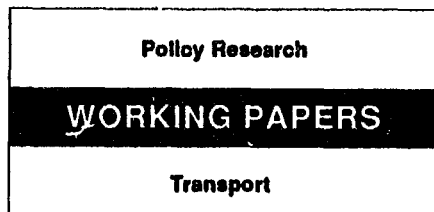


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Options for Reshaping the Railway

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Changing transport demands and growing competition from trucks, autos, and air transport are forcing the monolithic railway to change. Options for change must be adapted to different national and other circumstances, with a suitable tradeoff between efficiency of production and effectiveness in meeting market needs.

This paper — a product of the Transport Division, Infrastructure and Urban Development Department — is part of a larger effort in the Department to analyze and improve the effectiveness of transport enterprises. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Barbara Gregory, room S10-049, extension 33744 (June 1992, 59 pages).

In many countries, the mismatch between what the railways offer and what customers want has caused significant economic inefficiency and severe financial strains for the railways and their government owners. The concept of the railway as a monolithic entity is so strong in many countries as to be a roadblock against reshaping the railway. Yet such reshaping *has already taken place* successfully in such countries as Canada, Japan, New Zealand, Spain, Sweden, the United Kingdom, and the United States — and shows promise elsewhere.

Where incremental approaches are feasible, a useful first step in bringing the market to the railway is a transition to some form of *lines-of-business* strategy, which, like British Rail, could be intensified in stages. Where incremental approaches have not worked, cannot work, or have reached the limits of their effectiveness, a country should consider the full range of options Moyer and Thompson explore in this paper.

The *monolithic railway* rates high on apparent technical efficiency (conflicts are decided by executive fiat and transaction costs are minimized) but low on marketing effectiveness. A monolithic railway might be an appropriate choice for a fully planned, command economy (or for a true single-purpose operator such as a mining evacuation railway) — although a desire for better measurement of performance might still lead to a line-of-business organization.

The *lines-of-business* option improves accountability and responsiveness to markets but operating conflicts and transaction costs increase as the monolith becomes divided. Economies in transition, small railways with a restricted number of customers, or larger railways seeking to depart incrementally from a monolithic framework will probably find the line-of-business approach the best first step.

The *competitive access* option introduces intramodal competition in selected markets, while maintaining unitary control over most railway operations. Unless the distribution of “franchises” is self-balancing — providing clear benefits to all participants — the owning railways are

unlikely to permit a serious level of competition in markets they have traditionally controlled. A need for *intramodal* rail competition — either in large countries with well-developed rail systems or in adjacent countries with integrated economies, as in the European Community — could promote greater use of competitive access solutions.

The “wholesaler” option should accomplish an excellent marketing job, but the actual operation would remain in monolithic hands. When the quality of customer service is paramount (as in container landbridge services or in certain unit train applications) or when the rail service is driven by external requirements (as in container dry ports), it may be best if the railway is a “wholesaler” selling to a “retailer” who relates directly (and more effectively) with the customer.

The “toll rail enterprise” might come closest to reflecting a theoretical model of marketing effectiveness, yet it would generate potential operating conflicts and higher transaction costs — and would also call for the greatest administrative capability in the owning government. Where a rail service is easily separable from other services, or where the service does not conflict heavily with other services, a “toll rail enterprise” solution may be desirable — as with Amtrak, VIA (the Canadian Amtrak), and the Japanese Rail Freight Corporation. Situations in which this approach might work best: granting trackage rights to Zimbabwe to serve the port of Beira in Mozambique and to Russian Railways to serve the port of Tallinn in Estonia.

One generalization holds true in all circumstances: a monolithic railway does not function well in a market economy in competition with privately owned, properly (lightly) regulated competitors — especially trucking. *All* attempts to commercialize, corporatize, or increase the role of the private sector in railway activities have started with one or another form of reshaping the railway entity. Solutions will vary, but the universal objective as an economy becomes more market-driven is to make the railway more market-sensitive.

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SUMMARY AND CONCLUSIONS

Background: Why Reshape the Railway?

i. Historically, railways throughout the world developed as monolithic organizations, controlling their own facilities, performing all operating and administrative functions, and unilaterally determining what services to provide to an often captive market. Such an evolution faithfully reflected the conditions of the times. In the nineteenth century, railways represented the vanguard of technology; they could reliably depend only on themselves to produce most of their material needs. Moreover, as the dominant means of overland transport, railways from their inception could essentially dictate the products they would offer (without much regard to customer preferences) and the prices they would charge (without attention to cost considerations), subject only to any available intramodal competition. Acknowledging this monopoly status, regulatory structures arose to control it, and in many countries perpetuated the illusion of monopoly long after competing modes had emerged in the transportation marketplace. In the socialist economies, the adoption of central planning reinforced the railway as a unitary organization. Throughout the world, therefore, autarky and monopoly produced and preserved the railway monolith.

ii. In most countries, the production, market, and political conditions originally favoring monolithic rail transport entities no longer exist. Although constantly evolving and improving, railway technology is esoteric no longer. Railways are increasingly able to rely on a host of outside suppliers and service organizations to perform infrastructure, maintenance, administrative, and even operating functions, as dictated by economic considerations. Moreover, in the presence of mature, competing transport modes, railways can no longer be oblivious to customer preferences in designing services, nor can they price services without regard to their costs. Finally, the extreme centralization of all economic decisions that formerly characterized the socialist states (and their railways) is dissipating. In light of all these changes, the traditional unitary railway -- in which the lowest official dealing with both revenues and costs may well be the general manager or the president -- has become incongruous, and not just from a theoretical viewpoint.

iii. In many countries, the mismatch between what the railways offer and what customers want has caused both pronounced economic inefficiencies and severe financial strains for the railways and their government owners. In much of the world, the railways' losses of market share, burgeoning deficits, and mushrooming demands for State funding have led to enormous pressures on governments to effect a fundamental restructuring of the railway entity itself, and of its relationship with the State.

iv. These underlying pressures may manifest themselves in explicit and implicit Government objectives for reshaping the railway. Typical objectives may include:

- Improve economic efficiency;

- Reduce railway deficits and government funding burdens;
- Promote creative and aggressive management;
- Allow and encourage the railway to function as a market-sensitive, commercial enterprise;
- Enhance intramodal or intermodal transport competition;
- Obtain improved management information and performance evaluation through financial separation;
- Equalize conditions for rail vis-a-vis other modes;
- Increase the role of the private sector in railways;
- Foster public policy in planning and national development; and
- Shake the foundations of the old railway order and its entrenched interests.

v. One approach -- "separation" of fixed facility ownership from train operations -- has gained prominence in recent years as a response to some of the objectives above. *This emphasis on "separation" has, to some degree, misrepresented and oversimplified the issue.* In fact, a full continuum of options exists for reshaping the railway entity. In any country, the aptness of each option depends on the relative weight and urgency of governmental objectives; on the relative importance of the various markets served by the railway; on the available technology; on the scale of railway operations as a whole; and on the administrative capabilities of the government and of the railway. Moreover, in practice, the vastly complex three-dimensional matrix of operating functions, service types, and geographic zones that characterizes mature railway systems may call for a sophisticated *combination* of restructuring options, rather than for any single solution. One option might be chosen for freight (or freight sub-markets), another for intercity passenger, and yet another for suburban passenger.

vi. Focusing on selected points on the continuum, this paper explores generic reshaping options that can be altered or combined to fit the unique circumstances of individual railway entities.

The Generic Options

vii. In essence, each option expresses a possible set of relationships between the railway entity/entities, the markets served, and the functions performed. Indeed, today's railways perform a wide range of rail transportation services. Typically, this range includes intercity passenger, suburban passenger, and freight markets; each market can, in turn, be further categorized (for example, into "for-profit" and "not-for-profit" segments; by geographic region,

line, or city-pair; by class of service for passenger; and by commodity or service characteristics for freight). In serving these markets, regardless of the level of service differentiation, railways must somehow manage the following basic functions:

- Ownership, improvement, and maintenance of fixed facilities;
- Control of operations (i.e., dispatching);
- Train movement;
- Equipment provision and maintenance;
- Marketing; and
- Financial control and accountability.

viii. **Option 1: The Monolithic Railway (Status Quo Option).** Traditionally, the monolithic railway was almost wholly production-oriented, and was organized so that each functional department exercised total and undifferentiated responsibility over all services. For example, a single department might control maintenance of all coaches, wagons, and locomotives; or the train movement department might maintain a single roster of employees who could be assigned indiscriminately to freight, intercity, or suburban passenger jobs.

ix. **Option 2: Lines-of-Business Organization.** As markets, technology, and operating practices have evolved, even on monolithic railways, commonality has diminished to a surprising degree among many of the assets and resources used in different markets. Thus, for instance, electrified suburban passenger services employ self-propelled, multiple-unit coaches necessitating specialized workshops; tracks with heavy commuter flows tend not to have much freight. Advances in management information systems have, furthermore, improved the accuracy and timeliness with which direct as well as remaining common costs can be assigned to particular services. These two converging trends have enabled railway entities to reorganize themselves (to varying degrees of depth) according to lines of business so as to foster comprehensive business planning, market- and cost-sensitive decisions, and more responsive operations for each service performed. In essence, this is an option for making the monolithic railway less monolithic in a service, if not in a production sense, while reducing the entity start-up costs implicit in other alternatives.

x. **Option 3: Competitive Access.** Under this option, competing railway companies would have exclusive control over some trackage, but would also have (and give) the right of competitive access over the trackage of (to) other companies. One variation within this option would be a "regional overlap" approach, wherein regional (or national) operators would be given the right to operate over tracks leading to major traffic centers in adjoining regions (or countries). Smaller-scale options such as trackage rights and joint terminal agreements provide miniature examples of the competitive access approach.

xi. **Option 4: The "Wholesaler."** The railway entity would own and operate the fixed facility and perform all operations on behalf of marketing entities who would be the "retailers." This would mean that the railway itself would only haul trains; it would do no marketing to shippers. It might furnish some, or all, of the rolling stock and crews, at the retailer's option.

xii. **Option 5: The "Toll Rail" Enterprise.** The entire fixed facility (track, signals, communications, electrification, and so forth), except for exclusive facilities, would be the property and responsibility of one owner. There could be one or more authorized user(s), each of which would pay tolls for use of the facility. The tolls would be public and non-discriminatory, but might well vary by train size, axle load, direction of travel, time of day, season, and similar criteria. In a sense, the toll rail enterprise would be much like a regulated public utility.

xiii. For each of the above options, Table SC.1 shows how functions would be assigned to entities, and Table SC.2 refers to examples among today's railways.

Issues

xiv. In evaluating these options, railway planners need to consider a series of issues that reflect both actual experience and a priori analysis. The list of issues below is indicative, not exhaustive; not all issues will apply to all options. As evidenced by successful initiatives in such countries as the United Kingdom, Canada, Japan, Spain, and the United States, these issues do not constitute insuperable obstacles to reshaping railway entities.

xv. **Market Definition.** Will the resultant entity/entities have a clear and better view of the markets they serve and the full impacts of their business decisions on those markets?

xvi. **Financial Accountability.** Will mechanisms exist to fix both cost and revenue responsibility at appropriate locations in the organization(s), so that effective business planning and decisions can occur?

xvii. **Operations Coordination.** If the monolith is divided, what mechanism(s) will be established to resolve the inevitable operating conflicts among entities, or even among lines of business subsidiary to a single entity? Will the option in and of itself minimize or exacerbate such operating conflicts?

xviii. **Intramodal Competition.** Does the option permit an appropriate level of intramodal competition?

xix. **Appropriate Maintenance Levels.** Will the option encourage or discourage continuous maintenance of the fixed facility at a level of utility that *fully satisfies, but does not exceed*, the needs of users?

Table SC.1
Assignment of Functions to Entities under Reshaping Options
 (Note: In any one country, options can be combined or altered to fit conditions)

Function	Options				
	(1) Monolith	(2) Lines-of-Business	(3) Competitive Access	(4) Wholesaler	(5) "Toll Rail" Enterprise
	R=Railway	R=Parent L=Line of Business LP=Primary Line-of-Business	R1=Owning Railway R2=Railway having Trackage Rights	R=Railway W=Wholesaler	F=Fixed Facility Owner O=Operator
Fixed Facility Ownership	R	R (parent)	R1	R	F
Fixed Facility Maintenance	R	LP	R1	R	F
Operations Control	R	LP	R1	R	F or O
Train Movement	R	L	R1, R2	R	O
Equipment Provision	R	L	R1, R2	R (W) ^{2/}	O
Equipment Maintenance	R	L ^{1/}	R1, R2,	R (W) ^{2/}	O
Marketing	R	L	R1, R2	W	O
Accountability	R	L	R1, R2	R, W	F, O

^{1/} Where one line of business performs equipment maintenance for another, internal charges would be reciprocally assessed.

^{2/} In this case the railway would normally be the primary supplier, but the wholesaler could well be an optional source of supply for railway rolling stock.

Table SC.2
Examples of Reshaping Options

Options	Examples ^{1/}
(1) Monolithic Railway	Bolivia, China, USSR, Zimbabwe
(2) Lines-of Business Organization	British Rail, RENFE ^{2/} , United States (as a whole: freight railways, Amtrak, commuter authorities)
(3) Competitive Access	Canada (freight; CP and CN are to operate over some parts of each other's track); United States (trackage rights and joint terminal agreements); Council of the European Communities' directive (competitive access concepts)
(4) "Wholesaler"	American President Lines (double stack), Norfolk Southern Triple Crown, haulage agreements, Australia
(5) "Toll Rail" Enterprise	Amtrak, Japan Freight Railway Company, Japan's Shinkansen services, Swedish Railways (SJ)/Banverket, State Railways of Thailand

^{1/} Not all these examples are discussed in the text of this paper.

^{2/} Spanish National Railways. A list of acronyms appears at the end of this paper.

xx. **Track Maintenance Coordination with Operations.** How will the safety and work efficiency needs of the entity maintaining the track be reconciled with the needs of other entities for timely, unrestricted access to fixed facilities?

xxi. **Private Sector Development.** Will the option afford an opportunity for increased involvement of the private sector in railway transportation?

xxii. **Startup/Transaction Costs.** Do the initial costs of implementing the option, and the administrative costs of perpetuating it, outweigh its likely benefits?

xxiii. Table SC.3 evaluates the generic options in very broad terms according to their responsiveness to each of the issues. As might be expected, the *monolithic railway* rates high on apparent technical efficiency (since conflicts are decided by executive fiat and transaction costs are minimized), but low on marketing effectiveness considerations. The *lines-of-business* option offers improved responsiveness to markets and accountability, but reflects increased operating conflicts and transaction costs as the monolith becomes divided. The *competitive access* option introduces intramodal competition in selected markets, while maintaining unitary control over most railway operations. Unless the distribution of "franchises" is self-balancing, providing clear benefits to all participants, the owning railways are unlikely to permit a serious level of competition in markets which they have traditionally controlled. Thus, competitive access is often an evolutionary approach. The *"wholesaler"* option should accomplish an excellent marketing job, but the actual operation would remain in monolithic hands. Finally, the *"toll rail" enterprise* might come closest to reflecting a theoretical model of marketing effectiveness; yet it would generate potential operating conflicts and higher transaction costs. This option would also call for the highest degree of administrative capability in the owning government.

xxiv. Circumstances differ in every country and for each railway. Since the relative values applied to each objective (row) in Table SC.3 will vary by country, the ratings shown in each column cannot simply be added together to determine an optimum. Thus, no a priori conclusions are possible as to which generic option (or combination) would be "best" in a specific circumstance. Nevertheless, certain country types and railway characteristics would, in principle, lend themselves most readily to certain reshaping options. For example, a monolithic railway might be an appropriate choice for a fully planned, command economy (or for a true single purpose operator such as a mining evacuation railway) -- although a desire for better measurement of performance might lead to a line of business organization even in these circumstances. Economies in transition, small railways with a restricted number of customers, or larger railways seeking to depart incrementally from a monolithic framework, will probably find a line of business organization to be a useful first step. A need for *intra*-modal rail competition, either in large countries with well developed rail systems or in adjacent countries with integrated economies, could promote greater use of competitive access solutions, as in the European Community's recent order. When customer service quality needs are paramount (as in container landbridge services or in certain unit train applications), or when the rail service is driven by external requirements (as in container dry ports), it may be best if the railway is

a "wholesaler" selling to a "retailer" who relates directly (and more effectively) with the customer. Finally, where a rail service is easily separable from other services, and where the service does not conflict heavily with other services, a "toll rail" enterprise solution may be desirable. Examples of this possibility are Amtrak, VIA and the Japanese Rail Freight Corporation: potential situations could be the granting of trackage rights to Zimbabwe to serve the port of Beira in Mozambique, and to Russian Railways to serve the port of Tallinn in Estonia, the port of Riga in Latvia, or the port of Odessa in Ukraine.

Table SC.3
Characterization of Generic Reshaping Options

(Options are rated High (H), Medium (M), or Low (L) according to their responsiveness to each issue. The characterizations are for generic options and would naturally vary with the particulars of specific options scrutinized.)

Issues	Options and Characterizations				
	(1) Monolithic Railway (status quo)	(2) Lines-of- Business Organization	(3) Competitive Access	(4) "Wholesaler"	(5) "Toll Rail" Enterprise
Market Definition	L	H	M	H	M
Financial Accountability	L	M or L	M or L	M	H
Ease of Operations Coordination	H	M	M	M	L
Intramodal Competition	L	L	H	H	M
Appropriate Maintenance Levels	M	M	M	M+	? (Depends on pricing)
Track Maintenance Coordi- nation with Operations	H	M	M	M	L
Private Sector Development	L	M	M	H	H
Start-up Problems and Transaction Cost Burdens	L	M	M	M	H

xxv. *Underlying all these issues and options is the basic tradeoff between efficiency of production and effectiveness in meeting market needs.* The traditional monolithic railway, organized in a strictly hierarchical pattern along departmental lines, is geared to producing maximal amounts of relatively undifferentiated output with minimal inputs. However, what the customer wants and what the competition will provide do not necessarily mesh fully with the railway's technical production efficiency. Thus, by contrast, the reshaped railway -- whatever the depth of the attempted restructuring -- seeks to serve each market in a manner that maximizes either profits or other benefits dictated by its agreement with the State. Regardless

of the precise objective, a market-sensitive railway might appear to be less "efficient" than a well-managed monolithic entity in terms of production, and yet be much more effective in fulfilling its goals of improved service quality and commercial performance because the customer is interested in minimum logistic costs, not just the lowest railway rates and minimum service quality.

xxvi. For example, a reshaped railway will typically establish separate "commercial" and "noncommercial" lines of business. The former would be operated on a commercial, for-profit basis and would be self-supporting and generally unregulated; the latter would be operated under contract with government at some level(s), and would receive operating subventions under the "public service obligation (PSO)" rubric. This dichotomy would free the railway to operate as a commercial enterprise by reducing the government's span of control to separable PSO functions only, and would encourage both railway and government to view PSO functions as a business relationship between customer (i.e., government) and contract supplier (the railway). By the railway's traditional measures of technical operating efficiency (e.g., coach-kilometers per locomotive-kilometer), the restructured services, taken together, may appear to fall below historical levels. This decrease, however, may mask a host of steps taken by the respective lines of business to boost the responsiveness of each service to customers' needs and willingness to pay. The result should be a more profitable railway in the case of commercial services, and noncommercial services that better fulfill explicit public policy objectives.

Conclusions

xxvii. The concept of the railway as a unitary entity is so strong and self-perpetuating in many countries as to form a roadblock against reshaping the railway in ways akin to those broached in this paper. Yet such reshaping *has already taken place* with success in the U.S., Canada, Japan, Sweden, Finland, Argentina, Spain, and New Zealand (among others) and offers clear promise elsewhere. Technology, competition, and historical forces have eroded the foundation of the unitary railway; rail entities that are driven by production rather than market considerations are no longer necessary. As a result, where incremental approaches are feasible, transition to some form of lines-of-business organization would be a useful first step in bringing the market to the railway. Such a reorganization, whatever its depth, would improve market definition and financial accountability without undue startup and transaction costs. Following the example of British Rail, the lines-of-business strategy could be intensified in stages.

xxviii. Reshaping need not stop with lines of business, however. Where incremental approaches have not worked, cannot work, or have reached the limits of their effectiveness, the full spectrum of options exemplified in this paper will merit careful consideration. Experience has clearly demonstrated the feasibility and desirability of mixing and matching these options to fit national needs. Experience has also shown that, despite the difficulty of making valid generalizations, one broad statement can be made: *the monolithic railway simply does not function well in a market economy in competition with privately owned, properly (i.e., lightly) regulated competitors -- especially trucking. All attempts to "commercialize" or "corporatize," or to increase the role of the private sector in railway activities, have started with one or another*

form of reshaping of the railway entity. Thus, while the detailed solution will vary from one country to another, as an economy becomes more market-driven with wider competition in the transport sector, the need to reshape the monolithic railway into a market-sensitive transport entity remains a vital and universal objective.

BACKGROUND: WHY RESHAPE THE RAILWAY?

Historical Context

1. Historically, railways throughout the world developed as monolithic organizations, controlling their own facilities, performing all operating and administrative functions, and unilaterally determining what services to provide to an often captive market. Such an evolution faithfully reflected the conditions of the times. In the nineteenth century, railways represented the vanguard of technology; they could reliably depend only on themselves to produce most of their material needs. Moreover, as the dominant means of overland transport, railways from their inception could essentially dictate the products they would offer (without regard to customer preferences) and the prices they would charge (without attention to cost considerations), subject only to any available intramodal competition. Acknowledging this monopoly status, regulatory structures arose to control it, and in many countries perpetuated the illusion of monopoly long after competing modes had emerged in the transportation marketplace. In the socialist economies, the adoption of central planning reinforced the railway as a unitary organization. Throughout the world, therefore, autarky and monopoly produced and preserved the railway monolith.

2. In most countries, the production, market, and political conditions originally favoring monolithic rail transport entities no longer exist. Although constantly evolving and improving, railway technology is esoteric no longer. Railways are increasingly able to rely on a host of outside suppliers and service organizations to perform infrastructure, maintenance, administrative, and even operating functions, as dictated by economic considerations.^{1/} Moreover, in the presence of mature, competing transport modes, railways can no longer be oblivious to customer preferences in designing services, nor can they price services without regard to their costs. Finally, the extreme centralization of all economic decisions that formerly characterized the socialist states (and their railways) is dissipating. In light of all these changes, the traditional unitary railway -- in which the lowest official dealing with both revenues and costs may well be the general manager or the president -- has become incongruous, and not just from a theoretical viewpoint.

3. In many countries, the mismatch between what the railways offer and what customers want has caused both pronounced economic inefficiencies and severe financial strains for the railways and their government owners. In much of the world, the railways' losses of market share, burgeoning deficits, and mushrooming demands for State funding have led to enormous pressures on governments to effect a fundamental restructuring of the railway entity itself, and of its relationship with the State.

1/ Alice Galenson and Louis S. Thompson, *The Bank's Experience with Railway Lending: An Evolving Approach*, pp. 30-31.

4. These underlying pressures may manifest themselves in explicit and implicit Government objectives for reshaping the railway. Typical objectives, based on enhancing overall economic efficiency, may include:

5. **Promote creative and aggressive management.** To the extent existing bureaucracies hamper new modes of thought, reshaping the railway may be essential if new services and operating methods are to be instituted. However, railways since the 19th Century have added creative services without submitting to fundamental restructuring, simply by the accretion of new organizations on the old. For example, sleeping car services over both the private carriers in the United States and the national railways of Europe were operated by companies especially established for that purpose (e.g., Pullman, Wagons-Lits), as were many other specialized types of freight, express, and passenger services.^{2/} In Europe as elsewhere, opportunities for creative international and other services may exist with or without fundamental reshaping of the constituent state railways.

6. **Free the railway to function as a market-sensitive, commercial enterprise.** Some reshaping schemes relieve the railway operator of its huge fixed asset base and accumulated long-term debt. These actions, in conjunction with other restructuring techniques, may yield a more commercially sensitive railway.

7. **Enhance intramodal or intermodal transportation competition.** Certain reshaping options (competitive access, for example) allow participants to expand into additional markets while spreading fixed costs over a wider traffic base and keeping new investment to a minimum.

8. **Obtain improved management information and performance evaluation through financial separation.** Traditional railway organizational structures, as discussed in Chapters 2 and 3, lend themselves to financial reporting by department rather than by service or market segment. Reshaping the railway may be a means (although not necessarily the most cost-effective means) of accomplishing a substantive change in financial reporting systems. For instance, under the "toll rail" option, assignment of fixed plant and operational responsibilities to two or more separate organizations would result in the substitution of more-or-less arm's length transactions for internal accounting allocations.

2/ See Community of European Railways (CER), "Reply of the CER to the document of Mr. Van Miert (Ref: COM (89) 564 final of 1/25/90)," in which European railway management lists numerous instances of international cooperative freight and passenger ventures under the existing regime (for freight: Trans Europe Container Express, fast, cheap and safe trains, and Intercontainer among others; for passenger, examples include EuroCity trains, fare and equipment collaborative efforts). The CER therefore "calls on the Community's institutions and leaders to ensure that there is genuine complementarity between the political proposals put forward by the Commission and the often innovative strategies already laid down by the railways in their international fora." See also International Union of Railways (UIC), *Transformation of the International Railway System as Part of New European Transport Policy*.

9. **Equalize conditions for rail vis-a-vis other modes.** The competition to railways generally operates under totally different ground rules. Separation of fixed facilities from transportation operations and vehicle ownership is the norm; government itself -- not a subsidiary or private enterprise -- owns and maintains the highways, waterways, or airports as public amenities, with equal access opportunities to all operators. While the essential characteristics, capabilities, and functions of the ubiquitous highway and fixed rail modes will inevitably differ, policy makers in many countries perceive a need to equalize the conditions, in particular the proportions of fixed to variable costs (though not necessarily the total of both) applicable to these competitors. This attempt at equalization can take several forms: differential fuel and other taxes as users' fees, carefully balanced government subsidies, regulatory initiatives, and making the ground rules for the two modes more similar. Under the last rubric, although highways cannot ordinarily be made analogous to railways, the reverse arguably can occur; such a purpose invariably calls for reshaping options, akin to the "toll rail" enterprise, involving the separation of railway operations from the fixed facility. Sweden has effected such a restructuring for this reason, with the express goal of placing public policy decisions on transportation investments on an equal footing for the two modes.^{3/}

10. **Increase the role of the private sector in railways.** If dictated by public policy, transfer of railways from the public to the private sector can theoretically occur in toto, by region, by market, by function, or by some combination of the last three factors. Transfer by function may have special appeal if policy makers view the railway fixed plant as part of the inalienable national patrimony, and therefore nontransferable. Argentina, for example, has undertaken to award franchises on specific operations, but retains national ownership of the rights-of-way.^{4/}

11. **Reduce railway deficits and governmental funding burdens.** As indicated above, this objective is of surpassing importance in much of the world as a motivating factor for reshaping the railway.

12. **Foster public policy in planning and national development.** A country's needs for rail service in specific markets may persistently differ from the services that the railway actually provides. If so, the government may have no choice but to restructure the railway so as to fulfill the role assigned to it by national transport and development policy.

13. **Shake the foundations of the old railway order and its entrenched interests.** Railways are often venerable entities, with entrenched bureaucracies in both management and labor, and among governmental regulators and supervisory agencies. In the ranks of management, self-interest frequently equates to preservation of existing ways of thinking and functioning. In such cases a production rather than a profit or customer satisfaction orientation can plague the many layers of management. In the labor unions, job preservation may outweigh

3/ Stig Larsson, "The Restructuring of SJ," p. 4.

4/ Galenson and Thompson, op. cit., p. 32.

considerations of the long-term health of the industry. Compounding the ossification may be an accretion of governmental regulations and implementing bureaus of hoary antiquity. If management, labor, and regulators are so encrusted in their thinking and intransigent in their behavior as to resist all attempts to make the railway more responsive to modern needs for both transportation and fiscal responsibility, then only a complete upheaval -- effectively dismantling the existing entity from top to bottom -- may effect the necessary changes. Some of the reshaping options discussed in Chapter 2 may provide approaches to achieving such a deliberate and controlled upheaval. The total restructuring of the Japanese National Railways (JNR) exemplifies a reorganization deliberately undertaken to create new railway entities in place of the old.^{5/}

Separation Is Not The Only Option

14. One approach -- "separation" of fixed facility ownership from train operations -- gained prominence in recent years as a response to some of the objectives above. This emphasis on "separation" has, to some degree, miscast and oversimplified the issue. In fact, a full spectrum of options exists for reshaping the railway entity.^{6/} In any country, the aptness of each option depends on several complex factors, including the following:

15. **The relative weight and urgency of governmental objectives.** If totally eliminating the railway's operating deficit is the primary goal, then dividing the system into "commercial" and "noncommercial" markets -- the latter to be funded with a PSO -- will help, but not suffice. (Uruguay, for instance -- faced with exhausted assets, vanishing traffic, and soaring operating ratios and deficits -- chose to eliminate the entire passenger market in an effort to control the railway's costs.)^{7/} Likewise, if governmental development plans call for increased industrial development in a remote area at the end of an unprofitable branch line, then complete privatization of the rail network will not necessarily protect the government's long-term interest. These are extreme examples illustrating a basic principle: *the form of the reshaping must follow its intended function.*

16. **The relative importance of the various markets served by the railway.** If the railway primarily carries bulk freight, with insignificant passenger or parcel services, then a

5/ Kato, Hiroshi, *The Japanese Economy in Transition*, see especially the appendix "Privatization in Japan." See also Tanahashi, Yasushi, *Reform of Railways in Japan*.

6/ This paper focuses on options for reshaping the railway entity per se. For more specifics on the restructuring of relationships between the railway and the State, see (for example) Lee Huff and Louis S. Thompson, *Techniques for Railway Restructuring*, and Galenson and Thompson, op. cit.

7/ J.F. Berchesi, "The Rebirth of the Railway in Uruguay," in International Union of Railways (UIC), "Management and Policy Studies (MAPS)," seminar, Paris, September, 1989. See also Louis S. Thompson and Jorge C. Kohon, *Institutional Reform in Transport, Case Study: Uruguayan Railway*.

lines-of-business option may serve no purpose (unless it can usefully apply to submarkets within "bulk freight"). If all the markets are important and clearly identifiable, however, the lines-of-business approach may merit investigation.

17. **The available technology.** Options calling for detailed cost accounting manipulations may not prove beneficial in countries where computer installations are nonexistent or basic cost-accounting concepts are unfamiliar.

18. **The scale of railway operations as a whole.** All the reshaping options entail startup and transaction costs; in smaller systems, the costs of some reshaping options may sometimes outweigh their benefits, however attractive the end results may appear on paper.

19. **The administrative capabilities of the government and of the railway.** Creating new structures with *theoretical* advantages over the old may have negative results if one of the new entities is less insulated from political pressures, or less capable of making well-reasoned, independent decisions, than was the old. Conceivably, a fixed facility authority, divorced from the railway operator but wedded to the government, could become a convenient recipient of largesse in the form of insufficiently justified projects or overmaintained permanent way. On the other hand, some countries may not possess sufficient depth of managerial resources to operate a large and complex, monolithic railway. In such cases, a judicious division into functional and/or market-based components might yield smaller, simpler, more manageable entities that would better suit locally available expertise. Thus, the capabilities of and likely relationships between the government and the reshaped railway entity (or entities) require intense scrutiny.

20. Moreover, in practice, the vastly complex three-dimensional matrix of operating functions, service types, and geographic zones that characterizes mature railway systems may call for a sophisticated *combination* of restructuring options, rather than for any single solution. One option might be chosen for freight (or freight sub-markets), another for intercity passenger, and yet another for suburban passenger. Such is the case in Japan, where a separate entity provides freight services over the facilities of the regional passenger railways that succeeded the Japanese National Railways (JNR), and where certain of the regional railways in turn operate high-speed trains over assets of the Shinkansen Holding Corporation. The United States, where separate freight, intercity passenger, and suburban passenger operators have different functional relationships in different parts of the country, further demonstrates that complex transport requirements may necessitate intricate schemes for railway restructuring.

21. Focusing on selected points on the continuum, this paper explores generic reshaping options that can be altered or combined to fit the unique circumstances of particular countries and their railway entities.

2 THE GENERIC OPTIONS

22. In essence, each option in this chapter expresses a set of relationships between the railway entity/entities, the markets served, and the functions performed. Today's railways undertake a wide range of rail transportation services. Typically, this range addresses intercity passenger, suburban passenger, and freight markets; each market can, in turn, be further categorized (for example, into "for-profit" and "not-for-profit" segments; by geographic region, line, or city-pair; by class of service for passenger, and by commodity, lading, or service characteristics for freight). In serving these markets, regardless of the level of service differentiation, the following basic functions^{8/} must somehow be managed:

- Fixed facility ownership;
- Fixed facility improvement;
- Fixed facility maintenance;
- Control of operations (i.e., dispatching);
- Train movement;
- Equipment provision;
- Equipment maintenance;
- Marketing; and
- Financial control and accountability.

23. The order of the options, as presented below, reflects a theoretical spectrum ranging from a *single entity* accomplishing *all* basic functions, to *multiple entities* performing *different* basic functions. As the examples illustrate, no such smooth continuum exists in practice: under the "toll rail" option, a primary operator may fulfill all functions for one market while providing the fixed facility over which a secondary operator conducts train operations in a lesser market. Indeed, these generic options are by no means mutually exclusive. Even the monolithic railway has (in some countries) traditionally lent itself to small-scale "competitive access" agreements and, more recently, to lines-of-business marketing initiatives.

8/ The list of "basic functions" is intended to be illustrative, not exhaustive. Obviously, railway planners need to accord serious attention to such other important functions as stations (which the Spanish have explicitly and properly addressed in their restructuring plan -- see Chapter 3).

OPTION 1: THE MONOLITHIC RAILWAY

24. Over time and throughout the world, railways have typically been integrated transport entities, owning and operating their own fixed facilities and vehicles.^{9/} Historically, these monolithic railways have conducted a variety of transportation businesses over their fixed plants, and have generally lacked precise management information as to the relative profitability of these businesses.

25. Figure 2.1 depicts the traditional, monolithic railway structure. The vertical columns represent the three essential markets usually addressed by railways; further subdivisions are, of course, possible (for instance, freight into "bulk," "carload," "less than carload," "intermodal") but are omitted for simplicity's sake. Also, railways typically have such ancillary businesses as real estate, hotels and seaports, which are extraneous to this discussion but which may be significant in any given country.^{10/} The horizontal rows in Figure 2.1 represent the basic functions performed in support of the railway's businesses. In Figure 2.1 and similar charts, boxes in the body of the schematic indicate distinct entities performing the functions and/or services.

26. Thus, in the traditional paradigm, a single corporate entity performs all services and functions, without necessarily isolating the financial results of the various markets. Such an isolation would be impossible in some companies, and undesirable in others, since the status quo option can effectively serve to conceal cross subsidies in several dimensions -- not only among service types, but among specific lines and trains, and between the taxpayer at large and railway labor. The traditional structure is self-perpetuating: by concealing actual results, it often serves to preserve the status quo and is generally championed by those whose benefits exceed their costs under the status quo.

27. The monolithic railway was almost wholly production-oriented. Typifying ailing systems in many countries, Uruguay's railways before the restructuring lived by "a production-oriented rather than a market-led philosophy in that the enterprise provided services irrespective of market requirements and sold products of decreasing quality in terms of reliability, safety, and

9/ United Nations Economic and Social Council, Economic Commission for Europe, Inland Transport Committee, Principal Working Party on Rail Transport, "Draft study (white paper) concerning the development of an international rail transport system in Europe," p. 11.

10/ Also, railways may even have subsidiaries totally divorced from transportation, or may use "surplus" capacity of transport assets for unrelated businesses, such as printing (see Galenson and Thompson, op. cit., p. 27). Such ancillary businesses can be very important: British Rail's surplus in 1989/90 stemmed entirely from property development, according to "BR optimistic as it rides the storms," *Modern Railways*, August 1990, pp. 394-395. Thus, far from being "ancillary," consideration of important side-businesses must enter into any planning for restructuring.

Figure 2.1
Functions and Services of the Traditional Monolithic Railway

<u>Functions Performed</u>	Services Offered		
	Freight	Intercity Passenger	Suburban Passenger
Fixed Facility Ownership			
Fixed Facility Improvement			
Fixed Facility Maintenance			
Control of Operations		All functions and services performed by a single entity	
Train Movement			
Equipment (provision, maintenance)			
Marketing			
Financial Accountability			

punctuality [which] the market rejected . . ."^{11/} Embodying this attitude, the typical monolithic railway was organized so that each functional department exercised total and undifferentiated responsibility over all services. Thus, for example, in the organization chart of a typical North American railway circa 1960, the Baltimore & Ohio (Table 2.1), all "marketing" (actually "sales") functions, for both freight and passenger, reported through a single vice president for traffic. All operational functions (maintenance of way, maintenance of equipment, movement control, train movement, and clerical activities) reported through a single vice president for operations in a complex geographical/functional matrix. In effect, the only person with jurisdiction over both revenues and expenses was the president of the railway himself. The same was true in British Rail before the 1980's, where plenipotentiary Regional General Managers and traditionally strong functional hierarchies (e.g., engineering and personnel departments) obstructed comprehensive, market-based business planning.^{12/}

OPTION 2: LINES-OF-BUSINESS ORGANIZATION

28. As markets, technology, and operating practices have evolved, even on monolithic railways, commonality has diminished to a surprising degree among many of the assets and resources used in different markets. Thus, for instance, electrified suburban passenger services employ self-propelled, multiple-unit coaches necessitating specialized workshops; tracks with heavy commuter flows tend not to have much freight. Advances in management information systems have, furthermore, improved the accuracy and timeliness with which direct as well as remaining common costs can be identified with particular services. These two converging trends have enabled railway entities to reorganize themselves (to varying degrees of depth) according to lines of business so as to foster comprehensive business planning, market- and cost-sensitive decisions, and more responsive operations for each service performed. In essence, this is an option for making the monolithic railway less monolithic in a service, if not in a production sense, while reducing the entity start-up costs implicit in other alternatives.

Example: British Rail

29. British Rail (BR) has divided itself into five lines of business that are financially accountable to top management and that "purchase" service by contract from an operating department that is organized along a matrix of regional and functional lines. The lines of business include "commercial" InterCity, Freight, and Parcels. Noncommercial services include Network SouthEast (primarily commuter) and Provincial. As currently structured, BR's lines of business undertake marketing, and are financially accountable, for their respective markets.

11/ Berchesi, op. cit., p.2.

12/ Sir Robert Reid, CBE, "Presentation to the World Bank," November 1990. For a conceptual model of market-driven planning, see Neil E. Moyer and Louis S. Thompson, *Northeast Corridor: Achievement and Potential*, pp. 3-1 and 3-2.

Table 2.1

Example of Typical Monolithic Railway Organization

(Note: Elements are presented in the exact order and hierarchy shown by the carrier.
No attempt has been made to "rationalize" the structure or correct "mistakes.")

Chairman

President

Law Department: Vice President and General Counsel

Public Relations Department: Director

Finance and Accounting Departments: Vice President

Treasury

Relief Department -- Employee Benefits

Insurance

Accounting and Freight Claim

Accounting

Freight Claim

Traffic Department: Vice President

Freight: General Freight Traffic Manager

Freight Traffic Manager -- Rates, System

Freight Traffic Manager -- Sales and Service, System

Freight Traffic Manager -- Eastern Region

Coal Traffic Manager

Foreign Freight Traffic Manager

Manager, Railroad Trailer Service

Manager, Merchandise Traffic (less than wagon-load)

General Perishable and Livestock Agent

Assistant General Freight Agent

Freight Traffic Managers by [other] Region

(Note: traffic regions do not exactly match operating regions)

New York

Central

Northwestern

Southwestern

Industrial Development

Agricultural Development

Passenger: General Passenger Traffic Manager

General Passenger Agent -- Sales, System

General Passenger Agents in Major Traffic Generating Points

General Passenger Agent -- Rates, System

Advertising Manager

General Eastern Passenger Agent

Mail, Express, and Baggage: Manager

Superintendent, Mail Traffic

Superintendent, Express Traffic

Table 2.1 (continued)

Operating Department: Vice-President
 Assistant to Vice-President
 Manager, Budget Controls and Statistics
 General Superintendent, Motive Power and Equipment
 Chief Engineer, Motive Power and Equipment
 Manager, Research
 General Superintendent, Transportation
 Chief of Yard and Terminal Operations
 Superintendent, Car Service
 Chief [Civil] Engineer
 Signal Engineer
 Superintendent, Communications
 Fuel Agent
 Manager, Station Operations
 Manager, Highway Transportation and Warehouses
 Superintendent, Safety Department
 Superintendent, Floating Equipment

 New York Terminal Region: General Manager
 Central Region: General Manager
 Western Region: General Manager
 Chicago Terminal Region: General Manager

 Police: General Superintendent
 Dining Car and Commissary: Manager
Personnel Department: Vice President
Research and Development Department: Vice President
Purchasing Department: General Purchasing Agent

Source: Adapted from the representation of The Baltimore & Ohio Railroad Company in the *Official Guide of the Railways*, February 1959, pp. 352-353.

While the lines of business perform comprehensive business planning and define service requirements, all facilities, equipment, and train movements remain under the aegis of the regions, as depicted in Figure 2.2. The result is an "appallingly complex matrix" of internal contracts between the people specifying the services and those providing them. According to John Welsby, BR's chief executive, "we were spending an ever-increasing portion of our time chasing this internal matrix around rather than addressing our attention where it really should be -- to the needs of our passenger and freight customers."^{13/} Moreover, it is unclear exactly how fixed facility costs are apportioned to the services concerned, and the degree to which "profitable" services reflect in their internal financial statements the fixed and variable costs for the facilities they use.

30. Whatever its drawbacks, the reorganization of the 1980's seemingly achieved, without undue disruption or startup costs, an opportunity to give commercial sectors a realistic profitability goal, and incentives to "noncommercial" lines of business to reduce their losses. Having met its financial objectives in the 1980's, BR reports that "the railway now costs the taxpayer 51 percent less in real terms than in 1982."^{14/} Even the restructured BR cannot avoid cyclical business swings, however: the recession-induced results for 1990-91 have by no means accorded with the objectives of the current three-year plan.^{15/}

31. Spurred by the successes of its restructuring initiative and recognizing its failings, BR is now abolishing the regions totally and allocating their resources to the lines of business to which they most closely pertain. Where two or more lines of business make use of the same assets or staff, the primary user will rent the property or services to secondary lines of business on a "toll-rail" basis. Thus, InterCity will "own" King's Cross Station, London, which Network SouthEast (the commuter operator) will share as a "tenant." This important elaboration of the lines-of-business option appears in Figure 2.3.^{16/}

Other Examples of Lines-of-Business Organization

32. Viewed in the large, the massive restructurings in the United States, Japan, and Canada partake of the lines-of-business concept because they assign the freight, intercity passenger, and

13/ Richard Tomkins, "A new track to profit centres," *The Financial Times* [no date or page number; presumably June 1991].

14/ Reid, *Presentation to The World Bank*, p. 8. The same author provides further details on the internal organization of British Rail in his discussion paper, *Institutional Reform in Transport: The British Rail Experience*, pp. 20-24.

15/ "Sir Bob takes the initiative in hard times," *Modern Railways*, XLVIII (August 1991), 393-394. Moreover, according to "Misty Vision" in the September 1991 *Railway Gazette International*, both staffing levels and passenger complaints have allegedly shown increases since 1989.

16/ Tomkins, op. cit.

Figure 2.2
Lines-of Business Options
(British Rail Version, 1980's)

Functions Performed	Markets Addressed				
	Parcels	Freight	Passenger		
			InterCity	Provincial	SouthEast
Fixed Facility Ownership					
Fixed Facility Improvement					
Fixed Facility Maintenance					
Control of Operations			Functions performed by regions for all markets		
Train Movement					
Equipment (provision, maintenance)					
Marketing			Functions performed		
Financial Accountability			by the respective lines-of-business		
				Public Service Obligation (PSO)	

Figure 2.3
Lines-of Business Options
(British Rail Version, 1990's)

Functions Performed	Markets Addressed				
	Parcels	Freight	InterCity	Passenger	
				Provincial	SouthEast
Fixed Facility Ownership					
Fixed Facility Improvement					
Fixed Facility Maintenance	Most main lines "owned" and controlled by InterCity. Facilities primarily used by other markets would be "owned" and controlled by respective lines of business.				
Control of Operations					
Train Movement					
Equipment (provision, maintenance)					
Marketing					
Financial Accountability				Public Service Obligation (PSO)	

suburban passenger markets to separate institutions. More akin to the original BR approach are the internal reorganizations in France (SNCF) and Spain (RENFE); the Swedish rail operator (SJ), shorn of its fixed facilities (see below under the "toll-rail enterprise") has also organized itself along market lines.^{17/}

33. Faced with the need to consolidate the East and West German railways, a German government commission has developed a coordinated set of restructuring proposals. These embody several elements of recent reshaping schemes elsewhere: a new State-owned company, Deutsche Eisenbahn AG (DEAG) would "manage and maintain the infrastructure, receiving fees for its use *from its own business groups and possibly from other operators* [emphasis added]." Incorporating aspects of the lines-of-business and, potentially, competitive access options, this arrangement would follow the EC directive in requiring separate cost centers and accounting for fixed facilities and operations, respectively. Services would be divided along commercial/noncommercial lines, with the latter receiving PSO payments from regional and local authorities. The commission's report does not explicitly delve into DB's overstaffing problem, nor does it promise to eliminate the civil service status of current employees.^{18/}

34. In 1990, RENFE unveiled an ambitious restructuring plan. In essence, it created two distinct types of business units (BUs): "market" BUs to plan, market, coordinate, and be financially accountable for the various lines of business; and "functional" BUs to perform operations and maintenance according to "profit performance criteria," by agreement with the "market" BUs. One "market" BU, High-Speed, will exercise a greater degree of direct control than will the others over facilities and operations. Figure 2.4 illustrates the Spanish restructuring scenario.^{19/} Because the matrix of functional and market business units is innovative, RENFE's experience in applying this model will spark interest among railway managers throughout the world.

17/ Galenson and Thompson, op. cit., pp. 23-24.

18/ "Strategic report forms basis to build commercial railway," *Railway Gazette International*, CXLVII (September 1991), p. 555.

19/ The figure is extrapolated from RENFE, "New Corporate Model," March 1990. This source is unclear as to the precise span of control of the "high speed" BU -- i.e., whether it purchases some services from the functional BUs or is entirely insulated. The "ownership" function is arbitrarily identified with the Infrastructure Maintenance and High Speed BUs; of course, ownership actually rests with RENFE as a whole. The source also provides an organization chart showing how complex the model actually is. For example, the BUs are grouped into larger "directorates" as follows: high-speed and suburban each have a "directorate" of their own; infrastructure maintenance, "traffic" (operations analysis and control), freight, and parcel constitute a third directorate; regional and long distance passenger, with station services, constitute a fourth; and rolling stock maintenance, with "traction" (seemingly "train movement"), comprise the fifth.

Figure 2.4
Spanish Restructuring

Markets Served							
Functions Performed	Passenger					High Speed	
	Freight	Parcels	Long Distance	Regional	Suburban		
Fixed Facility Ownership							Functional Business Unit: Infrastructure Maintenance
Fixed Facility Improvement							
Fixed Facility Maintenance							
Control of Operations		Functional Business Unit: “Traffic”				Market Business Unit: High Speed	Accountability of Functional Business Units
Train Movement		Functional Business Unit: “Traction”					
Stations and Common Svcs.		Functional Business Unit: Stations and Common Services					
Equipment (provision, maintenance)		Functional Business Unit: Rolling Stock Maintenance					
Marketing	Market Business Unit: Freight	Market Business Unit: Parcels	Market Business Unit: Long Distance Passenger	Market Business Unit: Regional Passenger	Market Business Unit: Suburban Passenger		
Financial Accountability							



= PSO

OPTION 3: COMPETITIVE ACCESS

35. Under this option, competing railway companies would have exclusive control over some trackage, but would also have (and give) the right of competitive access over the trackage of (to) other companies. One variation within this option would be a "regional overlap" approach, wherein regional (or national) operators would be given the right to operate over tracks leading to major traffic centers in adjoining regions (or countries). Smaller-scale options such as trackage rights and joint terminal agreements provide useful practical examples of the competitive access approach.

Small-Scale Approaches to Competitive Access.

36. For more than a century, railways have made use of small-scale competitive access arrangements to reduce their operating and capital costs and to reach important markets in a mutually beneficial manner. Examples of these arrangements include the following:

37. **Trackage Rights.** Table 2.2 summarizes a typical trackage rights agreement between the Norfolk & Western Railway ("Railway A") and another carrier ("Railway B"). It reflects, in microcosm, the larger issues that arise in a competitive access scenario: assignments of functions and markets, costing, upgrading decisions, maintenance, operating rules, liabilities, mechanisms for dispute resolution, term of the agreement, and what happens if the owner wishes to abandon the track. The greatest level of detail in the agreement applies to liability and procedures in case of abandonment. Clearly, when separate entities are involved, legal complexities multiply. (Fortunately, these are standard agreements so that legal fees, at least, are subject to economies of scale. The same would not necessarily hold true for a major restructuring.)^{20/}

38. **Interchange Agreement.** Even smaller in scope is an interchange agreement (Table 2.3), in which two railroads wishing to interchange freight cars designate properties on which such transfer is to be effected and the terms and conditions governing joint use of such properties. Again, the agreement devotes considerable detail to liability considerations.

39. **Joint Terminal Agreement.** A third type of small-scale competitive access arrangement is a joint terminal agreement, which affords Railway B an opportunity to make use of Railway A's freight handling facilities at a particular location. The example (described in Table 2.4) uses a two-tiered cost allocation approach: a fixed rental, based on the value of the property and the cost of capital at that time; and a variable component, based on the expense of Railway A's operating the joint terminal, shared in proportion to the tons of freight handled by each carrier.

20/ Cf. Daniel L. Overbey, *Railroads: The Free Enterprise Alternative*, pp. 68-69.

Table 2.2
Summary of Typical Trackage Rights Agreement

Basic Concept

Railway A allows Railway B to operate its own trains with its own crews over a specified portion of Railway A's track.

Contents of the Agreement:

Identification of Trackage:

- The covered trackage is clearly demarcated.

Railway A Retains All Rights:

- Management control of, operation over the track.
- Right to award trackage rights to third parties.

Limitations on Railway B's rights:

- To provide a specific service only (e.g., serve one company).
- No other service to be provided (e.g., no other local freight service on Railway A).
- Trackage rights may not be sublet to other railways.

Cost:

- Base charge: per wagon-mile. Amount specified in agreement (23 cents).
- Calculate by multiplying Railway B's units times mileage of joint trackage.
- Escalation clause: per-wagon-mile cost will rise with inflation.
- Accounting/billing procedures specified.
- To be renegotiated every five years.
- Incidental costs (other than base charge): direct labor and materials, plus established overheads and equipment rentals.

Upgrading:

- Railway A may upgrade joint trackage as it desires.
- Improvements made to accommodate Railway B to be paid for by the latter, including initial capital and incremental maintenance costs.

Maintenance:

- Will be Railway A's responsibility.
- Performance standard: to allow Railway B to operate 263,000 pound wagons and six-axle locomotives [no speed standard specified].
- Beyond that, condition and availability of trackage not guaranteed.
- Railway B to hold Railway A harmless for consequences of Railway A's failure to maintain.
- If Railway B pays, Railway A will do more maintenance.

Operation:

- Railway B to comply with Federal and State safety laws and be responsible for same.
- Railway B to comply with Railway A's rules and movement orders.
- Railway B to assure and pay for its employees' qualification to operate over Railway A's trackage.
- Railway B to obtain and pay for radio equipment for use on Railway A.
- Procedures for disciplinary actions.
- Railway B to pay Railway A for any assistance rendered if equipment breaks down.

Table 2.2 (continued)

Liabilities:

- Extensive provisions, in which all conceivable occurrences are provided for.
- In general: Each railway is responsible for its own losses regardless of fault.
- Labor claims to be borne by each party for its own employees, except: Employees hired by Railway A for the benefit of Railway B will be covered by Railway B.

Arbitration Clause

Terms of Agreement; Termination; Event of Abandonment:

- Term is set at 30 years in the example.
- One year's notice is required for termination by Railway B.
- Railway A can abandon the line; Railway B would then have an option to purchase.

Successors and Assigns

Source: Norfolk & Western Railway Company, sample trackage rights agreement with general conditions [no bibliographic data available].

Table 2.3
Summary of Typical Interchange Agreement

Basic Concept

Railways A and B wish to interchange cars at a specific location. In this example, Railway A provides the specific track on which such interchange will occur. Railway A also permits Railway B to operate over so much of Railway A as to reach the interchange track.

Contents of the Agreement

Identification of Interchange Track

Precise Definition of Interchange:

- Occurs when locomotive is uncoupled from cars left on track.
- [Precision is important because of car hire charges.]

Railway A to Maintain Track

Cost Arrangement:

- Railways A and B to split 50/50 the "annual normalized maintenance costs."
- Current cost level is specified.
- [There is no guarantee that Railway A will actually spend that money on maintenance of the covered trackage.]

Applicable Rules:

- Interchange rules of Association of American Railroads (AAR).
- Federal/State safety rules: each party is responsible for its own adherence to the rules; each may reject rolling stock not in compliance with the rules.

Wrecks and Liabilities:

- Complex provisions.
- In general, each railway is responsible for its own rolling stock, and "no fault" applies.

Arbitration Clause

Source: Norfolk & Western Railway Company, sample interchange agreement.

Table 2.4
Summary of Typical Joint Terminal Agreement

Basic Concept

Railway A owns and operates a freight terminal at a specific location. Railway B obtains the right to use this facility jointly with Railway A.

Contents of the Agreement

Identification of Facilities

Functional Responsibilities:

- Railway A to perform all business and operational functions at the terminal.

Costs Charged to Railway B (annual):

Fixed Amount:

- For existing facilities, 2.5 percent of the value stated in the agreement.
- For incremental improvements if made by Railway A, 3.5 percent of their value.

Variable Amount:

- **Railway A's Costs to be Allocated:**
 - Train movements within terminal (including salaries for switching forces).
 - Taxes and assessments.
 - Salaries of agents and clerks.
 - Utilities for buildings.
 - Maintenance of covered properties.
- **Allocation Basis:**
 - Proportion of each railway's freight tonnage to total freight tonnage handled at terminal in any month.

Accounting and Billing Procedures

Liabilities:

- As usual, provisions are complex.
- Each party is generally responsible for loss and damage which is the fault of its sole employees or of defects in its own equipment.
- But: if loss or damage is caused by agents or employees involved in the joint operation, then no-fault prevails.

Default and Termination; Arbitration

Note: Not only does Railway A fail to assure that it will handle B's traffic with the same dispatch as its own, it makes itself non-liaible for any deficiency or act done or omitted by A's agent with respect to B's business.

Source: Pittsburgh, Chartiers & Youghioghenny Railway Co. and Pittsburgh & Lake Erie Railroad Co., joint terminal agreement for McKees Rocks, Pennsylvania, August 1, 1902.

40. **Joint Switching Agreement.** Finally, the joint switching agreement described in Table 2.5 has particular relevance because it rotates responsibility for all switching at a particular plant among three carriers. This is one self-balancing technique to counteract the natural tendency, on the part of the entity in control at any given time, to give preferences to its own operations.

41. **Advantages of Small-Scale Options.** These small-scale options developed because they mutually benefitted all parties concerned: were the benefit not mutual, such agreements would not have been signed or carried out between private, for-profit carriers. With the traffic of more than one carrier concentrated on a single facility, fixed maintenance, transportation, and investment costs could be spread over a larger traffic base, thus contributing to the landlord railway's profitability. The tenant, for its part, could enter new markets without making the capital investments that a duplicate facility would otherwise require. Such arrangements often yielded enhanced competition in the transportation marketplace -- a benefit to shippers and, allegedly, to the public. Since these small-scale options usually spawned no new, large corporate entities, the startup costs were low and implementation could occur relatively quickly.

42. Administratively simple, inexpensive, and beneficial to all parties directly involved, trackage rights and other joint agreements offer intriguing options for application on a larger scale as part of national restructurings. The examples below rely heavily on trackage rights as a basis for large scale competitive access scenarios.

Large-Scale Paradigm.

43. Building on the smaller-scale competitive access concepts described above, the paradigm in Figure 2.5 assumes a national railway comprising largely autonomous regions, exemplified by Regions A, B, and C. Each region behaves like a separate corporation that contains, on the one hand, line-of-business profit centers and, on the other, a cost center that controls and maintains the fixed facility and charges the lines of business for its use. Internal charges are set so that the fixed facility cost center breaks even.

44. The large half-tone dots in Figure 2.5 are traffic generating nodal points. Via trackage rights and appropriate terminal arrangements, each regional railway provides service at least over all the links for which its nodes are endpoints, and possibly beyond. Thus, between major traffic generating centers, one or more additional regional railways (beyond the "owning" regional railway) would be authorized to market and haul traffic. (This illustration is based on trainload freight between the traffic generation points.) To assure competition, the fixed facility cost center in Region A exacts the same user charges from the Region A profit centers as it does from those of Regions B and C, and so forth in the other Regions. In this way each major transportation market can have competitive service throughout much of the network.^{21/} Shippers would, of course, have the right to designate which railway would handle their traffic between the competitive nodal points.

21/ Most *intra*regional freight would still be captive to one regional carrier; where truck competition is weak or non-existent, the regional railway would still exercise a monopoly over such traffic. Hence the regulatory concerns addressed below.

Table 2.5
Summary of Typical Joint Switching Agreement

Basic Concept

Railways A, B, and C agree to share the switching responsibilities at a major industrial plant; each road will do the switching for all three, for a four-month period. [Ownership of the track here is evidently divided between the plant, and Railways A, B, and C.]

Contents of the Agreement

Identification of Facilities

Responsibility of the Switching Railway:

- Provide crews and locomotives and switch all cars to, from, and within the plant.
- The switching road will "give no preference" to its own traffic. [The rotational scheme helps to assure this; see text.]

Revenues:

- Will always accrue to the carrier on whose behalf the cars are switched.

Expenses:

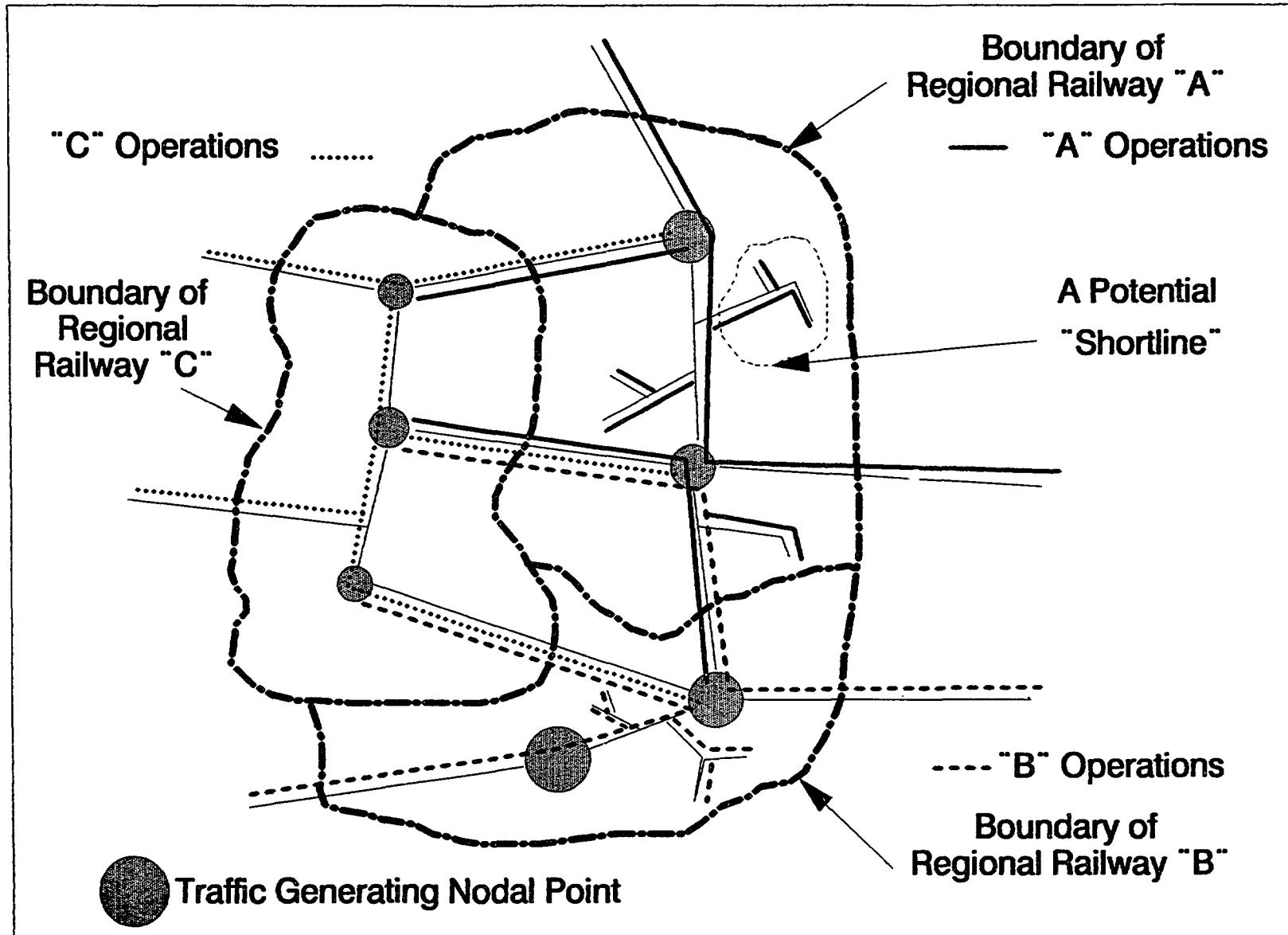
- Variable costs only are allocated.
- Costs covered:
 - Engines and supplies at standard rate (here \$7.50/hour).
 - Engines and switching crews: standard rate paid each employee.
- Allocation formula: Based on each road's projected share of loaded cars.

Liabilities:

- Very complex; occupies 50 percent of agreement's length and provides for every contingency.
- Under certain circumstances, liability is allocated in proportion to car counts for the six months preceding an accident.

Source: Wheeling & Lake Erie Railway Co., Pennsylvania Railroad Co., and Baltimore & Ohio Railroad Co., joint switching agreement for Massillon, Ohio, July 20, 1932.

Figure 2.5
Competitive Access Option: "Regional Overlap" Concept



45. Such a paradigm may be particularly appropriate in countries with heavy rail freight densities and virtually no competing transportation modes. In addition, the competitive access model can be applied to *groups* of countries, the national railways of each would function as the "regional" entities assumed in the paradigm.

46. Over a broad range of applications, this paradigm evokes two critical issues: trackage use charges and regulation.

47. **Trackage use charges.** Both the structure and level of the trackage fees will be important in determining how well this approach would work. If the fee *levels* are too high (reflecting inefficiency in the cost of providing capacity), then traffic will be depressed. The identical "tolls" for all users would provide some incentive for the owning railway to control its costs. Similarly, the development and publication of comparative maintenance cost statistics among the regional railways would identify poor performers and lead to pressure from the marketing departments. No matter what else happens, the principle must be established that the fixed facility cost centers must recover from users all their costs (so that fee levels are not too low). As explained in detail under "technical considerations" in Chapter 3, the fee *structure* is vital because it can determine the way in which the operators perceive their incentives to design services, load wagons, organize trains, and so forth. For example, a fee structure based on axles (weighted by tonnes per axle), trains, *and* track usage time (weighted by peak hours versus off-peak hours) would provide an incentive to run heavy wagons (subject to the axle load weights), long trains, adequate power (in order to reduce running time and the costs of delay due to locomotive failure), and at the right times (due to peak charges). To be fair, the fixed facility cost center would probably have to provide a rebate based on the number of minutes of delay caused by problems (dispatching errors, track maintenance, signal failure, and the like) which were not the fault of the train operator. By contrast, a fee structure solely based on wagon-kilometers (as is common in the U.S.) would reduce the incentive to run long and full trains.

48. **Regulation.** Depending on the economic conditions and transportation environment of the country or countries adopting this paradigm -- in particular, if no inter- or intramodal transportation competition to the state railway now exists -- rate and service regulation may prove necessary. This regulation might base itself on such principles as the following:

- Non-discrimination between essentially similar shippers under similar circumstances (useful in principle, although almost unenforceable in practice);
- No single rate can exceed its variable (avoidable) cost by an excessive amount without good reason. In the U.S., this amount is 100 percent (i.e., the rate cannot be more than twice the variable cost), but almost any other target can be established.
- The overall rate of return earned by the regional railway as a whole would have to be at or near the opportunity cost of capital.

49. Furthermore, the national government(s) might have to determine which railways may serve which markets. Even with this implied level of governmental interference, the competitive access paradigm could lead to more competition and more effective railway management than presently exist in countries with heavy freight densities and virtually no competing transportation modes.

European Community Directive

50. Containing elements of several reshaping options, the European Community directive most closely resembles the competitive access paradigm. Each country would carve out its fixed facility either as a separate entity or as a distinct cost center; in either case, the State would ensure non-discriminatory, equitably priced access to its railway network for "international groupings of railway undertakings, and for railway undertakings engaged in the international combined transport of goods." In other words, competitive access would have to be provided for international traffic.^{22/} The directive also addresses concerns common to railway restructurings throughout the world: for example, the separation of commercial and noncommercial services and the provision of public service obligation grants by the State or local authorities, the enhancement of railway managers' commercial orientation, and the rationalization of the railway's debt structure to strengthen the autonomous management of the railways.^{23/}

51. The proposals antecedent to the EC directive engendered controversy. The concept of the monolithic railway as an integrated organism, in which a central controlling "brain" regulates all "bodily" functions, inheres in many railway managers and experts. Indeed, the organic concept underlies the negative reply of the Community of European Railways (CER) to the European Commission Communication on a Community railway policy. In itself, according to the CER, the proposed separation of fixed plant from operations "does not . . . justify a full-scale debate." Citing the "grave implications" of the Commission's proposal, the CER goes on to say:

Unlike other modes of transport, the rail system is an integrated system. All the means of production are managed accordingly. The separation, other than in accounting terms, of rail infrastructure and rail services calls for very detailed consideration of . . . legal status, financial liability, planning, responsibility for services, and relations between the infrastructure management and the operator. Different criteria . . . apply in each Community member State.

52. Similarly, the CER inveighs against the competitive access element of the proposal.

22/ Council of the European Communities, "Council Directive of 29 July, 1991, on the development of the Community's Railways," Preamble and Articles 1, 8, and 10.

23/ Ibid., Articles 5 and 9.

. . . Access should be restricted to undertakings which bring genuine added value to the railway system . . . The majority of Community rail networks are not yet convinced that such a proposal would have beneficial consequences for the operation of the European network.^{24/}

53. By way of a counterproposal, the CER points to the existing European subsidiaries (e.g., Intercontainer, Interfrigo^{25/}) to show that options short of competitive access, and under the aegis of the existing railways, are fully available to meet the objectives set by the Community proposal.

Implications of Competitive Access

54. The concept of expanded access to rail facilities theoretically represents a spectrum ranging from commonplace, highly controlled arrangements (e.g., trackage rights) to uncontrolled competition for available capacity.

55. The latter is indeed an extreme. Totally free access, in which vehicles operated by different entities present themselves randomly for passage over a given railway link, *will not work* because:

- A railway's capacity is determined not just by endpoint terminal "slots" but by line capabilities, which are always limited by the number of tracks, the spacing and configuration of interlockings and line junctions, the signalling system, differential time/distance curves of various service types, and related physical and operational factors. While the theoretical capacity of a line segment may be great, its ability to accommodate a given type of service making given stops at a particular time of the day may be limited in the extreme.
- Thus, introduction of random vehicles into a necessarily carefully scheduled railway operating plan will result in inevitable and material delays.
- While a single entity exercising complete control over facility and operations may make advance policy decisions that would allow unscheduled operations and pre-plan the effects of consequent delays, and while multiple entities can agree in advance on policies for dealing with scheduled services, *totally* free access in a railway setting would result in regular infringements by independent entities on each other's operations and could degenerate into unacceptable service levels for all.

24/ Community of European Railways (CER), "Reply of the CER to the document of Mr. Van Miert (Ref. COM (895) 564 final of 1/25/90)," p. 10.

25/ It is interesting to note, in passing, that these entities, the existence of which the CER supports, themselves represent departures from the monolithic railway.

56. The specter of disorganization -- so foreign to the organic concept of the railway, discussed above -- underlies the CER's obvious disdain for competitive access. However, since competitive access is a continuum of possibilities, the options need not totally undermine the central control of railway operations. When the EC directs that access to member States' railways be accorded to international traffic,^{26/} it does not specify that the access shall be "on any terms" or haphazard in any way. The Swedish restructuring explicitly allows for a form of competitive access at some time in the future: "As a government agency Banverket must plan for a neutral treatment of different transport companies, which may become competitors for future access to the tracks."^{27/} "Neutrality" in this context does not necessarily connote a lack of discipline. Finally, although Isabel Benham promotes a revolutionary "open access" concept to be applied throughout the United States, her idea of a "Roadway Corporation" to own, maintain, and manage the fixed facilities still preserves a high degree of centralized control over train operations.^{28/}

57. Competitive access to rail facilities is not a new concept, as the examples indicate. The trackage rights agreements dating to the nineteenth century represented attempts by railway companies to expand beyond their physical limitations. As railway restructuring proposals become larger in scale, competitive access will become more feasible. Yet however free the access, considerable planning of train operations and detailed protocols for resolving conflicts will still be necessary because of the inherent nature of the railway.

OPTION 4: THE "WHOLESALE"

58. Functioning as a "wholesaler," the railway entity could own and operate the fixed facility and perform all operations on behalf of marketing entities which would be the "retailers." This would mean that the railway itself would only haul trains; it would target its marketing efforts at retailers, not at shippers. It might furnish some, or all, of the rolling stock and crews, at the retailer's choice. Figure 2.6 displays a "wholesaler" option; many variations on the theme are possible, even over a single railway.

59. For instance, American President Lines (APL) functions as a transportation "retailer," marketing the business (double-stack containers), collecting the revenues, and dealing with shippers. The performing railway hauls complete APL trains, provides crews and locomotives, and charges APL. In Australia, a number of freight forwarders function as retailers using the state railways' "wholesale" services. As multimodal transport providers, these forwarders conduct a large, deregulated trucking business. They control their own rail terminal and yard

26/ Council of the European Communities, *op. cit.*, Preamble and Article 1.

27/ Banverket, "Information about the new Swedish National Rail Administration," p. 3.

28/ Isabel Benham, "Open Access: A Concept for the Railroad Industry's Survival."

Figure 2.6
Wholesaler Option
(Relates to single line of business only. Specific wholesaler/retailer agreements will govern specific functional responsibilities)

<u>Functions Performed</u>	<u>Line-of-Business</u> <u>(e.g., double-stack container freight)</u>
Fixed Facility Ownership	WHOLESALER (RAILWAY) FUNCTIONS
Fixed Facility Improvement	
Fixed Facility Maintenance	
Control of Operations	
Train Movement	
Locomotives	
Wagons	RETAILER FUNCTIONS
Marketing	
Financial Accountability	

operations and negotiate on the open market with the railways to charter unit trains with agreed-upon service specifications. As a result, despite a state monopoly on railway ownership, competition among these efficient intermodal "retailers" flourishes.^{29/}

OPTION 5: THE "TOLL RAIL" ENTERPRISE

60. Under this option, the entire fixed facility (track, signals, communications, electrification, and so forth), except for exclusive facilities, would be the property and responsibility of one owner. There could be one or more authorized user(s), each of which would pay tolls for use of the facility. In some forms of this option, the tolls would be public and nondiscriminatory, but might well vary by train size, axle load, direction of travel, time of day, season, and similar criteria. In a sense, the "toll rail" enterprise would be much like a regulated public utility.^{30/}

61. Although the "toll rail" may well include elements of "competitive access" and vice versa, the two approaches differ in emphasis: under the "toll rail" approach, separate entities provide the fixed facility and conduct operations, whereas under "competitive access," more than one entity operates in a given market over a particular fixed facility.

62. Examples of the "toll rail" option range from Sweden, which has completely sundered fixed facility from operating functions, to the United States and Japan, which have very complex arrangements containing significant "toll rail" components, at least in certain regions. In none of these examples does competitive access play a large-scale role, although Sweden is studying the possibility.

Sweden

63. In July 1988, Sweden embarked on a very ambitious restructuring centering on a complete separation of fixed facility from operating functions -- a pure example of the "toll rail" option. As shown in Figure 2.7, a facility entity (Banverket) now owns and maintains all railway track in the country. The Swedish State Railways (SJ) has become an operator only, with responsibility for all commercial passenger and freight services, as well as the mandate to operate such noncommercial freight, intercity passenger, and commuter services as national or local authorities do not elect to operate themselves or under contract to others. Reorganized on a lines-of-business basis, SJ will *not* provide non-commercial services unless appropriate subsidies are paid by the cognizant government authorities. In theory, an opportunity exists for

29/ Theodore Keeler, *Railroads, Freight, and Public Policy*, p. 131.

30/ For typical "toll rail" proposals, some of which contain competitive access elements, cf.: Daniel L. Overbey, *Railroads: the Free Enterprise Alternative*, pp. 127 ff.; D. Daryl Wyckoff, *Railroad Management*, pp. 130 ff.; and Benham, op. cit. In the United States, this concept entered (at least "cursorily") into the Preliminary System Plan developed in response to the Northeastern rail crisis of the 1970's (see Eric W. Beshers, *Conrail: Government Creation and Privatization of an American Railroad*, ch. VI, p. 4).

Figure 2.7
"Toll Rail" Enterprise Option
 (Swedish restructuring, 1988)

<u>Functions Performed</u>	Markets Addressed					
	Freight			Passenger		
	Non-Commercial	Commercial	Commercial	Inter-Regional	Regional	Suburban
Fixed Facility Ownership						
Fixed Facility Improvement			BANVERKET (Facility Entity)			
Fixed Facility Maintenance						
Control of Operations						
Train Movement						
Equipment (Provision, Maintenance)		SJ (Operating Entity) (Organized by business groups)			LOCAL AUTHORITIES (most contract with SJ)	
Marketing						
Financial Accountability	COUNTY PSO			STATE PSO		

competitive access in the new Swedish arrangement; in one of fifteen regions, SJ in fact lost the tendering of the 1989 service contract to a small, private operator.^{31/} SJ and the private operator are not, however, directly competing against each other in that region for that market.

64. The documentation from Sweden^{32/} suggests that the prime purpose for effecting the separation was to place the railways conceptually on the same footing as roads, so that investment and maintenance decisions would take into account the full range of public costs and benefits.

65. Although long-term trends have not yet emerged, SJ has apparently upgraded its productivity and financial performance since the restructuring occurred.^{33/} The Swedish Government plans to complete a major assessment of its new policy in 1992,^{34/} and has recently instructed the Banverket to investigate the possibility of reintroducing competition into the rail sector.^{35/}

Japan

66. The documentation for the April 1987 restructuring^{36/} points to its underlying goal: to create a cataclysm so complete in the JNR that the latter's intractable problems of excess labor, bloated size, and flabby management would disappear in favor of smaller, leaner organizations, most of which would have hope for profitability. The "toll rail" was a key element of this complex plan; the basic structure, as diagrammed in Figure 2.8, consists of six regional owner/operators that are both facility entities and operators of the primary service, intercity passenger. A single national freight operator operates on trackage rights over the six regional railways; payments are calculated separately for the major facility components. Pure separation of fixed facility ownership from operation occurs only with respect to the high-speed lines, which the separate Shinkansen Holding Corporation owns and leases back to the passenger railways. Improvement projects extending the Shinkansen system are the responsibility of the Japan Railway Construction Corporation.^{37/}

31/ Stig Larsson, "The Restructuring of SJ," p. 4.

32/ See the long list of references for Sweden in the bibliography. In particular, the works of Lars Hansson describe the theoretical and ideological underpinnings of Sweden's complete separation of fixed plant from operations.

33/ Galenson and Thompson, op. cit., p. 23.

34/ Jan Brandborn and Lars Hellsvik, "The New Railway Policy in Sweden: Separation of Network and Operations," p. 10.

35/ Jan-Eric Nilsson, letter to José Carbajo.

36/ See, in particular, Yasushi Tanahashi, *Reform of Railways in Japan*, and Hiroshi Kato, *The Japanese Economy in Transition*.

37/ "Shinkansen extensions to go ahead," *Railway Gazette International*, CXLVII (September 1991), p. 561.

**Figure 2.8
JNR Restructuring**

Functions Performed	Markets Addressed				
	Intercity Passenger				
	Commercial				Suburban Passenger
	Freight	Non- Commercial	High-Speed	Other	
Fixed Facility Ownership			Shinkansen Holding Company		
Fixed Facility Improvement	Passenger Companies by Region		Japan Railway Construction Company		
Fixed Facility Maintenance					
Control of Operations		3 ISLAND PASSENGER COMPANIES (Kyushu, Hokkaido, Shikoku)			Private Urban Rail- ways
Train Movement			3 MAINLAND PASSENGER COMPANIES (East, West, Central)		
Equipment (Provision, Maintenance)	FREIGHT COMPANY				
Marketing					
Financial Accountability		"Endowed" PSO			

67. Sufficient time has not elapsed to judge whether this total restructuring will achieve success. However, the results for the first three years afford some encouragement. First, the three commercial intercity railways are showing operating profits higher than originally projected. For these companies, there is hope that commercial management principles are indeed flourishing. Second, the freight railway appears to be at least marginally profitable.^{38/} Third, total employment has declined drastically from the JNR days. And fourth, anecdotal evidence suggests that attitudes among the staff have matured from the days of the JNR "unsinkable ship" -- a prerequisite to the marketing sensitivity that must precede railway survival and growth in societies that present the public with other transportation options.

68. The critical test for the JNR restructuring is not whether the commercial networks can endure -- they seem to be self-sufficient for the time being -- but whether the noncommercial networks can survive on the interest from the "stabilization fund" that endows their public service obligation. Thus far the three island companies have generated deficits which were manageable on the income from their "endowment." Yet two out of the three island companies did not fully meet the financial targets of the reform plan; traffic levels have not shown satisfactory increases; and depopulation and road improvement continue on the islands. Still another goal of the restructuring, repayment of the long-term debt, has lagged. In sum, the reshaping of Japan's railways has produced results warranting guarded optimism for the moment.^{39/}

United States: Amtrak

69. Viewed in the large, the situation in the United States has gradually evolved since the late 1960's into a lines-of-business structure, with different entities addressing different markets and considerable intramodal competition remaining in the freight market. Elements of the "toll rail" option pervade the new structure, nevertheless.

70. In most of the country, the facility owner/operators are the freight railways, with Amtrak using trackage rights or paying fees as a secondary operator. In the Northeast Corridor, however, the situation is more complex. There, three primary facility entities exist: Amtrak south of New Rochelle, New York, and between New Haven, Connecticut and the Massachusetts state line; the States of New York and Connecticut, represented by Metro North and the Connecticut Transportation Authority, between New Rochelle and New Haven; and the Commonwealth of Massachusetts for the portion of the line in its territory. Commuter operators abound in this region and are very important over much of the line; their influence over the facility varies.

38/ Galenson and Thompson, *op. cit.*, Annex B, pp. 59-62.

39/ For a measured appreciation of those results, see Tanahashi, *op. cit.*, pp. 24 ff. It is significant to note that the Shinkansen Leasing Corporation is being terminated and the lines divided among the three using railways, apparently because the expected benefits of the leasing arrangement did not justify the added complexity of the arrangement (p. 22).

71. Overall, this "restructuring" -- achieved by fits and starts over a 20-year period, with no preordained master plan -- has fulfilled the very important goals of separating the responsibilities for different types of services, assigning common costs by negotiation, and revealing, at least grossly, the transport economics of the lines of business involved. With regard to the intercity passenger market, Amtrak has improved the percentage of costs covered by revenues, and in many submarkets (particularly in the Northeast Corridor) has upgraded service, sometimes dramatically. From a service standpoint nationwide, however, perfection has yet to be attained. Whether the system is providing the quality and quantity of transport that national policy would demand is unknown, since national policy toward Amtrak tergiversates between the Executive and Legislative branches. For the freight railways, now relieved of a passenger burden which most found more unprofitable than freight, the partial separation of fixed plant from operations has proven very beneficial.

Canada: VIA

72. In 1977, Canada created VIA, a crown corporation charged with intercity rail passenger service throughout the Dominion. (Regional carriers continue to operate some provincial services.) Like much of Amtrak, VIA operates over trackage owned and controlled by the freight railways, Canadian National (CN) and Canadian Pacific (CP). From the CN/CP perspective, VIA has accomplished its chief goal -- extricating the railways from the passenger business and its associated deficits. However, VIA's troubled history, lack of long-term policy guidance and legislative authority, and recent service reductions offer no clear prognosis for the future of intercity rail passenger service in Canada.^{40/}

40/ Galenson and Thompson, op. cit., p. 22.

3

ISSUES AND TECHNICAL CONSIDERATIONS

73. The government objectives exemplified in Chapter 1 give rise to a series of issues reflecting both actual experience and a priori analysis. As evidenced by successful initiatives in such countries as the United Kingdom, Canada, Japan, Spain, and the United States, these issues raise no insuperable obstacles to reshaping the railway. They do, however, provide a basis for characterizing each generic option for its responsiveness to national goals. This chapter concludes with a discussion of two topics which, although technical in nature, have important implications for long-term performance of a restructured railway: cost assignment and fixed facility maintenance.

ISSUES

Market Definition

74. Whether the intent of the reshaping effort is to convert the railway into a commercial enterprise, to enhance competition, to simply reduce the funding burden, or all three, proper business planning requires a clear understanding of the railway's markets and their commercial potentials (if any). Market definition implies an appreciation of *what the markets are* and *where they are tending* with respect to traffic trends, developments in competing modes, changing demographics, and economic development plans. Unless a reshaping plan incorporates this degree of understanding, the production-oriented railway will persist, thus thwarting fundamental restructuring efforts.

75. Table 3.1 therefore assesses how well each generic option lends itself to identifying and analyzing the railway's major markets.

Financial Accountability

76. Knowing what the markets are provides only incomplete information for business planning and management. In order to identify commercially viable services, to profitably tailor services to market demand, and to intelligently conduct and improve daily operations, railway managers need to know and exercise control over both revenue and expense characteristics of each market. Accountability for both costs and income is essential to the market-driven railway.

77. The traditional monolithic railway, by contrast, ordinarily fails to provide for accountability on a market-by-market basis; it does not even generate the accurate knowledge that is prerequisite to accountability. (Before restructuring, BR could not provide reasonable financial performance indicators for the regional general managers because of irremediable flaws

Table 3.1
Characterization of Generic Options Based on Market Definition

(Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	L	Traditional departmental organization makes it difficult to differentiate functions
(2) Lines-of-business organization	H	Differentiation by market is the very <i>raison d'être</i> of the lines-of-business organization.
(3) Competitive access	M	Will vary with the specific option selected. Trackage rights exchanges between two monolithic railways, in the absence of market differentiation, can still be considered "competitive access".
(4) "Wholesaler"	H	In this option, the "retailers" must concentrate on particular markets.
(5) "Toll rail" enterprise	M	While "toll rail" type arrangements customarily include market differentiation on the part of the operating railway, such a split between fixed facility and operating functions could still occur in the absence of a lines-of-business approach. Again, it would depend on the specific circumstances.

in the allocation techniques.^{41/} While identification of revenues with markets should present few problems (because a paper trail normally links receipts with the type of transportation provided), a monolithic railway can assign costs to markets only with the greatest difficulty

41/ Reid, op. cit., p. 2. "The Regions were not separate businesses with profit accountability. Their revenues and costs were only those which originated within the boundaries of their territories, and since many passenger and freight trains moved between Regions, there were major discrepancies in revenue and cost attribution. Moreover, until 1983, infrastructure costs were allocated from the annual total on a route-mile basis, no matter whether a length of track had been renewed or was scheduled for renewal. So while the command structure of the Regional General Manager system was strong, the business basis of their operations was weak."

because of the allocation methodology involved. Figure 3.1 shows those cost areas which a traditional railway can relatively easily isolate by function and service, and those which are not so easily done. In particular, facility-related costs require allocation, which is at best theoretical (since it reflects no arm's length transaction) and which requires sophisticated analytical techniques to be of genuine helpfulness to management and the owners. This is why the objective of "improved management information" (cf. Chapter 1) may require a complete restructuring of the railway entity under certain circumstances.

78. The monolithic railway therefore ranks poorly on Table 3.2, which characterizes the degree to which each generic option would encourage accountability on a market-by-market basis.

Operations Coordination

79. Some of the generic options involve multiple entities in operations, thus undermining one of the clear advantages of the monolith -- its ability to solve conflicts by command. Operating conflicts are indeed inevitable when two carriers use the same fixed facility. Even when operators are geographically separated (for instance, commuter services at city A and at city B on the through intercity line AB), their schedules can conflict because of impacts on and from through services. These facts require the institutional plan for reshaping the railway to incorporate mechanisms that will prevent or reduce operating conflicts, or which will cause people and organizations to look beyond their immediate gains to longer-term impacts of selfish behavior.

80. While the appropriate mechanism will depend on the specific situation in the country at hand, planners may wish to emulate existing approaches. On the Northeast Corridor, which belongs to several owners and serves various commuter and freight operators and one intercity passenger operator, a train planning unit emerged in the late 1970's to work out scheduling problems for all users before they became operating problems. Where two entities jointly use a facility, a rotating responsibility for movement control may act to curb the short-term tendencies of the controlling organization to afford operating preference to its own trains. This self-balancing mechanism is the plan for the new Harold Tower, a shared facility between Amtrak and the Long Island Rail Road. The former Washington Terminal Company, jointly owned by competing railways until 1971, had rotating personnel in certain management positions. The joint switching agreement described in Chapter 2 provided for each of three railways to switch a major industry for four-month intervals. Not only did the agreement state the admirable principle that all traffic would be handled equitably, but the rotation provision could act as a powerful motivation against infringements of the principle.

81. Table 3.3 evaluates each option in terms of its implied ease of operations coordination through prevention and resolution of conflicts. Based on the available mitigating measures, this issue clearly poses no threat to railway restructuring.

Figure 3.1
Cost Isolation in Traditional Railways

<u>Functions Performed</u>	Services Offered		
	Freight	Passenger	Commuter
Fixed Facility Ownership	Costs necessitating internal accounting allocation (except for facilities dedicated to a specific service, e.g., freight yards or passenger stations without suburban service)		
Fixed Facility Improvement			
Fixed Facility Maintenance			
Control of Operations			
Train Movement ^{1/}	Freight Service Costs	Intercity Passenger Costs	Commuter Costs
Equipment (Provision, Maintenance) ^{2/}			
Marketing			
Financial Accountability	Accountability was traditionally on a corporate basis. To establish credible accountability by service requires deft allocation of facility-related costs. (U.S. railways could not do it by and large until separation of non-freight services actually occurred.)		

^{1/} Occasionally trains are mixed, requiring allocations.

^{2/} Sometimes locomotives are used for more than one service, requiring allocations.

Table 3.2
Characterization of Generic Options Based on Financial Accountability
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	L	Too many non-arm's length cost allocations are necessary, as depicted in the chart.
(2) Lines-of-business organization	M or L	If the lines of business are merely superimposed over the existing regional/functional matrix, then allocations will still be necessary.
(3) Competitive access	M or L	In some versions, monolithic railways may be exercising access over each other, so that allocations will be required.
(4) "Wholesaler"	M	While the existence of retailers will necessitate market differentiation, transportation may still be provided by traditional monolithic carriers.
(5) "Toll rail" enterprise	H	The separation of fixed plant and operating functions will absolutely necessitate arm's-length transactions for fixed facility cost assignment.

Table 3.3
Characterization of Generic Options Based on Ease of Operations Coordination
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	H	Entire entity is under unified, authoritarian control.
(2) Lines-of-business organization	M	Varies with depth of lines-of-business organization. If the underlying railway is monolithic, then operations coordination should be easy. As lines of business acquire assets and act independently, operations coordination may become somewhat more difficult.
(3) Competitive access	M	Each segment of railway may still be under monolithic control; conflicting user needs and desires could still lead to conflict.
(4) "Wholesaler"	M	The railway itself may remain monolithic; the large retailers, depending on the functions they perform, could create conflict.
(5) "Toll rail" enterprise	L	Total functional separation could lead to built-in operating conflicts, requiring institutional mechanisms for resolution.

Intramodal Competition

82. In certain countries, railways maintain a monopolistic position.^{42/} Where such monopolies exist, the quickest way to effect transport competition would often be to introduce it within the rail mode itself. Such a step could foster responsiveness to user needs, spur technological modernization and service innovation, and instill an entrepreneurial spirit in railway management. Some of the generic options, in particular competitive access, would offer opportunities for healthy intramodal rivalry. Table 3.4 rates the generic options on their responsiveness to this issue.

Appropriate Maintenance Levels

83. A scenario for railway restructuring should encourage maintenance of the fixed facility at exactly the level of utility required to serve the markets -- no more, and no less. This requires forethought because some generic options may increase the number of entities and government agencies participating in rail transport decisions. In turn, each of these participants may have inherent short- and long-term conflicts of interest with respect to defining and protecting the capabilities of the permanent way. As a result, in crafting a solution for a given country, planners need to envision these conflicting viewpoints so as to set them in equipoise. Table 3.5 assesses the generic options for their amenability to a balanced maintenance regimen. This intricate yet important topic receives further treatment under "technical considerations" later in this chapter.

Track Maintenance Coordination with Operations

84. Just as the multiplication of operators can set the stage for disputes among them, the separation of fixed facility from movement functions may draw attention to the competing requirements of plant maintenance and train operations. Indeed, situations involving a primary owner/operator (Railway A) and a secondary operator (Railway B) imply a three-way conflict: between A's and B's train movements; between A's maintenance function and B's train movements; and, internally, between A's train movements and maintenance function. Whatever the specifics, a restructuring scenario should anticipate conflicts of this nature and incorporate mechanisms to prevent and resolve them. Since this issue (although important in its own right) resembles the "operations coordination" question, the characterizations of the options in Table 3.3 apply here as well.

42/ In particular, Galenson and Thompson (Annex 3, Table 3) show that in five socialist countries -- Romania, the USSR, Czechoslovakia, China, and Poland -- rail holds a share of from 74 to 94 percent of the total rail-plus-truck freight market.

Table 3.4
Characterization of Generic Options Based on Intramodal Competition
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	L	Inherent in monolithic railway in most countries.
(2) Lines-of-business organization	L	All the lines of business are facets of a single company and would be intended better to position the railway in relation to other modes.
(3) Competitive access	H	By definition, this option is intended to introduce intramodal competition in specified markets.
(4) "Wholesaler"	H	The existence of the railway "wholesaler" implies more than one "retailer" in a given market.
(5) "Toll rail" enterprise	M	Unless the toll rail is specifically open to more than one operator per market, there is no guarantee that intramodal competition will increase by means of this option.

Table 3.5
Characterization of Generic Options Based on Appropriateness of Maintenance Levels
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	M	See conflicting tendencies described in text.
(2) Lines-of-business organization	M	Depends on depth of lines-of-business organization, and its relationship with the facility maintenance department.
(3) Competitive access	M	Can involve monolithic railways with conflicting tendencies (see text).
(4) "Wholesaler"	M+	Presumably governed by detailed agreements between wholesaler and retailers.
(5) "Toll rail" enterprise	?*	Whether appropriate maintenance levels are likely in a "toll rail" option will depend on the way in which tolls are set and the specific functional responsibilities of the operating and facility entities.
* Depends on pricing		

Private Sector Development

85. Among other objectives, a government may reshape its railway so as to enhance the role of the private sector. Few of the Bank's borrowers will wish to divest the railway in its entirety to private ownership; many would, however, consider allowing multiple institutions, private and/or public, to provide services over a publicly owned infrastructure with prospects for an expanding role over time. Table 3.6 rates each generic option on its ability to foster private involvement.

Start-up/Transaction Costs

86. Reshaping the railway implies both a startup investment and changes in continuing transaction expenses. In some cases, particularly those involving the creation of multiple entities in place of the monolithic railway, both the initial and subsequent administrative cost burdens will be relatively high and must be weighed against other factors (e.g., changes in transportation revenues and expenses; likely gains on sales of property; service benefits and public policy considerations). However attractive the long-term outlook may be for a given scenario, its startup costs must obviously be affordable. As a result, this issue will enter into railway planning at its earliest stages. Table 3.7 characterizes the initial and continuing administrative cost burden of the various options.

Summary Discussion of Issues.

87. Table 3.8 describes the generic options in terms of their responsiveness to each of the issues. As might be expected, the *monolithic railway* rates high on technical efficiency (since conflicts are decided by executive fiat and transaction costs are minimized), but low on marketing effectiveness considerations. The *lines-of-business* option offers improved responsiveness to markets and accountability, but reflects increased operating conflicts and transaction costs as the monolith begins to crumble. The *competitive access* option introduces intramodal competition in selected markets, while maintaining unitary control over most railway operations. Unless the distribution of "franchises" is self-balancing, providing clear benefits to all participants, the owning railways are unlikely to permit a serious level of competition in markets which they have traditionally controlled. Thus, competitive access is an evolutionary approach. The *"wholesaler"* option should accomplish an excellent marketing job, but the actual operation would remain in monolithic hands. Finally, the *"toll rail" enterprise* might come closest to reflecting a theoretical model of marketing effectiveness; yet it would generate potential operating conflicts and higher transaction costs. This option would also call for the highest degree of administrative capability in the owning government.

88. *Underlying all these issues and options is the basic tradeoff between efficiency of production and effectiveness in meeting market needs.* The traditional monolithic railway, organized in a strictly hierarchical pattern along departmental lines, is geared to producing maximal amounts of relatively undifferentiated output with minimal inputs. However, what the customer wants and what the competition will provide does not necessarily mesh fully with the

Table 3.6
Characterization of Generic Options Based on Private Sector Development
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	L	The monolithic railway, by definition, is not to be sold off piecemeal, although some contracting is possible.
(2) Lines-of-business organization	M	Although still subsidiary to the monolith, the lines of business may lend themselves at least to joint-venture or other creative arrangements with the private sector.
(3) Competitive access	M	This option is still conducted by monolithic carriers, although some private involvement in the reshaping is possible.
(4) "Wholesaler"	H	Presumably the "retailers" would come from the private sector.
(5) "Toll rail" enterprise	H	The splitting of functions could easily lend itself to private sector participation.

Table 3.7
Characterization of Generic Options Based on Startup/Transaction Costs
 (Ratings are H=High, M=Medium, or L=Low.)

Option	Rating	Discussion
(1) Monolithic railway (status quo)	L	By definition, a single entity in a status quo situation must have zero "startup" costs and low transaction costs.
(2) Lines-of-business organization	M	Startup costs would vary with the scope of the changes made; transaction costs would have to increase as more precise accounting is introduced for internal transactions.
(3) Competitive access	M	Will vary with the precise nature of the operation. Trackage rights operations will, at the very least, lead to new transactions among the competitors.
(4) "Wholesaler"	M	Although the nature of the transactions will be more complex than under the status quo, the number of transactions should decrease because of the relatively small number of "retail" customers of the railway "wholesaler".
(5) "Toll rail" enterprise	H	The complete separation of functions envisioned in this option should lead to the highest startup and transaction costs.

Table 3.8
Summary Characterization of Generic Reshaping Options

(Options are rated High (H), Medium (M), or Low (L) according to their responsiveness to each issue. The characterizations are for generic options and would naturally vary with the particulars of specific options scrutinized.)

Issues	Options and Characterizations				
	(1) Monolithic Railway (status quo)	(2) Lines-of- Business Organization	(3) Competitive Access	(4) "Wholesaler"	(5) "Toll Rail" Enterprise
Market Definition	L	H	M	H	M
Financial Accountability	L	M or L	M or L	M	H
Ease of Operations Coordination	H	M	M	M	L
Intramodal Competition	L	L	H	H	M
Appropriate Maintenance Levels	M	M	M	M+	? (Depends on pricing)
Track Maintenance Coordi- nation with Operations	H	M	M	M	L
Private Sector Development	L	M	M	H	H
Start-up Problems and Transaction Cost Burdens	L	M	M	M	H

railway's production efficiency. Thus, by contrast, the reshaped railway -- whatever the depth of the attempted restructuring -- seeks to serve each market in a manner that maximizes either profits or other benefits dictated by its agreement with the State.^{43/} Regardless of the precise objective, a market-sensitive railway may be less "efficient" than a well-managed monolithic entity in terms of production, and yet be *much more effective* in fulfilling its goals of improved service quality and commercial performance.

89. For example, a restructured railway will typically establish separate "commercial" and "noncommercial" lines of business. The former would be operated on a commercial, for-profit basis and would be self-supporting and generally unregulated; the latter would be operated under contract with government at some level(s), and would receive operating subventions under the "public service obligation (PSO)" rubric. This dichotomy would free the railway to operate as

43/ For a detailed discussion of contracts between the State and the railway (among other steps in a methodical restructuring approach), see Huff and Thompson, op. cit.

a commercial enterprise by reducing the government's span of control to separable PSO functions only, and would encourage both railway and government to view PSO functions as a business relationship between customer and contract supplier. By the railway's traditional measures of technical operating efficiency (e.g., coach-kilometers per locomotive-kilometer), the restructured services, taken together, may appear to fall below historical levels. This decrease, however, may mask a host of steps taken by the respective lines of business to boost the responsiveness of each service to customers' needs and willingness to pay. The result should be a more profitable railway in the case of commercial services, and noncommercial services that better fulfill their public policy motivations.

TECHNICAL CONSIDERATIONS

90. The following topics, while highly technical in nature, require careful consideration in the planning and implementation phases of railway restructuring.

Cost Assignment Techniques

91. Cost assignment^{44/} under some of the options undergoes the test of inter-entity negotiations. In such negotiations, each entity looks out for itself first. To assure long-term viability of the entire structure, nevertheless, the cost assignment scheme should pass additional tests: measurement of the comprehensive cost effects on all entities, and assessing the relationship of costs to benefits.

92. **Comprehensive Cost Effects on all Entities.** Cost assignment techniques, however equitable and plausible on the surface, influence operating decisions by railway entities. The general rule is that, whatever cost factor is used, the paying railway will seek to minimize it over the long term. Through minimization of that cost factor, additional long-term costs may unwittingly accrue to all entities involved.

93. Assume, for example, a "toll rail" option involving a facility entity and several operators. If the facility entity charges other users by the wagon-kilometers they generate, then the operators will have an added incentive to reduce the number of wagons operated. In freight service, for example, this additional impetus can accelerate the trend toward larger wagons, heavier axle loadings, and potentially increased long-term degradation of the track structure. Each year, the operator saves, while the extent and cause of the incremental damage may pass

44/ In this paper, the term "cost allocation" denotes a division of common costs among elements of a single organization by management fiat, and connotes a mostly theoretical (paper) exercise. "Cost assignment," on the other hand, implies *any* means of ascertaining cost responsibilities, fixing the operating parameters (cost factors) on which charges are based, establishing unit rates, and passing the costs through to the responsible organizations. "Cost assignment" therefore subsumes, in addition to "allocation," negotiations and agreements among different entities or among clearly delineated business units of a single entity.

undetected and uncharged for. In the end, someone must pay for heavier maintenance or even for an "upgrading" project; or the operating capabilities and profitability potential of the railway deteriorate.

94. By the same token, if the facility entity charges by the train-kilometer, then the operator will have an incentive to run fewer, but longer, trains. This step degrades service frequency and may adversely affect market share and long-term revenues in both freight and passenger service.

95. Thus, the total costs and business implications of a particular cost assignment policy over the long term may be very different than the initial prospect to both the facility and operating entity, or to the responsible ministry. Indeed, a separation of functions implies a fragmentation of civil, mechanical, movement, and marketing decisions among separate entities. Monolithic railways have often failed to synthesize engineering, operating, and economic decisions, but have at least had the opportunity to do so; reshaped railways, on the other hand, must often overcome deliberately created institutional barriers in making long-term decisions that are optimal for all entities and concerned polities taken together.

96. Cost assignment-driven trends such as this would not operate immediately or with scientific precision, and would not necessarily overwhelm all other management decisions. Hidden costs may arise even without such scenarios as those described above. Yet an unconsidered choice of cost assignment parameters can influence engineering and operating decisions over the long term. These influences may manifest themselves in almost imperceptible distortions in trajectory rather than overt changes in direction.

97. **Relationship of Costs to Benefits.** Typically, a large-scale railway restructuring aims at affording maximal flexibility to the successor operating companies to act as businesses. The chosen cost assignment scheme can affect this flexibility by encouraging or discouraging innovation and expansions into new and potentially profitable lines of business. As an elementary example, again based on the "toll rail" option, the fixed facility entity may charge a standard per-unit rate for track maintenance (or some other function). The operating entity may be considering the addition of a new dedicated train to serve a completely new market with no adverse effect on existing revenue sources. Depending on how the rate was originally calculated, the incremental track maintenance imposed by the new service could be far less than the charges it will have to bear at the standard rate. If the cost assignment scheme makes no allowance for opportunities such as this, including (of course) a mechanism for long-term alterations to fit changing circumstances and to avoid shortfalls in meeting total costs, then the transportation economics of both entities may suffer. This situation points to a potential pitfall in some reshaping options: cost assignments may become ossified, necessitating formal negotiations to develop quick responses to marketing opportunities. A monolithic entity, on the other hand, if creatively managed, may be able to respond to situations like the example above much more quickly.

98. Moreover, depending on the mechanism yielding the costing formulas, special interests may be able to influence the assignments so as to convert them into cross-subsidies. Likewise, assignment schemes may become rigid over time, thus incrementally creating cross-subsidies and beneficiary groups as underlying conditions change while the formulas remain fixed.

99. **Creative Approaches to Cost Assignment.** While cost assignment schemes based on traditional units of measurement (train-km, wagon-km, gross ton-km) may appeal in that they intuitively relate to the consumption of the track structure, they can have negative long-term impacts through the subtle distortions they may induce in marketing, movement, and mechanical policies. Therefore, developers of the cost assignment scheme for a given reshaping application might consider introduction of cost factors related to revenue generation (revenue ton-km, revenue passenger-km, percentage of revenues) where they can serve as rough surrogates for use of the property and where they will give operating management the "right" incentives. Sliding scales based on levels of service (i.e., different rates for different traffic densities), compound calculations (use of more than one cost factor: e.g., X per wagon-km plus Y per revenue ton-km^{45/}), or some combination of all these approaches might produce a more supple costing technique that avoids long-term distortions and encourages the entrepreneurial spirit in the operator(s).

100. Cost assignment techniques clearly have implications far beyond the transportation economics of the railway entities. Public policy may dictate certain objectives in terms of quantities of rail transportation produced, in order to meet energy consumption, environmental, development, or other social goals. If the cost assignment techniques ignore these implications, then the underlying purpose of the entire reorganization scheme may be subverted.

Techniques for Developing Appropriate Fixed Facility Maintenance and Investment Levels

101. In any reshaping option, the proper matching of maintenance to needs would benefit from three techniques: (1) institutionalizing the process for establishing maintenance standards for each facility; (2) designating an appropriate maintaining entity; and (3) providing arrangements to insure future equilibrium in the facility maintenance function. The balance of this chapter treats these techniques in turn and concludes with a related topic: planning for investments in the fixed plant.

102. **Maintenance Standards.** An appropriate protocol for developing maintenance standards in an option involving more than one entity might include the following. (The suggested procedures assume, for simplicity, that the facility condition on the effective date of the option requires no immediate capital investment.)

45/ See, for example, the suggested cost assignment regime under the competitive cost access option in Chapter 2.

- (a) **Identify Required Line Capabilities.** Wherever a reshaping occurs, the successor companies need to establish what services will operate over each facility and what will be the performance characteristics for each service over that facility.
- (b) **Match Maintenance Standards to Required Capabilities.** For each facility, the parties need to agree on the standard to which it will be maintained to fulfill the highest requirements placed upon it while meeting the needs of all services. For track, appropriate performance and design standards for geometrics and components would solidify at this point. In such negotiations, the intended service levels for some operators may have to give way in the face of likely cost levels.
- (c) **Develop a Maintenance Plan.** Based on the intended uses of, and agreed upon standards for, the properties, the parties will need to develop a maintenance plan showing the procedures that will constitute "normalized" maintenance into the future. Because actual experience may vary widely from the pro-forma definition, periodic review of track conditions and adjustments in the maintenance plan will be necessary in accordance with an agreed procedure.
- (d) **Develop Data Underlying Cost Assignment.** If more than one operator uses the facility, three basic issues inhere in maintenance cost allocation:
 - The levels of service, hence plant, required by each operator. (All other things being equal, the operator who imposes the highest standards would pay the highest unit cost.)
 - The unit degradation imposed on the plant by each operator. (An operator may cause disproportionate maintenance expense even if the standards it requires, and the volumes of traffic it carries over the line, are relatively low.)
 - The volumes envisioned by each operator. (Low volumes may, in some cases, reduce the operator's fair share of some fixed costs.)

Documentation supporting the above issues would be assembled during the planning process to form a basis for cost assignment decisions. In reality, however, these issues often defy quantification (or the expense of quantification exceeds the benefits in terms of accuracy) and the "truth" emerges through negotiation rather than through science.

103. Selection of Maintaining Entity. Since maintenance standards and cost allocations raise so many tricky issues in a reshaping option, the choice of maintenance entity plays a critical role in assuring a constant and appropriate level of physical capability. The organization performing the maintenance will either be the primary operator, the facility entity, or a monolithic entity that

controls both facilities and operations. The institutional framework for the maintenance function will depend on whether single or multiple operators use the facility. Conceivably, the maintenance function could devolve to more than one entity based on geographical or detailed functional breakdowns. (It is hard to see, however, a case in which more than one entity could perform maintenance of a single subsystem, for example track, in a single location.) If two operators over a given facility have equal primacy, the selection of a maintaining entity would be made by negotiation. Finally, in unusual circumstances, the least important of multiple operators could indeed have maintenance responsibility; a short line owner/operator could, for example, do the maintenance even though the bulk of the tonnage results from trackage rights. Such a case actually exists in the Midwestern United States.

104. As with all decisions in a reshaping scenario, the choice of maintaining entity should consider the natural tendencies of the parties involved. The following discussion focuses, first, on the two principal parties in a "toll-road" option (the facility entity and the operator), and then covers the monolithic railway.

- (a) **Tendencies of the Facility Entity.** The facility entity has a long-term goal of protecting the utility, productivity, and value of its property. Nevertheless, in the short term, its high fixed costs (interest on debt, and potentially taxes) may give it an incentive to charge maximal fixed and variable fees to users while skimping on variable maintenance expense. This tendency may arise at the outset of the restructuring if the facility entity receives the plant in outstanding condition, since degradation may occur very slowly. Such a tendency will gain momentum if the financial arrangements with the government allow the facility entity to look with confidence to the future funding of an "upgrading" project to restore any maintenance deferrals.

Countermeasures do exist to such a predilection to deferral. First, if the facility entity has modest operating and financial goals and a well-assured revenue stream, then its short-term tendency to skimp on maintenance will wane. Also, if the facility entity's management perceives a clear financial link between the quantity and quality of maintenance performed, and the fees paid by users, then such management will have greater incentive to perform the required maintenance, especially if the verification methods and penalties discussed below are effected. Finally, if nothing else, liability considerations should motivate the fixed facility entity to fulfill its obligations. Indeed, the examples in Chapter 2 show how large liability concerns loom even in a small-scale separation.

- (b) **Tendencies of the Operating Entity.** An operating entity would likewise have a long-term goal of protecting its operating capabilities, both to enhance service marketability and to reduce movement costs. Nevertheless, an operating entity maintaining the track could also have short term profitability incentives to skimp on maintenance if the facility starts out in relatively good condition, if degradation is gradual, if the facility entity neglects to observe the condition of

its property, and if there are no secondary operators to notice the cutbacks. Such shortsighted tendencies would weaken if the operator begins its corporate life with an ample positive cash flow, and if it perceives direct and immediate benefits from adhering to the maintenance plan. Since the facility entity will benefit from the preservation of the property, and since certain types of deterioration result from the passage of time rather than trains, discreetly couched incentive payments from the facility to the operating entity may prove appropriate. Verifying performance or neglect, an independent inspection program would serve as a powerful negative motivation for the operator to adhere to the maintenance plan.

- (c) **Tendencies of a Monolithic Entity.** A facility entity/primary operator (monolithic entity) would have short- and long-term tendencies somewhat similar to those of completely separated entities. In fact, a unitary entity might deliberately embark on a program of maintenance deferrals more easily, and with less commotion and adverse publicity, than a pure facility or operating entity: the decision to defer could be made at the top, subordinates would simply carry it out quietly, and outside authorities (for example, government safety inspectorates) might discover it only after the fact. With separate owning and operating entities, deferral decisions would come to light with a speed proportionate to the vigilance of the non-maintaining entity. If strong enough and operating at enough volume, the secondary operator(s) might insist on higher maintenance levels, but these might only be reflected in higher trackage rights fees in the next year. Indeed, the sample trackage rights agreement (in Chapter 2) explicitly provides that the secondary operator may request as much maintenance as it wants -- if it is willing to pay.

105. Although all entities could share long-term tendencies to maintain, and short-term inclinations to neglect, the property, the operator may perform the maintenance function more assiduously than the facility entity (if different). The operator would feel the effects of deterioration relatively quickly, both through declines in service and revenues, and through increases in movement expenses. On the other hand, the facility entity would at first perceive shortfalls on the revenue side only. As the presumed dispatcher, the operator would also coordinate the interaction of maintenance and train movements more readily than the facility entity.

106. **Continuing Arrangements.** Owing to the complexities of facility maintenance issues, a strategic plan for a reshaping option should propose a continuing institutional arrangement to deal with all these concerns. Verification and inspection of facility maintenance on a periodic basis by an impartial party, coupled with appropriate and automatic monetary incentives and disincentives, would help to assure adherence to the planned standards. Such inspections would also confirm whether the pro-forma maintenance plan matches actual needs, and would pinpoint recommended changes. Evolving marketing approaches, hence service requirements, of the operators would also motivate maintenance plan changes, which should take place in a collegial and technical forum.

107. Investment Decisions. Like maintenance planning, investment and disinvestment decisions require close coordination between all entities involved in railway restructuring. Such decisions also entail early participation by the financing authorities, both governmental and private. Thus, the evaluator of a reshaping scheme should ask: during and after the restructuring, who will be choosing to upgrade or downgrade facilities, how will the choices be made, and who will have responsibility for implementation? Will the established process lead to comprehensive, businesslike decisions that encompass future marketing considerations, revenue streams, expenses, and the initial investment to be made? Under proper management, a monolithic railway would at least have the potential to set its investment priorities systematically and comprehensively. In some reshaping options, by contrast, the evaluation of a project may be so fragmented among entities as to permit only analysis of its elements rather than synthesis of its overall costs and benefits.

108. Clearly, a reshaping scheme would call for an especially methodical program for making investment/disinvestment decisions. Unless such a mechanism is in place, the self-interest of the parties involved may distort the decision-making process and result either in a "bad" decision (as measured against the goals of the restructuring) or no decision at all, which could also impede the achievement of the goals. However, a methodical, consultative approach to such decisions would -- at best -- make spontaneous responses to fleeting opportunities difficult to obtain.

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LIST OF ACRONYMS

This acronym...	...refers to
AAR	Association of American Railroads
APL	American President Lines
BR	State railway of the United Kingdom (British Rail)
BU	"Business unit" as referred to in the Spanish restructuring
CER	Community of European Railways
CN	Canadian National Railways
CP	Canadian Pacific Railway
DB	State railway of the former German Federal Republic (<i>Deutsche Bundesbahn</i>)
DEAG	Deutsche Eisenbahn AG (proposed successor to state railways of Germany)
DR	State railway of the former German Democratic Republic (<i>Deutsche Reichsbahn</i>)
EC	European Community
JNR	Former State railway of Japan (Japanese National Railways) (now restructured into smaller companies, see text)
PSO	Public service obligation: the British term for explicit government subventions to preserve rail services of no redeeming commercial value, but of perceived social value. This term is used in that sense throughout the report.
RENFE	State railway of Spain
SJ	State railway of Sweden
SNCF	State railway of France (<i>Société nationale des chemins de fer français</i>)
UIC	International Union of Railways (<i>Union internationale des chemins de fer</i>)

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