ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

The Intra and Inter Sectoral Integration of Urban Services planning, with particular emphasis of Road, Water and Sewerage, Telecommunication and Power Supply: The case of Inner city, Addis Ababa.

BY

HAILEMAREYAM MULUGETA

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters of Arts in Urban Development and Management

June, 2011

Addis Ababa

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

The Intra and Inter Sectoral Integration of Urban Services planning, with particular emphasis of Road, Water and Sewerage, Telecommunication and Power Supply: The case of Inner city, Addis Ababa.

BY

HAILEMAREYAM MULUGETA

Approved by Board of Examiners **Signature**

______________________ ______________________

Chair person of Graduate committees

______________________ ______________________

Advisor

______________________ ______________________

Examiner

Acknowledgment

Next to Almighty God, I would like to express my appreciation and deepest gratitude for my Adviser Fisha Wegayehu (Dr) for his comment and constructive criticism from inception to completion of the thesis, without his diligent effort the nature of the paper would have been completely different. I would like also to extend my gratitude to Wondimu Abeje (Dr) who shall take the credit for his initiation and motive while he was giving urban service course and even after.

My deepest gratitude and appreciation will also extend to all my friends who helped me morally, financially and giving edition and criticism on my thesis. Though they are too many, I would like to express my deepest thanks for Abadir Umer, Selfegnaw Azene, Abiy Wasiyhun, Mindahun Digafu, Henok Kebebe, Rahel Teshome, Wondeweson Abera, Abenet Ergendu and others whom I didn't mentioned here. You guys you deserved appreciation.

I would like also to extend my deepest gratitude for my family, brothers and sisters who helped me financially and morally during my study.

My sincere gratitude goes to the whole workers in the sectoral office, particularly those who gave me an in-depth interview from each sector. And also want to say thank you the Addis Ababa communication office for their TV program.

The last but not the list, I would like to express my gratitude for the Graduate studies program for financing my thesis, though the money was not adequate, and also want to thanks all the instructors who contribute for my future currier.

Table of contents

Contents **Page**

Acknowledgment i
Table of contents ii
List of tables iv
List of figures vi
List of Acronyms vii
Abstract viii

Chapter One

1. Background of the Study 1
1.1 Statement of the Problem 3
1.2 Objective of the study 5
1.2.1 Specific objective 5
1.2.2 Research questions 6
1.3 Research Methodology 6
1.3.1 Data collection Method and Sampling Technique 7
1.3.1.1 Primary Data 7
1.3.1.2 Secondary Data 9
1.3.1.3 Data Triangulation 9
1.3.2 Method of Data Analysis 10
1.3.3 Study Area Selection and Justification 10
1.4 Scope of the Study 10
1.5 Significance of the Study 11
1.6 The Organization of the Paper 11
1.7 Limitation of the Study 12

Chapter Two

2. Literature Review and Theoretical Frameworks 13
2.1 Theoretical Framework 13
2.1.1 The Concept and Need of Coordination 14
2.2 Instruments for the Coordination of Infrastructure 17
2.2.1Coordination at Planning Stage 17

2.2.2 Coordination of Projects and Capital Works Plan 19
2.2.3 During Construction Stage 24
2.3 Empirical Evidences on Coordination 30
2.3.1 Experience from Indonesia 31
2.3.2 Experience from Turkey 31
2.3.3 Experience from South Africa 32
2.4 Infrastructure and Utilities in the Context of Ethiopia 33

Chapter Three

3. Background of the Study Area 37
3.1 Population and Location of the Study Area 37
3.2 The City profile 38
3.3 Major Urban Services in the Study Area 40

Chapter Four

4. Data Presentation and Analysis 42
4.1 An Overview of Practice of Integration in Addis Ababa 42
4.1.1 Overview of Respondents Characteristics 44
4.2 Reasons for Frequent Road Excavation 47
4.2.1 Reasons for Frequent Excavation Inner City Vs Expansion Area 48
4.2.2 Delaying and Level of Maintenance 57
4 .3 Utility Database and Asset Management 61
4.3.1 Database for the previous and New Utilities 61
4.4 Cause and Consequences of Integration and Related Issues 63
4.4.1 Consideration for the Future Development 65
4.4.2 Alternative Financial Source to Fill the Budget gap 74
4.5. The Current Status of Integration at Intra and Inter Sectoral level 76
4.5.1 Level of commitment for coordination 76
4.5.2 The current Status of Integration among Infrastructure providing Institutions 80
4.5.3 Major Reasons for the Low level of Integration 84
4.6 The Absence of Integration and its Effect 86

Chapter Five

5. Conclusion and Recommendation 89
5.1 Conclusions 89
5.2 Recommendations 92

List of Tables **page**

Table: 1.1 Distributions of Respondents from each Institution and Departments..... 8

Table:1.2 Distributions of Interviewed People..... 9

Table 2.1 Area of Focus for Practice 19

Table: 2.2 Option for private participation 26

Table :2.4 Minimum clearance between telephone facilities and other utilities..... 36

Table :3.1 Population and housing condition in the inner city..... 37

Table :3.2 The Rood Coverage in Addis Ababa..... 38

Table :3.3 Population Distribution and Road Coverage of Inner City 39

Table: 4.1 Frequency and percentage of respondents by their educational level. 44

Table: 4.2 Educational backgrounds of respondents and their assigned Position. 45

Table: 4.3 Name of employer and the provision of on job trainings..... 46

Table: 4.4 Chi square summaries for different variables 46

Table: 4.5 Reasons for Frequent Trenching of asphalts reported by respondents 47

Table: 4.6 Reasons for excavation of Inner city reported by respondents..... 48

Table: 4.7 Reasons for Carriage way excavations as reported by respondents 50

Table: 4.8 Timing of trenching as reported by respondents of Utility providing institutions 54

Table:4.9 Types of technology used for trenching by utility providing institution..... 55

Table: 4.10 Availability of Cut Fee Rule reported by utility providing institutions..... 57

Table: 4.11 Respondents view towards the Standard of Maintenance 58

Table: 4.12 Responses of employee to the Availability of Database..... 61

Table: 4.13 The minimum plan year of urban services providing institutions 64

Table:4.14 Respondents opinion towards the Consideration of Future development..... 65

Table: 4.15 the respondents opinion towards consideration of utilities by the city's Master Plan..67

Table: 4.16 Respondents opinion towards use of Master Plane as reference 70

Table: 4.17 Employee's response on the existence of Plan change 71

Table: 4.18 Respondent's opinion to the Level of Commitment for Coordination by their respective institution 76
Table: 4.19 Respondent's opinion towards Role Modelness of their institution 77

Table: 4.20 Respondent opinions towards the Current Status of Departmental Integration by their respective institution 78

Table:4.21Respondents opinion towards the Current status of integration among infrastructure providing institutions 80

Table: 4.22 Reasons for the low level of integration by respondents 84

Table: 4.23 Respondents opinion to the responsible institution for coordination 85
Table: 4.24 Consequences of Integration reported by respondents 87

Table 4.25 money spend for utility relocation in the year 2010 88

List of Figures page

Figure 2.1. Conceptual Frame work For Integrated Infrastructure & service planning..... 13

Figure 2.2, Figure showing the standard of utility arrangement..... 35

Figure 3.1 Figure showing annually constructed asphalt roads (1998-2009)..... 39

Figure 4.1 picture showing Tele cable box on the walkways 50

Figure 4.2 picture showing excavation of roads within the carriage of way.....52

Figure 4.3 Fig showing the number of respondents with frequently excavating institution reported by AACRA.....53

Figure 4.4 picture showing excavation of roads using "Doma" in the inner city 56

Figure 4.5, Picture showing road maintenance below the standard..... 59

Figure 4.6 Picture showing Un maintained roads 59

Figure 4.7 Figure showing types of communication among the stakeholders 82

Figure 4.8, photo showing walking of people on the carriage ways 87

Acronyms

AACRA	Addis Ababa city administration road authority
AASHTO	American Association of State Highway and Transportation Officials
AAUPII	Addis Ababa Urban Planning and Information Institute
AAWSA	Addis Ababa water and sewerage authority
CCTV	Closed circuit television
EEPco	Ethiopia Electric Power corporation organization
ET	Ethio Telecom
ETC	Ethiopian Telecommunication Corporation
GIS	Geographic Information System
LAGI	Local agency guide line
MUWD	Ministry of works and urban development
NRC	National research center
NRC	National research centre of Canada
ORAAMP	Office for the Revision of Addis Ababa Master Plan
PASDEP	Plan for accelerated and sustainable development to end poverty
PPP	Public private partnership
ROW	Right of way
SUE	Subsurface Utility Engineering (SUE)
TPUCC	Toronto public utilities coordination committee
WB	World Bank

Abstract

Rapid population growth as well as dense and plan less structuring lead to an increase in demand for utilities Services. Consequently, increase the resources use for the construction and maintenance of utilities. Moreover, damages to roads and sidewalks during the construction and maintenance of utilities cause problems in daily life create financial burden etc. The rapid population growth in collaboration to haphazard planning of urban sectors may cause for devastating urban structure and inevitable physical disruption. Since the inner city is old and place of dynamism frequent construction and excavation is common phenomena. Frequent utility excavations in roads, non-standard filling and compressing in patch Works impair quality of asphalt-paved roads and sidewalk and decrease their economic life. This situation leads to use of scarce resources for double construction of asphalt-paved roads and sidewalks as well as economic losses, and vehicle and pedestrian traffic is adversely affected. "Excavation could be said an evil necessity" however, it is possible to minimize its effect. The primary objective of coordination is to retain or minimize this excavation and implement the potentially conflicting works in an efficient and effective manner moreover, eliminates unexpected conflicts with utilities, avoids un necessary utility relocations, reduce delaying of works and repetition, minimize social and economic costs and the like are the major benefits.

The objective of this research is to assess both the intra and inter sectoral integration of urban service planning's in the inner city of Addis Ababa, the study focus on the four institutions that have direct relation with this study. Moreover, four departments that have direct relation with the issue drown purposely. Out of the total workers 68 respondents randomly selected to represent the whole group. Beside, in-depth interview made from the virtual committee and other officials. Personal observation, TV talk show and secondary data have served for collecting data.

The research found that though the people are aware about integration the current status rated as poor but, still considerable number of people rated as medium the intra level integration. As shown in the analysis different elements have been mentioned as major factors for the low level of integration namely institutional arrangement, lack of strong controlling body, good governance, lack of finance, property issuance, and short plan year and frequent plan changes are listed. Moreover, this has considerable effect on the performance of all sectors as individual and as a group. The research found that the effort made by utility providers and road authority is very less even the regulatory gave lesser emphasis for the issue though the effect is significant. Utilities are not registered yet, short plan period, roads neglected for considerable period of time un maintained. Finally to conclude the area though integration is very important it has been neglected in academics discourse and practical issues, the absence of policy coupled with the haphazard planning and other similar factors exacerbate the situation in the inner city than the periphery. Recommendation on multiple trench less technology and registration of utilities, institutional arrangement and the involvement of private sectors have been forwarded. Areas the involvement of private sectors and the policy and related issues including the effect of the city master plan on these utility provision and performance of the road forwarded for further investigation.

Chapter One

1. Background of the Study

As most developing countries, Ethiopian cities characterized by various critical problems. Among them, unemployment, poverty, poorly developed infrastructure, inadequate shelter provision and poor social and economic facilities tend to be significant. It is obvious that all these problems are resulted from the mismatch of demand and supply, and lack of good planning and governances. The supply of infrastructure and service is lagging behind the fast population growth rate.

Urban services are the first and the most important services that are needed to foster the city growth. Moreover, they are critical for the flourishment of economic growth and quality life. According to the Institute for social and economic change report, infrastructure plays a crucial role in promoting economic growth and thereby contributes to the reduction of economic disparity, poverty and deprivations in a country. Despite the fact that, most of urban services provided in cities like Addis Ababa are scanty or can not respond to the parallel high growth rate of population. Similar to other developing cities, the Addis Ababa urban service is often subject to haphazard planning, disjointed implementation & poor post installation management (Mathewos, 2006). Since infrastructure development took the lion share of the cities and countries resources and indispensable services for the days to days life of community, development need to be managed and planned in a proper manner, standards and regulations should be considered(MWUD, 2007).

It is vivid that Ethiopian cities are not only the least urbanized, but also they are predominantly unplanned. Planning is one of the most important tools for the growth and development of any country in general and cities development in particular. Moreover, it has a potential to determine the urban economic and physical development. Coordinated, integrated infrastructure and service planning as well implementation has to be in placed. However, the City of Addis Ababa particularly (the inner parts) decaying faster than being improved.

> *Further, inner city decay in Addis Ababa manifests in different ways, including over crowdedness, congestion, building obsolescence, unhygienic environment, misuse of public spaces (e.g. by street hawkers) and deterioration of urban facilities. The problem of inner city deterioration in Addis Ababa is receiving a steadily growing attention both from urban planners and policy makers. These days, improving the physical and economic fabrics of the built up areas has been one of the key development concerns of the City Government* (www.addisababacity.gov.et).

In addition, the absence of this integrated planning and implementation is the major cause of economic, financial, social, health and environmental loss for a given city. The city of Addis Ababa is not saved from the existing problem, the supply of urban service could not parallel with the existing registered rate of population growth, demand and this mainly resulted from the incapability of provision of adequate finance for the sector and poor planning. Moreover, the poor management of the existing urban infrastructure is another problem which play significant role, in collaboration with the poor planning and mismatch between demand and supply. As already stated above, Addis Ababa is loosing huge amount of resource due to the absence or lack of coordination that has also haphazard impact on the fastest growth of the city infrastructure in particular and the city growth in general. It is a fact that the uncoordinated infrastructure development hampered the sector haphazardly.

The absence of full-fledged urban infrastructure, delivery policy and regulatory body may play significant role for the disjoint and unparallel activities of the road and utilities. Currently the regulatory body is being established under the city administration, but it can not bring the whole stakeholders together and avoid the problem of integration as expected. According to the cities good governance package (2007) every sector should work with regard to the master plan in an integrated manner. It is also mentioned in Tesfaye (2001) the conflict between different utility lines should be minimized, service provision is attained comparatively with chipper price, and the necessary space should be reserved during planning and design of roads in particular and towns in general. However, there were no strategies, policies, rules and regulations that direct the provision of infrastructure integration up until today. Hence, the researches expected, in conclusion therefore, to assess the features and the root cause of the problem of integration at the intra and inter sectoral level. To this effect this research hopes to highlight the relevance

of coordination and integration among stakeholders in the inner city of Addis Ababa in particular and to the city in general.

1.1 Statement of the Problem

Urban infrastructures are key elements in facilitating urban life; they are indispensable elements in the process of urbanization and existence of urban centers. And at the same time they have a potential to determine the economic and physical development of a given cities (Wondimu, 2009). Though urban infrastructures are very crucial element they are not provided in a very appropriate manner. Moreover, they are not planned and designed as well as implemented in an integrated manner. That is the main cause for financial loss, traffic incident, environmental problems, and health issues.

New development and improvement of the existing infrastructure are under going in the city centre than the periphery this is mainly because of larger concentration of people in the centre and the existence of unbalance demand and supply. Moreover, the inner city is decaying much faster than expansion area, apparently continuous maintenance is needed, that intern affects the smoothening of the existing traffic system.

Most of urban services follow the road network and the installation of utilities lines takes place on right of ways. Researchers and engineers agreed that, most of the city roads particularly roads that have been constructed before some years back are not up to the standard, which do not allow every other services provision and even not properly serve the existing traffic. Moreover, roads have been cut or excavated here and there frequently. An institution may cut or excavate the road and the same road will be excavated by some other institution a few days or months later, even by the same institution. Not only that, whenever there is technological improvement there is no doubt roads in the city centre would be excavated. As stated earlier, roads that are constructed in the city centre are not only below the standard but also register a high level of excavation which is the main cause for the improper functioning of roads and may register high rate of traffic accident and loss of scarce resource. Consequently, affect the economic life of the road. The study on Turk by Turkish courts of account 2008 shows:

Frequent utility excavations in roads, non-standard filling and compressing in patch Works impair quality of asphalt-paved roads and sidewalk and decrease their economic life. This situation leads to use of scarce resources for double construction of asphalt-paved roads and sidewalks as well as economic losses; and vehicle and pedestrian traffic is adversely affected.

It is a general fact that most infrastructural development always traced the road network, and mostly infrastructure expansion is made at the expense of road. The road mostly the carriage way trenched or excavated by any of the institutions (i.e water authority, telecommunication, Power Corporation and the like) and usually remains not maintained after the completion of the task. Consequently, the service year of asphalt road will reduce considerably. Digging out roads or excavation may be considered as dysfunctional, which has both positive and negative impacts. When road is excavated it is for the purpose of bringing new facility or services, and since it is labor intensive in most developing cities it might be considered as employment creation, Contrary to this it is the major cause for financial loss, environmental pollution, traffic accident and cause of health problems to the resident or people.

It is a day to day experience to see roads particularly in the city centre usually in the process of reconstruction. The road authority may take expansion or maintenance of new and existing roads, that road may be excavated by any of the above mentioned institution immediately, the same roads usually remain being not maintained for prolonged period of time for unknown reasons, this trend is even becoming common in the newly constructed and crossings of high way roads (i.e Kebena Road). Such problematic matters happened partly because of lack of coordination. The stakeholders do not give much emphasis for integration. Most institutions don't consider the integrated task as time and resource saving tool, they consider their tasks as a project assignment rather than as a nation task (MWUD, 2006). Moreover, these institutions do not have long term plan in one site; they may dig or excavate a single road twice or more within a year for similar projects. The most important thing that has to be mentioned here is that the absence of infrastructure policy and strong concerned body of execution play vital role for the existing inconvenience.

Studies have indicated that economic and technical issues are not the only barriers to the development of integration of urban services planning. Institutional concerns such as regulatory and utility decision making processes may also impede the development. Identifying those institutional obstacles and developing proper remedies to eliminate them are important near-term strategies for the infrastructure development and integrating the services.

> *Coordinated planning and operation of infrastructure (water, sanitary sewer, gas, electricity, telephone, etc) and superstructure (asphalt-paved road, sidewalk, etc.) is of great importance in terms of prevention of repetitions, wastage of time and resources, interruptions in vehicle and pedestrian traffic as well as ensuring a smooth and uninterrupted daily life during infrastructure works(Levent et al., 2008).*

Whenever we travel either walking or using any form of transportation mode is a very common phenomenon to listen the residents comment on the issue of integration. People let alone professionals even a layman is fade up with the issue. The complaints are not hidden for the planners and implementers. They might listen these complaints, but they still have not shown effort to avoid the problem once and for all. All these problems can justify that how sound it is integration at the intra and inter sectoral level and compulsory. This integration is not a one time task rather it has to begin from planning to implementation even shall extend to protection and sustainability.

This study therefore, shall focus on searching of the reasons and justification behind the absence or low level of integration of tasks during planning, implementation and financing among the stakeholders, and the strength and weakness of institutions for integration and its consequence on overall infrastructure development.

1.2 Objective of the Study

The main objective of this study is assessing the extent of integration among urban service providers and overview of weakness and strength of these service providers in the inner city of Addis Ababa.

1.2.1 Specific Objectives

- To asses or determine the level of integration during the time of planning, design and as well as implementation.

- To identify the major reasons/causes for the absence or low level of integration and its consequence.
- To know the driven force of excavation/cut off carriage way and also to identify the major reasons for the improper maintenance and management of road after the completion of the tasks.
- To evaluate the socio economic impact of the absence or low level of integration.
- To asses the effect of infrastructural policy and legal ground of stakeholders over the use of right of way.
- Finally to come up with contextual possible solutions and recommendations.

1.2.2 Research questions

- What is the current stage of integration among stakeholders and where lies the process of integration fail?
- Why roads and utilities have not been planned designed and implemented in an integrated manner?
- What are the driving forces of frequent excavation, poor maintenance and management of asphalt roads?
- What are the social, economical and environmental consequences of poor coordination among stakeholders?
- Does the master plan or physical plan give adequate emphasis for utilities and what is the policy ground over the use of right of way?
- What possible contextual alternatives can be forwarded?

1.3 Research Methodology

Doing research might be simple & trust worth, if and only if appropriate and valid methodology is being used. Since the intra and inter sectoral planning is a new practice in Ethiopia, it must have sound and contextual techniques to address the issue and collect necessary information. Regarding the research method it could be said descriptive and explanatory dominantly by its very nature and the research relied on both qualitative and quantitative data though tends to be qualitative. Here again both primary and secondary

1.3.1 Data collection Method and Sampling Technique

1.3.1.1 Primary Data

The primary date is the major source of information for the study. In order to gather this primary data, different method were applied as the key tools and methods for the study. Among the methods, personal observation, sample survey questionnaire, interviews were intensively used to triangulate the sources or data.

Sampling Technique: the research use Sample survey methods as one major elements of data gathering technique. A total of 502 workers are considered to be sampling frame. Out of the total 502 sample frame 14 % of the total sample size was drown to make the respondents representative and reliable. The data gathered through this technique shall be more representative and reliable. In this survey, department heads and workers at different stages of four institutions were served as the units of analysis. The structure of these four institutions is more or less similar. Therefore, from each sector four departments were drawn from the sampling targets purposively. These departments are planning/design, implementation, management/follow-up, finance and law departments because the researcher believes that these institutions have direct and indirect relation with integration. For clarification people who work in planning, implementation, follow up (management) and finance departments are selected through purposive sampling. The questionnaire was prepared and distributed for those who are highly involved in the aforementioned sectors. Regarding sampling procedure the research was conducted using purposive sampling. With assuming that, these four sectors have direct relation with the topic dealing with. Furthermore lottery methods (simple random sampling method) have been utilized to minimize the bias among the total respondents. In this technique every department and every worker in those specific departments had equal opportunity to be chosen.

Table: 1.1 Distributions of Respondents from each Institution and Departments

Institutions(unit of analysis)	Departments	No, of workers by Department.	Sample no, by dep't	Total no. Sample
AACRA	Planning/design	19	3	18
	Implementation/cons.	90	11	
	Management/	13	2	
	Finance and law	14	2	
ET	Planning/Design	18	3	17
	Implementation	72	10	
	Management	13	2	
	Finance and law	16	2	
EEPCO	Planning/Design	17	2	15
	Implementation	69	9	
	Management	14	2	
	Finance and law	14	2	
AAWSA	Planning/Design	22	3	18
	Implementation	75	10	
	Management	19	3	
	Finance and law	16	2	
Total		502	68	68

Source: Respective Institutions, 2011

Based on the above information four departments are drawn from four sectoral offices namely ET (118), EEPCO (114), AAWSA (133), AACRA (137) served as sampling frame. Therefore, the questionnaires distributed for 68 respondents accordingly. There are two types of questionnaires, the one is for AACRA and the other is for utility providers namely EEPCO, ET, and AAWSA. The first part of the questionnaire for each category is more or less similar but the second part is different. For instance, types of technology, time of trenching and similar questions only inquire for Utility providers. While institution frequently excavate the road and untimely maintenance of roads etc. inquired only for AACRA.

In-depth interview: people who are responsible for the task, higher officials and professionals were the major targets that can be addressed through in-depth interview. In this regard higher officials and the virtual committee (technical committee) on the integrated infrastructure development would be considered as the major emphasis. As already mentioned the four service providers' and the other newly established regulatory

body of higher officials and people who have worked in the right position were asked or interviewed in the structured and non structured form.

Table:1.2 Distributions of Interviewed People

Sectors to be researched(unit of analysis)	Higher officials	Professional Employee	Total No, people interviewed
Road authority	1	1	2
Telecommunication	1	1	2
Power supply	1	1	2
Water and sewerage authority	1	1	2
Planning Institute	1	1	2
Regulatory body	1	1	2(Alternative)
Total	6	6	12

1.3.1.2 Secondary Data

With regard to secondary data different documents have been reviewed. Available printed and non printed relevant materials were reviewed to recapitulate the lesson and strength the study from both local and international experience. Texts that are published by governmental and non governmental organization, previous findings and researches, magazines and internet releases served as the secondary input in the study. Moreover, previous panel discussions or talk show on the related topics were used as an additional source of information.

1.3.1.3 Data Triangulation

Every type of method has its own limitation or drawbacks and one can safely argue that to overcome the problem triangulation is the best and only method; it is recommendable to use different methods at a time. Having that in mind, the researcher applied triangulation techniques to combat the limitation of every method and to maintain the validity of the collected data. In this regard survey, in-depth interview, personal observation, panel discussion (TV talk show), published and unpublished documents have been used in this research.

1.3.2 Method of Data Analysis

Regarding the data analysis data which gathered from different techniques was analyzed through descriptive analysis. The data has been tabulated using tables, charts, percentage and arguments. Furthermore data obtained from the questionnaire were computed using the program SPSS (16.0).

1.3.3 Study Area Selection and Justification

The Inner city of Addis Ababa being selected purposely for the following reasons: The two adjacent sub cities forming the central business district of the city, namely Arada & Addis Ketema exhibit a population density figures that is approximately 7 to 8 times larger than that of the average for the entire city. Generally, the four inner congested parts of the city; Arada, Addis Ketema, Lideta & Kirkos sub cities all together account 43% of the city's population while covering 8.3% of its land area (AACA, 2005 cited in Gashaw, 2009).

It is a general fact that Addis Ababa is spontaneously growing city. This implies that, there were no good structure of development to the city and characterized by haphazard planning. Again it is a fact that, the inner part of the city is characterized with shanty, dilapidated situation. Moreover, the area is in fast decay than being renewed. Due to the fact that, the inner parts of the city has got little attention. In addition, LDP is undergoing in major parts of the inner-city to mention them; Arat Killo and Lideta, with this program and the city infrastructure development the asphalts of the city is being excavated, which haphazardly affect the overall infrastructure development. With these all facts the inner city is very convenient to look at the effect of un integrated planning.

1.4 Scope of the Study

The thematic scope of this study is integration and coordination of the institutions that provide utilities and infrastructures. The infrastructure providers at intra and inter sectoral level being assessed starting from planning, implementing to managing the infrastructure or utilities. It shall do so by way of focusing on the four sectoral institutions that all highly engaged on the provision of the urban infrastructure in the context of Addis Ababa. This study will also focus on the sectoral performance, their coordination and

integration starting from 10 years (i.e. since 2002), this mainly because the infrastructure development in general and integration in particular took due attention recently. However, the spatial scope of the study shall be the inner city of Addis Ababa; again this is mainly because in the last 10 years fastest growth of infrastructure development occurred in the inner part of Addis Ababa (See Justification for area selection). Moreover, the inner cities are old areas and densely populated, consequently the existing infrastructure could not support the high level of existing demand. In order to improve the service delivery, the inner city redundantly/frequently excavated by the service providers. Thus the problem much exacerbated in the inner cities than other parts of the city (see next page, map of the study area).

1.5 Significance of the Study

This study shall provide a general highlight on the importance and existence of integration and coordination among different service delivery institution. It also tries to highlight its effect on the general urban infrastructure development program and resource utilization and efficiency. After searching out and analyzing the problem particularly areas where the process of integration fails, it tries to produce document which guides and tackle the existing problem or current and future efforts of integrated planning and providing effective and efficient urban infrastructure plan. Furthermore, it will serve as reference for scholars to stimulate further research on the related topics.

1.6 The Organization of the Paper

This paper is comprised five major components, part one contains the study background, statement of the problem, objective, scope significance and methodology and the like. The second Part focuses on the review, which mainly concentrates on the brief explanation of infrastructure and integration of the international and national experience, conceptual frame work and definition of relevant terms and contextual experiences. The Third part mainly focuses on the background of the study area and justification for selection. The Fourth part contains the analysis and presentation. Finally the Fifth part mainly focuses on the conclusion and recommendation. Reference and relevant documents such as questionnaires and maps shall be annexed.

integration starting from 10 years (i.e. since 2002), this mainly because the infrastructure development in general and integration in particular took due attention recently. However, the spatial scope of the study shall be the inner city of Addis Ababa; again this is mainly because in the last 10 years fastest growth of infrastructure development occurred in the inner part of Addis Ababa (See Justification for area selection). Moreover, the inner cities are old areas and densely populated, consequently the existing infrastructure could not support the high level of existing demand. In order to improve the service delivery, the inner city redundantly/frequently excavated by the service providers. Thus the problem much exacerbated in the inner cities than other parts of the city (see next page, map of the study area).

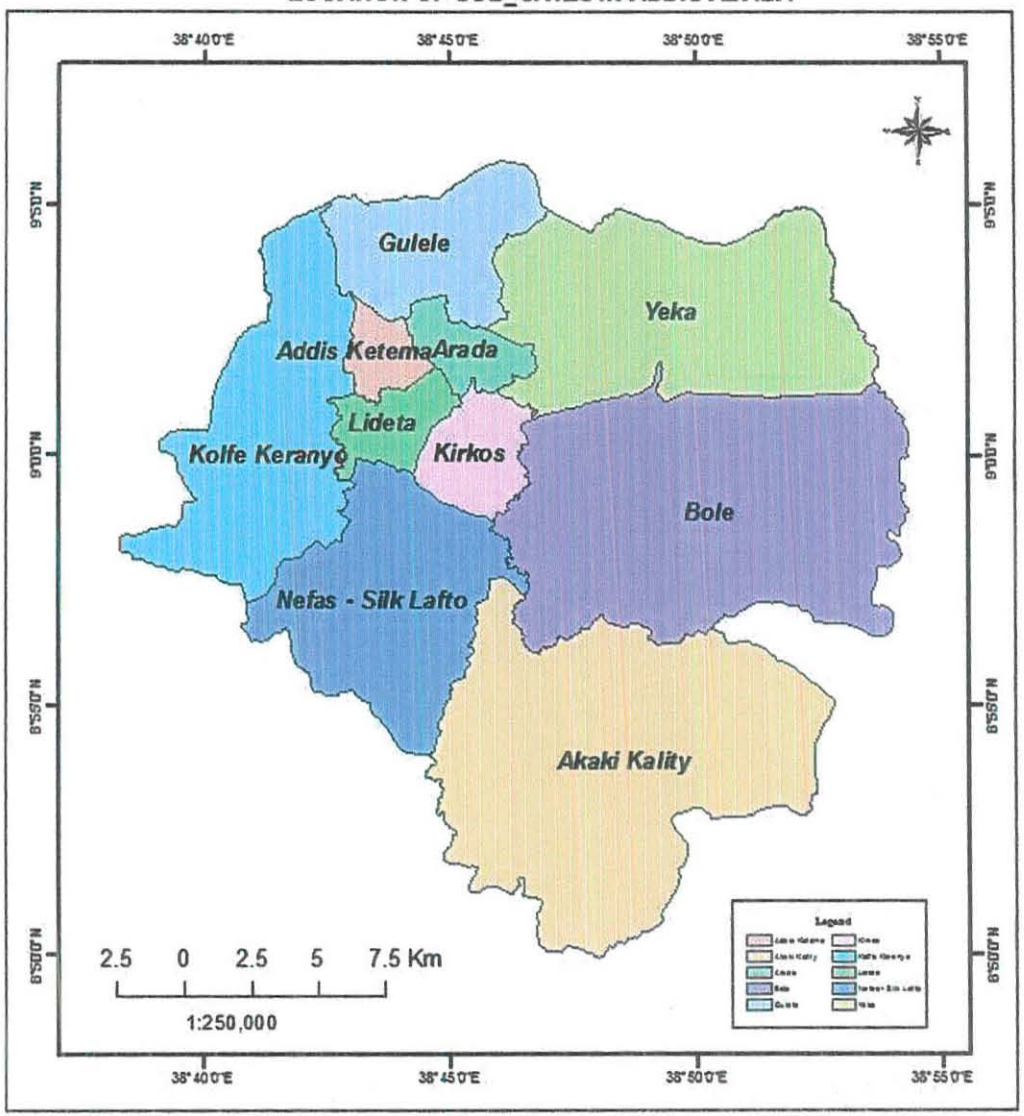
1.5 Significance of the Study

This study shall provide a general highlight on the importance and existence of integration and coordination among different service delivery institution. It also tries to highlight its effect on the general urban infrastructure development program and resource utilization and efficiency. After searching out and analyzing the problem particularly areas where the process of integration fails, it tries to produce document which guides and tackle the existing problem or current and future efforts of integrated planning and providing effective and efficient urban infrastructure plan. Furthermore, it will serve as reference for scholars to stimulate further research on the related topics.

1.6 The Organization of the Paper

This paper is comprised five major components, part one contains the study background, statement of the problem, objective, scope significance and methodology and the like. The second Part focuses on the review, which mainly concentrates on the brief explanation of infrastructure and integration of the international and national experience, conceptual frame work and definition of relevant terms and contextual experiences. The Third part mainly focuses on the background of the study area and justification for selection. The Fourth part contains the analysis and presentation. Finally the Fifth part mainly focuses on the conclusion and recommendation. Reference and relevant documents such as questionnaires and maps shall be annexed.

LOCATION OF SUB_CITIES IN ADDIS ABABA



THE STUDY AREA

1.7 Limitation of the Study

As most of the other researches the constraint of money said to be crucial limitation of this study, due to the same reason previously planned FGD cancelled and substituted with the Addis Zikre hasab Talk show, though they are not mutual. Other than the money constraint searching out related reviews particularly empirical evidence in the context of Ethiopia was difficult. It is vivid that dealing with different institutions also kind of challenge where the researcher encountered. Moreover, the respondents from each institute did not respond the questionnaire timely and some of them failed to respond to the questionnaires (nearly 4.1%). The other challenge was from the previous Ethiopian telecommunication service (current Ethio Telecom). Since the institution in the process of outsourcing the management and practice a kind of transformation or PPP it was really said to be the most difficult place where the researcher spends couple of weeks. Unlikely, the researcher can only achieve the survey part with that considerable time. The person who assigned on the virtual committee was not cooperative to give interview for skeptics and lack of confidence.

Chapter Two

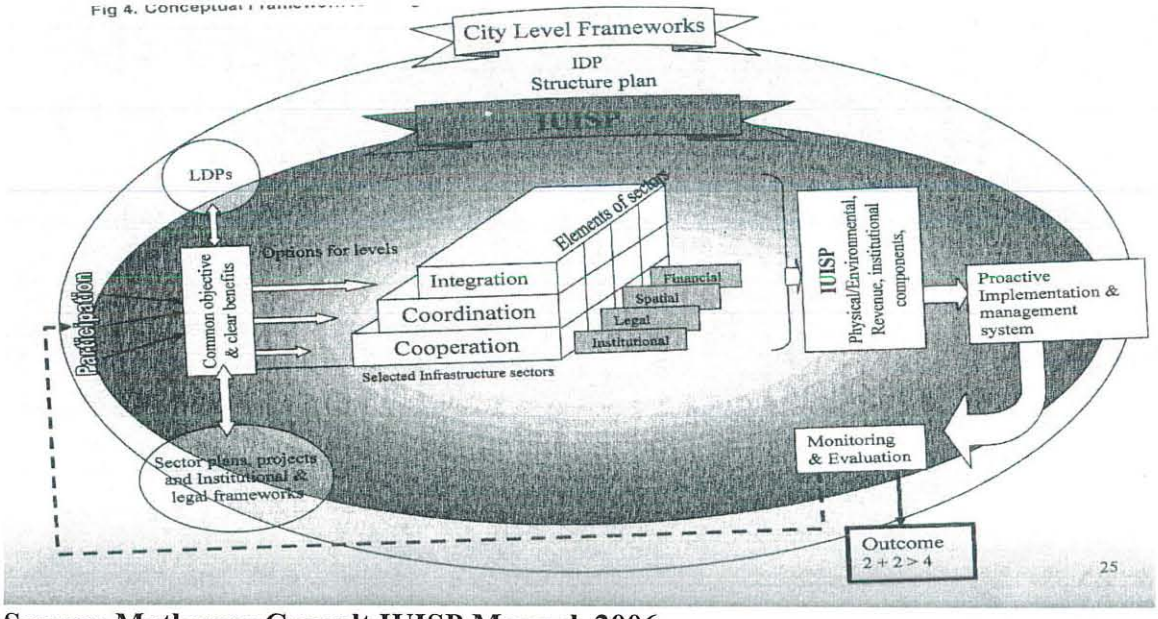
2. Literature Review and Theoretical Frameworks

The purpose of this chapter to give a general theoretical framework about the topic, it also aims to present general facts of previous findings, ambiguity and arguments about the concept that has been researched in this paper and giving relevant definition of terms that can be used frequently throughout the paper. Moreover, in this chapter international and national experiences will be presented as matter of fact, and will help also to know how far this issue has been studied, practiced in different countries as well as in Ethiopia.

2.1 Theoretical Framework

It is a general fact that integration is a process of bringing different tasks in to one harmonized system which seems very difficult and impractical. Integration involves different stages of activities and every single activity should be harmonized one another to bring effective and efficient system. Bringing different tasks in to one is not simple task. Since cooperation and coordination are stepping stones to bring effective and efficient works among the stakeholders, every stakeholder should participate with their will for cooperation and coordination.

Fig2.1. Conceptual Frame work For Integrated Infrastructure & service planning



Source: Mathewos Consult IUISP Manual, 2006

The primary objective of coordination is to implement the potentially conflicting works in an efficient & effective manner, as well as to ensure that nuisance caused to the public is kept to the practical minimum (Highway department research & development, 1998). The process of integration in comprises both cooperation and coordination, it also calls for the existence of a single formalized decision making system and procedure that facilitate the existence of such a system potentially allows for more effective and efficient use of resources to achieve certain objectives (Mathewos, 2006). We understood that from the above paragraph integration is the last stage of cooperation and coordination, sometimes integration can be measured through the existing level of coordination, in order to bring efficiency and effectiveness through integration we need to bring first cooperation and coordination, therefore cooperation is the preliminary stage of integration which need to be discussed in a very brief manner.

2.1.1 The Concept and Need of Coordination

The need for cooperation and coordination dated back centuries, the need for coordination is accelerating as more utilities are installed in limited right of-way (Utility policy manual, 1998). It is true that, resulted with high level of problems in the city centers. Urban areas are always in progress since they are epicenter of the development & they accommodate a large number of populations mainly resulted from natural increase and rural urban migration. Rapid population growth as well as dense and plan less structuring, especially cities like Istanbul and Ankara, have also lead to an increase in demand for utilities Services and consequently, in the resources used for the construction and maintenance of utilities. Most Third world cities could not be saved from such problems. Moreover, in cities with dense population, damages to roads and sidewalks during the construction and maintenance of utilities cause problems in daily life, create financial burden and necessitate effective solutions (Levent et al., 2008).

The rapid population growth in collaboration to haphazard planning of urban sectors may cause for devastating urban structure and cause for the process of retarded urban development. Infrastructure works mostly result in inevitable physical disruption, which leads to social costs, which are incurred but are not accounted for in the project budget. This would include lost time, business opportunities and additional fuel consumption, etc.

resulting from the effects of traffic disruption, noise, air pollution, and other environmental/social impacts (NRC, 2003). An organization may construct road, after awhile another organization may excavate the road for multiple reason with a week or month difference. Excavation haphazardly affects the existing infrastructure and also cause for wastage of the resource. It is also the major reason to reduce significantly the actual service age of the road.

As stated on AAPWA (2010) with increasing frequency, excavation and conflicts with utilities have had significant negative impacts on Public Work projects throughout the metropolitan City area. Owners agued that conflicts with utilities have become a leading issue in the design and construction of projects. They include not just the construction change orders, but serious delays and service disruptions to the public and poor public relations within the community. The costs of relocation to the Utilities also affect the community with higher rates and user fees, as the Utilities recover the extra costs (APWA, 2010). The issue of continuous excavation has many negative impact other than the economic cost, among them continuous service interruption (power, water, telecommunications) and the like are the major features. In addition it is also the major cause for traffic incidents and health problems. These and other similar problems helped the concept of coordination is being attract stakeholders and promoted for urban infrastructure. It is common to see institutions to work individually and always tried to achieve their objective, improved coordination has the potential to reduce these impacts dramatically. The existence of coordination helps to bring the change in urban growth which directly includes reduced project costs through efficiencies of scale and avoidance of repeat maintenance costs, primarily in the pavement repair area.

Utility coordination mainly has been a reactive undertaking, often only occurring towards the end of a design project, rather than a proactive process that begins at project conception. Proper planning, locating, and coordination between involved stakeholders will minimize costs and delays and lead to the best possible project at the lowest ultimate combined cost to the community (ibid). The researcher argued that the over all objective of utilities is providing best services for the community at reasonable price, in addition it is possible to bring the urban life at ease by doing so, but due to the absence of

coordination the cost will rise and works becoming delayed more than their accomplishment time. Moreover, the effect will extend up to the reduction of the service age of the roads due to continuous excavation and also haphazardly affect the environment. Effective utility coordination leads to many tangible benefits helping keep construction costs in line and projects on schedule, as well as promoting collaborations that make the process move more smoothly and efficiently for all (LAGL, 2000).

As already stated, bringing the stakeholders to work together in planning, implementing and follow up is not an easy task, particularly in areas where the existence of different arrangements of institutions and absence of infrastructure policy. Moreover, Utility coordination creates open exchange of information among Owners, utility providers, Engineers, and Contractors. Utility coordination also fosters cooperation among all groups in planning, design, and construction of projects that can be an overall benefit to participating and non participating stakeholders. Utility coordination is a responsibility shared by essentially three entities: Owners, Engineers, and Utilities. The benefit will extend to the public.

- **Expected Benefits from Coordination**

According to APWA (2010), specifically the following are list of benefits that can be realized through proper and timely utility coordination.

• Allows for flexibility and time for Utilities/Engineers to develop the most cost effective relocation plan.

• Reduces delays to the Contractor during highway construction caused by cutting, damaging, or discovering utilities that were not known.

• Avoids unnecessary utility relocations. Accurate utility information is available to the designers early enough in the development of a project to design around many potential conflicts.

• Eliminates unexpected conflicts with utilities. The exact location of virtually all utilities is known and accurately shown on the construction plans. In addition reduces delays to the project caused by waiting for utility work to be completed.

• Enhances safety. When excavation or grading work can be shifted away from existing utilities, there is less possibility of damage to a utility that might result in personal injury, property damage, and releases of product into the environment.

• Avoids damage to utilities and the subsequent untimely loss of utility service.

• Possible to extend or maintain the service life of the roads, etc. These all expected results will be effective when and where the practical and sound policy is in place because the issue of policy gives legal ground for all stakeholders that continuously use the rights of way.

2.2 Instruments for the Coordination of Infrastructure

Infrastructural coordination is simply a systematic interaction of all components in the whole system , the system component in comprises three elements namely theoretical, financial and technical issues, Use of appropriate instruments such as building development plans, shaping urban development for the effective planning, coordination and monitoring of infrastructure works. Moreover, the policy ground is needed to formulate manuals and guidelines in which the model of coordination can be developed and use of right of way. Thus, these following issues directly or indirectly related and serve as instrument for coordination of infrastructure works.

2.2.1Coordination at Planning Stage

Coordination with Utilities begins as early as practical during project development (e.g, planning, and preliminary engineering). Departments expected to send plans at various stages of completion to each affected Utility for review and comment. It is the responsibility of each Utility to verify and/or provide the following information on its utility facilities:

• Type and Size,

• Vertical and horizontal location, and

• Information on retired facilities.

If a utility installation will be located or relocated on or across public right-of-way, the Utility shall submit an application for a utility permit to the district for review and approval in accordance with the policies and procedures in the publication (Illinois utility

coordination 2010). Coordination at this level is expected to accommodate multi year plan in which to create one map for different activities.

- **Multi year Plan**

Coordination of infrastructure depends on good planning of works to be undertaken. As already said the process of coordination has followed five stages, among them planning is the basic where one can argue almost 90 % of the total coordination process accomplished at this stage. The development of multi year plans which have specific projects identified, is key to effective coordination of different programs, the practice seems to vary significantly in this area with some cities having plans that are projected out for 10 years, others which only concentrate on the coming year (NRC, 2003). Most cities' plan ranges from 3 to 10 years that is with the consideration of the projection of 20 years and above. The longer the planning period is the better for coordination process. In this case change of plan before and after the beginning of project work would be minimal.

Investment programs of municipalities and utilities are the sources of information that form the basis of coordination plan. Thus, investment programs of utilities to be realistic and feasible, implementation of programs without material deviation are of great importance for planning of coordination. Planning, execution and monitoring processes with regard to coordination of infrastructure works at metropolitan cities are regulated by laws Metropolitan Municipalities (Levent et al., 2008). But the laws and policy of infrastructure might not contain the detail procedural activities of utility works, due to the fact that many utility providers come up with conflict of interest over the use of rights of way that may extend up to courts case.

In this planning stage the utilities providers expected to submit multi year plan which is parallel to the master plan of the given city. These arrangements emphasize that, planning phase of coordination shall start with the notification of draft investment programs for the subsequent year to responsible agency by utilities and municipalities each year until the other year project implementation phase begin. According to NRC (2003) the effective coordination of the various utilities involved is critical. All below stated areas serve as

specific roles in the infrastructure approval process and affect how well individual programs are coordinated. The following criteria's said to be standards to measure the success of particular organizations include:

- The length of the plans distributed to the various infrastructure providers;
- The frequency of contact with external agencies;
- The existence of a formal multi-agency committee to review these issues;
- The existence of no-cut rules and pavement degradation fees;
- The size of the annual infrastructure deficit and the frequency of reporting to council &the public on these issues; and the existence of block funding approvals (ibid).

Table 2.1 Area of Focus for Practice

Area of focus for practices	**Inquiry**	**Remark**
Coordination practice	Multi year plan	Three and above years
	Formal committee	On Weekly, monthly or annual basis
Corridors upgrade	Coordination of development	
	Cost benefit analysis	Improve efficiency
	Further Economical investigation	Cost benefit analysis
Restrictive practice	Permit requirement	Importance of the work
	No cuts rule	
	Pavement restoration procedure	The minimum standard
	Pavement degradation fee	Compensation fee
Approval process/ Communicating needs	Dedicated funding source	
	Block funding	
	Formal planning tools	Uniformity
Technical consideration	Presentation, public notice and other information dissemination	References
	Pre inst. Engineering &policy issues	Minimize risk
	Software's	GIS
	Trencheles technologies	Drilling machines

Source: Summarized from NRC, 2003

2.2.2 Coordination of Projects and Capital Works Plan

As indicated above, to reach the highest stage of integration the first preliminary coordination work should be done at the earliest stage. Coordination involves the harmonization of a common action or to create a harmonious interaction among the

stakeholders that highly involved in infrastructure and service development or service delivery can be achieved based on the adoption of certain procedures and guidelines. Coordination and scheduling of Utility capital improvements and maintenance projects will be performed jointly by members of the utility owners. All members will provide their plans for major capital works (off course the plan should be multi year), road modifications, paving programs, and major maintenance programs prior to the year of construction (APWA, 2010). These all separate programs will be coordinated by the responsible institution and submitted to the responsible legal institution for compilation and publication. By doing this it is possible to reduce the cost of construction, time need and repetition of works, reduce maintenance cost and finally create harmonized system within the general system which can facilitate the over all urban growth for a given cities.

After having the necessary information to coordination and scheduling units design the integrated mapping in which the whole works becoming at ease. It is recognized that an effective mapping system is essential to achieving all the effective goals. Therefore, the development of an efficient system for mapping, i.e. integrated or individual maps, composite utility mapping, etc. that is very critical issue for the control of damage and handle the issues among stakeholders (TPUCC, 2004).

- **Formal Committees**

Avery common method of coordination is the establishment of formal or regular committees with representation from a variety of service areas. This method seeks to ensure open lines of communication among the various service providers. The committee includes representatives from each of the internal areas affected which are usually sewers, water, drainage and roads (NRC, 2003). Moreover, in this context telecommunication, water and sewerage, power supply, road and city administration said to be included in the committee. The committee should further accommodate every stakeholders those who have direct and indirect contact to the system.

The presence of regular committee usually benefits the stakeholders regardless of their commitment. Telecommunication and power mostly owned by private sectors or sometimes owned by county other than cities, in this case these utilities may not have

direct contact to the city but still performing in the city. Nonetheless sectors should actively participate in the coordination committees. As can be seen in some researches the efforts on coordination is mostly unsuccessful not because of absence of formal committee, but rather because of the members in the committee. This is mainly because of the people in the coordination committee are busy officials and sometimes political appointee who do not have enough time and concern for the program, in this case difficult to have formal or regular meeting.

- **Asset Management and Utility Database**

The other important tool to create coordination is that the utility registration system in which every utility provider and other stakeholders need to register their own utility on the surface or underground, this record should have one modern data base system in which every detail can be hold and can be accessed any time. The right and responsibility of registering the utility data vary from country to country but every writer agreed that the existing infrastructure and utilities of cities should be recorded and kept in an organized manner. The National Research Council of Canada (NRC, 2003) recommends that municipalities should adopt an integrated approach to plan the renewal of their road, sewer and water system, a systematic and proactive model is developed to ensure that renewal programs are based on sound data. The availability of these utility records will facilitate the planning works and it also helps to easily identify areas which need maintenance and also very helpful to adopt monitoring of the status of utilities over the rights of way. Recording in addition will help to easily identify the types of utilities installed in the right of way and help also for integrated mapping and planning among the utility providing institutions.

The data format and content vary among municipalities, but should allow for proactive management and be integrated. An inspection program should be developed to collect information about the road , sewer and water systems to ensure decisions are based on the proper information. The results on the inspection program need to be properly documented and stored. Condition assessments should be used to identify and prioritize renewal requirements for each system. Once the assessment is complete, a performance evaluation should be made to project the required investment over the next 10 to 20

years. Finally, once a component of a system has been identified for renewal an economic analysis should be used to select the most cost-effective renewal method and the timing for renewal (Anne and et al 2008).

- **Geographical Information System**

For effective and good planning, coordination and monitoring of urban infrastructure; *"Infrastructure Information System" is needed.* Geographic Information Systems (GIS) is grounded on building development plans prepared in digital environment, which are named also as footing in literature. However, the existing building development plans do not constitute an accurate and reliable ground for GIS (Levent et al., 2008). The use of GIS is critical to integrate both spatial and non spatial data and its analysis is user friendly, the interface of the system is user friendly and interactive. It holds the spatial data layers dynamically linked to the attribute data, organized according to different administrative hierarchies (Map India, 2003).

Most research documents further argued that in addition to the use of GIS there should be more sophisticated and high quality software application for infrastructural integration. According to the NRC (2003), currently most municipalities use capacity modeling software for roads, water, sewer, and drainage systems. Some software's are integrated with a municipal geographical information system (GIS), which presents better opportunity for coordination of individual capacity upgrading programs. Some municipalities use closed-circuit television (CCTV) for inspection and leak detection to determine underground infrastructure rehabilitation needs or in reaction to frequent maintenance requirements.

- **Organizational Structure**

In addition to recording the utilities with the highest and reliable technology the institutional arrangement of utility is a very critical component, the arrangement of these institutions may not be convenient to bring effective and efficient coordinated system. Researches prove that the structure of organization has vital role for the ease of cooperation and integration. Coordination of infrastructure works has been the subject of legal arrangements, an organizational structure that would operate as a committee (ICC)

comprised of public institutions, private utilities and nongovernmental organizations is envisaged for the coordination of infrastructure works. Nevertheless, organizational structure specified in legal arrangement for the coordination of infrastructure works has not been established in most cities (Levent et al., 2008). According to Mathewos (2006), the lack of integration of urban services planning could be said to have its basis in three major areas, among them poor institutional arrangement is critical. Thus, institutions that have good organizational structure are always benefited from the fruit of coordination and integration.

- **Alternative Methods /Trench less Technologies**

Applying modern technologies for the utility works can help to save huge amount of resources on the process of installation and maintenance. However, applying these technologies itself acquire huge investment at preliminary stage and at this point the economic cost benefit analysis should be made before one choose the type of instrument or technologies use for infrastructural works. Alternative practices such as Joint trench, Multi-inlet pipe system and gallery systems that enable burial of more than one line with one single excavation instead of separate burial of different utility lines with common features are not used adequately. Use of these systems shall decrease damages to superstructure caused by underground works, facilitate maintenance of infrastructure, prevent interruptions in vehicle and pedestrian traffic and minimize costs. However, instead of this, only short term installation costs were taken into account while savings in long-term maintenance and improvement costs were ignored or even not considered with the prejudgment that it would be costly (Levent et al., 2008).

A refinement to the corridor upgrade approach is the installation of a utilidors to have a variety of utilities, such as fiber optics, telephone, cable, and hot water for central heating. While utilidors are relatively common in Europe and in buildings throughout North America, their application to urban infrastructure is new. The benefits of utilidors include: One-time construction of the corridors, Long term access to utilities, ease of maintenance, and Minimal disruption to surfaces such as roads (ibid).

- **Trench less method**

Multiple conduits can be passed through a single bore or tunnel. There is a Requirement though for multiple bores to have a minimum spacing of 10 D between individual bores. Where D = the diameter of the largest conduit.

The **minimum depth** of a trench less bore is **1.5 meters**.

- **Open Trenching and Trench Restoration Requirements**

Most trenching involves work on medium or heavily trafficked roads with an asphalt surface. There is a requirement that all services must be at a minimum depth of 1 metre cover. Any trenching involving Utilities installation and other authorities may require a wider trench to ensure that appropriate separations are achieved without shoring requirements. Reinstatement needs to be as per the standard specification. Excavated material can not normally be reused. Many municipalities in their trench restoration standards require T-cut sections, specify compaction standards, require pavement replacement of the full width of the lane, and require replacement of full panels of concrete streets. This may involve greater pavement restoration and, therefore, increased costs to the applicant.

> *The municipality has the discretion to choose the restoration standards it will impose as long as the standards are reasonable and are imposed in a non-discriminatory manner. However, it is to the benefit of the municipality to involve those companies and utilities that will be making trench cuts within the municipality's right of way in the drafting of the standard specifications (***Réka Goode and Brenda Kahn 1999).**

2.2.3 During Construction Stage

The construction phase of a highway improvement project begins after all of the design, right-of-way acquisition and the letting processes have concluded with the award of a contract. At that time, all of the previously unrelated parties of a project are first put together as the team to build the project. In this sense, every stockholder's, contractors, utility owners, road owners and others should come together. INDOT has utilized a formalized communications process known as "partnering" on many contracts in recent years to maintain communications among all parties to the construction project. The initial meeting and continuing project meetings keep all parties informed as the project evolves. Partnering can aid communications among the utility companies involved with

the project that may have work plans that need to be coordinated. This process puts all the individual entities of the construction project together as a team to manage the project in a manner that benefits all parties.

> *Holding a coordination meeting with utility companies prior to the formal pre construction meeting should allow those companies to compare their work plans and determine if there are conflicts that need to be resolved. Utility company involvement at this stage may eliminate the need for such involvement at the formal pre-construction meeting that INDOT holds with the contractor* (Richard, et al on the report 2004).

- **Involvements of private Sector and Alternative Budget Sources**

Utility reforms of the 1980s and 1990s included not only unrestricted but also increased involvement of the private sector in the ownership and management of utility companies. In some individual companies private participation in infrastructure has been the norm. In United States for instance, telecommunications and electricity companies have always been privately owned as has significant proportion of water industry. Similarly, in France about a Third of the water system is privately managed reflecting along standing tradition of concession infrastructure provision to private enterprises. Private participation has generally succeeded in reducing costs and developing countries have since followed this route (J, Brook and C.Irwin2003).

Allowing the entry by new providers in some market segment often reforms have focused on restructuring the existing utility, but changes in industry structure and ownership can also result from the entry of new provides in to the business, there are strong arguments to involve the private commercial, (NGO) sectors. Distinction should be made between economic arguments, ideological arguments and historical practices in different countries. Privatization could be define from two perspectives, in the broad sense implies promoting private sector involvement in service delivery but not necessarily changing the ownership of utility. Outsourcing management contracts and concessions are ways to increase private sector involvement without changing the ownership. In the narrow sense of the word, privatization refers to ownership of transfer by selling the shares (divestiture) or selling the utility to a private party (Van Dijk and Teggegne2005). Due to complex nature of problem in the management some times privatization gives much monopoly for the private sector, due to the fact that many countries try to contextualize

privatization itself. With the complex nature of privatization the involvement of private shifted to the most appropriate public private partnership (PPP).

Table: 2.2 Option for private participation

Option	Operation	Management system	Maintenance			Investment		Ownership of asset
			A	B	C	Planning	Financing	
Service contract	✓	X	X	X	X	X	X	Public sector
Management contract	✓	✓	✓	X	X	X	X	Public sector
Lease	✓	✓	✓	✓	✓ ✓	✓	X	Public sector
Concession	✓	✓	✓	✓	✓	✓	✓	Public sector
Asset sale	✓	✓	✓	✓	✓	✓	✓	Public sector
Boot(new asset)	✓	X	✓	✓	✓	✓	✓	Public sector

Adopted: From J, Brook and C.Irwin2003.

✓ Responsibility lie with private operator

X Responsibility lies with the public sector

Build operate own transfer (Boot)

This incorporate three different functions planning (a) carrying out the work (b) and financing the maintenance(c) .B, the asset are transferred to concessionaire for a fixed period of time but are owned by the state.

- **Cost-Effective Execution and Monitoring**

It is obvious that coordination is the tool for efficient and cost effective infrastructural developments, Instruments developed for needs and resources planning of infrastructure coordination works should be final and joint programs. In which saving is made in superstructure works such as excavation, asphalt-paved road and sidewalk improvement. However, obtaining expected benefit from Infrastructure coordination depends on multi-year resources and needs planning made through considering time granted for first construction and improvement of infrastructure facilities.

- **Introduction of Cut Fee Rule**

According to Tesfaye (2001), the installation of utility lines could be divided in to three models namely underground, surface and overhead either singularly or in combination. The underground installation could be further classified as **Trenched**, **Un-trenched, Utility tunnel.** Having this in mind the installation of utilities prefers the first type of trench excavation for certain reasons. Unlike the others this trenched excavation has a number of negative impact on the other infrastructures or mainly done at the expense of the existing road. Roads that are redundantly/frequently excavated for utility installation have lesser strength, in other words roads record shorter service life period than the others. The Research in San Francisco assures that streets records fewer excavations will have more service year compared to streets that encounter frequent one. The trench cut fee is a reasonable condition placed up on the use of the city right of way and does not impair any franchised right of way utility. The prime motive of this trench cut fee is to bring cooperation and integration among the utility companies it encourages excavators to coordinate their excavation thus reducing the number of street cuts (Alvarez, 2000).

Trench CUT FEE has a number of benefits, among them it encourage excavators to coordinate their excavations with other utility companies. Thus, reducing the number of street cuts is inevitable. A study by the San Francisco State University concluded that the more cuts that occur, the shorter the service life of the street. The San Francisco State University concluded that: Asphalt Streets with: Have a service life of: Less than 3 cuts 26 years, Between 3 and 9 cuts 18 years, More than 9 cuts 13 years.

The study therefore concluded that when compared to streets with fewer than 3 cuts. Average streets with 3 to 9 cuts have a 30% shorter service life. When compared to streets with fewer than 3 cuts, on average, streets with more than 9 cuts have a 50% shorter service (Alvarez, 2000). He further argued that The City and County of San Francisco, which adopted an ordinance in October 1998, has already experienced improved coordination between utility companies through joint trenching. This reduces the number of street cuts & minimizes disruption to the public. Union City was unable to provide feedback since their ordinance went into effect less than eight months ago (ibid).

- **Considering SUE as an option**

Subsurface Utility Engineering (SUE) is a branch of engineering. It involves managing certain risks associated with utility mapping at appropriate quality levels. According to local guide Minnesota department of transportation (2000) (www.dot.state.mn.us/utility/) SUE is a key component in any utility coordination effort should be an accurate understanding of the existing condition, without an accurate map of utility plant is presently in and above the ground it is impossible to effectively design and coordinate the necessary provision that must takes place to accommodate the project. A study for the Federal Highway Administration quantified a savings of more than $4 for every $1 spent for SU through applying Utility coordination, utility relocation design and coordination, and other utility issues. The idea also further explained (WSDOT Utilities Manual, 2008).

As we all know utility management and sharing the utility information is again basic consideration and even mentioned as one of coordination tool. Exchanging the utilities record among the stakeholders in every stage can save the huge cost incurred during planning and implementation of coordinating tasks.

- **Complying with Statutory Requirements**

The Metropolitan Toronto Public Utilities Coordinating Committee (MTPUCC) was an organization of utilities, companies and associations involved in the construction and maintenance of utilities and other related services within the road allowance of metropolitan roads. The objective of the MTPUCC was to foster cooperative action amongst its members through discussion and mutual resolution of issues and coordinated development of standards in the areas of engineering design, construction and maintenance. The committee tried to establish sub committees to share the responsibility and to avoid the bureaucratic nature of coordination tasks (TPUCC, 2004).

According to TPUCC, Each member contributed to the MTPUCC by means of membership fees, to provide funding for the implementation and maintenance of digital mapping and records. After the digital mapping and records complete the overall compiled document will be distribute for each stakeholders, in which enable to access any information's without difficulties. The TPUCC is concerned with the orderly, safe

and efficient planning, design and construction and maintenance of these services within the public road allowance in Toronto, with this practice the Toronto public utilities coordinating committee achieved the objectives by bringing the stakeholders to work together. The TPUCC will foster cooperation amongst its Members through discussion, resolution of conflicts, and development of standards and coordination of programs in safety, engineering planning, design, construction and maintenance within the public road allowance, to improve customer service and optimize efficiency. The TPUCC will promote and coordinate the orderly, safe and efficient planning, design, construction and maintenance of utility services within the public road allowance in Toronto.

- **The Need for Policy**

The need for an Urban Sector Policy Framework (USPF) the absence of National Urban Policy Framework in general and utilities installation in particular has contributed to a lack of coordination between Ministries, Departments and Agencies functioning in the urban sector and to the absence of a clear basis for prioritization of activities. There are two principal reasons for a *National Urban Policy:* Firstly, cities are integral to our economy, and are where the majority of Australians live. The decisions that government, business and individuals make have significant effects on cities. Secondly, urgent challenges need to be addressed if we are to secure the long term productivity, sustainability and livability of our nation. To secure the ongoing prosperity and wellbeing of our communities, we must ensure that our cities meet the needs of current and future generations, and that economic growth can be sustained without compromising the natural environment or diminishing quality of life (Our cities discussion paper, 2010).

Policy generally aims to stipulate the location, materials and methods for installation and adjustment of utility lines on all the state highway system (ibid). The utility and urban infrastructure is a very critical issue, agencies cannot operate in a vacuum. Like any other service organization, urban services agencies must have guidance from the people they serve. Works shouldn't be done on vacant circumstances, there should be proper policy framework to harmonize the whole system, and Policy formulation aims to create

conducive legal procedure for the benefit and guidance of utility providers that in one way or another involved in the utility operations on highway right-of- way.

- **Policy and Norms of International Experience**

Most European and American countries have the infrastructure policy and norms of utility installation. Reviewing the experience of norms and standard of these countries is very critical to adopt the Ethiopian utilities installation and integration manual. According to Tesfaye (2001), Control of access can be materially affected by the extent and manner in which public utilities cross or other wise occupy the highway right of way. Where such longitudinal installations are requested, the utility owner must in each case show that

A. Accommodation will not adversely affect highway and traffic safety.

B. Alternate locations are not available or can not be implemented at reasonable cost, from stand point of providing efficient utility services in a manner conducive to safety, durability, and economy of maintenance

C. utility providers should work in an integrated manner for the safety of highway and reduce wastage of resources.

D. Roads that are constructed less than 3-5years could not be trenched unless and otherwise the situation forced to do so and the like.

2.3 Empirical Evidences on Coordination

Integrated urban infrastructure and service planning IUISP is not recent phenomenon for most European, America and Asian countries. Most countries in the world understand the use of IUISP and start implementing earlier, the issue of integration is also becoming popular in some of African countries such as South Africa and Rwanda. The concept of integration applied in many other sectors other than infrastructure or utilities provision, even here in Ethiopia the integrated housing development program could be consider as an example, employment creation, poverty alleviation, the issue of environment, sustainable development and promotion of small and micro finance are elements of the integrated housing program. Different countries have different experience of integration but the infrastructural integration of Ethiopia is lowest. Reviewing the experience of

some countries have much importance to understand how very important integration is and to adopt some useful perspectives in the effort of integration in the Ethiopian context.

2.3.1 Experience from Indonesia

According to Matewos (2006), integrated urban infrastructure and service development plan (IUIDP) of Indonesia is a good example of improved infrastructure planning coordination. Prior to the IUIDP practice, there was little coordination and tremendous backlog of unmet needs of infrastructure. Since the late 1980s the towns and cities of Indonesia have been planning and implementing IUIDP. The IUIDP had institutional, revenue and physical improvement component. It was initiated by ministry of public works of Indonesia in collaboration with World Bank and also supported by Asian development fund.

Implementing the IUIDP was not an easy task, this program was refined through time, and the approach was shuffled from sectoral approach to bottom up approach. The attempt was made at local level then developed to city and nation level respectively to achieve the infrastructural integration process (ibid).

Though Indonesia has achieved a substantial improvement of urban infrastructure through this program, The impact registered in making the organizations responsible for providing, managing sustaining the achievements was limited and the success was realized after the continuous effort were made. Bringing the stakeholders together and create conducive atmosphere for them had improved the service provision and saved the scarce resources in the given area. As a result the social and economic costs to the socity reduce considerably.

2.3.2 Experience from Turkey

According to Levent (2008), in 2004-2006, MMs spent approximately 1.428 million YTL (new Turkish Liras) for Asphalt-paved road and 420 million YTL for sidewalk constructions. With current Municipal work on asphalt-paved roads, all roads would be renovated every 5 years. Considering that economic life of hot mix asphalt is approximately 15 years; it can be understood that roads were renewed before their end-

of-life or service year. Cases where roads and pavements are damaged before their end-of-life for the sake of infrastructure works and excavations are a phenomenon encountered by every citizen in their daily life. However, to what extent improvement need of asphalt-paved roads and pavements has resulted from uncoordinated infrastructure works cannot be identified easily.

Frequent utility excavations became common practiced in most parts of Turkish cities roads, quality of asphalt-paved roads and sidewalk decrease drastically so as their economic life. Hence, the Turkish MMs decided asphalt-paved roads not to be excavated frequently, necessary measures to maintain integrity should be taken and infrastructure works should be carried out in coordination.

> *Routing and width of roads are significantly changed with changes in building development plans. While harmonizing status with development plans, those lines installed before plans must be displaced or reinstalled. In such cases, not only costs related to infrastructure but also asphalt-paved roads and sidewalk costs turn into sunk cost (Levent, 2008).*

Another cost item in the coordination of infrastructure works is infrastructure information system developed as part of GIS. These are carried out completely without planning coordination of infrastructure works and interoperability of GIS. Infrastructure information system can be developed through use of map in digital environment as footing. With this aspect digital maps named as footing are of vital importance in GIS. At many MMs, each utility prepare its own maps according to its needs and program. GISs are developed by using incompatible footings and thus, these systems can not be used in the coordination of infrastructure works, this in turn leads to double costs and work repetitions. And finally come up with periodic update of utilities and interoperability.

2.3.3 Experience from South Africa

As stated on Matewos 2006, South Africa adopted a municipal infrastructure program in the late 1990s with the aim of improving the quality of life of the poorest sections of South African communities through granting access to basic services. It is A multi faceted development program containing different packages such as water supply, sewage, road, storm water drainage, transport facilities , toilet and sport facilities.

The department of consultaion development has been responsible for integration of MIP projects in to broader multifaceted development programs. The department prepares goals and objectives and strives for the success of stated goals. Local governments were established in response to the mission. These local governments in South Africa restructured to focus on the provision of basic infrastructure by decentralizing the system. In general the program has met its mission to deliver infrastructure. It has also achieved its mission through the coordination of municipal infrastructure program by considering MIP fund and mobilizes local resource.

The Provincial government receives the grant funds from the national government and manages the funds in accordance with the approved business plan. In this case the project became successful and benefits large number of South African poor communities as expected.

2.4 Infrastructure and Utilities in the Context of Ethiopia

According to daily Ethiopia report, the provision of good quality infrastructure services is the key to an efficient operation of the private sector and the integration into the global market as well as for attracting foreign direct investment. Therefore, the Government has been and is still engaged in comprehensive infrastructure development programs in roads, telecommunications, energy and others. However, one can safely argue that the current status of service provision is said to be scanty in both extent and quality.

- **Principle of Infrastructure Development**

Infrastructure is always a crucial sector for the harmonization of social and economic activities and foster the over all development of cities. The development of other sectors hampered due to the inadequacy of infrastructure, since infrastructure is a very crucial factor it is unthinkable to bring sustainable economic and other forms of development in the absence of integrated infrastructure strategy. With the understanding of the above issues the urban development policy gave much attention for the provision of infrastructure in adequate manner and based on the policy some possible recommendations were forwarded in urban infrastructure improvement draft 2007).

- The existing infrastructure impact should be studied before the construction of new infrastructure.
- Infrastructure development should allow active participation of all stakeholders.
- Infrastructure provision and management should follow certain procedure and Higherarchy.
- Infrastructure that serves the public should be prioritized....

As we can see, the above Ethiopian urban policy gives much emphasis for the provision and development of infrastructure and it also tried to insight the areas of focus and what should look like the development of infrastructure. However, one can understand that the issue of integration is loosely presented in this infrastructure improvement package, in result it is difficult to achieve certain objectives in the absence of integration.

- **Infrastructure and Related Policy Issues in Ethiopia**

It is known fact that, there is no single full-fledged/consolidated infrastructure policy however, the infrastructural development was as major component of urban policy of Ethiopia, the urban policy of Ethiopia that promulgated in the year 2006 raise and depict some important elements of cities infrastructure.

Since Cities do not have enough infrastructure most of them do not equipped with adequate water, road, power and telecommunication, some other cities equipped with some infrastructure provision but still could not satisfy the existing demand(Urban development policy; 2005). Moreover, the new and existing infrastructural development activities undergoing in un integrated manner. A number of factors can be mentioned here as a root cause, According to Tesfaye (2001), Poor management of utility lines with in the right of way of roads being the major /core problem, its effect manifested by interference of utility providers, repeated excavation, road cutting and incurring extra expense. The possible cause for the problem could be one or a combination of the following:

- Absence, lack or non familiarity of guiding frames
- lack of implementing capacity

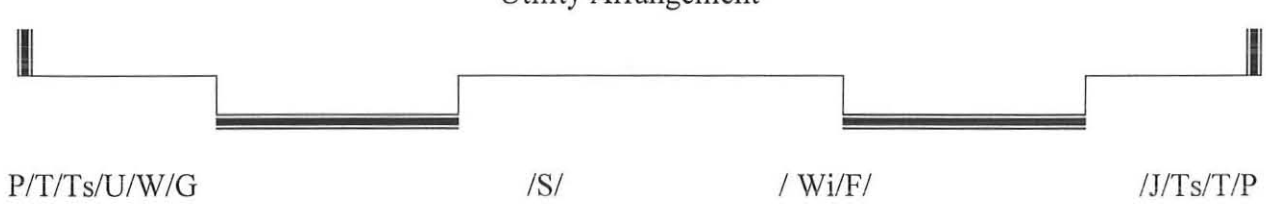
- lack of sustainable concern and Lack of coordination

As the writer said the aforementioned factors have strong impact on the absence of integration but lack or low level of integration is not only resulted from the above reasons. According to Mesfin (2009), Lack of established infrastructure policy, Lack of information with coordinate data on the existing underground utility locations, lack of clear and accountable legal frame work, and so on for the absence of integration on road and utilities.

- **Norms of Installation of Utility Lines Providing Institutions**

Ethiopian electric power corporation (EEPCO), water supply and sewerage authority(AAWSA), Ethiopian telecommunication corporation(ETC) are the major utility lines providing institutions both nation wide and at the city level, EEPCO and ETC have norms of installation (Tesfaye, 2001) and currently the Ethiopian water and sewerage authority prepared norms of installation, but still focuses on the water. This is mainly because of the nature of the sewerage doesn't allow to develop fixed standards.

Figure 2.2, Figure showing the standard of utility arrangement



P=Power transmission line	T=Telephone, Telegraph, Television
Ts=Traffic signal	J=Inlets W=Water
G=Gas	Wi=Irrigation
S=Sewer	F=Fuel transmit ion line

Source: Towards coordinated management of utility lines drafts (2001)

The drainage system mostly affected by the nature of the land , While the norms of installation prepared by EEPCO is separately prepared, that of ET is abstracted from technical specification of contractual agreement. When the cable is encountered along the pedestrian area, the cable shall be buried at least a depth of 100 cm and the horizontal clearance from the edge of the road shall be 90 cm.

- **Ethiopian Telecommunication Corporation**

The local telephone line network shall be designed carefully based on the fact that involves major portion of investment on the telecommunication network. The design work shall aim at optimum plant provision taking quality flexibility, reliability, practicability, economy and maintainability in to consideration. The design work shall be based on field survey, corresponded to various conditions and external environment in the coverage area concerned and shall base as much as possible on detail drawings, the proposed depth of chambers to the final grades and level of carriage ways and foot ways. ETC shall at his own expense, protect and support any pipe, conduit cable wire or any other items of telephone or foreign plant exposed or encountered during the excavation. ETC shall be obliged to restore all items to their original conditions and to the satisfaction of the owner of such plant. The ET underground lines should be buried with certain standard to avoid conflict among utilities. The following table summarizes the minimum distance between telephone lines and other utilities.

Table 2.4 Minimum clearance between telephone facilities and other utilities

Utilities	Parallel	Crossing
Power lines	45-cm short span	45 cm
Water pipes	30cm	15 cm
Sewerage pipes	30 cm	15 cm

Source: Towards coordinated management of utility lines drafts (2001)

- **Addis Ababa Water and Sewerage**

The installation of water pipes might not be as such difficult compared to the sewerage line, the sewerage line mostly follows straight lines and with the minimum depth of 1m. Since the line is installed with gravity and the standard mostly determines based on the land gradient. Moreover, the pipe is wide it needs wider excavation than the water pipes. However, in most circumstances deciding the sewerage standard is difficult because it mostly determined by the existing circumstances rather than pre determined standards.

- **Ethiopian Telecommunication Corporation**

The local telephone line network shall be designed carefully based on the fact that involves major portion of investment on the telecommunication network. The design work shall aim at optimum plant provision taking quality flexibility, reliability, practicability, economy and maintainability in to consideration. The design work shall be based on field survey, corresponded to various conditions and external environment in the coverage area concerned and shall base as much as possible on detail drawings, the proposed depth of chambers to the final grades and level of carriage ways and foot ways. ETC shall at his own expense, protect and support any pipe, conduit cable wire or any other items of telephone or foreign plant exposed or encountered during the excavation. ETC shall be obliged to restore all items to their original conditions and to the satisfaction of the owner of such plant. The ET underground lines should be buried with certain standard to avoid conflict among utilities. The following table summarizes the minimum distance between telephone lines and other utilities.

Table 2.4 Minimum clearance between telephone facilities and other utilities

Utilities	Parallel	Crossing
Power lines	45-cm short span	45 cm
Water pipes	30cm	15 cm
Sewerage pipes	30 cm	15 cm

Source: Towards coordinated management of utility lines drafts (2001)

- **Addis Ababa Water and Sewerage**

The installation of water pipes might not be as such difficult compared to the sewerage line, the sewerage line mostly follows straight lines and with the minimum depth of 1m. Since the line is installed with gravity and the standard mostly determines based on the land gradient. Moreover, the pipe is wide it needs wider excavation than the water pipes. However, in most circumstances deciding the sewerage standard is difficult because it mostly determined by the existing circumstances rather than pre determined standards.

Chapter Three

3. Background of the Study Area

Addis Ababa was founded in 1887 by empress Tayitu and become the capital in 1892, it is the oldest and largest cities in Africa (UN Habitat, 2006) and the city of Addis is Federal Capital, lies in the central plateau at an altitude of 2,400 meters, 9^0 north of the Equator. Its average annual temperature is 16^o C & the average annual rainfall lies at 122.1 m. meters. The city is situated in the centre of the country and sprawl over an area of 28,000 hectares. The central part of the city, so called metropolis is about 7,500km and crucial in all aspects (Van Djik, 2005).

3.1 Population and Location of the Study Area

The population size of the city increasing at an alarming rate for two major reasons: natural increase and rural urban migration. Rural Urban migration accounts 40 % of the growth (UN Habitat, 2006) but most researches revealed that the first factor said to be insignificant. Generally Addis Ababa is one of the fast growing cities in Africa. According to the CSA 2007 report, the total population size of the city was 2,739,551 and it is projected to be 2,980, 001 in the year 2011(CSA, 2010). The city divide in to 10 major sub cities, which in comprises 116 weredas. The four sub cities namely (Arada, Addis Ketema, Kirkos and Lideta) are the major focus of this study. In addition the general characteristics of the study area (i.e. population, household status, housing unit and types of tenure) presented in the following table.

Table 3.1 Population and housing condition in the inner city

Items	Arada	Lideta	Kirkos	Addis Ketema
Population	211,501	201713	211234	255372
Household	50349	46813	55256	52961
Housing unit	47364	44350	52582	49042
Government house	1769	532	21111	444
Private house	20153	21430	29352	21104
Keble house	25442	22388	21119	27494

Source: Fortune magazine volume 11 Sunday February 20, 2011

3.2 The City profile

Now a day the city characterized by a number of challenges, including the high rate of unemployment, housing shortage and environmental deterioration moreover, and scanty level of urban infrastructure is the main characteristics of the city that hinder the fast growth of the city (UN Habitat, 2006). As quoted in one study, 82% of the population of Addis live in unplanned neighborhood, which lack basic urban facilities and infrastructure networks The severity of urban decay and lack of public facilities are more deep in central parts of the City; mainly because, one, inner city of Addis constitutes the unplanned and the oldest parts of the City, the whole urban service either provided at scanty level or provided in and intermittent manner (www.addisababacity.gov.et).

Being the capital of a non colonized country in Africa, it has been playing a historic role in hosting the regional organizations such as the organization of African Union (AU), and the United Nations Economic Commission for Africa (UNECA) (ibid). Several other regional and international organizations have their headquarters and branch offices in the capital. It is also the centre of commercial activities and industry. According to the central statistical authority, it has been generated about one quarter of Ethiopians GDP in 1994 (van Dijk 2005). Banking and insurances, educational centers, entertainment, hotels and the like are available in the city of Addis Ababa.

Road Network of the Study Area

The total area of city of Addis Ababa is estimated to be 526.99 sq km (CSA, 2011). Since the establishment of the city 1886 there had been many efforts exerted to cover the city with the road network and currently large parts of the city area covered with the road network, counting the city road begin in 2008.

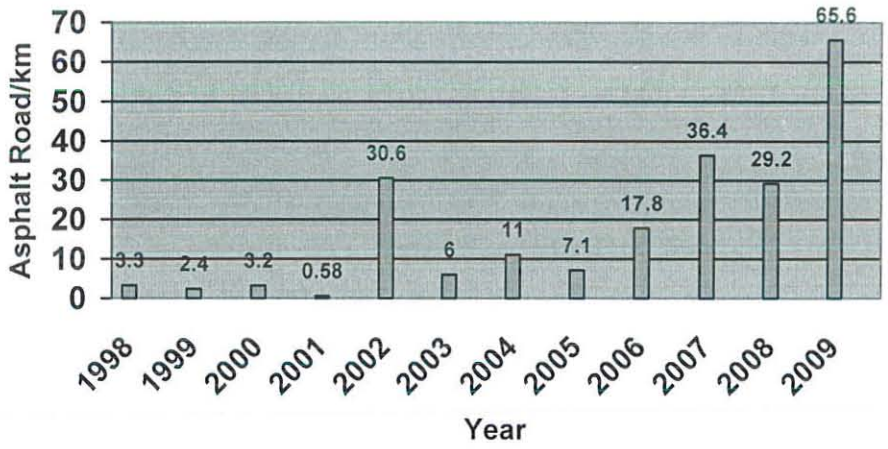
Table 3.2 The Rood Coverage in Addis Ababa

Asphalt road	1555.47 Km	With7metre width
Gravel road	1370.18 km	With7metre width
Chiseled road	267.68 km	With7metre width
Earthwork road	563.73 km	With7metre width
Total	3193 Km	With7 meter excluding the earthwork road

Source: AACRA Road management, 2010 (Nine month report)

The current status of road network said to be promising, but it is the least and some times incomparable with other cities of the developed world. It is true that the existing government gives much priority for road construction than the Derge and empirical regime. The road coverage of the city was only 5% before 1983 and reach 12% in the year 2002 (Finot Addis, 2003). As we can see in the urban policy the road development is highly prioritized next to water, due to this bias the road network is said to be in a good condition. Even if it is highly prioritized the success of constructing road vary from year to year due to a number of reasons, if we see constructed road for the last 10 years for instance we can easily understand the level of emphasis on this sector. The total road network of the city is about 12% which is better in comparative speaking.

Figure 3.1 Figure showing annually constructed asphalt roads (1998-2009)



Source: AACRA, 2011

Table 3.3 Population Distribution and Road Coverage of Inner City

Sub city	Covered area %	Pop/Km	Asphalt/km	Gravel road/km	Chiseled/km	Earthwork /km
Kirkos	15.4	26423.1	1.74850235	0.37276245	0.2310683	0.04304545
Lideta	11.56	31362.8	0.7128705	0.0353938	0.22534698	0.21186631
Addis ketema	7.77	55521.1	0.65963748	0.045593	0.27288411	0.21481563
Arada	9.98	35933.0	1.10653593	0	0.21146688	0.16439889

Source; AACRA departments of road management, 2010

3.3 Major Urban Services in the Study Area

- **The Water and Sewerage system**

It is indicated that piped supply of clean water was an innovation introduced by Emperor Menelik 15 years after the establishment of the capital. The first pipe water reservoir was built in1892. In1960 the Gefersa Dam was built and subsequently the Legedadi Dam and treatment plant were put in operation. Two additional resources are Dire Dam and the Akaki well fields. A program of spring rehabilitation and borehole drilling has enabled the city to supply water to outlying areas (Desta , 2003 cited in van Dijk 2005).

As indicated in Desta (2003), potable water coverage for the city of Addis Ababa was not more than 60%. Currently the coverage rises to 73 % and plan to make it 100% in the near future (AAWSA). Its performance can be shown by it's unaccounted for water (UFW at least 35%) and the low coverage (only 2% of the urban population is linked to) of the sewerage system. According to AAWSA, the total length of the sewerage coverage of the city estimated to be 320 km.

- **Telecommunications**

According to Ethio Telecom, ETC is the oldest Public Telecommunications Operator (PTO) in Africa. Not only the oldest but also the most efficient in sub Saharan relatively the sectors are showing marked improvement (www.ethioexport.org/country_main). In recognition of the Government's commitment to attract foreign direct investment, the Ethiopian Telecommunications Corporation (ETC) has taken a number of measures to foster an enabling investment climate. In its Eighth Development Program (2001-2005), it has plans to increase the telephone penetration rate from 0.3 % (3 to 1000 people) to a minimum of 1.0 % (1 to 100 people) and thus meet all pending demands of both the urban and rural population. Even if the city is capital of Addis most areas particularly expansion areas demand is not being satisfied in fixed line demand however the mobile phone distribution is in a much better condition compared to the fixed one. According to ET the current mobile customers are estimated to be 8 million.

- **Power Supply**

The main industrial towns are all connected into the national grid. Almost the entire ICS capability is provided by the seven hydroelectric power plants. Formerly the right of power generation was monopolized by the Ethiopian electric power corporation EEPCO which was established as a public enterprise by regulation No. 18/1997. The Government has liberalized the sector allowing foreign investors to participate in generating electric power by setting up hydroelectric power plants. The only restriction is, however, on the transmission and distribution (www.ethioexport.org/country_main.shtml). While still no private sector involved in this sector yet. Its being not accountable (dually accountable) to the City Administration legally is an issue in the co-ordination process of infrastructure works in the city.

As we all know frequent power cut of is a common phenomenon in Addis Ababa for the last 5-7 years. Many reasons can be mentioned here, but the major one is the imbalance between demand and supply. Moreover, the old distribution system also plays its significance role for frequent power cut in the city. Regarding the distribution system the Ethiopia electric power corporation has been engaged in new forms of power distribution system which is mainly focus on the underground cable program. With this activity nearly 165 km roads have been drilled and trenched beginning of this year. According to EEPCO Officer, the installation of the cable estimated to cost 77 million US dollars would enable to provide fast and efficient maintenance service when ever an electric line is damaged or become dysfunctional.

Chapter Four

4. Data Presentation and Analysis

This section analyses and discusses the major findings of data collected through different methods stated under methodology. It also attempts to give response to the research questions by dealing with the current integration at intra and inter sectoral level and many related questions. Moreover, the research attempts to answer the point where the integration process said to be failed and its consequence from different perspectives. This part mainly incorporates field survey and document analysis which includes survey, In-depth interview, Talk show and Personal observation. Moreover, the analysis and discussion will help to reach major conclusion and forward possible recommendation.

4.1 An Overview of Practice of Integration in Addis Ababa

Though there were some efforts of urban infrastructure and service planning in Ethiopia, they were however, not systematically developed. Evidently, almost all infrastructure and service providing institutions (water, transport, and drainage, electricity and telecommunication) always tried to integrate their plans with the existing and proposed networks. Nevertheless, due to lack of consistent follow up the initiative could not be successful as expected (Matewos, 2006). This is controversial; other documents said the effort was not made even by any of the responsible service providers. Some literatures also reveled that the effort is made but in un integrated manner. Each of the service providers plan, implement individually due to these and some other reasons it is difficult to integrate the effort to the master plan. Accordingly, Drainage and utilities were considered during the preparation of Addis Ababa master plan.

According to Tesfaye (2001), utility lines should be located to minimize need for later adjustment, to accommodate future road improvement, and to permits servicing such lines with the minimum interference to road traffic. To the extent, utility crossing that are more likely to require future servicing, such as water supply, gas lines should be installed in tunnels to permit servicing without disrupting traffic flow. But, the current practice of utility providers may go contrary to the above stated direction. This can be explained with the absence of integration among stakeholders, due to the fact that, almost all works

done without the expectation of future improvements and that can affect circulation of traffic.

Most utility providers, accomplish their task without referring the master plan. This mainly due to the gap between the city administration and utility providers, Some of the workers in the utility companies fail to believe the existence of the city master plan and mostly claim that their participation was law or insignificant during the preparation of the master plan, which play vital role for the inconvenience and low level of infrastructural integration. There were no regulations that enforce as to where and how utility provider install their lines within ROW, relocate or rehabilitate its line, though some form of standards are in place.

Following the City Administration's reform in 2003, the Addis Ababa Infrastructure and Construction Authority (AAICA) was established. The Authority was empowered to undertake co-ordination of infrastructure institutions and to supervise their projects. Under the co-ordination of AAICA, two committees have been formed by representatives of infrastructure institutions. The managers/ heads of the respective infrastructure institutions formed the main or steering committee and under the main committee a technical committee was formed. This committee (technical or virtual) is response to the failure of higher Officials committee, because the committee unable to undertake regular meeting and bring effective coordination among stakeholders. A number of reasons can be justified for the failure of this committee .According to IUISP manual (2006),

> *The committee was found ineffective mainly due to lack of a legal enforcement mechanism and the absence of a strong co-coordinating institution. The committee consisted of busy officials as a result representatives of various institutions usually failed to attend the committee meetings.*

The Addis Ababa regulatory design and management established since 2009 which mainly focus on design and construction standards. In addition to that, it also extends its focus to the integration of infrastructural works. The design regulatory and capacity building authority of Addis Ababa city Administration development bureau held discussion with stakeholders on regulation drafted for the integration of infrastructure.

According to deputy head bureau the regulation was scrutinized by representatives of organizations in the infrastructure sector and tested on pilot projects of the Ethiopian telecommunication corporation showing encouraging results (News Addis 2010).

4.1.1 Overview of Respondents Characteristics

- **Educational Status of the Respondents**

Education as one of man's cultural needs is the most important factor to bring forth all round development. Moreover, it is a key to enhance the level of capability working together with others, which can also influence the process of integration at certain level. Educational statuses of the sample of the respondents have been presented on table 4.1.

Table: 4.1. Frequency and percentage of respondents by their educational level

Name of Employer	12-complet		College diploma		First-degree		Second degree		Total
	No	%	No	%	No	%	No	%	
AACRA	0	-	5	31.5	11	68.8	0	-	16
AAWSA	1	5.9	3	17.6	13	76.5	0	-	17
EEPCO	0	-	8	57.1	5	21.4	1	7.1	14
ET	1	6.7	19	66.7	3	20	1	6.7	15
Total	2		26		32		2		62
Percent	3.2		41.9		51.6		3.2		100

Source: Own Survey, 2011

As can be seen from the above Table 4.1, the highest educational level of the respondents ranges from 12 complete to the second degree. The majorities of the respondents 51.6% are first degree holders and 41.9% of the respondents are Diploma holders. This further can be seen into the institutional level. Accordingly, the largest proportions of AACRA employee are first degree holder's account 68.8 % and followed by college diploma, the two extremes are insignificant for the aforementioned institution. In the case of AAWSA, 76.5 % are first degree holders & 17.6% are diplomas holders. The remaining respondents are categorized as 12 complete. Regarding EEPCO and ET the largest proportion is college diploma accounts 57.1% and 66.7% respectively, while in the first degree case there is no significant variation between the two institutions, EEPCO and ET accounts 21% and 20 % respectively.

- **Relationship of Educational Status and Position**

It is a general fact that, efficiency and effectiveness are the function of appropriate educational background and related work experience. Assigning the right person to the right position has positive effect in efficiency and effectiveness. Furthermore, the process of integration can be affected by the same factor. To see this correlation educational status and current position of the respondents, and questions that inquire these relationships were asked and the result presented as follows:

Table: 4.2 Educational backgrounds of respondents and their assigned Position

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Direct relation	40	64.5	64.5	64.5
Indirect relationship	18	29.0	29.0	93.5
No relationship	4	6.5	6.5	100.0
Total	62	100.0	100.0	

Source: Own Survey, 2011

As depicted on the above Table 4.2, 64.5% of the respondents have direct relationship with their educational background, this followed by indirect relationship which is 29% and only 6.5% of the respondents replied that their educational background and position do not have any relationship. In this regard, even if the direct relation is dominant the indirect one is also proportionally significant, which can affect the process of the integration at certain level.

- **Provision of Supportive Training**

The question that inquires, the view of the respondents on the importance and availability of on job training by their respective institutions, which aims capacity building of the respondents and enhancing the institutional capacity. The relationship of the on job training and the current performance of integration at both intra and inter sectoral level can be said statistically significant. People, particularly who assigned in the integration process should have a good knowledge about the issues. In this regard, getting on job training will enhance the performance of the employee; in return improve the coordination process. For instance, people who work in the virtual (technical) committee can benefit more if they have foreign exposure and contextualize some important features to the country. All respondents from the four institutions unanimously respond that

capacity building is crucial in the course of institutional and human resource development. The following table summarizes the view of respondents on the provision of supportive training.

Table: 4.3 Name of employer and the provision of on job trainings

Name of employer	Yes		No		Have no idea		Total
	No	%	No	%	No	%	
AACRA	12	75	2	12.5	2	12.5	16
AAWSA	8	47.1	9	52.9	0	-	17
EEPCO	9	64.3	5	35.7	0	-	14
ET	11	73.3	0		4	26.7	15
Total	40		16		6		62
Percent	64.5		25.8		9.7		100

Source: Own Survey, 2011

As can be seen on the above Table 4.3, about 64 % of the respondents obtained on job trainings from their respective institutions, the remaining 36.5% do not get and have no idea or neutral. This further can be classified in to institutional level, in which 75 % of the respondent of the AACRA and 73.3% of ET employees obtained on job training, which enable them to upgrade and familiarize with the new technology or information. By the same token 64.3% EEPCO workers obtained on Job training. Contrary to this, only 47.1 % of AAWSA employees obtained on job trainings. Therefore, it is possible to conclude that ET and AACRA are in a better condition of updating their employee through the provision of on job trainings.

The following table showing a Chi summary of some important variables and their significance level accordingly.

Table: 4.4 Chi square summaries for different variables

Variables	X^2	df	P-value
Education Vs Dept integration	5.515	6	O.480
Change of plans Vs level of integration	9.616	6	0.131
Departmental integration Vs Role model ness	15.523	9	.078
Existence of damage VS Types of excavation	18.667	12	0.097

Source: Own Survey, 2011

4.2 Reasons for Frequent Road Excavation

In consideration of integration, any utility and infrastructure works should be done in harmonized manner. Applying the most effective and harmonized system has a number of positive results. Among the results, minimizing wastage of resources and repetition of tasks are the major ones. Knowing the root causes of frequent excavation enable to achieve the stated goals of coordination. The following table summarizes the common reasons of excavations in the inner city of Addis Ababa.

Table: 4.5 Reasons for Frequent Trenching of asphalts as reported by respondents

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
New technologies	14	22.6	23.3	23.3
Damage/Emergency repair	12	19.4	20.1	43.4
Expansion on the existing utility	5	8.1	8.3	51.7
AACRA request for Relocation	5	8.1	8.3	60.0
Emergency repair & AACRA request for relocation	14	22.6	23.3	83.3
Have no idea	10	16.1	16.7	100.0
Total	60	96.8	100.0	
Missing System	2	3.2		
Total	62	100	100.0	

Source: Own Survey, 2011

Table 4.5, indicate that excavation in the city of Addis Ababa mainly resulted from multiple reasons. Among the reasons, respondents who replied due to new technology are 22.6%. A combination of Emergency repair and Request from AACRA accounts 22.6% and Emergency repair alone account (19.4%). Since most of utilities are aged it is expected to be significant, and followed by have no idea account 16.1%, request from AACRA for relocation accounts only 8.1%. The interview result scrutinizes the issue, upgrading of the existing utility and emergency repair are the two major reasons in the city. However, the request from road authority is still insignificant. Similarly, the talk show identifies that emergency repair and maintenance could be considered as major causes. The researcher want to remind the reader that, excavation some times done without any tangible reasons, institutions may excavate a one lane road two or more times. The reason justified is that, because of the problem encountered during the service

delivery, this indicates that considerable amount mistakes have been committed at this stages, consequently frequent excavation done for the adjustment of previously committed mistakes.

4.2.1 Reasons for Frequent Excavation: Inner City Vs Expansion Area

The inner city is characterized by frequent excavation and problems related with infrastructure pronounced in the city centre than expansion area. It is a general fact that, the inner city is characterized with bunch of problems, which dates back to 100 years and more. Hence, the city problem emanate since then. Many reasons can be mentioned for these problems, the issue of planning is the one and very critical. The city was not planned for the last hundred years. The following table is evident for level of planning problem in the study area.

Table: 4.6 Reasons for excavation of Inner city as reported by respondents

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Inadequacy of the previous infrastructure	25	40.3	42.4	42.4
Frequent damage	5	8.1	8.5	50.8
Due to the city LDP	12	19.4	20.3	71.2
LDP and Inadequacy of previous Infrastructure	15	24	25.4	96.7
Have no idea	2	3.2	3.4	100.0
Total	59	95.2	100.0	
Missing System	3	4.8		
Total	62	100	100.0	

Source: Own Survey, 2011

According to the survey result, about 40% of the respondents replied that the major reason for frequent trenching in the inner city is imbalance of demand and supply or the inadequacy of formerly constructed utilities. With regard to the problem of trenching, 24% of the respondents argued that LDP and frequent damage together took highest proportion next to imbalance of the previous infrastructure. Among the total respondents nearly 19% replied that frequent excavation in the city centre resulted due to the current LDP only. The remaining 8% and 5% said due to frequent damage and do not have any idea about the issue respectively. Similarly, the interview result supports the survey, and can be summarized as follows:

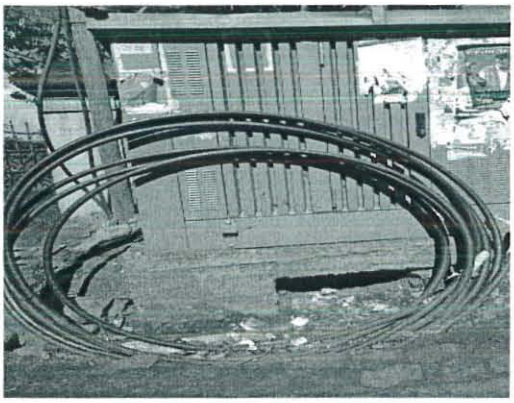
- Due to the growth of investment in the city centre, provision of infrastructure was not done through integration and the assumption of the current growth of the city (AACRA).
- Formerly there was no sewerage service, beside the sewerage, the water pipes are old characterized with frequent damage and previously installed lines could not support the existing demand, to respond that demand excavation is a must (AAWSA).
- Formerly our line was over pass and now we are changing that in to under pass and the other reason is that due to the strategy of the country, these all service providing institution want to address the need of the people. Thus excavation is compulsory (EEPCO).
- There was no infrastructural integration at that time; every stakeholder was doing separately (Regulatory).

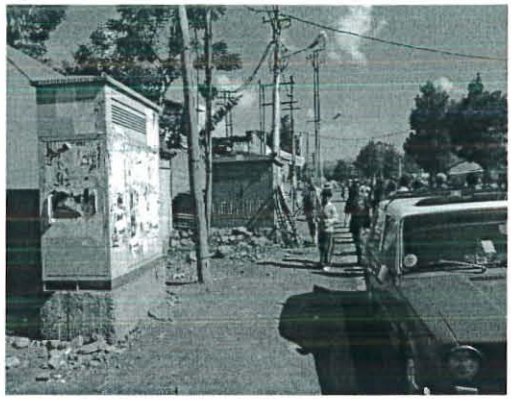
According to (AACRA), the city could not qualify even a good Town standard. The development of the city was highly congested in the city centre and there is tremendous population growth, due to the fact that every work in the city centre pronounced and become problematic. The issue rose in Addis Zikre hasab (2009) and stated as follows:

> *"every stakeholders are doing now what has not been done before some 10 or 20 years back, bunch of works done currently, there is no doubt the first exposed area is city center than the expansion area". To this effect the inner city is the most common areas exposed for frequent trenching and cut off asphalts.*

The researcher opinion in this regard, though it is the centre the facility which were installed and provided for that area characterized with poor quality, old, intermittent and that could not support the existing demand. There is also one more threat in the inner city of Addis Ababa, most telecommunication lines (boxes and manholes) are installed with the agreement between the road authority and telecommunication to be relocated in the near future and most manholes and line boxes stand on the rods that can affect the traffic movement as well. With no doubt, the inner city looking for one more huge excavation in the near future due to the agreement stated above and road expansions.

Figure 4.1 picture showing Tele cable box (walkways)





Source: Own picture, 2011

- **Excavation within Carriage Ways**

Currently the carriage way is becoming target for utility works. Many negative consequences followed this excavation. Assessing the major reasons for exaction of carriage way is very helpful to mitigate the problem from the grass root level. The following table indicates that the major reasons of carriage way excavation in the city.

Table: 4.7 Reasons for Carriage way excavations as reported by respondents

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Walkways are too narrow	11	17.7	28.2	28.2
Carriage way is simple for utility installation	3	4.8	7.7	35.9
Previous utilities are buried in carriage way	7	10.9	17.4	52.3
Existence of previous utilities on walkways	13	21.6	34.5	87.8
Have no idea	5	8.1	12.8	100
Total	39	62.9	100.0	
Missing System	23	37.1		
Total	62	100	100.0	

Source: Own Survey, 2011

As can be seen from the above Table 4.7, the carriage way mostly being excavated for certain reasons. The survey result shows that, about 37% failed to answer this question (missing system), this is mainly because the road authority was not inquired for this question. Among the total respondents those who replied for the question argued that, due

to the existence of the previous utilities on walkways account 21.6% and followed by 17.7%, due to the narrowness of the walkway. About 8% of the respondents do not have any idea why the carriage way is frequently excavated. The interview results partly scrutinize the issue, carriage way excavation mostly done by the water and sewerage authority. Formerly there was only 2% of the sewerage service in the city of Addis Ababa. This figure is growing fast but sill can not satisfy the current demand, now the coverage rise to 324 km shows (7%) increment in the city (AAWSA, 2011). The authority emphasis that, the walkways are already occupied with former utilities like water, Tele and power and the like so there is no vacant place for sewerage. Moreover, the sewerage line inquires comparatively wider area and depth, maintaining that depth and working on the walkway is still difficult.

This could be use as a good indicator for the emphasis of the city master plan for utilities, but still there was a possibility to accommodate both in one line, unlike water the sewerage lines need deep installation. When the water pipes installed in the Walkways it is still practical to install both at the same time using a single trench. For instance, after the installment of the sewerage line it is possible to pass over the water pipes by differentiating only the depth. But need serious precaution; water can be easily spoiled with the leak of sewerage. Thus, one can argue that there is loose coordination within the same authority.

Most roads in Addis Ababa particularly, the roads in the inner city are below the standard, which ranges from 7 to 12, that can not support the traffic flow of the city. When excavations made within the carriage way the traffic become worse. It is possible to mention example of the road near by old postal office, the asphalt is less than 20 meters wide and the sewerage line being trenched 2 meters from the edge (within the carriage way). The traffic movement of the area was said to be worse for considerable time even the excavated material covered large portion of the carriage way in which it was the main hindrance of the movement.

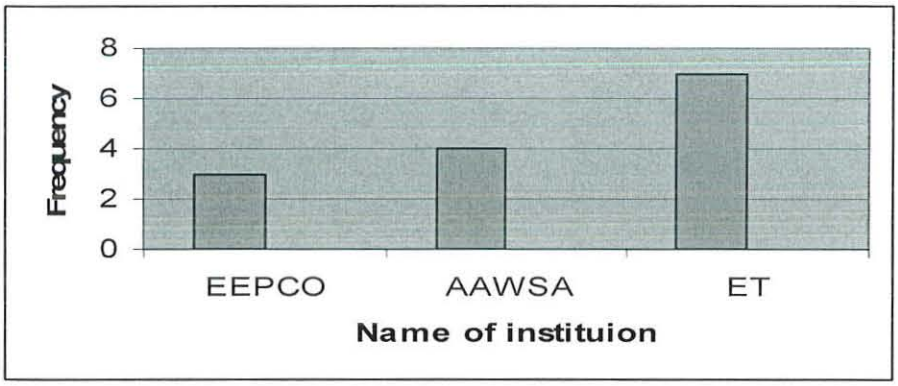
Figure 4.2 picture showing excavation of roads within the carriage of way

Source: Own picture, 2011

- **Institutions usually Trenching Asphalts Roads**

It is a general fact that, trenching of asphalt is becoming common practice in the city of Addis Ababa, particularly the inner city. According to AACRA, the three institutions i.e. water and sewerage, Telecommunication and Power Corporation (currently engaged) highly involved in the trenching of Addis Ababa asphalts. As mentioned in the review part, trenching mostly done for the betterment of the existing services. However, mostly done at the expense of existing road, excavation made on the road the road service year will reduce dramatically. This in collaboration to haphazard planning of urban sectors may cause for devastating urban structure consequently, affect the process and retarded urban development. (Infrastructure works mostly result in the inevitable physical disruption), the asphalt which trenched once and the asphalt trenched two or more times do not have equal service year, this can be supported by the empirical evidence from the review. In this regard each of the aforementioned service providers excavate the road at different times but in most circumstances the excavation can only made once and every stakeholders can use that trench for their own purpose. However, this is not a common practice in the city of Addis Ababa, particularly in the inner city. The following figure shows the institutions mostly trenched asphalts reported by AACRA respondents.

Figure 4.3, Figure showing the number of respondents with frequently excavating institution reported by AACRA



Source: Own Survey, 2011

As we can see from the above graph, majority of respondents replied that the city roads mostly trenched by ET, and followed by AAWSA. The percentage for the telecommunication said to be significant, this could be because of the continuous technological advancement in the sector, as already stated the communication sector grown at alarming rate. Hence, in order to go hand in hand with the existing technological advancement trenching shall be an evil necessity. However, AAWSA trenching asphalts mostly caused by maintenance and frequent damages. Since the sewerage is also new trend to the city, asphalt trenching is compulsory even in side the carriageway. In most other cities, utility provision using carriage way is not practical. However, it is becoming a common practice in the city of Addis Ababa particularly inner city; this is also a good indicator for the loose integration and relationship among parties. Moreover, it is also an indicator for level of consideration of the master plan for utilities.

- **Convenient Time for Excavation**

The time of excavation need to have serious control, because some areas may not be suitable to excavate any time. As per the researcher opinion, the road of the city could be said narrow and sometimes the excavation made within the carriage way. The socio economic impact of the excavation can be pronounced or amplified due to the improper timing of excavation, The review part clearly stated the adverse effect of the time of trenching which can be amplified during rainy season, cutting of carriage ways take the

situation from bad to worse and causes serious traffic problem if done on working days particularly at peak hours. By choosing the right season, the right days (holidays) and the right time (off peak hours, preferably night) it is possible to considerably reduce the negative effect of excavation (Tesfaye 2001). The following table is evident for the trend of trenching in the study area.

Table: 4.8 Timing of trenching as reported by respondents of Utility providing institutions

Excavation made	Frequency	Percent	Valid Percent	Cumulative Percent
Working days	39	62.9	86.6	86.6
Holidays	2	3.2	4.4	91.0
Weekends	4	6.4	8.8	100
Total	45	72.6	100.0	
Missing System	17	27.4		
Total	62	100	100.0	

Source: Own Survey, 2011

The survey inquire from which time is convenient for excavation, the result shows that large number of the respondents (62.9%) replied that working days, followed by the missing system(27.4) which is mainly because the AACRA respondents were not inquired for this question. The remaining 6.4% and 3.2% of the respondents preferred weekends and holidays respectively. The AACRA officials have argued that, the authority allow excavation based on the traffic flow of the area, if the area is high trafficking there is no possibility of permit on the working days or peak hours. In this case, utility providers forced to conduct excavation during night time or weekends. For instance, in Mexico square and any other crossings, there is no possibility of permit for excavation. Trenching of the main roads in the peak hour is strictly forbidden.

Similarly, regulatory office emphasis that, if excavation made in areas of high traffic flow and congestion during working days particularly, at pick hours the authorities will punish accordingly. The authority advises that working during night is important at least for two reasons. First it reduces the traffic jam, and secondly it is effective and efficient in terms of time and cost. However, working during in the night time is not experienced in the city of Addis Abba. Formerly the road authority used to maintain road during night time, but among these service providing institutions, possibly to say none of them use to work

during night. Nonetheless, the researcher observed that excavation during pick hours in the most trafficking centers. For instance piasa (old postal office), Churchill, National theatre, Semen hotel and even Mexico excavation were takes place during pick hours (time of schooling and rash hours).

- **Types of Instrument for Excavation**

The survey aims to inquire the type of material and technological advancement of the utility providing institution in the process of road excavation. Theoretically, the more the use of professionals and technologies the lesser will be the distraction on the road. This indicates that excavation should always made by professional and modern technologies. The following table can be evident use of traditional materials in the sector.

Table: 4.9 Types of technology used for trenching by utility providing institution

Types of technology	Frequency	Percent	Valid Percent	Cumulative Percent
Modern	8	12.9	17.8	17.8
Labor force	24	38.8	53.3	71.1
Both labor force & modern	13	21.0	28.9	100.0
Total	45	72.6	100.0	
Missing System	17	27.4		
Total	62	100.0	100	

Source: Own Survey, 2011

The above Table 4.9, large number of respondents (38.8%) use of labor force. The system missing is still significant (27%), this mainly resulted from the road authority was not inquired for the item. About 21% use both traditional and modern method for excavation. Only 12.9% of the respondents use modern technology. Existence of damage VS methods of excavation were statistically significant (X^2 =18.667, df=12, P <0.097). This implies that, the type of excavation has resulted with significant level of damage. The interview result shows that, previously every institution had not any obligation to use any form of technology. But, now regulatory forced these institutions to use not sophisticated but at least modern technologies. For instance, EEPCO use both sophisticated technologies and labor force while the project was enhanced. The same is true for the other institutions. Now every institution obliged to use cutter to cut the asphalt roads particularly on crossings, which enable them not to affect the roads outside being planned to be trenched.

Figure 4.4 picture showing excavation of roads using "Doma" in the inner city

Source: Own Picture, 2011

The researcher observed that, use of labor force and "Doma" to cut asphalts in areas such as Arat kilo, piassa and from National Theater to Mexico square. Supervisors were asked why they use these traditional instruments. The response is quite different from the idea that has been emphasized by AAWSA. According to AAWSA, using modern technology is not appropriate in the inner city due to a number of reasons. Among the reasons:

1. Cost using modern technology is much expensive than the use of labor force. For instance, to excavate 1m asphalt with reasonable depth costs not more than 100 birr. However, using machine may cost more than 1000 birr for the same area. If we had that machinery even, it is not cost wise compare to the labor force. However, this is only in the case of inner city, while the problem is not as such significant in the expansion area. Since the area is free from congestion and other utilities the machinery can be used effectively.

2. Damage the inner city perhaps occupied with the previous utilities, so using machinery and excavate the road may cause for tremendous damage, so institutions who usually trench asphalts forced to use labor force than the machinery. However, EEPCO use modern technology to excavate and drill the asphalts of Addis, in this regard nearly 165km of the city roads excavated with lesser damages.

- **The Presence of Cut Fee Rule Vs the Rate of Excavation**

The issue of cut fee rule is not common in cities like Addis Ababa and also very controversial. Utility providers argued that, the presence of cut fee rule forces institutions to incur additional cost and the service providers will impose extra charge to compensate their costs. However, the presence of these cut fee rules has nothing to do with this kind of cost increments; rather it encourages the service providers to work together in an integrated manner (NRC, 2003). Institutions rather can minimize their cost of excavation by doing in an integrated manner. The following table summarizes the view of respondents on the presence of cut fee rule.

Table: 4.10 Availability of Cut Fee Rule reported by utility providing institutions

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	18	40.0	40.0	40.0
No	13	28.9	28.9	68.9
Have no idea	14	31.1	31.1	100.0
Total	45	100	100.0	

Source: Own Survey, 2011

Having that in mind, the questions inquire for the utility providers only. Among the respondents the lion share taken by those who replied yes there is cut fee rule account 40% and followed by respondents who replied have no idea and no there is no cut fee rule account 31% and 29% respectively. According to the regulatory, there is no standard cut fee rule promulgated yet, but in the near future it is going to be on practice. The manual that has been prepared by the institution impose cut fee rule ranges from 5000-10000 birr for each excavation.

4.2.2 Delaying and Level of Maintenance over Asphalt Roads

It is known that, roads in the city of Addis Ababa excavate for many reasons. However, mostly maintained below the standard and even stay long without maintenance; this could be for both natural and human factor. The delaying of maintenance and constructing below the standard exacerbate the situation and significantly affect the service year of the roads. The current condition of maintenance presented in the table 4.11 as follows:

Table: 4.11 Respondents view towards the Standard of Maintenance

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Based on previous standard	9	14.5	16.4	16.4
Better than the previous	6	9.7	10.9	27.3
Below the previous standard	33	53.2	60.0	87.3
Have no idea	7	11.3	12.8	100
Total	55	88.7	100.0	
Missing System	7	11.3		
Total	62	100	100.0	

Source: Own Survey, 2011

As can be seen on above Table 4.11, About 53.2% of the respondents replied that maintenances usually done below the standard and 14.5 % of argued that the maintenance is done accordingly with the previous standard, next to that 11.3% of the respondents failed to answer the question. Similarly, 11.3 % do not have idea and only 9.7 % of the respondents replied better than the previous condition. From road authority and other utility providing institutions perspective there are many reasons for the poor maintenance of roads: among the reasons

The narrowness of trench- *trenching mostly done with 60-80cm width, since it is too narrow it is difficult to compact properly.*

Selected material-*since the area is not maintained timely the institution that trenched the asphalt back fill with the same material to make the road open for traffic. Though using the same material is not advisable.*

Lack of emphasis for maintenance-*since the maintenance is not considered as major parts of road construction and neglected for long period of time the problem become amplified.*

Scarce budget for maintenance- *it is obvious that the utility providers pay compensation fee for the road authority and utility providers received compensation from the road authority for relocation but the money goes to the budget department rather than the maintenance department and that again released with the other programs and even some times difficult to segregate the maintenance cost from the total budget. According to AACRA the money which is given for the maintenance is not adequate, for instance one of the road officials replied that the money given to road cut is not adequate for the road maintenance.*

To this effect, the standard of the road become below the minimum. Contrary to this, Tele higher official on the TV talk show replied for the issue, institutions are paying based on the request of the road authority. This argument shows that there is a clear gap among the service providing institution.

Figure 4.5, Picture showing road maintenance below the standard.

Source: Own Picture, 2011

- **Untimely Maintenance of Roads**

The researcher simply can argue that, many roads in the city of Addis Ababa either maintained below the standard or delaying for considerable period of time. One can travel in any mode of surface transport that person will be forced to hear complaints or the person him/her self will be the complaint, a road being trenched may take months or years without being maintained. The following pictures are evident.

Figure 4.6 Picture showing Un maintained roads

Source: Own picture, 2011

Data from the interview elaborates that, maintenance some times lagging behind up until the wait for accumulation of the trenched areas. Accordingly, delaying is a common

practice in the infrastructure development process. One of the respondents from AACRA stated as follows:

> *"We will wait at least certain level of km to be ready for maintenance otherwise the running cost will be high (i.e labor, machineries and the like cost) will be double or more if we follow every single trenches" (AACRA).*

From the in-depth interview conducted with the official's of AAWSA and EEPCO additional information has been elicited on the road maintenance. Delaying of projects is mainly occurred due to the natural and institutional problems. Consequently, it will affect the proper maintenance of the trenched asphalt. Natural factors, including the nature of the land and the time or season, if the season is rainy the maintenance work will not be executed. And some times works particularly the installation of the sewerage lines need to be tested after the completion of tasks. In this case, before the area backfilled there should be pre-test (test- pit) of proper functioning of the system. In addition to that, manhole works need a minimum of a month and above time interval to be strong, otherwise the manhole will be cracked without serving the proper servicing period (water and sewerage).

Similarly, it is possible to present empirical evidence on this issue. Most asphalt roads that have been excavated by EEPCO are not maintained yet. From the EEPCO side delaying mainly resulted due to a number of reasons. For instance, the international contractors agreed with EEPCO and road authority to maintain the road and deliver as before. However, after the completion of drilling and excavation start asphalting, the contractor forced to stop asphalting work, because AACRA and regulatory believed that the contractor is doing below the standard and quit the work immediately, due to this disagreement a number of trenched areas being un maintained until today. EEPCO, AACRA and the Contractor agreed to outsource the work for the private sectors. However, no one was willing to participate in this work and finally deal with the road authority to maintain the road based on the standard and the contractor also agree to pay the maintenance cost for the road authority. Price difference within this time interval is inevitable large number of trenched asphalts going to be maintained in the near future. To sum up the idea, the area has been neglected for considerable period of time, in both

academic discourse and practical performances. The system does not have accountability and good governance, the structure do not allow inspecting such issues. It is possible to mention unmaintained roads which range from 3 to 5 years even more. These roads may be found in scattered situation. However, these roads seems do not have responsible authority.

4 .3 Utility Database and Asset Management

4.3.1 Database for the previous and New Utilities

As indicated in the literature review part, utility database is very important for the coordination and integration process and now a day with the presence of modern technologies it is not as such difficult to register utilities. Hence, Utilities should be recorded with the use of modern technologies. The survey and interview result shows that utilities installed previously and utilities that have been constructed currently do not have the same feature. To this effect the current utility database shows some kind of improvement compare to the previous one but still unsatisfactory. The following table summarizes the view of respondent on the availability of database.

Table: 4.12 Responses of employee to the Availability of Database

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	25	40.3	55.5	55.5
No	5	8.1	11.2	66.7
Have no idea	15	24.1	33.3	100.0
Total	45	2.6	100.0	
Missing System	17	27.4		
Total	62	100.0	100	

Source: Own Survey, 2011

The above Table 4.12, shows that approximately 40% of the respondents replied that their institution record utilities, 27% are missing system this mainly because the road authority was not inquired for the item. About 24% of the respondents don't have any idea whether utilities are recorded or not. While 8% of the respondents replied that their institution does not record utilities. But here one can easily identify that the utilities are registered by their respective institutions and but still possible to raise the question if utilities are registered and kept in one data base system why the stakeholders do not

exchange accurate information for the other sectors. As far as the utility registration concerned the interview result can be divided in to two categories, the first one is utilities that are made before 10 years and the second one is utilities that installed after 10 years in this regard, we can see a clear cut between the results.

The interview result shows that, utilities are registered but only refer to the first category. In other words, it refers only utilities before 10 years back. Even utilities that are installed within this time frame do not equally registered with their respective institutions for many reasons. Among the reasons, the difficulty of searching their exact location and lack of considering the importance of utility registration were critical. The researcher opinion on the issue is that, its effect clearly observed on the efforts of integration. Most of works are not done with the expectation of the current demand and difficult to identify where they are exactly. Due to these problems the utilities are not registered totally yet.

- **Plans to Improve the Database**

Currently institutions are trying to develop database for their utilities for the sake of coordination. According to AAWSA officer:

> *"We begin outsourcing this work for the private sector and in the near future not only recently installed but also previously installed underground lines will be registered and stored in one database system"*

The EEPCO case is unique since they begin the underground installation in the new form and with up to date technologies, the registration of utilities is already completed. However, there are still some underground lines not registered yet that had been constructed before some 40 yeas back.

The regulatory office strongly argued that, the first and the most important thing for the integration is utility registration. An officer stated:

> *"All utility providers are asked to register and submit their detail of utilities for regulatory office. This has been processed since the submission date. Accordingly, all stakeholders submit their first draft utilities even if the final draft of utilities not submitted yet".*

The utility providers in this case will be provided at list basic information about the utilities that have been installed followed the road map. They in return asked to submit the specific area length and as built drawing for that specific task of the given area.

According to the office, since the effort is at beginning stage the office do not expect much perfection but still shows some progress, for instance the rate of damage of utilities shows improvement.

- **Damage Records**

The interview result indicates that, the damage record among the utilities providing institution is not a common practice. Whenever the damage happened utility providers claim for compensation, but the money which is given for compensation is not proportional with the actual cost of the damaged item this mainly resulted from the improper monitoring and evaluation of the utility damages and asset managements. According to the AAWSA, their institution suffered from such problems. Since the water cost is comparatively chip, the road authority and other utility providers frequently damage their line and allow huge amount of cubic water to flow and west. This mainly happen due to negligence and prejudices.

4.4 Cause and Consequences of Integration and Related Issues

Every infrastructure institution agree that, the current status of infrastructural integration is said to be below medium this resulted from the number of tangible and enforceable events among them, the plan year, the presence of formal committee, coordination practice, corridors upgrade, restrictive practice, approval process, technical consideration and the like.

- **The Minimum Plan Year**

The Addis Abba city master plan is prepared for ten consecutive years. The service providing institutions are expected to plan, design and implement accordingly. Theoretically the longer the plan year is the higher the probability of coordinating the infrastructure works. The following table shows the plan year of each respective institution.

Table: 4.13 The minimum plan year of urban services providing institutions

Name of employer	One year		Three yea		1 and 5 years		Five and above		Have no idea		
	No	%	No	%	No	%	No	%	No	%	
AACRA	3	20	0	-	1	6.7	8	53.3	3	20	15
AAWSA	11	64.7	3	17.6	0	-	3	17.6	1	5.9	17
EEPCO	5	35.7	2	14.3	0	-	1	7.1	5	35.7	14
ET	5	33.3	1	6.7	0	-	6	40	3	20	15
Total	24		6		1		18		12		61

Source: Own Survey, 2011

As can be seen in the above table , about 53% of AACRA plan is five year and above, respondents who said one year and do not have idea accounts 20 % each. Regarding AAWSA one year is the dominant one, three years and five year and above has equal proportion which is about 17.6%. The plan year of EEPCO is still one year account 35.7% and followed by equal proportion of have no idea. While ET plan year is concentrate on five year and above which account 40% and followed by one year account for 33.3%.

The interview result substantiates the same result; in this regard most of the institutions plan for the coming years due to a number of reasons. Among the reasons: lack of budget and adequate staffs are the major reasons, this would help to show the relationship of planning of integrated infrastructure and educational status. The Educational status and the available equipment coupled with other extraneous factors can determine the integration level. Though, educational status of the respondents said to be good. The plan period of most institutions can be generalized as plan for the coming year. However, the road authority tries to follow the city master plan by designing on year, five year and 10 years plan.

As already stated in the review part, the presence of long term plan is very important for the coordination process. The longer the plan year the easier will be the integration process. Perhaps, the presence of the short term plan is also vital. According to the regulatory office, we the institute has been trying to force the service providing institution

to submit their short term plan (one year Plan), but the plan is usually characterized with frequent changes in the middle of the project implementation.

4.4.1 Consideration for the Future Development

It is not a new practice to provide services with future projections. That has a number of benefits. Unlike its benefit it needs huge investment and forecasting of the future demand. Unlike others the infrastructure development in Addis Ababa mainly focuses on responding the existing demand rather than forecasting and providing the future demand. The question that inquired whether the availability of considering the future demands or not presented as follows:

Table: 4.14 Respondents opinion towards the Consideration of Future development

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	41	66.1	77.4	77.4
No	8	12.9	15.1	92.5
Have no idea	4	6.5	7.5	100.0
Total	53	85.5	100.0	
Missing system	9	14.5		
Total	62	100	100	

Source: Own Survey, 2011

As clearly depicted on the above Table 4.14, about 66.1% of the respondents agree with the consideration of the future demand this followed 14.5 % missing system. Among the respondents only 12.9% do not agree with the consideration of future demand and the rest 6.5% do not have any idea whether the current work is in consideration of the future demand or not. The interview result partly supports the ideas and could be summarized in two categories: the current service provision and the previous one.

Previous Service Provision

It is a fact that the problem of inner city is resulted from a number of reasons, particularly planning. Formerly any work done for the immediate request of the demands and done without projecting the future expansion, that is why currently the inner city encounter such kind of problems and is becoming the major reason for frequent excavation of asphalt roads. Since the city was grown spontaneously every service were not provided in

proper and adequate manner. The planners plan their service based on their convenience without considering the future development and referring the other issues that need due considerations.

Current Service Provision

Though the current service provision planning system is different from the previous one there are still critical problems that are manifested in this system. For instance, from the planning perspective the Walkways becoming a minimum of 4 m and above which was not greater than 2-3m and these Walkways are planned to be covered with tiles than sealed with asphalt, not only this in some areas particularly the road authority start buried cable duct, for instance Pushkin roads and the like. However, since the cost is beyond its capacity the road authority failed to continue with this initiation. The AAWSA and EEPCO case is more or less similar, as the researcher observed in the study area formerly installed water pipes were not more than 150 mm but that areas currently demand 200-350mm, with the expectation of the city growth and future demand the authority use to buried 400 and 600 mm of pipes. But still can not work side by side with the road authority in the expansion area, and that line is going to be relocated due to the asphalt expansion.

Similarly, EEPCO install its line with the future projection even in areas, where there is no enough current demand. However, it is difficult to say that 100 % effective due to financial and priority problems. From the above discussion it is possible to conclude the current condition is partly done with future projection. However, the gap is not bridged yet. The researcher strongly argues that, when the living condition of dwellers improved there will be a demand of gas lines. However, the city master plan still gives minor emphasis for such similar elements.

- **Master Plan Preparation Vs Participation of the Stakeholders**

As presented in Addis Zikrehasab (2009) talk show, the planning and information institute of city Administration representative replied that, the infrastructure providing institute employers (officials) do not have good knowledge about the city master plan. The institute emphasize that, people who assign in different position do not have even

know how, that is why they are complaining every time by saying that, the master plan do not consider utility providers or do not allow the participation of these stakeholders. The planning institute representative stated that:

> *"As you know the city master plan done within three years, we have been working together and they were also actively participated in the process of developing the city master plan. As far as planning institute concerned nearly 128 workshops have been conducted to incorporate the stakeholders' demand, off course we are not saying that we were totally perfect while we were preparing the city master plan. For instance, the road from (piassa to Tore hailoch) was not expected in this way".*

- **Emphasis of the City Master plan for Utility Providers**

It is a fact that any work in any city should comply with the master plan either directly or indirectly. Hence, any work has to refer the city master plan. Similarly, the preparation of this master plan needs quiet participation and need to involve every stakeholder, because this master plan is a general frame work that enables every actor to entertain within it. However, the preparation of master plan in some cities may execute without the consultation of every stakeholder. In this regard the survey attempts to elicit idea whether the Addis Ababa master plan gave enough attention for utilities or not.

Table: 4.15 the respondents' opinion towards consideration of master plan for utilities

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
High	13	21.0	32.5	32.5
Medium	12	19.4	30.0	62.5
Low	15	24.2	37.5	100.0
Total	40	64.5	100.0	
Missing System	22	35.5		
Toatal	62	100.0	100	

Source; Own survey; 2011

The above Table 4.15, revealed that (35%) of the respondents failed to answer this question, this partly because the respondent are not aware about the master plan. Next to the largest proportion of the missing value, approximately 24% of respondent rates low for the emphasis of master plan for utilities and followed by the city master plan gave

high emphasis for the utilities line accounts 21%. Those who rated medium account 19%. The in-depth interview also aims to elicit additional information about the emphasis of the master plan for the utilities. According to some respondents, there are some professionals and official who do not have enough knowledge of the city master plan. This may be because they are new for the position and the city. The others respondents tried to state the effort of the master plan by categorizing the master plan before and after the preparation of the structure plan.

The Master plan previously

The master plan of the city of Addis Ababa did not give adequate emphasis for utility records before 10 or 15 years back. According to this group, the emphasis for utilities is not only less but city had not been planned even. As most planners agreed that the city of Addis Ababa could be said a city without effective plan and grow spontaneously until recently.

> *"The city did not have urban structure up until recently even the city doesn't qualify the standard of a good town, look at the inner city it is shanty, dilapidated and narrow Street beside, the other facts the absence of master plan played significant role" AACRA*

The AAWSA and EEPCO case is more or less similar; they understood the master plan as framework of road network. However, the road does not contain every important component. For instance, there are no enough places for utilities. The existing utilities on the walkway said to be found in congested situation, sometimes huge damage happen due to this and similar reason. The member of technical (Virtual) committee of AAWSA stated that, people always complain the utility providers, but they do not understand the problems yet. Doing with that congested situation and improving the level of service is difficult. Currently AAWSA trenched the carriage way due to the absence of vacant places in the walkways. This idea partly supported by the planning institute and presented as follows:

> *"Yes formerly there was a problem but every problem could not be rooted from planning. As you all know you were highly involved in the master plan process and present your need for the utility provision, the master plan done accordingly, and we tried to incorporate the need from your side. However, still you are mentioning the planning problem".*

The Master plan Currently

The master plan compared to the previous said to be in a better condition. According to the interview result, this is mainly because of the improvement of the participation of the stakeholders. However, they still argued that even if the situation is in progress the emphasis could not be said satisfactory. Still the issue characterized with a number of problems that need immediate response. For instance, the availability of walkway and the right of way given for the utility providers is not adequately maintained. Previously most walkways in the capital were not more than 2 meters even today. The report of the planning institution revealed that, there had been continuous effort made among stakeholders and the institutes believe that it is said to be adequate for the preparation of master plan. Furthermore, even they were invited during the impact assessment of the city master plan revision. The institute strongly argued that, there is still problem resulted from the shortage of city finance and the problem which accumulated since the establishment of the city, but still we are working at the best of our capacity to improve the situation.

Most planners and city developers agree that, master plan of any city is much needed to determine the level and direction of the city development. In this regard, the stakeholders' participation is a must and their needs should be incorporated. However, still the demand for the future is not considered in this master plan. To mention some examples the sewerage and the gas line need to be accommodated in the right of way, while the sewerage is now on practice within the carriage way mainly due to the absence of enough space for these utilities. To elaborate the idea the city liquid west management is commonly characterized by on site treatment method, but the off site one is very practical and efficient methods in most parts of the world cities. As per the researcher opinion this has been neglected for considerable period of time.

The institute of urban planning asserted that, formerly these and other similar problems were common, walkways were not only narrow but also occupied and sealed with asphalt (tar), that makes trenching very complicated. Currently the roads of city need to be re planned with the appropriate standard of walkways that can accommodate every utility other than gas and the like. In addition, these walkways will not be sealed any more but

rather they will be covered with tiles that can be easily manipulated by every body particularly through the micro and small scale enterprises. Moreover, the maintenance cost will by far reduce.

- **Use of Master Plan as Reference**

As indicated earlier the city master plan is the frameworks to the city that can be traced particularly for urban service provision. However, referring the master plan is not commonly practiced in the city of Addis Ababa. The following table is evident for the aforementioned argument.

Table: 4.16 Respondents opinion towards use of Master Plane as reference

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	8	12.9	13.3	13.3
No	13	20.9	21.6	34.9
Have no idea	39	62.9	65.1	100
Missing system	2	3.2		
Total	62	100	100.0	

Source: Own Survey, 2011

The survey result, for this question reveled that large numbers of the respondents (63 %) do not have any idea about the issue itself and people who answered yes we follow the master plan and those who responded no together accounts (35 %). This implies that, the lion share of the respondents do not know anything about the city master plan and its purpose. As per the researcher opinion, respondents who assigned in planning, design, construction and follow up (management) at list have to have some exposure. It is possible to conclude that, people who assigned in those positions lack information about the issue or not internalizing the master plan yet. According to key informant,

> *"Though the master plan has its own drawbacks, the stakeholders could be said actively participate on the preparation process. However, during implementation a lot of problems have been encountered, but every problem rooted from the problem of not understanding the master plan or not accepting and respecting the master plan as their own plan".*

This implies that, there is loose coordination among the utility providers, planning institute and the road authority. The road authority always focuses to meet the objectives that are sated in the city master plan. According to (AACRA), the road authority has 10 year plan which aims to respond the city Master plan. In this regard there is no any place

which can be neglected without execution. We tried to adjust our programs with the city master plan. The City planning institution support this idea, the only organization that follow the city master plan is road authority therefore, these institutions can take the authority as role model to stick and refer the city Master Plan. Beside that, none of the other stakeholders have tried to follow the master plan up until today. The implementation and impact assessment of city master plan identify that there is a big gap between the plan and its implementation. Other than this, the road authority sometimes construct roads in areas where the city master plan did not traced and set some standards, these areas may not expected to boom within short period of time. However, the reality by far exceeds the expectation; in this regard roads will be constructed with the participation of the public. The same is true for the other utilities; unexpected development and change may force the service providers to construct not as per the scale of the master plan.

- **Change of Plan and Related Problem**

As we all know installation of utilities done mostly along the road or on the right of way. In this regard, the road authority is responsible to deliver on time its plan to the respective stakeholders and it is vice versa. Since its programs are very wide sometimes failed to submit the final draft of what has been planned to be implemented in specific area. Moreover, the plan could be changed for both known and unknown reasons.

Table: 4.17 Employee responses on the existence of Plan change

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	29	46.8	72.5	72.5
No	8	12.9	20.0	92.5
Have no idea	3	4.8	7.5	100.0
Total	40	64.5	100.0	
Missing system	22	35.5		
Total	62	100.0	100	

Source: Own Survey, 2011

The above Table 4.17 shows that change of plan is common phenomenon in Addis Ababa infrastructural works. Among the respondents nearly 47 % of respondents replied that there is change of plan among the stakeholders during implementation or

construction, followed by the missing system account 35%. The remaining response concentrate on the absence of plan change and have no idea has the percentage of 12.9% and 4.8% respectively. This idea further scrutinized by the interview result, plan change is very critical issue mainly happened due to the absence of adequate information, budget, and skilled manpower, property right and other natural problems. The problem mainly committed by each of institutions, but pronounced on the road authority. The road authority accepts the existence of the problem. However, the extent of the problem is not as wide as mentioned by the other stakeholders, the problem mostly occurred during the design and implementation stage for some clear reasons that consequently affect the overall process of integration. Among the reasons:

Lack of Information- As already stated the availability of information is very critical for asset management, minimization of plan change and integration process. However, these stakeholders mostly fail to exchange exact information among them selves and formerly the communication was informal. An institution may not have information of the other stakeholders (that has been plan and implemented in the near future), what kind of utilities are available in the city and the like, without having such complete information utility providers plan will be separate and incomplete. One can simply argue that, this is the main area of where the integration process failed.

Shortage of Budget - Shortage of budget is the main constraint for both plan change and the absence of integration. The budgets of each institution tremendously vary from year to year. For instance, water and sewerage budget of 2008 was not more than 1billion birr while the road authority budget was approximately 2 billion. The same is true for telecommunication; the institution budget for expansion and improvement of technology was greater than 3.2 billion birr in the same year (even the project completed within four months). This clearly shows that, the budget for each institution is not proportional. One can safely argue about the issue of policy. As we know water is the most prioritized sector in the urban policy of Ethiopia (2005).However, the road is highly prioritized than any other sector for many reasons and most of the sectors responded that this is a bias for the road sector for political reasons.

There are also some fund driven projects. For instance, infrastructure with the help of World Bank and other donors may expand the budget gap among stakeholders. In this regard, when one institution wants to construct the other may keep watching though the institutions may have something to do in the same area. For instance, the EEPCO upgrading process is funded by World Bank and the project has its own time interval for beginning and end, if they wait each other the money and work together the project may faised out with this limitation of time. Therefore, EEPCO forced to work without keeping other stakeholders to come and construct together, the fund driven projects mostly force to change the plans may be due to the capacity (if the project size is too wide the institution may be forced to concentrate in that specific project) by neglecting the other previously planned projects.

Institutional Capacity-As clearly mentioned in the review part, institutional arrangement is one of the most determinant factors for poor level or absence of integration. Some institutions are institutionally capable of performing as individual and group. While the other might not be capable to work as an individual and group, in this case the system fails. The talk shows identify that, institutional factor play tremendous role for the low performance of institutions in both intra and inter sectoral level. However, since all institutions are governmental, it is possible to say that a great asset and opportunity to achieve the process of integration. To conclude that, the institutional arrangement of the stakeholders at both individual and group level could be said weak.

Property Right and Issuance -According to the road authority, the plan change mostly occurred with the untimely completion of issuance of property right specially, if the area is an area owned by private owners, handling the issue might take longer than a year and above. This people may take the issue to the court, in this case the authority forced to wait either until the court forward decision or changing the previous plan. In result, it will create a lot of discrepancy in the development process, Basha Deble and Asko to Piassa road could be mentioned as best examples.

4.4.2 Alternative Financial Source to Fill the Budget gap

The interview result depicts that; the involvement of the private sector could be said negligible. It is a general truth that infrastructure investment acquire huge amount of resource and the return period relatively long. The private sectors mostly establish for profit making with short return period, in this regard private involvement is very minimal particularly in funding projects. They rather participate at the implementation stage when there is possibility of outsourcing activities (construction and the like). According to ACCRA, the private sector is involved in the construction stage. It is true for AAWSA too; institutions outsource some activities for the private firms. However the involvement of donors is significant. For instance EEPCO utility installation project funded by World Bank, since the project is fund driven, international bid was held and the international company lease the whole activity related with the underground installation. In most cases, a number of activities done through annual government budgets, even the planning made on yearly basis of the government budget. However, as one of interviewed person stated: other than the private sector;

> *"We have alternatives to finance our projects, for instance World Bank and other similar institutions support and financing projects. However, the involvement of private sector is negligible".*

In this regard, every service providing institutions were received different kinds of support in different time. Furthermore the interview was also aim to find the problems related with donation. As most of the interviewee agreed that, the donation has a number of benefits. Beside that, since the timing of the fund is not at one time it creates discrepancy among the works of service providing institution. For instance, telecommunication received 3.2billin donation while EEPCO and AAWSA had only annual government budgets in the year 2008. It could be said that ET progressively was working while the rest kept watching. In such cases, the private sector can be involved on the funding of the projects either on short or long term basis. However, the private sector participation in funding of the huge projects is not common unless and otherwise enough investment security is in place.

The issue of financial guarantee may highly related with budget security, as we all know the budget of the two organizations AACRA and AAWSA mostly emanate from the city administration, which mainly base from the tax being collected from the dwellers. However, the budget of the other two organizations EEPCO and ET is federal and mostly subsidized by other donors. From the security perspective the later one is comparatively more secured than the previous one. This doesn't mean that, the first two never get donation from donors but mostly they cover their expense from the city charter. By implication it is still a big treat for the integration process, the plan and program of the two nation wide sectors might not be confined and bounded to the city level. However, the interview result revealed that, there is a big discrepancy of works among stakeholders which mainly resulted with the budget related issues.

- **Participation of private Sector/ (PPP)**

As can be seen from the review part, the involvement of private sector is critical in the process of infrastructure development. However, could be rated as negligible in most circumstances. The private sector can be involved at different stages for instance at planning, construction, financing the project, leasing the sector and the likes, in addition to that, there are a number of alternatives for the involvement of private sectors(options service contract, management contract, concession, Asset sale, BOOT new asset) etc. Moreover, these private sectors can be involved in funding the cable duct during the construction stage. This can be returned back through some reasonable rent or can be transferred with sell to the service providers. There should be proper controlling system to avoid perfect monopoly, otherwise can be easily manipulated and change the nature from public to perfect private sector. To avoid such dilemma PPP is more practical and advantageous. For instance, the private sector can be involved in Constructing utilities of different institutions and when the relevant sector need to use that utility, it can be used in the form of franchising or leasing the infrastructure or buy from the private sector with reasonable price. However, this might not be an easy case unless and other wise the necessary legal framework is in place, other wise this might create perfect monopoly.

4.5. The Current Status of Integration at Intra and Inter Sectoral level

4.5.1 Level of commitment for coordination

The level of commitment for integration coupled with other factors play crucial role in determining the current status of integration at both intra and inter sectoral. In other words, the existing level of integration can not be improved or maintained unless and otherwise there is strong commitment within institutions themselves. The inquiry for assessing the level of commitment within institutions presented on the following table.

Table: 4.18 Respondent's opinion to the Level of Commitment for Coordination by their respective institution

Name of employer	High		Medium		Low		Total
	No	%	No	%	No	%	
AACRA	4	28.6	8	57.1	2	14.3	14
AAWSA	5	33.3	6	40	4	26.7	15
EEPCO	2	15.4	4	30.8	7	53.8	13
ET	9	60	4	26.7	2	13.3	15
Total	20		22		15		57
Percent	35.1		38.6		26.3		100

Source: Own Survey, 2011

As can be seen from the above Table 4.18, majorities of the respondents agree that their institutional commitment for integration within institutions lies on the medium level. The survey result reveled that, 38.6% of the valid respondent rate the commitment level of their organization medium and followed by 35.1 % who rate high and the remaining concentrate on the low category. The above distribution can be further elaborated at institutional level in which most of the AACRA respondents replied the level of the commitment said to be medium which accounts 57.1%. The remaining 28.6 % and 14.3% lies on the high and low respectively. Contrary to this, in the case of AAWSA medium and high are almost proportional which is closer to 40% and 33.3% respectively.

Regarding ET, 60% of the respondent rate the level of commitment as high and the rest 26.7% and 13.3% remain in the medium and low categories respectively. However, the EEPCO case is unique; majority of respondent's rated level of commitment as low and the remaining 30.8% and 15.4% lies to the medium and high category respectively. This

idea substantiate by the in-depth interview, most institutions failed to say the commitment towards both intra & inter sectoral level is high. Most of them appreciate the effort made by the regulatory for both intra and inter sectoral level. Since then, institutions become conscious for coordination and ready to bring integration through the implementation of BPR and BSC. As they replied, compared to the extent of the problem the effort is negligible. However, it said to be in a better condition in relative terms.

- **Respondent's Belief towards the Role Model ness of their Institutions**

The researcher believes that, institutions that perform best could be considered as role model for the others. Institution can borrow best practices of others and they often make use of those ideas and skills to promote their institutions. In this regard, respondents from institutions that provide services in this case the four targeted institutions were asked whether their institution can be role model for the others or not. Respondents' opinion towards role model ness of their institution can be summarized as follows:

Table: 4.19 Respondent's opinion towards Role Model ness of their institution

Name of employer	I agree		Strongly agree		Disagree		Strongly disagree		Total
	No	%	No	%	No	%	No	%	
AACRA	7	46.7	3	20	3	20	2	13.3	15
AAWSA	2	12.5	5	31.3	7	43.8	2	12.5	16
EEPCO	2	14.3	1	7.1	6	42.9	5	35.7	14
ET	9	60	3	20	2	13.3	1	6.6	15
Total	20		12		18		10		60
Percent	32.3		19.4		29.0		16.1		100

Source: Own Survey, 2011

Accordingly, substantial number of the respondents' i.e. (32%) responded to yes option. In other words, their organization can be role model for the others, which followed by the disagree account 29% of the respondent. The remaining 19% strongly agree with the existence of conducive environmental and institutional arrangement.

This issue also can be seen further into institutional level. In this regard, 46.7 % of the respondents from AACRA agree that their institution can be role model for the others at least with the parameter of assigning the right person to the right position. Regarding

AAWSA, 43.8 % of the respondents do not agree with their institutional arrangement and followed by strongly agree account 31.3%. The EEPCO case is more or less similar with AAWSA. Large number of respondents fall in disagree category which is 42.9 % and followed by strongly disagree is about 35.7 %, the remaining agree and strongly agree accounts 14.3% & and 7.1% respectively. Similarly, 60 % of the ET respondents agree that, their institution can be role model for the others and 20 % of the respondents strongly agree with the idea. Departmental integration and role model ness statistically significant (X^2=12.523, df =9, Pv=0.078) see table (4.4). However, the interview results indicate that the institutional arrangement of their respective institution is said to be hindrance for the best performance of the integration and efficiency. Interviewed people finally suggest that, the institutional arrangement should be restructured with the aim of efficiency that able to shoulder responsibility.

- **The Respondent opinion towards Departmental Integration**

The presence of departmental integration is a sum of different factors; among the factors the existence of good system, structure of the institutions, the level of commitment and existence of good governance are very important. It is obvious that, the existence of departmental integration has influence on the existence of integration among institutions. When we see the departmental integration the following result could serve as evident.

Table: 4.20 Respondent opinions towards the Current Status of Departmental Integration by their respective institution.

Name of employer	I agree		Strongly agree		Disagree		Strongly disagree		Total
	No.	%	No.	%	No.	%	No.	%	
AACRA	9	60	0	-	6	40	0	-	15
AAWSA	6	37.5	1	6.3	8	50	1	6.3	16
EEPCO	7	50	1	7.1	6	42.9	0	-	14
ET	11	70.4	2	13.3	1	6.7	1	6.7	15
Total	33		4		21		2		60
Percent	55		6.7		35		3.3		100

Source: Own Survey, 2011

As depicted on the above Table 4.20, nearly 60 % of the respondent fall in the category of agree and strongly agree, while the rest to disagree and strongly disagree categories.

This further can be observed through the cross tabulation at institutional level. In this case, 60% of the respondents of AACRA usually agree with the existence of departmental integration, those who disagree with departmental integration within their institution account 40%. It is quiet reverse to AAWSA, large proportion 60% of the respondents disagree and strongly disagree with departmental integration and the remaining 37.5% and 7.1% agree and strongly agree respectively. While 80% ET of the respondents agree that there is departmental integration in their institution and only 20 % do not agree with departmental integration. About 50% of EEPCO respondents agree and 7.1% strongly agree is almost similar with disagree, strongly disagree which is said to be negligible.

While the response from the regulatory is reverse, the office mentioned that departmental integration within the institution is very critical. However, most of institutions work at department level. This further affects the process of integration among stakeholders. For instance, any of the above mentioned institution except EEPCO usually cut roads without permission and regulatory office failed to communicate to the right person or concerned body about the issue. Roads usually excavated without the knowledge of the right person who has direct link with the regulatory and other stakeholders. As emphasized by the regulatory office, the EEPCO case is unique that simply administered by the project rehabilitation office, though there was a problem.

The idea substantiate by the interview response from other stakeholders, while most of them failed to believe that their institutions work in collaboration with others. For instance, AAWSA tried to decentralize the system and establish different offices at branch level and there is also project office that can handle issues related with the projects particularly fund driven projects. Compare to the previous time, the process of departmental integration said to be in a good condition, since the system is newly introduced it is difficult to say there is 100% integration, some times there is clear information gap among project, branch and head offices. Moreover, the departmental integration can be manifested on the sewerage and water departments. Though they are in the same administration there is clear gap between them. The researcher can strongly argue that, same is true for the other institutions particularly ET and AACRA. For

instance, formerly the researcher recognized that the road authority was simply constructing the roads and open for use, but there was no a clear system of managing the road and the like. The same is true for the construction and property right department.

4.5.2 The current Status of Integration among Infrastructure providing Institutions

The existing status of integration could be analyzed from different perspectives, among them the institutional, financial and physical integration of these parties at different levels (planning design and implementation and follow up stages). The level of integration among the stakeholders presented on table 4.21 as follows:

Table: 4.21Respondents opinion towards the Current status of integration among infrastructure providing institutions

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
High	12	19.4	20.3	20.3
Medium	19	30.6	32.2	52.5
Low	28	45.2	47.5	100.0
Total	59	95.2	100.0	
Missing system	3	4.8		
Total	62	100	100	

Source: Own Survey, 2011

As already depicted on the above Table 4.21, about 45% of the respondents rated low the current status of the integration, this followed by medium account 30.6%, only 19.4% rated high. The idea is also substantiated by the interview. Accordingly, every interviewee replied that the current status of integration among stakeholders is said to be low. However, there is an effort made by the regulatory office. The financial, institutional and physical integration among the stakeholders said to be poor even the integration within institutions itself is not satisfactory. The existing level of coordination among stakeholders could be measured based on the following criteria's:

- **The presence of Formal Committee and Regular Meeting**

Presence of the regular committee plays pivotal role in facilitating the process of coordination. Since these services providing institution are separate, there should be

common floor for discussion. Due to the fact that, the existence of the formal and regular committee are critical in the coordination process. The Addis Ababa infrastructure committee is being established since the emergence of the regulatory offices. This integration committee has two components. The first one is committee for the higher officials and the second one is professional (virtual) committee. The existence of the committee itself is meaningless unless there is formal and regular meeting within certain period of time. Accordingly, the professional committee is the response for the failure of regular meeting of the busy officials which was the major obstacle to achieve its objectives. There was regular meeting on weekly basis for the last seven to eight months but currently the meeting interrupted for unknown reason. The interview result can be summarized as follows:

> *"The meeting was conducted regularly on (weekly basis) for the last seven or eight months however, due to some extreme cases meetings were postponed. Moreover, the regular meeting canceled for the last three months for unknown reason" (AAWSA).*
>
> *"The meeting was good particularly our organization benefit more, since our works was on progress at that time ,whenever we faced any challenge there was a stage to present and to be solved or received immediate response" (EEPCO).*
>
> *Some times we missed the meeting deliberately and arbitrarily because the road authority much favored and our request will not be entertained equally (AAWSA and EEPCO).*
>
> *"The effort said to be good but is not proceeding as expected this is mainly because of the involvement of the regulatory offices in too many different affairs or tasks" (AACRA).*

- **The Presence of long and Short Term Plan**

As we inferred from the previous part, most institutions have short term plan period which ranges one to five year, the five year is said to be insignificant. Currently, the regulatory office forced the stakeholders to present short term plan of each activity years. However, the long term plan is not an issue among the stakeholders. In addition to that, even the short term plans are highly affected with frequent plan change of institutions. One can easily conclude that the current status of integration could be unsatisfactory and highly affected with short term plan and frequent plan change.

- **The Presence of Strong Responsible Body**

The regulatory and design office being assigned to coordinate the city integrated infrastructure works, though there are some efforts and progresses after the establishment its performance is said to be not good. The major reason could be integrating infrastructures is Third activity or extra activity. As observed in survey and interview result, most of the respondents assure that the regulatory office weak, this can be observed through the institutional arrangement, its capacity, availability of governing rules and the like. The authority still does not issue its rules and regulations that can govern the whole parties.

- **The Presence of Policy and Related Issues**

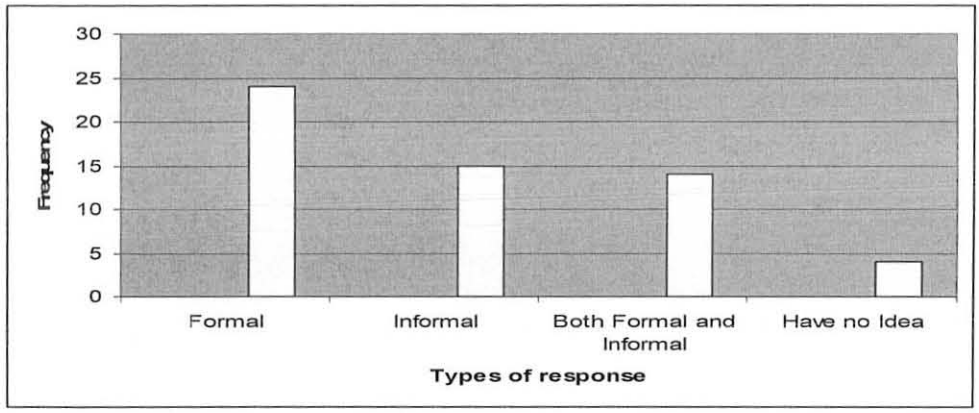
The Ethiopian urban development policy is promulgated and became effective in the year 2006. However, there is no consolidated infrastructure policy yet. In addition to that, the integrated infrastructure development package is not issued up until today. The priority and direction of the reality is said to be different, the urban development program priority of 2006 was water, but road was prioritized and became the direction of the cities. As per the researcher opinion, though the road and water are prioritized in the urban policy of Ethiopia and since every urban service are provided at scanty level, there is continuous need of urban infrastructure. According to the road authority head, emphasized that" the integration process fails because every thing is priority". Since the problem is cumulative and has effect over the past 100 years of planning and in addition to other issues, every thing needs to be addressed right now. The other parties agree with this issue, AAWSA officials stated that, we are doing now intensively that has to be done before ten or fifteen years back.

- **Types of Communication among service providing Institution**

The types of communication among service providing institution is one very important tool to asses the level of coordination. Formerly the type of communication was informal that in result with a number of difficulties and wastage of resources. The system was exposed for serious bureaucratic system which hinders the smooth relationship among

stakeholders. Currently the situation is changed to some extent. The following figure is evident for the type of communication among these parties.

Figure 4.7 Figure showing types of communication among the stakeholders



Source: Own Survey, 2011

Communication from other stakeholders needs to be assessed to see the current condition of collaboration and cooperation. The respondents were asked that the communication type of the stakeholders among each other, most of the time they communicate through formal way and followed by informal and combination of both respectively, but still significant number of the respondent do not have any idea how their institution communicate formally or informally with other similar institutions. By the same token, the interview result shows formal way of communication is the current practice. Some of the respondent failed to attend the regular meeting due to much favor of the road authority. Even the regulatory office do not considers their works as equal as roads.

> *Whenever we want to do any thing we are obliged to stick with the road map, contrary to this the road development do not forced to consider even our activities, to sum up the idea we tried to communicate formally, but still there are discouraging situations among ourselves.*

Contrary to this, road authority replied the communication type could be said formal, whenever we have any issue we communicate formally and settle the dispute. However, there are some institutions still shows negligence. Even sometimes our institution forced to write letter of announcement for the other stakeholders.

4.5.3 Major Reasons for the Low level of Integration

The current status of integration could be said low or poor among service providing institutions. The researcher tries to find the major reasons for the poor level of integration at inter sectoral level. The following table summarizes the main reasons for the absence or poor level of integration among stakeholders.

Table: 4.22 Reasons for the low level of integration by respondents

Types of response	Frequency	Percent	Valid percent	Cumulative Percent
Lack of adequate professionals	1	1.6	1.9	1.9
Lack of integrity and working together	10	16.1	18.5	20.4
Shortage of budget	7	11.3	12.9	33.3
Absence of responsible body	17	27.4	31.5	64.8
Absence of policy	9	14.5	16.6	81.5
Shortage of Budget and Absence of Responsible body	10	16.1	18.5	100.0
Total	54	87.1	100	
Missing system	8	12.9		
Total	62	100	100	

Source: Own Survey, 2011

As we can see from the above Table 4.22, the absence of the responsible body share the largest one which is 27.4%, followed by lack of culture working in collaboration and respondent who shortage of budget and absence of strong responsible body accounts 16% each. This followed by absence of full-fledged/consolidated policy accounts 14.5% and shortage of budget accounts 11.3%. Only 2% of the respondents replied that it is because of lack of adequate professionals. From the previous intra sectoral analysis part, one can draw the weak institutional capability of the regulatory office.

Similar question was inquired for interviewee; the interview result showed that, the absence of responsible body is still the major cause for the poor nature of coordination. Moreover, shortages of budget, lack of integrity and working culture still have significant proportion. According to the AACRA, in addition to the above all factors the absence of belongingness and responsibility play pivotal role for the low level of integration. The current poor or low level of integration is resulted from the absence of system that

assures accountability. AACRA also commented that, the only way to bring integration among the stakeholders is the institutional accountability and responsibility scheme.

- **The level of Integration Before & After Regulatory**

The idea is already mentioned in the previous category, since the nature of coordination and its problem is vast still difficult to recognize the effort of this authority. Similarly, respondents replied that the progress of the regulatory could not be said effective and tangible. Compare to the previous years one can observe changes. Formerly, there was no any responsible body to coordinate efforts of these stakeholders but today at list there is one responsible body, though it is not strong. The authority has taken the responsibility for coordinating disintegrated works. Meanwhile, it is not yet promulgated its policy for the infrastructural integration. According to the road authority, this can be considered as a good indicator for the weak regulatory office, though there is formal committee and regular meeting of these sectoral virtual committee, meeting was not held for the past three months, even the researcher were promised and planed to attend these regular weekly meetings among virtual (professional) committee, but the meeting never been conducted during the study.

- **Responsibility to Coordinate Service providing Institutions**

As indicated on the overview of the integration practice, the absence of strong coordinating body mentioned as a reason for the failure of integrating urban services. The process of integration after the establishment of the regulatory office said to be in a better condition. However, there is a clear gap of institutional capability. All urban service providers agreed that, there should be strong governmental organization to coordinate the effort, the following table is evident.

Table: 4.23 Respondents opinion to the responsible institution for coordination

Responsible Institution	Frequency	Percent	Valid Percent	Cumulative Percent
Telecommunication	3	4.8	4.8	4.8
Road authority	10	16.1	16.1	21.0
Water and sewerage	3	4.8	4.8	25.8
Regulatory	28	45.2	45.2	71.0
Any strong Body	18	29.0	29.0	100.0
Total	62	100.0	100.0	

Source: Own Survey, 2011

Table 4.23, indicates that 45% of the respondent's prefer the regulatory office to undertake responsibility for coordination. Which followed by any strong governmental office account 29%, "Any strong body" refers the preference of the respondents other than above mentioned stakeholders (i.e neither directly choose the regulatory nor any other specific sector) simply prefer any sector that has strong power in the City Administration. That should take the responsibility of coordinating scattered activities. 16% of respondent replied that the responsibility of coordination should be given for the road authority and the rest of the respondents replied that the responsibility should be given for telecommunication and water and sewerage is about 9.6% together. The idea was raised for in-depth interview and majority of the respondents replied that, the responsibility should be given for some strong authority other than above mentioned stakeholders. They claim that, the effort currently observed is not promising, due to this and similar reasons the responsibility either should not be given for the regulatory or the regulatory should come with separate work and strong task force.

Regulatory office strongly argues that, since the establishment of the regulatory office the effort shows tremendous change. This doesn't mean that, the office completely solve the situation, there are more works to be done. The researcher can safely argue that, the office effort seems incomplete due to two major reasons. The first one is the vast nature of the problem and the second one is the limited nature of its capacity (institutional capacity). The researcher opinion towards this idea is that, Regulatory office has been engaged in different activities: among the reasons building permit and giving permit license and the like are the most prioritized activities and sometimes the issue of coordination seems additional works. However, it is critical and need to be tackled as soon as possible. This indicate that the sector still do not attract strong attention from the responsible body.

4.6 The Absence of Integration and its Effect

The absence of integration is major cause for a number of social, economical and environmental problems. The following table summarizes the major effects of the absence of integration.

Table: 4.24 Consequences of Integration reported by respondents

Types of response	Frequency	Percent	Valid Percent	Cumulative Percent
Repetition of works/overlap	6	9.7	10.5	10.5
Wastage of scarce resource	17	27.4	29.8	40.4
Traffic congestion	4	6.5	7.0	47.4
Traffic accident and service interruption	2	3.2	3.5	50.9
Repetition of works & wastage of scarce resources	28	45.2	49.1	100.0
Total	57	91.9	100.0	
Missing system	5	8.1		
Total	62	100	100	

Source: Own Survey, 2011

As one can trace from the above Table 4.24, large proportion of the respondents (45%) replied that the major negative effects are repetition of works and wastage of scarce resources and followed by wastage of scarce resource alone is about 27.4%. Generally, the major negative effects of the absence or poor level of integration could be said economical (repetition of works and wastage of scarce resources), social traffic accident and congestion. Moreover, negative mentality of people as well as Environmental and health issues.

Figure 4.8, photo showing walking of people on the carriage ways

Source: Own Picture, 2009

- **Social Effects-** Even if there is no recorded data, the trenching of ROW particularly, the carriage way aggravated considerably for the traffic accident and thus claims lives of large number of people. Moreover, large number of handicap people faces many challenges related with this. Beside, still large number of people broken and become handicap due to the same reason (i.e. people may get in the manholes or trenched ditches and broken and get Sevier injury), the absence of integration pronounce (amplify) the overall economic and social problem. In addition, the process of excavation has another social cost, in which congestion is a common characteristic.

- **Economic Effects-** The economical impact could be probably the major negative impact from the absence of integration. Repetition of the same work, wastage of resource and reduction of the asphalt service year could be said the major ones. EEPCO and AAWSA together pay 1,154,992.3 amount of money for trenching the road in the year 2011. In return, the road authority paid money for relocation. The following table showing the amount of money spent on relocation.

Table 4.25 money spend for utility relocation in the year 2010

Name of institutions	Amount of money	Project number
ETC	57,682, 807.02 38	38
AAWSA	30,623,586.35 293	29
EEPCO	31,063,023.61 54	54
Total	119,369,416.98 121	121

Source: AACRA, 2010 cited in Mesfin, 2010

Consequently, different utilities buried in the wrong places, some of them buried in the Walkway will be evicted and shifted in the near feature, this implies that, the city of Addis Ababa should have to expect huge amount of economic crisis, due to the absence of integration. Either walkways or carriage way is trenched and large number of people forced to walk on the carriage way consequently create a huge accident.

Chapter Five

5. Conclusion and Recommendation

5.1 Conclusions

The continuous growth of population has increased the burden on urban services; this population growth coupled with haphazard planning exacerbates the sector problem. Moreover, the service particularly integrated planning has been neglected in academic discourse for considerable period of time. By the same token, practitioners gave lesser attention for some reasons. As a result social, economic and environmental effects are still significant. It is obvious that the only method that can minimize overall cost and bring efficiency in all aspects is integrated service planning. The primary objective of this study is finding the level of integration among stakeholders and the major reasons that could be justified for the problems. It also aims to find the major place where the integration process failed. With that in mind, both primary and secondary data were exhausted to come up the following conclusions.

In relation to this objective the researcher recognizes that the existing level of integration among stakeholders is still found in a poor condition however, most of the respondents agree with the presence of integration at intra level though it is unsatisfactory. Among the respondents who inquire for the inter sectoral integration the majority tends to say the existing level of integration is low or poor in all aspects of planning, design and implementation and follow up.

From the Planning perspective, the plan year of every sectors is not uniform among infrastructure providing institutions. Moreover, every utility provider except the road authority does not refer the city master plan in most of their activities. Since the plan year is short and there is frequent plan change the integration process challenging and from bad to worse. The level of integration is loose in the planning and design stage, the implication expected to be the same on the implementation and follow up too. Coordinating these sectors already began by regulatory office but, the current status of integration in all stages said to be low (i.e on planning, design, budget and financing, implementation and follow-up) at both intra and inter sectoral level. The absence of

integration caused and resulted with a number of consequences and it is still loose in spatial aspects. In this regard both the walkway and even carriage way is usually excavated for the service provision, most roads particularly roads in the inner city. The emphasis of master plan for utilities has still significant effect.

The second objective was identifying the major reasons /causes for the absence or low level of integration and its consequence.

- Organizational structure /capacity and arrangement- the current organizational Structure doesn't show responsibility and accountability, this system do not allow the participation of stakeholders moreover, the efficiency and effectiveness could be said in a poor condition,
- Absence of strong coordinating body- the regulatory office said to be weak since it is engaged in different sectors particularly in its capacity and its authority.
- Finance / participation of the private sectors- as stated earlier the involvement of the private sectors in all stages is not at satisfactory level.
- Plan year and change of plan- the research found that every actors do not internalize the city master plan yet to this effect the plan or project design at sectoral level mostly do not refer the city master plan and it also characterized with frequent plan change and short plan year etc . The major consequences resulted from the absence of integration can be summarized as Wastage of scarce resource, Repetition of works, Un maintained roads and the like, there are roads that are not maintained for extended period of time, that ranges from 3 to 5 years and some of the roads forgotten totally. It is true that the service year diminish haphazardly due to frequent excavation and un timely maintenance.

Thirdly the research aims to find the driving forces of excavation/cut off carriage way and also to identify the major reasons for the improper maintenance and management of road after the completion of the tasks. Excavation in the installation of utilities sometimes said to be mandatory where the previously installed lines are old and cannot support the existing demand. It is obvious that the walks ways are already occupied with previously installed utilities, unlike water and other utilities sewerage lines need wider area and depth and reasonable gradient. The existing walkways can not provide this place mainly

resulted from haphazard planning and spontaneous nature of the city, the stakeholders complaining that the master plan gave minor emphasis for utilities. Moreover, the level of participation could be said minimal. However, the planning institute responded that they were participated in all panels and workshops. Meanwhile, the participant may not have a good dissemination power or may not get opportunity to disseminate the information. Nonetheless, the carriage way is a target to be excavated. The problem of excavation amplified and become significant in its magnitude in the inner city than expansion area. This mainly resulted from the presence of haphazard planning coupled with population growth and fast rate of urban decay. Every stakeholder are intensively doing now what has not been done or completed some 10 or 20 years back, the problem is cumulative effect than one time occurrences. Inner city service provision characterized with poor quality, old, intermittent and that could not support the existing demand. From the survey and interview result it is possible to conclude Roads mostly excavate by the two institutions ET and AAWSA respectively however, Carriage way mostly excavated by water and sewerage authority. Currently EEPCO is dominantly involved in the road excavation.

The other important finding is that trenched areas are not maintained immediately, this is mainly resulted from waiting of accumulation of certain level of kms to be maintained. Moreover, the natural factors are still significant. In addition, maintenance may be delayed due to the agreement among the actors. Meanwhile the standard of maintenance is very controversial but, it is still difficult to maintain 100% as before due to a number of reasons. However, the shortage of budget and the difficult nature of trenches for maintenance played significant role for the poor standard of maintenance. Trenched fields sometimes backfilled with the same material and become asphalted or covered with asphalt without compaction that will sink after a few service period.

Evaluation of the socio economic impact of the absence or low level of integration was also aim of this study, from the economic and social perspective, absence or lack of integration has negative impact. In relation to this the research found that repetition of works, traffic accident, death of significant number of people and loss of huge amount of resources are the major backlogs resulted from the absence of integration. Since

excavation usually is done on the peak hours and done with traditional methods it will have considerable effect on both economic and social aspects. It is possible to accomplish most effectively and economically if actors work in an integrated manner.

To identify, the effects of infrastructural policy and legal ground of stakeholders over the use of Right of ways, is also another major objectives stated in the study. The research found that there is a big gap in the policy area since there is no consolidated policy. It is still difficult to come up with effective measure to combat the problems. The weakness of the regulatory authority resulted from this gap. Even the urban policy of the city gave much priority for water. However, the road sector is much favored than any other sectors. As a consequence discrepancy will emanate with this bias in which the road constructed much faster than water and sewerage the absence of infrastructure policy hence contribute for the loose integration among stakeholders that could not allow for the establishment of strong controlling body.

5.2 Recommendations

After having the above findings and conclusion it is possible to forward the following suggestions, and recommendations.

Planning, Budgeting and Design with the Participation of Stakeholders

The existing master plan has to be revised with international standard. Also should involve the stakeholders in plan preparation. Moreover, the institute should provide continues awareness creation and trainings in relation to the plan at least at preliminary level. The right of way should accommodate every elements even has to look in to the projection of future traffic volume and the need of utilities. Furthermore, the service providers should refer the city master plan for their planning and any other activities, in which the problem of plan change, repetition of works and separate activities will be minimized. In other words the utility providers have to comply with the city master plan and have to internalize before going to the detail of activities that ranges from planning to completion of tasks. Most of the time plan change occurred due to the lagging of property issuance. The change of plan has to be tackled as soon as possible by increasing the plan period and avoid the problem of the issuance of property right. All governmental & non governmental organization should work for shortened the issuance of Property right.

Asphalt-paved roads should not be excavated frequently, if it is mandatory it should be made with minimum economic and moral cost on the public. Necessary measures to maintain integrity should be taken and infrastructure works should be carried out in coordination. The time of starting and ending of excavation should be clearly stated and has to be done in off peak hours or holidays to minimize the pain over the public. Regulatory should control the standard of maintenance and completion up on given time. The walkway should be tiled or cobbled other than asphalted. Moreover, these lines should be colored to be easily identified. In other words the walkways particularly installed and potentially to be installed walkways should be covered by markable colors, so that utility providers can easily identify their own right of way.

Moreover, every utility including roads should be registered and standardized. The utility registration should be supported with the modern technologies and programs like GIS and GPS which enable to identify the utilities with their XY coordinate. That in return enables to use non trenching technologies to the sector in particular and bring efficiency and effectiveness in general.

Budgeting and planning go hand in hand. If the plan is long term and submitted to one strong force, it might not be difficult to estimate the actual cost and if there is deficit that can be funded through different mechanisms. There should be funding system for the whole utilities together particularly in time of unbalance of the programs and allocated finance. The private sector can be involved if there is fertile ground to entertain it. Generally the integration work has to be made with the involvement of the whole actors from inception of integration to completion.

Policy, Manuals, Procedures, Standards and Regulations

Formulation of appropriate urban infrastructure policy is a priority for effective, efficient integrated urban service provision and the policy has to give due consideration for good governance, integration/ coordination in urban center. The policy scheme emphasize on the involvement of private sectors in a secured manner for the public benefit. Co-ordination of infrastructure works is a subject of legal arrangements. Clear & accountable legal framework needs to be formulated. It should clearly define the roles and

responsibilities of actors during each phase of the infrastructure development process and to hold parties accountable for actions within their control. Manuals and standards such as order of space allocation for utilities across road, within ROW need to be improved so as to reduce/ avoid conflicts over the use of available space and strict application of regulations and law enforcement is necessary. Moreover, consolidated manual that shows detail of description tasks from inception to completion of the utility works is needed.

- Cut fee rule need to be promoted to make the actors aware of additional cost and to work complying with the existing system.
- Strong enforcement over the utility registration, time of beginning and end of excavation and its maintenance is quite recommendable
- There should be also clear and consolidated legal frameworks that can easily mange utilities conflict and property right disputes.
- There should be proper policy and guide that allow the participation of the private sector particularly in financing long term plan or investment.

In areas where the road is below 5 year of construction other trench lees method should be promoted or prohibit totally. It is advisable if the maintenance work is handed over from ACCRA to the utility providers who excavate the asphalts, because maintenance work is giving hard time for the road authority and is not effective up until today. However, giving the same task for the other utilities might be another burden and force them to involve in different aspects which play crucial role on their performance. Therefore, the participation of the private sector is advisable, but the road authority simply supervises the quality of works. It is a great opportunity for small and micro finance to be involved in this maintenance and even the excavation work. The sectors can outsource their tasks of excavation and maintenance to small and micro enterprises. As already explained above the policy issue is cross cutting among other sectors, it is recommended that further studies shall be carried out so that sound policies are implemented.

Alternative Methods/ Technologies in Infrastructure Works

It is possible to apply different alternative trench lees technologies which enable to minimize the social and economic burden. These techniques allow the installation of different utilities at a time with single excavation. Among the alternatives: joint trench,

multi-inlet pipe system and gallery systems that enable burial of more than one line with one single excavation. Use of boring machine or uses of pipe, cable or conduit installation using horizontal drilling are alternative methods of trench less technologies to minimize the effect of trenching on the asphalt roads.

The utility installation particularly the cable duct for utility placement on crossing should be made in consideration of the city development and public demand. By doing so it is possible to minimize the burden of excavation over the asphalts. Similarly, minimizes the wastage of scarce resource. Unlike its importance it is very expensive, this task said to be easy for the road authority particularly in areas where relocation process and in area where new development takes place. However, it is constrained by the scarcity of budget. The involvement of private sectors to the infrastructure services should be promoted, these private sectors can be involved in funding the cable duct during the construction stage. This can be returned back through some reasonable rent or can be transferred with sell to the service providers, but here there should be proper controlling system to avoid perfect monopoly, otherwise it might be easily manipulated and change the nature from public to perfect private sector, to avoid such dilemma the PPP is more practical and advantageous. There should be proper policy and guide that allow the participation of the private sector particularly in financing long term plan or investment. For instance, the private sector can be involved in Constructing utilities of different institutions and when the relevant sector need to use that utility it can be used in the form of franchising or leasing the infrastructure or buy from the private sector with reasonable price. However, this might not be an easy case unless and other wise the necessary legal framework is in place, other wise this might create perfect monopoly.

Recommendation on Institutional or Organizational Arrangements

The organizational structure of every institution should be rearranged that enable to give space for them for efficiency and effectiveness. There should be also a clear identification of their authority and has to allowed the participation of private public partnership. The good governance of these sectors shall be improved and oriented to bear accountability and risk taking system. It is preferable if ET and EEPCO could also be accountable to the city Government for their activities within the city.

A high level and virtual co-ordination committee with the necessary legal background, procedures and mechanisms that can work actively should be re-established and decentralization of works and power has to be practiced at different level. Decentralization by itself is not an end even it makes difficult the integration unless designed in a very systematic way. Willingness and commitment to work jointly among infrastructure authorities should be enhanced. Organizational structure specified in legal arrangement for the co-ordination of infrastructure works has to be established. Some time there is also question of power among the stakeholders that has to be abolished once and for all by clearly identifying the task and authority of these sectors. Lateral relation among these stakeholders is quite recommendable.

Particularly, the regulatory either should come up with strong authority & separation of works or another agency should come to coordinate the effort of different actors. Take the responsibility of coordination by focusing on the following issues.

- Since 90% of integration accomplished at planning stage the authority should give higher emphasizes for planning as major input or instrument of integration.
- Cheek the submitted plan at least three to five month ahead of the physical year begin and the plan has not been in conflict with the other utilities and check the plan is made in reference to the city master plan/comply with the city plan
- Deliver the plan for the others, assuming they might be affected and prepare stages for discussion. And it should also come with strong task force in the time of implementation or construction to inspect and evaluate the standard of infrastructure works. The authority expected to participate in all integrative activities from inception to completion of tasks. Therefore, it has to strength itself in different perspectives moreover, provided the stage and serves as facilitator in all activities in the time of dispute among these parties.
- And finally, the need for Public Private Partnership (PPP) is already recommended. This however needs further researches to be carried out on the possibility of modalities and legal arrangement that enhance private participation in areas of utilities provision in the context of Addis Ababa.

REFERENCES

Addis Limat (2010). Addis Ababa city Administration design building and capacity building office department of communication office magazine published every for months. Volume 1, number 2.

Addis Limat (2010). Addis Ababa city Administration Design Construction Management and development office communication office quarterly magazine.

Addis Zikre Hasab (2009). Talks Show, Problems Associated with Road and Utilities Planning and Construction. Television program, Addis Ababa communication office, Addis Ababa, Accessed may 26, 2011 Program (presents for discussion) Amharic version.

Alabaster, G. P.1 & Osinde, R.N (___). Providing Basic Urban Services for the poor in Secondary Urban Centers: Case Study from the Lake Victoria Region.

Arkansas (___). Utility Accommodation Policy State Highway Commission Arkansas State Highway and Transportation Department, Little Rock, Arkansas.

Asmelash Bezabehe (2007). Challenges and prospects of private investment with Particular emphasis to public service delivery: the case of Mekelle, Tigray Regional state. Masters Thesis, Addis Ababa University.

_____. Bureau of Engineering Project Delivery Manual Starting the Design Procedure:8.5chapter8.UtilityCoordination,<http://eng.lacity.org/techdocs/pdm/**Chapter**08/**Procedure8**_5.pdf>

Bari Anne (2008). Managment of utilities and adjacent to the Public Right of way: Survey Practices, City of Toronto.

Calgary (2000). City of, "Roads – Maintenance – Utility Excavation, http://www.gov.calgary.ab.ca/roads/about_calgary_roads/roads_mainte.../utility_excavation.htm, accessed January 15, 2011.

City of Tempe, (2008). Utility Permit and Construction Manual Prepared by the City Engineer's Office, REVISED Development and management program.

Central Statistics Authority (2008). The 2007 population and housing census of Ethiopia, results at country level, Volume II Analytical report, Addis Ababa

Dr Justin O'Brien(____). Conflicts of Interest on Wall Street: Corrupted Actors or System? Senior Fellow Institute of Governance, Public Policy and Social

Research Queen's University, <http://www.qub.ac.ukj.obrien@qub.ac.uk accessed on April 30, 2011.

Erwin Alampy (1999). Organization in development: the changing nature of service

Federation of Canadian municipal and national research centers (NRC 2003) Coordinating Infrastructure works a best practice by national guide to sustainable municipal infrastructure.

Finot Addis (2011). Addis Ababa city road authority quarterly news magazine

Gashaw Tena (2009). The contribution of Integrated Housing Development program in Iner city Revitalization: The case of Arada Subcity,Addis Ababa.Master thesis Civil service college.

George Alvarez, (2000) APWA streets and technology conference winter 2000 CARSON community centre session utility trench cut fee evaluation and ordinance.

Reka Goode and Brenda Ran (1999). Guide To the Legal Aspects of Trench Cuts, <http://www.mtc.ca.gov/library/trenchcuts/trench_cuts.pdf>.

Hilsburg (2004). Utility Accommodation Guide and Right of way use procedure manual<http://www.hillsboroughcounty.org/.../**guidesrights/useproceduresmanual**20041025.pdf>

Illinois APWA (2010). Utility Coordination For capital improvements project Best Management Practices, Bureau of Design and Environment, Manual Chapter Six Utility Coordination.

J, Brook and C. Irwin (2003). Infrastructure for poor people public policy for public provision.

Leong Weng Wah B Eng (2005). The Impact of Trenching on Urban Road operation and Maintenance, University of Southern Queensland Faculty of Engineering and Surveying ,<http://www.eprints.usq.edu.au/50/1/WengWahLEONG>.

Leventa et al (2008). Turkish courts of account, <http://www.environmentalauditing.org/.../Turkeys_eng_MetroMunic.pdf .

Mahadeva,M (2010). Infrastructure and Development in India: Inter linkages and PolicyIssues, J`ournal of Social and Economic Development

Mathewos consult (2006). Integrated urban infrastructure and service planning.

Mesfin Haile (2010). An Assessment of the Integration among Road and Utility Infrastructures in Addis Ababa: The Case of Kirkos Sub- city, Master thesis. Civil service College

Ministry of Urban Works and Development (2005). Urban development policy.

Ministry of Works and Urban Development (2006). Cities infrastructure development

News Addis (2010). Addis Ababa city Administration communications Affairs Bureau, Published once in fortnight by the volume 6 No 3.Press case team.

Nichols, Vallerga & Associates (2000). "City of Seattle Impact of Utility Cuts on Performance of Seattle Streets." <http://www.seattle.gov/transportation/pdf/final-rpt_Jan31.>.

ORAAMP (2002). City development plan 2001-2010, executive summery

Our cities (2010) building productive sustainable and livable future. Discussion Paper a productive, sustainable city. Australia.

Peter Hartig, PhD (2008)., Financing Urban Infrastructure. Innovative Financial Instruments for Cities C Philippines l525 San Carlos St., Ayala Alabang Village, Muntinlupa City. .

Research & Development Division RD/GN/0251998 Utilities Coordination under the Utility Management System.

Reza Moghadam and José Viñals (2009). International Monetary Fund, Financial Sector and Bilateral Surveillance-Toward Further Integration, Prepared by the Strategy, Policy, and Review Department and the Monetary and Capital Markets Department, in collaboration with the Research, Statistics and Other Departments.

Richard Smuther (2004). Accountablity communication coordination report of the utility relocation task force.

San Francisco,(____). City and County of 2000-02. "Regulations for Excavating and RestoringStreetsinsaneFrancisco,"<http://www.sfdpw.org/sfdpw/download/download.htm> accessed January 15, 2011.

Tegegn Gebre Egziabehere (2000). perspectives and issues of Urban development in Ethiopia, Working Paper no, 10 RLDS

Tegegn Gebre Egziabehere and Miene Pieter Van Dij (2005). Issues and challenges in local and regional development. Decentralization urban services delivery, rural urban linkage and inequality in developing countries. RLDS

Tegegne Gebre Egziabehere (2011). Livelihood and urban poverty reduction in Ethiopia, perspective from small and big cities (OSSEREA).

Tesfaye Yalew (2001).Towards coordinated management of utility lines (With right of Way of roads) draft.

TPUCC, (2004). Toronto Terms of Reference Public Utilities Coordinating Committee,<http://tpucc.com/Shared%20Documents/terms_of_Reference.pdf.

UN habitat (2006). Ethiopia: Addis Ababa urban profile regional and technical corporation division.

Utility coordination bets practice, Promoting effective collaborations.

Utility Policy Manual (1995). British Columbia Ministry of Transportation and Highways Highway Planning Branch Utility policy manual.

V.S. Karandikar et al, (2003). GIS based Road Information and Management System: A decision support tool for Public Works Department, Government of Maharashtra, India.

Wondimu Abeje (2009). Urban services, for the course urban service in urban.

WSDOT (2008) Utilities Manual M 2287.Technical Manual un surfaced Road Maintenance Management 008 Chapter 6 Project Delivery and Utility Relocation

Yeras work Admassie(____) Research Method and Data Analysis, MA program in urban development and Management.

Annex I

- **Definition of Terms**

Urban services, infrastructure and public facilities are interchangeable terminologies.

Infrastructure-is defined to denote the hard component that comprises all systems of urban physical structure that are mainly laid underground (e.g water mains) and on the ground (e.g roads) or above the ground (telephone and electric lines to provide public services. Infrastructure in this paper refers to road and utilities lines such as water supply, electricity, telephone and sometimes referred as stakeholders.

Urban services -Designates all installation and service which structure, organize serve and develop urban space and its hinterlands it includes urban infrastructure and administrative social and economic facilities.

Utilities-a services(as light, power or water provided by a public utility, equipments or space of equipment to provide such services or a comparable services.

Right of Ways- the width of the road from the ends of the private properties line. Which comprises all road component; carriage way, pedestrian way, median, other facilities and places within the ROW alternatively a general term denoting land, property or interest there in, usually in a strip acquired for or developed to transportation purpose.

The other definition of ROW public rights of way The "public right of way" is generally defined to include those areas along, beneath, in, on, and within any dedicated public alley, boulevard, court, lane, road, sidewalk, space, street, and way within the jurisdiction of the municipality.

Carriage way-Vehicular road that only serve smooth movements of vehicles

Arterials-A road type sometimes referred as primary road which include all principal road which cross the town, express way. These roads used for fast and heavy traffic.

Collector roads-sometimes referred as secondary roads that ensure the linkage between arterials and local roads.

Planning -the act or the process of making or carrying out plans specific the establishment of goals, policies and procedures for asocial or economic unit.

Backfill-material used to replace or the act of replacing materials removed during construction, also may denote material placed or the act of placing material adjacent to structures.

Design-to creates fashion, execute or construct according to plan

Cooperation-the willingness to work together in order to meet common objectives, which is achieved through the good will of stakeholders in the development of infrastructure and service development of infrastructure and service without any guiding procedures, rules and regulations.

Coordination-denotes the harmonization of a common action or to create a harmonious interaction among the stakeholders that are involved in infrastructure and service development it is achieved based on the adoption of certain procedures and guidelines.

Integration means bringing together into one. It requires both cooperation and coordination in order to work, it also calls for the existence of a single formalized decision making system and the procedures that facilitate the existence of such a system. Integration potentially allows for more effective and efficient use of resources in order to achieve a given set of objectives.

Inter sectoral integration-it denotes the integration between infrastructure entities; integration between different sectors/infrastructure entities.

Intra sectoral integration-a kind of integration within an infrastructure sector for example integration within the road sector between the road authority (arterial and sub arterial road) and local government and community initiatives.

PPP-it is an abbreviation dominantly used in many areas particularly in areas of modalities, which represent public private partnership.

Efficiency-efficient operation as measured by a comparison of production with cost. Alternatively the ratio of useful energy delivered by a dynamic system to the energy supplied to it (Webster dictionary)

Trenched-installed in narrow open excavation

Un-trenched installed without breaking ground or pavement surface for such operation as jacking tunneling, boring or mechanical compaction.

Utility tunnel an underpass for one or more utility lines

Annex II

Addis Ababa University
College of Development Studies
Urban Development and Management Masters Program

This questioner is prepared to get input for the study under conducted on the issue of the intra and intersectoral integration among the service providing institutions with particular emphasis of ET, EEPco, AAWSA, AACRA in Addis Ababa. The questionnaire prepared for the employee in the above four institutions working on planning, budeget and finance, construction, maintenance and management. This questionnaire only serve for the study stated above, so the respondents are asked to be confident and respond genuinely to these questions.

	I. Information related with performance of institution	
1	Name of your organization?	----------
2	Name of departments?	----------
3	Current responsibility or position in your organization?	----------
4	The maximum educational status you attained?	1=12 complete 2=College diploma 3=BA 4=MA 5=PHD
5	Does your field of study and assigned work any relation?	1= directly related 2= indirectly related 3= no relation
6	Is your organization provide on job training?	1=yes 2=no 3=have no idea
7	Could you explain precisely about the arrangement of your institution and current tasks?	---------- ---------- ----------
8	I agree that every department in our organization work in cooperation.	1 =I agree 2 =Strongly agree 3 =disagree 4 =strongly disagree
9	The current status and arrangement of our organization can be role model for assigning professionals, flexibility and efficiency?	1 =I agree 2 =strongly agree 3 =I disagree 4 =strongly disagree
10	If your answer is 3 for the above question what are the major reasons for the absence of integration?	1 =shortage of professionals 2 =lack of integrity 3 =budget constraint 4 =absence of responsible body 5 =other----------
11	The level of commitment in your institution to bring integration?	1 =high 2 =mediums 3 =low
12	Is there any established committee to bring integration?	1 =yes 2 =No 3 =have no idea
	II, Reasons for Frequent Road Excavation/Trenching	
13	Why roads are being excavated frequently?	1 =New Technologies 2 =need of repair 3 =It is mandatory 4 =Difficult to accomplish tasks at a time 5 =up on the AACRA request 6 =have no idea
14	Why excavation is pronounced or amplified in the inner city?	1 =previous utilities are not adequate 2 =need for repair 3 =LDP 4 =unknown reason
15	Which institution excavates roads frequently?	1 =ET 2 =AACRA 3 =AAWSA 4 =CITY Administration 5 =EEPco 6 =Other----------
16	What time or day interval is the fastest for the road being excavated immediately after maintenance?	---------- ---------- --------
17	What preconditions are available before the permission of excavation?	---------- ---------- --------
18	Do they prepare the time limit of the work and types of work?	1 =yes 2 =No 3 =Have no idea
19	What preconditions are you consider before allowing excavation?	---------- ---------- --------
20	Who allowed excavation before the coming of regulatory?	---------- ----------
21	Is there maintenance department in your organization?	1 =Yes 2 =No 3 =have no idea
22	How often the road maintained	---------- -
23	Why maintenance works are delaying?	----------
	III Consideration for the Future Development /Expansion	
24	Did you participate in the preparation of the city structure plan?	1 =partially 2 =highly involved 3 =no participation 4 =have no idea
25	How do you rate the level of participation of stakeholders during the master plan preparation?	---------- ---------- ----------

26	How do you rate the emphasis of master plan for utilities?	1 =High 2 =Medium 3 =low
27	The plan of your institution ranges?	1 =one year 2 =3 and above 3 =5 and above 4 =have no idea
28	Is there any full-fledged or consolidated manual that govern installation along the road?	1 =yes 2 =no 3 =have no idea
29	Do you think every stakeholder participate during the manual preparation?	1 =yes 2 =no 3 =have no idea
30	How often the manual is amended?	1 =as neded 2 =every five year 3 =every 10 years 4 =never amended 5 =other--------------
31	Does your organization have own installation manual?	1 =yes 2 =no 3 =have no idea
	IV,Utility Records and Asset Management	
32	Does previously and currently installed utilities registered?	1 =yes 2 =no 3 =have no ideaሰም
	what is your plan to improve the utility registration system?	-- ------------------------------------
33	Do you record and notice if your organization damages the others utility?	1 =yes 2 =no 3 =have no idea
34	Do you inspect utilities over the right of way?	-- ---
	V, Cause and Consequences of Integration and Related Issues	
35	Is there any attempt among stakeholders to bring integration? please specify	-- --
A	At planning stage	--
B	At construction stage	--
C	Maintenance and management	--
36	What benefit you expect if there is integration among stakeholders?	benefit for the institution -- benefit for the city -- benefit for the environment --
37	How do you communicate with stakeholders?	1 =Formally 2 = informally 3 = both way 4 =have no idea
38	Does your organization participate on integration committee?	-- position in the committee------------

		------------------
39	What is your perception towards the current integration?	1 =high 2 =medium 3 =low
40	The issue of authority sometimes referred as major hindrance for the absence of integration what do you think?	-- -- --------------------
	VI, Issues related with private sectors involvement	
41	How do you evaluate participation of the private sector	1 =do not participate 2 =partly participate 3 =highly participate 4 =Do not know
42	In which part mostly the private sectors involved	1=Planning 2=Financing 3=Construction 4=Maintenance 5=management
43	Who shall cover most of your project costs	1=Government budget 2=NGOs 3=Private sector 4=International organizations.
44	Do you pay for relocation	EEPco 1=Yes 2= No ET 1=Yes 2=no AAWSA 1= yes 2=no
	VII, Questions related with the planning issues	
45	Do you follow the structure plan of the city?	1 =yes 2 =partly yes 3 =no 4 =have no idea
46	Do you inform for stakeholders before you do any types of work?	1 =yes 2 =no 3 =have no idea
47	What are the main actors whom you are informed or launches your programs?	-- -- ------
48	Do you prepare free space for the other utilities?	1 =yes 2 =no 3 =have no idea
49	If your answer is no what do you think for the reason?	1 =budget 2 =Clack of integrity 3 =shortage of professionals 4 =lack of interest 5 =other----------------------------
50	Is there any possibility of doing other than what has been planned for the budget year?	-- ------------------------------------
51	What is the major reason for plan change	-- --
52	Whom shall take the responsibility of coordinating	1 =ET 2 =AACRA

	infrastructure works?	3 =AAWSA 4 =Regulatory 5 =EEPco 6 =others----------
53	How Do you evaluate level of integration before and after the coming of regulatory?	1 =high 2 =low 3 =medium 4 =no change 5 =have no idea
54	Do you think the existing roads are giving the expected service?	---------- ----------why---------- ----------
55	Among the Major reasons for the absence of integration?	1 =shortage of professionals 2 =lack of integrity 3 =budget shortage 4 =absence of responsible body 5 =others
56	Major consequences resulted from absence of integration?	1 =repetition of works 2 =wastage of scarce resource 3 =traffic jam 4 =service interruption and accident 5 =environmental pollution
57	What remedies has to be proposed to bring integration among stakeholders?	---------- ---------- ----
58	why projects delaying and incur additional costs?	---------- ---------- ----

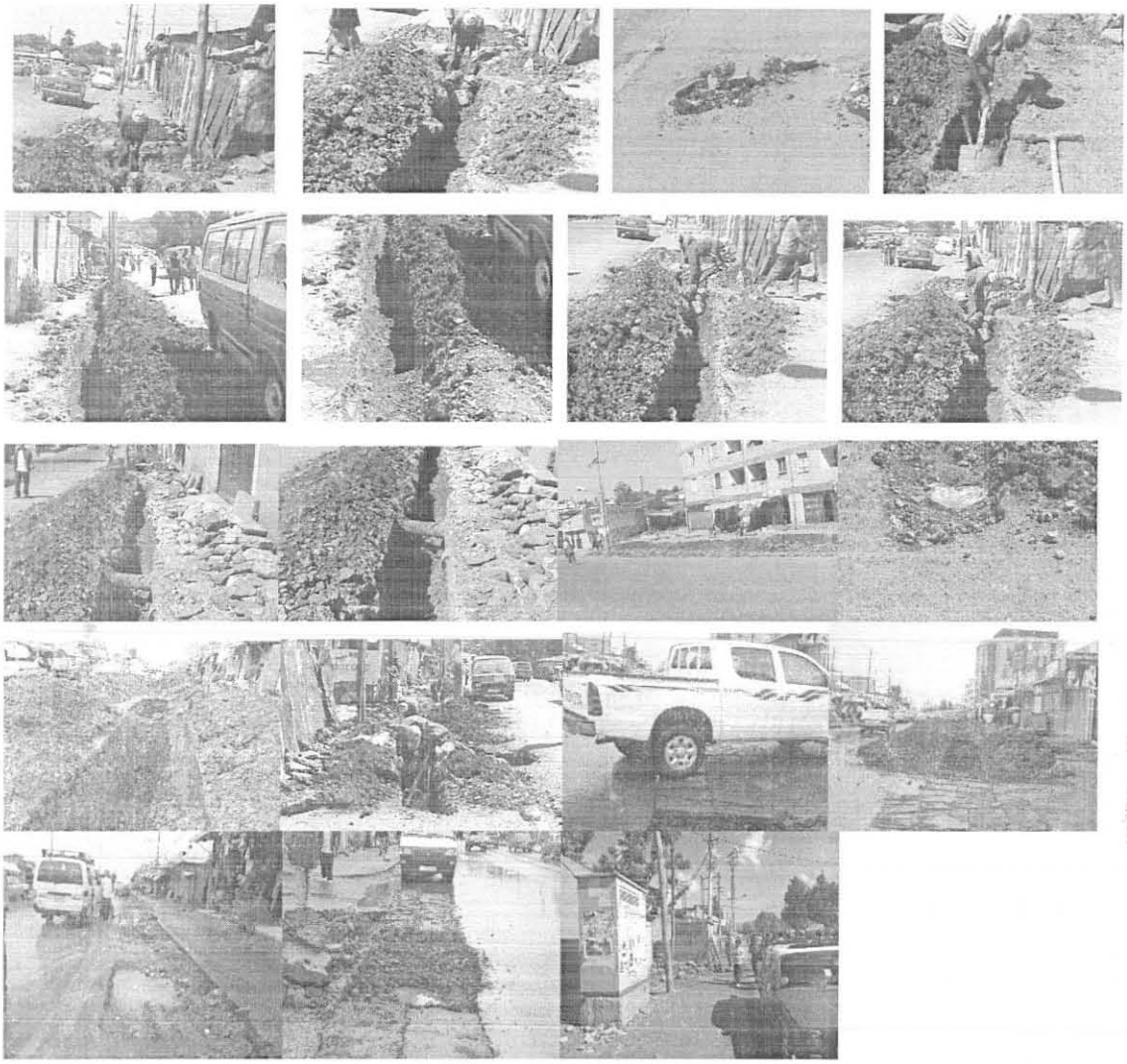
*if you want any thing to add please use the back page.

Thank you in advance!

Guidelines for in-depth Interview

- What are the major reasons you recognize for the failure of integration at both sectoral and intersctoral level?
- Which parts of the city (Inner city or expansion) commonly trenched or excavated? Why?
- Why roads are trenched frequently?
- Does trenching have any negative effect?
- How can you solve the dispute if there is any inconvenience among stakeholders?
- Why maintenance is made below the standard and delaying all the time?
- Whom shall you notice before you begin excavation?
- Does your utilities properly registered? What plan to improve the data registration?
- Is there any attempt to integrate the infrastructure works?
- What major problems you encounter during this process?
- What has be done to improve the existing coordination?
- Who shall take the responsibility of coordination?

Annex III Sample Pictures taken by the researcher



ADDIS ABABA CITY ADMINISTRATION(አዲስ አበባ ከተማ አስተዳደር)
INFRASTRUCTURE AND CONSTRUCTION AUTHORITY
INFRASTRUCTURE CONSTRUCTION
APPLICATION AND PERMIT FORMAT

Application
Permit No

APPLICATION

NAME OF APPLICANT ORGANIZATION		E-MAIL ADDRESS	TEL NO
Representative's Name	Title	Signature	Date

Details of Infrastructure Work to be conducted

....

Location | Street Name
Planned Starting date | Planned Completion date

N.B. A copy of detailed plan not bigger than A 3 paper size shall be attached!

DATA ON EXISTING INFRASTRACTURE

	Utility protection/relocation	AAWSA				EEPCO		ETC	
1	Under ground line(if yes specify	yes	no	yes	no	yes	no	yes	no
2	Conduit size								
3	Depth from top								
4	Distance from property line								
	Approval given by / Signature and / Official seal / Date								

FOR RE-PAVING WORK TO BE CARRIED BY AACRA

ROAD Classification		Carriage way ☐ Pedestrians walkway ☐		Length	U Price
Principal	Arterial	Asphalt concerete	Concreete tiles ☐	With	Total
Collector	Access	Surface treatment	Gravel ☐	Area	Cost

	Road service year since constructed or maintained	Repaving completion date	Pllaned year for upgrading or renovation	Suggestions remarks to acceptance rejection suspense
Approved given by / Date			Signature / Official seal	

PERMIT

SCHEMATIC DRAWING OF INSTALLATION

This permit is issued in accordance with the foregoing application for the period stated above subject to the above terms agreed to by the applicant Organization.

Applicant must fill this permit fifteen days ahead of commencement time of the construction

Prepared by	Title	Date
Approved by	Title	Date

ቅጽ 005

አዲስ አበባ ከተማ አስተዳደር

የግንባታ ፈቃድ የምስክር ወረቀት

/ለመሠረተ ልማት ግንባታዎች/

የአዲስ አበባ መሠረተ ልማትና ግንባታ ሥራዎች ባለሥልጣን፣ ማዘጋጃ ቤት ህንፃ ቢሮ 1ኛ ፎቅ ቁጥር 144 ስ.ቁ. 57 81 72 ፖ.ሳ.ቁ. 27103 E-mail: aaica@telecom.net.et	ግንባታ ፈቃድ ክፍል ቢሮ ቁ. 148 ስ.ቁ. 57 81 70	ግንባታ ክትትል ክፍል ቢሮ ቁ. 145 ስ.ቁ. 56 37 27

የግንባታው ሰቤት ስም					የግንባታ ፈቃድ ቁ.		
...ፍለ ከተማ		ቀበሌ		ስ.ቁ የቢሮ ብሎክ		ተጠሪ ግለሰብ	
ግንባታው የሚገ በት አድራሻ	ክፍለ ከተማ		ቀበሌ		ፓርሰል	Coordinate X	
ሳዳስተር ቁጥር		የሳዳና ስም				Y	
ግንባታው ይነት		መለ ኪያ		መጠን		የግንባታው ወጪ ግምት	
ስለ ግንባታው ገብራሪያ							

ግንባታ ፈቃድ ውሳኔ

በግንባታ ፈቃድ ደንብ ቁጥር 17/97 እና በግንባታ ፈቃድ መመሪያ ቁጥር 1/97 መሠረት የቀረበው የግንባታ ፈቃድ ሰነድ ተመርምሮ ከዚህ በታች ተመለከተው የግንባታ ፈቃድ ውሳኔ ተሰጥቶበታል።

በቀረበው የግንባታ ፈቃድ ሰነድ መሠረት ግንባታው ሊካሄድ ይችላል።		ፈቃዱን የማያስከለክሉና በግንባታ ወቅት መታረም ያለባቸው ከዚህ በታች... የተጠቀሱት ግድፈቶች ናቸው።		ከዚህ በታች የተጠቀሱት ግድፈቶች የግንባታ ፈቃዱን የሚያስከለክሉ ናቸው።		ከመሪ ፕላኑ መስፈርት ጋር ልዩነት ቢኖረውም ቢያንስ የዋናው ግንባታ መሠረት ሥራ ስለተጠናቀቀ በድጋሚ የተፈቀደ።	ያለማሻሻያ
							ከማሻሻያ ጋር

ከዚህ በላይ በዝርዝር የተገለጸው ግንባታ በቀረበው የመሠረተ ልማት ቅንጅት ማረጋገጫ* ሰነድ መሠረት ግንባታው እንዲካሄድ. . .

* ከዚህ የምስክር ወረቀት ጋር የተያያዘው ገጽ የመሠረተ ልማት ቅንጅት ማረጋገጫ ቅጽ እና ገጽ የRoad Profile ንድፍ የዚህ ግንባታ ፈቃድ አካል ነው።

የግንባታ ክትትል ሁኔታዎች	በግንባታ ወቅት መደበኛ ክትትል የሚደረግባቸው ደረጃቶ ከህ እስክ ሐ የተዘረዘሩት ሲሆኑ እንደአስፈላጊነቱ የቁጥጥር ጉብኝት ሊደረግ ይችላል። ተጨማሪ መደበኛ ክትትል የሚጠይቅ የሥራ ደረጃ ካለ በተራ ቁጥር መ ላይ ተጠቅሷል። ግንባታ ከመጀመር ከ3 የሥራ ቀናት በፊት ለክትትል ክፍሉ በማሳወቅ የግንባታ ማስጀመሪያ ማረጋገጫ ይያዙ።	ሀ. ማንኛውም ግንባታ ከመጀመሩ በፊት የቅየሳ ሥራ እንደተጠናቀቀ ለ. የየክፍለ ሥራው የመሠረት ቁፋሮ ሥራ ተጠናቅቆ እንደተጠናቀቀ ሐ. የዝርጋታው ሥራ እንደተጠናቀቀ መ. ----------

የዚህ ፈቃድ የአገልግሎት ዘመን ...		የግንባታ ፈቃድ ቁ.		ቀን

የግንባታ ፈቃድ መርማሪ ባለሙያ

ስም ----------

ፊርማ ----------

ቀን ----------

የግንባታ ፈቃድ አጽዳቂ ኃላፊ

ስም ----------

ፊርማ ----------

ቀን ----------

ማሳሰቢያ ይህ ቅጽ በ2 ኮፒ ተሠርቶ 'ተፈቅዷል' እና 'ለክትትል' ከሚሉት 2 የጻዛይን ሰነድ ኮፒዎች ጋር ለግንባታው ባለቤት የሚሠጥ ሲሆን፣ 1 ኮፒ ከቀሪ ፋይል የሚያያዝ ነው።
ይህ ቅጽ በኃላፊው ተፈርሞ በመ/ቤቱ ማህተም ካልተረጋገጠ አያገለግልም።

DECLARATIONS

I Hailemareyam Mulugeta, undersigned hereby declare that this Thesis is my original work and that it has not been submitted partially or in full by any other person for an award of a degree in any other University.

Declared by Hailemareyam Mulugeta

Signature ..... **Date** 23/11/03

This Thesis has been submitted for examination with my approval as University Advisor

Confirmed by Fiseha Wegayehu (Dr.)

Signature .....**Date** 01/08/2003

Date of Submission

.....