DIRECTIONS

THE FINAL REPORT OF THE ROYAL COMMISSION ON NATIONAL PASSENGER TRANSPORTATION

Volume 1

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Available in Canada through
your local bookseller
or by mail from
Canada Communication Group — Publishing
Ottawa, Canada K1A 0S9
Catalogue No. DSS Z1-1989/1-1992-1-2E (v. 1 and 2)
ISBN 0-660-14545-6 (v. 1 and 2)

CANADIAN CATALOGUING IN PUBLICATION DATA

Canada. Royal Commission on National Passenger Transportation

Directions: the final report of the Royal Commission on National Passenger Transportation

Issued also in French under title: Directions.
To be complete in 4 v.
Chairman: Louis D. Hyndman
ISBN 0-660-14092-6 (set of 4 v.)
ISBN 0-660-14545-6 (v. 1 and 2)
DSS cat. no. Z1-1989/1-1992E (set of 4 v.)
DSS cat. no. Z1-1989/1-1992-1-2E (v. 1 and 2)

1. Transportation — Canada — Passenger traffic. 2. Transportation — Passenger traffic — Government policy — Canada. 3. Transportation — Passenger traffic — Environmental aspects — Canada. 4. Carriers — Government policy — Canada. I. Hyndman, Louis D. II. Title. III. Title: the final report of the Royal Commission on National Passenger Transportation.

HE199.9C35 1992 388'.042'0971 C92-099717-1

TABLE OF CONTENTS*

* This Table of Contents reflects the material in Volume 1 of our report. The report consists of four volumes. Volumes 1 and 2 form the main report with Volume 2 providing additional details and technical material to support the material in Volume 1. Volumes 3 and 4 consist of a selection of research studies prepared for us under contract with their authors or by Royal Commission staff. Volumes 3 and 4 will be of interest to technical experts and are not integral to understanding our report.

List of Charts

List of Tables

Royal Commission on National Passenger Transportation

CANADA

Commission royale sur le transport des voyageurs au Canada

TO HIS EXCELLENCY
THE GOVERNOR GENERAL IN COUNCIL

MAY IT PLEASE YOUR EXCELLENCY

By Order in Council dated October 19, 1989 we were requested to inquire into and report upon a national integrated intercity passenger transportation system to meet the needs of Canada and Canadians in the 21st century and to ensure that transportation links among Canada's regions and communities are maintained and improved.

Having previously submitted an Interim Report in April 1991, we now beg to submit our Final Report in each official language.

Respectfully submitted,

Louis D. Hyndman, Q.C., Chair

Marie-Josée Drouin, Vice-Chair

Susan Fish

Marc Gaudry

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October 1992
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FOREWORD — OUR VISION

In the autumn of 1989, nine Canadians came together to face a unique challenge. Our mission: to establish guideposts for the passenger transportation system that Canadian travellers will use well into the next century and to develop sensible recommendations for the system's future.

Strangers at first, we came to blend our widely different life experiences and to merge into this report what we heard and learned from Canadians. We knew that passenger transportation was not just wheels and wings, terminals and stations. Rather, our topic was people — Canadians who want to visit friends and relatives, do business or enjoy a holiday.

Looking at the road ahead, the Commissioners thought about the unlimited horizons of our young people who increasingly travel this remarkable country. We pondered the trend of increasing numbers of seniors who pride themselves on remaining active and considered people with disabilities who also want to move about easily in terminals, and on and off airplanes, trains, buses and ferries. We shared the worries of Canadian taxpayers who, like us, want more choice, less government, top value for their travel and tax dollars and a voice in the transportation decisions that affect them.

Above all, as the Commissioners travelled extensively throughout the country and met with Canadians from all regions and all walks of life, we were impressed by the vastness and diversity of the land we call Canada and, more importantly, by the people who call it home. We believe there is something called the Canadian culture, the Canadian soul, the Canadian way of life, the Canadian vision. This Canadian uniqueness is worth preserving, whatever the difficulties.

We realize that while the transportation system no longer plays the nation-building role it once did, it nevertheless remains an important element in linking Canadians to one another.

And what about tomorrow? The Royal Commission on National Passenger Transportation has a vision for the future of Canada's transportation system and the role it will play in our daily lives. The journey begins now. . . .

The year is 2012. Canada is a respected and fully participating member of the global community. Efficient, productive and competitive, Canada's resources, products and brain-power are in demand worldwide.

Canada is envied for its sense of fairness and respect for human rights. Potential immigrants continue to look upon Canada as one of the most favoured lands of opportunity. Canada continues to rank at or near the top of the list of "quality of life" countries in the world.

The Canadian passenger transportation system is a model for the world in this year 2012. Canadians travel across the land using a system that is even safer than it was back in 1992. Sophisticated navigation systems enable planes to fly in weather that would have shut down the system back then. Car accidents and deaths have been reduced by on-board radar systems, automated traffic control, stronger but lighter car bodies — even some automatically driven cars. In some parts of the country, special car, truck and bus lanes speed up traffic and reduce congestion.

Canada has achieved an enviable balance between sensitivity to environmental damage and the other objectives of the transportation system. Responding to public opinion and efficient pricing over the last 20 years, the transportation sector now builds much cleaner cars, buses, trains, airplanes and ferries.

Half the new cars sold are electrically powered, or are hybrids using propane or natural gas with gasoline. Travellers must pay more when they travel on the few remaining carriers that still have dirty engines. Pollution costs are printed on the tickets travellers purchase, and comparisons of the amount of damage caused by each mode of travel are given wide publicity.

There have been few expropriations of land for new rights-of-way or for airports in Canada since 1992, because existing highways and terminals are used more efficiently. Agricultural land no longer disappears under asphalt and concrete.

Canadians are applauded around the globe for the priority they assign to the interests of people with disabilities. Today, in 2012, there are millions more Canadians over 60 than 20 years ago. People working in passenger transportation place priority on assisting those who have walking, vision or hearing disabilities, and terminal designs and travel announcements are user-friendly to all.

New-technology trains that pay for themselves are planned for or are in operation between Vancouver and Abbotsford, Edmonton and Calgary, and Windsor and Quebec City.

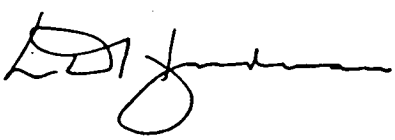
A new kind of government leadership emerged during the 1990s. Governments removed themselves from virtually all aspects of transport operations to focus on their new role as policy makers, referees and standard-setters. The government transportation staff undertaking these tasks has been reduced from 120,000 in 1992 to 20,000 today. Canadians feel they have more local control over their passenger transportation system.

Canadians also have access to the facts about their passenger transportation system and know that they can move around the country in the most efficient way, without waste or duplication. Choices abound in fares, departure times and comfort levels. Taxpayers know that the system pays for itself, while travellers know and accept that they pay for all the costs they impose upon the system when they travel. Those who do not travel know that they no longer pay taxes to support those who do. Only a few small subsidies remain; most were phased out during the 1990s. In short, Canadians have the system they want, get what they pay for and pay for what they get.

The further opening of competition brought in more airlines, more bus companies of all sizes, more alternatives on rail tracks and more ways to move over water. Terminals which also double as local shopping malls, business offices, exhibition halls and community centres are shared by different carriers and modes, and provide convenient connections to other terminals.

Equally important, taxpayers are satisfied knowing that rigorous benefit-cost studies are mandatory for all transportation project proposals and that existing roads and airports are well maintained and operate at maximum efficiency.

That is our vision for the future. It is achievable. The recommendations that follow — when applied — will bring it about.



Louis D. Hyndman, Q.C.
Chair

Autumn 1992

ACKNOWLEDGEMENTS

On presenting *Directions: The Final Report of the Royal Commission on National Passenger Transportation* to the Governor in Council of Canada, I am reminded of one of the more popular works by John Donne, in which he says: "No man is an island, entire of itself." I am, therefore, sincerely pleased for this opportunity to express my thanks to the many people who made this report possible. It is the work of many hands.

Firstly, I express my heartfelt appreciation and gratitude to my colleague Commissioners. When nine people from diverse professional and personal backgrounds are appointed to work on a common project, it is only through the utmost good faith and personal commitment that the endeavour can succeed. That diversity, good faith and personal commitment among my colleagues have made this a rewarding and rich experience for me. For their candor, their sound advice and their friendship as Canadians, I will be forever grateful. I know that they join with me now in expressing the following thanks.

The formidable challenge of assisting and supporting nine Commissioners, as well as the overall responsibility for the management of the Commission's work and inquiry operations, fell upon Dr. Janet R. Smith, the Commission's Executive Director. Her exceptional organizational and management skills kept the Commission operating smoothly at all times and gave us the freedom to devote ourselves exclusively to the inquiry at hand. We have all benefited from her extensive and incisive knowledge of the transportation sector and of government, her practical working experience and her penetrating intellect. Janet was, for me, a knowledgeable counsel and forthright confidante.

Many staff members joined the ranks of the Royal Commission on National Passenger Transportation during its three-year mandate, and we are indebted to all of them. They were frequently called

upon to go that "extra kilometre," and they always delivered on time. Their names appear in Appendix B. Some among them call for special mention.

United in loyalty and support to our mission was a professional and highly proficient senior management complement: John Sargent, Director of Research; Helen Hardy, Deputy Director of Research; Brian Johnson, Director of Policy and Planning; Denise Ommanney, Director of Public Consultation; Linda Bergeron, Director of Communications; Nina-Maria Butcher, Director of Administrative Services; and Sherry Hudon, Executive Assistant to Dr. Smith and Secretary to Senior Management Committee.

The task of recommending a transportation framework for Canada in the 21st century required counsel and advice from the leading researchers in several specialized fields, and we were fortunate to find the highest calibre of expertise in our consultants. Our sincere gratitude goes to all of those who contributed to the research program of our final report.

Since transportation systems are closely associated to countries, our mandate required us to consult with our international transportation counterparts. We needed to observe first-hand the roles that their passenger transportation systems are playing and to evaluate how the solutions advanced by other countries to concerns similar to our own might apply to the Canadian experience. These international consultations expanded and enriched the context of our final report, and we would like to express to all whom we consulted our appreciation for their willing and frank exchange of information. We also want to thank Transport Canada and External Affairs and International Trade Canada for their helpful assistance in organizing these international exchanges.

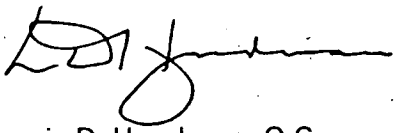
Still on the consultation front, we wish to voice our deepest gratitude to all those Canadians who came forward during the public hearings and throughout our mandate to communicate their opinions and

concerns about Canada's passenger transportation system. We heard from people with disabilities, business, labour, governments, seniors, young people and interested citizens. Commissioners were moved by the personal accounts of so many individuals who spoke and wrote to us about their experiences with the present transportation system. We were also impressed with the hope that Canadians have for a better system in the future. The best testimonial that we, as a Royal Commission, can offer these Canadians is to show them that we heard and listened to what they had to say: they will find many of their views and concerns addressed throughout the pages of this report.

The production of a comprehensive four-volume final report, especially one that deals with highly technical data, demands the finest quality of writing, revision, editing and translation. Commission staff, assisted by a team of professionals, strived to maintain not only a high quality of language and to keep the text readable for all Canadians. We thank Nadja Corkum and Claire Harrison of Astroff Corkum Ross Associates Inc. for their writing and editorial assistance with the English text, and Volker Junginger and Christine O'Meara of Tradunion Inc. for their translation and revision of the French version.

I would also like to express a personal note of thanks to Estelle Lord, my Administrative Assistant in Edmonton, for her loyal dedication and competent service.

And, finally, we acknowledge the patience of our families, who have endured our many absences from home during the work of this Royal Commission. Because of their support and understanding, we ask that they share in our pride and accomplishment.



Louis D. Hyndman, Q.C.
Chair

Autumn 1992

CHAPTER 1

POINT OF DEPARTURE

SETTING THE STAGE

In October 1989, the Government of Canada asked us to "inquire into and report upon a national integrated intercity passenger transportation system to meet the needs of Canada and Canadians in the 21st century."[1]

CHANGES IN THE WORLD COMMUNITY

During the three years of our mandate, we have witnessed unexpected and often dramatic changes in Canada and other countries. When we began our task in 1989, the great changes that have since swept Central and Eastern Europe and the subsequent redrawing of the political map had yet to occur. In Canada, the Meech Lake Accord appeared to be on its way to ratification. The Free Trade Agreement with the United States had been approved months earlier, and the North American economies were strong and growing.

Today, the U.S.S.R. is gone, and its successor states and the countries of Eastern Europe are struggling toward market economies. The General Agreement on Tariffs and Trade (GATT) is being challenged by the failure of its members to deal with the increasing competitiveness of modern economies in a wide array of sectors, from agriculture to intellectual property to services in general. The North American economies are battling a lengthy recession compounded by major economic restructuring. At the time of writing, Canadians are assessing, in a fundamental way, the nature of their country — by redefining national institutions and rethinking their approach to federalism.

Transportation around the world is also undergoing major change. Rail traffic in Eastern Europe has decreased as car sales have increased. The world's airlines have been hurt by recession and

the 1991 Gulf War — many failed, others merged or were sold. Growing environmental problems are prompting increased public awareness of the need for global action in transportation and other sectors. The benefits of loosening government controls over the delivery of services are resulting in new approaches to meeting travellers' needs. Many countries are trying new ways to finance transportation infrastructure privately and to privatize government transportation services. We believe that this rapid pace of change will continue. Canadians cannot ignore these changes in other parts of the world, and the challenges that they present.

WHY IT IS IMPORTANT TO MAKE THE RIGHT PASSENGER TRANSPORTATION DECISIONS

In total, Canadians in 1989 devoted substantially more resources to transportation than they did to health care — equivalent to 16 percent of gross domestic product (GDP) compared with 9 percent of GDP, respectively. Resources used to provide intercity passenger transportation accounted for 30 percent to 40 percent of total resources devoted to transportation, or 5 percent to 7 percent of GDP (depending on how extensively "intercity" travel is defined, particularly travel by private car).[2] This is an annual expenditure of $30 billion to $45 billion or $1,100 to $1,700 per Canadian. As the economies of nations become more and more interdependent, the choices that Canadians make about passenger transportation projects and investment will affect Canada's economic success in the global marketplace.

Revolutions in communications technology are changing the way businesses operate and are encouraging globalization of markets.[3] For example, the production, marketing and financial systems of large multinational corporations are increasingly integrated on a global basis. In the future, the quality of life in all countries will depend on their ability to adjust to a world in which there are fewer national barriers to the movement of capital, labour, goods and services.

Many sectors of the Canadian economy, such as the tourism industry and manufacturers who sell goods and services abroad, depend on the transportation system to provide cost-effective service so that they, in turn, can better serve their customers. Passenger transportation companies must look for ways to improve services and lower prices.

PUBLIC CONCERNS OVER PASSENGER TRANSPORTATION

On most trips taken, no matter by which mode, the taxpayer is often an unwitting partner. Travellers want more and improved passenger transportation services, but taxpayers are increasingly reluctant to bear the consequent financial burden. Some Canadians travel frequently and use the passenger transportation system extensively. Others travel seldom, or not at all, yet their taxes help pay for those who do travel. Even if current budgetary pressures abate, the public will continue to pressure the government to spend wisely — by maintaining the passenger transportation system when funds are limited and not over-building it when funds are plentiful.

Concerns about how transportation affects the environment have moved to the fore. Transportation leads to traffic congestion, causes air and noise pollution, and consumes land for roads, airports and parking lots. As Canadians become more aware of the impact of transportation on human health and the long-term well-being of the planet, environmental issues are becoming a more important factor in passenger transportation decisions. Governments at all levels face growing public pressure to regulate the transportation sector for greater protection of the environment.

OUR ACTIVITIES

In the course of our three-year mandate we consulted with Canadians, studied passenger transportation in other countries and undertook a research program.

CONSULTING WITH CANADIANS

Through public hearings, written submissions, toll-free telephone lines and consultations, we listened to Canadians who have an interest in passenger transportation. These included travellers and providers of transportation infrastructure and services, as well as governments, taxpayers, unions and regulators.[4] We wanted to understand the needs and aspirations of travellers, to ascertain the concerns of those who provide passenger transportation infrastructure and services, and to identify the issues and problems.

STUDYING PASSENGER TRANSPORTATION IN OTHER COUNTRIES

We also looked at how other countries are dealing with passenger transportation issues. Rapid political and economic change is affecting many nations, and we discovered that Canada is not alone in questioning the traditional ways of making passenger transportation policy and investment decisions, nor in seeking new ways to resolve transportation issues. Governments around the world are exploring ways to improve the efficiency of their transportation systems.

Several countries have recently undertaken major transportation studies, and some are already putting recommendations into practice. The United States, Switzerland, Sweden, and The Netherlands are approaching transportation issues from a broad perspective. They have developed, and are beginning to implement, long-term strategies that deal comprehensively with the issues in all transportation modes.[5] Other countries have undertaken studies that focus on specific problems and modes. Australia and Germany have examined escalating deficits and other issues in the rail sector.[6] Australia has been studying, and changing, road user-charges and air transportation regulation. New Zealand has made major changes in the way it provides roads and charges road users.

Many countries have relaxed government controls and economic regulation over their passenger transportation carriers. The United States, Australia, New Zealand and the United Kingdom view

transportation less as an instrument of public policy and more as an economic activity that can benefit from the tests, economic discipline, creativity and incentives of the market. Many countries are studying ways of setting prices that reflect the costs of transportation services and infrastructure:

- In the United States, a government report is explicit about the need to "assure that transportation users bear the maximum practical and appropriate share of the costs of services and facilities they use."[7]
- In Sweden, legislation emphasizes that transportation prices to travellers must include the costs of pollution, congestion and traffic accidents.[8]
- In Norway, an extensive toll system exists around Oslo city centre, and drivers using downtown streets must pay a charge that is intended to discourage city driving.
- In Singapore, city traffic is controlled through an area licensing scheme. Authorities auction limited numbers of special licences that all vehicles must have when entering and operating within the restricted zone.

Several countries are experimenting with alternative transportation ownership and administrative arrangements:

- In 1986, the Australian government transferred the responsibility for planning and operating the country's major airports to a Federal Airport Corporation.
- New Zealand established Transit New Zealand — a quasi-autonomous authority — to manage its roads, and the revenues from road-user charges were earmarked to cover the expenditures of the road authority.
- In 1987, the United Kingdom privatized its main airports, transforming the government-owned British Airports Authority into a private-sector company.

- In France, Italy and Spain, extensive systems of toll highways operate under private or mixed private-public ownership.
- Germany and the United Kingdom have announced plans to privatize their government-owned railway companies.
- A number of other countries are inviting private firms to participate in the development, financing, construction, maintenance and operation of roads, bridges and tunnels, such as the Channel Tunnel between the United Kingdom and France.

RESEARCHING INTERCITY PASSENGER TRANSPORTATION IN CANADA

Through our research program, we examined many aspects of intercity passenger transportation: how and where Canadians travel, the costs and who pays them, the safety of each mode, and the extent to which transportation affects the environment. We continued throughout our mandate to consult with travellers, providers of passenger transportation infrastructure and services, government officials and experts in Canada and abroad. We used our research and consultations to sharpen our understanding of the issues.

We concluded that the way the transportation system in Canada is managed is no longer adequate, for the following reasons:

- Governments often make passenger transportation decisions based on conflicting objectives.
- Although some travellers pay fully for their transportation, most travellers do not, and in no mode of travel are costs fully covered by fares, licences and fees paid by those who use the mode.
- Individual carriers face different rules and regulations. For some carriers, competition is the driving force; others operate as monopolies.
- Prices rarely reflect the costs of a traveller's use of the transportation system. As a result, travellers from well-used parts of the system help pay for parts that are used less often.

- Passenger transportation costs are sometimes higher than necessary because governments have not always invested in projects that yielded the highest positive return.
- Governments, industry and travellers rarely give full weight to the environmental and other social costs of transportation.
- Taxpayers do not have enough information about why particular decisions are made, or how their tax dollars are spent.

Our Approach

We have taken a long-range, comprehensive view of the passenger transportation system. Our program of study, consultation and research gave us a unique opportunity to step back from current day-to-day issues and view the passenger transportation system through a wider lens than that used by those who must deal daily with transportation problems. We want to help resolve not only today's issues and problems, but those of tomorrow as well.

OUR METHOD

From the start, we wrestled with two ways of accomplishing our task. One method was to address, individually, the hundreds of problems facing today's passenger transportation system. We could have approached our task by listing the current passenger transportation issues, attempting to resolve them, and then looking for consistency and coherence in our solutions.[9] But we believe this method alone would fail, because such solutions would not be based on a long-term goal nor on clear objectives. The result would likely be passenger transportation recommendations that were inconsistent, short-term and wasteful.

The second method was to develop a long-term passenger transportation framework. We believe that the framework (the laws, regulations and institutions that govern transportation) must be developed by setting a goal and developing objectives that Canadians agree upon.

With a guiding framework in place, future passenger transportation decisions will be coherent, consistent and less expensive after all costs paid by all parties are taken into account.

OUR DIRECTIONS

The directions that we recommend in this report, when followed, will not just mirror but will be in the forefront of the evolution of passenger transportation policy worldwide. Our recommendations will result in:

- a passenger transportation system that is safe;
- a passenger transportation system that protects the environment;
- a fairer passenger transportation system in which the costs would be paid by the people who benefit;
- a less expensive system where all costs are taken into account, with services better matched to traveller demand; and
- lower general taxes, resulting from lower total costs and the transfer of costs from the taxpayer to the traveller.

OUR GUIDING PHILOSOPHY

We looked at two possible underpinnings for a passenger transportation framework — a subsidized transportation system and a traveller-funded transportation system.

Subsidized transportation results in lower prices for the traveller but higher taxes for citizens, whether they travel or not. We considered this option carefully, because it is similar to those used by governments in the past. For example, building the Canadian Pacific Railway (CPR) in the 1880s and developing the airline industry in the 1940s involved taxpayer expenditure. Today, however, transportation systems are reasonably well developed, and governments and

industry must spend more on maintenance of the existing system than on new infrastructure. What was appropriate for a system in the process of development is not appropriate for one that is mature.

Some Canadians who spoke with us argued that a transportation system massively supported by the general taxpayer would make Canada more competitive internationally by lowering the costs of transportation as part of doing business. We found, however, that heavily subsidized transportation in other countries resulted in skewed business investments and activities, and inefficient, uncompetitive economies. For example, transportation in Eastern Europe and South America was, until recently, heavily subsidized, with no real improvement in prosperity and productivity. Even countries in the European Community are now assessing the results of large subsidies to their rail systems.

We believe that, unless our transportation system is made efficient now, Canadians will pay dearly later for the adjustments needed to survive in the global marketplace. We have chosen to build a framework on the basic philosophy that transportation should be provided through a system supported and maintained by its users and not through government departments and central controls. We see the transportation sector as requiring a different approach from such government-supported and controlled sectors as health and education, and relate it more closely to providers of services such as telecommunications and electric power. Transportation would lose its tax-supported base and transportation infrastructure and services would be provided according to the willingness of travellers to pay for them.

THE PAST AND THE FUTURE

The passenger transportation policies of the future would not mirror those of the past. In particular:

- In the past, government has regulated the economic aspects of passenger transportation systems and has provided much of the infrastructure. We believe these systems should be open and accessible, and that government should confine its role to being a referee and policy setter.
- In the past, jurisdiction over passenger transportation has often been divided in an inconsistent and contradictory way among levels of government. We believe that responsibilities should be assigned to the lowest level of government that can efficiently handle them, be that municipal, regional, territorial, provincial or federal, or a combination of these.
- In the past, the passenger transportation system has depended on funding from taxpayers whether they travel a little, a lot, or not at all. We believe that the passenger transportation system is now sufficiently mature to be self-sustaining, so that travellers should pay for what they get and get what they pay for.
- In the past, governments have made passenger transportation decisions without sufficient accountability to those who pay taxes or user fees. We believe that passenger transportation decisions should be visible and understandable and that all costs should be made public. The transportation system should be transparent in its accounts and accountable in its decision making.

We recognize that moving the transportation system out of government control right away would have major implications for industry and travellers. We therefore suggest transition periods to allow the passenger transportation system to adjust to being more autonomous, more accountable, more economically viable and more protective of the environment. These transition periods should be short and must not be an excuse for inaction or delay in the implementation of our recommendations.

Moving Forward

In the chapters that follow, we develop a passenger transportation framework for the future and make recommendations that implement it. We have organized this Report as follows:

- Chapter 2 presents a view of the Canadian passenger transportation system — past, present and future.
- Chapter 3 looks at the costs of the current passenger transportation system and who pays the costs.
- Chapter 4 discusses the principles underlying our framework. We make recommendations on a goal and on objectives for the passenger transportation system. We discuss the implications for governments, travellers, taxpayers, carriers, and providers of infrastructure. We also address transition mechanisms.
- Chapters 5 to 15 apply our principles to the existing passenger transportation system, addressing environmental, safety and accessibility issues, and analyzing the implications of our principles for each of the different modes.
- Chapters 16 and 17 address special transportation concerns — accountability, transparency and international issues.
- Chapter 18 examines changes in who will benefit from the new framework and who will pay.
- Chapter 19 summarizes the changes in legislation, regulations and institutions necessary to implement the framework and describes how these changes will meet our objectives.

We sought — and believe we found — Canadian solutions to Canadian problems. These proposals will lead to a significantly improved passenger transportation system that will encourage competition, creativity and technological change, will give most Canadian travellers the widest array of choices, and will ensure that non-travelling Canadians do not have to pay the bill for those who do.

ENDNOTES

1. See Appendix A, Volume 1 for full Terms of Reference.

2. These figures correspond to comprehensive measures of the resources used to provide transportation, health, and intercity passenger transportation. In the case of transportation, they include both services used directly by consumers and governments, and services that are used by businesses to produce non-transportation goods and services. Our measure covers transportation services provided by commercial carriers (indicated by their revenues), and transportation "produced directly" by the user. Private purchases of cars and car operating expenses are used as an indicator of the personal component of direct production. The costs of government-provided transportation infrastructure (not already reflected in charges to travellers included in carrier revenues) are included in the operating costs of those providing their own transportation services.

   The low end of the estimated range of resources devoted to intercity travel defines "intercity" trips as trips longer than 80 kilometres in one-way distance. The high end of the range defines intercity trips as all trips by air, rail (excluding urban transit), intercity bus, ferry (apart from urban and short river crossing ferries) and all car travel on provincial highways. When comparing the roles of the different means of transportation, especially in chapters 2 and 10, we are guided by the narrower definition. In chapters 3 and 18, where an important element is the costs of different types of infrastructure, we use the wider definition.

   A different approach to measuring the "size of the transportation sector" is to include only the value added of transportation carrier industries, which is, for all transportation (freight and passenger, urban and intercity), about 4 percent of GDP. By comparison, the value added in the health care services, hospital and pharmaceutical industries is 7 percent of GDP.

   For a more complete discussion, see Notes to Chapter 1 and Notes to Chapter 2 in Volume 2 of this report.

3. Over the past two decades, the volume of world merchandise trade has been growing more rapidly than that of world output. And, during the 1980s, world outflow of foreign direct investment grew much more rapidly than world merchandise trade. Source: Economic Council of Canada, *Pulling Together: Productivity, Innovation and Trade* (Ottawa: Supply and Services Canada, 1992).

4. For a full discussion of what Canadians told us, see Chapter V of *Getting There: The Interim Report of the Royal Commission on National Passenger Transportation* (Ottawa: Supply and Services Canada, 1991).

5. The Swiss government created the 62-member Federal Commission for a Swiss Integral Concept of Transport in 1972, whose report — *Rapport Final sur les travaux de la Commission féderale de la conception globale Suisse des transport* — was published in 1977. Sweden published its *Transport Policy for the 90s* in 1988. The United States released its major transportation review, *Moving America*, in 1990. The Netherlands developed its *Second Transport Structure Plan* in 1990.

6. The report of Australia's Industry Commission, entitled *Rail Transport*, was released in October 1991, roughly at the same time as that of the Government Commission on German Railways.

7. The U.S. policy statement is found in *Moving America*, p. 56.

8. *The Transportation Act, 1979* and *Transportation Act, 1988.*

9. See *Getting There: The Interim Report of the Royal Commission on National Passenger Transportation*, pp. 159-162 (Ottawa: Supply and Services Canada, 1991).

CHAPTER 2

CANADIAN PERSPECTIVES: PAST, PRESENT AND FUTURE

INTRODUCTION

Our inquiry is timely. The world is changing and Canada is changing with it. These changes present opportunities and challenges to those who will be making transportation decisions today and for the future. We firmly believe that our recommendations will help them choose well.

How can Canada take advantage of these opportunities and meet the challenges? Some guidance is found by examining the historical forces that shaped Canada's passenger transportation system, and by studying the current trends that will affect the transportation system in the future. Therefore, in this chapter, we examine the past, describe the passenger transportation system of today, and explore the possibilities for the passenger transportation system of tomorrow.

AN HISTORICAL PERSPECTIVE

Early colonists used lakes and rivers as natural highways into the interior of the country. In the 18th century, the earliest forms of water transportation, such as canoes, were supplemented for commercial purposes with schooners and flat-bottomed boats. Early in the 19th century, the introduction of the steamship brought formalized, mostly privately owned, marine passenger transportation with regular schedules, set fares and different classes of accommodation.

From the 19th century to the middle of the 20th century, governments and industry built the transportation infrastructure that was needed to support Canada's developing economy. As new forms of transportation were introduced, new types of infrastructure were developed:

- In the 19th century, the Welland, Lachine and Rideau canals were constructed, and thousands of miles of railway track were laid.
- By 1885, the first transcontinental railway was completed. The laying of railway tracks continued at a rapid pace into the second decade of the 20th century.
- In the 1920s, the popularity of the car spurred the development of roads. Road building continued for several decades, including the construction of the Trans-Canada Highway from 1949 to 1965.
- Also in the 1920s, commercial air services were introduced. In the 1950s, their growth led to the development of new airports, and the modernization of air navigation and air traffic control systems.

PAST ROLES OF GOVERNMENT

Early in Canada's history, governments considered the building of canals and laying of railway tracks to be private-sector enterprises. Many large-scale projects, however, turned out to be expensive and not commercially viable. Gradually, governments became involved in the financing, ownership and management of transportation infrastructure and services. Governments often stepped in with financial assistance in the form of subsidies, loans and loan guarantees to make the projects viable for private-sector investors.

Public support assisted the Canadian Pacific Railway Company (CP) in constructing the transcontinental railway. To attract a private syndicate to undertake construction, the federal government offered land grants of 25 million acres (10 million hectares), a cash subsidy of $25 million (equivalent in today's dollars to 15 to 20 times this much or $350 million to $500 million), and a series of privileges (including the promise of a 20-year monopoly on traffic in the area between the main line and the U.S. border). With government support, a successful railway company developed that still operates today.

Despite government financial assistance, the private sector often failed. Government had to assume ownership of the privately owned Welland and Lachine canals to keep these services operating. Also,

many private railway companies overextended themselves. In 1919, the federal government consolidated many of these railways under the control of the Canadian National Railway Company (CN).

Provincial governments began to invest in road development in the 1920s, and road building continued through make-work projects during the Depression of the 1930s. Following World War II, a surge in car sales and the growth in truck transportation led to pressures for more road paving and modernization. During this period, road construction and maintenance became a major area of spending by provincial governments.

Federal government involvement in transportation increased during World War II as the development of air services was added to the earlier roles in marine and rail services. After the war, the federal government played a major role in the financing of air infrastructure by building airports, expanding the air navigation system and assuming ownership of many airports. Between 1951 and 1961, federal capital spending on air services increased nearly ninefold. The federal and provincial governments also participated jointly, for the first and only time in a major transportation project, in the construction of the Trans-Canada Highway.

Governments also controlled passenger transportation carriers. Throughout this period of expansion, federal regulations governed air and rail carriers and provincial or territorial regulations governed car, truck and bus operators. These regulations controlled almost every economic aspect of passenger transportation, including starting a business in the industry, choosing routes, setting fares and establishing standards for service.

By regulating the industry, by owning carriers (such as CN and its subsidiary, Trans-Canada Airlines, established in 1937) or by combining ownership and regulation, governments used transportation services to further various public policy objectives. They believed that the profits generated in some passenger transportation markets should subsidize other, unprofitable markets.

CHANGING ROLES OF GOVERNMENT

By the early 1960s, governments began to study the effects of early transportation policies. During the 19th and early 20th centuries, the focus was on developing and building Canada's transportation system. By 1960, governments began to examine the transportation system in a different way. Although there were still areas where they felt new government investment was required to expand and upgrade infrastructure, the main modes and routes of transportation were now well established and the passenger transportation system had matured.

In 1961, the MacPherson Royal Commission on Transportation reported on the freight railway transportation system. It criticized government policies that hampered the railways' abilities to compete with other modes in the transportation of freight. Although the MacPherson Royal Commission's range of study was narrow, its conclusions had implications for transportation well beyond that of the freight railway system. Its findings influenced the 1967 *National Transportation Act* (NTA), the first federal transportation law that encompassed all modes of transportation. The new Act emphasized the need for competition between the air, rail, truck and bus modes to help achieve an "economic, efficient and adequate transport system."[1]

While the 1967 NTA promoted competition among modes, it did not eliminate economic regulatory restrictions on competition within modes. Air and water carriers, along with rail, truck and bus operators, were still subject to strict economic regulation.

In the 1970s and early 1980s, governments came under increasing pressure to relax many of these economic controls. The United States substantially reduced economic regulation in its transportation sector, and Canadian travellers and shippers pushed for reforms that would provide them with the same low costs as those experienced by users of the transportation system in the United States.

In response, the Government of Canada introduced a number of reforms in the late 1970s and early 1980s, and enacted the *National Transportation Act, 1987* (NTA, 1987). This Act declared that "a safe, economic, efficient and adequate" system is most likely to be achieved when "all carriers are able to compete both within and among the various modes of transportation." The major impact of this legislation on passenger services was on one mode only; it virtually eliminated entry, exit and price controls on the domestic airline industry. In addition, the federal government privatized Air Canada in 1988 and 1989.

The federal government also enacted the *Motor Vehicle Transport Act, 1987*, which resulted in a gradual dismantling of provincial regulatory controls over the trucking industry. Provincial governments continue to regulate intercity passenger buses, although New Brunswick and Prince Edward Island have recently eased entry requirements, and Alberta has opened entry to charter bus operations to anyone who can meet a minimal "fit, willing and able" test.

Many of the recommendations of the 1961 MacPherson Royal Commission, which emphasized the need for governments to repeal regulations and allow more competition in transportation, were implemented over 30 years.

Canada's Passenger Transportation System Today

Intercity passenger transportation today is big business. We estimate that, in 1989, spending on intercity passenger transportation by Canadian travellers and taxpayers was in the $30 billion to $45 billion range, (depending on how extensively "intercity" is defined, especially as regards travel by car[2]). This figure includes passenger services on intercity carriers, the intercity portion of car use including car purchase costs, and the portion of government spending on the infrastructure component of the system.

Intercity passenger transportation provides employment to many Canadians. In 1991, intercity passenger carriers employed some 70,000 people and many more Canadians worked on related aspects of the transportation system. For example, they constructed and maintained roads, airports, and the air navigation system; they built and serviced cars, trucks and buses; and they produced and sold the oil, gas and parts used by the transportation sector. Governments, at all levels, are major employers in the system, as owners and providers of transportation infrastructure and services. They also employ smaller numbers of people in regulatory and policy functions. For example, Transport Canada employs approximately 21,000 people, and all governments — federal, provincial, territorial and municipal — employ approximately 100,000 in transportation and communications.[3]

Intercity passenger transportation is a complex system of interrelated components. Passenger transportation consists of the road, air, rail, and water modes of travel. It can be divided into two components:

- carriers that provide bus, airplane, train and ferry services together with privately owned passenger vehicles — cars, light trucks and vans (for ease in this report we refer to these vehicles as cars); and
- infrastructure that consists of the terminals where carriers start and stop, the "links" over which carriers operate, and the traffic control systems that direct the behaviour of carriers.

Table 2-1 illustrates the components of the transportation system.

The intercity passenger transportation system is connected to urban transportation systems and there is no clear boundary between traffic that occurs between cities and that which takes place within cities. It is also often the same system that carries freight.

Table 2-1
COMPONENTS OF THE TRANSPORTATION SYSTEM

Mode	Carrier	Infrastructure		
		Terminals	Links	Traffic control
Road	Cars	Car parking	Roads (including bridges)	Police, road signs and signals, traffic control laws and regulations
	Buses	Bus terminals		
Air	Airplanes	Airports (including runways)	Air navigation systems	Air traffic control
Rail	Trains	Stations	Railway tracks	Dispatch, signal systems
Water	Ferries	Ferry terminals (including wharves and ferry slips)	Waterways and canals (including navigational aids)	Vessel traffic services

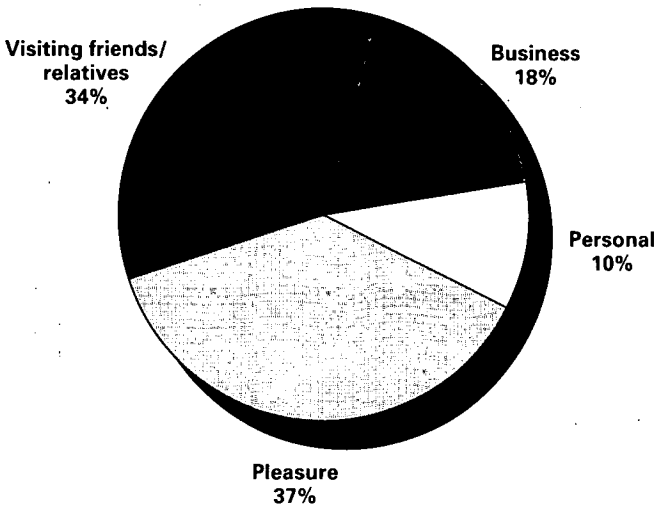
WHY CANADIANS TRAVEL

Intercity passenger transportation is an important part of Canadian life. Passenger transportation enables Canadians to pursue private and business goals. It connects region to region and city to city, providing people with the opportunity to meet for business, visit friends and family, or expand their horizons. In 1990, Canadians took over 150 million intercity trips, of which 134 million were within Canada, an average of five trips per Canadian.[4]

Most Canadians who travel do so for vacations, sightseeing and to visit friends and relatives. Business travel accounts for a small share of intercity travel within Canada (Chart 2-1).

Most intercity trips in Canada are over short and medium distances and occur within, rather than between, provinces or territories. In 1990, 76 percent of trips taken were between 80 and 320 kilometres one way (Charts 2-2 and 2-3). However, one-way trips over 320 kilometres account for over 60 percent of passenger-kilometres travelled.

Chart 2-1
DOMESTIC INTERCITY TRAVEL BY MAIN PURPOSE OF TRIP, 1990



Total: 133.8 million person-trips

Source: Statistics Canada, *Touriscope: Domestic Travel 1990*, Catalogue No. 87-504, October 1991, p. 27.

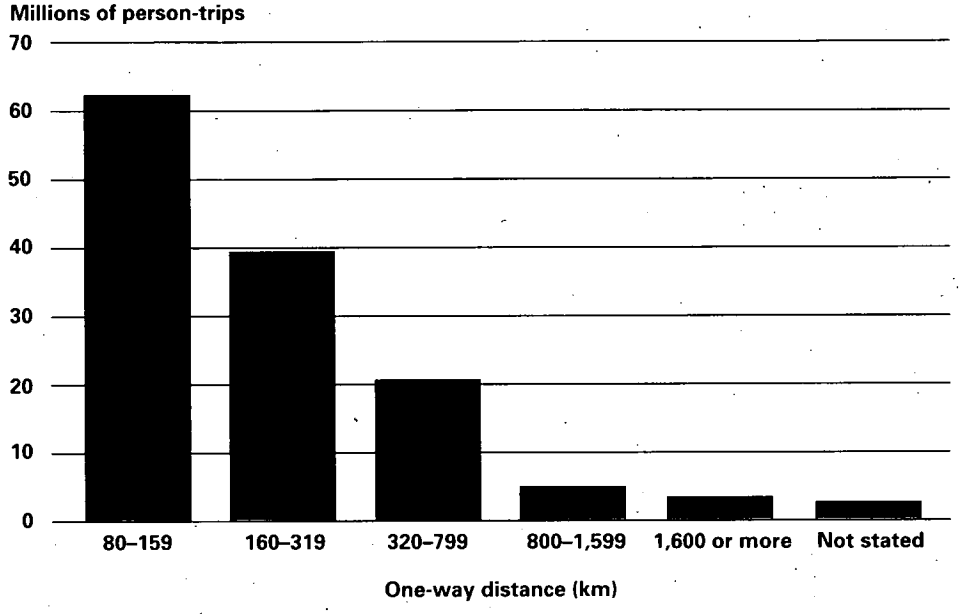
Note: Total person-trips include a "not-stated" category.

HOW CANADIANS TRAVEL

The car is the favourite mode of intercity travel for Canadians, as well as for citizens of all the other developed Western countries. In 1990, around 80 percent of all domestic intercity[5] passenger-kilometres travelled in Canada were by car. Although the car is used for only a small proportion of trips over 3,200 kilometres, it is the most popular means of travel in all other distance categories (Chart 2-3).

For Canadians, the car is also the most popular means of international travel (mostly to the United States), although 35 percent of all international trips are by air (Chart 2-4). International car travel is popular because the United States is, by far, the chosen destination

Chart 2-2
DOMESTIC INTERCITY TRAVEL BY DISTANCE OF TRIP (ONE-WAY), 1990

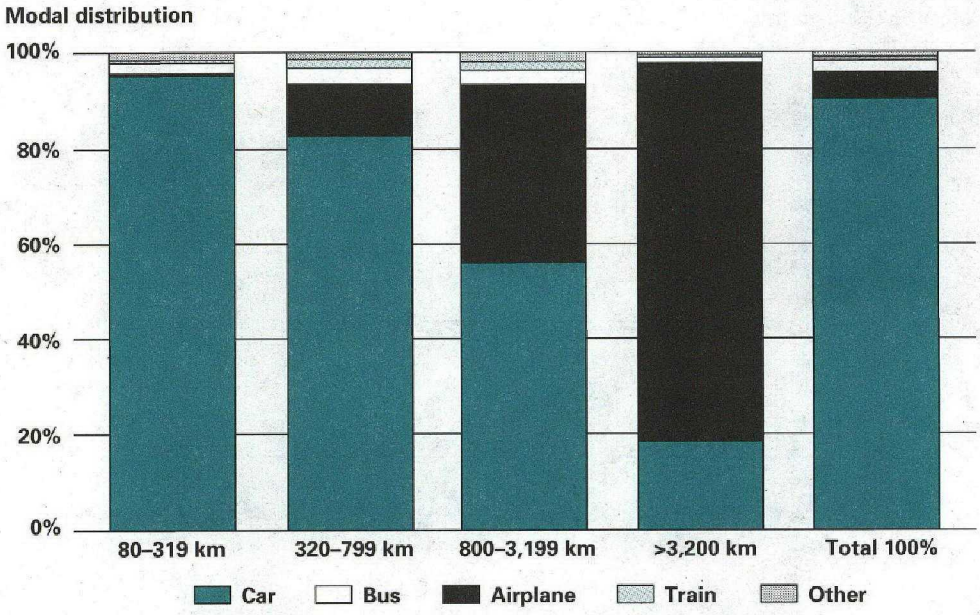


Source: Statistics Canada, *Touriscope: Domestic Travel 1990*, Catalogue No. 87-504, October 1991, p. 27.

of Canadians travelling outside the country. In 1990, 85 percent of all international trips taken by Canadians were to the United States. As with domestic travel, most international travel by Canadians is for vacations and to visit friends and relatives, rather than for business.

In terms of ways to travel, Canadians' choices have remained rather stable over time. As Chart 2-5 shows, the car has been the dominant mode of passenger transportation since 1930, except during World War II. Airplane travel has grown in importance since its beginning in the 1930s, and has become the dominant public mode of travel. The relative importance of bus and train travel has declined over the last 50 years.

Chart 2-3
Domestic Intercity Travel by Mode and Trip Length, 1990

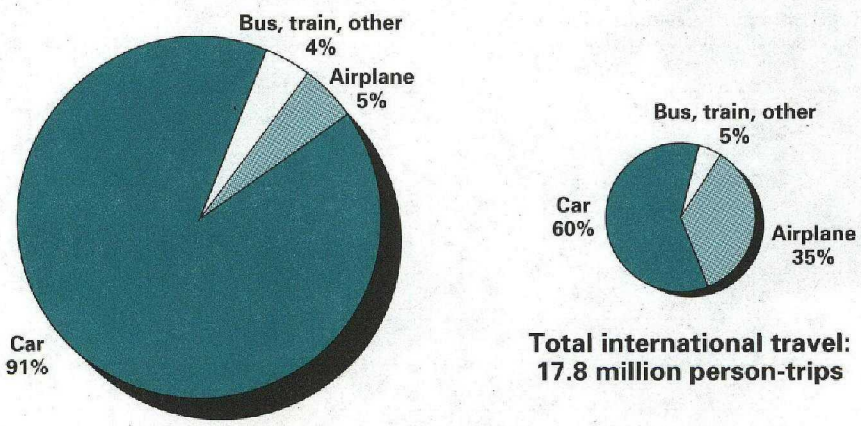


Source: Unpublished data from Statistics Canada's Canadian Travel Survey.

Note: "Other" category includes boat, motorcycle, bicycle, and means not specified by survey respondent.

Canadian travel patterns differ from those of some countries but not in the strong attachment Canadians have for cars. As shown by the international comparative data in Chart 2-6 and Table 2-2, the car is now almost as important a mode of transportation in the United Kingdom and (the former West) Germany as it has been in Canada and the United States for decades. In France and Italy, the car is also the dominant mode. In all these countries, car use has increased

Chart 2-4
Domestic and International Intercity Travel by Primary Mode, 1990



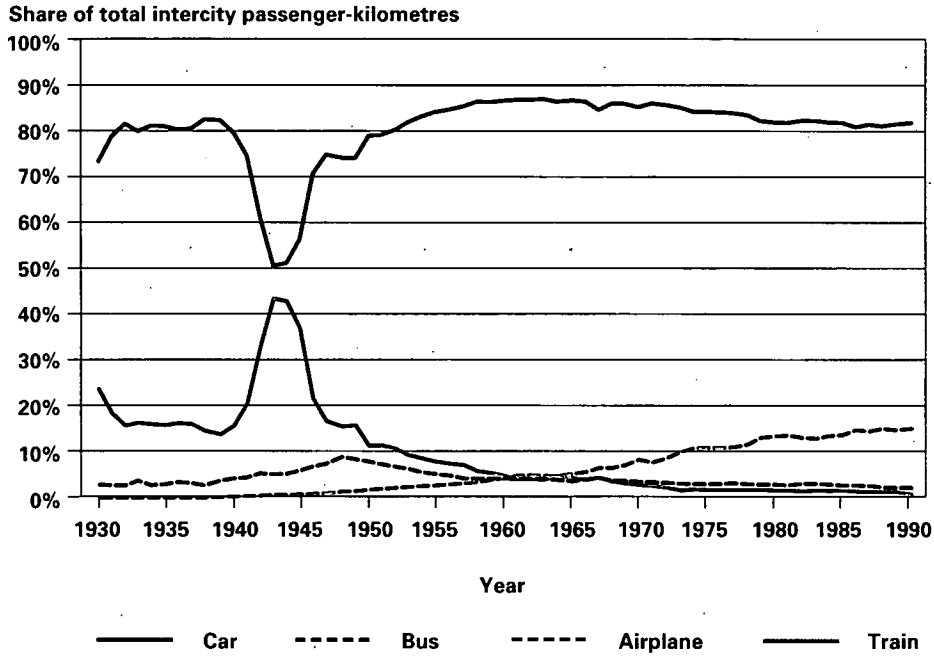
Sources: Domestic travel: Statistics Canada, Touriscope: Domestic Travel 1990, Catalogue No. 87-504, October 1991, p. 27.
International travel: unpublished figures from Statistics Canada's Canadian Travel Survey.

Note: "Other" category includes boat, motorcycle, bicycle, and means not specified by survey respondent.

appreciably over the past quarter of a century. In Japan, car use is also growing, although train travel continues to be more important than in Canada and the United States. Train travel also continues to play a somewhat larger role in Western Europe. Most countries, however, are experiencing the same long-term decrease in the importance of the bus and train travel that has been observed in Canada. Airplane travel, by contrast, has increased its share of passenger travel everywhere — most markedly in the United States. The increased importance of airplane travel would be even more apparent for a number of other countries if international travel were included in the data.

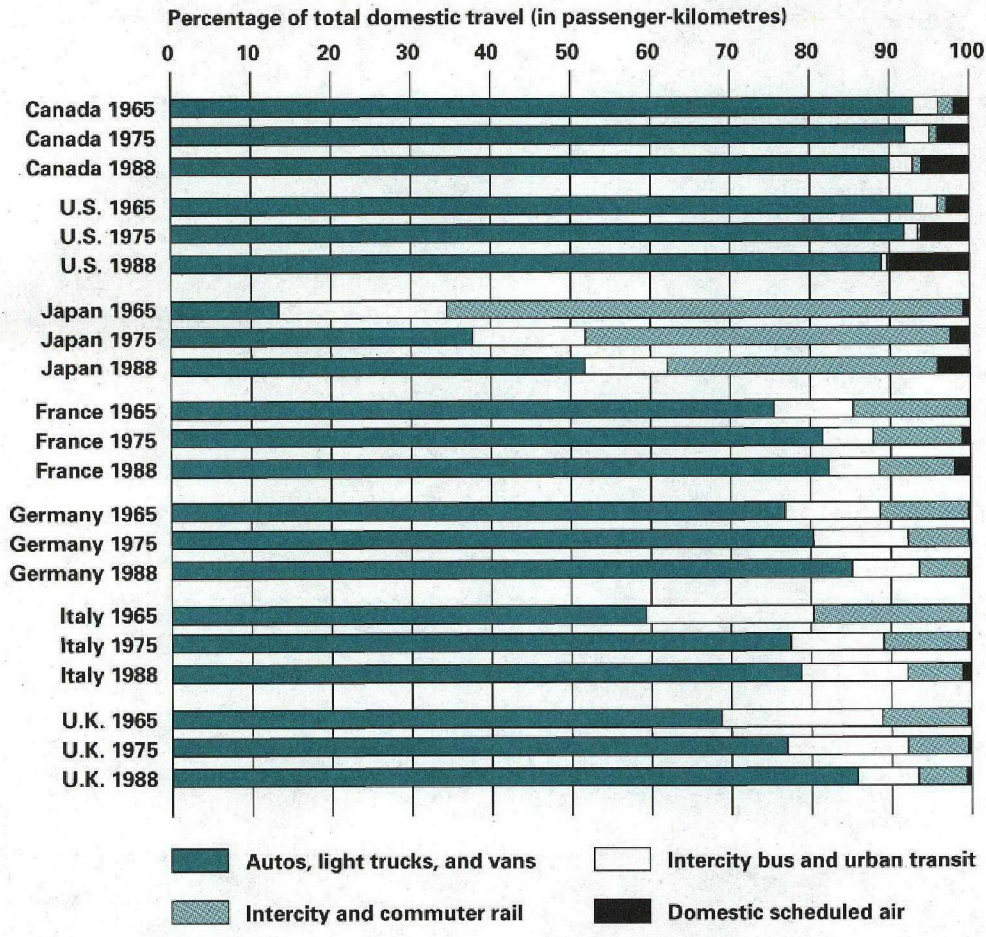
Chart 2-5

CHANGES IN MODAL SHARE OF DOMESTIC INTERCITY PASSENGER TRANSPORTATION, 1930–1990



Sources: Statistics Canada and Royal Commission staff calculations. For details, see Notes to Chapter 2 in Volume 2 of this report.

Chart 2-6
International Comparisons of Modal Shares in Total Domestic Travel, 1965, 1975 and 1988



Sources: Royal Commission staff calculations based on data from Statistics Canada, the European Conference of Ministers of Transport, and a number of U.S. and Japanese sources. For details consult the Notes to Chapter 2 in Volume 2 of this report.

Note: Total domestic travel includes both urban and intercity travel.

Table 2-2

Modal Shares of Total Domestic Passenger Travel, in Passenger-Kilometres, Selected Countries, 1965–1988

	1965 (%)	1970 (%)	1975 (%)	1980 (%)	1985 (%)	1988 (%)
Passenger-vehicle travel (e.g. cars, light trucks, and vans)						
Canada	93	93	92	91	91	90
United States	93	92	92	90	89	88
Japan	14	35	38	42	46	52
France	75	82	81	82	82	82
Germany	77	80	80	81	83	85
Italy	59	76	77	76	77	79
United Kingdom	69	75	77	82	84	86
Intercity bus and urban transit						
Canada	3	3	3	3	3	3
United States	3	2	2	2	2	1
Japan	21	17	14	14	12	10
France	10	7	6	7	6	6
Germany	12	11	12	11	9	8
Italy	21	12	12	14	14	13
United Kingdom	20	15	14	10	9	7
Intercity and commuter rail						
Canada	2	1	1	1	1	1
United States	1	1	**	**	**	**
Japan	65	47	46	40	39	34
France	15	11	11	10	10	9
Germany	12	9	8	7	7	6
Italy	19	12	10	9	8	7
United Kingdom	10	9	8	7	6	6
Air (domestic scheduled services)						
Canada	2	3	4	5	5	6
United States	3	5	6	8	9	10
Japan	1	1	3	4	4	4
France	**	1	1	1	2	2
Germany	**	**	**	**	**	**
Italy	**	1	1	1	1	1
United Kingdom	1	1	1	1	1	1

Source: Royal Commission staff calculations based on data from Statistics Canada the European Conference of Ministers of Transport, and a number of U.S. and Japanese sources. For details consult the Notes to Chapter 2 in Volume 2 of this report.

Notes: This table covers total domestic, not just domestic intercity, passenger transportion.

Data on total travel were used since internationally comparable data on the intercity portion of travel are not available. If intercity data were available, they would logically show an increased share for air, a decreased share for bus, and possibly a somewhat increased share for rail and somewhat decreased share for car.

Data may not be fully comparable across countries; thus the table should be used to make broad comparisons and significance should not be attached to small differences.

For geographically compact countries, domestic air travel may be unimportant. Data on total domestic and international air travel could be expected to show a much larger share for air for these countries.

** indicates share of less than 0.5%.

Canada's Passenger Transportation System: 1992 and Beyond

How much and what kind of transportation will travellers want, and be willing to pay for, in the next 30 years? What kinds of transportation services will be available? There is always a great deal of uncertainty when looking into the future. Passenger transportation requirements are the result of many factors — for example, the country's economic performance and the income levels of Canadians, changes in work patterns and lifestyles, and the development of new technology.

Extrapolating on present directions in passenger transportation provides some indication of future directions. Based on current trends:

- The car will remain the preferred mode of transportation and will dominate the public modes.
- In recent years — the only years for which we have data — people aged 25 to 54 have tended to travel more than those in younger and older age groups. As Baby Boomers have moved into adulthood and middle age, travel has increased. Over the next decade, changes in the age structure of the population will have relatively little impact on the total amount of travel. But after the turn of the century, the movement of the Baby Boomers into older age

groups will, if current travel patterns persist, tend to slow the growth of travel.

- Most long-distance travel, including almost all travel in the North, will continue to be by air.
- As a result of its small population and market, Canada will mainly rely upon transportation technology developed elsewhere. Canadian governments can set Canadian requirements for airplane emissions, but if companies based in other countries do not build equipment to those specifications, Canada will be limited in what it can do to influence the introduction of new technologies.
- Canada shares an international border with the United States, a country whose economy is ten times as large. Canada will have to continue taking account of its physical link to the United States in making future passenger transportation decisions.
- Canada's climate will continue to affect the costs of transportation. A cold climate makes transportation more expensive for several reasons: it affects the design, construction and life-cycle of vehicles and infrastructure; the costs of operations; and the seasonal demands for some infrastructure and equipment.

Projecting current trends, however, may not paint a complete picture of future transportation requirements, for a number of reasons:

- The demand for travel in the future, within each age group, could be different from today's pattern. For example, advances in medicine, changing lifestyles, and rising per capita income could mean seniors of the future will travel more than seniors do today.
- An aging population, which would have more leisure time and a higher proportion of citizens with disabilities, could have different preferences in choosing modes of transportation.
- Canadians' concerns about congestion and pollution in major urban areas might weaken their preference for car travel. Even a small shift in private car use could have a dramatic impact on the public modes of passenger transportation.

- Globalization could lead to increasing international travel. There is already some indication that this might happen. For example, between 1980 and 1990, international trips increased at an average annual rate of 5.2 percent, while domestic trips rose by 1.9 percent.
- Improvements in telecommunications technology could reduce the demand for face-to-face meetings and, therefore, lessen the demand for travel (especially business travel). On the other hand, the possibility of worldwide mobile personal communication links may enable business people to "take their office with them," thereby increasing travel and mobility.
- New forms of travel, such as advanced supersonic aircraft, intelligent vehicle-highway systems, faster rail systems and high-speed ferries, could influence the way Canadians travel.

Based on the experience of the past 30 years, we doubt that there will be dramatic change in the way Canadians travel in the next 30 years. Markets will continue to change, but the providers of passenger transportation services are unlikely to face dramatic shifts in demand or radically new forms of travel in the near future.

Nevertheless, because predicting the future accurately is virtually impossible, we recognized early on that our proposed framework for the passenger transportation system had to provide enough flexibility for industry, governments and travellers to adjust to major changes, should they occur.

Conclusion

Canada faces many opportunities and challenges, some of them similar to those of other countries. Canadians should understand how other countries are adjusting their passenger transportation systems. In other ways, Canada faces challenges and opportunities that are special — products of its unique history, geography, climate and culture. Canadians need solutions tailored to Canada's problems, issues and concerns.

ENDNOTES

1. After the enactment of the *National Transportation Act of 1967*, the government made accompanying changes to the *Railway Act*, and Canadian railway companies enjoyed a more liberalized environment than their U.S. counterparts until U.S. substantial economic deregulation of rail in the early 1980s.

2. As indicated in endnote 2 of Chapter 1, the range is due to intercity car travel being defined as either car trips over 80 kilometres in one-way distance, or all highway use by cars. See Notes to Chapter 1 and Notes to Chapter 2, in Volume 2 of this report.

3. Source for data on total government employment in transportation and communications: Statistics Canada, *Public Sector Employment and Remuneration 1990/91*, Catalogue No. 72-209, October 1991. This source does not report data for transportation employment alone.

4. For a more detailed description of intercity passenger transportation, see Volume 2, Chapter 2, of this report and Chapter III of *Getting There: The Interim Report of the Royal Commission on National Passenger Transportation* (Ottawa: Supply and Services Canada, 1991).

   Note: For both the domestic and international cases, intercity trips are defined as trips over 80 kilometres one way in this and the following section. This excludes many non-urban trips, especially by car, domestically, and many "cross-border shopping" international trips.

5. "Intercity" may be defined in different ways, and estimates of the amount of travel by car in particular are subject to considerable margins of uncertainty. Thus, our estimates of car travel, and of other means of transportation, in total intercity trips or in total passenger-kilometres travelled, should be viewed as approximate. See further discussion in Volume 2, Chapter 2 of this report.

CHAPTER 3

COSTS OF TRANSPORTATION AND WHO PAYS: TRAVELLERS OR TAXPAYERS?

INTRODUCTION

An essential first step in examining transportation issues and in making sound decisions on passenger transportation is to understand the full costs of transportation today, including accident costs, the cost of damage to the environment, and the cost of providing infrastructure. Further, if travellers are to cover the costs of providing and maintaining the passenger transportation system — as we will recommend — it is important to know what proportion of total costs travellers currently pay and what proportion is borne by others.

Some Canadians may be concerned that transferring the costs borne by others to those who travel might increase costs of travel, discourage use of the passenger transportation system and slow economic growth. We remind them, however, that these costs are already being borne by Canadians. Funding transportation through charges, rather than taxes, would not, by itself, alter the total costs Canadians pay. Furthermore, we believe that the changes we recommend in how Canadians should pay for the passenger transportation system will also lead to changes that will lower the total costs of the passenger transportation system.

In our approach, travellers and carriers would pay full costs, but these costs would be based on principles of efficient investment and pricing. Travellers would not be paying for a passenger transportation system that is wasteful because it has too much or too little capacity, or capacity of the wrong type and in the wrong place. Travellers and carriers would be able to purchase services at the lowest possible prices for the greatest benefit.

The remainder of this chapter is devoted to estimating the comprehensive costs of the current system — a system that is not as efficient as it could become. Our figures, therefore, overestimate the total costs of transportation and the additional costs to be paid by travellers, but these figures are a key starting point in understanding the current system and the potential for change. In referring to costs paid by travellers, we include charges to carriers that will be passed on to travellers in the fares they pay.

Today's Subsidies and Costs — Hidden and Direct

Currently, taxpayers knowingly support the transportation system through direct subsidies and unknowingly through hidden subsidies. Direct subsidies are those that governments show in their budgets as amounts transferred to carriers or travellers from the taxpayers. Hidden subsidies are those that are less visible to the public.

Hidden subsidies hamper the development of rational transportation policy. During our public hearings, several interveners expressed frustration about hidden subsidies in the passenger transportation system. These subsidies may mislead governments trying to make decisions based on efficiency and competition, and certainly lessen the public's ability to assess policy decisions. If, for example, a government must choose between building a road for a certain route or providing rail service, it will be unable to make the wisest choice (the best transportation at the least cost to the traveller) if the true costs of road and rail are not known.

The House of Commons Standing Committee on Transport also recognized the problems associated with hidden subsidies. In its March 1992 report, *High Speed Rail: The Canadian Concept*, in Recommendation 9, the Committee stated ". . . considering it is essential to more accurately determine the amount of subsidy for each mode, the Royal Commission on National Passenger Transportation should place particular emphasis, in its Final Report, on the identification of the levels of hidden subsidization within each mode."

Hidden subsidies, direct subsidies, special advantages or disadvantages resulting from government action can arise in a number of ways.

Transportation infrastructure costs: Governments may provide infrastructure (terminals, links and traffic control — see Table 2-1 in Chapter 2) to a mode free of charge or for charges that do not recover the full costs. In these cases, the subsidy comes from the taxpayer and appears in government budgets. How the subsidy should be apportioned among different groups of travellers may be subject to debate.

Environmental costs: At present, governments allow transportation activities to cause damage to the environment without charging carriers or travellers for these damages. This is equivalent to a subsidy from today's public, who experience the adverse effects on the environment, and possibly a subsidy from future generations as well. Other than costs of some clean-up work performed by governments, which are included in their budgets, most of the costs associated with environmental damage (for example, discomfort or ill health) do not appear in government accounts.

Accident costs: Travellers do not pay all the costs associated with accidents. Some of the costs are paid for by public health insurance systems that do not recover, or only partially recover, the costs from transportation users and carriers.

Special transportation taxes and fees: These taxes and fees are specific to transportation, but are not designated as charges for infrastructure, environmental damage or accidents. They include fuel taxes, and vehicle, carrier and drivers' licences. In our view, general consumption taxes, such as provincial sales taxes and the Goods and Services Tax, do not constitute a special cost or disadvantage for a particular passenger transportation mode, since such taxes are applied broadly in the economy. These general taxes are not included in our analysis. But special taxes and fees on transportation fares, or on inputs such as fuel, are of interest because they may give one mode a financial advantage over another.

General property taxes applied on the same basis to all industries would not be included, but differentials in the application of property taxes — for example, levying such taxes on rail rights-of-way but not on road — should, in principle, be recognized. Where special taxes — or differentials due to above-average rates of general taxes — exist, they should be considered to offset hidden subsidies associated with infrastructure costs, environmental damage and accident costs currently paid by taxpayers.

We have estimated the costs related to transportation infrastructure, environmental damage, accidents, the revenues from special taxes and fees, and payments of direct subsidies. We use these estimates to consider how governments treat different types of passenger transportation.

System-Wide Costs

As we stated earlier, people will not be able to make sound transportation decisions unless they have comprehensive figures for the costs of travel in each mode. To our knowledge, such figures have never been calculated in Canada. We have estimated the system-wide costs of transportation and how much users currently pay, and how much others pay (Table 3-1 and Chart 3-1). The total costs borne by others provide an estimate of total subsidies, both hidden and direct.

"Users" are travellers, vehicle owners and carriers. "Others," who pay for costs of transportation although they may or may not be using the transportation system, are taxpayers (who cover the financial costs paid by governments) and the general public (who directly bear most environmental damage costs).

We caution, however, that our estimates of costs are imprecise because of the current lack of data. Nonetheless, we believe that our figures are useful to begin gauging the true costs of transportation in the

different modes. It will be important for governments to develop better estimates before making future policy decisions, including setting charges for travellers.

We present these system-wide averages as an introduction. Later in the chapter, we provide estimates of the costs for particular routes, which may be more relevant to some policy decisions than the system-wide averages.

A simple basis for comparing costs between modes is the cost per passenger-kilometre, that is, how much it costs to carry one passenger one kilometre, or total costs divided by total passenger-kilometres. We recognize that cost per passenger-kilometre is not a perfect basis of comparison, because transportation by different modes is not always comparable. For example, when people travel by ferry and car, the costs are those of moving a passenger "accompanied by an average amount of car." On the other hand, the bus, airplane and train costs are only for passengers and their personal baggage. On some carriers, food is provided; on others, passengers pay extra for food. The average trip also differs across the modes. Air trips are generally much longer and ferry trips much shorter than those taken by road or rail. System-average costs per passenger-kilometre are therefore not fully comparable, but they do provide a start.

The costs of travel by different modes vary substantially. This is reasonable because some modes are more expensive to operate and provide more services than others. We are particularly interested, however, when costs not borne by users differ substantially by mode of travel. These variations indicate that government policy today is not neutral across modes and gives some modes competitive advantages over others.

INTERPRETING TABLE 3-1 AND CHART 3-1

Table 3-1(a) illustrates the components of average costs, in cents per passenger-kilometre, for domestic travel by the different modes in 1991. Table 3-1(b) estimates the total costs of domestic intercity

travel, in millions of dollars, for the different modes. Our total cost estimates for car travel in this chapter and in Chapter 18 refer to all car travel on highways, rather than the narrower definition of inter-city car travel restricted to trips of 80 kilometres or more used in estimates in other chapters.

The components of system-average costs, Table 3-1(a), are also presented graphically in Chart 3-1.

The costs borne by users (including special transportation taxes and fees paid by travellers) are stacked so that the overall height of the bar on the left indicates the total costs borne by travellers.

The costs borne by others are stacked to form the bar on the right. The total length of the bar represents the gross cost borne by others, before subtracting revenue received from special transportation taxes and fees. The distance below zero at which the bar starts is equal to the amount received. (The segment below zero represents revenues from the same special taxes and fees that are shown as a cost to users by the segment at the top of the left bar.) Therefore, the total height of the bar above zero shows the net cost borne by others.

The height of the users bar may be compared with the height (above zero) of the others bar to see the relative net contributions of users and others to the means of transportation in question.

We use estimates for 1991 to provide a current view of costs. Where 1991 data on costs and system use are not available, our figures are based on older data projected forward to 1991. This increases the margin of error in the estimates. In addition, we have attempted to smooth out the impact of the recession; our estimates are for normal costs and revenues in 1991. The table shows system-average cost estimates per passenger-kilometre to the nearest tenth of a cent, and total cost estimates to the nearest million dollars. Later tables show route costs to the nearest dollar. This is done in order to show some small cost components that would disappear if the table showed numbers that were rounded to the extent appropriate for the larger

cost components. All estimates, however, should be viewed as approximate.

The cost estimates are documented in Volume 2 of this report. In the following paragraphs, we briefly explain the meaning of each component of the costs.

Table 3-1(a)
Illustrative System-Wide Annual Costs of Intercity Domestic Travel, Paid by Users and Others, 1991, in 1991 Dollars

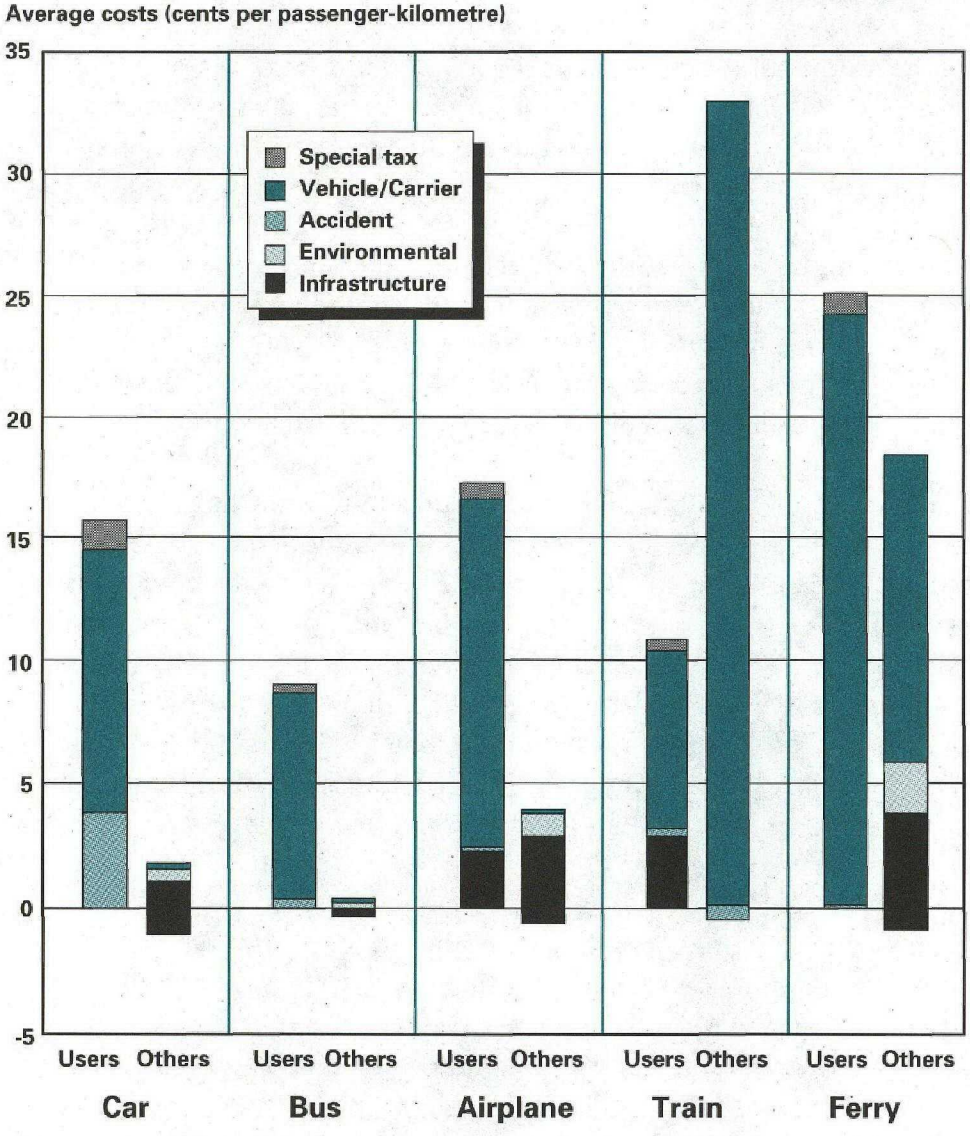
Average costs: cents per passenger-kilometre						
	Car			Bus		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	0.0	2.1	2.1	0.0	0.3	0.3
Environmental	0.0	0.6	0.6	0.0	0.2	0.2
Accident	3.7	0.1	3.8	0.4	0.0	0.4
Special trans. tax/fee	1.2	–1.2	0.0	0.3	–0.3	0.0
Vehicle/Carrier	10.9	0.0	10.9	8.4	0.2	8.6
Total	**15.8**	**1.6**	**17.4**	**9.1**	**0.4**	**9.5**
	Airplane			Train		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	2.2	3.4	5.6	2.9	0.0	2.9
Environmental	0.0	1.0	1.0	0.0	0.6	0.6
Accident	0.1	0.0	0.1	0.2	0.0	0.2
Special trans. tax/fee	0.6	–0.6	0.0	0.4	–0.4	0.0
Vehicle/Carrier	14.4	0.1	14.4	7.4	32.8	40.2
Total	**17.3**	**3.8**	**21.1**	**10.9**	**33.0**	**43.9**
	Ferry			All intercity travel		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	0.0	4.7	4.7	0.2	2.2	2.4
Environmental	0.0	2.0	2.0	0.0	0.6	0.6
Accident	0.1	0.0	0.1	3.3	0.2	3.4
Special trans. tax/fee	0.9	–0.9	0.0	1.1	–1.1	0.0
Vehicle/Carrier	24.1	11.6	35.7	11.2	0.2	11.4
Total	**25.1**	**17.4**	**42.5**	**15.8**	**2.0**	**17.8**

Table 3-1(b)
Illustrative System-Wide Annual Costs of Intercity Domestic Travel, Paid by Users and Others, 1991, in 1991 Dollars

Totals: $ millions						
	Car (210 billion pass-km)			Bus (3.3 billion pass-km)		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	0	4,486	4,486	0	10	10
Environmental	0	1,211	1,211	0	8	8
Accident	7,874	172	8,046	13	0	13
Special trans. tax/fee	2,461	–2,461	0	9	–9	0
Vehicle/Carrier	22,817	0	22,817	277	8	285
Total	**33,152**	**3,408**	**36,560**	**299**	**17**	**316**
	Airplane (25 billion pass-km)			Train (1.4 billion pass-km)		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	556	845	1,401	41	0	41
Environmental	0	247	247	0	9	9
Accident	25	0	25	3	0	3
Special trans. tax/fee	149	–149	0	6	–6	0
Vehicle/Carrier	3,595	0	3,595	104	459	563
Total	**4,325**	**943**	**5,268**	**154**	**462**	**616**
	Ferry (0.85 billion pass-km)			All intercity travel (240 billion pass-km)		
Type of cost	Users	Others	Total	Users	Others	Total
Infrastructure	0	40	40	597	5,381	5,978
Environmental	0	17	17	0	1,492	1,492
Accident	1	0	1	7,916	172	8,088
Special trans. tax/fee	7	–7	0	2,632	–2,632	0
Vehicle/Carrier	205	98	303	26,998	565	27,563
Total	**213**	**148**	**361**	**38,143**	**4,978**	**43,121**

Note: In order to illustrate smaller components, averages are shown to the nearest tenth of a cent and totals to the nearest million dollars. In general, cost estimates are approximate and are not accurate to this level of precision. See text.

Chart 3-1
ILLUSTRATIVE COMPREHENSIVE SYSTEM-WIDE COSTS OF INTERCITY DOMESTIC TRAVEL, PAID BY USERS AND OTHERS, 1991



Note: The chart is a graphic representation of Table 3-1(a). Any negative components of the costs borne by others are represented by shifting the others bar below the zero line.[1]

For purposes of our cost analysis, "infrastructure" consists of terminals, links and traffic control (including police systems) not provided by carriers. It excludes most bus terminals, some ferry docks, and some passenger rail stations that are provided by carriers. The total cost for transportation infrastructure is the sum of the estimated capital and operating expenses. (Where infrastructure is provided by a carrier, these costs are built into vehicle/carrier costs.) The others portion is the total cost minus the amount covered by charges paid by travellers and carriers.

The estimates of infrastructure costs include depreciation and interest on the investment in the facility. When the value of land is also a significant part of the total value of the facility, an interest charge on the value of land is also included in costs. The basis for the infrastructure cost estimates is discussed further in Chapter 5.

Infrastructure costs to travellers and carriers are charges levied by the infrastructure providers (primarily governments) to help cover the costs of building and operating them. For air travel, charges consist of the Air Transportation Tax, airport landing and terminal fees, and rent for airport space used by carriers. For rail travel, Canadian National Railways and Canadian Pacific Ltd. charge VIA Rail for use of track and other services (such as dispatch). For road travel, there are road tolls on one highway in British Columbia, but the revenues are so small relative to the total road system that they have not been included in the table.

Some infrastructure costs may be higher than necessary, in part because bigger or more elaborate facilities than travellers require have been provided. In this chapter, we set out existing costs; in subsequent chapters, we discuss whether and how some of these costs might be reduced.

Environmental costs result from the environmental damage caused by air and noise pollution from vehicle and carrier operations. As we pointed out earlier, the public generally bears these costs, which do

not appear in government accounts. Environmental costs borne by others are the estimated values of the total damage and unpleasantness associated with vehicle emissions and noise (Chapter 7).

Accident costs include a valuation of death and injury, health care costs and property damage. Travellers pay accident costs through their insurance premiums and through injuries and damage not covered by personal insurance or government health insurance. Accident costs borne by others are government health care costs that are not recovered from self-financing vehicle insurance plans or from carriers (Chapter 8).

Special transportation taxes and fees include fuel taxes and vehicle, carrier and drivers' licence charges. These special transportation taxes and fees are different from other government charges to travellers, such as the Air Transportation Tax and tolls, since governments do not directly apply the revenues raised from the special taxes to cover the costs of transportation infrastructure, environmental damage or accidents. Therefore, our table shows special taxes and fees as a separate category of charge.

We believe special taxes and fees should be considered an offset to infrastructure, environmental costs and accident costs borne by the taxpayer or the public. We have, however, adjusted the fuel tax components of special taxes before including them in the table, since every province except Quebec exempts fuel from the general provincial sales tax. For these provinces, we consider only that part of the fuel tax in excess of the provincial sales tax rate to be a special tax on transportation.

In Table 3-1 and Chart 3-1, we show the special taxes and fees as a component, along with charges for infrastructure, environmental damage and accidents, of total costs paid by users. Since special tax revenues are not used to finance a particular type of transportation expenditure, they may be viewed as a general offset to costs borne by others. Hence, revenues from taxes and fees are shown in the

others column with a negative sign. The resulting zero in the total column shows that these taxes do not increase the total costs of passenger transportation, but rather are a mechanism for determining who is paying what.

Vehicle/carrier costs are the capital and operating costs incurred by owners of private vehicles or by carriers providing public transportation. These costs also include infrastructure costs when carriers provide their own facilities, for example, when bus or ferry companies own their own terminals. Vehicle/carrier costs borne by users are calculated using fares charged to travellers or the costs of buying and operating a car, and subtracting charges to travellers and carriers for infrastructure, environmental costs, accident costs and special taxes and fees. In our estimates, vehicle/carrier costs also include costs arising from equipment requirements designed to lessen pollution or increase safety. (Such costs might alternatively be included under environmental or safety costs, but are difficult to separate from the basic cost of the vehicle.)

Vehicle/carrier costs borne by others represent direct subsidies to carrier operators. (In some cases, it might be argued that part of the direct subsidy should be viewed as covering infrastructure or other charges paid by the carrier, but we show the full direct subsidy as vehicle/carrier costs borne by others.)

Differences in the vehicle/carrier costs of each type of carrier, including cars, may not be considered relevant for government transportation policy decisions as long as travellers pay the costs and as long as monopoly pricing by carriers is not a concern. On the other hand, these vehicle/carrier costs form the largest component of total costs; it is useful to keep them in mind when considering whether costs currently borne by others are important or unimportant in the total picture for a given mode of travel.

In Table 3-1, total costs for users, others, and in total, are sums of their components. As mentioned earlier, we use total costs borne by others as our measure of the net subsidy from governments and

the public to each means of transportation. The total of costs borne by users and others is, of course, our measure of the overall costs of providing each means of transportation. When we refer to "total costs," we are referring to this sum.

CONCLUSIONS: TABLE 3-1 AND CHART 3-1

Average Costs and Subsidies

Bus travel is the least costly mode. The average total cost of bus travel is 9.5¢ per passenger-kilometre. We estimate that bus travellers pay all but 0.4¢ per passenger-kilometre of this. Bus travellers receive the least subsidy per passenger-kilometre of all travellers.

Car and airplane travellers receive a somewhat larger total subsidy than bus travellers per passenger-kilometre. The general taxpayer and the public subsidize car travel by an estimated 1.6¢ per passenger-kilometre and air travel by 3.8¢ per passenger-kilometre. These subsidies cover infrastructure, environmental and accident costs not paid by users, plus small direct subsidies paid for air travel in some provinces, less special taxes collected.

The largest gaps between users and total costs are for train and ferry travel — 33¢ per passenger-kilometre for train and 17.4¢ per passenger-kilometre for ferry. This is due to large, direct subsidies from taxpayers to travellers using passenger rail and some ferry services (these direct subsidies are shown as vehicle/carrier costs borne by others).

Environmental Costs

Our figures for environmental costs are based on high estimates for damage associated with carbon dioxide and other pollutants that affect air quality relative to the ranges of estimates available. We did this so the overall subsidy comparison would err on the side of favouring the less-polluting modes of passenger transportation. Although important, environmental costs do not turn out to be large

relative to total costs for any of the modes. Environmental costs for bus travel are the lowest.

Some observers believe that car travel causes a great deal more pollution than train or bus travel. When car pollution is viewed in terms of the average per passenger-kilometre, however, its costs are not always the highest. There are several reasons for this. Regulations regarding car exhaust emissions have encouraged greater reductions in the amount of pollutants emitted by cars than by buses or trains. In addition, when train equipment is old, the occupancy rate is low, or dining and sleeping services as well as basic seating are provided, trains may use as much or more fuel per passenger-kilometre as cars.

Nevertheless, cars account for most pollution, because most travel is by car.

Accident Costs

Accident costs per passenger-kilometre are much higher for travel by car than they are for any other mode. These costs account for almost one quarter of the total costs of car travel. Travellers bear most of these costs through insurance premiums and by paying for uninsured losses they suffer. Accident costs borne by others through unrecovered health care system costs are estimated to amount to 0.1¢ per passenger-kilometre. Costs of accidents borne by others for bus, air and train travel are negligible.

Total Costs

Table 3-1(b) provides estimates of the total costs, in millions of dollars for each mode of transportation. In the preceding discussion, we have focussed attention on differences in average costs, especially those borne by others. The average costs borne by others largely represent subsidies from governments to the various modes less special taxes and fees collected by governments. As Table 3-1 shows, governments currently treat the various modes of travel differently.

Total cost estimates are also of interest, however, as they indicate the overall amounts spent on each mode of transportation. While the average subsidy rates for car and air travel are relatively low, the large numbers of kilometres represented by car and air travel mean the total subsidies to these modes account for the bulk of the estimated $5.0 billion total subsidy to domestic intercity passenger travel (estimated at $3.4 billion for car and $0.9 billion for airplane).

Costs: Some Sample Routes

In addition to estimating comprehensive, system-wide costs, we have estimated the costs per one-way trip for four intercity routes that represent different combinations of length and passenger volume:

- Toronto to Montreal — a high-volume, medium-distance route (Table 3-2 and Chart 3-2);
- Saskatoon to Halifax — a long-distance route consisting mainly of medium-volume segments (Table 3-3 and Chart 3-3);
- Val d'Or to Montreal — a medium-distance route including low-volume segments (Table 3-4 and Chart 3-4); and
- Vancouver to Toronto — a long-distance route with high-volume air travel (Table 3-5 and Chart 3-5).

(Costs for a route that includes a ferry segment are shown in Chapter 18.)

INTERPRETING TABLES 3-2 TO 3-5 AND CHARTS 3-2 TO 3-5

In these tables, our estimates for total and users' vehicle/carrier costs are based on averages of costs and revenue yields for routes of similar volume and distance. They do not reflect actual carrier costs or revenues on the particular routes.

Table 3-2

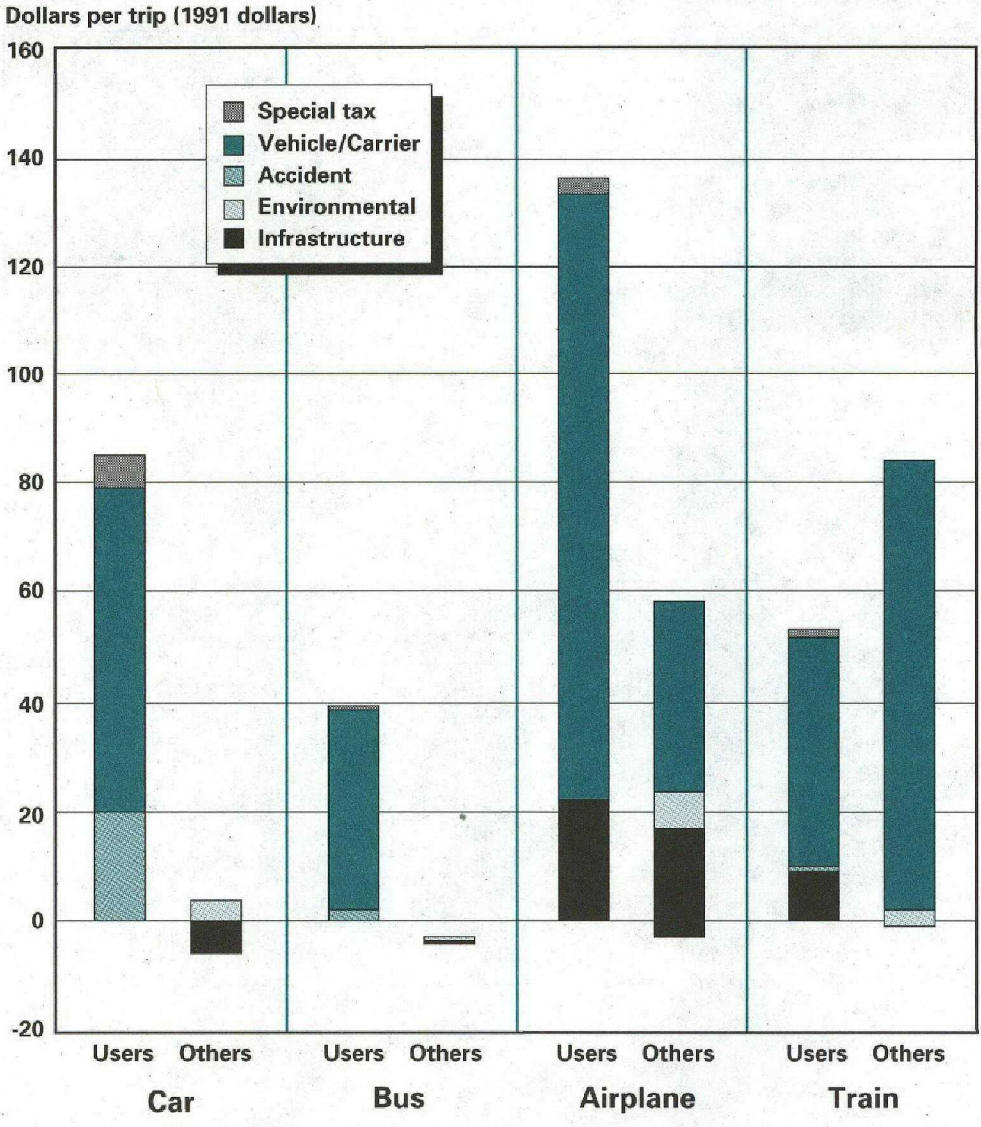
ILLUSTRATIVE COMPREHENSIVE COSTS OF INTERCITY TRAVEL, PER PASSENGER PER ONE-WAY TRIP, 1991, IN 1991 DOLLARS — TORONTO TO MONTREAL

		Car costs currently borne by:			Bus costs currently borne by:		
Type of cost		Users	Others	Total	Users	Others	Total
Infrastructure	($)	0	6	6	0.0	0.3	0.3
Environmental	($)	0	4	4	0.0	1.0	1.0
Accident	($)	20	0	20	2.2	0.0	2.2
Special trans. tax/fee	($)	6	–6	0	0.8	–0.8	0.0
Vehicle/Carrier	($)	59	0	59	36.6	–3.0	33.6
Total	**($)**	**85**	**4**	**89**	**39.6**	**–2.5**	**37.1**
Distance travelled	(km)		539			539	
Costs per passenger-km	(¢)	15.8	0.8	16.6	7.3	–0.4	6.9
Costs per standardized passenger-km[a]	(¢)	17.2	0.8	18.0	8.0	–0.5	7.5
		Airplane costs currently borne by:			**Train costs currently borne by:**		
Type of cost		Users	Others	Total	Users	Others	Total
Infrastructure	($)	22	20	42	9	0	9
Environmental	($)	0	6	6	0	3	3
Accident	($)	0	0	0	1	0	1
Special trans. tax/fee	($)	3	–3	0	1	–1	0
Vehicle/Carrier	($)	111	35	146	42	82	124
Total	**($)**	**136**	**58**	**194**	**53**	**84**	**137**
Distance travelled	(km)		496			540	
Costs per passenger-km	(¢)	27.4	11.6	39.0	9.8	15.6	25.4
Costs per standardized passenger-km[a]	(¢)	27.4	11.6	39.0	10.6	17.0	27.6

a. Standardized to air distance.

Note: In order to illustrate smaller components, averages per passenger-kilometre are shown to the nearest tenth of a cent and route totals to the nearest dollar. See text for qualifications.

Chart 3-2
Illustrative Comprehensive Costs per Passenger, Dollars per Trip, Toronto to Montreal



Note: The chart is a graphic representation of Table 3-2. Any negative components of the costs borne by others are represented by shifting the others bar below the zero line.[1]

Table 3-3

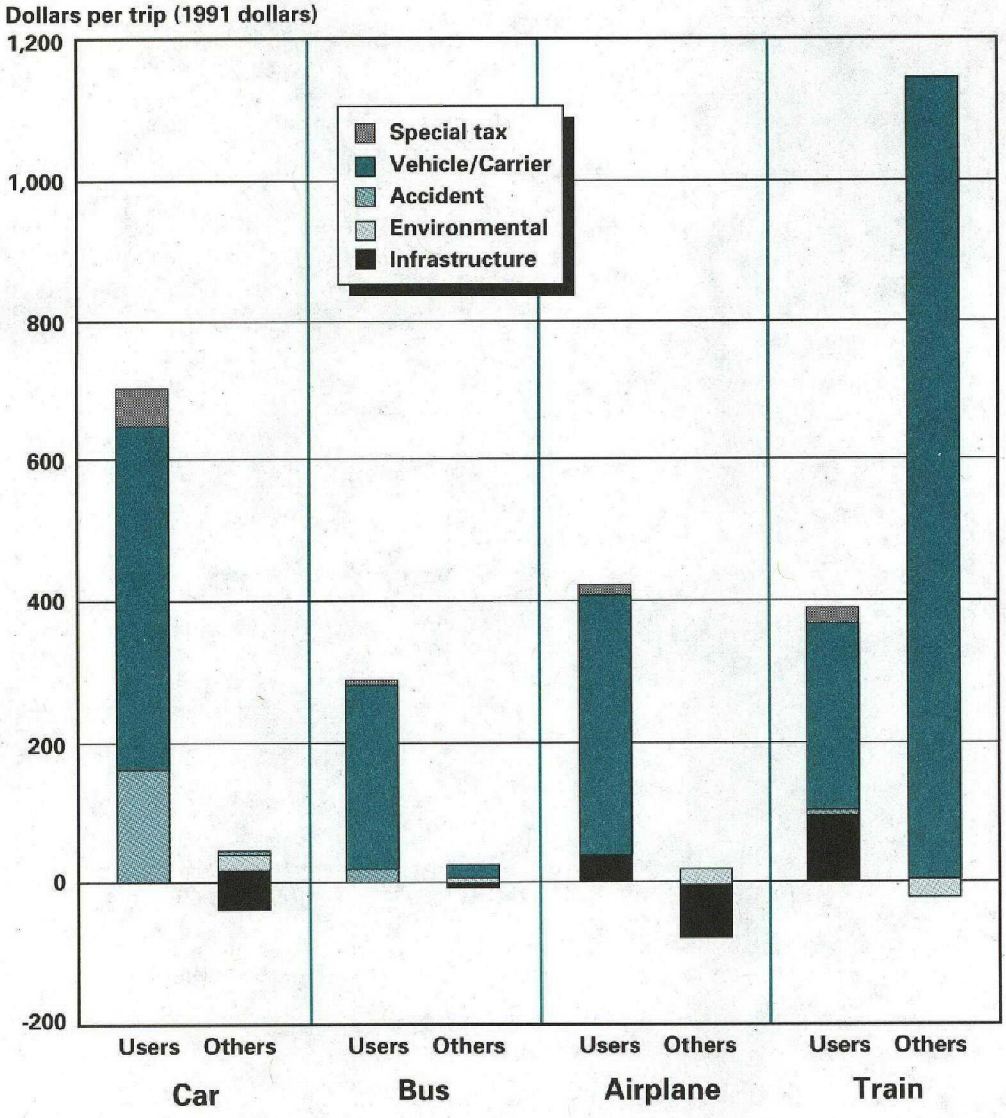
ILLUSTRATIVE COMPREHENSIVE COSTS OF INTERCITY TRAVEL, PER PASSENGER PER ONE-WAY TRIP, 1991, IN 1991 DOLLARS — SASKATOON TO HALIFAX

		Car costs currently borne by:			Bus costs currently borne by:		
Type of cost		Users	Others	Total	Users	Others	Total
Infrastructure	($)	0	67	67	0	8	8
Environmental	($)	0	21	21	0	7	7
Accident	($)	168	4	172	18	0	18
Special trans. tax/fee	($)	53	–53	0	9	–9	0
Vehicle/Carrier	($)	487	0	487	261	19	280
Total	**($)**	**708**	**39**	**747**	**288**	**25**	**313**
Distance travelled	(km)		4,485			4,485	
Costs per passenger-km	(¢)	15.8	0.9	16.7	6.4	0.5	6.9
Costs per standardized passenger-km[a]	(¢)	20.2	1.1	21.3	8.2	0.7	8.9
		Airplane costs currently borne by:			**Train costs currently borne by:**		
Type of cost		Users	Others	Total	Users	Others	Total
Infrastructure	($)	37	68	105	93	0	93
Environmental	($)	0	22	22	0	28	28
Accident	($)	4	0	4	8	0	8
Special trans. tax/fee	($)	15	–15	0	21	–21	0
Vehicle/Carrier	($)	368	–56	312	264	1,139	1,403
Total	**($)**	**424**	**19**	**443**	**386**	**1,146**	**1,532**
Distance travelled	(km)		3,500			4,468	
Costs per passenger-km	(¢)	12.1	0.5	12.6	8.6	25.7	34.3
Costs per standardized passenger-km[a]	(¢)	12.1	0.5	12.6	11.0	32.8	43.8

a. Standardized to air distance.

Note: In order to illustrate smaller components, averages per passenger-kilometre are shown to the nearest tenth of a cent and route totals to the nearest dollar. See text for qualifications.

Chart 3-3
Illustrative Comprehensive Costs per Passenger, Dollars per Trip, Saskatoon to Halifax



Note: The chart is a graphic representation of Table 3-3. Any negative components of the costs borne by others are represented by shifting the others bar below the zero line.[1]

Table 3-4

Illustrative Comprehensive Costs of Intercity Travel, per Passenger per One-Way Trip, 1991, in 1991 Dollars — Val d'Or to Montreal

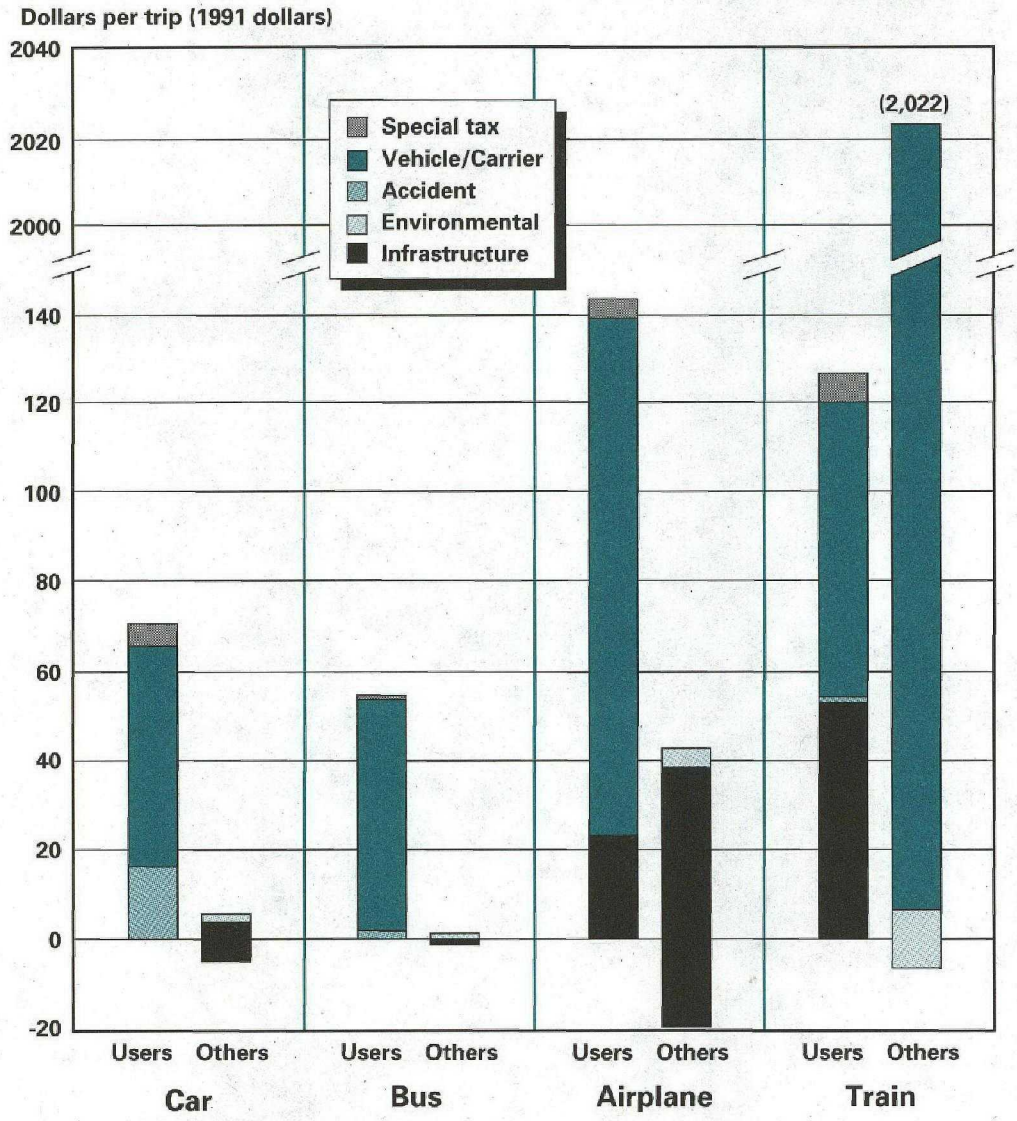
		Car costs currently borne by:			Bus costs currently borne by:		
Type of cost		**Users**	**Others**	**Total**	**Users**	**Others**	**Total**
Infrastructure	($)	0	9	9	0	1	1
Environmental	($)	0	2	2	0	1	1
Accident	($)	17	0	17	2	0	2
Special trans. tax/fee	($)	5	–5	0	1	–1	0
Vehicle/Carrier	($)	49	0	49	53	0	53
Total	**($)**	**71**	**6**	**77**	**56**	**1**	**57**
Distance travelled	(km)		450			450	
Costs per passenger-km	(¢)	15.8	1.4	17.2	12.4	0.2	12.6
Costs per standardized passenger-km[a]	(¢)	16.7	1.5	18.2	13.2	0.3	13.5
		Airplane costs currently borne by:			**Train costs currently borne by:**		
Type of cost		**Users**	**Others**	**Total**	**Users**	**Others**	**Total**
Infrastructure	($)	23	57	80	53	0	53
Environmental	($)	0	5	5	0	13	13
Accident	($)	0	0	0	1	0	1
Special trans. tax/fee	($)	4	–4	0	7	–7	0
Vehicle/Carrier	($)	116	–15	101	66	2,016	2,082
Total	**($)**	**143**	**43**	**186**	**127**	**2,022**	**2,149**
Distance travelled	(km)		425			700	
Costs per passenger-km	(¢)	33.8	10.1	43.9	18.2	288.8	307.0
Costs per standardized passenger-km[a]	(¢)	33.8	10.1	43.9	30.0	475.7	505.7

a. Standardized to air distance.

Note: In order to illustrate smaller components, averages per passenger-kilometre are shown to the nearest tenth of a cent and route totals to the nearest dollar. See text for qualifications.

Chart 3-4

Illustrative Comprehensive Costs per Passenger, Dollars per Trip, Val d'Or to Montreal



Note: The chart is a graphic representation of Table 3-4. Any negative components of the costs borne by others are represented by shifting the others bar below the zero line.[1]

Table 3-5

ILLUSTRATIVE COMPREHENSIVE COSTS OF INTERCITY TRAVEL, PER PASSENGER PER ONE-WAY TRIP, 1991, IN 1991 DOLLARS — VANCOUVER TO TORONTO

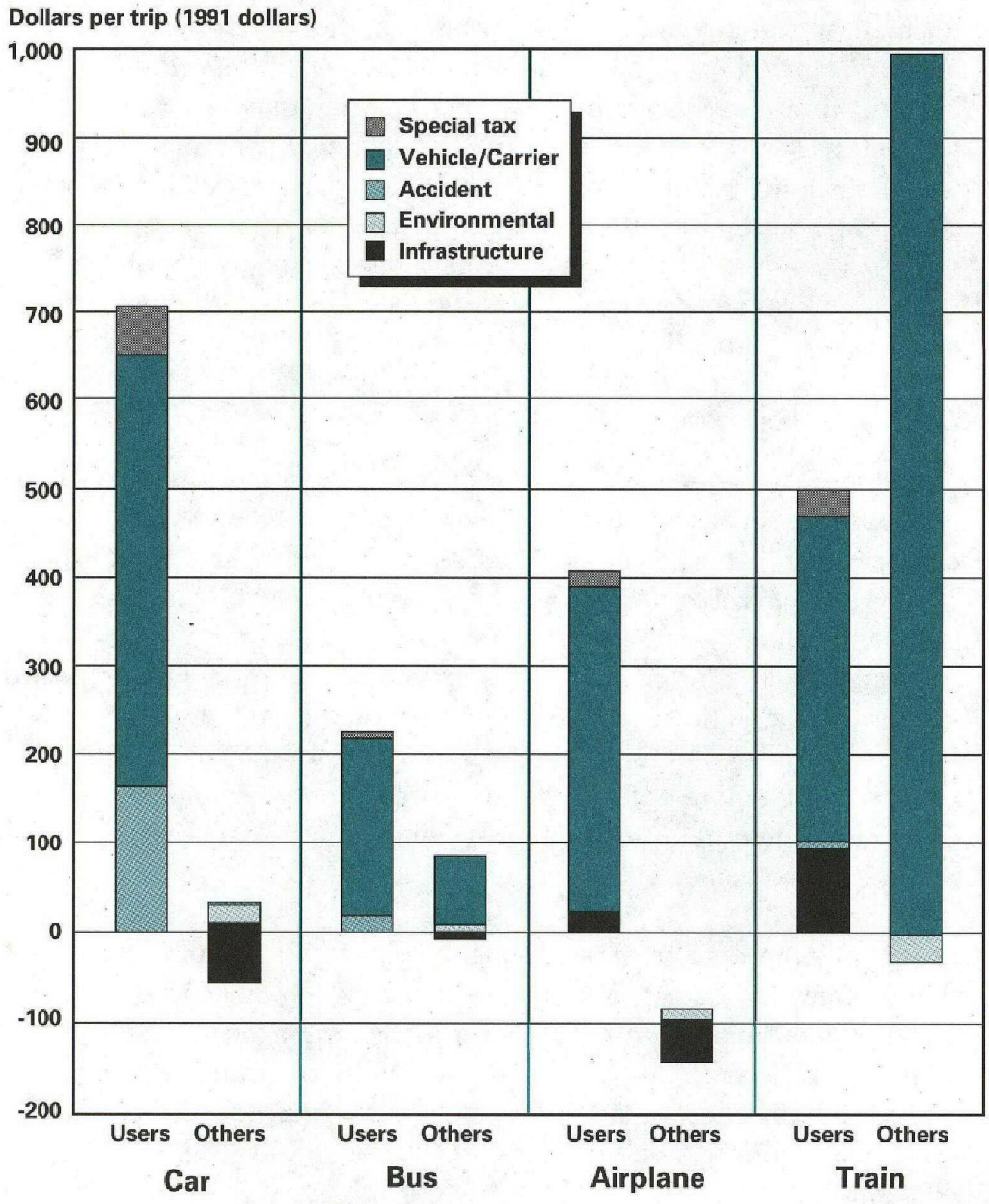
		Car costs currently borne by:			Bus costs currently borne by:		
Type of cost		**Users**	**Others**	**Total**	**Users**	**Others**	**Total**
Infrastructure	($)	0	66	66	0	8	8
Environmental	($)	0	20	20	0	6	6
Accident	($)	168	4	172	18	0	18
Special trans. tax/fee	($)	53	–53	0	8	–8	0
Vehicle/Carrier	($)	488	0	488	198	76	274
Total	**($)**	**709**	**37**	**746**	**224**	**82**	**306**
Distance travelled	(km)		4,492			4,492	
Costs per passenger-km	(¢)	15.8	0.8	16.6	5.0	1.8	6.8
Costs per standardized passenger-km[a]	(¢)	21.1	1.1	22.2	6.7	2.4	9.1
		Airplane costs currently borne by:			**Train costs currently borne by:**		
Type of cost		**Users**	**Others**	**Total**	**Users**	**Others**	**Total**
Infrastructure	($)	28	44	72	91	0	91
Environmental	($)	0	13	13	0	26	26
Accident	($)	3	0	3	8	0	8
Special trans. tax/fee	($)	19	–19	0	33	–33	0
Vehicle/Carrier	($)	357	–123	234	368	1,000	1,368
Total	**($)**	**407**	**–85**	**322**	**500**	**993**	**1,493**
Distance travelled	(km)		3,365			4,467	
Costs per passenger-km	(¢)	12.1	–2.5	9.6	11.2	22.2	33.4
Costs per standardized passenger-km[a]	(¢)	12.1	–2.5	9.6	14.9	29.5	44.4

a. Standardized to air distance.

Note: In order to illustrate smaller components, averages per passenger-kilometre are shown to the nearest tenth of a cent and route totals to the nearest dollar. See text for qualifications.

Chart 3-5

Illustrative Comprehensive Costs per Passenger, Dollars per Trip, Vancouver to Toronto



Note: The chart is a graphic representation of Table 3-5. Any negative components of the costs borne by others are represented by shifting the others bar below the zero line.[1]

In addition to showing estimates for the components of the costs for each means of transportation on the route in question, the tables show the overall average cost per passenger-kilometre, borne by users, others, and in total. These average per-passenger-kilometre costs, calculated using the route lengths for each different means of transportation, provide a basis for comparing their operating characteristics. Because the route length between two centres can differ for different means of travel, for some purposes — for example when considering the overall amount of subsidy for travel between two points — it is of interest to compare per-passenger-kilometre costs on a standardized basis. We have used the air distance for this standardized comparison.

Cross Subsidies

The difference between user and total vehicle/carrier costs on a route includes the impact of cross subsidies. Cross subsidies occur when a carrier uses revenues from profitable routes to cover part of the costs of unprofitable routes. For example, under provincial regulation, bus companies must provide service on low-volume routes in order to be granted high-volume routes; they subsidize the former with the profits from the latter. In our route tables, cross subsidies (the difference between estimates of total vehicle/carrier cost for the route and the vehicle/carrier share of fare revenues) are included in vehicle/carrier costs borne by others since other travellers on other routes pay these cross subsidies.

Some governments provide direct subsidies to buses on a small portion of total bus routes; these subsidies averaged across all bus travel are shown as vehicle/carrier costs borne by others in the system-wide costs. Cross subsidies do not appear in the system-wide average table (they cancel out). But, in the route tables, the amount in the others column for vehicle/carrier costs represents any direct subsidy plus any cross subsidy.

For bus routes of the Toronto to Montreal type, this amount is estimated to be negative. This is because although we estimate that the traveller pays an average of $36.60 toward vehicle/carrier costs for this type of trip, the average cost to the bus company is $33.60. In this case, there is no direct government subsidy and, therefore, the minus $3.00 shown for vehicle/carrier costs borne by others is a potential cross subsidy from passengers on this type of route to those travelling other routes operated by the same company.

On the other hand, for the Vancouver to Toronto type of route, we estimate that, given the lower bus fares for through-travel, bus passengers pay less than the average costs (average costs include a share in company overhead). In other words, they receive a cross subsidy. For air routes of the Vancouver to Toronto type, the vehicle/carrier situation is the reverse; on these air routes, passengers are estimated to contribute more than the average amount to profits. In other words they pay a cross subsidy.

In the case of trains, the entire amount of vehicle/carrier costs borne by others is an estimate of the direct taxpayer subsidy attributable to that route.

CONCLUSIONS: TABLES 3-2 TO 3-5 AND CHARTS 3-2 TO 3-5

Transportation Infrastructure Costs

On the high-volume Toronto to Montreal route, special taxes and fees for car and bus travel equal or exceed the costs of the road used. These special taxes and fees, however, do not fully offset the total costs of infrastructure, environmental damage and accidents. For air travel, infrastructure charges do not come close to covering costs for any of the domestic routes considered. On the medium-volume and lower-volume routes, as well as for the system-wide averages, special taxes and fees for car travel do not fully cover our estimate of the total capital, maintenance and other costs (including traffic policing) of roads.

Environmental Costs

Estimates for environmental costs of train and airplane emissions per passenger-kilometre differ by route, reflecting different vehicle occupancy rates and the use of different equipment. As well, our estimates assign a higher cost to some pollutants if they are released during the summer in areas that already have problems with air quality (such as the Windsor to Quebec City corridor and the Lower Fraser Valley regions).

In terms of environmental costs, the train on the high-volume Toronto to Montreal route incurs costs that are somewhat lower than the car's and considerably lower than the airplane's, although higher than the environmental costs of bus travel. On this route, train equipment is newer and more fuel efficient, the number of seats per train is higher, and train occupancy rates are high. (In Chapter 7, we consider how the train's effect on the environment might improve with different equipment.) On the lower-volume rail routes, the train has considerably higher environmental costs than those of car, airplane or bus travel.

The environmental costs of airplane travel can be lower than those of car travel on direct longer-distance routes, as shown by the Vancouver to Toronto example. In aircraft operation, much of the noise, fuel consumption and emission of carbon dioxide and other pollutants occurs while waiting for or during take-off. For longer direct flights, therefore, environmental costs are proportionately lower than for short flights.

Total Subsidies

On all the routes considered, bus travellers come closest to paying total costs if the cross subsidies among bus passengers are set aside. The total subsidy is larger for car travellers, but still not a large portion of total costs.

Total subsidies for air travel (excluding the impact of cross subsidies among routes) are larger than for car travel on most routes, and represent an appreciable share of total costs even on high-volume routes.

Subsidies to passenger rail include direct subsidies from taxpayers and some environmental costs. Transportation infrastructure costs are paid by the rail carrier for track use and train traffic control.

Even on the Toronto to Montreal route, which for the train has the lowest amount of direct (vehicle/carrier) subsidy from others and has the lowest environmental costs, the passenger rail subsidy is substantially larger than total subsidies to car or air travel. On the other routes, train costs borne by others (primarily the federal taxpayer) are many times larger than the subsidies to car or air travel.

Conclusion

Only the bus comes close to paying its way in the passenger transportation system. Bus travellers pay almost as much in special taxes and fees charged by governments as the costs of government-provided infrastructure, environmental costs and accidents incurred by bus travel.

Both car and airplane travel have a competitive advantage over the bus, because car and air travellers pay less of the full cost of their transportation. Government charges for car and airplane travel do not fully cover infrastructure and environmental damage costs. (Environmental damage by car, airplane and bus has been limited by regulation, and car, airplane and bus travellers do pay the costs of equipment required to comply with the regulations.) Car travellers also do not fully pay for the costs that car accidents impose on the health care system.

Overall, subsidies from taxpayers for rail and ferry are the largest, on average, per passenger-kilometre.

The following chapters contain recommendations that will change many of the above costs and who pays them. In Chapter 18 we will look again at these estimates of comprehensive costs when we consider the overall impact of our recommendations.

ENDNOTES

1. In the system-average table and chart, the only negative component of the others' costs is the special transportation tax/fee. This was represented in Chart 3-1 by a shift down in the others bar by the amount of special transportation tax/fee revenues. For the individual routes, cross subsidies are another potential negative component of others' costs.

   When users pay more than the vehicle/carrier costs associated with the route used, the excess is considered a contribution from users to others (other travellers). When this occurs, the base of the others bar is shifted below the zero line by an amount equal to the sum of revenues from special taxes and fees (a negative component of others costs) and of negative cross subsidies (cross subsidies available for other travellers).

   For example, for airplane travel on the Vancouver to Toronto route (Table 3-5 and Chart 3-5), the others bar starts at –142, the sum of –19 from special taxes and –123 from cross subsidy.

   Only the positive components of others' costs are shown as explicit segments of the bar. For Vancouver to Toronto airplane travel, the positive components add to 57, which is the vertical height of the bar above its –142 base.

   In a few cases for the individual routes, the negative components exceed the positive components of costs borne by others, resulting in negative net costs. In such cases, the top of the others bar, which indicates net costs borne by others, is below the zero line. For example, again for the Vancouver to Toronto airplane travel case, Table 3-5 shows net costs borne by others of –85. The top of the others bar for airplane travel in Chart 3-5 thus lies below the zero line at –85.

CHAPTER 4

NEW DIRECTIONS: FOUNDATIONS FOR A PASSENGER TRANSPORTATION FRAMEWORK

INTRODUCTION

In Chapter 1, we discussed our approach to providing Canada with a new passenger transportation framework for the 21st century that would lead to more consistent, coherent and economically sound transportation decisions. In this chapter, we set out the foundation for this new framework, discuss its implications for governments, travellers and carriers, and suggest transition mechanisms to get from the current situation to our proposed framework.

FOUNDATIONS FOR A NEW FRAMEWORK

We believe that the main goal of Canada's intercity passenger transportation system should be straightforward — to move people to where they want to go. Travellers should be able to choose the transportation services they want, get what they pay for, and pay for what they get.[1]

In the past, governments have used the transportation system to pursue other public policy goals. We believe that the passenger transportation system should not be used by governments in this way, today or in the future. As well, the traveller should not be asked to pay for the implementation of broad, national goals that are properly the responsibility of the general taxpayer.

In this report, we spend much time and space discussing charges to travellers. These include fares, fees, fuel taxes and licences. We realize that many of our recommendations may seem to advocate a greater financial burden on a public already unhappy about prices

and taxes. Although this may be the appearance, it is neither the reality, nor does it represent the fundamentals of what our approach will achieve. Although Canadians may be unhappy with transportation-related prices and taxes, and be unwilling to see them increase, they are nevertheless already "paying" all of the costs of transportation in some way. For example:

- taxpayers pay a substantial portion of the cost of the infrastructure used by travellers and subsidize some carriers directly;
- people with asthma pay for low-level ozone concentrations in cities through discomfort and poor health;
- commuters pay for traffic congestion in lost hours;
- homeowners pay for car, truck and airplane noise when they cannot enjoy their homes and yards; and
- everyone pays for the general degradation of the environment.

What we advocate in this report is that those who supply and those who use passenger transportation services pay the costs of their activities. Those who do not use passenger transportation services should not have to pay for them. In addition, those who pay in non-monetary ways should gain relief or compensation. This, we believe, would be a much more equitable system than the one we have today. Our recommendations should also result in a more efficient passenger transportation system and a lower financial burden on Canadians, and would enable governments to reduce taxes with the money saved.

OBJECTIVES

We believe that Canadian passenger transportation policy will be in the forefront worldwide if it leads to a passenger transportation system that is safe, protective of the environment, fair and equitable to taxpayers and all groups of travellers, and efficient.

Therefore, we **recommend** that:

4.1 Transportation policies be guided by the following four objectives:

(a) safety;

(b) protection of the environment;

(c) fairness to taxpayers, travellers and carriers; and

(d) efficiency, so that services are provided only where the benefits to the individual traveller equal or exceed the cost, and given levels of service are provided at the lowest possible cost.

Efficiency may strike some as a rather abstract objective, of interest primarily to economists. But this is not the case; efficiency means making the best use of one's resources and opportunities or, more simply, avoiding waste. As householders know from managing their family's finances, avoiding waste will get the most out of the family's income, or — in economic terms — will maximize its benefits, given its resources.

There are three types of waste to avoid. The first type of waste occurs when people spend more than is necessary to obtain goods or services. The parallel situation in transportation policy is when more is spent than is necessary — using a more expensive capital facility than necessary, or employing more people than necessary — to produce transportation services.

The second type of waste occurs when the householder would be better off not buying (or buying less of) the particular goods or services, and instead using the money on something else. The parallel situation in transportation occurs when governments decide to spend money on a particular transportation service, even though an alternative transportation service would be more worthwhile,

or when Canadians would be better off using the money to obtain other things.

Thirdly, not spending money can also, in some cases, be a source of waste. Not spending on maintaining a car or house may require a higher level of spending in the future. For example, not spending money on a new furnace may be more than offset by higher fuel bills over time and thus constitute waste. In transportation, failure to devote sufficient resources to maintaining a road may result in having to spend much more in the future, or in a major reduction in the usefulness of the road. Failing to provide an airport in a community that has grown substantially may lose an opportunity to save major amounts of time for people travelling to and from the community. If people value the time savings sufficiently, the lack of spending on the airport would constitute waste or inefficiency.

Choosing efficiency as one of the objectives to guide passenger transportation policy simply recognizes that passenger transportation systems that avoid waste will contribute the most to Canadians' economic well-being.

Protecting the environment and maintaining safety are part of Canadians' present and future well-being. The efficiency objective can, therefore, be broadly interpreted to include achieving adequate levels of safety and environmental protection. This was the approach we took in our Interim Report. For greater clarity, we identify environmental protection and safety as separate objectives.

What about other objectives? We agree with those Canadians who told us that nation-building and regional development should be objectives of the various levels of government. We also believe that these objectives can be pursued through a variety of policies.[2] We do not agree, however, that passenger transportation policies should be guided by objectives of nation-building and regional development. Our reasons are as follows:

Nation-building: In general, the passenger transportation system is mature, and most Canadians are well served by a number of modes. We do not believe that any single project, route, network or mode is likely to stand out today, as the transcontinental railway once did, as a symbol that unites Canada. We doubt that any new passenger transportation mega-project would contribute to building the nation, beyond its economic contribution, which can be assessed using normal criteria.

To be sure, there is a need to bind Canada together, but we believe that individual Canadians — aided by volunteer organizations and government departments other than transportation departments — can most effectively carry out the task of binding the nation together.

Regional development: We recognize that passenger transportation infrastructure and services can play a vital role in the development and functioning of national and regional economies. As we suggest in our efficiency objective, the benefits of infrastructure and services to travellers should be compared with costs when decisions on passenger transportation projects and services are made. From our research and consultations, we concluded that the separate and additional regional development benefits that may be derived from government expenditures on passenger transportation are unlikely to be substantial and should not be used to guide passenger transportation policies. Our reasoning is threefold.

First of all, passenger transportation projects and services that are likely to contribute to regional development will pass the benefit-cost test under the efficiency objective. The benefits that regions gain from passenger transportation projects, other than those associated with benefits to travellers, are generally limited. In almost all the populated parts of Canada, the basic passenger transportation infrastructure already exists. Adding more or improved infrastructure, if that does not increase traveller benefits more than costs, is a questionable means of stimulating development. Half-empty roads and underused airports would be the likely result.

Secondly, we recognize that regions may realize short-term economic gains from construction activities associated with passenger transportation projects, but these activities do not have the same economic effect today as they did in the past. Construction is increasingly automated, and equipment and materials are often purchased from other regions.

Furthermore, non-transportation projects also require construction. We do not believe that transportation projects should be singled out by governments for subsidies in order to carry out regional development objectives for which they are not designed.

Finally, under the terms of our mandate, we are to consider long-term passenger transportation policies for 30 or more years into the future. We have therefore focussed on the benefits that will continue many years after projects are completed. Projects not supported by a review of the needs of travellers, and the benefits to them, place a long-term drain on financial resources that could otherwise be positively used for the development of Canada or its regions.

Therefore, we **recommend** that:

4.2 Governments pursue nation-building and regional development objectives through other programs, rather than using the passenger transportation system.

If governments decide to pursue nation-building, regional development or any other objectives through the passenger transportation system, taxpayers in the jurisdiction that makes the decision should pay the cost of such programs, rather than those who use the passenger transportation system. As well, governments should let the public know why they are providing such subsidies and at what cost. We strongly believe that the use of subsidies should be the exception, not the rule.

PRINCIPLES FOR TRAVELLERS

How can we translate our four objectives into operational principles? Our broad goal is to move people to where they want to go, using any means for which they are prepared to pay, but avoiding waste. That is, we want a passenger transportation system that is safe, protects the environment, is fair to taxpayers, travellers and carriers and is efficient.

In many circumstances, market forces are a reliable guide for achieving the best use of resources. Market prices provide important signals about the kinds of travel services that travellers want, and competition provides an important discipline on those who provide these services. To prosper in a competitive environment, firms must respond to travellers' preferences, cut costs, improve productivity and innovate — all of which contribute to increased efficiency. Relying on market forces will also contribute to fairness. Individual travellers will pay for the choices they make, and they will pay the full costs of their travel without help from the taxpayer or other travellers.

The principles flowing from our four objectives have four thrusts. First, for much of Canada's history, transportation has played a nation-building or developmental role and Canadians have come to regard it as a public service like national defence, rather than a business like a hotel or restaurant. Too often in transportation, there has been a failure to appreciate the benefits from competitive markets — and the costs of restricting competition. Therefore, one of the main thrusts of our principles is to achieve the benefits from treating transportation like any other business where people buy and sell services, instead of as a government function. We have to identify areas, both in the activities of carriers and the providers of infrastructure, where there would be benefits from a greater reliance on competitive markets.

Second, treating transportation as a business will not work in all circumstances. Therefore, a second thrust of our principles must be

directed at those areas where the market does not work very well — where it would not provide adequate levels of safety or environmental protection or where it would not be efficient or fair to travellers or taxpayers.

If carriers and providers of infrastructure do not have to take account of the impact of their activities on the environment and the health care system, the prices they charge can result in Canadians travelling by polluting or dangerous means of travel because it is cheap. Governments can correct this by ensuring that environmental and health care costs are taken into account by carriers, infrastructure providers and travellers.

In some cases, particularly for airport and highway infrastructure, it may not be possible to have more than one provider. When services or infrastructure are provided under these monopoly conditions, providers might charge prices that are too high or might not provide the service that travellers want and are willing to pay for. Governments can take steps to ensure that the services provided and the prices charged to travellers are similar to what might be expected if competition did exist.

A third thrust of our principles is directed at those situations where leaving passenger transportation to operate in a business context would have unacceptable results and must, therefore, be modified to take account of an important public interest. Although "public interest" is a vague and potentially all-encompassing term, our focus is specific. We believe that government intervention is necessary in two circumstances:

- to take care of the special transportation needs of people with disabilities; and
- to help firms and travellers who would be especially disadvantaged by an abrupt introduction of market forces to adjust to a potentially dramatic change in their operating environment.

The fourth and final thrust of our principles must be to ensure that government fulfils its role in a responsible manner. An informed public is the best check on governments. We believe there is a need for political decisions on transportation to be transparent, so that taxpayers and travellers can make informed choices. Some specific changes could help:

- Decentralization may contribute by providing those affected by government decisions with an increased say in those decisions.
- Those making decisions could be more effectively held accountable if taxpayers and travellers better understood the implications of decisions.

Our principles must impose greater responsibility for achieving our objectives on all the participants in the intercity passenger transportation system — travellers, carriers, providers of infrastructure, governments and their agencies.

These objectives will be best achieved if the passenger transportation system is supported and maintained by those who use it. Travellers should pay for the travel services they use. People who do not travel should not have to pay for those who do.

Therefore, we **recommend** that:

4.3 Each traveller pay the full cost of his or her travel, and travellers, in total, pay the full cost of the passenger transportation system, including those costs related to protecting the environment, safety and accidents.

We recognize that some Canadians may not be able to pay for the transportation they require. In general, when people need financial assistance to travel, this help should be provided to them through

general or specific assistance programs, not by charging other users of the passenger transportation system.

In some cases, such assistance may still not make transportation services available to all. For example, although some people with disabilities could receive financial assistance to pay for travel, they may still lack physical access to passenger transportation services and infrastructure. Carriers and providers of terminals have a responsibility to provide accessible passenger transportation and should have a caring attitude toward people with disabilities.

Therefore, we **recommend** that:

4.4 Travellers with physical or mental disabilities have opportunities similar to those enjoyed by all Canadians to use public passenger transportation.

PRINCIPLES FOR CARRIERS

We believe that passenger transportation carriers should provide services in a competitive environment, operating under the same commercial principles, economic forces and general rules as most other businesses in the Canadian economy. They may, however, also be subject to government rules designed for transportation, such as those associated with safety or environmental protection. As long as these carriers are charged appropriately for safety, accident and environmental costs, competition in the marketplace should be relied upon to determine the most efficient pricing and investment decisions.

Therefore, we **recommend** that:

4.5 Competition and market forces be the prime agents in providing viable and efficient carrier services:

(a) anyone "fit, willing and able" to supply passenger carrier services have an opportunity to do so;

(b) carriers (including private car and private airplane owners) pay their share of the full cost of the terminals, links and traffic control services that they use, as well as any costs related to environmental damage, safety and accidents;

(c) as long as they are willing to pay their share of the costs, carriers have equal access to terminals, links and traffic control services; and

(d) anyone providing carrier services be able to withdraw these services, without undue delay, but with adequate notice to the public.

PRINCIPLES FOR PROVIDERS OF TERMINALS, LINKS AND TRAFFIC CONTROL

Terminals such as airports, links such as roads or railway tracks, and related services such as traffic control are essential for getting travellers to where they want to go. Carriers and travellers told us that if they are going to be asked to pay the full cost for these terminals, links and traffic control services, they want to be sure that what is provided is only what is needed, no more, no less. We agree.

Therefore, we **recommend** that:

4.6 Terminals, links and traffic control services be priced on a terminal-by-terminal, link-by-link and service-by-service basis.

We recognize that prices could also be determined by averaging across a number of links or facilities, and that, in the short term, this type of pricing may be the most feasible approach in cases such as roads.

In some circumstances, prices can be determined through market forces, as happens when one airport faces competition from a nearby airport, or when a user of a facility is in a strong bargaining position with the provider of the facility, such as a dominant airline's relationship with some airports.

Therefore, we **recommend** that:

4.7 Where there is sufficient competition, or where users are in a strong bargaining position with providers of terminals, links or traffic control services — and so long as there are appropriate charges for environmental damage, safety and accidents — competition and market forces be relied upon to determine prices and investment decisions for passenger transportation infrastructure.

Where terminals, links and traffic control services are provided on a monopoly or near-monopoly basis, market forces cannot be relied upon to determine prices. Monopolists can charge prices above costs and normal profits, or inflate costs by over-building. Where competitive forces are not sufficient, or where users are in a weak bargaining position, governments, as referees, must regulate prices and investment decisions on an intermodal basis.

Therefore, we **recommend** that:

4.8 Where regulations are required, they be designed to ensure that pricing and investment decisions be similar to what would otherwise occur through competitive market forces. Specifically, we recommend that:

(a) prices reflect the traveller's or carrier's use of each terminal, link or traffic control service and be designed to encourage neither over-use nor under-use. Where such prices do not recover the full cost, we recommend that they be adjusted to provide for full cost-recovery in such a way as to minimize the loss of efficiency; and

(b) investments be made only in those projects where benefits to travellers exceed costs and that yield the highest level of benefits over costs, regardless of mode. In making investment decisions, all costs, including safety, accident and environmental costs, as well as interest on funds invested, should be taken into account; adequate provisions should be made for maintenance; new technologies should be considered along with existing technologies; and full consideration should be given to the potential for intermodal operations to contribute to efficiency and ease of travel.

IMPLICATIONS FOR GOVERNMENTS

FUNCTIONS OF GOVERNMENT

We have said that competition and market forces should be the prime agents in developing a viable and efficient passenger transportation system. There are some functions in the passenger transportation system, however, that can only, and should only, be performed by governments.

Governments should be responsible for:

- establishing policies in relation to the framework — setting policy with respect to transportation agencies, establishing guidelines for project evaluations, notably for the assignment of joint costs to modes and user classes, taking a cross-modal view of transportation issues and coordinating the development of environmental and safety policies with respect to transportation;
- standards setting and enforcement — imposing safety and environmental standards, and applying charges to reflect the costs of environmental damage;
- data gathering and reporting — setting reporting requirements, and presenting data in a way that allows ready comparison by users among the various modes of transportation;
- research — together with providers of services, governments finance and carry out selected research on passenger transportation (the results of much passenger transportation research cannot be patented or sold but are of public benefit);
- maintaining competition — ensuring that carriers do not engage in anti-competitive behaviour (for example, by guaranteeing equal rights of access by carriers to terminals, links or traffic control in cases where failure to provide access could restrict competition, especially where carriers own the terminals or links, such as railway tracks or bus terminals); and
- regulating monopolies — regulating pricing and investment decisions of terminals and links that are provided on a monopoly or near-monopoly basis.

Therefore, we **recommend** that:

4.9 Governments be responsible for establishing policies in relation to the framework, setting and enforcing standards, gathering and reporting information to the public, ensuring a sufficient level of research, maintaining competition and regulating monopolies.

ASSIGNING RESPONSIBILITY TO LEVELS OF GOVERNMENT

We believe that assigning responsibility to the level of government closest to the people is consistent with our objectives, since our approach does not require that transportation responsibilities be assigned to particular levels of government — whether federal, provincial, territorial, regional or municipal.

In some cases, benefits or costs may extend beyond the boundaries of one jurisdiction. Only a higher level of government, or governments acting jointly, may be able to ensure consistency. At a minimum, cooperation among the different levels of government that have responsibilities for establishing the framework, making the rules, and refereeing would be required.

In other cases, the delegation of powers or jurisdictional modifications might be required. If formal constitutional change is needed to meet our objectives, then governments should consider implementing such change.

Therefore, we **recommend** that:

4.10 Decision making authority of governments be assigned to the level of government that is both closest to the people and most able to efficiently exercise such authority.

EQUAL TREATMENT OF MODES

When governments collect taxes for general revenue purposes — a general sales tax as opposed to charges to travellers — they should tax all modes of transportation on the same basis.

When governments impose charges to pay for infrastructure and services that are government-owned, the charges should reflect the efficient cost of providing the infrastructure or a service, and the revenue from the charges should be used for that purpose.

Governments should levy charges to cover any other costs that transportation activities impose on society, whether the activities arise from operations of a publicly or privately owned carrier, facility or service. Where regulations are used in place of charges, they should impose similar obligations on each mode.

Therefore, we **recommend** that:

4.11 Governments tax and regulate all modes equally.

ACCOUNTABILITY

Those responsible for making and applying the rules and for spending taxpayers' money should be accountable for their actions to these same taxpayers. Governments should improve such accountability through transparency — making relevant information available and understandable.

When governments consider providing taxpayer subsidies, such subsidies should be openly debated and visible. Full disclosure of the costs of the system — revenues, subsidies, who pays and who

benefits — will help people to make their own transportation decisions and to judge those made by governments. Disclosure will also provide a mechanism that enables the public to hold government agencies accountable.

Therefore, we **recommend** that:

4.12 Decision making be transparent so that Canadians understand why governments or their agencies make the passenger transportation choices they make, and so that those making decisions can be held accountable.

Transition Mechanisms

We recognize that today's passenger transportation system is a long way from embodying the objectives and principles outlined in this chapter, and that such a passenger transportation system could not be achieved at once.

Immediate action to implement the new objectives and principles could lead to sharp price increases that travellers would consider unreasonable, or could jeopardize the viability of a carrier or a particular carrier service, terminal or link. Time may be needed to allow prices to adjust, and to permit current service levels to be reduced, or otherwise modified, to match demand at an unsubsidized price. Governments will also need time to assess environmental and social costs. Any transition assistance should be subject to strict guidelines.

Therefore, we **recommend** that:

4.13 In cases where time is required to ease the problems caused by steep price adjustments, or where a carrier, a particular carrier service, a terminal or a link is given another chance to survive within the new framework, financial assistance be designed to encourage adjustment. Such assistance should be:

(a) given, where possible, to move people in the most efficient way, regardless of mode;

(b) provided and managed by the level of government responsible for the mode;

(c) borne by general taxpayers in the jurisdiction that makes the decision, not by other transportation users; and

(d) provided on a declining basis, for a predetermined, reasonable adjustment period, and then terminated.

4.14 If a carrier, a particular carrier service, a terminal or a link cannot survive despite a reasonable period of time for adjustment, the terminal or link be closed or the service discontinued.

Carriers and providers of terminals, links and traffic control services should be given maximum flexibility from regulation in order to adjust fares and the frequency and quality of service. This flexibility should also permit substituting services that use another mode of transportation.

Conclusion

Establishing the foundations for a new framework and the transition mechanisms required to achieve them are only first steps toward solving transportation problems. We must emphasize that these first steps are essential if Canadians are to make the right decisions in the future.

In the following chapters, we apply our approach to a range of issues in intercity passenger transportation.

ENDNOTES

1. The test of "demand" should be the price that travellers are prepared to pay and the test of "supply" should be the amount that would be provided in a competitive market, when all costs are taken into account.

2. If, for example, governments decide that it is desirable to encourage students to travel around Canada by subsidizing 20 percent of their fare, this could be accommodated by the transportation system but we do not view it as a transportation policy. The cost should be ascertained and the full cost should be paid to the passenger transportation system by all taxpayers. The passenger transportation system and its travellers should not have to shoulder the burden for a nation-building policy that governments feel benefits all Canadians.

CHAPTER 5

TRANSPORTATION INFRASTRUCTURE: INVESTMENT AND PRICING

INTRODUCTION

One of our objectives for the national passenger transportation system is fairness to users, carriers and the general taxpayer. We believe that fairness cannot be achieved if the current system of payment for government-provided transportation infrastructure remains in place. This system gives some modes a competitive advantage over others, and often means that the general taxpayer, who may not travel often or at all, pays for Canadians who do. As we stated in Chapter 4, our principles are that:

- each traveller pay the full cost of his or her travel, and travellers, in total, pay the full cost of the passenger transportation system, including those costs related to protecting the environment, safety and accidents (Recommendation 4.3);
- carriers (including private car and private airplane owners) pay their share of the full cost of the terminals, links and traffic control services that they use, as well as any costs related to environmental damage, safety and accidents (Recommendation 4.5b); and
- as long as they are willing to pay their share of the costs, carriers have equal access to terminals, links and traffic control services (Recommendation 4.5c).

We also believe that pricing to cover full costs, when applied intelligently, can offer major benefits in addition to fairness among different groups of users and between users and general taxpayers. Pricing can:

- help ensure that existing infrastructure is used in a way that offers the greatest economic benefit to Canada;

- provide valuable guidance for new investment decisions; and
- provide a basis for decentralizing the operation and management of infrastructure. In the absence of prices for outputs and inputs, it is difficult to give local management the power to decide how many and which services to offer, and which combination of resources to use in the production of services. Decentralization provides greater flexibility to meet local needs and can encourage managers to achieve the lowest cost for operations.

We emphasize that our approach to pricing is not designed to provide infrastructure providers with a means of passing any and all costs on to users. Rather, our approach is designed to ensure that costs are subject to greater discipline and that operating efficiency is increased.

We also want to reiterate that the costs we are discussing are already being paid. They are not new costs. Our concern is that the taxpayer, who may or may not travel, not be saddled with expenses that benefit those who do travel. While our framework will raise the cost to the traveller, we expect that it will lower the burden on the taxpayer.

In this chapter, we explore the costs of transportation infrastructure, how investment decisions should be made to ensure that the appropriate amount of infrastructure is in place, and methods for setting charges. In Chapter 6, we discuss access to infrastructure and the institutional arrangements for its ownership and management.

TRANSPORTATION INFRASTRUCTURE: AN OVERVIEW

COMPONENTS OF THE TRANSPORTATION SYSTEM

As we noted in Chapter 2, transportation infrastructure refers to the non-carrier component of the intercity transportation system: terminals, links, and traffic control systems (Table 5-1).

Table 5-1
COMPONENTS OF THE TRANSPORTATION SYSTEM

Mode	Carrier	Infrastructure		
		Terminals	**Links**	**Traffic control**
Road	Cars	Car parking	Roads (including bridges)	Police, road signs and signals, traffic control laws and regulations
	Buses	Bus terminals		
Air	Airplanes	Airports (including runways)	Air navigation systems	Air traffic control
Rail	Trains	Stations	Railway tracks	Dispatch, signal systems
Water	Ferries	Ferry terminals (including wharves and ferry slips)	Waterways and canals (including navigational aids)	Vessel traffic services

Today, the federal, provincial and territorial governments own and manage most of Canada's intercity transportation infrastructure. The federal government supplies airports, air navigation and air traffic control, and services for water links. Provincial and territorial governments design, build and manage roads and highways. Some carriers own and manage rail tracks and terminals, most bus terminals and some ferry terminals.

CAPITAL AND OPERATING COSTS

System-wide cost estimates for passenger transportation (Table 3-1, Chapter 3) show that the capital and operating costs of transportation infrastructure are $6 billion per year or, on average, 14 percent of the total cost of intercity travel. This estimate includes an "interest charge,"[1] as well as depreciation on the existing physical capital. Our estimates, however, are only approximate. Governments, which build and own most infrastructure, rarely keep records that show the value of the infrastructure. Our estimates are intended to reflect current replacement costs.

In most cases, intercity travellers share passenger transportation infrastructure with other users. For example, freight and passenger motor vehicles, as well as urban and intercity travellers, use the

same roads. It is often difficult to allocate infrastructure costs accurately among the different users. In our calculations, we have allocated the following percentages of infrastructure costs to intercity passenger transportation:

- 70 percent of the intercity road network to passenger vehicles;
- 84 percent of airports and the air navigation system to commercial passenger aircraft;[2]
- 2 percent of the rail network to passenger rail; and
- 12 percent of selected government expenditures for marine links and control systems (primarily aids to navigation and coast guard services) to passenger travel on ferries.

Making Investments in Transportation Infrastructure

PRIVATE-SECTOR INVESTMENT DECISIONS

Private-sector companies base their transportation infrastructure investment decisions on expected profitability and a return on their investment. We believe this criterion is appropriate as long as these firms are not making monopoly profits that distort their decisions, and are taking all costs into account, including those related to environmental damage, safety and accidents.

GOVERNMENT INVESTMENT DECISIONS

In the past, governments have often used transportation as a tool of public policy, making investment decisions that served political, economic and social goals in addition to transportation goals. We believe such goals are inappropriate for the passenger transportation system of the future. Today's passenger transportation system is now mature, and Canadians in most of the country are served by several modes of transportation. Although there may be some areas where new investment is required for expansion, most expenditures

are now made to maintain, replace, and upgrade infrastructure. We believe that infrastructure expenditures, if they are to be made by government at all, should, from now on, be made only if they are expected to provide a return on investment.

Two factors determine a return on investment: benefits and costs. While the total expected cost of an investment project is often easy to calculate, the expected benefits are much more difficult to estimate. The benefits for private-sector projects are based on expected increased revenues and cost savings from the investment. Revenues are determined by what people will pay for the new good or service and by how much of it they will purchase.

What are the benefits of a new road or an airport terminal? How can they be calculated? Under our principles, users should pay for what they use, and the price they pay should cover all costs, including those associated with environmental damage, congestion and safety measures. We believe that governments should measure benefits using the same yardstick as that of the private sector: the prices users are willing to pay and the revenues that the infrastructure is expected to generate.

The Principles of Infrastructure Pricing

The total costs of transportation infrastructure are substantial. At the same time, adequate infrastructure is essential if efficient transportation services are to be available. Excessive infrastructure is wasteful because the resources used could have been used to produce other needed goods and services. In the case of government ownership, excessive infrastructure is thus an unnecessary burden for taxpayers. Yet too little capacity, or capacity of the wrong type or in the wrong place, is also wasteful since it causes delays in the movement of people and goods. These delays reduce the ease of travel, add to the uncertainty and costs of doing business, and thus reduce Canada's productivity and competitiveness.

EFFICIENT PRICING

Efficient prices = prices that lead people to travel without wasting resources or losing opportunities

Efficient prices encourage people to use the road, rail, air and water modes in a way that does not waste resources or opportunities. These prices are also fair if users who are responsible for the same level of costs pay the same amount.

When travellers must pay for all of the costs incurred in producing transportation services, they will balance their use of these services against their costs. They will not use a facility more than they need to, because this wastes their money; nor will they use a facility less, since this wastes an opportunity.

Charges to travellers also test the public's willingness to pay for infrastructure investment. Over time, the capacity of transportation infrastructure requires expansion, contraction or change. Governments should use consistent rules to evaluate new investment projects. Charges provide a means of developing such rules by measuring Canadians' desire for expanding, changing or reducing the capacity of infrastructure or the size of transportation networks.

MARGINAL COST

Marginal Cost as a Starting Point

An important starting point in establishing prices for transportation infrastructure is the marginal cost — the additional cost that occurs when there is an increase in the amount used of a product or service, such as a road or a runway.

Marginal cost =	**the additional cost that results from a small increase in the amount provided of a product or service**
Example of a marginal cost:	**the cost for the wear imposed on a road every time a vehicle uses the road**

For example, the marginal cost of a road is the cost of the wear on the road incurred each time a vehicle uses the road. If operators of vehicles do not pay for the damage they inflict to the road, they have no incentive to reduce vehicle use or to switch to less-damaging vehicles. Generally, when users do not fully pay for the marginal costs of infrastructure — that is, when they face a lower charge than the costs they impose — their transportation choices cost the economy more than the return or value they receive. In our example, if users do not pay for damage to roads, they may choose to make an unnecessary trip, or use a vehicle that is cheaper to operate but causes more road wear. The benefits of such trips to the user are small, but the costs to the taxpayer may be substantial.

Operational Limitations in Applying Marginal-Cost Pricing

For many types of transportation infrastructure, as in other public utilities such as electrical power and telephone services, marginal costs are difficult to estimate or apply. There are four reasons for this:

First of all, marginal cost may be difficult to measure. For example, analysts may not agree on the amount of damage that heavy trucks impose on different types of roads.

Secondly, marginal cost may vary with circumstances. For example, the amount of damage trucks cause to roads may increase during spring thaw. Or, the cost of handling additional passengers in a terminal may increase if the terminal is already at the normal level of use and extra staff have to be hired. If these variations in cost are

predictable, it may be possible to vary prices to match the variation in cost — although changing prices may involve added complexity for the operator of the facility, and for users. Not all such variations in costs, however, are predictable, and transportation providers may not be able to set prices easily or accurately.

Thirdly, electronic technology is sometimes able to provide instantaneous information on variations in cost, and to identify the amount of use by individual users at any given moment. Although users are sometimes in a position to respond to varying prices, there are many circumstances in which fine-tuning prices to match variations in marginal costs is impossible, or not worth the inconvenience to suppliers and users. For example, it may be possible to keep track of variations over the day in the cost of producing electricity — as different cost sources of supply are used. But, for a household, as opposed to a large industrial user, it might not be worthwhile to keep watching the (hypothetical) price meter and adjusting use of electrical appliances as the price changes over the day.

Finally, even where marginal costs can be measured with some precision, infrastructure providers sometimes find it difficult to collect charges from users. Roads, especially those other than limited-access highways, are a good example of this. The main method of charging directly for road use is a type of toll booth. But toll booths, unfortunately, produce additional costs for the road owner and delays for the users. These additional costs would be especially large, relative to the costs of use of the road itself, for short trips using road systems with frequent access points and intersections. For these reasons, toll roads have been the exception rather than the rule, and — if used at all — are used only on limited-access highways. Instead, governments use fuel taxes, which can only be related approximately to the amount of road use and its costs, as the principal means of charging drivers for road use.

Developments in electronics may eventually make it possible, without great expense or invasion of privacy, to identify moving vehicles on a segment of road, and then charge for use. This might be done

using an electronic card, for which credit balances could be purchased, and which was automatically debited by signalling devices in, on, or near the road.

PRICING TO RECOVER TOTAL COSTS

When Marginal-Cost Pricing Causes Deficits

An important further limitation in applying marginal-cost pricing is financial, rather than operational. In many cases, it costs a substantial amount to provide a basic level of infrastructure such as a two-lane highway or an airport large enough to handle certain types of aircraft. The marginal costs associated with additional users, however, may be small.

Example of how marginal-cost pricing can result in a deficit:

- **A facility serving 100 users costs $1,000 per day, for an average cost of $10 per user.**
- **It costs only an additional $5 to provide service to each user after the first 100 users.**
- **If there are 200 users a day, the total cost is $1,000 for the first 100 users and $500 for the additional 100 users. The total is $1,500, or an average cost of $7.50 per user.**
- **If the price for all users is set at the marginal cost — $5 — revenue would be only $1,000, resulting in a deficit of $500.**

Transportation infrastructure pricing involves a difficult choice when marginal cost is less than average cost, a situation that can arise when producing the service requires an expensive basic facility whose capacity can be expanded cheaply. To charge more than marginal cost is not efficient because some potential users, who would have been willing to pay the marginal cost and who would have gained from using the facility, would not do so at the higher price. This non-use means a loss to the economy. And yet setting the price equal to marginal cost means a financial deficit in operating the facility.

If a government decided to set prices equal to marginal costs, and to accept the financial deficit, general taxpayers would then be financing the deficit and would in effect be paying for a part of the provision of benefits to users. The results of this are:

- a transportation system that violates our principle of fairness to taxpayers, users and carriers;
- a need for higher general taxes, which causes distortions in price-cost relationships elsewhere in the economy that will, in turn, cause losses of benefits to the economy; and
- pressures for government intervention into the management of that infrastructure requiring subsidies. Such intervention may reduce the pressures for cost efficiency that would occur if the infrastructure was run on a more commercial basis.

As well, in making investment decisions to add or close infrastructure, it is necessary to test how much users value the basic infrastructure, not just how much they value additional amounts of service or use. Marginal-cost pricing does not provide a complete test.

On balance, we favour a policy under which users pay the full cost of the infrastructure they use, assuming that such costs are no higher than necessary. In many cases, this policy of full cost recovery may require prices to be set above marginal cost.

Pricing to Avoid Deficits

There are several ways of pricing that enable infrastructure owners to achieve full cost recovery:

Setting prices equal to average costs: This approach is not as simple as it appears. There may be different categories of users, such as vehicles that take up different amounts of space and/or have different weights. The average cost could be calculated by the total cost divided by number of vehicles, by total square metres occupied by

all vehicles, or by total weight of all vehicles. Each calculation would result in different charges for each category of vehicle, and thus in a different pattern of use.

Determining responsibility for costs: Careful consideration of costs associated with different types of users may provide a better basis for allocating total costs than some simple average. For example, if heavier or larger vehicles require a road or runway to be built to a higher standard, the extra costs of building to the higher standard can be assigned to heavy vehicles when setting prices. If more capacity is needed to serve users at peak periods, these users can be charged an additional amount to cover the extra cost.

Pricing according to benefits: Prices incorporating costs that can be directly attributed to particular groups of users may still not cover total costs. One could set prices in a way that least reduces the use of the infrastructure and thus minimizes the economic loss associated with a reduction of use. If this were done, the benefits obtained by various users, as well as the costs for which they are responsible, would determine the price.

One option is to use a mark-up over marginal cost that varies with the extent of benefit. The benefit could, in principle, be measured by how much the use of the facility by a group of users declines as the price increases. The smaller the decline, the more the group appears to value the benefit of use. This option is related to the practice known as "value of service pricing" or "charging what the market will bear." Railway companies, whose average costs are generally higher than their marginal costs, traditionally use this type of pricing when setting freight rates for different categories of products.

Our principles do not support unconstrained charging of what the market will bear. Rather, we intend that infrastructure providers charge a sufficient amount to cover full but efficient costs.

Two-part pricing: With this approach, infrastructure providers charge one amount for the right to use a facility — such as an annual fee — and a second charge on a per-use basis. This system is found at some golf courses that charge an annual membership fee as well as "green fees" for every round of golf played. A transportation example of two-part pricing is the annual car licence fee, coupled with a fuel tax that varies according to use. The per-use fee can be set at, or moderately above, marginal cost, and the annual fee can be used to cover the gap between total cost and revenues generated by the per-use charges. The annual fee may also differ across classes of users, depending on the benefits that each group derives from the infrastructure.

Recommendations for Pricing

As part of Recommendation 4.8 (Chapter 4), we propose that prices be set to encourage neither over-use nor under-use of transportation infrastructure. In addition, we suggest that where such prices do not recover full costs, they be adjusted to cover this cost so as to minimize the loss of efficiency. In this chapter, we have argued that setting prices equal to marginal costs encourages the appropriate amount of use of a facility. We have also discussed the general options available to achieve full cost recovery where setting prices equal to marginal costs would not cover total costs.

We realize that infrastructure owners will be required to make shrewd assessments when selecting appropriate prices for individual facilities. They will have to decide how far to go in developing finely tuned prices by balancing the benefits of more accurate incentives against the costs of greater complexity in compliance and administration. Those who wish to raise prices above marginal-cost prices must assess which pricing approach will least discourage use. At the same time, they must decide on the fairness of imposing different prices on various groups of users. We believe that marginal cost should be the starting point to guide transportation infrastructure pricing policy. Where required to achieve full cost-recovery, mark-ups over marginal cost and/or entry fees should be set, taking account of benefits to different classes of users.

PRICING NETWORKS

Two types of transportation infrastructure — links and terminals — can be grouped into networks. For example, the road links in the Trans-Canada Highway make up a network, as do the road links in the non-urban road system of a province or territory, the route links in the air navigation system, or a group of airports used by commercial air carriers.

When owners provide a network of links or terminals, they tend to apply a common pricing formula to the entire network or major portions of it, rather than set individual prices based on the costs and demands associated with each link or terminal. For example, motor fuel taxes, which we view as the main charge for the road network, have a common basis within a province. For a given type of vehicle, the effective charge is almost constant per kilometre travelled, and does not vary with the cost of, or demand for, the section of road being used. Another example is the Air Transportation Tax, which is the primary charge for the air navigation system. It is not closely related to costs of, or demand for, the air navigation services provided on particular flights since it is a charge on each passenger and results in higher charges for larger airplanes.

The Stand-Alone Approach

Under our principles, travellers and carriers should pay the cost of the infrastructure they use. Should this coverage of costs apply to the network as a whole, or to as small a segment of the network as is practical?

In Chapter 4, we stated our preference for the stand-alone approach — users pay link by link or terminal by terminal.

The stand-alone approach is consistent with the principle that individual travellers and carriers pay the costs of infrastructure provided for their use. It also eliminates cross subsidies from one link or terminal to another, either within a mode or between modes.

Individualized pricing tests users' willingness to pay, and provides valuable information for decision makers who are considering the addition, expansion, or abandonment of links or terminals. If prices are set on a network-average basis, potential users of a proposed high-cost link or terminal may want its construction even though its benefits would not be worth its full costs. They know that such an addition will have a minimal impact on the network's average cost, which is all they will have to pay.

Prices related more closely to actual costs send the right economic signals to travellers in their choices of route. For example, the wear imposed by heavy trucks on roads is substantially less on main highways that are built to higher standards than it is on secondary roads. If a standard charge per kilometre for a given type of vehicle is applied, equal to the average cost of wear by that type of vehicle over the whole network, the charge will be greater than the actual cost of wear on main highways and less than the actual cost of wear on the secondary roads. The failure to relate charges to actual costs will tend to lead truck operators to choose routes that are inefficient to the economy when all costs are taken into account.

Setting average prices over networks consisting of high- and low-cost routes can also lead travellers to a choice of modes that is not beneficial to the economy. If such prices are different from route costs, users on a given route may be induced to choose a mode that has higher costs to the economy for that route.

The arguments in the preceding two paragraphs are subject to exceptions. These arguments are based on prices being better aligned to marginal cost under the stand-alone approach. However, given the frequent need for a mark-up over marginal costs to cover full costs, and the fact that the required mark-up may vary from link to link or terminal to terminal, prices under a stand-alone system may not always be closer to marginal costs for the different units than under a network-average pricing system.

Current practices in individualized pricing, and the practicality of moving toward such pricing, differ substantially across the modes and the various facilities that they use. For example, bus terminals are effectively priced on an individual basis, while a user of the road system generally pays an almost constant charge per kilometre for a given vehicle anywhere within a province.

In the following sections, we apply our general pricing principles to the terminals, links and control components in the different modes and discuss how far and how fast the stand-alone approach might be implemented. We do not illustrate potential charge levels. We discuss charges for environmental and accident costs in Chapters 7 and 8 and draw overall conclusions in Chapter 18 as to the set of charges that users of a mode might pay.

Applying the Principles to Terminals

BUS TERMINALS

Current pricing for bus terminals is close to the stand-alone approach that we recommend. In many cases, intercity bus companies own the terminals and face the full cost of providing services. Where municipalities own terminals, the terms that individual carriers negotiate likely reflect some combination of the costs of using a terminal and the benefits of that use to the carrier.

Bus terminals vary in size and, in a few cases, are integrated with terminals for other modes of intercity transportation. For example, the terminal can be a simple passenger pick-up and drop-off point next to a rural gas station or urban hotel. In other cases, central bus terminals in major cities provide passengers with a substantial range of supplementary services ranging from restaurants to newsstands.

Under our principles, there should be open access to essential infrastructure for all carriers prepared to pay for their cost. We believe that in most locations potential operators have sufficient options to

obtain space in, or to create new, terminal facilities. We are not concerned about monopoly power in such situations. In cases where access to a single terminal is of critical importance, however, a referee may be desirable, especially where the terminal is also owned by a major carrier. Federal legislation and policy on competition provide some protection of access rights for competitors when a major carrier owns a terminal, but such rights may require reinforcement.

RAIL STATIONS AND FERRY TERMINALS

Rail stations and ferry terminals, which are also frequently owned by carriers, do not raise any issues additional to those we have addressed concerning bus terminals.

AIRPORTS

Current Pricing

Transport Canada owns and operates the majority of Canadian airports serving scheduled air carriers. The primary charges are landing fees set according to a schedule that varies little from airport to airport. The federal government has also allocated a share of revenue from the Air Transportation Tax to cover the costs of the entire airport network. Revenues from concessions at airports also cover some airport costs.

The recent federal initiative to lease Transport Canada airports in Vancouver, Calgary, Edmonton and Montreal to newly created Local Airport Authorities (LAAs) should help move airport pricing in a direction that is more consistent with our pricing principles. The LAA airports will, after a brief transition period, have to recover full costs from users, including operators of concessions. The LAAs will not receive any share of the Air Transportation Tax and will set landing fees and possibly passenger facility charges according to their individual requirements.

Once an airport terminal is built, marginal costs for use by an additional aircraft with passengers are often low. Therefore, charges should also include some amount for the value of the service provided to the passenger. Aircraft weight may be a reasonable indicator of this value.

At airports, the demand at peak periods can strain capacity and may lead to expensive investments for expansion. In such cases, higher prices for peak-period users — aircraft and/or passengers — could encourage the highest-value use of the existing infrastructure and provide a test of the value that users attach to expansion investment.

Applying the Stand-Alone Approach

To find out how charges would vary by type of airports, if all airports operated on a stand-alone, full cost-recovery basis, we obtained estimates of the full costs attributable to commercial aviation at 98 airports owned by Transport Canada, as well as the current revenues obtained from landing fees and terminal charges. Table 5-2 presents these estimates for five categories of airports:

I. Vancouver and Toronto (which are the two largest airports and the ones currently closest to full cost-recovery).

II. The next six largest airports (in passenger capacity).

III. The next 20 airports (in passenger capacity). These airports were designed to handle more than 200,000 passengers per year.

IV. Twenty-six airports (generally serving smaller cities and towns, but oriented to scheduled commercial aircraft).

V. The remaining airports that also serve smaller cities and towns. (These airports are often in northern areas; some are not oriented primarily to commercial aviation. The estimated costs per commercial passenger for this group are less reliable.)

Table 5-2
SUMMARY OF AIRPORT COST RECOVERY, 1988

Airport category	Number of airports	1988 Enplaned/ deplaned passengers (millions)	Cost attributable to commercial aviation (airlines)[a]			Full cost[c] less revenue from commercial aviation per passenger[a] ($)
			Full costs[b] ($ millions)	Operating costs per passenger ($)	Full cost per passenger[b] ($)	
I.	2	29.1	310	2	11	6
II.	6	22.9	350	3	15	10
III.	20	7.4	160	9	21	18
IV.	26	2.2	100	18	46	44
V.	44	1.2	180	51	146	140
Total	**98**	**62.8**	**1,100**	**5**	**18**	**13**

a. 1988 cost and revenue estimates are in 1990 dollars.
b. For categories I, II and III, full costs include an approximate allowance for land costs of $5 per passenger. See Notes to Chapter 3 in Volume 2.
c. Full cost per passenger from previous column.

We first discuss the airports in categories I to IV, given the special circumstances of many airports in Category V.

If charges were set to fully recover costs in the first four categories of airports, there would be an appreciable increase in the cost of air travel for users of the airports in Category III and especially Category IV. Under full recovery of present levels of costs, charges per passenger, on average, would increase by the amount shown in the final column in Table 5-2. These charges, however, would not necessarily be applied directly to passengers as a uniform per-passenger charge equal to the average amount shown. Some of these costs would be incorporated in landing fees charged to the carrier and/or in terminal fees charged to carriers or passengers. Charges may be direct to the airline but are then reflected in the traveller's ticket price. It should be noted as well that, from the traveller's point of view, the overall

increase in prices would be offset to some extent by eliminating the portion of the Air Transportation Tax currently assigned to airport funding.

The federal government, however, did not build these airports with the intent of full cost recovery, and the airports are run under a centralized system that does not pressure management to find innovative ways of achieving cost savings and of increasing revenues. If management operated airports with greater efficiency and lowered operating costs, the increase in average charges would not be as large as the amounts shown.

We note, for example, that Oshawa Airport, which is not federally operated but is locally run, handles about the same number of passengers as the smaller airports in Category IV and covers its operating costs with charges to travellers.[3] Although there are many important differences[4] between the two airports, a comparison between Oshawa and the Transport Canada-operated airport at Yarmouth is interesting (Table 5-3).

Table 5-3
COMPARISON OF YARMOUTH AND OSHAWA AIRPORTS, 1987

	Yarmouth	Oshawa
Annual operating deficit ($)	700,000	0
Operating hours (per day)	9	16
Total movements (per year)	10,000	98,000
E/D[a] passengers (per year)	35,000	38,000
Staff	20	3

Source: See endnote 3.

a. Enplaned, deplaned passengers.

The airports in Category IV, on average, cover only 14 percent of operating costs with charges to travellers. We believe that if these airports were run locally, had to meet costs through charges to travellers, and were not subject to central policy requirements more appropriate for larger airports, they could eventually reduce

operating costs substantially. The result would be terminals that are less expensive and better matched to the level of services required by the community.

Recommendations for Airport Pricing and Investment

Investments, such as new runways at airports, should be made according to our principles. The federal government is proceeding with the necessary studies in order to build three new runways at Lester B. Pearson International Airport and two at Vancouver International Airport. The full costs of these projects, including interest charges, should be recovered from the users of these airports. Even though the federal government has progressed beyond the point of initial consideration, it nevertheless should apply our principles to these major investments.

We **recommend** that:

5.1 (a) Airport pricing and investment be on an airport-by-airport basis; and

(b) The Air Transportation Tax not be used to help fund airports.

We recommended in Chapter 4 that government provide financial assistance, on a declining basis, to ease adjustment in situations where applying our principles would result in steep price increases.

Therefore, we **recommend** that:

5.2 Where applying our principles to airports, including all Transport Canada airports, would result in steep increases in average charges to travellers, governments provide transitional assistance:

(a) at an initial level based on the current subsidy of operating costs;

(b) to be phased out over 10 years;

(c) to be used for capital as well as operating expenditures; and

(d) if the airport is closed, to be used locally for other transportation purposes.

As we noted, governments built some airports on a larger scale and to a higher standard than was necessary, and with the expectation that taxpayers and not travellers would pay for the costs. In commercial terms, it makes no sense to try to recover the full capital costs of such existing airports. A write-down in value is necessary, and Transport Canada's charges to the airport authority for capital costs should reflect this write-down. If the federal government decides to turn such an airport over to a local authority, it may in some cases be appropriate to transfer it without charge. Any new investment, however, should not be made unless the prices to be charged can be set in such a way as to provide a positive return on the investment.

We therefore **recommend** that:

5.3 (a) The valuation of existing airport capital facilities used for establishing charges to travellers, and for transferring the airport to local airport authorities, reflect the commercial potential of the airport, not historical costs; and

(b) New investments be made in an airport only when costs, including a return on the investment, are expected to be repaid through future revenues.

According to our estimates, airports in Category V have extraordinarily high costs per passenger. Passing on such costs to travellers would cause a sharp curtailment in use. While it is possible to run many of these airports in a more cost-efficient manner, especially if requirements more appropriate for larger airports are removed, we realize that several airports may have no prospect of survival on a stand-alone commercial basis.

Governments may wish to retain some of these airports for reasons of national defence, health services, emergency evacuation, or other purposes not related directly to providing passenger transportation. In such cases, governments should support the airport with general taxpayer-financing and indicate clearly the purpose of the airport and the financing of it. Airport management should also allow commercial aircraft to use the terminal when this is compatible with the purpose of the airport. Charges for such services should include the cost of any extra facilities provided and should not be less than the levels of charges at small but financially self-sustaining airports.

Where governments judge that there is insufficient reason, on grounds other than commercial transportation, for keeping the airport open, they should apply the general transition mechanism that we suggested for other airports — a subsidy sufficient to avoid sharp initial increases in charges, but phased out over 10 years. Governments

should not undertake any new capital spending that cannot be recovered from future revenues. The terms of transfer of the airport to a local operator should reflect the airport's commercial value, which may be well below its historical cost. At some stage in the transition, it may become clear that an airport is not viable and should be closed.

Applying the Principles to Links

THE ROAD NETWORK

Until the beginning of the 20th century, roads were a necessary, but secondary, means of transportation compared with rail and water. The advent of the automobile and truck caused this form of infrastructure to come to dominate our transportation system and restructure Canadian lifestyles. One significant change was in the method of funding roads. While there was a mix of public and private infrastructure before 1900, after that date, nearly all roads outside of dedicated logging and mining infrastructure were provided by local and provincial governments. Most of the developing system was also provided free of direct charges, and today there are only three toll bridges and one toll road in the entire country. (Including international toll bridges and tunnels in the count would boost the number.)

Since the 1920s, although some of the cost of roads has been offset by fuel taxes and by specific property assessments for municipal upgrading, the road system has essentially been built by government departments financed through general taxation. This situation has begun to change because technology has made it possible to levy charges directly against users. Charges or taxes on fuel consumption in Canada are now partway between those in the United States (low) and Europe (high), and go a substantial way toward offsetting the cost of today's system. Electronic road pricing[5] is technologically feasible, and we believe it will be introduced in some countries in the next two decades. In the United States and other

countries, examples exist of automatic toll facilities, reading electronic toll tags.[6] The move from general revenue-based subsidies to a pay-as-you-go system of road pricing is possible now, and some move to link-by-link pricing is feasible in the near future.

Fuel Taxes and Licence Charges

We realize that applying our pricing principles to road links will be gradual. Our cost analysis also suggests that a large increase in charges is necessary if users are to pay for the road system. Initially, the shift to a pay-as-you-go system should be achieved through increases in the existing fuel taxes and licence charges, which are generally set on a province-by-province basis. Governments should identify and set aside the infrastructure component of these charges (Chapter 6). We do not want higher fuel taxes and licence fees to be added to the existing tax structure and thus form additional, windfall revenue for governments. We strongly believe that increases in fuel taxes and licence charges should be offset by reductions in the general taxes that currently pay for most road costs.

Canadians, as travellers and as taxpayers, are already paying for total road costs; we are advocating a shift from tax dollars to charges to travellers, not an increase in the total burden.

The marginal cost of road use by cars is low. Marginal-cost pricing would not cover full costs, but using fuel charges to cover full costs, or some other basis that relates charges strictly to distance driven, would tend to discourage road use more than is necessary.

We have examined different pricing approaches that would set a fair charge for cars and still cover road costs:

- Using only fuel taxes to recover road costs would result in a substantial increase above marginal costs in the road component of fuel taxes, thus discouraging road use.
- Raising licence fees would lessen the increase required in the road component of fuel taxes and might discourage road use less.

- Licence fees might also be set according to the value of benefits received — for example, higher licence fees would be charged for heavier and/or higher-priced cars if authorities judged there to be an association between the price of the car and the owner's valuation of the opportunity to use the roads. Any such approach would inevitably have to be based on use of a rough indicator — such as car weight or car price — of the value of benefits received.

When road owners set road charges to travellers, they must also include charges for environmental and accident costs. The current system of charging for accident costs involves an annual insurance premium that varies little, if at all, with annual distance driven. The result is that, for each additional kilometre that road users drive, they face less than the marginal costs of the accidents they impose. As noted earlier, however, using the fuel tax as the main road charge for cars is almost certain to cost travellers substantially more than marginal road-use costs. Therefore, the low marginal charges for accident costs would tend to offset the excess marginal road charges collected through a fuel tax. This balance lessens concerns about continuing to depend on annual insurance premiums and fuel charges to efficiently allocate road capacity.

We believe that charges on fuel will be used for some time to cover a major portion of road costs. As we shall discuss in Chapter 7, fuel taxes may also be appropriate as a means of charging for environmental damage. If transportation is to pay its costs but not more than its costs, and if governments are to treat the different modes equally, there should be no special taxes on transportation that are above the taxes or charges required to meet infrastructure, environmental, safety and accident costs.

Therefore, we **recommend** that:

5.4 All fuel taxes be used for transportation purposes or as a means of charging for costs caused by transportation, such as environmental damage and the health care system costs.

Since the federal government provides few roads, the federal excise tax on gasoline and diesel fuels should be withdrawn except to the extent that it proves to be an appropriate environmental charge. Provincial taxes on fuel used by rail and air, for which provincial governments provide few services, should be withdrawn except to the extent that these taxes prove to be appropriate charges in environmentally sensitive regions for which provinces take responsibility (Chapter 7).

Charges for Heavy Road Vehicles

Trucking was not specified in our mandate, but our proposal to recover road costs from users requires an appropriate division of those costs among cars, buses and trucks. Costs of road wear are generally much greater from heavy trucks than from cars, but different trucks impose different costs. Even though current provincial/territorial truck registration fees rise with truck weight, estimates prepared for the Royal Commission (Volume 2) suggest that heavy axle-weight[7] trucks currently pay less than their total cost of road wear. They may, in some cases, impose greater costs per vehicle-kilometre in terms of road wear alone than they pay in fuel taxes per vehicle-kilometre.

For heavy vehicles, we suggest adding an axle-weight and distance tax to the fuel tax to bring the total charge at least up to the marginal costs they impose. By aligning total charges more closely to the wear imposed by trucks with different weights and axle/tire configurations, the additional charge would encourage truck operators to choose vehicle types and loading practices that imposed less wear

on roads. In addition, the charge would achieve more equal treatment of trucks and rail in the movement of freight, as rail freight generally covers its full costs.

Therefore, we **recommend** that:

5.5 Provincial and territorial governments institute weight-distance taxes for trucks as part of an overall road-financing program.

Conventional Toll and Electronic Road Pricing

While we realize that fuel taxes, weight-distance taxes and licence fees applied provincially or territorially will constitute the major charges for road use in the future, specific link-by-link charges more fully reflect our principles and are already practical in some cases in their traditional toll form.

Therefore, we **recommend** that:

5.6 Conventional tolling systems be considered when new or expanded limited-access highways are required, with tolls set to cover any costs of the road link in question that exceed those recovered by fuel taxes.

In addition, governments could use tolls to levy a higher charge on peak-period users if congestion is a problem on a road. Toll roads should also provide an opportunity to test and improve electronic systems for identifying and charging for vehicle use.

Longer-Term Directions of the System

Over the longer run, we expect that developments in electronics will make it inexpensive to identify vehicles, record locations and times of road use, and charge accordingly. We suggest that governments give serious consideration to a system in which charges per vehicle-kilometre vary by vehicle type, road used and time of use. When it becomes technically possible to apply a pricing structure of this type, the benefits of doing so should be weighed against any disadvantages (increased complexity for travellers, for example). The benefits from individualized pricing are greatest where costs, especially marginal costs, differ substantially among route links and where travellers' decisions are likely to be significantly affected by differences in price. Where cost differences are modest, a system of common rates of charge for substantial groupings of road segments and vehicles may provide the simplest solution.

The use of light vehicles on low-volume rural roads and other local access roads may generate marginal costs much lower than the average costs per vehicle-kilometre. The result is that, to cover the full costs of the road, users would have to pay high charges. We believe there is no point, once a road exists, in wasting opportunities by discouraging road use. Local property taxes, or other local taxes levied on those who receive the primary benefits from such roads, may be an appropriate source of funding for part of the costs. Governments will need to reconsider such sources of funding as the pricing of the road system moves toward a link-by-link basis.

AIR LINKS: NAVIGATIONAL AIDS

Air links are serviced by the navigational aids used by scheduled commercial and other aircraft. Inter-airport air traffic control, especially as it evolves toward a highly automated system, can also be treated as part of air links for pricing and investment purposes.

The cost of the air navigation system involves a large capital component with almost no extra costs to add more users. Therefore, charges will have to be set above marginal costs if total costs are to be recovered. The excess of charges over marginal costs should be related to the users' valuation of their benefits. Pricing in this way would minimize the extent to which charges that recover full costs cause aircraft operators and potential operators to forego use of the facilities. Pricing based on distance flown and size of aircraft is one way of recognizing the value of benefits received. Governments may also institute a two-part pricing system based on a membership fee for aircraft operators plus a fee for each use.

Recommendations for Air Links

Currently, the costs of the air navigation and traffic control systems would almost be covered by the Air Transportation Tax if all of it were allocated for these purposes. But the basis for charges under this tax, which is levied on airline passengers, is not related closely to costs imposed by the aircraft, or distance flown and size of aircraft. In addition, the charges should be levied on aircraft operators, who in turn will pass it on to passengers, since carriers and other aircraft operators make decisions about air navigation system use.

Therefore, we **recommend** that:

5.7 A system be developed that charges aircraft operators directly to cover the cost of air navigation and traffic control. The charge should reflect costs attributable to the type of flight and class of aircraft, and value of benefits received. This system would replace the Air Transportation Tax.

As suggested above, the basis for appropriate charges is likely to involve a combination of distance flown and size of aircraft. It may also reflect the aircraft's route or the region over which it is flying.

RAIL LINKS

Pricing the use of rail track involves issues similar to pricing roads. With rail, however, the systems are already in place, or could be readily put in place, to allow charges to be based on the rail link used, the time of use, and the speed and weight of the train that causes wear. Railways that own their own track pay its full cost, and presumably respond to marginal costs in making pricing and operating decisions. The component of the cost of track (approximately 5 percent) represented by VIA Rail's payment, including incentives, to CN and CP for track use varies to a limited extent with tonne-kilometres travelled, depending on the link.

WATER LINKS

Links for ferries and other vessels are open water and buoyed (and sometimes dredged) channels. The costs of water links may vary little with changes in the level of use, thus the marginal cost may be low relative to the average cost.

To minimize discouragement of use, the federal government should apply a pricing approach for water navigation links similar to that for air navigation. Charges should reflect the costs associated with different groups of users and the value of benefits received. Savings in operating cost and safety presumably vary with the size of the vessel and the distance travelled. Where practical, charges should also reflect the different navigation system costs associated with different routes or regions.

The portion of total government water navigation costs attributable to ferries is low, and we are not suggesting a special system for ferries. Currently, there is little or no recovery of water navigation costs from ferry operators and other users, but Transport Canada has made proposals to move toward recovering a substantial portion of these costs. Ferries would come under the proposed cost-recovery system in the same way as other commercial vessels, and we suggest that policy makers examine the pricing approaches we have recommended when putting such a system in place.

Applying the Principles to Control

"Control" is the directing of traffic and policing of terminals and links. In each mode, control services involve a mix of capital and labour costs. Usually, costs are more closely related to the maximum number of vehicles the particular facility can handle than to the actual number of vehicles operating below the maximum. For example, the cost of handling one more motor vehicle, airplane, train or ship within capacity limits is likely to be small. If demand for services changes significantly, however, capacity should be adjusted, with a corresponding change in costs.

Use and provision of control services are often closely associated with use and provision of links, and it may be practical to combine the administration of pricing for links with that of control. Some control cost components are route-specific and, where practical, could be an element in establishing route-specific charges. Other control costs may not be closely related to activity on individual routes and will have to be divided among all users of a network. For example, a component of the fuel tax might be used to charge users of a provincial or territorial highway system for the costs of their police forces.

ENDNOTES

1. There are two methods of accounting for capital costs: investment expenditures can be included in total costs in the year in which they are made, or they can be amortized over time in such a way that the stream of annual "depreciation charges" and of annual "interest charges" (or return on capital) has the same discounted present value as the initial investment expenditure. The latter approach gives a smoother stream of annual costs and provides a better estimate of the cost of using the facility in a particular year. The Royal Commission's cost analysis work uses this amortized cost approach; a real rate of return of 10 percent, applied to one-half the replacement value of the facility, is used to estimate the "interest charge."

2. The balance is attributed to general aviation. Costs of military and other government use of air infrastructure are excluded from the total being allocated.

3. Gordon B. Hamilton, "Cost Competitiveness of Canadian Airports," paper presented to Air Transport Association of Canada 57th Annual General Meeting, Vancouver, Canada, November 10-12, 1991.

4. Yarmouth has 6,000-foot (1,800 metres) and 5,000-foot (1,500 metres) strips that are 150 feet (45 metres) wide to accommodate DC-9 aircraft; Oshawa has 3,400-foot (1,000 metres) and 2,670-foot (800 metres) strips that are 100 feet (30 metres) wide to accommodate DHC-8 aircraft.

   Yarmouth is 350 km from the nearest alternative paved facility; Oshawa is 65 km.

   One fifth of Yarmouth's annual operating costs are attributable to its full on-site Emergency Response Service (which is not required under national safety standards); Oshawa depends on the local fire department.

   Control-tower costs from the longer operating hours at Oshawa are not reflected in the airport's accounts.

   Yarmouth faces frequent heavy snow; at Oshawa it is rare, and clearance is not so urgent.

   There is a 5-year-old terminal at Yarmouth; Oshawa representatives are asking the federal government to build a terminal there.

5. Electronic road pricing refers to systems that are able automatically to recognize the existence of a vehicle, and to apply a charge that may vary with location and time. The vehicle might carry a pre-paid "debit card" in the form of an electronic tag, from which the charge was deducted automatically; or an automatic link might allow the owner's bank account to be debited; or the system might send the owner a bill, like other utility bills.

6. Examples are: on Oklahoma turnpikes, the Dallas North Tollway in Texas, and the Crescent City Connection Bridge, New Orleans, Louisiana. European examples include the Oslo and Trondheim Toll Rings in Norway, the Autostrada connecting Milan, Florence, Rome and Naples in Italy, and the ACESA highway in Barcelona, Spain. These and other systems are described in T.D. Hau "Congestion Charging Mechanisms: An Evaluation of Current Practice," Transport Division, Infrastructure and Urban Development Dept., The World Bank, draft report March 23, 1992.

7. "Axle-weight" is a customary abbreviation to describe the features of heavy trucks that determine the load they impose on road structures. In reality, loads vary with a number of vehicle characteristics in addition to the number of axles, including the number and width of tires, the spacing of the axles, and the nature of the suspension. Charges should take account of as many of these aspects of truck configuration as is practical, as well as the distance travelled.