The background of the entire cover is a dark, textured surface with numerous bright red, glowing light trails that curve and swirl across the frame, creating a sense of motion and energy.

TRANSPORT POLICY AND FUNDING

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Preface

Our first book, entitled “Funding Transport Systems — a Comparison between Developed Countries,” was published by Pergamon in 1997. At that time, funding for transportation improvement was problematic because of financial difficulties in various countries, and people were becoming more aware of the significance of this issue. Thus, the book was welcomed by many readers.

More recently, a growing interest in environmental issues has been dramatically changing the transportation policy in many countries, and the importance of funding issues has been further increasing. In roadway improvement, new funding systems have been introduced, including the tolls imposed on roadway users. In railway improvement, railway operations have been privatized in some countries, with the result that the construction/ownership and operation have been separated, and various other new mechanisms have arisen. Decentralization of railway operation is also a major trend. In airport improvement, the role of private sector has generally been increased. We have now composed a new book, during this profoundly interesting time that has seen the introduction of a variety of new modes of thinking and methods of funding.

The big difference between this book and our first book is that we have substantially increased the analysis of the policies of various countries. It is natural that funding is closely related to the basic transportation policy in individual countries, and the objectives of transportation improvement in these countries are of extreme importance in comparing the funding systems. Transport policies are currently at a point of significant divergence, at which some countries are shifting their funding significantly and others are shifting only slightly. In this book, we have undertaken a substantial review of the recent modes of thinking toward transportation improvement including a view of the historical background.

The close examination of new policies is also an important addition in this book. We have analyzed new transportation improvement systems in detail, including the imposition of tolls on roadway users and the utilization of private funds for railway and airport improvement.

The latter part of this book consists of the actual comparison of funding in various countries. In this book, we have added new data collected over the past 10 years to the previous analysis of pre-1995 data. Furthermore, as the funding issue has become a great concern both in Western nations and Asian nations, we have added South Korea to the countries compared in this book. The modes of thinking toward transportation funding have been evolving dramatically; we believe that this is illustrated by the comparisons in this book.

In writing this book, we were privileged to have the cooperation of many people. A discussion at the “study group on transport funding” with members interested in international comparison of funding was of great significance to us. We received indispensable suggestions on the writing of this book from Mr. Taekyu Kim, Mr. Shinichi Ueda, Mr. Morihiro Kawata, Mr. Katsuhiro Yamaguchi, Mr. Katsuya Hihara, Mr. Kazuyuki Nozawa, and Mr. Kazunori Takahashi, who were the members of the study group. Our discussions with Professor Yoshitaka Aoyama and the researchers of Kyoto University and Okayama University were also quite valuable. The contribution of Mr. Satoshi Takagi was also worthy of note. Miss Yuko Nakagawa and Miss Aya Nakagawa well assisted the final preparation of the materials. Mr. Chris Pringle of Elsevier was especially helpful throughout the projects. We would like to express our sincere gratitude to all of these people. Last but not least, we would also like to thank Mrs. Noriko Nakagawa and Mrs. Masako Matsunaka for their assistance.

January 16, 2006

Dai Nakagawa and Ryoji Matsunaka

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Chapter 1

Introduction

Many countries around the world are making large investments in transportation improvements, but even greater investments are still needed. Funding is the key to promoting convenient and attractive transportation systems that will enable the creation of societies where anyone can enjoy a high degree of mobility, while simultaneously responding to environmental and energy-related problems.

Various types of financial resources are currently being used in countries around the globe, the most common of these being government funds obtained through taxation and fees collected from the users of transportation facilities. Certain countries have also implemented unique means of funding from sources other than users, for example, through funding by parties such as landowners who receive benefits from transportation improvements. In recent years, new methods have also surfaced using private sector funds.

Regardless of the source of funding, however, since capital is by no means abundant, new ideas appropriate to each situation must be generated to enable the continuation of high-quality transportation improvements.

From a theoretical perspective, the fundamental question of who should bear the burden of funding for transportation improvements is simple: "Those who enjoy the benefits of transportation improvements should bear the related costs." There is no need to implement projects in which costs are greater than the benefits, so the benefits of essential projects must always be greater than costs. Therefore, if the persons receiving the benefits bear costs appropriate to those benefits, then theoretically it will always be possible to secure necessary funding. In reality, however, this is not always easy because the benefits of transportation improvements come in many different forms. If the benefits are only seen by the users, then improvements can be made based on usage fees charged to the users. But in addition to the users, transportation improvements also bring benefits to the owners of nearby land and businesses. Another important factor is the positive effect on the economic activities in the region as a whole. The effects of improved public welfare for all of society have gained particular importance in recent years; for example, improvements to the environment and greater mobility for the physically disabled.

An ideal way of covering costs would be to have those costs covered in keeping with the benefits generated; for example, users bear costs corresponding to

the benefits enjoyed by users, and landowners bear costs corresponding to the increase in the value of land assets. Taxes could then be used to cover costs corresponding to benefits enjoyed by society as a whole, such as improvements to the environment. It is difficult, however, to accurately measure the benefits enjoyed by each party and to put in place methods by which the persons enjoying such benefits would actually bear the related costs. It is therefore difficult to actually execute ideal funding methods, and in reality, these methods are determined according to policy judgments that consider the above theoretical principles.

That is to say, the question of funding — who should bear how much of the costs of transportation improvements — is a question of evaluating the benefits generated by such transportation improvements, and is closely related to the most fundamental concept of “which goals are given the highest priority in the context of investments.”

The role of transportation systems is not only to carry people and goods quickly, safely, and reliably. They also function as social infrastructure that supports all forms of industry and activities in a given country or region, as welfare infrastructure enables freedom of movement for people and guarantees the right to activities and as a part of social policies for responding to environmental and energy-related issues. Which role is most emphasized reflects the basic policies of the country in question, and the financial resources for transportation improvements are configured to implement these basic policies. For this reason, discussions on funding transportation improvements must be carried out with a view toward the basic policies regarding transportation.

The goal of this book is to compare the different approaches to transportation improvements in each country and to discuss the actual conditions regarding funding systems that have been constructed to achieve their basic policies. Each country has its own ideas regarding transportation improvements, and these ideas are currently undergoing a transition from the traditional approaches to those of a new era. The financial resources designed to achieve these ideas are also changing. A variety of new funding systems are being introduced to cover the costs of transportation improvements depending on the country or the mode of transportation. A detailed comparison of the conceptual basis on which these funding systems are combined is extremely interesting and valuable in determining the best direction for future transportation improvements.

In Chapters 1–3, we explain the fundamental theories related to funding for transportation improvements and discuss the key features of funding systems. In Chapter 4, we provide a detailed discussion of the current state of transportation policies and funding in several major countries, referring to the basic approaches used in each country.

Conditions in each country related to the following factors will be important in the context of discussions presented in Chapters 1–4.

- Basic planning goals established by each country.
- Status of progress in specific transportation policies in response to environment problems.
- Approaches to the role of the public sector and the scope of private sector participation.
- Approaches to the division of taxes and user burden in securing financial resources.

The second half of the book (Chapters 5–7) provides a demonstrative clarification of how the ideas of each country are reflected in the makeup of actual financial resources. To do this, we present methodologies for an international comparison of the structures of financial resources, calculate the makeup of actual investment amounts and the parties making those investments, and compare these elements using charts and tables.

Specific details of comparisons include:

- investment amounts for roadways, railways, and airports in each country;
- changes in investment amounts for each transportation mode;
- ratios for burden of funding covered by the general public and by users; and
- ratio of funding currently being covered vs. loans representing funding covered in the future.

To undertake accurate comparisons, it will be necessary to conduct detailed surveys of the current status of funding systems for transportation in each country and then to construct methodologies for comparisons. This is because financial systems differ depending on the country and the transportation mode in question, so in many cases, it would be meaningless to simply compare statistical figures in a table. In this book, we have adopted a comparison of “parties actually bearing the burden of funding” as a means of achieving uniform, standardized comparisons.

The calculations used have the following two main features:

- (1) Past research in this field has been fragmentary without considering entire investment amounts for transportation improvements or a breakdown of financial resources. For this book, we gathered comprehensive data on roadways, railways, and airports for each of the countries covered.
- (2) Statistical methods and tabulation methods differ from one country to the other, but in this book, we have coordinated these methods to enable uniform, standardized comparisons that concentrate on statistical details rather than using figures as they appear in the tables.

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To achieve these goals, we had to gather large volumes of materials and pay close attention to these details, so a considerable amount of effort was required. We feel, however, that this work is essential for conducting appropriate discussions regarding funding for transportation improvements and creating outstanding future transportation systems throughout the world.

The following is an outline of this book's chapters.

Chapter 2: Theory and Practice of Funding. After discussing fundamental funding theories for transportation improvements, we will clarify the various characteristics of financial resources used for such improvements. We will also describe some of the most basic points, including who should undertake transportation improvements and what financial resources should be used; we will also compare the perspectives of various countries. We will then make comparisons of environmental responses in each country, which have been gaining importance in recent years.

Chapter 3: Funding Systems. Here, we will compare and analyze conditions in each country with regard to important systems central to discussions on transportation improvements. Specifically, we will focus on the following issues: regarding roadways, the existence of specified funding and the status of toll charging; regarding railways, the concepts and actual conditions related to the reorganization of national railways; and regarding airports, the existence of specified funding and cross-subsidies between airports. We will also introduce specialized systems currently under development in various countries worthy of attention.

Chapter 4: Transportation Policy and Funding Systems. In this chapter, we will offer a detailed introduction to the Transportation Policies and Funding Systems in six countries (France, Germany, Japan, South Korea, the United Kingdom, and the United States), with regard to roadways, railways, and airports. This introduction will also include analysis based on the important perspectives in the context of comparisons of financial resources.

Chapter 5: A Methodology for Comparing Financial Resources. We will point out factors deserving consideration in international comparisons of funding for transportation improvements and also illustrate methods for carrying out these international comparisons; specifically, methods focusing on the "parties actually bearing the costs of improvements." Based on these methods, we will categorize the actual financial resources used to achieve transportation improvements in each country.

Chapter 6: Calculation of Investment Amounts. In this chapter, we will provide an outline of the total investment amounts in roadways, railways, and airports in the six countries as noted in Chapter 4, as well as a breakdown of financial

resources. The utilization of extensive statistical documents ensures accurate calculation results.

Chapter 7: Calculation of Contributors' Shares. We will calculate the "Structure of Parties Bearing Costs" for transportation improvements in each country. Categories for parties bearing costs for transportation improvements include: citizens who bear the cost of general funding for national government; residents who bear the cost of general funding for regional governments; users of transportation facilities that bear the cost of user fees and related taxes; future users who will bear the cost of loan repayment; and parties receiving specified benefits, who will bear the cost of special taxes and other forms of funding.

Chapter 8: Comparative Study. In this chapter, we will compare funding for actual improvements in various countries using the "Structure of Parties Bearing Costs" calculated in Chapter 7. Perspectives on these comparisons will include: the degree of dependence on borrowed funds; the ratio of financial resources derived from specific taxes charged to users; and the ratio of investments made on the regional vs. the national level.

Chapter 9: For the Future. Here, we will describe the outlook for future transportation improvements based on the analyses provided in this book.

Chapter 2

Theory and Practice of Funding

2.1 Goals of Funding Systems

The most basic concept in the theory of financial resources is that “those who enjoy the benefits of transportation improvements should bear the corresponding costs.” In reality, however, it is not so simple, as the following issues come into play:

- Benefits are enjoyed by a wide range of parties, and it is not always possible to identify the extent of benefits generated for each party.
- Benefits extend into the future, and there will naturally be a degree of uncertainty in measuring future benefits.
- Benefits such as revitalization of regional economies and improvements to the environment are derived through complex factors and not only as a result of transportation improvements. It is difficult, both theoretically and realistically, to identify the benefits derived only from transportation improvements.
- Benefits are not necessarily calculated in monetary terms. In some cases, the persons receiving the benefits may not even be aware that the benefits are commensurate with the costs (see Figure 2.1).

Even if the benefits can be measured, it is not necessarily possible to create mechanisms through which the persons enjoying the benefits can pay the related costs, and in some cases the cost of collecting those payments may be substantial.

Given these problems, despite the simplicity of the basic concepts, determining how the actual burden should be distributed is an extremely complex question. In this chapter, we will explain some of the basic items that should be considered when approaching this difficult problem.

2.2 Role of the Public Sector

Historically, transportation infrastructure has been substantially funded by the public sector, but there is an increasing tendency to rely on the private sector because deteriorating national finances are having difficulty finding sufficient

Benefits are enjoyed by a wide range of parties

It is not always possible to identify the extent of benefits generated.

Benefits extend into the future

There will be uncertainty in measuring future benefits.

Benefits are derived through complex factors

It is difficult to identify the benefits derived only from transportation.

Benefits are not necessarily calculated in monetary terms

Beneficiaries may be unaware that benefits are commensurate with costs.

Figure 2.1: Characteristics of benefits of transportation improvement.

funds for transportation improvement. However, at the same time, such public concerns as awareness of environmental issues are increasing. The first part of this chapter describes the basic relevant theories of the public sector's role, its potential, and its limitations.

By the theory of welfare economics, goods and services are optimally supplied under market mechanisms by competition in the private sector. Transportation improvement, in some cases, should also rely on the private sector. However, because of some of the characteristics of transportation improvements, the market alone may be insufficient to achieve an appropriate level of investment.

The most important characteristics are the existence of external economies and diseconomies as well as fundamental social rights to mobility.

(1) *External economies.*

The advantage of relying on market mechanisms is based on the most fundamental concept of welfare economics: market value and transaction volumes are determined at the intersecting point of the suppliers' marginal cost curve and the users' marginal benefit curve, and that the maximum social surplus (calculated by adding suppliers' profits to users' surplus) is at its maximum at that time. In other words, if the costs of transportation improvements and the benefits generated by those improvements are all reflected in the market, then it is best to entrust these improvements to the market, without public sector intervention (see Figure 2.2).

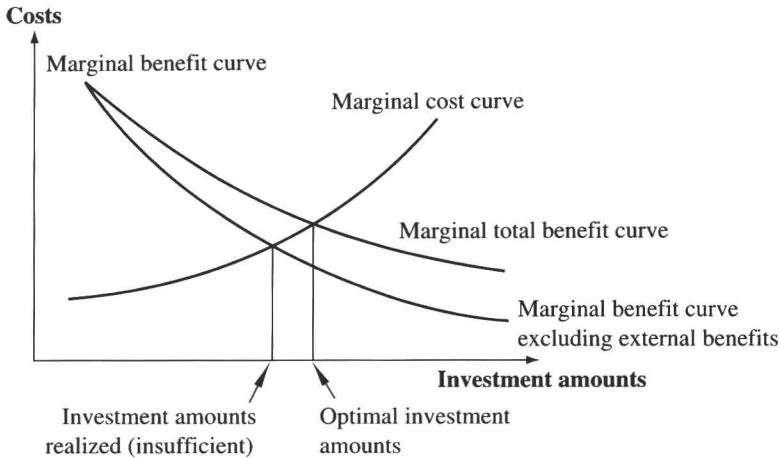


Figure 2.2: External economies resulting in insufficient volume of transportation improvements.

In the transportation market, however, this is often not the case. For example, when new roadways or railways are created, the value of the surrounding land generally increases, but unless special funding systems have been put in place, the landowners do not bear the cost of construction. The existence of people who receive benefits but do not bear costs means that optimum balance in the market is not achieved. In this example, the volume of transportation improvements is less than the appropriate level. The reason is that despite the fact that those who supply more should obtain more benefits, the portion of costs that should be borne by landowners is not reflected in the market, and so appropriate supply volumes are not achieved. If mechanisms are constructed to ensure that landowners provide fund, then more transportation improvements can be implemented. In this case, the persons bearing the costs would not necessarily have to be the landowners; assuming that benefits would be generated for society as a whole, then costs could be covered by common financial resources.

There are cases in which this fundamental theory is used in practice, such that funding is borne by the persons reaping the benefits of transportation improvements. The transport tax (VT) [Versement de Transport] in France is the most obvious example. A more detailed explanation will be provided in Chapter 3, but essentially, funding for public transportation is collected from companies located in the area. Another example can be found in Japan, where land development by private-sector railway companies is conducted simultaneously with the construction of