



Recognizing the Value of Rail Transit

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It has become quite common for Americans returning from Europe, Australia, or Japan to praise the vitality of cities in these countries compared with those in the United States and the simplicity of traveling in them: being able to walk or use the excellent transit provided without having to depend on a car.

The quality of transit systems is one of the essential elements in which our cities lag seriously behind their overseas counterparts. In a comprehensive study of urban transportation in various countries, Pucher (1) showed that transportation policies have a much greater influence on urban travel than do local conditions, such as population habits, topography, and so on.

The problem of reconciling vehicular traffic, particularly automobiles, with the urban environment has been treated seriously in most western countries. Support for "taming the traffic" and innovative improvements in public transportation is strong in Germany, France, Switzerland, and most other western European coun-

tries. Rail transit is regarded as the highest-quality transit mode and it is built wherever conditions and availability of funds allow it.

In the United States, however, there is frequent criticism of all investments in transit, particularly rail systems, ostensibly because they are "uneconomical" and cannot serve our cities because of their low housing densities. Is it really true that rail transit can be successful in most large cities in other countries but should have no role in U.S. cities? A realistic analysis shows that most rail systems recently built in North America have been very successful, although better coordinated urban development policies could make even greater use of their potential.

Strong Impact of Rail Transit

The planning and construction of a rail transit system is a major event in a city: it requires a large investment, and it exerts a permanent impact on transportation pat-

Trolley stop at University 65th Street, Sacramento.



SACRAMENTO REGIONAL TRANSIT DISTRICT



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Light rail transit car stops at large Steel Plaza stop in downtown Pittsburgh.

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Inbound light rail vehicle approaches PAT's South Busway into Pittsburgh.

terns, land use development, and the quality of life in the area. How extensive the benefits of a rail transit system will be depends on many factors (2). In a good economic climate with effective urban planning, rail transit can be used as a powerful development tool.

In addition to its strong impact, rail transit—and rail technology in general—has a distinct image, identity, or personality that often inspires in some people extreme emotional, positive or negative attitudes toward rail systems.

Extensive studies and experiences from hundreds of cities around the world provide a solid body of knowledge about the optimal role of rail transit in the “family of transit modes,” its potential, and its limitations (3). In most countries large groups of rail enthusiasts support rail transit in all its applications and forms. On the other hand, anti-rail extremists (particularly in the United States) argue against any rail project in any city. A realistic evaluation should avoid these kinds of emotional extremes.

Rail Transit Developments in Recent Decades

During the 1950s period of euphoria of accommodating automobile travel in cities,

streetcars were considered obsolete and were replaced by buses, claimed to be “more flexible” because of their ability to mix with other traffic. Without public assistance, rapid transit was maintained only in five U.S. cities. The future of urban rail did not look bright.

During the 1960s it became clear that large cities were paralyzed by traffic congestion and that limits to building new freeways had been reached. Transit became recognized as the basic tool for revitalizing cities and for unifying growing metropolitan areas. To compete with the automobile, transit systems had to offer high-quality service. Rapid transit and regional rail were the modes best suited for this task.

The concept of “flexible” transit in mixed traffic also proved to be erroneous. Cities that followed a policy of *separating transit from general traffic* proved that separating right-of-way was the most important measure to achieve the high level of service that attracts many automobile users. Combined with many technological innovations, this separation gave birth to light rail transit (LRT) and exclusive busways.

Thus, contrary to the initial claims that the automobile made rail transit obsolete, congestion and the inability to cope with the staggering growth of the number of automobiles actually resulted in the most

intensive construction of rail systems in history, as shown in Figure 1.

North America has participated in this renaissance of rail transit. In 1965 only 6 North American cities had rapid transit systems, whereas several cities had old-fashioned streetcars. In 1991, 14 cities have rapid transit, 9 cities have new LRT systems, and most of the streetcar systems have been renovated. The number of “metro cities” in the world increased similarly: from 26 in 1965 to about 88 today (i.e., by more than three times). Numerous new LRT and regional rail systems have also been constructed.

What Makes a Rail Transit System Successful?

Although the United States lags behind other Western countries in transit developments, the American public understands the value of rail transit, not only for providing quality transportation but also for its positive influence on urban form and the environment. Public support has been clearly demonstrated at the ballot box by the approval of taxation for rail projects, from San Francisco BART (Bay Area Rapid Transit) in 1961 to Atlanta, Houston, Los Angeles, and the 1990 statewide votes in

California. Traditional critics of rail systems often charge that rail projects are "failures," arguing that their capital and operating costs are higher and their ridership lower than projected. It is often claimed that buses could provide "a better service for less money," although studies of actual operating systems show the distinct superiority of rail in attracting passengers (5). Are these claims valid and realistic?

In fact, the relationship of achieved ridership and investment costs to those projected by transit line planners is not the main criterion of its success. Neither does lower-than-predicted ridership mean failure, nor excess prove its success. Moreover, investment costs are often less important than the stream of operating costs and benefits (direct and indirect) over many decades of a project's life. Similarly, highway improvements are not initiated solely on the basis of forecasted travel volumes. If

that were the case, thousands of miles of four-lane Interstate freeways would never have been constructed in low-density rural areas.

The main criteria for a rail transit system's evaluation are such factors as

1. Ridership developed several years after its opening;
2. Impact of the rail line on transportation in the city, on the role of transit, and on mobility of different population groups;
3. Operating costs per passenger and opportunity costs for other modes;
4. Vitality of the central business district (CBD) and other served areas; and
5. Changes in the quality of urban environment and lifestyle.

Let us take BART as an example. It was subject to extensive criticism by anti-rail extremists for many years after its opening.

Today it carries more than 250,000 week-day passengers and has had a major impact on the development of the San Francisco CBD and a number of suburban areas. Without it, construction of another Bay crossing would have been necessary long ago. With such a facility and related highways and parking, the Bay Area would have had a much less human character. The public heavily supports BART—in fact, the main controversy now centers on which area will get its first extension as part of a new \$2 billion construction program.

Following the recent Loma Prieta earthquake, for several weeks BART provided the only transportation between the two sides of the Bay. Estimates show that the gross product of BART riders, who would not have gone to their workplaces if there had been no BART, exceeded the total investment in BART construction. In other words, during that month alone, BART's

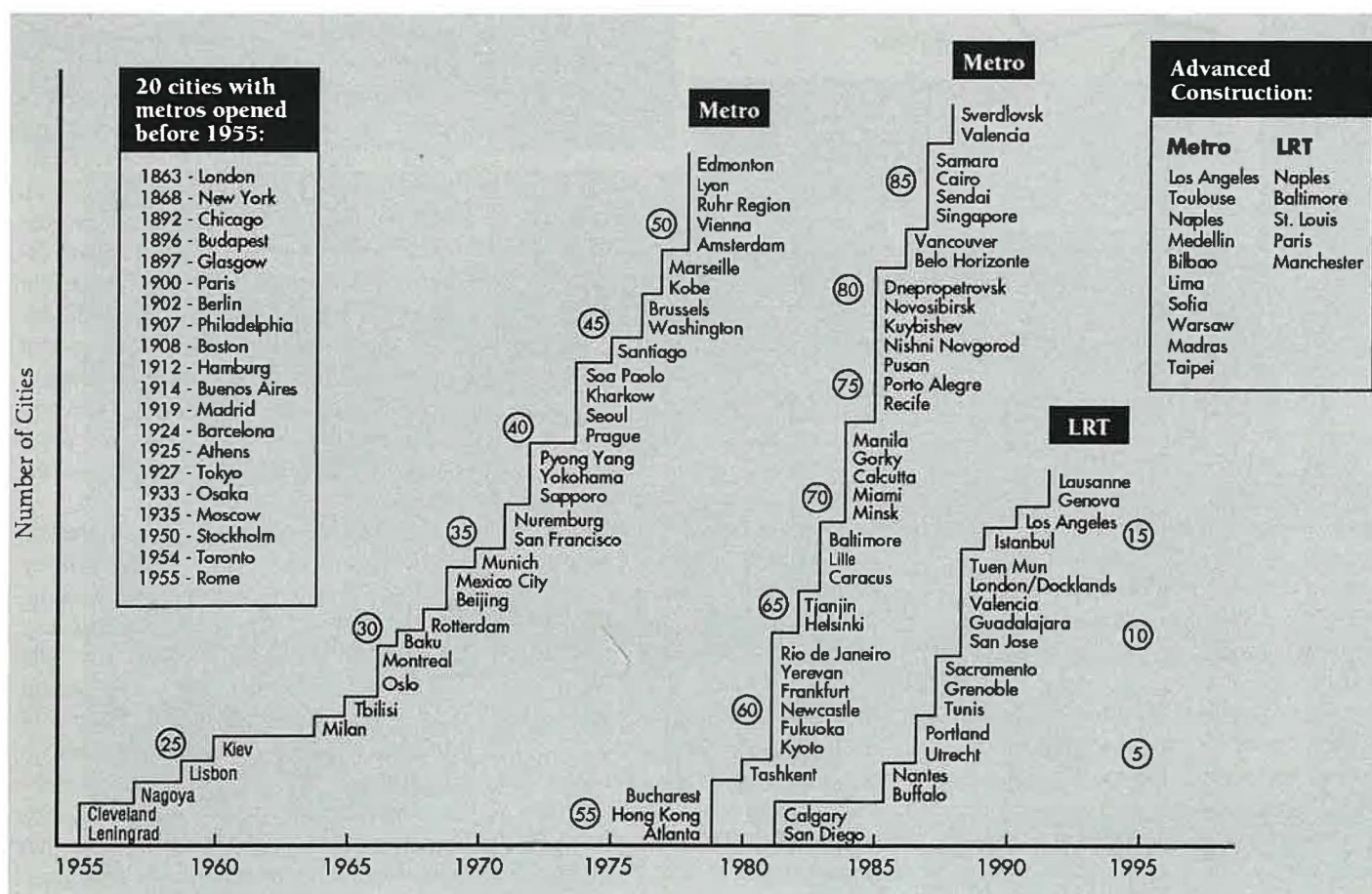


FIGURE 1 Metro and light rail systems of the world: number and years of opening.

economic value to the Bay Area more than covered the investment in this rail system.

The Washington, D.C., Metro has also revolutionized the area it serves: it has increased mobility (generated many new trips), stimulated billions of dollars of investment, shaped developments in many areas (e.g., CBD and Pentagon City), and elevated transit to a respectable service. Its ridership statistics (Figure 2) show that

Lyndon B. Johnson's instructions when he directed them in the now-famous February 22, 1966, letter "to search worldwide for concepts and ideas that can be used to make this system attractive as well as useful. It should be designed to set an example for the Nation, and to take its place among the most attractive in the world." It is true that the system could have been built for a substantially lower investment, but then

willing to pay more for the use of public facilities (e.g., transit) if there were no heavily subsidized competing services (e.g., private automobile use and parking paid by employers).

Difficulties in Forecasting

Errors in evaluating rail transit often come from premature evaluations of permanent systems. For example, Pickrell's report for the Urban Mass Transportation Administration (4) evaluated the Sacramento LRT on the basis of 14,400 daily riders; today, only two years later, the system carries 24,400 riders, or 69 percent more, and the number is growing.

Long-term impacts of a rail system take even more time to develop. That Boston and Toronto are held up as examples of more human-oriented cities than Houston and Phoenix is partly a result of the policies that developed high-quality transit (particularly rail) in the former cities, and neglect of transit in the latter.

Although Pickrell's report (4) exaggerates errors in cost and ridership projections, some do exist and they deserve attention. However, such errors should not be an indictment of rail transit as such, because exceeding estimated costs and overestimating trips is not unique to rail transit. For example, the Interstate system's \$128 billion cost was three times higher than that projected when the system was initiated. The difference in those costs alone was much greater than the entire federal assistance to transit since its beginning in the 1960s.

One notable example of missed forecasts is the multimillion dollar eight-lane highway tunnel at the foot of Capitol Hill in Washington, D.C., that may never carry capacity volumes. In the 1960s when it was built, planners forecast that the tunnel would carry an average daily traffic volume of 145,000 in 1985. The actual volume in 1985 was 91,000, or about 62 percent of the forecast. Yet the Federal Highway Administration, UMTA's sister agency, has not launched an investigative study of its projects to explore possible collusion on the part of local decision makers and planners.

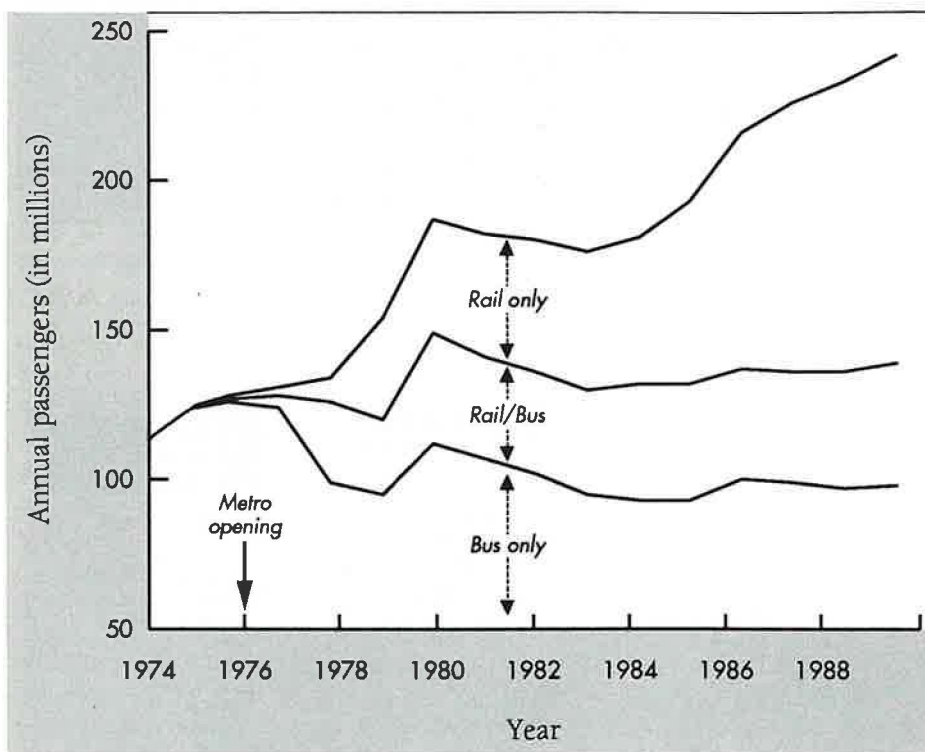


FIGURE 2 Impact of Metro opening on transit ridership in Washington, D.C.

since 1978, two years after Metro's opening, buses have generally retained stable ridership whereas the total number of unlinked trips has increased by a factor of 1.80. Even if all rail/bus (linked) trips are disregarded, total transit ridership has approximately doubled. The new transit trips either have been attracted from automobiles or were not previously undertaken. Thousands of automobiles in park-and-ride lots at Metro stations clearly demonstrate this superior ability of rail to attract automobile users.

Critics of the Metro point to its high cost, but the planners were following President

the Capitol would also have cost less if it had been designed with a flat roof.

This illustrates a difference in philosophies. Conservative economists claim that the main (perhaps the only) criterion of a project's feasibility should be its short-run direct cost, and that all public projects should be built at a minimum possible cost. Yet most people do not always buy the cheapest house or automobile; they consider other qualities and often pay more to obtain a product that is better than basic. Society also wants to have public facilities that offer good service and are attractive, safe, and comfortable. People would also be

Second, the reasons for lower-than-expected ridership are easily explained by certain developments in recent years. Although most advanced industrialized countries have been strengthening policies that protect the urban environment, conserve energy, and favor public over private transportation, this country followed an opposite direction during the 1980s. Under the Reagan Administration there was degradation of planning activities, increased

urban sprawl, and higher user charges applied to transit riders only—while the constant price of gasoline decreased. As indicated in the recent National Transportation Policy (5), this irrational situation resulted from a lack of coordinated policies, and it predictably resulted in reduced automobile occupancies, increased vehicle miles of travel, traffic congestion, deterioration of transit services, and a decline in the state of the urban environment and the

quality of life. Consequently, lower-than-expected transit ridership is a predictable result of our failures in policies, instead of rail technology.

The controversy about rail transit can be summed up as follows. Rail transit systems in cities like Atlanta, Portland, San Diego, San Francisco, and Washington, D.C., have significantly influenced development and increased transit image and ridership; their costs per passenger-mile are about 25 percent lower than those of buses and their operating ratios are correspondingly higher. On the basis of these successful results, rail systems are strongly supported by local political leaders and the public votes to tax itself for the expansion of the systems. However, some academics, who have never

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Left: San Diego maintenance storage facilities. Below: PAT's suburban light rail vehicle high platform with off-board fare collection station.



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*Left: San Diego Trolley's East Line at Lemon Grove Station, replica of community's 1895 train depot.
Below: Sacramento's trolley serves downtown transit mall.*

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been faced with the responsibility for planning or operation of any transportation system, continuously criticize all rail developments and claim, on the basis of their theoretical analyses, that rail systems are "failures". Who is right, the citizens and their leaders, or the academicians? Let the reader decide. Similar to Luddites in England, who in the early 1800s tried to stop industrialization by destroying factory machines, the anti-rail extremists are trying to stop the increasing public demand for higher quality of urban life by attacking rail transit.

Place of Rail in North American Cities

No transit expert would claim that rail transit is always the right solution, or that it has no role in cities. Experience in the last decade shows that with good design and coordination of transportation policies, rail

transit can be an effective solution for many corridors in our cities, even those in low-density suburbs with high automobile ownership. Some automobile-oriented areas today even have some of the most cost-effective rail transit systems: the Lindenwold Line in the New Jersey suburbs of Philadelphia and the San Diego trolley have higher operating ratios (0.80 and 0.90,

respectively) than most bus-only systems (6). Atlanta's rapid transit and Calgary's LRT also serve low-density suburbs through well-integrated bus and rail systems.

Reports of broad satisfaction with rail systems (surveys in Portland show a popular support of 75 percent) lead to a conclusion different from that of Pickrell's report

(4). If its findings were correct, rail systems are successful even with higher costs and lower ridership than those meeting UMTA's criteria. These criteria are therefore either too high or too narrow and mechanistic. This is in line with the frequent criticism of UMTA's investment guidelines by transit planners.

The United States currently follows urban transportation policies different from those in Canada, western Europe, and Japan. The United States is unique in its public policy of favoring the automobile and neglecting planning controls, without which coordination among the urban economy, environment, and transportation system cannot be effectively achieved.

Given this situation and the current trends, which lead toward greater congestion and a lower quality of urban life, our fundamental policies must be reoriented. More considerate treatment of pedestrians and concern for energy conservation and the environment necessitate a far greater emphasis on public transportation. Rail transit has a particularly strong potential to be the focal project for economic and environmental improvements in many North American cities (7). Extremism for or against rail or other transport technologies should be replaced by constructive work on rational policies toward the solution of the complex problems faced by metropolitan areas.

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San Diego Trolley transfer station.

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