



ASSESSMENT OF THE ADDIS ABABA LIGHT RAILWAY
TRANSIT PROJECT SUCCESS: THE USERS PERSPECTIVE

By:

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This is to certify that this research project prepared by Samuel Awraris, entitled "Assessment of The Addis Ababa Light Railway Transit Project Success: The Users Perspective" in partial fulfillment of the requirement for the award of master of arts degree in project management is fulfill with regulations of the University and meets the accepted standards.

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Abstract

The purpose of this study is to assess the Addis Ababa Light Railway Transit Project Success from the users' perspective in the line of East-West Light Railway Transit, Due to this plan; people are forced to use only Stations and Squares to cross, as a result of this problems like high number of pedestrians flow on stations, high traffic congestion in station areas, and high fuel consumption are pervasive. The objectives of this research are to assess the challenges that pedestrians and drivers are facing and to assess the stakeholders' involvement in the project planning and implementation. To attain those objectives of the study; the researcher used descriptive research designs. The universes of study were Drivers and Pedestrians and sample sizes for pedestrians were 97. The researcher used probability sampling technique to select 97 pedestrians on the selected stations which was Simple random sampling and convenient sampling to select a representative from the railway corporation and to select an expert. In addition to that the researcher used three different kinds of data gathering tools which were Questionnaire, Interview, and Document Analysis. The result of the study was that, the design plan of the railway was adapted from Chain, the pedestrians and drivers are facing a challenge, safeties of pedestrians were not considered during the project plan, most pedestrian don't feel safety when crossing, more CO₂were released to the environment due to congestion near stations and the involvement of stakeholders were not sufficient, In addition to that thought the society were affected by the project implementation they were not considered as a stakeholder.

Key Words: *Joint Project Planning, Attendees, Society Involvement, Challenges.*

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Abbreviation and Acronym

A.A.R.T = Addis Ababa Railway Transit.

A.P.M = Association for Project Management.

COOP = Cooperative.

CO₂ = Carbon Dioxide.

C.R.E.C = China Railway Engineering Corporation.

IFC = International Finance Corporation

J.P.P= Joint Project Planning.

J.P.P.S= Joint Project Planning Session.

L.R.T = Light Railway Transit.

PMI = Project Management Institute.

PMP = Project management plan.

POS = Project Overview Statement

PDS = Project Description Statement

StdDev = Standard Deviation.

SPSS = Statistical package for the social sciences.

TPM= Traditional project management.

USD = United States Dollar

Chapter 1

INTRODUCTION

1.1. Background of the Study

PMI (2000) defines project as a temporary endeavor undertaken by people who work cooperatively together to create a unique product or service. Project is also defined as any series of activities and tasks that: Have a specific objective to be completed within certain specifications, have defined start and end dates, Have funding limits, Consume human and non-human resources and Are multifunctional (Kerzener, 2009).

According to PMI (2000) managing projects involves five process groups. This process group collectively addressed as project management life cycle. (Kerzener, 2009) named these five process groups as: Project initiation, Project planning, Project Execution, Project monitoring & control and project closure.

During planning every specific detail information must be carefully investigated because project execution depends on what is planned. In a traditional project management projects are planned in a Joint Project Planning Sessions where everyone who has an input gets involved in the project to develop the detailed plan. Different parties; private investors, non-government organization, and the government at different levels (State, Regional, and Local) do plan and execute projects. One among many government funded projects in Ethiopia is the Addis Ababa Light Railway Transit Construction. This project aimed to address the problem of transportation and lengthy traffic jams on the road of Addis Ababa.

The project was commissioned to be constructed and run (at least in the early periods) by China Railway Engineering Corporation (C.R.E.C). Besides solving the transport problem of many people in the city, the railway plan of the road crossings does not seem to have been crafted well by the China Railway Engineering Corporation (C.R.E.C) and by the Italferr consultant, a company belonging to the Italian State Railways Group. Due to this poor planning pedestrians and drivers witnessed that they are facing problems such as high traffic congestion, high fuel

consumption, unsafe pedestrian crossing, drop in business activity, time and additional transportation cost in search of crossing.

Longer crossing distances increase the pedestrians' time of exposure to accident and traffic congestion. Multi-purpose road just like the East-West line increase the risk of "multiple-threat" accident. A multiple-threat accident occurs when one or more vehicles yield to a pedestrian in the crosswalk and block the view of the pedestrian from drivers in other lanes, who pass the stopped traffic and hit the pedestrian at high speed. (Martin 2006) Moreover the challenges of providing safe crossing facilities on multi-lane roads demand that the government carefully consider the impact on workability in populated areas.

The study is commissioned to provide a better understanding of the challenges associated with railway crossing in the line of East-West Light Rail Transit Project in Addis Ababa City which starts from Ayat and ends at Torhailoch with a total length of 17.4km. There are totally 22 stations, out of which 15 ground stations and 7 sky stations. The stations and Squares are used as crossings for pedestrians and many times there is large number of pedestrians in each of the station which is the main source of the problems.

This research project assess the challenges that pedestrians and drivers are facing in the exposition light rail line in the East-West light railway transit, The aim of the research is to develop an understanding of the challenges of rail-road crossings and to identify key gaps in knowledge in the field of project planning and implementing with little consideration given to assessing the wider range of economic and environmental impacts.

1.2. Statement of the Problem

Addis Ababa Light Rail Transit System runs in two directions. The first one, launch on November 9, 2015, extends from Ayat village to Torhailoch covering 17.4 kilometers and the second, opened on 20 September 2015, makes its way from Kality to St. George church in Piazza covering 14.2 kilometer. Totally the metro covers 31.6 kilometers with 39 stations. The east-west line (Subject of this research) passes through Megenagna, Meskel Square, Legehar, Mexico Square and extends to Torhailoch. It has a total of 22 stations, out of which 15 are ground stations and 7 sky stations.

An important factor in the design of pedestrian crossings for public rail transit services is the need to provide safe pedestrian crossings for all users, including users with disabilities. This includes pedestrian-rail crossings adjacent to roadway crossings, on dedicated pedestrian paths, or within station areas (Fitzpatrick, K., et al, 2015). Engineering work related to road crossings includes an assessment of the impact on safety at the road crossing. Rail and road authorities share the responsibility to ensure that crossings operate safely as a system including the safety of pedestrians (Transport Canada, 2007). In a similar vein, there seems a problem of coordination between and/or among the primary responsible parties in the design, and implementation of the Addis Ababa light railway project. In the words of the general manger of the Addis Ababa Railway Transit the researcher was able to note that pedestrian's issues were communicated to the Addis Ababa Road Authority as well as to Addis Ababa Traffic Bureau and they had an initial idea for constructing passageways for pedestrians when the project was under construction in 2011. Nevertheless, the concerned party failed to solve the issues.

The challenge of providing safe crossing control and warning for pedestrians is particularly complex, especially for children (who may be impulsive or unpredictable), persons with mobility impairments (who may require specific facility features) and senior citizens (who may require additional time for crossing). Pedestrians will usually choose convenience and take the shortest distance between where they are and where they want to go, regardless of designated sidewalks or pathways. The problem of pedestrians ignoring the traditional warning devices at crossings may become greater where pedestrian crosswalk facilities are not directly aligned with crossing warning signals (Transport Canada, 2007).

Currently, in the Addis Ababa light railway line, people are forced to use only Stations and Squares to cross from one side of the road to the other. It is designed in such a way that the average interval between two adjacent stations is 867.5 meters. The distance between crossways ranging from 1,210 meters the longest to 525 meters for the shortest interval. Findings from the researcher's preliminary assessment indicated that this faulty design has given rise to many social problems.

For example, Mr. Aman Wabe, residing around Gurd Shola for the past 16 years and who have been working as Program Officer in different projects for more than 20 years said that when huge projects like the Addis Ababa Railway Transit are undertaken by the government or any institution there should be society's involvement in order to minimize the impact, he witnessed that the large number of people entering those stations to cross daily, that physical ability of pedestrians were not considered when planning the project.

Affirming existence of the above problems, Assistant Inspector Assefa Mezegbu from Addis Ababa Police Commission said that they are forced to assign three police officers in each station for the sake of safety of pedestrians working in two shifts and this situation have create un effective human resource utilization. He also added that the high flow of pedestrians have become the major cause for traffic jam in some areas. The record from Addis Ababa Police Commission for the past two years indicates that 84% of the total accidents which appears in the line of East-West Railway were due to falling to give way to pedestrians in station and U-turn areas, this may be because of high number of pedestrians flow and behavioral change of drivers.

In summary some of the major problems being faced as a result of the poor railway line design includes; Pedestrians incur additional time and transportation costs in search of crossing, high number of pedestrians flow on each station, high traffic congestion on those station areas due to high number of pedestrians, high fuel consumption and high air pollution resulting from it, and high number of accidents to pedestrians as worth mentioning.

What makes this research different is that the light city railway which is under investigated is new to our society. Considering those problems that the societies and drivers are experiencing and with the current situation there should be an immediate solution.

1.3. Research Questions

1.3.1. General Question

What are the challenges that arise due to the Addis Ababa Light Railway Transit Project in the line of East-West Light Rail Transit?

1.3.2. Specific Questions

- ✓ What are the challenges that pedestrians and drivers are facing due to the zebra crossing?
- ✓ Does the project involve relevant stakeholders in the project planning and implementing?

1.4. Objective of the Study

1.4.1. General objective

The general objective of this research is to assess the Addis Ababa Light Railway Transit Project success.

1.4.2. Specific objectives

- ✓ To identify the challenges that pedestrians and drivers are facing due to the zebra crossing.
- ✓ To identify if the Addis Ababa Railway Transit Project involve relevant stakeholders in the project planning and implementing

1.5. Significance of the Study

The study is expected to serve as a reference for further studies in this area. The study is also expected to serve different purposes for different stakeholders. For example, it serves as an input for Ethiopian Railway Corporation for future projects, Addis Ababa Police Commission for an effective human resource distribution and Addis Ababa Traffic Bureau for solving traffic congestion/ jam problems among others. In addition to that the study is expected to contribute to the actions taken to neutralize the challenges that the pedestrians and drivers are facing and to improve safety of pedestrians.

1.6. Scope of the Study

The study has focused on assessing the success of the light railway transit project in the user perspective. The study concern is also limited to the success assessment of light rail way transit project the user perspective on the Zebra Crossing of the East-West light railway transit. The east west light railway transit project encompasses 22 stations; however the study considers 15 ground stations only. The study is only limited to the Pedestrians, Drivers, Environment and Railway Speed Efficiency.

1.7. Limitation of the Study

The study is sought to assess the success of the light railway transit project in the pedestrians and driver's perspective only, therefore the study has limitation in that the perspective of the sidewalk business owners which are found in the line of East-West and North-South Light Railway Transit in Addis Ababa City were not considered.

1.8. Organization of the Paper

The paper is organized in five chapters, In Chapter one; Introduction about project planning and the railway project of Addis Ababa, Statement of the problem, Objective, Significance, Scope and Limitation of the study are included. In Chapter two literatures from different articles and books are included. Chapter three was about methodology of the research; including data collection, data analysis and data presentation of the research. Chapter four includes the main findings, result and discussion. Finally, Chapter five includes summery, conclusion and recommendations of the research.

Chapter 2

REVIEW OF LITERATURE

The body of this chapter is as follows. In this chapter the researcher reviewed Theoretical parts that are meanings and claims of Project, Project Management, Project Planning, Traditional project management and Joint Traditional Project Planning Session. As well as Empirical review, which assess research studies in Ethiopia context and other country experience regarded with railway construction projects.

2.1. Theoretical Framework

2.1.1. What is project?

Many authors have defined a project in many ways some of them are “a project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification” (Robert.K.). “A temporary endeavor (that has definite beginning and end time) undertaken following specific cycle of Initiation, Definition, Planning, Execution and Close to create a unique product, service, or result through novel organization and coordination of human, material and financial resources” (PMI, 1996) and according to project management institution a project is a temporary organization that is created for the purpose of delivering one or more business products according to an agreed business case.

Association for project management (APM) defined a project as an endeavor in which human material and financial resources are organized in a novel way to deliver a unique scope of work of given specification often within constraints of cost and time to achieve beneficial change defined by quantitative and qualitative objectives.

According to Project Management Institute “A project is temporary in that it has a defined beginning and end in time, and therefore defined scope and resources, a project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal”.

A project can cover a wide range of operations, from small initiatives to complex programs. For instance, a dairy cooperative union can run a project to introduce a computerized management information system. A more complex program might be setting up a national health insurance scheme through cooperatives, which would involve many stakeholders (the government, advisory services, the cooperative movement, future clients, etc.), take time and require substantial investment (COOP Africa, Project Design Manual).

2.1.2. What is project management?

Similar to project many authors and books defined project management with different perspective, according to Atkinson R, 1999 a project management is the application and integration of modern management and project management is a knowledge, skills, tools and techniques to the overall planning, directing, coordinating, monitoring and control of all dimensions of a project from its inception to completion, and the motivation of all those involved to produce the product, service or result of the project on time, within authorized cost, and to the required quality and requirement, and to the satisfaction of participants.

Project management is the planning, organizing, directing, and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives. Furthermore, project management utilizes the system approach to management by having functional personnel assigned to a specific project. (The horizon hierarchy 2009)

After a project is initiated the next phase is to develop a detail plan for the work to be done in order to satisfy all stakeholders that are involved in the project. Planning processes ensure that the project addresses the organization's needs.

There normally is no single "project plan." There are several plans, such as the scope management plan, schedule management plan, cost management plan, procurement management plan, and so on, but the study will focus on the design planning. Planning processes include devising and maintaining a workable scheme not only to ensure that the project addresses the organization's needs but it won't have an impact on the pedestrians.

2.1.3. What is project planning?

Many authors and references have defined project planning in diverse ways. Slevin and Pinto, 1986 have define project planning as the extent to which timetables, milestones, workforce, equipment, and budget are specified or estimating the effort, time, cost and staff resources needed to execute the project.

The project planning is commonly perceived as creating 'Gantt Chart' alone, which is incorrect. Gantt chart is merely visual representation of project schedule. In fact project plan is quite broader concept Zilicus Solutions, (2012).

PMI (2008) has a related explanation for the planning. “The Planning Process consists of those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives.”

Out of the 39 processes listed, 21 are identified by the PMBOK as related to planning. If a project is to be properly planned, these 21 processes have to be properly executed. This implies that a major part or 48% of a project manager’s tasks revolves around planning (Zwikael & Globerson, 2004 and 2006). We can say that a project failure or successes are heavily depending on the planning phase.

Annie, I Anton 2003 state that if you don’t know where you are going, you will probably end up somewhere else; a complex project will likely fail without a plan, for who wants to satisfy customers’ needs, that plan is a complete, consistent, and correct expression of the stakeholders’ requirements.

Planning in the only way to accomplish a goal, because without planning, we do not have a path to follow and our efforts can leads us towards undesired objectives or results. Without adequate planning, it is difficult to really understand what it will take to complete a project successfully. Planning is used to put the project back on track if it deviated from the plan and also it is used to control a project and establishing a baseline with which to gauge progress.

Without planning, there is no control. (Guru Prakash.P) Bigelow (2001:1) claims that planning is the most important yet most undervalued element of project management. It is perceived as being the map that sets the direction for a project. It is critical to the project management process because it forms the basis for the project scope, schedule, resources, quality, risk and integration. Griffith and Gibson (1995) and Griffith et al. (1998) in their study the researcher will try to show that greater project planning efforts lead to better performance on projects in the areas of cost, timetable, and operational characteristics.

2.1.4. Traditional project management

According to the Project Management Institute (PMI, 2004), Traditional project management (TPM) is ‘the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.’ In this case project management is therefore, given as a complete cycle involving the completion of the following phases: initiating, planning, executing, controlling, and closing under the guidance of the project team. PMI (2004) further stresses that TPM work is concerned with fulfilling the demands for scope, time, cost, risk, and quality within the framework of predetermined stakeholder requirements.

Traditional Project Management is thus characterized by well-organized and premeditated planning and control methods that sometimes result in distinct stages of the project life cycle (Hass, 2007; Thomsett, 2002). The increased need to bring formality into project management (Cadle and Yeates, 2008) and control large development projects (Fitsilis, 2008) resulted in the emergence of TPM’s distinguishing characteristic of making sure that tasks for the whole project are carried out in this predetermined orderly sequence (Weinstein, 2009; Hass, 2007; Chin, 2004).

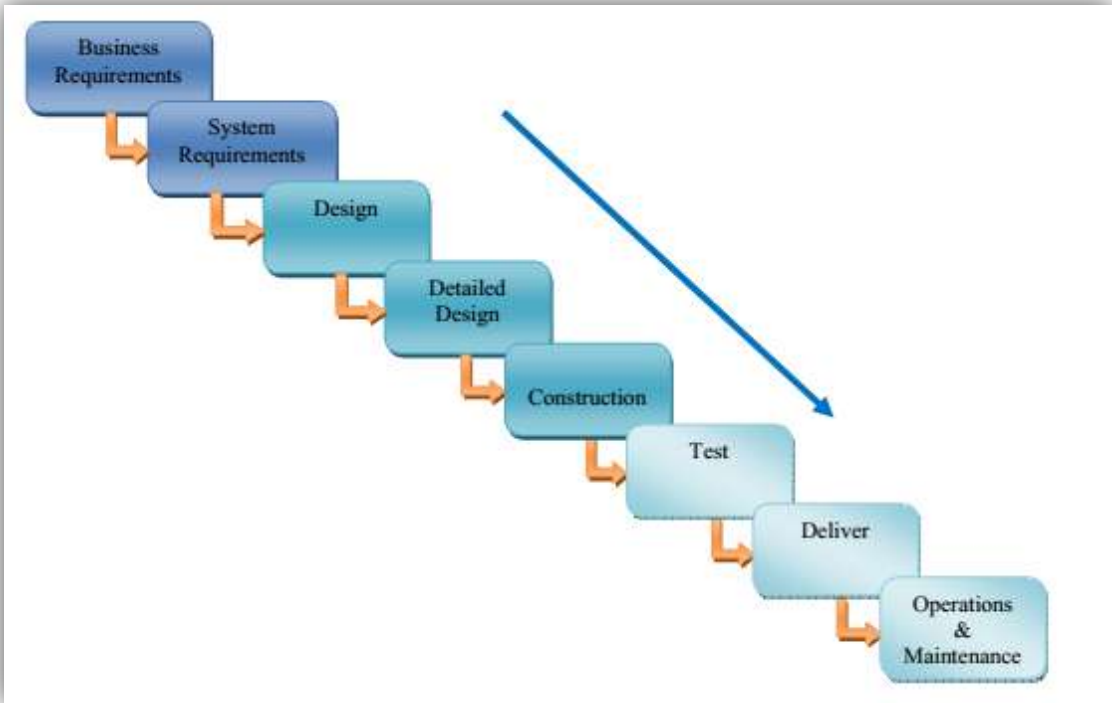
TPM is also centered on the premise that circumstances surrounding project events are foreseeable and the tools used to handle them are also predictable, however, past experiences and literature (Hällgren and Wilson, 2008; Hass, 2007; Aguanno, 2004) show that this is not always the case due to unanticipated occurrences that can interfere with those plans.

Traditional project management life cycle is like a waterfall which starts from an idea then proceed to the next phase up to compilation of the project as you can see from figure 2.1. one of the main disadvantage of TPM noted by Aguanno (2004) is that any design changes adopted

during the testing and development phases of a project have the potential to cause chaos because of the waterfall model's requirement to complete the preceding tasks first.

This may lead to project failure on the basis of time interruption and quality or the outcome may not be best fit or even the project outcome might have negative impact to other stakeholders, which are the essence of a consulting firm's continuous ability to attract clients; hence there is a need for methods that can handle this chaos.

Figure 2-1: The waterfall model



Source; Hass (2007) and Cantor (1998)

2.1.5. Project Success

It has been estimated that 30% of the world economy is based on projects, yet 70% of projects fail. This is a worrying statistic, so we need to define what success means for project delivery. Project managers are under constant pressure to deliver on time and on budget. (J. Rodney Turner)

The project changed dramatically from inception to delivery, in location, size, function etc. This so called “scope creep” is the key thing for project managers to be wary of; many good people have been caught out by this. In fact, the first two project managers on the Scottish Parliament building resigned in frustration. There is more to success than price and delivery, as shown in the following diagram. (Dr. Mike Bell F.R.S.C.)

Figure 2-2: The five dimension of a project success



Source; Dr. Mike Bell F.R.S.C

Most studies have focused on the scope of project success which means the way to measure success of project and factors affecting project success. Westerveld (2003) states that one of the most common ways of measuring project success is the well-known iron triangle of cost, time and required quality. Some studies have extended project success criteria into new aspects, such as stakeholder's participation and satisfaction, customer's benefit and upcoming prospective to organization (Shenhar et al., 2001). Morris and Hough (1986) applied a number of concepts to measure project success such as: project function, project management, and contractor's business performance. Other researchers examine project success by make use of micro and macro criteria (Lim and Mohamed, 1999).

As project management grows at the same time the definition for a project success grows as well. Now a day successes not only define in terms of Cost, Time and Quality but also Image and the capability to improve as time goes on.

Figure 2-3 Stakeholders Map



Source: (Walker 2003)

Amongst the most important aspects of the above 'map' are the inclusion of community and external independent concerned groups, and an identification of invisible team members. It is advocated that project success can be critically affected by the activities of these two recognized groups. (A. Heravi, et al., 2015)

2.1.6. Why do projects fail?

A significant number of projects fail to achieve their intended outcomes on time and within budget. The failure of large, ambitious projects in the public sector often receives considerable, negative publicity. The project scenario shown below illustrates the most common pitfalls. (Scottish Qualifications Authority 2007)

Figure 2-4: Why Project Fails



Source; Scottish Qualifications Authority 2007

2.1.7. Joint Project Planning Session

We have seen what Traditional Project Management is about and now the researcher will briefly explain how we can plan a traditional project and who should be involved in the planning phase. To create detailed projects plan a Joint Project Planning Session (JPPS) must be in a place. It means using a group process for generating the detailed project plan.

Joint project planning (JPP) is a strategy where in all stakeholders in a project participate in a one-to-three day project management workshop, the result of which is consensus agreement on project scope, schedule, resources, design, and budget. (Professor Yong Tan)

The JPPS is a group session in which all of the people who are involved in the project meet to develop the detailed plan. The session can last from one to three days, and it can be work-

intensive. Conflict between session attendees is common, but the final result of this meeting is an agreement about how the project can be accomplished within a specified time frame, budget, resource availabilities, and according to client requirements. (Shobi Chouhan, 2013)

John Herbohn and Steve Harrison have concluded that “Planning is essential to good project management. The plan is generate dynamic document. It changes as the project commences. In JPP Sessions the good planning is painful but the poor planning is even more painful. The document consider in JPP Sessions is POS. The POS can develop in a number of ways. It is an idea for consideration. It will probably be developed by one individual that is the project manager. It can be departmentally based or cross- departmentally based. It developed as the first phase of JPP. The JPP session being by discussing and clarifying exactly what is intended by the POS to all stakeholders that affect the implementation or affected by implementation. The project team might also use this opportunity to write the PDS for their understanding of the project.”

Not only the community participation but also other key stakeholder’s involvements are essential to designing and implementing a project. It help the project manager to find community-based projects that reflect the cultural values, collective vision, long-range governance, and social and economic development goals of native communities.

Community involvement is central to both the strategic planning and project planning that occurs before the development of any grant application. However, in addition to a detailed description of community involvement in the planning and implementation phases of the project, proposals must provide documentation to verify community involvement in and support for the proposed project. This documentation should explain and provide evidence of how the community was involved in determining problems faced by its members and in designing strategies for reducing or eliminating those problems. Keep in mind that each of the documentation sources listed below provides information about different elements of the planning process. (John Herbohn and Steve Harrison)

Examples of documentation that are stated by John Herbohn and Steve Harrison are as follows:

- ✓ Summary of a community comprehensive plan
- ✓ Summary of a community strategic plan
- ✓ Summary of results from a community needs assessment
- ✓ Tribal Council or Board meeting minutes and/or sign-in sheets
- ✓ Community meeting minutes and/or sign-in sheets
- ✓ Community surveys

2.1.8. Attendees of JPP Session

The JPP participants are invited from among those who affected by or have input into the project. The project involves deliverables or is a new process or procedure, anyone who has input to the process, receive output from the process or handles deliverables that invited to participate in the JPP. This means that the society is one part of the joint project planning.

✓ Facilitator:

A successful JPP Session requires an experienced facilitator. The facilitator is responsible for conducting the JPP. It is important that the facilitator not have interest or bring biases to the Session because that would diminish the effectiveness of the plan. It must be developed with open mind, not biased mind. (Shobi Chouhan, 2013)

✓ Project manager:

Project manager is not leading the planning session; he or she can concentrate on the plan itself; that is the project manager's major role in the JPP. Having the proposed project manager facilitate the JPP session may seem to be an excellent choice.

Project manager is the one who has final responsibility when it comes to getting the project done on time within budget, and according to specification. (Shobi Chouhan, 2013)

✓ Another Project manager:

Skilled JPP facilitators are hard to find. If the project manager is not good choice for facilitator, then the another project manager would be a good choice for facilitator, if they has experienced in JPP.(ShobiChouhan,2013)

✓ **JPP consultant:**

The project manager consultants will often serve as another source of qualified JPP facilitator. The project manager consulting will be invaluable. Especially in an organization that have recently completed project management training and are the process of implementing their own project management methodology. (Shobi Chouhan, 2013)

✓ **Technographer:**

The JPP facilitator is supposed by the technographer. It is an expert software tool used to support the project. The JPPtechnographer is recording planning decision on the computer as they occur in real time. Technographer can print out or display the plan for all to see and critique. (Shobi Chouhan, 2013)

✓ **Core project team:**

The core project team is made up of those individuals who will stay with the project form one day to last day. This does not mean that they are full time with the project. Today's organization that is not to be expected unless the organization is totally uses self-directed team. (Shobi Chouhan, 2013)

✓ **Customer representative:**

Customer representative are importance for participation in the meeting of JPP to convince consumers or champions. It is not easy, but it is necessary. Customer must purchase the project plan In order to have an acceptable plan of the project. (Shobi Chouhan, 2013)

✓ **Resource manager:**

Resource managers control resource that the project will require from the start up to the end of a project life cycle. Schedule their managers put together without the input and participation will be a waste of time. Resource management is a key element in the planning process has the option of committing resources to the project. (Shobi Chouhan, 2013)

✓ **Project champion:**

The project champion drives the project and sells it to senior management. Customers can champion an ideal situation because the commitment is already there. The project champion can

be the senior manager of the division, department, or process that will be the beneficiary of the project deliverables. (Shobi Chouhan, 2013)

✓ **Functional managers:**

Functional managers manage areas that can either provide input to or receive output from the project deliverable. They will be ensuring that the project deliverable can be smoothly integrated into existing functions or that the functions will have to be modified as part of the project plan. (Shobi Chouhan, 2013)

✓ **Process owner:**

In this the same reason that functional managers should be present, so should process owner. If the project deliverables do not smoothly integrated into their process, either the project plan or the affected process will have to be altered. (Shobi Chouhan, 2013)

Stakeholders include people who have a share or an interest in a particular policy, program, or project and may be affected by its implementation. Stakeholder involvement is an essential element in creating widely supported and trusted policies, programs, and projects (Tamara Redmon, 2006). This means that the society involvement in the railway project might have reduced the issues that have been mentioned.

2.1.9. Stakeholders in Projects

Peter (2008) defined stakeholder as anybody whose interest can be negatively or positively affected by the project and who may be able to affect the success or failure of the project. Any person or organization that is actively involved in a project, or whose interests may be positively or negatively affected by execute on or completion of the project.

According to the IFC (2007) Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses.

Kalsern(2002) incorporated other bodies as a stakeholders such as; end users, contractors, consultants, labor unions, line organizations, public authorities, financial institutions, insurance companies, controlling organizations, media, third parties, and competitors as stakeholders. Gilbert (1983) state that project environment is complex and changing. If stakeholder management is not adequately addressed in the project, this can mean unexpected problems and uncertainty to the project caused by stakeholders.

The IFC, (2007) reported that, Companies that have grasped the importance of actively developing and sustaining relationships with affected communities and other stakeholders throughout the life of their project, and not simply during the initial feasibility and assessment phase, are reaping the benefits of improved risk management and better outcomes on the ground.

Karlsen(1998) carry out study that revealed stakeholders can create both problems and uncertainty regarding project execution. In his study, such problems and uncertainties are caused by “decisions that were not taken,” “unexpected changes in specifications,” “the client was too focused on details,” “the stakeholder did not understand his or her role in the project,” “political guidelines that were unexpected changed” and “the end user did not know his or her needs.”

2.1.10. Project Impact Assessment

The Word Impact refers to the intangible result and/or long lasting effect or consequence of the project in terms of the ecological, economic, socio- cultural, political, technological and institutional aspects (Project Impact Assessment Division 1999). Social impacts include changes in people’s way of life, their culture, community, political systems, environment, health and wellbeing, their personal and property rights and their fears and aspirations (Frank 2015).

Project Impact Assessment Division, Foreign- Assisted & Special Projects Office (1999) states that end-of -Project Impact assessment is done preferably three months before or right after the official project completion date. It shall focus on the analysis of the overall project performance, assessment of strategies and approaches used, and the efficiency of inputs invested in the project. The effects and impacts of the project at that point in time shall be looked into. Ideally, the

questionnaires or the survey will be the same as that of the standard survey in order to have a comparable data. And the Impact assessment shall determine what changes have occurred as a consequence of the project on the following areas or aspects of development:

- ✓ Economic aspect
- ✓ Ecological aspect
- ✓ Technological aspect
- ✓ Political aspect
- ✓ Socio- cultural aspect
- ✓ Institutional aspect

2.2. Empirical Framework

Since the railway project is new for our society it will be difficult to find practical study which is related to this thesis. The researcher will assess studies in different country experience that are related to our country.

According to current social-economic situation, passenger flow, development tendency and integrated with population and employment current situation and development tendency along the line, as well as passenger flow documentations and other relevant study results, it is forecasted that the maximum unidirectional section passenger flow of Line E-W in peak hours will take place in the road section from Lideta Light to La Gare shared with Line N-S. The total unidirectional section passenger flows in initial stage, short-term and long-term are 38462 persons/day, 70308 persons/day and 115385 persons/day respectively. The maximum passenger flows of initial stage, short-term and long-term in peak hours are 5000 persons/hour, 9140 persons/hour and 15000 persons/hour respectively. (Habtamu 2015)

According to statistics, accidents related to pedestrians directly make up approximately one-third of the total number of Chinese road traffic accidents. The death toll of pedestrian traffic accidents accounts for 27% of the total death toll from traffic accidents. Most pedestrians in China have a low likelihood of obeying traffic laws, with many breaking the traffic rules when crossing the street every day.

Trains travel fast and cannot stop suddenly fast train may long distance to stop. And a modern train like Addis Ababa city railway train can be very silent which increases the level of threat to safety crossing.

Dhaka is the capital of Bangladesh with a population of 12.8 million (BBS, 2009) spread over an area 320.00 Square-Km (JICA, 2008). The existing transport system in the city is unable to cope with the increasing transportation demand. Now-a-days traffic safety has become a significant issue at railway level crossings in Dhaka city. Improper warning system, poor control and management, crossing geometry are considered to be the major factors for safety problems (Md. Rashedul Haque 2011).

During the year of 2009 and 2010, 18 level crossing accidents in Dhaka city were reported within which 2 peoples were died and other 18 were injured (Bangladesh Railway, 2010). Hence, we are loosening lives and properties. (Md. Rashedul Haque 2011)

Societies in Lagos experience the effects of traffic congestion on a daily basis. According to Adebisi (2011), the congestion is caused partly by road users themselves such as pedestrians. Lagos road users are known to be very impatient and bad at obeying traffic rules just like the society in Addis Ababa. Indeed many times traffic congestions have been caused by a driver refusing to give way for others.

In Hong Kong railway serves as the backbone of the system according to the public opinion survey conducted in 2014, the majority of the general public (68%) and in particular drivers (82%) consider that there is moderate to heavy road traffic congestion in Hong Kong caused by heavy pedestrians. (Hong Kong Transport Advisor Committee, 2014)

Sanders (2015) revealed that the cost of congestion in the United States of America included 87,606 crashes in work zones, 1,200 deaths, 37,476 injuries, 482 million hours lost in driver delays and \$6.5billion lost time. Sanders also identified the accident costs to include property and medical but that the user delays costs are often the largest cost. The user delay from increased accidents and user delay from reduced lanes are enormous. Also identified as part of congestion costs are increased fuel consumption and reduced air quality. On the other hand Nairobi city traffic jam costs Kenya 37 billion shillings annually, the country's transport and Urban Decongestion committee reported and put daily traffic cost of Nairobi at \$570,000 (This is Africa, 2014). McGregor and Malingha (2014)

Addis Ababa is a densely populated city. Movement of people and goods around the city has become very challenging. As the society develops and economic activities increase, there are growing uses of road space, coupled with a growth in vehicle fleet. At the same time, the scope for further expansion of our road network is increasingly limited, in particular in developed urban areas. Road traffic congestion has therefore become a common scene in Addis Ababa. It affects all road users, not just bringing problem to them but also causing unpleasant impact on our economic activities, the environment as well as the quality of life.

Indeed, traffic congestion is widely viewed as a growing problem in many urban areas across the world and particularly in developing cities like Addis Ababa; because the overall volume of cars and number of pedestrians in every station of the railway to grow faster than the overall capacity of the transportation system.

France, Italy, The United Kingdom and other countries have practiced the underground transportation approach to reduce the traffic problem. Underground transportation is equipped with advanced safety instruments to insure the safety of the pedestrian and driver. METRANS Project (2007)

De Gruyter & Currie (2016) state in their study that rail-road crossings can impact vehicle operating costs through changes to fuel and oil consumption, tire wear, vehicle maintenance and vehicle depreciation. Vehicle operating costs are usually estimated by applying default unit costs to vehicle traffic data specific to the crossings under investigation.

2.2.1. Air Pollution from Motor Vehicles

Air pollution is an important public health problem in most cities of the developing world. Pollution levels in megacities such as Bangkok, Cairo, Delhi and Mexico City exceed those in any city in the industrialized countries. Epidemiological studies show that air pollution in developing countries accounts for tens of thousands of excess deaths and billions of dollars in medical costs and lost productivity every year. These losses, and the associated degradation in quality of life, impose a significant burden on people in all sectors of society, but especially the poor. (Asif Faiz, Christopher S. Weaver and Michael P. Walsh, 1996)

Studies in the United States indicate that motor vehicles are responsible for most human exposure to benzene and butadiene (U.S. EPA 1990). Fuel use facts show that, one liter of petrol used results in 2.36kg of CO₂ emitted to the atmosphere and one liter of diesel used results in 2.68kg of CO₂ emitted to the atmosphere Feedstock Dependent (2017). Carbon Dioxide is the most important of the greenhouse gases which are contributing to Climate Change. Compared to improvements in the emissions of toxic pollutants, there has been less progress on reducing CO₂ from cars. (Asif Faiz, Christopher S. Weaver and Michael P. Walsh, 1996)

2.2.2. Researches on Pedestrian Attitude and Behavior

Researchers studying the behavior of pedestrians have used both video observation techniques and self-report data obtained via surveys and qualitative interviews or focus groups. The different research techniques have produced similar findings with respect to pedestrian road user behavior.

Accidents to pedestrians that involve falls on footways rather than collisions with vehicles are more common than collisions with vehicles, and may well cause more slight and serious injuries. Poor footway surfaces contribute to these accidents. In countries with cold climates and slippery surfaces are major causes. (Department for Transport: London, Older Pedestrians: A Critical Review of the Literature, June 2004)

2.2.3. Effects of Pedestrian Delay

Pedestrians will generally take the quickest route to their destination; therefore delay is linked closely with pedestrians' propensity to take risks. Pedestrians will generally try to shorten distances and reduce waiting times, often without adhering to the Highway Code and disregarding the risks involved.

A study conducted in Manchester showed that delay to pedestrians in United Technology Corporation systems with long cycle time's results in pedestrians being less likely to wait for the green light at signalized junctions (Preston, 1986). Route diversion is another influence on pedestrians' decisions to cross at a designated crossing place. In Daff's study only 27% of pedestrians using the crossing had diverted from their route.

2.2.4. Effects of Waiting Times

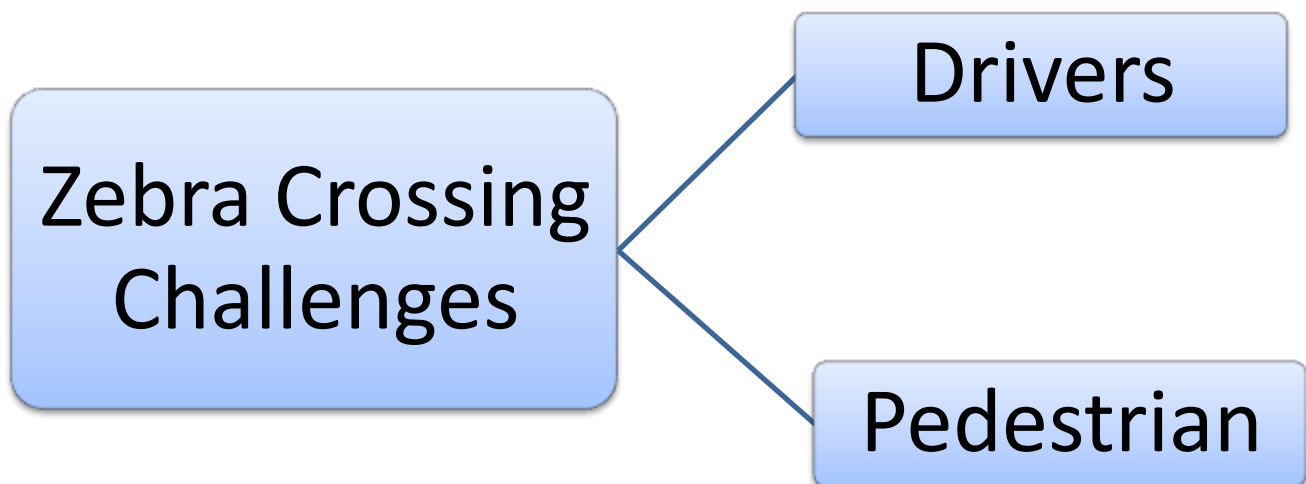
Studies have suggested that waiting time has an effect on pedestrian behavior when attempting to cross a road. This is particularly important when pedestrians are waiting to cross at signalized crossings (Pedestrian Behavior near Signalized Crossings, 1992, Daff MR, Cramphorn B, Wilson CJ and Neylan). There is some evidence that the longer pedestrians have to wait at a crossing; the more likely they are to cross against the signal. One author, reviewing practice in Europe and North America, argued that if the waiting time is longer than 40 seconds, the number of pedestrians crossing against the signal increases significantly (Baass, 1989).

In addition to that Asaba and Saito, (1998) show that when pedestrians became impatient they reported using the traffic to decide when to cross (looking for gaps in the traffic), crossed whenever they could, went to the front row of pedestrians waiting to cross or positively looked for a chance to quickly walk (which is illegal in Japan). This study suggests that traffic collisions involving pedestrians can be reduced by developing a control system that does not cause pedestrians to wait for an unduly long time.

2.3. Conceptual Framework

In this part the researcher will show conceptual framework in provides a conceptual representation of rail-road crossing challenges and in the literature, challenges included within the studies that were undertaken with regard to Pedestrians and Drivers facing challenges.

Figure 2-5: Conceptual Framework



Source; Developed by the Researcher Based on Literature, 2017

Chapter 3

RESEARCH METHODOLOGY

3.1. Introduction

The elements that are incorporated under this chapter includes the research design, method of data collection, source of data, population sample size determination, sampling techniques and data process and analysis.

3.2. Research Design

This research has its own objectives, to attain these objectives of the study; the researcher used descriptive research designs. Descriptive research intended to describe the existing problems and situation as it exists in the railway zebra crossing. The approaches followed owing to the nature of the problem studied and the quality of this research design to describe, explain and validate findings (Kothari, 2003). Description emerges following creative exploration, and serves to organize the findings in order to fit them with explanations, and then test or validate those explanations (Krathwohl, 1993).

In order to explain the variables the researcher used qualitative and quantitative data approaches. Qualitative approaches helped to interpret the research data and describe aspects about the respondent in the research. Quantitative approach helped to present the data in a tabular form, and compute percentage. Hence, the mixed method research approach to inquiry is used since it involves philosophical assumptions, and mixing of both approaches in tandem within a single study so that the overall strength of the study is greater than either qualitative or quantitative research (Creswell & Clark, 2007)

3.3. Study Population

The universes of study were Drivers and Pedestrians in East-West line of the 15 ground station. Those include residents, students, drivers employed workers, owners of different business organization and so on that will use the road to cross from one side of the road to the other.

The railway design has technical impact on cars and behavioral change on drivers, driving in the crowded situation which is caused by high level of pedestrians crossing from one side of the road to the other side, of course the root cause of this problem is the zebra crossing designed by Ethiopia Railway Corporation and drivers become one of the study population.

In addition to that pedestrians are forced to use Stations and Squares to cross from one end to the other due to the poor design of the railway project; As a result of this, that they become the main cause for congestion/ jam. So pedestrians were the second study populations.

3.4. Data Sources and Collection Methods

Data were collected from two sources, primary and secondary sources. Primary data were gather using questioner, interview and observation. The main reason behind this method is that it is relevant, the questionnaire was distributed to all sample of pedestrians whereas interview was administered for government representative of Addis Ababa Railway Corporation and a mechanic/driver for the impact assessment on cars. Moreover, personal observation was also used as this is essential in cross sectional studies to overcome the gap that longitudinal study could fill in. On the top of that secondary data were collected though reviewing related literature and some suitable documents that were written on the field of project planning.

Data were collected directly by the researcher this is important to assure the validity of the data and increase the collection rate in case of questionnaires distributed. Moreover during the data collection each respondent were questioned at the right time and suitable place.

3.4.1. Sample Size Determination for Pedestrians

Perhaps the most frequently asked question concerning sampling is, "What sample size do I need?" The answer to this question is influenced by a number of factors, including the purpose of the study, the risk of selecting a "bad" sample, and the allowable sampling error. (Glenn D. Israel 1992)

The researcher determined a sample size for pedestrians because in every station there are unknown numbers of individuals crossing from one side of the road to the other side of the road. Therefore the sample size determination for infinite population was employed as follows.

Since no survey has been actually administered yet, the safe decision is to use 0.5 – this is the most forgiving number and ensures that your sample will be large enough. (Smith) the formula to calculate the sample size is as follows;

Necessary Sample Size = $(Z\text{-score})^2 * StdDev*(1-StdDev) / (\text{margin of error})^2$ (Smith)

- ✓ Confidence Level = 95% (the Z-values is 1.96)
- ✓ SD= 0.5
- ✓ Q= 1-sd=0.5

The researcher has selected a confidence level of 95% because of the need of high quality result.

Sample size = $(Z\text{-score})^2 * StdDev*(1-StdDev) / (\text{margin of error})^2$.

$$\text{Sample size} = ((1.96)^2 \times 0.5 \times (0.5)) / (0.05)^2$$

$$\text{Sample size} = (3.8416 \times 0.25) / 0.0025$$

$$\text{Sample size} = (0.9604 / 0.0025)$$

$$\text{Sample size} = \underline{\underline{385.16 \approx 386}}$$

Scott M. Smith in his Book of “*Determining Sample Size*” which is world’s leading enterprise survey technology provide have stated that “*If you find your sample size is too large to handle, try slightly decreasing your confidence level or increasing your margin of error this will increase the chance for error in your sampling*”. Given that the population is homogenous it doesn’t affect the quality of the research so the researcher increased the margin of error from 5% to 10%.

Sample size = $(Z\text{-score})^2 * StdDev*(1-StdDev) / (\text{margin of error})^2$.

$$\text{Sample size} = ((1.96)^2 \times 0.5 \times (0.5)) / (0.10)^2$$

$$\text{Sample size} = (3.8416 \times 0.25) / 0.01$$

$$\text{Sample size} = (0.9604 / 0.01)$$

$$\text{Sample size} = \underline{\underline{96.04 \approx 97}}$$

97 respondents were required and it won't be reasonable to select those pedestrians from all station proportionately so the researcher selected stations based on the unpublished research finding of Habtamu Seid (2015).

Habtamu collected data from February 18 up to February 27, 2015 on the flow of pedestrians on each station and give grade to those stations based on the following table and considering the above finding the researcher selected those stations with a category of "A".

Table 3-1 Categories of Pedestrians

Pedestrian Category	Train Pedestrian Value (TPV)
A	More than 450
B	151-450
C	150 or less

Source; Habtamu 2015

Table 3-2 Grade of Station Based On Their Number of Pedestrians

No.	Station	Pedestrians Categories	Width of Footway
1	Torhailoch	A	$\geq 3.6M$
2	Coca cola	B	$\geq 3.6M$
3	Yodranos Hotel	A	$\geq 3.6M$
4	Chemical corporation	A	$\geq 4M$
5	Mazoria (traffic head quarter)	A	$\geq 4M$
6	Lem hotel	A	$\geq 4M$
7	Megenagna square	A	$\geq 4M$
8	Gurd shola	A	$\geq 4M$
9	Salitemehret church	B	$\geq 4M$
10	Civil service	B	$\geq 3.6M$
11	Saint michael church	A	$\geq 4M$
12	CMC 1	B	$\geq 4M$
13	Meri CMC 2	A	$\geq 4M$
14	Ayat 2	B	$\geq 3.6M$

Source: Habtamu 2015

The reason why the research selected those station with a grade of ‘A’ is there is high flow of pedestrians and questionnaire was distributed to those stations with grade of “A” that were in 9 stations as follows; Torhailoch, Yordanos Hotel, Chemical Corporation, 22 Mazoria, Lem Hotel, Megenagna Square, Gued Shola, Saint Michael Church and Meri.

3.4.2. Sampling for Mechanic/Driver

The researcher used a non-probability sampling techniques to select an expert (driver & mechanic), which was Convenient sampling. Etikan, Musa and Alkassim (2015) state that Convenience sampling is a type of non-probability or non-random sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study.

In doing so the researcher selects a person which fulfilled the requirements that were mentioned earlier (Driver & Mechanic). In addition to the requirement the informant were owner of an Auto-Repair company, had 30 years of experience as a driver and more than 15 years as a mechanic.

3.4.3. Sampling for Government Representative

The researcher used the same sampling method for government representative as used for Mechanic/Driver, which was non-probability and select convenient sampling. And at that time only a few persons were available and the researcher select one person who participated in the railway transit project and also currently works as a resource development in Addis Ababa Light Railway Operation.

3.5. Sampling Technique

Since there are unknown numbers of Pedestrians each day crossing from one side of the road to the other side, a probability sampling were used to gather data from 97 pedestrians in 9 stations. Number of data collected from each station = 97 respondent / 9 stations = 10.77 Approximately 11 pedestrians were questioned on the selected 9 stations.

The researcher used probability sampling technique to select 97 pedestrians on the selected stations. In case of probability sampling the researcher used Simple random sampling, this type of sampling is also known as chance sampling or probability sampling where each and every item in the population has an equal chance of inclusion in the sample and each one of the possible samples. Kothari (2004)

The reason why probability sampling were used is that every individual have equal chance of being selected, this means that the researcher distributed a questionnaire to those pedestrians who were using those selected stations to cross from one side of the road to the other at a particular time for each station and everyone have an equal chance of being selected in the sample size.

3.6. Data Gathering

The researcher used four different kinds of data gathering tools.

3.6.1. Questionnaire

Questionnaire was the main tool or instrument used to collect data in a descriptive-survey research study. Because survey researchers typically study issues and behaviors that change over time, they usually develop new instruments or refine existing ones (Lodico, Spaulding, Voegtle, 2005), so the researcher distributed a questionnaire to all pedestrians that were conveniently using those stations to cross from one side of the road to the other.

The researcher used both Structure and Un-Structure questionnaires. Both types of questions were included by the researcher as it gives to exhaust the ideas that respondents has about the issue in question. The questionnaire were organized in to two sections the first one which have 14 questions contain five point Likert scale range from “strongly disagree” to “strongly agree”, while the second section contained four multiple questions and two questions with open ended format i.e., inviting free response to the respondent. And questionnaires were translated in to the local language which is “Amharic” by Ethiopia Translation Office.

3.6.2. Interview

Interview was used to gather data form government representative of Addis Ababa Railway Corporation. An informant from an expert perspective for the impact assessment on car and drivers, who is owner of an Auto Repair and who have more than 30 years of experience as a driver and more than 15 years of experience as a mechanic was the researcher key informant.

From Addis Ababa Railway Transit(A.A.R.T) the researchers key informant who is a BSc graduate in Civil Engineering and have been working as a construction engineering from the beginning up to the end of the railway project and currently working as a resource development starting from 2015 G.C at Addis Ababa Light Railway Operation.

3.6.3. Document Analysis

In document analysis data were collected through reviewing related literature and some suitable documents that were written on the field of project planning and also the planning process in Addis Ababa Railway project.

3.7. Instrument Testing

Sound measurement must meet the tests of validity and reliability. In fact, these are the two major considerations one should use in evaluating a measurement tool. Validity refers to the extent to which a test measures what we actually wish to measure. Reliability has to do with the accuracy and precision of a measurement procedure. Kothari (2004)

3.7.1. Validity

Validity of the questionnaire and interview were done through discussion with the advisor and unnecessary errors have been removed from the questionnaire and interview guidelines. This was done to fix errors in questionnaire and interviews.

3.7.2. Reliability

The researcher used Cronbach's alpha test to prove reliability of questionnaire. The reliability exceeds the recommended cut-off value (0.7). According to Hair (1992) an alpha of 0.7 or less is rejected. The researcher have tested Cronbach's Alpha test on 10 respondents and the Alpha result was 0.834 which was a very good internal consistency of the items in the scale.

Table 3-3 Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.839	19

Source: Own Server, 2017

3.8. Data Analysis

Computer has become one of the most useful research tools in modern times. Computers are ideally suited for data analysis concerning large research projects. Researchers are essentially concerned with huge storage of data, their faster retrieval when required and processing of data with the aid of various techniques. (Kothari, 2003)

Statistical package for the social sciences version 20 (SPSS) computer program were used to represent the respond of questions in a percentage, and also to perform correlation. After data has been entered in the SPSS, it was analyzed using descriptive statistics. Descriptive statistics are commonly used for summarizing data frequency. The researcher used frequency analysis to answer the research question. Frequency analysis is a descriptive statistical method that shows the number of occurrences of each response chosen by the respondents.

In addition to that the researcher has performed a Pearson Correlation test between “Age of Respondents” and “Physical Difficulty” to see if there was a positive relationship between age of respondents and physical difficulty

3.9. Ethical Issues

There are several reasons why it is important to adhere to ethical norms in research. First, norms promote the aims of research, such as knowledge, truth, and avoidance of error. Second, since this research involves a great deal of cooperation and coordination among many different people in different disciplines and institutions, ethical standards promote the values that are essential to collaborative work, such as trust, accountability, mutual respect, confidentiality and fairness.

Chapter 4

RESEARCH RESULTS AND DISCUSSIONS

In this part of the research, details of analytical discussion is carried out in a sense that the researcher tried to link and show the relations between the theoretical framework out lined and the empirical findings based on the information gathered through interview, questionnaire, and personal observation. In doing so, this part of the research will address questions, interview and personal observation related to the zebra crossing challenges in Ethiopia Railway Corporation: In the case of East-West light railway transit project in Addis Ababa city.

4.1. Challenges that Pedestrians and Drivers are Facing

4.1.1. Quantitative Findings

Even though it was not part of the study, questions were intended to describe demographic variables of the respondents and to evaluate for any influence on the research findings. The demographic data consisted of sex, level of education, occupation and age.

Sex of Respondent

Table 4-1: Respondents Sex

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	62	63.9	66.0	66.0
Valid Female	32	33.0	34.0	100.0
Total	94	96.9	100.0	
Missing System	3	3.1		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked to indicate their gender by marking the category and as the survey shows 94 or 96.9% respondent's responded while 3 or 3.1% were missing values. 62 or 66% of these respondents were male and 32 or 34% were female.

Education Level of Respondent

Table 4-2: Respondent Educational Levels

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid BA/BSc & Above	37	38.1	39.8	39.8
Valid Diploma (12+2)	11	11.3	11.8	51.6
Valid Grade 12 completed & Certificate (12+1)	11	11.3	11.8	63.4
Valid Below Grade 12	34	35.1	36.6	100.0
Total	93	95.9	100.0	
Missing System	4	4.1		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked about their level of education and as the survey shows the missing value was 4 or 4.1% of the total sample, 37 or 39.8% respondents have BA/BSc & Above, 11 or 11.8% have Diploma, 11 or 11.8% were Grade 12 and certificate (12+1) and 34 or 36.6% were below grade 12.

Respondents Occupation

Table 4-3: Respondents Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Student	18	18.6	18.9	18.9
Valid Worker	77	79.4	81.1	100.0
Total	95	97.9	100.0	
Missing System	2	2.1		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked about occupation and as the survey shows there are 2 or 2.1% missing values of the total respondent, the majority of respondents were workers which was 77 or 79.4% total respondents and also 18 or 18.6% respondent were students.

Age of Respondent

Table 4-4: Age of Respondent

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 18-24	22	22.7	24.4	24.4
Valid 25-30	18	18.6	20.0	44.4
Valid 31-40	15	15.5	16.7	61.1
Valid 41-49	9	9.3	10.0	71.1
Valid 50-60	24	24.7	26.7	97.8
Valid 60+	2	2.1	2.2	100.0
Total	90	92.8	100.0	
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

The last but not the least quotation about demographic variables of the respondents were age and as the survey indicates there are 7 or 7.2% missing values for the respondent out of the total sample, respondents who were in the age between “18-24” there are 22 or 22.7% of the total sample, respondent in the age between “25-39” there are 18 or 18.6% of the total sample, in the age between “31-40” there were 15 or 15.5% respondent, in the age between “41-49” there were 9 or 9.3% respondents, in the age between “50-60” there were 24 or 24.7% respondents and in the age of greater than 60, there are 2.2% respondent.

Victims Respondents

Table 4-5: Victim Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	1	1.0	1.1	1.1
Disagree	2	2.1	2.2	3.2
Unsure	4	4.1	4.3	7.5
Agree	39	40.2	41.9	49.5
Strongly Agree	47	48.5	50.5	100.0
Total	93	95.9	100.0	
Missing System	4	4.1		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked if they were a victim of the Zebra Railway Design Plan and as shown in the above table there are 4 or 4.1% missing values, 1 or 1% respondent strongly disagree, 2 or 2.1% respondents disagree, 4 or 4.1% respondents were unsure, 39 or 40.3% respondents agree and 47 or 48.5% respondents strongly agree.

This means that the majority of the respondent that is 92.4% were victims of the Zebra Railway Design Plan, while 3.3% of the respondents were not considered to be victims of the Zebra Railway Design Plan.

Challenging to Cross

Table 4-6: Challenging to Cross

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	1	1.0	1.1	1.1
Disagree	18	18.6	19.6	20.7
Unsure	2	2.1	2.2	22.8
Agree	37	38.1	40.2	63.0
Strongly Agree	34	35.1	37.0	100.0
Total	92	94.8	100.0	
Missing System	5	5.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked if it's very challenging to cross to the other side by using stations and as we can see from the survey there were 5 or 5.2% missing values of the total sample, 1 or 1% strongly disagree, 18 or 18.6% respondents disagree, 2 or 2.1% respondents were unsure, 37 or 38.1% respondents agree and 34 or 35.1% respondents strongly agree.

The majority respondents which are 77.2% of the total respondents think that it's very challenging to cross from one side of the road to the other side by using stations, while the 20.7% of respondents think it's not challenging. And as observed by the researcher most station area that connects the station and the road are in a very slippery position which force individual in to the road or fall.

Feeling Safety

Table 4-7: Feeling Safe When Crossing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.0	1.1	1.1
	Disagree	21	21.6	22.8	23.9
	Unsure	2	2.1	2.2	26.1
	Agree	46	47.4	50.0	76.1
	Strongly Agree	22	22.7	23.9	100.0
	Total	92	94.8	100.0	
Missing	System	5	5.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they feel safe when they cross by using those stations and as we can see from the survey, there were 5 or 5.2% missing values, 1 or 1% respondent strongly disagree, 21 or 21.6% of respondents disagree, 2 or 2.1% respondents were unsure, 46 or 47.4% respondents agree and 22 or 22.7% of the respondents strongly agree. It is fair to say that 73.9% of the respondents don't feel safe when they cross by using those stations while the other 23.9% of the respondents disagree with this idea.

Tamrayehu (2016) stated that passengers are not satisfied with the safety service provisions of the rail operator specifically with available number of station conductors. From passengers' attitude measurement, it can be concluded that passengers feeling unsafe at station platforms of the AALRT may be due to the safety reason of no barrier between the platform and the track.

Suffer physical difficulty

Table 4-8: Physical Difficulties

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.1	4.4	4.4
	Disagree	42	43.3	46.7	51.1
	Unsure	3	3.1	3.3	54.4
	Agree	30	30.9	33.3	87.8
	Strongly Agree	11	11.3	12.2	100.0
	Total	90	92.8	100.0	
Missing	System	7	7.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they suffer noticeable physical difficulty when they try to cross using this station and as shown from the survey, there are 7 or 7.2% missing values, 4 or 4.1% respondents strongly disagree, 3 or 3.1% respondents were unsure, 30 or 30.9% respondents agree and 11 or 11.3% respondents strongly agree.

As shown in the above survey findings we can say that 45.5% of the total respondents suffer noticeable physical difficulty when they try to cross using this station while the 51.1% of the respondents don't suffer noticeable physical difficulty when they try to cross using this station.

This finding was a bit surprising so the researcher has performed a Pearson correlation test between “Age of Respondents” and “Physical Difficulty” to see if there is a relationship between age of respondents and physical difficulty.

Correlation between Age and Physical Difficulty

Table 4-9: Correlations Test

		Respondent Age	Physical Difficulty
Respondent Age	Pearson Correlation	1	.700**
	Sig. (2-tailed)		.000
	N	90	86
Physical Difficulty	Pearson Correlation	.700**	1
	Sig. (2-tailed)	.000	
	N	86	90

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own Survey, 2017

The Sig. 2-tailed level is .000 which shows that there is significance correlation between age of respondents and physical difficulty and the relationship is a positive 70%, which means that as one variable goes up or down so will the other one, So based on the above finding we can say that there is a significant relationship between age and physical difficulty of the respondents and as age goes up the barrier of physical difficulty increases.

Older people are less able to change speed or direction quickly to avoid hazards, and are more likely to have problems with balance. Therefore older people are more exposed to falling in station areas since those areas are in very slippery position.

Accidents to pedestrians that involve falls on footways rather than collisions with vehicles are more common than collisions with vehicles, and may well cause more slight and serious injuries. Poor footway surfaces contribute to these accidents. Cold climates and slippery surfaces are major causes. (Department for Transport, 2004)

Crowded of people

Table 4-10: Crowded of People

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	1	1.0	1.1	1.1
Disagree	5	5.2	5.4	6.5
Unsure	3	3.1	3.3	9.8
Agree	38	39.2	41.3	51.1
Strongly Agree	45	46.4	48.9	100.0
Total	92	94.8	100.0	
Missing System	5	5.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked if there were a crowded of people in stations to cross to the other side and as shown in the survey finding there are 5 or 5.2% missing values, 1 or 1% respondent strongly disagree, 5 or 5.2% respondents disagree, 3 or 3.1% respondents were unsure which is, 38 or 39.2% respondents agree and 45 or 46.4% respondents strongly agree.

One can say that 90.2% of the respondents think that there are crowds of people in station crossing from one side of the road to the other side because footpaths are narrow and roads are difficult to cross. Streets are often overcrowded, footpaths are narrow and roads are difficult to cross. In many areas there are not enough places even to walk, and footpaths are so crowded that pedestrians are forced into the road especially in rush hours.

Feeling Impatience

Table 4-11: Feeling of Impatience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.0	1.1	1.1
	Disagree	16	16.5	17.4	18.5
	Unsure	3	3.1	3.3	21.7
	Agree	38	39.2	41.3	63.0
	Strongly Agree	34	35.1	37.0	100.0
	Total	92	94.8	100.0	
Missing	System	5	5.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they felt impatience trying to cross using this station due to crowds of peoples in stations and as shown in the above survey findings there are 5 or 5.2% missing values, 1 or 1% respondent strongly disagree, 16 or 16.5% respondents disagree, 3 or 3.1% respondents were unsure, 38 or 39.2% respondents agree and 34 or 35.1% respondents strongly agree.

As we can see from the survey finding 78.3% of the respondents feel impatient due to high number of pedestrians in stations and roads trying to cross from one side to the other side. Asaba and Saito, (1998) show that when pedestrians became impatient they reported using the traffic to decide when to cross, crossed whenever they could, went to the front row of pedestrians waiting to cross or positively looked for a chance to quickly walk. This study suggests that traffic collisions involving pedestrians can be reduced by developing a control system that does not cause pedestrians to wait for an unduly long time.

Safeties of Pedestrians

Table 4-12: Safeties of Pedestrians

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.0	1.1	1.1
	Disagree	10	10.3	11.0	12.1
	Unsure	6	6.2	6.6	18.7
	Agree	43	44.3	47.3	65.9
	Strongly Agree	31	32.0	34.1	100.0
	Total	91	93.8	100.0	
Missing	System	6	6.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they think safeties of pedestrians are not considered in the Railway Construction Project and as we can see from the survey finding there are 6 or 6.2% missing values, 1 or 1% strongly disagree, 10 or 10.3% respondents disagree, 6 or 6.2% respondents were unsure, 43 or 44.3% respondents agree and 32 or 32% respondents strongly agree.

As we can see from the survey findings 81.4% of the respondents thinks safeties of pedestrians were not considered in the Railway Construction Project while 12.1% of the respondents disagree with this idea. However, as a matter of fact safeties of pedestrians were not considered according to the key informant. The information noted that though the design was duplicated from China, in their context pedestrians and cars do not have any contact with railway line.

Causes for Traffic Congestion/Jam

Table 4-13 Causes for Traffic Congestion/Jam

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	25	25.8	27.5	27.5
	Unsure	3	3.1	3.3	30.8
	Agree	42	43.3	46.2	76.9
	Strongly Agree	21	21.6	23.1	100.0
	Total	91	93.8	100.0	
Missing	System	6	6.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they think pedestrians are the major causes for traffic congestion/jam and as shown in the above survey finding there are 6 or 6.2% missing values, 25 or 25.8% respondents disagree, 3 or 3.3% respondents were unsure, 42 or 43.3% respondents agree and 21 or 21.6% respondents strongly agree.

As can be see 69.3% of the respondents believe that the major causes for traffic congestion/jam are pedestrians. Furthermore, as the observed by the researcher the major reason of the congestion was the flow of pedestrians in near station areas.

More Voluntaries

Table 4-14: More Voluntaries

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	5	5.2	5.5	5.5
Valid Unsure	1	1.0	1.1	6.6
Valid Agree	47	48.5	51.6	58.2
Valid Strongly Agree	38	39.2	41.8	100.0
Valid Total	91	93.8	100.0	
Missing System	6	6.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked if there should be more voluntaries in stations to assist people to cross to the other side and as shown in the survey findings there were 6 or 6.2% missing values, 5 or 5.2% respondents disagree, 1or 1% respondent were unsure, 47 or 48.5% respondents agree and 38 or 39.2% respondents strongly agree.

One can say that 93.4% of the respondents believe than there should be more voluntaries in stations to assist people to cross to the other side. Those voluntaries involvement is a very important in order to increases the safety of pedestrians and in addition to that the play an important role in reducing the congestion duration as observer by the researcher.

Been Late

Table 4-15: Been Late

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	25	25.8	27.8	27.8
	Unsure	3	3.1	3.3	31.1
	Agree	33	34.0	36.7	67.8
	Strongly Agree	29	29.9	32.2	100.0
	Total	90	92.8	100.0	
Missing	System	7	7.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they have been late to their appointment, work or class due to this problem and as shown in the above survey finding there were 7 or 7.2% missing values, 25 or 25.8% respondents disagree, 3 or 3.1% respondents were unsure, 33 or 34% respondents agree and 29 or 29.9% respondents strongly agree.

This means that 68.9% of the respondents have been late to their appointment, work or classes due to this problem. And also as the there is a time difference between driving in congestion and with low flow of cars in addition to that every individual whether they own a car or not will lose their working hours every day.

Walk Extra Distance

Table 4-16: Walk Extra Distance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.0	1.1	1.1
	Disagree	3	3.1	3.3	4.4
	Agree	43	44.3	47.8	52.2
	Strongly Agree	43	44.3	47.8	100.0
	Total	90	92.8	100.0	
Missing	System	7	7.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they walk extra distance to cross to the other side of the road and as shown in the above survey findings there was 7 or 7.2% missing values, 1 or 1% respondent strongly disagree, 3 or 3.1% respondents disagree, 43 or 44.3% respondents agree and 43 or 44.3% respondents strongly agree. This means that 95.6% of respondents walk extra distance to cross to the other side of the road. And as it has been mentioned the average interval between two adjacent stations is 867.5 meters. The longest interval is 1,210 meters and the shortest interval is 525 meters.

Pedestrian's Passageway

Table 4-17: Pedestrian's Passageway

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	1.0	1.1	1.1
	Agree	31	32.0	34.4	35.6
	Strongly Agree	58	59.8	64.4	100.0
	Total	90	92.8	100.0	
Missing	System	7	7.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if there was a pedestrian's passageway, that they will definitely use it, rather than using this station to cross and as show in the above survey finding there were 7 or 7.2% missing values, 1 or 1% respondent disagree, 31 or 32% respondents agree and 58 or 59.8% respondents strongly. This means 98.8% of the respondents will use pedestrian's passageway if the concerned party construct bridges or other related means for pedestrians.

Serious Problem

Table 4-18: Serious Problem

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.1	2.2	2.2
	Disagree	1	1.0	1.1	3.3
	Unsure	2	2.1	2.2	5.6
	Agree	34	35.1	37.8	43.3
	Strongly Agree	51	52.6	56.7	100.0
	Total	90	92.8	100.0	
Missing	System	7	7.2		
Total		97	100.0		

Source: Own Survey, 2017

Respondents were asked if they believe this is a serious problem and as we can see from the survey findings there were 7 or 7.2% missing values, 2 or 2.1% respondents strongly disagree, 1 or 1% respondent disagree, 2 or 2.1% respondents were unsure, 34 or 35.1% respondents agree and 51 or 52.6% respondents strongly agree. This means that 95.5% of respondents believe that this is a serious problem while the other 3.3% of respondents disagree with this idea.

New Design

Table 4-19: New Design

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	1	1.0	1.1	1.1
Valid Disagree	1	1.0	1.1	2.2
Valid Agree	41	42.3	45.6	47.8
Valid Strongly Agree	47	48.5	52.2	100.0
Valid Total	90	92.8	100.0	
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked if they think there should be a new design for future projects and as we can see from the above survey findings there are 7 or 7.2% missing values, 1 or 1% respondent strongly disagree, 1 or 1% respondent disagree, 41 or 42.3% respondents agree and 47 or 48.5% respondents strongly agree. This means that 90.8% of the respondents think that there should be a new design for future projects while the 2.2% of the respondents disagree with this idea.

France, Italy, The United Kingdom and other countries have practiced the underground transportation approach to reduce the traffic problem. Underground transportation is equipped with advanced safety instruments to insure the safety of the pedestrian and driver. METRANS Project (2007)

How Often

Table 4-20: How Often

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once in a day	5	5.2	5.6
	Twice in a day	40	41.2	44.4
	Three times in a day	12	12.4	63.3
	More than four times	33	34.0	100.0
	Total	90	92.8	100.0
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked how often they used this station to cross and as we can see from the above findings there are 7 or 7.2% missing values, 5 or 5.2% respondents use once in a day, 40 or 41.1% respondents use twice in a day, 12 or 12.4% respondents use three times in a day and 33 or 34% respondents use more than four times in a day.

This means that 50% of respondents use those stations ≥ 3 times to cross, 41.2% of respondents use it twice in a day and 5.6% of respondents use it once in a day and the researcher try to show that the exposure of the people to accident will literally increase.

Distance

Table 4-21: Distance

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-50 meter	25	25.8	27.8
	51-100 meter	29	29.9	60.0
	more than 100 meter	36	37.1	100.0
	Total	90	92.8	100.0
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked how much distance would they have to walk in order to cross and as shown in the survey finding there were 7 or 7.2% missing values, 25 or 25.8% respondents walk between 10-50 meters, 29 or 29.9% respondents walk 51-100 meters and 36 or 37.1% respondents walk more than 100 meters. This means that of the respondents walk extra distance in search of crossings.

Fair Amount of Time

Table 4-22: Fair Amount of Time

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid < 30 sec	45	46.4	50.0	50.0
< 1 Min	35	36.1	38.9	88.9
< 2 Min	8	8.2	8.9	97.8
3< min	2	2.1	2.2	100.0
Total	90	92.8	100.0	
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

What is the fair amount of time a person should have to wait to cross this street was one of the question that respondents were asked and as shown in the above survey finding there are 7 or 7.2% missing values, 45 or 46.4% respondents said <30 second, 35 or 36.1% respondents said <1 minutes, 8 or 8.2% respondents said <2 minutes and 2 or 2.1% respondents said 3< minutes.

This means the majority of respondents which is 50% think that 30 second is the fair amount of time that a person should have to wait to cross while the second majority which 38.9% thinks that 1 minute is fair amount of time. Even though a practice in Europe and North America which was conducted by Baass (1989) show that if the waiting time is longer than 40 seconds, the number of pedestrians crossing against the signal increases significantly.

Waiting Time

Table 4-23: Waiting Time

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid < 30 sec	9	9.3	10.0	10.0
< 1 Min	25	25.8	27.8	37.8
< 2 Min	29	29.9	32.2	70.0
3< min	27	27.8	30.0	100.0
Total	90	92.8	100.0	
Missing System	7	7.2		
Total	97	100.0		

Source: Own Survey, 2017

Respondents were asked how long would they have to wait to cross street and as we can see from the above survey findings there are 7 or 7.2% missing values, 9 or 9.3% respondents said <30 second, 25 or 25.8% respondents said <1 minutes, 29 or 29.9% respondents said <2 minutes and 27 or 27.8% respondents said more than 3 minutes.

This means the majority of the respondents which is 32.2% have to wait 2 minutes to cross the street while the second majority which is 30% of respondents has to wait more than 3 minutes to cross the street.

Studies have suggested that waiting time has an effect on pedestrian behavior when attempting to cross a road. This is particularly important when pedestrians are waiting to cross at signalized crossings (Pedestrian Behavior near Signalized Crossings, 1992, Daff MR, Cramphorn B, Wilson CJ and Neylan).

4.1.2. Qualitative Findings

Two qualitative questions have been put in the questionnaire where respondents will be able to flexibly express their views, experiences comments and suggestion. And survey indicated that the people suggest a construction of Pedestrians passageways between two stations which enable them for safety crossing. This means that it can be an underpass or overpass for pedestrians a road and railway, allowing them to reach the other side in safety in addition to that this will solve traffic Congestion/Jam.

Some of the respondents mentioned that there should be awareness given to the societies who use those stations daily to cross. In addition to that there should have been a follow up correction when the project start operating and future projects must learn from these issues in order to reduce this kind of problems.

In 2010, Companhia de Engenharia de Tráfego (CET), the agency responsible for managing transport in the Brazilian city of São Paulo, launched a pedestrian safety program aimed at reducing the number of pedestrians killed by 50% by the end of 2012 .Interventions included media campaigns and awareness raising, engineering measures and traffic law enforcement (World Health Organization). This program should be applied in all the areas that the railway passes to.

Findings from survey and observation show that disabled persons are facing challenge to cross to the other side of the road, especially those who use wheelchairs and people with limited walking abilities, Every station has two entrances for the way of in and out but as observed by the researcher the second entrances which was for disabled persons are always closed with some kind of wires and chains and some station don't even have the requirement facilities to be used by disabled persons.

However, the Federal Democratic Republic of Ethiopia, Building Proclamation, No. 624/2009, (p,4691) state that, “Any public building shall have a means of access suitable for use by physically impaired person, including those who are obliged to use wheelchairs and those who are able to walk but unable to negotiate steps”. By defining a building as “A permanent or temporary construction used for the purpose of dwelling, office, factory or for any other purpose.

By considering the above definition, one can categorized those stations as a building and the law enforce that there should be suitable environments for persons with disabilities, and during the project planning they were not considered and still facing challenges. Even though this proclamation enforces any institution to provide a suitable environment for disabled persons, the Addis Ababa Railway Transit has failed to provide those environments.

As the survey finding indicates most of the stations are not very comfortable to cross in addition to that they are in a slippery position which slipper individuals in to the road and cause accidents. And in some stations, crossing areas are taken by some peoples like individuals selling staffs and a lot people who are begging for money a lot of times as said by respondents. This makes the station areas very small and create crowded of peoples in stations.

A report in London (2004) show that accidents to pedestrians that involve falls on footways are more common than collisions with vehicles, and may well cause more slight and serious injuries. Poor footway surfaces contribute to these accidents. In countries with cold climates and slippery surfaces are major causes.

In the railway design people are forced to use only Stations and Squares to cross from one side of the road to the other and the average interval between two adjacent stations is 867.5 meters. The longest interval is 1,210 meters and the shortest interval is 525 meters and people have to walk extra distance in search of crossing, Furthermore 37.1% of the total respondents walk more than 100 meter in searcher of crossing.

The researcher has observed some of the following problems which were caused by the zebra crossing of the Addis Ababa Railway Construction.

- ✓ Most drivers were seen using dirt roads in order to avoid the congestion/jam,
- ✓ Pedestrians were braking rules and avoiding the voluntaries which were working to help people to safely cross, and
- ✓ In some stations the voluntaries were seen stopping cars for a small number of pedestrians in addition to that the driver inform the researcher that when driving in this kind of condition you have to be very sensitive and alert.

The challenges of zebra crossings on road vehicle delay have also received the research attention. Road vehicles such as cars and trucks can be delayed at rail-road crossings not only during times of train occurrences, but also at other times due to pedestrians flow out of station at crossing.

VicRoads conducted travel time surveys before and after a rail-road crossing was grade separated in Melbourne, Australia. Results showed that travel times generally decreased following the grade separation (up to 22% in peak periods).

My informant on this issue, graduated in 1990 with diploma in auto mechanic, have more than 30 years of experience as a driver and more than 15 years as a mechanic. Currently he is an owner of Auto Repair Shop which is located at Meri in front of Takle Berhan Ambaye Construction. Since the Auto Repair Shop is located in the railway line an interview with him helped to enrich the research with expert suggestions on the issue and by creating the exposure to talk to the car owners that have been forced to repair their cars due to high traffic congestion created as a result of the railway line construction.

As the informant has informed me that driving in congestion condition have many impact on cars especially it will be much serious on old cars. Driving on congestion condition can led to a serious problem both on cars and drivers. Some of the major problems are that engine getting overheating and when that happens water on the Radiator will get boiled up and the car will not start until the hot water gets cold. Overheating can permanently damage a car beyond incurring financial repair cost. Consequently, the car will be exposed to different adverse impact.

Another problem is that the pistons on the car which are made of aluminum had a very high tendency to change their shape, which means that they heat up very, very quickly. The point here is that when pistons will get hotter faster then it will bind against the cylinder walls, badly scoring those walls, seizing the piston, potentially breaking the connecting rod, and possibly damage cars. In addition to that the gaskets sealing the oil gallery and water jacket will degrade rapidly, destroy the sealing surfaces. Then engine oil will break down rapidly at very high temperatures. The oil will thin dramatically, losing both thickness and lubricity which further raises the engine temperature

Moreover, there will be a lot of Friction on the engine in driving on a congestion condition and when there is a lot of friction it will be another reason to heat up the engine, during friction the force that causes a movement of the car to slow down when it is touching another object. In addition to that no less than one third of a car's fuel consumption is spent in overcoming friction, and this friction loss has a direct impact on fuel consumption as the informant said. High fuel consumption is another major problem which will increase our cost of fuel and In addition to that problems, it led to high air pollution for the society and drivers around the congestion.

Air pollution is a major public health problem in most cities of the developing world. Pollution levels in megacities such as Bangkok, Cairo, Delhi and Mexico City exceed those in any city in the industrialized countries. Epidemiological studies show that air pollution in developing countries accounts for tens of thousands of excess deaths and billions of dollars in medical costs and lost productivity every year. These losses, and the associated degradation in quality of life, impose a significant burden on people in all sectors of society, but especially the poor. Faiz, Weaver and Walsh, (1996) also they have stated that Carbon Dioxide is the most significant of the greenhouse gases which are contributing to Climate Change. Compared to improvements in the release of toxic pollutants, there has been less progress on reducing CO₂ from cars.

Fuel use fact show that, one liter of petrol used results in 2.36kg of CO₂ released to the atmosphere and one liter of diesel used results in 2.68kg of CO₂ released to the atmosphere (Feedstock Dependent, 2017).

Driving in a Congestion/jam condition can also block areas to other drivers this means putting other cars in a “Blind Spots”. Blind Spots are danger areas that cannot be seen in the mirrors on either or both sides of the vehicle. In addition to Spark Plugs will get wet; it will be another problem to get the car start. This can lead to engine overflow, which in turn can wet the plugs so they are unable to form any kind of spark to start the engine.

In addition to that every individual will lose their time in the congestion and Nairobi City traffic jam costs Kenya 37 billion shillings annually, (McGregor and Malingha2014). The country's Transport and Urban Decongestion Committee reported that the daily traffic cost of Nairobi is 570,000 shilling. In addition to that Sanders (2015) revealed that the cost of congestion in the United States of America included 87,606 crashes in work zones, 1,200 deaths, 37,476 injuries,

482 million hours lost in driver delays and \$6.5billion lost even though the cost of congestion in Addis Ababa was not conducted by any party.

As the informant have inform the researcher there are many cars that come for repair due to the above mentioned problems and the minimum cost of service to repair those kind of cars will required more than 300 birr without considering the change spare parts.

In support of the above idea De Gruyter & Currie (2016) state in their study that rail-road crossings can impact vehicle operating costs through changes to fuel and oil consumption, tire wear, vehicle maintenance and vehicle depreciation. Vehicle operating costs are usually estimated by applying default unit costs to vehicle traffic data specific to the crossings under investigation.

According to the informant, driving in a Congestion/jam condition can be causes for unnecessary behavioral change of driver. To mention some terrible behaviors of drivers include; being selfish, unable to control emotion, ignore, trying to catch attention, blocking others way, trying to simplify car accident and so much more. In general to all drivers, driving in a Congestion/jam condition makes people loss patient and make them anger which will led them to accidents. In conclusion driving in a congestion/jam condition is more risky than in a non-congestion condition due to the above mentioned problems.

The best method is to provide a safe environment is to encourage and support safe crossing behavior and thinking among pedestrians and drivers.

4.2. Stakeholders Involvement in the Project Planning and Implementation

It has been known from a civil engineer who have been the participant of the project in planning and implementation that the idea of construct light railway in the city was first initiated by Ministry of Transport to solve the shortage of transportation that occur in Addis Ababa then a contract was awarded to one of the biggest Chinese railway contraction company known as China Railway Engineering Corporation (C.R.E.C) which had almost 5 decades of experience in construction of infrastructure projects.

The Addis Ababa light railway transit (L.R.T) project is funded jointly by the Government of Ethiopia and the Chinese government where the Ethiopian government have 15% share of equity and the rest 85% which accounts about is USD 475 million is financed by the loan from Chinese government. Besides financing all the work starting from the design to construction and managing the operation up to training of all local staff members are given to C.R.E.C Railway Construction Company also the company trained 50 Ethiopian train masters and maintenance team. In addition to that this company manufactures trains and does all the required construction jobs in China as well as in different countries and they have duplicated the design plan of the Addis Ababa Light Railway project from their country.

In China pedestrians and cars don't cross the railway at any point of the line. Stations and train lines are either underground or sky station. The railway design for Ethiopia also were adapted from that of the China's as it is, however the contextual reality regarding the construction site for the railway were not considered in approving the design due to that pedestrian crossings and vehicle turn routes were not part of the design. As a result the initial project plan don't have pedestrian crossings and vehicle turn routes after the discussion between Addis Ababa Road Authority and C.R.E.C company they have modified the initial plan so that stations can also be used for the purpose of pedestrian crossings.

The researcher found that the project was designed by the Chain Company but throughout the project there are different stakeholder's involvements in modifying the project plan and the informant has informed the researcher that stakeholders that have been involved in the project planning which most of them were government ministries with their own role, requirements and objectives are as listed below.

✓ **Ministry of Transport.**

Ministry of transport was the stakeholder who initiates the railway project as a solution that the societies were facing in the transportation sector. In addition to that Ministry of transport was responsible in rewarding the contract to C.R.E.C.

✓ **Addis Ababa City Administration, Land Development and Urban Renewal Office.**

Addis Ababa City Administration, Land Development and Urban Renewal Office were responsible to reallocate those house holders who have to be moved for the railway construction and payment of compensations.

✓ **Addis Ababa Police Commission.**

Addis Ababa Police Commission had the responsibility to provide police force to the railway both in the construction phase and in operation stage of the railway project.

✓ **Ethiopian Culture and Tourism Bureau.**

Ethiopian Culture and Tourism Bureau had the responsibility for the temporary removal and subsequent reinstatement of the statue of St. Abune Petros.

✓ **Addis Ababa Water and Sewerage Authority.**

Addis Ababa Water and Sewerage Authority had the responsibility to identifying areas that have underground water pipe and removing them as needed.

✓ **Ethiopia Telecommunication Corporation.**

Ethiopia Telecommunication Corporation has the same responsibility as Addis Ababa Water and Sewerage Authority but Ethio-Telecom had responsibility with phone lines that are underground and removing as required.

✓ **Ambesa Bus.**

Ambesa Bus in one of the oldest government transportation provider to Addis Ababa City and this stakeholder have the responsibility to provide transportation service to those who get off in the end line of the railway so that another Transit problem will not be created at the end line of the railway.

✓ **Ethiopia Electric Power Corporation.**

Ethiopia Electric Power Corporation had the responsibility in providing electric power to the railway project and also reallocating of electric power line in the city.

✓ **Consultant**

The Italferr consultant has the responsibility to review the work at any stage of the projects, identifying what went wrong and taking corrective actions.

Some studies have extended project success criteria into new aspects, such as stakeholder's participation and satisfaction, customer's benefit and upcoming prospective to organization (Shenhar et al., 2001). The involvement of those stakeholders makes the project to complete with less difficulty as the informant said and as we have seen in chapter two the JPPS participants are invited from among those who might be affected by or have input into the project. If the project involves deliverables or is a new process or procedure, then anyone who has input to the process or receives output from the process, or handles the deliverables should be invited to participate in the JPPS.

In Karlsen (1998) study he revealed that stakeholders can create both problems and uncertainty regarding project execution. In his study, such problems and uncertainties are caused by “decisions that were not taken,” “unexpected changes in specifications,” “the client was too focused on details,” “the stakeholder did not understand his or her role in the project,” “political guidelines that were unexpected changed” and “the end user did not know his or her needs.”

The society should have been considered as a stakeholder. Redmon (2006) stated that stakeholders include people who have a share or an interest in a particular policy, program, or project and may be affected by its implementation. Stakeholder involvement is an essential element in creating widely supported and trusted policies, programs, and projects. However, in the railway project, though the societies are affected by its implementation, the society was not represented as a stakeholder to contribute their share to the project success.

Society (end user) involvement in the project will definitely improve the railway design in order to have an acceptable outcome of the project, because one of the evidence is that all the government ministries involvement makes the project to compel within budget and time. Hence one can say those stakeholders involvement was very crucial. As the informant said the

involvement of society is mandatory only at regional stage of railway projects; there will be a separate committee that has the responsibility to work with the society to have an acceptable project outcome. He also stated that all the involved parties receive the railway project plan and make comment on it then approve or reject the railway plans.

The informant also witnessed that they have noticed the railway is affecting the society, in reverse. He mentioned that the trains speed efficiency is affected by the number of pedestrians, currently one way trip from Ayat to Torhayloch will take approximately 60 minutes but if there is a probability that the trains speed efficiency will not get affect by the flow of pedestrians and car turnovers then it would not take more than 40 minutes as the informant inform the researcher. In addition to that when it was planned trains only stop for 30 second in each stations, this is also affected by pedestrians and currently takes more than 1 minutes. Generally, fault in the design plan is costing travelers much time than it would have been done with society participation.

Trains can be delayed due to permanent speed restrictions over crossings or any temporary speed restrictions that may be imposed following incidents. This in turn can result in additional rail operating costs associated with acceleration and deceleration, but also additional time costs for rail passengers. De Gruyter& Currie (2016)

Chapter 5

CONCLUSION AND RECOMMENDATIONS

Under this chapter, summary of the whole thesis work, conclusions and recommendations are put.

5.1. Conclusion

The objective of the study was to identify the problems that pedestrians and drivers are facing in their day to day activity due to the design of the zebra crossing by Ethiopia Railway Corporation, in addition to that identifying main limitations in the design of the railway project and to find out what type of stakeholders were involved in the design planning of the railway project.

The universes of study were Drivers and Pedestrians. The railway design has technical impact on cars and behavioral change on drivers, driving in the crowded situation which is caused by high level of pedestrians crossing, of course the root cause of this problem is the zebra crossing designed by Ethiopia Railway Corporation, Also Pedestrians are forced to use Stations and Squares to cross from one end to the other due to the design of the railway in addition to that they become the main reason for congestion.

The researcher used descriptive research designs. Since this research intended to describe the existing problems or situation as it exist in the railway project planning. The researcher used four different kinds of data gathering tools which are Questionnaire, Interview, and Document Analysis.

Since there are unknown numbers of Pedestrians each day crossing from one side of the road to the other a probability and non-probability sampling were used, which was Simple random sampling and Convenient Sampling, this means that the researcher distributed a questionnaire to those pedestrians who were using those selected stations to cross from one side of the road to the other at a particular time for each station.

After data has been collected then entered in the SPSS, it was analyzed using descriptive statistics. Descriptive statistics are commonly used for summarizing data frequency. The researcher used frequency analysis to answer the research question. Then finally data were

presented by tables, Pie Chart and Bar Chart, from the data gathering the researcher have find that 92.4% of the respondents as well as drivers were victims and facing challenges in their day to day activities.

Challenges that pedestrians and drivers are facing due to the zebra crossing

- ✓ Pedestrians are forced to use Stations and Squares to cross from one side of the road to the other; however those stations and squares are very challenging to use. Some stations are taken by peoples like individuals selling staffs and peoples who are begging for money.
- ✓ Disabled persons are facing challenge to cross to the other side of the road, especially those who use wheelchairs and people with limited walking abilities, Since some stations entrance for disabled persons are closed and some station don't have the requirement to be used by disabled persons, However, Ethiopia Building Proclamation, No. 624/2009, (p,4691)enforce that there should be suitable environments for persons with disabilities, and during the project planning disabled persons were not considered and still facing challenges.
- ✓ Safeties of pedestrians were not considered because the project plan was directly adapted from China and this might be the main reason that most pedestrian don't feel safety when crossing. They mentioned this as the main reason why there should be more trained voluntaries.
- ✓ The average interval between two adjacent stations is 867.5 meters. The longest interval is 1,210 meters and the shortest interval is 525 meters due to these pedestrians have to walk extra distance, waste their time and sometimes late from their appointment, work and class.
- ✓ Every station has two entrances for the way of in and out but as observed by the researcher the second entrances are always closed with some kind of wires and chains.
- ✓ If the concerned bodies which are Addis Ababa Road Authority and Addis Ababa Road Traffic Management Bureau have constricted a railway passageway, most of pedestrians which is 98.8% of the respondents will defiantly use it in order to have a safe crossing.

- ✓ This is a serious problem that needs an immediate solution as most of the users agreed.

Department of Transport in London (2004) stat that accidents to pedestrians that involve falls on footways rather than collisions with vehicles are more common than collisions with vehicles, and may well cause more slight and serious injuries. Poor footway surfaces contribute to these accidents. In countries with cold climates and slippery surfaces are major causes.

As the researcher observed the main limitation of this project was that Stations and Squares are the only means to cross from one side of the road to the other and stations becomes crowded of peoples, with regard to this most of pedestrian lose patience which in effect become the major cause of traffic jam.

As the researcher observed Stations and Squares are the only means to cross from one side of the road to the other and stations becomes crowded of peoples, with regard to this it will be the major cause of traffic jam.

- ✓ Driving in a jam condition have many problems first, engine getting overheating and when that happens water on the Radiator will get boiled up and the car won't start until the hot water gets cold. Overheating can permanently damage a car beyond financially repair.
- ✓ The engine oil will break down rapidly at very high temperatures. The oil will thin dramatically, losing both viscosity and lubricity which further raises the engine temperature.
- ✓ High fuel consumption is another major problem which will increase our cost of fuel and In addition to that problem, it led to high air pollution for the society and drivers around the congestion.
- ✓ Driving in a Congestion/jam condition can be causes for unnecessary behavioral change of driver some of them are being selfish, unable to control emotion, neglecting, trying to catch attention, blocking others way, trying to simplify car accident and so much more.

Even though persons with disabilities are equal citizens in all aspects, Findings from survey and observation show that disabled persons are facing challenge to cross to the other side of the road,

especially those who use wheelchairs and people with limited walking abilities, Every station has two entrances for the way of in and out but as observed by the researcher the second entrances which was for disabled persons are always closed with some kind of wires and chains and some station don't even have the requirement facilities to be used by disabled persons

In the railway design people are forced to use only Stations and Squares to cross from one side of the road to the other and the average interval between two adjacent stations is 867.5 meters. The longest interval is 1,210 meters and the shortest interval is 525 meters.

Stakeholders that have been involved in the project planning and implementation

We have seen those stakeholder that have been participated in the project planning and they missed some key component of stakeholders such as Society involvement However those involved bodies might have sufficient inputs to the project plan and able to identify any problems that the railway have but their involvement were questionable since they fail to do so.

Furthermore the show that there is more Carbon Dioxide released in the environment in driving in congestion/jam condition created by high flow of pedestrians in stations and roundabouts, than in less congestion/jam condition.

In Karlsen (1998) study he revealed that stakeholders can create both problems and uncertainty regarding project execution. In his study, such problems and uncertainties are caused by “decisions that were not taken,” “unexpected changes in specifications,” “the client was too focused on details,” “the stakeholder did not understand his or her role in the project,” “political guidelines that were unexpected changed” and “the end user did not know his or her needs.”

5.2. Recommendations

The researcher strongly puts forward the following recommendations:

- ✓ There should have been a project follow up when it starts operation to minimizing environmental and social effect when the Railway Project was implemented in addition to that ongoing stakeholder communication must be in place when the project was implemented or start operation, this allow Ethiopia Railway Corporation to receiving and responding to community issues on an ongoing basis.
- ✓ Monitoring and evaluation should have been performed by some of key stakeholders who have been participated in the railway construction after the project was completed in order to minimize the project impact after implementation.
- ✓ Impact assessment should have been performed to observe if there are any effect or consequence of the project in terms of the ecological, economic, socio- cultural, political, technological and institutional aspects
- ✓ It is important that the Addis Ababa Road Authority and Ethiopia Railway Corporation jointly assess and determine pedestrian focused solutions. Solutions that reduce the risk of accidents. Moreover education strategy should be in place to create awareness to the society about the issue.
- ✓ Addis Ababa Road Traffic Management Bureau should put signs that must be in place so that pedestrians can be warned of the possibility of train is coming, indicators that represent “Look both ways for trains”, “Walk/Don’t walk pedestrian signals” and others as needed.
- ✓ Addis Ababa Traffic Bureau should put sound and visual warnings near stations, to direct pedestrians to proper crossing points, and also to indicate when it is appropriate to cross the road in order to increase the safety of pedestrians.
- ✓ Addis Ababa Road Authority should construct a speed break near stations which force drivers to slow down just before getting close to stations and beware of the flow of pedestrians.
- ✓ There should have been pedestrian’s passageways constructed by Ethiopia Railway Corporations between two adjacent stations, especially in school zones. School Zones require additional safety improvements. Since children (and adults) may forget that the situation can represent a safety.

- ✓ At regional stage in railway construction project the involvement of society is mandatory, there will be committee formation that has the responsibility to work with them to have an acceptable project out come this practice should be adapted at regional stages too.
- ✓ As the informant from Addis Ababa Railway Transit inform the researcher that there will be similar future projects with different lines with regard to this the researcher recommend that Addis Ababa Railway Corporation should take this problems as a lesson and increase the involvement of stakeholders and also consider the society as one of the main stakeholder.
- ✓ Ethiopia Railway Corporation should take these issues as lesson learning and use it as an input for future projects.
- ✓ Stations required a reconstruction, Some stations are difficult to be used by physical disabled persons, and the area that connects the station and the road are in a very slippery position which force individual in to the road or fall.

Finally future studies should consider other related issues not considered in this paper. For instance the design impact from business organization perspective was not considered in this research, In addition to that if Ethiopia Railway Corporation works on monitoring and evaluation after project was completed the impacts will not be exaggerated as it is the case right now. So monitoring and evaluation is another issue that raises attention.

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APPENDIX A

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

GRADUATE PROGRAM IN PROJECT MANAGEMENT

QUESTIONER

Dear Sir/Madam:

This questioner is prepared by post graduate student of project management based on **“Assessment of the Addis Ababa Light Railway Transit Project Success: The Users Perspective”** In partial fulfillment of the Requirement for the Award of Master of Arts Degree in Project Management and for the use of educational service, on the other hand it uses for all concerned government party to solve the issues that the pedestrians are facing. The questioner has no other objective.

The questionnaire will take approximately 5 minutes. I guarantee that all of your answers will be completely confidential. Thank you for taking the time and for your willingness to help me.

By; Samuel Awraris (0913869473)
Advisor; TekleGiorgis Assefa (Assistant Professor)

Notes;

- Not necessary to write your name.
- If you have additional suggestion use the space provided.

Sex; Male Female

Level of Education; BA/BSc degree and above
Diploma (12+2)
Grade 12 complete and certificate (12+1)
Below Grade 12

Occupation; Student Worker

Age; 18-24 25-30 31-40
41-49 50-60 60+

Section 1: For the following questions please put "✓" mark on your answer.

Questions	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
I am a victim of the Zebra Railway Design Plan.					
It's very challenging to cross to the other side.					
I don't feel safe crossing in this station.					
I Suffer noticeable physical difficulty when I try to cross using this station.					
There are a crowded of people in stations to cross to the other side.					
Due to crowded of people I feel impatience trying to cross using this station.					
Safeties of pedestrians are not considered in the Railway Construction project.					
Pedestrians are the major causes for traffic congestion/jam.					
There should be more voluntaries in stations to assist people to cross to the other side.					
I have been late to my appointment, work or class due to this problem.					
I walk extra distance to cross to the other side of the road.					
If there was a pedestrian's passageway I will defiantly use it, rather than using this station to cross.					
This is a serious problem.					
There should be a new design for future projects					

Section 2

1. How often do you use this station to cross?

Once in a day

Twice in a day

Three Times in a day

More than three times

2. How much distance do you walk to cross? (**Approximately**)

10-50 Meter

51-100 Meter

More than 100 Meter

3. What is the fair amount of time a person should have to wait to cross this street?

<30 second

<1 minute

<2 minute

<3 minute

4. How long do you have to wait to this street?

<30 second

<1 minute

<2 minute

<3 minute

5. Is there anything else that could do to improve the safety of this street crossing?

6. Any comment or suggestion regarding to the issue?

APPENDIX B

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

GRADUATE PROGRAM IN PROJECT MANAGEMENT

INTERVIEW POINTS FOR RAILWAY CORPORATION

This interview questioner is prepared by post graduate student of project management based on “Assessment of The Addis Ababa Light Railway Transit Project Success: The Users Perspective” In partial fulfillment of the Requirement for the Award of Master of Arts Degree in Project Management and for the use of educational service, on the other hand it uses for all concerned government party to solve the issues that the pedestrians are facing. The questioner has no other objective.

The questionnaire will take approximately 30 minutes. Thank you for taking the time and for your willingness to help me.

Discussion Points

Background

- Educational level
- Occupation to this organization

Project planning

- ✓ Who planned the railway project?
- ✓ Did any stakeholder participate in the project planning?
 - If yes, who were those stakeholders?
 - If no, why not?
- ✓ Have Ethiopia Railway Corporation identified issues or problems regarding to the railway design?
- ✓ Why pedestrians walking are not constructed?
- ✓ Have the concerned party noticed about the issues in pedestrians?
- ✓ What did the corporation learn from this project?
- ✓ Are there any future similar projects in Addis Ababa?
 - If yes, will there be a change in the plan?

APPENDIX C

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

GRADUATE PROGRAM IN PROJECT MANAGEMENT

INTERVIEW QUESTIONS FOR MECHANIC ALSO DRIVER

This interview questioner is prepared by post graduate student of project management based on “Assessment of The Addis Ababa Light Railway Transit Project Success: The Users Perspective,” In partial fulfillment of the Requirement for the Award of Master of Arts Degree in Project Management and for the use of educational service, on the other hand it uses for all concerned government party to solve the issues that the pedestrians are facing. The questioner has no other objective.

The questionnaire will take approximately 20 minutes. Thank you for taking the time and for your willingness to help me.

Discussion Points

Background

- Name
 - Name of the organization
 - Educational level
 - Occupation to this organization
 - Years of experience
-
- ✓ Does driving in congestion condition have impact on cars?(on breaks, engines or other)
 - If yes what are the impacts?
 - Does anyone come for a repair due to those impacts?
 - What are the minimum costs to repair those kinds of problems?
 - ✓ As a driver and a mechanic what impact does it have on individuals driving on high traffic congestion?
 - ✓ Does driving on high traffic congestion is more dangerous than non-congestion condition?
 - If yes, how?