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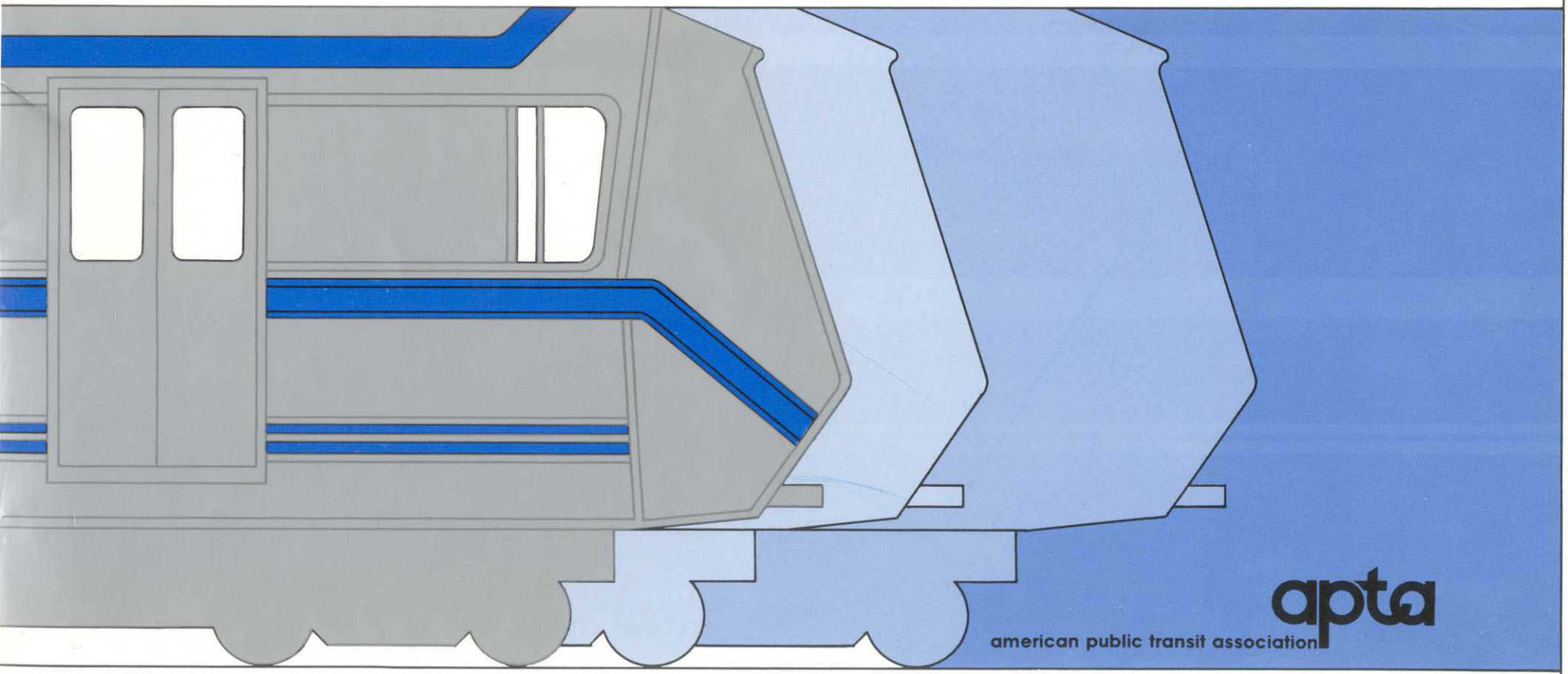
The Case For Rail Transit



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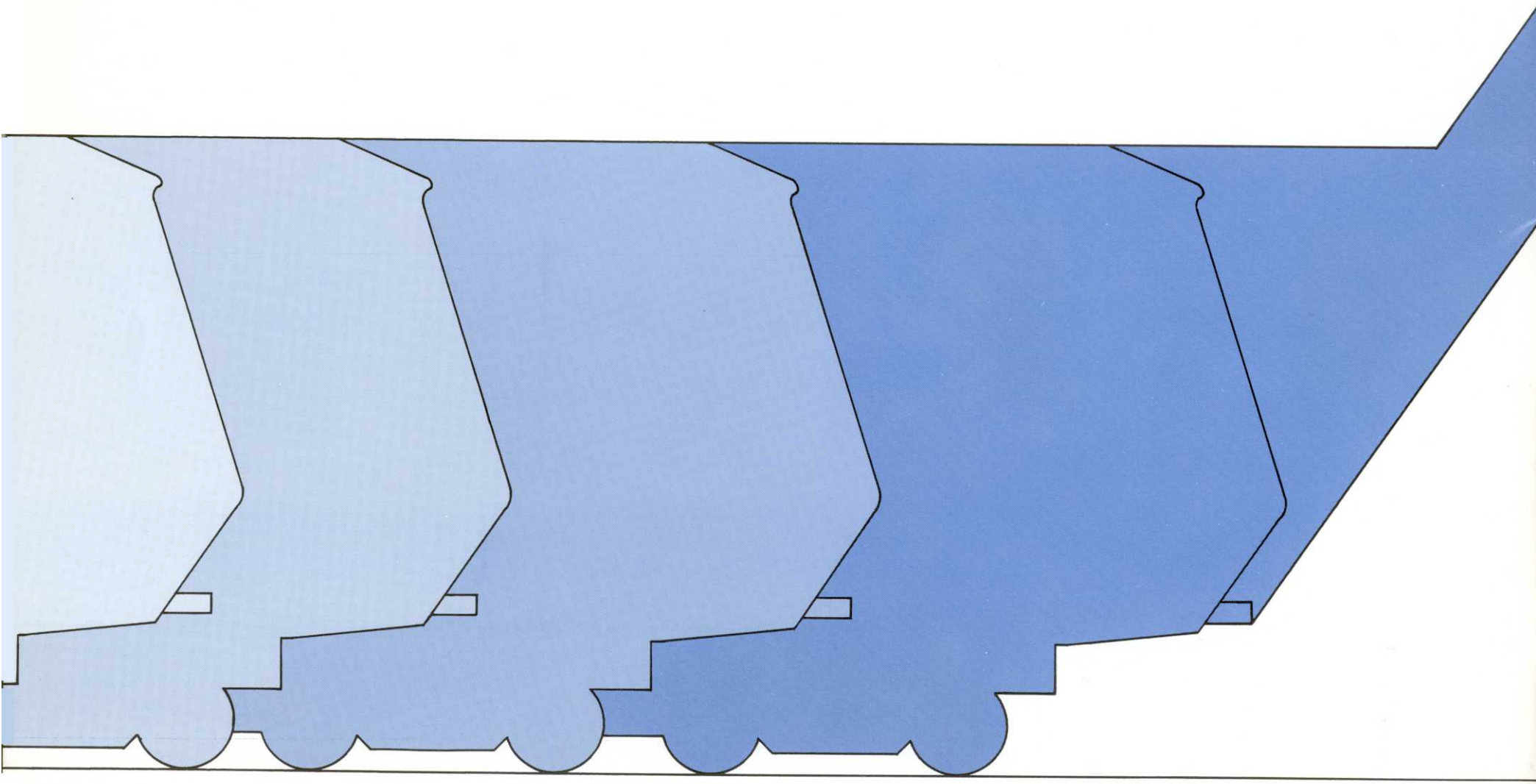

The Case For Rail Transit

a report by the

american public transit association

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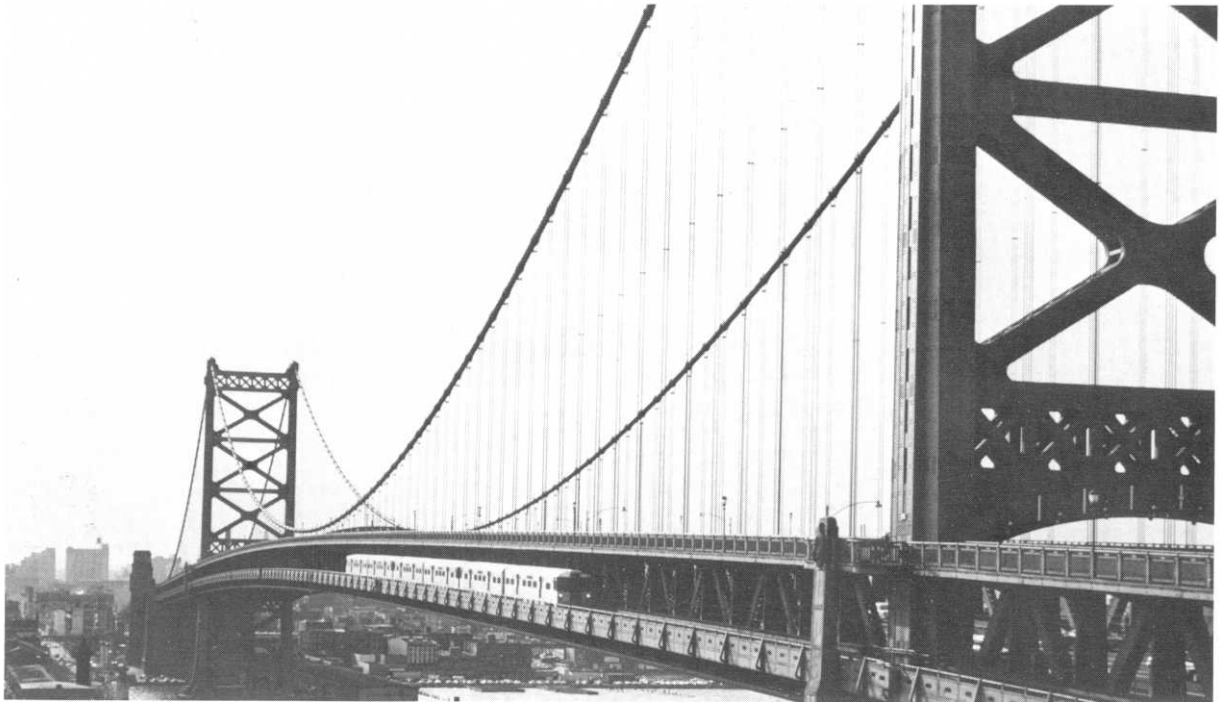
stating the case

To portray the city is to portray movement.

From man's earliest settlements taking life along mighty waterways to the high-rise, sprawling metropolis of the twentieth century swarming with pedestrians and vehicles, the movement of people and goods has framed the development and the character of the city. As the center of commerce and culture, the city's vitality and growth have always depended and will continue to depend upon how we manage and use our urban transportation networks.

So it follows that movement—how we plan it and how we provide it—must be of prime consideration when we debate the question: What kind of cities do we want?

Clearly, we want cities that place the emphasis on people. We want cities that offer a variety of services, employment, entertainment and residential choices. And, we want cities in which travel is efficient, inexpensive and pleasant so that we may take advantage of all that is being offered.



At the same time, we are faced with a frightening rate of depletion of our energy reserves, greater demands on precious urban land and depressed downtowns which are just now on the brink of revitalization.

But what kinds of transportation options do we have that are consistent with these visions of what urban North America should or should not be?

The automobile and the urban highway have left an indelible mark on the city. However, with the flow of gasoline turning to a trickle, the existence of urban thoroughfares which long ago exceeded their vehicle-carrying capacity and the metropolitan dwellers who will no longer tolerate the pollution and the paving over of their neighborhoods, the viability of the automobile as the dominant urban transportation alternative is fading.

On the other hand, public transportation is returning to the place of prominence it once held in cities across the continent.

Public transportation comprises a family of modes and vehicles. Each is appropriate and operates at its maximum efficiency in certain urban environments and not in others, depending upon local conditions.

Without doubt, in many cases modern motor buses operating on existing streets and,

where required, in special lanes, are a long-term solution to many of our energy, environmental and traffic congestion problems. The bus is today, and will continue to be, the primary public transit vehicle in the United States.

It is able to travel over a magnificent road system already in place. Buses are mass produced and, to a degree, standardized. They are not significant contributors to air pollution and compared to the automobile, they are miserly in consuming petroleum resources.

However, there are locations where rail transit should and must be considered. Rail transit is uniquely able to efficiently provide the needed capacity on heavily-used trunk lines that operate directly into major downtown centers. Rail easily can be fit into the design of a downtown. And, because of its characteristics, it can attract riders from automobiles.

Additionally, within budget constraints, rail may be creatively adapted to use in some non-traditional roles—in reduced demand situations, in suburb-to-suburb service and to connect areas of expanding density.

The point of this summary report is that there is a vital place for rail. As an urban and regional passenger carrier, in an energy conservation role, as a planner's tool, as an environmental safeguard and as an economic development catalyst, rail deserves serious examination and application. It is on this premise that the American Public Transit Association bases "The Case for Rail Transit."

moving people

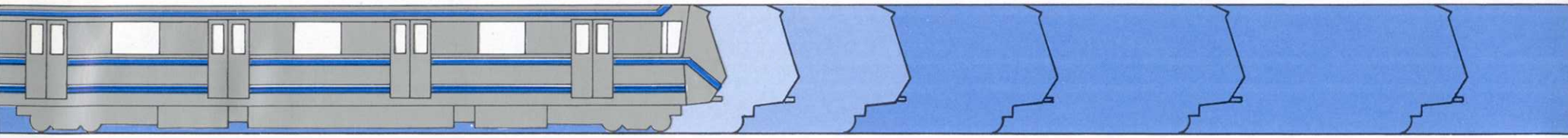
Between 1863 and 1935, 17 cities opened rail rapid transit systems of the basic subway style. Only four of those cities were in the United States. Between 1950 and 1977, 26 totally new rail rapid transit systems were opened. Only three of them were on American soil.

During these years, streetcar or light rail systems also appeared in cities all over the world. In the recent past, almost every metropolitan area operating some form of rail has announced expansion plans or is in the planning stage. Today construction of brand new systems proceeds as does preliminary work in cities which have yet to see any tracks being set in place.

As diverse as these networks are, they have one thing in common—the trains run because rail was selected as the mode of urban travel which could best move people, in line with local requirements.

Capacity

When a rail line enters a travel corridor, a rider trades the flexibility of an automobile for the speed and efficiency of rail transit. Trains run frequently and reliably and are not hampered by traffic congestion or weather conditions. And, rail provides capacity—one rail line carries more people, with greater speed and in less space than any other mode of urban transportation.



moving people: the facts

- At three-minute intervals, 10-car BART trains can comfortably move as many as 22,000 passengers in one direction during one hour.
- At the end of a baseball game, Philadelphia subways get fans on their way within 21 minutes while the stadium parking lot takes as long as two hours to clear.
- For suburban residents, a well-coordinated rail/feeder bus network places access to the central city as near as the corner bus stop.
- Forty-seven percent of the riders who board the Lindenwold line at one station formerly made the trip by automobile.
- The Bay Area Rapid Transit Impact Program found that more than 50% of those making the same trip before the line's opening, did so by automobile.
- Construction costs for a suburban highway amount to 88¢ per person per mile as compared to rail construction costs of 20¢ per person per mile, according to one study.
- The interstate highway system is now expected to cost in excess of $100 billion—almost three times the original estimate—and will be completed 15 to 29 years beyond the original completion date.

Rail transit is a natural for any heavily traveled, trunk-line corridor.

Currently the Bay Area Rapid Transit system operates trains of up to 10 cars every six minutes under San Francisco Bay into central San Francisco. That is 10 trains an hour, each with a passenger capacity up to 1100 riders or 11,000 passengers in one direction in one hour of the rush period. BART plans to reduce the interval between trains to three minutes, thus doubling the capacity. Twenty trains carrying 22,000 passengers in the peak direction could funnel riders to four downtown subways stations in one hour. In addition, these stations could accommodate the same number of passengers coming from the other direction.

A 1976 study of the New York City Transit Authority's Lexington Avenue line revealed that its four tracks carry 211,350 passengers during the 3 p.m. to 7 p.m. weekday rush period. Capacity like that is hard to match.

By lengthening or shortening trains, the capacity easily can be manipulated to meet expected or unexpected passenger flows without additional construction and without any additional impact on the environment. No extra highway lanes are needed to handle the surges.

Philadelphia rail service, operated by the Southeastern Pennsylvania Transportation Authority, illustrates the point with ease. In 1972, a 1½-mile extension of the Broad Street subway was completed to the new 60,000-seat Veteran's Stadium. The rail facility is adjacent to the old Philadelphia Stadium and the newer 14,000-seat Spectrum, built for hockey, basketball and music performances.

About 15% of the attendance at the stadium travels by rail, which is available in only one direction because the station is at the end of the line. At a game with 40,000 attendance, this amounts to about 6000 persons or seven extra trains. From the time the ninth inning ends, those 6000 riders are out of the stadium and aboard trains in 21 minutes. While the transit baseball fans are speeding home arguing over the umpire's last call, motorists are still sitting in the stadium parking lot arguing over traffic—sometimes for as long as two hours. Road conditions worsen when the three facilities are in use at the same time.

When the attendance totals 60,000 to 100,000, a train leaves every two minutes with 400 persons a minute moving out while the automobile-bound driver stews at his wheel.

July 4, 1976—the nation's 200th birthday—in New York provides another dramatic illustration of capacity. On that day, when the stately, high-masted ships from all over the globe converged on New York harbor, public officials urged the celebrants to use transit

because of the massive traffic jam they feared might occur. The celebrants listened and July 4 became a day when history was made once again.

The city subway carried 2.2 million riders compared to a normal Sunday load of 1.2 million. The Long Island Rail Road transported 107,300 people compared to a typical weekend figure of 44,500. The Hudson and Harlem commuter lines carried 55,000 passengers compared to 17,000 on that date, one year earlier. On the Port Authority Trans-Hudson trains, 135,000 riders boarded compared to the usual Sunday loading of 23,000.

The best part of the story is that vehicular counts for the day were some of the lowest ever recorded for a holiday period. The streets were left to the people for the largest birthday party that the world had ever seen.

Rail's capacity for getting people to jobs, to entertainment and to services is unequaled; and, aren't those the things cities are all about?

Coordination

Rail is used most efficiently when its service is carefully coordinated with a feeder bus network. Buses circulate through the neighborhoods adjoining rapid transit stations, transporting passengers to the train connection and returning them home later in the day. Although the traveler may live miles from the rail station, rail access is as close as the nearest corner bus stop. Today, rail system designers make special efforts to assure the ease and convenience of the bus/rail transfer.

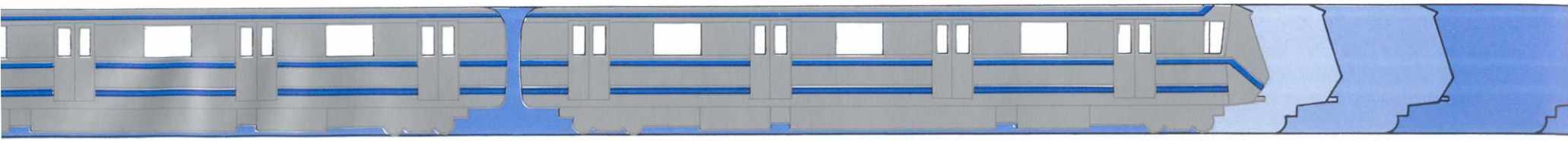
Such unified systems are in operation in almost every metropolitan area served by rail including Washington, D.C., Chicago, Boston, Philadelphia, Toronto, Montreal and in the San Francisco region. In Toronto the coordination is so well defined that many bus routes literally enter the interior of the rail stations. With downtown office and shopping complexes also providing direct, underground access to the subway, it is possible for many Toronto Transit Commission patrons to leave the winter behind. Once TTC riders board the bus in the morning, they may not have to face the Canadian chill until they are back at their bus stop that evening.

Attractiveness

It is features like these that draw passengers to rail once the trains start running.

In 1969, three bus routes traveled Chicago's Dan Ryan Expressway. In September of that year, the Chicago Transit Authority opened its Dan Ryan rapid transit line in the median strip of the highway. Ridership jumped from 5100 per day on the buses to 110,000 per day on the trains. Additionally, almost 20% of the Dan Ryan rail patronage was either diverted from automobiles or represented new trips that were not made before.

Even more dramatic results come out of the Philadelphia-southern New Jersey region.



The high-speed Lindenwold line, operating from suburban and populous Camden County into the central business district of Philadelphia, follows the right-of-way of a once deteriorated railroad commuter line which terminated in downtown Camden. Prior to construction of the Port Authority Transit Corp. or PATCO line, the railroad's ancient equipment was able to capture about 1200 riders a day. On opening day of the line's full length, PATCO carried 14,900 people. That figure has continually risen to its present level of about 42,000 revenue passengers traveling each workday.

In Haddonfield, one community on the line, 47% of the rail riders formerly drove cars, 37% came from buses and 13% had not traveled in that direction. About 3% had used the previously existing commuter rail service.

Also of significance is the traffic decrease that has occurred on the river bridge between Camden and Philadelphia. Traffic on the bridge has declined every year since 1969 as the sleek PATCO cars speed over the same span.

Chicago's Skokie Swift line has become legend in transit lore. Under an early federal, demonstration grant, the Chicago Transit Authority purchased five miles of an abandoned electric interurban line. With CTA's Howard Street rapid transit station on one end and an expanded park-and-ride lot in Skokie on the other, rail cars began running in 1964. Expecting 1500 riders on opening day, CTA fare collectors were greeted by 4000 riders instead. That figure climbed to an average of 7500 daily passengers by the end of the third year of service.

Skokie, a 10-square-mile suburb northwest of Chicago, averages about 1.4 automobiles per household. And, consistent with this, about 86% of the Skokie Swift's passengers have one or more cars available to them. Yet, they have been attracted to the speedy, non-stop connecting service.

BART also has made impressive progress in attracting passengers. Based on about 120,000 passengers per day, the BART Impact Program found that more than 50% of those making the trip before, previously did so by automobile. And in 1977, an average of 135,000 travelers pass through BART turnstiles each day. In the busy Oakland-San Francisco trans-bay corridor, BART picks up 29% of the travel market during the peak hour. And, the silver cars have also raised area transit ridership in the off-peak many-fold.

The Price of Rail—The Price of Road

The argument for rail's capacity, efficiency

and attractiveness is one easily made and supported. But what about the price tag?

In fact, rail does not cost enormous amounts of money to build, especially when compared with the cost of highways. Add to this the far greater return that rail provides on the transportation dollar and it is indeed a bargain.

A recent report compiled by the Institute of Urban and Regional Research at the University of Iowa provides some striking data on the subject. The cost of constructing a six-lane suburban highway with a capacity of 1800 vehicles per lane, per hour is 88¢ for each person per mile who will use it. At the same time, the cost of constructing a 10-mile rail segment with six stations and a capacity of carrying 18,000 persons per hour is a minimal 20¢ for each person per mile who will use it.

Twenty cents for rail and 88¢ for highway—that is solely in terms of construction costs.

But independent research efforts are not the only source of data. The Philadelphia rail extension of 1½ miles to Veteran's Stadium, discussed earlier, cost $40 million. This compares to costs of $100 million per mile for Interstate 95, two miles to the east.

In 1962, the Port Authority of New York and New Jersey purchased the Hudson and Manhattan Railroad, an aging rapid transit service connecting northern New Jersey with lower and mid-Manhattan. Including the purchase price, the Port Authority spent $258 million in capital funds for new cars and a generally upgraded and well-scrubbed system. Today more than 40 million passengers annually ride the "tubes" in comfort and convenience.

Yet, if that $250 million had been applied to highway use, it would have been barely a drop in the bucket. The proposed West Side Highway reconstruction or Westway is envisioned to cost more than $1 billion for its 4.2-mile length. The final cost may be higher than that, closer to $250 million a mile. Simply consider what the same $250 million did for the Trans-Hudson line.

The financial benefits do not end simply with the reduced construction and improvement costs. There are spin-off effects as well. *Science,* in its Aug. 23, 1974 issue, notes that rail and public transportation construction generates 3.2% more jobs than an equal dollar amount of highway construction.

Any comparison of rail and road costs inevitably leads to an examination of the most massive highway project ever undertaken—the interstate highway system. The 42,000-mile interstate network was to cost $37.5 billion when the first earth was turned in 1957. Already five years past its planned deadline for completion, the system is now expected to cost at least $100 billion. Rather than being completed in 1971, there are estimates it will be between 1987 and 2000 before the work is finished.

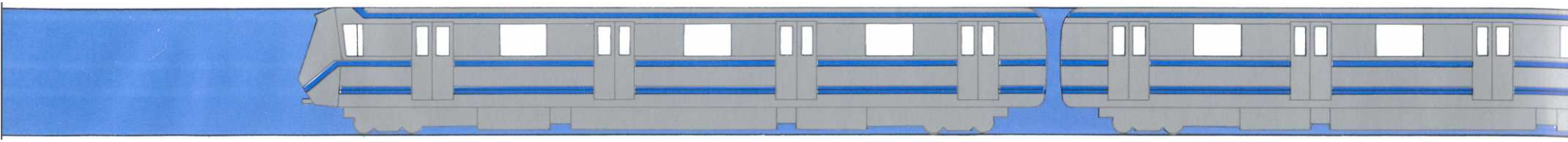
Clearly, urban rail construction is not immune to the cost overruns and delays which have plagued the interstate highway system. All major public works projects—rail or road—have suffered severely from the inflation which has gripped the national economy during the past 10 years.

Yet, the budget excesses and missed completion dates associated with urban rail construction are often more visible because of the localized nature of the project and the greater share of state and local funds involved.

As long as economic conditions continue to take their toll on heavy construction undertakings, the burden will be on local and federal decision makers to determine the most productive projects on which to spend transportation dollars.

When such decisions are made, it is often pointed out that highways are paid for by the users while rail systems are not. Strong evidence disputes that long-held notion that motorists pay the full costs of road construction and maintenance. In 1971 the National League of Cities calculated that member governments were subsidizing road and street travel by $4 billion more annually than was being paid in highway user taxes.

Urban rail's desirability as a mover of people coupled with a growing disenchantment with highway capacity and cost has succeeded in bringing a renewed interest in the rapid transit alternative. Yet there is much more to the story. Rail transit has proven its ability to address urban concerns beyond simply moving people from one place to another. It is some of those capabilities to which we turn our attention next.



conserving energy and protecting the environment

The city can be a model for the efficient use of energy or it can be a monument to its waste. With the days of inexpensive and plentiful fuel sources behind us, urban America has no choice but to pursue the former. Transportation is clearly the place to begin.

With the movement of people and goods gobbling up the lion's share of energy in North America, municipal officials must examine the directions in which their urban transportation networks are proceeding.

The United States consumes about 18 million barrels of oil per day. Of this, more than 50% is for transportation.

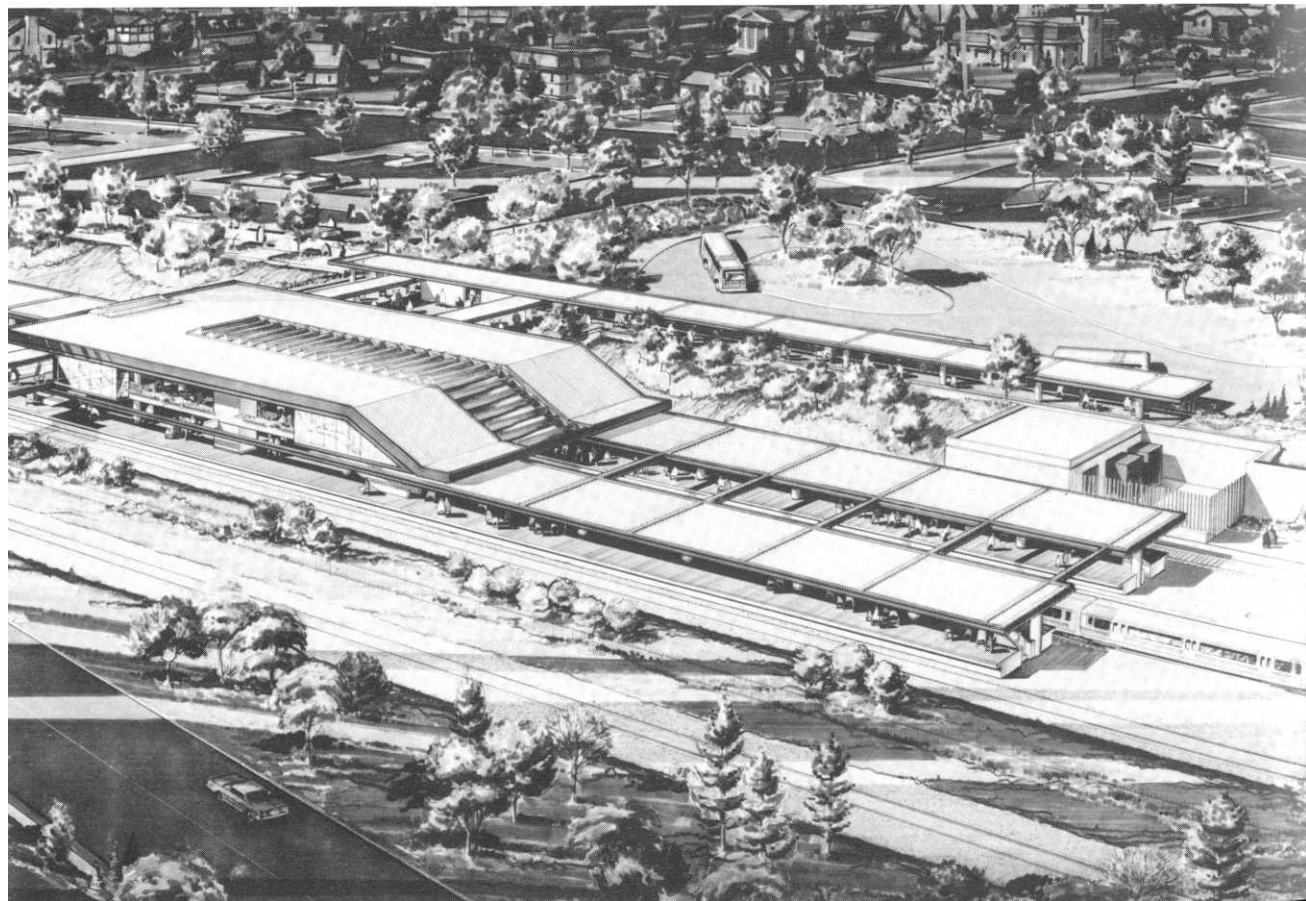
Highway vehicles consume 80% of that petroleum and of that, 71% is used by the private automobile. Or, looking at it another way, the automobile consumes 34% of the total petroleum consumed in the United States—34% of a precious fuel that is fast disappearing.

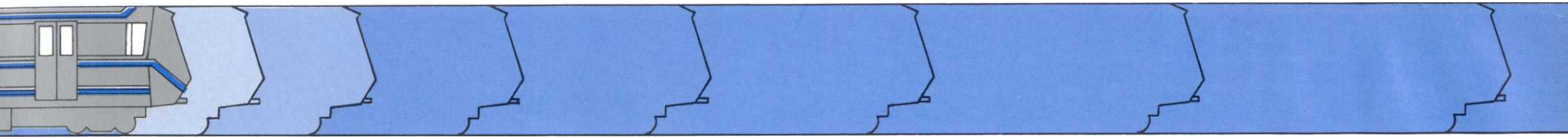
And, everything we know about the city tells us that it is not the right environment for the automobile. Engines idling at traffic signals, traffic-choked streets and highways and parking needs that can never be met all amount to the automobile operating at its least efficiency when inside the urban sphere. Yet, for too long, our cities have struggled to accommodate the car to their own detriment.

"The transportation sector is plagued with a disproportionate reliance on the least efficient fuel consumer, the automobile," wrote Douglas R. Campion, chief of the federal Urban Mass Transportation Administration office in Atlanta.

According to Campion, automobiles averaging 13.5 miles per gallon were in 1975 "substantially more wasteful of fuel than either the bus or train."

Other data collected in Atlanta also pre-





dict more efficient use of energy as public transit is expanded. In a paper by Joseph P. Byrd IV, senior planner for the Metropolitan Atlanta Rapid Transit Authority planning division and John W. Bates, manager of research and development for the same agency, it is argued that if transit is not expanded, "The demand for gasoline will continue to increase until the total supply is exhausted. When that supply is exhausted, the urban system which caused the exhaustion will no longer be capable of functioning."

Consistent with this line of thought are statistics collected by the Greater Cleveland Regional Transit Authority.

According to the Cleveland study, a rapid transit car—just one car in a multi-car train—easily produces 640 passenger miles on the electrical equivalent of one gallon of diesel fuel. A rapid transit car with an average rush hour load is 18 times as efficient as an automobile, the researchers found.

With an above average passenger load, a rapid transit car was found to be 35 times as efficient as an automobile and 12 times as efficient as an automobile used in a car pool.

BART provides similar documentation. In 1976, Dr. Henry Bain, technical advisor for the BART Impact Program, reported to the system's Public Information and Legislation Committee, "At the present time, BART is about 10 times more efficient a user of energy in moving a person one mile in the rush hour than is the automobile. We think of that as being BART's distinct contribution for moving people long distances on the trunk lines."

Bain went on to remark, "If all the people who have already shifted to BART—even before we've gotten all the riders we expect to have—were to go back to their cars, the net increase in energy consumption here in the bay area would be about 25,000 gallons a day."

Across the nation, on the east coast, the New York City region was recently distinguished as one of the most energy-efficient areas in the United States. New York's reliance on transit was cited as one of the major reasons that the average resident consumes about one-third less energy than his or her counterpart elsewhere. In a May 2, 1977 *New York Times* article, Robert A. Low, the city's environmental protection administrator, firmly states, "New York City, with its greater reliance on more economically heated apartment dwellings and its greater use of public transit, is particularly 'energy-efficient.' "

According to John P. Keith, president of the Regional Plan Association, the whole 31-county region—13,000 square miles from New Haven to Trenton—is "more frugal in the use of energy than the rest of the nation."

conserving, protecting: the facts

- The automobile consumes 71% of all petroleum used for highway transportation.
- One rapid transit car produces up to 640 passenger miles on the electrical equivalent of one gallon of diesel fuel.
- A rapid transit car with an average rush hour load is 18 times as efficient as an automobile.
- With an above average passenger load, a rapid transit car was found to be 35 times as efficient as an automobile and 12 times as efficient as an automobile used in a car pool.
- If all of the motorists who have already shifted to travel on the Bay Area Rapid Transit system were to return to their cars, the net increase in energy consumption would be 25,000 gallons of fuel a day.
- Per capita consumption of energy for transportation in rapid rail-oriented New York City is 47% of the national average.
- An analysis of the Skokie Swift line revealed that a 13% reduction in hydrocarbons occurred over a 40-square-mile area because of the line's elimination of approximately 2000 automobile trips.

The study on which the comments were based found that per capita consumption of energy in New York City is 47% of the national average. This is particularly noteworthy in light of the extensive rail orientation of the New York area's transit web.

As the United States grapples with the formulation of an energy policy, the fuel-efficiency levels associated with rail transit cannot go unheeded.

Rail's miserly use of fuel does not begin with revenue operations either. It commences long before, in the construction phases. According to the same *Science* article cited earlier, the construction of railroads and rapid transit consumes 61% less energy than putting a highway into place. This is another factor which must be carefully weighed during any transportation alternatives evaluation.

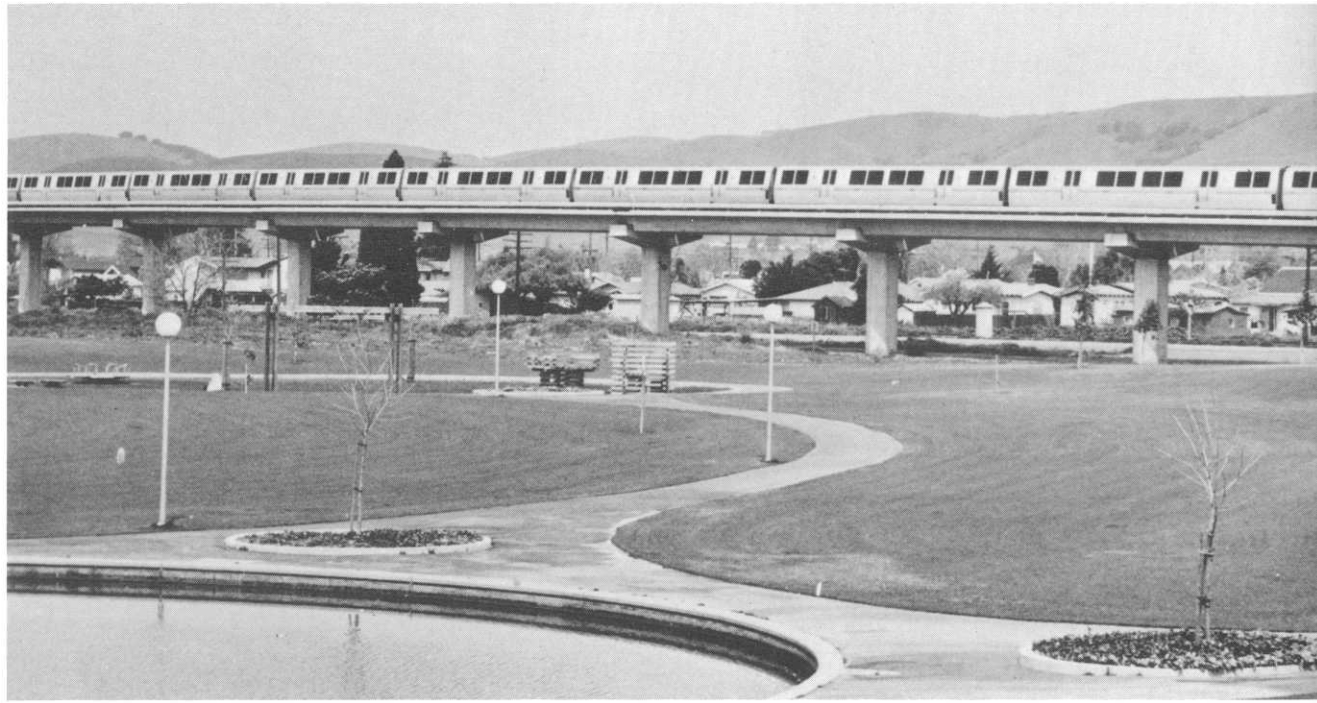
As rail consumes little of our energy pool, it also contributes nothing to our worsening pollution problem. In fact, rail provides outstanding opportunities for air pollution control.

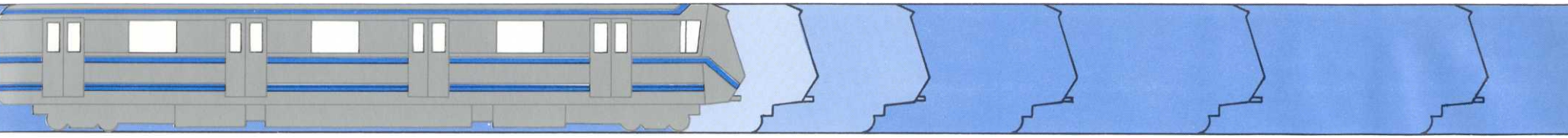
On one hand, since rail uses electrical power, the vehicles emit no noxious fumes or chemicals to further blacken our cities' air. Because urban rail vehicles use electricity, they can and do use a number of fuels including coal, nuclear and hydroelectric power. All three permit the conservation of our limited oil reserves. Where coal-burning power plants are used, however, they are generally far away from populated areas.

On the other hand, rail's attractiveness takes cars off of the road, reducing offensive automobile exhaust. With automobiles being the acknowledged culprit in most urban air pollution situations, this opportunity afforded by rail cannot be overstated. An analysis of the Skokie Swift line revealed that a 13% reduction in hydrocarbons occurred over a 40-square-mile area because of a reduction of approximately 2000 automobile trips.

With the numbers of cars that rail is taking and can take off of the roads, the pollution reduction potentials are enormous.

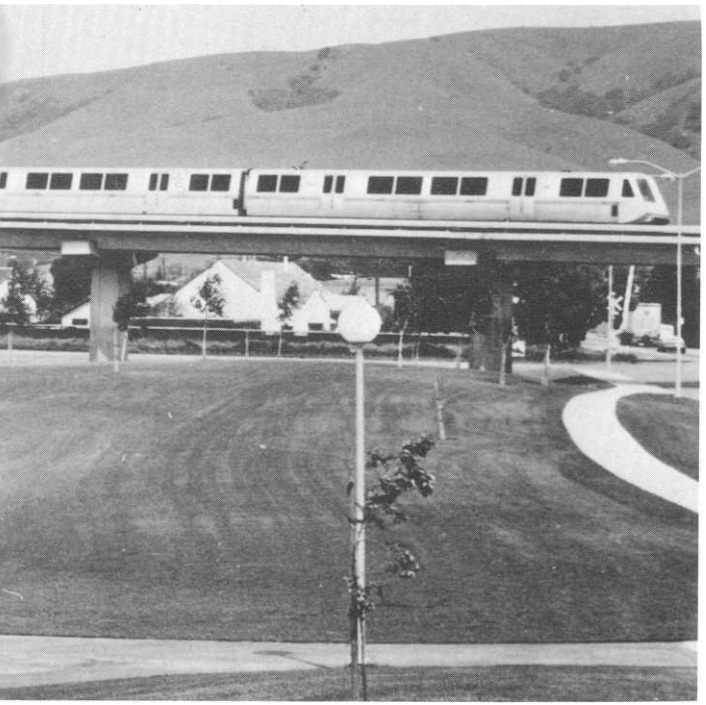
In the past few years, our environmental consciousness has been raised many-fold. Lines at the gas station, climbing fuel prices and air quality alerts have rudely shaken us into an alarmed state of awareness. As officials on all levels and private citizens evaluate how we will deal with what President Carter has called "the severest challenge we will face in our lifetimes, short of war," the potential role of rail must be given hard and thoughtful consideration.





shaping cities

Early man was a planner but he didn't know it. His cities were born out of a notion of what would be most efficient. By clustering his activities and his dwelling places, man could make far greater use of whatever resources existed. In this respect, the city of today differs little from that of ancient days.



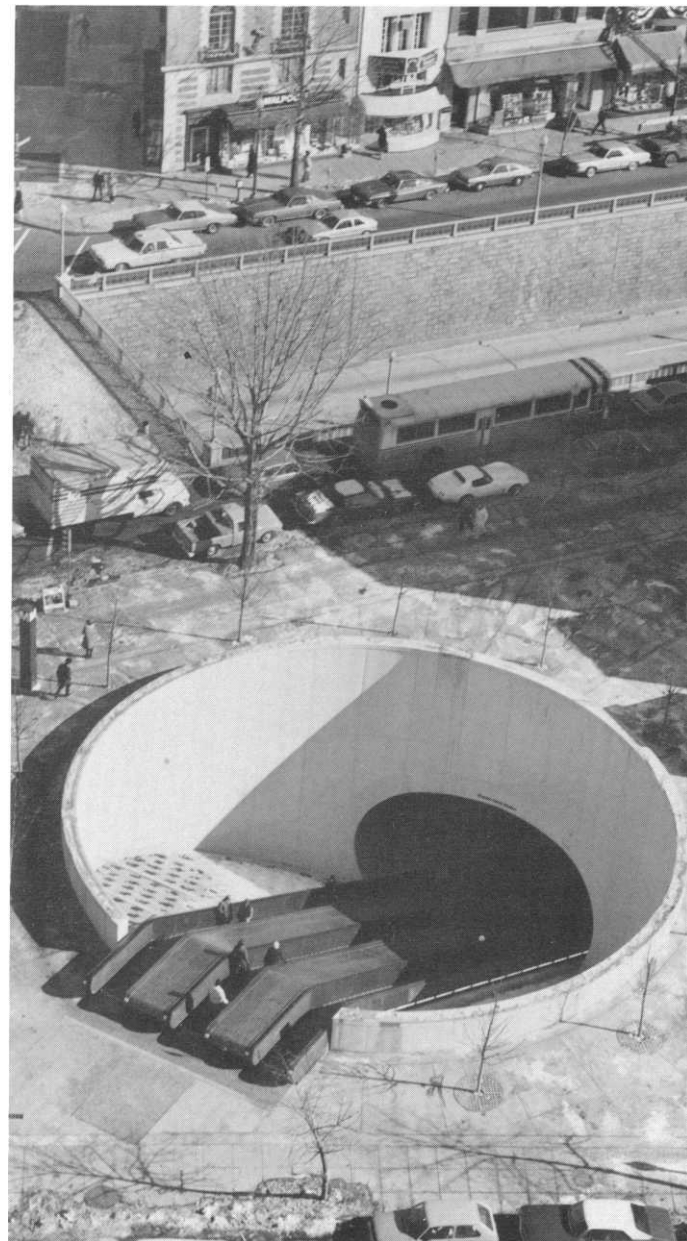
Considerations of energy and environment and concerns for quality of life and human scale have dramatized the need to plan our cities so that they work for us.

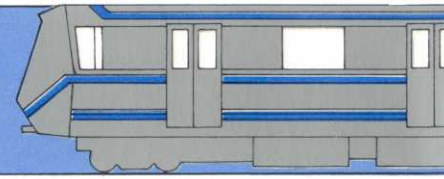
Experience dating back almost 100 years teaches us that rail transit is a planning tool. It can create neighborhoods, concentrate development, counter sprawl and stimulate downtowns—but only if it is fully integrated into the planning and development processes of the entire community.

As early as 1925, a survey of the New York region found that five million residents out of the total city population of about 5.5 million were concentrated in the corridors served by rapid transit. Early Chicago rail experience demonstrates a similar situation.

As the century progressed, the automobile thrived and became a mainstay of the American household. With it came insatiable suburbs transforming farmland into housing subdivisions, shopping centers and cloverleaf interchanges. This dash for the outskirts left downtown areas gasping for breath and teetering at the edge of eroding tax bases. With parking lots dwarfing the facilities they were built to serve and development lacking any rhyme or reason, suburban sprawl has taken its toll in inefficient land use, overdepenclence on automobile travel and forsaken central cities.

Experience of the past 10 years, however, has indicated that rail transit is one of the most powerful weapons we have in the battle against urban blight and unplanned suburbs.





shaping cities: the facts

- Between 1959 and 1969, 90% of all office construction in Toronto occurred in the planning districts through which the initial 4½-mile subway ran.
- The beginning of rail service in the nation's capital has opened up innumerable entertainment, shopping and cultural opportunities to workers and visitors alike.
- In San Francisco, a developer can increase his project's floor area ratio by constructing a direct entrance to a BART station.
- Rail transit has exhibited its ability to stimulate downtown activity, channel development into clusters and corridors and preserve neighborhood character, depending on local policies and objectives.

Toronto is one city which provides powerful evidence. Between 1959 and 1969, 90% of all office construction occurred in the planning districts through which the initial 4½-mile subway ran. Additionally, 48.5% of all high-rise apartment construction also occurred in those districts. Although heavy development was spreading outward, much of the construction resulted in strengthening the central business district and clusters of activities around outlying stations.

Rapid transit lines and extensions in cities like Cleveland, Montreal and Chicago have similarly stimulated nuclei of development around suburban stations.

And, it is no coincidence that the cities which have maintained the strongest downtown districts, such as New York, Chicago and Philadelphia are those which have possessed effective, established rapid transit systems for many years.

Cities like Toronto, Montreal, San Francisco and a host of others have downtown areas that are accessible and people-oriented. Rail transit systems allow residents to come to the central area, circulate around and through it and return home free of the encumbrances of traffic, parking and delays.

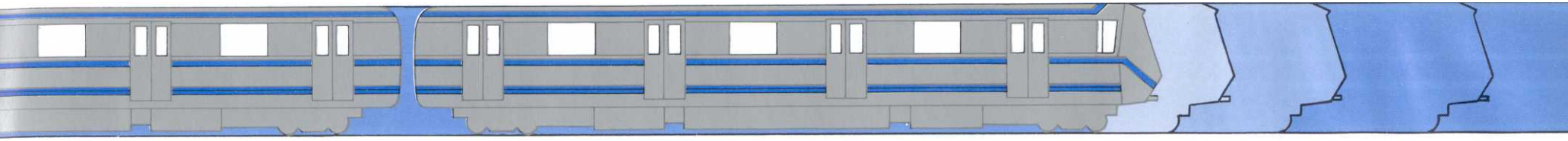
Washington, D.C., possessing the infant of North American rail services, illustrates the concept. Due to height limitations, the central business district of the nation's capital is quite spread out. A taxi ride from the Connecticut Avenue business district to Union Station—both considered downtown locations—could take up to a grueling 30 minutes. With the advent of Metro, the trip has been reduced to eight minutes of comfortable travel. Shopping, entertainment and cultural attractions have been opened up to workers and visitors alike. The result has been the addition of a third rush hour during the mid-day period when passengers shuttle to restaurants, stores and museums that were previously out of the question during a lunch hour.

The point was made earlier that rapid transit is most effective as a planning tool when it is used with careful control.

In Toronto, the development of rail was guided by policies and objectives designed to encourage the desired type of urban improvement. Larger sites than actually needed for rights-of-way were assembled. The intent was to attract large-scale development proposals from the private sector. Station structures were reinforced to be stronger than necessary so that additional construction could take place above. In addition, the planning commission remained open to granting higher density zoning requests around stations to encourage clustering of office, retail and housing facilities.

In San Francisco, "building bonuses" encouraged direct access between BART and new high-rise structures. Under these provisions, a developer could increase floor area ratio (the amount of floor space as compared to the size of the property) 20% above the usual limit by having a direct entrance between the building and a BART station mezzanine. By merely locating the building near a BART station, the ratio allowed is 10% higher than the norm.

Yet in some areas served by BART, local sentiment called for neighborhood preservation and minimization of impact. This, too,



was accommodated by rail. In the Rockridge district of Oakland, a neighborhood of World War I vintage, BART acted as a stabilizing force. The state constructed a massive, eight-lane elevated freeway right through the residential and commercial neighborhood, with many of the predictable results.

But in the median of the freeway was a BART station which acted as the focus for community efforts to revitalize and upgrade the neighborhood. Successful community action resulted in a change in the zoning code to prevent major new development and retain the residential character of the area. This, combined with BART's easy access to downtown Oakland and San Francisco, has reversed the physical and economic deterioration and has made Rockridge a desirable place to live once again.

The Rockridge experience demonstrates rail transit's use as a stabilizing force.

Depending on local policies and objectives, rail transit provides city planners with a flexible and formidable weapon. An electric rail transit line forming a defined and permanent corridor between center city and residential development allows for both an orderly development of a pleasant, people-oriented downtown as well as a more efficient suburb. It encourages a central city as well as suburban subcenters. Rail transit has proved its ability to preserve the character of a neighborhood or revitalize one that is deemed in need of change.

stimulating economic development

Intrinsically related to the city's planning function is its ability to attract investment. At a time when the fiscal seas have turned stormy for many of our metropolitan areas, the infusion of new capital in the form of increased land values and a heightened pace of development are nothing less than lifelines of increased tax revenues.

In city after city where rail transit has played a role, it has acted as a catalyst to just this kind of financial assistance. Put simply, while rail costs money to build and operate, it allows others—often the municipality itself—to make money.

Consider Toronto. According to G. Warren Heenan, a member of the Toronto Real Estate Board, by 1966 the $67-million Yonge Street subway resulted in $10 billion of development. Between 1950 and 1960, the Toronto Transit Commission reported that property assessments increased 32.8% city-wide and 45.4% in the areas adjacent to the subway entrances. A similar jump, though not quite as high, was recorded in the 1960-1970 period.

Similar financial benefits have accrued to

the city treasury of Montreal. Montreal has paid particular attention to supporting and integrating the Metro with extensive underground arcades. A developer's brochure promotes the buildings above by noting that the shopping promenades bring "two million people into your own basement." The result is a tremendous strengthening of the downtown as a shopping area as well as more patrons for the transit network.

A successful approach to air rights development allows a developer to pay only an annual rent on the land if a certain amount of floor space on the ground floor and basement is given over for use by the subway, if the exterior of the building accommodates required bus service and if full cooperation exists between the developer and the Montreal Urban Community Transit Commission. The city benefits; the private developer benefits, the transit commission benefits; and of course, the Montrealer benefits.

Economic stimulation to an area is again apparent with an examination of the Lindenwold line. According to a study by Colin A. Gannon and Michael J. Dear, the bulk of office growth in Camden County has occurred in communities on the rapid transit line. Gannon and Dear report on the Borough of Haddonfield, "During the period between 1961 and 1968, a total of 50,000 square feet of new office space was constructed in the borough. However, between 1969 and 1971 (the first three years of the line's operation), 143,800 square feet of new floor space in this borough was placed on the market. Further, an additional 79,200 square feet was firmly programmed for 1972-73. No other borough in Camden County matches this level of activity."

The report goes on to note that Haddonfield office complexes had some of the lowest vacancy rates in southern New Jersey, while office centers located with only highway access, despite proximity to shopping and community facilities, suffered vacancy rates of 25% and higher.

While Boston has one of the oldest urban rail systems in the nation, expansions have triggered significant new growth. The South Shore extension has brought about the beginnings of large-scale industrial development at one station and one area's first new housing construction in years at another. The industrial development, located on previously unused land, is especially significant because it is illustrative of rail's ability to bring workers to a location that previously was largely inaccessible without a car.

San Francisco's tax base was immeasureably enhanced by the construction of BART. From 1960 through 1975 major office space increased by 20.8 million square feet. That increase was contained within 39 new buildings, 10 to 52 stories in height, all located in one square mile surrounding two of the four major downtown San Francisco subway stations.

The BART system is credited with bringing about $1.4 billion worth of new construction.

Business development has not been confined to the San Francisco portions of BART, however.

Downtown Berkeley merchants report that they are now drawing customers from virtually the entire three-county BART service area. Some have specifically chosen to locate near the station entrance. Additionally, a new 14-story office building and a banking facility

stimulating development: the facts

- The $67-million Yonge St. subway in Toronto resulted in $10 billion of development.
- Between 1950 and 1960 Toronto property assessments increased 32.8% city-wide and 45.4% in the areas adjacent to the subway entrances.
- Office complexes located adjacent to the Lindenwold line in southern New Jersey reported some of the lowest vacancy rates in the area.
- From 1960 through 1975, major office space within one square mile of two BART stations increased by 20.8 million square feet.
- BART is credited with bringing forth $1.4 billion in new building construction.

have been constructed adjacent to the BART escalators.

The BART Impact report points out that "numerous new office and bank buildings" have been built around the 19th Street station in downtown Oakland and that the City Center project at the 12th Street subway station is now well underway.

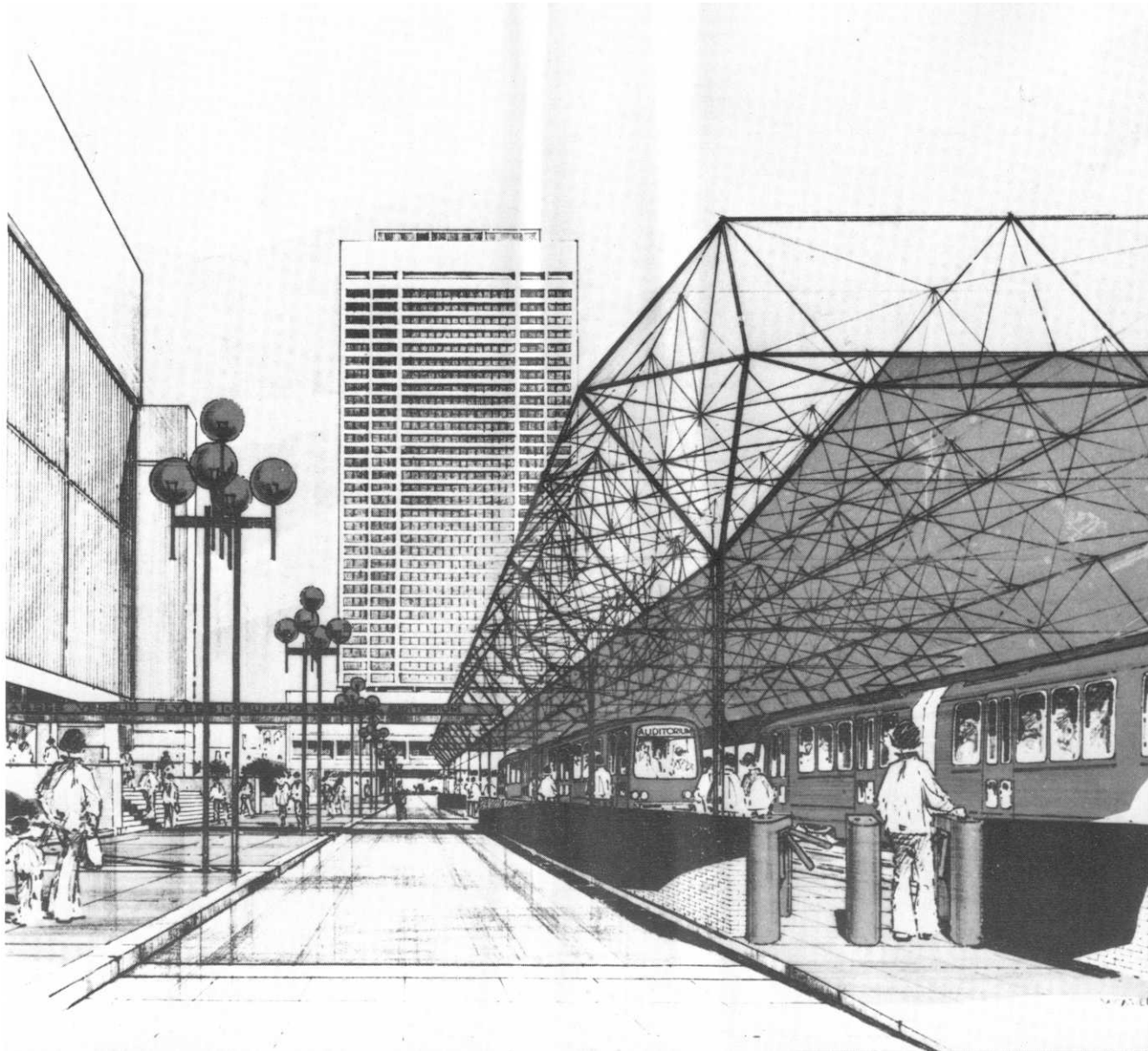
There is little dispute that rail can bring development. With properly controlled development come tax revenues and revitalization which will only have an upward, spiraling effect on the city and on its metropolitan region. From an investment standpoint, rail transit is a plus. Clearly it brings benefits to those who ride it as well as to those who do not.

the future

But what of the future for rail in North America?

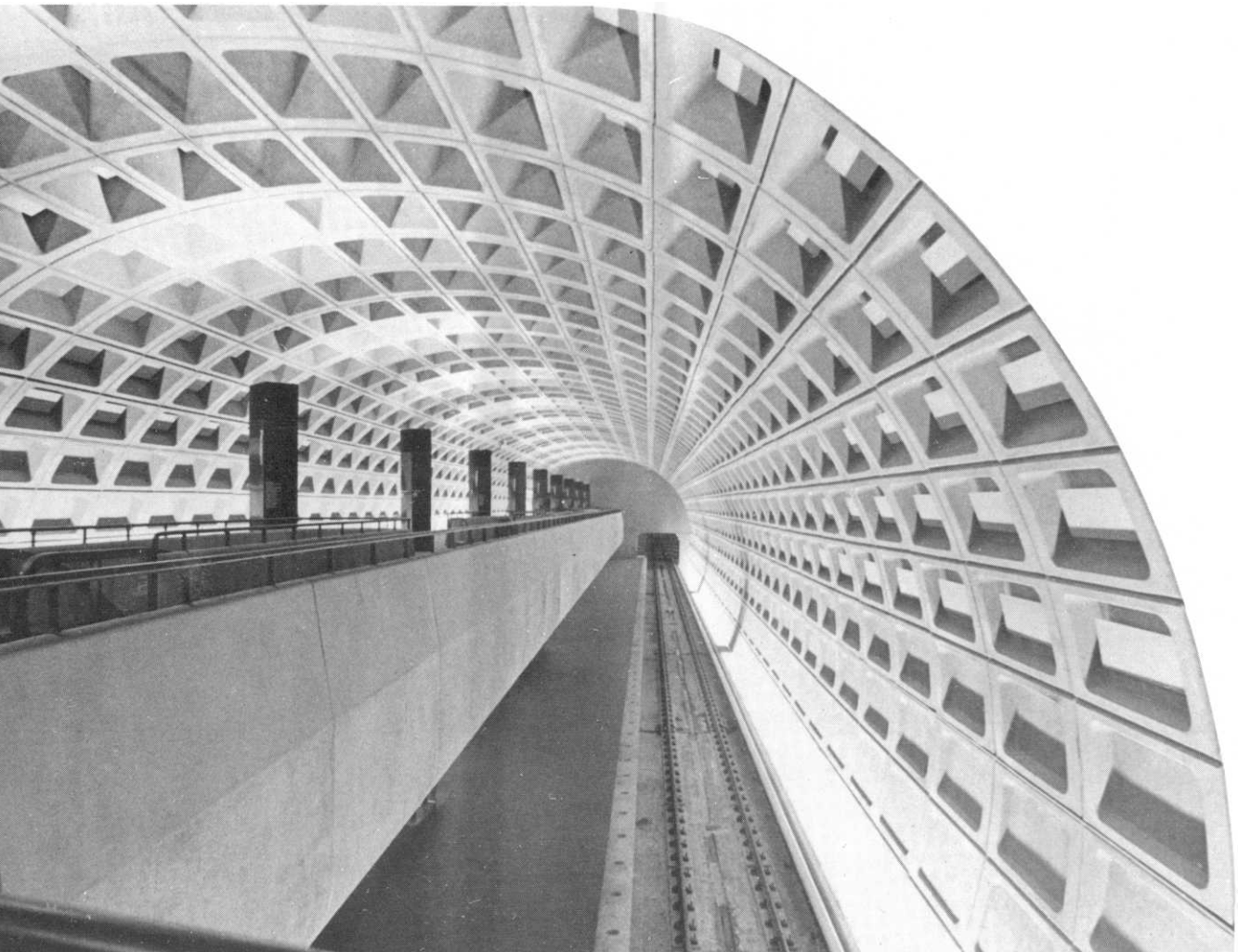
Of the continent's 10 urban rapid transit networks currently in service, six have been constructed since 1950. The remaining four have been expanded since that date. Several more systems are on the way; this year finds them in various stages of construction, design and planning.

In March 1976, in time for the Bicentennial, the Washington Metropolitan Area Transit Authority cut the ribbon on the first segment of its planned 100-mile regional rail rapid transit system. More than 30,000 pas-



sengers ride that five-mile line every day, topping all initial projections. During 1977 another 18 miles and 23 stations are being brought into operation. This will mark the first rail service into the Maryland and Virginia suburbs and provide access to such facilities as National Airport and Robert F. Kennedy Stadium.

Atlanta is well into the construction stage of its regional rail rapid transit system. Ultimately, the Georgia city will build more than 50 miles of subways, elevated and surface rail rapid transit.



The first phase, with almost 14 miles of route, is under construction and includes 17 stations. Another eight miles of right-of-way and seven stations are under design. Late 1978 is the target date for the commencement of revenue operation.

Ground has been broken in Baltimore for a 7.5-mile rail rapid transit line with subway, elevated and surface sections.

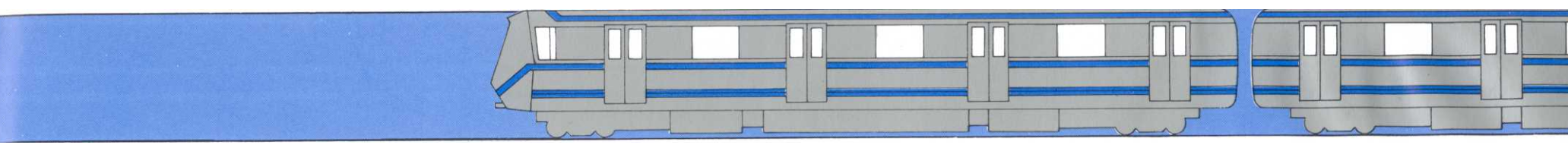
In Buffalo, N.Y., $336 million has been earmarked for construction of a light rail transit system. Rather than a conventional subway, Buffalo will build the first post-war light rail line in the United States. In a corridor deemed too busy for buses and perhaps not dense enough for rapid transit, light rail operating for most of the route on a reserved right-of-way, was determined to be the solution.

Design work is ongoing for a 20.5-mile system in Metropolitan Dade County, centered in Miami. Federal funds have been made available for the design and current planning calls for carrying the first passengers in 1982.

In Canada, construction is nearing completion in Edmonton on a 4.5-mile, $65-million light rail system. Similar networks have been proposed for both Vancouver and Calgary.

Other cities—San Juan, Honolulu and Los Angeles included—are also seriously exploring rail options.

In North America, urban rail is most certainly enjoying a renaissance period. But do not mistake it for a fad. In a sense, we are



just relearning what we once knew. Rail rapid transit is now a new discipline in this country; an old and respected profession in other parts of the world.

Looking Abroad

In considering our future transportation re-requirements, we must dispel the myth that we need the density of New York or Chicago to make rail work. We need only look across the ocean to find the proof.

San Francisco, New York, Philadelphia and Chicago have well developed rail systems and greater population densities than most European cities with rail transit. Frankfurt and Washington have about the same density. Brussels and Baltimore are also counterparts. Hamburg, which has an efficient rail network is about as dense as Seattle, Dayton and Los Angeles, which do not have rail operations.

Hamburg, Cologne, Brussels, Frankfurt, Dusseldorf, Stuttgart, Rotterdam, Hanover and Gothenburg, which range in regional populations from 800,000 to about 1.5 million, all have extensive rail transit service. No United States city in this regional population category can make the same claim.

We might also examine the number of persons per automobile in Europe as well as in the United States. In 1970, there were about 2.4 persons per car in the United States. In Germany, it was about five persons per auto. Yet, while American policies blatantly encouraged the construction of ribbons upon ribbons of highway, Germany managed to balance its transportation priorities between road and transit. The results are indicated in a recent article in the *UITP Review* by Gunter Girnau of the Federal German Association of Urban Public Transport Authorities.

Girnau reports: half of the population of West Germany depends totally or in part on public transportation; urban transit carries 60% of all traffic in major cities; more than 50% of shopping is done via transit on working days; almost 25% of the occasional and 16% of regular public transportation riders always have a private car at their disposal; and private car movements in Munich decreased by 70,000 daily in the city center after suburban and regional rail rapid transit services were inaugurated.

As rail's impact begins to be felt in American cities, similar results will occur. By the end of the century, rail systems could exist in every city in North America with a population over one million. It would be a major investment—but consider the dividends!

summation

It is no coincidence that the renewed interest in urban rail comes at a time of renewed interest and confidence in our cities. People are moving back into urban centers; office, retail and housing complexes are rising from downtown rubble; and long forgotten inner city neighborhoods are once again brimming

with life and community spirit.

Part of the explanation for this rebirth lies in the realization that urban and regional development is not a spectator sport—cities can do what we want them to do.

With this consciousness of our urban destiny comes hard choices. We must decide which transportation alternatives will best serve us; we must arbitrate among demands on our land; we must find and implement solutions to our energy and environmental pressures; and we must allocate our thinned financial resources. Perhaps most challenging is that every decision we make will affect some other.

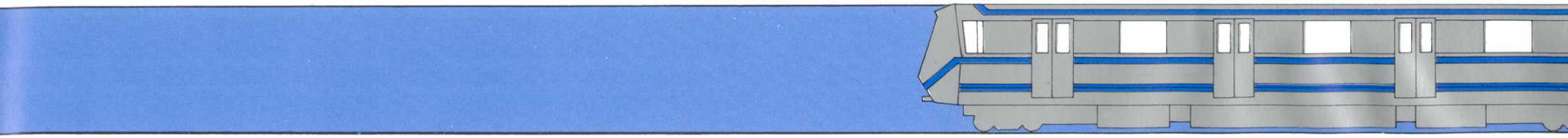
Transportation provides classic evidence of this interdependence.

Transportation critic Wilfred Owen has stated, "There are no easy guides to success or failure for the transport decision maker. Transport policies that make sense have to be derived from development policies that also make sense. The most urgent need is to create a new state of mind in which transport decisions are clearly seen as an integral part of other policy decisions."

In the May 1977 *Nation's Cities*, Owen writes, "Today, modern transportation has the technical capability of supporting any conceivable size or shape of city. But the urban community no longer is forced to settle for whatever growth patterns technology happens to make possible. Urban man is now in a position to decide what kinds of communities he wants to live in, and then to use transportation technology to help achieve them. Without this balanced approach to transportation supply and demand, no amount of investment will solve problems of moving about in cities."

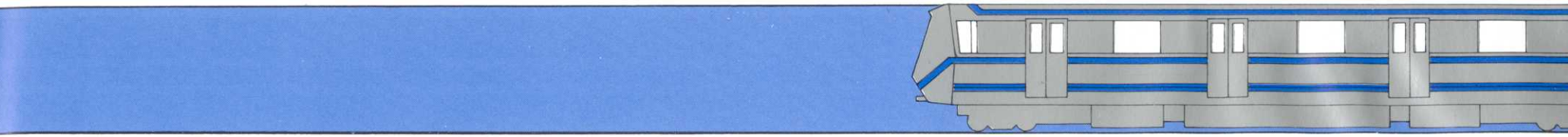
Owen continues, "Federal aid for urban transportation needs to be conceived as a means of promoting the redevelopment of cities and of enhancing the urban environment, while urban redevelopment needs to be seen as a means of transportation problem solving . . . By consolidating programs of housing, transportation and urban services, the stage would be set for a total attack on urban blight and for an orderly program of urban growth."

Urban rail transportation is one of the weapons available for the attack Owen writes of. Rail transportation has a proven record of efficient and low-cost operation. It saves energy, it channels development and it stimulates local investment. The true value of rail transit cannot be measured at the fare box or on a tax bill. Its payoff is the urban environment it has improved and continues to serve. That is the case for rail transit.



rail transit inventory

LOCATION	STATUS
Argentina	
Buenos Aires	Being extended
Rosario	Under study
Australia	
Adelaide	Being planned
Melbourne	Under construction
Sydney	Under construction
Austria	
Vienna	Being extended
Belgium	
Antwerp	Under construction
Brussels	Operating
Liege	Operating
China	
Peking	Extensions finished
Colombia	
Bogota	Light rail planned
Czechoslovakia	
Prague	Portion operating
Bratislava	Being planned
Denmark	
Copenhagen	Being planned
Egypt	
Cairo	Being designed
Finland	
Helsinki	Under construction
France	
Lyons	Under construction
Marseille	Under construction
Paris	Full operation
Liverpool	Suburban railways and subway (being extended); 2.41 Km. to be run by railway
London	Operating
Manchester	Construction approved but deferred
Tyneside	Under construction
Greece	
Athens	Extension planned
Hong Kong	
Hong Kong	Under construction
India	
Bombay	Under study
Calcutta	Under construction
Dehli	Under study
Madras	Under study
Iran	
Teheran	Being planned
Iraq	
Baghdad	Being planned



Brazil	
Recife	Under construction
Rio De Janeiro	Under construction
Sao Paulo	Portion operating
Bulgaria	
Sofia	Studies finished
Canada	
Calgary	Being planned
Edmonton	Under construction
Montreal	Being extended
Ottawa	Light rail planned
Toronto	Full operation
Chile	
Santiago	Portion operating
Germany	
West Berlin	Being extended
East Berlin	Being extended
Cologne	Portion operating
Dusseldorf	Under construction
Frankfurt	Being extended
Hamburg	Operating
Hanover	Being extended
Munich	Being extended
Nuremberg	Portion operating; under construction; being planned
Stuttgart	Portion operating
Wuppertal	Monorail in service
Great Britain	
Birmingham	Being planned
Glasgow	Being upgraded
Ireland	
Dublin	Under construction
Israel	
Haifa	Operating, cable-hauled
Tel Aviv	Under study
Italy	
Florence	Under study
Genoa	Being planned
Milan	Being extended
Naples	Being planned
Rome	Portion operating and under construction
Turin	Being planned
Venice	Postponed

LOCATION	STATUS
Japan	
Kobe	Under construction
Kyoto	Portion operating
Nagoya	Being extended
Osaka	Being extended
Sapporo	Extension planned
Tokyo	Being extended
Yokohama	Full operation; extension underway
South Korea	
Seoul	Operating; extensions planned
Lebanon	
Beirut	Being planned
Malaysia	
Singapore	Being planned
Mexico	
Guadalajara	Under construction
Mexico City	Being extended
Netherlands	
Amsterdam	Under construction
Rotterdam	Being extended
South Africa	
Johannesburg	Under study
Spain	
Barcelona	Being extended
Bilbao	Being planned
Madrid	Being extended
Malaga	Being planned
Seville	Being planned
Sweden	
Gothenburg	Pre-metro
Stockholm	Being extended
Switzerland	
Lausanne	Rack railway
Turkey	
Ankara	Being planned
Istanbul	Being planned
U.S.S.R.	
Baku	Being extended
Dnepropetrovsk	Being planned
Gorky	Being planned
Karkov	Operating
Kiev	Being extended
Honolulu	Under study
Miami	Under construction
Newark	Operating light rail in subway
New York	Being extended
Philadelphia	Full operation
Pittsburgh	Under study
St. Louis	Under study
San Francisco	Full operation
San Juan	Being designed
Washington	Portion operating
Uruguay	
Montevideo	Being planned
Venezuela	
Caracas	Under construction

Source: "Principal Rapid Transit or Underground Railways," *Railway Directory and Yearbook*, IPC Transportation Press, London, 1977.

Norway	
Oslo	Being extended
Peru	
Lima	Being planned
Poland	
Warsaw	Portion operating; under construction
Portugal	
Lisbon	Being extended
Romania	
Bucharest	Under study
Pakistan	
Karachi	Portion operating
Leingrad	Being extended
Minsk	Under construction
Moscow	Being extended
Novosibirsk	Being planned
Riga	Being designed
Tashkent	Operating
Tbilisi	Being extended
U.S.A.	
Atlanta	Under construction
Baltimore	Under construction
Boston	Being extended*
Buffalo	Under construction; light rail
Chicago	Extension planned
Cleveland	Full operation
Denver	Being planned
Detroit	Under study

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