

การพัฒนาการบริหารการทางพิเศษแห่งประเทศไทย
The Administration Development for Expressway Authority of Thailand

สุชาติ ชลศักดิ์พิพัฒน์*
Suchart Chonsakpipat*

*นักศึกษานิพนธ์เอก สาขารัฐประศาสนศาสตร์ คณะรัฐประศาสนศาสตร์ สถาบันบัณฑิตพัฒนบริหารศาสตร์

*Doctor of Public Administration Candidate, Graduate School of Public Administration, The National Institute of Development Administration (NIDA)

*Email : engineere220@gmail.com

บทคัดย่อ

การศึกษานี้เป็นการวิจัยเชิงปริมาณและเชิงคุณภาพโดยมีจุดประสงค์หลักเพื่อศึกษาการพัฒนาการบริหารการทางพิเศษแห่งประเทศไทยที่ดำเนินการอยู่ปัจจุบัน โดยใช้กรอบแนวคิดที่ประกอบด้วยการบริหารจัดการของการทางพิเศษฯ ที่อาศัยองค์ความรู้ในการบริหารจัดการคือ (1) การจัดการทั่วไป (2) การจัดการด้านการตลาด (3) การจัดการด้านการบัญชี (4) การจัดการด้านการเงิน (5) การจัดการด้านการผลิต (6) การบริหารและการพัฒนาทรัพยากรมนุษย์ และ (7) การจัดการด้านสถานะแวดล้อม ผลการดำเนินงานทั้งที่เป็นตัวชี้วัดทางการเงินและไม่ใช้ทางการเงิน การประเมินผลบริการสาธารณะโดยการศึกษาศักยภาพของพนักงานของการทางพิเศษฯ และความพึงพอใจของผู้ใช้ทางพิเศษที่เป็นลูกค้า และศึกษาเปรียบเทียบคุณลักษณะขององค์กรที่ให้บริการทางพิเศษทั้งในประเทศและต่างประเทศ ผลการศึกษานี้ทำให้สามารถนำเสนอโครงสร้างของการบริหารของการทางพิเศษฯ ในอนาคต

ข้อมูลปฐมภูมิในการศึกษานี้ได้จากการสัมภาษณ์กรรมการการทางพิเศษฯ ผู้บริหารระดับรองผู้ว่าการ และผู้ใช้ทางพิเศษซึ่งเป็นตัวกำหนดที่มีประโยชน์มากและทำให้สามารถนำเสนอโครงสร้างการบริหารของการทางพิเศษฯ ที่มีประสิทธิภาพ เมื่อได้ทำการวิเคราะห์ข้อมูลทั้งหมดที่เก็บรวบรวมจากพนักงานการทางพิเศษฯ และผู้ใช้ทางพิเศษแล้ว ปรากฏว่าการบริหารของการทางพิเศษฯ ที่ดำเนินการอยู่ในปัจจุบันควรต้องเปลี่ยนแปลง โดยเฉพาะในกรณีของ (1) การบริหารทรัพยากรมนุษย์และ (2) วิธีการประเมินผลปฏิบัติงานของพนักงานและผลตอบแทนการดำเนินงานของพนักงาน การศึกษานี้ได้นำเสนอรูปแบบการบริหารของการทางพิเศษฯ ที่น่าจะเป็นในอนาคต โดยประยุกต์จากรูปแบบการบริหารของบริษัท NEXCO-Central ในประเทศญี่ปุ่น ซึ่งรูปแบบโครงสร้างการบริหารของการทางพิเศษฯ น่าจะอยู่ในรูปแบบของบริษัทโฮลดิ้ง โดยที่การทางพิเศษฯ เป็นบริษัทแม่ที่ลงทุนในเป็นบริษัทย่อยที่จำเป็น

คำสำคัญ: การพัฒนาการบริหาร องค์ความรู้ด้านการจัดการ ผลการดำเนินงานตามอำนาจหน้าที่ การประเมินผลบริการสาธารณะ บริษัทโฮลดิ้ง

Abstract

This study used a mix-methodology comprised a quantitative and qualitative research approach. The main focus is to study the development of the Expressway Authority of Thailand (EXAT) administration at the present. The study conceptual framework takes into account of EXAT's administrative management by investigating its operations in seven key areas of management, which are (1) General Management, (2) Marketing Management, (3) Accounting Management, (4) Financial Management, (5) Operation Management, (6) Human Resource Management and Development and (7) Environmental Management. The authority performance is evaluated both in terms of financial and non-financial indicators. The public service performance is assessed by tracing employees' perception and customers' satisfaction. Lastly, a comparative study of other tolled-road organizations, both domestic and overseas organizations. The results were used to determine the proposed structure of EXAT's future administration.

Primary data used in this study were obtained from interviewing members of EXAT's board, deputy governor, and road users. These data are very useful determinants that enable to propose an effective organization management structure. Having analyzed all the data collected from EXAT employees and customers, it is found that the current EXAT administration should be changed, especially in the cases of (1) human resource management and (2) methods to assess individual performance and compensation of the staff. This study proposes a possible EXAT administration model by applying the NEXCO-Central company in Japan as a paradigm. The proposed EXAT administrative structure should be in the form of Holding Company, which EXAT will be the parent company who invests in the necessarily subsidiary companies.

Keywords: Administration Development, Knowledge of Management,
Authority Performance, Public Service Assessment, Holding Company

1. Introduction

Expressway Authority of Thailand (EXAT) is one of the 58 state-owned enterprises, classified in the transportation sector, under the control of Transportation Ministry.

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 innovated 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.

For the budget years 2009-2012, Thai Rating Information System (TRIS) that was hired by State Enterprise Policy Office (SEPO 2009-2012) rated the EXAT performance at 4.4357, 4.1198, 4.2822 and 4.4043 (5.0000-point scale), respectively. This was classed as a "good" performance.

EXAT's average daily revenue in 2009 was about 1.5 million USD and road users made a daily average about 1.2 million 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 of which the authority should modify its management and other aspects of its administration. This is largely because the authority is currently administered in pretty 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 key reasons required 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.
- (3) EXAT's marketing system is typical of a monopoly, of which many staffs lack of a service mind.

- (4) EXAT's workforce has been found to be too large. As a result, many employees have been directed to work on things that are not compatible with their capabilities.
- (5) Finally, similar to many other SOEs, EXAT often employs expensive consultants to work on things that can be done cheaper by internal expertise.

After investigating many aspects of EXAT's administration, the author believes that this study will be even more beneficial 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 authorities will provide supporting information for the proposed EXAT administrative structure. The selected authorities are from four continents: Asia, Australia, Europe, and Africa. The seven authorities being 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).

2. Objective

This study has the following objectives:

- (1) To study EXAT operations and the current operational problems of EXAT administration.
- (2) To identify the benchmark administrative characteristics for the EXAT development.
- (3) To propose an administrative structure model for EXAT administration development.

3. Literature Review and Scope of the Study

This study examines EXAT from available documents, employee and road user questionnaires, and interviews. Regarding the seven other expressway authorities, this study relies on the following key areas of management.

Boonnark (2001, as cited in Boonnark, 2006b) 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.

Soudani (2012) 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.

Higgins (1995) 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.

Boohene and Asuinura (2011) have found that human resources management practices comprise (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.

Vorhies and Morgan (2005) 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.

Boonnark (2006b) 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.

Hitt, Black, and Porter (2005) have argued that environmental factors that influence organizational operation consist of an external environment and working environment. It is only suggested that the external environment consists of socio-cultural, technological, economic, political-legal and global factors.

Additionally, this study also proposes another variable, the EXAT project management which was measured, by EXAT existing service projects, projects under construction, and future projects. The EXAT operating performance is also investigated in terms of both the financial perspectives 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, and ETC users ratio; and the non-financial perspectives that comprise measuring accident statistics and complaint statistics. This study investigates some characteristics of other expressway organizations' operation both in Thailand and overseas. They consist of (1) organization vision, (2) total service network distance, (3) total staff number, (4) expressway network average growth rate, (5) earning product types, (6) organization structure, (7) toll collection

types, (8) electronic toll collections-total toll collections ratio, (9) financial performance, (10) employee numbers-expressway distances ratio, (11) employee expenses-total revenue ratio. Lastly, the variable, public service evaluation, was investigated to know the EXAT employees' opinion and road users' satisfaction according to its administration. They were picked up from the questionnaires distributed to stakeholders, EXAT employees and road users, as well as the related personnel interview.

4. Research Conceptual Framework

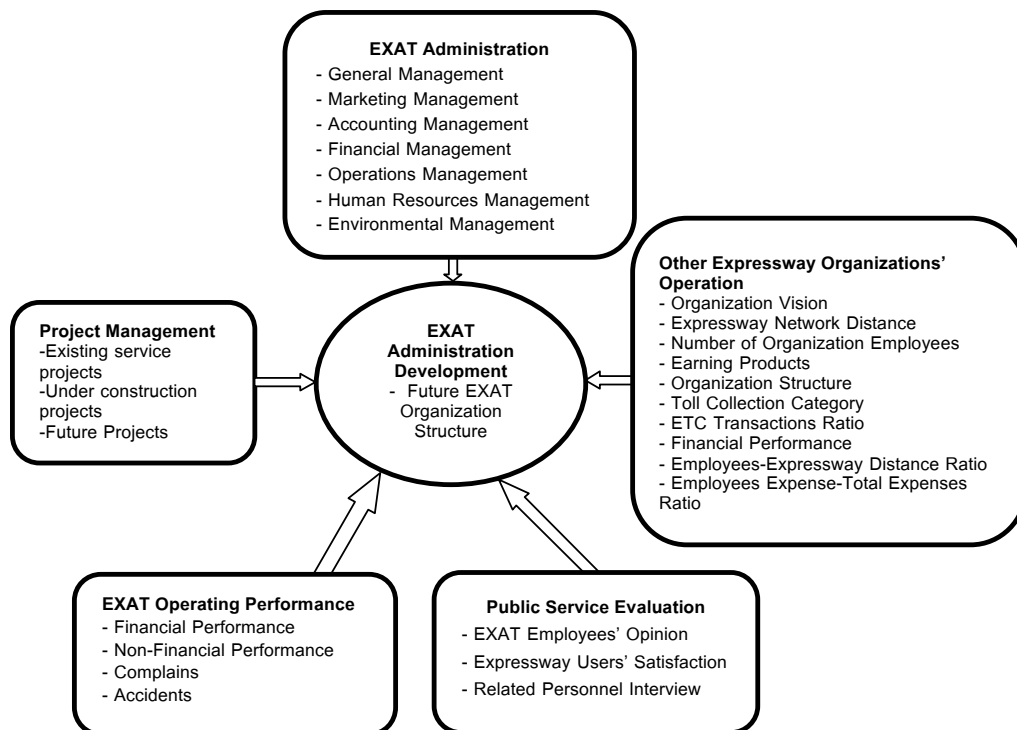


Figure 1: Research Conceptual Framework

Having reviewed the related literatures, 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, project management, its operations' performance, public service evaluation and other expressway organizations both domestic and overseas are assessed. The conceptual framework so developed is shown in Figure 1

5. Research Methodology

Research methodology used in this study can be considered as a mix between quantitative and qualitative approach.

5.1 Research Process

The process of this research commences with an investigation within EXAT of seven key areas of management (which are (1) General Management, (2) Marketing Management, (3) Accounting Management, (4) Financial Management, (5) Operation Management, (6) Human Resource Management and Development and (7) Environmental Management). In addition, the managements of the seven domestic and overseas expressway authorities are also reviewed to obtain supporting information to propose

changes to the EXAT 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 key areas of management, strategies are 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 the key index for the authority to achieve its objectives.

5.2 Research Design

This study is a 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 (i.e. by Delphi-technique and Cronbach's Alpha) before being distributed 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, these data are from annual reports, performance assessment reports provided by TRIS, relevant operation manuals,

related meeting reports, and relevant academic articles in Thai and English. For the other seven expressway authorities, their 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 key areas of management.

5.3 Population

One of the most important factors in any research that involves sampling is to ensure that the samples collected are the representatives of the whole population (Pitakthepsombat, 2007). 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, has the population size of 5,077 (recorded in May, 2013). The population size of the second group, individual expressway users, is about 1.3 million. Lastly, the population size of the third group, the enterprise expressway users who transport their customer goods and services through the EXAT network, is about 800 (the business firms registered with EXAT).

5.4 Samples

The samples are randomly picked from all the 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). This research employed the Yamane formula to determine the sample sizes by using the following equation.

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

Where: n = Sample size
 N = Research population size
 e = Deviation value (0.05)

Additionally, the study simultaneously considered the size of samples suggested by W. Laurence Nueman (as cited in Pitakthepsombat, 2007), which can be concluded that a sample size of 2,500 is large enough, regardless of how large the population is.

One part of the research population is the EXAT staffs, which is classified internally into 11 management levels. For the sake of simplicity, this study clusters the 11 management levels into three subgroups: Medium and High Level Executives (Level 8 and above-68 individuals), Low Level Executives (Level 7-172 individuals) and Operational Staff (Levels 1 to 6 -4,286 individuals).

The sample size of each group was determined by calculating the sample size for the total staff 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. Table 1 summarizes the population number and sample number used in this study.

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

Table 1: Population group, population number, and sample number.

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

5.5 Data Collection

This study employed 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 key areas of management. 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 were prepared. 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. Lastly, they were tested for content validity and reliability by distributing them to 30-40 test respondents; and the Cronbach's Alpha was employed to check that the responses from the test group were reliable (required not less than 0.8 (Hair, Anderson,

Tatham, and Black, 1998). The questionnaires, semi-structured, were also prepared in order to collect in-depth qualitative information.

The pre-tested and modified questionnaires were distributed to the designated three sample groups as

tabulated in Table 2. 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 to resolve any unclear questionnaire items.

Table 2: Detail of sample responses in terms of number and percentage of response.

Population Group	Sample Number	Sample Responses	% of Response
EXAT employees	1,000	894	89.40
Individual road users	2,500	1,884	59.52
Enterprise road users	240	214	89.17

6. Research Results and Discussion

Each questionnaire has questions regarding the seven key areas of management. Each question asks for opinion level of EXAT employees by using the 5-point Likert scale (5=strongly agreed, 4=agreed, 3=undecided, 2=disagreed, and 1=strongly disagreed) and satisfaction level of road users both individual and enterprise group (5=the most satisfied, 4=much satisfied, 3=satisfied, 2=little satisfied and 1=the least satisfied). Then, the statistical software was employed to estimate the frequency and percentages of each opinion level. Overall, it could be said that not only EXAT's employees

agreed but also expressway's users were satisfied with the present EXAT's administration. Table 3 illustrates an example of questionnaire results in terms of EXAT employee opinions concerning EXAT general management regarding the commanding ability. The other questionnaire results, which are not shown here due to limited space, include (1) General Management, (2) Marketing Management, (3) Accounting Management, (4) Financial Management, (5) Operation Management, (6) Human Resource Management and Development and (7) Environmental Management.

Table 3: Example of questionnaire results, in terms of EXAT employee opinions concerning EXAT General Management--commanding ability

General Management “Commanding Ability”	Opinion level (percentages)				
	Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed
Your authority has ordered by writing appropriately.	9.7	54.5	28.8	6.2	0.8
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= 894)					

However, the sampled employees believe that EXAT should be further developed. The three most characteristics which employees expect are (1) EXAT should be an SOE with satisfied and motivated personnel by providing a good working environment (72.5%); (2) EXAT should provide quick and accurate information to customers on things such as traffic management (62.9%). This is consistent with the road users’ interview

where they state that they seldom receive the information from EXAT; and (3) EXAT should increasingly operate and serve the customers with the modern technology (61.8%).

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 (22.1%); and

(2) EXAT should develop its work system (procedures) (17.9%).

The results of the individual road user questionnaire analysis have shown that EXAT administration needs to be improved. The objectives should be: (1) To provide fast and accurate information to the customers (52.8%); (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 (50.5%); and (3) To increase operation and service with modern technology (49.4%).

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 (40.3%); (2) EXAT should improve expressway traffic signs and lighting (19.2%); and (3) EXAT should modify its investment plan and extend its service network (14.4%);

The last group, enterprise road users, is generally satisfied with EXAT administration. However, they have expressed their opinions that EXAT should improve its management. The expecting attributes are (1) EXAT should increase the adoption of advance technologies in corporate operation and service (54.2%); (2) EXAT is required to accurately and rapidly offer the information to the customers (51.4%); and (3) EXAT should

create and develop new service models which better cover enterprise road user requirements (51.4%).

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 (20.0%); (2) Traffic officers should improve their service by better balancing the traffic management / flow stopping on expressways with merging traffic (40.7%); and (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 (46.7%).

The project management of EXAT is tabulated in Table 4 to show the present service project, under construction project and planned project in term of project length.

Table 4: Summary of the EXAT's expressway project distance

Service Project (Kilometers)	Under Construction Project (Kilometers)	Planned Project (kilometers)
207.9	16.7	253

In addition to the results analyzed from the questionnaires, the study also investigated other seven domestic and overseas expressway authorities to facilitate the discussion as well as to propose a new administrative structure for EXAT. It was found that EXAT was similar to the explored corporations in investment sources and earning products. For the investment sources, EXAT has invested by using its own revenues and a portion from the government budget as well as concessions to a private firm to build and operate parts of the expressway network. Regarding the earning products, EXAT earns its revenue through the network services with toll and commercial land development.

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

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

(1) Corporate Vision: Most of the studied organizations seem to have similar vision, "The Toll Road Service Leader" in their country, while EXAT's vision is "Choice of value, advanced development, and care for environment"; (2) Network Service Distance: It was found that EXAT has a network distance only 207.9 kilometers or the average growth rate was only 5 kilometers per year. It was also found that the service networks of most of the investigated organizations covering major areas of their countries; and (3) Staff Numbers: Staff numbers alone are not a satisfactory indicator. The more important indicator is the staff number-network distance ratio and in this regard EXAT's performance appears ineffective. Table 5 illustrated the number of staffs- distance ratios for the three studied companies.

Table 5: Number of staffs-distance ratios

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 show that EXAT needs to consider how to improve the ratio to be more compatible with the other authorities. EXAT's net profit is higher than the other seven authorities. However, there is still room for improvement by reducing the number of employees. This is supported by the fact that EXAT's personnel expense to the total expense ratio is higher than the other seven authorities. Hence, if EXAT is able to increase the work efficiency of its staff as discussed above or expand its network, the ratio will be improved and its net profit will be even higher.

In the case of revenue-asset ratio (4.69%), it can be seen that EXAT has utilized its assets quite ineffectively. It is therefore necessary to examine the network routes that have not achieved the forecasted traffic when they were planned and come up with strategies to increase customers. Additionally, the other asset which is the acquired land for expressway construction can be commercially developed to increase the revenue.

7. Recommendations

After analyzing the results and comparing with other benchmarks (i.e. the other seven toll road organizations) as discussed above, several recommendations are proposed to improve the administration of EXAT.

7.1. Policy Recommendations

7.1.1 Organizational Structure Reform

All factors previously specified have indicated that EXAT should be reformed along the line of the NEXCO-central administration model. As NEXCO-Central is a privatized firm, the model could not be fully adopted because many barriers obstruct Thai SOEs' privatization. The main difficulty is probably because the anxiety of employees about job security (Limpongpan, 2000). Therefore, the proposed administration model should be in the form of a holding company which operates through subsidiaries. EXAT will be the parent company (as cited in Echanis, 2009) who would invest into the subsidiary

companies to support the operations according to EXAT Act as illustrated in Figure 2.

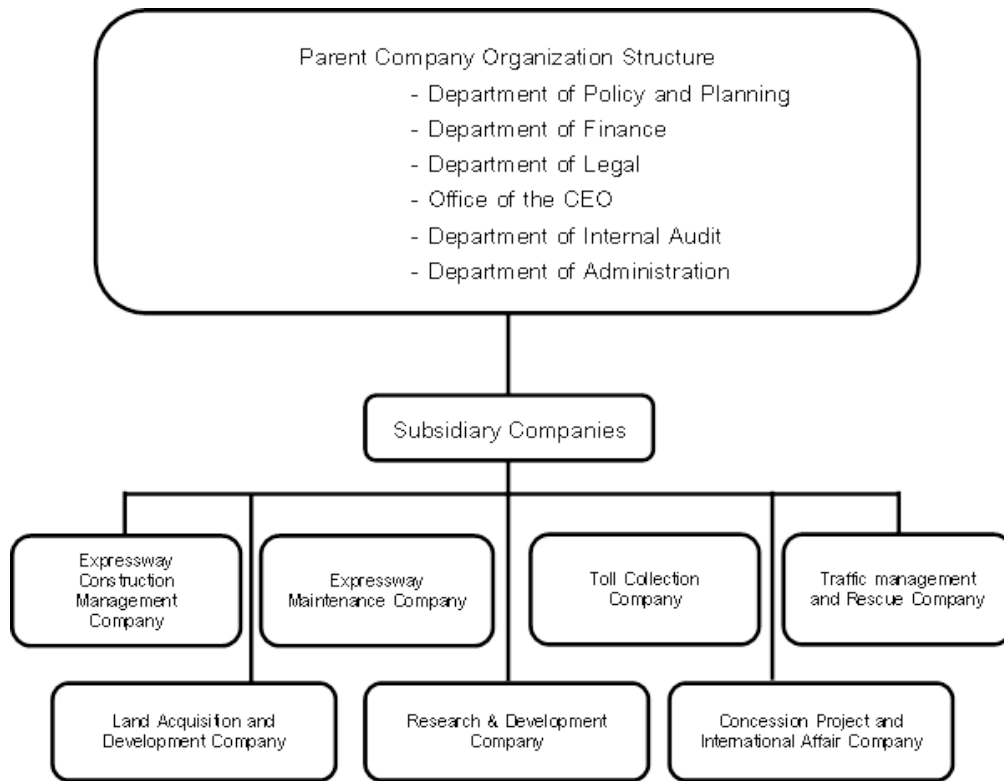


Figure 2: The Proposed EXAT Administrative Structure

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. An important opportunity for EXAT is the investment in overseas expressway businesses, especially in ASEAN. Another would be to

offer expressway consulting services to the same ASEAN target group, similar to the service provided in Japan by NEXCO-Central. 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 in addition to the state-of-the-art technology in ETC and

other areas to support road users. The Land Acquisition and Development Company should 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. The Expressway Construction Management Company and Expressway Maintenance Company will be responsible for the quality and safety of the road surfaces on expressway. The Toll Collection Company and the 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 collection and traffic management and rescue operations would be more efficient under this private system.

The proposed subsidiary companies should be independently managed, especially in terms of human resources and salary, so that they meet the requirements of the labor market for various positions. This will solve some of the problems, which the authority currently faces in performance assessment and salary structure. EXAT as the parent company would appoint the key persons and determine the overall compensation system to ensure fairness.

Importantly, EXAT should change its vision to be in line with the new organization structure. EXAT's current vision is quite different from the visions of the other studied expressway authorities. Most of these have adopted visions of being the Toll-Road Service Leaders in their countries. It is proposed that EXAT should modify its vision in anticipation of the AEC opening in 2015. The proposed vision that might better reflects the changed circumstances would be "To Be the Toll Road Service Leader in ASEAN"

7.1.2 Product Development

A sustainable organization must continuously offer modern goods and services that meet the needs of customers. 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 plans for the future cover 253 kilometers in the Bangkok area and the links connecting to some major cities. EXAT should add other earnings products through the commercial development of its occupied land in line with the other studied expressway authorities. The development can be managed either by EXAT itself or in conjunction with investment from the private sector.

7.1.3 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 PPPs Act). Under this Act, EXAT can contract out the design, building, and operations of new expressways to the private sector for an agreed period of time (usually 30 years).

7.1.4 Technology and Innovation

The authority should monitor expressway technology developments throughout the world in order to maintain a state-of-the-art system. A consequence of introducing new technology is that it often affects the workforces. Hence, it is necessary to not only provide the skilled employees needed to operate any new equipment, but also to re-train any staff who are displaced to do other work within the authority.

7.1.5 A Single Expressway Organization

At present, there are two organizations operating toll roads in and around Bangkok: EXAT, which operates expressways and the Department of Highways (DOH), 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.

7.1.6 Corporate Social Responsibility (CSR)

Employees: One of the most important EXAT stakeholder groups is its employees as the organization is 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 constructions and operations.

Measures could include noise barriers and educational scholarships for children of affected communities. This is consistent with the other expressway organizations studied.

7.1.7 Preparation for the ASEAN Economic Community (AEC)

Thailand will be a member of the AEC in 2015. When this happens, it is inevitable that there will be more passengers 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 most ASEAN countries operate toll-roads, EXAT should facilitate the 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 could be consideration of synchronizing regulations. An important indirect effect of the AEC is the nature of the workforce that probably

involves 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.

7.1.8 Executives Preparation

A committed and experienced management team with a high level of skills in the seven key areas of management is essential to effectively and efficiently manage the authority to achieve its objectives. At present, there is little or no executive development program beside the current 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 seven key areas of management.

7.2. Management Recommendations

7.2.1 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 to be clear and fair; (2) EXAT must establish a better recruitment system to obtain workers whose qualifications meet the department requirements; (3) Recruitment time needs to be greatly reduced; (4) EXAT should better recognize employees who do outstanding work through awards and other forms of recognition that will instill a sense of pride and result in better operating efficiency; (5) A better staff training plan needs to be designed to help staffs at all levels gain in knowledge and skills in addition to their normal job function; (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; and (7) Executive Succession Plans have to be provided.

7.2.2 Preparation for the ASEAN Economic Community (AEC)

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. As a short term plan, an English training program should be provided 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.

7.2.3 Corporate Social Responsibility (CSR)

As a result of its operations, EXAT induces 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; and (3) Consumption of electricity 24 hours a day.

EXAT can decrease CO₂, associated with toll queues by replacing manual toll collection with ETC to reduce the vehicle queue length. 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. Finally, EXAT should consider offsetting some of CO₂ emissions associated with its expressways by enlarging green areas along expressway routes and where it is safe to do so planting additional trees.

7.2.5 Technology and Innovation

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 destinations.

8. Conclusion and Future Research

In this study, Expressway Authority of Thailand (EXAT) was investigated its current administration in the seven key areas of management which are (1) General Management, (2) Marketing

Management, (3) Accounting Management, (4) Financial Management, (5) Operation Management, (6) Human Resource Management and Development and (7) Environmental Management. Data were collected from both the interviews and questionnaires, with a well design and sound research methodology. Numerical results were analyzed using statistical techniques. Other toll collection authorities in overseas were also investigated as benchmarks. Then, several recommendations were proposed to improve the current administration of EXAT, especially the new EXAT administrative structure, proposed as a holding company in this study.

“The Administration Development for Expressway Authority of Thailand” has been successfully studied. However, there are still rooms for future research:

(1) This study examined 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.

(2) In this study, the level of individual and enterprise road users’

satisfaction with the knowledge of management functions administrated by EXAT was assessed by measuring overall satisfaction. A further study should be conducted to research whether individual and enterprise road users' satisfaction are different between knowledge of various management areas and which ones are important for EXAT.

(3) The indicators used for knowledge of management area in this study are only a portion of the whole. There might be other indicators that could expand the dimensions of the research and provide additional strategies to improve EXAT administration.

(4) This study has investigated six overseas expressway authorities by selecting from Asia, Europe, Australia and Africa. The study is limited in that the number of studied corporations might be not enough. There are no corporations from Southeast Asia, North America and South America. Therefore, future research should cover more expressway authorities from other continents to obtain more complete results.

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