Transport Services in the 21st Century
Seamless Market or Choiceless Churning?

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CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................................ ii

ABSTRACT ............................................................................................................................................... iii

MAIN TEXT

Underlying Forces ............................................................................................................................ 1

Experience of the Early Liberalizers ................................................................................................. 2

Assuring the Best Results .................................................................................................................... 4

Entry and Exit ........................................................................................................................................ 5

Pricing Principles ................................................................................................................................. 9

Accessibility .......................................................................................................................................... 11

Logistics ............................................................................................................................................... 12

Externalities .......................................................................................................................................... 15

Infrastructure Management ............................................................................................................... 17

Conclusions ......................................................................................................................................... 18

Bibliography ......................................................................................................................................... 20

FIGURES AND BOXES

Figure 1. Employment in US Transport Services, 1964-1997 ......................................................... 2

Figure 2. Chile: Employment in Transport and Communications, 1966-1996 ............................ 4

Box 1. Labor Adjustment in Concessioning of Brazilian Federal Railways ................................. 8

Figure 3. Staff Made Redundant: Time Until Re-employment ...................................................... 8

Figure 4. Staff Made Redundant: Employment Situation One Year Later .................................... 8
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ABSTRACT

i. Growing efficiency and falling costs of passenger and freight transport services have been major factors underlying the increasing globalization of the world economy and the widespread welfare gains it has yielded. Accommodating new technologies, new markets and new organizational structures has required major changes within the sector. Some transport modes in some countries have maintained a steady process of adjustment, generating new opportunities for the manufacturers, traders and consumers they serve, and minimizing disruption for their own employees. In other cases, political and social forces have so bottlenecked change that when it could no longer be postponed, it took more cataclysmic form, imposing much greater human hardship.

ii. To help them respond to the pressures they face from globalization, the transport sector's customers are now demanding creation of a Seamless Transport Market, in which national and modal boundaries neither delay movements nor hinder the choice of the most appropriate route/mode combination for the movement required. Meeting this challenge will occupy most if not all of the 21st century, but great progress can be made on it in the first third if the industry will take the lead in responding to the opportunities offered by globalization, the new information technologies and the need for fuller coverage of its costs by users.

iii. Liberalization of national transport markets, to permit easy entry and exit, and open competition on the basis of costs that reflect externalities as well as market values, is partially underway in many countries. It has yielded good initial results, and needs to be deepened and extended. The most difficult issues are: activating exit (whether by internal reform or bankruptcy/restructuring) for large state-owned transport companies; maintaining competition in face of enterprises' naturally oligopolistic aspirations; and incorporation of externalities—such as costs of accidents, pollution and congestion—in transport prices. But recent years have seen root-and-branch reform of some dinosaurs, and reinforcement of competition authorities' supervision of trends in the transport services sectors. As regards externalities, considerable work is underway to measure them more accurately, and new electronic techniques open opportunities for much more precise pricing of transport services than was previously possible.

iv. A major thrust of the coming generation will be the extension of open markets for transport services to the regional and international level. Pathbreaking achievements of the 1990s have been the grant of cabotage rights throughout the European Union to air transport and road freight operators previously largely limited to carriage of their own countries' trade, and the effective unification of the Australian and New Zealand air transport markets. Good results from the operation of these new regimes should lead on to widening those regional markets, and application of similar approaches in other regions and also at the wider international level (possibly first in air freight).

v. Development of the Seamless Transport Market will also be assisted and supported by deepening, and wider spread, of the integrated "logistics" approach to management of movements and inventories that has had so much impact in Japan and the USA. It puts a premium on reliability, flexibility, and full information provision for transport services, in
addition to cost-competitiveness. It is helping to generate sharply increasing activity to reduce border-crossing delays and to overcome the multiple obstacles, often above all connected with lack of allowed competition and innovation, that have restricted the growth of multimodal transport. Resolution of these problems offers large potential economies in most of the transition and developing countries.

vi. Growing inclusion of hundreds of millions of people in the world economy through electronic communications will increase pressures for reduction of their physical isolation. While transport services to them will not achieve the degree of seamlessness possible on developing countries’ major routes, much can and must be done to improve their physical access: improved law and order, better maintenance of basic infrastructure, and promotion of competition in service provision. In countries with strong social services and information systems, the transport disadvantaged can be assisted with specific subsidies. In other countries subsidies cannot be so well targeted, but their burden on public revenues can be minimized by tendering the provision of relevant public transport services on a competitive basis, structuring the subsidy as an incentive to performance, and installing effective complaint resolution procedures.

vii. The sea-change that has been underway almost throughout the world from direct governmental management of transport infrastructure to regulation and supervision of private-sector fulfillment of these responsibilities will go on spreading and deepening. Governments will continue, however, to carry main responsibility for most road networks and many multimodal facilities. Europe shows considerable confidence that privatization, use of public-private partnerships and application of increased revenues from transport users will put transport as a whole on a self-financing basis, imposing little or no net budgetary burden. To maintain infrastructures adequate to secure best results from service liberalization and competition, the developing and transition economies face much greater financial difficulties. The most promising approach to solution is to commercialize what cannot be privatized, introducing combined public-private management and increased customer orientation, and steering towards full coverage of expenditures by revenues from users.

viii. The pace of change in transport promises to be no less in the coming decades than over the past twenty years, and in many developing and transition economies it should be greater. To stimulate initiative in responding to the opportunities, minimize churning in public decision making, and reduce disruption to the sector’s workers, it is important for countries to promote wide discussion of the likely broad directions of change and how they could best be applied in local circumstances. When major labor adjustment comes into prospect, extensive management-labor interaction should be promoted from the earliest opportunity.
TRANSPORT SERVICES IN THE 21ST CENTURY: SEAMLESS MARKET OR CHOICELESS CHURNING?

Underlying Forces

1. The last quarter of the twentieth century has seen vast change in the transport sectors of many countries, imposing much dislocation on people and companies engaged in the provision of transport services, and sometimes on whole communities. Some of the problems have resulted from macroeconomic instabilities like the Asian financial crisis of 1997, but most have been the product of changes within the transport industry itself. These sometimes harsh transformations have contributed much to broader social welfare by strengthening significantly exporters’ competitiveness, by enabling improvements that have occurred in variety and prices of goods available to local consumers, and by reducing the burden of transport on government budgets.

2. The experience of transport has not of course been unique; many other economic sectors have also faced the need for vast adaptation to new trends in the growth of the world economy. Three underlying forces have been dominant:

   (i) Globalization
   (ii) Government Budget Stringencies
   (iii) Information Revolution

3. These forces show no sign of slackening. If the world economy can continue to adapt successfully to them, then traffic will continue to increase strongly—and especially so in the developing and transition economies, reflecting both the huge poverty backlog to be overcome there and the higher GDP growth rates those countries are capable of. Indeed, just as falling relative costs of transport and communication have been a major cause of globalization and the global growth it has generated, so further service improvements by the transport industry could, and should, give a renewed boost to growth of incomes and employment more generally.

4. In light of the way those broader forces are affecting them, what the customers are demanding of the transport service industry is a Seamless Transport Market, in which national and modal boundaries neither delay movements nor hinder the choice of the most appropriate route/mode combination for the movement required. The challenge of creating such a seamless market will occupy the industry throughout the 21st century, but enormous progress can be made on it even in the first third, the period focussed here.

5. The main threat to that progress is what can be called "Choiceless Churning": inability of the concerned social and political forces to confront visible challenges and generate clear decisions, which in turn increase the choices available to operators and customers. Well-known examples are the twenty-year delays in coming to grips with the railway problems so much discussed through the 1960s and 1970s in the United States and Japan—finally resolved in the US only after eight major companies had been bankrupted, and, in the case of Japan ten years later, bequeathing an accumulated uncovered debt of some
$250 billion, equivalent to 10 percent of the country’s GDP. But choiceless churning is certainly not a monopoly of the railways sector, nor even of government. The prolonged underspending on road maintenance that so many countries have suffered from, and failures of the private sector in many cities to generate a reasonable, competitive system of public transit are equally widespread, if less dramatic, examples of the same phenomenon.

Experience of the Early Liberalizers

6. Despite the unfortunate delay in coming to grips with its railway problems, the United States has in many ways been the leader in introducing more market forces into transport services, with the major deregulation efforts of the late 1970s and early 1980s simultaneously in air, bus, rail and truck transport. Those reforms are generally considered to have been highly successful in terms of increasing customer choice, raising efficiency, stimulating productivity and containing costs. Moreover sufficient time has gone by that it is possible to delineate fairly well the overall picture regarding social and labor consequences.¹

(a) Despite large cutbacks in employment in some modes (most notably railways), overall employment in the transport service sector has grown strongly over the last generation, and twice as fast (nearly 40 percent) in the 17 years since deregulation as in the 17 years before it, mainly reflecting new services and new qualities being provided at the same time as productivity was increasing in the basic, traditional services. Figure 1 summarizes employment trends by main mode.

Figure 1. Employment in US Transport Services, 1964-1997.

(b) Following deregulation, average wage levels fell, relative to those in other sectors, by some 15 percent, quite rapidly, in for-hire trucking and by some 10 percent, more gradually, in airlines, but wages paid continue to be significantly above economy-wide averages for people with comparable qualifications and seem to reflect appropriately industry-specific experience and skills acquired. Reflecting the creation of a more open labor market in trucking, opportunities have significantly expanded for minority-group employees and for owner-operators, with noticeable improvement also of their remuneration relative to that of others.

(c) Direct railway employment (i.e., excluding employment by sub-contractors, who were used increasingly over the period) has fallen nearly 60 percent in the 17 years since deregulation, compared with 30 percent in the 17 years before, reflecting mainly the faster progress that deregulation helped make possible in application of technological advances, elimination of restrictive work rules, and abandonment or sale of unprofitable branch lines. The process generated great tensions and required repeated government interventions, but the railways’ traditional wage premium over other sectors has been retained little changed.

(d) Labor unions have remained strong in the large-company-dominated air transport and railway sectors, but lost substantial membership in trucking (only some 20 percent of truck drivers now belong to unions). Since the evidence is that union members are far more likely to have company-assisted health insurance and pension schemes, this also implies reduction in the share of the labor force enjoying such fringe benefits.

7. Chile is the one other country that liberalized most transport modes around the same time as the U.S. As shown in Figure 2, employment in the transport and communications sector, which had stagnated between 1966 and 1981, grew 90 percent in the following 15 years—even though this period also witnessed cutbacks of 60 percent or more in the staffing of prominent individual enterprises, such as the railways, ports and the national airline.  

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2 Instituto Nacional de Estadisticas, Compendio Estadistico for the years 1981-97, and Banco Central de Chile, Direccion de Estudios (1986), Indicadores Economicas y Sociales 1960-85 for earlier years.

3 It should not be inferred from the two cases cited that liberalization of transport services will always lead on to expansion of employment in the sector as a whole. The U.K. is one of the countries with the longest record of activity to liberalize transport, starting already with the road freight industry in the 1960s and extending to other modes mostly in the 1980s. In recent years it has also applied macroeconomic policies to promote growth in a free trade environment and reaped results in employment. There is some doubt as to the comparability of available figures over time, but they appear to be better for Great Britain, which we therefore cite here, than for the UK as a whole. These numbers (drawn from B.R. Mitchell, British Historical Statistics (HMSO, 1998) and from Annual Abstract of Statistics for various years) indicate that overall employment in Transport, Storage and Communication fell steadily from 1.689 million in 1964 to 1.266 million in 1987, from which it rose to 1.366 million in 1998. Information on Transport and Storage alone (i.e. excluding post and telecommunications) is available only since 1976. It indicates decline from 1,031,000 in 1976 to
Assuring the Best Results

8. These historical experiences are important to our vision of the 21st Century because the dominating thrust in the industry is going to be extension and deepening of liberalization and market competition, reinforced by the tools that emerge from the ongoing Information Revolution. Liberalizing initiatives were taken by various countries in all parts of the world in the 1980s and spread to a majority of countries in the 1990s. If the last twenty years have been mainly a period for liberalizing national transport markets, the coming generation will be the era for extending the open markets to the regional and international levels. Transport policies and investments have now always to be examined in regional context.

9. International traffic has already been growing faster than national traffic and this tendency will tend to be further increased by the regional trading areas being formed (EU, NAFTA, Mercosur, ASEAN, APEC, etc.) and the broader trade liberalization underway with the aid of WTO. In the specific area of transport liberalization WTO is also expected to play an increasingly important role, beginning with the "Millennium Round" of trade negotiations. For instance, the International Chamber of Commerce (ICC) has proposed that in the field of air transport WTO should give top priority to air cargo, which now accounts for more than a third of world merchandise trade by value and where countries have been more ready to act (for example, India opened its international cargo market in the early 1990s, in response to the need for export capacity).

853,000 in 1998, with the decline starting in 1981 and a few brief periods of temporary reversal of trend (most notably 1987-90). Evidently the British have tended increasingly to prefer employment opportunities in other fields.
10. With these large changes in prospect, crucial tasks for governments and societies are to ensure that they are designed in the most promising way for the given national and regional circumstances, and that the efficiency gains sought are not spoiled by seriously adverse distributional consequences of the transformations involved. One can identify six key dimensions to the construction of the seamless market, each of which can be the cause of choiceless churning if these points are not well taken care of.

(i) Entry and Exit

(ii) Pricing Principles

(iii) Accessibility

(iv) Logistics

(v) Externalities

(vi) Infrastructure Management

Entry and Exit

11. Some markets are best organized through competitive tenders for exclusive service (often used for urban passenger transport services) and others through open competition (as in most freight services, for example). But the world experience now provides very strong evidence of the merits of minimizing requirements of new entrants to any and all aspects of the transport service industry, and facilitating easy exit in the case of failure. Entry requirements may normally be limited essentially to safety and environmental standards, professional competence and financial stamina, but they must each be strictly enforced and maintained. Regulatory capacities and procedures of many developing and transition countries need upgrading to strengthen enforcement of such standards, but attainment of an adequate level does not need to be a long drawn out process.

12. Much of the deregulation in the United States, Europe and many other countries has been aimed at reducing obstacles to market entry, but there remain many developing and transition economies where entry still needs to be simplified and exit of failing (generally large state-owned) operators has become a priority step in the creation of a competitive transport market. Done timely, ‘exit’ can take the shape of reform and reorganization—basically into profit centers free to purchase needed services from within the organization, from companies set up on the basis of previous departments of the organization, or from other private-sector suppliers (as introduced, for instance, by the Danish State Railway). Delayed, it involves more disruptive restructuring or, ultimately, rebirth through bankruptcy, as in the case of Aeromexico in 1989. The need for freer entry and exit is a particularly serious issue in many countries for the freight forwarding business and for multi-modal operations.

13. Extending appropriate entry and exit approaches from national markets to the regional and international level will be a major issue for the coming years. From 1997/98 EU countries’ air transport and road freight operators have cabotage rights throughout the Union; in 1998 Canadian road freight operators gained for the first time limited rights to handle
Transport Services in the 21st Century: Seamless Markets or Choiceless Churning

shipments within the US. In the air transport field, Australia and New Zealand have created their Single Aviation Market, and very recently, in November 1999, an all-Africa Transport Ministers Conference voted to introduce immediate liberalization, equivalent to that in the EU, for services within Africa, with extension to intercontinental services in two years. A correct balance has to be found in an open regional market between assuring that countries with genuinely lower costs can benefit from that in competition and, on the other hand, avoiding erosion of agreed entry standards due to country variations in the rigor of their enforcement.

14. Lack of common standards throughout a country (for example, truck size/weight or phyto-sanitary) often add to the complexity of creating a truly open regional market. The European experience in effectuating cabotage rights between countries will hopefully lead on to a much wider exchange of such rights on an international level. US laws prohibiting air cabotage there will no doubt be modified, but private airlines will first need more assurance that the ‘level playing field’ will not be upset by privileges and subsidies to national flag-carriers or even by unusually generous bankruptcy laws.

15. Creating an open regional market is even more difficult when the countries involved are at more widely differing levels of economic and social development, such as Mexico within NAFTA and the EU Accession countries in Europe. Entry of Mexican trucks into the United States remains much more restricted than it was expected to be, due to their difficulties in establishing satisfactory safety standards and securing approvals from the variety of US federal and state authorities involved. The former communist countries in Eastern Europe have had great difficulties in developing international trucking services to compete with those from the west. Much effort is underway to upgrade standards and performance, especially in countries aiming at early accession.

16. There is rising customer demand for faster liberalization of international air transport, and active current debate as to how best to pursue it. The "Open Skies" bilateral air service agreements that the US has sought to negotiate since the early 1990s do now cover substantial shares of total traffic—including about 40 percent of all US carriers’ international traffic. Many of the agreements signed between other countries in recent years reflect the same basic ideas. Even with the reduced restrictiveness of the new agreements in respect of numbers of carriers, routes and fares, the framework created still severely limits airlines’ freedom to structure services and networks in the most efficient way to meet demand. Only certain routes are usually open to them, onward legs have normally to be separately negotiated and may run afoul of the bilateral agreements with those countries, and very few agreements provide cabotage rights within a country. Besides traffic rights, issues of trade facilitation, airline ownership/control restrictions and competitive access to airspace and airports have also to be resolved to achieve a truly open market.

17. The idea is gaining ground that air cargo might be made the forerunner of broader liberalization, just as it was in both the American and European internal deregulation initiatives. Several European countries have pressed for action initially on the important air-freight market between Europe and USA. Alternatives would be other regional agreements or establishment of an agreed multilateral framework that would attract a rising number of countries. Substantial movement in one or more of these directions can be expected in the coming years.
18. An essentially new but potentially important form of market entry is that of a transport operator to train paths on track owned and operated by others. Recognizing the debilitating effects that small national market sizes were having on European railways, and the virtual impossibility of inter-country mergers in the short run, the EU Commission picked up in the 1990s on Sweden’s pathbreaking initiative ten years ago separating responsibilities for track and for train operation and has sought to promote open access to track in the member countries. Many other countries are now considering similar steps as a means to introduce more competition in an industry hampered by its highly traditional structures.

19. If such competition can be made to work effectively, it could prove a main tool for improving railway service and enabling renewed growth of railways traffic. There are promising signs from recent trends in Sweden and the UK. The logical eventual result of this approach would be that railway infrastructure companies would seek to maximize profits by maximizing the number of saleable train paths they could provide and selling them to highest bidders (whether freight or passenger, national or foreign), with the likely simultaneous development of a secondary market in train paths.

20. The alternative foreseeable future is that, once strong long-distance operators have emerged and proved their effectiveness, European railways might tend rather to revert to the more traditional structure of competition within the railway industry—competing integrated companies as in North America. NAFTA has now led on to creation, by merger, of a unified railway company (Canadian National) owning extensive track in both Canada and USA and with strong links into Mexico, too. A Brazilian company is combining concessions won in Argentina as well as Brazil.

21. The belief has been rapidly spreading that transport services are best organized in the private sector, and that that contributes to the effectiveness of competition in the transport industry. Many countries are also highly interested in attracting private investors in these services and related infrastructure, in order to reduce the burden on the government budget. Even in the most state-dominated countries, road freight and inter-city bus services, and even some urban bus services, are more and more provided by the private sector, as in India, China and many countries of the former Soviet Union. Almost all Latin American railways and national airlines will be run by the private sector by early in the next century, and the wave of privatization is spreading rapidly to Africa and gradually to Eastern Europe; in East Asia, some flag-carriers have now been privatized, and important experiments are underway, for instance in China, with new private railways/airlines in defined regions.

22. Initial experience has been generally very positive, with large increases in efficiency and service quality, and sometimes in traffics, and substantial reduction in the budgetary burdens. Major staff retrenchments are often involved, and these need careful preparation and execution to avoid undue suffering and facilitate reabsorption into other jobs. The problem seems to have been handled particularly well by the Brazilian federal railways (RFFSA) largely because of extensive advance planning, in response to strong union concern, and transparency in the concessioning transactions.
Box 1. Labor Adjustment in Concessioning of Brazilian Federal Railways.

When the Brazilian Government decided in 1994 to concession the railways, it faced a major task of reducing staff from some 45,000 (down from 160,000 when the federal system had been created, in 1957) to about 20,000, the maximum that private operators would be likely to use. Detailed assessments were made of the numbers of each staff specialty who should be retained in each region, of the likely ability of regional labor markets to reabsorb leavers into non-railway jobs, and of the time this would take and hence the compensation needed to help carry them over until reemployment. Staff were offered three alternatives: early retirement (for those over 50 years old) with continued payment of social security contributions until full pension eligibility; voluntary separation with financial compensation related to years in service but averaging about 18 months’ salary (compared to standard legal requirement of about 10 months’); and, to the extent it would be needed, involuntary separation with financial compensation some twenty percent less. All living in railway accommodation were entitled to stay a further twelve months, and the latter two groups were offered substantial retraining and job-search assistance. In the event, largely due to coincidence in timing with Congressional discussion of major change in the general pensions law, many more people than expected chose the retirement option, directly or after voluntary separation, and less than 400 involuntary separations were needed. Nonetheless a total of some 5,000 younger people left. Although not many in the end took advantage of the training programs prepared (partly because of their late start), follow-up surveys have shown that the very large majority of the 5,000 younger leavers found alternative employment, and fairly quickly, and that, one year later, about half had cash incomes close to (or above) what they had been receiving on the railways. At that time (i.e. Spring 1998) all but 6 percent had found new employment (Figure 3) and all but 15 percent were still employed, the largest number in self-employment (Figure 4). Despite the difficult recent economic situation in the country, the latest survey (March 1999) indicates further slight improvement: unemployment rate of 10 percent (compared to effective national rate of some 18 percent) and reduction by half of those employed outside the formal sector (to some 5 percent). The concessionaires have extended the labor reductions, themselves providing the same benefits as under the government’s program. Total employment on the 20,000 km system has fallen to some 10,000, plus perhaps 2,500-3,000 persons now employed by maintenance sub-contractors. Railway costs per ton-km have fallen to 60 percent of what they were only three years ago, ton-kms/employee have tripled, and the US$250 million annual operating loss of the system has been replaced by a US$100 million annual payment by the concessionaires to government.

Figure 3. Brazilian Railways' Staff Made Redundant: Employment Situation One Year Later.

Figure 4. Brazilian Railways' Staff Made Redundant: Time Until Re-employment.
23. The evidence from the United States since liberalization suggests that the overall structures that may emerge in the large competitive, open market areas that more and more world regions are aiming at would tend to consist of a few dominant carriers, with a large number of small niche operators of one sort and another. The economies of scale and scope (especially in related information systems) which have underlain this trend may be weakened, at least in some sectors of the transport industry, by much increased reliance on inexpensive common-access information/communication systems such as Internet and satellite navigation and positioning systems, as opposed to expensive dedicated in-house systems.

24. Open-access information systems can be expected to play an increasingly important part in enhancing and widening competition and consumer service in the transport sector in coming years. Public information has been a weak aspect of some of the deregulatory experiences to date. There has been much concern in the US that airline computer reservation systems were run to the advantage of the carriers offering the service. A major disappointment of the early stages of the British deregulation/privatization of county bus services was the failure of the new operators to market their services adequately by informing people of changing timetables and offering through ticketing to other services. Symptomatic of the possibilities emerging with wide spread of Internet connections are the running auction market for trucking space that is increasingly being offered in the US, and the UK Government's commitment to have an integrated nationwide information system (at least on public transport timetables) operating by 2000.\(^4\) It should not be long before travelers in OECD countries will regularly interrogate their computer for alternative ways of going from A to B by public transport, including schedules, costs and potential savings from adjusting their date or time of departure.

25. When mergers, consolidations, alliances and major expansions are put forward, vigilant anti-trust review, at regional as well as national levels, must pragmatically analyze the proposed new structures to ensure maintenance of ‘workable competition’. Public authorities have also to maintain a watching brief on transport service operations and react speedily to evidence of the emergence of collusion in pricing patterns or the use of predatory pricing by established operators to strangle new competitors. A regulatory area that needs particular attention in some of the middle-income countries is better inter-agency coordination to permit timely decisions on industry initiatives breaking traditional boundaries and combining several modes, and services within each, often along with specific telecommunication services in addition.

**Pricing Principles**

26. A major aim of the liberalization of national transport markets over the last twenty years has been to replace government controls on prices for transport services with normal market controls, i.e. the pressures of competitors and substitutes. The public controls which had become necessary in earlier eras when choices were less and transport operators often had local monopolies were tending rather to constrain efficiency improvement and innovation. Direct regulation of prices could be limited to cases of genuine monopoly and

those where society was prepared to pay from the exchequer for the provision of services at prices below costs. The notions that Public Service Obligations have formally to be recognized and compensated (rather than covered out of vaguely-sourced cross-subsidies), and that such compensation should only be provided when the service contracts have been won competitively, have gained increasing acceptance.

27. By the end of the 1990s many of these principles are largely applied in the OECD countries. In most of the developing and transition economies, road freight prices are now largely free of effective regulatory controls but many governments still need to reduce their role in setting prices for bus, rail and air transport. More flexible, yield-management type of pricing that deregulated airlines have used so effectively to increase their load factors are likely to be particularly important for surface passenger operators as they develop services to respond to the more variable travel needs of people physically commuting to work less often.

28. A seamless transport market requires more than merely through tickets, covering stages on different carriers, or single bills of lading. It also requires that prices for use of publicly provided infrastructure properly reflect costs (including those of externalities, mainly pollution, congestion and accidents caused)—and demand elasticities in the case of congested facilities—if competition is to be effective in guiding the user to the most efficient mode for a particular movement. And the principles have to be applied in a comparable way throughout the market. Faced with the emergence of a 15-nation Single European Market in transport and concerned about stimulating more effective inter-modal competition, the EU Commission has done pathbreaking work toward achievement of a sound set of pricing principles, especially for the use of infrastructure. The same basic principles are being gradually accepted in developing countries as appropriate objectives.

29. The coming years are likely to see much more practical application of these long-discussed, but hitherto little used, ideas, for a variety of reasons including two very important technological ones. First, the information revolution has generated the electronic means which make it possible to reflect costs much more precisely in prices charged for time- and location-specific transport. Second, consumers and users are going to become so accustomed, through e-commerce, to flexible, auction-type prices for goods and services generally that they will accept more readily than hitherto the idea, for instance, of paying a premium to avoid traffic congestion. Experiments with road congestion charging and auctioning of landing slots and train access paths will spread. It is highly likely that well before the end of the coming generation preferred approaches will have emerged and will be widely applied.

30. Early progress can be expected in bringing taxes on heavy road vehicles and their operation up to the level of costs (including externalities) attributable to them. The EU Commission has proposed an ambitious schedule,\(^5\) whereby agreement would be reached already by 2001 on common basic charging systems for roads, railways, ports and airports, covering both accounting aspects and charging technologies. As regards roads, the initial focus would be mainly on costs incurred in infrastructure provision and costs of congestion. The charges could be collected through existing toll or Eurovignette systems, but are expected to be applied over rapidly increasing areas through electronic means—whether

\(^5\) Commission of the European Communities (July 1998).
using microwave technology where an on-board unit communicates with road-side equipment or, alternatively, satellite positioning and navigation systems and GSM (as are being increasingly employed for fleet management) where the on-board unit communicates with a satellite and mobile telephony is used to collect payment. In a second phase, 2001-04, main attention would go to operationalizing charging for other externalities, notably pollution, agreeing appropriate levels of charge for externalities of Community-wide significance. In 2005 or thereafter, the systems developed would become mandatory for application throughout the Union.

31. An interesting theme of recent research on better charging for road transport externalities has been the possibility of using some of the resultant additional revenues to lower employment taxes, being considered one of the most distortionary elements of modern tax structures. One study finds, for example, that a Europe-wide road freight tax, introduced gradually and with use of all revenues for corresponding reduction of employment taxes, would have significant positive effects on employment and relatively slight negative effects on road freight volumes: by 2010, economy-wide employment would be 0.5 percent greater, and road freight traffic only some 7 percent less, than in the base case without a road freight tax. How the additional revenues from charging road users for externalities might in fact be distributed is a major issue for political resolution in the coming years.

**Accessibility**

32. Hundreds of millions of people, especially in the developing countries but some also in the wealthier countries, remain largely excluded from the modern economy, whether as the result of neglected maintenance of publicly owned infrastructure, location in distant peri-urban slums, or still, in some cases, absence of basic transport infrastructure. Outdated local tax systems (for example, municipal octroi in India, provincial taxes in some other countries) and deteriorating law and order in many regions mean that carriers and travelers in many developing and transition economies must wrestle with a fearsome array of legal, semi-legal and illegal inspections and stops. Some land-locked countries still suffer from serious, monopolistic discrimination on the part of their neighbors. For instance, China Railways charges twice its normal high rate per km for carriage of containers when they are destined to Mongolia, with the result that the charge for moving a container from the port of Tianjin to Ulaanbaatar, a distance of some 1,700km, is about US$1,750/TEU; and no trucks can move between the two countries, so that all road freight must be transhipped at the border.

33. While "seamless transport" for people in more isolated areas is obviously not usually going to attain the tight time standards that are feasible and required in denser corridors, the relative improvements that they could experience over the existing situation may often be greater. Many people and areas could benefit substantially from a more rational distribution of the budgetary funds already directed to transport. To help achieve real progress in this

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7 World Bank (1999).
area, more governments should follow the example already set by some of setting firm "accessibility targets." Inter-country cooperation on transport in relatively isolated regions—such as Central Asia and the Caucasus, North-East Asia, parts of Africa—is improving, assisted by UNCTAD and regional bodies. The fact that, at relatively low cost due to the Internet, even the most isolated areas of the world can now for the first time participate directly in bidding for contracts originating anywhere should help generate effective pressure to improve facilities for physical movements.

34. Improvement of infrastructure and of basic standards of the ‘law and order’ type must however be supplemented by measures to improve the quality of service supply, and the evidence is very strong that this can best be done—perhaps can even only be done—by ensuring competition. Earlier fears that deregulation of transport services would lead to increased isolation of places off the beaten track have not generally proved justified; previously subsidized or cross-subsidized train or air services have tended to be substituted with more economical services, whether by short-line railroads, small aircraft or, most often, bus services (including use of second-hand buses released from busier routes).

35. On the other hand, while the threat of competition (‘contestability’) surely has some force, analyses of the actual results of transport market liberalization tend to show that, at least up to about three or four competing carriers, the more carriers actually operate on a given route the lower the price to the consumer. Imaginative ways therefore need to be found to increase competition in service to less accessible places: for instance, in the case where a country is dependent on a single railway line, use might be made of the European idea of opening railway track access to different operators. Competing road freight and passenger services should be encouraged wherever possible. Requiring bus operators to use open terminals, shared with other operators, is often a useful measure.

36. The essence of inaccessibility, however, is that many routes will remain very thin, at least for a while. Where demand is truly sufficient only for a single operator, or operators collude to fix tariffs, or set-up costs are too high for a new entrant to compete with an established operator, provision must be made for closer monitoring of market performance, together with a forum for users to protest against alleged abuses and seek redress when they are proven. Where routes are so thin that it is socially essential to offer service below costs, government should award the contract on the basis of open competitive bidding (so called negative concessioning) and regularly pay the subsidy agreed. Until a society’s administrative systems and information structures are able effectively to deliver subsidized vouchers or smart cards to those most in need, a similar approach is often the only equitable way of cushioning the transition to cost-based transport prices even on dense urban routes. This issue requires careful attention in the course of concessioning and franchising bus/rail transit services.

Logistics

37. Logistics (integrated analysis and active management of an enterprise’s overall supply chain, from sources of inputs to delivery of finished product) and Just-In-Time (JIT) practices for managing inventories have already had a huge effect on goods transport services in the more advanced parts of the world. They have further empowered the shipper within a liberalized transport market. The combined result for the average U.S. enterprise is generally considered to have been a reduction in total logistics costs (warehousing and transport) of
Deregulation, particularly of trucking, played an important part, because it squeezed down "rents" that carriers derived from regulatory restrictions and sharpened price competition, but even more because it increased competition in service quality. As a result, carriers made major efforts to respond, with the aid of new equipment, to shippers’ concern for better information about the status, location and real expected delivery time of their shipments. Such improved information flows then permitted reduction of inventories at the various stages of the supply chain, and sometimes the restructuring of distribution networks.

38. The key characteristics required of transport were effective control, synchronization with other processes, and precision ("95 percent on-time delivery" was no longer good enough), to permit less warehousing, handling, inventory, in-and-out movement, redundancy, errors and waste. Japanese companies moved earliest to use of JIT techniques and probably remain ahead of the US in earning these fruits, while European companies have been catching up but remain somewhat behind.

39. Many specialists, in Europe as well as North America, see the potential for saving up to a further 40 percent, even for manufacturing companies already at the frontier on measures of the type just described. The key-note of the new thinking is to extend the JIT right up to the consumer and to review more fundamentally the whole supply chain up to that point for potential savings or value additions by means of restructuring. And best advantage has to be obtained from the entirely new possibilities that the Internet has created for instantaneous open access, at very low cost, to information previously available only on paper or in expensive Electronic Data Interchange systems. Internet in a sense therefore establishes new standards, as well as many new possibilities, for the seamless transport market and the provision of value-added services by transport operators.

40. Many interesting examples are becoming known. Dell Computers in Ireland produces now in direct response to customers' orders via Internet, to which its own suppliers also have immediate access and react by offering/delivering to Dell their appropriate parts and components. Emery Worldwide and other smaller logistics companies pre-sort garments (sometimes stitched from material originally cut in the US) at point of shipment overseas, inform the US manufacturer of specifics of the consignment, and then distribute direct to shops in the US. Freight forwarders Kuehne & Nagel have signed a three-year contract for provision of all warehousing and delivery services for Philips Domestic Appliances and Personal Care throughout Europe. Grocery distributors foresee increasing delivery direct to point of consumption (in addition to shops), with specific characteristics (for example, final processing, packaging, heating, instructions) added during the final stages of transport; inventories would be largely limited to bulks. Specialized companies are being established to handle the combined warehousing, order fulfillment and delivery functions for goods sold through electronic commerce. There is growing interest in the field of ‘reverse logistics’, gathering disused equipment on the same journey to bring the replacement, and handling the extraction of components and materials that can be reused.

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8 See, for example, Harrison, D. (1999) and accounts of the EU Commission’s expectations regarding CO2 reductions over the next decade.
41. The demands from transport will be therefore be for the same synchronization, precision and continuous information exchange mentioned above, but, in addition, for more adaptation to the specific requirements of markets for different goods—including incorporation of ancillary services—and more flexible response to changing consumer preferences and emergencies. New ways will have to be found to stretch capacity at short notice, perhaps by pre-arrangement with sub-contractors to maintain labor and vehicles that can be readily adapted to the needs of different markets.

42. While some of the specific approaches described are obviously more immediately relevant to the US and OECD markets, there is no doubt that the potentials for savings from imaginative application of logistics are of the same substantial orders of magnitude in the transition and developing countries, especially in the many such countries where little or no modern logistics work has yet been done. The overall quality of the logistical environment of a country and a region, including the readiness of the transport service industry there to focus effectively on the kind of quality dimensions mentioned in the last few paragraphs, will be a crucial factor for the attraction of manufacturing and agriculture investments from outside—and hence also for retention of local savings.

43. Logistical optimization tends to increase the premium on reliability and flexibility of the transport services provided. Road freight and air transport responded with alacrity and consequently have been the main beneficiaries to date. How much railways may ultimately benefit (directly or through multi-modal movement) will depend above all on their capacity to offer levels of shipper-responsiveness competitive with those achieved by transporters long operating in a competitive private sector. The "engineering administration" character of most railways and prolonged poor financial performance (often due also to politically sensitive passenger fares being held much below costs, without compensation) have left many countries’ railways unable to respond adequately to the needs of modern multi-modal transport. Much the same goes for many waterways.

44. In some cases the main under-exploited multi-modal opportunity is for carriage of containers, in others rather for bulks. In both cases the need is for a very serious combined public-private effort to open up the often oligopolistic freight forwarding and multimodal operating industry to a much wider range of entrants, and to identify the procedural, regulatory, taxation, insurance, financial and equipment obstacles which are blocking the development of effective intermodal cooperation between countries, and regions within countries, and to initiate effective reforms. These are crucial current problems for areas where rapid ongoing trade expansion is seriously threatened by transport deficiencies, such as China and Mercosur. Insofar as information management and communication is always identified as the crucial factor in effective multi-modal transport, Information Revolution products are expected to make a large contribution to easing solution of the problems. The coming years are also likely to see gradual negotiation of a full International Convention on Multimodal Transport, clarifying liabilities.

45. Another effect of customers' logistics concerns is going to be greater effort around the world to modernize Customs and reduce border-crossing delays. Whether the delays are measured in days (even weeks), as at many key frontiers in the developing and transition economies, or in hours (even minutes), as in most of the OECD, there is barely a country where criticisms do not arise, particularly of slow past progress in resolving very visible problems. The American R&D effort on Intelligent Transport Systems and transport...
applications of telematics gives high priority to commercial vehicles and expects to result in fairly wide availability of automated inspections and electronic screening and credentialling in the U.S. by the middle of the coming decade. Tests of the border-crossing part of this system have had the participation of hundreds of volunteer companies since essentially the only requirements were to have a personal computer and an Internet connection. When companies gave sufficient information ahead of time, and particularly when the shipment was uniform, border inspection was indeed reduced to seconds.

46. As regards air freight, promising Customs cooperation experiments are underway, for instance between Australia and New Zealand and between the UK and the US, to develop systems whereby companies with gilt-edged compliance records would be able to move goods with a single notification of identifier codes for the consignment. By use of electronic waybills and manifests, sent upon departure of the freight from overseas airports, China-Taiwan Customs authorities cut clearance times in 1998 from 10-15 hours to 2-4.

47. Most of the developing and transition economies are still struggling with more fundamental problems of Customs reform and modernization, application of modern statistical systems to permit selective physical inspections, document simplification and standardization, and better coordination with neighbors. The rewards to effective resolution of these problems are correspondingly greater—as illustrated by the 1.0 percent GDP estimated to have been saved each year to Mexico as a result of its Customs reforms in 1989-90.9

48. There will also be advances in development of multi-modal links and information systems for passenger transport. Many of the Western European countries have greatly improved the link-up between air, rail and bus transport. An important initiative of several corporatized or privatized railways, such as those in Argentina, Japan, Sweden and the UK, has been development of improved feeder bus services—with dramatic effects on traffic in several cases, such as Buenos Aires. Such integration among passenger services should improve substantially further, as stressed, for example, in the UK Government’s recent new policy statement on transport.

Externalities

49. A seamless market has obviously also to be an environmentally sustainable one. Yet this paper has barely referred to what most people would consider the prime transport problem of the 21st century—rapidly rising road congestion in many cities of the OECD countries, and even more seriously in leading cities of the developing world. It is a problem of private cars, rather than of transport services, and can be solved only by measures focussing on car usage. Suffice it here to point out the major change in general policy that is in view: increasing use of prices incorporating externalities, as mentioned earlier, to stimulate user response, in addition to past techniques stressing vehicle improvements agreed with manufacturers and subsidization of public transit.

50. To the extent that people can be convinced to leave their cars at home for weekday trips within a metropolitan area, public transport will be one main gainer, as has been the case to some extent in various congested European cities in recent years. It is particularly urgent to find fiscally feasible approaches to ensure that this does indeed occur in two types of cities: the highly populated metropolitan areas of developing countries, especially in Asia, and most cities in the ex-communist countries with their inherited strong public transit systems which are now in danger of decline and destruction. An interesting angle of recent UK experience in this regard has been development of so-called "quality partnerships" under which local authorities provide their bus franchisees with traffic management advantages (for example, reserved or priority lanes) in exchange for other service quality improvements by the operators. Experimental work already underway may well lead on to the use of pricing to help deal with the serious environmental problem of air traffic noise. Regulators in several main European and Asian airports are working towards replacement of direct quantitative restrictions on flight movements with an airport "noise budget" of aggregate noise levels permitted in different times of the day, which is then allocated among airlines. Airlines make management decisions including aircraft selection, load factors, approach procedures, etc., within this budget. Application of such a system would lay the base for introduction of tradable permits, as in other fields of environmental regulation.

51. Largely as a result of improvements in vehicle and fuel technology, the OECD countries have generally succeeded in reaching the targets they had established earlier for reduction of unit pollution emissions from motor vehicles, and can be expected to continue to do so. The older vehicle parks of the developing and transition economies, and ineffective enforcement of standards adopted, continue to present a significant problem. Pollution by commercial vehicles—mainly particulates from diesel fuel and, still in many countries, lead from petrol—can be reduced to some extent by better maintenance and inspection, and—in the case of lead and sulfur in petrol—improved quality control on fuel distribution. But the main solution will need to come with fleet renewal, often with considerable upgrading of local vehicle manufacturers’ standards in the meantime, and in some cases refinery upgrading.

52. In regard to reduction of carbon dioxide (CO2) emissions, the principal contributions currently sought from the transport service sectors are improvements in logistical efficiency (to minimize unnecessary transport), and in service quality (especially on the part of rail and inter-modal links) sufficient to attract traffic from other more energy-intensive modes. In some of the developing countries, substantial gains can also be achieved by better maintenance of vehicles and roads; the World Energy Council recently established, for instance, that trucks in Africa average 5MJ per tonne-kilometer, nearly twice the energy consumption of trucks in Europe and ten times the typical energy requirement for rail and water transport.

53. More restrictive measures may become necessary if transport’s large and rising share of carbon dioxide emissions is not brought down early in the coming century, first by continued improvements in vehicle fuel efficiency, to be followed quite quickly by, second, advances in vehicle propulsion systems. As regards commercial vehicles, experiments are

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10 UK Department of Environment, Transport and the Regions, op. cit., p. 41.
now underway in various parts of the world with electric buses and with fuel-cell-powered buses. The Global Environmental Fund (GEF) has already supported some fuel-cell bus projects and has indicated readiness to undertake more. If technological progress in this area continues at its recent rapid pace, fuel-cell models might become available in substantial quantity by around 2010, starting what would likely be a 10-20 year period for replacement of the whole vehicle park.

54. About one million people are nowadays killed each year in road traffic accidents. This is as much as 20 percent of the annual loss of life due to deliberate mutual destruction during the Second World War. And people injured each year number in the many millions. Public consciousness of this terrible toll has led to programs that have gradually reduced accidents in the OECD countries despite rising vehicle numbers. But accident rates have been dramatically climbing in the developing countries, with the rapid increase in their vehicle parks, poorer infrastructure and less trained drivers. Annual fatalities per 10,000 vehicles are generally between three and ten times OECD levels in the developing and transition economies. Public awareness of this problem has been rising in these countries too and society will insist on more effective action in the coming years to reduce the human suffering directly attributable to the transport sector. As with congestion and pollution, the problem stems largely from cars. Nonetheless, the transport service industry also carries an important part of the responsibility. It has to play a significant role, along with government, public authorities, media, schools and manufacturers, in drawing up and implementing the comprehensive programs which experience has shown to be the only effective way to bring about real improvements in highway safety.

Infrastructure Management

55. Privatization and concessioning of port landside infrastructures has already proceeded apace around the world, and a similar process is gathering force for airports—specialists predict that already by 2010 most major airports, at least in Europe, will be in the hands of large international companies.\textsuperscript{11} Government will nonetheless continue to have a major regulatory responsibility for such public facilities and a direct responsibility for most road infrastructure, much railway infrastructure and many intermodal facilities. There is, however, considerable optimism, especially in Europe, that, in a context of anyway relatively limited need for expansion of existing networks, the introduction of better charging mechanisms, as referred to above (paragraphs 28-31), will not only generate substantial funds for further investment but will also attract strong private participation in Public Private Partnerships for construction of major new facilities.

56. In the developing and transition economies, on the other hand, key steps towards the creation of seamless transport markets remain customer-oriented management of infrastructure and finding the capital needed for expansion. Not only is there much more new building and modernization yet to be done, but many countries are coming from a past of

prolonged under-funding of maintenance, due to changing priorities for use of national budgets, and delays in restructuring their transport sectors. The importance of overcoming these problems is underlined by the experience of liberalization of transport services over the past twenty years, demonstrating that one of the most severe threats to securing best consequences from the new competition has been inadequate infrastructure capacity at key points.

57. The most promising solution to these problems, which is attracting an increasing following around the world, is explicitly to recognize the essentially commercial nature of transport infrastructure, to pool the revenues from specifically user charges (for example, the part of the fuel tax representing charge for use of the road, as opposed to general budgetary contribution or compensation for pollution) in a central fund (Road Fund or Transport Fund), and to associate user communities in the management and supervision of the fund and its applications. Such arrangements (most highly developed in New Zealand) have already had a dramatic effect on the quality of maintenance in a number of developing countries, have helped to bring longstanding problems of vehicle overloading under control, and have made acceptable much needed increases of user charges. It does not fully resolve the huge problem of capital funding, but it lays a far more promising base for finding a way out.

Conclusions

58. Transport services have demonstrated good capacity to adapt to the changing needs of the economy when the many people involved in their provision are all stimulated to think of new and better ways of serving customers. The large challenge of the coming century is to create a seamless transport market, for freight and for passengers, on regional and international bases, taking full advantage of the fruits of the continuing Information Revolution. The major adjustments involved are likely to be no less than those carried through in the last twenty years, but the range of emerging opportunities is expanding rather than receding.

59. The largest threat to the transport community’s benefiting fully from these opportunities is choiceless churning of issues, whether within the community itself as a result of modal jealousies or uncertainties about future employment or, as so often, in parliaments and society, reflecting understandable reluctance of people to give up past privileges, however unjustified they may have been. But it is the transport community itself that has the greatest interest in being able to discover, exploit, and bring to the benefit of society generally, the new opportunities. Hence some suggestions:

♦ First, of key activities equally, preferably jointly, by labor unions and employer associations:
  » Helping union members, and broader society, through the media, to foresee the broad directions of change in prospect, and why they are coming;

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» Explicitly reinforcing ‘social dialogue’ between management and labor when large-scale changes in employment or organization first come into prospect, so as to minimize surprises, facilitate fair treatment of those who will suffer and minimize disruption—to clients as well as to employees and their families;

» Promoting inter-modal and cross-border cooperation and understanding, insofar as these will be key determinants of success in the transport service industries;

» Joint training programs in the new disciplines and approaches affecting transport (notably logistics and Internet applications), to stimulate the development of promising new initiatives in service provision.

♦ Second, of key activities for labor unions:

» Promoting broader government policies that strongly encourage creation of new enterprises and new jobs in all fields, recognizing that transport services may be subject to periodic major employment adjustments;

» Participating in the design of any needed labor adjustment programs, to help ensure fair selection and treatment of leavers and to assist them in transition to new lives;

» Contributing to shaping and implementing regional regulatory arrangements that ensure adherence to essential safety and environmental standards but give fair opportunities to transport operators and employees from poorer countries.

♦ Third, of key activities for employer associations:

» Assisting government in transport infrastructure management by active support for, and participation in, Transport/Road Fund Boards;

» Strong participation in transport/trade facilitation committees, also with public sector involvement, to introduce international "best practice" and monitor performance;

» Promoting wide, participatory discussion throughout the industry of how it can best restructure and manage itself to secure fullest advantage from regional liberalization of transport and the Information Revolution.
Bibliography


