all of whom identified design quality as a major concern.

- Improve time control in all phases of project procurement and implementation.

- Price adjustment leads to an average increase of 20 percent in contract value over the planned contract duration. An average increase of a further 20 percent in contract value results when a contract is extended.

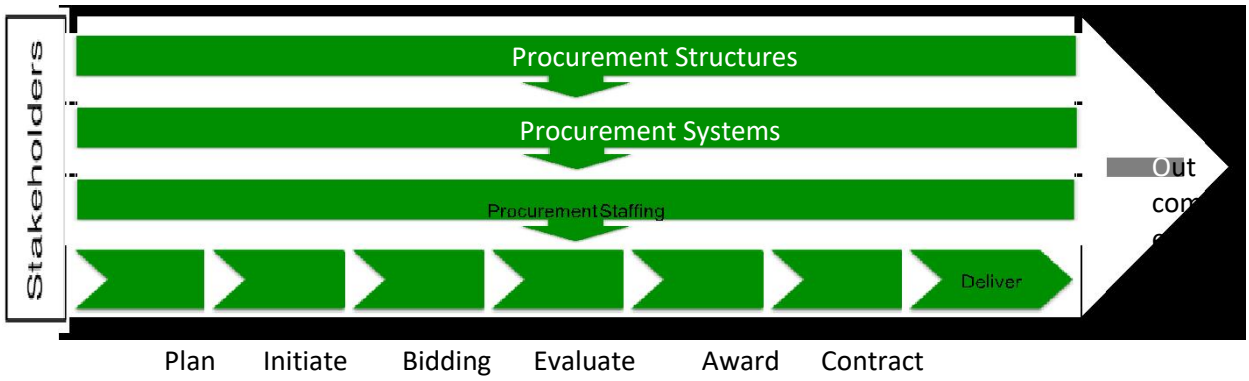
- Continue with the implementation of ERA's management systems for establishing cost estimates and to monitor and assess contractors' and consultants' performance. Initial results are encouraging, allowing better selection of contractors and consultants.

ANNEX 9: SUMMARY OF PROCUREMENT VALUE CHAIN ANALYSIS REPORT

Overall Findings and Recommendations

1. The procurement value chain consists of a matrix of systems that are interdependent. These systems may be summarized as shown in figure 9.1 below.

Figure 9.1. The Procurement Value Chain



2. The study found that achievement of the objectives in the procurement value chain in the Ethiopian context was suboptimal. Key challenges were observed in procurement structures, staffing, and management of the procurement process. Challenges in these areas affected fairness, economy, efficiency, effectiveness, transparency, and accountability.

3. The following recommendations are made not only to address the identified bottlenecks but also to help in transforming procurement and contracts management to add value in development projects:

- The study found that data collection and analysis were not systematically carried out. Investment in procurement market research, data collection, and systematic monitoring of performance of the procurement systems requires significant improvement. The Government's stated objectives to implement the public procurement proclamation and framework contracts cannot be measured and monitored unless data are systematically collected and analyzed to inform policy decisions. The Government should implement an effective Procurement Information Management System.

- The study found that it took an average of 373 days to award a large-value World Bank-financed contract and 219 days to award a Government-financed contract from initiation of the procurement process to contract signature. Internal administrative reviews and approvals constituted 24 percent of the time in World Bank-financed projects and 36 percent in Government-financed contracts.

- The study results suggest that procurement under the Government-financed contracts had significantly more redundant time of 130 days compared to 97 days under the World Bank-financed contracts. The cost of each procurement transaction was estimated at ETB 20,000. Innovative approaches in procurement coupled with on-time procurement could have saved about ETB 814,705,624 in the 137 reviewed transactions or an average of ETB 5,946,756 per contract. The lost benefits in service delivery due to delays were enormous. Streamlining the contracts review process and timely actions during the procurement process would improve efficiency and timeliness of procurement and service delivery.

4. About 76 percent of the surveyed procurement staff were reported to have no professional qualification in procurement. At the same time, career progression was one of the concerns of the interviewed staff. Creating a career profile for procurement staff, implementing professional certification in procurement and creating a national professional body for procurement staff would go a long way in increasing staff skills, improving procurement processes and outcomes, and retention of procurement staff.

5. The Government had started implementing centralized procurement arrangements for strategic and common use items at the federal level, but the use of information technology systems was limited mainly to the development of websites. To build on the gains already made, innovative procurement approaches and practices such as framework agreements and e-procurement could help the Government achieve value for money and economy, expand bidder participation, and streamline procurement process time. Efforts should be made to introduce and strengthen the approaches in framework agreements and e-procurements.

Key Findings and Recommendations on Specific Aspects of the Value Chain

Procurement Structures

6. The Public Procurement and Property Administration Agency (PPPAA) had made significant strides to ensure the procurement system was in place and in line with international best practices. Areas that would require attention include building capacity of procurement auditors, strengthening the procurement research unit, revising standard bidding documents, and assisting the establishment of a national professional body for procurement and property administration staff.

7. The Complaints Board was in place and doing its duty as required in the Procurement Proclamation. A more independent board would enhance confidence in the complaints system. This would require a revision of the Procurement Proclamation coupled with capacity building of the board members.

8. The Public Procurement and Property Disposal Service had made significant strides in framework contracting. Efforts should also be made to clarify the difference between framework contracts and framework agreements to enable the agency to engage more in framework agreements that allow public bodies to place call-off orders as and when required. It is recommended to build the capacity of this important national agency and create links with similar regional agencies.

Internal Structures

9. The head of a public body has specific responsibilities in the Procurement Proclamation, which, if implemented, would enhance the public procurement system. However, significant efforts are required to ensure that heads of public bodies establish procurement directorates, the staff are trained, and procurement plans are in place. The sensitization of heads of public bodies on the importance of establishing and capacitating procurement directorates is required.

10. The Procurement Endorsing Committees were established in the public bodies, although referred to in different terms such as Main Bid Committee, Contracts Committee, or Large Procurement Committee. The specific functions of this committee were set in the Procurement Directives. However, in practice, the meaning of endorse was unclear, causing confusion as to what exactly had to be endorsed in the procurement process. A revision of the Procurement Proclamation and Procurement Directive is required to clearly specify the functions of the committee, most likely limiting it to award of contract, or redefine it as an ad hoc evaluation committee.

11. Evaluation committees were established for the reviewed contracts. The members did a fairly good work in evaluating bids. However, in some cases, the committees lacked the input of procurement specialists to ensure the evaluation and reports met the required standards. Issues were noted in the evaluation of bids, especially in the interpretation of what constituted minor or major deviations. These issues may be resolved by having a procurement unit staffed with professionals to manage the key issues in evaluation. Standard guidelines on the evaluation of bids and proposals are required.

12. The Procurement Management Units or directorates were in place in the reviewed public bodies because most were beneficiaries of World Bank projects that required establishment of such expertise. Elsewhere, the setting up of the units was not consistent across entities, as recent procurement audits attested to lack of functional procurement management units.

Procurement Professionals

13. About 81 percent of the 95 procurement staff surveyed for this study raised concern about their low remuneration. About 35 percent of the staff intended to leave their present entity in a year. Still a sizeable proportion of 46 percent were unsure if they could leave or remain in their present entity, suggesting a zero-sum situation where available jobs outside the entity might not be any better than the present one. About 78 percent of the staff found the nature of their present job interesting, ruling out the nature of their current work as the reason for leaving.

14. The procurement staff without procurement qualification were 76 percent, while the 15 percent with certification were largely beneficiaries of the World Bank sponsored procurement training at the Ethiopian Management Institute. Given that 76 percent of the staff had no procurement certification, the skills were largely gained on-the job, which might not necessarily be the best practice. The risks of carrying over poor procurement practices among staff were very high.

15. The staff lacked skills in procurement planning, especially in market pricing and update of the plans. The skill levels in procurement of works and consultants were about average; those for contract

management were below average. These findings suggest a need for professional certification in procurement and a stepped-up effort in capacity building and continuous training.

Procurement Systems

16. The Procurement Proclamation was under review. The rules could be enhanced if a 'public body' is clearly defined and the issue of maintaining the supplier list addressed. One major issue to be reviewed in the revised law is the award criteria: the use of the lowest evaluated price versus the most economically advantageous tender.

17. The procurement audit manual in use at the PPPAA was mainly informed by financial audit as the focus. The manual should be revised to be more suitable for procurement and contracts audits.

18. The framework contracts manual was detailed and contained most of the guidelines required in framework agreements. Policy makers should be sensitized on the difference between framework contracts and framework agreements to enable public bodies to use framework agreements to place call-off orders as a more efficient approach than existing framework contracting.

19. The revised standard bidding documents were largely of good quality but required some revisions to make them user friendly and take account of revisions in the Procurement Proclamation. There were concerns about the quality of the standard request for proposal document. The bidding documents should be revised to bring them to required standards and be in line with the revised Procurement Proclamation.

20. The study reveals that market price surveys were quite important as a basis for procurement policy and as a guide to placing procurement contracts. However, there was need for staff capacity at both the PPPAA and the public bodies to perform this task. Moreover, a strategy for systematic design, collection of market prices, and analysis to inform decision making is required within the PPPAA and procurement units in public bodies. A fully functional Procurement and Property Management Directorate in each public body that is capacitated is the first step toward achieving this objective.

21. Procurement planning systems were seldom in place in the GOE-funded procurements. The GOE projects had plan prices that on average were two times below the market prices, especially in the roads and financial sectors, and specifically in works contracts procured through the National Competitive Bidding (NCB) method. The cost estimates for the World Bank procurements were closer to the contract award prices. These results suggest that the GOE public bodies should enhance their practices in preparing procurement plans. The use of market prices closer to bidding time to update procurement plans should be the best practice. The World Bank practice of asking public bodies to update their procurement plans before tendering yielded positive value.

22. The use of framework agreements is a good strategy to ensure public bodies achieve value for money in reduced transaction cost. However, the rule on 60-40 contract allocation is a controversial one and should be resolved. Framework agreements should be designed in a way to enable public bodies place call-off orders instead of waiting long for delivery of framework contracts.

Procurement Process

23. The GOE-funded procurements were underbudgeted by two times below the market prices. The cost estimates for the World Bank procurements were closer to the contract award prices.

24. Goods and works contracts that were procured using postqualification had higher completion time overrun of 145 percent compared with those prequalified at 106 percent. Moreover, the average cost per kilometer of a road in the GOE postqualified contracts was ETB 12,449,514 while that of the World Bank prequalified contracts was ETB 8,761,686—a difference of 42 percent in favor of prequalified contracts.

25. These findings support the assertion that prequalification leads to more capable firms that implement projects largely within contractual time lines and save on overall project procurement and implementation time. These and other study results suggest that carrying out prequalification processes in goods and works add value in the public procurement system.

26. The GOE and World Bank-financed projects attracted an equal number of 13 competing consulting firms. These results suggest a good pool of consultants interested in doing business irrespective of whether the funding source was the GOE or the World Bank. However, on average, the consultant short list process took 128 days compared to the recommended standard time of 35 days. Thus, entities overshot this period by 73 percent. Skills in evaluation of consultant expressions of interest should be refined through training of the procurement units as well as the evaluation committee members. Guidelines on consultant short-listing are also required to standardize best practices in this important phase of the consultant selection process. This action would save about 26 percent of procurement time spent on consultant short-listing.

27. Public bodies made commendable efforts to prepare bidding documents to meet their requirements given existing skills among staff. However, the perception of bidding documents being too bulky, inadequate information and instructions given to bidders, systemic issues emanating from the Procurement Proclamation, and the two-envelope system led to less than expected quality of bidding documents.

28. The net effect was an average of 16 bid clarifications and extension of bid submission by 19 days that could have been avoided were the bidding documents prepared to the required quality. The most affected were the GOE projects, and those that used International Competitive Bidding (ICB) and NCB methods, and cut across all sectors reviewed in this study. The average time taken to approve bidding documents was 38 days, the roads and water sectors taking the longest time. A revision of the standard bidding documents is recommended to correct issues noted in this report. Training of staff in the preparation of quality bidding documents is needed. The aim is to reduce the overall procurement time by 21 percent through preparation of bidding documents to the required standards.

29. Public bodies delayed to start bid evaluations for nine days. The technical evaluation of bids took an average of 33 days. The delay in the notification of bidders for financial opening including the notification time all added a further 20 days. It took an average of 24 days to perform financial evaluations, largely attributable to the two-envelope system in goods and works contracts. The bid

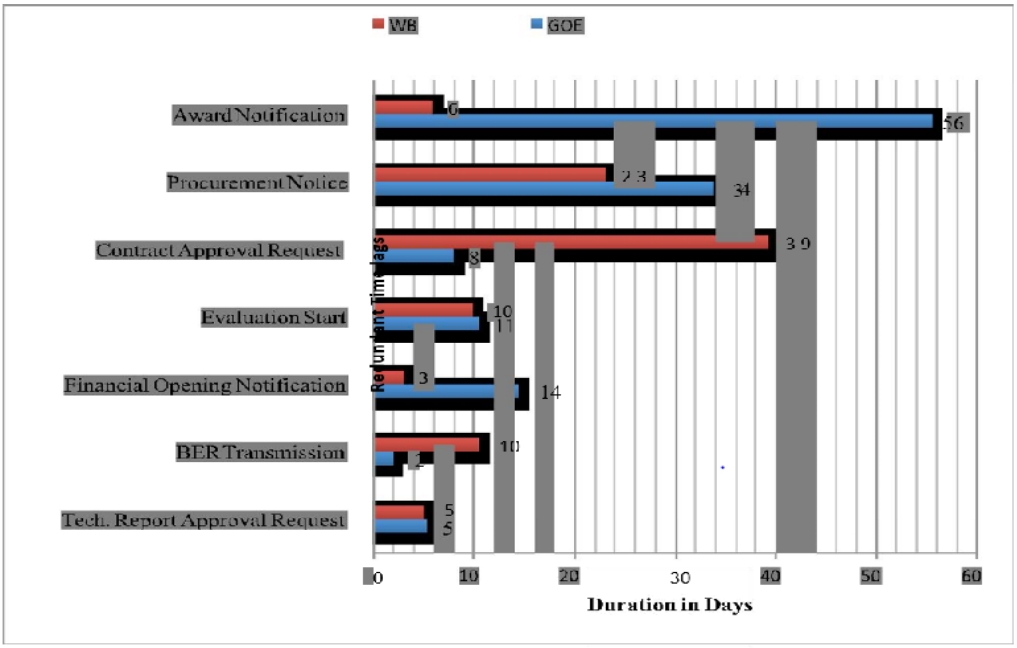
evaluation time including time lags averaged 86 days. The practice of a two-envelope system for goods and works should be avoided.

30. Public bodies took the longest time of 78 days to approve the evaluation reports, both technical and financial. Of this duration, the Procurement Endorsing Committee (PEC) took 21 days, the head of the public body 37 days, and senior management team and board of directors 22 days. The role of the PEC should be redefined as an ad hoc evaluation committee. The role of the board should only be to approve the budget and procurement plan. These measures would reduce 36 percent of the evaluation time that internal approvals currently take.

31. The World Bank took an average of 53 days to approve the bid evaluation reports and recommendation for contract award. This time was taken up in checking errors in submitted reports and working with entities to raise them to required standard. Based on World Bank data in the transport and water sectors, on average, seven submissions were made to the World Bank before the World Bank no-objection was given for procurement of goods and works without the prequalification process against the expected two submissions. Addressing the quality of staff skills and bidding documents would greatly reduce process time.

32. Overall, the redundant time in the procurement process averaged 130 days in the GOE projects compared with 97 days in the World Bank-financed projects. After the approval of the consolidated evaluation report, it took an average of 56 days in the GOE projects and 6 days in the World Bank projects before award notification to the successful bidder. Likewise, after the bidding documents were approved, it took 34 days in the GOE projects and 23 days in the World Bank projects to place the procurement notice. After completion of evaluation reports, it took 25 days in the GOE projects and 8 days in the World Bank projects before the request for approval of contract could be made. The study results suggest that the GOE projects had a significantly more redundant process time than the World Bank projects. Some of the main reasons of delays are shown in the report.

Figure 9.2. Time Lost in Redundant Processes in ICB, NCB, and QCBS Procurements



Note: QCBS = Quality- and Cost-Based Selection.

Table 9.1. Main Reasons for Project Delays

Delays at Public Entities	Delays at the World Bank
• Late start of bid evaluation • Problem selecting evaluators • Too many approval iterations • Delay in committee approvals • Management unavailable to approve • Procurement staff turnover • Procurement plan-budget alignment	• Lack of consolidated comments • Unavailable technical staff to review technical documents • Lack of clear procurement strategy at beginning of procurements

33. Whereas about 6 bids or proposals were received, slightly more than half would pass the technical evaluation, representing 60 percent of the bids or proposals received. There was no significant difference in competition levels based on source of funding. The level of competition among firms was equally likely whether the source of funds was the GOE or the World Bank.

34. The price differentials were analyzed by comparing the lowest and the second-lowest evaluated prices. The price differential was 26 percent in the GOE projects and 27 percent in the World Bank projects. The price differential was higher when the two-envelope system was used (35 percent) compared to when the single envelope was used (16 percent). Better-quality bidding documents including specifications and terms of reference would yield smaller price differentials by reducing errors in price estimation by bidders or consultants. The two-envelope system should be avoided in procurement of goods and works.

35. **Figure 9.3** shows, the average procurement time in days at each phase of the procurement process when using the ICB method. Time for preparation of bidding documents and bid evaluation was relatively more in World Bank projects than GOE projects. However, when using QCBS, the time lines were about the same except in the preparation of request for proposal documents (**Figure 9.4**).

Figure 9.3. Comparative Days' Time Lines in ICB Procurement Process

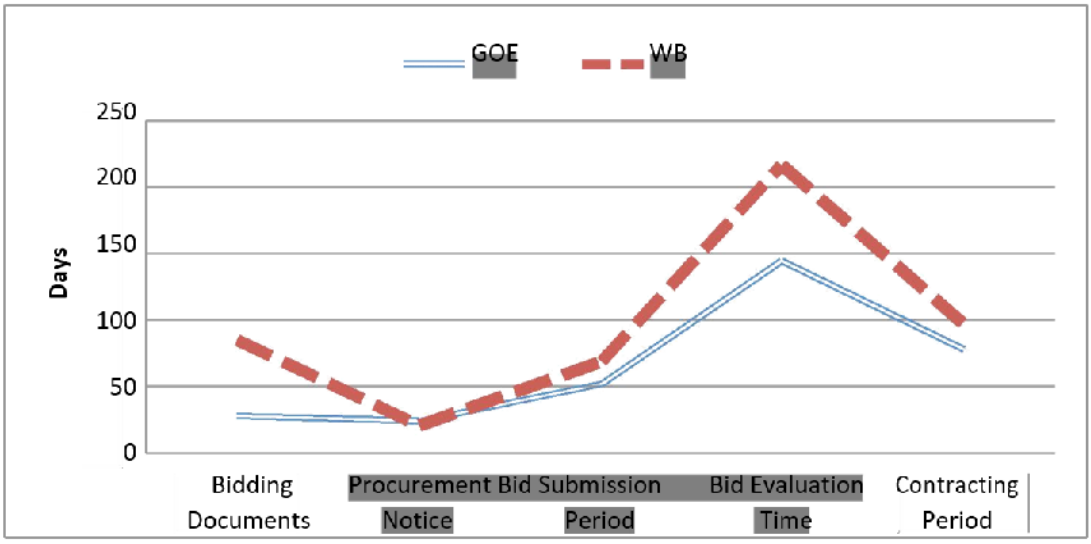
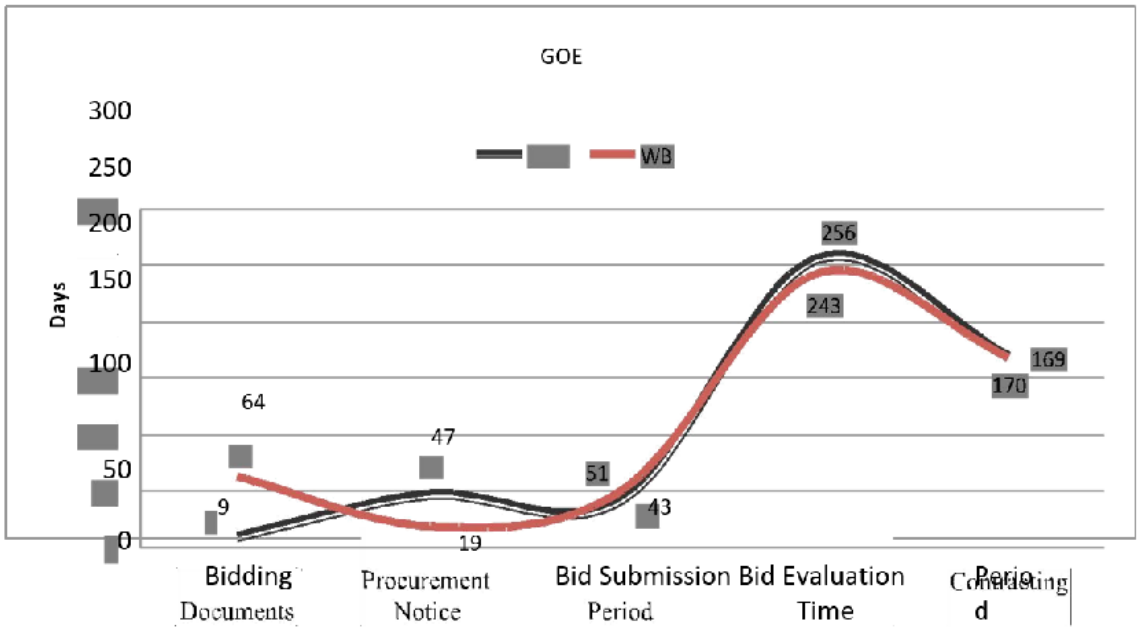


Figure 9.4. Comparative Days' Time Lines in QCBS Procurement Process



36. Review of recent World Bank data in the transport sector revealed that, excluding bid submission period, the share of overall procurement time from first submission of documents to the World Bank to award of contract was 77 percent to GOE and 23 percent to World Bank in consultancy services and 65 percent and 35 percent, respectively, for works. In the water sector, the attributable proportion of time was 76 percent and 24 percent, respectively, for works and goods contracts. These findings suggest that the quality of documents and staff capacity were key issues that affect the overall time to contract award. Each iteration generates additional time especially considering the use of the committee system by the Government.

37. The best practice is to develop procurement plans and use them to deliver procurements within the planned time lines. The award prices were discounted at an inflation rate of 16.1 percent to the date when the prices should have been obtained per the original procurement plan. The total computed lost value in the 137 contracts analyzed for this study was estimated to be ETB 812,304,462. Of this, ETB 549,743,933 representing 67.7 percent of the total lost value was in the GOE projects. Delays in implementation of procurement actions in the GOE projects led to significantly higher lost value than in the World Bank projects. The lost value was 4.7 percent of the discounted contract price. Public bodies may save a significant amount of money through effective implementation of the procurement plans on time.

38. The cost of each procurement transaction averaged ETB 20,010 but could range between ETB 16,264 to ETB 24,066. The total transaction cost for the 137 contracts reviewed for this report was about ETB 2,401,162. Innovative approaches coupled with timely procurement could have saved the Ethiopian economy an equivalent of ETB 814,705,624 for the reviewed contracts alone.

39. The World Bank should review its internal policy on approvals to reduce time taken in issuance of no-objections. The World Bank should issue consolidated comments on documents and evaluation reports to save time on exchanges between implementing agencies and the World Bank.

ANNEX 10: SUMMARY OF FINDINGS OF THE TRANSPORT AND POVERTY OBSERVATORY STUDY

1. The study involved four RSDP IV project roads, namely, Apost-Wendo-Negelle, Mekenajo-Dembidolo, Kombolcha-Bati-Mill, and Ankober-Aliyu Amba-Awash Arba. It was carried out from 2012 to 2016. The four road corridors had a combined length of 667 km, covering 25 *woredas* with an estimated population of about 1.65 million in 2015 (*Woreda* Administration). The *woredas* are located in 10 administrative zones in the Afar, Amhara, and Oromiya regions and Southern Nations, Nationalities, and Peoples' Region. The main objective of the study is to produce evidence-based socioeconomic and income-related influence of the project roads on poverty reduction. The study was a panel study that took five years to complete. In the first year, a baseline survey was done; the subsequent three years were devoted to monitoring and scouting the evolving trends on selected indicators measuring contributions of the project roads to poverty reduction.

2. The study employed a mix of quantitative and qualitative methods of data collection and management, which required prior approval of the client. In the study period, six quantitative surveys were conducted per year:

- Household survey that involved rural and urban families to provide household-based demographic, socioeconomic, and income information
- Survey on service-providing economic entities such as shops, pharmacies, hotels/restaurants, and so on
- Passenger survey that involved travelers using public conveyance system
- Transport survey that dealt with transport-providing enterprises operating in the respective road corridors
- Contractor survey, which involved contractors that ERA engaged to construct the road corridors
- Traffic count survey

3. Each year, focus group discussions (FGDs) that involved communities in the intervention roads and key informant interviews (KIIs) in relevant Government agencies were held at the *woreda* level. Moreover, literature and documents that dealt with impact assessment in relation to road investment and poverty reduction were reviewed.

4. Global positioning system data were downloaded from relevant sources for mapping the different inputs that the study needed.

Findings

5. The findings have been subsumed under the headings of transportation, social services, environmental and social safeguards, marketing, agricultural production and productivity, and income

and share of income spent on food. The main findings that are thought to have a link with poverty reduction are highlighted below by indicators falling under each heading.

Transportation

(a) Distance between home of a household and all-season road for the inhabitants in the project areas, on average, was reduced from over 75 minutes of walk in 2012 to 35 minutes in 2016.

(b) The supply of public transport means, passenger and freight vehicles, in the intervention localities cast against control increased by about 250 percent in 2016 compared to 2012.

(c) In 2016, for the majority of the surveyed beneficiaries (about 80 percent) in those project roads that have become serviceable partially or in full, passenger and freight transport cost either remained the same or increased compared to 2012.

(d) The occurrence of vehicular accident sustaining injury increased by 25 percent in 2016 compared to the base year in the intervention areas.

Social Services

(a) Of the sampled households in all the four road corridors, about 1.0 percent reported to have experienced girls' school interruption in 2016, which compares favorably to 1.4 percent of the households reporting in 2012. In the case of boys' school interruption, it was nearly at par with the girls' fallout (0.8 percent in 2016 against 1.5 percent in 2012) in the ZORI areas. The 2016 inter-road corridor variation was considerable ranging from 0 percent in RC3 and RC4 to 2.2 percent in RC2 in the case of girls, and with boys' dropout, the range was from 0 percent in RC3 and RC4 to 1.8 percent of the sampled interviewees reporting interruption in RC1. The variation between intervention and control roads was marginal.

(b) In all of the four road corridors the majority (average 60 percent) in 2016 rated the quality of health services offered to them in the nearby health facilities compared to 47 percent in the base year. The 2016 inter-road variation ranged from 51 percent of sampled households reporting satisfaction in RC3 to 65 percent in RC1. The difference between intervention and control roads was not significant.

(c) The upgraded roads are reported to contribute to improved health of residents along the road corridors. The main indicators used to assess the contribution of road infrastructure on quality of health services include number of health facilities, number of health professionals, quality of health services, time spent to travel to the nearest health facility, awareness about HIV/AIDS, immunization program for under-5 children and child delivery. A survey of the project corridors indicated that these indicators improved over the period 2012-2016. For instance, the number of clinic, usually associated with urbanization, increased by 50 percent. This rise could be due to increase in population normally associated with provision of infrastructure. Furthermore, time spent to travel to health facilities improved due to better condition of roads. The delivery of children in health clinic increased by 50 percent within the study period (2012-2016). This increase could be attributed to the improved services at

health facilities, availability of ambulance services, improved roads, availability of trained birth attendants at the health facilities, and level of awareness by women, in particular pregnant mothers. However, it was reported that the people interviewed indicated that the improved roads were the main contributor.

Environmental and Social Safeguards

6. There have been positives and negatives in relation to environmental and social safeguard issues. Examples of positives include the following:

(a) The four project roads provided a number of new jobs for a duration ranging from 4 months to 6 months. About 48 percent of the employed persons were unskilled, 25 percent were semiskilled, and 27 percent were skilled workers. The female share in the employment opportunities was about 8.5 percent.

(b) Pedestrian walkways have been constructed that allowed improved movement of people and goods, in the town sections in particular.

7. Examples of negatives include the following:

(a) In some localities, the dust was strong enough to affect traffic movement and cause vehicle accidents while construction has been ongoing.

(b) Complaints regarding compensation were raised in all road corridors. The details for size of land lost for the road construction and the number of PAP who have been compensated for the loss of their produce and the amount of compensation payment made to PAP is currently being worked out by ERA.

(c) The problem of flooding has been widely observed in the Mekenajo-Dembidolo road corridor, where several coffee-growing farmers reported losing coffee trees and other perennial crops.

Marketing

(a) Mobility of people and goods increased, especially to markets, by about 42 percent in 2016 compared to 2012.

(b) However, among the interviewed households, 71 percent thought nearby markets were richer in 2012 with goods and services they offered to buyers and sellers compared to 66 percent in 2016.

8. With respect to the number of visitation and richness of markets, inter-road variability was considerable—more frequent visitation to nearby market in 2016 varied from 40 percent in RC2 to 96 percent in RC1.

Agricultural Production and Productivity

9. Crop productivity is a function of use of productivity-increasing agricultural inputs, notably improved seeds and commercial fertilizers in Ethiopia. In 2016, 27 percent of farmers in the project areas used improved seeds against 23 percent in 2012. In the case of fertilizers use, the rate of application, on average, increased by more than 115 percent (1.3 quintal per ha) in 2016 over 2012. Results of FGD and KII showed that the project roads and link roads, especially URRAP roads, had the lion's share for the change, mainly due to improved timeliness in the supply of commercial fertilizers.

Income and Share of Income Spent on Food

10. Household income in the four road corridors on average increased by about 113 percent in 2016 compared to 2012. The highest increase was recorded in RC2 and the lowest in RC4 in the end year. Income-wise in 2016, a female-headed household was poorer by about 20 percent. Inter-road income variability was immense both in the base year and in 2016. The mean income difference in 2016 ranged from ETB 22,500 per household (RC1) to ETB 41,500 per household (RC2). In 2016, average income difference between intervention and control roads was nearly 68 percent in favor of the intervention roads.

Analysis on Findings

11. The project roads brought an enormous decrease in passengers' waiting time at a bus station in all the road corridors except in Kombolcha-Bati-Mille. Waiting time in Kombolcha-Bati-Mille for buses and minibuses increased by about 80 percent and 5 percent, respectively.

12. Satisfaction on richness of markets increased in the past five years among interviewed households in ZORI areas and decreased for non-ZORI households in all of the road corridors except Kombolcha-Bati-Mille. In Kombolcha-Bati-Mille, both ZORI and non-ZORI households showed an increasing trend of satisfaction. The double difference result indicates that the impact on the households' satisfaction in the ZORI areas in all the four road corridors was higher than in the non-ZORI areas. The highest impact was observed in Mekenajo-Dembidolo (about 82 percent) while the lowest impact was seen in Kombolcha-Bati-Mille (about 9 percent). However, looking at the P-values, it is only in Aposto-Wendo-Negelle (P-value = 0.06) and Mekenajo-Dembidolo (P-value = 0.001) that observed differences are significant at the 10 percent and 5 percent level of significance, respectively. That is, the road improvement showed an impact on the households' satisfaction on consumption items observed in nearby markets only on these two road corridors.

13. Double difference results show that the quality of health facilities frequently used by the surveyed households improved in 2016 in ZORI compared to non-ZORI (control) areas.

14. Findings show that the availability of health facilities enabling relatively safe child delivery drastically increased both in ZORI (65 percent) and in non-ZORI (35 percent) in 2016 compared to 2012. Results of the KIIs and FGDs indicate the contribution of the project roads to have been very significant.

15. In 2016, the percentage of children who were under the age of five having access to immunization program increased both in ZORI and non-ZORI areas in most road corridors. KII and FGD results indicate

that the main impact-creating factor has been the aggressive campaign by the Government-sponsored health extension, while confirming an important share of the project roads, especially URRAP roads.

16. Tendency to save is evolving among inhabitants in the road corridors. The number of households reporting to have savings account in the formal sector financing organizations is rising. Risk aversion to engagement in credit is declining. The project and other link roads have made a difference in the trending.

17. There has been an increase in the use of productivity-increasing inputs such as improved seeds and fertilizers in 2016 compared to 2012, which might have induced crop productivity to rise. The increase in the use of improved seeds and fertilizers, according to FGD and KII results, was because of improved supply of the high-tech inputs at the right time and in the right place, to which the project roads reportedly contributed immensely.

18. Household income in the four road corridors on average increased by about 113 percent in 2016 compared to 2012. Double difference test indicates that only in RC2, the income change is statistically significant, while in RC1, RC3, and RC4, with P-values of 0.35, 0.71, and 0.4, respectively, income change has not been statistically significant.

19. Given the outcomes that evolved from the implementation of the project roads in the four road corridors, based on the findings of this TPO study over the last five years, the study team concludes that the project roads made a significant contribution to reducing poverty in the project areas.

ANNEX 11: LESSONS IDENTIFIED FROM IMPLEMENTATION OF APL1 TO APL3 AND STATUS

1. This annex contains a review of all the lessons identified by the ICR of each of APL1 to APL3. The review is conducted to have an indication of the extent to which lessons identified from a preceding APL were addressed within the follow-up APL and the continuing relevance of the lessons. Generally, the identified lessons were addressed in the following APLs, especially when within the control of ERA management with the exception of those relating to (a) safeguards compliance where ERA needs to invest more management and staff resources to achieve an acceptable level of compliance; (b) poor quality of designs; and (c) design approach to urban sections. A major area on which there has been little success in addressing over the APL relates to terms and conditions of service for ERA staff. The specific areas mentioned above all remain identifiable as lessons from APL4. Finally, the relevance of the good experience from the Ethiopian APL to other countries is noteworthy subject to the presence of strong commitment as has been in Ethiopia.

Table 11.1. Lessons from APL1 to APL3 Implementation

S. No.	Lesson	Status
APL1		
1	Contractual obligations to ensure environmental performance of contractors can be strengthened.	Enforcement of safeguards compliance still a major issue.
2	The urban interface is a complex component of roads projects, which must be approached more systematically.	No meaningful action and so continues to be a relevant issue.
3	Training and capacity building are not as effective as they could be as long as civil service reform is not on the agenda.	Remains a relevant issue.
4	Scaling up of works under the Government's RSDP, both in terms of size and pace, requires redoubled efforts to ensure no loss of quality.	Loss of quality not yet reflected in available data but anecdotal evidence suggests it is due to inadequate designs, quality of contractors and supervisors, and stretched ERA oversight.
5	Mobilization delays continue to be a source of difficulties for both on-time delivery of promised outputs and final project costs; ERA and donor community need to maintain focus and collective purpose to avoid such delays as much as possible and to minimize their financial impact when they do occur.	Significant reduction in occurrence.
6	Road asset management requires needs-based maintenance programming.	Should there be involvement of Road Fund Office in handing over of projects because it pays for future addressing of shortcomings passed over?

S. No.	Lesson	Status
7	To effectively address constraints to accessibility and unmet transport needs, the GOE and its donor partners will need to look beyond the provision and maintenance of road infrastructure, toward a more holistic approach to the sector, including services.	Relevant point seemingly not being addressed. Road is not enough, and the means of using the road also needs to be available. Is rate of growth in traffic commensurate with rate of expansion of the road network? Relevant question particularly with regard to URRAP. On the other hand, as traffic does grow, are there in place needed traffic management systems?
APL2		
1	Technical engineering input during project preparation	ERA to set up a technical panel to provide advice on risk management and value engineering during project preparation.
2	Strategic and holistic capacity building and competitive remuneration to attract and retain the best staff in ERA	Organizational reforms that reflect role of key staff alongside market-competitive salaries needed. ERA maturing strategy needed to position itself against future. Similar to point #3 made under APL1. Yet to be effectively addressed.
3	Project management and thorough investigation of the reasons for cost increases across the entire ERA portfolio of projects	Study 'Review of Costs of Road Construction Projects in Ethiopia' undertaken. Not clear how much of recommendations accepted and being implemented. See annex 7 for summary of findings.
4	Results chain and design of measurable M&E framework	Problem of attribution of achievements in the results indicator to the project. Indicators to be more results focused, for example, reduction in travel time and improved riding quality are more attributable to project interventions. Project design issue for World Bank/donors to be addressed.
5	Need for strategic focus on infrastructure asset management	Implies holistic approach to asset management and ROW definition and protection.
APL3		
1	Importance of planning	Important with regard to link between traffic and land use, which may not be well understood or taken into account in current ERA practice.
2	Quality of designs	Poor quality of design limits reliability of cost estimates leading to cost overruns and delays during implementation. Remains relevant.
3	Safeguards compliance	Need for close support by ERA to contractors and consultants who may not be aware of safeguards policies. What level of support is needed from ERA and from the IDA/IBRD? No specific recommendation made for addressing but remains a major area of concern.

S. No.	Lesson	Status
4	Series of projects	The APL approach facilitated (a) provision of TA over a long period in different areas, (b) capacity building, and (c) institutional strengthening and development of management tools. A lesson from Ethiopia for World Bank operation in other countries.

ANNEX 12. SUMMARY OF BORROWER'S IMPLEMENTATION COMPLETION REVIEW REPORT

Description of Projects and Implementation Assessment

General

1. The main objectives of APL4 are strengthening and increasing road transport infrastructure and its reliability. APL4 improved road conditions by strengthening the existing road pavement structures, expanding road access to rural areas, and improving maintenance, and enhancing the efficiency of the existing main road network.

2. There are three components under APL4: Component 1 - Upgrading of Federal Link Roads and Related Supervision Services; Component 2 - ERA Modernization/Sector Capacity Building; and Component 3 - Network Management Studies. Component 1 consists of five road upgrading contracts, which have been procured using ICB procedures. These contracts were Mekenajo-Dembi-Dolo (three contracts) and Wolkite-Hossaina (two contracts).

3. The five civil works contracts consist of upgrading of 313.6 km of link roads. Components of APL4 are described in the following paragraphs.

Civil Works and Supervision Contract

4. Component 1: Upgrading of Federal Link Roads and Related Supervision Services, which includes the upgrading of

(a) Mekenajo-Dembi-Dolo with total length of 188.1 km, which consists of three contracts:

- Mekanejo-Ayra (Contract 1, 52.06 km)
- Ayra-Chanka (Contract 2, 70.55 km)
- Chanka-Dembidolo (Contract 3, 65.5 km)

(b) Wolkite-Hossaina with total length of 125.5 km, which consists of two contracts:

- Wolkite-Arekit (Contract 1, 60 km)
- Arekit-Hossaina (Contract 2, 65.5 km)

(c) Ankober-Awash Arba with total length of 93 km, which consists of two contracts:

- Ankober-Dulecha (Contract 1, 40 km)
- Dulecha-Awash Arba (Contact 2, 53 km)

5. The road was procured with two contracts. Contract 1 was not procured and Contract 2 was terminated because of the poor performance of the contractors. The was later dropped on APL4. It was agreed with the World Bank to finance the projects from the Government Treasury and now the projects are ongoing by the GOE.

Technical Assistance and Studies

6. Component 2: ERA Modernization/Sector Capacity Building, which includes harmonized Comprehensive Capacity Building and establishment of the HRC

7. Component 3: Network management studies, which includes the Maintenance Need Assessment and Upgrading of Road Financing Study, TPOs, and preparatory studies for the next phase of the RSDP and URRAP

Implementation of Civil Works and Supervision Contract

Mekenajo to Ayra (Contract 1, 52.06 km)

8. Contract 1 involves the upgrading of Mekenajo to Ayra section, which is of 52.06 km length and starts at Mekenajo Town. The project road branches off from Addis Ababa-Nekemte-Gimbi-Assosa main road at 456 km from the capital, Addis Ababa.

9. The contract was signed on June 3, 2011, between ERA and China Hyway Group for the construction works of 52.06 km length of asphalt concrete road; the commencement of the work contract was on October 7, 2011, the original completion date was April 4, 2014, and original contract price was ETB 633.53 million. However, the original completion date and contract price were revised, due to problems encountered during construction. Therefore, the completion date was revised on June 7, 2015, and total disbursement as of May 2017/December 2016 was revised as ETB 712.82 million. The contract was for 30 months excluding the defect liability period and including contractor mobilization.

10. Sheladia Associates Inc in subconsultancy with Hitcon Engineering has signed an agreement on July 8, 2014, with ERA to render the consultancy service. The road was upgraded to asphalt concrete and opened to traffic by 2017.

Ayra-Chanka (Contract 2, 70.55 km)

11. Contract 2 is upgrading of Ayra-Chanka of 70.55 km length. It is a continuation of Mekenajo-Ayra. The project road branches off from the Addis Ababa-Nekemte-Gimbi-Assosa main road at 456 km from the capital, Addis Ababa.

12. The contract was signed on June 3, 2011, between ERA and China International Water and Electric Corporation for the construction of 70.55 km of asphalt concrete road. The commencement of the work contract was October 7, 2011, original completion date was April 3, 2014, and original contract price was ETB 669.14 million. However, the original completion date and contract price were revised, due to problems encountered during construction. Therefore, the completion date was revised to December 15, 2015, and the total disbursement as of May 2017 was revised as ETB 937.65 million. The contract was for 30 months excluding the defect liability period and including contractor mobilization. Renardet Ingeniers

Conseils in JV with UNICONE signed an agreement on July 9, 2014, with ERA to render the consultancy service. The road was upgraded to asphalt concrete and opened to traffic by 2017.

Chanka-Dembidolo (Contract 3, 65.5 km)

13. Contract 3 is the upgrading of Chanka-Dembidolo road project with 65.5 km. It starts at Chanka Town and traverses in the westerly direction until it reaches Dembidolo.

14. The contract was signed on June 3, 2011, between ERA and China Hyway Group Ltd for the construction works of 65.5km length of asphalt concrete road. The commencement of the work contract was on October 7, 2011, the original completion date was April 3, 2014, and the original contract price was ETB 648.55 million. However, the original completion date and contract price were revised, due to problems encountered during construction. Therefore, the completion date was revised on February 7, 2016, and total disbursement as of May 2017 was revised as ETB 700.32 million. The contract was for 30 months excluding the defect liability period and including contractor mobilization. Lea International in JV with UNICONE signed an agreement on July 7, 2014, with ERA to render the consultancy service. Upgrading of Chanka-Dembidolo road with asphalt concrete was completed and opened to traffic on July 28, 2016.

Wolkite-Arekit (Contract 1, 60.31 km)

15. The contract was signed on June 3, 2011, between ERA and China Gezhouba Group Company Ltd. for the construction works of 65.5 km length of asphalt concrete road. The commencement of the work contract was on October 7, 2011, the original completion date was April 6, 2014, and original contract price was ETB 717.44 million. However, original completion date and contract price were revised, due to problems encountered during construction. Therefore, the completion date was revised on April 21, 2015 and total disbursement as of May 2017 was revised as ETB 1105.70 million. The contract was for 30 months excluding the defect liability period and including contractor mobilization. Comptran Engineering and Planning Associates in JV Beza Consulting Engineers PLC signed an agreement on April 12, 2011, with ERA to render the consultancy service. The project was fully upgraded to asphalt concrete and opened to traffic by 2016.

Arekit-Hossaina (Contract 2, 65.5 km)

16. The contract was signed on June 27, 2011, between ERA and Hawk International Finance and Construction PLC for the construction of 65.5 km length of asphalt concrete road. The commencement of the work contract was on October 07, 2011, the original completion date was April 6, 2014, and original contract price was ETB 619.19 million. However, the original completion date and contract price were revised, due to problems encountered during construction. Therefore, the completion date was revised on May 18, 2015, and total disbursement as of May 2017 was revised as ETB 827.19 million. The contract is for 30 months excluding the defect liability period and including contractor mobilization. Comptran Engineering and Planning Associates in JV with Beza Consulting Engineers PLC signed an agreement on April 12, 2011, with ERA to render the consultancy service. The road was fully upgraded to asphalt concrete and opened to traffic by 2017.

Cost and Time Overrun of APL4 Projects

Time Overrun

17. As it can be seen from table 12.1, all contracts were not completed on original contract time. An EOT was requested by each contractor due to problems encountered during construction. ERA approved justified requests for the EOT after series of discussions with the contractor. Major reasons for request for the EOT by contractors and consultants were rainfall, shortage of construction materials such as cements, shortage of construction engineers, and design problems. Time overrun accounts for 43 percent on average for all contracts.

18. Time overrun in APL4 is significant. Significant time overrun in all contracts contributed to significant price escalation and delayed benefits to be materialized from the projects. Table 12.1 shows APL4's time overrun.

Table 12.1 APL4 Time Elapsed

	Original Contract Time (Days)	Revised Contract Time (Days)	Time Elapsed (Days)	Time Elapsed (%)
Mekenajo-Ayra	910	1,264	354	39
Ayra-Chanka	910	1,531	621	68
Chanka-Dembidolo	910	1,193	283	31
Wolkite-Arekit	913	1,200	287	31
Arekit-Hossaina	913	1,321	408	45
Average				**43**

Cost Overrun for Civil Work

19. Cost overrun in APL4 projects was on average 30 percent. Major reasons for high cost overrun in APL4 are the following:

- Price escalation due to rising road constructions
- Variation due to increase in quantity of work
- Claims to delay in ROW clearance, shortage of cement and fuel, shortage of key professionals, and other reasons.

Table 12.2. Financial Cost of the Projects As per the Contract Singed and Actual Disbursement as of May 2017

Project Name	Length (km)	As Per the Contract (ETB, millions)	Actual Disbursement (ETB, millions)	Increasing Cost (%)
Mekenajo-Ayra	52.06	633.53	712.82	12.52
Ayra-Chanka	70.6	669.1	937.65	40.13
Chanka-Dembidolo	65.5	648.6	700.32	7.98
Subtotal	**188.1**	**1,951.2**	**2,350.80**	**20.5**
Wolkite-Arekit	60	717.44	1,105.70	54.12
Arekit-Hossaina	65.5	621.2	827.19	33.16
Subtotal	**125.5**	**1,338.64**	**1,932.89**	**44.39**

Total	**501.72**	**3,289.86**	**4,283.68**	**30.21**

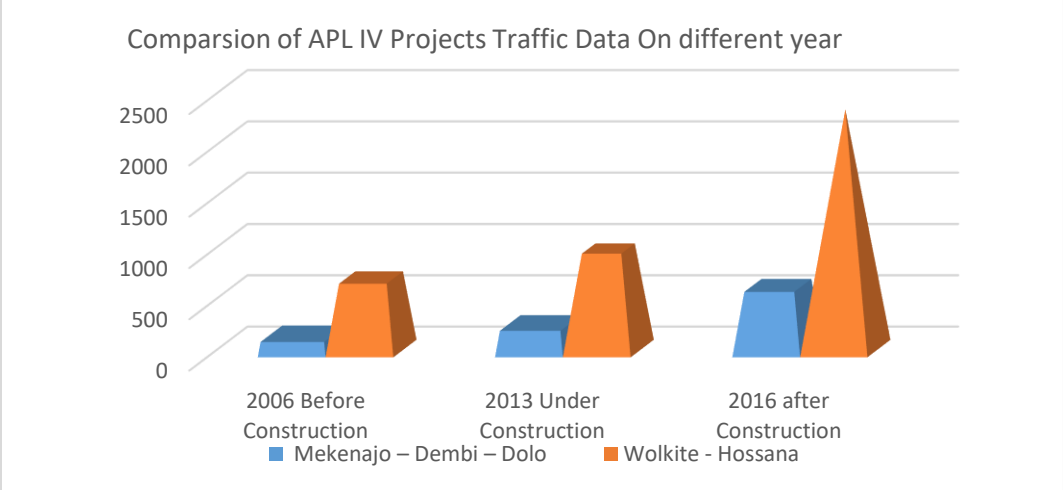
Impact on Mobility

20. Traffic on Mekenajo-Dembidolo and Wolkite-Hossaina has significantly increased after the existing road was upgraded with asphalt concrete.

21. Traffic on Mekenajo-Dembidolo was increased by 330 percent, and on Wolkite-Hossaina by 773 percent in 2017 after completed the upgrading of the road projects. The increase in traffic on Mekenajo-Dembidolo and Wolkite-Hossaina roads that are upgraded from gravel to asphalt concrete is significant and the increase is attributable to significant improvement in roughness and significant reduction in travel time and vehicle operating costs.

22. Traffic on Mekenajo-Dembidolo and Wolkite-Hossaina in 2016 after completion of upgrading with asphalt concrete is higher than the traffic estimated during their respectively feasibility studies. Therefore, upgrading of Mekenajo-Dembidolo and Wolkite-Hossaina road projects under APL4 has a significant impact on traffic mobility.

Figure 12.1.Comparison of Traffic Data on APL IV Road Projects with Feasibility, Appraisal, and Completed Stage



Economic Impact of APL4 Road Projects

23. The impact on the road projects on regional and national economy is best measured by their respective economic rate of return after upgrading. The economic rate of return is significantly higher than what was estimated during the feasibility study.

24. After upgrading the EIRR was found for the base case of Mekenajo-Dembidolo and Wolkite-Hossaina, which was 21.5 percent and 24.4 percent, respectively, while estimation during appraisal (before implementation) was 14.8 percent and 13.7 percent, respectively.

25. This shows the actual EIRR after implementation is higher than the EIRR before implementation by 6.7 percent for Mekenajo-Dembidolo and by 10.7 percent for Wolkite-Hossaina. Table 12.3 shows the

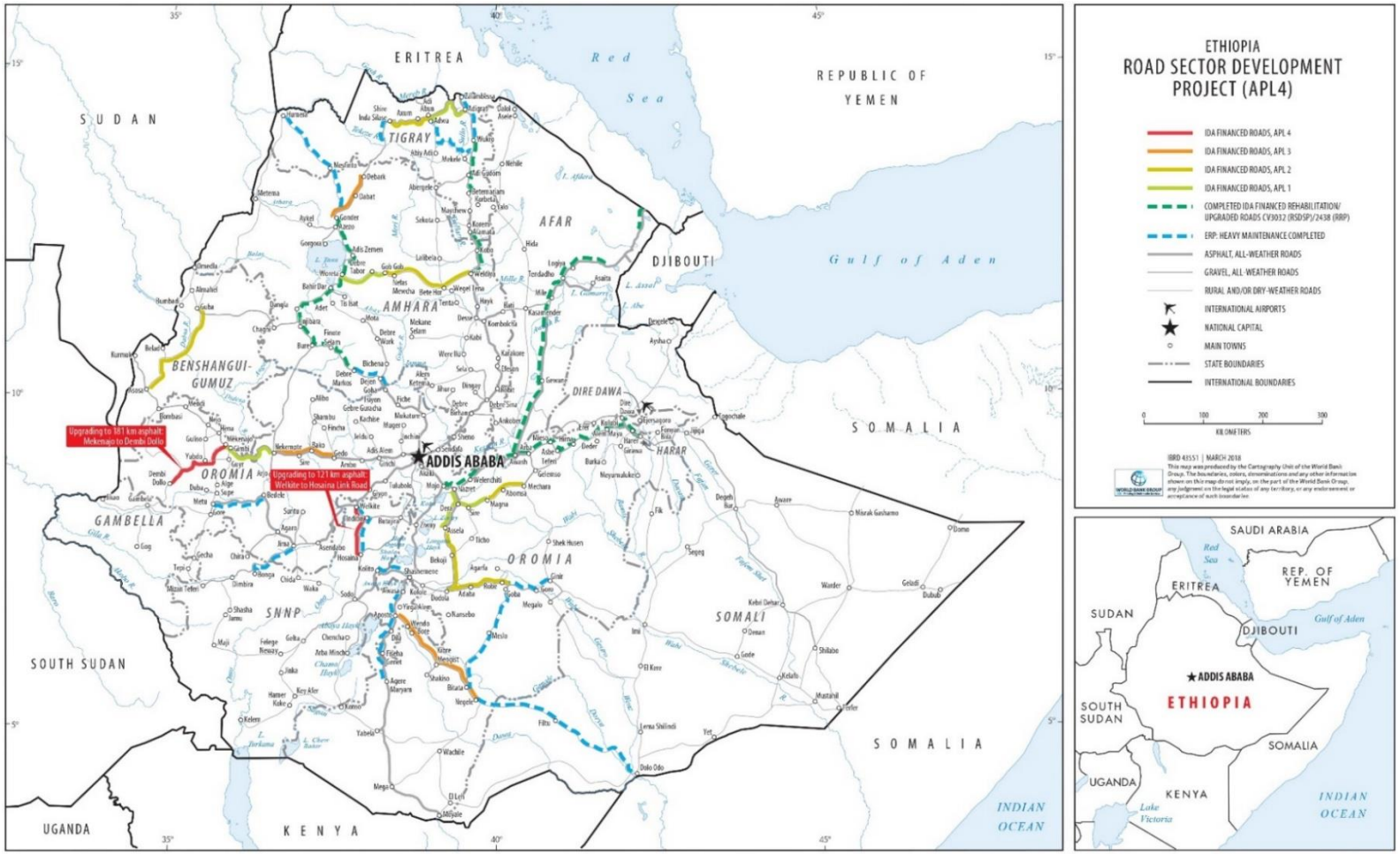
EIRR before and after implementation. Detailed economic analysis before and after implementation is shown in annex 4.

26. The results of economic analysis using HDM-4 model for the project road before and after implementation are summarized in table 12.3.

Table 12.3. Results of the Economic Analysis Before and After Implementation

Road Project	Length (km)	Before Implementation (Appraisal)				After Implementation (Ex Post)			
		Base Case		Benefit –20%		Base Case		Benefit –20%	
		IRR	NPV	IRR	NPV	IRR	NPV	IRR	NPV
Mekenajo-Dembi Dolo	188.1	14.8	491.0	12.3	220.2	21.5	2655	18.6	1617.5
Wolkite-Hossaina	125.5	13.7	246.5	10.8	53.0	24.4	3098	22.5	2291.9

MAP



Source: The World Bank Group