

Merrily We Rail Along

Since the Bay Area Rapid Transit Authority put its rapid rail system into operation in 1974, a number of other metropolitan areas within the United States have considered rapid rail transit. Of these, Washington, D.C. and Atlanta have managed to place new systems into operation. Baltimore and Miami have new systems under construction. Others are being analyzed and planned. To put Houston's own transit planning experience into perspective, a brief overview of four other cities' experience is offered here. These four cities—Atlanta, Miami, Los Angeles and Denver—share certain characteristics with Houston. All have the reputation of

being "new" cities which have developed tremendously since the 1940s, spreading out at low population densities in a "sprawl" configuration which bespeaks the influence of the automobile on twentieth-century American settlement patterns. Like Houston, the transit planning authorities in these four places overlap governmental jurisdictional boundaries to reach out to separately incorporated or unincorporated suburban areas. Most experienced initial rejection of rapid rail proposals (Houston area voters turned down a proposition to create a transit authority in 1973), all were encouraged by the hope of massive federal subsidies for designing and

constructing their systems, and all have had to face the prospect of operating lines at a deficit. Most lines stake potential rider appeal on attracting commuters tired of fighting freeway traffic. Thus the systems tend to join downtown business districts with middle income suburban areas, providing an alternative to automobile transportation rather than concentrating on the provision of service to lower income neighborhoods where people may in fact rely upon public transportation. In response to this inequity, all the examples profiled are undergirded by extensive bus fleets, constituting a less glamorous but essential component of the transit systems.

Atlanta

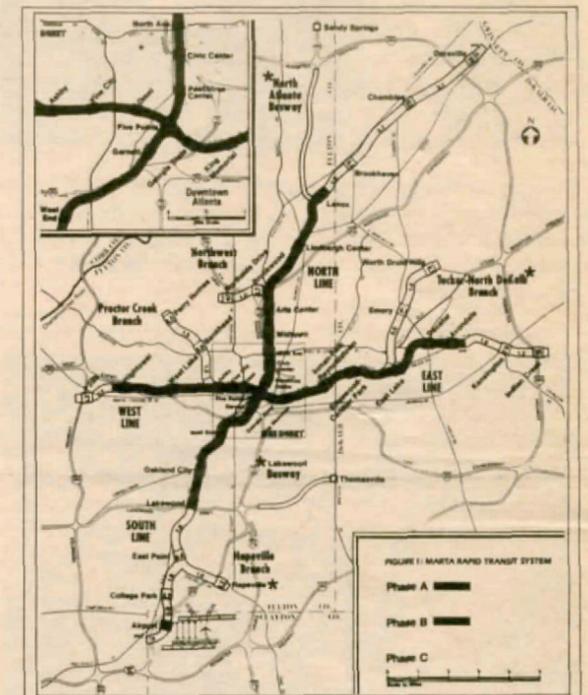
Atlanta, where MTA General Manager Alan F. Kiepper and Assistant General Manager William D. Alexander were general manager and assistant general manager, respectively, of the Metropolitan Atlanta Rapid Transit Authority (MARTA) before coming to Houston, has in operation the 13.7 mile "Phase A" increment of its proposed 53 miles of rapid transit lines. Voters authorized construction of the entire system in 1971. Three years were spent in analyses, design and engineering of the first phase, which was placed under construction in early 1975 and was opened in segments between July 1979 and December 1981. In 1973 the entire 53 mile system (which MARTA hoped to have in operation by 1981) was estimated to cost \$1.75 billion. Previous estimates had been as low as \$1.3 billion. Phase A cost over \$1 billion, yet it represented only slightly more than one-quarter of the projected mileage of the entire rail transit system. It consists of two lines, an 11.8 mile east-west line and a much shorter 1.9 mile north-south line, which intersect beneath Five Points, the historic center of downtown Atlanta.

rapid rail line in an elevated configuration also surfaced in Atlanta. In 1975 the Atlanta business establishment rose in arms when MARTA wanted to build the downtown subway sections of the Phase A lines with cut-and-cover construction. MARTA cited cost increases of \$23 million to \$36 million if tunneling was to be employed rather than one of two alternative methods of cut-and-cover construction. After engineering studies were performed however, the estimated differences were revised downward to a premium of between \$2 million and \$11 million for tunneling. The downtown lines were tunneled. The segment of the north-south line linking Peachtree Center with the main station at Five Points was tunneled at a depth of 52 feet below street level under a downtown street that was 65 feet wide and through soil that consisted of segments of rock, a mix of rock and clay, and clay. Dewatering was necessary also to circumvent potential problems when tunneling below the water table.

Brinckerhoff Quade and Douglas of New York, Tudor Engineering Company of San Francisco and, initially, Bechtel Inc., the consortium which designed San Francisco's rapid transit system. Designs for the seventeen stations in Phase A were commissioned from different Atlanta architectural firms. Phase B, a 9.7 mile extension to both ends of the north-south line, currently is under construction.

In the ten years that elapsed between 1971 and 1981, MARTA had to contend with federally mandated analyses and impact reviews of a much more extensive order than had been required of San Francisco or Washington, D.C. in return for an \$800 million subsidy from the Urban Mass Transportation Administration of the U.S. Department of Transportation. It also ran head on into a spiralling rate of inflation that drove costs far beyond initial projections, despite the ironic fact that the recession of the mid-70's caused many of the early construction contracts to be awarded for less than MARTA's estimates. Kiepper and his staff responded to problems with a single-minded determination to get the system—or at least Phase A—into operation.

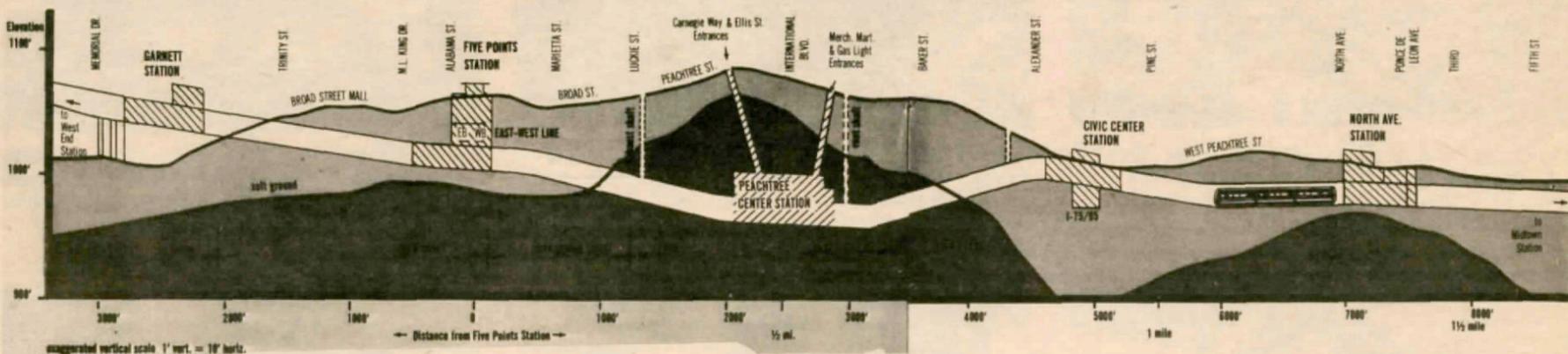
As in Houston, the Atlanta system managed to take advantage of existing railroad alignments for much of its right-of-way. Unlike Houston, Atlanta tied station locations, especially in and near downtown, to new or existing office, retail and convention center construction. The Urban Mass Transit Administration used Atlanta for a case study to evaluate the urban planning implications of station locations, a process helped by the fact that Atlanta has a strong tradition of civic planning. MARTA literature stresses the effectiveness of the system in promoting urban revitalization and conservation of historic buildings, especially of such landmarks as the flamboyant Moorish-style Fox Theater in downtown Atlanta and the old DeKalb County Courthouse in suburban Decatur.



Atlanta: MARTA system. Phase A is darkest tone portion at center. (MARTA)

Controversies similar to the one stirred up by MTA's proposal to build the Main Street portion of Houston's

MARTA was chartered in 1965 and it weathered voter rejection of its first transit plan in 1968. Design consultants for the system have been a joint venture of Parsons



Atlanta: Diagrammatic section of north-south line, Phase A. Vertical scale is exaggerated. (MARTA)

Los Angeles

No other city in the U.S. can outdo Los Angeles when it comes to studying transit projects. In L.A. this tedious, expensive and (since it is so time consuming and costly) often controversial process dates back to 1954. In 1968 voters turned down an 89 mile elevated system (for which Tony Lumsden of Daniel, Mann, Johnson and Mendenhall produced a sleek, Archigram style station and guideway design prototype). Since then the Southern California Rapid Transit District (SCRTD) has received public affirmation in various referendums for various proposals, but the studying still goes on. It has long been agreed upon that the first segment to be built should be an 18 mile rapid rail line running from Union Station beneath downtown Los Angeles and out the Wilshire Boulevard corridor to Hollywood, where it would be tunneled beneath the Santa Monica Mountains to the San Fernando Valley. Tunnels would range from 50 feet to 200 feet in depth. The current estimated cost of the system is just over \$2 billion. Los Angeles has been hard hit by Republican cut-backs in Urban Mass Transportation Administration

funds. SCRTD had already extracted commitments for massive federal support. Whether it can now rely on those commitments is uncertain.

Kaiser Engineers and Daniel, Mann, Johnson and Mendenhall, which have collaborated on the Baltimore transit line (now under construction) and are two of the four firms that comprise MTA's engineering and design consultant group, Houston Transit Consultants, are the chief consultants to SCRTD. They also have developed a design for an extensive Downtown People Mover system, operating on elevated concrete guideways to serve downtown Los Angeles, which is considerably larger than Lumsden's 1967 design and has been held up because of law suits brought by downtown property owners objecting to alignment. John Dyer, who had been Coordinator of Metropolitan Dade County's Office of Transportation Administration since 1971, was named General Manager of SCRTD in 1981.



Los Angeles: Perspective rendering of Downtown People Mover system in Bunker Hill section of downtown Los Angeles. (Architectural Record, July 1979).

Miami

Metrorail, the rapid rail transit system being built by the Dade County Transportation Administration of Metropolitan Dade County, Florida—encompassing Miami and its suburbs—is the only recent U.S. rapid rail line to be built entirely in an elevated configuration. In fact, Bangkok appears to be the only other city in the world where an all-elevated rapid rail system has been authorized. Apart from the configuration of the system however, Metrorail has encountered the same problems that are seemingly endemic to rapid rail planning, especially escalation of cost projections due to inflation.

The Miami Urban Area Transportation Study, organized in 1964, suggested the feasibility of a rapid rail transit system for Metropolitan Dade County in 1969. In 1972 Dade County voters approved a bond issue of \$132.5 million to serve as the local share of planning and building costs for a 54 mile rail system. This was to be all elevated; the Transportation Administration reasoned that Miami's high water table constituted a deterrent to subway construction. The Kaiser Transit Group (a consortium including Kaiser Engineers and the Chicago architectural firm of Harry Weese and Associates, which had worked on the Washington, D.C. Metro) was hired to do preliminary engineering for the system in 1973. By the time Kaiser presented recommendations in early 1975, the estimated cost of the system had jumped to \$1.3 billion. Securing a commitment for 80% financing from the Urban Mass Transportation Administration (the same percentage figure with which MARTA was endowed) and defeating a referendum proposition to halt planning and construction of the entire system, the Transportation Administration began planning the 20.5 mile Stage One Metrorail line, a single line running southwest and northwest from downtown Miami, estimated to cost between \$800 and \$900 million. Construction began in 1979. It is hoped to have the first segment ready for trial operation by February 1983. The entire system is supposed to be ready by late 1984.

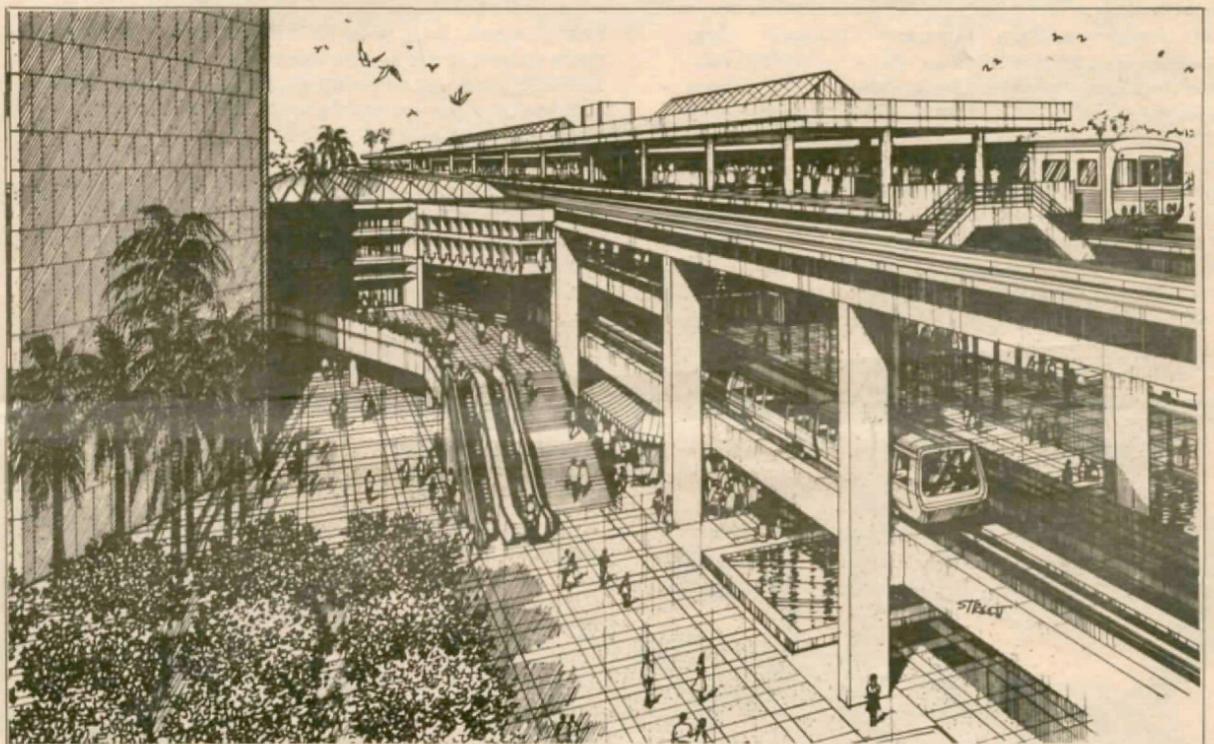
The downtown portion of Metrorail skirts the west side of the older part of Miami's business district, nearly five blocks from the current hot spot for new office and hotel development, a corridor between Brickell Avenue and Biscayne Boulevard. To compensate for this, the Transportation Administration began construction this fall on the first stage of a second mode of public transit, a 1.9 mile elevated Downtown People Mover, the estimated cost of which has risen from \$76 million to \$117 million since 1976. Connected to the Government Center Metro-

rail station, the main downtown stop, the Downtown People Mover will consist of ten vehicles operating on a double guideway loop encircling the present downtown area. A second phase envisions connections to near-town districts to the north and south. The Downtown People Mover is routed above sidewalks, boulevard medians, through a number of proposed new buildings and it is connected to the Metrorail line itself as a secondary line running beneath the main tracks. (The elevation of the Metrorail guideways along the downtown portion of the line is quite high) Operation is scheduled to begin in 1984 to coincide with the inauguration of Metrorail.

Metrorail stations are elevated reinforced concrete platforms, roofed but open to the air. According to the Transportation Authority, versions of a standardized design will be employed for most of the line's 20 stations, with extensive landscaping planned to ameliorate the impact of the structures. Metrorail renderings depict vines clinging to the pylons that support the guideways. Alignments tend to parallel streets or to be routed above boulevard medians.



Miami: Metrorail system, Stage One. (Metrorail)



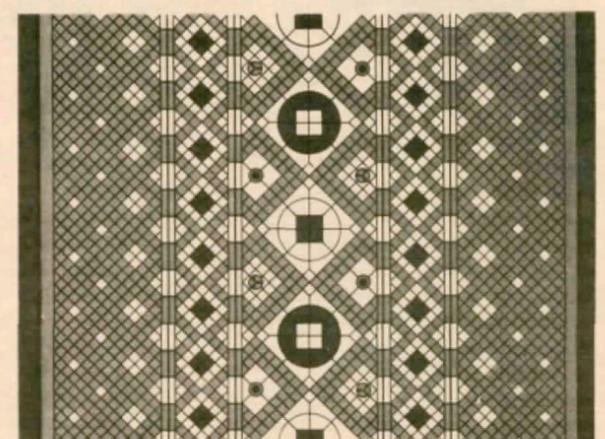
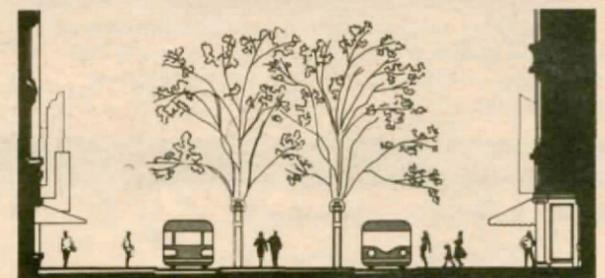
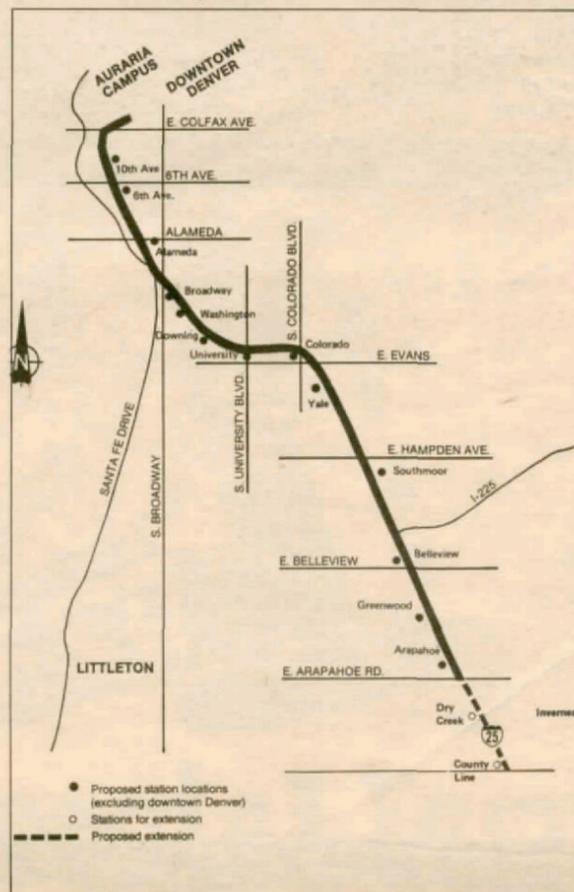
Miami: Perspective rendering of Government Center Station illustrating dual level guideways: Metrorail (above) and Downtown People Mover (below). (Downtown Development Authority of Miami)

Denver

Over the past decade the Denver Regional Transportation District (RTD) has flirted with various technologies and alignments, but not until 1979 did it begin to focus on a 77 mile rail system. This would be a light rail system however, rather than heavy rail (as in San Francisco, Washington, D.C., Atlanta, Baltimore, Miami and as proposed for Los Angeles and Houston) and would operate at grade. A network of overhead wires provides the power source to operate light rail vehicles. That is, they are updated versions of the electrified street cars that began to be introduced in American urban transit systems around 1890. A 15 mile line, the Southeast Corridor, has been designated by RTD as the initial portion of the system to be implemented. Its alignment and configuration in downtown Denver have yet to be determined. DeLeuw, Cather and Company of Chicago, the principal engineering consultant in the design of the Washington Metro, is RTD's chief consultant. In 1980 the total cost of the 77 mile system was estimated at \$500 million.

Denver's most publicized transportation project has been the Transitway/Mall, a 14 block concourse on Sixteenth Street. Vehicular traffic along the Mall will be restricted to shuttle buses running in two narrow lanes on either side of a wide central promenade. MTA had planned a similar sort of development for Main Street when it still intended to route a subway beneath the street. I. M. Pei and Partners are architects of the Denver Mall, which will be bracketed at either end by regional commuter bus terminals.

Denver: RTD Southeast Corridor. Diagrammatic route map of the first phase of light rail construction. (RTD)



Denver: Typical section (above) and plan (below) of Sixteenth Street Mall. (Architectural Record, July 1979)