

Essays in Canadian Surface Transportation

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Edited by Filip Palda

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Preface

TRANSPORTATION POLICY IS A UNIQUE TOPIC among academics. Unlike experts who debate welfare, education, and the debt, transport researchers seem to have a united outlook: the best prescription for the transport industry is fewer regulations, lower subsidies, and less government ownership. Perhaps this explains why in the last 15 years the federal government has done much to deregulate, desubsidize, and privatize. However, academic opinion seems united in the view that there is still a long way to go.

This view is important because Canadian transport policy now seems to be advancing and standing still at the same time. Ottawa has said it wants to privatize air and sea ports, end most transport subsidies by 2005, and cut the red tape that strangles profitable mergers and raises business costs. At the same time, Ottawa has gone back on its promise to privatize Pearson airport. It is also taking its time about ending subsidies, and reforming the regulations that are crippling Canada's rail industry.

Making our own reforms

The needed reforms will come to the transport industry whether government wants them to or not. The question is whether that change will be on our own terms. If we dicker while other countries get their acts together we will pay a steep price. Right now the U.S. rail industry is being born again. Rail companies are merging, cutting costs, and coming to flexible agreements with their workers. In Canada, union rules and government hesitation are holding back the merger between the CN and CP

rail. We have the potential to compete with the best in the North American market, but we may waste this potential if we delay reform and wait for events outside our country to write the details of our policies.

The present book is a collection of four essays on surface transport policy in Canada. Why surface transport? Experts know that there is still much to reform in this area, but the media and the public are less aware that something needs to be done. Air transport seems to get most of the publicity, perhaps because of the spectacular corporate battles between Air Canada and Canadian Airlines. The attention the airlines get is out of proportion to their economic importance. The purpose of this book is to help close the gap between the economic importance of surface transportation and its importance in the public policy debate.

Privatizing ports

In the first essay, David Gillen and Douglas Cooper ask whether Canada's sea and airports should be privatized. Privatization tends to stir strong emotions. It has devoted fans and bitter enemies. In principle, a privately-run port should run more efficiently than a publicly-run port. The private port has a bottom line. This means it answers directly to customers and shareholders. Customers (airlines, shipping lines, and passengers) can take their business elsewhere if they are not satisfied. Shareholders can look for other investments if the port managers do not keep costs down. Port managers and unions have to work in harmony to keep their clients happy because government is not there to pay for administrative blunders and labour disputes. Enemies of privatization fear that private ports will not behave responsibly. They will be noisy and will fail to build on a scale that can satisfy the economy's need for infrastructures. Perhaps worst of all, ports will try to exploit their customers by raising prices too high. If there are no other ports nearby, customers will be forced to pay the ransom.

What the evidence says

Either side in this debate may be right in principle. The answer lies in the evidence. Are private ports more efficient than public ports? Do private ports gouge their customers? Do private ports underinvest in infra-

structure? Do private ports pollute and ignore regulations? Gillen and Cooper answer “no” to all questions. In the 1980s Britain privatized Heathrow, Gatwick, and Stanstead, as well as a number of smaller airports. Investment in airport infrastructure more than doubled in the *three years* following privatization. At Heathrow investors are putting \$440 million of their money on the line to build a rail link to London that will cut the trip from one hour to 15 minutes. The question of whether ports can escape competition has been intensively studied in the U.S. The answer that is creeping out of detailed market studies suggests that airports have trouble evading competition. The same is true of seaports where improvements in the way containers can be loaded on trucks has opened up inland waterways as a source of stiff competition against the established coastal ports. The presence of competition is important because it forces ports to be efficient.

Evidence for private market efficiency in Canada is encouraging when set beside examples of publicly-run ports. The Canadian government has 14 airports in which the entire operations have been contracted out to private firms. These firms had lower costs than publicly-run firms. In a comparison of three federally-run Canadian airports with three privately-run U.S. airports, the Auditor General found that U.S. airports use 40 percent less manpower to give an equivalent level of service. Sea ports also suffer from problems. The port of Churchill loses about \$6 million every year and is kept running for the naked political reason that closing the port down would lose jobs for the region.

On the final point of whether private ports are careless polluters and lax in their safety, we have only evidence from abroad to guide us, since Transport Canada owns almost all major airports. Evidence from Britain and the U.S. suggests that private airports are at least on par with publicly-owned airports when it comes to safety and pollution. Some private airports, such as Burbank Airport and Palm Beach airport have even led the way in finding new ways to deal with noise pollution.

In their clear and balanced essay, Gillen and Cooper argue that privatization is good, but that if Ottawa is not willing to go the full distance it can still improve our ports by handing authority for them over to the

communities they serve. Decentralizing services can make for a better match of what customers want and what the airports provide.

Truck and rail

In the second essay, Norman Bonsor gives a straight account of Ottawa's tangled policy towards truck and rail. Regulations and subsidies in these two sectors defy principles of economic common sense. Our trucking regulations make prices too high and our rail subsidies make prices too low for trucking and rail to work at their best.

Via Rail is a depressing case of a company which works poorly because of subsidies. Over the last 15 years Via has eaten more than \$6 billion in federal subsidies to charge passengers a third of what it costs to move them around. The run between Armstrong, Ontario and Winnipeg became infamous for the \$8.73 dollars of subsidy for every kilometer travelled by each passenger. It would have been cheaper to send each passenger in a rented limousine. Even though subsidies have come down to about \$300 million a year, Via still needs 33 cents of government money for every kilometer it carries a passenger.

The same sort of economic silliness troubles commercial rail. Under the name of the Western Grain Transportation Act (WGTA), rail companies got \$779 million in federal money in 1991 to carry grain from the Prairies to distant harbours. Ottawa put these subsidies in place because an earlier scheme known as the Crow's Nest Pass Agreement was falling apart. Under the Agreement, rail lines had to keep rates to grain shippers low and steady. The rail lines were expected to make up their losses by charging other commercial customers high prices. In other words, the rail lines taxed some of their industrial customers to give farmers a cheap ride. By 1981 farmers were paying only 19 percent of the true cost of shipping their grain. For the rail lines, the only way out of this mess was to neglect their Prairie rolling stock. This gave them an excuse to limit service to their Prairie customers. The rail lines were not being cruel or negligent. They were listening to what consumers of grain were telling them: "We are not ready to pay you a premium so that you can carry Prairie grain to our bakeries." Consumers put a lower value on Prairie grain than it cost to grow it and carry it to them. Instead of letting the market close down an activity people did

not value, Ottawa passed the WGTA in 1983. This Act got the grain rolling again by covering the rail lines' losses.

Professor Bonsor's essay explains that regulations may do as much harm as subsidies. Government is crippling the commercial rail industry by refusing to let the major rail lines abandon unprofitable tracks. Rail carriers are only allowed to abandon 4 percent of their tracking every year. CN estimates that 66 percent of its track carries only 10 percent of its traffic. At CP, 54 percent of the track carries 3 percent of its traffic. This surplus track is like a weight on the rail lines that slows them down in their competition with American carriers. Small private companies seem willing to snap up abandoned tracks and operate them as "short-line" services. But government is slow to approve the entry of short-line operators. Unions also make it hard on short-liners because they want to pass on to their new employers the extortionate contracts that bound CN and CP. Canadian taxpayers and rail users end up paying the price for lines that almost no one needs.

Things are more encouraging in the trucking industry. Direct subsidies there are low and regulations are dropping away. Canada had no choice but to follow the U.S. when it opened the trucking industry to competition in the 1980s. The main problem the industry still faces is that trucks pick up a hidden subsidy when they roll on roads the government pays to build and maintain. This subsidy further confuses the signals that might guide consumers of transport services in a wise choice between truck and rail. Prices and economic reality in both industries have parted ways. Professor Bonsor's masterful essay explains how we can bring them back together again.

Greased lightning

Gillen, Cooper, and Bonsor are critical of government's ability to manage transportation. But they believe that Ottawa's attitude toward truck and ordinary rail is becoming more realistic than it was. These authors give the reader hope that things can get better. However, Richard Soberman's piercing critique of high-speed rail suggests that an air of fantasy still hangs over some fields of transport policy.

High-speed rail is a glamorous hoax that Canadian politicians are slowly falling for. In recent years, interest groups have pressured

Ottawa to build a high-speed rail line between Windsor and Quebec. Via Rail, Bombardier, environmentalists, train nostalgists, and a brood of transport consultants are telling politicians that Canada needs high-speed rail to pump up commerce between Ontario and Quebec. Their lobbying follows a familiar pattern. Make the case that there is a service the economy needs. All it will take is a little push from government to get things rolling. The benefits to commerce will more than balance the costs to taxpayers. The “little push” in this case is \$1.6 billion to cover nearly $\frac{1}{3}$ of the \$5.3 billion costs of building the high-speed line. This hype about high speed rail is like the story of nail soup. In this tale a man enters a house promising to cook a splendid soup with a simple nail he pulls from his pocket. All the host has to do is provide a few side garnishings of potatoes, onions, meat, and carrots.

If we look past the hype we may see that fast trains may not make economic sense. The French TGV is the world’s glittering example of high-speed rail. It serves a dense corridor of passengers and brings them large benefits. But, according to an OECD study, the money they pay will likely never cover the billions of dollars the French government sunk to design and build the TGV. Perhaps this is why the private market in France let government bite the costs. Private investors in North America seem equally reluctant to put their money on fast trains. In 1994 a private consortium made up of Bombardier, GEC-Alsthom, and Morrison Knudsen Corp. gave up their plan to build a high-speed rail line. They wanted \$3 billion of state money to help fund the \$7.5 billion line. The state resisted the pressure and wisely passed a law forbidding any funding for the project.

Soberman’s essay makes fascinating reading for taxpayers who want to understand what they will be funding if they get a high-speed rail line. His essay is also a rich source of ideas for policymakers who want to know what it would take to make high-speed rail a good investment. In order for a 200 kmh line charging \$100 for the trip between Montreal and Toronto to break even, 4.7 million passengers would have to travel that line each year. This is 128 percent of the *combined 1987 VIA, bus, and airline traffic* along the same route. Instead of losing ourselves in such reveries, Soberman argues that government should look at

whether there are cheaper, more sensible ways to upgrade our passenger rail lines. With some minor changes to our existing lines we may get faster trains that at least pay their own cost. These trains may not be as fast as the French TGV, but neither will they drain our pockets as quickly.

City of hope

The essay by Wendell Cox and Jean Love explains that cities are the last holdouts against the modern ideas that are sweeping through other fields of Canadian transport policy. Privatization, desubsidization, and deregulation are not welcome words to municipal planners. Their resistance to change is something to worry about because cities generate most of Canada's economic growth. The federal government seemed to acknowledge the importance of cities in 1993 when it launched a program to rebuild their infrastructures. Ottawa poured money into cities and sat back to watch the concrete flow. What no one seemed to mention is that concrete and other hardware are only part of what makes a city infrastructure. Management and attitude are equally important ingredients. The attitudes of the cities have been bad and federal handouts will probably make them worse.

The problem with many municipal governments is that they manage the city's transport services but face no clear bottom line. Buses and subways make losses because they pay too much money to their unions, and pay too little attention to their customers. Captive local taxpayers and sympathetic federal politicians are there to pick up the bill for this negligence. The easy money from these two sources numbs local leaders to economic realities. It is easy to risk \$183 million on a high-technology Light Rapid Train (LRT) if you know someone else will be paying the bill. The city of Edmonton took this risk in the early 1980s and is now stuck with a technologically superior economic turkey. Alberta taxpayers are stuck with the bill.

Cox and Love explain that insulation from the bottom line has blinded cities to trends in urban transport. In large urban areas, suburbs make up 73 percent of the population. The city makes up only 23 percent of the population, and every year fewer people go to work in the city. This pattern of population means that trains are out and

buses are in. Trains are good for serving a dense city core where many people travel. When the city core is no longer so dense or so popular, buses running along special routes are the best solution. Such “busways” can be built for $\frac{1}{10}$ the cost of urban rail systems and provide citizens with better services than city trains. In spite of these advantages, Canadian cities stubbornly push for rail. Vancouver and Edmonton are two recent examples of cities where the urban rail obsession is strong.

These obsessions might not be serious if urban rail at least helped to unclog city roads at some reasonable cost. Evidence from the U.S. is depressing on this point. John Kain of Harvard University has estimated that the annual cost of attracting a new transit passenger on a rail system proposed for Dallas would be more than \$55,000. This is enough to buy a new sportscar for each new passenger, every year. Results from other studies around the U.S. look pretty much the same.

An obsession with rail transit is not the only problem cities face. Every type of transport service Canadian cities provide is coming at too high a cost. Between 1970 and 1990 transit costs per kilometer travelled rose by 36 percent after taking inflation into account. Put differently, by 1990 transit systems spent \$650 million more than would have been necessary to produce the same level of service if costs had been maintained within the inflation rate. Cost have increased because cities have insulated their transit systems from the need to meet a bottom line.

To the bring bottom line back into view, cities should either privatize their transit systems or contract out all services. The savings from contracting services out can be large. London’s bus costs have fallen by 25 percent (adjusted for inflation) since competitive tendering began in 1985. Cox and Love challenge us to think about a Canada which might one day have the same good fortune as the British did when they decided to let the private market put transit back on track.

No pattern to the policy

Readers of the essays in this book may become frustrated to learn that there is no well-planned government policy that guides Canadian surface transportation. Lack of a policy is not alarming provided that gov-

ernment follows some principles. The principles laid out in this book suggest that government should try not to confuse the market by playing with the prices of transport services. Privatizing, deregulating, and desubsidizing are not the only ways to do this, but the evidence suggests that at the moment they are the best guides to follow.

—*Filip Palda*

Public Versus Private Ownership and Operation of Airports and Seaports in Canada

David Gillen and
Douglas Cooper¹

*I have never known much good done by those who affected to trade
for the public good.*

Adam Smith

Introduction

IN A RECENT ARTICLE DISCUSSING THE PRIVATIZATION of British Rail, *The Economist* wrote: “It is a brave man who interferes in a love affair, however tempestuous. The British public loves railways, even as it hates the way they are run. Opponents of the government’s privatization

1 The authors are indebted to Trevor Heaver, Ron Gilbertson, Lloyd McCoomb, and particularly Filip Palda for comments on earlier drafts and in providing helpful discussion.

bill, published this week, argue that it will cause grief."² This statement could apply equally well to any one of Canada's hundreds of government owned corporations. The article went on to point out what many, including economists, have argued for many years, namely, that there are significant economic gains to be had from privatization and these translate into welfare gains to the community. First, and foremost, privatization will "root out inefficiency—when a railway in a small country employs 35,000 civil engineers, something is amiss."³ Second, it introduces new management styles and skills oriented to serving the users of the rail system and becoming more consumer oriented. Third, it will lead to better investment decisions.⁴

The ideal view of privatization is that it enhances individual freedoms, encourages and improves efficiency, makes industry more responsive to the demands of the customer, decreases the public debt, and reduces the potential stranglehold of trade unions by forcing management to face the realities of the market place.⁵ The argument is made that when projects meet private investors' profit return expectations, only economically sound projects will be undertaken. Furthermore, the operation of infrastructure facilities by private operators is claimed to result in lower costs than if they were run by the public sector. The cost

2 "On the Right Tracks," *The Economist*, January 23, 1993, p. 20.

3 *Ibid.*

4 Better in many cases can mean less investment or reductions in capacity, as governments are notorious for overbuilding.

5 The major objectives of privatization were, perhaps, best spelled out by Great Britain's then Financial Secretary to the Treasury, John Moore, in 1983 and augmented by a subsequent government White Paper. They are: to reduce government involvement in the decision-making of industry; to permit industry to raise funds from the capital market on commercial terms without government guarantee; to raise revenue and reduce the public sector borrowing requirement; to promote wide share ownership to create an enterprise culture; to encourage workers to share ownership in their companies; to increase competition and efficiency; and to replace ownership and financial controls with a more effective system of economic regulation designed to ensure that benefits of greater efficiency are passed on to consumers (Veljanovski, 1987).

savings are said to be real efficiency gains and not simply transfers from one sector of the economy to another.⁶ The private sector also represents a source of financing development, expansion, and improvement of infrastructure at a time when governments are meeting increasing taxpayer resistance and are reluctant to further increase their debt. Finally, there is an argument that a public firm would have less incentive to charge socially efficient prices. This is based upon the notion that public firms will be used for “general government purposes” such as promoting regional economic development and, that allocative inefficiencies would arise from a government firm as they provide the wrong mix of outputs.⁷ This means that with public ownership there is some likelihood that infrastructure will be financed out of general revenues rather than through user charges.

Opponents charge that privatization would lead to monopolies, loss of service, reduced flexibility, and unfairness among users as well as between modes. They view private ownership as “a return to the mean market mentality of the nineteenth century, to the elevation of private greed over public interest, and a short sighted policy that sells valuable state assets in order to finance tax cuts and which converts public monopolies into private ones with no adequate safeguards for the consumer or worker” (Veljanovski, 1987). These claims and counter-claims associated with the controversy regarding privatization of British Rail are at the heart of the discussion and fuel the debate over privatization in general. While this essay does not deal with railways, it does discuss privatization, with an emphasis on ports and airports, and what has been stated for railways in Britain applies equally well to Canada’s crown corporations.

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- 6 See Gomez-Ibanez, John Meyer and D. Luberoff (1991), “The Prospects for Private Infrastructure: Lessons from U.S. Roads and Solid Waste,” *Journal of Transport Economics and Policy*, Vol. XXV, No. 5 (September): 259-279.
 - 7 In the absence of these two arguments there is no strong theoretical argument that a more efficient form of and base for pricing is more likely with private operations than with public operations.

The privatization⁸ phenomenon is not isolated to a few countries. The World Bank, in 1988, reported that approximately 1800 state owned enterprises were being privatized in 83 countries (World Bank 1988). In Canada, before privatization efforts began in 1984, the crown corporations received approximately \$8 billion annually in government support and employed more than 250,000; thus, one worker in forty in the country was employed in a crown corporation at an average annual wage of \$32,000. As of July 1987, the Canadian government owned 54 parent crown corporations with 144 subsidiaries and 183,000 employees. Assets were valued at \$6 billion. These crown corporations extended across every facet of the economy and included railways, airlines, airports, the post office, ports, cultural institutions, and agricultural marketing boards. Hirshhorn (1990) reports that in 1980 approximately 34 percent of Gross Domestic Product (GDP) involved activities which were supervised or regulated by government. Table 1 lists the number of government owned or controlled enterprises.

In Canada in the mid-eighties, the trend to get government out of those activities which the private sector could handle accelerated as politicians and policy-makers sought to redefine the role of government since it was viewed as having become too large. With its intrusion into the marketplace, the government inhibited entrepreneurship and caused distortions resulting in significant efficiency costs. This movement followed similar change in the United States and Britain. The programs of privatization which began to be implemented in the late 1980s were influenced to a great extent by the privatization actions of the British government. The case for a more market-oriented approach was also affirmed by the report of a Royal Commission in 1985 (Hirshhorn 1990). Politicians and policy-makers argued that traditionally provided public goods and services could, and in many cases should, be supplied by the private sector or with a public/private nexus. The dominant thinking

8 In this paper we take a broad definition of privatization and include defederalization in the definition. The reasoning is that taking airports or seaports out of federal hands and placing them in local hands will have similar effects to private ownership in that the local owners will be responsive to market demands. The difference between privatization and de-federalization then is one of degree rather than kind.

was that it was important to achieve the most efficient output possible from the limited resources available and that governments could address questions of equity and fairness through the tax-transfer system; using markets to redistribute income via underpricing or subsidies had significant economic efficiency costs.⁹

There are several reasons for the re-thinking of the common reliance on government as the sole provider of certain classes of goods and services including transportation infrastructure. First, there is the immediate concern of fiscal constraints and the pressures to reduce deficits, which makes private sector participation attractive.¹⁰ Second, there are arguments that the public sector cannot, or will not, bring fiscal responsibility in the form of efficient prices and productive efficiency. Third, it is difficult for the federal government to adopt flexible policies and standards that are adequate to meet local or regional conditions. A single policy or uniform standard for the entire country leads, in many cases, to inefficiencies and excess costs with no corresponding benefits. Finally, the failure to deregulate infrastructure after having deregulated and privatized transportation services has led to a failure to achieve some of the available efficiency gains from deregulation.

The deregulation of infrastructure through privatization or private sector management in order to realize the gains available from the discipline of market forces has a brief but successful history. New Zealand, for example, moved to a “for profit” Air Traffic Control system in 1987. The results have been dramatic. Within four years, Airways Corporation of New Zealand recovered full costs, paid taxes, generated \$30 mil-

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- 9 There may be a role for government to play on purely equity grounds in providing goods and services. If persons are poor because they have less ability to generate income, the tax-transfer system provides a solution. However, if people have less ability to translate income into utility, something other than transfers are required.
 - 10 It should be noted that simply transferring responsibility to the private sector to avoid government spending provides neither a desirable nor an economically efficient solution to meeting the transportation needs of a community, however broadly defined.

Table 1: Number of Government-Owned Enterprises and Government-Controlled Enterprises, 1985

	Parent		Subsidiary		Total	
	Wholly Owned	Effectively Controlled	Wholly Owned	Effectively Controlled	Parent	Subsidiary
Federal	43	13	46	35	56	81
Provincial	193	10	131	56	203	187
Newfoundland	10	2	2	4	12	6
Prince Edward Island	10	2	1	6	12	7
Nova Scotia	14	4	6	2	18	8
New Brunswick	11	1	4	1	12	5
Quebec	43	0	49	30	43	79
Ontario	32	0	24	1	32	25
Manitoba	22	0	7	0	22	7
Saskatchewan	7	0	17	0	7	17
Alberta	15	1	4	11	16	15
British Columbia	23	0	17	1	23	18
Yukon/NWT	4	0	0	0	4	0
Joint Federal/ Provincial	2	0	0	0	2	0
Grand Total	236	23	177	91	259	268

Source: Hirshhorn (1990).

lion in dividends and reduced expenses by 20 percent.¹¹ In 1986, Australia created the Federal Airports Corporation to operate the major airports in the country. BAA (British Airports Authority) was created when the British government privatized the five major regional air-

11 See, Paul Proctor (1992), "For-Profit New Zealand ATC System Cuts Costs and Increases Efficiency," *Aviation Week and Space Technology* (April 27, 1992, p. 32).

ports. Government owned air carriers in Europe and Canada have shown significant gains in productive efficiency when privatized and placed in a competitive market setting.¹²

The decision to privatize has not been based simply on political stripe or a belief that the private sector is inherently more efficient than government. Boardman and Vining (1989), for example, examined a number of studies that had investigated the relative efficiency of public versus private corporations.¹³ The industries examined included electric utilities, refuse, water, health-related services, airlines, railroads, financial institutions, fire services, and non-rail transit. They concluded that in terms of all profitability indicators, public sector firms perform substantially worse than do private firms, and that it is the competitive environment that explains the difference in profitability between public and private firms.

On the other hand, Vickers and Yarrow (1989) report that in an investigation of the relative performance of private and public enterprises, the evidence does not clearly establish the clear-cut superiority of private ownership with respect to cost efficiency. They do make the point, however, that privately owned firms tend, on average, to have lower costs (more internal efficiency) when competition in product markets is effective.

In this essay, we examine the arguments for and against alternative ownership and managerial organizations in airports and ports. Many of the arguments are transferable to other types of infrastructure such as roads. The central question that is being asked with increased frequency is “whether running airports and seaports like non-profit organizations or public utilities is in the public’s best interest?” Many are taking the position that airports and seaports would contribute more to the transportation sector and the economy in general as privately held organizations that pay taxes and fees to government, which now owns them. It is

12 See, Gillen, D., T. Oum, and M. Tretheway (1986).

13 Boardman and Vining (1989), “Ownership and Performance in Competitive Environments: A Comparison of the Performance of Private, Mixed and State Owned Enterprises,” *Journal of Law and Economics*, Vol. XXXII (April): 2-33.

also claimed that they would be more sensitive to the needs and concerns of those most directly affected by them and would operate at lower costs. This view is one which is taking hold in a number of countries, including Canada. The traditional reliance on government to be the provider, manager, and operator of transportation infrastructure is being questioned. The stimuli for this exploration of new possibilities arise from essentially three concerns: cost or technical efficiency, financing and pricing.

In the following section, we describe the Canadian airport and port systems. The description includes a brief history, the current institutional features and their respective outputs, and financial characteristics. The next section discusses a methodology for assessment and provides a general framework for considering the public/private ownership and management question. Following, the arguments for and against privatization are considered for both airports and ports. Included in this section is a description of some of the privatization initiatives that have occurred elsewhere. A summary and conclusions are contained in the final section.

The Canadian airport and port systems

Airports

After World War I, with aviation rapidly developing in Canada, airports were the responsibility of municipalities. Federal government involvement was limited to providing emergency landing sites and advising municipalities regarding development and operation of airports.

In the 1920s, the primary role of aviation was to transport passengers and freight into remote areas and carry mail. The Airports and Airways Section of the Civil Aviation Branch of the Department of National Defense was founded in 1928. It was given the responsibility of providing auxiliary services, such as beacons for night flying and navigation, to municipal airports.

The federal government presence in airport ownership and operation began in the 1930s when unemployed workers were hired to im-

prove existing airports and build new ones. Between 1932 and 1936, 50 airports were built across Canada at 100 mile intervals. The depth of the depression taxed the financial resources of the municipalities and they were unable to fund needed improvements to airports as aircraft became larger and more sophisticated. In 1936, Parliament approved the first major federal-municipal finance agreement whereby the Federal government agreed to pay up to one third of the cost of airport terminal construction. By 1939, almost \$2 million had been spent.

With the arrival of World War II, the importance of aviation in general and the need for Canada as a training area¹⁴ led the Department of National Defense to take over administration of all airports. In addition, 24 new landing fields were constructed and existing facilities were improved.

After the war, airports were returned to civilian control, in an improved and modernized condition. Some municipalities refused to take the airports, and where these were on a transcontinental route, the Department of Transport (now Transport Canada) continued to operate them. The Federal government introduced an operating subsidy plan in 1946 to assist the municipalities. As aviation flourished, however, and aircraft grew in number, size, and technical sophistication the resources of the municipalities were outstripped. Consequently, the federal government, over time, assumed the responsibility for the development and operation of major airports in Canada. It took over Toronto International in 1958, Vancouver International in 1962, and Calgary International in 1967. In addition, the Department of Transport built new airports at Edmonton and Halifax, both in 1960.

By mid-1985, the Department of Transport owned 153 airports. It operated 89 of these sites and had lease agreements and management contracts with others, such as municipalities, to operate the remaining 64. The airports owned and operated by the Department ranged in size from small general aviation airports to the largest air carrier airport in Canada. While there are over 1000 airports in Canada, the 89 operated by the Department of Transport accounted for almost 95 percent of all

14 Canada was a major participant in the British Commonwealth Air Training Plan.

commercial traffic in Canada and 100 percent of international passenger traffic.

Transport Canada also has total responsibility for air traffic control in Canadian airspace. This has been the case since 1937 when the Department of Transport took responsibility from the Department of National Defense. Radio and air traffic control was introduced at major airports in 1940, and along main airways commencing in 1942. Radar was introduced in 1956. These systems have been progressively updated through the years, with a major radar modernization program currently under way (RAMP program). In total, Transport Canada has 124 sites with radar equipment, 859 with navigational aids, and 381 with communications systems, all of which require maintenance.

The present Federal involvement in airports goes beyond ownership and includes management and subsidies to a number of airports across the country. Table 2 sets out the Federal investment by region (Hirshhorn 1992). The top 26 airports in Canada are termed the Group I airports and handle most scheduled services. Within the Group I are the major federal airports (MFA) which include Pearson (Toronto), Vancouver, Halifax, Mirabel, Dorval, Ottawa, Winnipeg, Edmonton, and Calgary. The airports included in the various Groups are listed in table 3.

Transport Canada also operates the airports as a system with revenue transfers between money making and money losing airports in the system. Table 4 presents this systemwide data of the major federal airports. The numbers reflect the long established policy of centralization and single user fee structure regardless of local conditions.¹⁵

The federal policy toward airports in Canada has moved from one in which they were used as a tool for economic development and regional assistance and to complement aviation regulatory policy to one in which the government has a commercial orientation and is responsive to cities and regions that seek to lease airports from the federal government. The current policy reforms are related to government's claimed efforts to reduce the deficit and the pressures brought about by deregulation of the domestic airline industry, as well as the liberaliza-

15 These policies were changed in the late 1980s.

Table 2: Federal Airport Investment (1992)

Region	Number of Airports				
	Owned & Operated by Federal Gov't	Owned by Federal Gov't & Operated by Others	Owned by Others & Operated by Federal Gov't	Owned & Operated by Others with Federal Subsidies	Total
Atlantic	15	2	0	16	33
Quebec	9	25	1	10	45
Ontario	12	10	0	2	24
Central	10	23	3	4	40
Western	14	22	2	14	52
Pacific	15	9	6	2	32
Total	76	88	12	50	226

tion of transborder and international aviation. Greater commercial orientation and responsiveness to local needs are significant motivations for the current policy. Additionally, the previous structure and management of airports, which was centralized in Ottawa, was viewed as unable to respond to the significant changes taking place at particular sites.

Seaports

With 25 percent of Canada's gross national product composed of international trade, and with considerable commerce moving on the Great Lakes and St. Lawrence Seaway, Canada's ports and seaports are a significant part of the national economy. In 1991, the ports handled a total of 350.8 million metric tonnes of cargo with Ports Canada accounting for roughly 50 percent, Harbour Commissions and Harbours and Ports accounting for 40 percent, and a variety of public and private facilities accounting for the remaining 10 percent. The six year record of Canadian cargo handling is presented in table 5. Only two of Canada's provinces and one territory do not have important ports within their boundaries. The ports vary in terms of size and types of commodities handled; some

**Table 3: Airports Owned or Operated by Transport Canada
(Total of 54)**

Group I Airports		
Calgary International*	Charlottetown	Edmonton International*
Fredericton	Gander International	Halifax International
London	Moncton	Montreal (Dorval)*
Montreal (Mirabel)	Ottawa	Quebec
Regina	Saint John	Saskatoon
St. John's	Sydney	Thunder Bay
Toronto International	Vancouver International*	Victoria
Windsor	Winnipeg International	
Total: 23		
Group II Airports		
Baie Comeau	Fort McMurray	Fort St. John
Kamloops	Mont-Joli	Penticton
Prince George	Prince Rupert	Sault Ste. Marie
Sept-Iles	Timmins	Wabush
Total: 12		
Group III Airports		
Churchill	Deer Lake	Fort Nelson
Goose Bay	Grande Prairie	Iles-de-la-Madeleine
Lethbridge	North Bay	Port Hardy
Quesnel	Sandspit	Schefferville
Smithers	Stephenville	Terrace
The Pas	Val-d'Or	Williams Lake
Yarmouth		
Total: 19		
* Airports transferred to local airport authorities through leasing arrangement.		

Table 4: Revenues and Expenses of Major Federal Airports

	1988	1989	1990	1991	Avg. Annual % Increase
Revenues (000's)					
Landing Fees	\$96,021	\$110,788	\$113,179	\$119,682	4.94
Concessions	\$75,812	\$84,771	\$92,699	\$102,018	6.42
General Terminal Fees	\$67,696	\$77,923	\$81,285	\$83,457	4.72
Parking	\$49,318	\$53,324	\$61,292	\$63,537	5.59
Rentals	\$33,699	\$41,119	\$45,139	\$53,032	9.11
Aviation Fuel Charges	\$13,109	\$17,496	\$13,986	\$18,660	7.44
Service Fees & Misc.	\$12,173	\$14,283	\$15,300	\$15,823	5.77
Total	\$348,828	\$399,704	\$422,880	\$456,209	5.88
Expenses (000's)					
Terminal Control Costs	\$68,185	\$91,326	\$100,868	\$112,148	9.80
Interest on Capital Fund	\$87,106	\$89,986	\$94,359	\$99,242	3.06
Salaries & Benefits	\$72,721	\$75,493	\$85,714	\$93,082	5.47
Depreciation	\$54,355	\$56,960	\$49,248	\$60,706	2.62
Contract Services	\$34,498	\$40,630	\$62,193	\$57,693	10.05
Headquarters & regional Overhead	\$32,284	\$28,230	\$32,288	\$39,333	4.48
Purchased Goods	\$20,829	\$26,442	\$30,776	\$34,004	9.69
RCMP Security	\$24,327	\$25,000	\$21,421	\$29,347	4.28
Grants in lieu of Taxes	\$24,845	\$22,774	\$22,147	\$25,234	0.39
Utilities	\$16,439	\$17,302	\$17,447	\$17,620	1.68
Loss on Disposal of Fixed Assets	\$502	\$784	\$580	\$677	6.46
Total	\$436,010	\$473,927	\$517,040	\$569,086	5.85
Profit (Loss) from Operations	(\$88,182)	(\$74,223)	(\$94,161)	(\$112,877)	5.47
Air Transport Tax	\$85,307	\$108,774	\$108,040	\$103,217	4.34
Net Profit (Loss) After Tax Allocation	(\$2,875)	\$34,551	\$13,879	(\$9,660)	17.56

Source: Transport Canada TP 1300.

handle only a few bulk commodities while others handle a variety of goods ranging from bulk commodities to containers.

The Canadian port system today consists of approximately 365 commercially-oriented ports which can be divided into three major groups: Ports Canada, Harbour Commission Ports, and Harbours and Ports of Transport Canada. In 1982, fifteen of Canada's major ports came under the jurisdiction of the National Harbours Board (NHB), an organization established in 1936 by the National Harbours Board Act (1936) (Ruppenthal 1983). These fifteen accounted for approximately half of all waterborne commerce in Canada. Ports Canada, formerly the National Harbours Board, administers 15 ports pursuant to the 1983 Canada Ports Corporation Act. Seven of these ports are autonomous local port corporations located in Halifax, Montreal, Prince Rupert, Quebec, Saint John, St. John's, and Vancouver. The eight other ports are administered on a divisional basis by Canada Ports Corporation and are located in Belledune, Churchill, Port Colborne, Prescott, Port Saguenay, Baie-des-Ha!-Ha!, Sept-Îles, and Trois-Rivières.

The Canada Ports Corporation was established in 1982 as a crown corporation to review, co-ordinate, and facilitate ports planning by semi-autonomous local port authorities.¹⁶ The enabling legislation contemplates a degree of local autonomy. It provides for the establishment of local port corporations that are significant at the national or regional level, are financially self-sufficient, and are able to manage their own affairs.

The Harbour Commission group operates under three legislative statutes. The first, the Harbour Commissions Act of 1964, governs the administration of Oshawa, Windsor, Thunder Bay, Fraser River, North Fraser River, Port Alberni, and Nanaimo. The Commission ports of Toronto and Hamilton operate under their own statutes. Harbour Com-

16 Ports Canada serves as an "intermediate" model, which contrasts with the situation in the United States where local port authorities are highly autonomous and in competition with one another. At the other extreme are countries such as, Japan where management of port operations and capacity planning are highly centralized. In this latter case, port development is viewed as being an element within a broader economic development strategy.

**Table 5: Canadian Seaport Tonnage Handled
(Millions of Tonnes)**

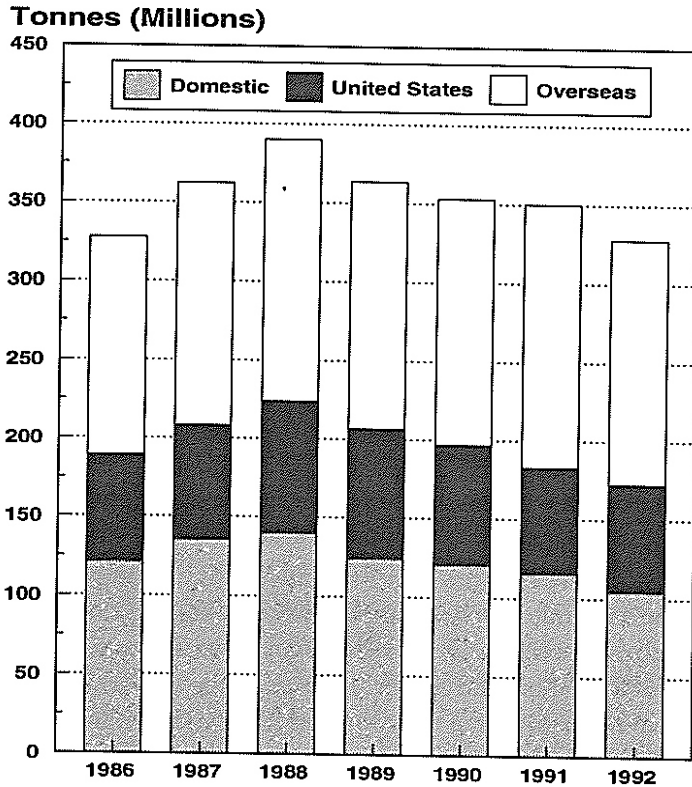
Year	Domestic	United States	Overseas	Total
1986	121.0	68.2	138.4	327.6
1987	135.1	73.2	153.8	362.2
1988	139.9	83.8	166.2	389.9
1989	124.0	82.7	156.7	363.4
1990	120.7	76.2	156.1	353.1
1991	115.8	67.0	167.2	349.9
1992	104.5	67.9	155.3	327.7
Source: Shipping in Canada.				

mission ports operate as semi-autonomous bodies responsible to the Minister of Transport and are established by the Governor in Council on the recommendation of the Minister. The rationale, in the past, for establishing these harbour commissions ranged from the need to establish a body to provide waterfront services to a variety of users, the need to manage strategic waterfront property, and the fact that harbours were major community employers.

Ranging in 1991 tonnage from 434,839 metric tonnes at Oshawa to 17,363,153 metric tonnes at Thunder Bay, commission ports handled a wide variety of cargo, consisting of approximately 70 percent dry bulk, 2 percent liquid bulk, and 28 percent break bulk. Two ports handle containers: Fraser River with a throughput of 15,990 twenty-foot equivalent units (TEU's) and Toronto with 40,021 TEU's. Total tonnage, primary cargo, and 1991 operating income (operating revenues less operating expenses and depreciation) for the nine Harbour Commission ports are displayed in table 6.

The Public Harbours and Port Facilities Act assigns to the Minister of Transport control of all harbours, wharves, piers, and breakwaters that are the property of Canada but not the responsibility of another

Figure 1: Canadian Seaport Tonnage Handled



minister. As a result, there are currently 340 commercially-oriented ports and 186 other sites across Canada whose public port facilities and harbours are under the jurisdiction of Transport Canada and administered through the five regional offices of the Canadian Coast Guard's Harbours and Ports Directorate. The operational role of Transport Canada in its ports is normally limited to enforcing facility use regulations, monitoring port operations, and collecting user fees. Most other services are provided by the public sector. An essential objective of the 1983 legislation creating Ports Canada was to "create a balance between the role of the ports in the national framework, and the need for responsiveness to regional and local conditions. The legislation offered a high

Table 6: Harbour Commission Ports

Port	Total Tonnage (Metric Tonnes)	Primary Cargo	1991 Operating Income
Fraser River	2,084,547	Miscellaneous	\$3,140,899
Hamilton	11,380,000	Iron Ore—58%	\$2,091,000
Thunder Bay	17,363,153	Grain—75%	\$669,546
Nanaimo	1,676,867	Forest Products—62%	\$1,545,437
Oshawa	434,839	Steel—42%	\$701,861
Port Alberni	592,787	Forest Products—100%	\$46,898
North Fraser Harbour	13,947,580	Wood Fiber—57%	\$124,414
Toronto	1,942,530	Salt—26% Cement—26%	\$6,780,961
Windsor	3,285,000	Salt—43% Stone—30%	\$213,320

degree of local autonomy to those ports which could achieve financial self sufficiency” (Ports Canada 1991).

All Canadian ports, whether administered by Ports Canada, Harbour Commissions, or Transport Canada, have as their stated objective to work toward a port system that: (a) contributes to the achievement of Canada’s international trade objectives as well as national, regional, and local economic and social objectives; (b) is efficient; (c) provides port users with accessible and equitable transportation services; and, (d) is coordinated with other marine activities and surface and air transportation systems (Harbours and Ports 1991).

Changes in ship size and cargo handling technology have had a significant effect on Ports Canada, primarily in the form of containerization. Beginning with a single terminal in Montreal in 1968, Ports Canada container ports, which now include Vancouver, Halifax,

and Saint John, presently account for approximately 95 percent of the total Canadian container traffic.

In addition to the traditional role of serving the local marketplace, the introduction of standard size containers and specialized equipment to handle them has made it economical for a port to act as a gateway of foreign trade for entire countries, even those as large as the United States and Canada. This is particularly true on the west coast where multimodal¹⁷ trips allow cargoes to be moved to locations throughout the west, east of the continental divide, and even as far away as Europe (Boschken 1982).

The advent of containerization, along with coordination between ports, railways, and motor carriers promoting intermodal transfers, has had a dramatic effect on inter-port competition in North America. Where as recently as fifteen years ago a port could expect to derive over 80 percent of its traffic from the area within a radius of 200 miles from its wharves, today a port's hinterland can extend for thousands of miles and can no longer be considered its sole domain. For all practical purposes, North America is now one transportation market. In 1990, for example, 20 percent of container traffic destined for Canada came through U.S. ports, some from as far away as Los Angeles. During this same period, five percent of container traffic heading for the U.S. arrived via Canadian ports (Canada Ports Corporation 1991).¹⁸

One of the many significant effects of intermodalism has been the change in shipping fleets. Ships are now being designed and built to move only containers and their size is growing dramatically, so much so that vessels of greater than 2500 TEU's, which now constitute less than 25 percent of the containership fleet, will soon make up more than 60

17 Intermodal is taken to mean the movement of unitized freight, either by steel container on highway trailer, on one bill of lading, or by more than one mode of transport in a (relatively) continuous operation.

18 Also intensifying inter-port competition is the increasing tendency for ocean shipping lines to become involved in the inland movement of containers. Many lines own or lease double-stack rail equipment giving them incentive to concentrate their cargoes at those ports where they can link up with their associated inland operations. This has had the effect of concentrating traffic at relatively few ports or load centres (Canada Ports Corporation 1991).

percent. As they grow, each ship's significance to a port will grow as well, intensifying competition among each region's ports. Shallow ports, those with difficult access, or those that are simply smaller and less well equipped will be at a disadvantage in winning a share in the east-west trade that has built up between the three major trading blocks of Asia, North America, and Europe.

While some factors, such as domestic transportation costs, local market size, and national transportation policies, are outside of the ports' control, others, under the general headings of productivity, service, and congestion, can and must be controlled to attract business. The first of these, productivity, normally measured in number of crane lifts per hour, is linked to the stability, cost, and attitude of dock labour and the degree of port mechanization. In addition, there is some evidence that dedicated terminals, which are more common in the U.S. than in Canada, can lower shipping costs by boosting productivity and smoothing the interface among the shipping line, port, terminal, and rail line. The second, service, includes hours of operation, ease of access and departure, and documentation efficiencies. Provision of on-dock transfers of cargo between ocean carriers and long-haul rail lines is also considered to be an important service factor. The third, congestion, can be broken down into landside vehicular congestion, problems caused by inadequate storage and handling space, and port congestion while ships wait for berths and cranes (Canada Ports Corporation 1991).

Whether public or private, unique location, large local markets, and even good fortune are not enough to insure a successful port operation. Rather, the key element appears to be the appropriate organizational design, incorporating "an enterprise orientation that provides systematic incentives to perform effectively and competitively as well as a sophistication in designing organization to meet contingencies unique to the changing port industry" (Boschken 1982). Interestingly, the degree of managerial separation from the political process that the port enjoys appears to be vital to its success. As stated in the Port of Oakland 1979 Annual Report, "Managing a big harbour...cannot be done effectively if every important decision is to be sifted through a political body."

Seaports and their managements form a important link in the national and international transportation network. As part of the total cost

Table 7: Public Harbours and Port Facilities (1990-91 Revenues and Expenditures by Region)

Region	Total Revenue	Operating Expenses	Commissions & Applied Overheads	Total Expenditures	Operating Income*
Newfoundland	\$2,226,051	\$3,024,667	\$952,846	\$3,977,513	(\$1,751,460)
Maritimes	\$3,520,561	\$6,067,798	\$1,961,580	\$8,029,378	(\$4,507,520)
Laurentian	\$2,193,033	\$8,287,179	\$1,217,427	\$9,504,606	(\$7,311,551)
Central	\$2,497,204	\$5,393,116	\$885,315	\$6,278,431	(\$3,781,229)
Western	\$2,484,809	\$4,301,481	\$1,106,046	\$5,407,527	(\$2,922,722)
Total	\$12,921,658	\$27,074,241	\$6,123,214	\$33,197,455	(\$20,274,482)

of producing and delivering goods and services, the efficiency of ports can be reflected in the amount of goods produced as well as their route to market. Any lowering of the transshipping charge due to technological innovation or lower port profit margin would increase producers' and/or consumers' surplus, encouraging increased production and consumption, as well as increasing the potential trading area for imports and exports (Boschken 1982). Lowering the charge through public subsidy would not have the same beneficial effect, though, as the opportunity cost of the subsidy would more than offset any gains from lower prices.

Uneconomic pricing is evident in Canada as most Harbours and Ports public ports do not generate sufficient revenues to cover their capital, operating, and administrative costs. Therefore, government support, largely in the form of appropriations through Parliament, is necessary. Illustrating this need are the 1990-91 fiscal year operating results for Transport Canada harbours and ports are listed in table 7.

A framework for assessing privatization

In the privatization debate, the distinction between changing the ownership and changing the competitive circumstances that face the corporate entity is all too often blurred. Privatization and liberalization are distinct concepts. Privatization represents a change in the principal's objective from one of maximizing some welfare function to one of profit maximization.¹⁹ As Vickers and Yarrow (1989) point out, ownership of a firm will have a significant effect on its behaviour and performance since changes in property rights modify the structure of incentives faced by decision-makers within the firm. This has the consequence of altering both monitoring and incentive arrangements. Liberalization, on the other hand, refers to a move away from command and control strategies to a decentralized and impersonal allocation mechanism through the opening up of competitive forces.

Economic efficiency may be improved by either or both privatization and liberalization. There are three components to the measure of economic efficiency: productive efficiency, static allocative efficiency, and dynamic (allocative) efficiency. Productive efficiency addresses the question of whether an organization produces its output at a given level of quality at the least cost possible. Productive efficiency will be achieved if the best available technology is utilized and the mix of inputs used is consistent with the set of relative input prices in the market. In other words, the firm which has achieved productive efficiency is operating on the lowest cost function available.

Static allocative efficiency refers to the issue of whether the right level and quality of output is produced that yields maximum overall benefits. This will be achieved when the price of the output reflects the marginal cost of production. If prices are less than costs, too much output is produced and scarce resources are squandered. Prices that exceed costs result in too little output or too low quality or both with the consequence that benefits are lost because a demand, which would have paid

19 Included in this case would be one in which profit enters and plays a significant role in the managers' utility function.

all of the resource costs that are excluded from the market, has not been satisfied.

Dynamic (allocative) efficiency deals with the issue of investment in capacity. A firm has achieved dynamic efficiency if it is operating with no excess capacity or with as little excess capacity as the technology allows.²⁰ The key to realizing both static and dynamic allocative efficiency is competition.

Advocates of privatization as well as liberalization base their arguments upon three literatures in economics and management: property rights, transactions cost, and principal-agent literature. Property rights literature focuses on the non-transferability of ownership claims in the public sector. Transactions cost literature analyzes the decision by an economic agent, such as a firm, to make or buy a product or service. Principal-agent literature is concerned with the problem of information and incentives and addresses the question, “what is the optimal incentive scheme for the principal to lay down for the agent?” (Vickers and Yarrow 1989). This refers to a situation in which a shareholder of a firm (the principal) has interests which differ from those of the managers. The shareholder hires the manager (the agent) to represent him/her and to manage the firm to achieve the best rate of return for the principal. The problem is that the principal cannot control what the agent does and thus must try to develop incentive schemes that lead the agent to act on his behalf.

Some opponents of this line of reasoning argue that government provides a more complex output and thus should not be compared to a private firm. The argument is based somewhat on the “principal-agent” problem. The principal-agent problems are deemed more difficult and costly to address in the public sector (Hirshhorn 1992).²¹ The essence of this reasoning is that public sector managers are unable to appropriate or lay claim to the gains from their efforts and thus have less incentive to

20 If there are indivisibilities in construction it may not be possible to eliminate all excess capacity. Runway and roadway investment are examples of transportation investments with some indivisibilities.

21 Where there are legitimate public policy objectives this argument may have some validity but it is the “legitimacy” of the objectives which must be questioned.

undertake actions which provide for greater efficiency or benefits, however measured. Furthermore, the lack of transferable property rights results in less incentive for monitoring managerial behaviour. In a system in which the future value of (strategic) decisions is capitalized into the value of the firm, the owners have both a greater incentive and ability to ensure managers are working on their behalf. A public sector bureaucrat has less incentive to minimize costs or make decisions that increase the future value of an asset.²²

If there are positive externalities that convey benefits by virtue of public ownership or efficiency gains from cost savings arising from scale economies attributable to public ownership or regulation, public provision or standards are economically justified. Similarly, if there are network externalities resulting from the fact that all parts of the network are complements, government intervention may provide efficiency gains.

Another legitimate basis for public intervention occurs when people make decisions where the marginal social cost of the decision exceeds the marginal private cost²³ and private markets cannot be developed to internalize these effects. However, to simply use public ownership as a means to redistribute income does not constitute a legitimate public policy objective.

Transactions cost literature (Williamson 1975) focuses upon the “make or buy” decision by government. The three options available to the government are to have the product or service provided and marketed by the private sector, have it produced by the private sector through contracts and purchased by the public sector for allocation and distribution, or have it provided by the public sector. The decision will rest upon the ability of government to have private sector production and to extract the rents from the private sector from their more efficient production. Interestingly, this is the same behaviour as a private firm. Economic welfare is enhanced when the private sector produces the

22 This line of reasoning comes out of the property rights literature. For a succinct and transparent discussion see H. Varian (1992). See also R. Rees (1985), “The Theory of Principal and Agent,” *Bulletin of Economic Research* 37: 3-26.

23 This is sometimes termed the problem of moral hazard.

product or service if it is more efficient, even if the private sector also appropriates the rents.

The transactions cost issue is more important for the choice of instruments in a public-private nexus than it is for deciding between public or private production (Hirshhorn 1992). There may be circumstances, for example, in which government may want to use the efficiency of the private sector but maintain property rights because of market failure concerns or for public policy considerations. It may also be that the product or service is a durable and specific asset (physical or human). In this case, government may decide to produce if it concludes that any irreversibilities occurring after the initial decision to produce or invest create constraints on the terms of trade. Williamson (1975) notes that private sector firms will themselves produce or vertically integrate to reduce transaction costs in circumstances involving specialized investments, special skills, or a special location.

Privatization and increased competition are both sources of improved economic efficiency and in most cases they are complements.²⁴ A change in ownership results in a change in entitlement to residual profit. There is a shift in the relationship between those who make decisions and those who benefit from the flow of profits. The change in property rights results in a change in the structure of incentives for management, hence management's behaviour and firm performance. However, there may be a trade-off between internal (productive) efficiencies and allocative efficiencies from privatization. Privatization may not be desirable if it is less efficient and if public monitoring arrangements are no less efficient than what the private sector has to offer. In this case public sector ownership is better, in terms of both internal and allocative efficiency. Vickers and Yarrow (1989) demonstrate that a necessary condition for the superiority of private ownership is to have a significantly more effective monitoring system. They also make the point that the value of private ownership increases with the elasticity of demand.

Public sector ownership does not imply state monopoly nor does private ownership imply competition. Having a firm subjected to the competitive processes provides a spur to internal efficiency, eliminates

24 See Gillen, Oum, and Tretheway (1985 and 1986).

x-inefficiency, and serves as a mechanism to achieve allocative efficiency. Privatization provides a discipline on managers of firms through competition in the market for corporate control while competition in the product market provides discipline to the firm. Competition, even if it is not perfect, may well yield advantages over a regulated or controlled regime. It is important to consider the costs and benefits of using the competitive market solution to what have been deemed market failure problems. In particular, contestable markets, incentive mechanisms that spur internal efficiency, and the use of networks and vertical relationships should all be considered. Just as there may be a trade-off in the decision to privatize, there may be a trade-off between allocative efficiency and scale economies in the decision to liberalize. For example, allocative efficiency may be reduced due to monopoly while productive efficiency may be lost due to duplication of firms and fixed costs in the industry. Yet there are several reasons why competitive forces might improve efficiency even in public enterprises. Internal efficiency may be enhanced as an additional firm can weaken or destroy the monopoly on industrial information. There are also more opportunities for rivals to introduce new products or undertake niche strategies when a public firm is in the market.²⁵

The discussion of privatization, as Poole (1992) has noted, has centred on several major questions. The issues are equally applicable to ports, airports, and other public facilities in different countries. The questions include: Does privatization lead to rational capacity investment? Is there evidence that privatization results in greater efficiency and lower operating costs? Do prices rise or fall and how does the structure of prices change with privatization? Are capital costs higher using private sector capital instruments rather than public funds? How does privatization deal with externalities such as air, noise, and water pollution? Does customer service improve? Are there monopoly problems? Should national and regional objectives play a role? Is privatization sufficient or is liberalization also necessary? In the following sections we address these questions for both airports and ports.

25 A good example of this is allowing courier and other specialty firms into the markets traditionally reserved for a public post office.

Privatization of airports and ports

There are those who argue that public ownership is essential since national and regional objectives are not furthered by a system of autonomous airports and seaports.²⁶ The argument is founded on the notion either that government should use transport to redistribute income or that there are externalities that private sector ownership or management would not consider. This market failure, it is argued, is of sufficient consequence that public ownership is required; seaports and airports, locally owned, would pursue their own narrow interests and would fail to consider the broader public interest that goes beyond local objectives. This line of reasoning was reflected in Canadian policy toward airport ownership and operations until the mid-1980s. After passage of the new National Transportation Act (NTA) in 1988, which reaffirmed the market orientation of transport policy and contained deregulation provisions for air carriers, and with increasing evidence that efficient pricing and investment in infrastructure yielded real welfare gains to the community, government sought organizational reform of infrastructure in keeping with the reliance on market forces to guide decision-making as contained in the NTA. For airports, this reflected a continuation of a policy in reform of airport management which began in 1978 with the Haagland Study and was revived in 1985 after a hiatus by the government of the day.

The question of the appropriate choice of instruments must begin with an assessment of the role of government in “port” ownership and management. Governments should be concerned with those circumstances in which there are scale economies, market failure due to externalities, potential for monopolization, and circumstances in which there are efficiencies associated with coordination of large, long term sunk investments. This is also a legitimate argument for public ownership if there are network externalities that a private producer would ignore.

The basic argument for private provision of infrastructure is that the private sector is more efficient. The efficiency gains arise from two sources. First, private managers have the incentive and capacity to make

26 See for example, Eric Heikkila (1990), “Structuring a National System of Ports,” *Portus* (Summer 1990), p. 19-23.

decisions that ensure the maximum value of an asset. Second, the private sector can produce the output at lower costs. These lower costs stem from a number of sources and include greater internal efficiency and productive efficiency. Furthermore, the efficient level of capacity and technology associated with private sector ownership/management will also lower costs.

Airports

In the 1980s, an increased emphasis on market forces as a way of organizing production and distribution was embraced by a number of governments as well as the world aviation community. Not only did a number of countries follow the lead of the United States and deregulate domestic airline services, but others proceeded to privatize their national carriers in whole or in part. A number of countries also moved in the direction of privatizing airports. Britain is the only country to date which has completed the privatization initiative through sale of their airports.²⁷ However, several different forms of privatization have taken place in other countries since 1991. These include long term leases of airports to private firms, contract operations of airports, creation of new terminal facilities by private sector builder/operators, development of local airport authorities (LAA), and the creation of new airports as private business ventures.

Britain has had two cases of privatization. The larger, identified earlier, involved the three large London airports (Heathrow, Gatwick, and Stanstead) and the four primary Scottish airports (Aberdeen, Edinburgh, Glasgow, and Prestwick). The second privatization involved the purchase by British Aerospace (BAe) of a 76 percent interest in Speke Airport (Liverpool) for the purpose of developing it as an industrial airport and providing relief capacity to BAA capacity.

The several other initiatives to privatize by sale occurred in France, Germany, Jamaica, Malaysia, Singapore, and South Africa. In 1991, the Danish government planned to sell Kastrup airport (Copenhagen), the Belgian government had partially privatized Brussels Airport (estab-

27 In 1987 the British government converted the BAA into a private company, BAA plc.

lishing the Brussels Airport Terminal Company—BATC), and the New Zealand government planned to sell its three international airports at Auckland, Christchurch, and Wellington.²⁸ Long term lease arrangements have also been introduced into aviation from other industries. Several sizable airports in the United States have long term leases: Richenbacker Field (Ohio), Morristown and Teterboro (New Jersey), and Bade Field and Atlantic City International (both in Atlantic City). Contract operations are found at Burbank Airport (California), Stewart International (New York), and Westchester County/White Plains (New York). In Britain, Biggen Hill, Exeter, and Southland airports have all been operated under contract by BAA.

The options of privatizing by building/operating and building/operating/transferring²⁹ have been limited to terminal developments. Terminal 3 at Pearson International Airport (Toronto) was the first major project of this type. Similar operations have been established at Birmingham Airport (U.K.) and Ataturk Airport (Turkey). Few new private airports have been developed. Two examples are London City Airport located in the downtown Docklands district of London and Alliance Airport in Fort Worth, Texas, established by Ross Perot.

Local airport authorities (LAA) developing in Canada are similar in some respects to the type of airport ownership commonly found in the United States.³⁰ They have evolved from the Canadian federal government initiative begun in 1987. LAA's exist in Calgary, Edmonton, Vancouver, and Montreal and are currently under consideration in Toronto, Ottawa, Halifax, Winnipeg, Moncton, Victoria, Thunder Bay, Windsor, and Quebec City. The LAA's are not "private" but are established under

28 These three airports had already been corporatized by the New Zealand government.

29 This is the type of model being employed by the four private road initiatives that have begun in California.

30 They differ in that airports in the U.S. are in many cases owned by local governments whereas this is not allowed under the current rules governing airport transfers. They are similar to U.S. airports in that they are closer to the community that they serve and are more responsive to local needs. They also have a greater commercial orientation.

provincial enabling legislation that specifies which government organization may appoint board members.

The local airport authority model selected in Canada is a hybrid of public and private forms of ownership and management. The LAA's view themselves as "public utilities" with a different motivation than public owners have and an eye to the bottom line. What distinguishes "local" public ownership from federal public ownership are the following. First, the LAA assumes full financial responsibility for its operations, while federally owned airports have a broader internal source of funds (general revenues) from which to meet shortfalls. Second, the motivation for operations, investment, and policy differ significantly. With federal ownership there is a propensity to focus on large rather than incremental changes. Investments tend to be technical/engineering oriented, while LAA's focus more on customer oriented projects. Federal ownership means that any airport investment must compete with all other government investments for funds and that a political allocation model is used. LAA's focus upon operational needs and use economic capital allocation decision criteria. Federal ownership has risk averse decision-making, with the objective of minimizing political risk. The result is safe but non-progressive decisions. The LAA does not eliminate non-profit objectives in its decision-making but does, at least, have profits in its constraint function

In these Canadian cases, the rationale for the move to privatize, or one of the variants discussed earlier, had multiple purposes. In a period of growing fiscal constraints, the market was to signal, finance, and create new airport investments as well as expansion of existing capacity. It was also seen as a mechanism to achieve operating cost savings with improved efficiency and reduce capital costs through more efficient pricing while at the same time being sensitive to the needs of customers, passengers, and airlines. Opponents voiced concern that privatization was an inappropriate model because of externalities, monopoly, and "public good" issues even in spite of alleged efficiency gains from privatization.

A concern and argument of those opposed to privatization is that capital costs will be higher than those of government owned airports. The use of tax-exempt municipal bonds in the U.S. reduces interest ex-

pense and hence overall capital costs. This option is not available in Canada. However, while the tax exempt status represents a financial saving, it does not represent a true economic saving. It has simply distorted the relative returns between airport investment and other investments; the result may be too much airport capacity in a given region.

Financial analysts also make the argument that the after-tax cost of debt to a private firm may be less than the before-tax cost of debt to a public firm since the debt is tax deductible. However, there is a more fundamental issue here. Proponents of public funding and/or ownership argue that money is “cheaper” for governments because they do not have to pay a risk premium to the capital market. While this may have been true in the past, increasing borrowing by government, coupled with increasing deficits, has resulted in the downgrading of government credit ratings. This has resulted in a general increase in costs across all projects and government borrowing. The market is, in essence, telling the borrowing government that it is “more risky.” The provinces of Ontario and Saskatchewan provide good examples of precisely this point. There is another point to be made as well. Governments compete with private firms for capital in the economy because it represents the scarce savings of the economy. This competition can bid up the cost of capital to all users.

The cost of debt to a public firm may well be much higher than for a private firm if the public firm receives financing or a subsidy from public revenues to pay its debt. Jorgenson (1992) has noted this point. He reports on research by Jorgenson and Yun (1990) which shows the marginal cost of a tax dollar is \$1.46: for every dollar of public spending, the cost is \$1.00 in tax revenue and 46¢ of loss in economic efficiency in the private sector. Ballard, Shoven, and Whalley (1985) produce a marginal cost of \$1.33. Furthermore, when a government borrows to finance a project, it must service this debt. It generally does this with revenue from taxes or other levies, the allocative economic efficiency costs of which have been shown to be significant (Shoven and Whalley 1991).

Publicly funded projects suffer the malaise of “bureaucratic delay” (Forror 1990) and inertia with respect to the planning, operation, and management of construction. Transport Canada estimated, for example, that the construction of Terminal 3 at Pearson International Airport

would have taken almost twice as long as it did were it handled by the federal government as it would have been in the past (Poole 1990). If privatization reduces capital requirements arising from savings in development time and more efficient building methods, the total costs may be less, even if the per unit price of capital is higher, as the private firm has every incentive to obtain the lowest costs for the project value. Therefore, the costs of government ownership can be, and generally are, higher than those of private ownership.

Investment in capacity is also more likely to be at an efficient level under a privatization scheme. In Canada, over-investment in capacity at Mirabel and Calgary airports was a direct consequence of the Federal government making investment decisions on political grounds and attempting to maintain a national standard. The fear that the private sector will fail to invest and will simply exploit (and run down) existing capacity lacks evidence.³¹ Investment by BAA more than doubled in the three years following privatization.³² At Heathrow, \$440 Million is being spent on a rail project to link the airport with downtown London. When complete, the trip will be cut from one hour to fifteen minutes. At lease-managed airports, investment has also grown. Morristown, NJ, for example, has undertaken continuing investment in runways, terminals, and ancillary services since being leased in 1982. A similar situation has occurred at Teterboro Airport, under lease since 1970 (Ashford and Moore 1992).

An analysis of both BAA and Lockheed air terminals has provided evidence that productivity, both nominal and real, has increased markedly. A cost comparison of a federally owned and operated airport, Yarmouth NS, and a municipally owned airport, Oshawa, ON, provides marked evidence that local ownership leads to substantially lower costs. In the example of the two comparable airports, Yarmouth had a \$700,000 deficit, while Oshawa was in a break-even position.

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- 31 A reduction in capacity should also not be construed as *prima facie* evidence of private sector failure. In many cases public ownership/management can lead to excess capacity. Rational investment decision-making may lead to a reduction in capacity to a more economically efficient level.
- 32 The investment has been in terminals only. Runway expansion is currently blocked by legislation.

Yarmouth had a staff of 20, while Oshawa had 3.³³ Edmonton International Airport, now operating under a local airport authority, achieved a 25 percent reduction in operating costs in the first full year of operations relative to when it was owned and operated by the federal government.

Hirshhorn (1992) reports that the Canadian federal government has 14 airports in which the entire operations have been contracted out to private firms. He notes that operating costs tend to be lower and that contract airports utilize resources more efficiently. Reinforcing this conclusion, Hickling's study (1990) of two federally operated airports in Quebec found that the two privately managed airports had substantially lower costs, which was attributed to the increased freedom and flexibility of private managers. Finally, an Auditor-General Report that compared the efficiencies of three federally operated airports with those of three U.S. airports, found the manpower requirements of the U.S. airports to be 40 percent less.

The questions of pricing and monopolization go hand-in-hand. Critics of privatization argue that prices will rise and airports will exploit their monopoly position. What is the evidence and what are the arguments?

In many cases airports are the sole suppliers of runway and terminal services to airlines. Some argue that this provides a sufficient condition to reject privatization since public firms would not exploit their monopoly positions, or they are not allowed to earn a profit and thus have no incentive to exploit their monopoly positions. A number of points must be made here. First, a monopoly can result from the ability of a single firm to satisfy the market because of continuously falling average costs and the lack of scope economies.³⁴ Morrison (1983) has shown, however, that for large airports there are essentially constant re-

33 See, Hamilton, G. (1991), "Cost Competitiveness of Canadian Airports," paper presented at the ATAC 57th Annual General Meeting (November).

34 There are a number of bases for the creation of monopoly for airports. These include the existence of scale and scope economies, barriers to entry from land markets, and community constraints and government control of complementary services such as air traffic control (ATC) that are not expanded.

turns to scale in the absence of congestion. When congestion is present, marginal costs (both private and social) are rising. For smaller airports there is no substantial empirical evidence, but casual empiricism suggests that there may be some minor increasing returns over a range of smaller sizes of airports. At some point, however, airports are subject to increasing costs (or decreasing returns). The reasoning is that established airports are surrounded by residential and commercial development. It is not easily possible to add runway capacity although it is possible to add terminal capacity. The alternatives are building a new airport or, equivalently, competitive entry, but this entry is inhibited for two reasons. First, inefficient underpricing of existing capacity does not attract capacity investment and leads to administrative allocation rather than market based allocation. Secondly, different sectors of the community take different positions on airport location and expansion. Some groups view airports as externalities rather than as assets of the community. Therefore, they impose extraordinary costs in terms of location and procedural wrangling for building and operation.

Any attempts to move to “economically efficient” prices at U.S. airports, privatized or not, have met with the threat of lawsuits.³⁵ Legislation passed in 1992 in the U.S. now allows airports to levy “passenger facility charges” (PFC’s) but only under defined circumstances and in conjunction with other changes, including a reduction in federal grants. BAA, prior to privatization but at a point at which it had been corporatized, established a marginal cost based pricing scheme and peak-period pricing. When the private Terminal 3 was completed at Pearson International Airport in Toronto, the prices charged for almost all services and access by taxis and buses differed dramatically from those charged by Transport Canada on the same airport. The Terminal 3 prices were much closer to “efficient” prices.³⁶ Since the LAA was estab-

35 United States airports utilize either a compensatory or residual method of financing, neither of which is likely to lead to economically efficient prices including the pricing of externalities such as noise.

36 See a full description in Gillen, D., Tae Oum, and M. Tretheway, *A Study of Peak Period Pricing with an Application to Toronto International Airport*, Report to Airport Authority Group of Transport Canada, 1989.

lished at Edmonton, the authority has also been moving to more efficient prices.

There is clear evidence that efficient prices are more likely with privatization. The prices are not monopoly prices and an airport does not have unfettered control over prices for a number of reasons. An airport provides services to a broad range of customers with differences in their demand elasticities. Just as airlines practice yield management, the practice of segmenting the market by placing restrictions on fare classes and being able to vary fares with the number and type of restrictions, so too could and would airports. They have to spread their costs, traceable and non-traceable, across all user groups. Second, airport services are a derived demand by carriers and other commercial aviation interests. Their demand is contingent on the demand for their product. To the extent they operate in competitive markets, which airlines do, the ability of airports to increase prices is limited. At a practical level, airports face competition from other airports and other modes, in the short to intermediate term. In the longer run, communications is a substitute. Third, there is inter-airport competition for many of the airports in Canada: for example, Vancouver and Seattle, Edmonton and Calgary, and Toronto and Buffalo and/or Pittsburgh. The ability of an airport to increase its prices will be constrained by an airline's ability to move to another airport and simply feed from the previous centre. It is the case that inefficient, and some monopoly pricing, is more likely with public ownership. Having a common price for all users underprices some and overprices others. The higher price will, in some cases, approximate the monopoly price. Airports also tend to focus more on costs than on (monopoly) prices.³⁷ Airports essentially have three sources of revenue. Land rental for industrial use on or adjacent to the airport is relatively stable from year to year. Similarly, concession revenue, generally a percentage of sales, does not vary significantly from year to year. Airport/terminal revenue does vary with the volume of traffic. At most major airports this does not vary much. Therefore, revenue in aggregate is relatively stable over time. Hence, since airports cannot affect revenue

37 This is the opposite from most industries.

except over the longer term, they must focus on costs as a means to increase profits.

Proponents of public ownership for airports argue that private owners will pollute more. In the case of airports, public sector airports, it is argued, cope better with noise issues than do or would private sector airports. Poole (1992) provides evidence to the contrary. He reports that BAA, Burbank Airport, and Palm Beach County Airport have been successful and innovative in dealing with noise mitigation. The (noise) externality issue, however, has little to do with ownership type. In the United States, the federal government and, in some cases, state or local governments establish noise ordinances that apply to all airfields in their jurisdictions. Transport Canada performs this function in Canada.³⁸ These regulations apply equally, regardless of whether ownership or management is public or private.

Do private airports and seaports have a greater incentive to ignore standards or undertake investments and operations that exceed standards or place extraordinary pressures on the environment? Poole (1992) provides evidence that private airports do as well as public airports in mitigating noise. In Canada, there is little evidence one way or the other, since almost all major airports are owned by Transport Canada. One can, however, look at locally owned or municipal airports such as Oshawa, Edmonton Municipal, and Toronto Island airports for some evidence that local ownership provides an incentive for airports to respond to the demands of the local population and airport environs. Some of the most innovative noise management strategies have been put in place by Edmonton Municipal Airport (Gillen and Levesque 1989 and 1990).

A network externality refers to a situation in which the addition of one more node (airport) to a network adds value to the network that exceeds the value of the node operating independently. The reason is that not only can a new airport link with all other airports but those other air-

38 For a full discussion of noise issues and international comparison see Gillen, D. and T. Levesque (1990), *The Management of Airport Noise*, Final Report to Transportation Development Centre (July), and Gillen, D. and T. Levesque (1989) *Noise Management Strategies: A Survey*, Technical Report 89-01 to Transportation Development Centre, Montreal, 1989.

ports can also link with the new airport. The value of all previously existing airports is therefore higher because they can generate higher utility and/or profits, hence the externality. Network externalities are said to provide a strong argument for having some public control of airports. The reasoning is that an airport that links with other airports will, by monopoly pricing, reduce traffic to itself as well as to many other airports in the system. This externality results from the fact that the airport ignores the impact of its pricing decisions on other airports. There are a number of issues to be considered. First, it assumes that public owners or operators would price to take into account the "system effect" and this has never been shown to be the case. Second, although there is complementarity between origin and destination airports, there are also substitutes. This substitution can offset the need to take into account the positive cross-elasticity between one airport and another. Essentially, the complementarity and substitutability offset each other. It would only be the case in which there is perfect complementarity between two airports that externality pricing creates problems. Third, there is the argument (above) that no airport has an incentive to restrict output. They would engage in some form of yield management. Fourth, there is the evidence from the U.S. where airports are owned and operated by independent authorities that make decisions in their own best interests. The U.S. aviation system has not broken down from a failure on the part of airports to recognize that they are part of a system. Airports are not unlike most other markets, there are substitutes and complements. The minor interdependencies between airports do not provide a strong argument for having Federal control.

Seaports

Seaport privatization, or at least commercialization, is a worldwide phenomenon. A 1990 survey of port authorities and national ministries revealed that at least 36 governments were exploring the possibility, although, of these, only nine have been active in their pursuits (Bennett 1992). The position of many on the public versus private ownership question is not a neutral one, in the sense that many are taking the position that if there is no compelling justification for public ownership, private ownership is preferred, i.e., less government is better.

For the most part, government involvement in ports has been viewed as a response to a failure, or anticipated failure, of private markets to provide desired outcomes. Depending on the specific area involved, this failure can occur for a number of reasons, including free-riding and lack of discretion in the level of consumption in the area of public goods, failure of private enterprise to take account of externalities in the case of environmental protection, and lack of competition where economies of scale and large startup costs promote natural monopolies. Simple market failure, while cause for government intervention, should not be justification for public ownership when remedies for the failures can be found in the form of taxes, regulations, and legal sanctions (Hemming 1988).

The problems created by the three cases of market failure listed above as well as the needs to establish property rights and to coordinate planning are often given as the five minimum duties that must be carried out by some sort of overall organization in order for a port to function (Goss 1990-c). For those who favour public ownership, that organization should be a public port authority. Their arguments pertaining to each of the five duties are given below and are addressed in turn.

While property ownership for land, its use, and the right and means to transfer ownership are usually clearly established, the same cannot be said of the aquatory (that area relevant to a port that is normally covered with water). As a consequence, anyone building a jetty or pier may have no property rights in it, and particularly no exclusive rights. In some cases it may even be regarded as a hazard or obstruction making the builder subject to fines or damages. In such a situation, there is little incentive to build at all or, at best, the incentive is to build with as little financial outlay as possible in the event that it must be removed (Goss 1983, 1990-c).

A successful port obviously needs wharves and terminals that will survive use and abuse by ships as well as the elements for a long time. Thus, there must be some mechanism for securing property rights in these long lived structures. A public authority, empowered by statute or public proclamation with power and jurisdiction over the aquatory,

could then construct the necessary port works with a “legal security equivalent to property rights for all practical purposes.” (Goss 1983)

Without disputing any of the above, there is no reason for the process to stop there. Once legal rights have been clearly established by law or statute, they can be sold to private enterprise. Clearly, when the State of California transferred to the city of Los Angeles, in 1911, “all the right, title, and interest of the state of California...in and to all tide lands and submerged lands, whether filled or unfilled, within the present boundaries of the city,” it was exercising this power even though it was ceding the property to another public entity. By transferring property to private owners, costs and benefits of actions are concentrated on those who make the decisions. “Property rights mean self-interested monitors. They reduce the social cost of monitoring. That is precisely the problem that the nationalized industries were incapable of solving, since the residual claimant was the government and not a wealth maximizing shareholder...If the market is competitive, maximizing the residual rewards of business becomes equivalent to maximizing consumer welfare, even though this is not the intention of businessmen” (Veljanovski 1987).

With the possible exception of single user ports, establishing a sea-port requires some sort of coordination for the building of “permanent” or even temporary structures in the aquatory. Due to the dynamics of the ocean environment, with its currents and tides, a pier, jetty, or breakwater in one location could easily cause siltation or erosion at some other location.

Some argue that landside development requires extensive planning as well, including cooperation with the neighbouring community in locating rail connections, roads, and public utilities, as well as in controlling positive and negative externalities of the port. In addition, they say that without planning it is possible that competition among private firms within the port could lead to oversupply of capacity (Goss 1983).

Once again the facts are indisputable, but concluding that these necessitate a public port authority is shortsighted. Where a port is sold to a single profit maximizing entity, no problems will arise as careful infrastructure planning and coordination with the adjacent town to reduce congestion will help it to control costs. If a port is sold to several private

firms, coordination of infrastructure construction with regard to environmental consequences such as erosion and siltation will still be in the best interest of all involved. If there is a failure, the damaged firm will have remedy at law. Finally, the possibility of overcapacity is a short run problem only and will be corrected by market forces either through growth in traffic or the exit of capacity via reassignment or bankruptcy.

Proponents of public ownership of seaports also draw on the argument that there are certain goods that in an ordinary competitive market would tend to be undersupplied or possibly not supplied at all. In a seaport, this may include such items as radio navigation aides, lightships, marker buoys, beacons, and radar reflectors. They base their position on several arguments, including the inability of the supplier to exclude consumers (or beneficiaries) from using without paying, the lack of a relationship between the level of costs to provide the service and the levels of use, and, finally, the fact that there is no variation in the cost to the consumer with changes, however large, in the level of use. This final point says that there is zero marginal cost and since the price charged for a product or service is normally related to the marginal cost, no revenue can be collected for providing it, hence a need for some overall public authority to supply it.

This line of reasoning must be carefully assessed. If there is genuine excludability and there are no free-riders, private markets will provide the optimal number of navigation aids, lights, marker-buoys, et cetera. The reasoning is that commercial interests and negotiation between firms, port owners, and ship owners would lead to investment in and the provision of the optimal amount of these services because it is in their best interests. The port can attract ships and can capture all the gains from providing this “public good.” Single ownership of a port does not preclude the provision of these services. Rather, only if there is non-excludability and if marginal cost equals zero, would they tend to be undersupplied by the private market.

While there may be a need for certain public goods in seaports, private ownership of ports should not preclude public supply of some of these goods any more than private ownership of airports in the United States precludes use by aircraft of their air traffic control systems. Also,

it is in a seaport owner's best interests to provide those goods not supplied by government if it expects ship owners to continue to use its port.

The concept of economic externalities has become more important of late as one of its most obvious examples, pollution, has become more of a public concern. Among the many externalities associated with ports (or, perhaps more correctly, with port users) are safety, pollution, and congestion, both in the port and in the surrounding community.

Given that these externalities exist, there must be some mechanism in place to deal with them. If a ship sinks in the middle of the channel it becomes a hazard to other ships and must be removed whether or not the owner is willing and able to do so (or can even be identified). Likewise, fires must be put out, spills cleaned up, and rules of the road established and enforced.

As is the case with public goods, however, private ownership of ports does not require nor even imply an absence of government oversight or participation in protecting the public from pollutants or safety hazards. Private industry today must comply with myriad environmental regulations at both the national and local levels. In addition, fire and police protection are provided to all businesses, public and private, and are paid for out of local taxes. There is no reason to believe that privately owned seaports would be treated differently.

It is interesting to note that improving efficiency is used as an argument by both sides of the private versus public ownership question. The public ownership faction feels there are many ports that, in at least some segments of their operations, have little or no competition, thus allowing them to exploit their positions through the extraction of economic rents. Since these financial surpluses are the results of particular situations rather than superior efficiencies, they will lead to losses in economic welfare. To prevent these losses, the faction continues, some public entity must constantly monitor the ports' performances in some manner that goes beyond merely checking the bottom lines. Profits may merely reflect a monopoly, not efficiency. For a public landlord port authority, this can be achieved by ensuring that there is competition among the companies vying for port leases and contracts. This does not necessitate there being a large number of firms competing but merely that the cost of entry or exit be kept low enough so that the market is con-

testable. If this is the case, current tenants or suppliers will be forced to try to reduce costs, rather than raise prices to produce a profit, in order not to attract new entrants.

Whether a landlord or a comprehensive port authority, Goss (1990-c) argues, only a public authority can provide the necessary monitoring to protect the public against the excesses of cartels and monopolists. Those who favour privatization, on the other hand, hold that even in the worst case, i.e., where public monopoly is replaced by a private one, reduced political interference, increased accountability of managers to owners (shareholders), and pressures brought by private capital markets to seek productive and allocative efficiency will lead to increased efficiency (Hemming 1988). Where there is competition, and this is almost always the case, the market will force the private owners to operate efficiently.

The public versus private ownership debate does not end with the five areas mentioned above. There are several other arguments put forth by public authority advocates. First, there is the danger of a local monopoly or cartel forming that could decrease economic welfare by pricing above marginal or average cost but just below the shippers' cost, causing business to move elsewhere. Second, the private sector's time horizon can be relatively short compared to that of the public sector, due to pressure by shareholders for quick results, necessitating higher prices to recover costs more quickly, although it can just as easily be argued that the public sector has its own time exigencies, with politicians under pressure by their constituents. Third, the large, indivisible investment usually required for port installations and heavy equipment are atypical of private investment interests. Although this may be true when a large port is viewed as a whole, there is no reason why a site cannot be developed piecemeal, with each part being built as demand and financial conditions dictate. Finally, coordination with public investments in connecting links in the transportation chain, i.e., rail lines and highways, is more complex than if all were in the public domain.

While these may be valid points, are we simply replacing market failure with bureaucratic failure when we make a decision to place an activity in the public sector? Most arguments against public ports are, in fact, simply arguments against bureaucracies in general. In the public

arena, political interference and lack of appropriate incentives can reach the point where managers simply want to be left alone and so they merely do enough to achieve that goal. On the other hand, managers can cultivate their relationships with their bureaucratic overseers in order to increase their budgets and thus inflate their own prestige, power, and pay. In either case, public production will be relatively inefficient (Hemming 1988).

Public monopoly can also create circumstances in which economic rents can be translated into costs. In any monopoly or situation in which there is actual or potential market power, there will be economic rents available. If factor markets are competitive, these rents will remain with the owner of capital, at least until they are dissipated by entry. To the extent that some factors also have some market power, they will appropriate some or all of the rents. In the end, a rent, which is simply a transfer and does not affect allocative or productive efficiency, will be translated into a permanent cost increase, which does impact economic efficiency.

This scenario is most likely with public monopolies or regulated environments. First, the public sector is heavily unionized, which creates an opportunity for the labour factor to exercise its market power. Second, with public monopolies, there are rents available both from being monopolies and from being public. The latter point arises from the fact that publicly owned or regulated enterprises have, in most cases, the opportunity to obtain funds from government revenues. Governments derive revenue from taxation, a power unique to governments. Their monopoly powers over taxation create rents. It is, therefore, not happenstance that labour forces in public ports and airports receive above average wage and benefit packages. The move to privatize would not lead to lowering wages below marginal product costs, but would only reduce or eliminate rents that have been extracted over time. It would also serve to change work rules, thereby increasing the productivity of labour and reducing costs.

While political interference and bureaucratic failure are probably the principle sources of public sector inefficiency, they are not the only sources. Without fear of economic repercussions, such as bankruptcy and take-over or the inability to borrow due to a poor credit rating, there is little incentive to operate efficiently. In addition, lack of competition

can lead to insensitivity to consumer-desired quantity and quality (Hemming 1988).

The current trend to integrated logistics systems has both led to and resulted from increased specialization in shippers and terminals. The latter has been made possible due to the technological change that has taken place in vessels, ports, and terminals. Heaver (1992) makes the point that these developments have created an opportunity for greater reliance on competitive market forces for port policy and port management. In the port, the port authority would essentially play the role of the landlord and the private capital market would satisfy the demand for terminal services. Technical change, leading to greater specialization of vessels and cargo, places relatively greater weight on scale rather than scope economies. Terminal specialization means fewer “common” port inputs. These factors make terminals relatively independent, reduce barriers to entry, and raise the opportunity for greater terminal competition.³⁹

There are few, if any, ports that are free from competition. Efficiencies brought about by containerization and inter-modal transfer leave few markets accessible through only one port. The competition experienced by seaports may be found among essentially five different categories:

- 1) Competition among port ranges or coastlines regardless of nationality: advances in inter-modal transfer systems and enhanced efficiencies in truck and rail transportation have provided access to many inland areas once felt to be the province of a single port. In this way even ports as far apart as the west and east coasts of North America are in competition.
- 2) Competition among ports in different countries: an excellent example here is the contest for container traffic to the industrial mid-west of the U.S. carried on by the ports of the Maritime provinces of Canada and the cities of Baltimore and New York.
- 3) Competition among individual ports in the same country: while there often appears to be a great deal of cooperation (or collu-

39 Heaver (1992) makes the point that these changes mean that terminals and not ports should be the focus of any strategy.

sion) among countries', provinces', and states' ports regarding tariffs, this is often misleading as tariffs come a distant third among the generalized costs of using ports (the other two being cargo handling and the costs associated with turnaround time).

- 4) Competition among the various providers of facilities or services within a port: even in landlord ports, this type of competition cannot be taken for granted as advances in cargo handling technology have reduced the need for large numbers of firms. Also, service providers are capable of reaching agreements among themselves regarding prices and labour practices.
- 5) Finally, competition among modes of transport: in this case, ships, and thus ports, have already lost out on most passengers and high specific value or perishable goods. Since most of the trades through major Canadian ports are bulk cargoes such as coal, grain, ore, and wood chips, or neo-bulk cargoes such as wood pulp and paper that are going to overseas destinations, the ports are unlikely to be seriously affected by competition from other transportation modes (Goss 1983).

Port competition also has another dimension. Competition among ports is composed of the myriad services each has to offer. A new service can be introduced into a port through investing in new terminals. A terminal can be placed anywhere and represents an incremental investment. Thus, like airports, which have a few runways and, in some cases, many terminals, terminals can be added at a port. The changing nature of ports and terminals and the changing terminal technology, in which terminals are self-contained, are important because, in the absence of entry barriers, significant increases in competition can take place. Thus, inland terminals located some distance from a port can create competition among ports that would not have existed previously, in much the same way that hubs create competition among airports that would not exist in a point-to-point network.

Summary, conclusions, and policy directions

Much of the debate over privatization has focused on the greater efficiency of the private sector and the potential cost savings. It is also seen as attractive for financing the much needed capacity increases that the public sector cannot or will not undertake. Herein lies the real rub. The public sector has failed to price in an efficient manner what it owns and operates. The end results are not only excess demand, but also inefficient levels of investment. It is not that the public sector is unable to price efficiently, it is simply unwilling to do so because with its historical operating measures and procedures it has left the impression with the public that there is community fairness and value in underpricing, uniform pricing, and having excess capacity.

In comparing the advantages of public versus private provision of infrastructure, distribution issues as well as allocative efficiency must be considered. The losers from privatization will be organized labour and, to some extent, landowners. This results from the private sector's initiative to seek out and capture rents. It is, of course, obvious that now these two groups gain disproportionately under public ownership.

The potential gains of moving from an administrative rule decision process of allocating resources to one in which the market plays a dominant role arise from two sources. First, there are the incentives created by ownership. Second, gains are available from the introduction of competitive forces. The competitive process provides the spur to internal efficiency, eliminating x-inefficiency and serves as a mechanism to improve allocative efficiency.

The value of privatization or some form of defederalization is dependent upon competition. Without competition, the gains from privatization or corporatization will be smaller since the risks will remain in the public sector while the rents will accrue to the private sector. A key issue, therefore, in assessing the shift away from the public sector is the extent to which a competitive market exists. If it does not, the restraints on the exercise of monopoly power must rely on some form of corrective regulation. It is not clear that this offers significant improvements over public ownership.

Public safety and environmental concerns are neither a necessary nor a sufficient condition for public ownership since they can be addressed through established mechanisms, as private firms are currently including issues of investment. Some, however, are willing to argue that the role of transportation infrastructure in preserving and developing the national well-being may provide a rationale for public ownership. We disagree. The private sector has undertaken and will undertake investments that are long lived and require considerable investment; the oil and mining industries are testimony to this. The risk premium should not differ significantly between the public and private sectors, as argued earlier.

Airports and seaports have much in common. They serve a multitude of user groups. They involve investments that are large and long lived. They create externalities. They are both perceived as a means of realizing economic growth and development. Both have moved some distance from public federal ownership. The federal government began to market airports in the late 1980s. Seaports have been shifted to a significant extent to autonomous local port authorities. Although these represent significant moves, there is a considerable way to go. Efficiency gains can be achieved through greater private contracting for building and services; there is ample evidence for this in all modes. The most significant gain from greater private participation is in the flexibility with which the private sector is able to use resources. This results in substantial increases in productivity and consequent reductions in cost.

There is considerable debate as to the monopoly power of airports and ports. Changing technologies, intermodalism, and network strategies by carriers have all led to a diminution of market power. Nonetheless, where monopoly power may be troublesome, corrective regulation may be required. It should be noted, however, that regulation is not without its own problems.

Perhaps the most important outcome from moves to corporatization and privatization is that of removing investment and pricing decisions from the hands of politicians and bureaucrats, who have some grand notion that building airports, ports, roads, and railroads will somehow provide a panacea for the economic ills of a region or nation. What has generally happened is that government has not only

provided the capacity but has underpriced it as well. It should be remembered that transportation is a derived demand and neither investments in capacity nor policy initiatives will alter economic activity in a substantive way. This simple notion seems to be lost to the proponents of public ownership. In their view, privatizers fail to see the “market failures,” including the need for government to provide public services. The “publicizers” see government as wise, disinterested, and technically competent. The evidence is far from compelling for this view, particularly when government intervenes to try to direct markets. Government failure has done more harm than has market failure. Privatization, or at the very least corporatization, provides a superior solution.

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Competition, Regulation, and Efficiency in the Canadian Railway and Highway Industries

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SINCE CONFEDERATION, GOVERNMENT INTERVENTION in Canadian transportation markets has been pervasive. The aim of intervention has been to restrict the functioning of market mechanisms and substitute a set of non-market prices. To a large extent, the demand for intervention in transportation markets comes from special interest groups (for example, unionized labour, suppliers of transportation services, and regional interests) seeking gains in income either directly via higher wages or profits or indirectly by way of reductions in transportation rates that would not be available in the absence of such intervention. The major policy instruments used by governments to influence transportation markets have taken three major forms: direct government ownership of companies (e.g., Canadian National Railways, Air Canada), economic regulation aimed at setting limits on the number of suppliers of services and/or the level of prices (all transport modes), and direct and indirect subsidization of transportation outputs.

Until very recently, prices in the majority of Canadian transport markets were set at levels far different to those that would have arisen in the absence of government intervention. There is a vast and growing body of evidence to show that government intervention in the transportation sector has been incredibly costly and has been directly responsible for creating an inefficient allocation of resources. An efficient allocation of resources is one in which, for a given level of output, factors of production are employed in such a fashion that the good or service is provided at minimum cost. In the case of the majority of transportation services, production costs and prices in regulated markets have been higher than would have occurred in the absence of regulation. In addition, government ownership and subsidy payments have a been, and continue to be, a substantial burden on taxpayers. Over the period 1927-1991, direct subsidy payments to the rail sector have totalled almost \$12 billion (current dollars), with \$11 billion accounted for in the period 1967-1991.¹ Over \$7 billion of the total has been spent on providing subsidies to uneconomic rail passenger services. Direct subsidy payments to highway carriers have been relatively small by comparison and for the period 1927-91 total \$870 million. It should be noted that indirect subsidies to highway carriers have likely been very large. The major indirect subsidy arises from the fact that user fees collected for the use of publicly provided infrastructure such as highways fall short of the cost of providing the infrastructure.

The Canadian economy is one of the most transport-intensive in the world. The small population, large physical size, and heavy dependence on international trade makes the transportation sector more important to the economy than it is for most nations. In much the same way that tariffs restrict trade flows, transportation costs also act as barriers to interregional and international trade flows. Cost raising inefficiencies

1 Excluded from the total are subsidy payments made under the Western Grain Transportation Act and direct federal assistance to CN. Only part of the very large subsidy payments under the Western Grain Transportation Act (over \$7 billion in the period 1983-1993) are properly categorized as being a transportation subsidy. It is very difficult to determine with precision the size of direct federal assistance to CN. Much of the "subsidy" payments in recent years have been by way of recapitalizations.

that are present in Canadian transportation industries will have the effect of reducing trade flows and thus lead to an overall reduction in the level of income and employment.

Many of the grosser distortions visited on the transportation markets by government regulation have been reduced significantly in recent years. There are, however, important cost-raising inefficiencies present in transportation markets that are directly attributable to existing government policies. In particular, rail carriers face restrictions on abandoning uneconomic services² and (as is also the case with the trucking sector) face higher tax burdens than do the U.S. carriers they compete with in the increasingly important transborder freight market. Also of concern is the fact that rail productivity in Canada in recent years has increased at a much slower rate than it has in the U.S. Tretheway and Waters (1991) provide an examination of the "productivity-debate" and conclude that although measurement is difficult, the broad trends suggest that productivity is indeed growing faster in the U.S. than in Canada.

This essay is aimed at analysing how government regulation and subsidization of the highway and rail sectors have influenced competition and optimal prices in road and rail freight and rail passenger transportation markets. This is an appropriate time to examine the above issues. First, a federal Royal Commission on passenger transportation in Canada released recommendations in late 1992 on how public policy toward passenger transportation should be framed. The Royal Commission was set-up in October 1989 following the uproar from special interest groups over service cuts in Via Rail's operations. Second, the National Transportation Act of 1987 (which came into operation on January 1, 1988) contained sweeping and highly controversial changes in the way in which the rail industry was regulated in Canada. The Act required that four years after the legislation came into operation, Commissioners appointed by the Governor in Council would conduct a comprehensive review on the overall effectiveness of the Act. Third, the rail industry in Canada is facing a number of very serious structural problems. Production costs in Canada are higher than for comparable

2 The services are uneconomic in that total revenue is insufficient to cover production costs.

U.S. rail carriers and the “productivity gap” appears to be widening. In addition, Canadian rail carriers are facing increased competition from highway carriers for both domestic and international traffic. Over the next few years, Canadian rail carriers will have to cut production costs and improve productivity or face a very bleak future.

The first section provides an overview of the key economic factors that pertain to both the rail and trucking industries. The next section provides a brief history of government intervention in the rail sector and followed by a similar history for the trucking sector. The proceeding section details the major issues surrounding the current debate over subsidy and regulatory regimes as they relate to the highway and rail modes. The final section looks at the question of optimal public policy.

Economic considerations

Both the rail and trucking industries have been subject to stringent government economic regulation. Governments at various times have assumed that competition in these transport sectors would be detrimental to the public interest. In reality, such views stem from a mistaken conception of the underlying economic factors involved in the production of rail and trucking services.

With respect to the railways, governments have frequently assumed that the industry was characterized by a natural monopoly (a decreasing cost industry) that required regulation of prices and service levels. That is, it was assumed that not only would competition lead to production costs being at a higher level than would arise if production was limited to one carrier in a market but, in addition, competition within the industry would produce an unstable situation, which would, at some point, lead to the exit of all but one firm that would enjoy monopoly power.

There is in fact no evidence to suggest that the production of railway services is characterized by the presence of large or important scale economies. What is important in the case of the rail sector is not economies of scale, but economies of density. The latter is a measure of how unit costs behave as traffic density (tonne-kilometres per kilometre of track) increases up to some point. The available econometric evidence suggests that increasing traffic density is an important determinant of

lower unit costs up to roughly 10 million tonnes per annum per kilometre of track (Harris 1977, Keeler 1974). In fact, there is every reason to believe that density economies will be present up to the point of maximum track capacity, which is much greater than the 10 million tonnes referred to above.

The absence of large scale economies does not mean that entry into the rail sector is contestable. A contestable market is one in which, “entry is absolutely free, and exit is absolutely costless” (Baumol, 1982). For exit (leaving the industry) to be costless, sunk costs must be zero or very small. Sunk costs are expenditures on specific factors (miles of track, for example) that cannot be used for other purposes or easily resold. Under existing institutional arrangements, carriers must provide their own track in order to enter the industry. Meaningful entry would require an enormous investment in sunk costs and would be most unlikely to occur. This does not mean that it is impossible to promote the entry of new carriers into the industry. In the final section, it is argued that competition in the rail industry might be considerably improved by turning CN into a “track authority” rather than have it continue in its present format as a supplier of rail transport services.

In the case of highway trucking, regulation has been based on an underlying assumption that if entry were unrestricted, “destructive” competition would result and/or the industry would be monopolized by a few firms.³ In fact it is very hard to visualize an industry less prone to “destructive” competition or monopolization than the trucking industry. In the truckload (TL) sector, there is an almost complete absence of scale and network economies. Entry into the industry and exit from the industry are very easy due to the absence of sunk costs. In the less than truckload (LTL) sector, network economies are almost certainly present. However, entry and exit are not especially difficult.

3 “Destructive” in this context means a state of persistent excess capacity leading to rate levels below those required to yield a normal return on capital.

A brief history of regulation and subsidization in the rail sector

It is difficult to appreciate today the central position occupied by transportation issues (mainly those related to the pricing of rail freight services) in Canadian public policy debates in the period between Confederation and the late 1950s.⁴ Although the so-called “transportation culture” (Kaplan 1989) no longer dominates public policy debates, elements of the issues raised in the earlier period still influence public policy in the 1990s.

Regulation of the Canadian rail industry: 1903-1932

Initially, the first railways in Canada were essentially granted monopoly rights for specific markets and were allowed to set tariffs and service levels in the absence of any regulatory intrusion. The exercise of the monopoly powers, especially in western Canadian markets, led to charges of “unjust-discrimination.” In response, governments attempted to deal with the monopoly rate problem by entering into contractual relations with rail carriers to secure concessionary rate levels in return for subsidies.

In 1897, the Government of Canada entered into an agreement with the Canadian Pacific Railway (hereafter CP) whereby in return for a one-time subsidy of \$3,404,720, CP would build a rail line through the Crows Nest Pass and would reduce rates on the eastward movement of grain to the Lakehead by 3 cents per 100 pounds as well as reducing rates on the westward movement of “settlers” effects. In 1901, Manitoba entered into an agreement with the Canadian Northern railway to reduce rates below those provided by the Crows Nest Pass Agreement on Manitoba originating grain moving to the Lakehead and reductions in rates (of 15 percent) on westward traffic in return for subsidies to be used in constructing a line between Winnipeg and the Lakehead.

The first major regulatory intrusion into transportation markets was contained in the Railway Act of 1903. The Act was a direct response

4 Darling (1980) provides an exhaustive treatment of the politics of freight rates.

to complaints by shippers and provincial governments over rate levels. Under the Act, the Board of Railway Commissioners had the power to disallow tariffs, “fix, determine, and enforce just and reasonable tolls,” and prohibit “undue and unreasonable discrimination.”⁵ In 1906, the Board prohibited carriers from forming physical or money pools and also prohibited rebates to shippers and confidential contracts. The latter prohibition was only removed in 1987.

One of the most important issues addressed by the Board in 1908 was the question of regulating originating and terminal switching services and rates. The majority of shippers were, given the absence of any meaningful inter-modal competition, effectively captive to a specific terminal rail carrier. That is, shippers had physical access only to the line of one rail carrier: the carrier on whose line the shipper was located. With rail services being supplied by a number of distinct carriers, a considerable volume of traffic would have benefited by interline services (moving over the lines of more than one carrier), either to avoid a circuitous routing and/or associated high rates. It was clearly in the interest of a terminal carrier to set relatively high interswitching rates (the rate charged for switching traffic from one carrier’s line to another’s) so as to prevent traffic moving to another carrier. The Board set an interswitching limit of 4 miles from the point of interchange (a limit that was only changed in 1987) and an interswitching rate level. In order to obtain Board-ordered interswitching services, a shipper would have had to prove that it was harmed by the absence of such services. In 1918, the Board began requiring carriers to move terminating or originating traffic at a prescribed rate for another carrier when the receiver or shipper was within 4 miles of an interchange point.

By 1914, two additional transcontinental railways, the Canadian Northern and the National Transcontinental, had been built (largely at public expense).⁶ By 1917 it was clear that the overall rate level allowed by the Board was too low to allow the new transcontinental roads to

5 Over the period 1888-1903 the Railway Committee of the Privy Council was nominally responsible for the conduct of the railways.

6 The Dominion government was responsible for the construction of the National Transcontinental from Winnipeg to Quebec and Moncton. The line was leased to the Grand Trunk Pacific.

cover costs. The Board rejected an application for a large rate increase mainly on the grounds that it would have resulted in very large profits for the low cost carrier, Canadian Pacific. The result of the decision was the bankruptcy of the two new roads.

The Royal Commission of 1917 recommended that the Canadian Northern, the Grand Trunk Pacific (the operator of the National Transcontinental), and the Grand Trunk be incorporated into the government owned Intercolonial Railway to become the Canadian National Railway. The CNR (hereafter CN) was incorporated in 1919 with integrated operations starting in 1923. From 1923 to the beginning of the Great Depression, the rail duopoly (CN and CP) competed for both freight and passenger traffic fairly vigorously.

The cartel years: 1932-1987

The Great Depression, coupled with dramatically increased competition from trucking, caused both railways to lose money, the losses for CN being particularly large. The 1931-32 Royal Commission (the Duff Commission) inquired into competition in the rail industry and recommended that both roads should cooperate rather than compete. The key point of the resulting legislation (the Canadian National-Canadian Pacific Act) encouraged the two companies to engage in cooperative schemes for the “purpose of effecting economies and providing for remunerative operation.” The railways immediately began exchanging cost information, setting common rates for freight, and, in addition, jointly operating passenger trains in central Canada.

By the mid 1930s it was apparent that in a number of important markets, rail carriers were not able to compete on price with highway carriers under the general rail rate structure. In response, rail carriers were allowed in 1938 to begin quoting agreed charge rates. The agreed charge rates were only made available to relatively high volume named shippers who were willing to guarantee a minimum quantity and also agree to source a high percentage of freight movements by rail (typically at least 60 percent). So that rail carriers would not compete on an intra-modal basis for the traffic, all carriers had to agree to the rate if common points were involved.

Both CN and CP were highly profitable during the period covered by World War II. Wage and prices controls, introduced in 1941, were lifted in 1946 and the financial health of both carriers rapidly worsened as prices rose and traffic fell. In 1948, the railways requested the first general rate increase since 1920. Over the period 1948-58 the railways requested 14 general rate increases.

The rate increases, which over the period 1948-1958 permitted rates to rise by around 160 percent, were only applied in full in those markets where the demand for rail movements was highly inelastic. Carriers were unable to raise rate levels by very much in markets where they faced inter-modal competition. In addition, rates on the movement of export grain were frozen by statute in 1925 at the levels prevailing in 1899. Currie (1967) estimates that the overall rate level rose by only 55 percent.

Rates, which were higher in the West and the Maritimes than in Central Canada to begin with, rose at a much faster rate in the West and the Maritimes than in Central Canada simply due to the fact that there was more competition in freight markets in Central Canada than in the other two regions.

In 1952, the Railway Act was amended in an attempt to bring greater equality in rates across regions. The amendments also included a "one and one-third rule" whereby rates on traffic from or to points in the Prairies could not be set at more than one and one-third the trans-continental rate.⁷

Carriers avoided the rule by replacing published transcontinental rates with Agreed Charge rates (the latter were not covered by the 1952 amendment). Regulatory attempts to eliminate short-haul/long-haul discrimination were ended in 1955.

In 1959, after the rail carriers applied for another large rate increase, the federal government froze freight rates and enacted the Freight Rates

7 Rates on many movements from, say Toronto to Vancouver, were very much lower than rates on moving the same traffic from Toronto to Calgary. The reason for the rate being higher on the shorter haul was simply that there was little in the way of inter-modal competition for Toronto to Calgary movements. Toronto-Vancouver markets could be served by vessel via the Panama Canal.

Reduction Act. The Act provided subsidies for railways and roll-backs in some past rate increases.⁸ Effectively, the overall level of rates was frozen until the National Transportation Act of 1967.

The 1967 National Transportation Act represented a basic shift in public policy toward the railway sector. First, the notion that rates should somehow be equalized across regions was abandoned. Second, freight rates (except those covered by the statutory grain rates) were effectively deregulated. The only regulatory restrictions were that rates must be published and should be at least equal to the variable cost of production. In order to provide some protection to captive shippers, the newly created Canadian Transport Commission had the power to set a maximum rate equal to variable cost plus 150 percent. Over the period 1967-87, there was very little regulatory intervention. Under Section 23 of the Act, the commission had broad powers to set aside rates judged prejudicial to the public interest. The broad powers were not used with any frequency.

The National Transportation Act formerly permitted railways to act collectively in setting rates. It should be noted that such joint rate making was exempted from any investigation under the Combines Investigation Act.

The Act shifted the cost of providing uneconomic non-grain services from the railways to the public. It was readily apparent in the 1960s that both CN and CP were losing considerable monies on providing uneconomic passenger services and also with respect to uneconomic branch lines. Under the Act, carriers were allowed to request that uneconomic services be abandoned. If the Canadian Transport Commission held that abandonment was not to be allowed, carriers would be able to recover 80 percent of the losses incurred in providing passenger services and 100 percent of the losses on uneconomic branch lines by way of subsidy payments.

Both the federal government and the Canadian Transport Commission showed considerable reluctance to face the fact that the Canadian rail network had since the early 1900s contained thousands of miles of lines that were surplus to capacity. This reluctance is illustrated by the

8 The reductions did not apply to passenger rates, international traffic or to competitive rates.

very low rate at which railways were allowed to abandon uneconomic lines and services. Between 1945 and 1965, less than 500 miles of track had been abandoned. In 1967, the government protected 17,000 miles of track from any abandonment process until 1975.

Two issues deserve special consideration: the statutory grain rates and the provision of passenger services. As far back as the 1950s, there is evidence that railways were losing money on transporting grain under the 1897 Crow Rates.⁹ Inflation in the 1960s and 1970s, coupled with large increases in the amount of grain to be transported created major losses for railways on the carriage of grain. By 1981, it was estimated that grain producers paid less than 19 percent of the cost of rail transportation. In total, Gilson (1982) estimated that for the 1981/82 crop year, the total cost of moving grain under the statutory rates was \$644 million greater than revenues. The gap between costs and revenues could be expected to escalate over time since costs were not frozen but rates were.

Rail carriers were not subsidized for the losses on grain traffic but were expected to cross-subsidize grain movements from profits on other traffic. Rail carriers rationally chose not to invest in facilities related to grain carriage; the result was that rolling stock and trackage deteriorated, reducing grain moving capacity. Between 1972 and 1981, governments and the Canadian Wheat Board provided 14,400 hopper cars; the federal government committed close to \$500 million for rehabilitation of 2,315 miles of Prairie track over the period 1977-84.

In 1983, the Western Grain Transportation Act transferred the burden of the Crow Rates from the railways to the taxpayer.¹⁰ The Act provided an annual basic subsidy of \$658.6 million (the amount by which it was estimated revenues were below the cost of producing rail grain

9 In 1925, the Crow Rates were given statutory status and were applied to all rail carriers. Over time, the rates were extended to more and more grain traffic.

10 Over the period 1984-1992, grain shippers have paid an increasing share of the cost of moving grain by rail.

movements) plus a variable amount, all to be paid directly to the rail carriers.¹¹

As we have noted above, rail carriers were losing money on the provision of passenger services and the National Transportation Act basically shifted 80 percent of the losses from the railways to the taxpayer. Between 1968 and 1977, CN and CP requested permission to abandon 82 routes. The Canadian Transport Commission permitted only 23 routes to be abandoned.

Losses on passenger services rose dramatically over the period 1968-1978. For the period 1971-1978, losses claimed by the railways were close to \$1.5 billion, the loss in 1978 alone being \$258 million.

In 1978 the federal government, concerned with the rapidly escalating subsidy payments, formed a crown corporation, Via Rail Canada Inc., to take over most of the intercity passenger routes of CN and CP. Via Rail was to contract with CN and CP for tracks, stations, operations and maintenance services at a price that covered long run costs.

Rather than being contained, subsidy levels under Via Rail for passenger train operations rose rapidly. For the 1980/81 fiscal year the subsidy equalled an astonishing \$457 million, prompting the government to order service cuts of 20 percent. For every dollar received in fares, Via Rail collected three dollars in subsidy payments.

The question arises as to why the required subsidy was so large. First, Via Rail operated a large number of services that were inherently uneconomic and which government had refused to allow to be abandoned. For example, the service between Armstrong, Ontario and Winnipeg required a subsidy of \$8.73 per passenger mile, more than it would have cost to provide a chauffeured limousine service for each passenger. Second, the contracting arrangements between Via Rail and the two railways ensured that costs for operations would be considerably higher than optimal. Via Rail faced a carrier duopoly that submitted bills to Via Rail for services that Via had no power to audit. It had no

11 The basic subsidy varies on an annual basis depending on the level of traffic, productivity changes, and the rate of inflation. Shippers are protected from inflation in excess of 6 percent per year in future rail cost increases and from rates that are in excess of 10 percent of the average grain price. For the crop year 1990/91, the variable amount was \$66.3 million.

running rights as such and could not contract with other companies for services. In 1980, for example, roughly 70 percent of Via's operating costs were comprised of payments to the two carriers. Ellison (1987) argues that CN and CP were very successful in passing on to Via Rail (and ultimately to the taxpayer), "the high wages and costs associated with restrictive work rules that had been sustained under the rail duopoly." It must, however, be noted that the high costs were present throughout the whole rail system, not just for passenger services. In addition, Canadian Transport Commission's auditing of CN and CP bills to Via Rail ensured only that the Commission's costing regulations were adhered to.

The National Transportation Act reforms: 1987-1992

In 1980, U.S. railways were freed from very detailed rate and service regulation. The Staggers Act allowed carriers to quote confidential (non-published) rates for the first time and also stripped them of immunity from prosecution under the Sherman Act for collective rate making.

Staggers had an immediate impact on the Canadian rail sector. Prior to Staggers, international rates were determined jointly by U.S. and Canadian carriers. Rate levels were set so as to achieve parity with U.S. domestic long haul rates. Traffic originating in Canada would typically be routed by the carrier via the long route. After Staggers, U.S. carriers began quoting lower (confidential) rates to Canadian shippers with the result that Canadian carriers started to lose traffic.

CN and CP lobbied the government to change the Canadian regulatory structure so as to allow them to compete with U.S. carriers on the important transborder market. CN in fact suggested that the major change should be one that allowed confidential contracts on transborder traffic and existing rules on domestic traffic!

The 1987 National Transportation Act reforms were far-reaching and, for the first time since 1932, the regulatory structure encouraged rather than discouraged intra-modal rail competition. The major reforms were:

1. Confidential contracts
2. Prohibitions on collective rate making
3. Liberalized interswitching limits
4. Competitive line rates
5. Improved abandonment and line transfer procedures
6. Final offer arbitration in rate disputes

The introduction of confidential contracts together with prohibitions on collective rate making are necessary but clearly not sufficient conditions for making carriers compete intra-modally on rates and service. Only a small percentage of the total overall rail market is served by both major carriers; thus, prohibiting joint rate making does not in and of itself stimulate competition within the rail industry.

The 1987 reforms radically increased the minimum interswitching limit. As we noted above, this was set in 1908 at 4 miles. The minimum interswitching limit in 1987 was extended to 30 kilometres, with the newly formed National Transportation Agency able to increase this in given circumstances. Interswitching rates were set based on average system-wide costs. What the increased limit does is allow a much larger number of shippers access to more than one carrier. Provided that a shipper can negotiate a rate with a connecting carrier, the National Transportation Agency will order compulsory interswitching.¹² For shippers beyond the interswitching limit, the 1987 Act contains competitive line rates (CLR's). Under the Act, a shipper that is "captive" to one rail carrier can apply to the agency for a "competitive" rate.

The extended interswitching limits and the competitive line rates were opposed by both carriers.¹³ In the interswitching case, they claimed that it would cause a diversion of traffic to U.S. carriers and exert downward pressure on rates to the financial detriment of the Canadian rail sector. Competitive line rates were viewed as being even more onerous. In addition to the criticism directed at the extended

12 In fact, once a rate is negotiated, carriers have automatically granted the interswitching.

13 The position of CP was that the competitive access measures taken together represented a substantial "over-kill."

interswitching arrangements, it was claimed that competitive line rates amounted to confiscation of assets. In hearings on Bill C18, CN asserted that the competitive access measures would cause a loss of revenue over a five year period of between \$0.8-\$1.4 billion and CP asserted that between \$0.6-\$1 billion worth of traffic over a 4 year period would be affected by the measures. They claimed that the new abandonment procedures would not allow them to reduce costs sufficiently to make-up for the revenue losses or to compete effectively with U.S. carriers or the trucking industry.

Also opposed by the rail carriers was the introduction of the dispute settling mechanism. Any shipper not satisfied with a rate or service could apply to the agency for final offer arbitration.¹⁴

The abandonment provisions set an annual maximum ceiling to the amount of trackage that a carrier could abandon of 4 percent.¹⁵ On application to the National Transportation Agency to abandon track, carriers were required to give 90 days notice and opponents were given 60 days to object. If objections were made, the agency would render a decision within 6 months. If the line was judged uneconomic at the time and unlikely to be economic in the foreseeable future, the agency would be required to order it abandoned. The agency could mandate that a line not be abandoned if there was a reasonable probability that the line would be profitable in the future and if revenues were less than variable costs, a subsidy would be paid.

The available data clearly shows that a very large percentage of trackage in Canada is likely very uneconomic. CN estimates that 66 percent of track carries only 10 percent of total traffic, with 33 percent carrying only 1 percent. CP, which has less track than CN, estimates that 54 percent of track carries less than 3 percent of total traffic.

One positive feature of the 1987 Act was the provisions for independent shortline railways. A carrier could transfer an uneconomic line to a lower cost shortline operator. It should be noted that there has been

14 The agency was also granted wide powers to examine whether or not a carrier's rates or actions threatens the public interest.

15 The percentage was calculated with the protected Prairie mileage excluded from the base.

considerable growth in the U.S. in shortline operations since Staggers. Prior to 1980, 44 shortline operations were started-up in the U.S. Over the period 1980-1988, an additional 196 shortlines were created (Dooley 1991). The shortline operator has a cost advantage over a Class 1 (major) carrier and, in consequence, a line that is uneconomic for a major carrier may be economic if operated by an independent shortline operator. The major cost advantage is primarily due to lower labour costs attributable to more flexible work rules, smaller crew manning requirements, and, in many cases, lower wage and benefit rates. It should be noted that in the U.S. the growth of shortlines has slowed considerably in recent years. Part of the reason for this is that many U.S. Class 1 carriers have managed to significantly reduce crew sizes and have negotiated more flexible work rules, thus reducing the cost differential between themselves and the shortline operators. Another reason is that the most lucrative trackage for shortline operations was transferred by the major carriers prior to 1991.

In Canada, the major advantages for shortline operations over CN and CP operations arise from reductions in labour inputs and wage rates and from aggressive marketing, including more flexible scheduling.¹⁶ The Central Western Railway operated the first shortline in Canada when it took over the Stettler (Alberta) subdivision from CN. The Central Western Railway estimates that its operating costs are 60 per cent lower than was the case for CN and it is also offering a higher quality service (Loughman 1991). In February 1992, the company purchased an additional 200 km of track in the Stettler area from CP.

In April 1992, the Goderich and Exeter Railway Co., a subsidiary of RailTex Inc. of Texas, bought the Goderich-Stratford, Ontario line from CN. Under the new ownership the line, which was not profitable under

16 The major disadvantage is that, with the small scale of operation, locomotives may not always be used as efficiently in the shortline operation as would be the case in an integrated network. The disadvantage is not, however, a major one.

CN management, has attracted new traffic and has cut costs and, in consequence, is operating at a profit.¹⁷

The impact of the 1987 reforms

The question arises as to how effective the 1987 reforms have been in promoting efficiency and competition. Granting that the reforms shifted considerable bargaining powers from carriers to shippers, the issue of whether or not they have caused the type of onerous losses predicted by carriers must be addressed.

First, it is quite clear that confidential contracts have been widely negotiated. In 1990, it is estimated that 70 percent of non-grain traffic in Canada moved under such rates.

Second, although it is difficult to obtain an accurate measure of the impact of the competitive access provisions, there is evidence to suggest that shippers have used the provisions to achieve lower rates. Under the old 4 mile interswitching limit, 66 percent of shippers were essentially captive to a single line. Over 60 percent of these shippers are estimated to fall within the new 30 km limit (National Transportation Agency 1990). Thus, shippers have considerably more bargaining power under the 1987 Act than they had previously. CP estimates that over the period 1987-1991, non-Western Grain Transportation Act revenues per tonne mile fell by 6 percent in current dollars and by 19 percent in constant dollars (CP 1992). Some of the decline in rates can be ascribed to the fact that in 1988 many provinces began the process of easing entry restrictions in the highway trucking industry and thus the rail sector faced increased inter-modal competition in many markets. Some is undoubtedly due to the increased power granted shippers in the rail market and some to the impact of the recession.

Over the period 1988-1991, the agency has only received 2 applications for competitive line rates, both of which concerned a U.S. carrier.¹⁸

17 Labour inputs have been reduced by roughly 40 percent under the new ownership.

18 Both competitive line rates continue to generate controversy. In both cases, a U.S. carrier (Burlington Northern) was involved. In addition, the shipper

However, it is highly probable that many shippers have used the threat of competitive line rates as a bargaining tool to get lower rates.

The application of the final offer arbitration process has led to some bizarre results. Parrish and Heimberger Ltd. applied to the agency for final offer arbitration on a rate from CN for the movement of two cars of flour (one to Halifax and one to Montreal) from Hanover, Ontario. CN asked the agency to dismiss the application on the grounds that the rate proposed by the shipper was non-compensatory. The agency held that it could not rule on a rate that did not exist. When the arbitrator chose the shipper's offer, the agency (Decision 563-R-1990) held that the prohibition on non-compensatory rates did not apply to arbitrated rates!

Third, carriers have only been allowed to abandon a very small proportion of total track under the 1987 provisions. The two major Canadian carriers are thus operating in an increasing competitive environment with a very large amount of uneconomic surplus capacity. In 1992 carriers filed applications to abandon significant amounts of trackage. CP has requested, for example, that it be allowed to abandon all lines east of Sherbrooke, Quebec.¹⁹ In 1994, CP and CN announced that they were exploring merging rail operations east of Winnipeg. The lines east of Winnipeg lost over \$2 billion during the past 5 years.

The number of shortline approvals has been disappointingly small. To the end of 1991, the NTA has approved only nine lines conveyed. As of December 31, 1992 only two shortlines are in operation (the Central Western Railway and the Goderich and Exeter). Perhaps the most significant factor favourable to short lining has been the December 1990 Supreme Court of Canada decision on the conveyance of the Stettler subdivision to Central Western Railway (CWR). The major issue was whether CWR was subject to federal labour legislation in the operation of a shortline that it acquired in 1986 from CN. The Canadian Labour Relations Board had ruled (upheld by the Federal Court of Appeal) that successor rights were in force and thus CWR was to operate under the

designated a factitious destination point: the traffic was to be moved in fact to points other than those given in the application.

19 The application is for the closure of the 700 km of track of the Canadian Atlantic Railway from Sherbrooke, Quebec across Maine to Saint John, New Brunswick.

provisions of the Union/CN collective agreement.²⁰ Successor rights have to do with whether or not a new owner of a business automatically “picks up” a union agreement that was in place prior to the business changing hands. The Supreme Court held that the CWR operations did not constitute a federal undertaking (it was not an interprovincial railway) and in addition that it was not an integral part of a “core federal undertaking.” Thus, CWR was not bound by the Union contract and could therefore introduce flexible work rules and changes to wage rates and benefits.

RailTex (the operator of the Goderich and Exeter) has agreed with CN rail to purchase the Sydney-Truro, Nova Scotia line (400 km of track) for \$20 million. The Province of Nova Scotia is opposed to the sale of the line unless the federal government provides a guarantee that the line will operate “forever.” Even if the sale is allowed, the province can effectively stop the operation of the shortline by refusing to issue an operating permit.

One of the impediments to the formation of shortlines is the apparent requirement that lines be purchased rather than leased.²¹ CWR was not able to obtain commercial financing by virtue of the language in the Railway Act that places lenders in a non-preferred position. CWR negotiated a reduction in Western Grain Transportation Act payments for a capital advance from the federal government. A very significant impediment to the creation of shortlines is that under existing union successor right rules they cannot operate interprovincially. In addition, although the National Transportation Act does not restrict line transfers to branch lines, it is probable that a mainline would be considered an integral part of a federal undertaking and thus subject to the Railway Act and successor rights even if the line was within a single province.

20 The Chairman of the United Transportation Union called independent shortlines, “A threat to all unionized people,” (Quoted in Loughman [1991]).

21 Originally the CWR was to lease the line from CN. CN’s legal department was of the opinion that in the event of CWR having difficulties, CN as owner of the line could be liable to make good any payments to creditors.

Subsidies to railways

The Canadian experience has been one of massive direct subsidies to railway carriers. The subsidization stems from an inability on the part of governments to allow carriers to abandon services that are clearly uneconomic and policy decisions that are aimed at very narrow regional issues. The subsidy payments are detailed in table 1.

Subsidies to rail passenger movements

From any perspective, rail passenger subsidies have been the single largest Canadian transportation subsidy. Prior to 1967, rail carriers were expected to subsidize losses on passenger services from profits earned on other traffic. Beginning in 1967, the federal government provided a subsidy equal to 80 percent of the losses incurred. Between 1967 and 1979 subsidies totalled a massive \$1.27 billion (current dollars). Over the period Via Rail has been operating, the subsidy payments equal a minimum of \$5.9 billion. Thus, for the period 1967-1991 the Canadian taxpayer has provided subsidies to rail passenger services of over \$7.24 billion (current dollars).²² Subsidies would have been much higher if the federal government had not mandated service cuts in 1981 and 1989.

Although the level of subsidy payments has declined marginally since 1989, it is still large (\$392 million in 1991). Passenger fares account for approximately 33 percent of the cost of supplying services: for every dollar collected in fares, the taxpayer contributes another two dollars.

Subsidies for branch lines

This is the second largest subsidy category. A very large proportion of the \$2.18 billion in payments since 1967 has been directed at the Prairie branch line network, which experiences considerable over-capacity. The \$2.18 billion is an under-estimate since part of the cost of the Western Grain Transportation Act is due to the existence of uneconomic

22 Subsidies to non-Via rail passenger services between 1978 and 1991 equalled \$72.7 million.

**Table 1: Subsidies to Canadian Rail Carriers 1927-1991
(Millions of Dollars)**

1	Rail Passenger Trains (NTA 261) 1967-1980	\$1,271
	Via Rail 1978-1991	5,899
	Non-Via Rail 1981-1991	73
2	Branch Lines Guaranteed 1967-1987	1,858
	Non-Guaranteed 1967-1987	260
	1987 NTA 1987-1991	69
3	Eastern Rates 1967-1989	519
4	Maritime Subsidies MFRRRA plus AFFRA 1927-1991	787
5	NTA "Normal" Payments 1967-1972	326
6	Freight Rates Reduction Act 1959-1968	506
7	Bridge Subsidy 1952-1967	100

branch lines. Not all grain dependent branch lines are uneconomic.²³ The best estimate is that approximately half of grain dependent branch lines are uneconomic. If such lines were abandoned, subsidies paid under the Western Grain Transportation Act would fall.

Subsidies for eastern grain movements

Between 1967 and 1989, rail carriers received subsidies of \$518 million for eastern grain movements. Special rates were in effect for the rail movement of grain and flour from Georgian Bay ports to Montreal, Halifax, and other east coast ports for export. The basis for the subsidy was the difference between what the National Transportation Agency (formerly the Canadian Transport Commission) determined was a compensatory rate and the actual rate, which was based on rates in existence in 1960.

23 A branch line is termed grain dependent if 60 percent or more of traffic on the line is grain.

Subsidies for the Atlantic region

The 1927 Maritime Freight Rate Reductions Act provided rail carriers with an ad valorem subsidy of 20 percent on the movement of freight within the Maritimes and on the Maritime portion of freight moving from the region to the rest of Canada. The subsidy was increased to 30 percent in 1957 on outbound international shipments. In 1967, the Atlantic Region Freight Assistance Act extended the 30 percent subsidy to truckers on the Maritime portion of outbound traffic. In 1970, subsidies for truck movements within the region were set equal to rail subsidies.

The general subsidy on movements within the Maritimes was eliminated in 1980 and replaced with a 15 percent subsidy on the movement of select commodities. In 1974, the subsidy on outbound traffic by rail and truck was increased by 20 percent on top of the 30 percent for almost all manufactured commodities produced within the Maritimes. In 1991, the total subsidy to rail carriers was \$23.3 million (and total subsidy to highway carriers was \$81 million).

It is highly probable that prior to regulatory reforms in the rail and trucking sectors in 1987 and 1988, the major beneficiaries of the subsidy program were rail and highway carriers rather than regional shippers. Anderson and Bonsor (1986) argue that a lack of competition in transportation markets, due particularly to entry restrictions in the trucking sector, created conditions in which the subsidy was not passed to shippers in the form of lower rates.

“Other” rail subsidies

The “other” subsidies are those that thankfully have now disappeared. The freeze on rail rates between 1959-68 cost Canadian taxpayers \$506 million. The phase-in provisions of the 1967 National Transportation Act continued the “normal” subsidy payments to rail carriers for the period 1967-1970 and cost Canadian taxpayers an additional \$316 million.

Rail carriers received a “Bridge Subsidy” on traffic moving in Northern Ontario for the period 1952-1967. The rationale for the subsidy was that the nature of the terrain and traffic density imposed higher costs on carriers that were not compensated for in the rate structure.

Subsidies under the Western Grain Transportation Act

The Western Grain Transportation Act subsidies, which equalled \$779 million in 1991, are typically thought of as being an income supplement program for western grain producers rather than as being a transportation subsidy. The subsidies do in fact have a strong transportation component for a number of reasons.

First, the subsidy encourages cross-hauling of grains. This occurs due to the fact that the subsidy is paid to rail carriers rather than to grain producers. Consider the following example. In the 1989/90 crop-year, the statutory rate from Brandon North to Vancouver or Prince Rupert was \$47.26 per tonne. Of the total, \$14.04 was paid by the producer and \$33.22 by the government. Under the tariff, the additional cost to ship the grain to the West Coast rather than to Thunder Bay equalled \$27.15 per tonne. The additional cost to the producer was however only \$8.07.²⁴ In 1993, grain destined for U.S. markets was being moved by rail to Thunder Bay from western Canada in order to collect the WGTA subsidy and then was moved back west prior to entering the U.S.

There is no doubt that the artificiality embedded into the tariff structure by the method in which the subsidy is paid has resulted in an inefficient level of cross-hauling. The artificial low rate to the shipper reduces the penalty for moving grain by rail over a long distance, thus promoting an inefficient use of the rail network.²⁵

24 This is a useful oversimplification. The Canadian Wheat Board acts as the agent for the producers of major grains and operates a price pooling mechanism with separate pools for wheat other than durum, durum wheat, and barley. Each producer receives the same price for each grade of grain. Under the current pooling practices of the Board, the pooled price for each grade averages the impact of selling different grades into different markets at different times. Each producer receives the averaged pooled price less the costs of grain handling (elevation, administration, et cetera) and the cost of moving grain by rail to the west coast or Thunder Bay. The individual grain producer actually pays transportation charges to the port closest to him. The producer's share of the additional charges that arise when grain is moved to the more distant port reduces the amount available to producers from the Wheat Board's pool.

25 This is not intended as a criticism of the Canadian Wheat Board, which acts as the producers' agent in selling major grains. The Wheat Board routes

If the entire subsidy were to be paid to the producer, the inefficiency would be eliminated and markets would respond to “correct” prices rather than to the existing “phoney” prices.

A second issue that needs to be addressed is that the “one size fits all” rate structure does not recognize cost-based differences in producing rail grain movements. The existing rate structure is effectively an average cost-based one. Rates do not necessarily reflect the cost advantages or disadvantages that one route may have over another. Specifically in this regard, it is to be noted that the actual cost of moving grain from the Prairies to Thunder Bay may well be below the cost of moving the same grain an equal distance westward. (For CP, the rate for westbound movements is in fact higher than for eastbound movements. The distance from Calgary to Vancouver is assumed for rate making purposes to be the same as from Edmonton to Vancouver even though the former is 123.7 miles closer).

Third, the Act has allowed the existence of a vast network of very lightly used uneconomic (but for the subsidy) Prairie lines. In 1991, there were 6,388 miles of branch lines that were designated as grain dependent (lines for which grain accounted for a minimum of 60 percent of the traffic). Since the subsidy was introduced in 1984, the rate of line abandonment has slowed very considerably. For the period 1977-1983, roughly 300 miles of branch line was abandoned annually, compared with an abandonment rate of 100 miles per year for the period 1984 to 1991.

It is estimated that approximately half of the Prairie grain dependent branch lines (3,000 miles) are high cost lines and could be abandoned (Grain Transportation Agency 1991). Almost all of the Prairie rail network is, however, protected from abandonment until the year 2000 by a series of prohibition orders that were issued in the period 1974-1984.

grain east or west in an attempt to maximize returns to the producer. The objective of the Wheat Board is not that of minimizing rail transportation costs, but of maximizing the overall returns to the grain producer given the existing regulatory structure. Even if the subsidy were to be paid directly to the producer rather than to the rail carriers, grain would still be moved to the more distant export port as determined by market conditions.

Regulation and subsidization of the trucking industry

Prior to the early 1920s, Canadian railways enjoyed a virtual monopoly on the movement of most inter-city freight. From the end of the First World War to the mid 1930s, the trucking industry in Canada grew at a phenomenal rate and in many markets the monopoly power of the railways was effectively eliminated. In 1916, for example, there were 2,618 commercial vehicles registered in Ontario and by 1937 this had risen to 107,458 (Ontario Royal Commission on Transportation 1938, 62). By the mid 1920s, the large increase in supply began to exert a downward pressure on rate levels in the trucking industry.²⁶

Railways, with the support of the organized sector of the trucking industry, lobbied governments to regulate the trucking industry. The type of regulation promoted by the railways was for the federal government to strictly regulate entry so as to limit supply and for truck rates to be set at the level of rail class rates. If adopted, this type of regulation would have virtually eliminated inter-modal competition between road and rail carriers.

The federal government, in fact, left the issue of entry and rate regulation of the trucking industry to the provincial governments.²⁷ By the late 1930s, the majority of provinces had started to regulate entry, but not rates, not only intra-provincially but also extra-provincially. Although there were differences across provinces, most regulation was based on the notion of a “public necessity and convenience” test. In order to gain entry, a potential entrant would somehow have to show that his services were required and that such services were not being provided by existing carriers.

The pattern of regulation that became established by the early 1940s was not altered greatly until 1987. All provinces restricted entry in extra-provincial markets, with Newfoundland also attempting to control

26 From 1923 to 1929 the number of truck registrations in Canada increased from 54,000 to 155,000 (Royal Commission of Enquiry into Railways and Transportation in Canada 1932).

27 In 1937 and 1940 bills were introduced into Parliament to federally regulate the industry. Both were withdrawn.

rates. Intra-provincially, all provinces except Alberta restricted entry. In addition to controlling entry, Manitoba and Saskatchewan actually prescribed rates (in British Columbia and Quebec the boards “approved” filed rates).

Carriers committed considerable resources to entry-seeking and forestalling activities. Although regulation is supplied by governments, the supply-restraining mechanism entails costs for both regulated carriers and regulators. Bonsor (1980) estimated that in 1978, 2.1 percent of total annual operating revenues were spent on entry-seeking and forestalling activities.

There is a large body of evidence to show that provincial regulatory boards were “captured” by established, i.e., licensed, highway carriers. With few exceptions, the regulatory boards followed a very restricted entry policy, leaning over backwards to “protect” existing carriers.²⁸

In the U.S., the Interstate Commerce Commission strictly controlled entry and rates on non-agricultural interstate movements during the period 1935-1980.²⁹ Compared with regulation in Canada, the major difference was that the Commission was even more restrictive in allowing entry and exerted a much greater influence on rates.

For both countries there is an impressive body of research showing that regulation directly created inefficiency and high prices. For Canada, the best estimates suggest that rates in British Columbia, Ontario, and Quebec were, depending on the type of movement involved, between 27 percent and 5 percent greater than the competitive level (McRae and Prescott 1980). Friedlaender (1969) and Moore (1975) have argued that in the U.S. rates were between 20 to 40 percent greater than the competitive level.

The vast majority of the gains from regulation were not in fact captured by carriers. The regulatory system directly encouraged large inef-

28 In Ontario, for example, the annual increase in the number of new licenses granted over the periods 1955-1975 was very small and in some categories actually decreased.

29 In the mid 1950s, U.S. courts held that poultry and fruits and vegetables were exempt from ICC regulations. The U.S. Department of Agriculture estimated that deregulation caused rates to fall by between 36 percent and 19 percent on specific commodities (USDA 1958, 1959, 1961).

iciencies in production (e.g., not being allowed backhauls and thus being forced to run back to the original starting point empty, restrictions on commodities carried, cost of entry-seeking, et cetera) that resulted in higher costs. It is also clear that unionized labour was one of the major beneficiaries of the regulatory system. Moore (1978) estimated that wage rates in the U.S. regulated industry were 37 to 55 percent greater than would have occurred without regulation. Boucher (1980) argues that in the case of Quebec, regulation caused wage rates to increase by 18 percent.

The U.S. Motor Carrier Act of 1980 effectively deregulated the U.S. industry. Deregulation was accompanied by a rapid restructuring in the industry and falling rate levels. Many Canadian carriers took advantage of the eased-entry regime and began operations in the United States. American interests lobbied for “mirror” reciprocity: in effect an open entry system for Canada. In 1982, the U.S. banned the issuing of further permits to Canadian carriers, a ban that was lifted when both federal governments agreed “in principle” to open borders in international truck movements. Provincial governments came under increasing pressure, mainly from shipper organizations, such as the Canadian Manufacturers Association and industry trade groups, and the federal government to deregulate the industry. Deregulation was adamantly opposed by the regulatory boards, which had a long history of protecting carriers from competition, the overwhelming majority of carriers, and the unions.

In 1988, all provincial governments agreed, some very reluctantly, to adopt a “reverse onus” test: an application for entry was presumed to be in the public interest and those seeking to block entry would have to show that it was not. After a 5 year period, the ability to block entry would disappear entirely. The (federal) 1988 Motor Vehicle Transport Act, which applies only to extra-provincial trucking operations, requires that a fitness-only test for entry be in place in all provinces by 1993.

The full impact of deregulation on the Canadian industry has not yet been felt. A number of provinces have been slow at allowing liberalized entry (Manitoba in particular) in extra-provincial markets. Some have also attempted to restrict entry into intra-provincial markets.

What has occurred to date mirrors to some extent what occurred in the U.S. after deregulation in 1980. First, the available data supports the contention that rate levels have fallen in major inter-provincial markets. Second, there has been both exit and entry of carriers.

Subsidization of the trucking industry

The only major direct subsidy in place in the trucking industry is that given under the 1967 Atlantic Freight Rate Assistance Act. This subsidy program provides an ad valorem subsidy on the Maritime portion of outbound freight movements and on movements within the Atlantic region. The intended aim of the subsidy is to lower transportation costs for Maritime originating freight.

It is highly probable that, prior to the 1988 Motor Vehicle Transport Act reforms and the 1987 National Transportation Act reforms, the major beneficiaries of the subsidy payments were in fact rail and highway carriers.

The subsidy payment to highway carriers has grown very considerably over time. In 1972 the subsidy totalled a modest \$10.26 million. By 1985 it had risen to \$49 million and in 1991 it equalled \$81 million. Over the period 1967-1991, total subsidy payments have been slightly under \$900 million.

There is no evidence to show whether or not the increasingly costly subsidy program is providing any real benefits to Maritime shippers.

Road and rail competition

Canadian rail carriers have consistently claimed that they are forced to operate in an economic environment that discriminates against the rail sector in favour of the trucking industry. Although the claim goes back to at least the early 1920s, deregulation of the trucking industry combined with the 1987 regulatory reforms in the rail sector, which granted shippers greater powers in rate negotiations with railways, has brought the issue to the forefront again.

The issue is a very complex one. First, the rail carriers (correctly) claim that they are operating in an environment that imposes costly and uncompensated "public service" obligations on them but not on highway carriers. That is, rail carriers are unable because of regulatory con-

straints to abandon services on which they lose money. They are thus forced to cross-subsidize the losses on the uneconomic services from revenue obtained from other traffic.

Second, and more difficult to analyze, railways contend that they have to meet all of the costs of providing line-haul services, whereas highway carriers operate in a system that does not require them to meet all of these costs. At issue here is the fact that rail carriers must provide and maintain their own rights of way, while highway carriers have access to a publicly provided and maintained road system. In the case of the trucking sector, road user fees are levied (at least in principle) on those using the road system in the form of fuel taxes and licence fees. If, as rail carriers assert, these user fees are below the cost of providing and maintaining the road system, there is an indirect subsidy to road users. Unfortunately, the issue of indirect subsidization to the trucking sector has not been adequately studied. In Canada, no data exist to show conclusively whether or not user fees collected from truckers meet the real cost of their use of the publicly provided facilities. The best available evidence strongly suggests, however, that highway trucking is receiving a large indirect subsidy. Toms (1991) estimates that for a wide variety of highway rigs, the cost recovery from registration fees and fuel taxes in Ontario falls very far short of meeting the total costs (and in most cases also the incremental costs) of providing highway services to truckers. For a "standard" highway rig, cost recovery varies between 47 and 74 percent.³⁰ The report of the 1992 Royal Commission on Passenger Transportation indicates that user fees levied on highway passenger traffic are also below the cost of providing highway services. In this context, it must be noted that the major highway-carrier user fee is the tax on fuel. Rail carriers also pay taxes on fuel even though they provide their own rights of way. Thus, the extent to which fuel taxes can be considered a pure-user charge is debatable.

Third, and related to the first, is the issue of whether or not rail carriers are forced to shoulder an "unfair" tax burden. The railways assert that not only do they have to pay property taxes on the rights of way, whereas property taxes are not levied on public highways, but that in a

30 The reported results exclude federal excise revenues. Even if these were to be included, costs are not recovered.

number of provinces the actual fuel tax rates are considerably higher for rail carriers than for highway carriers (Manitoba and Saskatchewan).

Fourth, Canadian railways face a higher tax burden than do U.S.-based carriers. Although comparisons of relative sectorial tax burdens across jurisdictions are very difficult to make, it is apparent that, in a number of important areas, tax burdens on Canadian railways are in excess of those faced by U.S. carriers. Based on data for the 1st Quarter of 1992, Canadian federal and provincial taxes on fuel to rail carriers were approximately 42 percent higher than federal and state taxes on rail fuel in the U.S.³¹ On average, the rate per litre in Canada is about 10.3 cents and that in the U.S. is below 2 cents. Most of the difference is in the taxes levied at the non-federal levels. CN and CP estimate that for 1991 they paid \$169 million more in fuel taxes than if they had been operating in the U.S. and subject to that country's fuel-tax levels (Round Table 1991).

Fifth, like many sectors of the Canadian economy, Canadian railways are accorded less generous depreciation allowances than is the case for U.S. carriers. Given existing tax rates, this means that pre-tax earnings must be higher in Canada than in the U.S. in order for there to be an equality in the rates of return. CP (1992) suggests that 12.5 percent more pre-tax income must be invested per dollar in Canada than in the U.S.

Governments in Canada have implicitly assumed that railway operations are highly insensitive to tax rates. That is, railways are assumed to be ideal candidates for taxation as they can simply pass tax loads on to the consumers of rail services in the form of higher prices without causing a loss of traffic. Roughly 30 percent of rail traffic is transborder in nature, implying that Canadian carriers must compete with U.S. carriers. This, coupled with increased competition from the trucking sectors, means that the tax burden cannot be simply passed through to shippers in the form of higher rates.

31 For Canada, the GST has been excluded. The U.S. federal tax also includes the LUST (leaking underground storage tanks) and the (environmental) superfund additions.

An optimal policy framework

The question arises as to what is an optimal policy framework for providing road and rail transportation services in Canada. The 1967 National Transportation Act essentially encouraged a Canadian rail duopoly to legally set rates at whatever the market would bear. Intra-modal competition was absent and inter-modal competition from highway carriers was restrained by provincial regulation of entry and/or rates. (Provincial governments frequently complained of “high” rail rates while at the same time promoted strict entry constraints on the trucking sector). The 1987 rail reforms, which were in part a direct result of Canadian carriers losing an increasing share of an important and growing market to deregulated U.S. carriers, effectively transferred bargaining power from carriers to shippers. The powers of the National Transportation Agency under the Act are broader than those granted to the Canadian Transport Commission under the 1967 Act. To an extent, regulation of rail carriers increased with the 1987 reforms.

For the highway trucking industry, the existing policy of not regulating entry into the extra-provincial sector after 1992 is an optimal one. The federal government should resist the temptation to appease narrow private interests (e.g., some segments of the industry, organized labour, and a number of provincial governments) by going back to a regulated system. That system imposed very heavy economic costs on the economy.

In the case of the rail sector, existing public policy is far from optimal. As a starting point in looking for an optimal policy, it must be recognised that forcing carriers to provide uneconomic services is inefficient and socially wasteful. Such a policy places large financial burdens on carriers that must result in a reduction in the rate of return on capital employed in the rail industry (thus making investment in new facilities or services unattractive). It must be noted that the ability to cross-subsidize unprofitable traffic has declined significantly in recent years, due to increased competition from highway carriers and also from intra-modal competition in the rail sector.

The regulatory ceiling on the maximum annual line abandonment of 4 percent should be immediately eliminated. Carriers should be free

to either abandon uneconomic services or convey lines to shortline operators. To this end, the power of the National Transportation Agency to order continuation of uneconomic services should be greatly curtailed. In addition, there is nothing to be gained by ordering an uneconomic line kept open and transferring the burden from the railway to the taxpayer in the form of subsidies.

It must be admitted that such a policy will not find favour with the rail unions, provincial governments, a sub-set of shippers, and other special interest groups. It must be recognized that the alternative to reducing the large amount of uneconomic capacity is a rail industry that will be increasingly unable to compete with other transport modes due to cost disadvantages, and one that is thus not attractive to investors, or a rail industry that would require increasingly large public subsidies. We have gone the subsidy route before and have learned that it is very costly and only postpones the required restructuring.

Re-regulating the rail industry in Canada, as has been advocated by organized labour, would represent a non-viable, sub-optimal approach to the problem. Regulation was never effective in promoting efficiency. In the U.S., which actually practised the type of regulation favoured by many critics of competition, the result was a rail industry that was virtually bankrupted by the dead-hand of government.

The potential benefits of transferring a considerable percentage of existing lightly-used track from CN and CP to shortline operators is large. We noted above that Central Western Railway estimates the cost of operating the Stettler shortline to be 60 percent lower than would be the case if CN were operating it. Optimal policy requires that impediments to establishing shortlines be removed. In particular, the transfer of mainline inter-provincial trackage to shortline operators should be encouraged. This would require changes in the power of unions to enforce successor rights. One of the reasons that CP has applied to abandon the Canadian Atlantic Railway rather than offer it for sale to a shortline operator is that any shortline operator would have to honour pre-existing labour agreements and thus there would be little opportu-

nity to use labour more efficiently. It is probable that the Canadian Atlantic Railway would be profitable if it were turned into a shortline.³²

More far-reaching and controversial is the question of the optimal level of competition within the rail industry. Ellison (1987), for example, doubts that the 1987 regulatory reforms are sufficient to promote adequate competition in the Canadian rail market. Given that the industry is characterized by a duopoly, neither carrier will be sufficiently motivated to engage in aggressive competition. Cubukgil (1990) offers the same opinion. Previously, we argued that competition in rail markets has increased considerably since the 1987 reforms. How much of this is due to intra-modal as opposed to inter-modal competition is open to question.

Demsetz (1968) argued that in cases where a monopoly has resulted from ownership of the necessary infrastructure and where it would be inefficient to duplicate the infrastructure (e.g., local telephone networks, electrical grids, rail lines, et cetera), that optimal public policy would be best served by auctioning the right to use the infrastructure rather than by government regulation. In order to promote competition in the rail sector, a policy to greatly expand “running rights” (allowing carriers to run on another carrier’s track) is required. It is recognized that the rail sector is characterized by a lack of contestability (entry under the existing rules requires the entrant to provide a right of way, a very large investment in sunk costs) and is not attractive to new entrants under the existing regulatory regime.

The best way to stimulate competition is to separate the provision of the rail infrastructure (way and structures, et cetera) from the provision of rail transport operations. This policy is in fact one that is to be adopted in the European Economic Community (EEC) by January 1993. The existing rail network, which has a very high degree of public ownership, will be opened to new entrants that will be able “purchase” the rights to run on the existing track and/or be granted “franchises” to produce specific services.

Calls for greatly expanded running rights and unlimited entry of new carriers in Canada are not new. In a submission to the Canadian

32 CP is apparently considering selling the line in three blocks: one in New Brunswick, one in Maine, and one in Quebec.

Transport Commission's inquiry examining the impact of U.S. deregulation on the Canadian industry, The Director of Research and Investigation, Combines Investigation Act, called for an expanded opportunity for new and existing carriers to obtain running rights over existing trackage, subject only to a fitness test. Ellison (1987) and Cubukgil (1986, 1990) also recognized that viable competition in the rail sector would require compulsory third-party running rights. Both favoured turning the (publicly-owned) CN infrastructure over to a "Track Authority" that would essentially supply only track and fixtures and charge tolls for traffic.

There is great merit in the notion of turning CN into a track authority. It promises the benefits of increased competition and lower costs. It would also solve the problem of "what to do" with CN. There are, however, a number of practical problems to be overcome. First, a publicly-owned track authority would have no incentive to be efficient. That is, the potential benefits of the track authority notion would be unrealized if the presence of significant inefficiencies led costs to be higher than optimal. If the track authority is set up as a private company, there would be greater incentive for efficient operation. Second, the production of rail services is characterized by the presence of joint and common costs. Such costs are not directly attributable or traceable to the production of a specific movement. They are allocated in the marketplace to specific movements by charging whatever the traffic will bear.³³ That is, rail carriers are required to practice price discrimination in order to cover common and joint costs. The price discrimination is geographic or by commodity. A track authority will have to practice price discrimination since a "one size fits all" charge for use of the track will lead to losses if the charge is set too low or to loss of traffic and under-utilization if the charge is set too high.

Subsidies to Via have been cut-back in recent years. The subsidy in 1989 equalled \$532 million. Route cuts in 1990 allowed the 1991 subsidy level to decline to \$392 million. Current plans call for the subsidy to be

33 Technically, the costs are distributed across traffic in accordance with an inverse elasticity rule: traffic for which the demand is more inelastic with respect to rates will be charged higher rates than will traffic for which the demand is more elastic.

cut to \$250 million by 1996. Even with the reduction in the subsidy level in recent years, the results are still very dismal. On a system-wide basis, the revenue/cash operating expense ratio is only 31.2 percent. This means that the required government subsidy per passenger per mile in 1991 was a whopping 43 cents.

Close to 70 percent of passenger trips (and 80 percent of train movements) are within the Quebec City-Windsor Corridor. Some of these trains can actually cover the cost of operations from the fares collected (e.g., Quebec City-Montreal) even under existing institutional arrangements. Others, especially on the more northern routes, are dramatic money-losers. The Cochrane, Ontario to Quebec City passenger service meets roughly only 3 percent of operating costs from the fare box.

If Via Rail is ever to be viable and not a constant drain on taxpayers, unprofitable services must be eliminated. Much can also be gained in terms of reducing operating costs by allowing independent carriers to contract with Via Rail for the supply of train trips. Such a policy will be in operation in Britain by 1993 and promises cost reductions.

With respect to competition between road and rail carriers, it is important that highway carriers meet the cost of providing the underlying highway infrastructure. The available evidence (which is not definitive but is strongly suggestive) points in the direction of highway truckers being supplied with an indirect subsidy.

The report of a Royal Commission inquiring into passenger transportation in Canada was released in late November, 1992.³⁴ The commission has (correctly) recommended that a user-pay policy be implemented for all passenger transportation services and that all modes be taxed equally. The commission suggests that passenger transportation in Canada is subsidized by roughly \$5 billion per annum, with the highest rate of subsidization per passenger kilometre being for Via Rail (33 cents per passenger kilometre in 1991). The report calls for the elimination of both direct subsidies (such as those provided to Via Rail) and indirect subsidies (such as those provided by the provision of the highway infrastructure to users at prices that do not cover costs).

34 The report, which is almost 2,000 pages long, was released on November 19, 1992 during the final editing of this paper. The comments in this paper on the Report of the Royal Commission are thus necessarily brief.

Under existing institutional arrangements, elimination of the major indirect subsidies would require a major rise in provincial fuel taxes.

The report also suggests that opportunities for levying user-pay fees directly in the form of tolls exist when new highways are built or existing ones are expanded. Although little use is made of tolls in Canada, they are widely used in a number of jurisdictions. (Excluding international crossings between Canada and the U.S., there are—to the author's knowledge—only 3 toll bridges and 1 toll highway in Canada.) In many U.S. northeastern states (Connecticut, New York, New Jersey, Pennsylvania, and Delaware, for example) and some U.S. midwestern states (Illinois and Ohio) a number of major highways can only be used on a toll basis.

The province of Ontario is in the process of setting up a public body that would have the power to levy tolls so as to cover the construction costs and maintenance requirements for new highways. The major problem with the Ontario approach is that there is no incentive for the toll road to be operated in the most efficient manner. One alternative would be to auction to a private operator the right to operate the road for a given period of time (5 years, for example). The province could specify service levels with respect to maintenance, et cetera, and set the required payment to be made to the province for "renting" the road (so as to cover construction costs) and then accept the lowest bid in terms of toll levels. Other variants are possible.

In a number of situations, it may be possible to have the road owned and operated privately. The major problem with this is that there will likely be an absence of competition (no more than one road going from A to B) and the private owner will effectively be able to set tolls at the monopoly level.

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High Speed Trains for Canada: Technological Excellence, Groundless Conviction, or Bureaucratic Obsession?

Richard M. Soberman

Introduction

PSYCHIATRISTS GENERALLY AGREE that people would be better adjusted if “they could do more” of the things they like and fewer of the things they dislike. Many Canadians dislike flying, but they take more than 14 million domestic trips by air each year anyway; most Canadians like trains, but they take less than 4 million trips every year. The reasons for not following good psychiatric advice with respect to these travel decisions are fairly obvious—most of the time individuals make their travel decisions on the basis of perceived differences in travel time, cost, and convenience, to name probably the most important. Consider, for example, a recent round trip from Toronto to Ottawa: one way by VIA Rail (club), the return by Air Canada (economy).

	Toronto to Ottawa	Ottawa to Toronto
Mode	VIA One	Air Canada
Origin	Home	Transport Canada
Leave Origin	0800	1630
Taxi Fare	\$20	\$23
Scheduled Departure	0900	1745
Delay	none	25 min
Fare	\$90	\$223
Check-in Hassle	none	moderate
Comfort	very good	cramped
Ability to Read or Work	good	poor
Meal Service	very good	coffee
Arrival Time—Terminal	1300	1915
Arrival Time—Destination	1325	2000
Taxi Fare	\$12	\$40
Door to Door—Cost	\$122	\$286
Door to Door—Time	5 hr 25 min	3 hr 30 min

For this business trip, the two hour time saving by air works out to about \$82 per hour, an indication of the value some people place on their time, even for a trip that is less civilized by almost any measure. Of course, if someone else is paying for the trip, or if the fare is tax deductible, the cost differential is almost meaningless. Moreover, VIA Rail was on time, an increasingly usual occurrence, and Air Canada was delayed, not an unusual occurrence. The flexibility of departure times, on the other hand, was much greater for air travel than for travel by rail.

The case for high speed train service on this route (or similar routes where rail travel, other than for purely recreational purposes, can be considered as a *realistic* alternative to air), therefore, really rests on the question of how much the time differential can be reduced, and at what cost. After all, merely doubling the current average speed of about 100

km per hour, not a very tall order for today's railway engineers, entirely eliminates Air Canada's travel time advantage.

Background

General interest in high speed passenger trains derives from a variety of factors, including concerns about the environment, government spending on roads and airports, highway safety (and, to a lesser extent, aviation safety), as well as some degree of nostalgia related to the lore of trains and the importance of railways to the cultural heritage of this country. Interest has been heightened over the last twenty years by the remarkable technical advances made, first by the Japanese with their "bullet trains" and, most recently, by the French with their *TGV* (*Train à Grande Vitesse*). Canadians who have travelled on these trains marvel at the experience and, understandably, wonder why such superb services cannot be provided in this country. There are, of course, other examples of fast trains in the U.K. and elsewhere in Western Europe and, much closer to home, the very respectable *Metroliner* operated by Amtrak between Washington and New York.¹

On this continent, the first serious look at high speed ground travel began in the early 1960s. Concerned about highway and airport congestion throughout the entire seaboard between Boston and Washington, the U.S. government embarked upon a series of *Northeast Corridor High Speed Ground Transportation* studies. These studies examined the feasi-

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- 1 While these Japanese and European experiences have created a degree of envy on the part of many Canadians, such envy might be better directed at Amtrak which operates in a demographic and competitive market that more closely resembles the Canadian scene. By Canadian standards, Amtrak has achieved considerable success. From 1981 to 1988, for example, Amtrak increased its *operating* cost recovery from 48 to 69 percent, compared to VIA Rail's overall system operating cost recovery of 28 percent in 1988. Amtrak's Northeast Corridor services already show a healthy operating profit. The entire system is projected to break even by 2000 and *begin* to make a contribution to capital. By contrast, 1990 revenues for the TGV Sud-Est amounted to 163 percent of costs, yielding a net profit after covering all debt service costs. Ten years after opening, the entire cost of the new line is expected to be "paid back." See Gérard Mathieu, "Ten Years TGV Sud-Est—A resounding success," *Railway Engineering International*, Vol. 20, No. 3 (1991): 7.

bility of a wide range of existing and emerging technologies, including monorails, tracked hovercraft, gravity vacuum tubes, turbotrains, and modern electric trains. Millions of taxpayer dollars were dissipated on inventors who typically overstated performance capabilities and understated costs. When the dust settled, electric trains reaching speeds of 200 kmh were introduced between New York and Washington in 1976. Since that time, however, no other high speed trains have been placed in regular commercial service elsewhere in America.

In Canada, interest in high speed ground travel was motivated by similar concerns about road and airport congestion, as well as some desire on the part of Ottawa transport officials to “keep up with the Joneses,” in this case, their counterparts in Washington. Prior to *Expo '67*, Canadian National had leased four *Turbotrains*, built by United Aircraft in the U.S., for service between Montreal and Toronto. Though capable of higher speeds on existing track than conventional trains, the *Turbotrain* failed almost entirely to live up to its performance claims, experienced severe reliability problems, and quietly disappeared from the scene in both Canada and the U.S.

In 1969, the Canadian Transport Commission (CTC) embarked upon its own technology assessment study for the highest density travel corridors in southern Ontario and Quebec, and eventually coined the phrase “Quebec-Windsor Corridor,” still identified today by VIA Rail as its Corridor Services.² In part, that study was also motivated by events in France and pressures from the inventor, Bertin, who had developed an experimental tracked, air cushion vehicle on a test track too short to measure its real speed potential.³ After comparing a number of alternative technologies, including Short Takeoff and Landing (STOL) air service,⁴ using the best available data on travel markets in the Corri-

2 Richard M. Soberman, George Clark, and Tom Parkinson, *Intercity Passenger Travel Study*, (Ottawa: Canadian Transport Commission, 1970).

3 The *Aerotrain* was an aircraft-like vehicle, supported on a cushion of air, like a hovercraft, wrapped around a concrete structure for guidance, and driven by a rear mounted aircraft engine and propeller.

4 Interest in STOL services and the subsequent Montreal-Ottawa STOL demonstration, funded by the federal government, was, of course, moti-

dor, the CTC study concluded that the most cost effective solution would likely involve modest investments in *existing track* in order to permit higher speed operation and more frequent service.

The CTC recommendation never really went very far, partly because Ontario government officials expressed concerns that high speed service could only be achieved at the expense of service to intermediate points that would be by-passed. More importantly, the federal government was too busy wrestling with the ever increasing losses on rail passenger services operated by Canadian National and Canadian Pacific throughout the country.⁵ Dissatisfied with the increasing subsidies demanded by the railways and faced with considerable public discontent over the quality and reliability of these services, the government of Canada began toying with the idea of establishing VIA Rail as a national rail passenger crown corporation, mimicking similar moves taken in the U.S. by the creation of Amtrak.⁶

vated to assist DeHaviland in marketing *Twin Otters* and, subsequently, the *Dash* series of short haul aircraft. At the time, proponents of STOL technology, including the then prestigious (but now defunct) Science Council of Canada, argued that high speed trains would never “fly” and that for short haul intercity transport, STOL would be an outstanding success that would reap immeasurable industrial benefits for Canada and displace the need for passenger trains.

- 5 Although the *National Transportation Act of 1967* included measures for reducing the huge bill for rail passenger services by eliminating those money losing services that were not deemed essential, successive governments lacked the intestinal fortitude to make any serious cut-backs in service. However, the Act did transfer most of the burden of those losses (80 percent) from the railways to the government, a measure intended to improve the general competitiveness of Canadian railways for freight traffic.
- 6 Though similar in concept, the conditions requiring the creation of a national rail passenger corporation in the U.S. were, and are, far different than those in Canada. The U.S. railroad network of the day consisted of a very large number of separate, private companies, the large majority of which were in serious financial difficulty, including such now defunct giants as the New York Central and Pennsylvania railroads. There were no single transcontinental railroads and, other than the Alaska Railroad, the U.S. federal government owned no rail facilities. Some integrating unit was thus necessary if rail passenger service was to be provided as a matter

During the 1970s and 80s, however, the Canadian government showed very little interest in any serious appraisal of the potential for higher speed rail service. A few studies touted the virtues of rail travel. In a report entitled *Alternatives to Air*, the Canadian Institute for Guided Ground Transport (a research centre at Queen's University, funded by Transport Canada, both major railways, and, subsequently, VIA Rail) concluded that train service in the Quebec-Windsor corridor could compete favourably with the airlines and be profitable.

Although generally based on some rather optimistic projections of potential passenger markets, the Queen's report did inspire VIA Rail to embark upon a series of costly feasibility studies, largely employing consultants who would tell them what they wanted to hear and ignoring consultants who might introduce some degree of realism into the process. Through these studies, VIA hoped to convince the federal government that massive capital investment and improved train service for the Quebec-Windsor corridor represented a politically and economically sound endeavour. The government responded with a series of cyclical decisions to eliminate, restore, and again eliminate a large number of existing VIA Rail services.⁷

of public policy. In Canada, there were basically two transcontinental railways serving almost the entire country from coast to coast, the largest of which is still owned by the government of Canada. Creating VIA under these quite different conditions, if nothing else, was an admission of the inability of the federal government to effectively control its own crown corporation.

- 7 Although not the subject of this paper, government schizophrenia on rail passenger policy has certainly muddled the waters and deserves some mention. In the summer of 1981, faced with growing VIA losses, the Liberal Minister of Transport, Jean Luc Pepin, eliminated about 30 percent of VIA's service, without parliamentary debate. When the Liberals were routed by the Conservatives, Don Mazankowski lived up to an election promise and restored most of these services, and then some, in 1984. Mazankowski also prepared a very reasonable piece of rail passenger legislation which established targets for financial performance based on a "use it or lose it" policy for determining which services would be continued. The proposed legislation, however, was never introduced due to internal wrangling within the Conservative Caucus. Five years later, when VIA's losses had climbed to more than \$650 million (about \$100 per passenger), the Minister of Trans-

The current stimulus for consideration of modern train services in the Quebec-Windsor Corridor basically derives from the industrial sector, encouraged by the euphoria surrounding the French National Railway's (SNCF) tremendous technological success with high speed trains. As the North American licensee for the TGV, Bombardier, in association with a group of private financiers, began promoting the concept of a financially viable, truly high speed train service in the Corridor on the basis of its own pre-feasibility study. Bombardier's interests, of course, were self-evident: by successfully demonstrating the application of this technology in Canada, larger markets could, presumably, be opened in the U.S.

Bombardier's proposal was based on an estimated capital investment of between \$5 and \$6 billion for the entire Corridor, about one third of which was expected to come from government sources as a *quid pro quo* for the indirect benefits that would accrue to the general public. These benefits allegedly include reduced highway and airport congestion, environmental protection, the reduction of operating subsidies for VIA Rail's Corridor services, and, of course, employment creation in the manufacturing and construction sectors.⁸ At about the same time, another interesting proposal was announced by a competing supplier, ASEA Brown-Boveri Canada (ABB), based on its lower speed *Sprinter*, a

port, Benoit Bouchard, proclaimed even more severe cutbacks than those originally initiated by Jean Luc Pepin. Bouchard's January 1990 policy statement reduced VIA service by about 50 percent and established specific annual limits for government spending of \$350 million, to be phased in over four years. While no data are publicly available on the specific allocation to Corridor services, these services accounted for about 58 percent of all 1991 expenses and about 83 percent of all passengers.

- 8 The environmental arguments certainly have merit, provided reasonable utilization of rail services can be achieved. ABB, for example, estimates fuel consumption at 1.7, 17, and 33 litres per passenger between Toronto and Montreal by rail, automobile, and air, respectively. Since CO₂ emissions, acknowledged to be an important cause of ozone depletion, vary directly with fuel consumption, there would be environmental benefits derived by diverting large numbers of passengers from more fuel intensive modes of transport to a well-utilized rail service, regardless of improvements in fuel efficiencies achieved by these modes.

Canadianized version of ABB's X2000 train, now successfully operating in Sweden.

Bombardier's successes in other areas of transport technology, such as aircraft and rapid transit systems, was not to be taken lightly and in response to its proposal, the governments of Quebec and Ontario established the Quebec-Ontario Rapid Train Task Force to study the matter in greater detail. (Concurrently, the federal government established its own Royal Commission on National Passenger Transportation with a much broader mandate.) The Quebec-Ontario task force completed the first round of its deliberations in 1991 by recommending more study, which led to an agreement by Quebec, Ontario, and the federal government to share equally in a \$6 million detailed feasibility study, now under way.

A primer on high speed

Before turning to the possible relevance of high speed rail service in the Quebec-Windsor corridor, a capsule description of high speed train services may provide an understanding of the basic issues involved. First, one must recognize that existing rail passenger vehicles are already capable of achieving higher speeds than those offered in commercial service almost anywhere in North America. In order to achieve rapid acceleration and higher cruising speed, obviously, a high power propulsion system is necessary. Setting aside the propulsion requirement, however, performance is limited or affected by a number of fundamental factors, namely: condition of the track, frequency of stops, geometric design standards (grades and curves), other traffic using the same facilities, and the number of grade crossings with highways.

Frequency of stops or station spacing influences the maximum speed that can be attained and the duration of travel at that speed before it is necessary to slow down and stop at a station to load and unload passengers.

Given the necessary locomotive power, operation at high speeds also requires a *high quality track structure* that must be maintained at a very high standard. The quality of track is dictated by such factors as the rigidity of the entire track structure, soil conditions, and the size of rail.

Maintenance involves retaining the original geometry of the track (for example, gauge, the distance between rails). If the same track is used by heavy freight trains with much less sophisticated suspension systems, it is extremely difficult to maintain track for high speed, except at prohibitively high cost.

Geometric design is particularly important on curves. Railway curves are banked to compensate for the centrifugal forces that act on a vehicle as it rounds a curve. The degree of banking (superelevation) depends on vehicle speed and the sharpness of the curve (curvature). Here, there is a basic incompatibility between high speed and normal speed trains using the same track; if high speed trains use a track that is not adequately banked, there is a safety hazard. If a slow freight train uses a track that has been banked for high speed, there is a tendency for the train to “fall off” the track or, at least, severely damage the lower rail.

Other traffic using the same facility also influences the maximum speeds that can be attained from the standpoint of safe traffic control, particularly where overtaking is involved.

Frequency of grade crossings is probably the single most important impediment to increasing speed on existing track. As long as crossings are not grade separated, train speeds must be limited to permit safe stopping in the event of any obstruction on the track, such as a stalled motor vehicle. For this reason, a 90 mph speed limit is imposed on all railways in Canada.⁹

Putting these key factors together, there are basically two fundamental and somewhat related choices to be made in the actual design of a high speed rail system. One is whether the system is electrified or relies on a train-mounted power supply such as a diesel-electric locomotive. The other is whether the service is to operate on dedicated track or track shared by slower speed passenger and freight trains.

9 In view of its allegedly superior braking characteristics, the speed limit was increased to 100 mph for the experimental *Turbotrain*. On its inaugural run, however, the *Turbotrain*, equipped with a nose-mounted closed circuit video camera for the benefit of invited media representatives, successfully demolished a milk truck which had stalled on a grade crossing.

These choices are not entirely independent. For dedicated track, the capital investment is so large as to be justifiable only for very high traffic volume and train frequency. It is precisely under such conditions that the operating economies gained by the use of electrical energy outweigh the additional capital costs of installing the power supply and distribution system. Practically speaking, therefore, dedicated track and electrification go hand in hand. In the case of shared track, electrification may also be necessary as well as cost effective for high speed service.

Very high speeds (about 300 kmh), such as those achieved by the TGV, clearly require electrified service operating on dedicated track, completely separated from other rail traffic that can damage the track and interfere with operations, fully protected from accidents at grade crossings, and adequately designed in terms of standards for grades and curves. (Curves for 300 kmh service, for example, require a radius of not less than 6,000 metres, compared to about 2,500 metres for 200 kmh service.) Satisfying these requirements is unquestionably more costly than accommodating lower speed service on existing, rehabilitated track typical of the X2000 trains in Sweden and the *Metroliner* trains in the U.S. Obviously, there are opportunities to mix and match. For a particular route, there may be some segments of operation on completely dedicated track, whereas other sections may involve operation on shared track, possibly including grade crossings at reduced speeds. Depending on the length of reduced speed operation, overall travel times may not be affected significantly.

On a worldwide basis, advances in high speed train technology are most frequently identified with the achievements made by national railways in Japan and France. The first significant breakthrough occurred in 1964 when the *Shinkansen* or *Bullet* train commenced regular service between Tokyo and Osaka with a maximum operational speed of 210 kmh, subsequently increased to 275 kmh in the late '80s. (According to recent news releases, 350 kmh service may be introduced shortly in Japan.) In 1981, the French National Railways (SNCF) inaugurated TGV service between Paris and Lyons with a maximum operational speed of 260 kmh. By 1989, the new Atlantique service between Paris and Le Mans/Tours reached an operational speed of 300 kmh. One year later,

on an experimental run, the TGV established the current world record of 515 kmh!

Though nothing yet equals the French achievements, there are other interesting examples of high speed services in Germany, Sweden, Italy, the U.K., and the U.S. which have generally not attracted as much attention. Comparative information on these systems is summarized in table 1.¹⁰ As shown, several systems operate on track that is shared by conventional passenger trains and, in some cases, even by freight trains. The Amtrak experience between Washington and New York is particularly interesting from the standpoint of potential applications in the Canadian corridor. With twelve *Metroliners* (powered by ABB locomotives) and twelve conventional trains operating daily in each direction, Amtrak now carries 38 percent of the total air/rail market. Because this distance is shorter than the route between Toronto and Montreal, the speed difference between the *Metroliner* and the TGV is of lesser concern.¹¹

In examining these examples, from the *Metroliner* to the TGV, it is important to note that while speed is undoubtedly the single most important attribute of service, these systems all involve what is almost a quantum jump in rail passenger marketing attitudes. The whole travel experience involves novel designs for stations and terminals, user friendly ticketing and reservation systems, and a variety of on-board amenities and services. Trains do not just move faster; passenger handling and conveniences more resemble a good airline operation (with

10 Table 1 compares only technical characteristics. Unfortunately, comparative data on costs, revenues and financial performance of these different services is not readily available. As noted previously, however, according to the SNCF, at least one of the TGV services operates on a full cost recovery basis. Differences in the regulatory and public policy environment within which these services operate, particularly regulations and policies related to domestic aviation, may also affect the "success" of these services.

11 The New York-Washington service shows an operating profit. The capital cost of rebuilding the existing line to permit reliable operation at 200 kmh on some segments was of the order of \$2.5 billion (1976), however, or an average cost of about \$6 million per km. See W. Graham Claytor, "Amtrak on Target to Break Even by 2000," *Rail Gazette International*, Vol. 147, No. 12 (December 1991): 863-868.

greater comfort) than they do a typical Canadian rail passenger operation.

Current Canadian initiatives

Compared to the existing high speed systems noted above, there are two serious proposals in Canada for the Quebec-Windsor Corridor, with some suggestion of applications in a second corridor between Calgary and Edmonton. Bombardier's proposal involves TGV technology at 300 kmh, operating on electrified, completely new, dedicated track between Quebec City and Montreal, Montreal and Toronto via Ottawa, and Toronto and Windsor via London. ABB's X2000, or *Sprintor*, would operate at 200 to 250 kmh on electrified, rehabilitated, existing track, first between Toronto and Montreal, with subsequent extensions to Quebec City and Windsor. In both proposals, smaller communities at intermediate points, such as Cornwall, Brockville, Belleville, and even Kingston, would not be served directly, due to the time losses involved.

Present interest in these proposals has reached a high level in a few select circles which include officials in the transport ministries of Quebec and Ontario, potential equipment suppliers, VIA Rail itself, and those consulting firms selected to carry out a number of costly studies. Special interest groups, including environmentalists and railway nostalgists, while not in the main stream of action, certainly endorse the case for high speed rail in periodic articles which appear in the daily press.

In a recent editorial, for example, the *Toronto Star* (September 1, 1992) urged immediate government action to introduce "supertrains" in the Quebec-Windsor corridor, largely on the basis of the employment potential created by such a massive project.¹² The *Star's* decisiveness is based on the complete absence of any realistic information on the costs

12 The *Star* is not unique in advocating major public spending in these recessionary times and using employment creation as the justification for massive capital projects. Certainly, many economists support the notion of public spending in recessionary times, as long as such investments represent a prudent use of tax dollars. What is surprising is that both journalists and consultants are so quick to jump on this particular bandwagon. After all, employment can also be created by building pyramids which, though

and benefits of such an undertaking, totally in keeping with the various pronouncements made by government officials. The major difference, of course, is that editorialists only argue for massive public spending; bureaucrats actually make liberal use of taxpayer dollars.

To understand how we arrived at this situation, it is useful to go back in history about twenty years and consider a simple decision made in an almost totally unrelated field. After years of controversy, in 1971, the Cabinet of Ontario overturned decisions reached by Metropolitan Toronto and the Ontario Municipal Board regarding construction of the Spadina Expressway. When he cancelled the Expressway in his now famous “Cities are for People” speech, Premier William Davis promised new provincial initiatives in the field of public transportation, including increased capital and operating subsidies and the development of advanced, state-of-the-art transit technology.

Based on experimental developments in Germany, magnetic levitation was the new technology recommended to the Premier by his advisors and consultants. The government owned Urban Transportation Development Corporation (UTDC) was created to accelerate the application of this technology. Although magnetic levitation was shortly abandoned as a practical application within urban areas, the UTDC did develop and market a number of vehicles and systems—new streetcars (or *light rail vehicles*) for Toronto, as well as an advanced light rail system using linear induction propulsion and advanced train control systems. Subsequently, the provincial government provided Metropolitan Toronto with strong financial incentives to choose this technology over conventional streetcars for the Scarborough RT, largely for its demonstration value, eventually leading to sales in Detroit and Vancouver (where it is known as Skytrain). This tactic, incidentally, has not been lost on the proponents of TGV in the Canadian corridor, the successful introduction of which would presumably open up new markets elsewhere in North America.

admirable from an architectural point of view, do not represent a particularly cost-effective use of public funds. Most major public capital works tend to be highly labour-intensive, a fact that accounts for a significant portion of total costs; if employment benefits are used to offset these costs, any labour-intensive project, however ridiculous, can be shown to have an attractive cost-benefit ratio.

Unfortunately, for all its achievements, UTDC was perceived as a Tory creation that always served as a good target for the opposition during Question Period. When, to everyone's surprise, the Liberals eventually took charge of Ontario after almost a half century of Tory rule, it came as no surprise that UTDC was put on the block for privatization. During the period of government ownership, UTDC had established a test track and manufacturing facility in Kingston and had also acquired Hawker Siddley's subway and commuter rail car manufacturing plant in Thunder Bay. Eventually "sold" to Lavalin, with the demise of that firm, UTDC ultimately ended up within the Bombardier family of companies. As the North American licensee for the *TGV* and the new owner of the UTDC's manufacturing facilities in Kingston and Thunder Bay, Bombardier deserves and receives serious attention from officials and politicians of both provincial governments. In addition, Bombardier is now involved in preparing an offer for the implementation of *TGV* service between Dallas/Forth Worth and Houston, the only high speed rail application under serious consideration in the U.S. at this time.

Bombardier's interest and influence are totally understandable. Bombardier obviously views the Quebec-Windsor market as one of several potential applications of a technology that will add to its manufacturing activity. In its own pre-feasibility study, Bombardier concluded that, with *some* government participation in financing capital costs, *TGV* service would be commercially viable from the standpoint of potential private investors. Similar conclusions were reached by ABB in their pre-feasibility study of the *Sprinter*. In view of Bombardier's favoured position in both provinces, however, it is not surprising that ABB has been given far less recognition and support by the governments of Ontario and Quebec, as well as by the government of Canada. In some respects, Bombardier already has the inside track while ABB is on the outside, looking in.¹³

13 ABB, however, is faring better in the U.S. The original supplier of *Metroliner* electric locomotives, ABB imported an X2000 for demonstration service in Amtrak's Northeast Corridor in the Spring of 1993 between New York and Washington and between New York and Boston. Between Hartford and Boston, the X2000 was hauled by diesel electric locomotives because the

Aside from suppliers, VIA Rail Canada, the crown corporation responsible for rail passenger services from coast to coast, is hardly a dispassionate observer in the current dialogue on high speed. Although VIA's history, performance, and expectations are really the subject of another discussion, VIA's role cannot be ignored, even though its participation in any high speed service that may be introduced is highly questionable. According to the Minister of Transport (*La Presse*, September 3, 1992), the federal government would have, at best, minimal involvement in high speed service which would *preclude* VIA's participation as the operating authority.

A capsule description of the organization may be useful in explaining VIA's interest in high speed rail. VIA Rail is basically a concept conceived in the minds of senior federal government bureaucrats. Emulating what they saw in the U.S., these bureaucrats convinced the government to establish VIA Rail in the late 70s as a means by which better rail passenger service could be delivered to Canadians at lower public cost. At first, the concept was opposed by both Canadian National and Canadian Pacific, then legally responsible for operating passenger trains. But it did not take long for railway officials to realize the bonanza that the establishment of a national rail passenger corporation would provide for off-loading redundant equipment, facilities, and, in some cases, personnel.

Although VIA is a railway, it owns no track. It does purchase track "rights" and other services from CN and CP on a "cost plus" basis. Both railways are entitled to recover all costs associated with the operation of passenger service on behalf of VIA according to the CTC *Costing Order*, certainly an improvement over the conditions of the National Transportation Act of 1967 under which the railways were still burdened with 20 percent of the losses on these services. VIA, in turn, sells service to the public on routes prescribed by the Minister of Transport. Under such conditions, the railways have little or no incentive to improve either efficiency or quality of service, VIA has very little bargaining power with the railways, and VIA cannot even make its own marketing decisions, which are dictated by political expediency.

line is not electrified (as was the case for limited demonstrations of the same train in Canada).

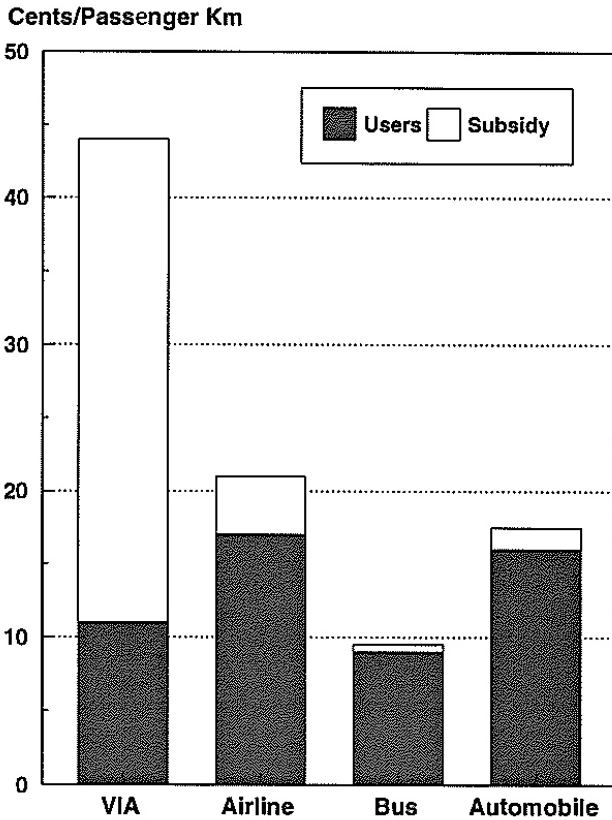
Over the years, VIA's dependence on CN and CP has declined inasmuch as CN operating labour became VIA employees and VIA built, at great cost, its own under-utilized maintenance facilities, through no fault of its own.¹⁴ However, VIA's independence has also been greatly reduced by the 1990 policy which essentially dictates what routes are to be served, as well as the number of trains to be operated on each route.

Unlike Amtrak, which receives financial directives from the U.S. Congress, VIA has never been given any cost recovery targets as the basis for determining service priorities. Although the 1990 VIA policy statement did establish total subsidy limits, no cost recovery targets were established. In the absence of such financial discipline, VIA has little leverage to negotiate with its own labour force, which is compensated according to antiquated rules (featherbedding) that would have to be totally overhauled and streamlined for high speed services.¹⁵ The net effect of this combination of factors is that, except for coastal ferries in remote regions, rail passenger service has the poorest financial performance of any mode of intercity passenger transportation in Canada. Setting aside some rather curious assumptions regarding cost allocation, findings of the recently completed *Royal Commission on National Passenger Transportation*, shown in figure 1, suggest that rail passengers

14 At the time, VIA planned these facilities as an alternate means of getting out from under CN's monopoly pricing for equipment maintenance. However, in 1985, the Nielsen Task Force did urge consideration of contracting out for equipment maintenance either with Ontario's GO Transit (also in the process of building maintenance facilities for the same reason) or with private equipment manufacturers. Nevertheless, the federal Ministry of Finance approved VIA's request to fund five new maintenance centres in the late '80s, just a few years before the Minister of Transport reduced VIA's fleet and services by half. This sequence of events may be illustrative of the proverbial communication problems between left and right hands.

15 Amtrak, for example, successfully negotiated collective agreements in which locomotive engineers are paid by the hour rather than by mile, which is the case for VIA's locomotive engineers. The threat of discontinuing services that could not achieve financial targets for cost recovery, imposed by Congress, allowed Amtrak to obtain such concessions. In Canada, the less than five-hour trip between Montreal and Toronto still earns 3.5 days salary under VIA's collective agreement, clearly a horrific cost for a travel time that could easily be cut in half with TGV service.

Figure 1: Average System-Wide Costs of Intercity Domestic Travel, 1991



pay less than 25 percent of average costs compared to 96 percent for bus, 82 percent for airlines, and 91 percent for private automobiles.¹⁶

Under these conditions, VIA's continued interest is certainly curious. VIA's management obviously believes its organization to be a prime candidate for the operation of *TGV* service in the Corridor, despite the Minister's statements to the contrary. Ministers (Pepin,

16 Royal Commission on National Passenger Transportation, *Directions* (Summary), (Ottawa: 1992: 10

Mazankowski, Bouchard, Young) change, of course, as do rail passenger policies (1981, 1984, 1990). Nevertheless, recognizing that many communities within the Corridor would be by-passed in the advent of privately operated high speed trains, VIA could be in the unenviable position of being deprived of its most important source of revenue and left only with the residual, local service function.

Finally, the consulting industry is another important constituency encouraging government interest in high speed rail. In these times of economic recession and frequent bankruptcies, a select number of consultants have been doing quite well due to the generosity of various federal and provincial bureaucrats. What is not clear, however, is how well the public interest is being served by this philanthropic use of taxpayer dollars.

The Ontario-Quebec Rapid Train Task Force

When the right pressures are put on the right politicians and when bureaucrats have no real answers, the usual practice is to undertake a study. More often than not, the practice is also to place individuals who know little about the subject in charge. In this way, objectivity is assured. In Ontario and Quebec, government response to renewed interest in high speed rail and claims of financial self-sufficiency led to the establishment in late 1989 of the *Ontario-Quebec Rapid Train Task Force*, created to undertake an in-depth assessment of the political, economic, and financial feasibility of high speed rail passenger service in the Quebec-Windsor corridor.

The outcome of the Task Force was predicable even before it held its first meeting. Hearings would be held that would be dominated by “rail fans,” Task Force members and senior staff would have an opportunity to visit the world and accumulate frequent flyer points, a list of options would be developed for assessment to provide an impression of comprehensiveness, and the Task Force would eventually conclude that more study would be required.

In its final report of May 1991, the Task Force certainly could not be accused of humility, labelling their findings as “the most thorough re-

view to date of high speed rail in the Ontario/Quebec corridor.”¹⁷ Naturally, the Task Force members travelled extensively in Europe, Japan, and the United States. The Task Force also retained “independent consultants... after a deliberate and competitive search.”¹⁸ Of the ninety five submissions received over eleven days of public hearing, the vast majority came from municipal councils who would never have any financial stake in the outcome, from objective organizations with such names as *Think Rail*, from potential suppliers, and from organized labour.

The Task Force report is bulky and, since its own executive summary runs on for twenty seven pages, it would be difficult to provide a detailed assessment here. However, a few points characterize the rather unfortunate lack of objectivity in its deliberations. For example, the analysis is restricted to three distinct technologies: a 200 kmh *non-electrified* option on improved track, a 300 kmh *electrified* option on new dedicated track, and a 400 kmh maglev option involving an entirely new guideway concept. The maglev option is the typical “strawman,” included to create an impression of comprehensiveness, analyzed, and subsequently discarded on grounds that it is still too futuristic with no meaningful available data. It is also interesting to note that after a globe-trotting review of existing systems, Amtrak’s *Metroliner* service between Washington and New York, a 200 kmh electrified service on existing, improved track, receives no more than a passing glance.

The fundamental bias of the Task Force is also reflected in its treatment of markets and potential ridership. Basic ridership data, essential to any meaningful market analysis, are extremely crude and highly questionable—certainly no fault of the Task Force. The paucity of reli-

17 Ontario/Quebec Rapid Train Task Force (Task Force), *Final Report*, May 1991, p. EXECSUM-3.

18 One consultant was involved in three of the eight studies commissioned. The evaluation of socio-economic impacts and the analysis of potential ridership was entrusted to American consultants, while a major review of previous studies was awarded to an organization that had already publicly argued the commercial viability of high speed rail services in the Corridor. Prior and well-known biases certainly did not disqualify any consultants from participation, provided, of course, those biases were what the Task Force wanted to hear.

able data on market shares for intercity passenger travel, particularly for automobiles, has plagued analysts for years. Such data are difficult and expensive to collect and, even where they do exist, they are usually treated as confidential or proprietary. Weaknesses of the data base, however, did not prevent the Task Force from stating that “use of available transportation services . . . reveals . . . the *relative popularity of rail*.”¹⁹ How do the data presented, even with the above noted limitations, support this language?

Table 2 shows certain ridership data extracted from the Task Force report for 1987. Automobile dominance is clear (85 out of 95 million trips), even allowing for significant errors in the raw information. However, considering carrier ridership estimates alone, even though VIA does account for a large component of *all* Corridor trips (3.4 out of 9.5 million trips), these data hardly support the notion of VIA’s “relative popularity” in the key markets for high speed rail shown in figure 2.

For the Toronto-Montreal and Toronto-Ottawa markets, airline travel is more “popular” than VIA, whereas for the Montreal-Ottawa (where government travel policies prohibit travel by air for civil servants), Montreal-Quebec, and Toronto-Windsor markets, bus service is more “popular.” Naturally, improvements in speed can be expected to change this picture considerably, changes that can only be predicted through a reasoned and objective analysis of the data and causal factors that now exist.

The economic analysis, or *quasi* cost-benefit analysis, used by the Task Force to justify its key recommendations raises additional doubts as to the objectivity of the entire exercise. Cost-benefit analysis involves comparing a range of alternatives in terms of the incremental benefits and costs associated with each. Properly carried out, one fundamental principle of cost-benefit analysis is to compare all options against the null or “do nothing” alternative. Aside from manipulation of the raw assumptions and data, a cost-benefit analysis can easily be turned into a “project justification” manoeuvre by enhancing the preferred alterna-

19 Ibid., p. 1-10.

Table 2: 1987 Trip Estimates for Selected Corridor Routes

Market	Common Carrier				Auto	Total
	VIA	Air	Bus	Sub Total		
Total Corridor	3,377	2,661	3,514	9,552	85,259	94,811
Toronto- Montreal	414	999	124	1,537	745	2,282
Toronto- Ottawa	166	652	289	1,107	1,350	2,457
Montreal- Ottawa	262	74	693	1,029	5,567	6,596
Sub Total	842	1,725	1,106	3,673	7,662	11,335
Montreal- Quebec	147	76	955	1,178	6,324	7,502
Toronto- Windsor	145	95	153	393	773	1,165
Other	2,243	765	1,300	4,308	70,500	74,808

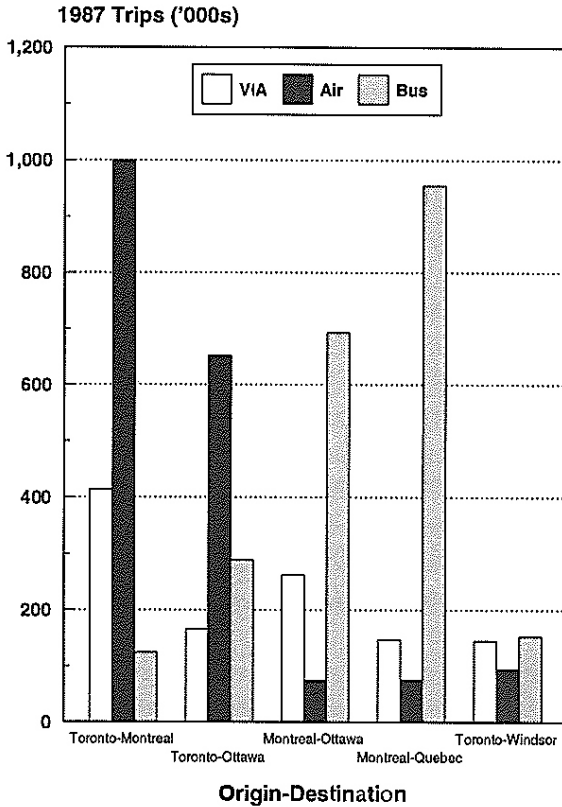
Source: Ontario/Quebec Rapid Train Task Force, *Final Report*, May 1991, p.1-11.

tive through the inclusion of unrealistic options and the exclusion of other realistic alternatives.²⁰

The data of table 3 reflect the key measures that find their way into the cost-benefit analysis presented in the Task Force final report, based on operating estimates for 2010. (Note the difference between *maximum* speed, which describes the technology, and *average* speed, based on the total trip time.) The ridership estimated for the 300 kmh service is obviously much higher than for the 200 kmh service due to shorter travel

²⁰ The classic example of cost-benefit analysis in transportation is typified by the now shopworn story of the teenager who proudly announces that she saved fifty cents by walking home from school instead of taking the bus, whereupon her father responds by asking why she didn't save three dollars instead by not taking a taxi. This mentality still finds its way, in a more sophisticated form, into many cost-benefit analyses of transportation projects, particularly in the case of rapid transit in urban areas.

Figure 2: Mode Shares for Selected Corridor Routes



time, but it is also due to the 50 percent increase in frequency. For a service which is 50 percent faster and 50 percent more frequent, however, estimated operating costs increase by only 15 percent. Costs for operating labour alone could be expected to increase by more than this amount, assuming comparable work rules. In addition, energy costs at 300 kmh would be considerably higher than those at 200 kmh and, as shown in many studies of track maintenance costs, maintenance of way expenditures generally increase almost exponentially with speed. The difference in operating cost estimates between the two alternatives is simply not defensible.

Table 3: Comparative Measures for High Speed Options

Item	Units	200 kmh (Sprinter)	300 kmh (TGV)	400 kmh (Maglev)
Travel Time	hours	3.5	2.75	2.0
Average Speed	kmh	157	200	300
Daily Departures	each way	12	18	24
Capital Investment	\$ Millions	1,284	3,517	5,705
Operating Cost	\$ Millions	104	116	142
Passengers: Montreal- Ottawa- Toronto	1000s	2,100	3,820	4,700
Fare (Montreal- Toronto)	\$ one-way	63	68	75

However, what is really missing from this cost-benefit analysis is any comparison with either the *status quo* or moderate improvements to the *status quo* services. A review of VIA Rail annual reports over the last decade, for example, shows a slow but sure improvement in both cost recovery (still very low) and on-time performance (now quite respectable). There is no reason to believe that this trend will not continue, recognizing, of course, that some capital investment will be required to maintain even the existing level of service on a deteriorating infrastructure with an aging vehicle fleet. Estimates of the capital investment needed to maintain existing service, as well as estimates of ridership levels and revenues for such service, are essential elements of any meaningful cost-benefit analysis. In fact, attempts to estimate financial rates of return, as in the Task Force report, without reference to the *status quo* are entirely meaningless.

The Task Force's conclusions with respect to environmental issues offer a final footnote on its overall objectivity. Environmental concerns are serious issues today (and rightly so) and it never hurts to play this theme whenever possible. Admitting that results are "more qualitative

than quantitative,” the Task Force concludes that of the three options, “the 300 kph (kmh) service was found to have the best overall environmental effects.”²¹ Presumably, that conclusion reflects the greater diversion of passengers from less environmentally friendly modes. Since the 300 kmh option requires several hundreds of kilometres of entirely new right-of-way acquisition through both rural and urban areas on as yet undetermined alignments, that conclusion certainly cannot be substantiated at this point in time.

Eventually, the Task Force concluded that there were insufficient data and information upon which to base a firm government decision. This weakness in the data base, however, despite the very significant cost differentials, did not deter the Task Force from recommending that:

there should be a full examination of the feasibility of introducing, in the future, a high speed passenger rail service *based on technologies capable of speeds well in excess of 300 kmh*.

In so recommending, the Task Force basically precluded any subsequent consideration of significant improvements in existing rail passenger service in the corridor that might be more affordable in the Canadian context, and which have already been successfully demonstrated both in the United States and in a number of Western European countries.

Aside from closing the door on any serious, objective cost-benefit analysis of a comprehensive range of alternatives, the Task Force also set in motion, on the basis of such flimsy data, a rather curious procurement process for the next round of consultant studies, financed this time by the federal government, as well as by the Ontario and Quebec governments. Even before the release of its report at the end of May 1991, word spread within the consulting community that \$6 million would be divided up for detailed feasibility studies of the TGV. In fact, the inner sanctum of consultants who would eventually be selected to undertake these studies played no small role in helping the bureaucracy draft both the terms of reference and the budgets for the various sub-studies, in a kind of “share the wealth” process.

21 *Ibid.*, p. EXECSUM-20.

For example, it was common knowledge during the summer of 1991 that one consultant would be retained as a project manager responsible for managing and integrating various sub-studies including surveys, ridership forecasts, location studies, and technology assessments. Originally, about \$350,000 was allocated for the task. Winning *that* contract, however, would preclude participation in other, more lucrative tasks and, apparently, the bureaucrats became somewhat uneasy about being able to attract sufficient consultant interest for such a paltry sum. By the time the “official” request for proposals was issued a few months later, the budget had increased to \$650,000. So much for the concept of “value for the taxpayer dollar.”

During the summer and fall of 1991, telephones were literally ringing off the hook in both Montreal and Toronto as consultants attempted to form liaisons that would present an image of Quebec-Ontario cooperation. Obviously, there are cases in which joint venture responses to a solicitation for proposals make sense on the basis of complementary skills. Here, however, complementary geography appeared to play a more important role and, in some cases, the collaborators themselves only met for the first time after contracts had been awarded. Individual consultants, of course, cannot be faulted for abiding by the rules of a game in which one of the prime motivations of those entrusted with the responsibility for awarding contracts is frequently to dispense largesse, or spread the money around, in as trouble free a manner as possible.²²

Setting aside the propriety of the whole process for the ongoing studies, and even setting aside the question of whether, at the end of the day, good value will be obtained for the \$6 million expenditure, two fundamental issues remain. The first concerns whether the right questions are being asked or will the outcome of this entire effort be dictated by the clear lack of objectivity. The second issue is why governments, in the face of claims of financial self sufficiency made by *at least two potential private sector investors*, should be involved at this stage at all.

22 In fairness to the Quebec-Ontario-Canada study, the \$6 million to be dispersed among the favoured few pales by comparison with the public funds spread around by the federal government’s separate *Royal Commission on National Passenger Transportation* which also managed to find time for some serious globe-trotting.

A realistic approach

Technological achievements of the Japanese and French railways may indeed have relevance, if not throughout the entire Quebec-Windsor Corridor, then at least on selected segments of the route. Obviously, there are differences that apply in the Canadian context that would affect financial viability, some of the most important of which concern population densities, collective agreements with operating labour, and both federal and provincial requirements for environmental impact assessments. There is also the question of what role, if any, VIA Rail should play in the delivery of such service, given its poor track record to date, albeit for reasons largely beyond its control.

Under these circumstances, rather than selecting a particular technological solution and attempting to arrive, in the words of the Task Force, at a “go or no go” decision, there is an obligation if government funding is involved to examine the full range of realistic alternatives, beginning with the existing services. After all, if the final conclusions of the current round of studies are that *TGV* type service is not financially viable, does that mean that no improvements are justified?

Consider, for example, that the federal government subsidized all VIA services (excluding services to remote communities) to the tune of about \$330 million in 1991. Probably, at least half went into Corridor services, although there is no way to substantiate this figure from publicly available information. Capitalizing \$160 to \$180 million per year is equivalent to a government buyout that could be worth \$1.5 to \$2 billion.²³ Alternatively, a guaranteed stream of revenue could reasonably be made available to a private sector operator in return for upgrading existing services or constructing a new system and taking over most, if not all, Corridor services.²⁴ The question, then, is what kind of service improvements could be acquired for that level of public investment, or

23 Future policies could certainly further reduce total subsidy limits with corresponding reductions in a potential “buyout” sum.

24 Here, there is a fundamental problem inasmuch as current proposals for high speed service by-pass many communities now served by VIA. Leaving VIA with responsibility for these residual services while the high speed service skims the only real revenue potential makes very little sense. As discussed elsewhere, these by-passed communities could be tied into the

less, that would make it financially attractive for private investors to relieve the federal government of responsibility for these services. Would it be improved service for the same government expenditure or the same service for lower public cost?

Answering this question involves examining the effects of a range of possible improvements, characterized by higher speeds, on both benefits and costs. The main objective of higher speed, of course, is to sufficiently reduce travel time in order to attract large volumes of passengers from other modes of transportation and, in addition, to generate new demand for intercity travel. In simple terms, any feasibility study requires, as a minimum, estimates of how costs and benefits are likely to be affected by increases in average speed. This approach can be illustrated by considering the proposed Toronto-Ottawa-Montreal combined service.

For the cost side of the equation, the process is straightforward, at least conceptually. High speed can only be achieved by investing capital in infrastructure and the acquisition of new rolling stock. Modest increases in average speed should involve modest capital investment and for large increases in average speed, larger capital investment. Operating costs will also change with increasing speed; both energy and track maintenance costs will obviously increase with speed, but, depending upon work rules, the costs of operating labour could decline. As suggested in figure 3, however, the *total* cost function (including both debt service on the investment and operating costs expressed in terms of either annual costs or present discounted values) should increase more rapidly at higher speed. Naturally, there is a limit to the average speed that can be achieved.

On the benefit side, revenue is a rather important consideration, particularly for potential private sector investors, but it is not the only benefit to be taken into account where *partial* government funding is a possibility. Clearly, there would be a variety of secondary or indirect benefits that could justify some level of government expenditure, even

high speed system with integrated feeder buses, particularly if a bus company were to be included in any high speed rail private sector consortium. See R. Soberman and A. Cubukgil, "A Model for the Privatization of Rail Passenger Services in Canada," in *Proceedings of the Canadian Transportation Research Forum* (Halifax: May 1989): 111-123.

though such benefits are typically overstated by their proponents. Few would disagree that it is worth *something* to reduce road fatalities, improve air quality, and stimulate economic growth in some manner.²⁵

Regardless of how they may be assessed and valued, benefits of this type are, more or less, directly proportional to ridership. Thus, ridership and, correspondingly, revenue can be used as a reasonable proxy for a multiplicity of private investor and public interest benefits.²⁶ On balance, modest increases in average speed should have little effect on ridership. (Here, improvements in reliability, scheduling, and the ease of ticketing and reservations are probably more important.) However, the impacts should be more dramatic for larger increases in speed, up to the point where most of the potential market for *all* intercity trips is captured.

Since VIA does not recover costs on the current Montreal-Toronto service, in relative terms, the starting point for the revenue function shown in figure 3 is lower than the starting point for the cost function. Beyond that point, there are two possibilities for the general shape of the

25 Aside from the kind of economic stimulus that regional scientists deal with, there may be real impacts on manufacturing which derive from economies of scale and which cannot be ignored by governments concerned with employment creation. For example, there has not really been any serious innovation in either rail transit or railway passenger vehicle technology in North America since the 1930s that did *not* involve government support, either direct or indirect. As a result, Bombardier in Quebec and Hawker Siddley in Ontario were both able to compete in U.S. and Mexican markets for subway and commuter cars by piggy-backing orders on large volume sales in locally protected markets. (Both, incidentally, were required to defend themselves in court against dumping charges filed by U.S. manufacturers.) Some economists argue that government procurement practices which divert resources from the private sector into the public sector provide no greater stimulus to economic growth than if the funds had been left in the private sector. Nevertheless, governments throughout the world *do* spend in order to stimulate employment, a practice that does not absolve them of the responsibility to invest wisely.

26 Although there would be a variety of fares, there will be an average “yield” per passenger carried. If the average speed between Toronto and Montreal (currently about 110 kmh for the fastest trains) were to be increased, then it would be reasonable to expect an increase in ridership, average yield, and total revenue.

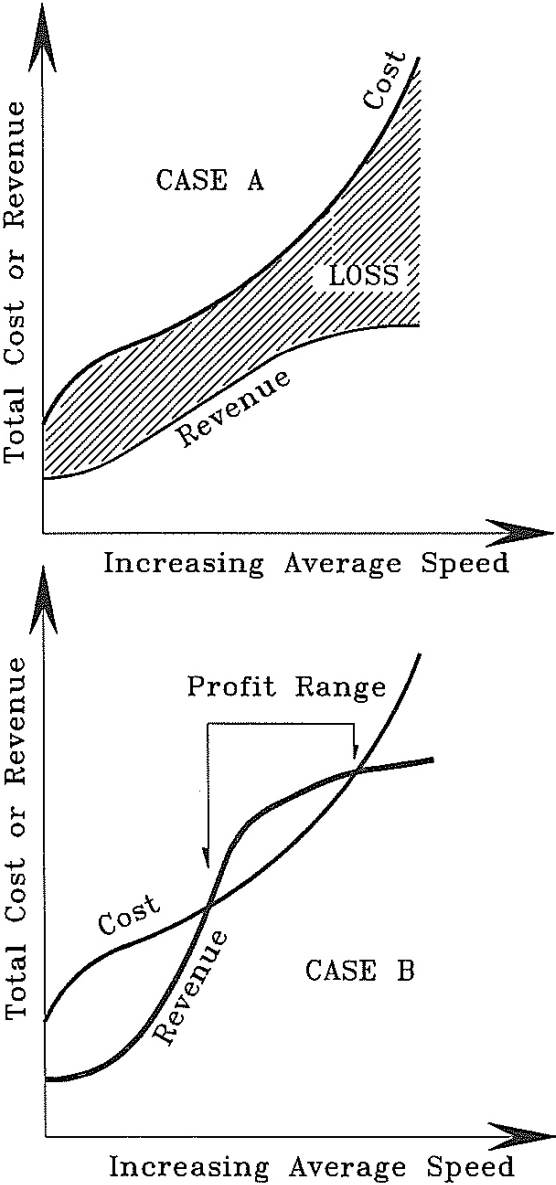
revenue function. In Case A, there is *no* combination of speed and price that generates revenues in excess of costs. In other words, the revenue and cost functions never intersect. In Case B, there is *at least one* combination of speed and price for which revenues and costs are equal—a breakeven point beyond which there are profits to be made. For investors, at a bare minimum, some estimate of the maximum revenue potential and the shape of the total cost function would provide a higher comfort level for any assessment of financial viability.

Placing real dimensions on these cost and revenue concepts is, of course, not an easy task. The Bombardier and ABB proposals represent two points on the cost function which are still very preliminary. Their estimates reflect particular assumptions about the rolling stock and infrastructure improvements required. Both Bombardier and ABB assume full electrification. As already noted, Bombardier assumes train operation on completely dedicated track without grade crossings and without interference from other trains. On dedicated track, there would be no limits on train frequency, capacity, or performance dictated by other traffic. Estimates prepared by Bombardier in 1990 suggest a capital investment of about \$5.3 billion (including a \$1.6 billion government contribution) for the 829 km route from Quebec City to Montreal to Ottawa to Toronto. For the Toronto-Ottawa-Montreal route, the Task Force estimated a capital investment of \$3.5 billion.

The ABB proposal for the same general route, at about \$1.6 billion (\$250 million more than the Task Force estimate, which does not include the costs of electrification), is designed to operate on existing, improved track. In this case, however, other traffic imposes limits on train frequency, capacity, and overall performance.

The impact that increased average speeds would have on costs between existing service and those proposed by either ABB or Bombardier is less clear. It could be argued that moderate increases in average speed (and corresponding improvements in reliability) might provide higher returns. For example, both proposals allow about \$250 million for electrification since the *TGV* and the *Sprinter* are electric trains. Diesel-electric trains, however, are capable of maximum speeds in the range of 200 kmh and turbo powered locomotives, perhaps 250 kmh. (There may be good environmental and economic reasons for dismissing these alter-

Figure 3: The Effect of Average Speed on Costs and Revenues

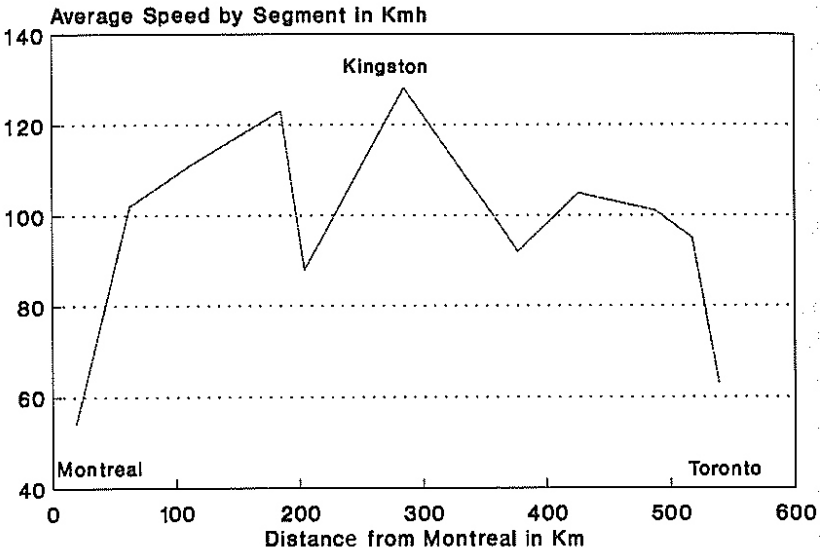


natives, but the tradeoffs should be examined.) Again, as noted earlier, the (electrified) *Metroliner* between New York and Washington reaches an official maximum speed of 200 kmh only on one section of the entire route.²⁷ Yet, the *Metroliner* is perceived to be very successful.

VIA's express trains now make the Montreal-Toronto trip in four hours (about 130 kmh). Prior to offering this faster service, the typical train averaged about 110 kmh with considerable variation in average speed over various segments of the route, as shown in figure 4. The short distances between some stations obviously contribute to lower speed. In addition to these station stop delays, some segments have speed restrictions due to frequent grade crossings, sections of excessive curvature, or poor track condition. There are, for example, numerous grade crossings that restrict speed on the present route.²⁸ By eliminating some of the more serious speed restrictions through selective improvements, it would be possible to achieve average speeds somewhere between those of existing service and those of the overall service improvements suggested by ABB and Bombardier.

Therefore, the real question is, if an investment of \$1.6 billion produces an average speed capability of 157 kmh, what increase in average speed could be achieved by an investment of perhaps one-third that amount on a more selective basis? For example, to save 10 minutes between Montreal and Dorval may require a much larger investment than would be required to save 30 minutes elsewhere on the route. Such intermediate average speeds do not preclude the use of *TGV* or *Sprinter* technology at their full potential over selected segments of the Montreal-Toronto route. If the cumulative effect of selective improvements reduces trip times by one hour, then that option may well turn out to be more cost effective than attempting to reduce trip times by two hours, relative to realistic assessments of the potential market. Furthermore,

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- 27 As noted earlier, feasibility studies by the Canadian Transport Commission which preceded the advent of the *TGV* concluded that intermediate improvements in speed and reliability would probably produce larger payoffs than "quantum leaps" in speed.
 - 28 Proponents of the *TGV* proposal argue that the costs of constructing a new, completely dedicated right of way would be lower than the costs of eliminating all grade crossings on the existing track.

Figure 4: Montreal-Toronto Speed Profile

what impact would such improvements have on revenue, as well as on other benefits, that might justify public spending?

Depending upon the magnitude of the increases in speed, frequency of service, and fares, new rail passengers will come from competing bus and airline services, as well as from private automobiles (by far, the largest unknown potential market). An interesting example of such effects is shown in figure 5 for a high speed, electrified service between Hamburg and Frankfurt, a route of over 950 km with a maximum speed of 250 kmh.²⁹ Although similar data are unavailable for the Corridor, Task Force estimates of traffic increases in moving from an average speed of 157 kmh to 200 kmh can be compared for purposes of illustration. Over this speed range, the German experience indicates an actual growth rate that is well below the Task Force estimates, although it is

29 Eberhard Jansch, "Integration of High Speed Rail Services on German Federal Railway," *Rail Engineering International*, Vol. 21, No. 1 (1992), p. 14.

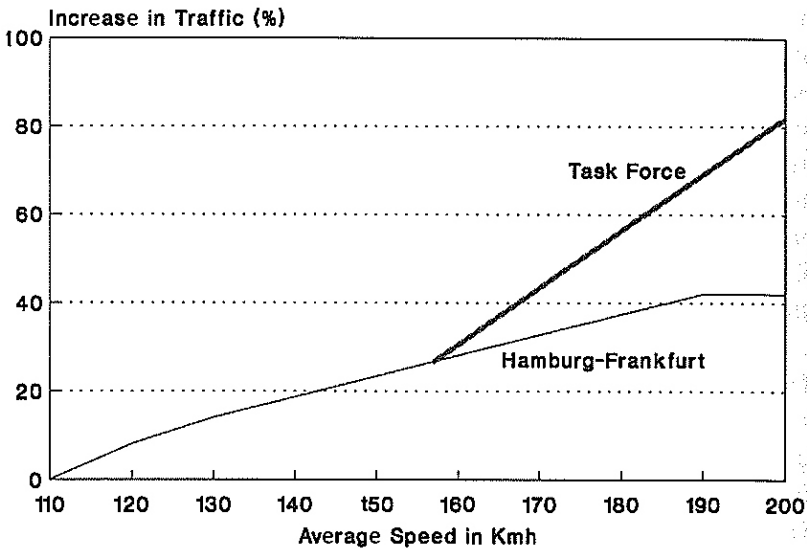
obviously more difficult to penetrate the airline market over a 950 km route than it is over the 630 km Montreal-Toronto route (via Ottawa).

For the Montreal-Ottawa-Toronto route, the potential market involves three basic components, namely: those who are now travelling by *all* modes, increases in the total number of intercity passengers resulting from population growth, and new, or induced, trips. In fact, proponents of high speed rail argue that the existence of such service will generate a large number of entirely new trips that would not otherwise be made. Assuming that any significant increase in average speed is accompanied by a substantial increase in fares, high speed rail service is also likely to lose some of the more price-sensitive passengers, who now use VIA, to buses and automobiles.

Unfortunately, few data are available to estimate the magnitude of the total potential market and those data and forecasts that do exist present a rather confusing picture. To cite only one example, the Task Force reports just under one million airline passengers between Montreal and Toronto for 1987, shown above in table 2. Yet, three years later, all airlines combined offered 57 daily trips in each direction, equivalent to a total of about 3.4 million seats.³⁰ There are other significant anomalies in recent reports by VIA, consultants, and the federal government. About the only point of agreement among these various estimates of the market is that automobile travellers represent the largest single element of the existing market. As a result, the largest unknown is the extent to which high speed rail services could penetrate the automobile market, particularly for groups of two or more travelling together and/or in cases where an automobile is required at the destination end of the trip.

Since there are really no reliable data on the actual investment needed to increase rail speeds, nor any forecasts of the passenger volumes that would be attracted to such services, there may be room here for a little reverse psychology. In other words, if forecasts of passenger

30 Obviously, not all seats were filled, but the resulting load factor of only 29 percent is too far below the 60 percent considered as a minimum in the industry. Some of the difference can be attributed to in-transit passengers (e.g. Winnipeg to Montreal with a stopover in Toronto), but it is unreasonable to expect that these in-transit passengers are equivalent to the total number of originating passengers.

Figure 5: The Effect of Average Speed of Rail Service on Rail Traffic

volumes and system costs are so uncertain, is it possible to examine the reasonableness of volume and investment combinations required to achieve financial self sufficiency?

To determine the passenger volumes needed to achieve cost recovery at different levels of investment, assumptions have to be made about fare levels (and the likelihood of attracting the required passengers at each fare level). According to the Task Force, in 1987, VIA fares averaged \$52 for the one-way trip between Toronto and Montreal. At increased speeds, certainly some increase in fares would be realistic. The Task Force assumed a 21 percent increase in fare for a 30 percent improvement in travel time and a 31 percent increase for a 45 percent improvement.

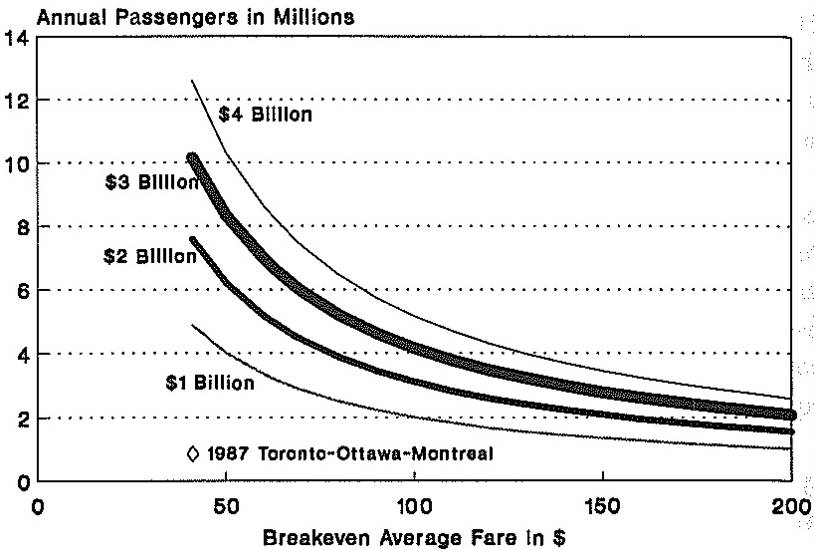
Figure 6 shows the annual number of passengers required to achieve cost recovery, for a range of capital investment (\$1 billion to \$4 billion) and a range of "average" fares on the Toronto-Ottawa-Montreal segment of the proposed Corridor network. For purposes of illustration, these investments have been amortized at 11 percent over 30 years

in order to obtain equivalent annual costs (for both infrastructure and rolling stock).³¹ Task Force estimates of annual operating and maintenance costs have been added to the amortized capital investment despite the reservations noted earlier about these estimates. The volume and weighted average fare (about \$41) which corresponds to 1987 VIA ridership for the Montreal-Ottawa-Toronto network is also shown in figure 6.³²

The level of capital investment is basically a proxy for average speed. For higher investments, better, and thus more attractive, service can be delivered. Presumably, this means that at a given fare, higher volumes will be achieved or, at a given volume, average fares can be increased. For an investment of \$1 billion, for example, the increase in speed would have to be sufficient to attract about 1.9 million passengers who are willing to pay, on average, \$100 per trip. The question, then, is whether such an investment would increase average speed sufficiently to attract 1.9 million passengers, *at that fare*. In other words, to justify a \$1 billion investment, both ridership and fares would have to double from their 1987 levels.

This approach can also be used to examine the ABB and Bombardier proposals specifically, as shown in figure 7. Again, using the Task Force conclusions, for a fare of \$100, the *Sprinter*, averaging 157 kmh, would have to attract about 2.3 million passengers, and the *TGV*, averaging 200 kmh, would have to attract about 4.7 million passengers.³³ Allowing for diverted trips, population growth, and generated trips, these breakeven

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- 31 These calculations can obviously be shown for other interest rates, as well. In a more detailed analysis, of course, present discounted values of both costs and revenues should be compared over a reasonable time period. However, for purposes of illustration only, the annual cost basis can be used to determine breakeven volumes in a "typical" year.
 - 32 Since the proposed route for high speed rail between Montreal and Toronto includes Ottawa, there is some difficulty in comparing data for existing services that involve distinct segments, namely, Montreal-Ottawa, Montreal-Toronto, and Ottawa-Toronto. The weighted average fare is not a particularly meaningful figure except that it does reflect the average yield per passenger carried on the system.
 - 33 These figures are consistent with comparable estimates made for similar conditions in a recent U.S. study. See Transportation Research Board, *In*

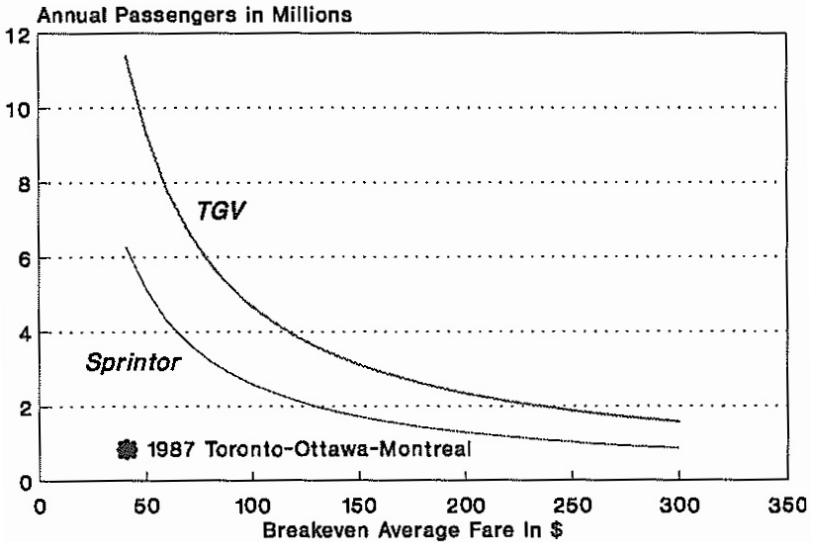
Figure 6: Breakeven Fare and Volume Combinations

volumes represent 63 percent for the *Sprinter* and 128 percent for the *TGV* of the 1987 combined VIA, bus, and airline passenger volume. In 1987, at an average speed of 110 kmh, VIA carried 23 percent of the same total carrier volume.

While such expectations might appear somewhat optimistic, no allowance has been made for government contributions on the basis of “public interest” benefits. The net effect of such contributions would be to alter the breakeven analysis considerably, an argument that is not lost on the proponents of these high speed systems. For example, if the costs shown in figure 6 were to be reduced by say, 30 percent, through a government contribution to capital consistent with the “buyout” argument suggested earlier, either the necessary breakeven volumes or fares would be reduced correspondingly. Assuming no change to the \$100

Pursuit of Speed, New Options for Intercity Passenger Transport, (Washington: 1991), Appendix B.

Figure 7: Comparative Breakeven Fare and Volume Combinations for TGV and Sprintor



average fare, the breakeven volumes fall to about 1.6 million for the *Sprintor* and 3.3 million for the *TGV*. A one-time government contribution thus considerably enhances the financial feasibility of investing in high speed services from the standpoint of private sector interests.³⁴

34 The justification for such continued government subsidy of Corridor rail services is another matter. It has been argued elsewhere, and even by the current government, that Corridor services should achieve full cost recovery. See Adil Cubukgil and Richard M. Soberman, *The Need for Rail Passenger Service and Opportunities for Modal Substitution*, (Ottawa: Canadian Transport Commission, 1986) and Nielsen Task Force, *Transportation, A Study Team Report of the Ministerial Task Force on Program Review*, (Ottawa: 1985). In this regard, draft rail passenger legislation prepared by the current government in 1984, but never tabled, proposed full cost recovery for Corridor services.

This approach simply attempts to establish some reasonable range of investment in improved rail services that can be justified on the basis of realistic fares and market share, with and without government subsidies. If there is insufficient information to determine that reasonable range, it may perhaps be easier to establish the unreasonable range. In other words, it may be easier to conclude that 3.3 million passengers is an unrealistic target than it would be to estimate what a realistic target might be.

A recent U.S. study, however, does shed some light on the combination of fares and ridership that makes high speed rail affordable, suggesting that annual volumes of 6 million passengers are needed to break even for city pairs in the 150 to 500 mile range. For the highest density Northeast Corridor, that study concludes that:

prospects for an HSGT (high speed ground transportation) system to break even would be good if... capital costs are kept below \$18 million per mile, if operating costs are kept below \$0.12 per seat-mile, and if fares are comparable with current air fares.

For other less dense corridors, the same study concludes that the necessary “combination of circumstances, though possible, is remote.”³⁵

The role of government

If governments are to consider improving and operating rail passenger services in the Corridor, then, in spending taxpayer dollars for feasibility studies, there is an obligation to examine the full range of alternatives, including those that may be more affordable for population densities and conditions within the Canadian Corridor. If, however, consideration is to be limited to two (and, realistically, only one) private sector proposals, then why, in these times of government deficits, should Quebec, Ontario, and the federal government spend taxpayer dollars on studies which really should be undertaken by the private sector in the first place?

It is unlikely that the entire cost of building and operating a high speed rail service in the Corridor will be carried by government alone, if

35 Transportation Research Board, *op. cit.*, p. 117-118.

for no other reason than the fact that the Corridor is already well served by transportation facilities and systems including frequent airline and bus service and the most extensive network of highways in Canada. On this point, the *Royal Commission* itself argues:

High speed rail systems have high fixed costs and low variable costs. . . . The key issue is whether there would be enough riders in any Canadian corridor to pay the costs. . . . There are already buses, airplanes and cars operating in these corridors and a subsidized high-speed rail service would have unfair advantages. . . . Any high-speed rail system . . . should be paid for by transportation system users who benefit and not by the taxpayer.³⁶

In addition, private sector proponents have already stated that with only partial government support, the balance of the capital investment needed, as well as operating costs, can be financed by anticipated revenues. Moreover, despite the best of intentions, VIA Rail, itself a government owned enterprise, is very unlikely to play any significant role in high speed Corridor services. Aside from statements by the Minister of Transport as to VIA's role in high speed service, private investors simply will not invest for profit in an entity that is managed, operated, and maintained by civil servants. VIA Rail carries too much historical baggage to be seriously considered for operating a profit-driven, commercially viable system. Government owned bureaucracies do not adjust well to the commercial world.

Both Bombardier and ABB have argued the financial viability of improved rail passenger services in the Corridor on admittedly different bases, recognizing that further detailed feasibility studies are required. Realistically, however, private investors can only be convinced of the profitability of the undertaking on the basis of their own assessments of costs, revenues, and risks. Certainly, they cannot be expected to act on the basis of forecasts and conclusions derived from government studies. Over the last 20 years or so, for example, government agencies and their consultants:

36 Royal Commission, *op. cit.*, Vol. 1, p. 282-283.

justified the need for Mirabel Airport on the basis of tremendous growth in airline traffic and the inability of Dorval to accommodate such growth, leading to a \$600 million investment in an airport that no one wants to use.

constructed Terminal 2 at Pearson International Airport for *international* carriers, eventually occupied by Canada's largest *domestic* carrier, on the premise that Terminal 1 could not handle the new generation of jumbo jets.

concluded in 1972, that a 56 mile network of magnetic levitation vehicles could be constructed in Toronto (as well as in Ottawa and Hamilton) in 5 years, using readily available "off the shelf" technology (yet to be placed in commercial operation anywhere in the world, 20 years later) at about 30 percent of the cost of conventional rapid transit.

Based on this record, are private investors going to line up to invest in a high speed rail system because consultants to government conclude that such service will be profitable? In fact, can anyone remember any government sponsored feasibility study that failed to justify the initial hypothesis? Justification or profitability aside, even basic cost estimates have little credibility these days. Recent initial government estimates of \$5 billion for promised expansion of Toronto's rapid transit system have now risen by more than 40 percent in less than two years.

The only meaningful feasibility studies will be those undertaken by potential private sector consortia themselves so that they can determine the level of government support that they would require in order to proceed. That is the process followed by other investors to satisfy their own shareholders, whether it involves a new automotive assembly plant or a new real estate development. If it turns out that high speed rail cannot pay for itself and that prospective investors need government funding and guarantees to proceed, then *that* is the proposition which should be made to the relevant governments by the individual consortia. At that point, governments could carry out their own studies as to justification from the standpoint of serving the public interest. In this regard, one useful role that government can play concerns data collection, which is essential to estimating both commercial viability and a variety of public

interest benefits. Collecting data, after all, is one of the primary activities of brigades of civil servants.

Conclusions

Over the last twenty years, interest in high speed ground transportation for Canadian “corridors” has surfaced and waned periodically in response to potential developments and promises such as tracked air cushion and magnetic levitation vehicle technology. Recently, however, cutbacks in VIA Rail service in the face of the astounding technical achievements of the *TGV* in France, has generated renewed interest in the potential application of high speed rail technology in Canada. This interest has been coupled with claims of economic feasibility and a willingness on the part of certain private sector firms to invest in such service.

The two most serious proposals, by Bombardier and ASEA Brown-Boveri, both promise to provide rapid and frequent service to selected communities in the Quebec-Windsor Corridor. Both proposals say very little about costs, ridership, and revenues. It is readily evident that both proposals would require a complete overhaul of the current institutional, decision making, and work rule structures under which existing rail passenger services are now provided.

Clearly, it would be splendid to have supertrains operating in the Canadian Corridor but, equally as clear, much more information and data are required by the proponents themselves as to actual costs and potential markets, under Canadian conditions, before such service could be implemented.³⁷ Such information should be developed in the course of detailed feasibility studies that consider the full range of improvements, from increased existing average speeds to the full potential of the *TGV* technology.

What are the prospects? Probably, no one is yet in a position to say. More importantly, we are unlikely to be in a better position even after

37 The possibility of massive government support cannot be discounted entirely. An unpopular government could throw caution to the wind and decide to engage in *any* form of pre-election public spending that creates employment, regardless of the costs.

millions have been invested in the current round of feasibility studies. There are several fundamental reasons.

First, we must recognize that not all technology is easily transferable from one society to another, if for no other reasons than those attributable to differences in economic, demographic, and geographic factors. Densities within the Canadian Corridor, for example, differ by an order of magnitude from those of the Tokyo-Osaka corridor. Land is so scarce in Japan that airports are being designed on offshore structures; domestic air travel is almost non-existent. In Europe, passenger service is the dominant function of the railways. In both Japan and Europe, large cities are more closely spaced and reliance on transit within cities is more predominant than it is in Canada. It comes as no surprise, therefore, that the really significant advances in rail passenger technology have emerged in Japan and those countries of western Europe where passengers are such an important part of the railway business.

Second, all of the successful high speed rail examples involve very advanced and sophisticated railway technology, as well as highly trained and experienced professionals from government, the railways themselves, and, of course, manufacturers. High speed rail is not a playing field for amateurs, however well intentioned. Do government ministries in Ontario and Quebec have similarly skilled individuals and, if so, are they placed in charge of the necessary studies? Ever since the Glassco Commission convinced the federal government that good managers can manage anything, regardless of what they know, the concept has slowly percolated down to provincial (and municipal) governments. In fact, being professionally proficient now seems to be one of the least important qualifications for career advancement in the civil service. More often than not, managers are appointed so as to diversify their experiences on the way to even better positions, rather than because their talents and substantive knowledge are relevant to the particular tasks. These “generalist” managers are expected to rely on advisors and consultants for “details,” provided they know what questions to ask, which is perhaps one reason why senior bureaucrats and their advisors were able to assure the Premier of Ontario, twenty years ago, that

“off the shelf” magnetic levitation technology could, inexpensively, solve all the problems of urban traffic congestion.³⁸

This rather cynical view of how well the public is being served by its senior bureaucracy is widely, but more privately, held by an ever increasing circle of observers. Carol Goar of the *Toronto Star* (August 15, 1991) in commenting on a study by Barbara Wake Carroll,³⁹ cites, “a trend toward (government) managers with... less experience in the areas for which they are responsible for providing policy advice and program management,” as they “department-hop” their ways to the top. In Goar’s words, the post-Glassco approach stresses, “the importance of managerial competence over the need for *substantive understanding* of what a government department actually does.” In fact, these trends are increasing at a frightening rate all over the world, not only in the transport field, but in other sectors, as well. Prestigious international aid agencies, for example, typically castigate Third World governments for massive waste on investments in *technology* originally recommended by their own articulate experts on *finance*. In a word, therefore, government officials now entrusted with the responsibility for the current assessment of a truly high technology application have questionable qualifications for doing so themselves or even for selecting those who might be able to do so, objectively.

Third, setting aside the value and importance of professional expertise, there are some serious motivational issues which permit governments and their senior officials to turn a blind eye to the propriety with which taxpayer dollars are spent. The “old boys” network is alive and well in the consultant selection process for studies of major capital projects in transportation. Those who stand in line for feasibility studies

38 Here, there is an important distinction to be made. Those experts who offered assurances of technical feasibility and low cost for maglev simply had no sound basis for doing so, but they certainly had some strong vested interests. High speed rail, whether TGV or Sprintor, does not fall in the same category of technological achievement. These rail technologies, without doubt, *do* work and represent significant technical achievements.

39 Barbara Wake Carroll, “The Structure of the Canadian Bureaucratic Elite: Some Evidence of Change,” *Canadian Public Administration*, Vol. 34, No. 2, 1991: 359 - 372.

also stand in line for implementation—a practice that is prohibited in many other jurisdictions. How else can objectivity be assured? Within this network, bureaucrats who award contracts, naturally, want to be fair and treat everyone in turn, with almost complete disregard for fairness to the taxpayer. Such practices are not prescriptions for solid, objective, and technically sound assessments; they are prescriptions for trouble free spending and guarantees of the need for “further study.” David Lewis Stein, commenting on the use of consultants for rapid transit projects in Toronto, is less kind, labelling such procurement practices as bordering on a “Consultants’ Relief Act.”⁴⁰

In summation, however, the course is clear. Unless in a fit of desperation governments in Ottawa, Ontario, and Quebec decide, collectively, to embark on a spending frenzy, high speed rail in the Corridor will not emerge as a result of government studies. Private sector proponents have argued that with some degree of front-end, government participation, they are prepared to build and probably operate a high speed system. Undoubtedly, some degree of government funding *is* justifiable, if only as a buyout from existing, money-losing services. Other public interest benefits such as reduced expenditures on airports and highways, or even benefits that possibly contribute to national unity, likely add to the case.

The primary onus, however, falls to the private sector proponents to carry out their own studies, using their own consultants and their own funds to assess the degree of government participation needed as a prelude to implementation. Sailing enthusiasts are familiar with the adage that anyone who has to ask the price of a boat is probably not a serious customer. Likewise, if private firms considering investment measured in terms of billions have to ask government to underwrite studies costing a few millions, how seriously should they be taken?

40 David Lewis Stein, “The Waste on Transit Studies Would Make You Weep,” *Toronto Star*, September 18, 1992.

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How the Competitive Market Can Make Canadian Transit Efficient and Effective

Wendell Cox and Jean Love

Executive summary

THIS ESSAY ARGUES THAT CANADA is missing out on the main benefits of public transit because public transit is being run by state monopolies, which are inefficient and do not respond to the needs of commuters.

There is a persistent hope that public transit will improve urban areas by reducing air pollution and traffic congestion. Trends show exactly the opposite. Public transit's share of trips continues to decline in urban areas across the nation, in spite of large and growing public subsidies to transit. There are two fundamental reasons for this.

First, transit authorities have not tuned in to the changing reality of the market they serve. Urban areas have developed in a way that is difficult for traditional transit to serve—suburbanization and more widely spread employment have severely limited the customer market for old-style, high capacity transit services. Yet transit authorities have persisted in developing high cost, high capacity urban rail systems that are

poorly matched to the developing urban form. The changing customer market requires reliance on lower cost, lower capacity systems, such as highway based rapid transit (priority treatment for buses and car pools), intelligent vehicle highway systems (on-board computerized time minimization systems for autos), and telecommuting (working at home or at remote locations with computer links to the office).

Second, publicly owned and administered transit has experienced such extreme cost escalation that the same services can be provided by the competitive market for considerably less. This consumption of scarce transit revenues by higher than necessary costs has limited transit's ability to establish higher levels of service that might have responded to the changes in customer demand. More cost effective service is available. In other countries, transit authorities are going competitive, and are providing quality service to riders, while improving the return on tax subsidies by incorporating competitive alternatives.

Through competitive contracting, transit authorities are able to purchase the most efficient service available, from quality public and private operators. London uses public-private competition to provide nearly half of its bus service. Scandinavian countries are converting to competitive contracting. U.S. urban areas such as San Diego, Denver, and Dallas provide more than one-quarter of their service through public-private competition. In each case, the public gains because unit costs (per mile) are no higher than are necessary, permitting the maximum level of service to be provided for the funding available.

Through entrepreneurial services, communities receive customer-oriented services provided by private entrepreneurs, with little or no public subsidy. In South Africa, black entrepreneurs provide mini-bus services that have become the primary means of transport for black workers. In Miami and in the New York area, entrepreneurs carry large numbers of transit riders.

Transit will be able to achieve its public objectives with respect to air pollution and traffic congestion only if private resources are relied upon to the greatest extent possible, and public resources are used efficiently. This requires attention to the market—by facilitation of services that are attractive to customers, and by production of services at no higher cost than is necessary.

The plan of this paper is as follows. First we look at how Canadian cities are changing and how this affects the demand for transit. Transit's share of the transportation market has fallen, in part because the structure of cities is changing, but also because public transit has ignored the demands of consumers and thus has failed to satisfy consumers. This loss of market share has occurred in spite of the large subsidies and monopoly powers transit agencies enjoy. Governments do not seem conscious of the failure of transit and, as a result, have failed to explore non-transit solutions to making urban transport more efficient. We describe some of the many promising new technologies that can reduce urban congestion and pollution. Second, we explain how customers can be put in the transit picture through competitive tendering. Competitive tendering reduces the government's role in the everyday operation of transit and it substitutes private service producers. Third, we outline options for using private entrepreneurs in the production of profitable transit services. These entrepreneurs have an incentive to seek out what customers want. This would be a radical shift from the old style of transit in which producers dictate to consumers what they shall get.

Off track: public transit policy

Traffic congestion and air pollution are of great concern to Canadians, especially those in large urban centres. Public transit represents an apparent solution to these problems, and is subsidized to the extent of more than 50 percent for this purpose.

There are two factors that limit the widespread use of public transit in Canada. First, increased suburbanization, prosperity, and work force participation rates have rendered transit a less efficient form of transportation than is the automobile. Second, Canadian public transit is operated outside the structure of competitive market incentives; transit is insufficiently customer-oriented and spends much more than is justified by factor costs in the competitive market.

While the majority of Canadians cannot or will not be lured from the automobile back to transit use, public transit could provide efficient transportation for a larger market than it currently serves. But unless transit strategies are fundamentally changed, public transit will do little, if anything, to reduce air pollution and traffic congestion.

Background: suburbanization

Central cities throughout the developed world, except where land is severely limited, are losing population, employment, and commercial and retail development relative to the surrounding areas.¹ Suburbanization, which is most evolved in North America, is occurring in Europe as well.

While Canada is increasingly an urbanized nation, the focus of urbanization has shifted from the city to the suburbs. Central cities still dominated the urban area in 1951, but by 1986, nearly three out of four Canadian urban dwellers lived in less densely populated suburban areas. (See figure 1.) Yet deconcentration of population has occurred in the central cities as well. While Canadian central city density is nearly twice that of U.S. cities, Canadian central densities declined 50 percent on average from 1950 to 1975.²

Urban and suburban population densities continue to decline as development spreads outward.³ An increasing percentage of employment and retail functions are now located in dispersed suburban areas, and an increasing number of Canadians travel from home in one suburb to work, shopping, and recreational activities in another suburb.

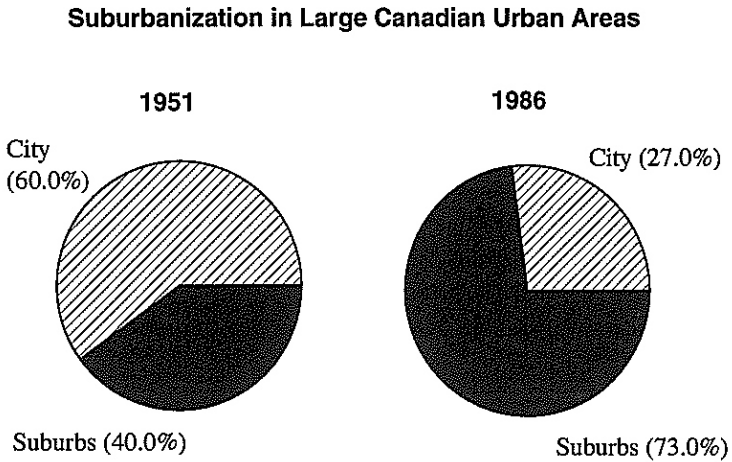
The shift in population and jobs to less dense urban areas and the joint impact of deconcentration and decentralization have important implications for travel patterns. Travel increasingly is dispersed with respect to origin and destination. Traditional radial (hub and spoke) traffic flows suitable for home to downtown trips have been replaced by more complex traffic flows that are hard to define, often appear to be random, and are hard to serve by traditional public transit services.

1 For an overview of international trends toward decentralization and deconcentration, see Peter Hall, *The World Cities* (London, UK: Weidenfeld and Nicolson, 3rd Edition, 1984).

2 John Mercer, "The Canadian City in Continental Context: Global and Continental Perspectives on Canadian Urban Development," *Canadian Cities in Transition*, Trudi Bunting and Pierre Filion, eds. (Toronto, Ontario: Oxford University Press, 1991).

3 See Trudi Bunting and Pierre Filion (eds), *Canadian Cities in Transition* (Toronto, Ontario: Oxford University Press, 1991).

Figure 1: Canada is increasingly a nation of suburbs



Suburbanites and urban dwellers alike increasingly choose the most efficient form of transportation to take them from where they are to where they want to go—the automobile.

The trends in auto use and suburbanization are unlikely to change. Auto ownership and suburbanization are related to elevated affluence and the increased living space and mobility that money can buy. While automobile ownership and use in Canada trails that of the US, auto ownership and use is increasing at a faster rate in Canada and Europe than it is in the U.S.⁴ (See figures 2 and 3.) There is no indication that anything other than poverty or large-scale nationwide land-use policies will arrest, much less reverse, the trend toward suburbanization and increased use of the automobile.

Commuters tend to be rational. They weigh the costs in money, time, convenience, and comfort to choose the mode that best suits their needs. Most objective studies have confirmed that, on a door-to-door

4 John Pucher, "Capitalism, Socialism, and Urban Transportation," *APA Journal*, 278, 2, 1990.

basis, the car is the most rational, lowest cost option especially for commuters who live in low-density areas.⁵

Transit's declining market share

Public transit market share—per capita annual ridership—is declining throughout North America, Europe, New Zealand, and Australia.

Canadian per capita transit ridership was 53 trips in 1991—just 6 percent of total trips—and comprised a 9 percent decline in ridership since 1986.⁶ (See figure 4.)

From 1984 to 1990, transit market share decreased for two-thirds of the large Canadian transit systems.⁷

Transit market share has declined faster than has total ridership. Per capita transit ridership remains at its 1960 level, yet total average trips per person by all modes increased more than 60 percent from 1964 to 1986.⁸

Per capita ridership in some Canadian communities has fallen precipitously; for example, despite the addition of a light rail system, per capita transit use in Edmonton dropped 41 percent from 1982 to 1989.⁹

5 See, for example, John Kain, "Choosing the Wrong Technology: Or How to Spend Billions and Reduce Transit Use," *Journal of Advanced Transportation*, 21, Winter, 1988.

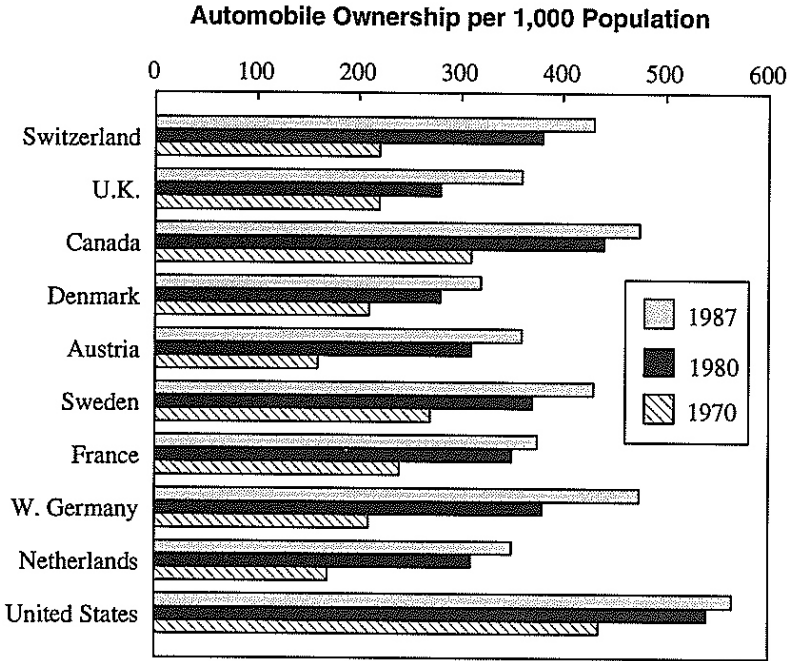
6 Statistics Canada, *Canadian Economic Observer: Historical Statistical Supplement 1991-1992* (Ottawa, ON: 1992).

7 Calculated from Canadian Urban Transit Association data.

8 Estimate was extrapolated from Ministry of Transportation Ontario, *An Overview of Travel Characteristics in the Greater Toronto Area: Transportation Tomorrow Survey* (Downsview, ON: Ministry of Supply and Services, 1988).

9 Personal communication from city of Edmonton Planning and Development Department, April 22, 1991.

Figure 2: Automobile ownership is higher in the U.S.



From: John Pucher, 1990.

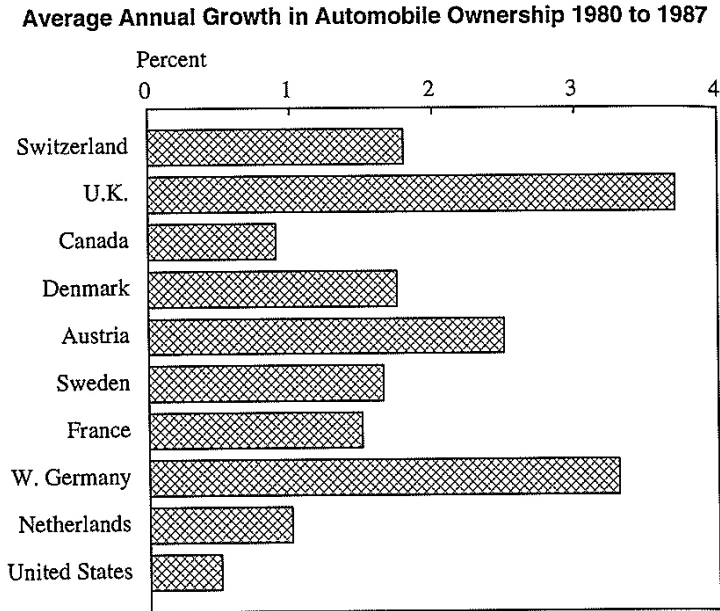
In western Europe, per capita transit ridership is declining in 12 of 20 major urban areas (national capitals and metropolitan areas of more than one million population).¹⁰

In the United States, transit's work trip market share declined 17 percent during the 1980s. Only two of the 39 U.S. metropolitan areas with more than one million people experienced a market share increase (work trip market shares for these two cities was four percent or less in 1980).

New rail investments have not helped sustain transit ridership. Canadian and U.S. metropolitan areas that made major rail "in-

10 Calculated from data in multiple issues of *Jane's Urban Transport*.

Figure 3: Automobile ownership is increasing at a faster pace in Canada



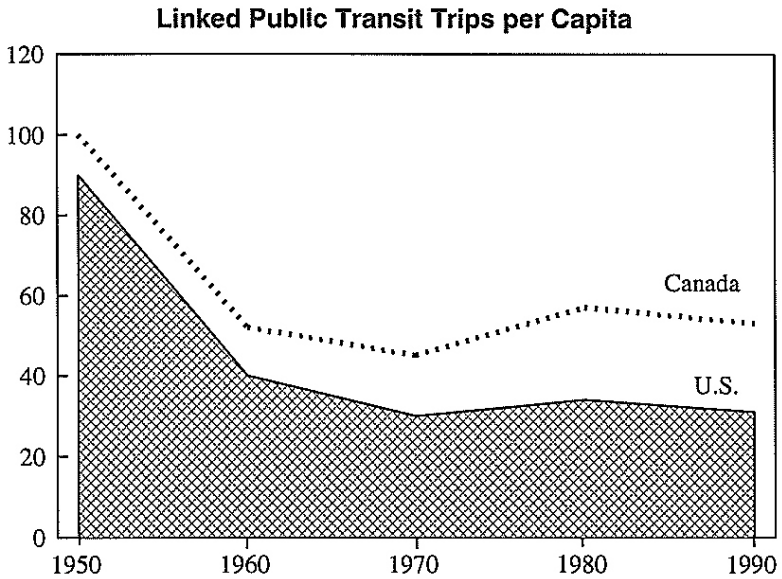
From: John Pucher, 1990.

vestments" performed poorly—none had a market share increase. Examples of this decline in market share follow:

- Transit's market share has declined in both Edmonton and Calgary since light rail lines were opened.
- Market share in Vancouver has decreased since that community opened one of North America's most popular rail lines (1986). This has prompted public officials to question the wisdom of the original decision to build rail.¹¹

11 "Vancouver Commuter Rail Losing Out to Autos," *Daily Journal of Commerce* (Seattle, Washington: July 27, 1993) quotes Vancouver Mayor

Figure 4: Transit ridership decreased during the 1980s; the decline in market share was greater



- Market share in Toronto, with one of North America's most extensive rail systems, has declined more than 5 per cent since 1982.
- Portland's market share decreased 33 percent during the 1980s despite opening a new light rail line.
- Atlanta's market share declined 36 percent during the 1980s despite expanding its heavy rail system.¹²

Attracting passengers from automobiles

Given declining suburban and urban densities, the dispersion of trip origins and destinations, and the increased necessity of linked trips result-

Gordon Campbell (who was also chair of the Vancouver Regional Transit System) and B.C. Ministry of Transport Officials.

12 Calculated from U.S. Census Bureau data.

ing from high female participation rates in the labour force, it is unlikely that the majority of automobile drivers could be lured back to public transit use. Yet some drivers could be attracted back to transit use. Attracting automobile drivers in meaningful numbers requires:

Operation of services that are sufficiently competitive with the convenience of the automobile.

Careful stewardship over transit resources so that the highest level of transit service can be provided for the funding available.

It is no easy matter to substitute transit usage for car usage. Often repeated saws about the “love affair with the automobile” are misleading. Dependence on the automobile has to do with necessity, not love. The only transportation system that can possibly deliver the majority of employees to work in a reasonable period of time is the automobile. And, for most people, the only alternative for most non-work trips is the automobile. Even transit managers, who should be the least “obsessed” with automobiles usually have an automobile provided by the transit agency as well as a personal automobile. Transit managers—like most people—rely on automobiles because they provide the only efficient transport in sprawling urban areas.

To entice drivers from automobiles, it is necessary to understand what these potential transit customers want:

Proximity: Customers want service that is convenient to both their trip origin and destination.

Frequency of Service: Customers want to have the ability to travel whenever they like. That means that service must be frequent, and it must be available virtually all day.

Speed: Customers want to get where they are going as quickly as possible.

Transit can reduce air pollution and traffic congestion only if it entices automobile drivers to switch to transit. Mere diversion from automobiles is not enough. Attracting an automobile passenger from a car pool without removing the automobile from the road accomplishes nothing. With respect to reducing air pollution and traffic congestion, the test of transit policy is not how many people are riding transit, it is *how many automobiles does transit remove from the road.*

Following Europe

Some have suggested emulation of the “successful” transit policies of Europe—that gasoline taxes should be increased so that a litre costs in the vicinity of \$1.50 to coerce people to ride transit. But there are important differences between Europe and Canada. Canadian urban areas are decentralized with multiple centres, while European urban areas often have a single commercial centre.

A single commercial centre provides the concentration of destinations that permits high transit ridership. Yet, many Canadian cities have multiple centres. For example, Joel Garreau’s *Edge Cities* indicates that the Toronto area—home to an extensive rail transit system—has or is developing 12 commercial centres (“Edge Cities”) that are larger than downtown Winnipeg. Transit systems cannot effectively serve such dispersed centres.¹³

Toronto and increasing automobile dependency

Toronto’s public transit system is widely regarded as North America’s most successful. Yet it illustrates the difficulty of retaining transit market share. Toronto’s extensive rail system is often cited as having induced extensive development. The Municipality of Metropolitan Toronto has implemented practices that have required the location of more dense developments adjacent to subway stations. Despite the dense development along subway lines, public transit carries a declining percentage of urban trips in both the Municipality and the metropolitan area.

Data from the Planning Department of the Municipality of Metropolitan Toronto illustrates this point. (See Table 1.) Within the municipality, automobile use increased 176 percent from 1961 to 1990, while public transit use increased by 63 percent. More than seven new automobile trips were taken for each new public transit trip. Moreover the declining market share of public transit is even greater when considered in the context of the metropolitan area. By conservative estimates comparing 1990 to 1961, at least 12 new automobile trips were taken for each

13 Joel Garreau, *Edge City: Life on the New Frontier* (New York, NY: Doubleday, 1991).

Table 1: Daily Trips with Origins or Destinations in the Municipality of Metropolitan Toronto (Portion of Metropolitan Area Outside Municipality Excluded)

YEAR	Automobile Trips (Millions)	Public Transit Trips (Millions)	Total Trips (Millions)	Public Transit Trips
1961	2.1	0.8	2.9	28%
1973	3.7	1.0	4.6	21%
1988	5.4	1.5	6.9	22%
1990	5.8	1.3	7.1	18%

Data from Municipality of Metropolitan Toronto Planning Board, as quoted in Sam Cass, *Transportation and Air Quality* (Toronto, Ontario: Better Roads Coalition, 1991).

new public transit trip. Public transit's share of trips in the metropolitan area is estimated to have declined over 40 percent since 1961.¹⁴ Indeed, public transit itself may have been an instrument of suburbanization, with average public transit work trip length increasing by more than 50 percent from 1960 to 1980 (from 8.5 kilometres to 13.1 kilometres).¹⁵

Long-term regional plans anticipate little if any increase in urbanized area density as the geographic expanse of the Toronto urbanized area is expected to grow at the same rate as the population over the next 30 years.¹⁶ Ninety percent of new residences and 66 percent of new em-

14 Estimates assume the same number of automobile trips per person for metropolitan residents outside of the Municipality (itself a conservative estimate, since suburban residents tend to take more automobile trips than central city residents) and includes additional public transport trips taken on suburban public transport systems that are outside the Municipality.

15 Peter Newman and Jeffrey Kenworthy, *Cities and Automobile Dependence: An International Sourcebook* (Aldershot, U.K.: Gower Technical, 1991).

16 Calculated from data in *Urban Structure Concepts Study* (Toronto, Ontario: IBI Group, June 1990).

ployment is expected to occur in the suburbs (outside the Municipality of Metropolitan Toronto).¹⁷ One of North America's largest and most heavily used freeways, the McDonald-Cartier Freeway, with four roadways of three or more lanes each, provides a crucial link between suburban areas and is a draw for major commercial development. Moreover, construction is under way on an outer bypass freeway, Route 407. Clearly, the land use policies necessary to ensure decreased dependence on automobiles, which had some influence in the central city, have not similarly influenced development in the suburbs and are not anticipated to do so in the future.

The rail experience

Transit often has developed rail systems that have proven to be both inefficient and ineffective.¹⁸ This is starkly illustrated by the U.S. experience. During the 1980s, more than \$20 billion was spent to build and expand urban rail systems in 14 cities. Yet, transit work trip market share declined in all but one of the rail cities, in which it remained unchanged.¹⁹ Even Washington, D.C., which has the nation's most expensive new rail system, anticipates a *continuing decline* in market share.²⁰

17 *Ibid.*

18 The availability of large amounts of federal funding and the Congressional earmarking process have encouraged urban areas to develop expensive rail systems. It is likely that if urban areas had been required to pay for such systems themselves, they would have either not been built, or more cost effective systems would have been chosen. The tendency of federal funding to skew local projects toward less effective and inefficient options was documented by the Congressional Budget Office in *Efficient Investments in Waste-Water Treatment* (Washington: 1985).

19 Calculated from U.S. Census data.

20 Federal City Council, *Transit in the Nation's Capital: What Lies Ahead* (Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, 1986).

Urban rail has had little overall impact on travel patterns. Typically, one-third or fewer of rail riders have been attracted from automobiles.²¹ A U.S. Department of Transportation study documents that most new urban rail systems cost more than anticipated to build and operate, and carry far fewer riders than planned.²² The same study estimated the cost of each new rider attracted to rail ranged from \$6,000 to \$21,000 annually:

The annual cost of each new rider on Atlanta's rapid rail system has been estimated at nearly \$19,000.²³ This is enough to purchase a new Ford Taurus for each rider each year.

Per passenger costs on Los Angeles' new commuter rail system have been projected to be as high as \$30,000 annually (the cost per *new* transit passenger would be higher).²⁴

John Kain of Harvard University has estimated that the annual cost per new transit passenger on the proposed Dallas rail system would be more than \$55,000.²⁵

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- 21 Wendell Cox and Jean Love, *The Recent North American Light Rail Experience*, report prepared for the New South Wales Department of Transport (Belleville, Illinois: Wendell Cox Consultancy, 1991).
 - 22 Don Pickrell, *Urban Rail Transit Projects: Forecasts versus Actual Ridership and Costs* (Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, 1989).
 - 23 The paradox is that many people ride Atlanta's rail system; almost half of Atlanta's transit ridership is on its rail system, yet overall trips on the transit system have increased less than four percent since the rail system opened. (see John Kain, "Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation," *APA [American Planning Association] Journal*, Spring 1990).
 - 24 Calculated from Roger Snyder and Antonio Villaraigosa, "Commuting on the Backs of the Poor," *The Los Angeles Times*, November 27, 1992.
 - 25 John Kain, "Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation," *APA Journal*, Spring 1990. Kain uses a figure of \$185.50 per round trip rider per day, which has been annualized in the text. Kain estimates that the proposed rail system would attract only 6,500 new transit trips daily, which is approximately one one-thousandth of Dallas County's more than 5.5 million daily person trips.

The new passengers diverted to Portland's light rail line equalled less than two months of natural travel growth in the Portland area—from a regional perspective, within two months of the time that a \$300 million system was opened, it was as if the investment had not been made.

Merely attracting new ridership does not remove automobiles from the road. The new transit riders may have been automobile passengers, may not have made the trip at all, or, because most of the new rail systems serve the downtown business district, may have walked a few blocks to shop or eat lunch.²⁶ Moreover, some former transit riders may have switched to driving their automobiles, because their transit services became less convenient (bus services are often restructured to "feed" rail services, forcing transfers which can increase travel times). Finally, the new rail systems have simply failed to reduce traffic congestion. Traffic congestion increased in all urban areas that built new rail systems during the 1980s, and the increase in congestion generally was worse than average.²⁷

The U.S. experience is echoed in Canada. Edmonton's light rail system, for example, failed to increase ridership. In fact, transit ridership has declined substantially since it was opened.²⁸

Rail system planning rarely includes a cost-benefit analysis that objectively compares rail development to added investment in alterna-

26 Similarly, high speed rail systems, which have been proposed for development in the U.S., have achieved only the most limited success in attracting automobile users on intercity trips. France's highly touted high speed rail system is estimated to attract no more than 10 percent of its ridership from automobiles. (See Wolfgang Zuckerman, *End of the Road: The World Car Crisis and How We Solve It* [Post Mills, Vermont: Chelsea Green, 1991].) A number of U.S. high speed rail proposals have been cancelled or delayed indefinitely over the past decade. A fundamental cause has been the inability to attract investors (because of doubts about financial viability).

27 Based upon data in *Roadway Congestion in Major Urbanized Areas: 1982 to 1988* [Texas Transportation Institute], a report prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration, July 1990.

28 John Kim and Douglas S. West, "The Edmonton LRT: An Appropriate Choice?" *Canadian Public Policy* XV:2, 1991.

tives such as bus lines. Planners routinely assume that buses are capable of carrying less than *one-half* the number of passengers per hour than they are carrying today in the most successful bus rapid transit applications. Indeed, bus rapid transit systems can equal or exceed the volume of passengers carried by any new rail system in North America.²⁹

Private and political interests, not customer service, tend to drive the decision to construct rail. It is not unusual for the consultants to be awarded major contracts to build the very systems they recommended as transit consultants. New urban rail systems are politically attractive, especially to some public officials who equate public service with monument building. They are also attractive to firms that specialize in planning and building them. But these are not public purposes; they are private interests, and they reflect anything but a pre-occupation with customer service. Hundreds of millions of dollars have been “invested” in rail transit. After more than a decade, cost and ridership data indicate rail “investments” have been a waste of public resources.

More cost effective strategies

Rail systems have been ineffective in reducing traffic congestion and air pollution, because they are ill-suited to present-day urban areas, which no longer have sufficiently strong travel corridors to make their services more attractive to customers than automobiles. To attract automobile drivers in significant numbers, transit services must be tailored to the dispersed travel patterns. Lower capital cost strategies must be used, so that urban areas can be more comprehensively served.

Highway based strategies

All urban areas have comprehensive street and highway systems. The most efficient and perhaps the only strategies that can reduce traffic congestion and air pollution involve more effective use of this already existing resource. Highway-based transit strategies include:

29 Rail planners have also based long-term plans on the behaviour of highly volatile factors. For example, planners responsible for the Edmonton LRT believed that oil prices would continue to grow through the 1980s and that this would generate sufficient demand for transit (Kim and West, 1991).

Bus express lanes on streets: In London and Nagoya, major streets have been equipped with exclusive bus lanes that permit buses to operate more quickly, improving travel time relative to the automobile.

Busways on freeways: Busways are capable of carrying any reasonably foreseeable volume of transit ridership in a corridor. For example, in Curitiba, Brazil, a single busway carries nearly 300,000 passengers daily—nearly three times that of Vancouver’s Skytrain. Ottawa’s busway carries 200,000 passengers a day—about equal to the number of rail passengers in Vancouver, Edmonton, and Calgary combined—and busways can be built for 90 percent less than the average capital costs of rail systems.³⁰

High occupancy vehicle lanes: Lanes reserved for buses and car pools can be very effective in attracting use. A high occupancy vehicle (HOV) lane in the Washington, D.C. area carries more passengers than any parallel heavy rail line, while a Los Angeles high occupancy vehicle lane carries more passengers than that city’s new light rail line.

There is a fundamental reason for the superiority of busways and HOV lanes in relation to new urban rail systems that has to do with the nature of corridors. A rail corridor is very narrow. To commute by rail, the passenger must either live within walking distance (inside the corridor), drive to a park and ride lot, or ride a connecting bus. The transfer from automobile or bus to rail takes time and is partially responsible for the inferior travel times characteristic of rail. Moreover, using automobiles to reach park and ride lots may negate any potential energy savings or reductions in air pollution. Most of the energy use and pollution caused by automobiles occurs before the engine is warm, while travel-

30 John F. Kain, Ross Gittell, Amrita Daniere, Sanjay Daniel, Tsur Somerville, and Liu Zhi, *Increasing the Productivity of the Nation’s Urban Transportation Infrastructure* (Washington, D.C.: U.S. Department of Transportation, Federal Transit Administration, 1992).

ling at low speeds, or while idling.³¹ Engines may not be fully “warmed” on shorter trips to park and ride lots, and ensuing slow speeds and idling while searching for a parking space add to energy consumption and air pollution.

Busway and HOV corridors are much wider than are rail corridors. A bus may circulate in a neighbourhood and then get on a busway, providing a quicker trip by eliminating the need for a transfer. Similarly, a car pool can originate miles from the HOV lane, enter the lane, and provide a quick trip because no transfer is required.

A report by principal author John Kain of Harvard University indicates that Canadian and U.S. busways have generally been more successful than have rail systems in attracting new ridership. The report further indicates that the construction costs per ride on busways and high occupancy vehicle lanes are less than one-fourth the construction costs of either rapid rail or light rail.³² Clearly, there are more cost effective means than rail in increasing transit’s market share (table 2).

Other non-transit technologies are expected to play an important part in the reduction of air pollution and traffic congestion as well:

Telecommuting (people working at home or at satellite facilities) is expanding and is expected to represent a larger share of employment in the future. As telecommuting grows, fewer work trips will be necessary and automobile dependency will decline.

Intelligent vehicle highway systems (IVHS), which will provide drivers with computerized traffic information, could reduce traffic volumes by up to 20 percent. An experimental system is already operating in London.

31 See, for example, Michael Cameron, *Transportation Efficiency: Tackling Southern California’s Air Pollution and Congestion* (New York, NY: Environmental Defense Fund and the Regional Institute, March 1991) and John Semmens, “Public Transportation,” *Coming Out of the Ice*, Joseph and Diane Bast, eds. (Chicago, Illinois: Heartland Institute, 1990). Cameron estimates that for a seven mile trip, more than 90 percent of total emissions occur in the first mile. Shorter trips would incur nearly the same amount of emissions, most of which are related to stopping and starting the car.

32 *Ibid.*

Table 2: Capital Cost per Round Trip—Light Rail Compared to Light Rail Alternatives

Busway/High Occupancy Vehicle (HOV) Lanes	-83.2%
Commuter Lanes*	-99.4%
Exclusive Busways	-85.3%
Light Rail	0.0%
Heavy Rail	+3.2%

*Commuter lanes are converted to car pool and bus use only during rush hours.

Data from John Kain, Ross Gittell, Amrita Danieri, Sanjay Daniel, Tsur Sum-merville, and Liu Zhi, *Increasing the Productivity of the Nation's Urban Transportation Infrastructure* (Washington, DC: US Department of Transportation, Federal Transit Administration, Technology Sharing Program, January 1992).

Congestion pricing, the use of computerized toll collection systems at peak travel hours, would bring market pricing to automobile commuting, resulting in reduced traffic congestion and air pollution. Revenues from congestion pricing systems could be used to improve transit service and transit ridership. However, unless transit cost control is achieved, new revenues from congestion pricing would be no more effective in expanding transit services than would the new subsidy revenues already provided. Congestion pricing, however, faces difficult political opposition: drivers (and voters) may not accept paying for something that they previously paid for through gasoline taxes or that they perceive to be “free.”

Traffic congestion and its resulting air pollution may be temporary; some areas that suffer from congestion have job-housing mismatches. Since jobs usually follow residences to suburban areas, time alone may solve many congestion problems. Some areas with current job-housing mismatches, such as Orange

County, California,³³ are adding employment opportunities at a faster pace than they are adding residences.³⁴

Putting customers into the equation

Public transit is a producer driven industry

Transit has not fully implemented strategies that could divert more people from their automobile. Public transit services are producer, rather than customer, driven. Transit has done little to respond to the substantial changes in commercial and residential development since World War II. For example:

Transit agencies continue to operate large buses on most routes, even where customer demand could be satisfied by smaller vehicles.

Transit services continue to primarily feed central business districts, with little service to expanding suburban commercial centres.

Transit agencies continue to construct high capacity corridor developments, such as rail systems, despite their inappropriateness in today's more decentralized urban form.

The full marketing concept is largely inoperative in transit, which usually relegates the marketing function to an insignificant and impotent role. Public transit typically attempts to convince non-riders to use the services that are produced rather than attempt to produce services that would meet passenger needs. To be successful, commercial enterprises must have an effective customer or marketing focus. Virtually no transit agency has given marketing the prominence that will be required if transit is to make market share gains. Lack of attention to marketing is typical of many government-provided services. Marketing is the producer's way of learning what consumers want, tailoring the product to the needs of consumers, and finally letting consumers know

33 A part of the Los Angeles consolidated metropolitan area.

34 Peter Gordon and Harry Richardson, "The Case for Urban Sprawl," *The Sacramento Bee*, October 8, 1989.

the product is good for them and where they can get it. Such a philosophy of consumer service is absent from transit.

*Regulation, “cross-subsidization,” and
“public ownership”*

To see why consumers play so small a role in the design of transit, it is important to know something about the history of transit. This history is one of heavy, and often heavy-handed, government involvement.

In most countries, urban transit has traditionally been highly regulated. Before coming under public ownership, transit service was provided by regulated private monopolies. A fundamental justification for transit regulation was to ensure that services were widely available throughout the urban area, both in high demand and low demand (money losing) areas. The regulated private carriers “cross-subsidized” losing routes with revenues obtained from profitable routes. In this manner, government was able to give monopoly rights to a favoured supplier and at the same time protect itself from concerted public outcry by ensuring that a large part of the population received below cost service. Government’s granting of the monopoly ensured that it would have a significant say in the operation of transit.

Unfortunately for those who favoured this cross-subsidized scheme, public transit use began to decline in the 1920s and 1930s and accelerated after World War II. Many jurisdictions began to doubt the ability of private franchises to continue to serve and cross-subsidize low-use routes. The next logical step for those who favoured a large government presence was government ownership. Herbert Morrison, who served in the U.K. post World War II Labour cabinet, gave the official reason for public ownership of transit services. In connection with establishing the London Transport organization in 1933, Morrison stated that the public good would be served by two fundamental advantages of public ownership:

A publicly-owned transit agency would be able to maximize the amount of service provided to the public because it would be exempt from taxation and would not have to return a profit for investors.

Employees and managers of the publicly-owned transit agency would be driven by the public interest, rather than by the profit motive. As a result, it was expected that the publicly-owned transit agency would be more productive than the privately-owned system.

Time and experience have shown both rationales to be flawed, but they continue to be used to justify transit and divert attention from the problems of public ownership.

Marketing and consumer concerns have been low on the list of government priorities for several reasons. As we explain later, public monopolies usually end up serving the needs of the producers and employees of those monopolies. But there is also a notion that public enterprises should serve higher purposes than the needs of a broad range of consumers. In Canada these higher purposes can be summed up in two points:

1. *Social benefits*: Public transit provides the primary form of mobility for many economically disadvantaged people—the public transit dependent (captive market)—and their mobility is an important social goal.
2. *Environmental and traffic benefits*: Public transit provides mobility to discretionary riders—those who make trips by public transit that they might otherwise make by automobile. This reduces road congestion, air pollution, and energy consumption. This can also result in lower public expenditures for road construction.

These goals are used to justify the very large public subsidies to transit and to justify giving governments monopoly power over transit. While these goals may be laudable, there are other cheaper and more direct solutions available. The reason these solutions have been resisted is that they put consumers in the equation and take government out of it.

The purpose of public transit is the movement of the greatest number of people in a safe and comfortable manner for a given level of expenditure over a sustained period of time. No other objectives should distort or displace this purpose. The alleged beneficiaries of public transit include not only the riders, but also the community in general. Public transit should serve the riders by providing the highest level of safe and

quality service possible at the lowest cost. And public transit should serve the taxpayers by providing the desirable level of safe, quality service at the lowest cost. The customers of public transit are the riders and the taxpayers.

Public transit does not exist in a vacuum. With a substantial national deficit, recurring provincial deficits, and resistance to tax increases, it is unlikely that transit will obtain a substantially larger share of public funding in the future. The demand for public services is great, but the supply of taxes is limited.

Reigning in costs

More taxes do not mean more service

It would seem reasonable that higher taxes for transit would bring a corresponding increase in public transit service. However, both the national and international experiences in transit suggest that more public money does not necessarily return a corresponding amount of new transit service.

Indeed, there seems to be a strong positive relationship between the amount of new operating funds received by public transit and an increase in unit costs,³⁵ which has led to formulation of the public spending corollary to Parkinson's law:

Unit costs of public services tend to increase to consume the available funding.³⁶

This dynamic is evident with respect to public transit in Canada: the public transit agencies with the strongest revenue growth have generally also had the greatest unit cost escalation (see table 3).

35 Wendell Cox and Jean Love, "Controlling the Demand for Taxes Through Competitive Incentives," *The State Factor*, Vol.17, No.12 (Washington, D.C.: American Legislative Exchange Council, December 1991).

36 For a discussion, see Wendell Cox and Samuel A. Brunelli, *The Untold Story*, (Washington, D.C.: American Legislative Exchange Council, 1992).

Table 3: Relationship of New Revenue For Operations to Change in Cost Per Hour: 1984 to 1990

Transit Agency Change in Fares and Operating Subsidies (Inflation Adjusted)	Average Increase in Revenues (Fares and Operating Subsidies)	Average Increase: Cost per Hour	Number of Transit Agencies in Category
+20% & Over	+34.9%	+6.3%	5
0% to +19.9%	+8.7%	+3.5%	7
Decrease	-5.8%	-2.1%	5

A sample of 17 large and medium sized public transit agencies. Calculated from Canadian Urban Transit Association (CUTA) data.

Transit cost escalation

Across Canada, transit costs per kilometre rose 36 percent from 1970 to 1990 (inflation adjusted).

By 1990 transit systems spent \$650 million more than would have been necessary to produce the same level of service if costs had been maintained within the inflation rate.

For each new dollar of revenue, transit systems delivered less than 60 cents of value in new service.³⁷

U.S. cost performance was even worse: cost per kilometre rose by 66 percent from 1970 to 1990, an annual rate of 2.6 percent (inflation adjusted).³⁸ Other nations have experienced cost difficulties, though generally not to such an extreme as experienced in the U.S.

37 In 1990, calculated from 1970. New service costed at the 1970 rate in 1990 dollars.

38 The substandard U.S. cost performance is attributed to the impact of the U.S. federal funding program, which imposes significant additional requirements and creates incentives to increase unit costs. Thus, the most in-

Competition versus monopoly

As long as transit remains a public monopoly, transit costs will continue to escalate above inflation. At one time, some economic theorists believed that the problems of monopoly were problems of ownership—that only private monopolies were harmful and that public monopolies were virtuous, as they would replace the profit motive with a public service motive. Experience, however, has demonstrated the emptiness of this theory.

Competition in the marketplace improves performance and keeps costs down. Alternatively, monopoly—whether public or private—is characterized by higher prices and limited production. To improve its cost performance and provide the enhanced service necessary to attract drivers from their automobiles, transit services must be provided through the competitive market. This would require the subordination of producer interests to that of consumers as well as the will to overcome the strong opposition of the transit unions, which have been granted the power to virtually derail the public purpose of public transit.

Competitive tendering

Competitive tendering is the provision of a public service through a competitively awarded contract. Competitive tendering is a synthesis of public and private roles. The public sector decides what services should be competitively tendered and what specifications should apply to the service. The competitive market responds to the invitation of the government, and one or more producer is selected to provide a specific service for a period of time. The public sector retains policy control over the service, while the competitive market produces the service under public scrutiny. Competitive tendering is being used around the world for a variety of public services including public transit.

In the past decade, there has been a strong trend toward the incorporation of competitive incentives in public transit. Transit's fiscal difficulties have impelled political action in some communities and nations

appropriate international financial comparisons are with U.S. transit systems, because factor markets have been so distorted by the federal government.

to change the incentives of public transit from those of monopoly to those of competition. The perverse incentives of public transit and the fiscal challenges faced by government have combined to liberalize markets in public transit, just as national markets are being liberalized.

Transit can usually purchase the same or better service from the private sector through competitive tendering (bidding). Under competitive tendering, the public transit agency continues to decide where services go, how often they operate, fare structures, service standards, and safety standards. Usually the buses look the same, and customers perceive no difference.

The economics of competitive tendering

The fundamental advantage of competitive tendering is that it saves money. Competitive tendering brings competitive incentives to the production costs of a public service and reduces public costs in three ways:

1. Lower costs through provision of service at no more than the competitive rate (the “going” rate).
2. Lower costs through the “ripple effect” as public agencies improve their cost performance in response to the competitive environment.
3. Lower net costs as a result of tax revenues, licences, and fees paid by private contractors on the public services they operate.

How competitive tendering works

There are five basic steps to competitive tendering:

1. The government seeks competitive tenders for delivery of a specific quality and quantity of service for a defined period of time.
2. A contract is awarded to the lowest responsible and responsive tenderer that demonstrates the ability to provide the required quality and quantity of service.
3. Contractors that fail to provide the service as specified are financially penalized or replaced.
4. New competitive tenders are sought in sufficient time to award a new contract for service commencing at the expiration of the contract.

Canada: Competitive tendering has been limited in Canadian public transit.

Suburban services have been competitively tendered in the Montreal area for nearly 10 years. At least 100 buses are competitively tendered.

Smaller community services are competitively tendered in British Columbia, Saskatchewan, Ontario, and Quebec.

Some suburban systems are competitively tendered in the Toronto area.

Mississauga Transit competitively tendered a single route at savings of more than 20 percent compared to the internal cost of operation.³⁹

London: The world's most extensive competitive tendering program has been undertaken by London Transport.⁴⁰ Nearly 50 percent of London bus service—2,400 buses—is now competitively tendered. London Transport competitively tenders more buses than are operated by the transit systems of Toronto and Montreal combined.

28 contractors are used to produce the transit service, yet the London Transport system remains a unified system with full fare and service coordination. 271 routes are tendered. A staff of 55 monitors the contractors, and administrative costs average less than 6 percent.

Average cost savings are 20 percent, and many contracts have been won by the public operator, which has significantly improved its cost performance in response to competition for the right to operate service.

Overall, London's bus costs per mile have declined 25 percent (inflation adjusted) since competitive tendering began in 1985. In 1992-1993, \$600 million less was required to operate London's level of bus service than would have been required if costs had risen at the inflation rate.

Competitively tendered services now carry nearly 500 million passengers annually, approximately the same number of pas-

39 American Bus Association, *Transit Times*, (Washington, D.C.: April 1990).

40 Information from *London Transport Annual Report and Accounts: 1992-1993*.

senger carried by the transit systems of Montreal and Toronto combined.

Service quality has generally improved. In fact, even where a public operator wins a contract, performance has been better than it was before tendering (again indicating the impact of competition).

San Diego: For more than 10 years, a competitive environment has existed in San Diego area public transit (bus) services. In the late 1970s, county and municipal officials became concerned about the rapidly escalating costs of publicly-owned San Diego Transit. In response, they began converting services to competitive tendering, reduced the amount of service provided by San Diego Transit, and subjected San Diego Transit to competition. Competitively tendered services operate at approximately 30 percent lower costs than do San Diego Transit services, but much more importantly, the cost escalation was stopped. From 1979 to 1989, while inflation was 60 percent (GNP implicit price deflator), and while public transit costs per mile increased by more than 100 percent, San Diego system-wide costs (bus and light rail) increased 35 percent per mile, while San Diego Transit costs increased less than 50 percent. Before competitive tendering began, San Diego Transit operating costs were rising faster than the national average. The scale of the cost savings is illustrated by the fact that San Diego's savings compared to the national public transit rate approximate the cost of constructing its first light rail line.

Los Angeles: Price Waterhouse has reported average savings of 60 percent for a large competitive tendering project in Los Angeles. Savings on some services were found to be 69 percent, the highest yet recorded. The routes, which were threatened with cancellation due to rising transit costs, were competitively tendered by the city of Los Angeles and the county of Los Angeles in 1987. Since that time, their cost effectiveness has permitted lower fares than those on the publicly provided regional system. In addition to the savings, Price Waterhouse found a 300 percent improvement in service reliability, a 75 percent reduction in complaints, and virtually the same safety performance rela-

tive to the region's large public transit agency.⁴¹ At present, more than 300 buses are operated under competitive tender in the Los Angeles area, and a 25 percent expansion is planned for 1992.

Denver: In 1988, Colorado enacted legislation requiring Denver's public transit system to competitively contract for 20 percent of its bus service. KPMG Peat Marwick found that savings of 31 percent were achieved by the second year. Longer term cost savings are likely to be higher, as savings exclusive of transitional costs are already 39 percent. The private providers have produced quality service, prompting KPMG Peat Marwick to note: "No relationship was found between safety and quality of service and higher bus operator turnover. In most measures, the contractors performed as well as or better than RTD despite lower wages."⁴²

United Kingdom outside London: Public transit bus services were deregulated in the United Kingdom outside London in 1986; now all services requiring subsidies must be competitively tendered. More than 75 percent of public transit bus services are operated commercially (without subsidy). Dedicated school bus services are competitively tendered.

Sweden: In 1989, parliament passed legislation to encourage competitive tendering of public transit services. To date, 16 of the 24 counties have been competitively tendered. Savings are 10 to 15 percent. Stockholm began competitive tendering for bus and rail services in 1991.

New Zealand: A 1990 act of Parliament required that all public transit services be provided commercially or through a "competitive pricing procedure." Christchurch reduced its system-wide costs by 32

41 Price Waterhouse, Subhash R. Mundle and Associates, Benjamin D. Porter, and Patti Post and Associates, *Bus Service Continuation Project: Final Report* (Los Angeles: January 1992).

42 KPMG Peat Marwick, Subhash R. Mundle and Associates, and Transportation Support Group, *Denver RTD Privatization Performance Audit Update* (Denver: November 1991).

percent in the initial round of contracts. Competitive tendering of all dedicated school bus service is also required.⁴³

Copenhagen: The Danish parliament has enacted mandatory competitive tendering legislation for Copenhagen public transit bus services (45 percent by 1994) and a 100 percent mandate is under consideration. More than 30 percent of services are now competitively tendered and savings are estimated at 10 to 15 percent. In addition, the transit agency credits competitive tendering with reversing its downward trend in ridership.⁴⁴

New South Wales: Competitively tendered bus services have replaced rail services in Sydney and on rural intercity routes.

Victoria: The newly elected Liberal-National state government is converting the entire publicly-owned Melbourne bus system to competitive tendering.

Other nations: Competitive tendering has also begun in Germany, France, Portugal, Chile, and South Africa, and major conversions are scheduled to begin in Finland and Norway within the next two years.⁴⁵

Designing competitive tendering systems

Competitive tendering programs must be skilfully designed to achieve optimal public results. The following principles should be observed.⁴⁶

43 Ian Wallis, *Competitive Tendering in New Zealand: Evolving Policies and Experience*, paper delivered at the 2nd International Conference on Privatization and Deregulation in Passenger Transport (Tampere, Finland: 1991).

44 *The Danish Model: Competition and Quality in Public Transport*, Hovedstadsområdet's Takiksselskab (Copenhagen: 1992).

45 Wendell Cox and Jean Love *International Experience in Competitive Tendering*, paper delivered at the 2nd International Conference on Privatization and Deregulation in Passenger Transport (Tampere, Finland: 1991).

46 W. Cox and J. Love "Designing Competitive Tendering Systems for the Public Good," *Transportation and Technology* (U.K.), 1991. Vol. 15, pp. 367-389.

Principle 1

There is nothing inconsistent between private tendering and a government that retains policy control over tendered services:

- a. Public authorities are free to design the service with schedules, standards, and established performance criteria and fares.
- b. Public authorities should closely monitor service contract compliance as a routine activity, whether the contract has been awarded to a public authority or a private company. Public authorities should be prepared to invoke contract provisions as may be required to ensure public service of specified quality and quantity.
- c. Contracts should be awarded to the lowest responsible and responsive proposer; the public authority should ensure that it is obtaining service from a company that is capable of providing the service, having proven its financial and management responsibility in similar services. Further, the public authority should ensure that it awards the contract to a company that understands the service package, having submitted a proposal that is sufficiently responsive to the public request for proposals that was issued for the service.

Principle 2

A competitive supplier market should be fostered to ensure the most cost effective service.

- a. Requests for proposals should be provided to all potential proposers in sufficient time to permit well considered responses.
- b. Each request for proposals should cover the smallest increment of service practicable so that the maximum number of qualified proposers may respond.
- c. Requests for proposals should clearly specify all service requirements and contain clear and concise information on the required format of proposals.
- d. Service contracts should be subject to new requests for proposals at least every five years, whether the incumbent operator is a private company or a public authority.

- e. Contract expiration dates should be rotated to minimize the increment of service being competitively tendered at a particular time.
- f. Contract prices should not be subject to negotiation after contract award. Proposers should be required to offer fixed prices for the entire term of the contract, or for an initial period, with subsequent prices indexed using a broad indicator of inflation (such as a percentage of the Consumer Price Index or Gross Domestic Product Implicit Price Deflator).
- g. Public transit authorities should participate fairly in the procurement process:
 - 1. Individuals and departments involved in preparing a public authority proposal should not take part in the evaluation of proposals.
 - 2. Public authorities should submit sealed proposals subject to the request for proposals deadline.
 - 3. Public authorities should be subject to the same proposal and contract terms, conditions, and performance criteria as would apply to a private company, including termination provisions.
 - 4. Public authority proposals should include the attributable, fully-allocated operating and capital costs for the functions proposed for purchase through the request for proposals.
 - 5. Public authorities should include cost saving innovations in their proposals only to the extent that such innovations are used in other services provided by the public authority. (To permit otherwise encourages public authorities to reduce proposal costs for the purpose of winning contracts without reducing overall public costs.)
- h. Where there are public capital facilities or equipment, they should be made available to the successful public or private proposer to provide the specified service. This will minimize capital and financing costs.
- i. Public authorities should impose no contractor employee requirements beyond compliance with applicable labour laws.

Principle 3

Requests for proposals and final contracts and prices should be disseminated to any and all parties that solicit the information. Pre-proposal conferences should be open to all private operators. Public authorities should formally adopt, advertise, and abide by this principle of “open process” to assure the integrity of the procurement system and to encourage healthy, fair competition.

Entrepreneurial services (regulatory liberalization)

The Potential for Entrepreneurship

In some cases, transit services can be operated commercially (without subsidy) by private providers. These entrepreneurial services can replace more expensive subsidized transit services, supplement existing services, or fill service needs that cannot be filled by publicly subsidized transit services.

Recent U.S. developments illustrated the potential. The largest U.S. entrepreneurial system operates in New York City, estimated at up to 75,000 private vans.⁴⁷ In nearby New Jersey, many private bus operators provide service with virtually no operating subsidy and some capital subsidy. In 1990, these operators provided service of nearly 1,000 buses, carried 55 million passengers annually, and in terms of passenger miles carried represented the fifth largest bus system in the United States (after New York, Chicago, Los Angeles, and New Jersey Transit).⁴⁸

47 E.S. Savas, Sigurd Grava, and Roy Sparrow, *The Private Sector in Public Transportation in New York City: A Policy Perspective*, (New York: Institute for Transportation Systems, The City University of New York, 1991).

48 Analysis of *National Urban Mass Transportation Statistics: Section 15 Annual Report 1990* (Washington, D.C.: U.S. Department of Transportation, Federal Transit Administration [formerly the Urban Mass Transportation Administration]), 1991.

A U.S. Department of Transportation study⁴⁹ conservatively estimated that 400 private, unsubsidized vans in Miami carry approximately 50,000 riders per weekday—more riders than are carried by Miami's billion dollar heavy rail system. Ridership surveys found 78 percent of van riders were workers with annual incomes less than \$25,000 a year, and 53 percent of riders were non-English speaking.

In both New York and Miami, public transit authorities have attempted to drive the vans out of business, using regulatory and legal strategies. In each city, the transit agencies have established lower fares on bus routes that have private competition. (If the transit agencies had been private, they might have been prosecuted for "predatory pricing.") But, a New York van operator explained why customers continued to patronize the vans even at higher rates and what the transit agency would have to do to win back the passengers: "Easy. Just give them faster and better service."⁵⁰

There is potential for such entrepreneurial services, not only in public transit, but also in taxicab services, especially in central cities of the largest urban areas.

The high costs of regulation

The Canadian and international experience in deregulation has demonstrated that regulated industries tend to develop a higher than competitive cost structure over time. For example, taxicab regulation in Toronto is estimated to add 25 percent to the price of taxicab fares.⁵¹ This higher cost reduces the mobility of taxicab users, many of whom have limited incomes. The higher cost of regulation casts a cloud over the strategy of

49 Urban Mobility Corporation, KPMG Peat Marwick, and Subhash Mundle, *The Miami Jitneys* (Washington, D.C.: Department of Transportation, Federal Transit Administration, Office of Private Sector Initiatives, August 1992).

50 Seth Faison, "Bus-Fare Cuts Fail to Lure Queen's Riders: Private Vans Thriving Despite Price Pressure," *The New York Times* (November 29, 1992).

51 D. Wayne Taylor, "The Economic Impacts of the Direct Regulation of the Taxicab Industry in Metropolitan Toronto," *The Logistics and Transportation Review*, June 1989, vol. 25, no. 2.

ensuring a particular level of service to the entire community through “cross-subsidization.” This practice imposes a hidden and inefficient tax on all taxicab users to provide non-economic service. If there is a public purpose for non-economic taxicab service, then the cost should be borne by the entire tax base, and not just the users of commercially sustainable taxicab service. There is no doubt that the cost to society of such non-economic service would be less if it were funded by tax money and provided by government through competitive market mechanisms. This would permit formerly regulated industries to operate competitively, restoring market costs and pricing. Subsidies would thus be transparent instead of hidden, making the genuine impact of public policies much more clear.

Regulations and laws that unnecessarily limit or preclude the operation of entrepreneurial services serve private rather than public purposes. They protect producers and injure consumers.

Towards a customer-oriented regulatory framework

A new transit regulatory structure is needed, one that puts the interests of customers first. It must serve the riders, the taxpayers, and the community. Transit services should be structured to serve the community by reducing traffic congestion and air pollution. This requires that no more than necessary be spent to produce a kilometre or hour of service, so that the highest level of transit service can be provided. New Zealand’s 1989 Transport Act provided for such a regulatory structure. A customer-oriented regulatory structure would incorporate entrepreneurial services wherever possible, while using competitive tendering to obtain those services that are not provided by the market.

The transition

Riders and taxpayers would be best served by a quick transition to a customer oriented regulatory framework. If a quick transition is not implemented, and some non-competitive public operation continues, it is important that non-competitive services be subject to a strong regulatory mechanism. The unit costs (cost per hour or cost per kilometre) of the transit agency’s non-competitive service should be regulated by an

outside body. The need for regulation during the transition period can be illustrated by the comparison of a publicly-owned electrical utility with other public utilities:

A publicly owned electric utility, for example, must seek approval for any rate increases from a regulatory commission. The commission regulates the rate per unit of electricity produced, not the overall budget of the utility. If the utility fails to obtain a rate increase, it must find ways to earn a commercial return within the lower rate structure, while continuing to deliver service to all of its customers.

If, however, the utility were subject only to political budget limitation (as with is the practice in transit) then the utility could respond to budgetary constraints by withdrawing electric supply service to less profitable communities.

This option of funding cost escalation with service reductions would be inappropriate for a utility. It is just as inappropriate for transit.

The emerging “CPI minus X” regulatory model is recommended. It works as follows:

If the increase in the consumer price index (CPI) were 3 percent, then a CPI minus 1 requirement would permit a 2 percent increase in unit costs (costs per mile). If the CPI remained constant, then a 1 percent decline in unit costs would be required.

Over a five-year transitional period, “CPI minus X” regulation, where “X” is set at 3.5 percent (based on national averages), would go a long way toward restoring public costs to market rates while easing the transition to the customer-oriented regulatory model.⁵²

Urban transit and scarce resources

Present public transit service levels cannot be sustained with present levels of funding, because of transit’s real cost escalation and transit’s propensity to production-driven design. Present transit strategies are not working, and they divert resources and otherwise preclude adoption of strategies that could work.

52 CPI minus 3.5 percent over five years would eliminate approximately one-half of the cost escalation above inflation built up from 1970 to 1990.

Conclusion: toward customer-oriented transit

Transit is falling far short of its potential to improve urban life.

Transit cannot reduce air pollution and traffic congestion unless it attracts new customers. The present array of services, while important, is incapable of attracting a meaningful number of new customers. Public transit strategies must be customer-oriented, not producer-oriented. Customers may be attracted out of automobiles, but they will not be coerced. New, innovative, customer-oriented services must be established.

Transit services cost more than is necessary. Public resources are limited, and the financial distress faced by the federal, provincial, and local governments underscores the necessity to improve the return on public funds. Very basic principles should be applied:

Spend only if necessary: Transit services should be provided without subsidy wherever permitted by the commercial market. This does not mean that transit services cannot be coordinated; it means that the efforts of public transit agencies should be directed toward coordination of services, rather than provision of services.

Spend no more than is necessary: If a service or project requires public funding, then no more should be spent than is necessary. If a lower cost capital project can achieve the same purpose as a higher cost project, then the lower cost project should be chosen. If a private contractor can provide service for less, then service should be competitively tendered.

These are not just principles to which transit should adhere; they are principles that necessarily guide any government that is the servant of the people.