

# Critical History of Transit Planning and Decisionmaking

Ten years ago few people thought Denver needed a fixed guideway transit system. Most residents of Denver's low-density urbanized area could travel easily by automobile. Since then, however, worsening air pollution and other impacts of growth have sharpened concern for environmental quality among the residents of the area and, in turn, aroused interest in fixed-guideway transit.

While popular support for mass transit was growing, several factors encouraged the development of automated transit for Denver. Increasing bus system deficits inspired a search for a more efficient approach to transit operations. UMTA'S Center City Transportation Project in 1970 suggested a PRT link for downtown Denver, thus ins talling the PRT concept as a popular favorite. The relocation of many advanced technology companies to the Denver area provided a reservoir of experts with skills and interest in new technology. This was the context that shaped transit planning in Denver.

The following history covers the decision making process in Denver from its beginnings in regional highway-oriented studies through the recent system selection decision. The discussion is organized around three key decision periods: (1) the decision to study transit that was implicit in the establishment of a regional transit planning and operating authority; (2) the decision to approve a transit financing plan in 1973; and (3) the period of reevaluation leading to the decision to select an automated rapid transit system in 1975,

## DECISION TO STUDY TRANSIT

Until the late 1960's Denver was strictly a highway-oriented city. Support for transit grew out of an interest in environmental protection and control of future growth that swept the region (and the rest of the Nation) at the turn of the decade. In short order the environmentalists had joined forces with city officials, civic groups, and businessmen

concerned about financial difficulties of the city's bus company to negotiate the establishment of a powerful regional transit authority that could plan improvements in the area's transit service.

Transportation planning in the Denver metropolitan area began in the early 1940's with origin-destination studies performed by the Colorado Division of Highways (CDH). In 1957, the U.S. Bureau of Public Roads provided funds that allowed CDH to sponsor the first Denver Metropolitan Area Transportation Study (DMATS). DMATS was jointly carried out by CDH, the Inter-County Regional Planning Commission (the predecessor of DRCOG), and the City and County of Denver. Financed primarily by Federal highway and HUD 701 funds, DMATS concentrated on planning a highway network. The study forecast that a maximum of only 4 percent of total trips in Denver would use public transportation.

In the late 1960's the highway orientation of DMATS alarmed many citizens who felt that additional highways might turn Denver into a Los Angeles-type spread city. Transit was viewed as a tool for shaping a more desirable urban form. Environmental organizations, concerned citizen groups, and the Metropolitan League of Women Voters therefore began to promote transit.

During the same period, the Denver Tramway Corporation, the principal transit operator in the region, was encountering increasingly difficult financial circumstances. The Denver Chamber of Commerce set up a transportation committee to investigate remedies to these fiscal problems.

Both the citizen groups and the businessmen advocated the creation of an independent regional transit agency with taxing authority to plan, construct, and operate transit facilities in the Denver metropolitan area. They were joined by officials from the City and County of Denver in lobbyin<sub>g</sub> the Colorado State Legislature to create such an agency.



Environmental concerns—including auto-created smog—were a major factor behind public support for a new transit system in Denver

In 1969, the Center City Transportation Project began discussing a proposal to build a PRT system from the Denver's Mile High Stadium to the CBD.<sup>8</sup> This system would allow CBD commuters to park at the stadium and ride the PRT downtown. The recommendation for PRT rather than a more conventional transit technology was significant. PRT was popular in Denver from the beginning of public attention to transit needs. Both UMTA and the transit industry considered PRT a promising new system. While no particular technology was promoted at that time, PRT was generally assumed to be the only transit system suitable for Denver's low-density land use patterns,

These various developments and pressures persuaded State legislators to stand behind Denver's transit initiatives. In 1969 the Colorado State Legislature established the Regional Transportation District (RTD). RTD was mandated to develop a transit plan and hold a financing referendum for it within 5 years. After gaining voter approval, RTD could construct and operate the transit system.

<sup>8</sup> Arthur D. Little, Skidmore, Owings & Merrill et al., *Denver, Center City Transportation Project*, Washington, D. C., 1971.

## DECISION TO APPROVE A TRANSIT FINANCING PLAN IN 1973

RTD's planners worked in a climate in which a majority of Denver's residents were solidly in favor of PRT. A carefully integrated land use and transportation planning effort with continuous involvement of citizens and local officials had no trouble in reaching a consensus to recommend a long-range plan for a PRT system and a complementary early action bus improvement program. The proposal won public support in the September 1973 referendum as voters approved a one-half cent sales tax authority for RTD.

When it was created in 1969, RTD actively sought to coordinate land use and transportation planning. The consultant RTD hired to prepare a long-range transit development plan in 1971 was an interdisciplinary team. The joint venture of Development Research Associates (DRA) and Wallace, McHarg, Roberts and Todd (WMRT) was chosen from among 13 bidders. The winning team's three-step planning process proposed to (1) survey the goals and desires of the community; (2) forecast

a land use plan acceptable to the citizens and public agencies in the area; and (3) then design a transportation package tailored to implement the land use plan. Kaiser Engineers was later added to the team.

An integrated planning approach was being institutionalized in the Denver region at that time. In 1971 RTD had entered into an agreement with the Denver Regional Council of Governments (DRCOG) and the Colorado Department of Highways (CDH) to establish the Joint Regional Planning Program (JRPP). The JRPP was structured to coordinate land use planning, highway planning, and public transportation planning. Within that framework the three agencies cooperated in assembling data for the first phase of the DRA-WMRT study. DRCOG supervised and coordinated the demographic projections. Local governments also contributed data to the plan.

In spring 1972 DRA-WMRT completed its Phase I report, *A CorIcept*. The study surveyed the ecological and social composition of the region and included a development plan and preliminary transportation data. Seven county profiles in separate documents supplemented the report. It was adopted by all three agencies—RTD on February 1973, CDH in August 1973, and DRCOG in December 1973.

The development plan relied heavily upon environmental factors in determining the best locations for future growth. Hazards to development, such as poor soil and drainage conditions and steeply sloping topography, were identified along with ecologically fragile or valuable areas—watersheds, rare wildlife habitat, and the like. Environmentally advantageous sites for new development were located. The plan proposed that much of the new growth be sited in already developed areas so that suburban sprawl would be curtailed. According to this policy of encouraging more concentrated development, Denver City was forecast to gain 90,000 inhabitants by the year 2000, whereas trend projections expected only 50,000 new residents. A series of activity centers were identified where high density growth would be located and urban services concentrated. g

The strong environmental influence in the land use plan was consistent with prevailing opinion of the citizens and leaders in Denver at the time. RTD

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<sup>g</sup> The activity centers are shown on Figure 5, Denver Recommended Transit System, page 14.

had been created in 1969 under the influence of a number of individual environmentalists. But by 1972 environmentalism had taken hold among the general public. That year, as RTD's land use plan was released, fears about uncontrolled growth led area voters to refuse to host the 1976 Winter Olympics.

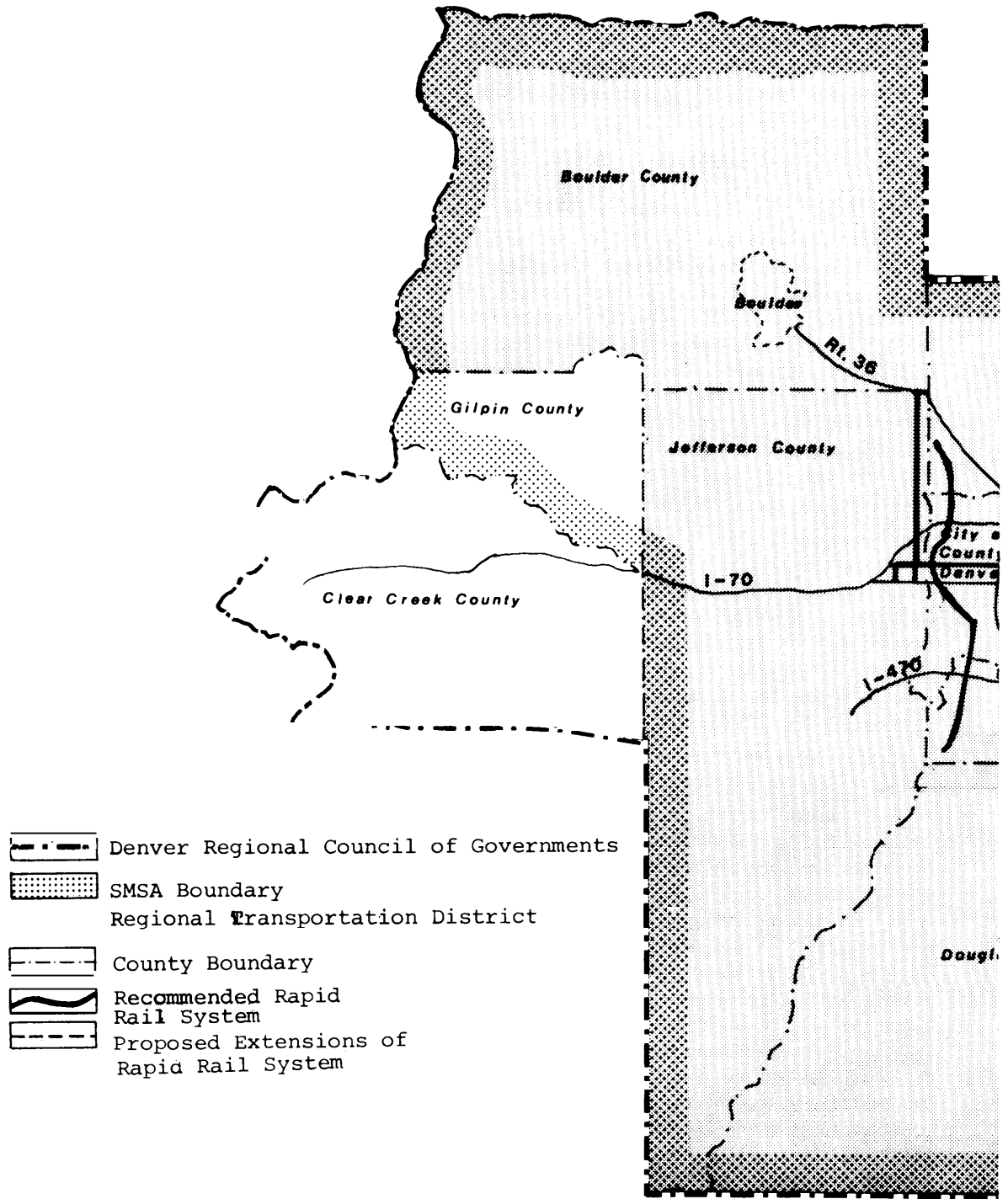
DRA/WMRT incorporated these popular concerns into its transit and land use plans. In 1971 RTD established Citizen Action Committees (CAC). CAC'S included many of the same people who, out of interest in relating transit and land use policy, had helped create RTD. They worked closely with the DRA-WMRT team as it surveyed the goals and desires of the community and developed a land use plan.

In June 1973 DRA-WMRT published its final report, *Phase 11: A Public Transportation Plan*. The plan called for a 98-mile personal rapid transit-type system supplemented by a bus feeder system and included an "early action plan" for immediate bus improvements. The transit system would utilize 12-passenger unattended vehicles that a patron could summon to a station and direct to his destination like a horizontal elevator. Such a "personalized" system appeared to be highly competitive with the private automobile. The report projected an appealingly low operating cost for the proposed system—lower than for a similar level of bus service.

The PRT concept was endorsed by the three agencies in JRPP in spite of the apparent risk inherent in an unproven technology. The reasons for its acceptance can be found in the series of events that had unfolded since RTD was created.

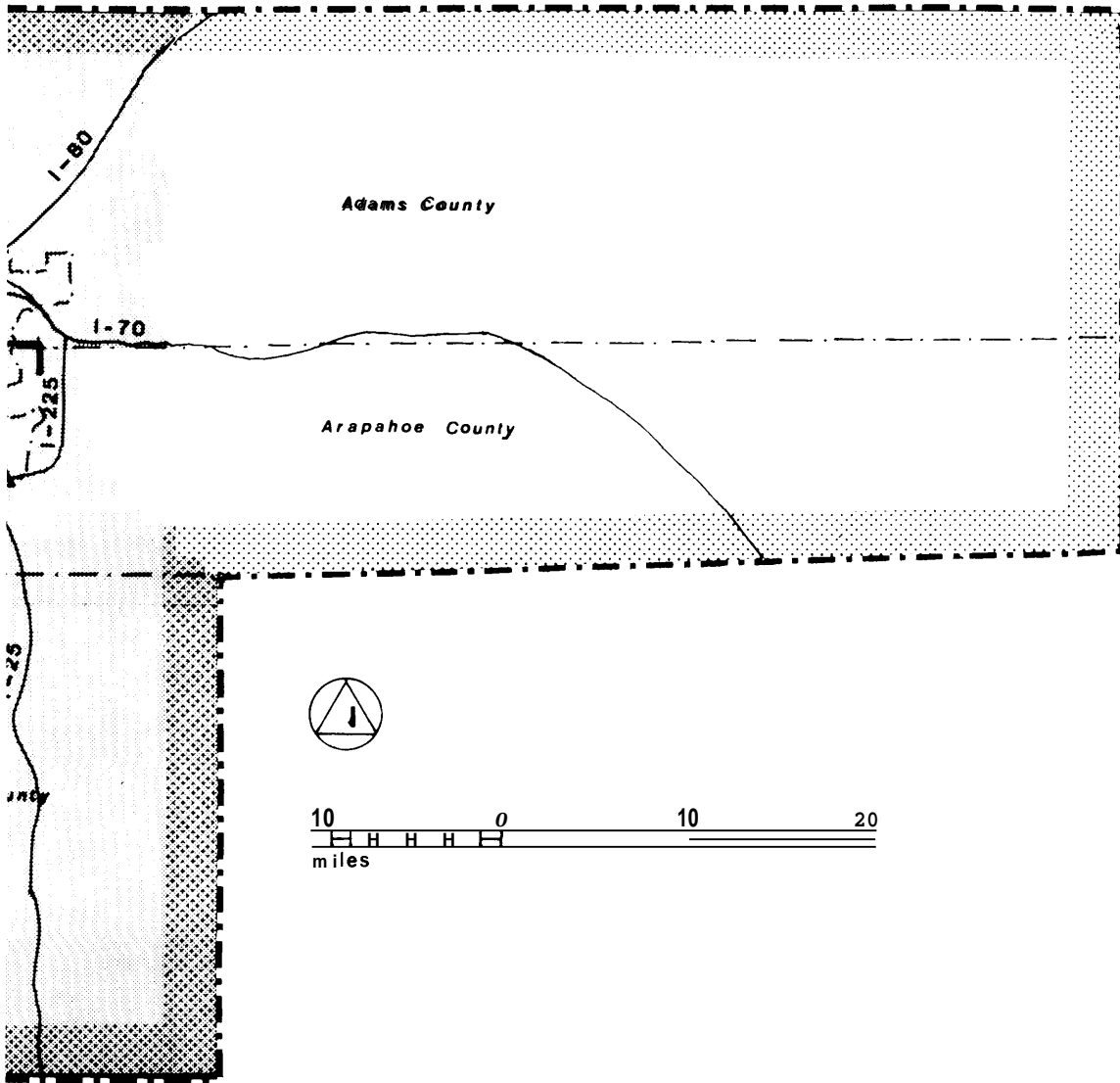
First, while RTD was being organized, another PRT project was proposed for Denver. (The first proposed PRT had been the Center City Transportation Project CBD shuttle.) The new proposal was UMTA'S "Demo B" project, which would provide for construction and operation of a demonstration PRT system. In 1972 Dr. Robert Hemmes, Assistant Administrator for UMTA'S Research and Development program, announced that Denver would be the site for the "Demo B."

Meanwhile RTD hired an executive director, Harry Parrish, who was interested in PRT. RTD's consulting team included Bill Eager, a planner who had previously worked for Boeing, which was developing its own PRT technology. Eager helped shape RTD's "family of vehicles" concept, which

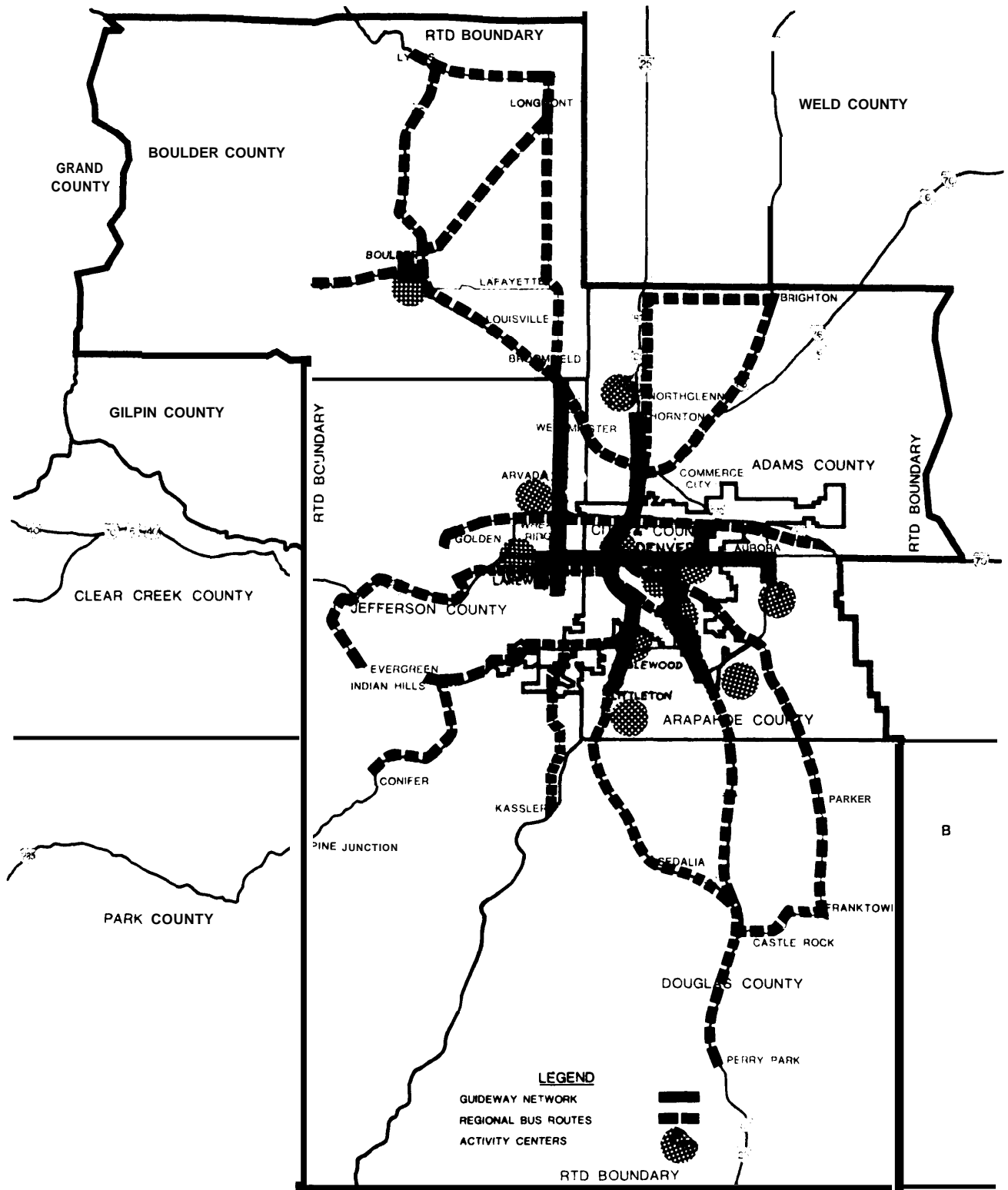


**FIGURE 1: DENVER METROPOLITAN AREA**

A Standard Metropolitan Statistical Area (SMSA) includes cities), usually with a population of at least 50,000, plus other political divisions that are economically and socially with the central area.



Inter city (or adjacent counties) integrated



**FIGURE 5: DENVER- RECOMMENDED TRANSIT SYSTEM**

Source: Regional Transportation District, Long Range Transit Development  
 Analysis: Transit Concept Comparison, April 1975.

called for use of new technologies where appropriate.

During the same period a conference on PRT in the Denver area generated considerable enthusiasm about new-technology transportation systems. An additional factor favoring PRT was the movement to Denver of several advanced-technology research and development firms, including Martin Marietta Aerospace and Transportation Technology, Inc., whose enthusiasm for developing new technologies may have added to the atmosphere in favor of new technology in Denver.

PRT also looked appealing for practical reasons. In April 1971 Denver took over bus transit operations from the local operators. The public agency incurred growing deficits that totaled nearly \$4 million by the end of 1973. The large deficit tended to make capital-intensive systems such as PRT more attractive than conventional bus and nonautomated rail transit. Theoretically, automated systems cost less to operate principally because of lesser labor costs per passenger. Another reason behind popular enthusiasm for improved transit was a gasoline shortage in the Denver area in 1973.<sup>10</sup>

After publication of its Phase I and II reports, RTD assembled a campaign to cement the public support behind the PRT plan and a financing plan to implement it. Before the referendum, RTD drafted and gained approval for legislation that substituted a sales tax increase for the general property tax contemplated in the original RTD legislation. The one-half cent sales tax was expected to generate \$1.5 billion (including the Federal share) to implement the RTD plan, if the financing plan was approved in referendum. At the same time the legislature acted to permit a second referendum if voters rejected the RTD plan during the first trip to the polls.

RTD's strategy for promoting the plan to the public included surveys, media advertisements, campaign mailings, special fund-raising committees, and speaking tours. During the campaign citizen advisory committees actively promoted the RTD plan by holding informational meetings and distributing literature.

The election was scheduled for September 1973, although RTD could have waited as much as a year

<sup>10</sup> The gasoline shortage in the Denver area occurred prior to the nationwide fuel shortages of fall and winter 1973-74.

longer. The referendum was timed to take advantage of popular support for the efforts to address environmental issues in Denver, which had been expressed in the decision to reject the 1976 Olympics sponsorship.

Technically, the issue before the voters at referendum was RTD's request to levy the one-half cent sales tax. However, the tax was linked closely to a promotional campaign for the PRTs system. The RTD literature made direct reference to PRT, and a few weeks before the vote several firms displayed their PRT vehicles in Denver. In addition, the RTD board promised to consult the people again if the transit system finally selected was substantially different from PRT. The campaign strategy was successful, and on September 7, 1973, 57 percent of Denver region voters registered approval.

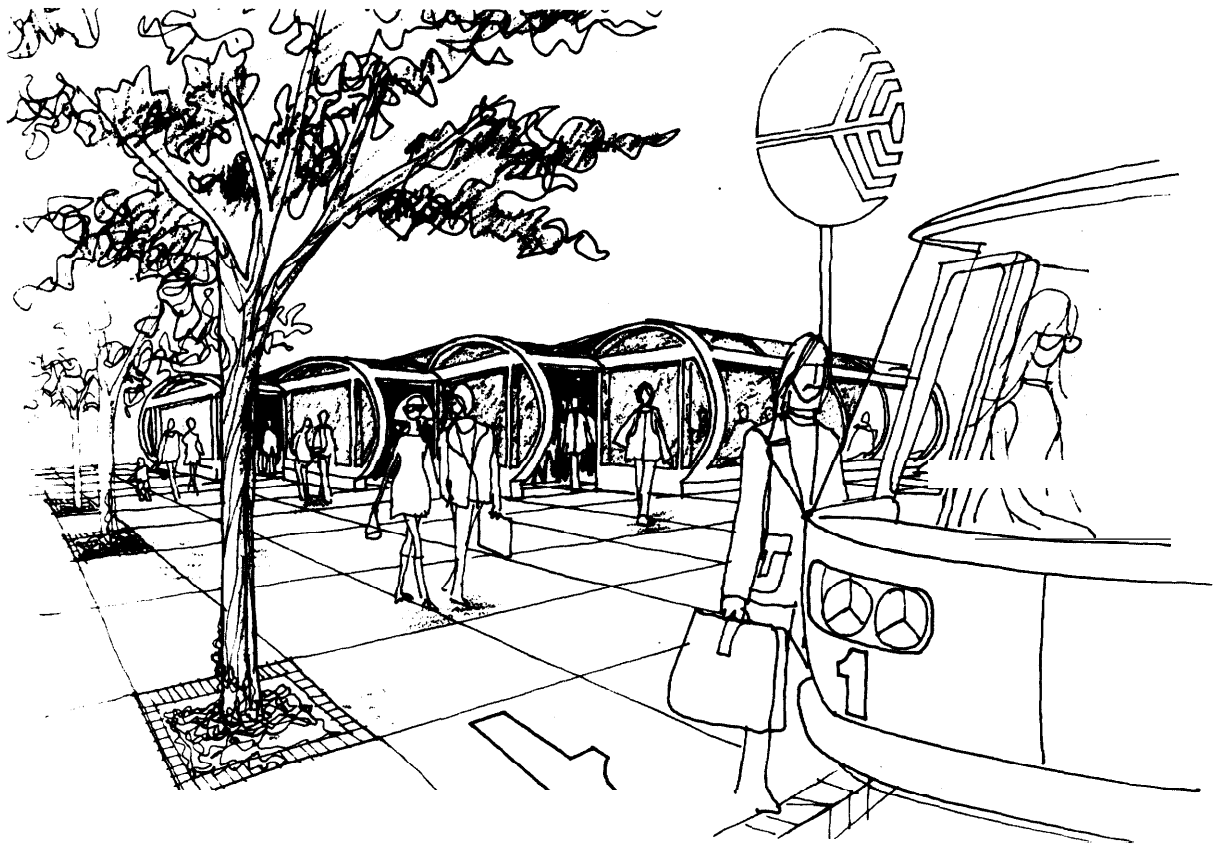
## SELECTION OF THE ART SYSTEM

After the referendum vote, RTD's progress toward implementing the transit proposal temporarily reversed. UMTA required RTD to evaluate a full range of alternatives to the PRT concept before proceeding with preliminary design. RTD carried out an alternatives analysis and produced a plan which, although the PRT concept is considerably modified, nevertheless enjoys broad-based popular support.

UMTA began backing away from its early enthusiasm for the Denver PRT proposal in 1974. Embarrassing cost overruns in the demonstration project in Morgantown, W. Va. had cast doubt on the financial and technical feasibility of a PRT system similar to the one proposed in Denver. In addition, the Airtrans System at the Dallas-Fort Worth Airport—like Morgantown's PRT, a technological predecessor of the proposed Denver system—was not performing up to specifications.

At the same time these projects were running into difficulties, UMTA began to realize that it could not meet all the requests for Federal assistance from cities across the country with large fixed-guideway systems in planning or preplanning stages.

When RTD asked for a study grant to continue work on the PRT-type system approved in 1973, UMTA responded with a new requirement for a complete evaluation of alternatives. UMTA implied informally that its funding levels would be geared to the most cost-effective alternative. After the



The transit system proposed in 1973 linked personal rapid transit lines with feeder bus service

referendum RTD had taken steps to select a consultant to refine the PRT plan, prepare an UMTA capital grant application, and ultimately to do final design and manage construction of the entire system. UMTA'S insistent request for an alternatives analysis resulted in the addition of this task to the work program. However, the candidates for the consultant job had already submitted their proposals—and had undergone a round of interviews—by this time,

RTD selected a consultant team headed by TRW, Inc. with participation of architects Gruen Associates, engineers Ralph M. Parsons & Co., and DeLeuw, Cather & Co. The consultants were hired to function as the “system management contractor,” a title that implied the predominance of the construction-phase responsibilities.

The findings were reported in April 1975. 11 They included recommendations for an 80-mile

11 RTD, *Public Transportation Alternatives, Report and Recommendations to the Board of Directors from the Staff of the Regional Transportation District*, April 1975, p. 5.

automated fixed-guideway system—referred to as the Automated Rapid Transit system (ART)—supplemented by expanded bus service (see Figure 5). The proposed ART system employs a much simpler and, it was hoped, less expensive technology than the PRT system proposed in 1973. The ART system would use automated or semiautomated vehicles that would be mass produced. The specially designed vehicles of the earlier plan were ruled out.

The system would serve all 12 of the activity centers identified by the 1972 Phase I plan and would be implemented in stages up to the year 2000. The initial 30-passenger vehicle probably would be replaced with larger vehicles as demand increased. The first segment of the ART system, approximately 28 miles long, would run north and south from Denver's CBD to serve three other activity centers.

Most of the first segment follows expressways and railroads and therefore would cause little (if any) disruption of residential communities. RTD



was sensitive to neighborhood opposition because it found (as did many other cities) that people who support a plan in the abstract often become concerned if transit facilities threaten to disrupt their own neighborhoods.

In the period following the 1973 referendum—but before the reevaluation got underway—citizens in the east side of Denver had begun to oppose PRT alignments routed through their area that did not follow railroad rights-of-way. In addition, citizen groups in the South Colorado and East Colfax corridors objected to having an elevated PRT guideway in their neighborhoods.

To avoid such criticisms, the ART plan promises to implement segments of the transit system only as the demand arises and to give priority to those segments that are acceptable to the residents of neighborhoods they affect. In the meantime the other corridors would be provided with improved bus service—ranging from local buses to exclusive

bus lanes as circumstances warrant.

JRPP adopted the ART plan on June 19, 1975. It has thus been officially approved by the three agencies participating in JRPP: the Denver Regional Council of Governments, the Colorado Department of Highways, and, of course, RTD. The plan has been well received by local governments, other regional agencies, and the public, and continued support is expected.

Despite widespread support for the plan, issues have been raised concerning two aspects of the alternatives analysis: the procedures used for formal citizen and public agency participation, and some of the procedures and the assumptions used in the alternatives evaluation itself.

RTD, however, has fulfilled its obligation to do an analysis of alternatives, and the ball is once again in UMTA'S court. UMTA plans to comment on RTD's alternatives analysis by November 1975.