CHAPTER 1

INTRODUCTION

1.1 Background

Most developing countries are in urgent need of highway construction programmes. The primary objective of road infrastructure development project is to generate benefits to the users, such as, convenience, cost savings, reduced travel time, and thereby accelerating economic development in the influence area of the road project. No infrastructure project should be undertaken unless the economic benefits criteria and economic viability is fully established prior to the decision on investment in road projects (Chakraborthy, 1996). Traditionally, highways in India have been viewed as a public convenience that must be financed and operated by the public sector. But the Govt. faced funding constraints in later stage development because of chronic budgetary problems. The sector witnessed the emergence of Public Private Partnership model in highway development in early 1990s and subsequently, the National Highway Authority of India (NHAI) was set up in the year 1995 for overseeing the functioning of the private entities in the highway development thereafter (Subra, 1999). Since then a number of projects have been implemented on PPP model, particularly through Build, Operate and Transfer (BOT) contract. Consequently, it has become increasingly accepted that highways should be built, financed, and operated by private firms and that road user should pay toll for using them. Moreover, users are more likely to accept the concept of paying for roads owned by private sector that builds highways faster and more efficiently than state-owned firms.

However, the National Highway Authority of India (NHAI) continues to carry out regulatory functions including monitoring the projects, setting up quality norms, etc. During the specified period prescribed in PPP contract, the private firm operates and
maintains the infrastructure created, thereby assuring road users of adequate quality services, safety, and security standards on the toll way stretches.

Thus, the system of toll road has been operating for quite some time in India and has benefitted all passengers travelling on toll roads. While the toll collection and recovering the project development costs are the key objectives of private entities, the issues arising out of providing quality services to the toll road commuters is the matter of highest concern and need to be addressed adequately.

It is mandated to ensure that the highway users are provided with quality services for the toll they pay. It ensures that the road contractor and developers maintain the standards that they are supposed to, according to the concession agreement between the contractors and NHAI, as after all the commuter is levied toll for not just the highway usage but certain services as well. But, it is often observed that once the road is ready for operation, toll collection starts and service performance parameters are forgotten. The concessionaire continues to collect toll from the ever-increasing traffic and neglects quality services to the commuters and deviates from the service deliveries as promised in the concession agreement. (Mamuni Das, 2010)

Road User Services are the advantages or service benefits accruing to the vehicle drivers or owners or occupants through features like road safety, comfort, convenience, etc. (Khanna, 1993). For example, a group of services the toll road operators are expected to provide to the travelling public include patrolling services, ambulance facilities at the time of accidents, communication facilities, parking lots, rest rooms along road side, motels etc.
1.2 Objectives and Scope of the Study

This study aims to take a holistic approach to performance of toll roads through analysis of the performance indicators, both quantitative and qualitative, with the following main objectives -

1. To identify specific indicators to evaluate performance of toll roads
2. To develop the performance evaluation criteria to measure performance of toll roads
3. To study the causal factors for performance deficiency and suggest measures for improvement in key performance areas

Scope of Study

The study is a modest attempt to develop a performance evaluation framework for toll road network in Pune region, which covers performance assessment of the operational toll roads in the toll way network of nearly 500 km., including toll posts in the region. The performance of six toll roads and eight toll plazas are analyzed against standard criteria that are set, based on key objectives of the projects. The study is intended to cover a Holistic Performance Model-a novel concept in researchers’ perspective. The focus is on three key components of toll way operational system- (i) Traffic and Toll Revenue (ii) Toll Plaza Operations and (iii) Public opinion about road user amenities. The Pune tollway system will be assessed on corresponding performance parameters, such as system output (toll traffic, toll revenue, etc.), tolling operations services and road way quality of service to travelers. Then the performance of the toll roads using these parameters is compared. These parameters are selected primarily to ensure that the toll road system fulfills the results that were envisaged. A range of studies are conducted to carry out the assessment which includes:
i. A study of toll traffic and financial factors which are key output indicators of the toll road system. This assessment is based on traffic demand and toll revenue projections which are the toll road operators’ primary concern in toll business.

ii. A field survey at operational sites for collecting information on tolling service parameters related to toll posts meant for toll collection. This will enable us to know how the operators run toll plazas to handle traffic congestion around it and manage toll lanes.

iii. Public is very important component in PPP projects like toll road projects. So, a road user study in terms of passengers’ survey was carried out for overall analysis of the performance of roadway level of services to the travelers, and this assessment is required to evaluate how each toll way performs on each service indicator.

1.3. Motivation for The Study

The need for this study is primarily to solve the problems related to operational toll roads, as users of these roads frequently complain about the very functioning of the system and are utterly dissatisfied with the way the operators collect hefty toll amount but fail miserably in providing quality service across several mandated quality parameters. As bad roads are detrimental to regional growth, monitoring of toll road infrastructure facilities is required. The assessment of performance levels of operational parameters and services gives the status of roads and fixes the responsibility of the agencies involved in road maintenance and management. As the owner, mostly the NHAI, is not conducting customer satisfaction surveys across all the toll stretches rigorously, these kinds of studies can help the authorities to take appropriate actions. It also enables the citizens to provide feedback about the poor condition of the road system and penalize the developers for not maintaining consistence performance.
1.4. Overview of Research Approach

A literature study was carried out to identify factors influencing toll road operations followed by a feasibility study. The literature sources include primary sources comprising reports, thesis, conference reports, company reports and government publications. Secondary sources include newspapers, books, journals, internet, etc. (Mark Saunders et al. 2003). Following this, an appropriate framework of factors involved in performance measurement and detailed data collection methods was developed. Data collection is a multi-pronged approach. It covers a comprehensive search of secondary literature available in the public domain, to determine the efforts of all the stakeholders and current-state of the work in the sector, followed by primary research. The study is basically a cross-sectional, partly descriptive and partly quantitative in nature. The primary data collection techniques broadly include a structured observation study and a questionnaire survey. Data on variables is collected across toll road segments and is partly quantitative and partly qualitative. For example, quantitative data is traffic data and financial data. Qualitative data is toll operation indicators and Roadway Service indicators. Suitable methods are developed for data collection in field and a questionnaire survey for capturing user experience. The data collection process involved (i.) Toll traffic and Toll Revenue (ii) Observation of the tolling process, (iii) Structured interviews for toll road users.

Based on the type of data—quantitative or qualitative, different analyses techniques are used to analyse and interpret the data. The analysis was carried out by using standard analysis techniques, descriptive and inferential statistics. The key analyses techniques are frequency distribution, ranking, one way ANOVA, factor analysis etc. The software primarily used for Analyses are MS-Excel and SPSS.
1.5. Contribution of Research

As badly maintained roads are proving detrimental to regional growth, monitoring of toll road infrastructure facilities giving various road way services is required. The assessment of performance levels of operational parameters and services gives the status of road and reminds the agencies of their responsibilities regarding road maintenance and management. As the owner, in this case mostly NHAI, is apparently not conducting customer satisfaction surveys, this kind of study can help the authorities to take appropriate corrective actions. It also enables the citizens to provide feedback about the poor condition of the road system and penalize the developers for not maintaining consistent performance.

1.6. Outline of Chapters

Chapter 1: Introduction

Each component of the study such as background, scope and objectives, methodology and data collection procedure is presented.

Chapter 2: Literature Review

This chapter presents a comprehensive coverage of various studies carried out in the toll road system with emphasis on operational performance. Global toll road scenarios with their present status and evolution of toll concepts in Indian context are discussed. Gap analysis is carried out for identifying the scope of the work for the study.

Chapter 3: Conceptual Framework

This chapter covers mainly the theoretical concepts studied for the study and primarily includes performance indicators, performance framework of operational toll road, and the method of measurements of some quantitative and qualitative variables.
Chapter 4: Research Design

The research methodology covering data sources, acquisition of data, data coding and analysis techniques are elaborated. Sampling procedure including sampling frame, size, etc. are specially covered in this section.

Chapter 5: Pilot Study

A small scale research study has been carried out as pilot study for gaining experience prior to the final research study. Two toll ways in Pune region are assessed on the operational performance indicators particularly representing tollway infrastructure services created along tollway side.

Chapter 6: Data Analysis and Findings

The data after proper editing is taken through various analysis processes comprising descriptive inferential, and expected outcomes are derived and presented in the most meaningful way.

Chapter 7: Conclusions and Recommendations

This chapter presents summary of the whole study with inferences. The scope for future research will also be discussed.

1.7 Summary

The thesis on “Performance Assessment of Toll Road System- a Study in Pune Region” is an academic inquiry to address the problem of toll roads performance during operational phase. The Scope of the study, the objectives, motivation for the research and a broad research approach and outline of chapters are covered in this chapter.