

North American Intercity Rail Passenger Systems

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Louis Armand, former head of the International Railway Union (UIR), once predicted that if trains could only survive the 20th century, their success in the new millennium would be assured. Armand's prophecy appears to be holding true as turn-of-the-century passenger railroading exhibits a convergent pattern of commercial and technical innovation that promises to renew the train's prominence in intercity transportation. This break with prior trends will occur when today's distinct streams of commercial and technical initiatives are successfully combined to improve the train's competitiveness and productivity. Such synergy between passenger rail technology and technique has largely been absent over the past half century despite sporadic technical breakthroughs and managerial initiatives that revealed the passenger train's considerable promise.

LEGACY OF THE LATE 20TH CENTURY: DIVERGENT PASSENGER TRAIN PERFORMANCE

Lacking the integration of new technology with modern passenger rail management, late 20th century railroads have paradoxically exhibited parallel success stories and failures in passenger operation. On the one hand, Japan's Shinkansen, America's Metroliner, and France's TGV have demonstrated that trains could attract new riders and succeed economically in direct commercial competition with automobile and air travel. On the other hand, passenger rail operators around the world experienced operating losses, declining market share, and poor productivity as increasing levels of government subsidy cushioned the gap between expenses and revenues.

Public policy can help explain this contradiction between noteworthy passenger train accomplishments and the mode's lackluster performance as a whole. When governments facilitated the application of new techniques or technology to passenger railroading, commercial success generally followed. Japan's government approved funds for the first Shinkansen in 1958. America's High-Speed Ground Transportation Act of 1965 launched the upgrading of train services between Washington, New York, and Boston. And in 1973, the French government committed to financing a high-speed TGV between Paris and Lyons. These initiatives resembled postwar aviation and highway development programs in that public funds were invested into modern technology and infrastructure.

But aviation and highway programs developed national networks, whereas rail passenger initiatives were confined to specific projects. Public policy thus segregated modernization efforts into a small subset of passenger train operations, while mounting subsidies were allocated to preserve more traditional (and uneconomic) services. It is only at the turn of the century that serious efforts are being made to reconcile these conflicting approaches. Initiatives to commercialize and privatize passenger rail's management, along with efforts to integrate rail infrastructure with other modes and across jurisdictional

boundaries, are enabling greater success. Intercity passenger rail is thus approaching 2000 with a capacity to fuse the payoff from modern technology with the focused reinvention of commercial practices that have spelled success for trains and other modes in the past.

This evolution of policy has been matched and perhaps exceeded by the attention that researchers have been paying to interrelationships between passenger rail finance, management, and technology in recent years. Events like UIC's World Congress on Railway Research, initiated in 1994, the 1997 National Conference on Critical Issues for Intercity Passenger Rail sponsored by the Transportation Research Board, and UIC's 1998 Eurailspeed Congress each showcased the resurgence in rail passenger research. A wealth of evidence can also be found in the numerous studies on commercial feasibility of new and upgraded passenger train services that were commissioned by the Canadian and United States national governments, provincial and state governments, and special-purpose high-speed rail authorities during the 1980s and 1990s.

High-speed rail technology has clearly passed the incubation stage within particular firms or even specific nations, as indicated by its introduction in Japan, France, and the New York–Washington segment of the Northeast Corridor. High-speed rail technology is now being exported on a global scale (e.g., from Europe to Korea, Taiwan, and the United States), sometimes with joint ventures that have technology transfer provisions in place. On the operating side, the scale of commercial innovation has moved upward from market-specific services (e.g., the Metroliner or the Paris–Lyons TGV) to regional or functional organizations such as Amtrak's strategic business units or the Eurostar consortium. Newly created private corporations have taken up passenger train operating franchises that offer new levels of commercial freedom, most notably in the United Kingdom.

As well, there has been a growing body of evidence that points to positive sum association between intercity passenger rail and other modes, including regional public transit in North America and Europe and air-rail intermodal links in Europe. Passenger trains' contributions to quality of life through reduced pollution, enhanced energy efficiency, and more sustainable land use are increasingly documented. Research problem statements compiled by the Committee on Intercity Rail Passenger Systems also recognize the shift in focus toward passenger trains as a mode for which systematic research efforts will yield significant rewards.

SUPPLY-SIDE TRANSFORMATION

The accelerating pace of change, coupled with a greater fusion of technical and organizational innovations, makes predicting the place of passenger trains in the new millennium more exciting but also more difficult. Such assessments will be more accurate if they explicitly recognize and seek to model the effects of supply-side transformations that are likely to generate new service characteristics for intercity passenger rail. These service patterns will then be connected to new travel behavior that is likely to emerge as trains offer new intercity travel options.

Whatever the precise shape of the global passenger transport networks that emerges in the 21st century, it is safe to predict that rail passenger services will be much more tightly integrated into these networks. Instead of the haphazard interconnections between train stations and airports, regional public transit, and highway networks that typified much of 20th century transport planning, future planning and financing arrangements will ensure that the physical links are in place to enable each mode to serve an optimal intermodal function. Examples of current best practices that will guide future norms include the interconnection that brings TGVs beneath the central passenger terminal at Charles de Gaulle airport, Paris;

the shared use of intercity rail trackage by conventional trains, high-speed trains, and interurban light rail transit centered on Karlsruhe in southwest Germany; and Amtrak's Metropark station, which allows drivers from New Jersey's two most important highways, the New Jersey Turnpike and the Garden State Parkway, to park-and-ride Northeast Corridor trains.

Such physically linked infrastructures will be complemented by commercial integration that makes intermodal transfers as straightforward as today's intramodal connections between aircraft or transit vehicles. Whereas contemporary ticketing, baggage, and information systems often inhibit intermodal travel options, their future counterparts will enable the inclusion of intercity rail into journeys. New intermodal links are likely to be mirrored by commercial partnerships and alliances between rail operators, airlines, bus operators, and even automotive firms (e.g., car rental companies). These joint ventures are likely to be accompanied by cross-modal management and ownership patterns, exemplified by Richard Branson's ownership of both air and rail operations in the United Kingdom.

To find commercial success within this evolving intermodal network, 21st century passenger railroad organizations will have to be more customer focused than were their predecessors. Soon, train schedules, frequencies, and on-board amenities will no longer be dictated by operating departments and their personnel. This is because travelers will be attracted onto the rails for all or part of a journey only when the passenger train's comfort, convenience, and economy surpass those provided by the alternatives for that travel segment. In Europe, such a focus on the customer can be seen most clearly with the Eurostar, which has redefined passenger rail service (and some would argue all intercity travel) between London, Brussels, and Paris. Eurostar offers five distinct service levels, ranging from a restricted-fare no-frills economy ticket to first-class travel with door-to-door pickup and drop-off by chauffeured car (or minimotorcycle for those brave enough to attempt overcoming traffic congestion in central London or Paris). Each price and service package is designed to appeal to a particular segment of a diverse and competitive travel market that ranges from backpackers to business executives. Recent experiments with distinctive regional service (e.g., use of specialized equipment, local foods and beverages, and higher levels of on-board amenities) in North Carolina, along Amtrak's Coast Starlight, and in the Pacific Northwest suggest that North American passenger trains can build market share by creating a local identity—a key attribute of the intensifying focus on customers.

Another dimension of intercity travel that will become more prominent in the 21st century is the land cruise by passenger train. Like the earlier transformation of ship travel that this trend echoes, long-haul train services will increasingly be redesigned to appeal to the leisure traveler, for whom the on-board travel experience becomes a valued part of the journey. High levels of service enhance the scenic and social attractions of these cruises. Today's best known, though still esoteric, rail cruises (e.g., Venice–Simplon Orient Express in Europe and the American Orient Express in North America) build on the nostalgia for luxurious and exclusive land travel. Such offerings represent only the tip of the iceberg for land cruising's potential, as the evolution of maritime travel suggests. Following the introduction of jet aircraft, travel by ship retained a core market of those attracted to traditional ocean liners, which enabled commercial survival through the 1970s. But this market was progressively broadened to redefine cruising as a travel experience that offered much more than nostalgia. In the 1990s, ships cater to all tastes and budgets. The greatest constraint on a similar evolution of cruising by train is the access to tracks owned by railroads that focus on other aspects of the transportation business (e.g., freight).

To deliver the kinds of specialized and high-quality rail services typified by the Eurostar and the American Orient Express, a new paradigm for labor-management relations needs to take root in the new millennium. Airlines, cruise lines, and even the leaders in new rail services have each made moves to develop flatter and less hierarchical management structures that reduce the tension between workers and supervisors that is typical in traditional rail operations. An important aspect of this transformation will include providing rail workers with a stake in the new passenger train ventures through various forms of profit sharing, co-ownership, and perhaps even full-scale employee ownership.

These changes in the supply of rail passenger service will be accompanied by a less visible but crucial transformation in the relationship between passenger trains and freight transport. The logistics revolution that was launched in the 1980s, in near-total isolation from the passenger train, places growing demands on all modes' freight-carrying capabilities. Just-in-time delivery requires the speed and frequency of movement that will ideally suit some new passenger train services. If future economic growth remains linked to the growth of goods traffic along present trends, air and road infrastructure will lose the capacity to keep up with freight flows. This will create a golden opportunity for the passenger train to capture some of the enhanced productivity and consequent profit that air and road competitors have long enjoyed from their dual use of infrastructure. In North America, recapturing these efficiencies will require a new economic partnership between passenger rail operators and freight railroads akin to the new relationships to be created between management and labor. Profit sharing, joint ventures, and even a reintegration of passenger and freight rail enterprises are all possible, depending on the level of economic opportunity.

DEMAND-SIDE TRANSFORMATION

These profound changes in the way that passenger trains are managed, operated, and connected with other transport modes and functions represent only part of the picture of what train travel will look like in the new millennium. The demand characteristics of intercity travel reflected in new travel behavior trends will be significantly different from those of today. Among the most predictable of these changes are the demographics of travelers, which (within North America) can be projected from today's aging baby boom and maturing Generation X. Members of the former cohort are likely to seek ways to maintain the autonomy of a lifestyle that is enabled by automobile travel long past their physical capacity to drive long distances. Auto-trains, which take boomers and their vehicles to and from the Northeast and the Midwest to Florida, the Rocky Mountains, and other destinations, could become a favored means of extending the boomers' mobility pattern by enabling long-distance car trips without the physical demands of extended driving. Generation X may be more pragmatic about intermodal travel options than the preceding cohort. Instead of coming of age when the automobile and the aircraft reached new performance peaks, Generation X has experienced major shortcomings of car and plane travel (e.g., congestion, pollution, and declining service standards). One can expect less resistance to trying new modes and combinations of modes in the intercity travel of this cohort.

New rail passengers will bring expectations and values substantially different from those of today's riders. The ability to target specific service offerings at local markets, to adapt the travel experience to individual needs, and to reward loyalty by building a lifelong relationship between traveler and carrier will each be important to dealing with the train's

future clientele. Travel behavior is also likely to be transformed by external economic and environmental influences that motivate personal mobility.

The user-pay approach to meeting mobility needs represents an economic trend with significant implications for passenger train demand. Hidden subsidies for the operation and maintenance of airports, air traffic control systems, and even some highways are increasingly being replaced with user fees such as airport departure taxes, air navigation fees, and road tolls. Such fiscal change will enhance passenger rail's competitive advantage and therefore its commercial viability. The pace of such change will be decisive in shaping passenger rail's commercial opportunities in the new millennium. If user pay proceeds in the aviation and automobile modes alongside the reduction or elimination of operating subsidies to passenger rail, mobility prices are likely to signal the advantages of rail to travelers.

The train's low energy intensity relative to automobiles and aircraft is another competitive advantage that could build market share, depending on future trends in energy pricing and taxation. Modal substitution between air travel and high-speed rail would be the most sensitive to changing energy costs and should signal whether this change is taking place as early as the first decade of the 21st century. If such a scenario does indeed emerge, rising mobility costs would be likely to encourage shorter trips for leisure and business over the medium to long term. Such travel patterns would more closely match the train's competitive advantage.

WHITHER INTERCITY PASSENGER RAIL?

The outcome of trends in the supply of and demand for new passenger trains described above could lead in several directions. If efforts to make transportation more sustainable yield higher mobility prices through user payment initiatives or higher energy costs, the speed at which a passenger train revival spreads across the transportation sector will likely be accelerated. Whereas external factors such as energy and the environment may influence the pace of change, they will not determine its outcome.

Other modes can be expected to spur technical and organizational changes to cope with energy and environmental challenges. Whether the other modes' innovations will keep pace with or surpass rail's potential advantage is an open question. It thus remains to be seen whether the passenger train's future success will come at the expense of other modes or a 21st century rail passenger renaissance will simply amount to capturing a share of new travel demand by the niche services that have thrived amid the sector's overall adversity.

Rolling back even part of the automobile's and the airplane's postwar gains in market share may appear improbable or even fantastic to those who have witnessed passenger trains steadily lose revenue, riders, and modal split during the latter half of the 20th century. On the basis of an extension of business-as-usual trends in air and road transportation, such a transformation is highly unlikely. But even under business as usual, meeting new mobility needs offers an opportunity for passenger rail to incrementally expand its most competitive services under the right circumstances. Where gridlock and "winglock" threaten to limit the efficiency of all transport operations and the economy as a whole, high-speed trains can prosper without taking existing travelers off the roads or out of the skies. Project proposals for high-speed rail in California, Texas, and Florida regularly test the waters for such expansion, which has been judged premature to date.

The commercial fate of fast trains in the northeastern United States will certainly influence prospects for high-speed projects elsewhere in North America. Should economic and environmental concerns significantly influence the ways in which intercity transportation is purchased and paid for, intercity trains will gain the opportunity to realize very ambitious

growth. One can thus envision a scenario in which the rail mode will become integrated into a passenger transportation system where familiar modes will play new roles in delivering mobility that is more efficient and sustainable in the new millennium.

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FIGURE 1 Amtrak's new high-speed Acela train. **NOTE:** Acela is a protected trademark of the National Passenger Rail Corporation and may not be reproduced without permission. (*Photo courtesy of Amtrak.*)