

**ADMINISTRATION DEVELOPMENT FOR EXPRESSWAY
AUTHORITY OF THAILAND**

Suchart Chonsakpipat

**A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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School of Public Administration
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ABSTRACT

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This study is quantitative and qualitative research which mainly aims at studying the development of present Expressway Authority of Thailand (EXAT) administration. The research conceptual framework can be broken down into five areas of study: General Administration, Project Management, Operating Performance, Public Service Evaluation, and Other Expressway Organization Evaluation.

The examination of General Administration will investigate seven knowledge of management functions which are General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development and Environmental Management. Project Management will explore existing expressway projects, projects currently under construction, and future expressway projects. Operating Performance will investigate not only the financial performance of EXAT but also its non-financial performance as measured by user complaints and accidents. The Public Service Evaluation will trace employee perceptions and the expressway user satisfaction as to the current level of EXAT service. Lastly, the characteristics and performance of Other Expressway Organizations will provide supporting information to help determine the future administrative structure model. The study has been able to obtain primary data by interviewing EXAT staff, road users, a member of the EXAT board, and a Deputy Governor. Examination of all of these factors has enabled the researcher to propose a more effective organization management structure for EXAT.

After analyzing the data collected from EXAT employees and customers, it was found that current EXAT administration (especially in the area of Human Resources Management and Development concerning performance assessment issues) needs to be developed in order for EXAT to become an effective organization.

Additionally, the study has proposed an EXAT administration model which is similar to that of Central Nippon Expressway Company Limited in Japan. The administrative structure proposed is that EXAT be restructured into a Holding Company which invests in the necessary subsidiary companies. By applying this organization structure to EXAT, the EXAT targets should better be able to be achieved.

Finally, other policy and management recommendations as well as recommendations for future research are offered.

Keywords

Administration development, knowledge of management, Authority performance, Public service assessment and Holding company

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I wish to express my gratitude to my father, my wife and all members of my family who inspire me to pursue my higher education. Last but by no means least, I wish to dedicate this dissertation to my beloved late mother who gracefully instilled in me a sense of responsibility and a desire to keep improving myself. Even after she passed away, she is my inspiration.

Suchart Chonsakpipat

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ABBREVIATIONS

Abbreviations	Equivalence
3Rs	Reduce, Reuse and Recycle
AEC	ASEAN Economics Community
ASEAN	Association of Southeast Asia Nations
BECL	Bangkok Expressway Public Company Limited
BMCL	Bangkok Metro Public Company Limited
BTO	As a kind of concession with Built Transfer and Operate
CSR	Corporate Social Responsibility
DARS.d.d	Motorway of Republic of Slovenia
DOH	Department of Highway
EBITDA	Earn Before Interest Tax Depreciation Amortize
EGAT	Electricity generation Authority of Thailand
ETC	Electronic Toll Collection
EXAT	Expressway Authority of Thailand
HA	Highway Agency
HHI	Hopewell Highway Infrastructure
ITS	Intelligent Transportation System
MoF	Ministry of Finance
MoT	Ministry of Transportation
MTC	Manual Toll Collection
NECL	North Bangkok Expressway Public Company
NESDB	Office of National Economic and Social Development Board
NEXCO-Central	Central Nippon Expressway Corporation
PPPs	Public Private Partnership
PTT	PTT Public Company Limited
QM	Queensland Motorway
RBM	Result Based Management

SANRAL	South Africa National Road Agency
SEAN	South East Asia Energy
SEPO	State Enterprise Policy Office
SOE	State Owned Enterprise
TRIS	Thai Rating Information Service
TTP	Thai Tap Water
UNGC	United Nations Global Compact
VMS	Variable Message Sign

CHAPTER 1

INTRODUCTION

The main contents of this chapter consist of the Problem Statements, the Objectives of the Study, the Scope of the Study, Research Limitations, Expected Benefits of the Study, and the stages of Research Result Presentation in relation to the Administration Development of EXAT.

1.1 Problem Statements

The Thai economy is continuously growing due to a number of positive internal and external economic and other factors. For the domestic mechanisms, it is necessary to have co-operation between the public and private sectors in order to develop in the same direction. State-owned enterprises (SOEs), with total assets of approximately 34 billion US dollars, are an important part of the public sector and help to drive the economy and build economic growth.

At present there are 58 SOEs in Thailand divided into 9 major categories: energy, transportation, telecommunication, utilities, industries, agriculture and natural resources, commerce and services, society and technologies, and finance (State Enterprise Policy Office (SEPO), 2009). The SOEs' operations are regulated by SEPO which monitors the operations of each SOE and annually evaluates their performances by hiring Thai Rating Information System (TRIS) to assess them. In 2009 TRIS assessed 54 SOEs and rated that their performances as in the range of 1.4094-4.8629 (on a 5.0000 point scale) (SEPO, 2009). An organization with a rating of 3.0000 or above is classed as being "efficient". SOEs rated less than 3.0000 are considered "inefficient", which indicates that their performances in financial terms are loss-making and that the government will need to reserve additional budget for them.

EXAT, which is under the control of Transportation Ministry, is one of the SOEs classified in the transportation sector.

EXAT's Vision is:

“Choice of value, advanced development, and care for environment”.

1.1.1 The EXAT Mission Statement is:

- 1) To provide/develop/improve the expressway system in line with the standard and safety;
- 2) To provide innovate and value-added services;
- 3) To manage assets with proficiency to enhance potentials of expressway business and benefits for society; and
- 4) To develop the administrative management and investment systems to increase value for the organization.

1.1.2 EXAT's Organizational Goals are:

- 1) The expressways and assets are exercised to their full capacity and with safety;
- 2) The services have quality and are trusted by the people;
- 3) The business performances grow with stability and yield appropriate profits.

1.1.3 EXAT's Value Statement is:

“Excellence service, visionary innovations and flawless image”.

(Expressway Authority of Thailand, 2012a)

For the budget years 2009-2012, TRIS has rated the EXAT performance at 4.4357, 4.1198, 4.2822 and 4.4043 respectively. (EXAT, 2012b). This was classed as a “good” performance.

EXAT's average daily revenue in 2009 was about 1.5 million USD and road users made an average of about 1.2 million daily transactions. Expressways are convenient and fast for travelling, and help to save fuel. Since 2009, traffic has been increasing every year. This would seem to indicate that most road users are generally satisfied with EXAT's services.

However, even though EXAT has been assessed by TRIS to be a good performing authority and appears to satisfy road users, this study has identified

several areas in which the authority should modify its management and other aspects of its administration. This is largely because the authority is currently administered in much the same way as other SOEs. This prevents it from maximizing its efficiency as would be the case if it were in the private sector. The main areas requiring attention are:

1) EXAT's organization structure is huge resulting in a long line of command. This means that management is not able to be flexible in line with the changing environment.

2) EXAT's financial operations and project investments depend on the budget the government provides, which can vary with changes in the political, economic and social situation. In order to increase EXAT's operational efficiency and road user benefits, the authority must develop the capacity to obtain project investment from other sources. This will enable it to continue as a self-supporting, sustainable organization if government investment is not available.

3) EXAT's marketing system is typical of a monopoly, with the result that many authority personnel lack a service mind.

4) EXAT's workforce has been found to be too large. The result of this is that many employees have been directed to do work that is not compatible with their capabilities, and in some cases in areas where they lack the relevant skills.

5) Finally, as is common in many SOEs, EXAT often employs expensive consultants to do work that could otherwise be handled just as effectively with existing internal expertise.

In investigating the above and other aspects of EXAT's administration, the researcher believes that this study will benefit if it examines other expressway authorities, both local and overseas, in order to identify how they are managed or administered. The information obtained from these corporations will provide supporting information for the proposed organization management structure model. The overseas expressway authorities selected are from four continents: Asia, Australia, Europe and Africa. The seven authorities studied are Hopewell Highway Infrastructure (China), Bangkok Expressway Company Limited (Thailand), NEXCO-Central (Japan), Queensland Motorway (Australia), Highway Agency (United Kingdom), Motorway Company (Slovenia) and South Africa National Road Agency Limited (South Africa).

1.2 The Study Objectives

This study has the following objectives:

- 1) To study EXAT operations and the current operational problems of EXAT administration.
- 2) To study 7 other expressway authorities in order to identify good governance concepts.
- 3) To propose an administrative structure model for EXAT administration development.

1.3 The Study Scope

This study examines EXAT from available documents and employee and road user questionnaires and interviews, and 7 other expressway authorities in Asia, Europe, Africa and Australia from available documents.

1.4 Research Limitations

Despite the limitations of research time and budget the study has been managed to maximize the benefits in order to gain valuable knowledge and truths. It will be the useful literature not only in the further studies of EXAT but also in applying the research methodology to other SOEs and large independent organizations practices across all industry segments.

1.5 Expected Benefits from the Study

- 1) To identify and document the current operations of EXAT and assess road user opinions of the EXAT services.
- 2) To compare the administration of EXAT with the overseas authorities.
- 3) To propose a model for EXAT administration development.
- 4) To provide policy recommendations to EXAT.

1.6 The Research Results Presentation

The research results for the study EXAT Administration Development are divided into 5 main chapters consisting of: (1) Introduction; (2) Literature Review; (3) Research Methodology; (4) Data Analysis and Studied Results; and (5) Conclusions and Recommendations.

This chapter is the study outline. The following chapter outlines the overall aspects of EXAT and reviews the relevant literature to set up the conceptual framework for the study.

CHAPTER 2

LITERATURE REVIEW

The major content of this chapter consists of Expressway Authority of Thailand General Information, review theory and knowledge of development, development administration, management, accounting management, financial management, human resources management and development, marketing management, operation management, environmental management, relevant researches and research conceptual framework.

2.1 Expressway Authority of Thailand General Information

2.1.1 History

The Expressway Authority of Thailand (EXAT) is a State Owned Enterprise which was established under the Ministry of Interior by Declaration of the Revolutionary Council No. 290 on November 27, 1972. After the Bureaucracy Reform on October 3, 2002, it was transferred to be under supervision of the Ministry of Transportation and Communications. On January 9, 2008 the law was modified and the Expressway Authority of Thailand Act 2007 was enacted.

EXAT's main roles under the Act are to:

- 1) Construct or provide expressways and maintain them;
- 2) Operate businesses relevant to expressways and other related

businesses or other businesses beneficial to EXAT.

The Legal Background of EXAT:

The word "Expressway" has the legal meaning as a road constructed or transferred or obtained to facilitate specially traffic whether constructed at ground level, above ground, underground or at water surface.

In 1966 the government appointed a committee to consider, explore, resolve and plan road traffic in Bangkok.

In 1969 the committee proposed that the government ask the Office of National Economic and Social Development Board to request help from the German government in order to send experts to study and provide a master plan for traffic management in Bangkok.

In 1970 the then National Development Ministry proposed that the cabinet appoint a committee to prepare for the establishment of a toll collection organization under the regulation of the Ministry of Interior.

On Sep. 21, 1971 the cabinet approved the appointment of the committee.

On Oct. 20, 1971 the committee appointed a sub-committee for drafting the legal framework for a toll collection organization and a sub-committee for considering the toll collection organization's structure.

On Jan. 17-Feb. 5, 1972 the Ministry of Interior undertook a study tour to Japan and Korea to study details in order to consider the legal draft and organization model.

On Nov. 1972 the sub-committee considering the toll collection organization legal framework proposed the Expressway Authority of Thailand Act to the Judicial Council of the then revolutionary government. The Judicial Council passed the Act through declaration of the Revolutionary Council No. 290 on Nov. 27, 1972.

In 2002 the government conducted a Bureaucracy Reform and issued two Judicial Council Decrees:

1) A decree that transferred administration work and bureaucracy authority to the reformed Bureaucracy Agency Act. 2002.

2) A decree that transferred EXAT oversight from the Ministry of Interior to the Ministry of Transportation from the date of publication in the government gazette on Oct. 6. 2002.

The Expressway Authority of Thailand Act was declared on Dec. 30, 2007 and effective on the next day of declaration in the government gazette. This replaced the declaration of the revolutionary council No. 290 on Nov. 27, 1972 and the revised Act of the declaration of the Revolutionary Council No. 290 on Nov. 27, 1987

2.1.2 Authority and Function of EXAT

According the EXAT Act 2007 the authority has the following functions and authorities:

- 1) Hold title;
- 2) Collect tolls or other service charges including fees for asset usage, service and any facilities within rights of way;
- 3) Determine measures for safety related to the usage and maintenance of expressways as well as maintain the assets, services and any facilities within the rights of way;
- 4) Borrow money from within and Outside the Kingdom of Thailand;
- 5) Issue bonds or other deeds of investment of benefit to EXAT's business;
- 6) Establish or hold shares in limited or public companies to do businesses related to EXAT business;
- 7) Invest or join to other individual to do related business;
- 8) Offer concessions to construct or extend expressways, renew the concessions, and transfer or withdraw such concessions;
- 9) Hire or grant any individual to do any part of EXAT's business provided that if any other SOEs have the authority or function to operate them and board of committee has found that SOE can achieve them with effectiveness, EXAT must hire or grant that SOE to do its business before others.
- 10) Trade and provide other services regarding the equipment and instruments related to expressways.
- 11) Rent out or develop EXAT real estate if necessary for the benefit of EXAT by simultaneously considering the public interest.
- 12) Plan, explore and design expressway construction or extension.
- 13) Other actions which relate to the accomplishment of EXAT objectives.

EXAT is operated under board committee that is recruited and appointed by the cabinet to regulate and determine the policy which is managed by the Governor. The organization objectives can be summarized as to: (1) effectively and safely use expressways, areas within rights of way and assets, (2) provide quality services, (3) achieve sustainable growth, (4) gain appropriate profit, and (5) benefit the nation and people.

EXAT's Vision is:

“Choice of value, advanced development, and care for environment”.

The EXAT Mission Statement is:

- 1) To provide/develop/improve the expressway system in line with the standard and safety;
- 2) To provide innovate and value-added services;
- 3) To manage assets with proficiency to enhance potentials of expressway business and benefits for society; and
- 4) To develop the administrative management and investment systems to increase value for the organization.”

EXAT's Organizational Goals are:

- 1) The expressways and assets are exercised to their full capacity and with safety;
- 2) The services have quality and are trusted by the people;
- 3) The business performances grow with stability and yield appropriate profits.

EXAT's Value Statement is:

“Excellence service, visionary innovations and flawless image”. (EXAT, 2012a)

2.1.3 Organization Structure and Job Allocation

2.1.3.1 Organization Structure

On March 23, 2012 EXAT updated its organization structure to support its strategic plans and organizational administration according to the policies, objectives and regulations. The management structure consists of a Governor, 5 Deputy Governors, 1 Assistant Governor, 4 experts, 12 departments, 39 divisions and 152 sections.

2.1.3.2 Job Allocation

- 1) Organization line to the Governor: The Internal Audit department (which controls Audit 1 Division and Audit 2 Division) and the Office of the Governor (that controls the General Affairs and Conference Division, Public Relations Division, Information Division, Business Development and Marketing Division, and Research and Development Division).

2) Organization line direct to the Deputy Governor for Administration: The General Administration Department (which controls the Personnel Division, Personnel Development Division, and Supply Service Division) and the Treasury and Accounting Department (that controls the Finance Division, Accounting Division, Budget Division, Revenue Audit Division, and Management Development Division).

3) Organization line to the Deputy Governor for Technical Affairs: The Policy and Planning Department (which controls the Planning and Project Analysis Division and Evaluation Division) and the Information Technology Department (that controls the Computer Application System Division and Computer Operation Division).

4) Organization line to the Deputy Governor for Law and Land Acquisition: The Land Acquisition Department (which controls the Land Acquisition Division, Property Development and Rights of Way 1 Division, and Property Development and Rights of Way 2 Division) and the Legal Department (that controls the Legal Affairs Division and Litigation Division).

5) Organization line to the Deputy Governor for Construction and Maintenance: The Expressway Construction Department (that controls Expressway Construction 1 Division, Expressway Construction 2 Division, and General Construction Division), and the Maintenance Department (that controls the Expressway Maintenance Division, Building and General Property Maintenance Division, Equipment Maintenance Division, and Electrical Mechanical Work and Vehicles Division).

6) Organization line to the Deputy Governor for Operations: The Toll Collection Department (that controls Toll Collection 1 Division, Toll Collection 2 Division, and Toll Collection 3 Division) and the Office of Operation Planning.

7) Organization line to the Assistant Governor: The Risk Management and Internal Control Division.

2.2 Theories, Development Knowledge and Literature Review

The word “Development’ according to the Thai dictionary means the progress or the growth. Jirachok Veerasai (1998 quoted in Kavee Rakchon and Kamon Adunpun, 1995) indicated that “Development” has no exact meaning but the broad meaning is progress, growth and positive change which is normally divided into various development areas such as economic development, political development, social development and administrative development.

Amorn Raksasud (1963 quoted in Kavee Rakchon and Kamon Adunpun, 1995) has the opinion that the word “Development” as widely used now has a different meaning to that used in ancient time which was making progress, positive changes etc. “Development” currently means the serious striving of a country, organization or person who performs a function to gain positive results for the economy, government and society.

Saul M. Katz (1966 quoted in Kavee Rakchon and Kamon Adunpun, 1995) defines the development as the major societal change from one state of national being to another more valued state. It involves a complex of mutually related and political changes. Fred W. Riggs (1970 quoted in Kavee Rakchon and Kamon Adunpun, 1995) argues that the essential idea of development lies in this increased ability of human societies to shape their physical, human and cultural environments. Clearly, they do this as societies and collectivities not as individuals.

Edward W. Weidner (1962 quoted in Kavee Rakchon and Kamon Adunpun, 1995) has collected scholar opinions of the meaning “Development” that can be divided into four groups: (1) development is about growth (considering and making changes to obtain output), (2) development is about system change (such as changes in the social system or administrative system in developing countries), (3) development is operation with goal orientation, especially, modernity or nation-building and socio-economic progress goals, and (4) development is planned change which first settles a national plan which is implemented with means to achieve the expected ends. Moreover, he also indicates that development is only a concept and a way change takes place in a certain direction rather than to a fixed end. Development is never completely achieved as the planned target is always changing

The literature review indicates that organizations must be developed to continuously survive under the dynamic environment. Organizations which fail to develop are unlikely to survive.

2.3 Literature Review for Theory and Knowledge of Development Administration

Kawe Rakchon and Kamon Adunpun (1995 quoted in Kavee Rakchon and Kamon Adunpun, 1995) argue that development administration is based on the study of comparative public administration aims to search for the principles and administration methodology in order to achieve national development. For the early period, a comparative study between developing country administration and developed country administration was implemented. Later, the development administration study aimed to focus on knowledge application or science construction.

Edward W. Weidner (1962 quoted in Kavee Rakchon and Kamon Adunpun, 1995) has mentioned that development administration is programs of planned change and change can be divided into three types: (1) growth that involves changes in performance level, (2) growth that involves changes in the system in which it takes place, and (3) growth which changes environmental factors.

Kitti Boonnark (2006a: 39-40) argues that result based management can be used to construct the strategies which are necessary to develop the fundamental knowledge of management. That knowledge of consists of (1) General Management, (2) Marketing Management, (3) Accounting Management, (4) Financial Management, (5) Operations Management, (6) Human Resources Management and Development, and (7) Environmental Management. These are continuously applied in the processes of result based management.

The operational performances of Indian SOEs that are being considered for privatization have been evaluated by employing the General Management knowledge. (Ahuja and Majumdar, 1998). The customer satisfaction affecting the profit of Chinese SOEs have been studied employing Marketing Management knowledge (Zhang and Pan, 2009). Fredric William Swierczek (2010) has measured Thai SOEs performance using the indicators of return on investment, return on equity, return on sales, return on capital, asset turnover, administrative costs to sales, current ratio, return on sales per employee and debt ratio by using Accounting Management and

Financial Management. Antic and Sekulic (2006), have studied modern paradigms for measuring business performance by proposing a model which makes administration more effective and executives have operational control processes by applying Human Resources Management and Operations Management.

Suthep Chawalit (1993) argues that the development administration of Pattaya city cannot apply manager model administration which is used in the United States to its administration. There are many barriers to implementing the said model such as: (1) its centralized-oriented organization, (2) operational regulations for personnel administration, (3) fluctuation of the external environment for administrating the city of Pattaya (such as its economy, society, politics and so on), (4) no social structure to facilitate, and (5) many influences of business interests. Therefore, it is better to investigate an appropriate alternative administration model for Pattaya city which is a tourist city with unique identification.

Nop Sriboonnak (1997) argues that private education institutes provide study for persons to take bachelor and higher degrees in order to give service to the nation and society. Moreover, they can make the research and provide academic services such as maintaining art and culture. However, the management processes of private education institutes are not consistent with development administration principles. Whether they can obtain maximum effectiveness or not depends on their abilities to integrate development administration concepts.

A development administration procedure which is extensively employed in Thailand and specified in the Thai Constitution of 1997 and clause 3/1 of the State Administration Act (volume 5), is result based management, RBM. It is a significant activity that changes the role, mission and administration methods of organizations by taking into consideration the people and work based results in order to determine and assess strategies rather than the input factors and work processes. RBM emphasizes the determination of vision, mission, objectives, etc. based on target and output identification and consistent outcomes. It also determines the operating performance indicators to: (1) improve organizational operation, (2) improve administration, (3) provide operational direction, (4) assess performance in order to know the results compared to the plans and targets, (5) enable the reporting of operation progress to executives, and (6) enable the solution of problems in time. (Srinakarinviroj University, 2008)

The development administration literature indicates that development administration is critically important for organizations to development to achieve their visions, missions, and objectives.

2.4 Literature Review for Management

In the study of EXAT administration development, it is necessary to use management knowledge as a measure for the analysis because good management is necessary for an organization administration to be effective. In other words, the better the management system that is employed, the more effective the organization can be. The core management principles are generally said to consist of: (1) planning, (2) organizing, (3) leading, and (4) controlling and if any part of them is not implemented, the organization is unlikely to meet the expected objectives.

Miller and Dess (1996: ch6) have proposed that in putting management strategies into operation it is necessary to consider the strategy appropriateness and to be a learning organization. Moreover, good management requires skilled and knowledgeable personnel. If the organization staff do not have the required experience and knowledge, then good management will be difficult.

Kitti Boonnark (2001: 45-52 quoted in Kitti Boonnark, 2006c) has proposed 11 system principles or elements of good management that focus on the operational flexibility. These are: (1) problem analyzing ability, (2) good planning, (3) effective coordination, (4) good command, (5) clear communication, (6) appropriately decentralized, (7) good monitoring and assessing, (8) appropriate participation, (9) effective teamwork, (10) appropriate organizational structure, and (11) good leadership.

Beetham (1996) has explained that public administration concerns politics and may involve compromise. For example, the matter of need to make a profit, which is different from the private sector even though they operate in the same market place. The private sector demands effective administration while the public sector demands often involve politics which means that public organizations must listen to the requirements of every group in decision making.

Rhodes (1997) has explained that the United Kingdom has adopted the public administration concept of the 3E's: economy, efficiency and effectiveness. It is noted that this system has the main principle of focusing on the management but not the policy. Not

only is the performance evaluated, but also efficiency. It causes focus to be on: internal organization administration, outsourcing services operated by the private sector as a means of cost reduction, the importance of the management style in creating production targets, contracting limitations and administration independence.

Ticlau, Mora, Tiganas and Bacali (2011) have argued that for public sector organizations to achieve marketing targets, it is necessary to apply the basic criterion of awareness of leadership and creation of the structure. The former means that public leaders must be aware the importance of marketing so that it will be a part of organization strategies and implemented in every organization level. The latter, creating the structure, means that for public sector marketing to be successful it is necessary to have the organization structure at every level to support the marketing operations. In other words, unless the organization has provided the marketing units, there is no agency to set the budget and operate the marketing activities.

Thapara Prompienpan (2009) argues that many problems in the public sector are caused by some local officers who dishonestly operate or not consider the people interests. Additionally, its administration is often central-oriented without monitoring and checking systems. The proposed solutions consist of (1) promoting good persons, (2) not promoting bad persons and (3) increasing monitoring and checking of local officers. The future administration trend will concentrate on monitoring and checking the budget usage of the local officers.

S. Lioukas, D. Bourantas and V. Papadakis (1993) have argued that factors influencing the effective administration in management especially for strategy planning, financial decision making and human resources consist of: (1) organization human resources (2) organization size (3) politics influence, (4) marketing competitors and (5) consumer demands.

John Isaac Mwita (2000) has argued that operating with central-oriented management can reduce the service expenses and quality regardless of the employee reduction and the number of decision making staff reduction.

Ballantine (1964 quoted in Echanis, 2009) refers to a parent or holding company as one which controls another as a subsidiary or affiliate by the power to elect its management. Affiliates are those concerns which are subject to common control and operated as part of a system. The advantages for establishing holding company are: (1) leverage, ownership control, fund access, (2) regulatory requirement,

(3) compensation and personnel issues, (4) expansion in international markets, (5) expansion in local market, (6) joint-ventures for specialized-industry projects, (7) tax benefits and (8) establishment of service units for conglomerate. (Erlinda S. Echanis, 2009)

Sathit Limpongpan (2000) argues that there are many factors affecting the privatization acceptance of the State Railway of Thailand such as labor solidarity, employment conditions, employment benefits, privatization experience, policy influence and demographic factors. It has been found that the best predictors of the perceived acceptance of privatization of the authority are policy influence and labor solidarity.

Management literature indicates that organizations that are well administrated have to be clearly commanded otherwise the organization operations will be uncertain. The key factor for a good management is the provision of a suitable organization structure and workforce. It has been found that the organization with an effective administration will have the opportunity to achieve good corporate governance and transparency. Therefore, it is very necessary for the organizations to be effectively managed.

2.5 Literature Review for Accounting Management

Payom Singsanae (1994: 1-11) explains that accounting is account data processing which enables provision of a financial budget that is a useful report for internal executives and external persons. Accounting data processing for each organization may employ different standard accounting regulations. The precision of the accounting data depends on the internal controls of each organization.

Gingkanok Pittayakun (2000: 3) has mentioned that accounting means accounting practices regulations, data classification, data recording, document and account book storing and financial budget provision.

Kitti Boonnark (2000: 3-4 quoted in Kitti Boonnark, 2006c) has indicated that a good accounting system should consist of six core principles: (1) a general accounting system, (2) a managerial accounting system, (3) a cost accounting system, (4) a budget accounting system, (5) an accounting auditing system and (6) a cost center and profit center accounting system.

Kitti Boonmark (2006a: 52-56) has explained that accounting knowledge focuses on constructing financial data and information for management. Strategies of all management fields rely on financial data and information, which requires a good organization accounting system. The management strategies determined based on a weak accounting system will affect the organization decision making with a high risk of failure. Accounting management knowledge is very necessary for modern executives because accounting is an important instrument to measure administration and the mirror to reflect the organization's performance at all times. Therefore, modern executives have to know accounting principles to harmonize administration.

Neale G. O'Conner, Chee W. Chow and Anne Wu (2004) have argued that accounting management and controlling consist of: (1) approval procedure, (2) formal procedure, (3) total quality control, (4) budget target and (5) performance target.

Saimak Nejadhosseini Soudani (2012: 136-145) has argued that accounting data systems including collecting, chalking up, managing, controlling and reporting are the key factors affecting the organization financial performance. It has been indicated that organization performance depends on accounting information systems.

Hilmi Erdogen Yayla, Fazil Kirkbir and Ekem Cengiz (2007) have argued that account operator behavior which consists of conflict, shared values, balanced power, communication, confidence and collaboration affect organization performance

Accounting literature indicates that organizations need accounting knowledge because it is an instrument to measure their performance from important financial information. Moreover, they are able to comparisons with other organizations to drive and carry the organization in the correct direction with appropriateness.

2.6 Literature Review for Financial Management

Robert C. Higgins (1995: 5, 39) has provided the important notices that financial reports will be a significant window to reflect any reality which has happened or is happening in the organization. Additionally, financial report analysis has the objective to evaluate the organization performance and also cause good internal control.

Somchai Pakkawaswiwat (1993: 5) has indicated that world financial system has been undergone significant change in the number of financial transactions, contents and operation speed.

Kitti Boonnark (2001: 38-71 quoted in Kitti Boonnark, 2006c) has noticed that executives should analyze organization finance by using the financial principles of: (1) financial ratios, (2) costing analysis, (3) analysis and organizing financial structure and (4) financial loss reduction analysis.

Kitti Boonnark (2006a: 7-60) has explained that financial knowledge aims to effective financial management that consists of many important financial instruments to appropriately provide the organization financial status, performance and financial liquidity. Therefore, financial management will be an important part to help the organization efficiently and effectively determine administrative strategies.

Wang Suping (2008) has found that constructing financial management data is a key factor to improve the organization finance. Therefore, public organizations have been supported to provide the financial data in order to be the path to provide public organization capital and continuously improve their administrations.

Mustafa Afeef (2011: 173-183) has found that working capital management is an important factors in organization efficiency and profit earning ability and involves managing: (1) the receivable collection period, (2) the inventory conversion period, (3) the payable deferral period, and (4) the cash conversion cycle. The organization profit focuses on return on asset and operational profit on sales.

Financial literature indicates that financial management is very necessary for organization administration because financial analysis causes an organization know how its financial situation is and what the external market trend is to determine a policy and plan precisely and appropriately.

2.7 Literature Review for Human Resources Management and Development

Nisada Wedchayanon (2000: 311-327) has provided the knowledge and notices that human resources are very important for all organization operations. They are determined to be the significant policies and country development strategies that have been specified as part of the National Society and Economic Development Plan.

Additionally, human resources management is also an important instrument for the organization because it will help personnel to gain experience and knowledge to improve their working capability.

Kitti Boonnark (2006b:74-81) has provided the concept, knowledge and important issues that human resources management and development has to cover. The significant principles are: (1) recruitment, (2) orientation, (3) probation, (4) salary structure management, (5) compensation and welfare, (6) performance assessment, (7) learning development, and (8) punishment procedure. If Thai organizations can provide human resources management and development systems based on those principles effectively, the personnel performance will be efficient and effective.

Patricia Mclagan (2001: 12) has proposed the opinion that human resources development is very important. It is the integration of training, individual development, organization development and career progress development for the effectiveness of the individual, group and organization and to fulfill the organization's potential.

Kitti Boonnark (2006a: 32-35) has proposed the principles that should be applied to determine human resources management policies. These are: (1) the win-win principle, (2) the personnel need and attitude analysis principle, (3) the modernization and standardization principle, (4) the organization target consideration principle, and (5) the external environment analysis principle.

Sombat Kusumawalee (1997: 17-30) has concluded that Thai human resources management and organizations may suffer in competitive ability because Thai business organizations rely on the science from other countries that may not share the same culture and social factors. They have to correct: (1) labor deficiency both quantitative and qualitative, (2) operation system and work management system quality deficiency, (3) innovation deficiency, (4) structure and management mostly based on bureaucracy, (5) organization ability to learn for responding to the society.

Sujittra Tananun (1997: 21) has referred to human resources development according to the concept of Leonard Nadler and Zeace Nadler (1980), which states that employers must provide learning programs for their employees at the appropriate time in order to improve their work and their work progress.

Thongchai Santiwong (2003) argues that human resource management means the mission of all executives, managers and supervisors to focus on operating all activities concerning the personnel who report to them in order that the organization's personnel factor will be the effective, resulting the achievement of organization targets.

Shyh-Jer Chen (2001) has described a human resources management system which consists of: (1) compensation by performance, (2) training and (3) broadly selection affect the organization performance.

Yunxia Bai, Jiaqin Yang, Yunkui Xue and Ye Jin (2010) have found that to employ many people in a public organization does not necessarily increase labor costs because it affects a reduction in average compensation of executives and the workforce. Consequently, public organizations should plan to develop their administrations in order to obtain the better performance from their existing workforce by using the motivation mechanism based on the compensation management rather than looking to reduce employee numbers.

Ren Chang Jiang (2010) has found that reduced government intervention and marketing competition are the factors that affect the human resources management practices of: (1) redundant workforce reduction, (2) decision making power for workforce employment and laying-off, (3) executive decision making for determining bonus to workforces, and (4) workforce participation. Both factors also affect public organization performance.

Syed Akhtar, Danial Z. Ding, and Gloria L. Ge. (2008) have found that strategic human resources management practices affecting the operations of products, service and finance are: (1) training, (2), participation, (3) result-based evaluation, (4) career progress opportunity, (5) employment stability, and (6) profit allocation.

Rosemond Boohene and Ernesticia Lartey Asuinura (2011: 266-272) have found that human resources management practices concern: (1) recruitment, (2) selecting, (3) performance evaluation, (4) salary structure, and (5) training. Moreover, human resources development concern (1) recruitment, (2) selecting, and (3) performance evaluation. They both are factors that affect organization performance. They have also recommended that the management of recruitment, selecting and performance evaluation must be carried out fairly.

Abdul Hameed and Aamer Waheed (2011: 224-229) have found that organization personnel development consists of: (1) personnel learning, (2) personnel skill increment, (3) command, and (4) personnel attitude. They will be developed by coaching, training and development, job assignment, participation and delegation, which are the factors that affect organization operation and financial investment in order to develop their human resources.

Sohel Ahmad and Roger G. Schroeder (2003: 19-43) have found that human resources management practices proposed by Pfeffer (1998) are: (1) job stability, (2) new employment, (3) self management and decentralized decision making, (4) compensation by organization performance, (5) training extension, (6) workplace differentiation reduction and (7) financial information sharing barriers. They have to be applied country by country or industry by industry. They are the factors that affect workforce commitment to the organization and organization operations.

Garry A. Gelade and Mark Ivery (2003: 383-404) have found that human resources management practices which affect the organization operation in the areas of sale volume compared to the planned target, customer satisfaction, employee retaining and accounting accuracy are: (1) employee allocation level, (2) over time worked, and (3) professional development.

Malcolm G. Patterson, Michael A West, Rebecca Lawthom and Stephen Nickell (1997: 1-28) have found that: (1) employee attitude consisting of job satisfaction and organizational commitment, (2) organizational culture, (3) human resources management practices consisting of recruitment and selecting, induction, training, appraisal, skill flexibility, job variety, job responsibility and teamwork, and (4) managerial practices consisting of strategy, quality, research and development affect firm performance which concerns profitability and productivity.

Human resources management and development literature indicates that human resources are the key organizational success factor. Organizations must seriously concentrate on this area because the planning for personnel development affects performance quality, gains more revenues, reduces operating costs, increases service quality, and protects the organization. Therefore, employee knowledge and experience will be the intellectual capital that the organization can transform to higher revenues. One of the most important aspects of human resources management policy

is that it must be seen by employees to be fair. The larger the organization is, the more important human resources management is. Therefore, human resources management and development is a necessary factor to develop organization administration.

2.8 Literature Review for Marketing Management

Srisupa Sahachaisere (1994: 22-23) has explained that policy or any measure determined for government administration will focus on and give priority for the stability and wealth construction of the national economic system in order to raise the life quality level of the people. The policy determination has to significantly rely on marketing principles including public sector. Therefore, marketing will be the key mechanism or instrument to generate revenue for the nation and strengthen the national economy in order to accomplish the planned targets.

Kitti Boonnark (2006a:48-51) has explained that marketing is the knowledge to encourage executives to think of new ideas to develop customer satisfaction by the four marketing principles of price, place, promotion and products. Any administration strategies will be of no value if customers are not satisfied. So it is necessary for organization management to know and integrate marketing principles in constructing administration strategies. However, management should understand that marketing management is flexible and must be continuously reviewed according to changing circumstances.

Philip Kotler and Kevin Lane Keller (2006: 26-27) have argued that marketing plan determination is necessary to specify target markets and target customers before beginning marketing activities by using marketing principles to examine the two aspects of the marketing environment. These are the work environment (which consists of marketing intermediaries, suppliers, the public and competitors) and the general environment (which consists of economics, society and culture, politics and legal and technology). They both influence the organization operations.

Aud-urai Taechasawad (2006) has found that marketing is a part of business activity which is important in national development. Organizations should develop marketing strategies that have social responsibility and consider society welfare and happiness both at present and in the future as well as just sales. Consequently, the

business organization can satisfy target customers, earn profit for its survival, and contribute to the national economy.

Lien-Ti Bei and Cian-Fong Shang (2006) have found that liberalization of the banking and oil industry requires the government banking and oil industry to construct marketing strategies to compete, especially in the area of service quality to satisfy customers.

Douglas W. Vorhies and Niel A. Morgan (2005: 88-94) argued that marketing ability which consists of: (1) product development, (2) pricing, (3) channel management, (4) marketing communication, (5) selling, (6) marketing information management, (7) marketing planning, and (8) marketing implementation, affect organization operations. The more effective the marketing ability is, the more customers will be satisfied with the organization's service. This is necessary for the organization to be able to make a profit from its business.

Sabri Erdil, Oya Erdil and Halit Keskin (2012) argue that marketing oriented consists of: (1) collection and use of marketing information, (2) marketing-orientation development, and (3) marketing-orientation strategy implementation. These are the stimulators an organization needs to innovate so that it will be in a competitive position. It responds the customer demands and the dynamic market situation, leading to an increase in operating performance.

Kambiz Heidarzadeh, Shahnaz Nayebzadeh and Maryam Jalaly (2012: 3225-3234) have found that marketing-orientation positively affects organization innovation and results in customer loyalty for the organization. Consequently, organization performance will be increased.

Marketing management literature indicates that public sector organizations with a monopoly marketing system can suffer from lack of marketing development because there are no competitors. However, marketing management is still necessary for such organizations to improve and develop their number of customers and increase organization effectiveness to earn more revenues.

2.9 Literature Review for Operation Management

Angelo Kinicki and Brian K. Williams (2006: 35-37) have explained that operations management is to manage the operation and deliver goods or services more effectively by focusing on: (1) work schedule, (2) operation planning, (3) workplace convenience, (4) appropriateness of inventory. It is a quantitative concept that is clear enough to specify to be the required standard. It can answer questions such as: What percent of goods must be sold in order to be able to gain a profit? What are the alternatives for a manager to make the best decision?

Kitti Boonnark (2006b: 60-62) has explained that operation management is knowledge that aims to provide a planning system in order that the cost and budget will be in a suitable balance and the focus can be on maximizing the customer satisfaction. Moreover, it will help the organization to control the operation time, costs and budget.

Andre Luis de Castro Moura Duarte, Luiz Artur Ledur Brito, Luiz Carlos Di Serio and Guilherme Silveira Martins (2011: 395-411) have argued that operational practices which consist of (1) quality management (international standard organization (ISO 9000 & 14000), (2) just in time (JIT), and (3) service outsourcing affect organization performance.

Kwasi Amoako-Gyampah and Moses Acquah (2008: 575-592) have argued that manufacturing strategy which consists of cost, delivery, flexibility, and quality are the factors affect competitive strategy, cost leadership and differentiation. It has been indicated that quality only affects organization performance.

It has been indicated that operation management is necessary for organizations because they are in the business of providing goods or services. The importance is that organizations need to develop their operation management in order to gain better performance and reduce the effects to stakeholders.

2.10 Literature Review for Environmental Management

Jintana Boonbongkan (2009: 4-9) has explained that organizational environment affects organization decision making and activities. It either supports or obstructs

organization operation and can be divided into two types that are (1) the internal environment (that consists of owners and shareholders, employees, and organizational culture), and (2) the external environment (which consists of two parts: the general environment such as political influence, economic influence, technology influence, and social and cultural influence; and the work environment such as customers, competitors, suppliers, workforces, regulations and partners).

Kitti Boonnark (2006b: 67-70) has explained that environmental management is a knowledge for the organizations to monitor and realize the environmental factors surrounding them. They are external variables that are outside the control of management yet may affect business performance such as changes in the economic situation, society, politics and so on. Therefore, external environment is an important issue that executives must take into account. Organizations have to analyze and evaluate such opportunities and threats on an on-going basis.

Taweesak Sutakavathin (1994: 124-125) has argued that environment factors that change and pressure the organizations are divided into two types: (1) the macro environment (consisting of society, economics, politics, technology, and demographics) and (2) the competitive environment (consisting of competitors, suppliers, new entrants, customers and substitutes).

Michael E. Porter (1963) argues that private sector operations depend on industry competition environments called the “five competition forces model” in order for the organizations to evaluate their external environments. The forces are: (1) the threat of intense segment rivalry, (2) the bargaining power of customers/buyers, (3) the bargaining power of suppliers, (4) the threat of new entrants, and (5) the threat of substitutes.

Michael A. Hitt, J. Stewart Black and Lyman W. Porter (2005: 77-78) have argued that environmental factors that influence organizational operation consist of an external environment and working environment. It is indicated only that the external environment consists of socio-cultural, technological, economic, political-legal and global factors.

Ren Jie (2010) has found that as a member of World Trade Organization China must face international competition, specifically financial industry. Therefore, it is necessary for Chinese companies to improve their administration in order to

compete with international financial institutes. This will require developing an entrepreneur culture and strengthening national commercial banks.

Xiaohua Lin and Richard Germain (2003) have found that industry foreign direct investment affects public organizations in China and causes them to change their centralized administration to a new decentralized one, in order to compete with international investors.

Junki Kim and Hongkyou Chung (2007) have found that Korean SOE operation effectiveness is pressured by the privatization so that policy makers have to specify privatization to an organization strategy in order to keep them effectively operating.

Mike Kennerley and Andy Neely (2003: 213-229) have found that there are many changes taking place in the business environment affecting employees such as: (1) operating processes, (2) workforce skill levels, and (3) performance evaluation culture. Therefore, it is necessary to develop performance evaluation systems that consist of: (1) individual measuring as part of a measuring group for overall organization operation evaluation and (2) infrastructure to support the organization's ability to collect, cooperate, identify, analyze, forecast and distribute performance evaluation material in order to maintain organizational effectiveness.

Javier Gonzalez-Benito and Oscar Gonzalez-Benito (2002) have defined environmental pro-activity or environmental management into four areas which can positively affect organization performance. These are: (1) planning and organization practices, (2) logistics processes, (3) product design, and (4) internal production processes. They are considered in dimensions of: (1) mass operational performance, (2) lean operational performance, (3) marketing performance, and (4) financial performance. It is indicated that there is no universal model that depends on the patterns to manage the organization environment.

Environmental management literature indicates that both external and internal organizational environments affect operations to differing degrees, especially for public sector organizations. Therefore, it is necessary to learn their effects and set organizational strategies to effectively operate.

2.11 Literature Review for Satisfaction

Millet (1954: 397-400) has provided a citizen satisfaction attitude model for government services that considers: (1) equitable service, (2) timely service, (3) ample service, (4) continuous service and (5) progressive service.

Waraporn Ratchatawan (1996: 16-18) has argued the factors influencing service satisfaction that consists of: (1) the service provider satisfaction that is affected by work safety, work career growth opportunity, workplace environment, chief supervision, salary, social characteristics and individual factors, (2) customer satisfaction that is affected by service speed, customer factors, work system, service event public relation, service provider regulations, service fairness, service operator interaction and service quality.

Niyom Sriwiset (1978: 58) has found that provincial teachers were highly satisfied with the factors of responsibility, relationship between partners and chiefs, and work safety. They were moderately satisfied with work achievement, recognition, work career growth and salary. Teacher heads were slightly different, being satisfied with the factors of work career growth, work characteristics, responsibility, and work environment. The study also indicated that there was different satisfaction with recognition and responsibility factors between experiences teachers and non-experienced teachers.

Satisfaction literature indicates that human being satisfaction for any service or goods are the responses to expected demands. More or less satisfaction depends on the service effectiveness determinants that are the convenience of service, service efficiency of demands, service time and service progress.

2.12 Literature Review for Service

Siriporn Tanthipoonwinai (1995: 1) argues that service means work which makes ones satisfied and is convenient in terms of individual needs.

Chamnan Pooaim (2005: 7-8) has mentioned in relation to good service technique that SERVICE can be held to stand for S=smiling and sympathy, E=early

response, R=respective, V=voluntariness manner, I=image enhancing, C=courtesy and E=enthusiasm.

Bunjong Kanjanadun (quoted in Kris Suppanarapak, 2003: 25) has given a meaning of public service that is similar to public goods; meaning every kind of activity that public sector provides for the people to respond to their demands.

Thavorn Podsombat (quoted in Kris Suppanarapak, 2003: 26) has given the meaning of public service that means public organizations distribute public goods to the people for their better living. Government officers have to study service principles that consist of: (1) the principle of public benefit, (2) the people service principle and (3) the people service administration principle.

Service literature indicates that service is something that customers need and expect with different demands. For the public service, customers expect more than usual because it is needed by the whole. Therefore, to serve with good quality and responding to customer needs, public organizations must consider equity and fairness.

2.13 Research Conceptual Framework

Having reviewed the related literature, the conceptual framework or integrated model for this study has been developed to investigate and look at ways of developing EXAT administration such that it becomes a sustainable organization. EXAT's existing seven knowledge of management functions, its operations, and other expressway organizations both domestic and overseas are evaluated. The conceptual framework so developed is shown in Figure 2.1.

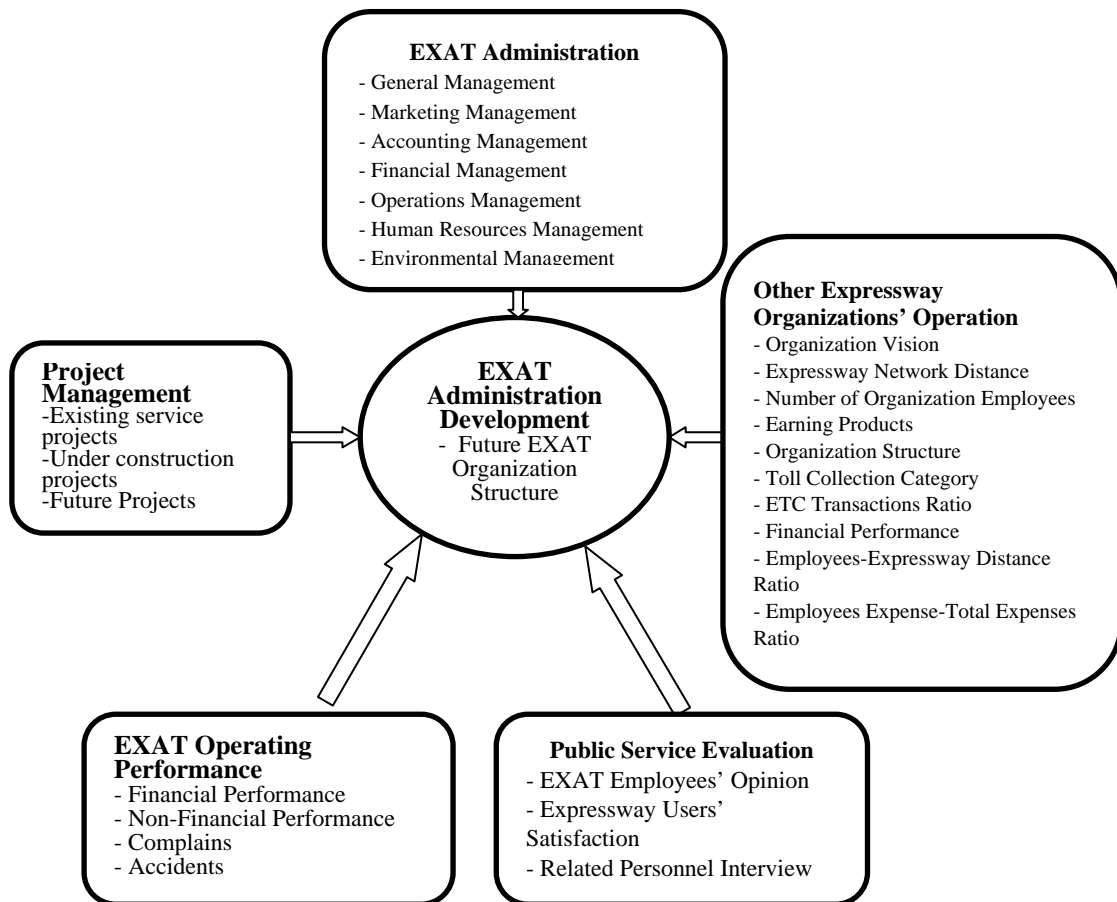


Figure 2.1 Research Conceptual Framework

2.13.1 Expressway Authority of Thailand Operation

In general both public and private organizations have involve the seven knowledge of management functions previously reviewed that consist of General Management, Marketing Management, Accounting Management, Financial Management, Operation Management, Human Resources Management and Development and Environmental Management. They will be organizational instruments so that organizations can achieve their planned targets, especially their financial ones. Before considering the results of the study, it is necessary to examine he different indicators used in assessing the knowledge of management functions for EXAT.

1) General Management

Small, medium and large organizations will all have their own unique administration system in place for accomplishing their planned targets. However, most organizations will cover the following General Management indicators;

(1) Problem Collecting and Analyzing Ability: This study examined EXAT's problem solving in relation to its ETC system (under the commercial name "EasyPass") by reviewing the minutes of meetings on ETC matters and exploring EXATs resolution activities such as data collecting, problem analyzing, solution proposing and solution implementing.

(2) Planning Ability: This was assessed by reviewing planning meeting minutes and reviewing the planning manual including related regulations. The expected data was the planner experience and ability, the completeness of planning data, the appropriateness of time spent in planning, and performance evaluation compared to the plan.

(3) Commanding Ability: This study focused on the suitability of ordering types, the clearness of ordering and the suitability of ordering time. The information was obtained from the questionnaires for EXAT employees.

(4) Monitoring and Evaluating Ability: This study focused on budgeting management by exploring minutes of budget meetings to identify the appropriateness of target identifying, the stages and methods employed, the regularity and suitability of monitoring and evaluating, the reporting presentation and process, and executive responses.

As indicated above, the General Management indicator for Commanding Ability was measured through EXAT employee opinions in the questionnaires.

For expressway users both individual and enterprise, this study measured satisfaction with EXAT General Management by focusing on: (1) problem collecting and analyzing ability by exploring the indicators of problem solving variety, problem solving accuracy, problem solving speed, and personal and instrument readiness for problem solving. The information mentioned, was obtained by interviewing road users who complained about the ETC system in order to identify their level of satisfaction with the said indicators; (2) communication ability by seeking road users views on the accuracy of guide sign position, the brightness of guide signs, the clearness of words provided on guide signs, and the number of guide signs installed. This information was obtained by analyzing the questionnaires; (3) participation by focusing on existing organizational responsibility activities including channels provided for complaints and recommendations. This information was obtained by analyzing the questionnaires.

2) Marketing Management

Marketing management is another necessary instrument to administer organizations. This is not only the case in the private sector but also in the public sector, even though public sector organizations are often monopolies. This is because goods and service produced by both sectors must respond to customer demands in order for the organization to be sustainable. The critical objective of marketing management for both the private and public sectors is to satisfy customer requirements by implementing the four marketing management principles of price, place, promotion and products. For this study of EXAT administration development, the marketing management function was assessed through the questionnaires. The indicators selected for each principle were (1) Price: For EXAT employees, the price indicators were the toll rate, the suitability of toll rate adjustment, and the worthiness of paid toll. In case of expressway users, the price indicators were the types of toll payment, obtained service compared to paid toll, and suitability of toll rate adjustment. (2) Place: For both employees and road users, the place indicators were the customer convenience regardless of MTC or ETC, the possibility for future extension of the existing ETC channel, and the development frequency to response the social change and marketing research. (3) Promotion: For employees and road users, the promotion indicators were media selection, understandable communication content, advertising frequency, advertising time, benefit received relative to cost, advertising continuity and advertising ethics. (4) Products: For employees and road users, the product indicators were satisfaction with the existing expressway network, other products, the need for network extension, continuity of product development, and care of the environment.

3) Accounting Management

Every organization's transactions and costs during a financial year are recorded so that the organization can know its operating performance and analyze the organization opportunities and threats from the accounting entries. The more suitable the accounting indicators that an organization employs, the more effective information it will obtain. In other words, an organization cannot receive the correct information if their accounting systems are ineffective, and this could be fatal to the future of the company. This study examined the accounting management functions of

EXAT by focusing on the accounting standards applied and information from organization annual reports and the organization accounting system by using the indicators of appropriateness of the number of employed documents, convenience and ease of use of documents, quality of the internal accounting control system and the accounting manual. The information was obtained by interviewing accounting and audit officers.

Management accounting was studied using the indicators of (1) probability to develop accounting information obtained from general accounting, (2) ability to practical management from the obtained information, (3) ability to represent future potential.

Cost accounting was studied using the indicators of (1) adequacy and appropriateness of cost accounting documents (2) employing accurate cost accounting theory (3) existing analyzed items and cost evaluation.

Auditing was studied using the indicators of (1) audit reporting level, (2) audit schedule consistency with audited issues, and (3) developing and adopting audited report in order to increase organization effectiveness.

4) Financial Management

This is also another important instrument for organizations to assess their strength and weakness because every organization may have to face a financial crisis. If an organization does not have financial knowledge and a good financial reporting system, it may miss essential alarms and find that it has an economic crisis caused by ineffective financial management.

The main principles financial of management which every organization must have and the indicators used in this study to assess them are: (1) The financing and accounting association (the consistency between financial documents and the accounting model) and the accounting knowledge of existing accounting personnel. This was examined by interviewing accounting officers. (2) Financial warning sign monitoring systems such as financial ratio analysis reports and cost analysis reports. These were examined by investigating existing financial reports and (3) an effective budgeting system involving executive participation and systematic budgeting stages and follow-up monitoring, assessing and reviewing. This was examined by reviewing the budgeting manual and regulations.

5) Operations Management

The indicators for operations management were obtained from EXAT employee and road user satisfaction with (1) expressway network distance, (2) existing service expressway directions, (3) guide signs installed on expressway by considering the clearness of guideline sentences and (4) toll booth numbers. This information was obtained from the questionnaires. For road users, the number of service steps, speed of each service step, number of service documents, ease of completing the document and flexibility of service were also determined from the questionnaires.

6) Human Resources Management and Development

It can be said that the most key success factor to drive the businesses to accomplish its targets is human resources because every organizational activity must involve a human being. Therefore, human resources management and development could be said to be the most important management function for a business. The more effective an organization's employees are, the more success the organizations will have. Organizational human resources management and development principles which must be considered are: (1) Recruitment time and the fairness of the recruitment process; (2) The staff orientation process; (3) Probation and discipline procedures; (4) Wage structure management & compensation including welfare, the consistency of salary structure to job position and the difference of salary structure compared to other organization in the same industry; (5) Performance assessment, organization performance procedure credibility and fairness and clearness of performance assessment procedure; (6) Knowledge development, by considering the training planning appropriateness, appropriateness of training duration, consistence of training program and organization needs, program evaluation and monitoring after training; and (7) procedure of disciplinary punishment, punishment system clearness and communicating to organization staffs, practical punishment system and punishment fairness. To be effective organizations, they have to continuously monitor the indicators previously specified to consistent with the said principles. All of the above indicators were assessed from the questionnaires.

For expressway users' satisfaction, there were additional questions asked in order to know service officers' quality that consists of intention and caution,

interaction, service behavior and recommendation. Additionally, questionnaires provided more information about (1) officer groups that needed to be improved and (2) officer behavior that needed to be improved.

7) Environmental management

Organizational operations will experience the effects from either the internal or external environment that is difficult to predict. They can be opportunities or threats, and therefore organizations have to manage their environment by using risk management instruments which analyze environmental characteristics that affect organization operations and then specify strategies to deal with them. Effective risk management has to cover economics, society, politics, science and technology, culture, legal, competitors and critical environmental situation. They were investigated in EXAT by examining the risk management manual and reports.

The seven-knowledge of management functions previously mentioned are the important instruments that help organizations to develop competitive strategies to operate effectively. The more competitive the strategies are, the better the organization's performance. Both quantitative and qualitative indicators have to be closely monitored because they will affect the organizational performances.

2.13.2 EXAT Project Management

Additionally, this study also proposes another variation, EXAT project management, by considering EXAT existing service projects, projects under construction, and future planned projects.

2.13.3 Expressway Authority of Thailand Performance

Organizational quantitative indicators resulting from EXAT operation can be represented not only in a financial perspective that consists of net profit, debt-equity ratio, return on total asset, annual revenue, total expense-revenue ratio, personnel expense-total expense ratio, EBITDA, revenue remittance ratio, expressway distance prolongation, total expressway user number, ETC users ratio but also in a non-financial perspective by measuring accident statistics and complaint statistics.

2.13.4 Public Service Evaluation

For quantitative indicators, stakeholders that can be classified into internal stakeholders (organization employees) and external stakeholders (expressway users both individual and enterprise). Firstly, employees' satisfaction is an important factor for organizations because if they are not satisfied, they will not commit to the organization resulting in ineffective performance. In other words, if employees are satisfied with their work environments such as providing safe workplaces and so on, they will be inspired to commit to their organizations resulting in more effective work. Organization employees' satisfaction and commitment result in effective performances. When operating performances are effective, the organizations will be sustainable. It is essential that organizations examine employees' satisfaction indicators that consist of: (1) organizational communication, (2) organizational structure, (3) employee recruitment, (4) employee development, (5) organizational regulation and legal, (6) performance assessment, (7) welfare and compensation, (8) work environment, (9) working stages, (10) fairness of feat system and (11) punishment system fairness. All indicators previously specified were obtained from employee questionnaires.

Regarding external stakeholders, individual expressway users and enterprise expressway users have some differences in their needs. Individual road users want simply to travel to their destinations while enterprise road users need to transport goods or service to their required destinations in the most efficient way. Because of their different anticipations, it is necessary to measure the indicators according to their demands. EXAT has to make individual expressway users satisfied with (1) the politeness of service employee, (2) speed of toll collection, (3) time duration to enter expressway, (4) available time of rescue team to accident place, clearness on expressway (5) expressway guide sign precision, (6) safety on expressway, (7) traffic situation communication to expressway users, (8) frequency of toll discount and (9) expressway routes to payless. For enterprise expressway users, EXAT also has to make them satisfied with different expectations so that there are more indicators that are: (1) complaint procedure, (2) time for complaint resolution, (3) both existing and future expressway routes, (4) speed of providing financial document (5) channels to top up ETC toll, (6) rules and regulations on expressways and (7) traffic

communication on expressway. The satisfaction levels in relation to all of the above questions have been obtained from the questionnaires.

2.13.5 Domestic and Overseas Toll Road Organizations' Performance

This study considers some characteristics of other expressway organizations both local and overseas. These consist of (1) organization vision, (2) total service network distance, (3) total number of staff, (4) average growth rate of expressway network, (5) types of earning product, (6) organization structure, (7) types of toll collection, (8) ratio of electronic toll collections to total toll collections, (9) financial performance, (10) ratio of employee numbers to expressway distances, (11) employee expenses to total revenue ratio.

The other organizations' characteristics previously specified provide supporting information in order to propose a future management structure including competitive strategies for EXAT administration development.

Using the conceptual framework in Figure 2.1, EXAT operations have been studied in relation to the seven-knowledge of management functions in order to know its employees' opinion and expressway users' satisfaction. The other areas outlined in the conceptual framework have also been evaluated and, having obtained this information, the administration structure for EXAT administration development can be proposed by considering the supporting information from other expressway organizations. The proposed administration structure will not only cause EXAT employees to be satisfied but also expressway users. The satisfaction results obtained from EXAT employees and expressway users show that there is an existing level of loyalty to EXAT service. Consequently, organizational support will continuously grow and lead to a sustainable organization. The next chapter will discuss the methodology to be employed in this study for both quantitative and qualitative researches.

CHAPTER 3

RESEARCH METHODOLOGY

The previous chapter reviews the relevant domestic and international literature enabling the construction of the conceptual framework. This chapter will present the research methodology by applying both the quantitative research and to be more complete study, the additional qualitative research shall be taken. The chapter will identify the details of the Research Process, Research Design, Research Population and Sampling Technique, Research Instruments, the pre-test for validity and reliability of the designed questionnaires or instruments, Data Collection, Data Processing and lastly the statistical analysis to be employed in this research.

3.1 Research Process

The process of this research commences with an investigation within EXAT of seven knowledge of management functions which have been determined from the literature that has been reviewed. These are: General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management. At the same time, it also reviews the management of several domestic and overseas expressway authorities in order to obtain supporting information to propose changes to the administration structure. It is important to identify how these are dissimilar so EXAT is able to apply the information to the service processes in order to determine ways to become more effective. Having surveyed the seven kinds of management earlier mentioned, strategies shall be proposed which will make EXAT employees more satisfied, resulting in more efficient authority performance and finally, more customer satisfaction. Employee and customer satisfaction are seen as key indexes for the authority achieving its objectives.

3.2 Research Design

This study is non-experimental research using not only the primary data but also secondary data. The primary data has been collected by employing questionnaires which have been tested for content validity and reliability before distribution to random samples. Moreover, in-depth interviews of EXAT employees, expressway users (both individual and enterprise), an EXAT Board member and a Deputy Governor were also conducted in order to make the research more complete. The secondary data was collected from relevant documents. For EXAT, this comprised annual reports, performance assessment reports provided by TRIS, relevant operation manuals, significant meeting reports and relevant academic articles in both Thai and English. For the overseas expressway authorities, annual reports were reviewed. The collected data, both primary and secondary, was used in order to assess EXAT's performance in relation to the seven knowledge of management functions in the General Administration area of the Conceptual Framework, as well as to develop a more effective organizational management structure for EXAT.

3.3 Research Population and Sampling Technique

One of the most important factors in research that involves sampling is to ensure that the samples employed are the population representative; the more the sample characteristics are representative of population, the more accurate the research result will be.

3.3.1 Population

In this study, the research population consists of three groups: EXAT employees, individual expressway users, and enterprise (business) expressway users. The first group, EXAT employees, at present total around 5,077 (permanent staff 4,526 and temporary staff 551, recorded in May, 2013). These are divided into levels from level 1 to level 11. In relation to the second group, individual expressway users, there is a daily average of around 1.3 million transactions entering the expressway network. In relation to the third group, the enterprise expressway users who transport

their customer goods and services through EXAT network, 800 are currently registered with EXAT. The samples will be random from all three groups in order to collect the primary data and consequently to further analyze the research results. This study involves two types of analysis unit; individuals (EXAT employees as well as individual expressway users) and organizations (business firms registered with EXAT, especially the logistics and transportation companies).

3.3.2 Sampling Technique

This research employed the Yamane formula to determine the sample size by using the following equation;

$$n = \frac{N}{1 + Ne^2}$$

n = sample size
 N = research population size
 e = deviation value (0.05)

Additionally, the study simultaneously considered the size of sample suggested by W. Laurence Nueman (quoted in Pichit Pitaktepsombat, 2007: 255), which can be seen in Table 3.1. Neuman concluded that a sample size of 2,500 is large enough regardless of how large the population.

Table 3.1 Population Size and the Sample Percentages According to Nueman

Population size	Sample percentage (%)
Less than 1,000	30.0
1,000 to 10,000	20.0
10,000 to 150,000	10.0
150,000 to 10 million	1.0
More than 10 million	0.025

One part of our research population is expressway staff, which is classified internally into 11 management levels. For the sake to this study the 11 levels were divided into three groups: Medium and High Level Executives (Level 8 and above - 68 individuals), Low Level Executives (Level 7 - 172 individuals) and Operational

Staff (Levels 1-6 - 4,286 individuals). The sample size for each group was determined by firstly calculating the sample size for the total staff by using the Yamane formula, and then proportioning this according to the relative size of the group. Having obtained the sample numbers for each group, questionnaires were distributed on a simple random basis. Similar methodology was applied in identifying sample sizes and distributing questionnaires to individual and enterprise expressway users.

In order to make the research more complete, in-depth interviews were also conducted with 10 EXAT employees, 25 expressway users (both individual and enterprise), an EXAT Board member and a Deputy Governor.

3.3.3 Research Instruments

This study employs both structured and semi-structured questionnaires in order to collect the primary data from authority employees, individual expressway users and enterprise expressway users. The information obtained is beneficial to the study since it will provide opinions and other information in relation to the seven knowledge of management functions in the General Administration area of the Conceptual Framework. This will assist in determining whether EXAT's current management is seen to be effective and efficient.

There were three stages of questionnaire construction. Firstly, the questionnaire drafts for each of the three groups (authority staff, individual expressway users and enterprise expressway users) were prepared according to the reviewed literature.

Secondly, the drafts were reviewed especially for content validity by 2 EXAT executives and 2 independent scholars. They were modified according to the recommendations and then made ready for pre-test in order to ensure that they were effective instruments before distribution.

The questionnaires were tested for content validity and reliability by distributing them to 30-40 test respondents outside the sample group. The Cronbach's Alpha was employed to check that the responses from the test group were reliable. In order to be acceptable the Cronbach alpha (α) were required to be 0.8 or more.

Besides the questionnaires for the quantitative research, this study also prepared semi-structured questionnaires in order to collect in-depth qualitative information from EXAT staff, individual expressway users, enterprise expressway users, an EXAT Board Member and a Deputy Governor.

3.3.4 Measurement Level

In the quantitative analysis of the different authorities, there are many dimensions (such as business profit and loss, expressway distance, etc.) that are best measured using a ratio scale.

In the quantitative analysis of the satisfaction levels (of authority employees and individual and enterprise expressway users), an ordinal level five item Likert scale was used. The scale items are: five (5) “most satisfied”, four (4) “much satisfied”, three (3) “satisfied”, two (2) “not satisfied” and one (1) “least satisfied”.

The seven knowledge of management functions were also gauged using an ordinal level five item Likert scale, the scale items being: five (5) “strongly agree”, four (4) “agree”, three (3) “undecided”, two (2) “disagree” and one (1) “strongly disagree”.

Lastly, for the demographic data: sex is a nominal scale, measured in terms of male and female; age is a ratio scale, measuring in terms of years; working position is an ordinal scale, measured in terms of the three employee groups (medium & high level executives, low level executives, operational staff); working duration is a ratio scale, measuring in terms of years.

3.3.5 Measurement Indicators

Each questionnaire was divided into four sections of which section 3 was the most important as it collected the primary data from the respondents covering the seven knowledge of management functions. Each administration function was represented by one or more indicators in order to be practically measured.

3.3.5.1 Employee Indicators

For the General Management function, the three indicators examined were EXAT’s problem resolution ability, its planning ability, and its monitoring and evaluating ability. The problem resolution process was assessed by reviewing the minutes of meetings held following road user complaints in relation to the recently introduced electrical toll collection system (Easy Pass). The investigation reviewed the processes of identifying the problems, collecting information, analyzing the situation, and correcting the problems. Planning ability was assessed by searching the minutes of planning meetings, the planning manual, and other relevant documentation.

The investigation reviewed planner experience and ability, the collection of planning data, the time spent in planning, and the implementation and performance of planning. Monitoring and evaluating ability was assessed by reviewing meeting minutes for discussion about identifying and considering the appropriateness of targets, the stages, methods employed and regularity of monitoring and reporting on them, and the executive responses to review reports.

For the Accounting Management function, the accounting manual and relevant accounting documents were reviewed in order to ensure that the required working documents were maintained, that the audit system was transparent, and that any recommendations contained in audit reports were properly responded to by management. Additionally, the financial qualifications and knowledge of accounting officers was reviewed from recruiting documents, and the budgeting and planning and monthly financial reporting processes were reviewed from relevant reports and documents.

Table 3.2 exhibits the indicators and data sources for employees so that the study can examine their attitudes and verify their level of satisfaction with both overall authority management and the following knowledge of management functions: General Management, Marketing Management, Human Resources Management and Development and Environmental Management.

Table 3.2 Indicators and Data Sources of EXAT Employee Questionnaire

Item No.	Indicators	Sources of Data
General Management		
Problem Resolution Ability		
1	Accurately and completely problem collecting.	Minutes of meeting of easy pass resolution.
2	Stages of systematically problem analyzing.	
3	Invariably resolution explaining.	
4	Accurate and practical resolution.	

Table 3.2 (Continued)

Item No.	Indicators	Sources of Data
General Management		
Problem Resolution Ability		
1	Accurately and completely problem collecting.	Minutes of meeting of easy pass resolution.
2	Stages of systematically problem analyzing.	
3	Invariably resolution explaining.	
4	Accurate and practical resolution.	
Planning Ability		
5	Planner capability and expertise.	Minutes of meeting for planning, planning manual and relevance regulation.
6	Systematically and completely data collecting.	
7	The completion of data in planning.	
8	The appropriateness of period of time in	
9	planning	
10	Organization performance and assessment.	
Marketing Management		
Price		
11	The appropriateness of toll	Question No. 5
12	Toll adjustment	Question No. 6-7
Place		
13	The suitability of toll collection systems	Question No. 8-10
14	Efficiency of toll collection systems	Question No. 12-16
Promotion		
15	The appropriateness of public relations	Question No. 17-19
16	Public relations quality	Question No. 20
17	Promotion approaches	Question No. 21-22
Products		
18	Product types to earn revenue	Question No. 23
19	Requirements of product increment	Question No. 25

Table 3.2 (Continued)

Item No.	Indicators	Sources of Data
Human Resources Management and Development		
20	Recruitment system	Question No. 35-36
21	Orientation system	Question No. 37 and relevant meeting minutes.
22	Performance evaluation system	Question No. 38-39
23	Human resources development system	Question No. 40-42
24	Penalty or punishment system	Question No. 43-44
25	Salary structure and welfare	Question No. 45
Environmental Management		
26	The environmental management processes	Question No. 46-49, review risk management processes and relevance cabinet resolutions

3.3.5.2 Individual Road User Indicators

For the General Management function, the indicators examined were EXAT's problem resolution ability, expressway communication ability, and its social responsibility. The problem resolution ability was assessed by conducting a telephone interview with expressway users who had complained to or asked for information from the EXAT 1543 call center. The survey only applied to those callers who had left their telephone number. Data was collected in relation to the nature of the problem / enquiry, the speed and accuracy of the response, and the readiness of EXAT personnel & equipment to deal with the issue. The expressway communication ability was assessed by reviewing customer satisfaction with the clarity of the guide signs installed on expressways. Social responsibility assessed EXAT's treatment of people living adjacent to expressways by reviewing construction contract documents.

For the Operations Management function, the electronic toll collection (ETC) service was assessed by interviewing road users who had complained in order

to acquire information about the suitability of the service stages, the document number used, the speed of each service stage, and the quality of the service documents.

Table 3.3 exhibits the indicators and data sources for the individual expressway users so that the study can verify their level of satisfaction with EXAT's current handling of the following knowledge of management functions: General Management, Marketing Management, Financial Management, Operations Management, Human Resources Management & Development and Environmental Management.

Table 3.3 Indicators and Data Sources of Individual Expressway User Questionnaire

Item No.	Indicators	Source of Data
General Management		
Problem Resolution Ability		
1	Varieties of problem solving.	Telephone interviewing of complainants according to the EasyPass resolution.
2	Problem solving quality.	
3	Readiness of problem solving.	
Expressway Communication Ability		
4	The quality of expressway guide signs.	Question No. 1-5
Social Responsibility		
5	Participation channel providing.	Question No. 6-7
6	Activities for corporate social responsibility.	Question No. 8
Marketing Management		
Price		
7	The appropriateness of toll rate.	Question No. 9-11
8	Toll rate and its adjustment.	Question No. 12-13
Place		
9	Suitability of toll collection & top up systems.	Question No. 14-17
10	The toll collection system development.	Question No. 18
Promotion		
11	Public relations quality.	Question No. 19-21

Table 3.3 (Continued)

Item No.	Indicators	Source of Data
12	Promotion approaches.	Question No. 22-23
	Products	Question No. 24-25
13	The current product types.	Question No. 26
14	Requirements of product increment.	Question No. 27
15	Concerning to the environment.	
	Financial Management	Question No. 28
16	The benefit obtained from the service.	
	Operations Management	Question No. 29-31
17	Quality of service processes.	Question No. 32-34
18	The existing service network.	Question No. 35-38
19	The operating system quality.	
	Human Resources Management and Development	Question No. 39-43
20	The quality of employee service.	Question No. 44-47
21	Requirements of service employee development	
	Environmental Management	Question No. 48-50
22	The environmental management processes	

3.3.5.3 Enterprise Road User Indicators

For the General Management function, the indicators examined were EXAT's problem resolution ability, expressway communication ability, and its participation suitability. The problem resolution ability was assessed by conducting a telephone interview with expressway users who had complained to or asked for information from the EXAT 1543 call center. The survey only applied to those callers who had left their telephone number. Data was collected in relation to the nature of the problem / enquiry, the speed and accuracy of the response, and the readiness of EXAT personnel & equipment to deal with the issue. The expressway communication ability was assessed by reviewing customer satisfaction with the clarity of the guide

signs installed on expressways. Social responsibility assessed EXAT's treatment of people living adjacent to expressways by reviewing construction contract documents.

For the Operations Management function, the electronic toll collection (ETC) service was assessed by interviewing road users who had complained in order to acquire information about the suitability of the service stages, the document number used, the speed of each service stage, and the quality of the service documents.

Table 3.4 exhibits the indicators and data sources for the enterprise expressway users so that the study can verify their level of satisfaction with EXAT's current handling of the following knowledge of management functions: General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management & Development and Environmental Management.

Table 3.4 Indicators and Data Sources of Enterprise Expressway User Questionnaire

Item No.	Indicators	Source of Data
	Management	Telephone interviewing the complainers according to the Easy Pass resolution.
	Problem Resolution Ability	
1	Variety of problem solving.	
2	Quality of problem solving.	
3	Readiness for problem solving.	Question No. 1-5
	Expressway Communication Ability	
4	The quality of expressway guide signs.	Question No. 6-7, 9
	Participation Suitability	Question No. 8
5	Channels provided for participating.	
6	Participation activities.	
	Marketing Management	Question No. 10-12
	Price	Question No. 13-14
7	Quality of collection and toll top up systems	
8	Toll rate and its toll adjustment	Question No. 15-18

Table 3.4 (Continued)

Item No.	Indicators	Source of Data
	Place	Question No. 19-20
9	Suitability of toll collection & top up systems	
10	The toll collection system development	Question No. 21-24
	Promotion	Question No. 25-26
11	Public relations quality	
12	Promotion approaches	Question No. 27-28
	Products	Question No. 29
13	The existing service product types	Question No. 30
14	Requirement of product increment	
15	Concerning to the environment	Question No. 31
	Financial Management	
16	The benefit from the service	Question No. 32-34
	Production Management	Question No. 35-37
17	Quality of service.	Question No. 38-42
18	The existing service networks.	
19	The quality of operating system.	
	Human Resources Management and Development	Question No. 43-48
20	The quality of service employees.	Question No. 49-52
21	The requirements of service employee development.	
	Environmental Management	
22	The environmental management processes	Question No. 52-54

Besides the indicators previously mentioned, this study also investigated aspects of 7 overseas expressway authorities covering 4 continents consisting of: Bangkok Expressway Company (Thailand), Central Nippon Expressway Company (Japan), Hopewell Highway Infrastructure (China), Queensland Motorways (Australia),

The Highways Agency (United Kingdom), The South African National Road Agency (South Africa), and The Motorway Company (Slovenia). This is so that the study will be more complete as the information collected in relation to these organizations will provide further evidence to support the proposed organization structure model.

3.3.6 Data Collection

The pre-tested and modified questionnaires were distributed to the designated samples: EXAT employees, individual expressway users and enterprise expressway users. The identified samples were asked to return the questionnaires within three weeks in order to control the study schedule and during that time they were kept in contact with in order to resolve any unclear questionnaire items.

3.3.7 Data Processing

Once processed, the results from the collected data were analyzed and presented in descriptive pattern based on the theories and conceptual framework identified in Chapter 2.

Additionally, this research also concerned the service behavior of EXAT employees from observation on duty. The observed information was examined for consistency with the processed data and the results will be explained in descriptive terms with the statistical figures in order to support the research conclusion.

Due to the research time limitations, simple statistical values, for instance, percentage, mean and standard deviation, will be used to interpret the data from the questionnaires. The computer program SPSS (version 15.0) was employed to estimate the statistical values.

The questionnaires will be compiled within the time frame and then investigate their perfectiveness. The gathered data shall be coded and reviewed again before applying the SPSS program in order to guarantee that the outcome will be reliable.

3.3.8 Statistical Analysis

The statistical analysis for this research is descriptive statistics and simply measures the statistical figures of the samples of EXAT employees, individual and

enterprise expressway users, which are percentage, mean and variance of the surveyed samples.

This chapter has presented the research methodology for the study to obtain the primary and secondary data for analyzing the current EXAT operations including the other domestic and overseas expressway authorities. All results obtaining from the said research will be displayed in chapter 5.

CHAPTER 4

DATA ANALYSIS AND STUDIED RESULTS

The previous chapter dealt with the stages of research methodology in order to pick up the primary data from EXAT employees and the road users by structured and semi-structured questionnaires and the secondary data from the annual reports of other domestic and overseas expressway authorities. This chapter will provide the details of EXAT operation, the results from the questionnaires and interviews, the results of the analysis and interpretation.

4.1 The Operation of Expressway Authority of Thailand

4.1.1 Vision, Mission, Goals and Value Statement

EXAT's Vision is:

“Choice of value, advanced development, and care for environment”.

The EXAT Mission Statement is:

- 1) To provide/develop/improve the expressway system in line with the standard and safety;
- 2) To provide innovate and value-added services;
- 3) To manage assets with proficiency to enhance potentials of expressway business and benefits for society; and
- 4) To develop the administrative management and investment systems to increase value for the organization.”

EXAT's Organizational Goals are:

- 1) The expressways and assets are exercised to their full capacity and with safety;
- 2) The services have quality and are trusted by the people;
- 3) The business performances grow with stability and yield appropriate profits.

EXAT's Value Statement is:

“Excellence service, visionary innovations and flawless image”. (EXAT CSR Report, 2012)

4.1.2 Manpower

EXAT's business is in the transport sector of the service industry. Its major operating cost is the personnel expense so it is necessary to effectively manage the workforces in order to achieve performance targets and maintain employees' morale and spirit. As in any service businesses, human resources management is the key to the organization successfully fulfilling its vision.

At the present, the EXAT organization structure can be classified as large, centralized and mechanistic. It operates quite formally and demonstrates the typical characteristics of a monopoly business, employing the “defender” strategy for its administration. There are 5 Deputy Governors, with responsibility for the fields of management, technical services, legal services and land acquisition, construction and maintenance, and operation. These areas of responsibility do not cover all aspects of the authority's operations, requiring individual executives to sometimes take action to modify the management and administrative structure to deal with changes in the environment. This has led to work overlap between divisions and sections, and left some work for which no division or section feels responsibility. Additionally, work allocations are often not consistent with department job descriptions.

As at May 9, 2013, there are 5,077 employees working in EXAT. These comprised 4,526 permanent staff and 551 temporary staff. The retirement figure in 2013 was 4% of the workforce. The workforce has been classified in terms of education, working position and working level in Tables 4.1 and 4.2.

Table 4.1 Manpower Ratios According to Working Position

Working position	Percentage	Working position	Percentages
Engineer	3.27	Toll collection controller	6.63
Architect	0.11	Toll collector	29.28

Table 4.1 (Continued)

Working position	Percentage	Working position	Percentages
Management officer	1.02	Technician	9.41
General management officer	3.65	Assistant technician	0.04
Economist	0.11	Traffic officer	7.07
Lawyer	2.65	Rescue officer	4.02
Accounting officer	0.49	Secretary	0.40
Financial officer	1.35	Clerical officer	7.29
Budget analyst	0.24	Typist	0.02
Purchasing officer	0.71	Operator	1.57
Auditor	1.37	Car driver	0.71
Administrative officer	3.16	Office boy	0.27
Personnel	1.19	Labor chief	0.04
Public relations officer	0.11	Labor	1.06
Chief of toll collector	12.35	Janitor	0.40

Source: Expressway Authority of Thailand, 2013.

It can be seen from Table 4.1 that toll collection (Chief of toll collector, toll collector controller and toll collector) accounts for 48.26% of the full-time workforce. This shows that at present toll collection is a labor intensive function. Therefore, it is necessary to manage toll collection employees carefully to avoid problems in operation. This reliance on manual toll collection is a threat that EXAT must address.

Table 4.2 Manpower Ratios According to Education Qualification and Working Level

Education qualification	Percentage	Working level	Percentage
Elementary	2.14	Level 1	0.22
Junior high school	1.70	Level 2	9.52
Senior high school	37.30	Level 3	35.82

Table 4.2 (Continued)

Education qualification	Percentage	Working level	Percentage
Vocational certificate	25.41	Level 4	9.92
High vocational certificate	13.43	Level 5	27.25
Diploma	0.22	Level 6	11.82
Lower than bachelor degree	80.20	Level 7	3.80
Bachelor degree	17.37	Level 8	1.13
Master degree	2.36	Level 9	0.29
Doctoral degree	0.07	Level 10	0.00
Bachelor degree or above	19.80	Level 11	0.09

Source: Expressway Authority of Thailand, 2013.

The manpower ratios by working level in Table 4.2 can be summarized as follows:

Operating Staff	(level 1-6)	94.70%
Low Level Executives	(level 7)	3.80%
Mid Level Executives	(level 8-9)	1.24%
High Level Executives	(level 10-11)	0.09%

As well as demonstrating that EXAT is a labor intensive organization, these figures show that it has a relatively flat organization structure. Organizations such as this are very sensitive to management communication problems, which makes it very important for Human Resources Management and Development to focus on this area.

4.1.3 Project Management

4.1.3.1 Present Expressway Networks

EXAT is the organization which focuses on effectively operating its services with quality, particularly, the traffic resolution in Bangkok areas and vicinity based on good governance, business potential and society and environment responsibilities. At present, expressways are open to service 7 routes with the total distance 207.9 kilometers and 3 interchanges (details exhibit in Fig. A2) covering Bangkok areas and its vicinity. They consist of:

- 1) The Chaloem Maha Nakhon expressway which is 27.1 kilometers long and opened during 1981-1987;
- 2) The Si Rat expressway which is 38.4 kilometers long and opened during 1993-1998;
- 3) The Chalong Rat expressway which is 28.2 kilometers long and opened in 1996;
- 4) The BuraphaWithi expressway which is 55 kilometers long and opened during 1998-2000;
- 5) The Udon Rathaya expressway which is 32 kilometers long and opened during 1998-1999;
- 6) The At Narong-Ram Intra expressway which is 4.7 kilometers long and opened in 2000; and
- 7) The Kanjanaphisek expressway which is 22.5 kilometers long and opened in 2009.

In 2009 there were 1,242,323 daily transactions through EXAT networks and the daily revenue was \$US 1.522 million (\$US 1=30 THB).

4.1.3.2 Expressway Projects under Construction

At this time EXAT has two projects which are under construction (see details in Appendix A, Figure A.3). The first is the Si Rat-Outer Ring Road which will be 16.7 kilometers long and is being implemented by the private sector in accordance with the Private Investment in State Undertaking Act 2013 (PPP Act) and it is expected to open to traffic in 2016. The second project is on-off ramps of the Chaloem Maha Nakhon expressway which is an EXAT project to increase road user convenience and expected to open to the traffic in 2014. When these projects are completed, EXAT will have operating networks with a total distance 223.9 kilometers compared with the present 207.9 kilometers.

EXAT has been operating for 41 years since its establishment in 1972. Its current service network of 207.9 kilometers represents an average growth of just 5.6 kilometers a year which appears quite unsatisfactory.

In 2007 the government passed the EXAT Act in an effort to give the authority more flexibility to operate its business. Importantly, a recent traffic movement study shows that there are more than 10 million vehicle journeys in

Bangkok and vicinity a day but the daily average traffic on EXAT expressways is only about 1.4 million transactions. So it is a substantial challenge for EXAT to develop its administration in order to attract people to increasingly use its expressways.

4.1.3.3 Future Expressway Projects

EXAT has done the feasibility studies for the following seven projects (see detail in Appendix A, Figure A.4):

- 1) The third stage expressway section N₁, N₂ and N₃ which is 40.9 kilometers long;
- 2) The Dao Kanong-West Outer Ring Road and Outer Ring Road section-Pakto expressway which is 83.8 kilometers long;
- 3) The Si Rat-Dao Kanong expressway which is 6.1 kilometers long;
- 4) The Burapha Withi-Pattaya expressway which is 57 kilometers long;
- 5) The Udon Rattaya-Ayutthaya expressway which is 35 kilometers long;
- 6) The Chalong Rat-SaraBuri expressway which is 63 kilometers long; and
- 7) The Katoo-PaTong expressway in Puket Province which is 3.07 kilometers long.

With these projects, EXAT can increase its service networks by 288.87 resulting in a total expressway network of 513.47 kilometers.

It has been seen that the EXAT future projects consist of the expressway extension not only in Bangkok and vicinity but also in outlying provinces. EXAT's administration must be developed to be capable of such growth and managing a nationwide business.

The expansion process will be supported by the EXAT Act 2007 which allows the authority to operate more flexibly and allows it to establish subsidiary companies to search for private sector investment, as well as the Private Investment in State Undertaking Act 2013 (PPP Act) which provides another tool private sector investment.

4.1.4 2012 Performance Assessment

As a State-Owned Enterprise (SOE), EXAT must comply with the requirements of the State Enterprise Policy Office (SEPO), a Division of the Ministry of Finance. Each year, the SEPO employs Thai Rating Information System (TRIS) to evaluate the overall performance of SOEs'. The most recent TRIS evaluation of EXAT was for the 2012 budget year. The weighted average result was 4.4043 from a 5.000-point scale. The assessed details are shown in Table 4.3

Table 4.3 TRIS Assessment of EXAT Performance for Budget Year 2012

Evaluation criterion	Percentage	Rated points
1. Operation in accordance with policies	23	4.3881
2. Operating performance	42	4.6102
3. Organization administration	35	4.1679
Roles of board members	6	3.8059
Risk management	7	4.4210
Internal control	4	4.2200
Internal audit	6	4.0269
Information management	6	4.2888
Personnel management	6	4.2198
Total	100	4.4043

Source: Expressway Authority of Thailand, 2013.

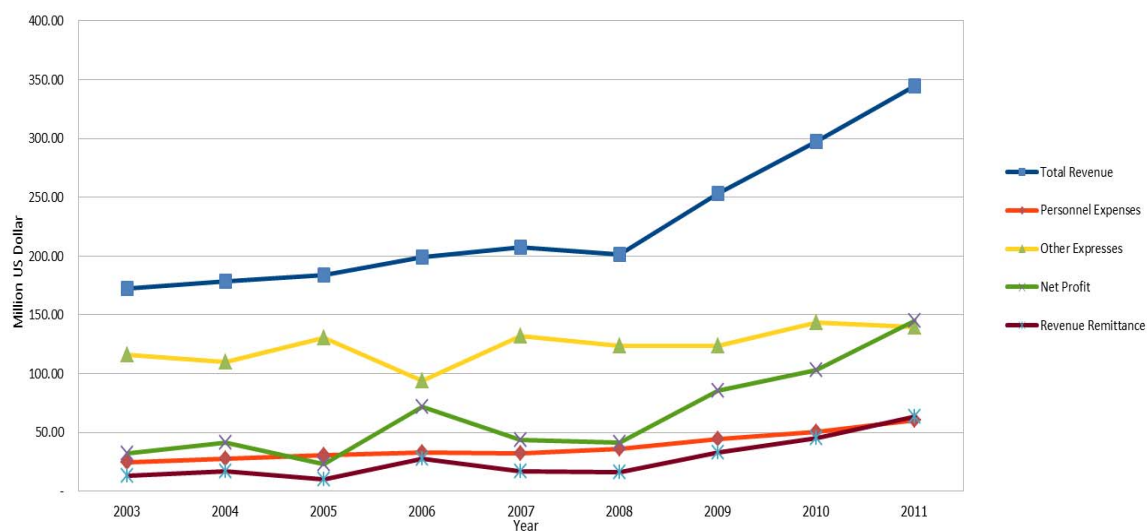
EXAT's overall score of 4.4043 is rated as a "good" performance. However, of the three evaluating criteria (operation in accordance with policies, operation performance and organization administration), it is found that organization administration is assessed at the lowest point which is 4.1679 from the 5.0000-point scale. Therefore, there is room for EXAT develop its administration to raise its overall performance.

EXAT financial performance as measured by the indicators Total Revenue, Personnel Expenses, Other Expenses, Net Profit and Government Revenue Remittance over the nine year period from 2003-2011 is shown in Table 4.4 and Figure 4.1

Table 4.4 EXAT Financial Performance Indicators (\$US million)

Year	Total Revenue	Personnel Expenses	Other Expenses	Net Profit	Revenue Remittance
2003	172.26	24.43	115.92	31.90	13.10
2004	178.55	27.89	109.59	41.05	16.70
2005	184.03	30.69	130.49	22.84	10.40
2006	199.34	33.24	94.10	71.99	27.70
2007	207.59	32.10	131.86	43.61	16.78
2008	201.21	36.34	123.46	41.40	16.00
2009	253.31	44.23	123.70	85.37	32.86
2010	297.28	50.82	143.57	102.87	45.40
2011	344.63	60.22	139.57	144.83	63.73

1 \$US = 30 THB

**Figure 4.1** Graph of EXAT Financial Performance Indicators

It will be seen from Table 4.4 and Figure 4.1 that the Revenue Remittances to the Ministry of Finance are continuously increasing and that EXAT can accumulate some of its profits every year. It is predicted that EXAT will continue to operate with profit which that means it will have accumulated capital to invest either in the short

term or long term to extend its service networks and increase its income. It will also seem that personnel expenses appear to be representing an increasing percentage of total expenses.

Table 4.5 and Figure 4.2 show the ratios of Net Profit-Total Revenue, Revenue Remittance- Net Profit, and Personnel Expenses-Total Expenses over the nine year period from 2003-2011.

Table 4.5 Ratios of Net Profit-Total Revenue, Revenue Remittance-Net Profit and Personnel Expenses-Total Expenses

Year	Net profit-total revenue ratio	Revenue remittance-net profit ratio	Personnel expenses-total expenses ratio
2003	0.185	0.411	0.174
2004	0.230	0.407	0.203
2005	0.124	0.455	0.19
2006	0.361	0.385	0.261
2007	0.210	0.385	0.196
2008	0.206	0.386	0.227
2009	0.337	0.385	0.263
2010	0.346	0.441	0.261
2011	0.420	0.440	0.301

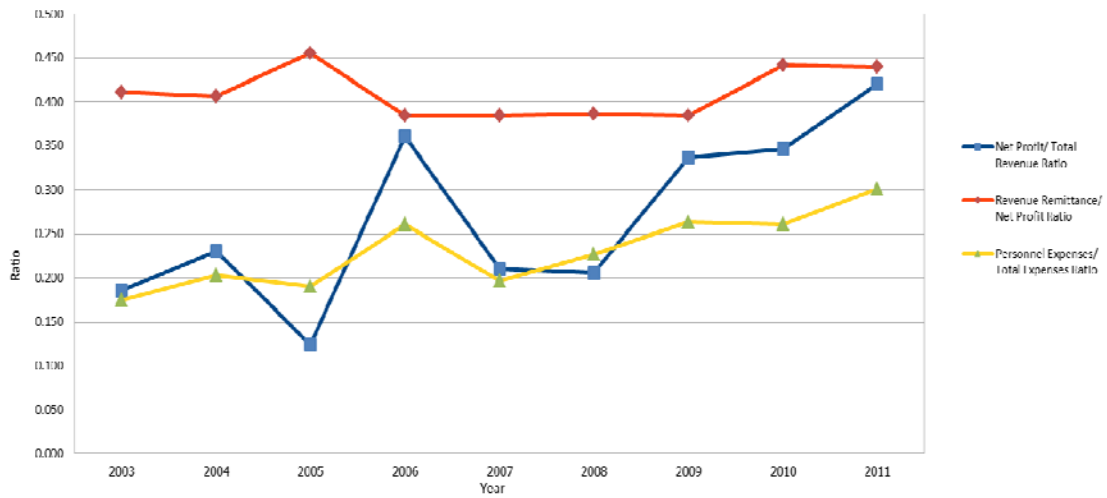


Figure 4.2 Graph of Ratios of Net Profit-Total Revenue, Revenue Remittance-Net Profit and Personnel Expenses-Total Expenses

It will be seen from Table 4.5 and Figure 4.2 that the revenue remittance-net profit ratio is quite stable while the other ratios demonstrate a steady increase.

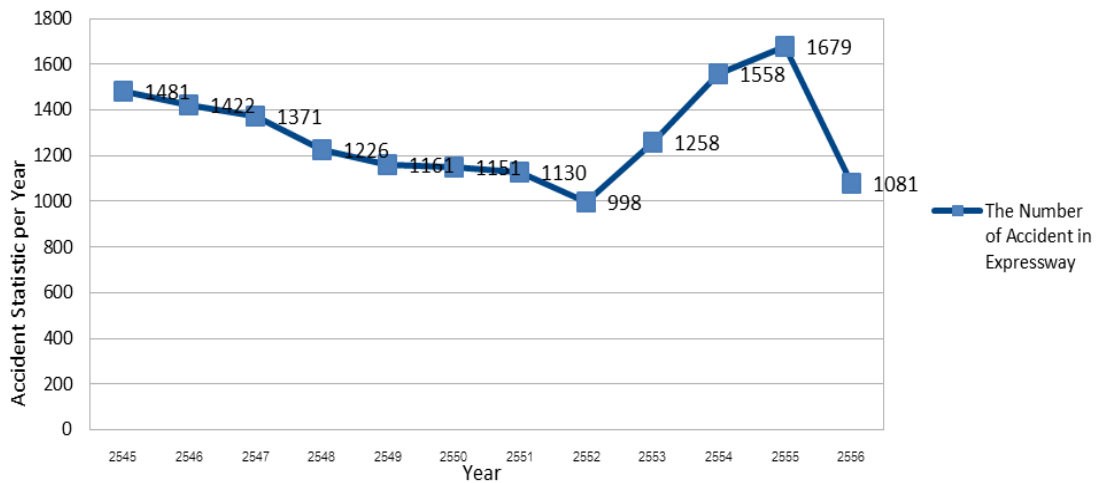
The two indicators which play a part in assessing non-financial performance are accidents and complaints. Table 4.6 and Figure 4.3 show annual accident numbers over the eleven year period from 2002-2012.

Table 4.6 Accident Statistics on Expressway Networks during 2002-2012

Budget year	Accident number
2002	1481
2003	1422
2004	1371
2005	1226
2006	1161
2007	1151
2008	1130
2009	998

Table 4.6 (Continued)

Budget year	Accident number
2010	1258
2011	1558
2012	1679
2013	1081 (Oct 2012-Apr 2013)

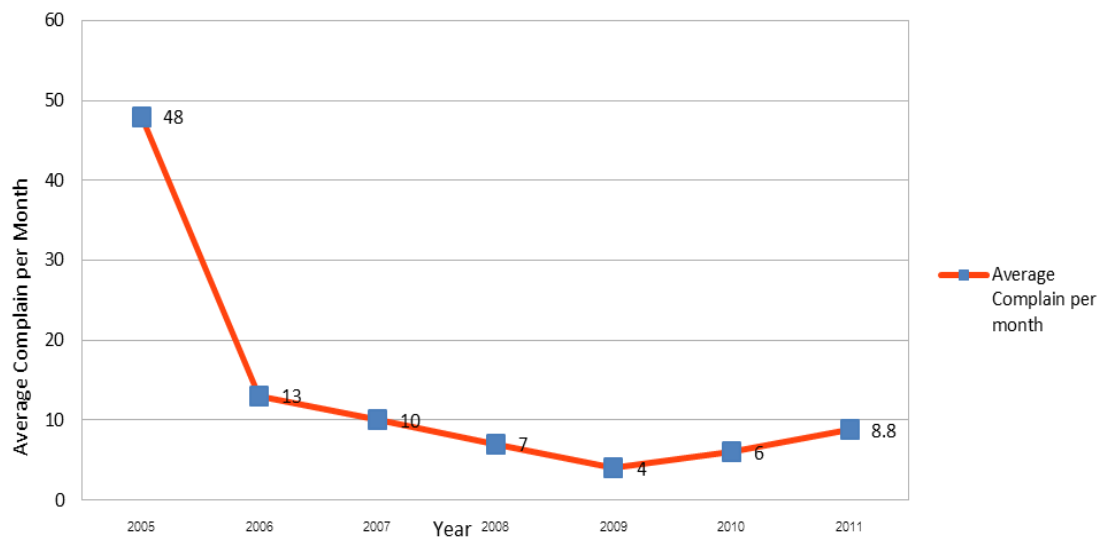
**Figure 4.3** Graph of Accidents Statistics on Expressway Networks during 2002-2012

It will be seen from Table 4.6 and Figure 4.3 that the trend of accidents on the expressways continuously decreased between 2002 and 2009 but has increased dramatically since then to in excess of 100 accidents per month. EXAT must determine strategies to reduce the number of accidents.

The second EXAT non-financial performance indicator is formal complaints by road users. Table 4.7 and Figure 4.4 show average complaints per month over the seven year period from 2005-2011.

Table 4.7 Complaint Statistics during the Period 2005-2011

Year	Average complain number per month
2005	48
2006	13
2007	10
2008	7
2009	4
2010	6
2011	8.8

**Figure 4.4** Graph of Complaint Statistics for the Period 2005-2011

It can be seen from Table 4.7 and Figure 4.4 that monthly complaints fell from 2005 to 2009 but have begun to increase slightly over recent years. EXAT must management knowledge to assess and correct this trend.

4.2 Study Population

The questionnaires employed in this study were used to obtain primary data in relation to the opinion of and satisfaction with EXAT on the part of employees and road users (both individual and enterprise). They were tested for content validity in accordance with conceptual framework and literature reviewed in chapter three and revised following advisor suggestions. Their reliability was accepted as the Cronbach's α value was not less than 0.8. Having been tested the questionnaires (which are presented in Appendix C) were distributed to the samples in each group.

Since the studied population is classified into three groups, EXAT employees, individual road users and enterprise road users, the population numbers are 4,526, 1,500,000 and 800 respectively. The sample calculated by Yamane's Formula is 400, 400 and 240 consecutively, which is not sufficient for the first two kinds of population. Therefore, the W. Laurence Nueman principle (quoted in Pichit Pitaksombat, 2007: 255) has been considered in association with the formula and the results 1,000, 2,500 and 240 respectively will be the sample numbers applied in this study. The questionnaires distributed, the responses and their returned percentages are tabulated in the following Table 4.8.

Table 4.8 Distributed Questionnaires Numbers, the Responses and Their Returned Percentages

Group of questionnaire respondents	Total distributed questionnaires	Returned questionnaire numbers	Percentage of received questionnaires
EXAT employees	1,000	896	89.60
Individual road users	2,500	1,488	59.52
Enterprise road users	240	214	89.17

From the above table it can be seen that the returned percentages of questionnaire for EXAT employees and enterprise road users, 89.60% and 89.17% are high enough to cause the believable study. For the third group, individual road users,

it is able to be questionable, 59.52%, but when it is considered to the absolute numbers, 1,488, it is large enough to make this study reliable.

4.3 Results from EXAT Employee Questionnaires

4.3.1 Demographic Profile of Sampled Employees

Table 4.9 shows the frequency distribution of basic demographic information in relation to surveyed employees.

Table 4.9 Frequency Distribution of EXAT Employee Demographic Information

Basic information	Number (frequency)	Percentage
Sex		
Male	580	64.7
Female	316	35.3
Total	896	100
Age		
18-20 years	5	0.6
21-30 years	172	19.2
31-40 years	361	40.3
41-50 years	260	29
51-60 years	98	10.9
Total	896	100
Education		
Lower diploma	113	12.6
Diploma	226	25.2
Bachelor degree	472	52.7
Master degree	83	9.3
Doctoral degree	2	.2
Total	896	100

Table 4.9 (Continued)

Basic information	Number (frequency)	Percentage
Position level		
Level 1-3	309	34.5
Level 4-6	536	59.8
Level 7-8	49	5.5
Level 9-11	2	.2
Total	896	100
Salary		
Less than 10,000 THB	123	13.7
10,001 – 20,000 THB	235	26.2
20,001 – 30,000 THB	272	30.4
30,001 – 40,000 THB	119	13.3
40,001 – 50,000 THB	64	7.1
50,001 – 60,000 THB	34	3.8
60,001 – 70,000 THB	26	2.9
70,001 – 80,000 THB	17	1.9
More than 80,000 THB	6	.7
Total	896	100
Service period		
1-5 years	251	28
6-10 years	65	7.3
11-15 years	217	24.2
16-20 years	204	22.8
21-25 years	86	9.6
More than 26 years	73	8.1
Total	896	100
Department		
Office of governor	74	8.3

Table 4.9 (Continued)

Basic information	Number (frequency)	Percentage
Office of audit	0	0
Finance department	0	0
Administrative department	48	5.4
Department of plan and policy	11	1.2
Department of information	1	.1
Expressway construction	33	3.7
Maintenance department	118	13.2
Toll collation department	369	41.2
Traffic control department	191	21.3
Legal department	3	.3
Land acquisition department	42	4.7
Under assistant governor	6	.7
Under governor	0	0
Total	896	100
Sources of EXAT information (able to select more than 1 choice)		
Television	263	29.4
Radio	197	22
Intranet	417	46.5
Internet	270	30.2
Newspaper	226	25.2
Circular letter	618	69
Others (e.g. EXAT Radio)	19	2.1
Total	896	100
Expected future expressway direction		
North	364	40.6
South	180	20.1

Table 4.9 (Continued)

Basic information	Number (frequency)	Percentage
East	76	8.5
West	63	7
Northeast	212	23.7
Others (e.g. Bangkok vicinity)	1	.1
Total	896	100

It can be seen from Table 4.9 that the fundamental information of EXAT employees samples are male 64.7%, age range 31-40 years 40.3%, education background bachelor degree 52.7%, position level 4-6 59.8%, salary range 20,001-30,000 THB 30.4%, service period 11-15 years and 16-20 years 24.2% and 22.8% respectively, under toll collection department 41.2%, receive EXAT information from circulation letters 69% and future expressway direction expectation in north 40.6%.

4.3.2 Analysis Results of EXAT Employee Opinions

The opinions of EXAT employees in relation to the knowledge of management functions of General Management, Marketing Management, Human Resources Management and Development, and Environmental Management can be found in Tables 4.10-4.14.

Table 4.10 EXAT Employee Opinions Concerning EXAT General Management

General Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Commanding ability					
Your authority has ordered by writing appropriately.	9.7	54.5	28.8	6.2	0.8

Table 4.10 (Continued)

General Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Your authority has ordered with sufficient writing.	8.3	49.4	32.7	8.1	1.5
Your authority has ordered with clear writing.	10	48.2	32.8	7.5	1.5
Your authority has ordered step by step respectively.	14.3	50.1	27.7	6.2	1.7
Your authority has ordered on time.	5.8	35.7	42.1	13.1	3.3
Your authority has appropriately ordered.	6.4	41.9	40.3	9.3	2.2
Your authority has ordered in time.	6.9	38.6	39.4	12.4	2.7
Total (N= 896)					

It can be seen from Table 4.10 that in considering the indicator of EXAT's overall General Management ability, 54.27% of the surveyed employees agreed and strongly agreed with its performance. In considering individual items, it was found that 64.4% agreed and strongly agreed for ordering step by step, 64.2% agreed and strongly agreed for ordering in writing appropriately, and 58.3% agreed and strongly agreed for ordering with clear writing.

Table 4.11 EXAT Employee Opinions Concerning EXAT Marketing Management

Marketing Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Price					
Toll rate and other service price setting is appropriate compared to the service quality for EXAT customers.	14.1	55.1	24.2	5.2	1.3
Price adjustment for toll rate and other service price each time period is suitable.	12.9	52.1	27.6	5.8	1.6
At night time there are little traffic then EXAT can increase its customers by reducing the toll rate during 24.00 hr-05 hr.	9.5	24.6	17.9	30.8	17.3
Place					
MTC system is suitable.	17.1	45.6	25.8	8.3	3.2
EXAT still needs MTC.	35.4	46.9	14	3.6	.2
ETC system can appropriately increase the toll collection efficiency of toll collection.	10.5	40.5	34.6	11.2	3.2
EXAT should increase the numbers of ETC booths.	19.4	40.6	24.9	9.3	5.8
EXAT should apply ETC system for the truck.	14.3	38.2	20.3	18.9	8.4
Money top up for ETC at toll booth is convenience for the customers.	8.8	38.1	27.8	16.7	8.6

Table 4.11 (Continued)

Marketing Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Money top up at toll plaza for ETC is convenience for the customers.	13.8	49.6	25.4	7.9	3.2
EXAT should still have money top up for ETC at toll booth.	8.3	32.1	21.2	22.1	16.3
EXAT should still have money top up for ETC at toll plaza.	19.5	55.1	17	5.8	2.6
EXAT is necessary to increase the place to top up the money for instance shopping plazas.	42.1	43.2	9.9	3.2	1.6
EXAT should do the research and development for ETC system in order to increase the more efficiency than at present.	48.1	38.4	9.6	2.9	1
Promotion					
EXAT should communicate to publicize the information to its customers more than the present.	50.7	38.6	8	1.9	.8
EXAT has regularly disseminated its operating information.	16	46.2	31	5.8	1

Table 4.11 (Continued)

Marketing Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT has publicized its operating information at the suitable time period.	10.4	41.9	40	6.8	1
Disseminated EXAT information is clear.	7.6	38.8	42.7	8.9	1.9
EXAT information is easy for the customers to acknowledge.	7	38.4	44.6	8.3	1.7
EXAT should provide the sale promotion for example discounting the percentages for the Easy Pass customers.	25.3	42.3	18.9	10	3.5
EXAT can increase the Easy Pass customers by terminating to ask for deposited money.	31.5	41.1	17.4	7.4	2.7
Products					
Existing service network distance about 208 kilometers is enough for the serving EXAT customers.	5.5	17.5	31.8	31.4	13.8
EXAT can increase its revenue by develop the acquisition land within the rights of way.	41.3	42	13.4	2.2	1.1
EXAT should extend its service network distance more than 210 kilometers.	45.2	37.5	14.2	2.6	.6

Table 4.11 (Continued)

Marketing Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT should plan to construct the expressways in order to connect to the neighbor.	33.9	34.5	21.9	6.1	3.6
Total N= 896					
Total N for marketing management = 896					

It can be seen from Table 4.11 that in considering the indicator of EXAT's overall Marketing Management ability, 61.48% of the surveyed employees agreed and strongly agreed with its performance. In considering the major components of Marketing Management, it was found that 64.35% agreed and strongly agreed with EXAT's handling of the price principle, 63.23% agreed and strongly agreed for the place principle, 62.25% agreed and strongly agreed for the promotion principle, and 56.10% agreed and strongly agreed for the products principle.

It can also be seen from Table 4.11 that:

1) In relation to price, 69.2% agreed and strongly agreed that price setting was appropriate compared to the service quality, 65.0% agreed and strongly agreed that price adjustments were suitable, and 48.1% disagreed and strongly disagreed with offering a toll rate reduction late at night.

2) In relation to place, 86.5% agreed and strongly agreed that the ETC system required more research and development, 85.4% agreed and strongly agreed that more places should be provided for ETC top up, and 82.5% agreed and strongly agreed that MTC should be retained.

3) In relation to promotion, 89.3% agreed and strongly agreed that EXAT needed to communicate more with customers, 72.4% agreed and strongly agreed that more drivers would use ETC if no deposit was required, and 67.6% agreed and strongly agreed with offering promotions for ETC customers such as percentage discounts.

4) In relation to products, 83.3% agreed and strongly agreed that EXAT should generate more revenue by commercially developing acquired land, and 82.7% agreed and strongly agreed that expressways should be developed to connect to neighboring countries.

Table 4.12 EXAT Employee Opinions Concerning EXAT Operations Management

Operations Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT can achieve its planned missions.	9.4	43.1	42.4	3.3	1.8
EXAT has appropriately determined sub-activities in each operating mission.	6.5	45	42.4	5.5	.7
Expressways constructed by EXAT are safe for road users.	11.6	57.3	26.8	3.9	.4
There are enough guide sign numbers for leading road users.	7.8	40.4	35.9	13.2	2.7
The letters on guide signs are accurate.	9.9	47.1	33.3	7.6	2.1
The size of Thai letters displayed on guide signs is suitable.	10.9	55.2	26.1	6.6	1.1
The size of English letters displayed on guide signs is appropriate.	9.5	51.3	29.6	8.4	1.2
The size of the numbers displayed on guide signs is appropriate.	8.5	55.2	27.8	7.3	1.2

Table 4.12 (Continued)

Operations Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
There are enough numbers of toll plazas.	6.5	37.5	35.6	15	5.5
Total N=896					

It can be seen from Table 4.12 that in considering the indicator of EXAT's overall Operations Management ability, 56.93% of the surveyed employees agreed and strongly agreed with its performance. In considering individual items, it was found that 68.9% agreed and strongly agreed that EXAT expressways are safe for road users, 66.9% agreed and strongly agreed that the size of Thai letters on guide signs was appropriate, and 63.7% agreed and strongly agreed that the size of numbers on guide signs was appropriate.

Table 4.13 EXAT Employee Opinions Concerning EXAT Human Resources Management and Development

Human Resources Management and Development	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT employee recruitment system is fair.	5.0	25.8	47.3	12.3	9.6
EXAT employee recruitment period is suitable.	5.1	31.2	40	17.7	5.9
EXAT should appropriately develop the orientation system for new employee accordance with the organization changed situations.	20.3	55.6	17.5	4.9	1.7

Table 4.13 (Continued)

Human Resources Management and Development	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT should clearly illuminate the stages of personnel performance evaluation.	25.8	53.1	14.7	4.1	2.3
EXAT should clearly express the personnel performance assessment methods.	27.3	50.6	16.9	2.8	2.5
EXAT personnel performance evaluation system is appropriate.	4.6	34.6	44.6	11.8	4.4
EXAT has planned the personnel development by efficiently providing the seminar training for the assigned missions in each section.	6.1	42.1	36.9	10.7	4.1
EXAT personnel performance evaluation system is appropriate.	4.6	34.6	44.6	11.8	4.4
EXAT has planned the personnel development by efficiently providing the seminar training for the assigned missions in each section.	6.1	42.1	36.9	10.7	4.1

Table 4.13 (Continued)

Human Resources Management and Development	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT has appropriately designed the training contents.	4.1	39.6	41.5	11.5	3.2
EXAT has provided the suitable time period for training.	4.4	37.2	42.3	13.2	3
EXAT has appropriately monitored the employee operating after training.	4.1	32.6	44.6	13.6	5
EXAT has the fair penalization system.	5.8	40.4	41.3	7.9	4.6
EXAT has the practical penalization system.	5.6	41.1	41.2	8.4	3.8
EXAT salary structure is suitable.	4.6	26.8	32.5	20.2	16
EXAT welfare is appropriate.	8.1	42.5	26.8	15.2	7.4
Total N = 896					

It can be seen from Table 4.13 that in considering the indicator of EXAT's overall Human Resources Management and Development ability, 48.84% of the surveyed employees agreed and strongly agreed with its performance. In considering individual items, it was found that 78.9% agreed and strongly agreed that EXAT must provide better explanations of the personnel performance evaluation stages, 75.9% agreed and strongly agreed that EXAT needs to develop a better orientation system for new employees, and 48.2% agreed and strongly agreed that EXAT has an effective personnel development system.

Table 4.14 EXAT Employee Opinions Concerning EXAT Environmental Management

Environmental Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
EXAT has significantly interested in external environment situation such as economics society, politics, customers attitude and so on.	9.2	46.3	33.9	7.9	2.7
EXAT has efficiently analyzed the opportunity and threat from the external environment.	5.9	43.3	41	7	2.8
EXAT has efficiently determined strategic plans to respond according to the external environment.	5.6	43	44.8	5.5	1.2
EXAT has appropriately monitored the risks caused by external environments.	6.0	40.7	45.8	6.5	1
EXAT has appropriately evaluated the risks caused by external environments.	7.5	41.1	43.8	6.4	1.3
Total N = 896					

It can be seen from Table 4.14 that in considering the indicator of EXAT's overall Environmental Management ability, 49.72% of the surveyed employees agreed and strongly agreed with its performance. In considering individual items, it was found that 55.5% agreed and strongly agreed that EXAT was significantly interested in external environmental factors, 49.2% agreed and strongly agreed that EXAT had sufficiently analyzed the opportunities and threats from the external

environment, and 48.6% agreed and strongly agreed that EXAT has appropriately evaluated the risks caused by the external environment.

4.3.3 Additional Opinions of EXAT Employees

Table 4.15 exhibits the frequency distribution of sample EXAT employees classified by their opinion concerning the necessity to develop EXAT administration.

Table 4.15 Opinion Concerning the Need to Develop EXAT Administration

Opinion	Frequency	Percentages
Extremely necessary to be developed.	384	42.9
Necessary to be developed	428	47.8
No need to be developed	55	6.1
No answer	29	3.2
Total	896	100

As can be seen from Table 4.15, almost all (90.7%) of the sampled employees believe that EXAT administration must be developed.

Table 4.16 exhibits the frequency distribution of sample EXAT employees classified by their opinion concerning the significant characteristics that EXAT should develop.

Table 4.16 Opinion Concerning the Significant Characteristics EXAT Should Develop

Opinion (more than one could be chosen.)	Frequency	Percentages
Be the universally efficient SOE compared to the one in overseas.	549	61.3
Quickly and accurately give the information to its customers.	564	62.9
Construct and develop the new service models which increasingly cover the demands of EXAT customers.	492	54.9

Table 4.16 (Continued)

Opinion (more than one could be chosen.)	Frequency	Percentages
Apply advance technology to EXAT operating and increasingly provide the service.	554	61.8
Have the new communicating system to publicize the traffic information on the expressway and at grade road for the road users enabling to effectively decide the travelling routes.	524	58.5
Allow the road users and people able to increasingly propose the opinion concerning EXAT operations.	399	44.5
Allow road users and relevant people participate to the EXAT operation assessment.	275	30.7
Provide the valuable financial and accounting reports which can be increasingly applied to the EXAT operations.	301	33.6
Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time.	650	72.5
Others: (e.g. allocate concession revenue to cover the interest expenses of land acquisition, reduce the organization size, give priority to customer satisfaction, and seek investment from the private sector to expand the network.)	14	1.6
Total	896	100

It can be seen from Table 4.16 that the highest result is that 72.5% of sampled employees would like to have an encouraging workplace with a good atmosphere to enable them to work more happily. Other areas of agreement were that 62.9% saw a need to provide quick and accurate information to customers, 61.8% saw a need to focus on employing advanced technology, and 61.3% saw a need to strive to provide the same levels of service as overseas expressway authorities.

Table 4.17 exhibits the frequency distribution of sample EXAT employees classified by their opinion concerning the knowledge of management functions which EXAT should develop.

Table 4.17 Opinion Concerning Knowledge of Management Functions EXAT Should Develop

Opinion (more than one could be chosen.)	Frequency	Percentages
General Management	607	67.7
Marketing Management	470	52.5
Accounting Management	237	26.5
Financial Management	377	42.1
Operations Management	470	52.5
Human Resources Management and Development	632	70.5
External Management	339	37.8
Total	896	100

As can be seen from Table 4.15, the two administration areas which surveyed employees considered most in need of development were Human Resources Management and Development (70.5%) and General Management (67.7%).

4.3.4 Recommendations of Employees to EXAT

Table 4.18 exhibits the frequency distribution of sample EXAT employees classified by recommendations made to EXAT through additional comments on their questionnaire.

Table 4.18 Additional Employee Recommendations to EXAT

Recommendation	Frequency	Percentages
1. Modify guide signs which there are few numbers installed on the expressways and they are unclear as well as modify the lighting system on expressways.	3	.3

Table 4.18 (Continued)

Recommendation	Frequency	Percentages
2. Modify easy pass which has the problems on the top up procedure and operating.	8	.9
3. Modify audit system, bribe protection system and conflict of interest.	1	.1
4. Modify the quality of traffic information by clearly informing the road users where are the congestion or accident place in advance before entering the expressways.	1	.1
5. Modify the public relation which is currently little publicized.	7	.8
6. Modify the quality of officer 1543	1	.1
7. Develop investment plan and increase network.	10	1.1
8. Co-ordinate to police to release the traffic congestion.	1	.1
9. Develop the quality of traffic officers.	4	.4
10. Develop the systems of human resources management, performance evaluation and salary structure.	29	3.2
11. Develop the working system.	22	2.5
12. Develop the effectiveness of financial management.	5	.6
13. Develop the quality of toll collectors.	4	.4
14. Develop the quality of toll collection system equipment.	9	1
15. Develop the moral and ethics of EXAT employees.	4	.4
16. Develop the welfare system.	7	.8
17. Develop the environment condition and industrial hygiene at workplace.	4	.4

Table 4.18 (Continued)

Recommendation	Frequency	Percentages
18. Modify legal administration system.	2	.2
19. Develop EXAT marketing management by focusing on constructing the corporation with the alliance.	3	.3
Total number of recommendations. (Overall is 896)	125	13.95

It can be seen from Table 4.18 that of the total sample size of 896 respondents, 125 (or 13.95% of the total) made direct recommendations to EXAT. The most common recommendations were in relation to the performance evaluation system and salary structure (22.09% of all suggestions), the working system (17.92% of all suggestions), and investment plans and the network extension (7.88% of all suggestions).

4.4 Individual Road User Questionnaire Results

4.4.1 Demographic Profile of Individual Road Users

Table 4.19 shows the frequency distribution of basic demographic information in relation to individual road users.

Table 4.19 Frequency Distribution of Individual Road User Demographic Information

Basic information	Frequency	Percentages
Sex		
Male	740	49.7
Female	748	50.3
Total	1488	100
Age		
Less than 20 years	79	5.3

Table 4.19 (Continued)

Basic information	Frequency	Percentages
21-30 years	485	32.6
31-40 years	467	31.4
41-50 years	276	18.5
51-60 years	135	9.1
More than 60 years	46	3.1
Total	1488	100
Location		
Bangkok	950	63.8
Vicinity areas	477	32.1
Others	61	4.1
Total	1488	100
Education		
Lower diploma	230	15.5
Diploma	160	10.8
Bachelor degree	850	57.1
Master degree	237	15.9
Doctoral degree	11	.7
Total	1488	100
Occupation		
Company employee	995	66.9
Business owner	99	6.7
Government officer	110	7.4
SOE officer	54	3.6
Student	53	3.6
Merchant	44	3
Employee	73	4.9
Others	60	4
Total	1488	100

Table 4.19 (Continued)

Basic information	Frequency	Percentages
Salary level		
Less than 10,000 THB	180	12.1
10,001 – 30,000 THB	820	55.1
30,001 – 50,000 THB	276	18.5
50,001 – 70,000 THB	93	6.2
70,001 – 90,000 THB	54	3.6
More than 90,000 THB	65	4.4
Total	1488	100
Average daily number of usages		
0 time	365	24.5
1 time	446	30
2 times	476	32
3 times	67	4.5
4 times	54	3.6
More than 4 times	80	5.4
Total	1488	100
Regular usage routes (you can choose more than 1 choices)		
Chaloem Maha Nakhon Expressway	633	42.5
Si Rat Expressway	522	35.1
Chalong Rat Expressway	406	27.3
BuraphaWithi Expressway	320	21.5
Kanjanaphisek Expressway	231	15.5
Udon Rattaya Expressway	173	11.6
Total	1488	100

Table 4.19 (Continued)

Basic information	Frequency	Percentages
Reason for expressway usage		
(you can choose more than 1 choices)		
Save the expenses more than at grade travelling.	257	17.3
Less time usage than at grade travelling	1149	77.2
More safety than at grade road.	232	25.6
Able to be the destination on scheduled time.	571	38.4
Able to know the traffic situation on expressway more conveniently than at grade road by using telephone number 1543.	91	6.1
Others	41	2.8
Total	1488	100
Sources of EXAT information (you can choose more than 1 choices)		
Television	738	49.6
Radio	456	30.6
Intranet	126	8.5
Internet	332	22.3
Newspaper	377	25.3
Circular letter	67	4.5
Others	96	6.5
Total	1488	100
Expected future expressway direction		
(you can choose more than 1 choices)		
North	609	40.9

Table 4.19 (Continued)

Basic information	Frequency	Percentages
South	500	33.6
East	347	23.3
West	376	25.3
Northeast	509	34.2
Total	1488	100

It can be seen from Table 4.19 that the fundamental information of individual road user samples are female 50.3%, range of age 21-30 years and 31-40 years 32.6% and 31.4% respectively, residential in Bangkok area 63.8%, bachelor degree 57.1%, company employees occupation 66.9%, revenue range 10,001-30,000 THB 55.1%, 2-time average daily usages 32%, regularly used expressways for Chloem Maha Nakhon 42.5% and Si Rat 35.1%, reason to use expressway that less time consumed than at grade road 77.2%, obtaining EXAT information by television 49.6% and radio 30.6% and future expressway direction expectation in north 40.6% and northeast 34.2.

4.4.2 Analysis Results of Individual Road User Opinions

The opinions of individual road users in relation to the knowledge of management functions of General Management, Marketing Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management can be found in Tables 4.20-4.26.

Table 4.20 Individual Road User Opinions Concerning EXAT General Management

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Communicating Ability					
Install guide signs on expressways clearly enough.	13.3	37.2	42.1	5.4	2.0

Table 4.20 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Install guide signs on expressways brightly enough to see the letters.	12.3	38.7	40.9	6.7	1.4
Install guide signs on expressways specifying the clear sentences.	10.7	36.6	42	9.2	1.5
Install the suitable number of guide signs on expressways.	9.6	33.1	45.2	10.6	1.5
Install guide signs at the suitable positions on expressways.	9.2	34.2	45.1	9.7	1.8
Total N = 1,488					
EXAT Participation					
Allow people to participate by proposing the comments on consideration of EXAT future project.	8.5	21.8	45.2	18.3	6.1
Provide the CSR activities for example asking the donating of used clothes from the road user for donating to the poor in the provinces and so on.	12.8	27.3	41.3	15.4	3.2
Provide the channels for anyone who has been affected from the EXAT operation for example the impolite manner of the	12.1	28.6	44.9	12.0	2.4

Table 4.20 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
officers during operation by complaining through telephone number 1543.					
Total N = 1,488					
Total General Management N = 1,488					

It can be seen from Table 4.20 that in considering the indicator of EXAT's overall General Management ability, 85.43% of the surveyed individual road users are satisfied with its performance. In relation to Communication, it was found that 90.04% were satisfied with the communicating ability of management, 92.6% were satisfied that installed guide signs were clear enough, 91.2% were satisfied that installed guide signs were bright enough, and 89.3% were satisfied with the wording on installed guide signs. In relation to Participation, it was found that 80.83% were satisfied with the level of road user participation, 85.6% were satisfied with the 1543 call center's role in complaint handling, 81.4% were satisfied with the provision of CSR activities, and 75.7% were satisfied with the level of road user participation in recommending future operating projects.

Table 4.21 Individual Road User Opinions Concerning EXAT Marketing Management

Marketing Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Price					
Lump-sum toll rate collecting that means paying the toll at the entrance for example Chaloem Maha Nakhon expressway.	7.7	26.4	46.7	16.0	3.2

Table 4.21 (Continued)

Marketing Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Toll rate paid accordance with the travelling distance that means receiving the ticket at the entrance and pay the toll at the exit for example Burapha Withi expressway.	12.7	32.5	40.6	11.4	2.8
The toll rate is suitable for the quality serving by EXAT.	6.4	24.9	45.7	17.2	5.8
The toll rate adjustment in the past.	4.5	22.0	48.7	19.2	5.6
EXAT will reduce toll rate during period of 24.00 hours-05.00 hours.	22.6	30.4	28.0	14.7	4.4
Total N = 1,488					
Place					
Manual Toll Collection is suitable.	6.9	34.6	46.1	10.0	2.4
Electronic Toll Collection is suitable.	15.3	31.2	42.7	8.7	1.9
Money top up of Electronic Toll Collection at toll booth and toll plaza are suitable.	11.0	25.8	50.2	11.2	1.8
Money top up of Electronic Toll Collection should provide at other place for example at shopping plaza.	13.2	29.8	45.8	9.5	1.7
The toll collection system is developed from manual collection to electronic collection.	14.2	34.2	40.2	9.0	2.4

Table 4.21 (Continued)

Marketing Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Total N = 1,488					
Promotion					
Publicize to communicate the EXAT information to the customers for example notifying the traffic situation on expressways and suggest the appropriate routes by using VMS which is intermittently installed on the expressways.	8.6	29.4	45.3	13.8	2.9
The frequency of proposing the traffic information on expressways.	5.8	22.1	49.3	19.2	3.6
The frequency of proposing EXAT operating information.	4.9	19.9	50.1	21.0	4.2
The clearness of proposing EXAT operating information.	5.7	21.4	49.3	20.0	3.6
The clearness of proposing traffic condition and EXAT operation information.	6.1	22.8	49.1	18.6	3.4
Provide the sale promotion for example giving the discount to the Easy Pass road users.	11.8	24.3	43.8	16.3	3.8
Promote the sale by cooperating with the vehicle vendors to sell their cars together with Easy Pass.	11.6	24.0	51.1	11.7	1.6
Total N = 1,488					

Table 4.21 (Continued)

Marketing Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Products					
About 210 kilometers long of expressways are currently serving by EXAT.	7.7	24.8	53.9	12.0	1.5
The development of the land within the rights of way (e.g. providing “green” rest areas to give road users a temporary place to relax).	14	29.6	39.4	14.5	2.5
EXAT will increase expressway network length to cover more areas.	22.6	38.6	31	6.6	1.1
EXAT will reduce the effect to environment, the residences nearby the construction site and during opening to the traffic.	11.6	29.0	48.5	8.9	2.0
Total N = 1,488					
Total Marketing Management N = 1,488					

Indicator of EXAT’s overall General Management ability, 85.43% of the surveyed individual road users are satisfied with its performance.

It can be seen from Table 4.21 that in considering the indicator of EXAT’s overall Marketing Management ability, 83.21% of the surveyed individual road users were satisfied with its performance. In considering the major components of Marketing Management, it was found that 79.96% were satisfied with EXAT’s handling of price matters, 88.24% were satisfied EXAT’s handling of place matters, 79.48% were satisfied with EXAT’s handling of promotion matters, and 84.17% were satisfied with EXAT’s handling of product matters.

It can also be seen from Table 4.21 that:

1) In relation to price, 85.8% were satisfied with toll collecting by travelling distance, 81.0% were satisfied with the idea of toll reductions late at night, and 80.8% were satisfied with paying the lump-sum toll price at entry.

2) In relation to place, there was a high level of satisfaction with the current toll collection methods (89.2% for ETC and 87.6 for MTC), while 88.8% believed that more places should be provided for ETC top up.

3) In relation to promotion, 86.7% were satisfied with the idea of supporting vehicle vendors by allowing them to sell their cars together with its EasyPass, 83.3% were satisfied with EXAT's provision of information to customers, and 79.9% were satisfied with the idea of having promotional sales which offered discounts.

4) In relation to products, 92.2% support extending the expressway network to cover more areas, 89.1% were satisfied with EXAT's continuing efforts to reduce the environmental effect of expressway construction and operation, and 86.4% were satisfied with the existing expressway network.

Table 4.22 Individual Road User Opinions Concerning EXAT Financial Management

Financial Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Finance					
The service or benefit obtained from the EXAT operation is worth to the paid toll.	6.1	25.4	52.2	13	3.4
Total N = 1,488					

It can be seen from Table 4.22 that 83.7% of individual road users are satisfied with EXAT's overall financial management ability.

Table 4.23 Individual Road User Opinions Concerning EXAT Operations Management

Operation Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The EXAT traffic service network currently covers Bangkok and vicinity areas.	5.6	27.4	52.6	12.8	1.6
EXAT will enlarge its traffic service network by extending beyond Bangkok and vicinity areas.	18.1	36.1	37.7	7.3	.8
The safety of traffic surface on the expressways.	10.8	33.9	45.1	9.1	1.1
EXAT will install ETC system for vehicles which has more than 10 wheels.	15.6	33.1	38.6	9.7	3.1
Communication equipments on the expressways for the road users to communicate the EXAT officers.	12.4	25.4	45.8	13.4	3
Lighting system on expressways.	11.9	33.1	45	8.1	1.9
Total N = 1,488					

It can be seen from Table 4.23 that in considering the indicator of EXAT's overall Operations Management ability, 88.03% of the surveyed individual road users were satisfied with its performance. In considering individual items, it was found that 91.9% supported extension of the expressway network beyond Bangkok to increase national coverage, 90.0% were satisfied with the brightness of lighting system on expressways, and 89.9% were satisfied with the safety of the traffic surface on expressways.

Table 4.24 Individual Road User Opinions Concerning EXAT Human Resources Management and Development

Human Resources Management and Development	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The intention and carefulness of the servicing officers.	7.6	31.7	49.1	8.7	3
The ability of the EXAT officers in question answering to their customers.	6.5	31	51.6	9.7	1.2
Human relations of the officers service to the customers.	6.7	31.2	49.8	10.3	1.9
Advising a good guideline to EXAT customers such as suggesting the travelling routes according to the customer requirement.	8.3	31.5	47.4	11.2	1.5
The manners and speech of EXAT officers during communicating to the customers.	8.8	30	50.3	8.7	2.2
Total N = 1,488					

It can be seen from Table 4.24 that in considering the indicator of EXAT's overall Human Resources Management and Development ability, 88.03% of the surveyed individual road users were satisfied with its performance. In considering individual items, it was found that 89.1% were satisfied with the manners and speech of EXAT officers when communicating with customers, 89.1% were satisfied with the ability of EXAT officers to answer their questions, and 88.4% were satisfied with the intention and care of EXAT officers.

Table 4.25 Individual Road User Opinions Concerning Which Aspects of EXAT Officers Should be Developed

Opinion Concerning EXAT Officer Development	Frequency	Percentages
EXAT officers who are expected to be developed to provide better service (more than 1 choice allowed).		
Toll collectors	766	51.5
Traffic officers	812	54.6
Information officers	561	37.7
Others	63	4.2
Total	1488	100
EXAT officer manners which should be improved (more than 1 choice allowed).		
Greeting manners during serving the customers	841	56.5
The style of EXAT officers during serving their customers.	789	53.0
The dressing of the officers.	186	12.5
Others	89	6.0
Total	1488	100
What characteristics should traffic officers develop or improve (more than 1 choice allowed).		
Should not stop the cars one side for too long.	687	46.2
Should inform the situation in advance to the customers (e.g. accidents on the expressways).	980	65.9
Should have the processes to serve the customers who need the urgency in case of emergency.	638	42.9
In case of having broken down cars ahead it should provide the measures to remind the following road users in order to protect the accidents.	840	56.5

Table 4.25 (Continued)

Opinion Concerning EXAT Officer Development	Frequency	Percentages
Should co-ordinate with the at grade traffic officers so that the traffic continuously flows.	830	55.8
Others.	52	3.5
Total	1488	100
The characteristics of the information officers should develop or improve (more than 1 choice allowed).		
Should not allow the telephone in to ask the information wait for too long.	640	43.0
Information officers should increase their knowledge of travelling routes.	683	45.9
Information officers should increase their knowledge of the routes suggesting in case of traffic jam.	823	55.3
The officers should politely speak to the road users.	472	31.7
Others.	33	2.2
Total	1488	100

It can be seen from Table 4.25 that:

1) Just over half of the sampled individual road users believe that EXAT traffic officers (54.6%) and toll collectors (51.5%) should be developed in order to increase their effectiveness, while only 37.7% saw a need for information officers in the 1543 call center to be developed.

2) 56.6% of the sampled individual road users believe that officer customer greetings should be improved, while 53.0% believe that their “style” of service delivery should be improved. Only 12.5% felt that officer dress standards needed to be improved.

3) 65.9% of the sampled individual road users believe that traffic officers should provide better advanced knowledge of the traffic situation on expressways, 56.5% believe that they should implement better measures to warn road users of broken down vehicles ahead, and 55.8% believe that they should coordinate better with grade road traffic control officers to ensure a continuous traffic flow.

4) 55.3% of the sampled individual road users believe that information officers need to increase their skills in suggesting alternative routes to help customers in case of traffic jams. 45.9% of respondents were dissatisfied with information officer network route knowledge, and 43.0% were dissatisfied with the time sometimes taken to answer telephone calls.

Table 4.26 Individual Road User Opinion Concerning Environmental Management Issues

Environmental management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Environment such as economics situation, oil price and so on will affect the EXAT service to the customers.	19.6	44.0	29.3	5.4	1.7
EXAT should put environmental risk management in place in order not to affect its service to customers.	22.5	52.6	22.5	1.7	0.7
EXAT must assess the environment specially the natural disaster such as flood and so on in order to prepare the measures so that it will not affect EXAT service to the customers.	25.5	49.7	21.6	2.2	1.0
Total N= 1488					

It can be seen from Table 4.26 that in considering the indicator of Environmental Management, 71.30% of the surveyed employees agreed and strongly agreed with the need for EXAT to address the issues raised. In considering the individual items, it was found that 75.2% agreed and strongly agreed that EXAT must assess the environment to forecast and prepare for natural disasters so that they will not affect service to the customers., 75.1% agreed and strongly agreed that EXAT should have an environmental risk management program, and 63.6% agreed and strongly agreed that EXAT faced a dynamic environment which may affect customer service.

4.4.3 Additional Opinions of Individual Road Users

Table 4.27 exhibits the frequency distribution of sample individual road users classified by their opinion concerning the necessity to develop EXAT administration.

Table 4.27 Opinion Concerning the Need to Develop EXAT Administration

Opinion	Frequency	Percentages
Extremely necessary to be developed.	539	36.2
Necessary to be developed	775	52.1
No need to be developed	80	5.4
No answer	94	6.3
Total	1488	100

As can be seen from Table 4.27, almost all (88.3%) of the sampled individual road users believe that EXAT administration must be developed.

Table 4.28 exhibits the frequency distribution of individual road users classified by their opinion concerning the significant characteristics EXAT should develop.

Table 4.28 Opinion Concerning the Significant Characteristics EXAT Should Develop

Opinion (more than one could be chosen).	Frequency	Percentages
Be the universally efficient SOE compared to the one in overseas.	546	36.7
Quickly and accurately give the information to its customers.	785	52.8
Construct and develop the new service models which increasingly cover the demands of EXAT customers.	689	46.3
Apply advance technology to EXAT operating and increasingly provide the service.	735	49.4
Have the new communicating system to publicize the traffic information on the expressway and at grade road for the road users enabling to effectively decide the travelling routes.	751	50.5
Allow the road users and people able to increasingly propose their opinion concerning EXAT operations.	629	42.3
Allow road users and relevant people participate to the EXAT operation assessment.	489	33.5
Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time.	337	22.6
Others.	49	3.3
Total	1488	100

It can be seen from Table 4.28 that the main areas of agreement were the need to provide quick and accurate information to customers (52.8%), the need to provide expressway traffic information at grade roads so that road users can decide the best

travelling route (50.5%), and the need to employ advanced technology in operation and service (49.4%).

4.4.4 Recommendations of Individual Road Users to EXAT

Table 4.29 exhibits the frequency distribution of individual road users classified by recommendations made to EXAT through additional comments on their questionnaire.

Table 4.29 Additional Individual Road User Recommendations to EXAT

Recommendation	Frequency	Percentages
1. Modify guide signs which there are few numbers installed on the expressways and they are unclear as well as modify the lighting system on expressways	30	2.0
2. Modify easy pass which has the problems on the top up procedure and operating.	62	4.2
3. Modify the quality of traffic information by clearly informing the road users where are the congestion or accident place in advance before entering the expressways.	2	0.1
4. Modify the public relation which is currently little publicized.	4	0.3
5. Modify the traffic surface which is rugged will cause the accidents.	7	0.5
6. Modify the quality of officer 1543.	1	0.1
7. Develop investment plan and increase network.	23	1.5
8. Co-ordinate with police to reduce traffic congestion.	2	0.1
9. Develop the quality of traffic officers.	10	0.7
10. Develop the working system.	1	0.1
11. Modify the effectiveness of financial management.	1	0.1
12. Modify the quality of toll collectors.	2	0.1
13. Modify the quality of toll collection system equipment.	4	0.3

Table 4.29 (Continued)

Recommendation	Frequency	Percentages
14. Develop the moral and ethics of EXAT employees.	1	.1
15. Develop the environment condition and industrial hygiene at workplace.	2	.1
16. Develop EXAT marketing management by focusing on constructing the corporation with the alliance.	3	.2
Total number of recommendations. (Overall is 1,488)	155	10.4

It can be seen from Table 4.29 that of the total sample size of 1,488, 155 respondents (or 10.4% of the total) made direct recommendations to EXAT. The most common recommendations were in relation to problems with Easy Pass (40.38% of all suggestions), improvement of expressway traffic signs and lighting (19.23% of all suggestions), and investment plans and the network extension (14.42% of all suggestions).

4.5 Enterprise Road User Questionnaire Results

4.5.1 Demographic Profile of Enterprise Road Users

Table 4.30 shows the frequency distribution of basic demographic information in relation to enterprise road users.

Table 4.30 Frequency Distribution of Enterprise Road User Demographic Information

Basic information	Frequency	Percentages
Firm address		
Bangkok	101	47.2
Vicinity areas	69	32.2
Other provinces	44	20.6
Total	214	100

Table 4.30 (Continued)

Basic information		Frequency	Percentages
Sex			
	Male	136	63.6
	Female	78	36.4
	Total	214	100
Position			
	Employee	111	51.9
	Manager	35	16.4
	Owner	62	29
	Others	6	2.8
	Total	214	100
Age			
	Less than 20 years	16	7.5
	21-30 years	38	17.8
	31-40 years	83	38.8
	41-50 years	59	27.6
	51-60 years	18	8.4
	Total	214	100
Education			
	Lower than diploma	47	22
	Diploma	38	17.8
	Bachelor degree	115	53.7
	Master degree	10	4.7
	Doctoral degree	4	1.9
	Total	214	100
Salary level			
	Less than 10,000 THB	25	11.7
	10,001 – 30,000 THB	72	33.6
	30,001 – 50,000 THB	61	28.5

Table 4.30 (Continued)

Basic information	Frequency	Percentages
50,001 – 70,000 THB	29	13.6
70,001 – 90,000 THB	21	9.8
More than 90,000 THB	6	2.8
Total	214	100
Number of vehicles operated		
1-5 vehicles	138	64.5
6-10 vehicles	29	13.6
11-15 vehicles	32	15
16-20 vehicles	7	3.3
21-30 vehicles	6	2.8
31-50 vehicles	2	.9
Total	214	100
Types of vehicle operated		
4 wheels	155	72.4
6-10 wheels	33	15.4
More than 10 wheels	22	10.3
Others	4	1.9
Total	214	100
Average daily number of expressway usages		
Less than 10 times	109	50.9
10-20 times	74	34.6
21- 30 times	18	8.4
31-40 times	6	22.8
41-50 times	3	1.4
More than 50 times	4	1.9
Total	214	100

Regular usage routes (you can choose more than 1 choices)

Table 4.30 (Continued)

Basic information	Frequency	Percentages
Chaloem Maha Nakhon Expressway	54	25.2
Si Rat Expressway	72	33.6
Chalong Rat Expressway	78	36.4
Burapha Withi Expressway	60	28
Kanjanaphisek Expressway	31	14.5
Udon Rattaya Expressway	13	6.1
Total	214	100
Reason for expressway usage (you can choose more than 1 choices)		
Save the expenses more than at grade travelling.	57	26.6
Less time usage than at grade travelling	129	60.3
More safety than at grade road.	62	29
Able to be the destination on scheduled time.	72	33.6
Able to know the traffic situation on expressway more conveniently than at grade road by using telephone number 1543.	20	9.3
Total	214	100
Sources of EXAT information (you can choose more than 1 choices)		
Television	100	46.7
Radio	95	44.4
Intranet	69	32.2

Table 4.30 (Continued)

Basic information	Frequency	Percentages
Internet	19	8.9
Newspaper	69	32.2
Circular letter	3	1.4
Total	214	100
Expected future expressway direction.		
(you can choose more than 1 choices)		
North	84	39.3
South	56	26.2
East	22	10.3
West	23	10.7
Northeast	27	12.6
Others	2	.9
Total	214	100

It can be seen from Table 4.30 that the fundamental information of individual road user samples are located in Bangkok area 47.2%, male 63.6%, employees 51.9%, age 31-40 years and 41-50 years 38.8% and 27.6% respectively, bachelor degree 53.7%, earnings 10,001-30,000 THB 33.5%, occupied 1-5 vehicles 64.5%, occupied 4-wheel cars 72.4%, average daily usages less than 10 times 50.9%, regularly used expressways for Chalong Rat 36.4% and Si Rat 33.6%, reason to use expressway that less time consumed than at grade road 60.3%, obtaining EXAT information by television 46.7% and radio 44.4 and future expressway direction expectation in north 39.3% and south 26.2%.

4.5.2 Analysis Results of Enterprise Road User Opinions

The opinions of enterprise road users in relation to the knowledge of management functions of General Management, Marketing Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management can be found in Tables 4.31-4.37.

Table 4.31 Enterprise Road User Opinions Concerning the EXAT General Management

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Communicating Ability					
The clearness of the sentences on guide signs installed on expressways.	17.8	58.4	11.7	7.9	4.2
The numbers of guide sign installed on expressways are sufficient.	16.4	55.6	15.0	6.1	7.0
The guide sign are installed in the suitable positions on expressways.	14.5	54.7	17.8	5.6	7.5
The traffic information on expressway provided by telephone number 1543 is accurate.	9.3	45.3	30.8	7.5	7.0
The suggestion of EXAT by telephone number 1543 is appropriate.	9.3	40.2	35.5	10.3	4.7
Total N= 214					
EXAT Participation.					
The participating to propose the EXAT operation and complaint such as the complaint of the effect of the exhaust from the cars using expressways through call center 1543.	9.8	40.2	37.9	7.9	4.2
The frequency of the participation that EXAT proposes to the customers.	8.9	41.6	26.6	10.3	12.6

Table 4.31 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The numbers of activity that EXAT provides for the CSR for example asking for the used books from the road users to donate to the upcountry schools.	9.8	46.3	24.3	11.7	7.9
The EXAT responding after receiving the complaints or recommendations.	6.1	45.8	28.5	12.6	7.0
Total N= 214					
Total management N = 214					

It can be seen from Table 4.31 that in considering the indicator of EXAT's overall General Management ability, 83.95% of the surveyed enterprise road users were satisfied with its performance. In relation to Communication, it was found that 86.46% were satisfied with the communicating ability of management, 87.9% were satisfied that installed guide signs were clear enough, and 87.0% were satisfied with the number and positioning of guide signs. In relation to Participation, it was found that 81.45% were satisfied with the level of road user participation, 87.7% were satisfied with the 1543 call center's role in complaint handling, 80.4% were satisfied with the provision of CSR activities, and 80.4% were satisfied with the call center's response after receiving a complaint or recommendation.

Table 4.32 Enterprise Road User Opinions Concerning EXAT Marketing Management

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Price					
Lump-sum toll rate collecting that means paying the toll at the entrance before entering expressway for example Chaloem Maha Nakhon expressway.	6.1	49.1	28.0	9.3	7.5
Toll rate paid accordance with the travelling distance that means receiving the ticket at the entrance and pay the toll at the exit for example BuraphaWithi expressway	7.0	42.5	33.6	8.4	8.4
The toll rate is suitable for the quality served by EXAT.	6.5	39.7	35.5	7.9	10.3
The toll rate adjustment in the past.	5.6	41.6	28.5	12.6	11.7
EXAT will reduce toll rate during period of 24.00 hours-05.00 hours.	8.4	43	23.4	13.1	12.1
Place					
Manual Toll Collection is suitable.	6.5	43.5	25.2	14.5	10.3
ETC specified only 4-wheel vehicle is suitable enough.	11.2	57.9	19.2	8.9	2.8

Table 4.32 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
Money top up of ETC at toll booth and toll plaza are suitable.	7.9	59.3	22.4	7.9	2.3
Money top up of ETC should provide more places for example at shopping plaza.	7.9	57.9	28.0	3.7	2.3
The toll collection system has been developed from manual collection to electronic collection.	7.9	52.8	30.4	7.0	1.9
The development of toll collection system by paying the toll through bank account.	7.0	45.8	34.6	10.7	1.9
Promotion					
Publicize to communicate the EXAT information to the customers for example notifying the traffic situation on expressways and suggest the appropriate routes by using VMS which is intermittently installed on the expressways.	7.0	43.9	25.7	16.4	7.0
The frequency of proposing the traffic information on expressways to the enterprise road users.	4.2	40.2	29.4	16.8	9.3

Table 4.32 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The frequency of proposing EXAT operating information to the enterprise road users.	3.3	39.3	27.6	19.2	10.7
The clearness of proposing traffic condition information on the expressways to the enterprise road users.	3.7	40.2	29.4	17.8	8.9
The clearness of proposing the EXAT operation to the enterprise road users.	7.9	51.9	23.4	10.3	6.5
The traffic information service and others of EXAT through call center 1543.	8.4	57.0	22.4	9.8	2.3
Provide the sale promotion for example giving the discount to the Easy Pass enterprise road users.	5.6	59.3	27.6	4.7	2.8
Promote the sale by cooperating with the vehicle vendors to sell their cars together with Easy Pass.	4.2	47.2	39.3	7.5	1.9
Product					
About 210 kilometers long of expressways are currently enough serving by EXAT.	3.7	38.3	37.4	15.0	5.6

Table 4.32 (Continued)

General Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The development of the land within the rights of way for example providing rest areas to serve the road users by being the temporary place to relax including providing the green areas by planting the trees.	8.4	35.5	33.2	15.0	7.9
EXAT will increase the expressway length to cover more service areas.	8.9	40.2	24.3	18.2	8.4
EXAT will reduce the effect to environment, the residences nearby the construction site and during opening to the traffic.	7.0	43.9	22.0	17.3	9.8
Total N= 214					
Total marketing management N=214					

It can be seen from Table 4.32 that in considering the indicator of EXAT's overall Marketing Management ability, 80.99% of the surveyed enterprise road users were satisfied with its performance. In considering the major components of Marketing Management, it was found that 79.70% were satisfied with EXAT's handling of price matters, 87.56% were satisfied EXAT's handling of place matters, 81.01% were satisfied with EXAT's handling of promotion matters, and 75.70% were satisfied with EXAT's handling of product matters.

It can also be seen from Table 4.32 that:

1) In relation to price, 83.2% were satisfied with paying the lump-sum toll price at entry, 83.1% were satisfied with toll collecting by travelling distance, and 81.7% were satisfied that the toll rate was appropriate to the service quality.

2) In relation to place, 93.8% believed that more places should be provided for ETC top-up, 91.1% were satisfied with the move from MTC to ETC, and 89.3% were satisfied with the system of ETC top up at toll booths and toll plazas.

3) In relation to promotion, 92.5% were satisfied with the idea of promoting ETC by offering discounts, 90.7% were satisfied with the idea of supporting vehicle vendors by allowing them to sell their cars together with its EasyPass, and 87.7% were satisfied with EXAT's provision of information to customers.

4) In relation to products, 79.4% were satisfied with the existing expressway network, 79.1% supported developing areas within the rights of way for relaxing and providing green areas, and 73.4% supported extending the expressway network to cover more areas.

Table 4.33 Enterprise Road User Opinions Concerning EXAT Financial Management

Financial Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The service or benefit obtained from the EXAT operation is worth to the paid toll.	2.8	43.9	25.7	16.8	10.7
Total N = 214					

It can be seen from Table 4.33 that 72.4% of enterprise road users are satisfied with the existing financial management of EXAT.

Table 4.34 Enterprise Road User Opinions Concerning EXAT Operations
Management

Operation Management	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The EXAT traffic service network currently covers Bangkok and vicinity areas.	8.9	57.5	15.9	7.9	9.8
EXAT will enlarge its traffic service network by extending beyond Bangkok and vicinity areas.	14.5	54.7	16.4	7.0	7.5
The safety of traffic surface on the expressways.	7.0	55.6	20.6	7.5	9.3
EXAT will install ETC system for vehicles which have more than 10 wheels.	6.5	46.7	28.0	10.3	8.4
Communication equipments on the expressways for the road users to communicate the EXAT officers.	4.7	46.7	29.0	11.7	7.9
Lighting system on expressways.	7.0	43.5	29.0	10.7	9.8
Thai letters on guide signs are easy to understand.	6.1	43.5	28.0	12.6	9.8
English letters on guide signs are easy to understand.	5.5	40.2	27.6	16.4	10.3
Thai words on guide signs are consistent with English words.	5.6	40.7	24.8	18.7	10.3
Total N=214					

It can be seen from Table 4.34 that in considering the indicator of EXAT's overall Operations Management ability, 79.35% of the surveyed enterprise road users were satisfied with its performance. In considering individual items, it was found that 85.6% supported extension of the expressway network beyond Bangkok to increase national coverage, 83.9% were satisfied with the safety of the traffic surface on expressways, and 82.3 were satisfied with the existing service network.

Table 4.35 Enterprise Road User Opinions Concerning EXAT Human Resources Management and Development

Human Resources Management and Development.	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The intention and carefulness of the serving officers.	3.3	42.1	25.2	20.6	8.9
The ability of the EXAT officers in question answering to their customers.	2.3	45.8	24.3	19.6	7.9
Human relations of the officers service to the customers.	2.8	46.3	23.4	18.7	8.9
Advising a good guideline to EXAT customers such as suggesting the travelling routes according to the customer requirement	3.7	50.9	28.5	8.4	8.4
The manners and speech of EXAT officers during communicating to the customers.	5.6	51.9	28	6.1	8.4

Table 4.35 (Continued)

Human Resources Management and Development.	Satisfaction level (percentages)				
	Most Satisfied	Much Satisfied	Satisfied	Not Satisfied	Least Satisfied
The operating of traffic officers on the expressway to allow the traffic flow.	3.7	49.1	28.5	7.9	10.7
Total N = 214					

It can be seen from Table 4.35 that in considering the indicator of EXAT's overall Human Resources Management and Development ability, 77.56% of the surveyed enterprise road users were satisfied with its performance. In considering individual items, it was found that 85.5% were satisfied with the manners and speech of EXAT officers when communicating with customers, 83.1% were satisfied with the ability of EXAT officers to offer helpful suggestions, and 81.3% were satisfied with the work of traffic officers keeping the traffic flowing.

Table 4.36 Enterprise Road User Opinions Concerning Which Aspects of EXAT Officers Should be Developed

The opinion concerning administration development.	Frequency	Percentages
EXAT officers who are expected to be developed to provide better service. (you can choose more than 1 choice)		
Toll collectors	91	42.5
Traffic officers	41	19.2
Information officers	51	23.8
Others	31	14.5
Total	214	100

EXAT officer manners which should be improved.
(you can choose more than 1 choice)

Table 4.36 (Continued)

The opinion concerning administration development.	Frequency	Percentages
Greeting manners during serving the customers	101	47.2
The manners of EXAT officers during serving their customers.	116	54.2
The dressing of the officers.	73	34.1
Others	16	7.5
Total	214	100

The characteristics that traffic officers should be developed or improved. (you can choose more than 1 choice)

Should not stop the cars one side for too long.	87	40.7
Should inform the situation in advance to the customers for example the accidents on the expressways.	78	36.4
Should have the processes to serve the customers who need the urgency in case of emergency.	84	39.3
In case of having broken down cars ahead it should provide the measures to remind the following road users in order to protect the accidents.	54	25.2
Should co-ordinate with the at grade traffic officers so that the traffic continuously flows.	61	28.5
Others.	9	4.2
Total	214	100

The characteristics of the information officers should be developed or improved. (you can choose more than 1 choice)

Table 4.36 (Continued)

The opinion concerning administration development.	Frequency	Percentages
Should not allow the telephone in to ask the information wait for too long.	100	46.7
Information officers should increase their knowledge of travelling routes.	96	44.9
Information officers should increase their knowledge of the routes suggesting in case of traffic jam.	72	33.6
The officers should politely speak to the road users.	53	24.8
Others	7	3.3
Total	214	100

It can be seen from Table 4.36 that:

1) 42.3% of the sampled enterprise road users believe that EXAT toll collectors expect should be developed in order to increase their effectiveness. A relatively small number saw the same need for traffic officers (19.2%) and information officers in the 1543 call center (23.8%).

2) 54.2% of the sampled enterprise road users believe that the “style” of service delivery by EXAT officers should be improved, 47.2% believe that customer greetings should be improved, and 34.1% believe that officer dress standards should be improved.

3) 40.7% of the sampled enterprise road users believe that traffic officers stop traffic for too long, 39.3% believe that they should have a plan for possible emergency needs of customers, and 36.4% believe that they should implement better measures to warn road users of broken down vehicles ahead.

4) 46.7% of the sampled enterprise road users believe that the time sometimes taken for information officers to answer telephone calls is too long, 44.9% believe that information officers need to increase their skills in suggesting alternative

routes to help customers in case of traffic jams, and 33.6% were dissatisfied with information officer network route knowledge.

Table 4.37 Enterprise Road User Opinions Concerning EXAT Environmental Management

Environmental Management	Opinion level (percentages)				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Environment such as economics situation, oil price and so on will affect the EXAT service to the customers.	22.0	49.1	20.1	3.7	5.1
EXAT should have the environmental management in order not to affect its service to the customers.	22.0	42.5	24.3	5.6	5.6
EXAT must assess the environment specially the natural disaster such as flood and so on in order to prepare the measures so that it will not affect EXAT service to the customers.	23.8	37.9	24.3	8.9	5.1
Total N=214					

It can be seen from Table 4.37 that in considering the indicator of Environmental Management, 65.76% of the surveyed employees agreed and strongly agreed with the need for EXAT to address the issues raised. In considering the individual items, it was found that 71.1% agreed and strongly agreed that EXAT

faced a dynamic environment which may affect customer service, 64.5% agreed and strongly agreed that EXAT should have an environmental risk management program, and 61.7% agreed and strongly agreed that EXAT must assess the environment to forecast and prepare for natural disasters so that they will not affect service to the customers.

4.5.3 Additional Opinion of Enterprise Road Users

Table 4.38 exhibits the frequency of enterprise road user opinions concerning the necessity to develop EXAT administration.

Table 4.38 Opinion Concerning the Need to Develop EXAT Administration

Opinion	Frequency	Percentages
Extremely necessary to be developed.	69	32.2
Necessary to be developed	118	55.1
No need to be developed	18	8.4
No answer	9	4.2
Total	214	100

As can be seen from Table 4.38, almost all (87.3%) of the sampled enterprise road users believe that EXAT administration must be developed.

Table 4.39 exhibits the frequency distribution of enterprise road users classified by their opinion concerning the significant characteristics EXAT should develop.

Table 4.39 Opinion Concerning the Significant Characteristics EXAT Should Develop

Opinion (more than one could be chosen)	Frequency	Percentages
Be the universally efficient SOE compared to the one in overseas.	68	31.8
Quickly and accurately give the information to its customers.	110	51.4

Table 4.39 (Continued)

Opinion (more than one could be chosen)	Frequency	Percentages
Construct and develop the new service models which increasingly cover the demands of EXAT customers.	110	51.4
Apply advance technology to EXAT operating and increasingly provide the service.	116	54.2
Have the new communicating system to publicize the traffic information on the expressway and at grade road for the road users enabling to effectively decide the travelling routes.	101	47.2
Allow the road users and people able to increasingly propose their opinion concerning EXAT operations.	101	47.2
Allow road users and relevant people participate to the EXAT operation assessment.	79	36.9
Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time.	62	29
Others.	5	2.3
Total	214	100

It can be seen from Table 4.39 that the main areas of agreement were the need to employ advanced technology in operation and service (54.2%), the need to provide quick and accurate information to customers (51.4%), and the need to construct and develop new service patterns to cover customer demands (51.4%).

4.5.4 Recommendations of Enterprise Road Users to EXAT

Table 4.40 exhibits the frequency distribution of enterprise road users classified by recommendations made to EXAT through additional comments on their questionnaire.

Table 4.40 Additional Enterprise Road User Recommendations to EXAT

Recommendations to EXAT	Frequency	Percentages
1. Modify guide signs which there are few numbers installed on the expressways and they are unclear as well as modify the lighting system on expressways	1	0.5
2. Modify easy pass which has the problems on the top up procedure and operating.	1	0.5
3. Modify the public relation which is currently little publicized.	1	0.5
4. Modify the traffic surface which is rugged that will cause the accidents.	1	0.5
5. Modify the quality of officer 1543.	2	0.9
6. Develop investment plan and increase network.	1	0.5
7. Develop the quality of traffic officers.	1	0.5
8. Develop the human resources management such as performance assessment and salary structure.	1	0.5
9. Develop the work system	1	0.5
Total suggestion N = 214 numbers	10	4.9

It can be seen from Table 4.40 that of the total sample size of 214, 10 respondents (or 4.9% of the total) made direct recommendations to EXAT. The most common recommendation was that EXAT should improve the quality of the 1542 call center (20.0% of all suggestions).

4.6 Interview Results

As part of this study an interview was conducted with an EXAT board member and one of EXAT's Deputy Governors in order to obtain their opinions on both the existing authority administration and the tentative EXAT future administrative model proposed in the study. Interviews were also conducted with road

users to obtain a further overview of authority administration. Both sets of interviews will be useful in making this dissertation more reliable.

4.6.1 Interview Results for EXAT Board Member and Deputy Governor

The interview with an EXAT board member and Deputy Governor were conducted in order to obtain primary data (Appendix B, item 1) from another other direction apart from the employee and road user questionnaires. The interview took the form of a semi-structured questionnaire. Both of the interviewees indicated that EXAT operated in a dynamic economic and social environment which required continuous assessment of its administration. They fully understand that EXAT needs to develop in the area of Human Resource Management and Development so that employees have the ability and commitment to ensure that the authority operates effectively. In addition, they also expect that future development will include new products such as service network extension both city and intercity expressways. Innovation focusing on the computer technology in the toll collection process and construction of expressways connecting to neighboring countries are anticipated.

4.6.2 Interview Results for Road Users

The road user interviews (Appendix B, item 2) indicated that in broad terms EXAT is believed to provide a “moderate” level. However interviewees were not critical of its operations because they accepted that the road user environment has been constantly changing according to the government policy, especially with the recent moves to introduce tax exemption for the first car which has causing heavier traffic on expressways. Therefore, EXAT must determine strategies to deal with the uncertain environment.

4.7 The Studied Results of the Operations of Other Expressway Organizations

4.7.1 Bangkok Expressway Company Limited (BECL)

BECL, a private company and established in 1987, is an investment partnership that was established to operate transport businesses in Thailand.

4.7.1.1 General Management

BECL's vision is:

“To be the national leading private company that provides the expressway service with the good management system in order to be beneficial for the public travelling under the corporate governance and responsible to the society”.

BECL has identified four principle policies in order to achieve its vision. They are:

- 1) To build society acceptance to acknowledge the good image of the organization;
- 2) To relieve the traffic problems in Bangkok area and vicinity;
- 3) To maintain a stable financial status;
- 4) To improve company operations in both efficiency and quality in accordance with the corporate governance criteria as well as proper risk management.

BECL's management structure consists of a management committee and four subcommittees: audit; administration; staff selection & compensation; and corporate governance & risk management. BECL is organized through a management team headed by the managing director and 13 executives comprising three assistant managing directors, the senior director for the office of managing director, the senior director of the financial department, the senior director of the traffic control department, the senior director of the internal audit department, the senior director of the planning and development department, the senior director of the construction and maintenance department, the senior director of the toll revenue department, two deputy senior directors of construction and maintenance and the deputy senior director of the planning & development department as shown in Appendix A Figure A.7

BECL continuously operates in accordance with corporate governance principles because it realizes their importance to stakeholders. It has won many awards during the period 2003-2010 such as the Disclosure Report Award in 2003. It has specified the following corporate governance policies: (1) shareholder rights, (2) shareholder equality, (3) stakeholder role, (4) information disclosure and transparency and (5) committee responsibility.

4.7.1.2 Marketing Management

Products: Currently the main product of BECL is transportation services through two expressway systems awarded from EXAT under Build Transfer Operate (BTO) concession contracts. They are the Si Rat expressway (which is 38.5 kilometers long) and the Udon-Rattaya expressway (which is 32 kilometers long) to the north of Thailand, with the overall route length 70.5 kilometers. These opened to traffic during 1998-1999, and cover not only the Bangkok city area but also its vicinity areas including the provinces adjacent to Bangkok for instance Ayuttaya province and Nonthaburi province (see in Appendix A Figure A.8). In the period January 1, 2010 to December 31, 2010 the daily average traffic volumes on the Si-Rat expressway and Udon-Rattaya expressway were 583,565 and 55,267 transactions respectively

For the future, BECL has won another 30-year Build Transfer Operate (BTO) concession contract from EXAT for a project called the Si Rat–Outer Ring Road. This is an extension of the Sri-Rat expressway to the west of Bangkok and is 16.7 kilometers long. The construction period is 48 months starting from Dec. 15, 2012 and the route is expected to open with a daily traffic volume of about 120,000 transactions in 2016.

In addition to these expressways, BECL has invested in other infrastructure projects to earn more revenue in order to support its operation and generate a long term return on investment. In 2010, it invested in NECL for expressway business, in BMCL for mass transit service business, in SEAN for the construction and operation of hydro power plant business and in TTP for water business.

Price: The toll rates for both the Si-Rat expressway and the Udon-Rattaya expressway were agreed and settled in their respective concession contracts. The tolls are able to be adjusted every five years relative to changes in the Bangkok consumer price index (CPI) as declared by the Ministry of Commerce. In order to attract the customers to the services, the toll rate has been continuously discounted during certain time periods for some parts of the expressway to support long distance customers.

Place: Road users can utilize the Sri-Rat expressway through 48 toll plazas that are divided into two groups: 18 toll plazas at EXAT's Chaloe Maha

Nakhon expressway and 30 toll plazas on Si-Rat expressway. There are two toll collection systems for road users: MTC with a capacity of 300-400 transactions per hour, and ETC (Easy Pass) with a capacity of 1,100-1,200 transactions per hour. MTC is the normal system which has been employed since the first stage (Chaloem Maha Nakhon) expressway opened for the service. ETC has been available for the expressway users (especially on the Sri-Rat expressway) since July 25, 2010 with 224,440 transactions daily (21.47% of all transactions) recorded in 2011.

Promotion: BECL attracts its target customers by discounting the toll rate at some plazas, Rama 9-1 toll plazas on Si Rat expressway and At Narong toll plaza on Chaloem Maha Nakhon expressway. Moreover, for important festivals such as New Year Day etc., BECL has cooperated with EXAT to promote its service by providing souvenirs to expressway users including the service points for them at the exit to create user commitment in the concept “We are ready to provide good service to customers along the route”. Additionally, BECL frequently engages in outdoor sales for ETC users at the crowded places such as Central Plaza Department Stores and large workplaces.

BECL even though behave of private company, who provides the expressway services supports government road safety policy through a campaign called “Phone without Driving” and “Drunk without driving”. Additionally, publicizing to the customers in order to be informed the company service quality such as the convenience, speed, save, and safety. It also publicizes the discount toll rate on some sections of the expressways to the customers in order to be acknowledged. Finally, it employed many media such as radio, television, leaflet, variables message sign on expressway and website to distribute the company information to the expressway users and exchange the information each other,

4.7.1.3 Operations Management

In order to protect EXAT against the project risks of cost overrun and construction delay, the BTO concession contracts awarded to BECL were Lump Sum Turnkey contracts involving a fixed contract time and cost.

BECL has been very concerned about the environmental impacts of the construction and operation of their concession projects and has operated in accordance with the standard of environmental protection identified by the

government agency, National Environmental Committee, including the relevant laws or regulations. Consequently, the expressways were built by using the most efficient construction technique at that time, called Segmental Box Girders, to reduce the environmental impact. This helped to minimize dust, noise and traffic congestion during the construction period. Having finished the expressway construction, BECL has shown social responsibility by operating within the provisions of ISO 14001 in order to minimize any ongoing adverse effects on its employees, expressway users and nearby communities.

4.7.1.4 Human Resources Management and Development

On December 31, 2010 there were 650 staff working in BECL made up as follows: offices of the managing director and internal audit (5.23%), supporting staff in the administration department and finance department (12.94%), operational staff consisting of the toll revenue department, traffic department, construction and maintenance department, and planning and developing department (81.23%).

The company realizes the importance of the human resources development by focusing on personnel improvement and competency development in order to achieve its objectives. Human resources development is one of the company's critical plans emphasizing (1) competency development, (2) potency development, (3) the succession plan provision, (4) retain the potential and capable employees, (5) safety of life and asset of the customers, and (6) employee compensation.

BECL has also provided programs to develop the capabilities of committee members and executives, such as its Director Certification Program (DCP) under which new committee members and executives will be oriented in order to acknowledge the company information for example the company ethics. Finally, the committee has created succession plans for executives and other employees in key positions.

4.7.1.5 Environmental Management

BECL has realized the importance of both internal and external environmental change, for example the crisis of skilled labor shortage in the case of internal environment and the financial crisis for the external environment which will affect the company performance. BECL has introduced a systematic risk management planning process in order to manage and reduce the company risk. This is monitored

and controlled by a risk management committee. In addition to this a risk management manual and plan have been developed in order to manage, monitor, evaluate and review information relating to environmental change. The risks BECL has to manage are seen as (1) concession risk, (2) financial risk, (3) investment risk and (4) operational risk.

4.7.2 Central Nippon Expressway Company Limited (NEXCO-Central)

NEXCO-Central was established in 1956 and is considered to have developed through four stages: building the foundation (1956-1965); expanding the expressways (1969-1987); enhancing the network and adding new dimensions to maintenance and service (1988-2001); and privatization (initiated in 2005). Each stage has its development activities tabulated in Appendix A, Table A.1

NEXCO-Central was one of three expressway companies privatized in October, 2005. It operates the expressway network covering the Tokyo metropolitan and the Chubu areas including the Hokuriku and Kinki regions. At present (in 2010), the company is operating a network covering 1,761 kilometers consisting of ten expressways: the Hokuriku Expressway, the Tokai-Hokuriku Expressway, the Tokai Ring Road, the Meishin Expressway, the New Meishin Expressway, the Ken-O Expressway, the Chuo Expressway, the New Tomei Expressway, the Tomei Expressway and the Ise Wangan Expressway (shown in Appendix A, Table A.2). There is another 420 kilometers of expressway under construction. In 2010, NEXCO's annual earnings were US\$ 4.8 billion and the average daily traffic volume using its expressways was 1.72 million vehicles.

4.7.2.1 General Management

NEXCO-Central is a continually innovative Japanese corporation whose vision is:

“To become the top expressway company in the world”

NEXCO-Central has identified six principle policies in order to achieve its vision. They are:

- 1) To put the customer first;
- 2) To gain and keep the trust of the public;

- 3) To stay innovative;
- 4) To be deeply conscious of the environment;
- 5) To think and act from the bottom up; and
- 6) To encourage good and satisfying teamwork in order to achieve corporate aims or targets.

Operations are carried out by six company groups (road maintenance and inspection, toll collection service, expressway patrol, rest area management, road repair and maintenance, and maintenance staffing service recruitment) and five affiliated companies (engineering development and research, system operation management, insurance services company, physical distribution center, and toll collection system maintenance).

NEXCO-Central is administrated by an organization structure (shown in Appendix A, Figure A.9) lead by the Chief Executive Officer (CEO) who manages a head office that is organized into five headquarters and nine departments including four branches which cover sixteen construction offices and twenty four maintenance & customer service centers.

In operating the corporate services, it is necessary to directly and indirectly involve stakeholders (shown in Appendix A, Figure A.10) who can be classified into customers, the public, the environment, employees, international society, partners and local communities.

The company enhances its growth by fulfilling CSR in accordance with the UNGC and ISO 26000 and supporting an environmentally sustainable society, showing concern for global warming, promoting 3Rs, developing new technology and cooperating with the regional community in order to satisfy the corporate stakeholders such as customers and employees.

4.7.2.2 Marketing Management

Place: The road users can enter the NEXCO-Central network by either MTC or ETC, the latter of which was introduced in March, 2001 and used by 85% of drivers in 2010.

Promotion: NEXCO-Central has launched a concierge service, called “Service with an eye for detail” at selected rest areas (45 positions in 2007) which offers a diverse range of services such as traffic condition information and rest areas

facilities & services. Through the webpage, URL:<http://kousokubiyori.jp/>. the company provides search engines for investigating useful information such as the toll rate and route alignments. A NEXCO-Central credit card is another corporate promotion instrument because, whenever it is used, reward points are gained which can be redeemed for electronic money or toll discounts.

Product: In addition to the ten expressways previously referred to as shown on Appendix A, Table A.2 and Figure A.11, NEXCO-Central has redeveloped many of its rest areas into shopping malls under the name “EXPASA” in order to enhance customer satisfaction. These offer a broad range of products and services according to customer demands and provide attractive shopping environments as well as hospitality services. Moreover, it has provided parking facilities called “Pratt” that allow access from local roads and permit non-expressway users from nearby expressway communities to enter the rest areas and enjoy the open space.

The company issues a premium driver’s card which is a combination of credit card and electronic money. Customers are able to use this in various situations for their daily lives, such as shopping in parking and service areas including the neighborhood stores. In December, 2010, the company had 210,000 cards with special services at more than 400 shops.

For travel business, NEXCO-Central was the first expressway authority to register with the Japanese Association of Travel Agents to become a travel service provider. The company has developed and offered expressway-related tourism products in cooperation with local communities and other companies.

Moreover, NEXCO-Central has provided services to overseas expressway organizations in three forms: (1) serving as a consultant to make feasibility studies (FS), detailed designs (DD) and provide construction management (CM), (2) providing personnel exchange with PLUS (the Expressway Authority in Malaysia), providing training in expressway construction and maintenance at VEC (the Vietnam Expressway Corporation), and participating in international organization, etc. and (3) human resource development and deployment.

4.7.2.3 Operations Management

NEXCO-Central has divided its operation and management structure into what it calls four major pillars: engineering, maintenance, traffic patrol and toll collection.

The organization has a management plan aiming for 100-year durability. Having made the 100-year plan, NEXCO-Central has looked towards advanced technology. For example, it is able to use infrared cameras to inspect concrete structure and identify pavement condition with no traffic disturbance. Moreover, the company also employs the latest road pavement surface, porous asphalt, in order to ensure safety, comfortable driving and durability on expressways. The company realizes the importance of the environment to society and has set the following environmental management policies: (1) considering global warming by promotions to increase the number of ETC customers, reducing the traffic congestion, applying natural energy sources and, saving energy to alleviate the CO₂ emissions that impact the environment, (2) promoting the 3Rs during construction and maintenance periods and (3) taking regional communities into consideration by providing a better environment for regional communities such as decreasing the noise induced from the vehicle travelling on expressways by installing sound insulation walls or employing the construction machinery according to the standard set by the ministry of land during the construction period. Moreover, the company has developed the concept of an “eco-road” that is friendly to the natural environment by: (1) lessening negative impacts (preventing the loss of natural habitat and securing a travel path for wildlife) and (2) to add positive impacts (creating more natural habitat in road space).

4.7.2.4 Human Resources Management and Development

In 2010 there were 2,115 employees working for NEXCO-Central with the other 8,495 numbers employed in the corporate subsidiaries (recorded in 2010). The company is very concerned about human rights and strives to better balance the number of male and female employees (e.g. the percentage of female workers increased from 10% in 2006 to 27% in 2009) as well as increase the number of disabled employees and the number of older employees. The company has provided three key policies for human resources management: (1) provision of a better work environment, (2) a good balance between family life and work life, and (3) human resources development and training.

4.7.2.5 Environmental Management

NEXCO-Central realizes that it can be affected by changing environments and that many of these (such as the economic situation) can be unstable or dynamic

and have a major effects on the company. Having been faced with such changes, the company has developed a risk management system which is monitored by a risk management committee. Risk managers are deployed for each department, and have to evaluate the risk, determine policies for improvement, formulate risk management plans and execute them. The company optimizes the risk management by applying the management cycle (consisting of Plan, Do, Check and Act) as shown in Appendix A, Figure A.12

4.7.3 Hopewell Highway Infrastructure Limited (HHI)

HHI is a public company awarded expressway concession projects in the People's Republic of China. It is the highway arm of the Hong-Kong conglomerate Hopewell Holding Ltd, and was listed on The Stock Exchange of Hong Kong Limited in August 2003. HHI's main works are the construction and operation of the expressway infrastructure in Guangdong province. Having been strongly supported from its parent company, HHI has focused on the corporate businesses, particularly in the thriving Pearl River Delta region in China, mainly on the initiation, promotion, development, investment and operation of toll roads and bridges

4.7.3.1 General Management

HHI is regulated through a board consisting of six executive directors and six independent non-executive directors (shown on chart Appendix A, Figure A.13) whose main responsibilities are corporate strategic direction and policy setting. The board has established two committees in order to deal with important corporate matters: the audit committee and remuneration committee. The major responsibilities and functions of the audit committee are to consider the appointment of the external auditor, to review and supervise the corporate financial reporting process, internal control and to review and monitor the interim and annual financial statements before submission to the board. The main function of the remuneration committee is to assist the board in development and policy administration of director and senior management remuneration as shown on Appendix A, Figure A.14

HHI realizes the impacts of the corporate services on stakeholders by mainly concentrating on road users and striving to eliminate or at least lessen problems for them. One of the important strategies for the firm to fulfill its corporate social responsibilities is to deploy ample resources to upgrade and enhance the safety

and service facilities of the expressway system to ensure the safety and comfort of road users. An example is the installation of 150 traffic surveillance cameras on the GH superhighway to monitor the traffic. To ensure the more smooth of flow of traffic and road safety on the GS Superhighway, HHI has also closely collaborated with the traffic police in order to implement the “4-Fast” policies of traffic-accident handling that are Fast Detection, Fast Arrival, Fast Handling and Fast Clearance.

4.7.3.2 Marketing Management

Place: There are currently 39 sets of ETC lanes and 14 sets of automatic card-issuing lanes on the Guangzhou-Shenzhen superhighway and 9 sets of ETC lanes and 2 sets of automatic card-issuing lanes on Phase I of the Western Delta Route.

Products: HHI products are: (1) the 183-kilometer Guangzhou-Shenzhen Superhighway, which is 122.8 kilometers long with an average daily traffic volume of 392,000, (2) Phase I of the Western Delta Route, which is 14.7 kilometers long with an average daily traffic volume of 37,000, (3) Phase II of the Western Delta Route, which is 45.5 kilometers long with an average daily traffic volume of 44,000. In 2013 HHI will increase the network with the planned completion of Phase III of the Western Delta Route, which will be 38 kilometers long. So the total operating expressway service will finally cover 221 kilometers as shown in Figure Appendix A, Figure A.15

4.7.3.3 Operations Management

Having faced a constantly changing operating environment, HHI is maintaining the competitive advantages of its expressways by implementing effective cost control, increasing operational efficiency and enhancing service standard. The company has undertaken measures which include (1) increasing staff productivity, (2) enhancing energy savings and (3) controlling the rise in administrative expenses. One of the measures that the company employs to enhance the corporate operational efficiency and service quality is to implement the installation of ETC and automatic card-issuing lanes at the entrance and exit of the expressways.

4.7.3.4 Human Resources Management and Development

On 30 June 2011, HHI was operated by 39 employees excluding the joint venture company employees. Since the company realizes that the corporate has to be driven by professional employees in order to achieve the corporate target, the

remuneration committee of the company appointed by board of directors has offered competitive remuneration packages which are fixed and determined with reference to the salary levels in the workforce market and their individual performance. The company also has share option and share award programs for eligible employees in order to provide more incentive to its employees. Moreover the company recognizes their contribution and continuing efforts through discretionary bonuses based on both individual and business performance. Finally, medical insurance is provided to all members. In order to achieve the planned strategies previously mentioned, the company has conducted a full-scale review of the salary levels and organized briefing sessions for management, department heads and employees to explain the of human resources related policies and practices.

On top of offering competitive remuneration packages, the company has promoted family-friendly employment policies and practices including the provision of the stress management workshops and seminars in order to share the experience and methods to handle stress.

Due to the dynamic environment affecting the company, it has invested in human capital development by providing relevant training programs which are designed after taking into account staffs' knowledge and skill gaps that are identified during performance appraisals. The overall training objectives are to raise staff personal productivity, prepare for their future roles and hence contribute to the firm achievement.

4.7.3.5 Environmental Management

HHI annually reviews the business situations in terms of the growth of gross domestic production (GDP), import and export trading growth and the sale car volume growth because these figures are very useful to the company in order to analyze, interpret and develop plans and strategies. The company specifically manages the corporate financial risk by appointing a board member to oversee the corporate risk management framework. The risk management policies are established to identify and analyze the risk affecting the company performance, to set suitable risk limits, to control the risk monitoring and adherence to market conditions and company activities. The company aims to develop a disciplined and constructive control environment by providing the training of management standards as well as

work procedures to all employees in order to have them understand their roles and obligations. The company manages its financial risk mainly in terms of foreign currency risk management, interest rate risk management, credit risk management and liquidity risk management.

4.7.4 Queensland Motorways

Queensland Motorways is a progressive tolling infrastructure development company which operates under a road franchise agreement with the Queensland State Government. It specializes in delivering, owning and operating the toll road and bridge infrastructure in southeast Queensland and developing advanced transportation solutions. The company's priority missions include (1) reducing traffic congestion on the motorways, (2) increasing road patronage, (3) achieving further operational efficiencies, (4) employee retention, (5) delivering projects on time and on budget, (6) implementing quality systems, (7) enhancing systematic performance and (8) improving the customer experiences.

4.7.4.1 General Management

The corporate vision is "To be a leader in providing quality motorways and transport solutions that are valued by the corporate customers." In order to achieve the corporate vision, the company has been organized into five groups which are (1) operation, (2) corporate, (3) legal & board services, (4) technology & development and (5) the gateway upgrade project as shown Appendix A, Figure A.16

According to the environmental changes, the company has provided five key strategic areas: (1) operation and project delivery, (2) customer and stakeholder satisfaction, (3) innovation and quality, (4) organizational capability, and (5) financial performance.

The company seeks to deliver effective internal communication by conducting a regular survey of all. Additionally, the company uses the Internet to improve communication delivery.

The Board is responsible for the overall corporate governance including to (1) setting the corporate strategic direction, (2) establishing goals for management and (3) monitoring the achievement of those goals (4) appointing, removing, reviewing performance of and setting the remuneration of directors and

executives. They will (1) ensure the integrity of internal control and management information systems and (2) approve and monitor financial and other reports. Since the board members have various responsibilities as previously mentioned, the board has established four sub-committees to deal with specific issues: (1) Nomination/ Remuneration Committee, (2) Audit and Risk Management Committee, (3) Budget Committee, Business & Development Committee and (4) Gateway Upgrade Project Committee.

4.7.4.2 Marketing Management

Place: Free-flow tolling with the commercial name “Go Via”, which was initially applied on 22 July, 2009, is a non-stopping tolling system where tolls are automatically calculated as motorists travel under a toll point. Consequently, the motorists have enjoyed a relatively seamless transition system both on the road and through the company toll road system.

Promotion: The launching of free-flow tolling substantially increased the number of motorists who use the self service channel. The company provides a website in order for road users to obtain the beneficial information of the free-flow tolling system as well as their transactions and automatically top up their account. Additionally, the company has also introduced 625 “Go Via” retailers that offer customers a convenient point to manually top up their accounts and purchase toll passes. Lastly, a mobile customer service centre, called the Cruiser, is used to provide information to public.

Product: The company currently operates 68 kilometers of motorway which are (1) Gateway, (2) Gateway Extension, (3) Logan Tolled Motorways, and (4) the Port of Brisbane Motorways. They annually serve about 81 million tolled trips or around 222,000 trips per day as displayed in Appendix A, Figure A.17

4.7.4.3 Operations Management

In order to provide more effective operation, the company has implemented an advanced technology system (ITS) that enables it to collect real-time traffic and accident information. The collected information is provided for motorists who are travelling on the expressway in order to help them make better travel decisions. Additionally, the company has invested significant effort to preserve and enhance the natural environment at the places where the company operates by

conducting a carbon inventory study to better understand and monitor the company's energy usage and its impact. Consequently, it will be provided with information for the company to set up a benchmark and targets for energy reduction.

The company believes in the necessity of communicating, participating and listening to its neighbors, the community and other stakeholders. Hence, the company provides accessible and knowledgeable consultation teams as contact points for stakeholders. The company not only supports programs, important events and charities which benefit the local community where the motorways operate, but also strongly encourages its employees to participate in community initiatives.

4.7.4.4 Human Resources Management and Development

The company recognizes that it is very essential to retain highly skilled workforces in order to continuously achieve its goals. Therefore, the company has approved significant learning and development programs for its employees as well as negotiated with the Framework Agreement between the company, State Government and union in order to protect the interests and the rights of employees. The Framework Agreement includes all tenured full-time and part-time employees, long-term casuals and managers on fixed term contracts (excluding executive managers). Additionally, the company continuously reviews the operating processes and procedures according to the newly invented toll collection system (Go Via) as well as trains its employees to upgrade their skill, ensuring the efficient service provision.

Having implemented the ITS system and free-flow tolling, the company provides extensive training and knowledge transfer programs that ensure the employees can effectively handle their operation. Not only does the company strengthen its manager skills in order to underpin ongoing development activities by providing the leadership capability programs, it also prepares the training, education and regular communication programs to enhance its employee skills. The company realizes the importance of employee workplaces which are safe for its employees during working time hence sets a high priority on providing a working environment with the goal of zero harm. The company will continuously work close to high-risk areas of the business to raise awareness and ensure practical risk management practices are in place.

4.7.4.5 Environmental Management

The free-flow tolling system employed by Queensland Motorways has satisfied users by reducing the motorist travel time by between ten and thirteen minutes. The company also uses the newly invented technology, ITS, in order to provide the better service to the customers, involving the provision of current traffic situation on expressways. Having obtained the conditions of traffic during travelling, the customers are able to decide the appropriate routes so that they can reach their destination within the scheduled time.

Due to the changing environment (and especially the changing financial climate) the company has appointed an Audit & Risk Management Committee which is responsible for developing and monitoring risk management policies. The policies are determined to identify and analyze the risk the company faces in order to set suitable risk limits and controls. For the financial aspects, the company manages exposure to credit risk, liquidity risk and market risk.

4.7.5 Highways Agency

The Highways Agency is an executive agency of the Department of Transportation, the United of Kingdom, which is responsible for administrating, maintaining and improving the strategic road network in England. In 2011, there were 3,742 employees operating on the agency network.

4.7.5.1 General Management

The Highways Agency has provided a strategic plan for 2010-2015 with the vision “To Be The World’s Leading Road Operator“. In order to achieve the said vision, the agency has employed five strategic goals: (1) We provide a service that the customer can trust, (2) Our network is dynamic and resilient asset, (3) Our roads are the safest in the world, (4) We deliver sustainable solutions, and (5) We set the standard for delivery.

The agency has a board of directors that consists of four non-executive directors including the Chairperson and five executive directors including the Chief. In order to achieve the agency targets identified by the board, the agency is managed by the Chief Executive and five divisions: (1) Network Services, (2) Network Delivery & Development, (3) Major Projects, (4) Finance & Business Services and

(5) Traffic Management. Appendix A, Figure A.18 and A.19 indicate the agency management structure covering the responsible activities of each division and Highway Agency road network.

The agency communicates its performance to the staff through regular monthly briefing sessions and also through online channels such as the Chief Executive's weekly blog that prompts a two way dialogue with a comment facility at the end of each entry.

4.7.5.2 Operations Management

The agency provides traffic and network information to road users to help them with journey planning, reduce congestion and lower vehicle CO₂ emissions. The agency customers are informed the real-time traffic information through various instruments directly provided by the agency or other service providers such as a HA iPhone app and variable message signs on the road network.

To operate more efficiently, the agency obtains service feedback from customers by conducting the road user satisfaction surveys. The feedback received from the surveys is very useful for the agency since it provides both positive and negative responses as shown in Appendix A, Table A.3

One of the other important factors that make road users satisfied is the network maintenance which is the core responsibility of the agency, covering various essential activities in the terms of routine maintenance, road renewals, and structure and technology renewals which are required to keep the network safe and maintained to the optimum level.

Concerning the environment the Agency tries to look beyond the network zones by providing the measures to eliminate or minimize greenhouse gas emissions and office waste and encourages biodiversity, adaptation to climate change, sustainable procurement and good governance.

4.7.5.3 Human Resources Management and Development

The Motorway Agency realizes that some agency employees are working in a high risk environment such as near moving traffic and on the carriageway and does all it can to ensure that employees have a safe working environment by setting a road worker strategy called "Aiming for Zero". Moreover, the agency has also provided regular on-the-job recognition by annually running a

“You Make it Happen“, award on the program called Staff Appreciation and Recognition Scheme (STARS) for the individuals who have demonstrated a special achievement beyond their normal duties.

4.7.5.4 Environmental Management

The Agency has developed new technology in the form of a Magnetic Anomaly Detector which can be fixed on to bridges and viaducts to replace an existing technology called the “Motorways Incident Detection and Automated Signaling” (MIDAS) System. The new technology can more cheaply and reliably detect traffic conditions which the Agency can utilize to control the information displayed on the agency variable message signs (VMS) that help to regulate traffic flows and reduces the build up of long queues.

4.7.6 The South African National Roads Agency Limited (SANRAL)

The South African National Road Agency’s core business is not only the provision and maintenance of a national road network but also the economic promotion as well as society development in South Africa. The agency network is 16,170 kilometers long, classified into two separate types of operation: toll-roads (3,120 kilometers) and non-toll roads (13,050 kilometers). The agency service roads are displayed in figure A21. The network offers seamless connections between the major cities, towns and rural areas and consequently assists economic growth, social development and job creation.

Because of the different operation characteristics, the sources of funds to construct the roadway systems come from two primary sources: (1) the national treasury for non-toll roads, and (2) revenue from toll collection and private parties under public private partnerships (PPPs) for toll-roads.

4.7.6.1 General Management

SANRAL’s vision is “To be recognized as a world leader in the provision of a superior primary road network in southern Africa“. The agency promises to achieve its missions which are (1) a highly motivated and professional team, (2) state-of-the-art technology, (3) proficient service providers and (4) promoting the ‘user-pay’ principle and (5) providing the agency values of Excellence, Proactiveness, Participativeness, Integrity and Care.

The agency foresees that community development is a comprehensive strategy that addresses (1) physical needs, (2) human dignity, and (3) self-sufficiency. They need to participate with the targets of reducing poverty, vulnerability and economic marginalization. Consequently, the community should gain lifelong benefits such as a safe road surface that contributes to the better life which is the core agency philosophy.

It is believed that to be a sustainable agency, the agency has to operate its business by considering the environmental impact according to the International Standard Organization (ISO) 14001, Environmental Management System. The agency provides the environmental management activities for the phases of pre-construction, construction and open to service that are the parts of contractual obligations of contractors or relevant parties.

The agency is managed in three clusters that consist of: (1) a finance group, (2) an engineering group and (3) a corporate service group. They have divided the responsible areas into four regions and the agency offices. The agency offices consist of a head office and regional offices managed a CEO under the control of the board of directors. The organization structure is shown on figure A20.

The agency provides scholarships to sponsor the students who are interested in studying civil engineering and related degrees in the environment field. Having, the students will be employed by the agency and mentored in the professional core skills urgently required by the agency.

The agency also operates a scholarship program for the student grades 10, 11 and 12 who study mathematics and science, aiming to support the pupils in science classes with a trend toward engineering fields for example civil engineering. The agency has joined to be the partner of the university and provided the funds for a talent targeting program, aiming to increase the academic, society and psychological preparation of talented students.

4.7.6.2 Marketing Management

Place: The agency employs physical toll booths as well as an advanced multi-lane-free-flow toll collection system which allows tolls to be charged without vehicles stopping or slow down.

Promotion: The agency publicizes its information by launching campaigns to create awareness not only about the agency projects but also the toll

system. Additionally, site visits are conducted to present agency information by communication teams.

Products: The agency currently is responsible for 3,120 kilometers of toll-roads of which 1,832 kilometers are operated directly by the Agency and 1,288 kilometers are operated under concession by private investors as shown in Appendix A, Figure A.21.

4.7.6.3 Operations Management

The agency employs information technology which is an integral part of the agency business by playing the important roles in planning, budgeting, implementing, monitoring and controlling activities. During 2009-10 the agency employed IT instruments in: (1) initiating work on the my SAP treasury module to improve financial information management and integration (2) agency-wide rollout of Microsoft Office 2007 and (3) installation of new multifunctional copier units with secure print control resulted in a substantial reduction in paper wastage throughout the agency.

4.7.6.4 Human Resources Management and Development

One of the important employment policies of SANRAL is employment equity according to various workforces in South Africa. The agency still demands suitably skilled, qualified, dedicated and passionate employees. The agency goal is to be the employer whom the workforces in any regions choose to work. The employment policies are to attract, retain and persuade high quality employees. Consequently, the agency workforces feel a sense of personal achievement, satisfaction, individual purpose and security. The board has established the human resources remuneration committee which mainly determines (1) remuneration, (2) conditions of service, (3) service benefits practice and (4) human resources management policies. The committee particularly focuses on working transformation, employment equity, succession planning, and skills development.

In order to be a sustainable agency, SANRAL realizes the importance of employee skill development, hence, the agency has expedited the transfer of skills and knowledge throughout the organization, especially at the management level.

The agency also realizes the importance of health and wellness for the company workforce by setting the programs to visit the workplace twice a year and

provide a wellness day to check employee health. The agency has appointed the number of volunteer officers who monitor and implement health and safety issues to ensure optimal conditions for all workforces in accordance with the Occupational Health and Safety Act 2003.

4.7.6.5 Environmental Management

SANRAL has introduced a new technology system, ITS, which will provide more effective operation for road users because it can collect real-time traffic information and disseminate it to them. The information on traffic conditions, accidents and unexpected events, will help the road users to manage their journey more efficiently, resulting in less time spent and safer travel.

Another new technology, ultra-thin pavements, will enable the agency to lower its costs. This technology not only provides more durable road surfaces, but also reduces the need for virgin aggregate in road construction.

4.7.7 Motorway Company of the Republic of Slovenia (DARS d.d)

DARS d.d, which was established in 1993, constructs, manages and maintains motorway sections based on granted construction concessions in the Republic of Slovenia. The company started operating on January 1, 1994 as a public owned company until December 31, 2003. It has operated as a public limited company since January 1, 2004.

4.7.7.1 General Management

DARS d.d's vision is "to become a business oriented, successful and market-regulated commercial company for the management of modern infrastructure networks in line with the expectations of users". Its mission is "to achieve the goals of the owner, the Republic of Slovenia". The company organization chart is displayed in figure A22

The company has determined seven fundamental values: (1) professionalism, (2) transparency, (3) efficiency, (4) innovativeness, (5) responsiveness, (6) user friendliness, and (7) respect for the employees.

The company carries out communication with its employees through a variety of ways such as an internal newsletter, monthly bulletin and intranet. The first channel, the internal newsletter, is periodically published covering company news,

expert comments and items of interest on all levels of company operation in order to awaken an active interest as well as establish a flow of feedback and new ideas and fresh contents. The second channel, the monthly bulletins, is intended to acquaint employees with current events in the company and in connection to the company and the publication of replies to employee questions. The last channel, the intranet site, publishes current and updated information on an ongoing basis including useful documents, forms, acts, photos, documentation and clippings.

4.7.7.2 Marketing Management

Place: The company services can be utilized by paying directly either in classical form (using payment cards and cash) or electric form (using DARS card/DARS transporter card and ABC tag).

Promotion: The company is well aware of the importance of immediate access to important information such as financial news by communicating through the media center on the website www.dars.si. Additionally, the company responds to the majority of questions posed by media representatives related to all operational areas of the company on the same day via e-mail or directly by telephone.

The company can be contacted by road users through e-mail or telephone with questions, proposals, comments, complaints and even praise, related to the usage of expressways. Traffic congestion caused by reconstruction and maintenance works and road safety were the most questions asked of the company. The negative impact of the motorways on the environment and the corrective measures such as the installation of noise protection were the popular questions asked by people who reside in the vicinity of expressways. Road users can pick up information on traffic congestion from many channels such as the company website (www.promet.si), radio stations, TV station and e-mail.

Products: In 2010 DARS d.d managed and maintained 801.6 kilometers of toll-roads made up of 606.6 kilometers of motorways, 163.4 kilometers of link roads, 22.3 kilometers of turnoffs and 9.3 kilometers of other connecting roads. The routes are indicated in Appendix A, Figure A.23. Slovenia has two kinds of tolling system: (1) vignette tolling for light vehicles not exceeding 3.5 tons) and (2) open & closed tolling for heavy duty vehicles (over 3.5 tons).

The company has constructed rest stops for road users with facilities such as petrol stations, service centers and restaurants. There are currently 58 rest stops provided for company customers and more are under construction. Having been opened to service, the company took the satisfaction survey of its users in term of the rest place distribution and the offering quality. Most customers were satisfied with the company service.

4.7.7.3 Operations Management

DARS d.d established a quality management system according to the requirements of the ISO 9001:2008 standard whose success and efficiency was verified by the internal auditors in the terms of financial aspects, satisfaction of motorway and expressway users, satisfaction of employees and the success of individual processes.

The company realizes the importance of user satisfaction of the road service and a survey has been conducted in order to determine the factors affecting customer satisfaction by grouping their opinions in terms of motorway safety, maintenance and equipage of motorway, notification regarding motorway conditions, rest stop offers and toll collection. The results showed that drivers found ploughed road surfaces and comprehensible traffic signals as the most important satisfaction factors while catering offers at the rest stops were considered least important. They also showed that the user satisfaction did not depend on the time of the year the survey was conducted; customer satisfaction did not change with regard to the season the surveys were carried out.

4.7.7.4 Human Resources Management and Development

In 2010 DARS d.d employed 1,247 staff. Their average age was 42 years, and 25% were female. The company understands that its employees are the most important key success factor for achieving its goals. Consequently, the company annually assesses the organization atmosphere and adopts appropriate measures for improving staff satisfaction, the quality of the work environment and increasing the team work level.

The company knows that employee education and training results in greater work efficiency, expertise, innovativeness and success in change management. Therefore various staff development activities were organized, especially in relation

to employee studies. The company assists employees in improving their formal professional education, especially through training instruments over the Internet where a large number of employees can obtain both general and specific knowledge.

Employees are provided motivation and encouragement through the promotion system based on known criteria and a individual special achievement awards and commendations at the end of each year.

For the safety of employees, the company strives to design operating systems for material transportation at toll booths that reduce the number of crossings over toll. It also ensures that written instructions for working safely have been prepared in accordance with government regulations. Additionally, lectures are carried out so that the employees are able to gain experience with working equipment before they have to use it.

4.7.7.5 Environmental Management

DARS d.d understands the importance of the environment changes, hence the company strives to identify the most relevant risks affecting company operations, monitor them through the business process, and react in timely manner in order to reduce any deviations from the planned results. The company realizes that the risks affecting the company performance include many external factors such as: (1) the change of the planned toll system, (2) legislation and regulations, (3) non-compliance with the contractual provisions, (4) traffic safety, (5) the traffic movement capacity on motorway, (6) information technology supporting to business processes, (7) employees, (8) environment protection, (9) property protection and (10) health & safety at work.

One of the general risks that the company has to manage is the financial risk which might negatively affect the its ability to (1) earn revenue, (2) control expenses, (3) preserve the value of financial resources and (4) control liabilities. The financial department is concerned with risks covering (1) exchange rate change, (2) interest rate change, (3) interest margins change, (4) credit risk of DARS d.d., (5) credit risk of business partners, and (6) liquidity risk. Having analyzed the affected risks, the company will set up a process to monitor, control and manage in order to minimize the risks

4.8 Data Analysis

4.8.1 Primary Data

The primary data obtained from the questionnaires and interviews relates to the public perception of EXAT's handling of the seven-knowledge of management functions (General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management).

EXAT employees have their opinions that EXAT must develop its administration (90.70%) and its first three expected characteristics are to be an SOE that (1) encourages and provides a good atmosphere and workplace for its employees (72.5%), (2) provides information to the customers accurately and rapidly (62.9%) which is consistent with the road user interview and (3) employs the advance technology in operation and service increasingly (61.8%).

They believe that EXAT should first develop three strategies that are (1) a human resources development strategy (70.5%), (2) management development strategy (67.7%) and (3) marketing management development strategy and operation management development strategy (52.5%).

There were 13.95 percents of the respondents who proposed suggestions and the first three recommendations are that EXAT should develop (1) human resources management specially performance assessment system and salary structure (22.09% of all suggestions), (2) the work system (17.92% of all suggestions) and (3) an investment plan and network extension (7.88% of all suggestions).

It was indicated that EXAT employees agreed and strongly agreed with the existing authority administration which are consistent with the interviewed results but they have notified that;

1) They disagreed and strongly disagreed toll reduction at night time in order to get more customers (48.10%)

2) They agreed and strongly agreed that EXAT must (1) communicate to provide its information to customers more than the present (89.30%), (2) research and develop toll collection system to increase more effective than existing (86.5%), (3) provide more places to top up ETC (85.3%), (4) increase its revenue by

developing the land acquired (83.3%), (5) extend expressway network to service more than existing (82.7%), (6) continue to offer MTC (82.3%), (7) clearly explain the performance assessment stages (77.9%), and (8) develop the orientation system appropriately to the dynamic situation (75.9%).

3) Only 39.3% agreed and strongly agreed that the performance assessment is appropriate. In other words, the performance assessment is not considered appropriate.

4) Only 31.4 % agreed and strongly agreed with the salary structure. In other words, they are unhappy with the existing EXAT salary structure.

It can be concluded that EXAT employees expect that EXAT shall develop specially Human Resources Management and Development, General Management and Marketing Management.

In case of individual road users, their opinions are that EXAT must develop its administration (88.30%) and its first three expected characteristics are to be an SOE that (1) provides information to the customers accurately and rapidly (52.6%), (2) employs advance communication systems to inform the traffic situation on expressways and at grade road for road users to effectively decide the alternative routes (50.5%) and (3) employs advanced technology in operation and service increasingly (49.4%).

There were 10.40% of the respondents who proposed suggestions and the first three recommendations are that EXAT should develop (1) improve easy pass system which has the problems on top up procedure and operation (40.38% of all suggestions), (2) increase numbers of traffic signs and improve its unclearness including the lighting system (19.23% of all suggestions) and (3) provide an investment plan and extend its network (14.42% of all suggestions). They have indicated that traffic officers need to be developed (54.6%) and the most officers need to improve their greeting during operations (56.6%). The traffic officers should improve the provision of the traffic situation on expressways especially accidents in advance (65.9%). Lastly the information officers should improve their route suggestion knowledge to advise customers in case of traffic congestion (55.3%).

The individual road users are quite satisfied with EXAT administration (satisfaction range from 71.30%-88.00%) which is consistent with the interview results. But they have notified that EXAT ought to (1) extend its network distance to

cover more service areas than the existing (92.20%), (2) assess the natural environment and provide the measures to reduce the effect on its operations (75.20%) and (3) focus on the environmental management (71.30%).

It can be concluded that EXAT needs to develop its service operations especially Marketing Management which is the network extension to increase service areas and Environmental Management which causes the road users have the confidence its operation.

Enterprise road users have also perceived that EXAT must be developed (87.30%), the first three expected characteristics being that EXAT (1) employs the advance technology in operation and service increasingly (54.20%), (2) provides the information to the customers accurately and rapidly (51.40%) and (3) constructs and develops the new service patterns to cover the customer demands (51.40%).

There were 10 samples or 4.90% of the respondents who suggested guidance to EXAT and the highest of them (2 respondents) proposed that the quality improvement of 1543 call center needed to be improved. They perceived that toll collectors needed to improve their performance (42.30%). Additionally, the greeting during service needs improvement (54.20%). For traffic officers operation, they firstly anticipate improvement of traffic flow balancing to reduce vehicle stoppages (40.70). For information officers, telephone waiting times need to be reduced (46.70%).

Even though the study results indicated that enterprise road users quite agreed with EXAT administration with a satisfaction range of 65.60%-83.90%, they still expect authority administration development.

4.8.2 Secondary Data

As secondary data, this study has explored the administration of seven other expressway authorities. It has been found that the principle administration patterns of General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management are similar. They are just different in minor details; therefore, all information obtained will be the instruments to support EXAT administration development. This study will consider the organization details relative to organization vision, network distances, number of employees, percentage

of operational profit, percentage of personnel expense-total expense ratio, percentage of revenue-asset ratio, earning products, D/E ratio, investment types, daily average traffic volume and annual average toll revenue. They are investigated from each organization annual report which is tabulated in Appendix A, Table A.4-A.5.

It can be found that almost all the studied organizations have a vision which anticipates their authorities to be the toll road service leader in their area, but not EXAT's vision which is: "Choice of value, advanced development, and care for environment".

The toll road organizations have been established one after the other and this study has indicated that the earlier toll road organization is in Japan which was established in 1956. There are increasingly in the toll road organization establishment in many countries afterward. For EXAT, it has just celebrated the year 40th in 2012, in other word it is just the beginning the middle-aged organization.

In case of consideration the organization service distances, it is found that NEXCO-Central, Japan, operates the longest distances (1,761 kilometers long) and Queensland Motorways, Australia, operates the shortest distances (68 kilometers long). There are 207.9 kilometers long operated by EXAT that is nearly the one operated by HHI which is the private company as the concessionaire in south of China with the service distances 221 kilometers long in 2013.

In relation to the workforces operating in the organization, it is found that NEXCO-central has employed the highest number of workforces that is consistent with the service expressway distances. On the other hand the more the service expressway distances are operated, the more the workforces should be employed in the normal situation. But if it is focused on EXAT that operates 207.9 kilometers long expressways, it will be found that it hires more workforces than other toll road authorities even though their service distances are longer than EXAT service. Therefore, it is necessary for EXAT to determine the strategies to reduce the staff numbers or to increase the service distances, consequently, the workforce numbers and service distances will be lessened or closed to the others. The authority can hire environmental management in perspective of technology by applying the developed ETC replaced to MTC. However, it is inevitable to develop its workforces substituted by machines, then the training programs for employees to gain the other skills in order

to be still retained in the authority. They need to implement the human resources management and development. Additionally, it is also to hire marketing management in principle of promotion by providing the advertising and sale promotion plans in order to attract the customers to extensively use ETC.

For the financial performance of each toll road corporations, it has the range from loss performance (-38.34%) to profit performance (35.03%). EXAT is the authority that has maximum profit. It could be implied that EXAT performance is more effective than other's ones because EXAT business is quite monopoly. However, the authority can gain more net profit by reducing the overall organization expenses. Having considered the personnel expenses previously specified, it is necessary to reduce that costs, therefore, the authority will gain more profit. It means EXAT has to simultaneously develop its human resources and management including technology.

It also verifies the revenue and asset ratios that have various figures with range 2.12%-38.98%. It is found that EXAT ratio is quite low (4.69%) so it can be indicated that the authority is ineffective in asset management. Hence, it is necessary to determine the strategies in order to raise the said ratio by increasing the nominator, revenue, using management, human resources management and development, operation management, environmental management especially in technology and marketing management concentrated on the new products creation offering to the customers.

For D/E ratio, it varies from 0.03 to 7.04. EXAT figure is 0.93 which is very close to the HHI's one. In the business perspective, the appropriate average ratios varies from 1.0 to 1.5 so that EXAT still has the gap to incur debts that means EXAT is able to obtain more capital to invest to extend its expressway service network. It will satisfy the customers consequently, the authority can earn more revenue by applying the financial management, human resources management and development and operation management.

Next is the organizational net profit that can be enhanced by lessening the personnel costs. This study has indicated that the personnel expenses for each corporation vary in the range 4.23% to 31.88% and ineffectively, EXAT personnel cost is the highest figure. Therefore, EXAT has to define the relevant strategies that are management, human resources management and development, accounting

management, environmental management in term of technology and so on to effectively administrate.

It is further considering the types of corporate investment that can be classified into three groups which are (1) self investment, (2) concession and (3) both self investment and concession which EXAT is operating. At present, concession or public private partnership pattern is the popular and interesting instrument for the public sectors in order to increase national infrastructure. EXAT is also inevitable to apply this instrument and even though it is operated by private sectors the authority, as the regulator, has to regulate and monitor the project to be conformed to the contract by hiring environmental management in legal and technology perspectives, management, financial management and so on.

The other significant indicator of each corporate from this study is the traffic volumes which vary from 216,389 to 1,720,000 transactions. NEXCO-central has served the highest average daily traffic volumes and the second highest is EXAT. If it is only considered in the absolute traffic volume figures, there will be no meaning. Having considered the average daily volume and network distance ratios which are tabulated in Table 4.41, it is found that EXAT network per kilometer serves more traffic volumes than NEXCO-Central does.

Table 4.41 Comparison Traffic Volume for Each Corporation

Organization	Service Network (Kilometers)	Average Daily Traffic (Transactions)	Average Daily Traffic per Service Network (Transactions/Km.)
Expressway Authority of Thailand	207.9	1,320,187	6,350
Bangkok Expressway Company Limited (Public)	70.5	918,896	13,033
NEXCO-Central	1,761.0	1,720,000	976
Queensland Motorway	68.0	216,389	3,182
Hopewell Highway Infrastructure	183.0	403,000	2,202

It continues to analyze the authority earning ability, EBITDA, and it is found that they vary from 101 to 291 millions \$US. NEXCO-Central has the maximum figure which is 6,145 millions \$US. When it considers in term of EBITDA per expressway distance, it can notice the ineffective operation of EXAT because the figure is the least compared to the others.

Table 4.42 Comparison Earning Ability for Each Corporation

Organization	Service Network (Kilometers)	EBITDA (million \$US/yr)	EBITDA per Service Network (million \$US/yr/Km.)
Expressway Authority of Thailand	207.9	207.487	0.998
Bangkok Expressway Company Limited (Public)	70.5	109.613	1.554
NEXCO-Central	1761.0	6,145.421	3.489
Queensland Motorway	68	101.111	1.486

The last information explored in this study concerns the total annual revenues and it has been indicated that NEXCO-Central earns the highest revenue (6,250 millions \$US) and the rest varies from 204 to 515 millions \$US. EXAT earned about 287 millions \$US (recorded in 2011). It will be more useful if it considers the earning per kilometer of expressway. Having analyzed the relevant information, the ratios of earning per kilometer of service expressways of NEXCO-Central, Queensland motorway, HHI and EXAT are 3.1664, 3.549, 1.463 and 1.384 millions \$US per kilometer respectively. Ineffectively, EXAT has earn the least revenue compared to the others therefore, it is necessary to earn more revenues by determining the operating strategies involving to human resources management and development, marketing management, environmental management especially in technology and so on.

The primary data obtained from three-group questionnaires and relevant personnel interviews are the instruments that assess the EXAT public service in the

present situation. The other instruments, secondary data, which consist of project management, authority performance, authority administration and other toll road administration and performance. First, the project management concerns the existing projects which have opened to the service including the future planned projects to enlarge the existing network not only in Bangkok and its vicinity areas but also the main provinces over the country. The authority has planned nearly 300 kilometers expressway to cover the areas previously specified for the future operation. Second, EXAT performance indicates both financial and non-financial performances. It is fortunate that the authority has continuously gained profit in the past five years so that EXAT will have the funds to increase expressway network in the future. In case of non-financial, it focuses on the indicators of monthly complains and accidents. Third, EXAT administration is the other important factor by considering seven-knowledge of management. Lastly, other toll road company administration and performance have been traced in terms of administration characteristics and company performance which are the supporting factors to propose the EXAT administration structure.

4.9 Key Success Factors

The EXAT administration development can not accomplish according to the proposed model without key success factors which are the authority workforces, technology and clear government policy. First, the authority workforces, are the very important to any authority because they drive the authority to achieve its vision and missions, hence, they must have the skill and capabilities not only in technique but also in management. They also have to focus on the preparation of the communication mean, English. Second, technology, is the other key success factor that has been continuously developed therefore, EXAT is necessary to research the appropriate technologies for applying to its service by concerning the cost reduction and effectiveness increment. Lastly, the clearness of government policies, are also inevitable that government has to determine the policy how to solve the traffic problems in Bangkok and vicinity areas and what EXAT roles and boundary in the traffic resolutions because they can be solved by mass transit system and road systems, toll roads and non-toll roads. Having determined the clear policy for traffic

resolution by assigning the unique toll road regulator, EXAT can develop its administration itself. At present, government has a quite clear policy to promote the mass transit system and road system is the secondary instrument to solve the traffic problems. Consequently, EXAT has been reduced the roles to construct expressways in the capital of Thailand, Bangkok, and its vicinity areas, on the contrary, there is the trend to build more expressways connecting between the major cities. There is the very important barrier which is the government policy to determine the unique toll road organization because DoH, another government agency, has currently operated motorways or the toll roads. It has been found that the studied corporations have their operation networks covering the whole country. Lastly, in EXAT context it can foresee the opportunity to go international by constructing expressway network to the border of Thailand and finally, connecting to the neighbor country toll road network, specifically, in ASEAN to support the touring and business each other for AEC after 2015.

Chapter 4 has indicates the primary data analysis results from three groups of questionnaires and relevant personnel interviews. It also explores the secondary data from the annual reports of other expressway authorities, relevant manuals and so on. At the end of this chapter, the organization structure is proposed with the key success factors. Next chapter, the last chapter, will provide the studied results, research recommendations and recommendations for future research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The title of this study is “The Administration Development for Expressway Authority of Thailand”. EXAT is a state enterprise which was established in 1972 under the regulation of the Ministry of Interior. It has been regulated under the Ministry of Transportation since 1999 following a government reformation. EXAT currently operates 207.9 kilometers of expressways serving the Bangkok area and vicinity including the important routes to the northern and the eastern regions of Thailand. There is an average of over 1.3 million daily road user transactions processed by EXAT (recorded in 2010). Customers are able to use the services through either manual toll payment or an electronic toll payment system called Easy Pass, which serves 25% of all transactions. EXAT has earned a profit in each of the past 5 years. Moreover, its performance as assessed by TRIS Corporation over the period is in the range 4.0000-4.5000 of a 5.0000 scale which is classified by TRIS as a “good” performance level.

Even though the EXAT’s performance is ranked “good”, TRIS Corporation has made some recommendations as part of its assessment in relation to claim management and service management. The aim of this study is to identify whether any parts of the current EXAT administration can be improved to better enable EXAT to serve customers and become a self-supporting, sustainable state enterprise.

The Conceptual Framework for this study consists of an examination of:

- 1) General Administration: Seven knowledge of management functions comprising General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management;
- 2) Project Management: Existing expressway projects, projects currently under construction, and future expressway projects;

3) Operating Performance: The financial performance of EXAT as well as its non-financial performance as measured by user complaints and accidents;

4) Public Service Evaluation: Employee perceptions and the expressway user satisfaction as to the current level of EXAT service;

5) Other Expressway Organization Operation: The characteristics and performance of Bangkok Expressway Company (Thailand), Central Nippon Expressway Company (Japan), Hopewell Highway Infrastructure (China), Queensland Motorways (Australia), The Highways Agency (United Kingdom), The South African National Road Agency (South Africa), and The Motorway Company (Slovenia) were studied by scrutinizing their annual reports. Performance indicators such as organization vision, establishment year, operating network distance, number of employees, % of net profit, personnel expenses to total expenses ratio, revenue to asset ratio, Debt/Equity ratio, earning products, investment pattern, average daily traffic, total revenue and EBITDA were compared. These indicators will provide supporting information to help determine the future administrative structure model.

This study employed not only quantitative but also qualitative research. For quantitative research, questionnaires were used as an instrument to obtain data related to employee opinions and road user satisfaction. The interviews of related persons are provided in order for qualitative research.

The data collected in this study has been classified into two types which are primary data and secondary data. The main source of primary data comprises the structured questionnaires which were tested for content validity and reliability before being distributed to the samples. Another source of primary data is interviews using semi-structured questionnaires with randomly selected members of the sample groups, a member of the EXAT board and a Deputy Governor. The secondary data has been obtained from local and international literature, annual reports, operating manuals and relevant minutes of meeting.

5.1.1 Conclusions from Primary Data

As the questionnaire study population comprises three groups (i.e. EXAT employees, individual road users and enterprise road users), there are three sets of questionnaires. In the reliability test, the results according to Cronbach's α of the three

groups are more than 0.80. For the number of samples, the Yamane's formula has been applied in association with the W. Laurence Nueman principle. These show that the sample sizes are population representative. The population and sample sizes of each group are presented in Table 5.1. The results collected for each group are presented in Table 5.2.

Table 5.1 Details of the Population Type, Population Size and Sample Size

Population Group	Population Number	Sample Number
EXAT employees	4,874	1,000
Individual Road Users	1,320,187	2,500
Enterprise Road Users	800	240

Table 5.2 Detail of Sample Responses in Terms of Number and % Response

Sample Group	Sample Number	Sample response	% Response
EXAT Employees	1,000	894	89.40
Individual Road Users	2,500	1,884	59.52
Enterprise Road Users	240	214	89.17

5.1.1.1 EXAT Employee Opinion

The primary data in relation to EXAT employee opinion analyzed from the questionnaires shows that overall EXAT administration performs towards the "good" level which is consistent with most road users who also stated that its service is good. Employees agree with the present EXAT initiatives which are:

- 1) To continue to offer manual toll collection;
- 2) To provide more places to top-up tolls in ETC system;
- 3) To research and develop the ETC system in order to increase efficiency;
- 4) To communicate EXAT information more to customers;
- 5) To increase the service expressway distance;

- 6) To commercially develop the acquired land to earn more revenue;
- 7) To improve the new employee orientation system;
- 8) To better explain the stages of employee performance assessment.

However, the sampled employees believe that EXAT should be further developed. The three characteristics which employees expect the most are;

- 1) EXAT should be an SOE with satisfied and motivated personnel providing a good working environment;
- 2) EXAT should provide quick and accurate information to customers on things such as traffic management. (This is quite consistent with the road users interview where they state that they seldom receive it from EXAT); and
- 3) EXAT should increasingly operate and serve the customer with the modern technology.

The two most common recommendations of the sampled workforces were:

- 1) EXAT should develop its human resources management in relation to the performance assessment system and salary structure; and
- 2) EXAT should develop its work system (procedures).

Moreover, the sampled employees indicated that they wished EXAT to focus on the knowledge of management functions of Human Resources Management and Development, Marketing Management and Operations Management in particular to improve the performance of the authority.

5.1.1.2 EXAT Individual Road User Opinion

The results of the individual road user questionnaire analysis have shown that EXAT administration needs to be developed. The objectives should be:

- 1) To provide fast and accurate information to the customers;
- 2) To have new patterns of communicating the traffic situation on the expressway and at grade road level for road users to effectively decide the journey route;
- 3) To increasingly operate and serve with modern technology.

The authority can achieve these objectives by using Human Resources Management and Development to better train the workforces and Environmental Management to apply modern traffic engineering technology in order to notify the real-time traffic condition on the expressways.

For suggestions, the individual road users have proposed the first three things which are:

- 1) EXAT needs to improve the Easy Pass system which malfunctions often in operating and toll topping up;
- 2) EXAT must develop not only the traffic officers by having them advised road users of accident information as soon as possible but also the information officers to enhance their skill in suggesting alternative routes to road users in case of traffic congestion.
- 3) EXAT should modify its investment plan and extend its service network;

These recommendations can be achieved by employing Human Resources Management and Development in training, Marketing Management in promotion and customer relation and Environmental Management in providing state of the art equipment to communicate the real time traffic condition to road users.

Additionally, their opinions provide a strong message to EXAT that it is necessary to enlarge the existing networks to cover more service areas and manage the corporate risks so that road user service can be maintained without disruption.

5.1.1.3 EXAT Enterprise Road User Opinion

The last group, enterprise road users, is generally satisfied with EXAT administration. However, they have expressed their opinions that EXAT has to develop its management and having it been improved, its attributes which are anticipated are:

- 1) EXAT has to increasingly carry out the advance technologies to corporate operation and service;
- 2) EXAT is required to accurately and rapidly offer the information to the customers; and
- 3) EXAT should create and develop new service models which better cover enterprise road user requirements.

These things will be achieved by employing Environmental Management in providing advanced technology and Marketing Management, Operations Management, and Human Resources Management and Development to determine the best service models for enterprise road users.

For recommendations, the enterprise road users have proposed:

1) EXAT should improve the quality of the officers who provide information to customers. Additionally, toll collectors need to be developed in greeting customers during services.

2) Traffic officers should improve their service by better balancing the traffic management/flow stopping on expressways with merging traffic.

3) The telephone call center officers who provide traffic information must improved their service so that the customers who call to them will not wait for too long.

All recommendations are able to be fulfilled by applying the knowledge of Human Resources Management and Development in training and Environmental Management in call center technology.

5.1.1.4 Summary of Employee and Road User Opinions

The employee and road user opinions analyzed from their questionnaire responses are summarized in the following Table 5.3.

Table 5.3 Summary of Employee, Individual and Enterprise Road User Opinions

Description	EXAT employees	Individual road users	Enterprise road users
The necessity to develop EXAT	It is necessary.	It is necessary.	It is necessary.
Expected characteristics	-EXAT has to accurately and rapidly give the information to the customers.	- EXAT has to accurately and rapidly give the information to the customers.	-EXAT should increasingly operate and serve the customers with the advance technologies.

Table 5.3 (Continued)

Description	EXAT employees	Individual road users	Enterprise road users
Expected characteristics	-EXAT should provide the modern communication system in order to publicize the traffic news on both the expressways and at grade road for the road users to effectively decide their destination routes.	-EXAT should provide the modern communication system in order to publicize the traffic news on both the expressways and at grade road for the road users to effectively decide their destination routes.	- EXAT has to accurately and rapidly give the information to the customers. -EXAT should develop and create the modern services to cover more customer demands.
Recommendations	-EXAT should increasingly operate and serve the customers with the advance technologies.	-EXAT should increasingly operate and serve the customers with the advance technologies.	-Improve the quality of officers 1543 who serve information to the customers.
	-EXAT should develop its human resources management focusing on performance assessment and salary structure.	-EXAT should improve the Easy Pass system which is malfunction in operation and toll top up.	

Table 5.3 (Continued)

Description	EXAT employees	Individual road users	Enterprise road users
Recommendations	<p>-EXAT should develop its administrative system.</p> <p>-First-three strategies which EXAT should execute are human resources development strategy, administrative development strategy and marketing and operation development strategy.</p> <p>-EXAT still needs manual toll collection system.</p> <p>-EXAT ought to provide more toll top up places for ETC system.</p>	<p>-EXAT has to install more guide signs and modify which are not clear and improve the brightness of the expressway lights.</p> <p>-EXAT has to improve the investment plan to increase its service networks.</p> <p>-Develop the operation of traffic officers expecting them to inform the customer in advance when there is the accident.</p> <p>-Develop the officers who provide the information to the customers by increasing their skill in the route advice in case of traffic congestion.</p>	<p>-Develop the toll collection officers by expecting to improve their greeting during service provision.</p> <p>-Develop the traffic officers in order to balance the vehicle stopping.</p> <p>-Develop the officers who provide the information by not allowing the customers wait too long for asking the information.</p>

Table 5.3 (Continued)

Description	EXAT employees	Individual road users	Enterprise road users
	<p>-EXAT is expected to have more research and development in ETC system to be more effective than the existing one. EXAT should increasingly communicate to publicize the information to the customers.</p> <p>-EXAT is expected to provide more networks. EXAT should commercially develop the acquired land to enlarge its revenue. EXAT is expected to develop its orientation system which is suitable for any situations. EXAT should clarify the stages of staff performance evaluation.</p>		

5.1.2 Conclusions from Secondary Data

Having investigated 7 other domestic and overseas expressway organizations, it was found that EXAT is similar to the explored corporations in investment source and earning products. For the investment source, EXAT has invested by using its own revenues and a portion from the government budget and concessions to a private firm to build and operate part of the expressway network. In relation to earning products, EXAT earns its revenue through the network services with toll and commercial land development.

Notably, one authority has developed an additional product to increase income. NEXCO-Central, Japan has established a consultancy firm in order to advise on the management of expressway construction. This is another product that EXAT could consider in providing its expertise to other countries, especially those in the Asian Economic Community (AEC) that will be opened in 2015 such as Cambodia, Laos and Myanmar.

The major differences between EXAT and the other expressway organizations studied are:

1) Corporate Vision: Almost all of the studied enterprises have a vision to be “The Toll Road Service Leader” in their countries, while EXAT’s vision is “Choice of value, advanced development, and care for environment”.

2) Network Service Distance: Although established for 40 years, it is found that EXAT has a network distance only 207.9 kilometers. If considered in terms of network growth rate, it has seen that the average growth rate is only 5 kilometers per year. It is also found that the service networks of most of the investigated organizations covered a major area of the country. Hence, EXAT should consider how to extend its network, especially for connecting between the outlying provinces since it is very hard to expand in Bangkok.

3) Staff Numbers: Staff numbers alone are not a satisfactory indicator. What is important is the employee to network distance ratio, and in this regard EXAT’s performance appears ineffective. Table 5.4 will show the said ratios for three of the studied companies.

Table 5.4 Employee Number and Network Distance Ratio

Organization Name	Network Distance (Km)	Staff Number	Staff - Distance Ratio
Expressway Authority of Thailand	207.9	4,603	22.14
Bangkok Expressway Company	70.5	650	9.22
Motorway Company of Slovenia	606.6	1,247	2.06

The results shown in Table 5.4 show that EXAT needs to consider how to modify its staff-network distance ratio to be more consistent with the other authorities by applying Human Resources Management and Development in the area of training to increase efficiency, Environmental Management in the area of technology such as ETC, and Marketing Management in order to induce road users to adopt new technology and products.

According to the study, EXAT's net profit is the highest of the 7 authorities. However, if the profit is considered in terms of employee numbers as has been previously analyzed, it will be seen that there is still room for improvement. This is supported by the fact that EXAT's personnel expense-total expense ratio is the highest of the 7 authorities. Hence, if EXAT is able to increase the efficiency of its staff as outlined above or expand its network, the ratio will be lessened and its net profit will be higher.

In case of the revenue-asset ratio which is only 4.69%, it is seen that EXAT has utilized its assets quite ineffectively. It is therefore necessary to examine the network routes that have not achieved forecast traffic levels and formulate strategies to increase customers by applying Marketing Management focusing on promotion and toll reduction, as well as Human Resources Management and Development concentrating on training of toll collectors and traffic officers in order to satisfy road users. Additionally, the other asset which is the acquired land for expressway construction can be commercially developed to increase EXAT revenue. Financial Management should be applied in studying whether the land development projects are feasible and Marketing Management applied in the areas of price and promotion. Having employed suitable strategies, the revenue-asset ratio will be raised.

5.2 Recommendations for EXAT Administration Development

5.2.1 Policy Recommendations

5.2.1.1 Organizational Structure Reform:

All factors previously specified have indicated that EXAT should be reformed along the lines of the NEXCO-central administration model. As NEXCO-Central is a privatized firm, the model could not be adopted in full. There are many barriers to privatizing Thai SOEs, the main one being employee resistance caused by anxiety about job security (Sathit Limpongpan, 2000). Therefore, the administration model proposed is a holding company which operates through subsidiaries. EXAT will be the parent company (Echanis, 2009) because in the past it has continuously retained earnings. These could be used to invest into the subsidiary companies to support the parent company operations according to EXAT Act. The parent company should consist of a Policy and Planning Department, Finance Department, Legal Department, Office of the CEO, Internal Audit Department and a Department of Administration. For the subsidiary companies which should probably be invested are an Expressway Construction Management company, an Expressway Maintenance company, a Toll Collection company, a Traffic Management and Rescue company, a Land Acquisition and Development company, a Research and Development company, and a Concession Project and International Affairs company as shown in Figure 4.5.

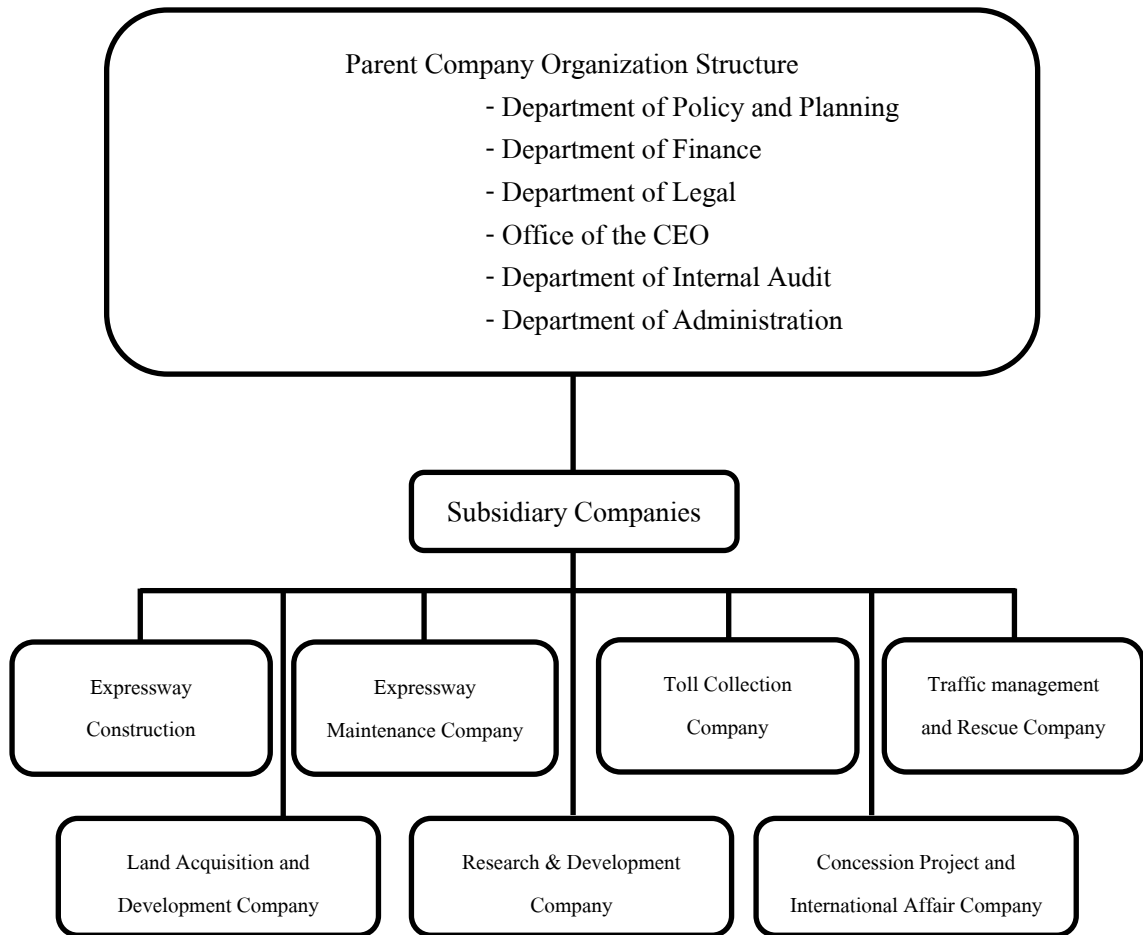


Figure 5.1 The Proposed EXAT Administrative Structure

The Concession Project and International Affairs Company and the Expressway Construction Management Company will be the core businesses creating the new products in terms of increasing both national and international service networks which have been planned for nearly 300 kilometers long. This is consistent with the requirements and opinions of the surveyed authority staffs and road users who expect EXAT to be the main pipeline connecting the major cities of Thailand in the same way as the studied overseas corporations. An important opportunity for EXAT is investment in overseas expressway businesses, especially in ASEAN. Examples of similar investments are PTT's projects in Myanmar and EGAT's projects in Laos. Another business opportunity would be to offer expressway consulting services to the same ASEAN target group, similar to the service provided in Japan by NEXCO-Central.

As well as state-of-the-art technology in ETC and other areas to support road users, the Research and Development Company should look at creating new products to generate revenue and enhance customer loyalty, as has been done by NEXCO-Central with its tour business and road user credit cards.

The Land Acquisition and Development Company should also seek to increase the holding company earnings by looking at various overseas models for providing small shops and other facilities in the rest areas along expressways for road users to enjoy and relax. This is consistent with the opinions of the surveyed authority employees and road users.

The Expressway Construction Management Company and Expressway Maintenance Company will be responsible for the quality and safety of the road surfaces on expressway. Additionally, they can play a role in greenhouse gas reduction by innovatively inventing or implementing technology that can reduce energy consumption. There are many such innovations that have been introduced overseas, such as the 3Rs (reduce, reuse and recycle) activities in Japan aimed at lessening natural material consumption. Finally, the two companies should promote a campaign to plant large numbers of trees along the expressway rights of way to increase the green areas and offset CO₂ emissions.

The Toll Collecting Company and Traffic Management and Rescue Company are the main companies which provide personal service to road users. A major advantage of the proposed organization structure is that each company has only one mission. It is expected that the Toll Collecting and Traffic Management and Rescue operations would be more efficient under this system. This will lead to the improvements in toll collecting and traffic management and rescue that the surveyed authority employees and road users were looking for.

The proposed subsidiary companies should be independently managed, especially in relation to their human resources and salary structure, so that they meet the requirements of the labor market for various positions. For example, the Traffic Management and Rescue company salary structure will be different from that of the Toll Collecting Company because it is based on different job descriptions and levels of responsibility. This will solve some of the problems which the authority currently faces in performance assessment and salary structures. EXAT as the parent company

would appoint the key persons and determine the overall compensation system to ensure fairness.

Importantly, EXAT also change its vision in line with the new organization structure. EXAT's current vision is quite different from the visions of the other expressway authorities studied. Most of these have adopted visions of being the Toll-Road Service Leaders in their countries. EXAT's current vision is:

“Choice of value, advanced development, and care for environment”

It is proposed that EXAT modify its vision in anticipation of the AEC opening in 2015. A proposed vision that better reflects the changed circumstances would be:

“To Be the Toll Road Service Leader in ASEAN”

5.2.1.2 Product Development:

A sustainable organization must continuously offer modern goods and services that meet the needs of customers. In the knowledge of management function of Marketing Management, this requires innovation by employing marketing and engineering research to continuously update existing products and invent new ones. The knowledge of management function of Financial Management must be simultaneously employed to conduct project feasibility studies so that project finance can be obtained.

EXAT should provide expressway services all over the country in order to provide customers with a service that is consistent with the networks of the other expressway authorities which have been investigated. At present, EXAT expressway projects planned for the future cover 253 kilometers in the Bangkok area and vicinity.

EXAT should add other earnings products through the commercial development of its occupied land in line with the other expressway authorities studied. The development can be managed either by EXAT itself or in conjunction with investment from the private sector. Such development activities must take into account important Marketing Management issues such as:

- 1) Products-existing products in the target areas should be considered together with marketing research so that differentiated products that satisfy customers are launched;

2) Price - it is necessary to seriously consider the appropriate rent prices and concession fees in order to be fair to all parties so that the businesses have a long-term future;

3) Advertising and promotion - it is essential to publicize the area development information to the target customers. Additionally, a price reduction campaign should be launched for certain expressway routes from time to time in order to enlarge sale volumes.

5.2.1.3 Investment Sources Development:

Expanding the EXAT service area will require a large budget as it will involve not only the expressway construction cost but also the cost of land acquisition. To date, EXAT funding has largely come from the government. The government has many demands on its budget and may not be able to support the optimal level of investment required to expand the EXAT network each year. Because of such budget limitations, in April 2013 the government passed the Private Investment in State Undertaking Act (commonly called the Public Private Partnership or PPP Act). Under this Act, EXAT can contract out the design, building and operation of new expressways to the private sector for an agreed period of time (usually 25-30 years). Raising funds from the private sector under the Act will involve the following knowledge of management functions:

1) Marketing Management-to publicize the project information in order to attract potential investors;

2) Financial Management-to prepare project feasibility studies and decide whether the projects should be funded by the authority or the private sector;

3) Accounting Management-to follow the provisions of the Act, which require both parties to maintain detailed records and follow standard accounting practices in order to avoid potential conflicts;

4) Operations Management-to manage the project so that it is completed within the scheduled time and budget.

5.2.1.4 Technology and Innovation:

The authority should monitor expressway technology developments throughout the world in order to maintain a state-of-the-art system. The knowledge of

management functions of Financial Management and Operations Management are important in assessing new technology and ensuring that it operates according to the determined plan. A consequence of introducing new technology is that it often affects the workforces. Hence it is necessary to employ the knowledge of management function of Human Resources Management and Development not only to provide the skilled employees needed to operate any new equipment, but also to re-train any staffs who are displaced to do other work within the authority.

5.2.1.5 A Single Tolled-Road Organization:

At present there are two organizations operating toll roads in and around Bangkok: EXAT, which operates expressways and the Department of Highways, which operates motorways. In practice, there are problems in cooperation and the connection between the two systems since they operate under different regulations. In order to provide an optimal system for road users, the government is negotiating to assign a single organization to regulate all toll roads, which is consistent with the operation of the other expressway authorities analyzed in the study. However, it is necessary to employ the knowledge of Environmental Management about the concerned regulations.

5.2.1.6 Corporate Social Responsibility:

Employees: One of the most important EXAT stakeholder groups is its employees as the organization is highly unlikely to achieve its goals if they do not perform their functions appropriately. Accordingly, EXAT should have a practical plan to provide safe workplaces that have a good working environment and do not expose employees to dangerous levels of noise and exhaust fumes.

The Community: EXAT should have an operating plan to support those who live or operate businesses near expressways. This should cover fair treatment of those whose land has been acquired as well as those affected by expressway construction and operation. Measures could include noise barriers and educational scholarships for children of affected communities. This is consistent with the other expressway organizations studied. The knowledge of management function of Environmental Management should develop such plans in line with ISO 24000.

Green House Effect: Nowadays the green house effect is said to be causing climate changes around the world. As a government agency, EXAT should be

responsible and adopt a policy of energy reduction or energy replacement or CO₂ accumulation reduction. This needs to be addressed at both a strategic level (in terms of policy and new innovations) and a management level (in dealing with existing and future operational issues). An example of a socially responsible strategic innovation can be seen from the NEXCO-Central study, which indicates that one of the popular ways to reduce CO₂ levels in Japan is the use of vehicles which consume electricity instead of gasoline. At a management level, developments such as this should be investigated and monitored as part of an Environmental Management study. If the innovation proves successful, Operations Management should prepare an implementation plan (which in this case could be land for equipment installation to serve electrical vehicles in rest areas.)

5.2.1.7 ASEAN Economic Community (AEC):

Thailand will be the part of the AEC which will become effective in 2015. When this happens, it is inevitable that there will be more drivers from ASEAN countries travelling on EXAT expressways. The introduction of the AEC will affect EXAT both directly and indirectly.

The major direct effect requiring consideration at the policy level is the need for greater communication and coordination between road authorities. Since almost ASEAN countries operate toll-roads, EXAT should facilitate formation of an Association of AEC Toll Road Organizations. The beginning objectives of the Association could be to exchange information on mutual problems, discuss possible technology transfers, and consider emerging issues such as expressway connectivity, joint ticketing, and ways of facilitating tourism and business road travel between member countries. A longer term issue which could be considered relates to differences in driving regulations. On this later point, the knowledge of management function of Environmental Management should examine the road regulations of each ASEAN country to assess the practicality of adopting a universal driving law for ASEAN. At present there are some major differences (such as Thailand, Indonesia and East Timor driving on the left while all other ASEAN countries drive on the right).

An important indirect effect of the AEC is the nature of the workforce that may be involved in expressway construction. There is a major shortage of Thai

construction workers at present, especially for outdoor work. When the AEC becomes effective, unskilled workers will be able to move freely throughout ASEAN countries. It is expected that many will move to Thailand, and that ASEAN workers will then make up a large part of the EXAT construction workforce.

5.2.1.8 Executives Preparation:

A committed and experienced management team with a high level of skills in the seven-knowledge of management functions of General Management, Marketing Management, Accounting Management, Financial Management, Operations Management, Human Resources Management and Development, and Environmental Management is essential in order to effectively and efficiently manage the authority to achieve its objectives. At present there is little or no executive development outside that associated with existing functional responsibilities. EXAT should introduce a structured executive development program across all levels of management which provides a better understanding of strategic management issues and how to understand and apply each of the knowledge of management functions to the corporate operation.

5.2.1.9 EXAT Administration Structure:

Having the studied the conceptual framework in terms of the primary and secondary data collected for this investigation, it is proposed that EXAT's organizational structure be reformed. The EXAT Act 2007 provides the authority with the power to set up subsidiary companies. It is therefore proposed that EXAT adopt an administration model which is similar to that of NEXCO-Central (Central Nippon Expressway Company Limited) in Japan. The administrative structure proposed is that EXAT be restructured into a Holding Company which invests in the necessary subsidiary companies to accomplish its missions. By applying this organization structure to EXAT, the EXAT targets should better be able to be achieved.

5.2.2 Management Recommendations

5.2.2.1 Human Resources Management and Development:

According to the opinions of sampled employees, there are major shortcomings in the area of Human Resources Management and Development. Proposed improvements are:

1) The current performance assessment system needs to be reviewed as many employees consider it to be unfair in that the stages and assessment criteria are not clearly stated;

2) EXAT must establish a better recruitment system to obtain workers whose qualifications meet the requirements of responsible departments;

3) Recruitment time needs to be greatly reduced as the time currently taken to appoint new staff is considered;

4) EXAT should better recognize employees who do outstanding work through awards and other forms of recognition, as is the case with some the other expressway organizations studied. This will instill a sense of pride and result in better operating efficiency;

5) A better staff training plan needs to be designed to help staff at all levels gain in knowledge and skills outside their normal job function (e.g. as suggested in road user interviews, a program to train traffic officers in solving problems with EasyPass equipment to solve entry point delays);

6) A better executive development program is needed involving workshops and specialty training in order to enhance their skills in relation to the seven- knowledge of management functions.

5.2.2.2 Succession Planning:

Most of the overseas expressway organizations have Executive Succession Plans to provide continuity of leadership in the event of the loss of a key. EXAT has no such plan and should assign Human Resources Management and Development Department to develop one.

5.2.2.3 Preparation for the ASEAN Economic Community

The major area of preparation for the AEC that requires management action involves language: the language of spoken communication for those who deal directly with road users, and the written language on all equipment and guide signs which are installed on expressways. Moreover, it may be beneficial to create a multi-lingual guide book to allow road users from ASEAN countries to read about EXAT travel routes, Thai driving regulations, etc. in their own language.

It is essential to manage the issue of spoken language in order for staff to effectively give directions and deal with breakdowns and accidents. As a short term

plan, the Human Resources Management and Development function must create an English training program for traffic officers, rescue officers, toll collectors and information officers. This is because English is the standard language for international communication. However, it may be useful in the longer term if some of EXAT's workforces were able to communicate in the native language of each country. The Human Resources Management and Development function should therefore undertake a feasibility study into recruiting selected workers from other ASEAN countries.

5.2.2.4 Corporate Social Responsibility:

As a result of its operations, EXAT introduces carbon dioxide (CO₂) to the atmosphere through:

- 1) Vehicle emissions while cars and trucks are waiting before entering the expressways;
- 2) Vehicle emissions while waiting on the expressways because of heavy traffic on at grade roads;
- 3) Consumption of electricity 24 hours a day.

EXAT can decrease the CO₂ associated with toll queues by replacing manual toll collection with ETC to reduce the vehicle queue length. It is expected that EXAT will install ETC systems at 50% of the toll booths in each plaza, which is consistent with road user opinion. It is essential for EXAT to develop the ETC system to serve customers more effectively by using Operations Management.

In relation to electricity consumption, EXAT should research ways of reducing or replacing the electricity used in its operations such as the design and construction of "green" office buildings which do not use as much electricity and the development of alternative power sources (e.g. establishing small power plants (SSP) under license from the Electricity Generation Authority of Thailand (EGAT) on EXAT land).

Finally, EXAT should consider offsetting some of the CO₂ emissions associated with its expressways by enlarging green areas along expressway routes and where it is safe to do so planting additional trees.

The knowledge of management function of Environmental Management should investigate ways of achieving the above objectives. Any proposals developed

should involve Financial Management (to analyze project feasibility), Operations Management (to ensure that the project happens within the scheduled time and budget), and Marketing Management (to promote the innovation).

5.2.2.5 Technology and Innovation:

As part of its Social Responsibility, EXAT should continuously monitor new technologies that deal with expressway noise and exhaust fumes. Additionally, if EXAT is to achieve become a self-supporting, sustainable SOE, it must create customer loyalty by continuously providing state-of-the-art products and processes to serve road users.

EXAT should introduce two new technologies: multi-lane free flow for electronic toll collection and an intelligent transportation system (ITS). These would provide a better service for customers by increasing speed of access to the system and providing traffic information to enable road users to decide the best routes to their destination. However, in introducing these technologies, it will be necessary to retrain the staffs that will be replaced by machines in order to avoid industrial problems.

5.2.3 Future Research Recommendations

5.2.3.1 This study examines overall workforce opinion in relation to current knowledge of management functions but does not consider differences of opinion by department or employee profile. Thus a further study should be conducted to analyze employee opinions in various departments and consider whether other factors such as age, level of responsibility, work period, education level and so on affect employee opinions.

5.2.3.2 In this study the level of individual road user satisfaction with the knowledge of management functions administrated by EXAT is assessed by measuring overall satisfaction. A further study should be conducted to research whether individual road user satisfaction is different for different knowledge of management areas and which ones are important for EXAT.

5.2.3.3 In this study the level of enterprise road user satisfaction with the knowledge of management functions administrated by EXAT is assessed by measuring overall satisfaction. A further study should be conducted to research whether individual road user satisfaction is different for different knowledge of

management areas and which ones are important for EXAT. Moreover, the study population for enterprise road users consisted only of those transport organizations registered with EXAT. Any further research should include the non-registered enterprise user population in order to pick up more complete data.

5.2.3.4 The indicators used in each area of knowledge management in this study are only a portion of the whole. There are other indicators which could be applied in a further study that could expand the dimensions of the research and provide additional strategies to improve EXAT administration.

5.2.3.5 This study has investigated seven overseas expressway authorities by selecting three corporations from Asia, two corporations from Europe, one corporation from Australia and one corporation from Africa. The study is limited in that the number of studied corporations might be not enough, there are no corporations from Southeast Asia outside Thailand, , and there are no corporations from North and South America. Therefore, the next research should cover more expressway authorities from every continent to obtain more complete results.

5.2.3.6 The conceptual framework in this study could potentially be applied as the research conceptual framework for the other SOEs either the same industry or a different industry.

5.2.3.7 To implement the proposed organization structure as holding company, EXAT must study the factors that affect the achievement of the new administrative structure especially the issues involving the employees which are very sensitive.

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APPENDICES

APPENDIX A

EXPRESSWAY AUTHORITY OF THAILAND ORGANIZATION STRUCTURE (Simplified in 2012)

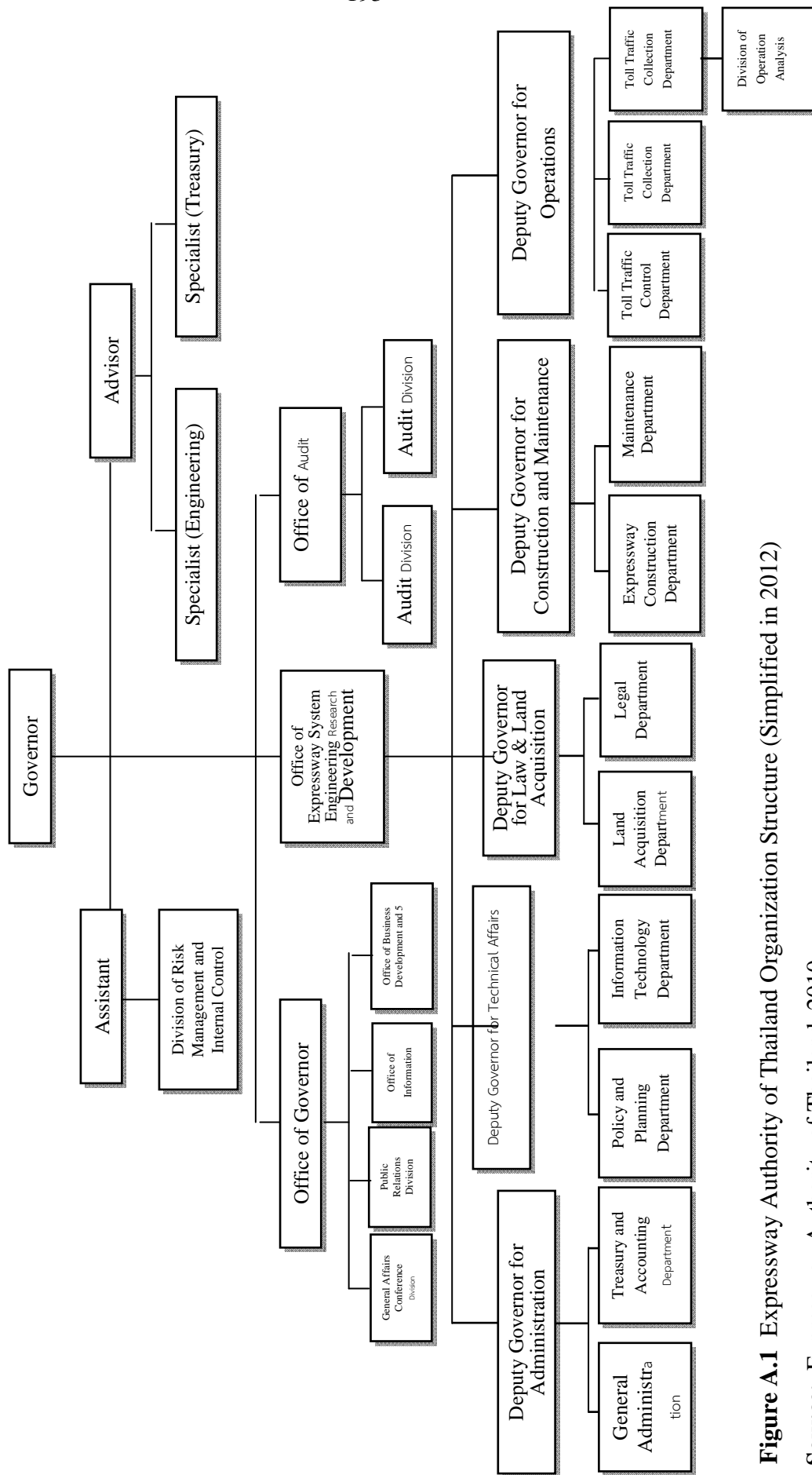


Figure A.1 Expressway Authority of Thailand Organization Structure (Simplified in 2012)

Source: Expressway Authority of Thailand, 2010.



Figure A.2 Existing Service EXAT Network

Source: Expressway Authority of Thailand, 2010.



Figure A.3 Expressways under Construction Expressways

Source: Expressway Authority of Thailand, 2010.

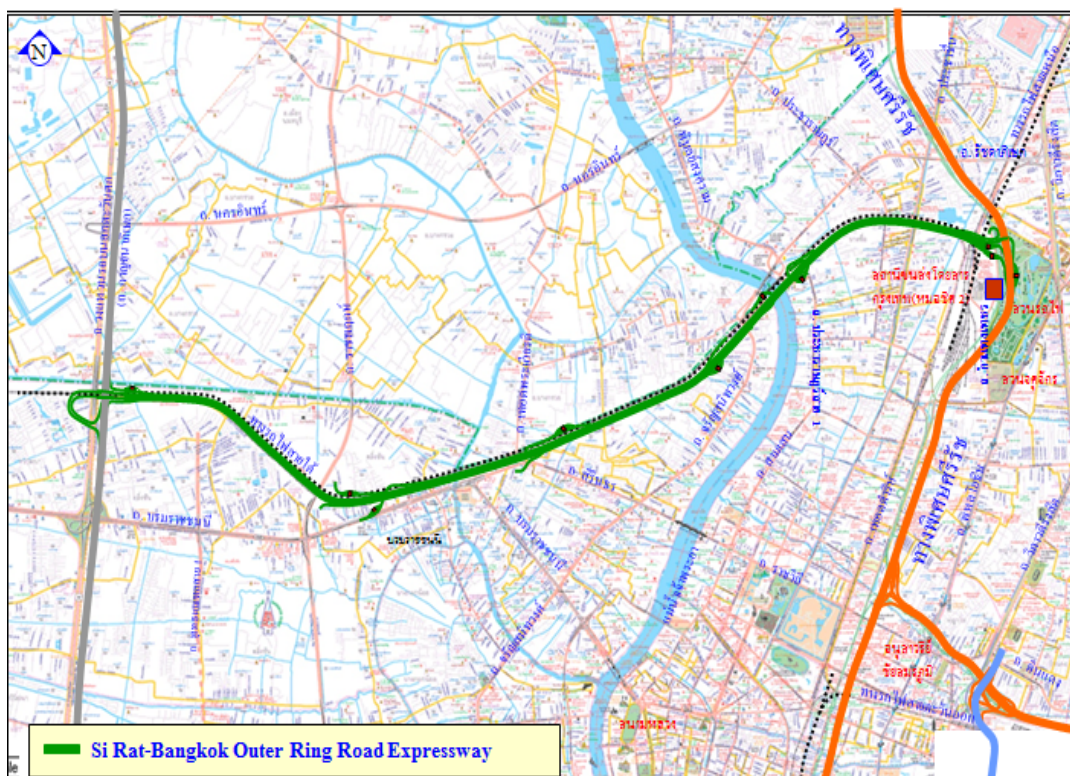


Figure A.4 Si Rat-Outer Ring Road Expressway
 Source: Expressway Authority of Thailand, 2010.



Figure A.5 On-Off Ramps Chaloem Maha Nakhon Expressway
 Source: Expressway Authority of Thailand, 2010.

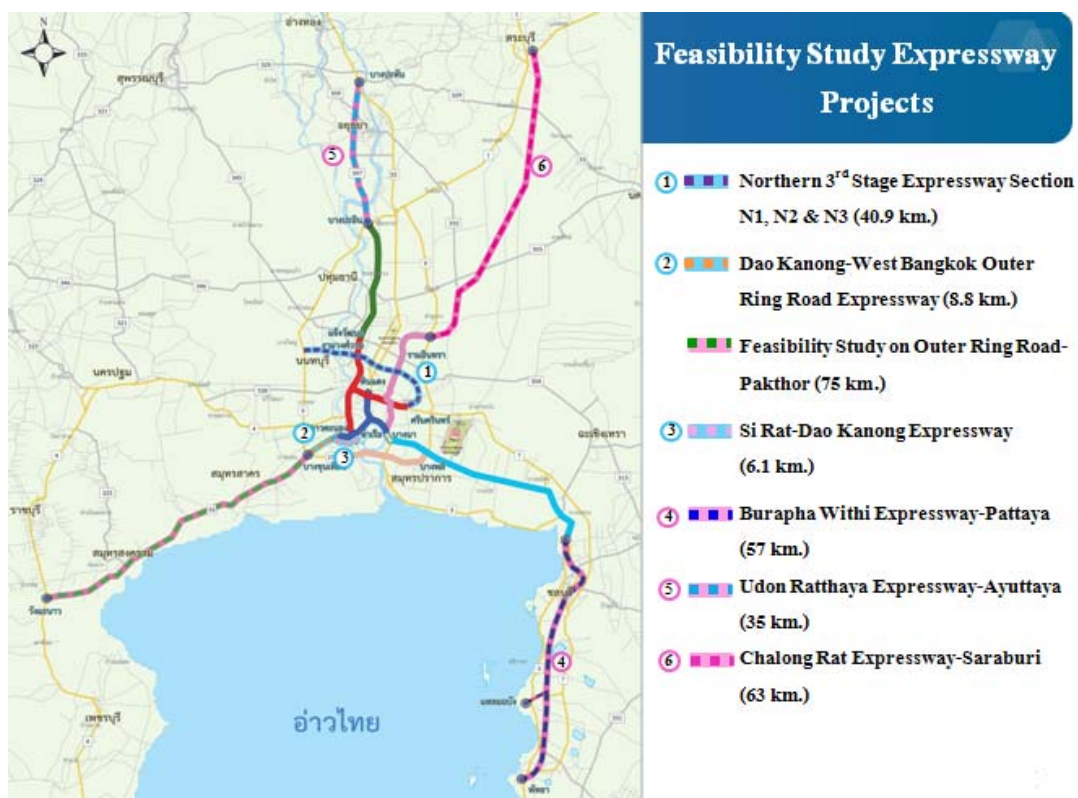


Figure A.7 Feasibility Study Expressway Projects

Source: Expressway Authority of Thailand, 2010.

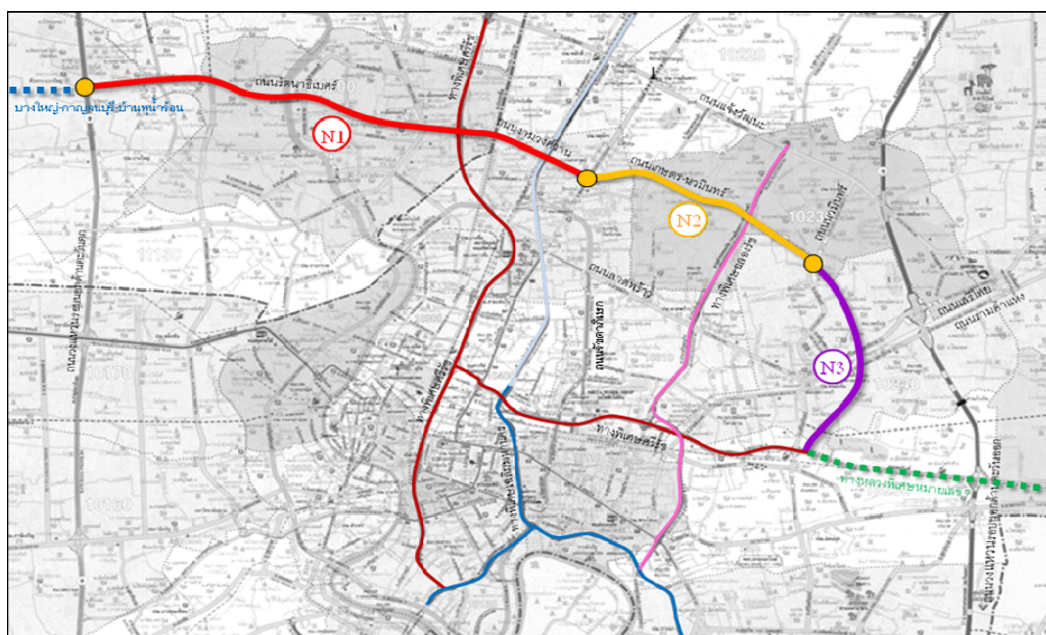


Figure A.8 Northern Third Stage Expressway (Section N₁, N₂ and N₃)

Source: Expressway Authority of Thailand, 2010.

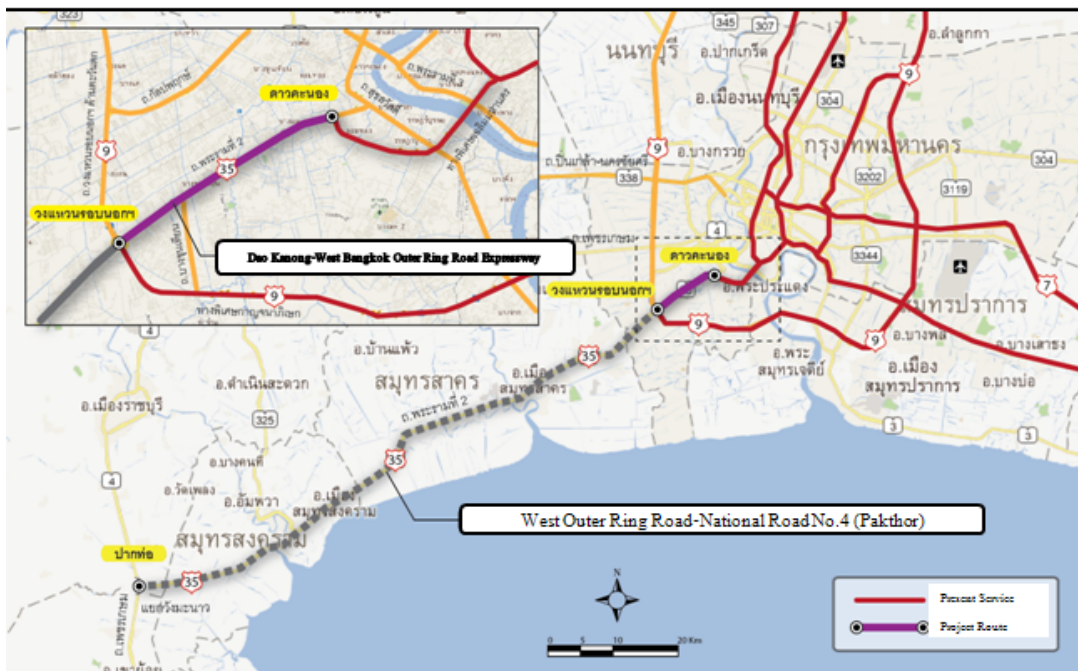


Figure A.9 Dao Kanong-West Bangkok Outer Ring Road Expressway

Source: Expressway Authority of Thailand, 2010.

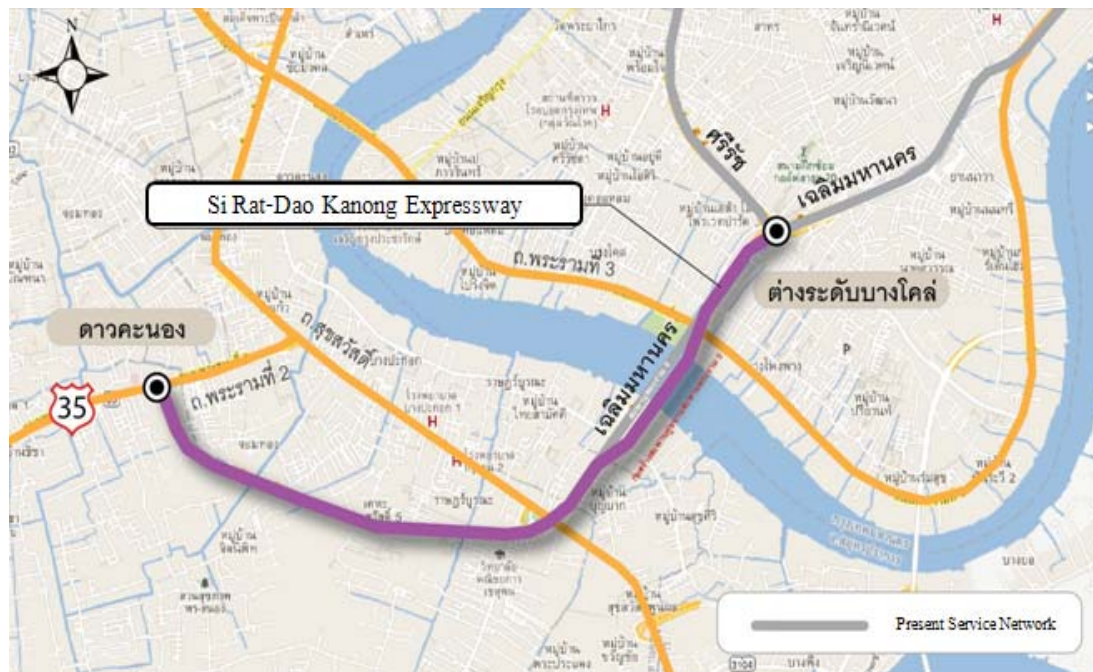


Figure A.10 Si Rat-Dao Kanong Expressway

Source: Expressway Authority of Thailand, 2010.

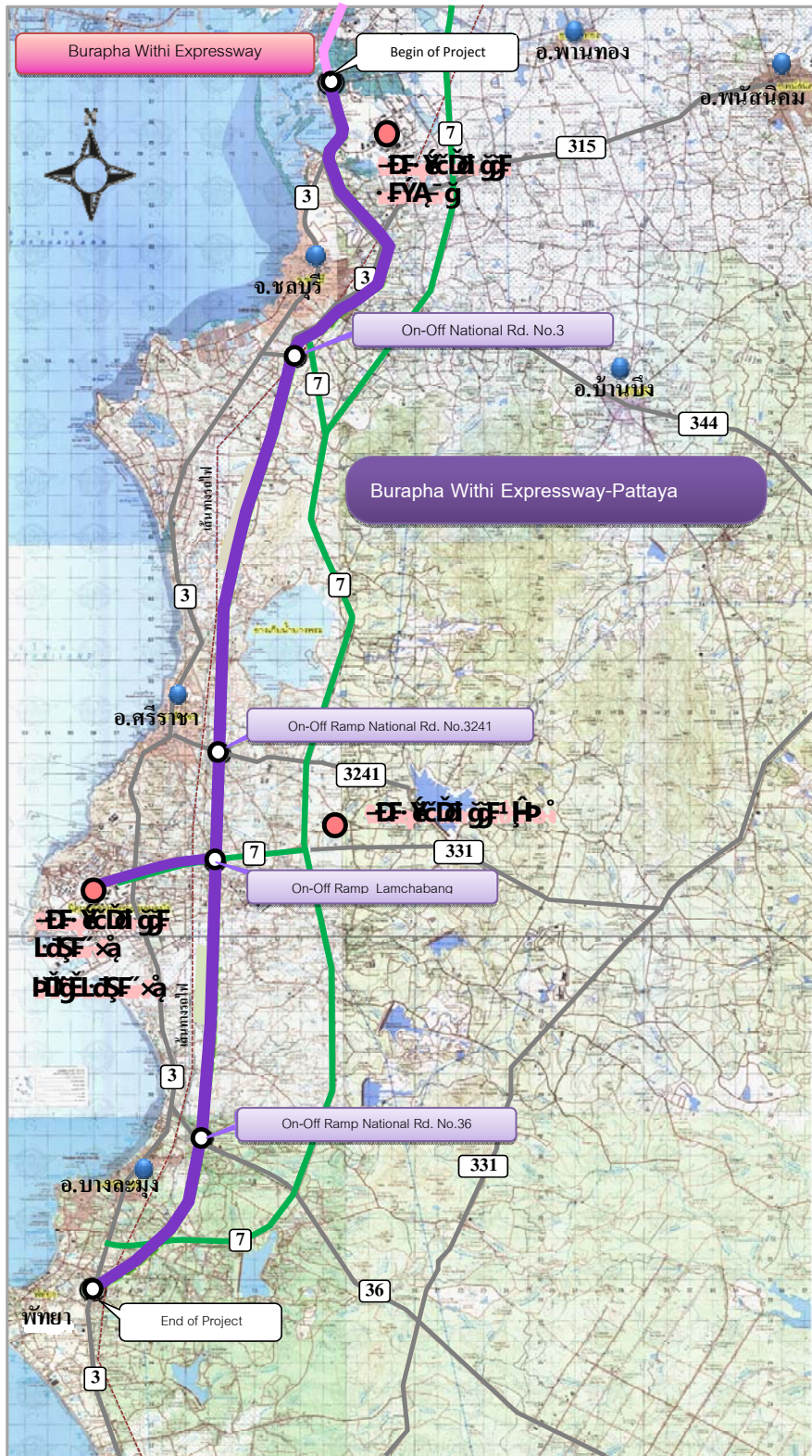


Figure A.11 Burapha Withi Expressway-Pattaya Project

Source: Expressway Authority of Thailand, 2010.

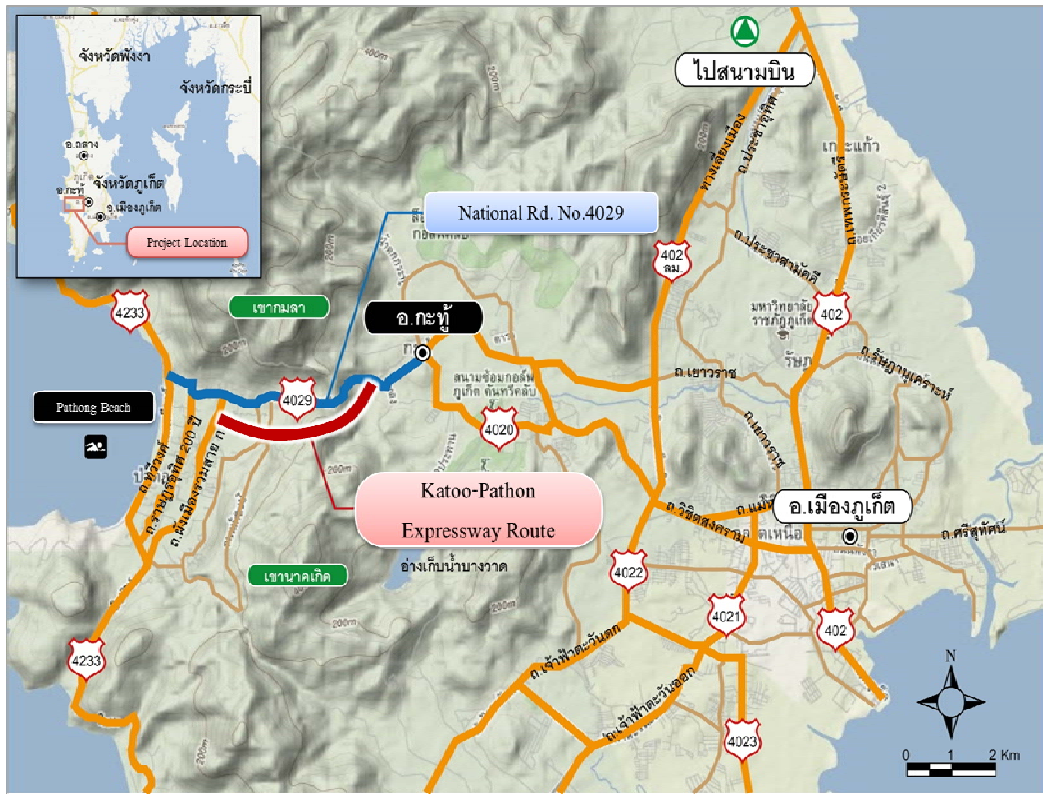


Figure A.14 Kato-Patong Project, Phuket

Source: Expressway Authority of Thailand, 2010.

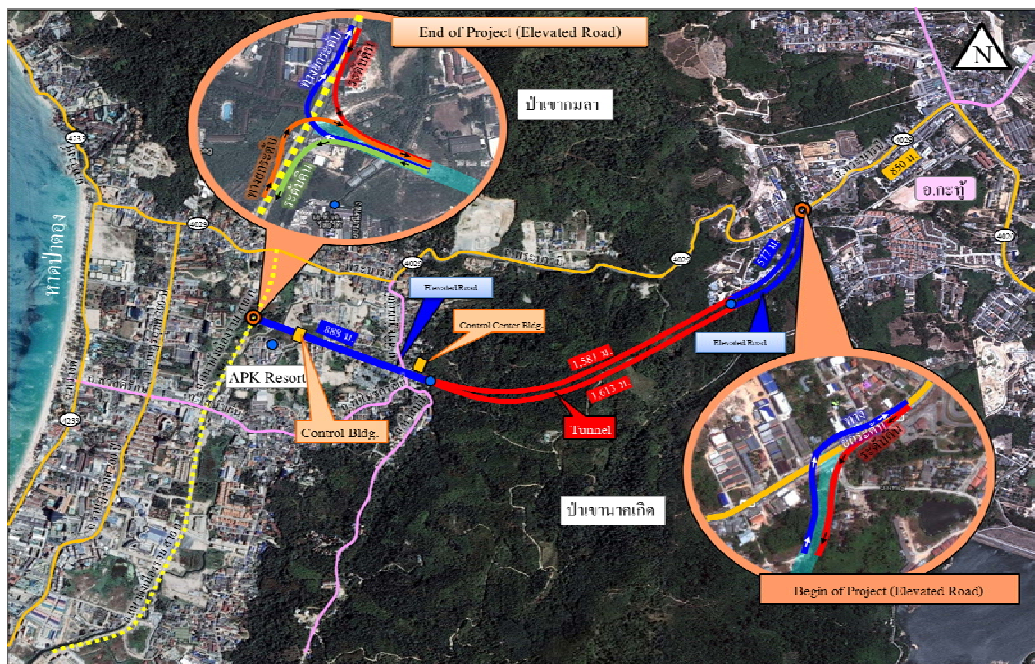


Figure A.15 Kato-Patong Starting –Ending Points

Source: Expressway Authority of Thailand, 2010.

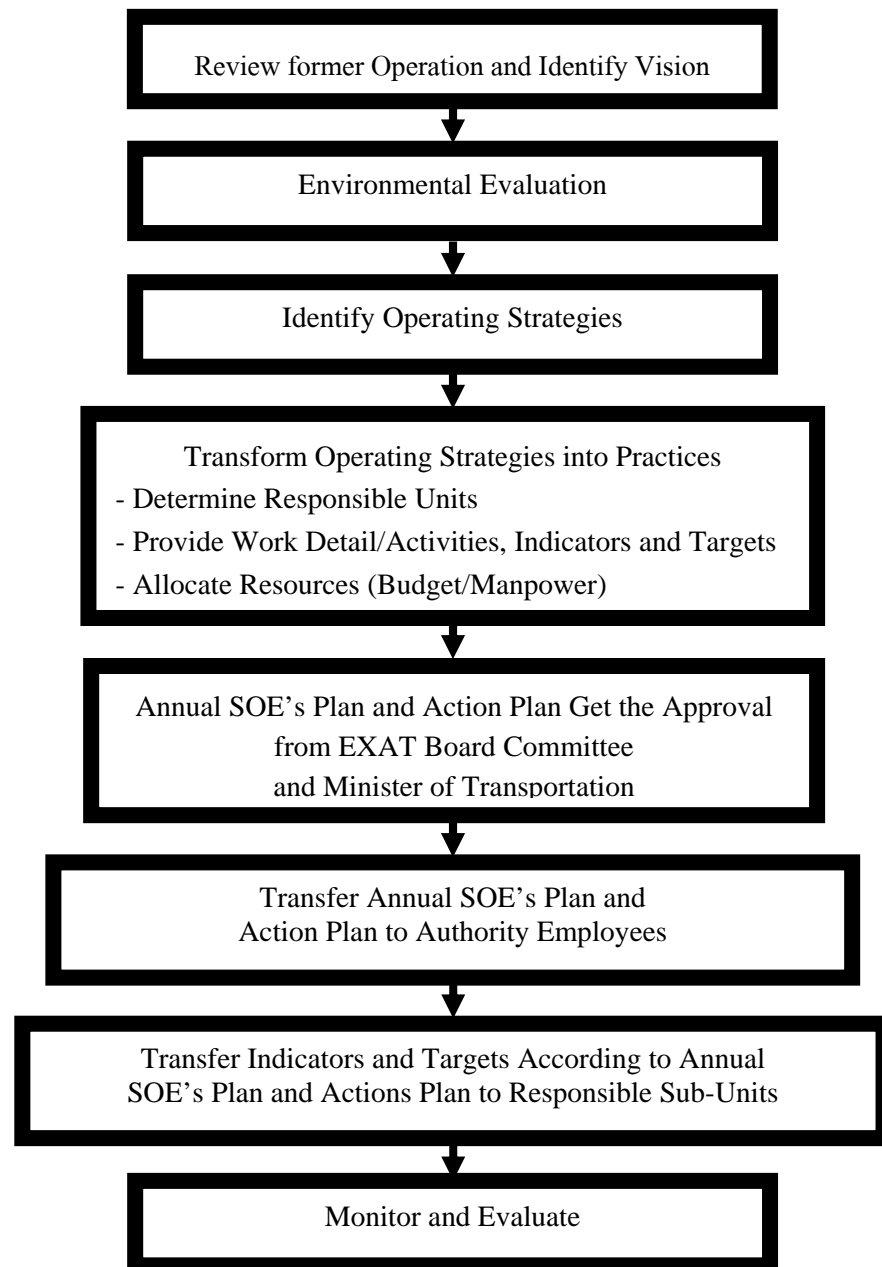


Figure A.16 Strategic Planning Process (Simplified)

Source: Expressway Authority of Thailand, 2010.

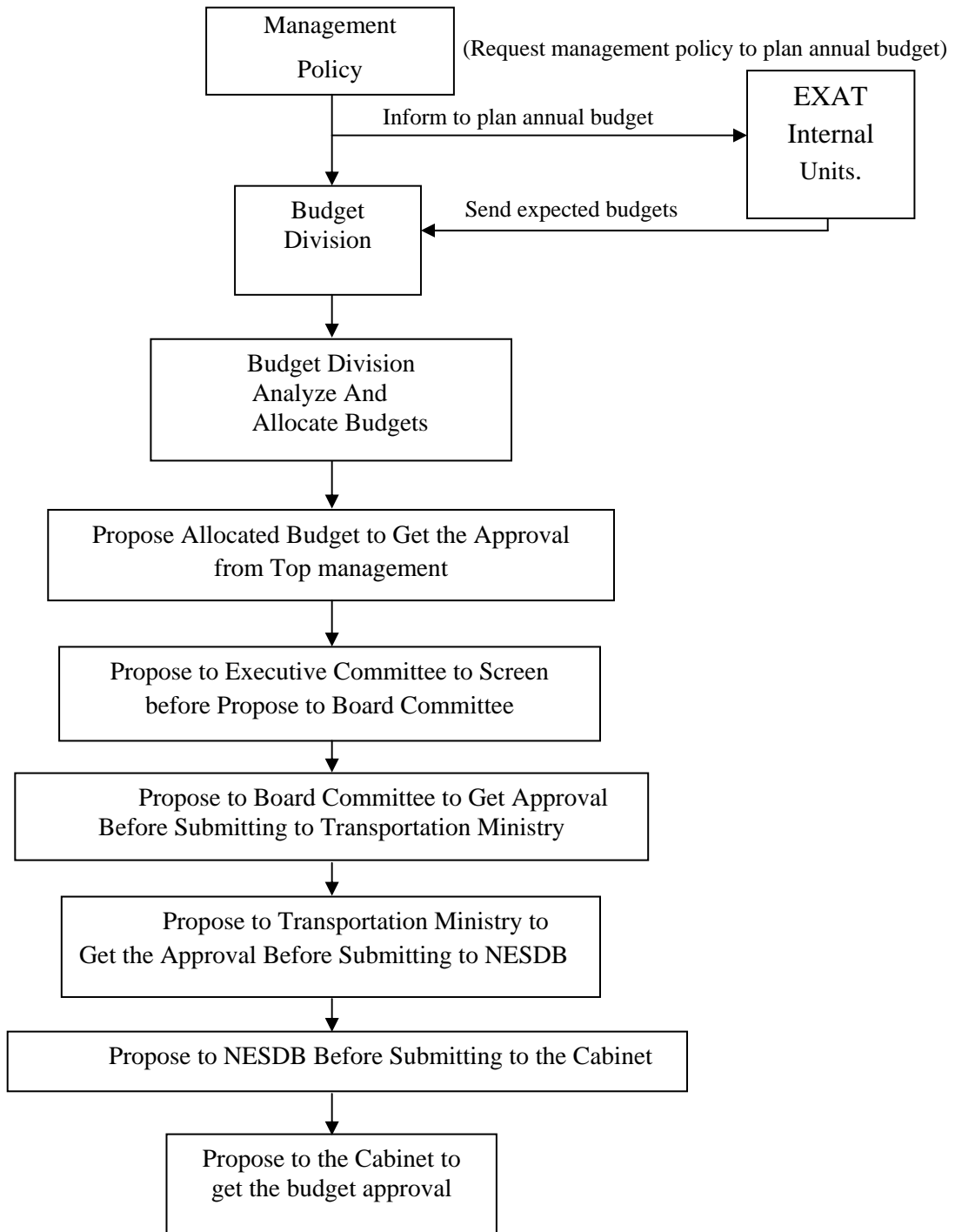


Figure A.17 Budget Planning Stages (Simplified)

Source: Expressway Authority of Thailand, 2010.

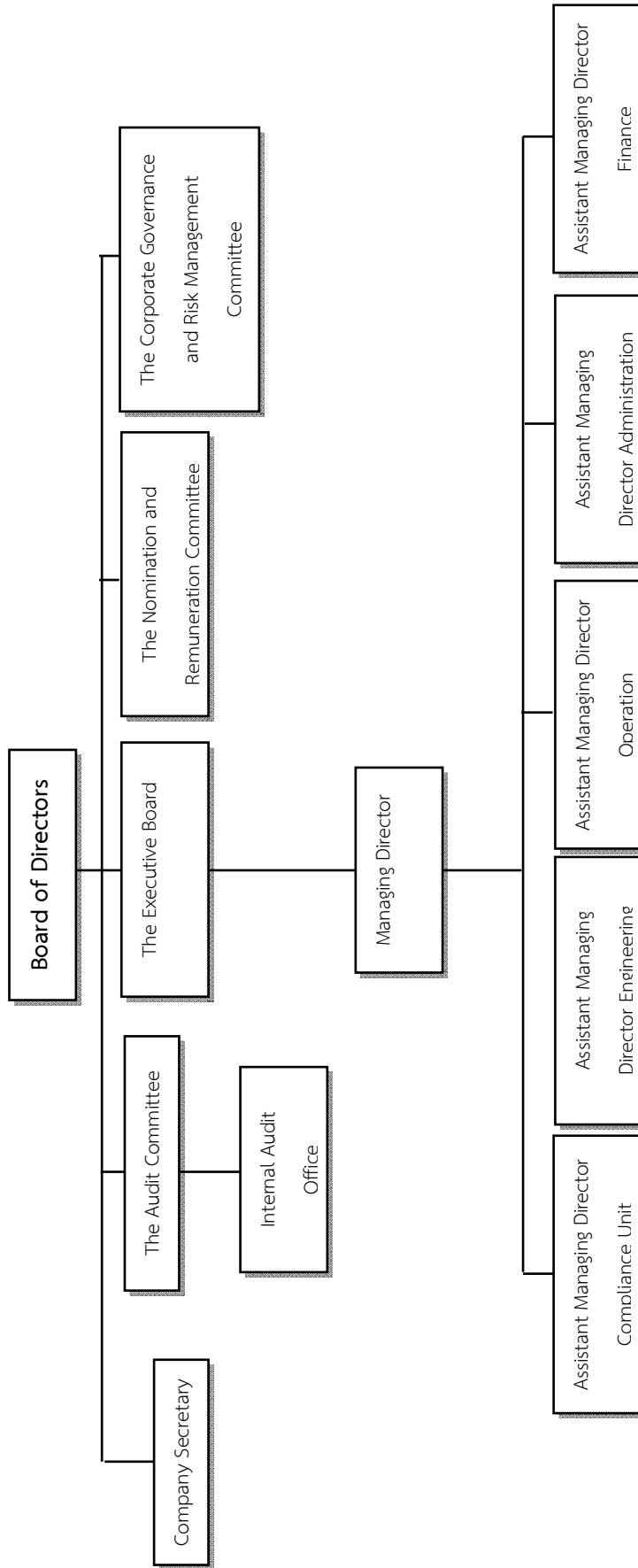


Figure A.18 Bangkok Expressway Company Limited (Public) Organization Structure

Source: Bangkok Expressway Company Limited (Public), 2010.

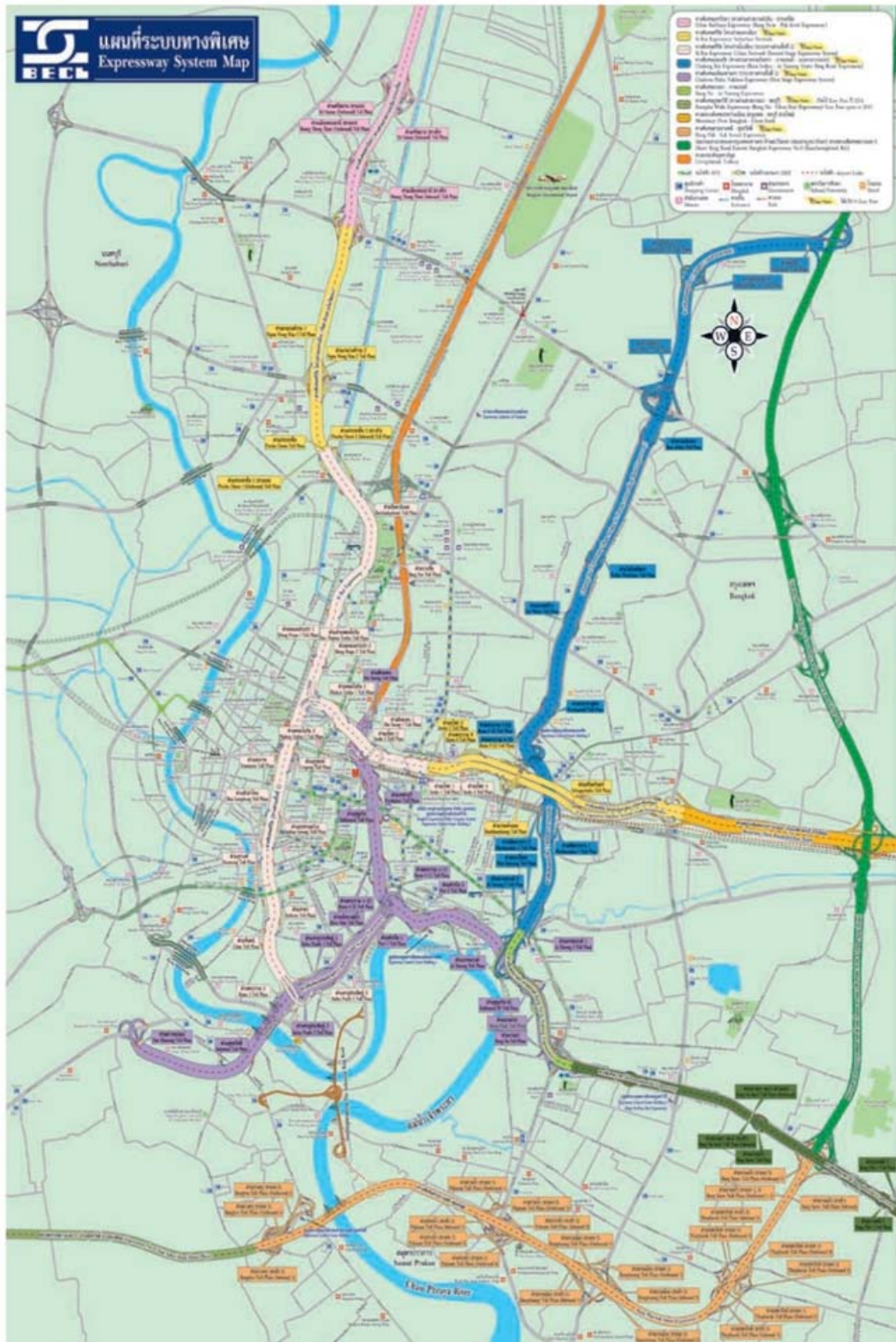


Figure A.19 Bangkok Expressway Company Limited (Public) Service Expressway Network

Source: Bangkok Expressway Company Limited (Public), 2010.

#

Table A.1 NEXCO-Central History

NEXCO – Control History	
For the building the foundation from 1956 to 1965 the development activities were	
Apr.1956	Japan Highway Public Corporation (JH) is established.
Oct.1957	Construction minister authorized JH to build the Meishin Expressway.
Sep.1958	Government placed order with JH to construct Japan’s first expressway.
May 1962	Construction minister authorized JH to build the Tomei Expressway.
Jul.1963	Japan’s first expressway, the 71-kilometer Meishin Expressway opened to the traffic.
Jul.1965	Remaining 189 kilometers of Meishin Expressway opened to the traffic.
For expanding the expressways from 1969 to 1987 the development activities were	
May 1969	All 347 kilometers of Tomei Expressway opened to the traffic.
Sep.1973	The total length of JH’s expressway exceeded 1,000 kilometers.
Dec.1976	The total length of JH’s expressway exceeded 2,000 kilometers.
Jul.1979	Vehicle fire occurred in the Nihonzaka Tunnel.
Mar.1982	The total length of JH’s expressway exceeded 3,000 kilometers.
Oct.1987	The total length of JH’s expressway exceeded 4,000 kilometers
For enhancing expressway network and adding new dimension of maintenance and service from 1987 to 2001 the development activities are	
Oct.1988	Short-term concentration of maintenance work started.
Mar.1989	Highway cards and magnetic prepaid cards were introduced.
Dec.1991	The total length of JH’s expressway exceeded 5,000 kilometers.
1993-	Measures for larger vehicles are implemented.
1995-	Measures to prepare for large earthquakes were implemented after the Great
1990s-	Harshin Earthquake.

Table A.1 (Continued)

NEXCO – Control History	
Nov.1993	Measures to assist the aging expressway were implemented. Construction minister authorized JH to build the 303-kilometer
Nov.1996	New Tomei Meishin and Expressway.
Mar.2001	The total length of JH’s expressway exceeded 6,000 kilometers. Electronic Toll Collection (ETC) system was introduced.
For Privatization period from 2001 to present the development activities were	
Oct.2005	JH split into three companies and NEXCO-Central was established.
Apr.2006	The total length of the three Companies’ expressways exceeded 7,000 kilometers.
Nov.2007	Travel service provided in the first time as the expressway company.
Dec.2007	MOU was signed with Vietnam Expressway Corporation.
Apr.2008	The 49.7-kilometer new Meishin Expressway opened to the traffic.
Apr.2008	International Business was established.
Jul. 2008	All sections of the Hokuriku Expressway opened to the traffic.
Dec.2008	First overseas office was established in Hanoi, Vietnam.
Feb.2009	MOU was signed with PLUS Expressway Bhd (Malasia)
Feb.2010	The 1.9-km., a part of Ken-O Expressway opened to the traffic.
Apr.2010	Quick charging system for electric vehicle installed at Ebina SA and Kamigo SA in Tomei Expressway.
May 2010	Contract was signed with Vietnam’s Ministry of Transport to provide technical assistance.

Source: NEXCO-Central, 2010.

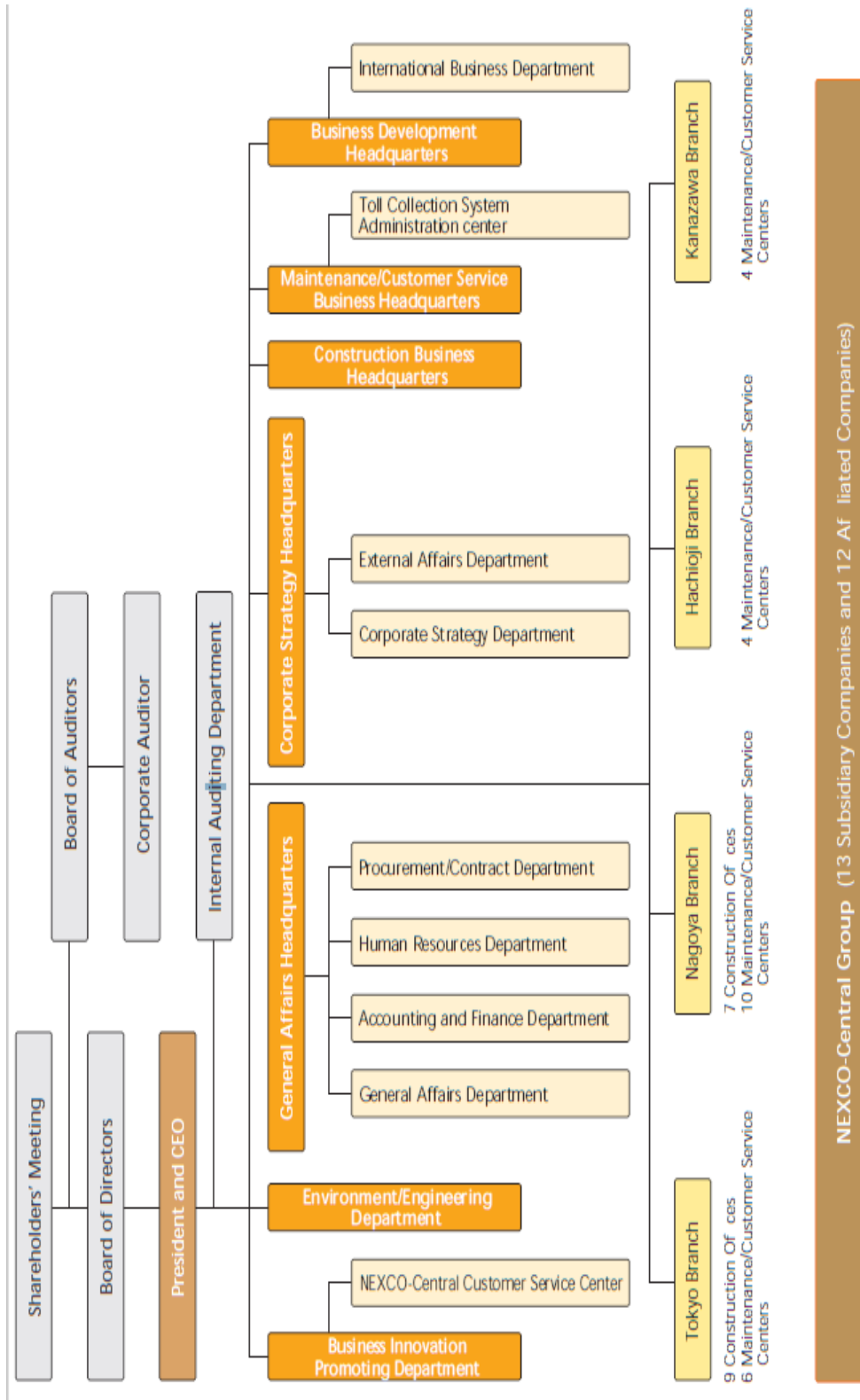


Figure A.20 NEXCO-Central Organization
Source: NEXCO-Central 2010.



Figure A.21 NEXCO-Central Company Stakeholders

Source: NEXCO-Central, 2010.

Table A.2 NEXCO-Central Existing Service Expressway Network

No	Route	Distance (kilometers)
1	Hokuriku Expressway	282.1
2	Tokai-Hokuriku Expressway	184.8
3	Tokai Ring Road	75.9
4	Meishin Expressway	87.5
5	New Meishin Expressway	18.8
6	Ken-O Expressway	11.2
7	Chuo Expressway	366.8
8	New Tomei Expressway	217.0
9	Tomei Expressway	346.7
10	Ise Wangan Expressway	50.2

Source: NEXCO-Central, 2010.

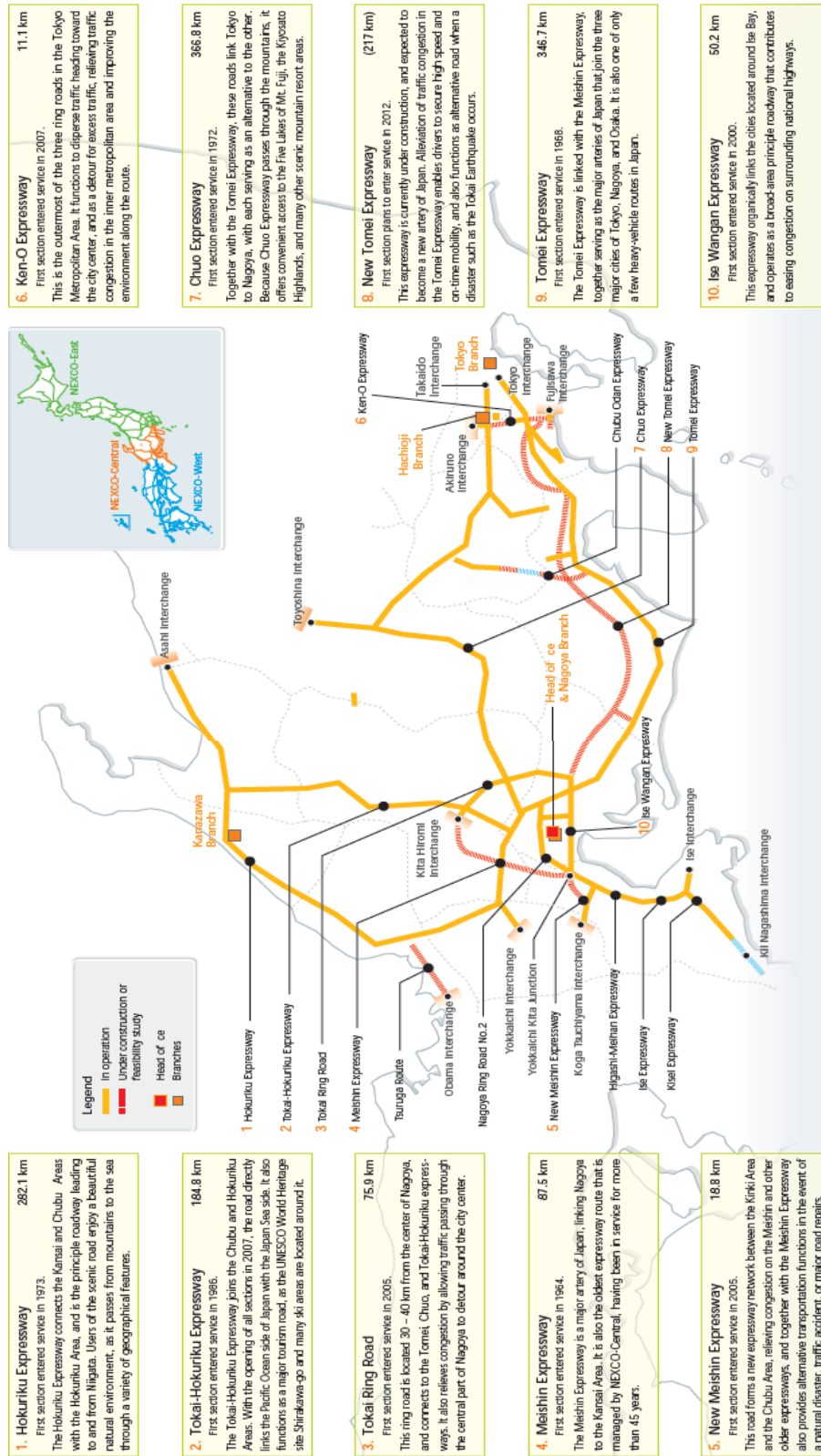


Figure A.22 NEXCO-Central Expressway Network
Source: NEXCO-Central, 2010.

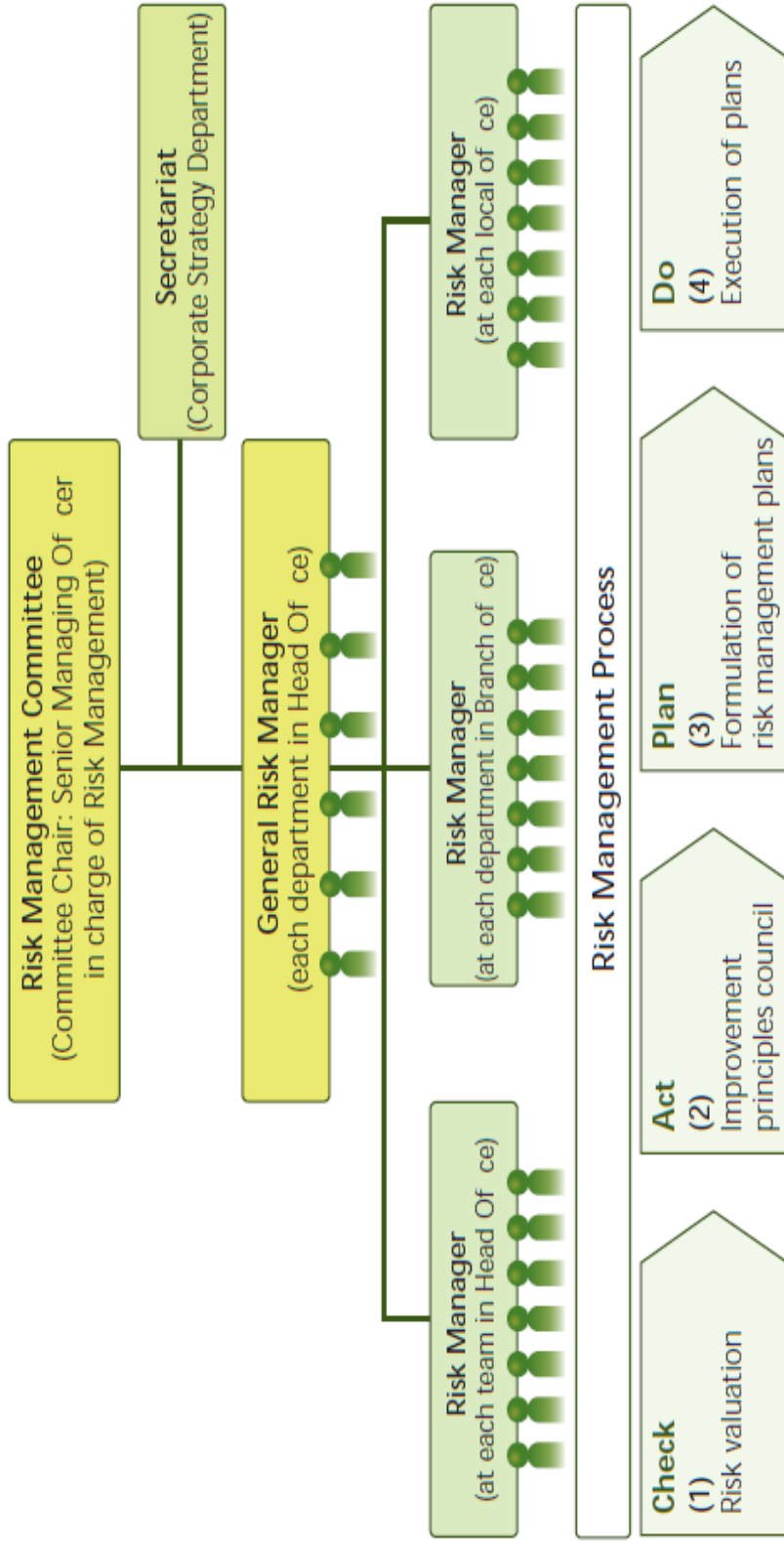


Figure A.23 NEXCO-Central Risk Management Structure

Source : NEXCO-Central, 2010.

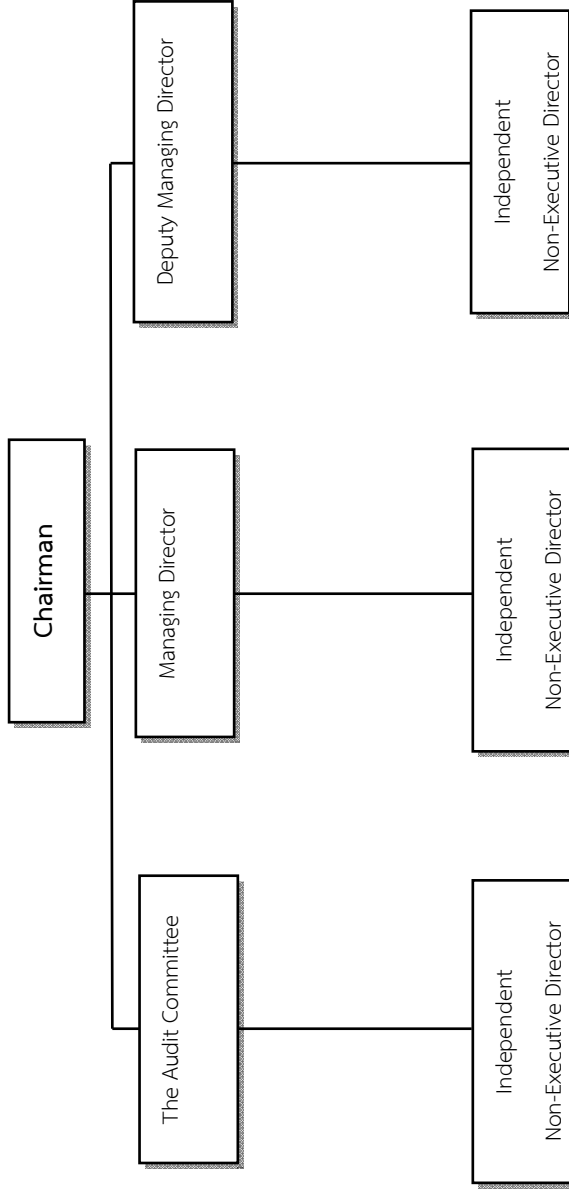


Figure A.24 Hopewell Highway Infrastructure Limited Organization Structure (Simplified)

Source: Hopewell Highway Infrastructure Limited, 2010.

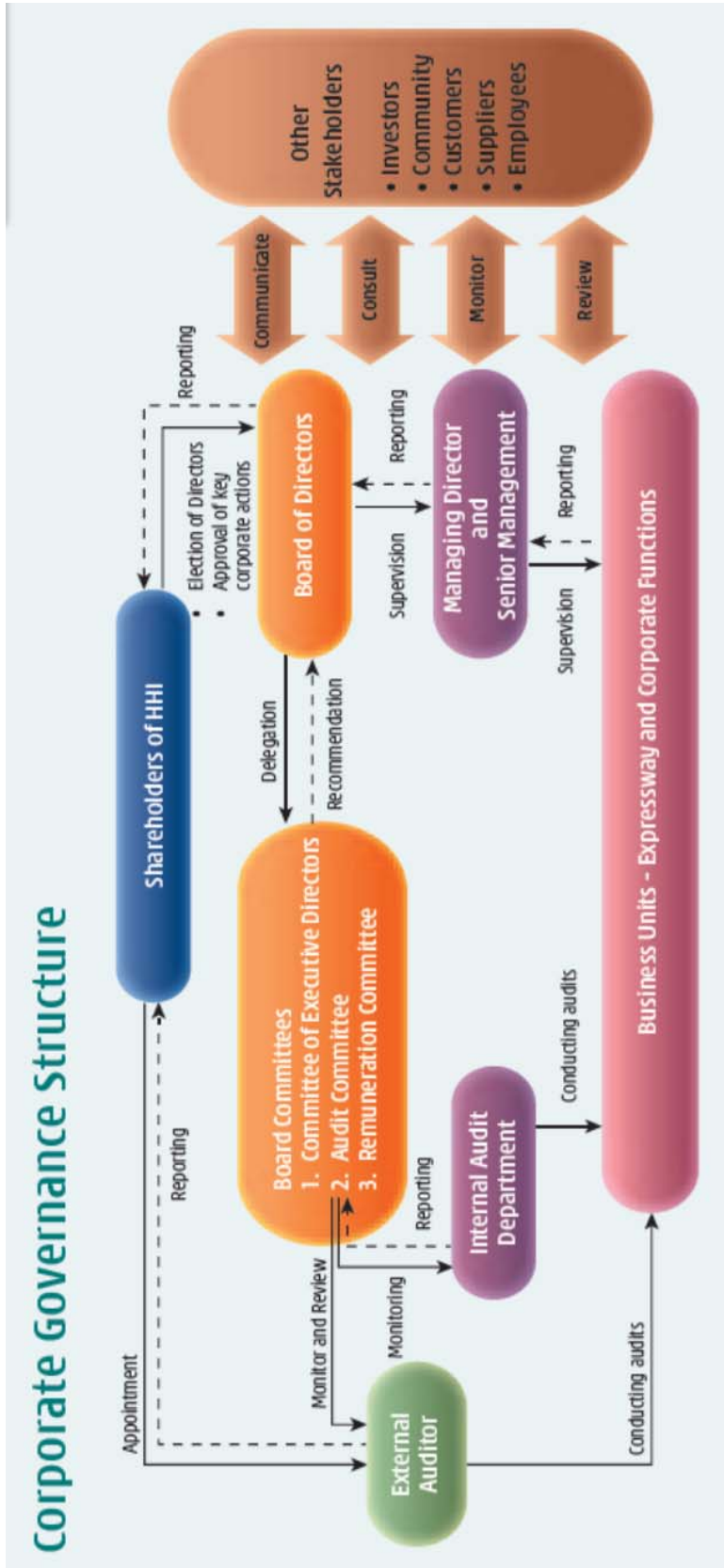


Figure A.25 Hopewell Highway Infrastructure Limited Organizational Structure

Source: Hopewell Highway Infrastructure Limited, 2010.

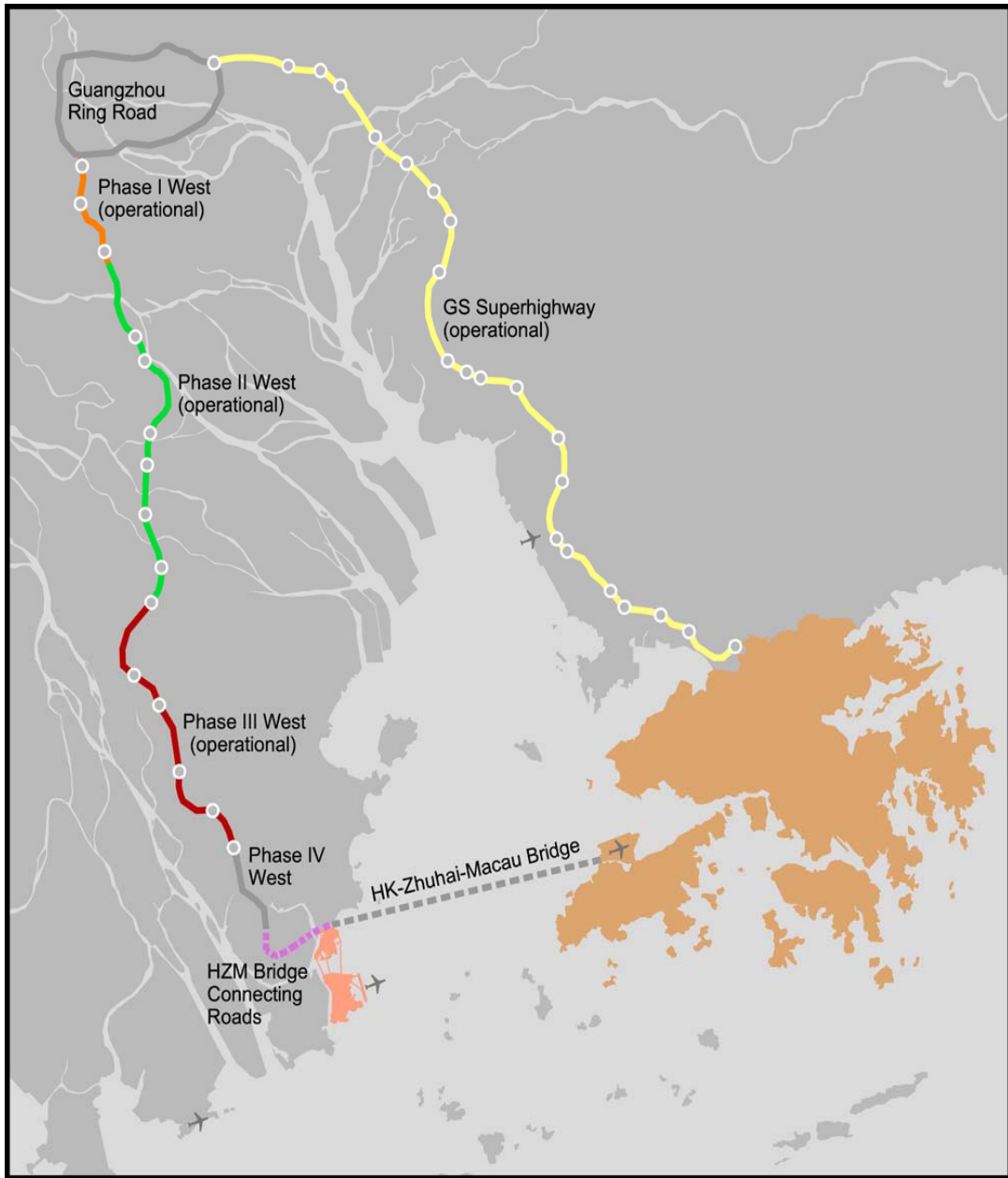


Figure A.26 Service Network Operated by Hopewell Highway Infrastructure Limited

Source: Hopewell Highway Infrastructure Limited, 2010.

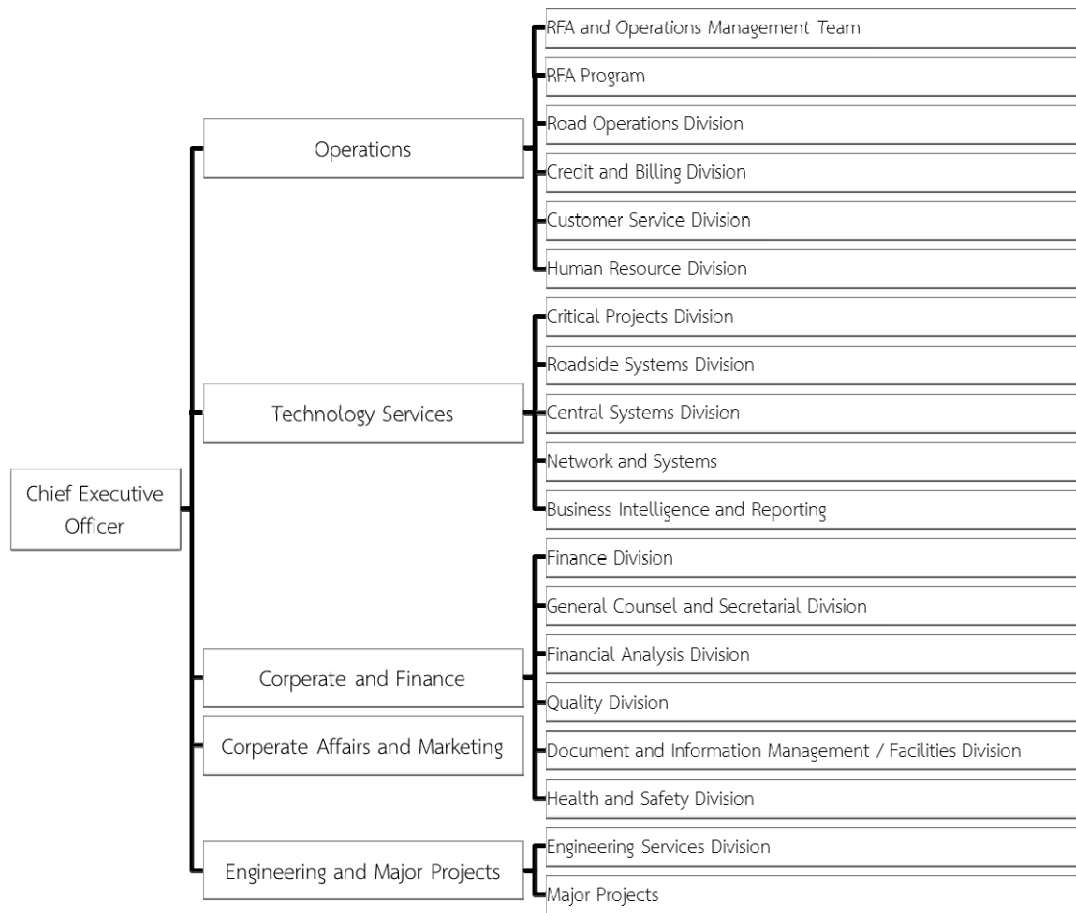


Figure A.27 Queensland Motorway Company Organizational Structure (Simplified)
Source: Queensland Motorway Company, 2010.

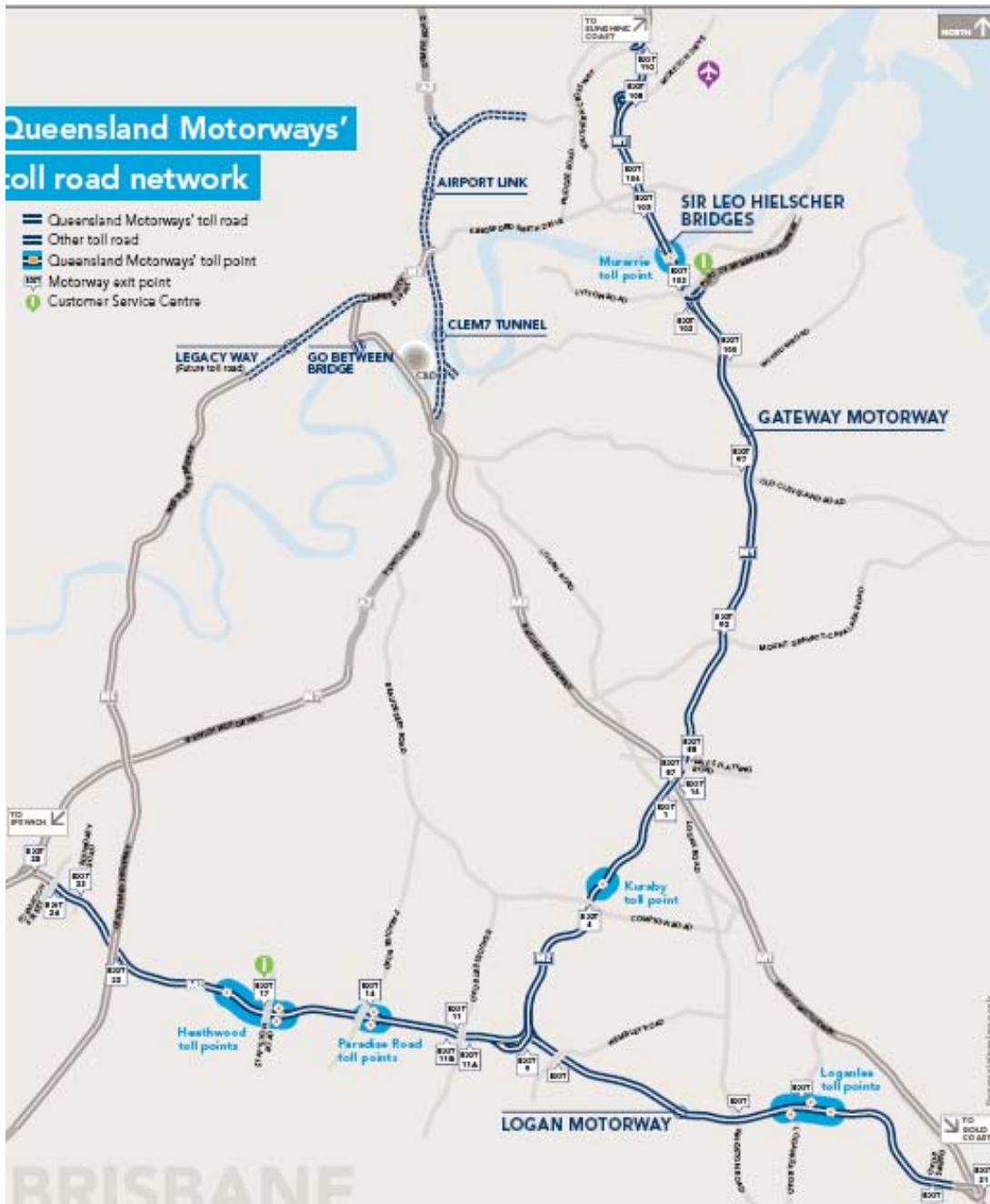


Figure A.28 Motorway Network Operated by Queensland Motorway Company
 Source: Queensland Motorway Company, 2010.

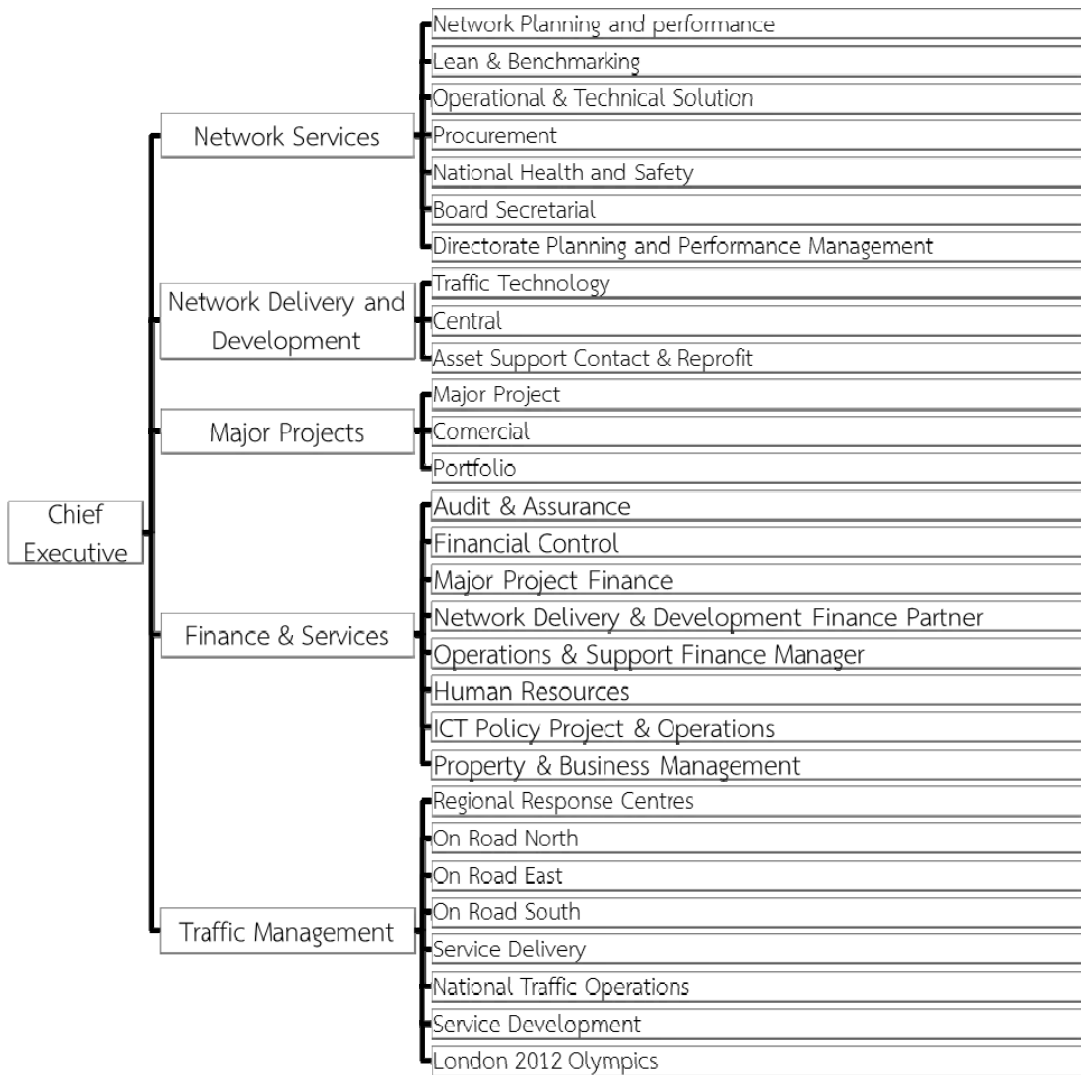


Figure A.29 Highway Agency Organizational Structure (Simplified)

Source: Highway Agency, 2010-2011.



Figure A.30 Highway Agency Strategic Road Network

Source: Highway Agency, 2010-2011.

Table A.3 Positive and Negative Road Users' Opinion

Customers appreciate	Things that customers dislike
<ul style="list-style-type: none"> • Almost 90% respondents say that traffic officers' role on network is important. • Over 60% respondents think that managed motorways improve traffic flow, and more than 50% (53%) respondents say that the measure will contribute to safer journey. • Most respondents consider motorways (90%) and trunk roads (86%) to be generally free from litter. • More than 80% respondents find travel time messages on variable message signs helpful 93% respondents find the delay messages helpful. 	<ul style="list-style-type: none"> • Being delayed unexpectedly. • Lack of information about planned closures and roadwork. • Potholes and uneven road surface. • More than 50% of road users experiences bad driving by others on their last journey on the network.

Source: Highways Agency, 2010-2011.

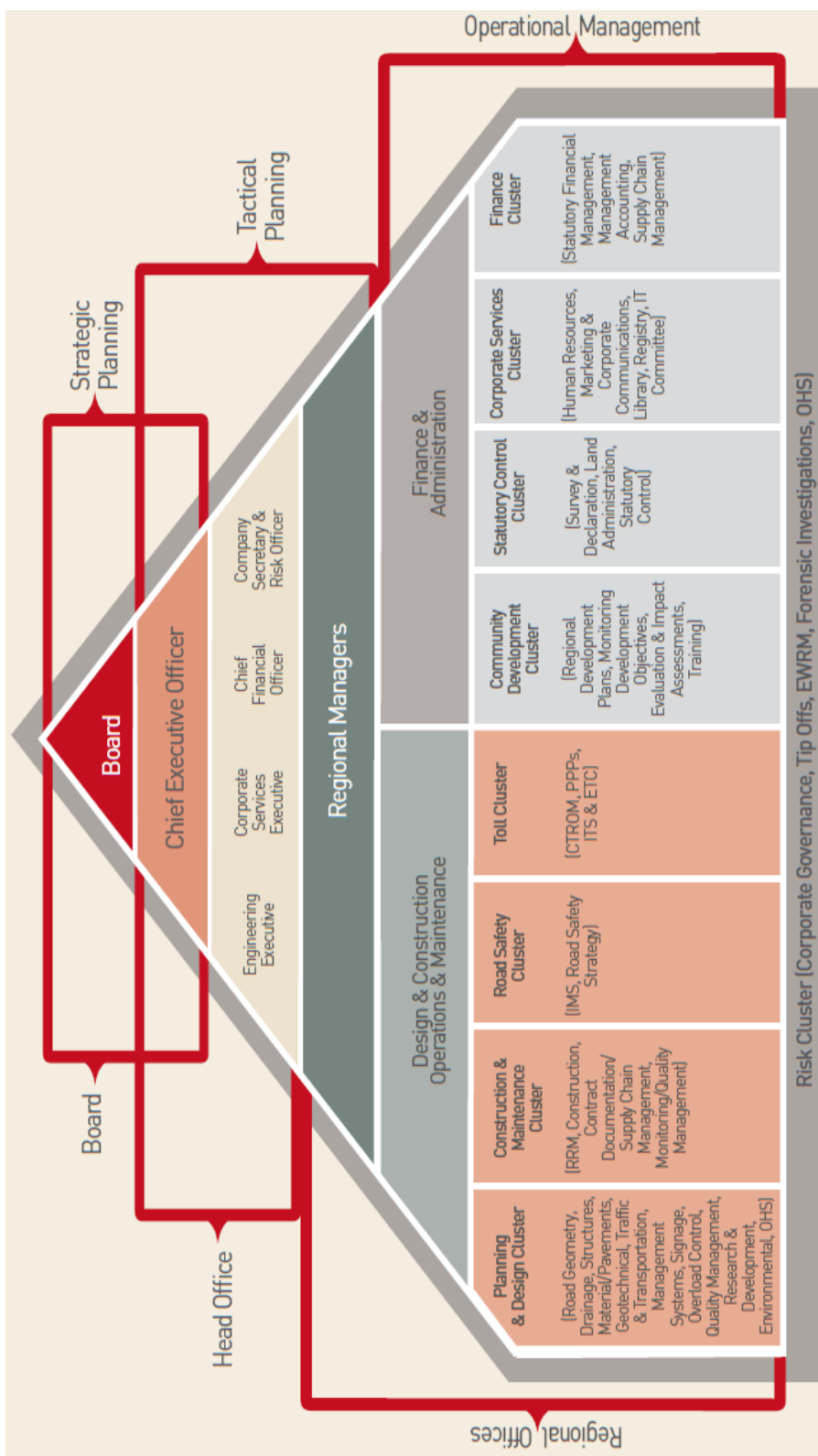


Figure A.31 SANRAL Organizational Structure

Source: SANRAL, 2010.

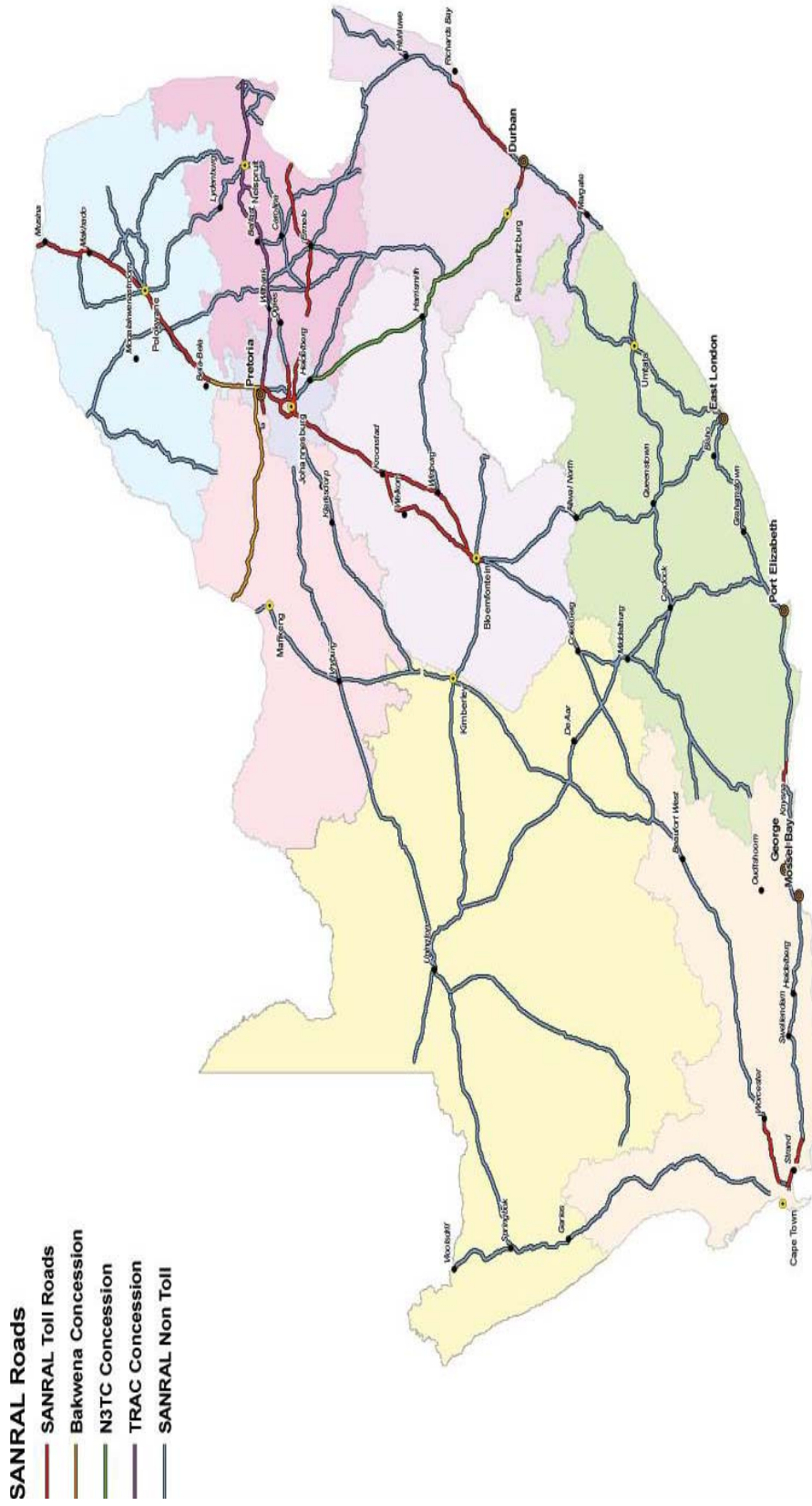


Figure A.32 Service Expressway Network Operated by SANRAL

Source: SANRAL, 2010.

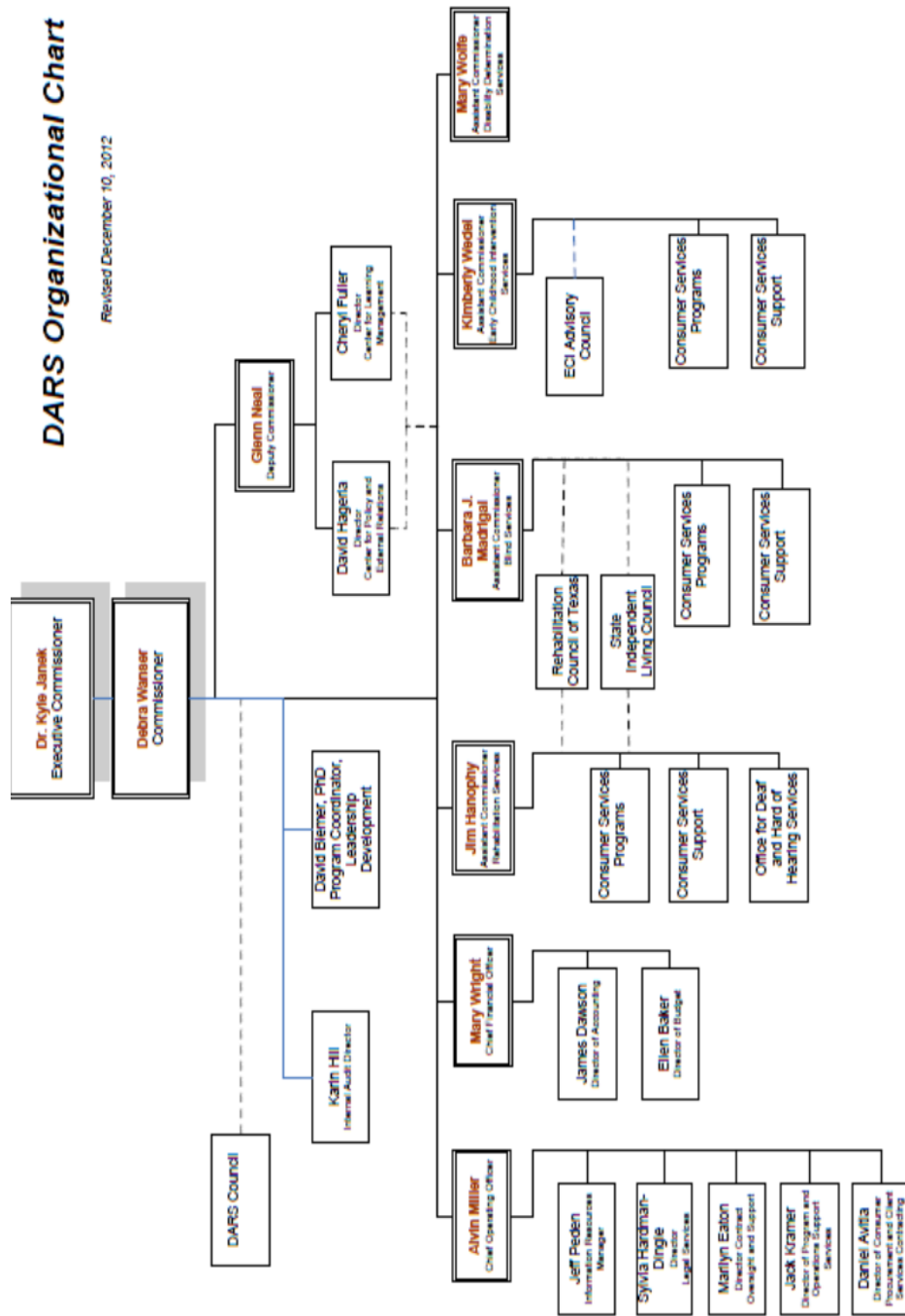
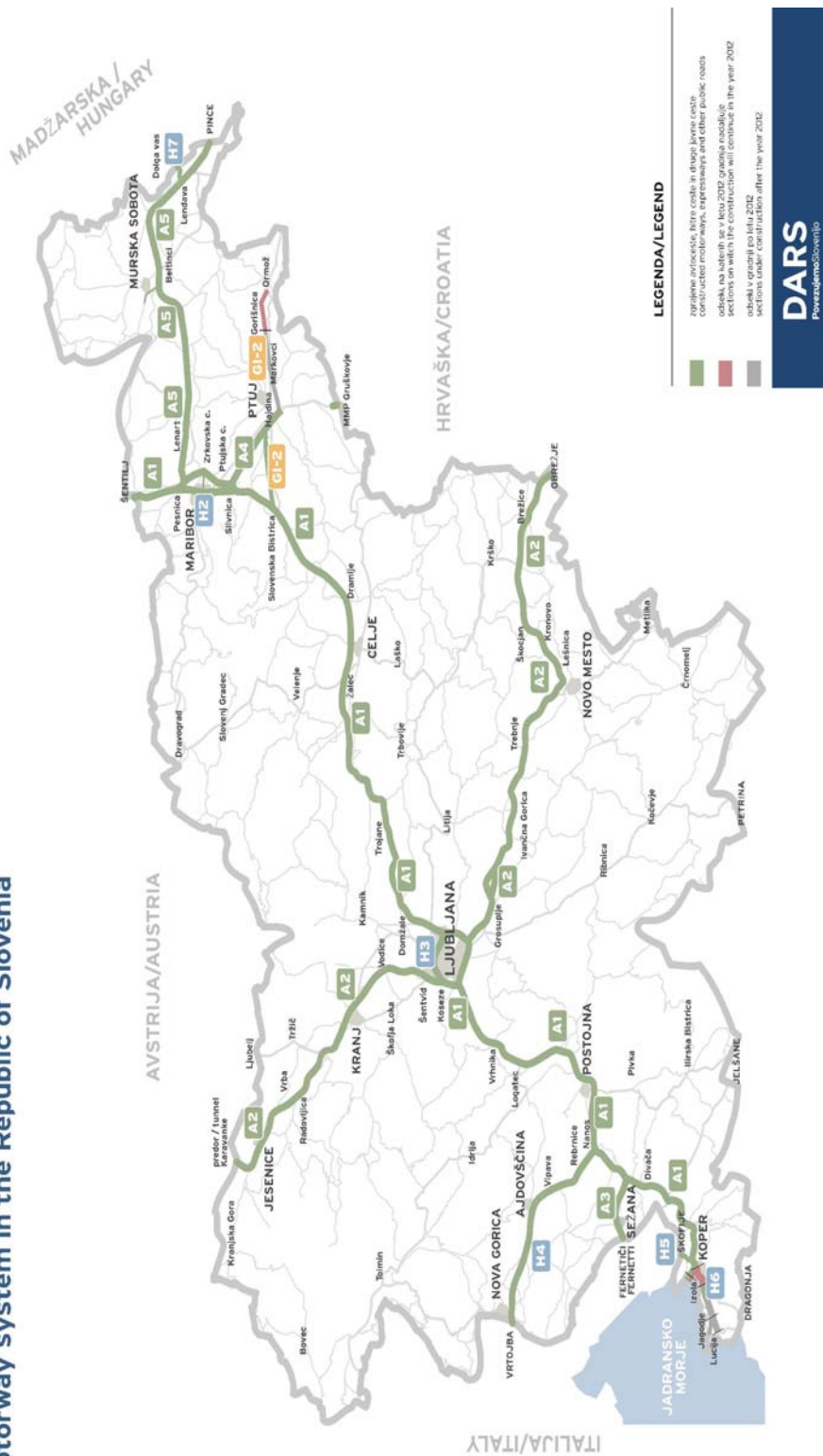


Figure A.33 DARS.d.d Management Structure

Source : DARS.d.d, 2010.

Avtocestni sistem v Republiki Sloveniji Motorway system in the Republic of Slovenia



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Figure A.34 Motorway System in Republic of Slovenia Operated by DARS. d.d

Source: DARS.d.d, 2010.

Table A.4 Organization's Vision

Organization	Vision
Expressway Authority of Thailand	Worthy alternatives, progressive innovation and care of environments.
Bangkok Expressway Company Limited (Public)	To be national leader private company to provide expressway service with good management to facilitate public transportation under good governance and social responsibility.
Hopewell Highway Infrastructure Limited	N/A
NEXCO-Central	To be global expressway company leader ¹
Queensland Motorway	A leader for providing quality motorway and transportation resolution that value evaluation by company customers.
Highway Agency	A global leader to road service.
South Africa National Road Agency Limited	Agency is accepted that is the leader to provide the best main road network in South Africa.
Motorway company in the Republic of Slovenia	Be the company that focuses on business, be an achieved company and be a commercial company with marketing controlling for managing modern infrastructure network expected by road users.

Table A.5 Characteristics Comparison of Toll Road Organizations

	Expressway Authority of Thailand	Bangkok Expressway Company Limited (Public)	Hopewell Highway Infrastructure Limited	NEXCO-Central	Queensland Motorway	Highway Agency	South Africa National Road Agency Limited	Motorway company in the Republic of Slovenia
Established Year	Nov. 27, 1972	Dec. 23, 1987	N/A	Privatized on Oct. 1, 2005 and established in April 1956	N/A	N/A	N/A	1993
Expressway Distance (Kilometers)	207.9	70.5	221.0	1,761	68.0	N/A	3,120	606.6
Number of Employees	4,603	650	N/A	2,115 (8,495 for Subsidiaries)	N/A	3,742	N/A	1,247
% of Net Profit	35.03	22.53	28.12	0.09	(38.34)	24.07	N/A	9.62
% Personnel Expense to Total Expense	31.88	9.05		N/A	9.80	N/A	4.23	15.96
% Total Revenue to Asset	4.69	19.80	12.05	38.98	9.42	N/A	2.12	5.64
Earning Revenue Type	Expressway and land development	Expressway and subsidiary investment	Expressway	Expressway and rest areas business	Motorway	Motorway	Motorway	Expressway and rental areas
D/E Ratio	0.93	1.13	0.93	7.04	-5.56	0.03	0.30	N/A
Investment Type	Government and concession	Concession	Concession	Privatization company	Concession	Government	Government and concession	Government and concession
Average Daily Traffic Volume (EBIDA)	1,320,187	918,896	403,000	1,720,000	216,389	N/A	N/A	N/A
\$US Millions	207.487	109.613	N/A	6,145.421	101.111	N/A	147.386	291.173
Annual Total Revenue \$US Millions	287.692	258.290	323.333	6,250.000	204.059	N/A	515.007	411.600

APPENDIX B

INTERVIEW RESULTS

1. The board member and deputy governor interview results

Management, EXAT is a monopoly organization that main product is expressway service. Its strengths are that (1) land within rights of way can be developed to earn more revenue, (2) its network covers Bangkok and vicinity areas and (3) there are many customers. For its threats are that (1) high investment results long time break-even point, (2) Almost assets are fix assets that have not been effectively utilized to provide valued-added for EXAT, (3) stages of decision making lack of rapidity because many stages and disciplines have to follow and (4) it can serve expressway users with limitations because of huge investment and acquired land problems. It can be evaluated that EXAT has achieved its service in city areas but not between cities that is the reason EXAT has to extend its network, especially the route between cities.

EXAT has to improve its management structure according with economic and social situations by considering to establishing sub-units that are (1) international business, (2) research and development to increase EXAT innovation and (3) EXAT has to focus on engineering and administration in order to be innovative organization.

It is now EXAT is in the role as regulator and operator so that it is have to determine EXAT role clearly in order that it can settle the optimal effective administrative structure. For instance, if EXAT has its role to be regulator, it will establish a subsidiary company to regulate a concessionaire etc.. At present, EXAT is a regulator for two concession projects but its organization structure has no specific division to operate that function. Therefore, it is necessary to settle the related division within short term.

Marketing management, for the products it has been found that existing service network is not enough for people demands who want to travel within Bangkok and vicinity areas. Therefore, it is certainly necessary to extend EXAT network. In generally, expressway system is divided into city expressway system and intercity expressway. In case of city expressway system, even though there are nearly 200 kilometers long in Bangkok and vicinity areas, it is not enough for expressway users' demands. It is essential to construct more expressways by connecting to be ring expressway because there is a missing link therefore policy makers should seriously consider to construct this missing portion. For the intercity expressway, it is certainty

that EXAT network is not enough for current demands so it is anticipated to extend its network more than the existing service expressways. Additionally, EXAT should consider to do the businesses in overseas especially in Asian nations. EXAT should provide a plan to construct its expressways to connect neighbor country expressway systems in order that people in Asian countries can conveniently travel to each other.

For the acquisitioned land within the rights of way, specifically in urban areas where are prime areas for business transactions then EXAT will have the opportunity to develop them like commercial areas in studied organization that will be other EXAT products to earn more authority revenue.

EXAT has a chance to build expressways to the border of Thailand to connect neighbor expressway systems then EXAT has to prepare (1) construction plan and (2) staffs who have efficient skill, capability and vision to operate its business in order to achieve the planned targets.

Operation management, EXAT should develop its service by implementing computer technology to serve its customers for example, using multi-lane free flow without stopping at the entrance.

Human resources management and development, EXAT lacks of succession plan clearness for management level and effectiveness to support good workplace atmosphere for its employees. Additionally, there are many staffs resulting the high personnel expenses and they have no inspiration to develop themselves to effectively work. Therefore, EXAT should develop their existing employees to (1) deeply gain many kinds of knowledge for example, land development, (2) harmonize each other, (3) give a chance for them to participate the organization development by setting up a meeting between management and subordinates to gain relationship each other and (4) prepare for a communication system specifically, language media to do the business internationally.

Environmental management, EXAT has to operate according to government policy then it is very important that government has to identify clearly its policy and support the budget for EXAT to acquire land, construct and develop employees to increase their effectiveness in operation. At present, it is known that government has the priority to rail system so it should identify clearly the direction to support EXAT

function. Additionally, EXAT should invent new technology for its business to serve and satisfy expressway users.

2. The expressway users interview results

This study has also interviewed expressway users for obtaining primary data from another source in order to make it more effective and reflect the most real situation and the interview contents have been provided and certified by the advisor. There are 21 interviewees by separating into (1) 4 for chutuchote plaza, Chalongrat expressway, (2) 4 for dindaeng plaza, Chalerm Maha Nakorn expressway, (3) 4 for prachacheun plaza, SiRat expressway, (4) 4 for bangna km 6, Burapha Vithi expressway and (5) 5 for bangkao plaza, Kanchana Pisek expressway.

Operation management, EXAT can help expressway users by shortening their travel times. However, they expect EXAT to solve the congestion problems on expressways. Moreover, EXAT also has to find out the way to allow them more quickly exit. For ETC system, it can help to solve the upstream queue length problems but it is anticipated that EXAT has to prepare the special lane for ETC users to conveniently enter expressways because it is currently difficult to enter ETC booth. The ETC booths are also changed to the appropriate positions, potentially at right side, as well as increase number of ETC booths to serve customers.

Marketing management

Products, almost expressway users have the opinions that EXAT should enlarge its service areas by constructing more expressways especially in north direction. For the connecting to neighbor expressway system opinions, it has been divided into two kinds of opinion that are (1) it will be very useful and convenient if EXAT can construct expressways to the border of Thailand resulting more transactions to tour and do the businesses each other but it may be difficult because of high investment and (2) it is no need for EXAT to extend its network Thai border but it is expected that if EXAT can administrate its organization well will be enough.

Place, it has been found that there is an important barrier to use EXAT expressways because of the long queue lengths for MTC system. For ETC system, most of interviewees have found that there are also many barriers for customers to use expressways through this means. Even though the ETC booths are allowable, the

customers are very difficult to enter because there are other vehicles (using MTC system) obstructing the ETC entrance. Therefore, EXAT should provide traffic officers to manage the entry lanes for ETC users to conveniently enter the booths. Lastly, EXAT should consider to installing ETC system to serve for vehicles that have more than 4 wheels. It is another way to reduce the queue length at the entrance but it also has to prepare the measure to protect and solve the malfunction collecting machines.

Promotion, almost interviewees say that they rarely receive EXAT information because they are busy and have no time. But some receive them from leaflets at the entrance, radio and television. Additionally, there are few interviewees who obtain the information through EXAT website, newspaper. Almost interviewees rarely receive the information through call center 1543, even though it is a very useful service for expressway users to know real-time traffic situation on expressways. They can decide the travel route both before and during using expressways and at least they will know the source of traffic congestion such as the accidents ahead.

APPENDIX C

QUESTIONNAIRES

**ADMINISTRATION DEVELOPMENT FOR EXPRESSWAY
AUTHORITY OF THAILAND
QUESTIONNAIRES 1 : For EXAT Employees**

Explanation 1) This research objective is to develop Expressway Authority of Thailand

2) Questionnaires have been divided into 3 sections

Section1: General Individual Information

Section 2: Questions

Section 3: Additional Opinions

Section 4: Recommendations Beneficial to EXA T

3) Your answers will be very important for developing EXAT administration

Section 1: EXAT Employees' Information

Explanation Please answer the questions by marking X into the provided space in front of the choices.

- 1.1 Sex Male Female
- 1.2 Age 18-20 years old 21-30 years old 31-40 years old
- 41-50 years old 51-60 years old
- 1.3 Education Under Diploma Diploma Bachelor Degree
- Master Degree Doctoral Degree
- 1.4 Position Level Level 1-3 Level 4-6 Level 7-8 Level 9-11
- 1.5 Revenue Less than 10,000 THB 10,001 – 20,000 THB
- 20,001 – 30,000 THB 30,001 – 40,000 THB
- 40,001 – 50,001 THB 50,001 – 60,000 THB
- 60,001 – 70,000 THB 70,001 – 80,000 THB
- More than 80,000 THB

1.6 Working Period 1 – 5years 6 – 10 years 11 – 15 years 16 – 20 years
 21 – 25years more than 26 years

1.7 Department Office of Governor Office of Audit Finance Department
 Administrative Department Planning and Policy Department
 Information Department Expressway Construction Department
 Maintenance Department Toll Collection Department
 Traffic Control Department Legal Department
 Land Acquisition Department Other.....

1.8 What kinds of source do you obtain EXAT information? (You can choose more than one choices).

1 Television 2 Radio 3 Intranet
 4 Intranet 5 Newspaper
 6 Circular Letters 7 Others.....

1.9 Do you think which expressway direction EXAT should construct in the future?

North South East
 West Northeast

Section 2: Questionnaires

Explanation: Measure opinion level from the questions of variable factors by using five-point Likert scale that are;

Strongly Agreed	5
Agreed	4
Undecided	3
Disagreed	2
Strongly Disagreed	1

Please mark “√” for your opinion that is consistent with the following answers

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed	
		5	4	3	2	1	
	Management						
	Commanding ability						
1	Your authority has ordered by writing appropriately.						
2	Your authority has ordered with sufficient writing.						
3	Your authority has ordered with clear writing.						
4	Your authority has ordered step by step respectively.						
5	Your authority has ordered on time.						
6	Your authority has appropriately ordered.						
7	Your authority has ordered in time.						

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
8	Marketing management Price Toll rate and other service price setting is appropriate compared to the service quality for EXAT customers.						
9	Price adjustment for toll rate and other service price each time period is suitable.						
10	At night time there are little traffic then EXAT can increase its customers by reducing the toll rate during 24.00 hr-05 hr.						
11	Place MTC system is suitable.						
12	EXAT still needs MTC system.						
13	ETC system can appropriately increase the toll collection efficiency.						
14	EXAT should increase the numbers of ETC booth.						
15	EXAT should apply ETC system for the truck.						
16	Money top up for ETC at toll booth is convenience for the customers.						
17	Money top up at toll plaza for ETC is convenience for the customers.						
18	EXAT should still have money top up for ETC at toll booth.						
19	EXAT should still have money top up for ETC at toll plaza.						

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
20	EXAT is necessary to increase the place to top up the money for instance shopping plazas.						
21	EXAT should do the research and development for ETC system in order to increase the more efficiency than at present.						
22	Promotion EXAT should communicate to publicize the information to its customers more than the present.						
23	EXAT has regularly disseminated its operating information.						
24	EXAT has publicized its operating information at the suitable time period.						
25	Disseminated EXAT information is clear.						
26	EXAT information is easy for the customers to acknowledge.						
27	EXAT should provide the sale promotion for example discounting the percentages for the Easy Pass customers.						
28	EXAT can increase the Easy Pass customers by terminating to ask for deposited money.						
29	Products Existing service network distance about 208 kilometers is enough for the serving EXAT customers.						

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
30	EXAT can increase its revenue by develop the acquisition land within the rights of way.						
31	EXAT should extend its service network distance more than 210 kilometers.						
32	EXAT should plan to construct the expressways in order to connect to the neighbor.						
33	Operation management EXAT can achieve its planned missions.						
34	EXAT has appropriately determined sub-activities in each operating mission.						
35	Expressways constructed by EXAT are safe for road users.						
36	There are enough guide sign numbers for leading road users.						
37	The letters on guide signs are accurate.						
38	The size of Thai letters displayed on guide signs is suitable.						
39	The size of English letters displayed on guide signs is appropriate.						
40	The size of the numbers displayed on guide signs is appropriate.						
41	There are enough numbers of toll plazas.						

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
42	Human resources management and development EXAT employee recruitment system is fair.						
43	EXAT employee recruitment period is suitable.						
44	EXAT should appropriately develop the orientation system for new employee accordance with the organization changed situations.						
45	EXAT should clearly illuminate the stages of personnel performance evaluation.						
46	EXAT should clearly express the personnel performance assessment methods.						
47	EXAT personnel performance evaluation system is appropriate.						
48	EXAT has planned the personnel development by efficiently providing the seminar training for the assigned missions in each section.						
49	EXAT has appropriately designed the training contents.						
50	EXAT has provided the suitable time period for training.						
51	EXAT has appropriately monitored the employee operating after training.						
52	EXAT has the fair penalization system.						

Item No.	Questions	Opinion Level					For Researcher
		Strongly agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
53	EXAT has the practical penalization system.						
54	EXAT salary structure is suitable.						
55	EXAT welfare is appropriate.						
56	Environmental management EXAT has significantly interested in external environment situation such as economics society, politics, customers attitude and so on.						
57	EXAT has efficiently analyzed the opportunity and threat from the external environment.						
58	EXAT has efficiently determined strategic plans to respond according to the external environment.						
59	EXAT has appropriately monitored the risks caused by external environments.						
60	EXAT has appropriately evaluated the risks caused by the external environments.						

Section 3: Additional Opinions

Item No.	Questions	For Researcher
1	<p>In your opinion, do you think how necessary EXAT should develop its administration for being a sustainable organization.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Extremely necessary to be developed <input type="checkbox"/> 2 Necessary to be developed <input type="checkbox"/> 3 Not necessary to develop (if selected, finish answering) <input type="checkbox"/> 4 Undecided (if selected, finish answering) 	
2	<p>In your opinion, if EXAT will be a sustainable organization, what kinds of characteristics EXAT should be. (you can should more than one choices)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Be the universally efficient SOE compared to the one in overseas. <input type="checkbox"/> 2 Quickly and accurately give the information to its customers. <input type="checkbox"/> 3 Construct and develop the new service models which increasingly cover the demands of EXAT customers. <input type="checkbox"/> 4 Apply advance technology to EXAT operating and increasingly provide the service. <input type="checkbox"/> 5 Have the new communicating system to publicize the traffic information on the expressway and at grade road for the road users enabling to effectively decide the travelling routes. <input type="checkbox"/> 6 Allow the road users and people able to increasingly propose the opinion concerning EXAT operations. 	

Item No.	Questions	For Researcher
	<ul style="list-style-type: none"> <input type="checkbox"/> 7 Allow road users and relevant people participate to the EXAT operation assessment. <input type="checkbox"/> 8 Provide the valuable financial and accounting reports which can be increasingly applied to the EXAT operations. <input type="checkbox"/> 9 Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time. <input type="checkbox"/> 10 Others, for example allocate the concession revenue covering the interest expenses for land acquisition, reduce the organization size, giving the priority to retain the customer satisfaction, from private sectors and so on. 	
3	<p>Do you think what development strategies EXAT should implement to administrate to be a sustainable organization. (you can choose more than one choices)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Management strategies <input type="checkbox"/> 2 Marketing management strategies <input type="checkbox"/> 3 Accounting management strategies <input type="checkbox"/> 4 Financial management strategies <input type="checkbox"/> 5 Human resources management and development strategies <input type="checkbox"/> 6 Operation management strategies <input type="checkbox"/> 7 Environmental management strategies <input type="checkbox"/> 8 Other development strategies (please identify)..... 	

Section 4 : Other recommendations beneficial to EXAT

- (1)
-
-
-
- (2)
-
-
-
- (3)
-
-
-
- (4)
-
-
-
- (5)
-
-
-

Thank you for your cooperation for this research
Researcher

1.8 Regular usage routes (you can answer more than one choice)

- Chaloen Maha Nakhon Expressway
- Si Rat Expressway
- Chalong Rat Expressway
- Burapha Withi Expressway
- Kanjanaphisek Expressway
- Udon Rattaya Expressway

1.9 Reason for expressway usage (you can answer more than one choices)

- Save the expenses more than at grade travelling
- Less time usage than at grade travelling
- Safer than at grade road
- Able to be the destination on schedule time
- Able to know the traffic situation on expressway more conveniently than at grade road by using telephone number 1543.
- Others.....

1.10 Sources of EXAT information (you can answer more than one choices)

- Television
- Radio
- Intranet
- Internet
- Newspaper
- Circular letter
- Others.....

1.11 Expected future expressway direction. (you can answer more than one choices)

- North
- South
- East
- West
- Northeast

Section 2: Questions

Explanation: Measure expressway users' opinion to EXAT variable factors by using five-point Likert-scale as;

The most satisfaction 5

Much satisfaction 4

Moderate satisfaction 3

Little satisfaction 2

The least satisfaction 1

Please identify your satisfaction by marking X into the space you prefer

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
1	Management Communicating ability Install guide signs on expressways clearly enough.						
2	Install guide signs on expressways brightly enough to see the letters.						
3	Install guide signs on expressways specifying the clear sentences.						
4	Install the suitable number of guide signs on expressways.						
5	Install guide signs at the suitable positions on expressways.						
6	The appropriateness of participation Allow people to participate by						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
	proposing the comments on consideration of EXAT future project.						
7	Provide the CSR activities for example asking the donating of used clothes from the road user for donating to the poor in the provinces and so on.						
8	Provide the channels for anyone who has been affected from the EXAT operation for example the impolite manner of the officers during operation by complaining through telephone number 1543.						
9	Marketing management Price Lump-sum toll rate collecting that means paying the toll at the entrance for example ChalermMahaNakorn expressway.						
10	Toll rate paid accordance with the travelling distance that means receiving the ticket at the entrance and pay the toll at the exit for example BurapaVithi expressway.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
11	The toll rate is suitable for the quality serving by EXAT.						
12	The toll rate adjustment in the past.						
13	EXAT will reduce toll rate during period of 24.00 hours-05.00 hours.						
14	Channel Manual Toll Collection is suitable.						
15	Electronic Toll Collection is suitable.						
16	Money top up of Electronic Toll Collection at toll booth and toll plaza are suitable.						
17	Money top up of Electronic Toll Collection should provide at other place for example at shopping plaza.						
18	The toll collection system is developed from manual collection to electronic collection.						
19	Promotion Publicize to communicate the EXAT information to the customers for example						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
	notifying the traffic situation on expressways and suggest the appropriate routes by using VMS which is intermittently installed on the expressways.						
20	The frequency of proposing the traffic information on expressways.						
21	The frequency of proposing EXAT operating information.						
22	The clearness of proposing EXAT operating information.						
23	The clearness of proposing traffic condition and EXAT operation information.						
24	Provide the sale promotion for example giving the discount to the Easy Pass road users.						
25	Promote the sale by cooperating with the vehicle vendors to sell their cars together with Easy Pass.						
26	Products About 210 kilometers long of expressways are currently serving by EXAT.						
27	The development of the land						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
	within the rights of way fro example providing rest areas to serve the road users by being the temporary place to relax including provide the green areas by planting the trees.						
28	EXAT will increase the expressway length to cover more service areas.						
29	EXAT will reduce the effect to environment, the residences nearby the construction site and during opening to the traffic.						
30	Financial management The service or benefit obtained from the EXAT operation is worth to the paid toll.						
31	Operation management The EXAT traffic service network currently covers Bangkok and vicinity areas.						
32	EXAT will enlarge its traffic service network by extending beyond Bangkok and vicinity areas.						
33	The safety of traffic surface on the expressways.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
34	EXAT will install ETC system for vehicles which has more than 10 wheels.						
35	Communication equipments on the expressways for the road users to communicate the EXAT officers.						
36	Lighting system on expressways.						
	Human resources management and development						
37	The intention and carefulness of the servicing officers.						
38	The ability of the EXAT officers in question answering to their customers.						
39	Human relations of the officers service to the customers.						
40	Advising a good guideline to EXAT customers such as suggesting the travelling routes according to the customer requirement.						
41	The manners and speech of EXAT officers during communicating to the customers.						

- 42 Do you think what kinds of EXAT's employees are needed to be developed to increase their services? (you can answer more than one choice)
- Toll collectors
 - Traffic control officers
 - Information officers
 - Others.....
- 43 Do you think what kind of characteristics of EXAT officers should be improved? (you can answer more than one choice)
- Greeting manners during serving the customers
 - The style of EXAT officers during serving their customers.
 - The dressing of the officers.
 - Others.....
- 44 What characteristics that traffic officers should develop or improve? (you can answer more than one choice)
- Should not stop the cars one side for too long.
 - Should inform the situation in advance to the customers for example the accidents on the expressways.
 - Should have the processes to serve the customers who need the urgency in case of emergency.
 - In case of having broken down cars ahead it should provide the measures to remind the following road users in order to protect the accidents.
 - Should co-ordinate with the at grade traffic officers so that the traffic continuously flows.
 - Others.....
- 45 What kinds of manner should information officers have to improve? (you can answer more than one choice)
- Should not allow the telephone in to ask the information wait for too long.
 - Information officers should increase their knowledge of travelling routes.
 - Information officers should increase their knowledge of the routes suggesting in case of traffic jam.
 - The officers should politely speak to the road users.
 - Others.....

Item No.	Questions	Opinion level					For Resear cher
		Strongly Agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
46	Environmental management Environment such as economics situation, oil price and so on will affect the EXAT service to the customers.						
47	EXAT should have the environmental management in order not to affect its service to the customers.						
48	EXAT must assess the environment specially the natural disaster such as flood and so on in order to prepare the measures so that it will not affect EXAT service to the customers.						

Section 3: Additional Opinions

Item No.	Questions	For Researcher
1	<p>In your perspective, do you think how necessary EXAT has to be developed its services for you more than present services?</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Extremely necessary to be developed <input type="checkbox"/> 2 Necessary to be developed <input type="checkbox"/> 3 No need to be developed (if selected, finish answering) <input type="checkbox"/> 4 No answer (if selected, finish answering) 	
2	<p>In your perspective, if EXAT have to serve you better than at present, what characteristics EXAT should be? (please answer regarding to provided choices and you can mark more than one choice)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Be the universally efficient SOE compared to the one in overseas. <input type="checkbox"/> 2 Quickly and accurately give the information to its customers. <input type="checkbox"/> 3 Construct and develop the new service models which increasingly cover the demands of EXAT customers. <input type="checkbox"/> 4 Apply advance technology to EXAT operating and increasingly provide the service. <input type="checkbox"/> 5 Have the new communicating system to publicize the traffic information on the expressway and at grade road for the road users enabling to effectively decide the travelling routes. <input type="checkbox"/> 6 Allow the road users and people able to increasingly propose their opinion concerning EXAT operations. 	

Item No.	Questions	For Researcher
	<input type="checkbox"/> 7 Allow road users and relevant people participate to the EXAT operation assessment. <input type="checkbox"/> 8 Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time. <input type="checkbox"/> 9 Others, please identify.....	

Section 4 : Other recommendations beneficial to EXAT

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Thank you for your cooperation for this research
Researcher

More than 51 vehicles

- 1.8 Types of occupied vehicles 4-wheel car 6-wheel car
 More than 10-wheel car Other, please identify

1.9 Average daily number of expressway usages

- Less than 10 times 10-20 times 21-30 times
 31-40 times 41-50 times More than 50 times

1.10 Which EXAT routes do your organizations regularly use? (you can answer more than one choice)

- 1 Chalm Maha Nakorn Expressway
 2 SiRat Expressway
 3 ChalongRat Expressway
 4 BuraphaVithi Expressway
 5 KanjanaPisek Expressway
 6 UbonRatthays Expressway

1.11 Why does your enterprise use expressway? (you can answer more than one choice)

- 1 Save the expenses more than at grade travelling.
 2 Less time usage than at grade travelling
 3 More safety than at grade road.
 4 Able to be the destination on scheduled time.
 5 Able to know the traffic situation on expressway more conveniently than at grade road by using telephone number 1543.

1.12 Which future expressway direction does your enterprise expect? (you can answer more than one choice)

- North South East
 West Northeast

1.13 How can you obtain EXAT information? (you can answer more than one choice)

- Television Radio Intranet
 Intranet Newspaper Circular Letter
 Others, identify

Section 2: Questions

Explanation: Measure expressway users' satisfaction to EXAT variable factors by using five-point Likert-scale as;

The most satisfaction 5

Much satisfaction 4

Moderate satisfaction 3

Little satisfaction 2

The least satisfaction 1

Please identify your satisfaction by marking X into the space you prefer

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
1	Management Communication The clearness of the sentences on guide signs installed on expressways.						
2	Sufficiency of guide sign number installed on expressways.						
3	Appropriateness of guide sign positions installed on expressways.						
4	Accuracy of traffic information on expressway provided by telephone number 1543.						
5	Accuracy of traffic information on expressway provided by telephone number 1543.						
	The appropriateness of						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
6	EXAT participation. The participating to propose the EXAT operation and complaint such as the complaint of the effect of the exhaust from the cars using expressways through call center 1543.						
7	The frequency of the participation that EXAT proposes to the customers.						
8	The numbers of activity that EXAT provides for the CSR for example asking for the used books from the road users to donate to the upcountry schools.						
9	The EXAT responding after receiving the complaints or recommendations.						
10	Marketing management Price Lump-sum toll rate collecting that means paying the toll at the entrance before entering expressway for example ChalermMahaNakorn expressway.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
11	Toll rate paid accordance with the travelling distance that means receiving the ticket at the entrance and pay the toll at the exit for example Burapha Withi expressway						
12	The toll rate is suitable for the quality served by EXAT.						
13	The toll rate adjustment in the past.						
14	EXAT will reduce toll rate during period of 24.00 hours-05.00 hours.						
15	Place Manual Toll Collection is suitable.						
16	ETC specified only 4-wheel vehicle is suitable.						
17	Money top up of ETC at toll booth and toll plaza are suitable.						
18	Money top up of ETC should provide more places for example at shopping plaza.						
19	The toll collection system has been developed from manual collection to electronic collection.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
20	The development of toll collection system by paying the toll through bank account.						
21	Promotion Publicize to communicate the EXAT information to the customers for example notifying the traffic situation on expressways and suggest the appropriate routes by using VMS which is intermittently installed on the expressways.						
22	Frequency of proposing the traffic information on expressways to the firm road users.						
23	Frequency of proposing EXAT operating information to the firm road users.						
24	Clearness of proposing traffic condition information on the expressways to the firm road users.						
25	Clearness of proposing the EXAT operation information to the firm road users.						
26	The traffic information service						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
	and others of EXAT through call center 1543.						
27	Provide the sale promotion for example giving the discount to the Easy Pass firm road users.						
28	Promote the sale by cooperating with the vehicle vendors to sell their cars together with Easy Pass.						
29	Products About 210 kilometers long of expressways are currently enough serving by EXAT.						
30	Development of the land within the rights of way for example providing rest areas to serve the road users by being the temporary place to relax including providing the green areas by planting the trees.						
31	EXAT will increase the expressway length to cover more service areas.						
32	EXAT considers the effect to environment, the residences nearby the construction site and during opening to the traffic.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
33	Financial management Service or benefit obtained from the EXAT operation is worth to the paid toll.						
34	Operation management EXAT traffic service network currently covers Bangkok and vicinity areas.						
35	EXAT will extend its traffic service network beyond Bangkok and vicinity areas.						
36	Safety of traffic surface on the expressways.						
37	Installation of ETC system for vehicles which have more than 10 wheels.						
38	Communication equipments on the expressways for the road users to communicate the EXAT officers.						
39	Lighting system on expressways.						
40	Thai letters on guide signs are easy to understand.						
41	English letters on guide signs are easy to understand.						

Item No.	Questions	Satisfaction level					For Resear cher
		The most 5	Much 4	Moderate 3	Little 2	The Least 1	
42	Thai words on guide signs are consistent with English words.						
43	Human resources management and development Intention and carefulness of the serving officers.						
44	Ability of the EXAT officers in question answering to their customers.						
45	Human relations of the officers who serve customers.						
46	Advising a good guideline to EXAT customers such as suggesting the travelling routes according to the customer requirement						
47	Manners and speech of EXAT officers during communicating to the customers.						
48	The operating of traffic officers on the expressway to allow the traffic flow.						

49. What kinds of EXAT officer does EXAT have to develop to increase its service?

- Toll collector
 Traffic officer
 Information officer
 Others, please identify.....

50. What kinds of officer aspect does EXAT have to develop to increase its service?

(you can answer more than one choice)

- 1 Greeting manners during serving the customers
- 2 The manners of EXAT officers during serving their customers.
- 3 The dressing of the officers.
- 4 Other, please identify.....

51. What kinds of traffic officer's characteristic does EXAT have to develop? (you can answer more than one choice)

- 1 Should not stop the cars one side for too long.
- 2 Should inform the situation in advance to the customers for example the accidents on the expressways.
- 3 Should have the processes to serve the customers who need the urgency in case of emergency.
- 4 In case of having broken down cars ahead it should provide the measures to remind the following road users in order to protect the accidents.
- 5 Should co-ordinate with at grade traffic officers so that the traffic continuously flows.
- 6 Others, please identify.....

52. What kinds of manner should information officer at call center 1543 develop?

(you can answer more than one choice)

- 1 Information officer should not allow the telephone in to ask the information wait for too long.
- 2 Information officers should increase their knowledge of travelling routes.
- 3 Information officers should increase their knowledge of the routes suggesting in case of traffic jam.
- 4 Information officers should politely speak to the road users.
- 5 Others, please identify.....

Item No.	Questions	Opinion level					For Resear cher
		Strongly Agreed 5	Agreed 4	Undecided 3	Disagreed 2	Strongly disagreed 1	
53	Environmental management Environment such as economics situation, oil price and so on will affect the EXAT service to the customers.						
54	EXAT should have the environmental management in order not to affect its service to the customers.						
55	EXAT must assess the environment specially the natural disaster such as flood and so on in order to prepare the measures so that it will not affect EXAT service to the customers.						

Section 3: Additional Opinions

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Item No.	Questions	For Researcher
	<input type="checkbox"/> 6 Allow the road users and people able to increasingly propose their opinion concerning EXAT operations. <input type="checkbox"/> 7 Allow road users and relevant people participate to the EXAT operation assessment. <input type="checkbox"/> 8 Should be the SOE whose employees are encouraged in working and increasingly provide the good atmosphere workplace to more happily work than the present time. <input type="checkbox"/> 9 Others, please identify.....	

Section 4 : Other recommendations beneficial to EXAT

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Thank you for your cooperation for this research
Researcher

BIOGRAPHY

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PRESENT POSITION

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