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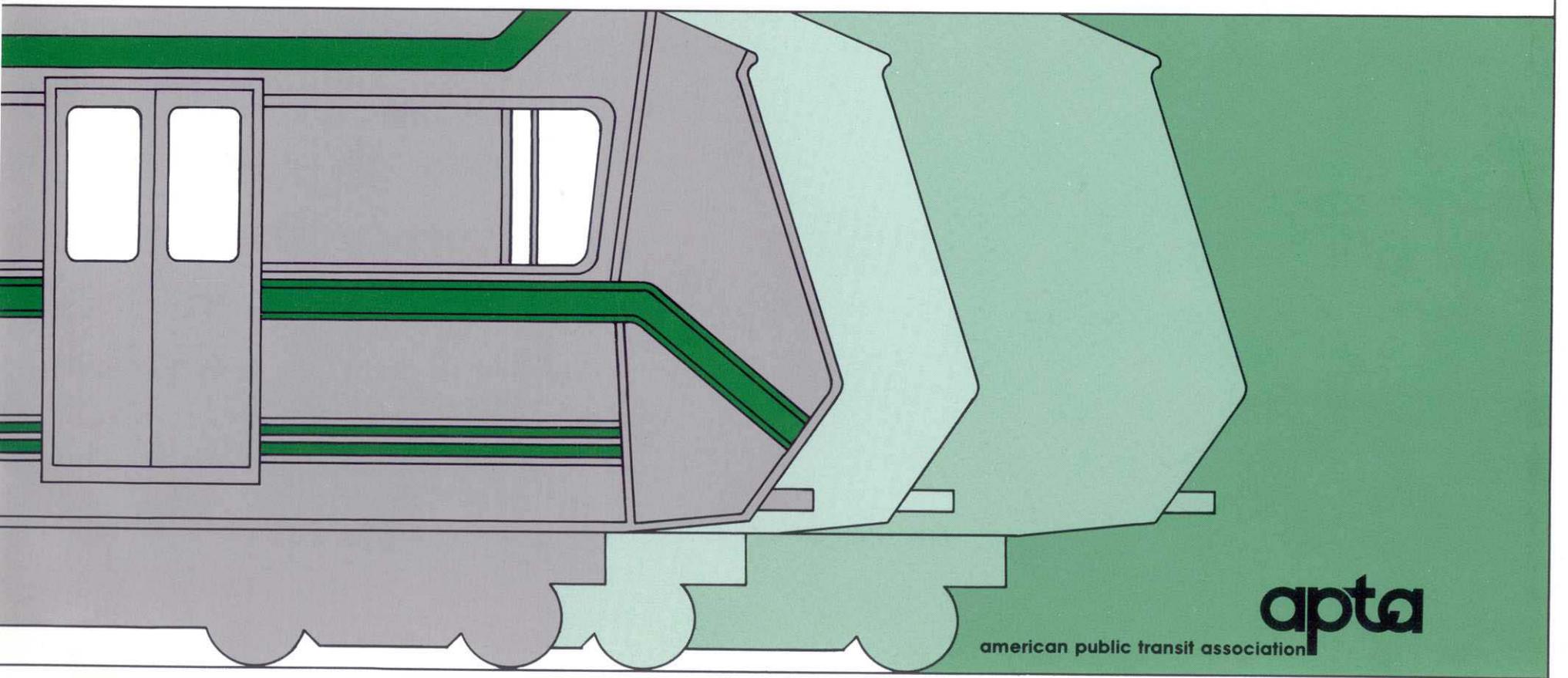
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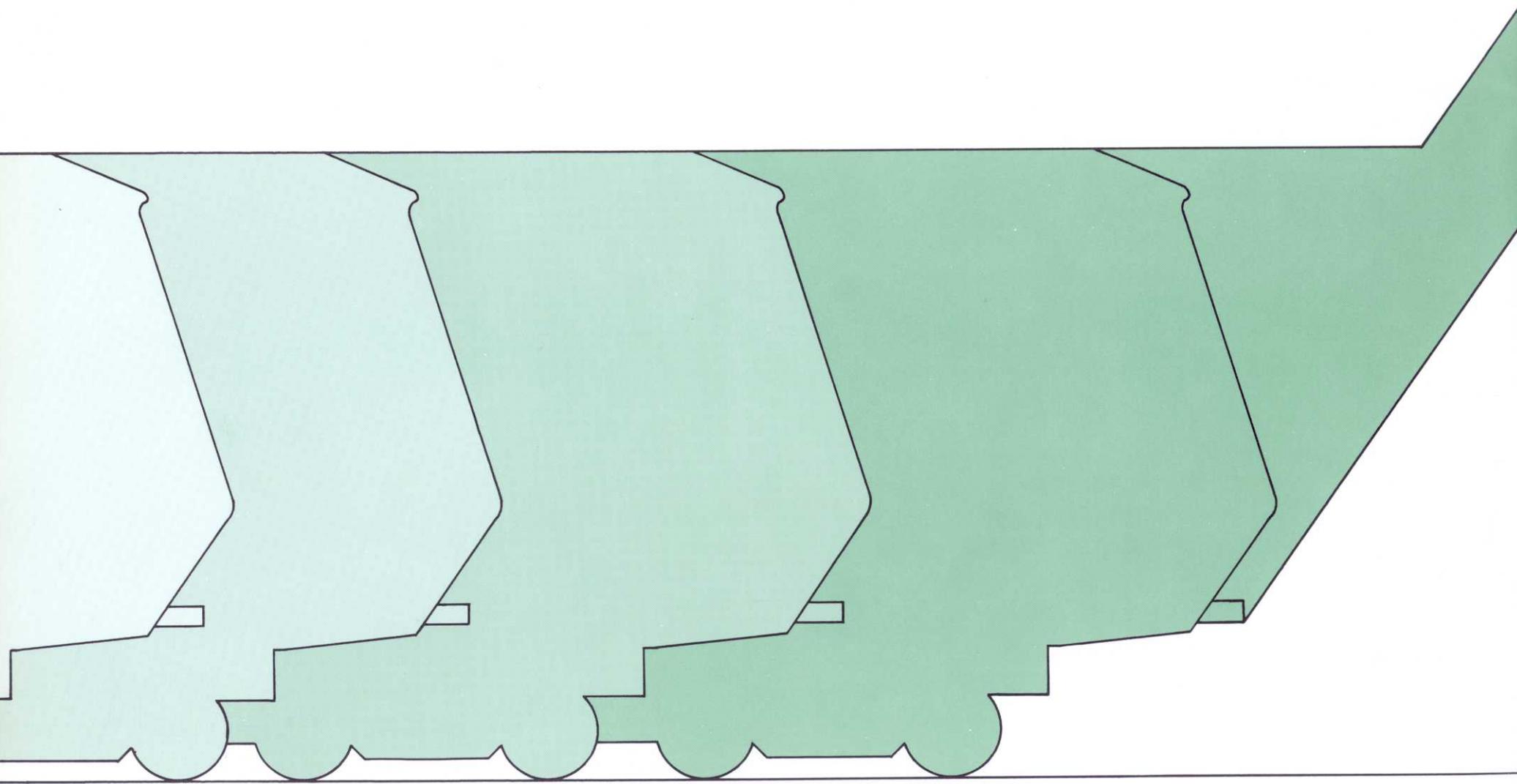
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The Future Of Rail Transit



apta
american public transit association



The Future Of Rail Transit

a report by the
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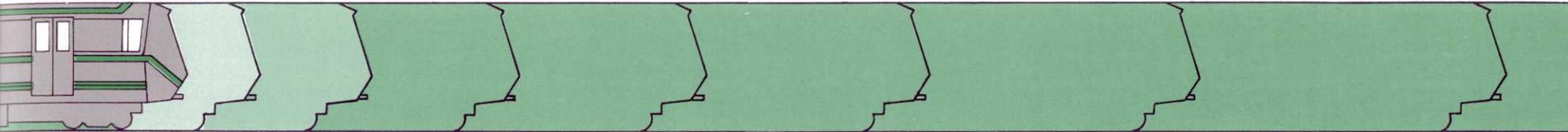
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the future. . .

To portray the city is to portray movement, and movement means that people are able to reach out to participate in the life of their community.

Our urban transportation system moves people, and in North America today urban transportation is going through a transition.

We are rediscovering the benefits of public transit. Transit means a family of services and operating modes—each with unique characteristics and each at its maximum efficiency in certain settings and not in others.

APTA's publication, *The Case for Rail Transit*, suggests that appropriate use of rail can make our cities more *livable*, a more human environment. Four roles of rail transit are explored:

- as a high capacity passenger carrier moving people;
- as an environmental safeguard to conserve energy, to protect the environment, and to improve our air quality;
- as a shaper of more efficient, comfortable cities; and
- as a catalyst of urban economic development and revitalization.

The Future of Rail Transit examines these impacts on the North American cities where rail is being improved, constructed, or considered.

Only a few years ago, BART, the San Francisco Bay Area Rapid Transit System, was heralded as the infant of a new generation of urban rail.

Since then, dozens of new systems and extensions to old ones have gone into operation

throughout the world. Dozens of other projects are being evaluated and planned.

The Future of Rail Transit examines the renaissance of rail in the United States and Canada. The benefits described in *The Case for Rail Transit* are now set into the context of local conditions and decisions in 24 cities.

We describe the extensions and improvements currently under way in cities where rail transit is today an essential part of the urban transportation system, and we examine the plans and resulting benefits in those cities which are seeking to initiate rail projects.

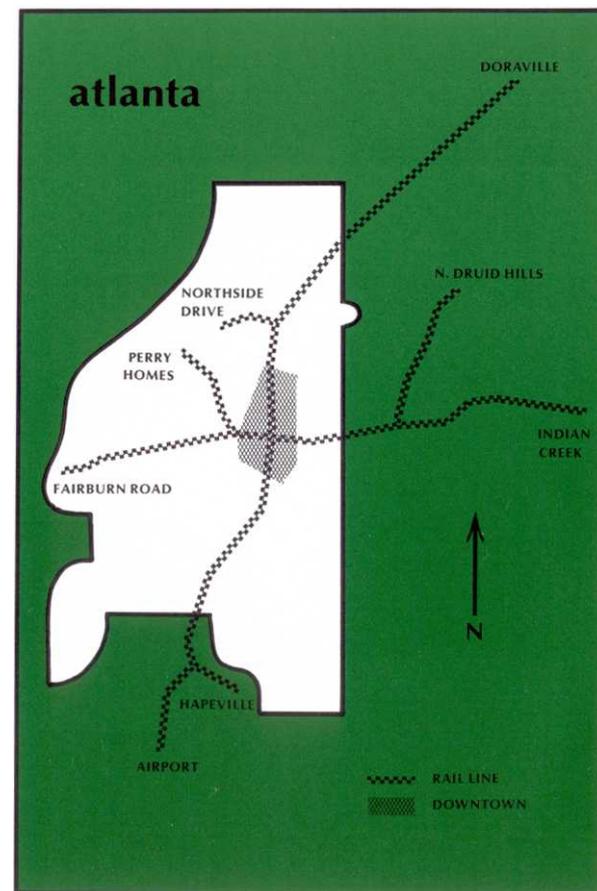
Research for *The Future of Rail Transit* was contributed by APTA's members in each of the cities. In many cases, methodologies may vary, and data may not be comparable. What is important, however, is not the numbers, but the ideas, the movement, and the people—an understanding of how rail transit adapts, how it complements, how it enhances, and how it stimulates. How it helps to make our cities livable—on some of North America's most diverse urban landscapes. That is the future of rail.

atlanta

Atlanta residents are in for quite a Christmas present in 1978—a set of trains. Seven miles of them, in fact, representing the initial revenue service of the region's rapid transit system.

By all standards, Atlanta is growing. With a current metropolitan population of more than

1.7 million, it is expected that more than three million people will live in the area by 2000. In the relatively recent past, Georgia's state capital has evolved into the business and transportation hub of the southeastern United States. Over 1500 manufacturers provide a diversified economic base and more than 300 companies are actually headquartered in Atlanta. The air-



port is the nation's second busiest. And, an increasing number of major cultural, historical, recreational, and sports centers have become a part of the Atlanta scene.

Against this panorama of vitality, two problems have surfaced and have become critical to the region's future—traffic congestion and mobility.

Motor vehicle registration in the five-county Atlanta metropolitan area was 215,000 in 1950. By 1960, registrations had increased by over 100% with another 83% jump during the 1960s. Forecasts say that 1.5 million cars will be jamming Atlanta's roads by 1980. The result has been massive rush-hour congestion. The heavy traffic period in the morning in 1958 was 30 minutes. Today it is two and one-half hours. In the afternoon, the heavy traffic period has extended from 45 minutes to four hours. Noontime traffic today is almost as heavy as the morning and afternoon rush of 10 years ago. Interstate highway segments are already operating far in excess of their planned capacities.

In spite of soaring increases in automobile usage, there is still a substantial number of citizens who are transit-dependent. Although an efficient system of buses serves the regions, these trips are also subject to traffic delays.

Responding to the needs of the future, in 1971, Atlanta voters approved a regional transportation network encompassing 53 miles of rail rapid transit linked with eight miles of busways. Included in the package is an extensive web of feeder and express bus lines to support the rail spine.

Moving People: Under construction is a system comprising an east-west line and a north-south line, intersecting under downtown Atlanta.

Each of the legs branches outside of the central area to increase coverage.

About 65% of the network parallels existing railroad rights-of-way to minimize neighborhood disruption and strengthen existing transportation corridors. Notable exceptions are in downtown Atlanta and east of the city in Decatur. In the central city, one line tunnels under Peachtree Street, providing access to almost every major educational, recreational, and employment center. At the request of the citizens and officials of Decatur, the line travels below the city's medium-size downtown to be used as a catalyst for redevelopment.

Although about 50% of the rail passengers are expected to begin their journeys with a bus ride, just under 30,000 parking spaces will be provided at stations. Kiss-and-ride lanes and bicycle storage will also be present.

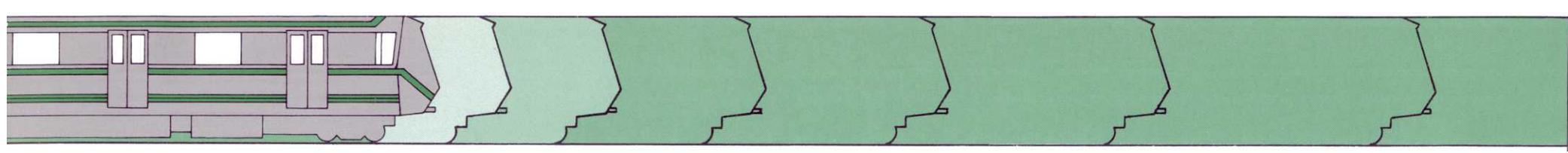
By late 1981, MARTA projects the 14-mile Phase A segment of the system to be carrying 110,000 passengers daily. With a full 53-mile system operating by 1990, rail and bus patronage in Atlanta has been set at 500,000.

The introduction of rail into the Atlanta region will open up opportunities for disadvantaged groups. Consider neighborhoods like Dixie Hills. A low-income area, Dixie Hills is connected by bus to the central city. It will be linked by feeder bus to the rail system, providing not only speedy access to downtown Atlanta but also service to jobs in the outlying sections. Other transit-dependent communities like Perry Homes or Vine City will experience even more dramatic improvements in travel times, since many residents will be within walking distance of a rail station.

Conserving Energy, Protecting the Environment: Motor vehicles are currently the leading source of air pollution within the Atlanta metropolitan area, contributing over 63% of the weight of air-borne pollutants. The greatest reduction in automobile exhaust emission between today's levels and those of 1995 is expected to be due to enforcement of federal automotive emissions standards. However, an 8% reduction in vehicle miles is projected to result from the introduction of rail into the

atlanta: the facts

System Type	Heavy Rail
Length	52.9 miles; 26.5 miles at grade, 10.1 miles in subway, 16.3 miles aerial
Status	Initial 14 miles under construction
Begin Revenue Operations	1978
Number of Stations	39; 19 at grade, 13 in subway, 7 aerial
Yards	1
Predicted Daily Ridership	500,000 (bus and rail, 1990)



Atlanta region. This, coupled with a 20% increase in the average speed of automotive traffic, also due to rail, will amount to more than an 8% reduction in total emitted pollutants. A reduction in overall consumption of gasoline is another related by-product.

Shaping Cities: From the very beginning, Atlanta officials have envisioned the rail system as a tool to provide more orderly urban development growth patterns, consistent with adopted goals, development policies, and the regional plan. Rail in Atlanta will not, by itself, determine the rate of growth for the region. However, as a part of a balanced transportation system, it will guide growth by offering an aid to public programs and private development projects along selected corridors.

Sprawl is a major problem in the Atlanta region. The rail system is designed to encourage residential and employment growth into the areas where transit can best serve them. By 1995, it is expected that 407,000 acres of land will be incorporated into Atlanta's urban uses. Without the rail line, planners predict that 489,000 acres would have been developed, with lesser densities in dispersed, inefficient patterns.

Stimulating Economic Development: Considerable effort has been made through the planning, design, and construction process to integrate urban development and rapid transit from the outset, in recognition of the obvious economic and transportation service benefits. Immediately after the passage of the referendum in 1971, urban planners in the region undertook the preparation of detailed plans for the areas around the different stations. This effort, financed by the Urban Mass Transportation Administration and sponsored by the Atlanta

Regional Commission, is known as the transit station area development study process. It culminated with the official adoption of a detailed plan for the impact area of each station by the government of the jurisdiction where the station is located. Revised zoning ordinances have been drawn up in accordance with those plans. A number of programs for complementary public works are being pushed forth on the basis of TSADS plans. TSADS plans seek to encourage maximum development in areas around the stations where such growth is appropriate, but at the same time discourage it where it would conflict with established neighborhoods or where it would create unacceptable environmental impact. Things are beginning to happen as a result of this and related efforts.

For example, two large office towers are being built by the state of Georgia simultaneously and in the air rights of the Georgia State station. This was made possible through a timely cooperative construction agreement between MARTA and the state of Georgia in which the state provided the necessary surface rights for the development of the station, retaining the air rights for the construction of the buildings.

A similar arrangement was worked out with Southern Bell Telephone Company at the North Avenue Station. In this case, certain property rights acquired by MARTA were exchanged for the necessary underground easements on land owned by Southern Bell. The foundations of both the station and a new regional headquarters office building for Southern Bell are being built at the same time. In addition, this new complex will include shops, restaurants, and other offices directly accessible from the rapid transit station. This agreement also permitted

saving of a major national architectural landmark, the Fox Theater, which was to have been demolished by Southern Bell for the construction of its headquarters building.

Several other stations will be tied in directly with many large-scale existing and future developments. The Five Points Station, largest in the system where the east-west and north-south trunk lines will intersect, will have an underground passageway to Rich's, a major department store; to Underground Atlanta, one of the region's largest and most important tourist attractions; and to a future proposed development complex. The Omni Station, on the west line, will be connected directly to the facility of the same name, home of the Atlanta Hawks and the Atlanta Flames. The Omni's 15,000-seat auditorium is also heavily used throughout the year for big-name entertainment including circus and ice shows. In addition, the Omni Station ties in directly with the adjacent Omni International, a hotel, office, shopping, and entertainment facility of regional significance.

Within Phase A, a station will directly serve Peachtree Center, a multi-structure development containing offices, shops, entertainment, and the 1100-room, 70-story Peachtree Plaza Hotel. This station and line segments on either side are being built in a rock tunnel 115 feet below the surface at the deepest point. The bare rock of the cavern will constitute the finished walls for the mezzanine and platform areas.

The next station to the north, Civic Center, will connect directly to the Peachtree Summit Building one level below the street. This 30-story building was completed in 1977 in anticipation of the rapid transit system and houses MARTA's administrative offices. A comparable office

building is slated for construction by the same developer next to the Summit in the near future. The Civic Center Station will also be connected via a people mover, also part of MARTA's program, to the Atlanta Civic Center and to the Bedford-Pine Urban Redevelopment Project.

Well before its official opening date, rail is already making things happen in Atlanta.

buffalo

If all goes according to plan, sometime in 1982 Buffalo residents will be able to ride more than six miles down Main Street in about half the current travel time. They will be passengers on one of the nation's first complete light rail systems to be built since World War II.

It will be a day that has been long anticipated.

As the second largest city in New York state, Buffalo has had its share of many of the problems afflicting our older, industrial cities. A shift in the economic base is occurring as manufacturing activities decline and the service and government sectors grow. This has led to a reemphasis of the downtown as well as a need for improved access to suburban commercial clusters. A burgeoning state university campus along with significant renovation and new community development also characterize Buffalo's evolution.

Although the Niagara frontier is tied together by an efficient bus system, many of the metropolitan area's roads are already carrying traffic far beyond their designed capacity. Main Street, the route of the planned rail, is particularly overburdened. A 1970 study identified 42 cor-

buffalo: the facts

System Type	Light Rail
Length	6.4 miles, initially; 1.2 miles at grade, 5.2 miles in subway
Status	Planning and design under way; Construction to begin late Fall 1978
Begin Revenue Operations	1983
Number of Stations	14, initially; 6 at grade, 8 in subway
Yards	1
Predicted Annual Ridership	37.5 million (1983); 55.7 million (1995)

ridor intersections operating at unsatisfactory peak-hour levels and forecasted another 13 would reach that condition within five years.

As a northeast-oriented, diagonal route, Main Street crosses a basically north-south/east-west street grid. It serves as a collector of commuters going to and from downtown as well as handling crosstown traffic. Currently cars average about 12 miles per hour along its distance.

Complicating Buffalo's transportation picture are severe winter conditions which cause the greatest average annual snowfall of any large United States city.

Many of these unique factors have resulted in Buffalo's choice of the rail alternative.

Moving People: In 1983, the Buffalo light rail line is expected to carry 37.5 million riders; that figure is expected to rise to 55.2 million by 1995.

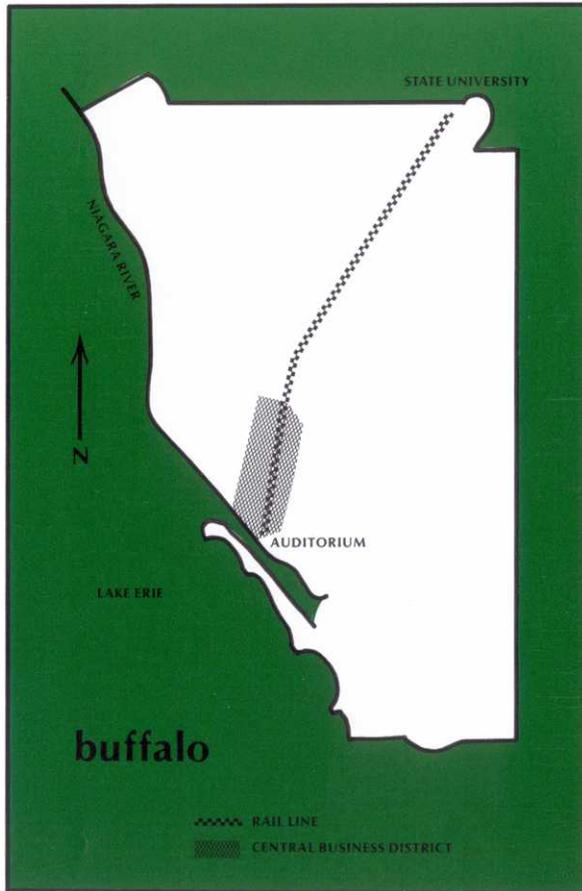
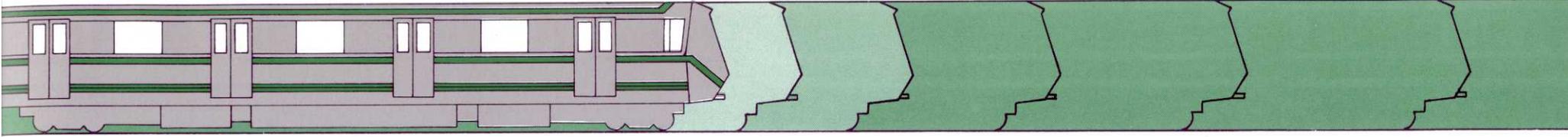
Travel time over the full 6.4-mile length has been set at 18 minutes; 19 minutes less than the bus and 11 minutes less than the automobile.

More important than the numbers of people who will be moved are the opportunities that

will be opened to them. The system serves a variety of the city's neighborhoods. Two, Ellicott and Masten, have the lowest car ownership rates and the highest unemployment levels in Buffalo. The advantages of improved accessibility to schools, jobs, and community facilities will be of particular benefit to residents of these areas. Another neighborhood, Elmwood, is characterized by a large proportion of elderly persons. Many, who are transit-dependents, also stand to gain. To the residents of more affluent sections as well as suburbanites, the rail line will provide a speedy link to the central business area.

Buffalo's transit planners note that the use of a Main Street route results in an additional impact. The thoroughfare would become a meeting ground—a neutral territory—where people from disparate neighborhoods would come together for the transit journey.

Conserving Energy, Protecting the Environment: Rail in Buffalo is expected to be a boon to environmental quality. Downtown, at-grade sections of the line are to be constructed in con-



and noise. In fact, current estimates say 15% fewer vehicles will enter downtown Buffalo once rail service is under way. A 1976 study predicts that the line will save 245,000 barrels of petroleum annually.

Shaping Cities: Although Main Street serves as the geographic spine of Buffalo, its importance as a focal point for development has diminished somewhat. Densely lined with buildings toward the central city, the corridor is marked by strip-type commercial structures and vacant lots farther out. The rail line is expected to counter many of these patterns, clustering new construction around stations and allowing less space for parking and more for pedestrians. City officials look to the downtown transit mall as means to invigorate the core business area and discourage the continuing spill of the suburbs into rural farmland.

Stimulating Economic Development: Buffalo's light rail line has been planned as a powerful weapon in the city's struggle to attract new business and commerce.

The funding for a downtown civic center, which is about to open, was approved with the knowledge that a rail system would bring thousands of patrons to various events without the usual parking and congestion problems. The State University of New York is building what will be one of the nation's largest higher education complexes at a location to be served by an extension of the currently planned line. The city's long-neglected waterfront is on the verge of redevelopment, now that the light rail line will provide easy access. Property sales along the route have already become brisk, with some developers discussing proposed projects with municipal officials.

The system is estimated to generate \$127.4 million in new office and retail space during the first 50 years of its operation, according to urban economists. At the same time, assessed valuations of property along the route are forecasted to rise a full 20% by 1995.

In a city that is striving to increase its employment base, the system's operation will create about 550 permanent jobs preceded by another 4000 during the construction phase. Payroll taxes returned to the city's treasury will rise accordingly.

Finally, over 50 years of the system's life, \$299.7 million in retail sales and \$13.5 million in office and clerical income are expected to be directly attributable to the introduction of rail.

On all fronts—transportation, economy, environment, and spatial—Buffalo residents are looking forward to a new quality of life with the advent of rail.

baltimore

Construction is underway in Baltimore, Md., on the largest public works project in Maryland's history—the eight-mile rapid transit line running from Charles Center in downtown, northwest to Reisterstown Plaza at the city line. A project of the Maryland Department of Transportation's Mass Transit Administration, the line runs 4.5 miles in subway, one mile at grade, and the rest aerial. Six of the stations are subway; three are aerial. Estimated final cost at the time of completion in 1982 is \$721 million, paid 80% federal,

junction with a traffic-free mall. The elimination of automobile traffic along a one-mile section of Main Street will result in reduced auto-emissions, street amenities and a maximum two-minute walk from light rail stations to downtown offices and shops along the route.

An efficient rail system will attract drivers from behind their wheels for the downtown trip, with accompanying reductions in congestion

20% by Maryland DOT's transportation trust fund.

Baltimore is particularly suited for rail transit, as is true of so many of the nation's older cities. The downtown streets are narrow and there are few through, crosstown streets. Competition for driving space is fierce between car and bus. To this is also added Baltimore's truck traffic. As one of the major seaports of the country, truck traffic through the City of Baltimore is heavy at all hours, much of it traveling on the city's downtown streets.

Moving People: The population of the Baltimore metropolitan area is 2.07 million, eleventh largest in the country. The 1970 population of Baltimore City was 906,000, making it the seventh largest city in the country, with the seventh highest population and employment density.

Baltimore is a prime candidate for rail transit, and for rapid transit especially. At the present time, it takes approximately 25 to 30 minutes to travel the northwest route by car and 35 to 40 minutes by bus. By rapid transit, the trip will take 15 minutes.

While 1975 bus ridership in the corridor was approximately 50,000 per day, it is estimated that initial transit ridership in 1982 will be 83,000 per day. Initial maximum peak hour operating capacity of the system will be 57,600.

The line will directly serve poor and middle class people in the dense urban areas of the city and suburban residents farther out.

In 1975, a study was made comparing costs of an all-bus transit system in Baltimore vs. a combined bus-rail system. The rail line considered was the rapid transit project out to Reisterstown Plaza. Patronage on an all-bus system would re-

baltimore: the facts

System Type	Heavy Rail
Length	8 miles; 1 mile at grade, 4.5 miles in subway, 2.5 miles aerial
Status	Under construction
Begin Revenue Operations	1982
Number of Stations	9; 6 in subway, 3 aerial
Yards	1
Predicted Daily Ridership	83,000

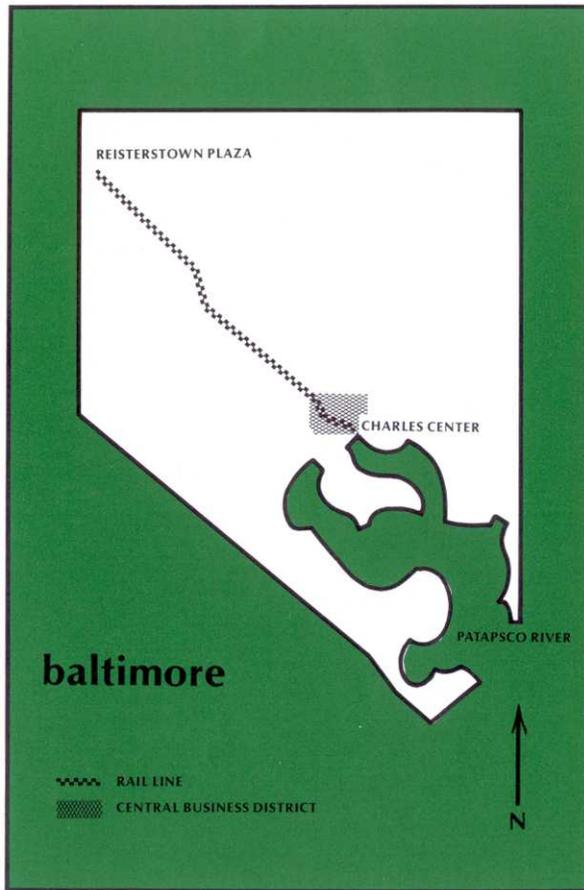
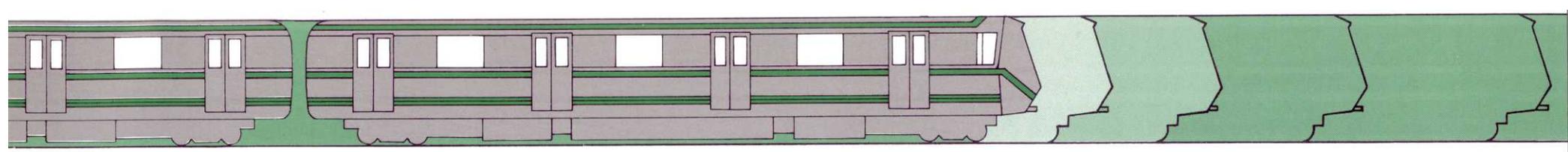
quire an increase of the present state-owned and operated fleet from 960 to 1360 buses just to maintain existing levels of service. Adding these 400 buses to existing traffic congestion would reduce operating speeds significantly and add operating costs greater than any increase in revenues from patronage. Projected to 1982, the year the rapid transit line is scheduled to begin operation, an all-bus system would cost \$83.5 million a year to operate, carry 109 million passengers, and earn \$33.6 million in revenue—yielding a gross deficit of \$49.9 million and requiring a subsidy of approximately 46¢ for each passenger trip. On the other hand, the combined bus-rail system should cost \$83.9 million a year to operate, carry 114.9 million passengers, and earn \$40 million in revenues—yielding a gross deficit of \$43.9 million and requiring a subsidy of 38.2¢ for each passenger trip.

Conserving Energy, Protecting the Environment: Between 4000 and 5000 automobiles are expected to be removed daily from the most congested parts of Baltimore City; this will reduce the total number of daily vehicle miles

by an estimated 60,000 to 70,000 and bring decreases in hydrocarbons, carbon monoxide, and nitrogen oxide. Figuring an average of 15 miles per gallon in fuel consumption to make the trip into the city by car from the northwest, 4000 to 6000 gallons of gasoline will be saved each day.

Shaping Cities: The corridor in which the rapid transit line will run is currently well-defined. Rail transportation will link a series of established activity centers.

Downtown, stations at the Charles Center and Lexington Market will enhance the role of these places as pedestrian-oriented centers of commerce. Farther to the northwest, stations will adjoin a state office complex and Mondawmin Mall, one of the nation's first dual-level, inner-city shopping centers. Mondawmin, currently being renovated, has attracted a number of new office and retail tenants. Reisterstown Plaza, the northwest terminal of the initial line, is a shopping center serving city as well as suburban dwellers.



With these diverse facilities providing access into stations, a sensible and efficient pattern of development nodes will emerge.

Stimulating Economic Development: Very real benefits to the economy are already being felt from construction. It will require 15,000 man-years to build the rapid transit line, generating \$225 million through payrolls. The infusion of this money into the Baltimore area economy is

expected to generate an additional 20,000 man-years of employment. Cumulative economic impact on Maryland is expected to be \$1.2 billion. About 300 permanent jobs will be created to operate the rapid transit line.

It is expected that from \$50 to \$100 million in new tax-paying commercial development will occur in Baltimore City as a result of rapid transit construction. The most significant project to date is the City of Baltimore's value capture proposal, Baltimore Gardens. Designed by Arthur Cotton Moore, this redevelopment project is based at Lexington Market station, and includes opening up the mezzanine of the station to a multi-level courtyard and shopping plaza.

The future includes further transit plans. An environmental impact statement has been approved for the extension of the Phase I line 6.1 miles past Reisterstown Plaza out to Owings Mills in Baltimore County. This would complete rapid transit service to the northwest, and would relieve heavily traveled Liberty and Reisterstown Roads. With alternative analysis yet to be completed, plans exist for light rail on the old North Central line, from downtown north to the industrial complex at Hunt Valley, and for light rail south into Anne Arundel County in the median strip of U.S. Route 3.

edmonton

The infant of light rail operations in North America is Edmonton, Alb., with its first revenue passengers carried in April 1978. In about three and one-half years since the first earth was turned, Edmonton residents are riding in and out of downtown on a speedy 4.5-mile rail transit line.

Edmonton has grown rapidly since World War II, from a population of 160,000 in 1951 to 451,000 in 1976. Intensive high-rise development has occurred in the central business district while active residential development is taking place on the periphery. Older developed communities throughout the city are normally well-maintained or redeveloped by private enterprise.

Particularly rapid urbanization in the northeast section of the city led to an investigation of transportation options and a decision to pursue light rail.

Moving People: Edmonton has designed and constructed a system that can comfortably carry between 5000 and 6000 people per hour in each direction during peak times.

Most of those passengers will be traveling to Edmonton's bustling core, where the line begins in subway. With one mile and two stations downtown, the cars surface and travel 3.5 miles along the existing Canadian National Railways right-of-way.

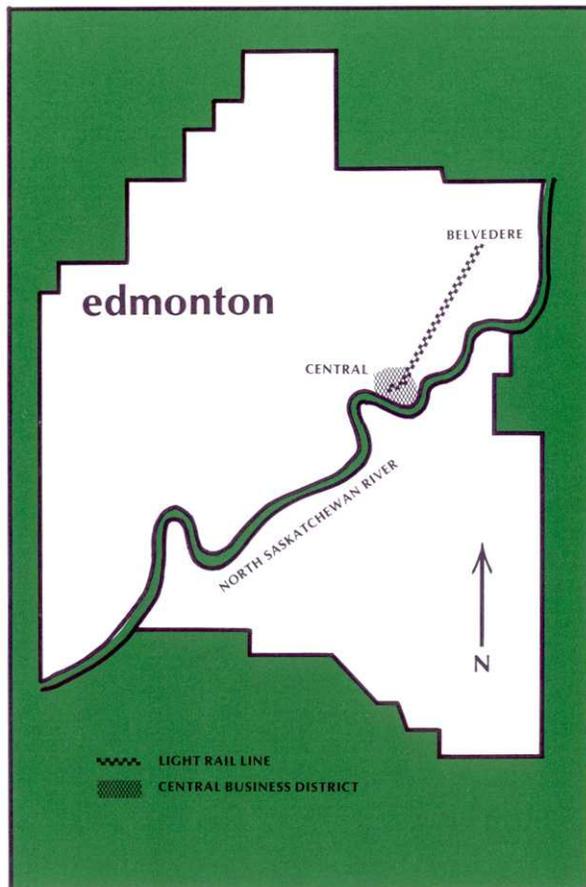
Edmonton's line was designed to move people today as well as in the future. In the subway portion, the technical specifications chosen will accommodate the largest standard rail car in use during design—those of Toronto. Just before the line surfaces, a third subway station shell has been built. This area is subject to redevelopment and the station can be completed when activity warrants.

An additional feature of the tunnel, north of the Churchill Station, will allow for a possible extension to the north or northwest. These design elements clearly underscore light rail's flexibility.

As the line travels northeast, it cuts diagonally across a grid system of streets. This allows for

wide coverage with an extensive feeder bus network.

Shaping Cities: City planning plays a very active role in Edmonton. It is consistently involved in forecasting, studies, preparation and assessment of plans, and in administering zoning and development controls. Through civic department organization, all municipal functions such as engineering, utilities, traffic, and parks work



closely with the city planning department. The result was a decision to implement light rail because it fit in closely with other municipal goals.

A freeway option was ruled out because of the negative impact on several neighborhoods. Residents of the northeast area, particularly, expressed strong opposition to the disruption of their community by additional automobile impact. At the same time, city officials saw that any freeway advantages would be lost in a short time, as growing population again caused the same congestion problems that existed at the time.

Stimulating Economic Development: In recent years, Edmonton citizens have seen their city's downtown come of age. Major centers of commerce and entertainment dot the central city. Now, light rail service complements this development and increases its accessibility as well as making proposed projects that much more desirable.

Central Station is located in the heart of the city's business and shopping district. Churchill, the other downtown station, offers an easy con-

nection to the library, art gallery, Citadel Theatre, and Churchill Square.

Two of the remaining stations serve major public complexes. The stadium station will provide easy travel for sports enthusiasts, who have in the past, experienced annoying traffic tie-ups.

Being conscious of rail's role in the economics of a city, Edmonton officials have required that development proposals around stations be approved by the local government. High density development which can best be served by the light rail link is being encouraged.

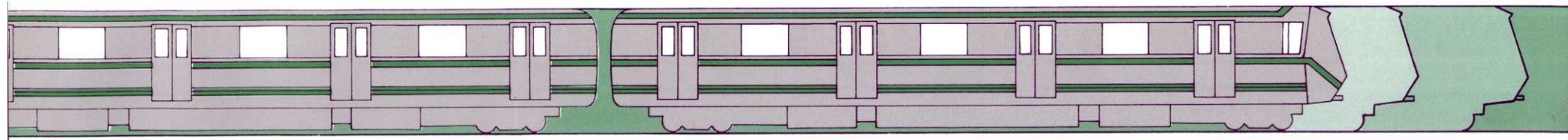
The introduction of light rail into Edmonton has provided residents with one more safeguard to an exciting and vibrant quality of urban life.

miami

With its swaying palm trees, sandy beaches, and high-rise hotels, Miami, Fla., attracts hoards of tourists. But, the region is also home to 1.45 million people; people who recently opted for rapid transit rather than massive new highway expenditures.

edmonton: the facts

System Type	Light Rail
Length	4.5 miles; 3.5 miles at grade, 1 mile in subway
Status	Operating
Began Revenue Operations	1978
Number of Stations	5; 3 at grade, 2 in subway
Yards	1
Predicted Daily Ridership	12,000



By 1983, Dade County expects to be operating the initial 20.5 miles of a rail transit system which will be integrated into an extensive network of feeder buses. The project first received crucial public support in 1972 when voters approved \$132.5 million in bonds to finance the local share of a rapid transit system coupled with limited road improvements.

A growing area whose population increased 156% in the 20 years between 1950 and 1970, Dade County is the anchor for the south Florida "Gold Coast" and includes the City of Miami, one of the southeast's major urban areas and a booming international trade and tourism center. Like much of the nation's sunbelt, and particularly Florida, Dade County witnessed a dramatic development boom which started in the 1960s and has been slowed only by the severe impact of the nationwide recession of 1974.

Dade County residents rely heavily on automobile transportation. Automobile ownership is among the highest in the nation, with an estimated 1.13 automobiles per household in 1973. As a result, most of the expressways and major arterial highways carry far more traffic than they were designed to do. For example, on a portion of South Dixie Highway, the major arterial to the south, daily vehicular traffic volume approaches 227% of design capacity. Segments of Interstate I-95, the only interstate highway in the county and the major thoroughfare to the north, carry daily traffic of up to 150% of design capacity.

In addition, the county's population includes a large number of families below the poverty level (approximately 11%) while about 14% of the population is over the age of 65. Thus,

despite the high average rate of automobile ownership, about one family in five owns no car and is completely transit dependent.

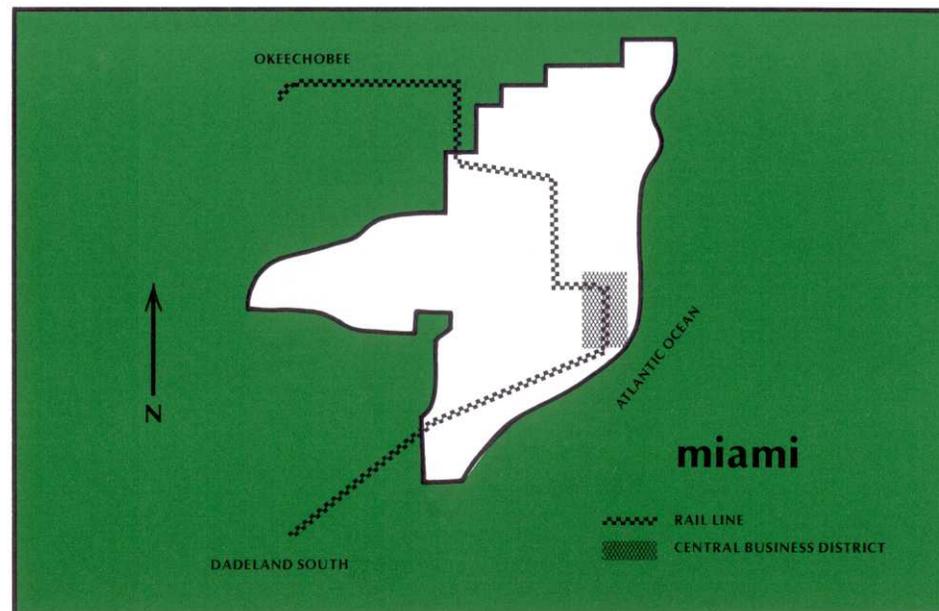
As the most effective and efficient way to solve Dade County's transportation problems—ranging from congested highways to a large transit-dependent population—a rail rapid transit system, along with a complementary bus system and limited road improvements, is the choice for this metropolitan area.

Moving People: By 1985, approximately 460,000 Dade County residents each day will reach jobs, schools, shopping or medical centers, and recreation areas on the combined public transit system of rail rapid transit, buses, and the downtown people mover. Trips that now take commuters up to an hour will be reduced to minutes. For example, riders will be able to

travel from Dadeland (about 12 miles south of downtown Miami) to downtown in 19 minutes. Trains will stop at each station every 3 minutes during rush hour.

The 20.5-mile, first stage of the heavy rail system, to be open by 1983, will be mostly elevated (18 miles) with some sections at-grade (2.5 miles). The rail route will begin south of Miami and proceed northeasterly along the Florida East Coast Railway right-of-way, generally parallel to one of the county's main traffic arteries, South Dixie Highway. The route proceeds to the central business district in Miami and then continues northwesterly through the county's second most populous city, Hialeah.

When the total projected rail system of more than 40 miles is completed, the stations along this core system will be within a 10-minute



feeder bus ride of 988,000 residents (58% of the projected year 2000 population) and within five minutes walking distance of 251,000 jobs.

Dade County's transit dependents will comprise the majority of those riding the rail system when it first opens. Of the 460,000 expected to use the complete transit (rail, buses, people mover) system in 1985, the Stage I 20.5-mile rail system is anticipated to attract 202,000 daily patrons.

Conserving Energy, Protecting the Environment: While Miami does not experience the serious air pollution problems suffered by most of the nation's large industrial cities, the area will still benefit from the reduced auto emissions and energy consumption resulting from a rail system. In terms of air quality, the improved transit system, including the 20.5 miles of rail, will cause a decrease in pollutants generally because of the reduction in automobile travel. Automobile emissions cause about 80% of the air pollution loads in Dade County today, and the reduction in vehicle miles traveled is estimated to result in from 3 to 15% reduction in pollutant emissions. The improved transit system is expected to divert 25% of all transit trips from automobiles or about 115,000 daily trips. These diverted trips would mean a daily gas savings of 33,850 gallons, or 10.3 million gallons a year, which translates into 575,000 barrels of oil.

Shaping Cities: The fixed guideway element of Dade County's rapid transit system exhibits greater potential for influencing regional land use patterns than any other transportation project ever undertaken in the county. The rail alignment conforms with the county's present land use patterns and for the most part follows

arterial streets through major movement corridors. The general geographic thrust of the system is north and southwest, the principal directions of both historical and future growth. The route runs through major activity centers, particularly a downtown government center complex which will serve as the headquarters for key local, state, and federal offices.

Stimulating Economic Development: Dade County's rail project will mean a boost to the local and state economy in terms of more jobs, new development along the route, and increased property values and tax revenues.

A recent analysis shows that the construction of the rapid transit line will create an average of 9634 additional jobs each year in Dade County, with another 4580 jobs per year generated throughout the rest of Florida. Of these 9634 new jobs, each year, 3000 jobs will be directly related to rail construction; operation of the system will provide at least 1600 to 1800 new jobs in Dade County. On top of these economy boosters, the wages from all these extra jobs is

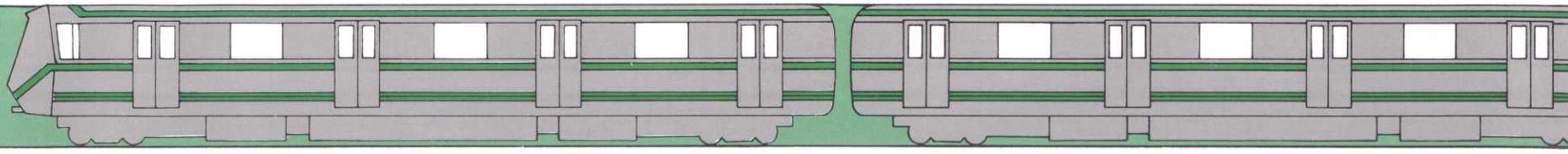
estimated to create additional sales tax revenues for Florida in the amount of \$11.8 million.

Economic redevelopment is expected to increase in the rail corridor due to the availability of rail transit and an increased transportation capacity. The county government has taken the lead role in bringing together the county, municipalities, land developers (in both private and public sectors), and representatives of neighborhood communities to examine in detail the planning issues surrounding each station. To date, an elaborate downtown government center complex is being planned around a downtown Miami station, and a hotel and office development is being designed for one of the south line stations adjacent to a major shopping center. Other projects under consideration at station sites range from medium and high density apartment buildings and office complexes to shopping centers, aerial walkways, parks, and upgraded light industrial areas.

In terms of overall impact of the rapid transit system on development opportunities, each

miami: the facts

System Type	Heavy Rail
Length	20.5 miles; 2.5 miles at grade, 18 miles areial
Status	Planning and design under way; Construction to begin Fall 1978
Begin Revenue Operation	1983
Number of Stations	20
Yards	1
Predicted Daily Ridership	202,000 (1985)



million dollars spent in construction of rail rapid transit is expected to generate \$6 million in private development. A recent study by Houston's Rice Center for Community Design and Research indicates that Miami/Dade County could also benefit through joint development/value capture schemes. The Rice figures predict Miami could, through various land development activities, produce from \$25 million to \$36 million (1976 dollars) in supplementary value-capture-related income in the next 20 years from possible developments at nine of 20 stations on the Stage I line.

calgary

With an eye on future needs, Calgary, Alb., has completed an evaluation process that led to the selection of light rail to serve one of the city's most heavily traveled corridors. Although construction has barely begun, revenue service is targeted to begin during the summer of 1981.

In 1976, Calgary's population was 470,000 and the labor force was 207,500. The population is expected to reach 618,000 in 1986 and 778,000 in

1996. About 58,000 people, or 30% of the work force, are employed downtown.

Development has typically been low density with a distinct separation between residential and employment areas. In the central business district, new skyscrapers have given the city an impressive skyline.

Studies conducted in 1975, to examine the need for, and to plan, major transportation facility requirements, resulted in the recommendation that rapid transit be implemented in the city's south corridor along with staged road and other transit improvements. Subsequent consideration by the city council, provincial officials, and an independent consultant verified the appropriateness of a light rail choice. The consultant's report was presented to the city council in May 1977 and by the end of July 1977, implementation had begun with the purchase of 27 light rail vehicles.

Moving People: By 1982, Calgary expects transit demand in the south corridor to be 4200 passengers per hour in the peak direction. The corridor extends about 10 miles south of the central business district. Single-family homes make up 70% of the dwelling units in the suburbs. Recently, higher density development has in-

creased and substantial opportunities for further development still exist.

From a southern terminus at Anderson Road, the line follows a Canadian Pacific rail right-of-way for the greater portion of the run. At a point outside of downtown, the cars will travel successively along a street in a protected arrangement, through a subway section, along one side of an arterial roadway, and through another tunnel, emerging on Seventh Avenue. Seventh Avenue, a major central business district street, will be closed to private automobiles with the thoroughfare turned over to buses, emergency vehicles, and the light rail service. Five stations at approximately three-block intervals will be located on the street, providing access to intersections and to Calgary's overhead pedestrian system.

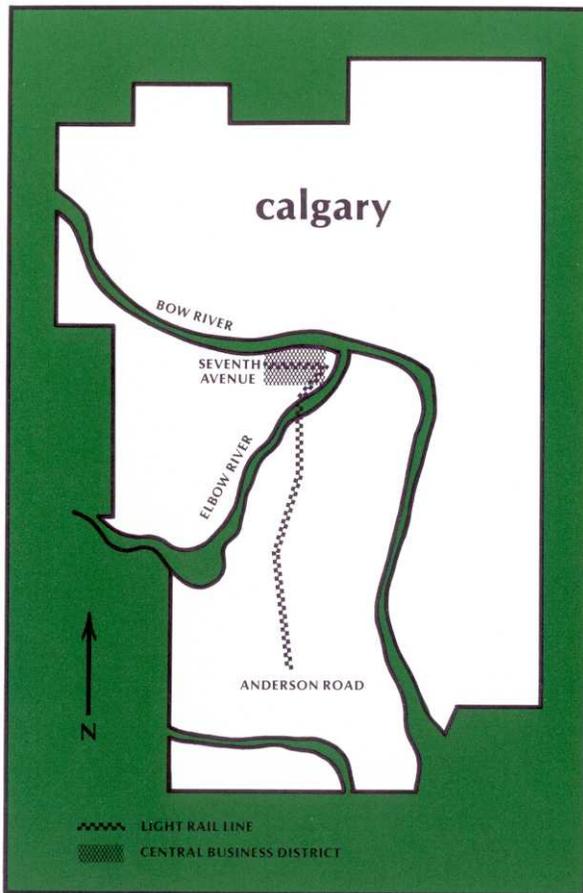
Shaping Cities: What are essentially planning decisions led to Calgary's choice of light rail in the first place. Concerns for increasing traffic congestion and an alignment with strong redevelopment potential were major factors in the analysis of transportation alternatives.

As construction progresses, the city is taking special efforts to make sure that light rail brings desired results. Comprehensive land use reviews are under way to evaluate potential development impacts within one-quarter mile of the system's stations in the outer areas. Emphasis is being placed on comprehensive development proposals and the avoidance of low-density, piecemeal development in those locales.

Calgary's light rail line is expected to be an important support factor to the city's economic health. By making access easier and enhancing speed of travel, existing urban investments will be protected. Light rail in Calgary is a recogni-

calgary: the facts

System Type	Light Rail
Length	8 miles; 7.4 miles at grade, 0.6 miles in subway
Status	Under construction
Begin Revenue Operations	1981
Number of Stations	12 at grade
Yards	1



tion of current problems as well as ensurance of adequate capacity for the future.

honolulu

In a region where volcanoes provide the most effective defense against urban sprawl, Honolulu is proposing the development of a 23-mile rapid transit

system to serve its densely populated central corridor.

Rugged terrain on Hawaii's six major islands restricts urban development to about 3% of its 4 million acres. Oahu, the island on which Honolulu is located, is representative of island development. Dense population centers are separated by agricultural and undeveloped lands. At the time of the 1970 census, nearly four out of five persons in the state resided in the Honolulu metropolitan area. Since statehood in 1959, Hawaii's population growth rate has been about twice that of the nation, with approximately 94% of new residents in the state settling on Oahu.

July 1975 tallies place the population of the City and County of Honolulu at about 704,400. That number is swelled year-round by thousands of vacationers who visit the island from mainland United States and parts of Asia.

Sandwiched between the ocean and the Koolau Mountain Range, urban Honolulu has developed into a linear city only 1.5 to two miles in width. Within this narrow strip, the bulk of east-west travel movement is served by one six-lane freeway and four principal arterials, fed by a network of minor local streets. Because of the area's dense development, both the state and city ruled out new major highway facilities; their disruption to communities and adverse environmental impacts would be unacceptable to the residents of the area.

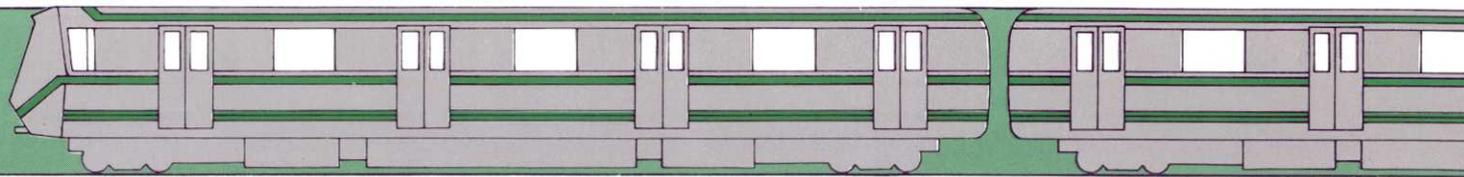
The suggested line includes 1.7 miles in subway under Honolulu's high value and historically significant downtown; 15.2 miles of aerial alignment located largely in public rights-of-way; and 6.3 miles at grade in freeway median strips. The recommended route strikes a good

balance between top-quality transit service and minimum relocation and cost. It will serve various population centers and all major activity and employment clusters on Oahu. It is in these centers that most of central Honolulu's existing and future employment opportunities are concentrated, representing 80% of total island-wide employment. An extensive feeder bus network will link all of Oahu's urbanized areas to the rail line.

Moving People: The rail system will be designed to carry 30,000 passengers per hour in each direction, based on headways of 90 seconds. By 1995, operation of the full 23-mile line is expected to attract 332,600 travelers daily with a grand total of 586,800 people using the combined rail and bus support network each day. Travel time from the most distant stations to downtown will be about 20 minutes.

A feature of the chosen line is its proximity to areas with large portions of transit-dependent persons. The alignment runs through or adjacent to 10 census tracts, singled out for having large numbers of elderly persons, poverty-level households, and families without access to an automobile. In light of the employment centers, education complexes, and health facilities which lie along the rail route, the system will particularly open a new range of opportunities.

Conserving Energy, Protecting the Environment: While Oahu's population has increased by 20% during the past decade, automobile ownership and vehicle miles traveled have jumped by about 75%. Honolulu's urban, east-west corridor is especially affected by this increase in traffic volume. Transportation planners have predicted that automobiles will exceed road capacity in the corridor by about 100,000 vehicles per day in



1995. In addition to massive problems of congestion, this is expected to substantially worsen Honolulu's air quality, which is already showing signs of deterioration.

Heavy automobile traffic is blamed for maximum hourly average concentrations of carbon monoxide which exceed state ambient air quality standards. In fact, during 1976, the state standard for the maximum hourly average concentration of carbon monoxide was violated on 41 days out of the year.

Studies of transportation alternatives for Honolulu have found that only the rail option is capable of keeping central highways and streets operating at reasonable levels. At the same time, a 23-mile fixed guideway system is forecasted to reduce the amount of pollutants in the air by almost 5000 tons yearly. This reduced

number of automobile trips due to rail operations is also expected to save 10 million gallons of oil per year by 1995.

Shaping Cities: The proposed transit system is expected to have a strong influence on the pattern of urban growth and development on Oahu, providing a valuable tool for achieving the land use objectives and policies of the region. This particularly relates to the more orderly development of currently zoned urban land and preserving existing agricultural land.

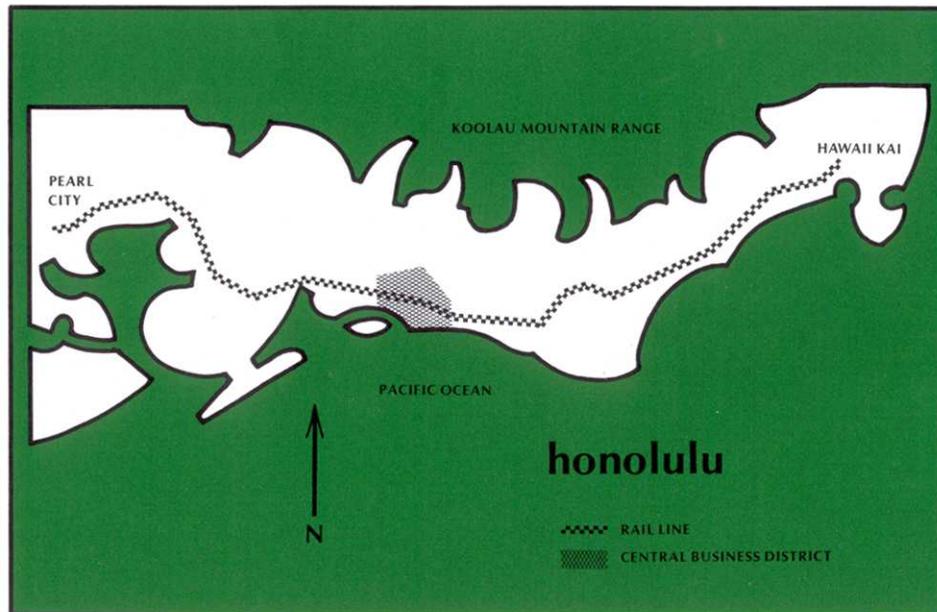
Honolulu has already established a clear pattern of clustered development. Rail will reinforce this efficient arrangement by linking most of the island's major residential and commercial activity centers. Military complexes, including Pearl Harbor, occupy the western end of the line. They are followed by Honolulu Interna-

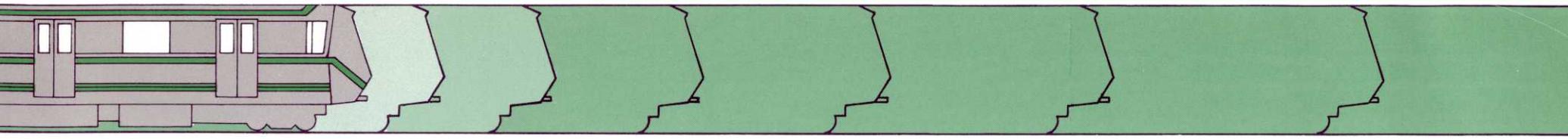
tional Airport, the city's central business district and civic center, and the Ala Moana Center, a major regional shopping center. At the eastern end of the line are Waikiki and the university area.

At planned stations like Koko Head and Kahala, rail accessibility complements adjacent zoning which permits medium density apartment development. In addition, the line can play a significant role in the revitalization of the Kaimuki business district, to the north of Diamond Head. This area, adversely affected by a major shopping center, continues to serve a vital role in providing community and neighborhood shopping opportunities to the local residents. Rail transit, under the proper conditions, can strengthen the economic viability of Kaimuki and counter some of the negative impacts it is experiencing.

Stimulating Economic Development: Honolulu's general plan, which sets the guidelines for development of the entire island, is predicated on the implementation of the rail system. Studies are currently underway to determine land values and impacts around stations.

It is forecasted that construction of the system will create approximately 1500 jobs per year during the six-year construction period. Operation of the line will generate 500 jobs. The value of increased personal income created by construction activity and related employment as well as salvage value of acquired right-of-way is estimated to be \$190 million. Downtown, municipal officials are looking forward to a more accessible and less congested central business district, particularly in light of its limited parking areas. The Chamber of Commerce and the Downtown Improvement Associa-





tion have both gone on record in favor of the system to maintain the vitality of Honolulu's central areas.

Effective and comprehensive transportation planning has been a part of the Honolulu scene for some 10 years. The decision to pursue rail transit is clearly based on careful and responsible analysis.

portland

In 1975, urban officials in metropolitan Portland said no to the Mt. Hood Freeway that would have cost \$200 million, would have demolished a wide strip of inner-city neighborhoods, and would have saved only five minutes travel time between the suburbs and downtown Portland.

A new policy spread from the Mt. Hood decision. The region would cut down urban sprawl, preserve, and revitalize city neighborhoods by not building new urban freeways. Realizing that this policy meant new demands on already congested roadways, the regional council of governments told transit to pick up the slack.

The transit agency, Tri-County Metropolitan Transportation District of Oregon, serves three counties of which Portland is the mercantile center. Many small and diverse manufacturing firms offer a stable industrial base in an economy fortified by a thriving inland port and Oregon's timber industry. While these industries have located in scattered sites throughout Portland and its suburbs, the central business district, with its concentration of governmental, financial, and service industries, is the largest job site in the metropolitan area.

honolulu: the facts

Length	23 miles; 6.3 miles at grade, 1.7 miles in subway, 15.2 miles aerial
Status	Environmental Impact Statement being prepared; State legislature has approved general concept and provided \$6 million matching funds
Number of Stations	21; 3 at grade, 3 in subway, 15 aerial
Yards	1
Predicted Daily Ridership	332,600 (1995)

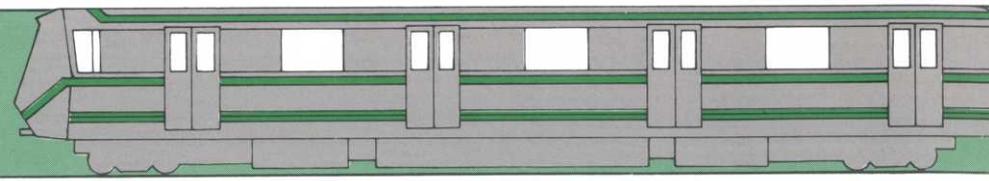
Downtown Portland is wedged between the Willamette River and steep residential hills on a congested and valuable piece of land. Before the hills, the business district nudges several old residential neighborhoods—communities that once looked ripe for commercial expansion but have become, instead, places of historic preservation, close-in housing, and renovation. To comply with federal clean air laws, the city put a lid on downtown parking at approximately 40,000 spaces, or 1977 levels. Yet another 25,000 jobs are expected in the downtown core by 1990. Height restrictions keep the business core from going up and it can't go out. So it is crowded.

Portland's topography has limited the number and size of its transportation corridors. Considering the geographic problem, the congested core, limitations on downtown parking, and the no new freeway policy, the logical regional investment is in transitways along some of the existing major corridors. Tri-Met's Board of Directors stated a modal preference for light rail transit on these transitways. Their statement stemmed from a study comparing an all-bus system with

acombed bus/light rail transit system over the long run and adopting 1990 goals for the agency.

Portland is at the decision stage on the first transitway project. It is called the Banfield Transitway Project and offers five design choices, one of which is light rail transit. Tri-Met and the Oregon Department of Transportation concluded the planning and development stage of the project with a public hearing on the draft environmental impact statement in April. The project goes now to the Tri-Met board, the city councils of Portland and Gresham (a suburb potentially served by two of the light rail alternate routes), and the Multnomah County Commission. From there the metropolitan planning organization, the governor, and federal transportation officials will review the local decision. Pending local agreement and approval at the federal level, construction may start in late 1979 and be complete in 1983.

Moving People: Three corridors have been identified for potential lines. The Oregon City (south) corridor runs 13 miles; the sunset (west) corridor runs seven miles; and the Banfield (east)



corridor runs 14 or 10 miles, depending on the alternative chosen.

Alternate routes connect a suburban community or an outlying neighborhood with downtown retail/office employment, link two major shopping centers, and serve two of the largest employment centers in the region along with a coliseum and convention center. Light rail plans call for 15 to 21 stations, depending on the alternative chosen, fed by a grid system of buses.

The light rail option would provide a capacity to carry 5500 people in each direction every hour during the rush period. Flexibility of the mode would allow increases in capacity, depending on demand.

Conserving Energy, Preserving the Environment: Roads in the Portland area are already carrying more cars than their design capacity. Current estimates suggest that 44.1 lane-miles of highway would be needed to ease current congestion. However, area planners have predicted that the light rail system in the Banfield corridor could divert 48 million vehicle miles traveled by 1990. Using 1995 estimated automobile energy efficiencies of 19 miles per gallon, the savings on 48 million vehicle miles totals more than 2.5 million gallons.

Indications are that potentials for pollution reduction in Portland lie with motor vehicle emissions control. By 1990, at least 50% less carbon monoxide and hydrocarbon emissions are predicted. Similarly, annual nitrogen oxide emissions are to be reduced 10% to 20%, with the greatest reduction associated with the implementation of light rail.

If these hydrocarbon and nitrogen oxide reductions are realized within the central

business district, a 70% reduction in photochemical oxidant formation could result.

Shaping Cities: Regional officials anticipate major changes in land use related to public investment in a major, fixed, long-lived transit corridor.

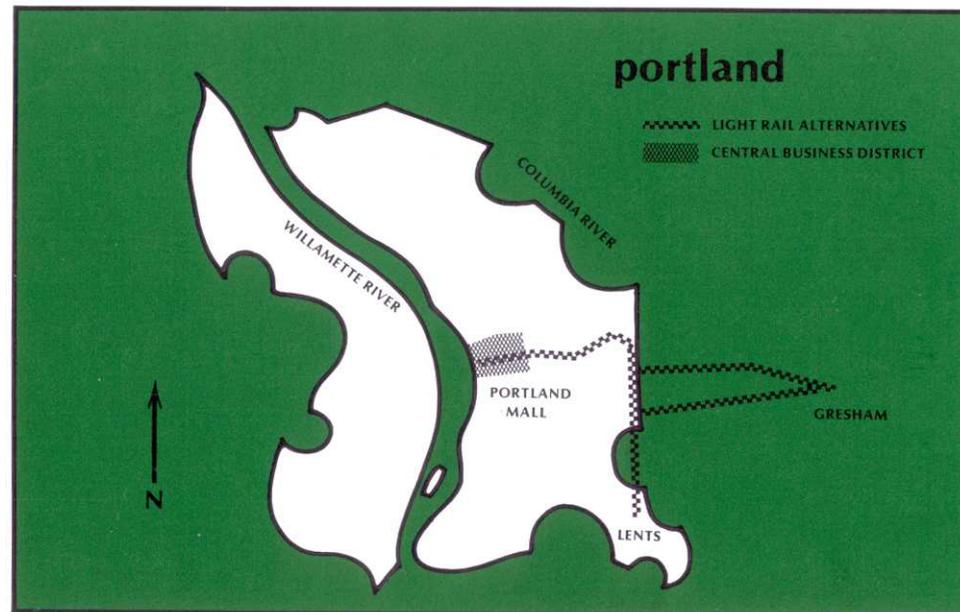
In April 1978, Tri-Met applied for a federal grant to study the feasibility, structure, and function of the transportation corridor development corporation concept. Phase one of the project would investigate interim controls for land use along the new Interstate 205 freeway which interconnects with the Banfield Freeway and transitway. The study will help find tools to redirect land use in the corridor and influence transit-supportive development.

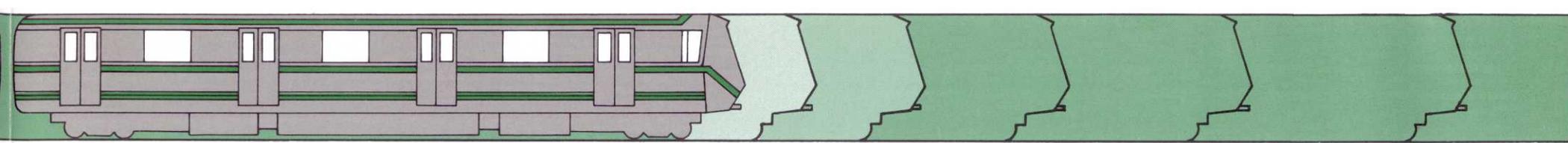
County and city officials have expressed their vision of fixed guideway as a tool for shaping ur-

ban growth. They see the corridor as a place for dense residential and pedestrian-oriented development.

Stimulating Economic Development: Portland's recent experience with its all-bus transit mall indicates the magnet effect of a major transit investment. The mall dedicated two central city streets to transit. Designers used trees, art, shelters, and other amenities to make the mall attractive as well as functional.

The public investment in the mall is generally credited with making a stable and favorable environment for central business district development. Approximately 3.5 million square feet of gross building area in downtown Portland were under construction or committed to development as of April 1978. Several hundred thousand more square feet of renovation, historic preser-





vation, and new construction were added between 1972 when the mall was proposed and 1978 when construction was completed. As of April 1978, the value of committed development has been set at something over \$200 million. Most of the new construction is for office and commercial space, although both private and public housing and hotel and retail facilities are included.

Because light rail plans are preliminary, specific development projects to tie in with the project have not yet been pinpointed. However, Tri-Met and other regional officials have announced their intentions to guide transit development with value capture as a central principle.

Presently proposed projects include a major downtown convention center, a transportation center housing intercity bus, rail, transit, and airport connections, and an entertainment complex.

Throughout Portland's evaluation of the rail alternative, residents and elected leaders have expressed their concern that the decision to build light rail is not simply a selection of a particular mode, but rather a conscious action to shape and direct the future of the metropolitan area.

detroit

Detroit residents are looking forward to a date, possibly in 1985, when a ride downtown will take a fraction of the time it now takes. The reason—the implementation of light rail plans now being developed for the motor city region.

The Southeastern Michigan Transportation Authority has been conducting an alternatives analysis study since December 1975, the objective of which is to determine and select the best regional transit system for the 1985 time-frame. Phase I of the study has been completed; it led to the determination that five regional system alternatives should be analyzed in more detail. That analysis, termed the Phase II Alternatives Analysis/Draft Environmental Impact Statement, is now under way.

Three of the alternatives are estimated to cost no more than \$825 million; the fourth is estimated to cost \$960 million; and the fifth is estimated to cost approximately \$1.16 billion. Federal funds are available to implement any of the first three alternatives. More federal funds would be required, however, to implement the fourth or fifth alternatives should one of these be selected. The fourth and fifth alternatives are being considered in light of the possibility of the availability of additional funds.

Each of the five alternatives includes an expanded suburban bus and commuter rail system and a downtown people mover. The five alternatives differ chiefly with regard to the length of the light rail segment and/or how much of the segment will be at the street level (or below street level).

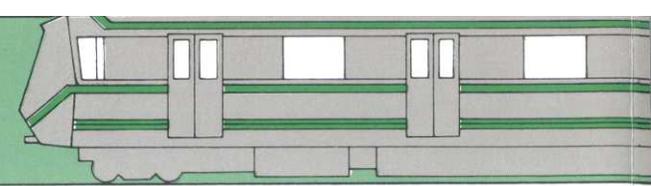
The alternatives will each be evaluated as to cost-effectiveness and environmental impact. The timetable calls for the SEMTA board to hold public hearings and choose the best alternatives in late 1978.

Detroit, which is the largest city in the state of Michigan, is subject to most of the problems afflicting our older industrial cities, often to a greater degree than most similar cities. The

economic base of the city, and indeed the whole metropolitan area, is shifting as manufacturing activities decline and government sectors grow. The need for consolidation of service and government activities has led to a reemphasis of the central business district while at the same time increasing the need for improved access to suburban, commercial, and retail developments. Expanding state university and community college campuses, together with significant rehabilitation of existing facilities, exemplify the rebirth. Prime examples of this include the completed Renaissance Center with 1400 new first class hotel rooms and nearly two million square feet of office and retail space and the \$150 million developments that have occurred in the area of the Medical Center, including the renovation and upgrading of five major hospital facilities, attendant clinics, and medical school support buildings.

Currently the metropolitan Detroit region is served by two major bus systems, with central city-oriented service operated by the City of Detroit and suburban oriented-service operated by SEMTA, the regional transportation authority. Numerous corridor intersections are operating at unsatisfactory peak-hour service levels and additional intersections are forecast to be in that condition by 1990.

As a northwest-oriented radial route, Woodward Avenue crosses a basically north-south/east-west street grid. It serves as a thoroughfare for commuters going to and from the downtown, as well as handling shorter crosstown traffic. Currently, automobiles average about 15-20 miles per hour along its distance.



Severe conditions characterize metropolitan Detroit's winter weather with a large average annual snow fall and consistent freezing temperatures for several months at a time. These and other factors which characterize the metropolitan area have resulted in Detroit's preference for a rail alternative.

Moving People: In 1986 the Detroit light rail line is expected to carry 15 million riders, that figure will rise to 20 million by 1990. During peak hours the light rail trains will move as many as 6000 passengers in one direction each hour. Travel time over the 11.3-mile length has been set at 36 minutes; nine minutes less than the bus.

The proposed system will serve a wide variety of the metropolitan Detroit neighborhoods. Several of the inner city areas have the lowest auto ownership rates and highest unemployment levels in the Detroit metropolitan area, which already has an unemployment rate considerably higher than the U. S. average. In the City of Highland Park the neighborhoods bordering Woodward Avenue are characterized by an extremely large portion of low-income elderly persons who are very transit dependent. To the residents of the more affluent sections north of Six Mile Road and suburbanites, the rail line will provide a convenient link to the central business district.

Conserving Energy, Protecting the Environment: An efficient rail system will attract drivers from behind their wheels for the downtown trips with accompanying reductions in congestion and noise. In fact, current estimates predict 9% fewer vehicles will enter downtown Detroit once rail service is under way. The ongoing alternatives analysis study predicts that the line will save 13 million gallons of gasoline annually.

Shaping Cities: While Woodward Avenue serves as the geographic spine of the metropolitan Detroit area, there has been a decline in its importance as a focus for development. In the central business district the corridor is densely lined with commercial and retail buildings. Moving north, this changes to strip commercial and medium to high density residential, and major cultural/institutional facilities, then yielding to another cluster of commercial and retail facilities in the area of the New Center. Beyond New Center there is generally strip commercial development with low to medium density residential neighborhoods on both sides, yielding eventually to open space developments.

The rail line is expected to concentrate development at nodes, clustering new retail, office, and multi-family housing development around stations, thereby requiring less space for parking and providing more for pedestrian-oriented activities. At the same time, a downtown transit mall is being developed to focus feeder and line-haul bus service for the other major corridors to one single area, thereby concentrating activity and providing an opportunity for increased retail sales and other benefits.

Stimulating Economic Development: Metropolitan Detroit's light rail line was conceived as a means to counter the prevailing trends of migration of business and commerce in the region. At the same time, assessed valuations of property along the route are forecast to rise.

The system's operation will create about 400 permanent jobs, preceded by another 12,000 man-years of construction-related jobs during the implementation phase.

For these reasons, light rail has won Detroit's vote.

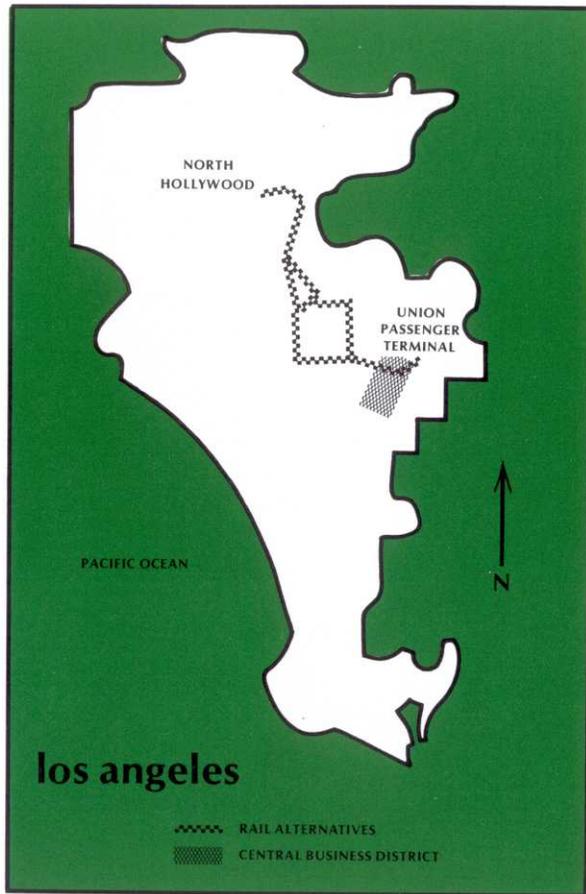
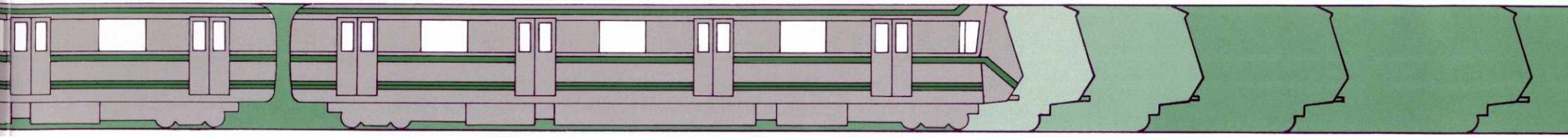
los angeles

In a city that is as legendary for its freeways and smog as it is for its movie stars and beaches, Los Angeles transportation officials are looking at the applicability of rail transit and reaching some very interesting conclusions.

At a glance, Los Angeles gives new meaning to the word sprawl. However, despite its huge geographic area, densities are high; in the urbanized region, density is approximately 5200 persons per square mile, ranking third nationally after New York and Philadelphia. In the regional core, density is about 12,000 to 21,000 persons per square mile, comparable to three of New York's five boroughs. Population in the City of Los Angeles stands at about 2.8 million with approximately 7.5 million people residing in the county.

Currently, the area is served by one of the nation's largest and most efficient bus systems, operated by the Southern California Rapid Transit District and seven other municipal carriers.

Leading the list of transportation concerns in the Los Angeles region is traffic. Freeway congestion with back-ups stretching for miles, traffic accidents, and air pollution problems have become all too familiar features of southern California life. The urgency of the problem was recently underscored with the release of U.S. Environmental Protection Agency test results failing the Los Angeles-Long Beach area in five clean air categories.



Moving People: Currently, a portion of a single corridor is under study, with three alternative alignments that would serve the regional core area from North Hollywood in the San Fernando Valley to Los Angeles Union Passenger Terminal via Hollywood, the Wilshire district, and downtown Los Angeles.

Average weekday patronage on the 16-mile rapid transit segment being considered is pro-

jected to be 265,000. Peak-hour capacity has been set at 15,000 persons per hour, assuming six-car trains running at four-minute headways.

Use of the alignments under consideration would create a service area of one million persons. Of those, 200,000 people would be within walking distance of stations. The results would be a reduction in travel time for transit riders by one-half to two-thirds over current journeys.

Additionally, more people will have easier access to employment centers along the line from the central district, out Wilshire, and northerly though Hollywood into the San Fernando Valley. The area to be served is the largest employment center in the entire region. Interestingly, the area is not and will not be directly served by freeways; two were planned but were removed from the freeway program by public demand.

Conserving Energy, Preserving the Environment: Present analysis has determined that a 16-mile rail segment would result in 227,000 fewer daily auto trips in the regional core portion of the area by 1990. The impact of this on air pollution translates into 45 million fewer grams of carbon monoxide, five million fewer grams of hydrocarbons, and one million fewer grams of nitrogen oxides. Proportional decreases in the consumption of gasoline would also occur.

Shaping Cities: The rapid transit line is expected to facilitate the adopted center concept of the City of Los Angeles which is directed toward higher density development within the regional core to stabilize the urban area.

Stimulating Economic Investment: Urban design consultants have identified substantial opportunities for joint development around many of the proposed rapid transit stations. Specifics on this will be published in the draft

report on alternative analysis/environmental impact statement for rapid transit in the regional core.

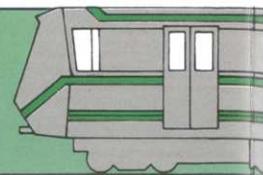
Other economic impacts include the creation of an estimated 30,000 jobs in design, construction, fabrication, and installation of the system over a five to six-year period.

In an area like Los Angeles, where urban sprawl and automobile-related issues are a major concern, the consideration of the rail option appears to be a natural.

san diego

Current rail plans in the San Diego area would give that city the distinction of operating a light rail system that not only links suburban centers and downtown, but one that links nations. Proposed is a light rail line to operate from the Santa Fe Depot, west of the city center, through downtown, with a termination at the International Border crossing to Mexico in San Ysidro. The entire alignment is approximately 16 miles in length and, together with an integrated bus network, is designed to provide an improved transportation system for the San Diego region's southern corridor.

Probably the most encompassing statement one can make about the San Diego area is that it is growing. Between 1970 and 1975, regional population grew by 15%, with about 1.56 million current residents. By 1995, the population is expected to increase over 50% to about 2.4 million. Employment is also gaining with more than a 50% increase in the number of jobs having occurred between 1960 and 1975.



Commercial and service activities are generally located in the downtown areas of the 14 cities which make up the region and along the main arterials with concentrations in major shopping centers. Three major military installations occupy a significant amount of land. Several colleges and universities, employment centers, and recreational attractions also dot the area, resulting in a number of activity clusters which generate and attract travel. The area is served by a grid of freeways and interstate highways as well as fixed-route bus transit and several dial-rides.

Gasoline powered vehicles are the predominant direct regional source of reactive hydrocarbons, carbon monoxide, and nitrogen oxides. San Diego County has been classified as an area exceeding air quality standards by the Air Resources Board.

With heavy travel demand and air pollution problems, transportation alternatives have become a major concern of the region.

Moving People: The proposed guideway corridor represents a mixture of land uses ranging from central business district-oriented ones to single family, residential, and industrial areas. It also contains a wide diversity of social and economic groups within its overall population. Further diversifying the socio-economic spectrum is the military population assigned to naval facilities along the corridor area.

The line would run on downtown streets to a connection with the San Diego & Arizona Eastern Railway right-of-way. It would follow the railroad alignment to the International Border. The 16 at-grade miles of route would contain 18 stations, all of which would be served by bus routes as well. A transit mall is to be created on

a five-block portion of Broadway in the central city. Light rail vehicles would operate in the center, sharing the street with pedestrians and service and emergency vehicles.

The project is forecasted to increase corridor transit usage by 100% with 26,000 daily riders on the system by 1995. Planners predict current travel times to be reduced by 25% per average trip. Particularly of interest is a draft environmental impact statement for the project which notes that the line would increase service to lower income groups by about 17 to 20%.

Conserving Energy, Protecting the Environment: According to current studies, implementation of the project would result in a small but significant improvement in regional air quality. This would be a product of 389,000 fewer vehicle miles traveled due to the system. Savings of more than 100,000 barrels of crude oil have also been forecasted from the reduced automobile trips.

Shaping Cities: The line is expected to generate a moderate influence on regional development. Among the anticipated results are a corridor scale growth influence on housing development. This is likely to mean a higher proportion of the residentially developable parcels located close to proposed stations may develop sooner and at higher densities.

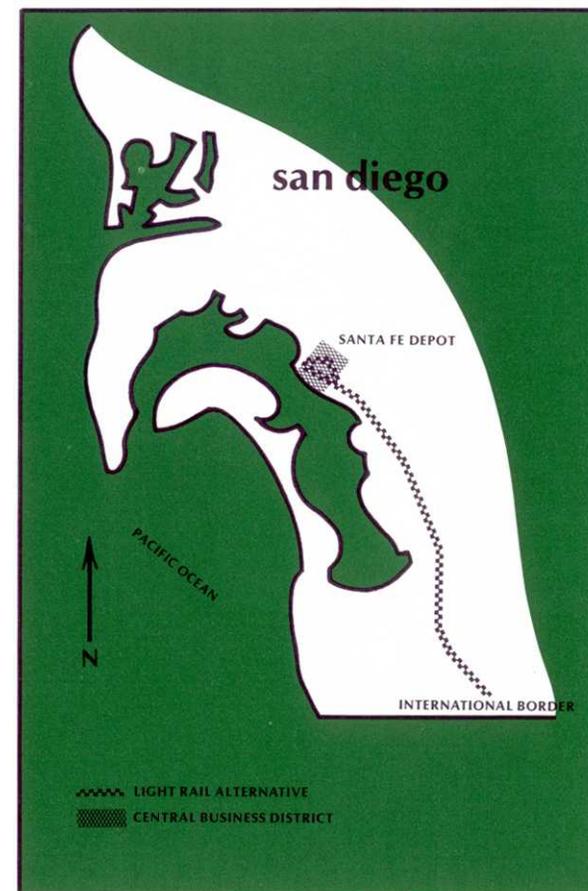
Some commercial office space is anticipated to develop around suburban stations. Downtown, the line could serve as an internal circulation system between downtown retail facilities and a proposed convention center.

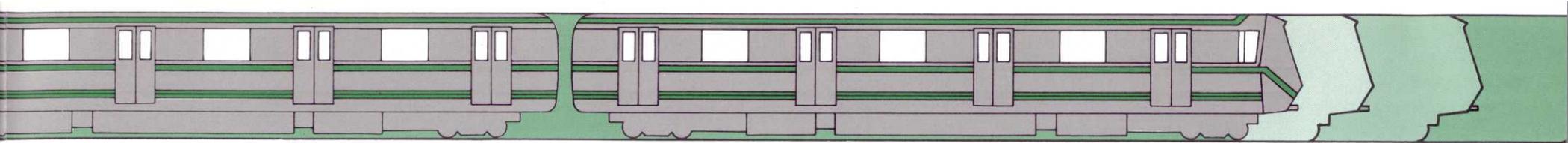
Overall, the project would be compatible with and reinforce development plans in the corridor.

Stimulating Economic Investment: It is anticipated that the construction of the guideway

will produce increased employment and a positive economic stimulus to the local San Diego economy.

According to the draft environmental impact statement, the project would increase regional economic activity by about \$46 million, comprising \$20 million in direct purchases of labor and material and \$26 million of induced economic activity. In addition, 2000 to 2500





man-years of new employment would be generated.

Project construction would produce more than \$400,000 in new local jurisdictional retail sales tax revenues.

In almost all respects, the rail alternative provides the San Diego region with vast new opportunities for a sensible and balanced transportation system.

denver

The Denver metropolitan area, during the past four years, ranked second in rate of growth of the largest twenty-five metropolitan regions in the country. This rapid expansion, stimulated in large part by intensive energy development in the Rocky Mountain region, argues strongly for public investments, such as rail transit, to complement other public and private actions, which can improve this area's ability to absorb growth.

The implementation of the north-south rapid transit project will substantially benefit the citizens of the Colorado Front Range. The system will improve transportation service throughout the region, focus urban growth, conserve community resources (streets, utilities, schools, and other public services), furnish opportunities for joint development, help preserve natural resources through conservation of energy and protection and enhancement of open space, and strengthen the continuing economic vitality of the region. Additionally, the improvement in transit service is a vital element of the region's plan to meet clean air standards.

Moving People: By 1985 the transit system will have eliminated the need for 86 miles of traffic

san diego: the facts

System Type	Light Rail
Length	16 miles at grade
Status	Preparing environmental impact statement
Number of Stations	18 at grade
Yards	1
Predicted Daily Ridership	26,000 (1995)

lanes and some 3800 activity center parking spaces that would otherwise be required. When the 71-mile transit system, defined in the adopted public transportation plan for the year 2000, is completed a total of 348 lane-miles and 13,100 parking spaces will not be required.

Based on patronage estimates, the north-south rapid transit system is expected to carry upwards of 252,000 patrons per day in the year 2000. This represents 31% (1985) and 54% (2000) of the region's transit trips. Total daily regional transit patronage of 230,000 (1985) and 470,000 (2000) is projected for the combined light rail and the complementary bus systems. This represents a 59% (1985) and a 112% (2000) increase over patronage expected within a baseline bus system.

Recent experience with a Regional Transportation District fare incentive demonstration program strongly suggests that the earlier patronage estimates are conservative. In the first two months of the off-peak fare-free incentive program, daily patronage increased by almost 170,000, or 74% of the ridership that was projected to be carried by both rapid transit and the bus systems in 1985.

Both transit and automobile users will have better access to and from employment, shopping, cultural, and recreational facilities in the north-south rapid transit corridor. Shorter trip times and less congestion will make these resources more readily available to all segments of the population. Improved service levels and special facilities will offer new mobility to the elderly, handicapped, and the young.

Compared with the 1985 projections for a baseline bus system, the north-south rapid transit line will reduce the average transit travel time to jobs and other opportunities in the corridor by approximately 50% that year. By 2000, the north-south rapid transit corridor could double the percentage of regional population within 40 minutes travel time of activity centers in the corridor. In addition, this system will provide pedestrian accessibility for some 18,000 persons (1970 population within one-quarter mile of station sites). Twenty percent of these are transit dependents.

Compared to a baseline bus concept, the proposed transit plan would provide approximately 50% better access to central urban activity centers for low income families, the elderly, and

households with no automobiles. The system would also place 60% of the total regional jobs within 40 minutes transit travel time from central urban neighborhoods, twice the total of the baseline bus system.

Conserving Energy, Preserving the Environment: The project will achieve a net savings in the energy consumed for ground transportation and a significant reduction in the amount of petroleum fuel consumed in the regional transportation district. Petroleum expended during construction of the system would be recovered in the transit system's first year of operation from the surplus generated by the reduction in automobile gasoline consumption. Total construction energy expended will be recouped in nine years. This is perhaps the most

significant environmental benefit of this project for the region.

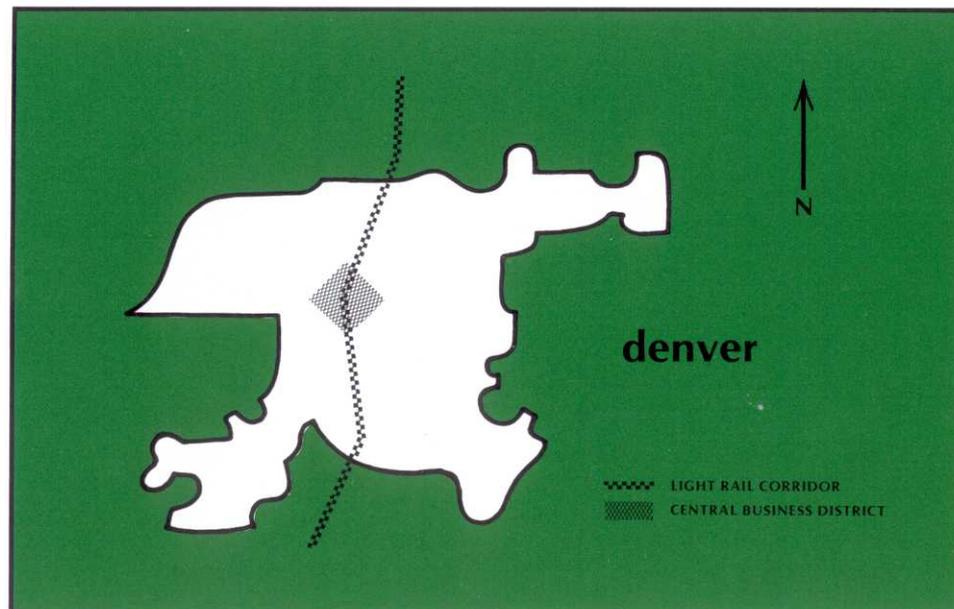
In order for a growing region like Denver to meet federal clean air standards, the basic transit pattern must change. A major transit investment is a crucial element in this region's attempt to avoid the impending clean air crisis.

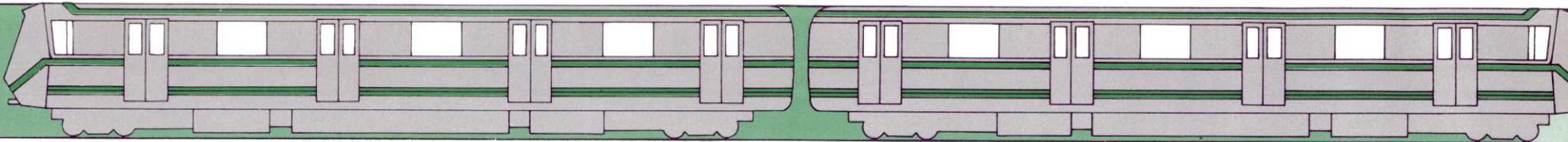
Shaping Cities: The north-south rapid transit line of the proposed rapid transit network is an essential public investment and catalyst in the structuring of urban growth consistent with regional and local land use plans. The need for public expenditures for water, sewer, streets, and community facilities will lessen. Major utility and community facility investments are now in place throughout the corridor. Concentration of new developments in accordance with local

plans will help to slow the potential urbanization of environmentally sensitive stream valleys, prairies, and mountainous areas to the east and west, and make more efficient use of existing facilities. Additionally, this project will encourage the development of residual land, thereby reducing the pressures for further sprawl.

Transit stations can aid communities in inducing development or redevelopment at several locations along the north-south rapid transit corridor. Sites where development is expected to be significant are areas designated in local plans for development or redevelopment and for which utility services have been provided or programmed. The Regional Transportation District, in cooperation with the Rice Center for Community Design and Research, has completed a major study of value capture opportunities along the north-south corridor. Major joint development is anticipated to be induced in Littleton, Englewood, Aurora, the Denver central business district, Thornton, and Northglenn. By means of joint development, transit can be integrated into the community and provide impetus for development in areas where such development is locally planned and approved.

RTD has initiated the first steps toward establishing the transit presence at these locations. The current five-year plan includes the construction of the transitway/mall in the Denver central business district; transit center investments in Northglenn, Englewood, and Littleton; and park-and-ride facilities in Northglenn, Thornton, Englewood, and Littleton. These transit investments, combined with service improvements, constitute an incremental approach





toward upgrading of the transit service in this corridor.

Perhaps the most significant economic benefits that will accrue to the region will be the opportunity to use transit as one of the many tools to help structure growth in a growing region such as Denver.

st. louis

The St. Louis urban area is home to over 2.2 million people, a figure that is expected to grow 10% by 1985. The area is divided by the Mississippi River between the Missouri and Illinois portions of the region. Fixed rail transit service has been studied in different parts of the area and the East-West Gateway Coordinating Council, the St. Louis Area Council of Governments, recently approved a new plan for further study.

This study proposed both greater freeway bus service throughout the region and three light rail transit lines in more developed areas. These three lines take advantage of existing rights-of-way using railroad alignments and major streets to provide grade-separated, rail transit service. These lines traverse both transit dependent areas and heavily traveled corridors, and were selected from nine alternative routes. Approximately 38 million passengers would be carried annually on this system of busways and light rail lines, 26.1 million of them on the light rail components.

One project is located in the central corridor, operating between East St. Louis, Ill., through the St. Louis central business district, and through the central city to Clayton, a nearby

denver: the facts

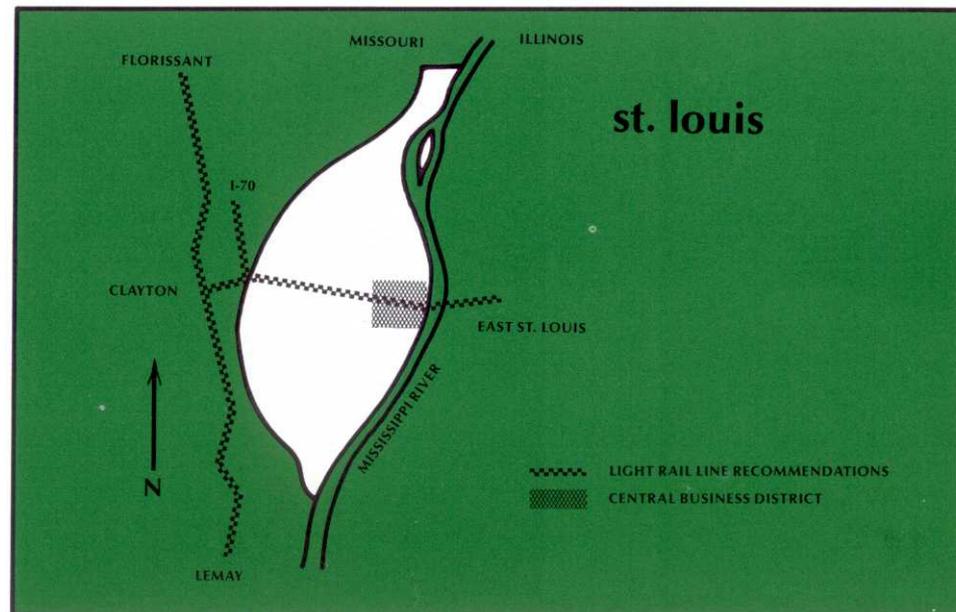
System Type	Light Rail
Length	19 miles; 12 at grade, 8 aerial
Number of Stations	14
Yards	1
Predicted Annual Ridership	22 million (1985)
Status	Planning

suburban employment center. This corridor serves a large number of regional attractions including employment concentrations, universities, residential concentrations, and cultural and social activity centers.

Another project would be developed in a north-south corridor through Clayton, intersecting with the central corridor line. The route

serves other employment areas besides Clayton, including the Hazelwood industrial area, Lambert-St. Louis International Airport, and other commercial areas. It also serves residential development all along its route.

The third project is a short line leading off the central corridor along a railroad right-of-way into another transit-dependent area. These pro-



posals were recently approved by EWGCC and have been forwarded to the Urban Mass Transportation Administration for review.

The impacts of these proposals on traffic, pollution, energy, and development are not yet known. A report will be issued shortly by EWGCC outlining these impacts in general terms. Another effort by EWGCC will produce a more detailed assessment of these impacts.

This refinement is expected to begin in the next few months and will last approximately 12 months. Preliminary engineering and design may begin then as the impacts of these projects are evaluated.



new york city

The nation's rail transit capital, New York, N.Y., is continuing its massive rail expansion and capital rehabilitation program. The fact that this program continues in spite of the city's well-publicized financial woes is ample proof of the priority assigned to rail transportation in this region.

The most important single rail project is the 63rd Street-Queens Line, which is being built to connect existing subway lines in Manhattan on Sixth and Seventh Avenues with the borough of Queens to the east. This borough serves as a residential location for tens of thousands of Manhattan workers, with many high-rise apartment buildings following the route of the existing Queens Boulevard line. Unfortunately, the quick access afforded by that line and the residential density that it has sparked have led to ridership levels of up to 50-60,000 per hour which produces intolerable crowding.

The new 63rd Street line is deliberately designed to parallel the existing 53rd Street route, thereby alleviating overcrowding and strengthening the preeminence of rail transit in serving this corridor. In addition, a station will be provided at Roosevelt Island located in the middle of the East River between Manhattan and Queens. This island is the site for the development of a massive new residential community of approximately 15,000 dwelling units or 45,000 people. Actual completion of this development has been hindered by the fact that its only direct connection to Manhattan has been by aerial tramway, a delightfully picturesque mode but one lacking the capacity or convenient distribution of the new subway line whose opening should ensure Roosevelt Island's completion.

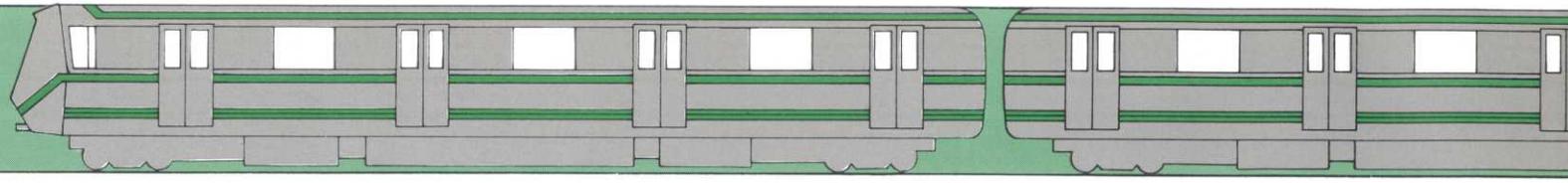
Work is also continuing on another key piece of the Queens subway expansion, the Archer Avenue subway. Located in a somewhat run-down disadvantaged commercial center, this line will provide passengers with a choice of either the Jamaica Avenue BMT or the Queens Boulevard IND service, which should help to balance loadings by diverting passengers for

downtown Manhattan to the less heavily used BMT line. It also will provide convenient transfer access to the nearby Jamaica station of the Long Island Rail Road, the nation's busiest commuter railroad, through which all but one of its branches operate. These transit improvements, together with the recently begun removal of a portion of the Jamaica Line's elevated structure, should help to spark its rehabilitation and renewal efforts.

Plans and construction drawings have recently been completed for a major commuter railroad facility, the new Flatbush Avenue Terminal of the Long Island Rail Road in Brooklyn. Being built to replace an existing, small, inadequate, run-down facility, this \$20 million project will provide a new LIRR station plus significant improvements and refurbishing of two adjacent subway stations for the 30,000 commuters who use this location, primarily as a transfer point for subway access to the lower Manhattan financial center. Because electrified rail facilities can be placed underground, air rights development is greatly facilitated and studies are now under way for an office building structure over this site. The station improvements, together with the air rights overbuild, will be a major contribution in the efforts now under way to stimulate and renew the commercial heart of the borough of Brooklyn.

boston

Boston, Mass., finds itself in the unique position of operating both the nation's oldest subway and its newest rail extensions. The trains first began running under that city's streets in



1897, and over the years they have continued to run farther and farther out into the metropolitan region. The effect has been to confirm Boston's transit orientation, creating efficient corridors of development and a continually strong and lively downtown.

Several years ago, the Massachusetts Bay Transportation Authority's Red Line extended service into the coastal Quincy area. Construction is currently pushing the line 3.2 miles farther south into Braintree. On the northern end, ground has been broken so that trains may run 6.4 miles beyond Harvard Square to Arlington, through some of the region's most densely populated suburbs.

Improvements on the Orange Line, however, provide perhaps the most dramatic illustration of rail's advantages and versatility. Extension of the northern end as far as Oak Grove has created suburban focal points around stations. Feeder bus service and parking lots all divert commuters onto transit and off already congested highways and downtown streets. On its southern leg, the Orange Line is involved in a four-mile wholesale relocation. Elevated tracks over busy Washington Street will be removed as the stretch of rail is diverted to a nearby railroad right-of-way. The improvement will open the corridor—one of the city's most disadvantaged—to a variety of neighborhood improvement projects as well as open new transportation opportunities to local residents. At its completion, the Orange Line will serve a diversity of people and neighborhoods.

Boston's other rail improvements include the addition of 175 brand new light rail cars and a commuter rail improvement project which has

spent \$43.2 million to date on new cars, locomotives, and right-of-way improvements.

Boston, by state authority, was the first city to halt the interstate highway program. A number of the transit extensions will travel through corridors that were once marked for massive superhighway construction. At the same time, residents will find increasingly convenient access to downtown; a central business district characterized by narrow, winding streets and clearly unsuitable for heavy automobile travel. City officials, who are overseeing booming waterfront redevelopment, new office and residential complexes, and adaptive reuse projects like Fanueil Hall and Quincy Market, are

aware that convenient rail coverage will help to make downtown Boston work.

philadelphia

The Lindenwold high speed line, connecting southern New Jersey suburbs with downtown Philadelphia, is one of the nation's most successful rail transit systems. The Delaware River Port Authority is investigating three corridors for expansion of the Lindenwold service.

The east-west Mount Laurel corridor is currently characterized by heavy congestion of its major roadways during the peak periods.



Railroad rights-of-way within the area could accommodate rail transit tracks. At the same time, adjacent residential communities would generate substantial walk-on patrons.

Four rail rapid transit alignments, utilizing both railroad rights-of-way and highway medians, are being evaluated in the north-south Glassboro corridor. Passenger rail service, once offered through the corridor, has resulted in the development of high density travel demand from population centers which have sprung up.

An extension to the existing Lindenwold line is known as the Atco corridor. The availability of suitable railroad right-of-way and the relatively short length of the extension are being evaluated for route feasibility.

Studies of the benefits of these extensions have identified results for users and nonusers as well. User benefits include savings due to reduced automobile purchases, insurance costs, parking costs, and gasoline and maintenance costs. Anticipated nonuser benefits that have been pinpointed include increased development and increased land values along transit corridors and around transit stations, the reduced need for prime urban land for parking in the city, and improved access to major activity centers. Much of this analysis is based on the experience of existing Lindenwold service.

According to the analysis, the transit system would be promoting planned development in southern New Jersey by defining transit corridors as high-density residential and commercial preference areas, leaving the present space between corridors for agricultural, recreational, and cluster planned unit developments. In addition, because the proposed extensions do pass through some undeveloped areas, the im-

mediate press by developers for prime land can concentrate on these areas, rather than searching for open land in a random fashion. An immediate gain for the communities will be an increase in tax ratables and the establishment of final zoning plans for the immediate future.

Expansion is also in the works for rail service operated in the Philadelphia region by the Southeastern Pennsylvania Transportation Authority and the City of Philadelphia.

Engineering and design are complete for a center-city commuter rail tunnel to provide a vital one-mile link. Construction is set to begin late in the summer of 1978. At the same time, engineering and design are under way on a rail link from downtown Philadelphia to the airport. It is anticipated that service will be operating by 1981 or 1982.

In the capital budget, recently approved by the SEPTA Board of Directors, are provisions for the purchase of new light rail and commuter rail cars and for a light rail maintenance shop. Proposals for subway car purchases, rail car renovation, and track improvements including electrification are also being made.

washington

With two years of service to the residents and visitors of the national capital area under its belt, Washington, D.C.'s, Metro has already made its mark. Travel is quicker. More and more people are discovering downtown. Development is proceeding around stations.

Earlier this year, rail service was inaugurated into Silver Spring, Md., making Metro truly a

regional network. Travelers can now go from the Maryland suburbs, through the center of the District of Columbia, out into Virginia to National Airport. By the end of 1978, service is scheduled to begin on another leg out to New Carrollton, Md. Soon to follow are links penetrating deeper into the dense Maryland and Virginia suburbs connecting a number of metropolitan subcenters with downtown. The greater portion of service to and within Washington's central business district core is operating.

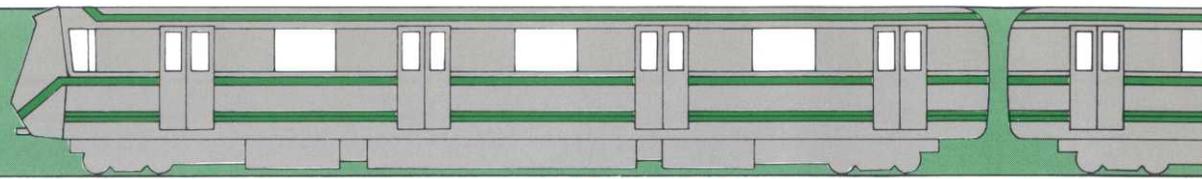
Most of the expectations for the system are materializing. Ridership is high. Downtown projects are being linked to stations. Central city retail establishments located near stations are reporting business surges. Restaurants are handling record crowds as Metro brings new sections of the city into the radius of a lunch-hour excursion.

Joint development projects are under way both downtown and in Rosslyn, Va., with office/retail complexes going up on land above and adjacent to subway stations.

Perhaps the most dramatic proof of the subway's popularity came in the conclusions of a panel of local officials conducting a reappraisal of the network. Keenly aware of public wishes, the group recommended completion of the full 100-mile system, with essentially the same routes as originally designed.

With daily ridership approaching 200,000, Metro will be extending weekday service hours to 11 p.m. in September 1978, and Saturday service will be instituted.

The system that two years ago was a novelty and new toy is now a hard-working and valued member of the Washington community.



toronto

Toronto, Ont., remains a stronghold of rail. It is served by an integrated system of commuter,

light, and heavy rail lines with a number of expansions under way.

In January 1978, the opening of the Spadina subway added 6.17 miles to metropolitan Toronto's 26-mile heavy rail system. It signalled the

beginning of high-speed, high-capacity subway service between the region's northwest corridor and downtown. Enhancing the unique architectural designs of the segment's eight stations are works of art created expressly for the new subway by nine contemporary Canadian artists.

The Spadina line is expected to attract 12 million additional passengers annually to the Toronto Transit Commission system. Already, it has begun relieving rush-hour congestion of the Yonge Street line by doubling subway capacity to and from the region's northern suburbs and the central city.

As it accomplishes these transportation goals, the Spadina line has illustrated rail's compatibility with the environment and with urban preservation. Sections of the route run beneath the Forest Hill and Nordheimer-Cedarvale ravines. After completion of the subway construction, the ravines were carefully restored to a natural setting including grading, sodding, and tree and bush planting. At the same time, responding to a request from the Toronto Historical Board, the commission saved a turn-of-the-century house located along the alignment from demolition by moving it from its original location to construct the subway structure. Following construction, the house was moved back to its original site to be converted into a unique passenger entrance to the new Spadina station.

Other extensions under way include a westerly lengthening of the Bloor-Danforth line, one-half mile to Kipling. On the east, the route is being extended 1.6 miles to Kennedy. Both links are expected to begin revenue service in 1980. In 1980, construction is scheduled to begin on a light rail line connecting the new Kennedy station with Scarborough Town Center. Scar-



borough Town Center is a major subcenter in the region, and its linkage to the rail transit system is one more support for orderly growth across the metropolitan area.

Toronto is also currently receiving the first six prototype cars to run on its existing light rail routes. By 1980, 190 new Urban Transportation Development Corporation production cars are to follow, resulting in greater efficiency throughout the network.

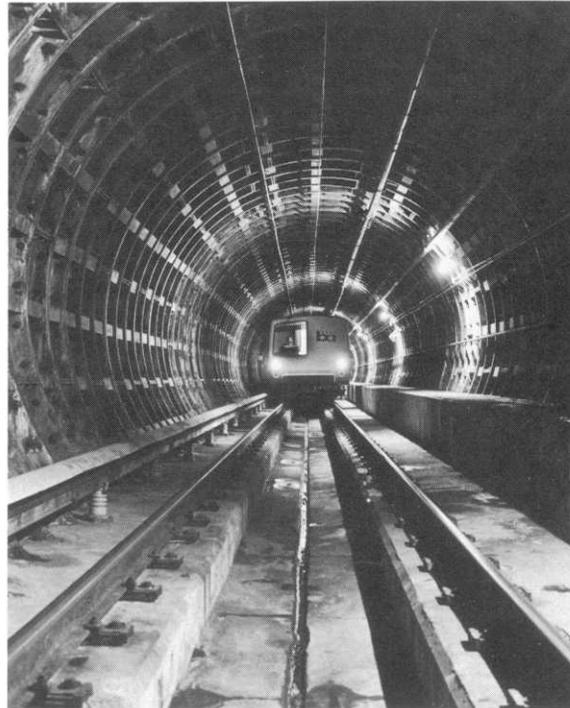
montreal

Montreal, Que.'s, metro began carrying its first revenue passengers in October 1966. By early 1967, a network of three lines was complete. Only eleven short years later, an ambitious expansion program is well underway.

Montrealers like their subway. Its rubber-tired vehicles travel quietly and quickly through stations that are veritable photographer's paradises. During the Metro's first full year of operations, it carried hundreds of thousands of residents and visitors to the 1967 world's fair. At the same time, it played a role in an unprecedented urban renaissance which began in downtown Montreal during the early 1960s and continues through today. Numerous office, retail, convention, and hotel complexes are directly linked to Metro stations. During Montreal's severe winter season, many downtown office workers need not go outdoors from the time they enter a station near their home, until evening when they return there on the subway. The system is complemented by an efficient system of buses.

Based on this very positive experience, several extensions are in various stages of planning and construction.

Most recently, line number one, an east-west route, was extended almost five miles east from the former terminal at Frontenac to Honore-Beaugrand. Opened in 1976, the new segment runs adjacent to the site on which Montreal hosted the 1976 summer Olympic Games. The Metro was a major factor in the smooth transport of visitors around the city during the Olympic period, with a record number of more than 4.3 million people riding the Metro from July 18 to July 24 of that year.



At the western end of line number one, construction is nearing completion on a 5.2-mile extension. Set to open in September 1978, subway service will then run from Atwater to Agrignon Park.

Additional construction is under way to lengthen line number two, bringing it from Bonaventure to Lionel Groulx. Opening is scheduled for the spring of 1979. Further extension of that line north to the area around Metropolitan Boulevard has been approved, and the beginning of service is scheduled for 1981 or 1982. With that extension, line number two will take on a U-shape with its lower portion traveling through central Montreal.

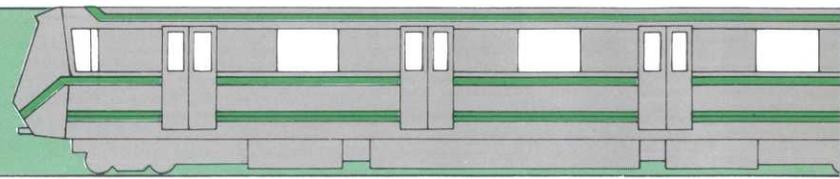
A segment of a planned crosstown line, line number five, has also been approved. It would connect Saint-Michel with Avenue Du Parc.

Incrementally, the Montreal Metro is tying together the many jurisdictions that make up this sprawling metropolitan region.

chicago

Chicago remains one of the most rail-oriented cities in the nation. To augment an already effective network of rapid transit and commuter rail, several extensions are in the works.

A 7.3-mile extension along the median strip of the Kennedy Expressway will link the present terminus of one line with O'Hare International Airport, the nation's busiest air terminal. With park-and-ride lots at intermediate stations, 36,000 daily riders are projected to ride the new line. This includes 12,300 air passengers, 7200 airport employees, and 5200 airport visitors as well as



11,800 commuters. At a time when a limosine ride to the airport can take as much as 70 minutes, rapid transit will bring travelers from the loop to O'Hare in 33 minutes.

An additional planned improvement is the Franklin Line subway. With 3.5 miles underground, 0.9 miles at grade and 0.25 miles aerial, the line will connect with and supplement existing Chicago Transit Authority service. Providing easy transfer to some of the rapid transit system's major routes, the Franklin line will ease congestion on existing subways operating at or above capacity and speed travel times on some trips. The extension is part of the Chicago Central Area Transit Project, which is a direct

outgrowth of a study performed by the City of Chicago in 1968 to develop a plan to improve distribution of transit and commuter passengers.

A project related to transit expansion is the development of a State Street mall. The mall is to run the entire nine-block central business district length of State Street. The existing roadway will be narrowed to two exclusive lanes which will carry only buses and emergency vehicles. The mall is projected to accommodate 300,000 average daily pedestrian movements between 8 a.m. and 6 p.m. This includes 75,000 boarding and alighting bus passengers from 2600 buses daily and 50,000 State Street subway users.

The three projects together will generate nearly 4000 construction jobs and more than 6000 other spin-off positions.

Chicago Transit Authority extensions along with the mall project are only part of the rail improvements getting under way in the Chicago region. New transit security equipment, rapid transit and commuter rail car purchases, installation of new track and equipment for the suburban railroads, and the upgrading of suburban rail stations are also part of the overall plan.

Chicago's rail expansion plans continue to demonstrate the viability of the rail options in our urban centers.

cleveland



The Greater Cleveland Regional Transit Authority operates two very different rail transit systems, the rapid transit (high platform) line from Cleveland Hopkins Airport through downtown to East Cleveland and the light rail line from downtown to Shaker Heights. These two systems have a characteristic unique in North America, sharing the same tracks for 2.5 miles.

A fleet of 48 new articulated light rail cars is now on order, with delivery expected in 1980. These extra-large, double-end cars will be constructed of stainless steel, will be air-conditioned, and will each seat 84 passengers.

The light rail line will be virtually rebuilt as part of the same project. New rails, new overhead wire, and improved drainage facilities will be provided. Additional power stations will support the new higher-performance cars. As a

first in light rail, the entire system will also be equipped with cab signal control.

Specifications are being prepared for new rapid transit cars to replace the original blue fleet of cars built in 1954 and 1958. These cars will be somewhat similar in performance and capacity (80 seats) to the Airporter cars built in 1966 and 1970.

During the next few years, an in-depth program of station rehabilitation and modernization will be carried out at all 19 stations on the rapid transit line. A complete new multi-modal interchange station at East 34th Street will make it easier to transfer between the rapid transit and light rail systems and from either to the surface bus system. The entire rail system will receive new graphics, and track on the rapid transit will be rehabilitated.

Design will begin very soon on a new central rail maintenance facility to service both the rapid transit and light rail fleets as well as all rail work equipment.

Preliminary planning is now under way for a two-mile extension of the light rail system along Shaker Boulevard in Cuyahoga County's eastern suburbs. A heavily traveled belt freeway will be intercepted, with a park-and-ride facility for at least 1500 automobiles. It is expected that about 12 additional light rail cars of the type now on order will be required to serve this extension.

The process of alternative analysis has begun to determine future fixed-guideway extension priorities. It is expected that the present systems will serve as the core of an eventual county-wide network.

pittsburgh

Pittsburgh is one of a few cities in the United States to retain trolley service. What remains today are 23 miles of trolley lines operating in South Hills through a mixture of working class and upper middle income communities, some of which were once bleak coal-mining hamlets.

In 1976, the Port Authority of Allegheny County turned to light rail—recommended by a comprehensive comparative analysis—as most suitable for South Hills, economically and pragmatically.

PBGH, a joint venture formed by Parsons, Brinckerhoff and Gibbs & Hill, was selected through competitive bidding to make essential engineering, design, and environmental impact studies. PBGH began its assigned task in late spring 1977 and has since then held several rounds of informational meetings with public officials, civic, neighborhood, and citizen groups in each of the affected communities. A preliminary draft of the environmental impact statement is now before the Urban Mass Transportation Administration for review.

This work pertains to stage one of the project. That includes complete reconstruction of 10.5 miles of existing lines, renewal of electrification and signalization facilities governing all 23 miles, a new distribution pattern in downtown Pittsburgh, and purchase of 80 light rail cars. PBGH is nearing completion of studies relating to system and vehicle design, downtown distribution, and stage one reconstruction cost estimates.

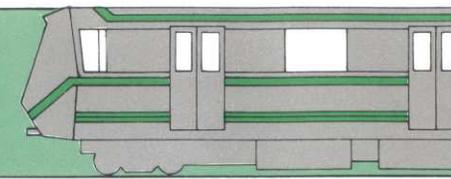
The 10.5-mile line in stage one will run southward from Penn Central Station, downtown, on railroad right-of-way across the Momongahela River and into South Hills via the Mt. Washington Transit Tunnel. It then will follow PAT's Shannon-Drake route through the city's Beechview section, and suburban Dormont, Mt. Lebanon, Castle Shannon, Bethel Park, and Upper St. Clair. The southern terminus, where a new car maintenance-storage center is to be built, will be located at South Hills Village, one of the largest shopping malls between Chicago and New York.

Along the way, there will be some 16 stops with passenger shelters and 12 stations equipped with facilities to aid the aged and handicapped. A half-dozen distribution plans, some in subway, are under consideration for downtown. A portion of the line, through highly urbanized Mt. Lebanon, will be underground.

PAT hopes to have stage one in operation by 1982-83. In the interim, steps will be taken to fund and design stage two. When complete, the entire 23-mile system will operate with through and feeder bus routes serving South Hills, principally those operating via PAT's new 4.5-mile South Busway. It is anticipated that South Hills transit network will handle approximately 100,000 passengers per weekday by 1985.

san francisco

The San Francisco Municipal Railway trolley cars which have become a part of the Market Street cityscape will soon disappear—into the



Muni subway, that is. With the addition of a fleet of new light rail vehicles, the cars will travel on the upper level of a two-level subway under Market Street, constructed by the San Francisco Bay Area Transit District. This service is expected to begin during the summer of 1979.

Muni's downtown light rail terminus will be at the foot of Market Street at the Embarcadero station. Light rail cars will proceed through the subway under Market Street, with stops at four joint BART/Muni stations. Beyond the Civic Center station, BART lines depart from the Market Street alignment.

Muni cars will continue to the first Muni-only station, Van Ness. Beyond Van Ness, two light rail lines emerge from the subway, and continue their routes over existing surface trackage. The remaining lines will continue through two more stations and then connect into the Twin Peaks Tunnel, built by Muni in 1917. From that point, the lines will follow their current routes.

Muni will introduce a method of operation whereby individual cars from different routes will converge at the subway portals and travel in trains of up to four vehicles under Market Street. The result will be greater speed and capacity.

Along with these innovations, a light rail maintenance and storage facility is partially completed. To further enhance system flexibility, extensions to two of the light rail lines are being planned.

Once implemented, the Muni metro will provide improved travel times and greater transit coordination for San Francisco travelers.

BART is also looking toward improvements on its network. One proposal calls for a third track

through the downtown Oakland area. With completion expected in approximately 1980, the additional guideway will provide more flexibility and augment operations. An additional improvement involves the electronic monitoring of stations, eliminating the need for attendants. Currently, testing is under way in the Ashby station.

as well as a general face-lift.

A proposal for a three-mile extension would add seven stations and run the line through a greatly deteriorated area along one of the busiest corridors in the entire state, Springfield Avenue. Two smaller extensions are also being examined, one of which would connect the present terminal in north Newark with a Conrail commuter station.

Other improvements being planned include modernization and refurbishment of the line's 11 stations, improved track and roadbed for higher speed operation, and 15 new light rail vehicles.

newark

In Newark, N.J., planners are looking to possible extensions of the city's 4.3-mile light rail line

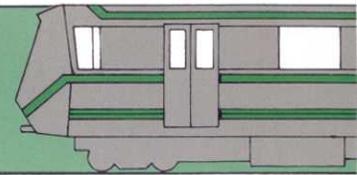


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about the american public transit association

The American Public Transit Association is the national organization representing the urban transit industry. Its members total more than 300 rapid rail and motor bus transit systems in the United States, Canada, and Mexico. Ninety per cent of those using urban public transit in the United States are carried by APTA members.

Formed on a cooperative, non-profit basis and devoted to the operation and development of urban transit, the American Public Transit Association's objectives are:

- To represent the interests, common policies, requirements, and purposes of the operators to public transit;
- To provide a medium for exchange of experiences, discussion, and comparative study of industry affairs;
- To promote research and investigation to the end of improving public transit;
- To aid members in dealing with special issues;
- To encourage cooperation among its members, their employees, and the general public;
- To collect, compile, and make available to members data and information relative to public transit; and
- To encourage industry-wide compliance with the letter and the spirit of equal opportunity principles.

The Association also includes manufacturers, suppliers, consultants, and contractors who, through their own division, provide for concerted action on problems affecting them.

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