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Review of Downtown People Mover Proposals: Preliminary Market Implications for Downtown Applications of Automated Guideway Transit

December 1977

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16. Abstract

A major objective of the Automated Guideway Transit (AGT) Socio-Economic Research Program sponsored by the Urban Mass Transportation Administration (UMTA) is to ascertain the potential market for AGT systems. The 38 proposals submitted for consideration in UMTA's Downtown People Mover (DPM) Project indicate that there is a U.S. market for a people mover system. In these proposals, which are reviewed here, the cities address the social, economic, environmental, and planning considerations of DPM systems in central city locations. These considerations include the proposed application site characteristics, potential ridership, system economics, social acceptability, environmental impacts, energy consumption, transportation system planning, and revitalization goals for the central business district.

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FOREWORD

The information contained in this report has been extracted from the 38 proposals submitted by U.S. cities for consideration in the Urban Mass Transportation Administration (UMTA) Downtown People Mover (DPM) Project in June 1976. No attempt was made to interpret the data provided by the cities or to evaluate the analysis techniques and results reported in the proposals. Each proposal represents the city's perception of the issues pertinent to the installation of a DPM system in an urbanized area.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
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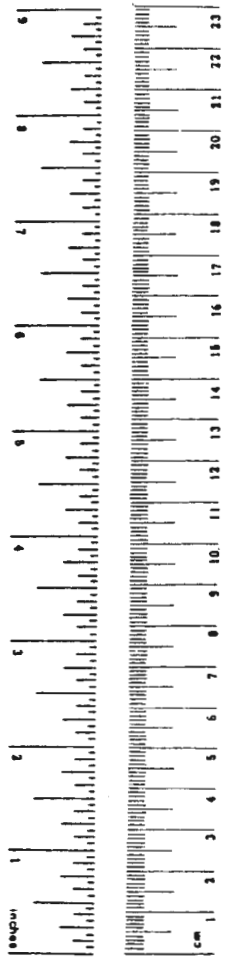
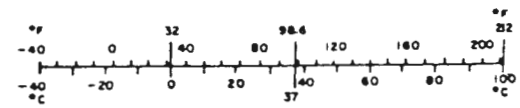


Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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1.0 INTRODUCTION

The Automated Guideway Transit (AGT) Socio-Economic Research Program, initiated by the Urban Mass Transportation Administration (UMTA) in 1975, is a comprehensive, multidisciplinary research effort addressing the social, economic, environmental, institutional, land use, and performance issues of AGT technology in the urban environment. A major objective of this program is to ascertain the potential market for AGT systems in the United States.(1)

An initial assessment of one form of AGT technology--Single Line Transit (SLT) systems, or "people movers" as they are commonly known--is gained from the proposals submitted by 38 U.S. cities for consideration in UMTA's Downtown People Mover (DPM) Project. These proposals address a range of socio-economic considerations associated with the installation of DPM systems in central business district (CBD) locations. These considerations include:

- application site characteristics,
- system ridership,
- system economics,
- past project planning,
- local funding sources,
- related transportation planning activities,

- related central city redevelopment activities, and
- environmental impacts.

Presented in this report is: a brief description of the status of AGT technology in the U.S., a summary of the project and site characteristics given in the DPM proposals, and individual summary sheets for each city. The summaries of the systems proposed by 19 preliminary final candidate cities include: a sketch of the route alignment; quantitative information on the proposed system's characteristics;[2] a short narrative on expected ridership characteristics, related transportation and land use planning activities; and possible institutional and environmental problems. The report concludes with a description of the remaining candidate DPM systems. No attempt was made to interpret the data provided by the cities or to evaluate the analysis techniques and results reported in the proposals.

1.1 DPM Project

The DPM Project, initiated by UMTA in April 1976, is designed to demonstrate the application of people movers in the urban environment. The project aims at evaluating patronage and community acceptance, the reliability, maintainability, safety, and economic characteristics of such systems. The objectives of the DPM Project are to:[3]

a. Test the operating and maintenance (O&M) cost savings which automated transit systems might deliver;

b. Assess the economic impact of improved downtown circulation systems on the central city;

c. Test the feasibility of people movers both as feeder distributors and as potential substitutes for certain functions now performed by more expensive fixed guideway systems, such as subways;

d. Establish that automated, relatively simple people mover systems can be made sufficiently reliable and maintainable, while providing adequate service availability at affordable costs, to be a viable urban transit alternative;

e. Establish the social acceptability of automated unmanned transit vehicle operation and the environmental impact of modern guideways in the urban (CBD) environment; and

f. Thoroughly document the entire project, including an evaluation of system performance, the social, economic, and environmental impacts of the DPM installation, the lessons learned from the project, and a set of guidelines and procedures that could be emulated by other potential candidate cities.

Letters of interest in the DPM Project were submitted by 65 urban areas. Of these cities, 38 submitted formal proposals. A three-step site selection process based on the minimum criteria announced in the 6 April 1976 news release for applicants (see Appendix) was undertaken by UMTA:

a. Preliminary review of planning, ridership, local support, and cost information contained in the proposals;

b. Cost-benefit evaluation of information obtained in the proposals; and

c. Analysis of UMTA site visits and additional supporting information requested from the cities by UMTA.

After the first step, 19 cities remained as preliminary final candidates for the DPM Project. Eleven finalists remained after the second step: Baltimore, Cleveland, Detroit, Houston, Indianapolis, Jacksonville, Los Angeles, Miami, Norfolk, St. Louis, and St. Paul.

On 22 December 1976, UMTA announced the selection of Cleveland, Houston, Los Angeles, and St. Paul as demonstration cities for the DPM Project.[4] In addition, Detroit's proposed DPM was approved as part of a prior transit funding commitment. Baltimore and Miami, although not selected for participation in the DPM Project, were advised that their proposals were of sufficient merit to permit reprogramming of funds from existing Federal transit commitments to finance DPM development, should they choose to request such action.

1.2 Data Limitations

Comparative analysis of the proposals based on the data provided here is not appropriate. The information represents the city's perception of socio-economic issues, which would influence the successful installation of an urban DPM system. As such, the data from the proposals vary significantly from one city to another. The level of detail and the accuracy of information is dependent on each city's past planning activities related to people mover systems and its familiarity with AGT technology.

Cost projections of the various systems are not based on similar dollar years and assumptions and therefore were not compared. Where escalated costs are presented, the assumption regarding inflation rates vary among cities. Some cities, for example, include right-of-way acquisition in capital cost estimates while others do not, particularly if the proposed route is on publicly held land. For some systems, the DPM capital cost also includes construction of other transportation facilities, such as multi-mode terminals or parking lots.

A further limitation of the data presented here is related to ridership projections. The ridership projections contained in the proposals are based on a variety of conventional demand analysis techniques which are not sensitive to level of service variations pertinent to the new technology alternatives considered in the proposals.

Direct comparisons of the proposed DPM systems with similar systems currently operating in airports, amusement parks, and shopping centers are similarly inappropriate. Construction costs, environmental impacts, and operating and maintenance requirements will differ, since these systems are not subject to the rigorous urban environment in which the DPM systems will operate.

2.0 STATUS OF AGT TECHNOLOGY

AGT is a class of transportation systems that operates unmanned vehicles on fixed exclusive guideways.

2.1 Types of AGT Systems

Three major categories of AGT systems have been identified.[5]

2.1.1 Single Line Transit (SLT)

Single Line Transit, which is also referred to as shuttle loop transit, is the simplest type of AGT system. Vehicles move along fixed paths with few or no switches. The vehicles of a simple shuttle system move back and forth on a single guideway; vehicles in a loop system move around a closed path, stopping at any number of stations. They may or may not make intermediate stops. The vehicles may vary considerably in size and may travel singly or coupled together. Examples of SLT systems include those in operation at Tampa International Airport, Houston Intercontinental Airport, and Seattle-Tacoma International Airport.

2.1.2 Group Rapid Transit (GRT)

These systems serve groups of people with similar origins and destinations. The principal differences between GRT and the SLT are that GRT tends to have shorter headways and a more extensive use of switching. GRT stations may be located on sidings off the main guideway, permitting

through traffic to bypass. GRT guideways may merge or divide into branch lines to provide service on a variety of routes. Vehicles with a capacity of 10 to 50 passengers may be operated singly or in trains. Headways range from 3 to 60 seconds. GRT systems are in operation at Dallas/Fort Worth Airport and Morgantown, West Virginia.

2.1.3 Personal Rapid Transit (PRT)

The term PRT is restricted to systems with small vehicles carrying either one person or groups of up to six usually traveling together by choice. Plans for PRT systems typically include off-line stations connected by a guideway network. Under computer control, vehicles switch at guideway intersections so as to follow the shortest uncongested path from origin to destination without intermediate stops. Most proposed PRT systems call for vehicles to be operated at headways of 3 seconds or less. Cabintaxi in Germany is a prototype PRT system; there are no systems in passenger service.

2.2 DPM Systems

People Mover systems refer to the simplest type of AGT technology--SLT systems. The vehicles used in these systems range in capacity from less than 20 to over 100 passengers. The vehicles are generally constructed of aluminum or fiberglass and are lighter than conventional rapid rail transit cars. Size and weight differences allow for narrower guideways and smaller stations.

The guideways may be located on elevated structures, at street level, or below ground and are constructed of steel or reinforced concrete. Power collection is generally accomplished by power rails on the guideway and power collectors on the vehicle. Where switching is necessary, it is accomplished either by a vehicle mounted mechanism or by moveable beams or sections of the guideway. Many variations of the technology are possible to include combinations of shuttle and loop operation.

Computers control the operation of the system. In general, the complexity of the control system increases as the operational capabilities of the system grows. A staff of employees is used to monitor operations, assist passengers, maintain and service equipment, and perform administrative requirements.[6]

2.3 Domestic AGT Systems

To date, the operational AGT systems in the United States have provided reliable and safe service for over 200 million passengers in a variety of operating environments. Of the twenty-three domestic AGT systems presented in Table I, eight are located at airports, two at shopping centers (Fairlane and Pearlridge), three at universities (Duke University, University of West Virginia, and Georgia Institute of Technology), and ten at recreation sites. Fourteen of these domestic systems are operating; five are under construction; two have been completed, but are not yet in service; one is operating as a test facility; and one is no longer in service.[7,8]

TABLE I

DOMESTIC AGT SYSTEM PROFILE[1]

SYSTEM	MANUFACTURER	YEAR COMPLETED	SINGLE LANE MILES OF GUIDEWAY	NUMBER OF VEHICLES	NUMBER OF STATIONS	CAPITAL COST ($ MILLIONS)[2]	O&M COST/ PASSENGER ($)[2]
California Exposition Sacramento, CA	Universal Mobility	1968	1.3	4-8 veh. trains	2	2.3	0.27 (1974)
Hershey Park Hershey, PA	Universal Mobility	1969	0.8	4-6 veh. trains	2	1.5	NA
JETRAIL, Love Field Dallas, TX	Stanray Pacific	1970 (discontinued in 1974)	1.4	10	3	2.5	0.16 (est.)
Tampa Airport Tampa, FL	Westinghouse	1971	1.4	8	8	8.7[3] (est.)	0.03[3]
Magic Mountain Los Angeles, CA	Universal Mobility	1971	0.8	6-6 veh. trains	3	1.8	NA
Houston Airport Houston, TX	Rohr	1972	1.2	6-3 veh. trains	8	4.0[3] (est.)	0.25[3]
Seattle-Tacoma Intn'l Airport Seattle, WA	Westinghouse	1973	1.7	12	8	22.7[3] (est.)	0.07
Carowinds Charlotte, NC	Universal Mobility	1973	2.0	4-8 veh. trains	1	3.0	NA

TABLE I (Continued)

SYSTEM	MANUFACTURER	YEAR COMPLETED	SINGLE LANE MILES OF GUIDEWAY	NUMBER OF VEHICLES	NUMBER OF STATIONS	CAPITAL COST ($ MILLIONS) [2]	O&M COST/ PASSENGER ($) [2]
Dallas/Fort Worth Airport Ft. Worth, TX	Vought	1974	13	51 pass. 17 utility	28 pass. 25 utility	53.4 (1971)	.75 (1977)
King's Island Cincinatti, OH	Universal Mobility	1974	2.0	7-9 veh. trains	1	3.5	NA
Bradley Intn'l Airport Hartford, CT	Ford	1975 (not in service)	0.8	2-2 veh. trains	3	4.5	NA
King's Dominion Richmond, VA	Universal Mobility	1975	2.0	6-9 veh. trains	1	4.6 [3] (est.)	0.18 [3]
University of West Virginia Morgantown, WV	Boeing	1975	5.4	45	3	65.5	0.36 [4]
Walt Disney World Orlando, FL	Community Transportation Division	1975	0.87	30-5 veh. trains	1	10.6 [3]	0.07 [3]
Busch Gardens Williamsburg, VA	Westinghouse	1975	1.3	1-2 veh. train	2	4.0	0.05 (est.)

TABLE I (Continued)

SYSTEM	MANUFACTURER	YEAR COMPLETED	SINGLE LANE MILES OF GUIDEWAY	NUMBER OF VEHICLES	NUMBER OF STATIONS	CAPITAL COST ($ MILLIONS) [2]	O&M COST/ PASSENGER ($) [2]
Fairlane Town Center Dearborn, MI	Ford	1976	0.5	2	2	5.5 [3]	0.16 [3]
Pearlridge Shopping Center Honolulu, HA	Rohr	1976 (not in service)	0.23	1-4 veh. train	2	NA	NA
Georgia Institute of Technology Atlanta, GA	Georgia Institute of Technology	Test facilities only	0.6	2	3	NA	NA
Duke University Durham, NC	OTIS/TTD	Under Construction	0.5	2 pass. 1 cargo	2 pass. 1 cargo	NA	NA
Miami Airport Miami, FL	Westinghouse	Under Construction	0.5	2-2 veh. trains	2	6.7	0.06 (est.)
Atlanta Airport Atlanta, GA	Westinghouse	Under Construction	2.3	17	NA	35.0	NA

TABLE I (Concluded)

SYSTEM	MANUFACTURER	YEAR COMPLETED	SINGLE LANE MILES OF GUIDEWAY	NUMBER OF VEHICLES	NUMBER OF STATIONS	CAPITAL COST ($ MILLIONS) [2]	O&M COST/ PASSENGER ($) [2]
Bronx Zoo New York, NY	Rohr	Under Construction	2.3	54	NA	2.5 (1973)	NA
Minnesota Zoo Minneapolis, MN	Universal Mobility	Under Construction	1.3	18	NA	5.0	NA

[1] Source: "Preliminary Data Base for Existing Automated Guideway Transit Systems," The MITRE Corporation/METREK Division, M77-58, July 1977, unless otherwise noted.

[2] Cost estimates generally reflect costs at date of initial operation unless otherwise noted.

[3] Domestic AGT System Assessments, Stanford Research Institute, 1977.

[4] "Independent Assessment of Morgantown Personal Rapid Transit System, N. D. Lea & Associates, Inc., 1977.

2.4 Preliminary Market Implications

Success of the existing AGT systems has led to the recognition that AGT technology could improve the level of transportation service in urban areas. In fact, the cities that submitted proposals for the DPM project specified several functions that the DPM could provide to improve the transportation level of service in their central business districts. These functions are grouped into four major categories:

a. Feeder Service to Line-Haul Transit - DPM systems distribute trips between major transportation facilities and activity centers in medium to high density urban locations;

b. Replacement for Conventional Bus Circulation System - DPM systems provide high quality circulation service at lower operating costs than downtown conventional bus;

c. Alternative to Private Automobile - DPM systems provide an alternative to automobile use for urban residents and employees for trip purposes such as shopping, business, and recreation; and

d. Urban Goods Movement - DPM systems can be used for goods movement and to provide urban services such as trash hauling during hours when the system may otherwise be idle.

The proposed DPM systems would operate in a variety of urban environments in cities with population ranging from 27,000 to 7.9 million (1970 U.S. Census). Their respective daily ridership estimates range from 3,600 to 77,000 passengers. The cities anticipate that investments in the DPM systems will serve as a catalyst for urban revitalization, reinforcing current public and private renewal efforts or inducing new development.

This view is reaffirmed by the findings of a survey undertaken by the American Public Transit Association (APTA) Inner City Task Force.[9] The survey indicates that many city officials believe medium guideway transit, such as DPM systems, can "promote urban revitalization, contrate new development, and meet the transportation needs in downtown districts and surrounding neighborhoods." Of the 23 cities that responded to the APTA survey, 15 expressed interest in a people mover system; 14 stated that such a system would be a key feature in renewing their central business districts. These cities (Albany, Atlanta, Bellevue, Dallas, Detroit, El Paso, Houston, Los Angeles, Louisville, Memphis, Nashville, New York, Seattle, and St. Louis) submitted applications for the DPM Project.

The response of cities to the DPM Project (65 letters of interest and 38 proposals) indicates that a market exists for improved circulation service within the central business districts of U.S. cities. Other types of urban applications outside the CBD--suburban activity centers, universities, new towns, industrial or office parks--can also benefit from the circulation and distribution service improvements that may accrue from AGT technology.

The market for downtown applications constitutes only one segment of the potential market for AGT technology in the U.S. Ongoing market research undertaken in the AGT Socio-Economic Research Program will provide a detailed analysis of the market for all classes of AGT technology in a variety of urban applications. This research will evaluate the potential public use and local acceptability of AGT systems in U.S. cities.

3.0 PROFILE OF DPM PROPOSALS

In their proposals, the cities consistently identified similar socio-economic factors that would influence successful planning, construction, and operation of a DPM system in the urban environment:

- application site characteristics,
- ridership characteristics,
- system economics,
- social acceptability,
- environmental impacts and energy consumption,
- transportation system interface, and
- revitalization of the CBD.

This section provides a brief summary of these socio-economic factors.

3.1 Application Sites

By the definition of the DPM Project, the proposed systems are limited to downtown area applications. These DPM systems are intended to reduce automobile dependency in the downtown and to diminish congestion and air pollution problems by providing a transportation alternative for circulation and distribution trips.

The type of circulation service each system would provide is a function of system configuration and ridership patterns as shown in Tables II and III. The proposed DPM systems would provide three functional categories of circulation service:

a. General CBD Circulation - These DPM systems are designed in a simple loop configuration and serve major buildings and activity centers in the same geographical location. Sixteen of the proposed systems may be considered to be in this category.

b. Circulation Between Distinct Activity Centers - This category includes single or multi-shuttle DPM systems which connect major activity centers in the CBD that are separated by natural barriers, man-made obstacles (such as highways, railroad lines), or distance. Fourteen of the proposed systems generally fit into this category.

c. Circulation Between CBD and Commuter Transportation Facilities - These systems are usually shuttle systems with end points at major commuter facilities (intercept parking or bus terminals). Often, these facilities would be developed in conjunction with the DPM system. Of the proposed systems, eight could be placed in this category.

3.2 Ridership

Weekday and annual ridership estimates of the proposed DPM systems are included in Tables II and III. As shown in these tables, ridership estimates range from 3,600 passengers per weekday in Nashville to 77,000 in Knoxville. For the preliminary finalist systems, the range includes 16,000 weekday passengers in Sacramento and Baltimore to the 62,000 passenger estimate for New York and the high estimate 65,000 daily passengers for Detroit. The wide range may be attributed to the route length and area coverage, system capacity, density and magnitude of employment, and

TABLE II

SYSTEM DESCRIPTION OF CANDIDATE DPM PROPOSALS: PRELIMINARY FINALISTS[1]

CITY	DPM[2] FUNCTION	ROUTE LENGTH (miles)	SINGLE LANE LENGTH (miles)	NUMBER OF STATIONS	NUMBER OF VEHICLES	VEHICLE CAPACITY (persons per veh.)	WEEKDAY RIDERSHIP[3]	ANNUAL RIDERSHIP (millions)
Anaheim, CA	b	NA	NA	5	NA	NA	25,000	7.8
Atlanta, GA	b	3.0	6.0	7	37	30-60	40,000	14.6
Baltimore, MD	c	1.7	3.4	9	12	20-35	16,000 - 20,040	4.2 - 5.2
Bellevue, WA	c	1.2	1.6	6	10	NA	12,560 - 29,930	3.8 - 7.8
Cleveland, OH	a	2.0	2.0	10	22	44-81	46,500	13.0
Dallas, TX	a	1.3	2.5	7	16	44	30,900	9.0
Detroit, MI	a	2.3	2.3	11	30	40-60	39,450 - 65,000	7.5 - 9.8
Houston, TX	a	1.09	2.25	8	12-28	NA	25,061	6.6
Indianapolis, IN	b	3.5	3.9	11	20-50	NA	23,265	7.3
Jacksonville, FL	b	1.9	3.8	7	NA	20-40	49,000	14.7
Los Angeles, CA	c	3.4	6.4	11	46	60-70	58,100	18.0
Memphis, TN	b	4.7	6.7	16	62	40	40,100	NA
Miami, FL	b	3.3	6.6	15	38-40	50	40,200 - 55,500	NA
New York, NY	a	2.9	5.8	7	12	93	61,700	16.6
Norfolk, VA	c	1.7	3.4	6	8	100	36,500[4]	7.9[4]
Sacramento, CA	c	3.4	6.8	12	16	25-30	16,630	5.1
Seattle, WA	c	NA	NA	5	NA	NA	20,000	NA
St. Louis, MO	a	3.7	7.4	12	8	100	18,000	5.5
St. Paul, MN	b	2.6	5.2	10	NA	NA	48,000	13.0

NA = Data Not Available

[1] Ranges are explained in proposal descriptions in Section 4.0.

[2] Category a refers to systems providing CBD circulation, Category b refers to systems providing circulation between distinct activity centers, Category c refers to systems providing circulation between the CBD and major commuter facilities.

[3] Ridership for initial year of operation, except where noted.

[4] 1987 Ridership

TABLE III

SYSTEM DESCRIPTION OF OTHER CANDIDATE DPM PROPOSALS [1]

CITY	DPM [2] FUNCTION	ROUTE LENGTH (miles)	SINGLE LANE LENGTH (miles)	NUMBER OF STATIONS	NUMBER OF VEHICLES	VEHICLE CAPACITY (persons per veh.)	WEEKDAY RIDERSHIP [3]	ANNUAL RIDERSHIP [3] (millions)
Albany, NY	a	1.5 - 2.5	3.0 - 5.0	3 - 10	5 - 20	12- 20	16,000 - 21,000	NA
Altoona, PA	b	0.6	1.1	4	2	NA	NA	NA
Boston, MA	b	3.2	3.2	9	NA	NA	57,000	NA
Clearwater, FL	b	3.7	7.4	8	9	69	13,060	NA
Duluth, MN	b	12.1	24.2	10	14	NA	NA	NA
El Paso, TX	b	1.3 - 2.0	2.8 - 3.5	4 - 5	10 - 12	50-70	32,270	11.8
Ft. Lauderdale, FL	a	NA	1.8	9	10	NA	NA	NA
Knoxville, TN	c	1.25	2.5	8	5	NA	77,070	20.0
Lake Charles, LA	a	NA	NA	NA	NA	NA	NA	NA
Louisville, KY	a	2.0	2.0	13	10	56	13,640	4.1
Marietta, GA	a	2.4	4.7	NA	NA	NA	2,500	NA
Nashville, TN	a	1.2 - 2.3	1.2 - 2.3	7 - 14	14 - 28	22	3,590	1.03
New Orleans, LA	c	3.0 - 3.4	6.0 - 6.8	8 - 9	40	44	50,000	14.9
Niagara Falls, NY	a	3.3	3.3	9	15 - 45	45 - 100	20,620	NA
Orlando, FL	b	1.6	1.6	4	12	12	6,330	2.0
San Antonio, TX	a	1.6 - 3.6	1.6 - 3.6	8 - 15	5 - 6	50	7,670 - 9,880	NA
Santa Monica, CA	a	NA	NA	NA	NA	NA	NA	NA
Springfield, IL	b	0.83	1.6	6 - 8	5	NA	NA	NA
Trenton, NJ	a	1.4 - 2.9	2.8 - 3.3	11 - 17	18 - 26	NA	11,900 - 14,800	3.5 - 4.4

NA = Data Not Available

[1] Ranges are explained in proposal descriptions in Section 5.0

[2] Category a refers to systems providing CBD circulation, Category b refers to systems providing circulation between distinct activity centers, Category c refers to systems providing circulation between the CBD and major commuter facilities.

[3] Ridership for initial year of operation.

density and magnitude of non-employment activities, as well as the uncertainty regarding the appropriateness of traditional demand forecasting techniques for new transit technology.

To categorize trip characteristics of the expected DPM ridership is difficult, since many of the proposals did not include breakdowns of ridership by trip purpose or time of day. In addition, the categories used by each city vary and are therefore not suitable for comparative analysis. However, where these figures were available, they were included in the proposal descriptions (Sections 4.0 and 5.0).

Cities with high employment concentrations in the DPM service area anticipate more than half of the ridership to consist of work-related trips, either commuting trips or daytime circulation trips. These cities include: Norfolk (66 percent), New York (65 percent), Los Angeles (69 percent), Houston (76 percent), Cleveland (55 percent), Baltimore (61 percent), and St. Paul (60 percent).

Distribution of DPM ridership between peak and off-peak trips was considered an important issue since anticipated peak hour ridership is a key factor in sizing the DPM systems. Specified maximum line capacity/number of passengers per hour represent 11 to 13 percent of the daily ridership for Baltimore, Cleveland, and Dallas, 17 percent for Houston, and 17 to 27 percent for Detroit. Anticipated relative peak period ridership to total daily ridership presented in

the proposals is dependent on the number and duration of peak periods experienced in each city. Estimates range from 12 to 14 percent for Anaheim, Los Angeles, and St. Louis to 51 percent for New York. Many of the cities indicate that they expected the DPM system to have a significant amount of off-peak ridership. The cities that made a numerical estimate of the anticipated relative off-peak ridership to total daily trips are: Baltimore (55 percent), Cleveland (51 percent), Indianapolis (60 percent), Jacksonville (68 percent), Miami (87 percent), and St. Paul (68 percent).

3.3 System Economics

The major categories of economic issues that were addressed by the various proposals are: capital cost, operating and maintenance cost, and value capture benefits. A summary of the system economics for the proposed DPM systems is included in Tables IV and V.

3.3.1 Capital Cost

The capital cost of an individual system depends on a number of factors: the dollar base used; the assumptions made regarding specific component costs (guideway, vehicle, command, control and communications equipment etc.); the size and capacity of the system; the types of items included in the estimates (right-of-way, station amenities, related transportation facilities to be constructed with the DPM, etc.); and geographical considerations.

TABLE IV

SYSTEM ECONOMICS OF CANDIDATE DPM PROPOSALS: PRELIMINARY FINALISTS[1]

CITY	TOTAL CAPITAL COST[2] (millions of dollars)	CAPITAL COST PER SINGLE LANE MILE[2] (millions of dollars)	ANNUAL OPERATING AND MAINTENANCE COST[2] (millions of dollars)	OPERATING AND MAINTENANCE COST PER VEHICLE MILE (dollars)	OPERATING AND MAINTENANCE COST PER PASSENGER[3] (dollars)	PROPOSED INITIAL FARE (cents)
Anaheim, CA	43.5 - 47.5	12.4 - 13.6	2.1	1.20	0.28	25 - 50
Atlanta, GA	60.0	10.0	2.2	1.60	0.15	25
Baltimore, MD	25.0	7.5	0.88	1.53 - 2.44	0.17	15
Bellevue, WA	24.7	15.9	0.25	NA	0.03 - 0.07	Free
Cleveland, OH	52.1[4]	26.0[4]	1.7[5]	3.25[5]	0.13(5)	Free
Dallas, TX	45.0	18.0	1.4	NA	0.15	25
Detroit, MI	55.4[4]	24.1[4]	1.8[6]	1.68[6]	0.19 - 0.25[6]	15
Houston, TX	39.0 - 40.0	17.7 - 18.1	1.2	2.33	0.19	10 - 25
Indianapolis, IN	50.2	12.9	0.42	0.54	0.06	10
Jacksonville, FL	41.1	10.9	1.3	NA	0.09	15
Los Angeles, CA	167.0[5]	26.1[5]	2.6	1.31	0.14	10
Memphis, TN	48.0	7.0	NA	NA	NA	NA
Miami, FL	73.8	11.2	1.7[6]	NA	NA	NA
New York, NY	71.6[5]	12.3[5]	2.45[5]	2.55 - 5.04[5]	0.08 - 0.15[5]	25
Norfolk, VA	30.7	9.0	0.5	NA	0.09	Free
Sacramento, CA	34.9	5.2	0.68	1.19	0.13	25
Seattle, WA	26.0	NA	0.2	NA	NA	NA
St. Louis, MO	43.5	5.9	2.2	1.60	0.41	25
St. Paul, MN	48.2	9.3 - 10.8	1.9	1.90	0.15	10

NA = Data Not Available

[1] Ranges are explained in proposal description in Section 4.0.

[2] Millions of 1976 dollars except where noted.

[3] Calculated from Available data.

[4] 1978 dollars

[5] 1980 dollars

[6] 1975 dollars

TABLE V

SYSTEM ECONOMICS OF OTHER CANDIDATE DPM PROPOSALS [1]

CITY	TOTAL CAPITAL COST [2] (millions of dollars)	CAPITAL COST PER SINGLE LANE MILE [2] (millions of dollars)	ANNUAL OPERATING AND MAINTENANCE COST [2] (millions of dollars)	OPERATING AND MAINTENANCE COST PER VEHICLE MILE (dollars)	OPERATING AND MAINTENANCE COST PER PASSENGER [3] (dollars)	PROPOSED INITIAL FARE (cents)
Albany, NY	10.0 - 35.0	8.75 - 11.9	0.55	1.00	NA	10
Altoona, PA	10.0 - 11.0	8.8 - 9.6	0.15	NA	0.13	NA
Boston, MA	35.0	10.9	0.80	NA	NA	10
Clearwater, FL	61.2	8.3	0.57	NA	NA	25
Duluth, MN	72.5	2.9	0.90	1.53	NA	NA
El Paso, TX	18.8 - 25.5	6.6 - 7.3	0.66	2.00	0.06	NA
Ft. Lauderdale, FL	8.6	4.8	0.10	0.30	NA	NA
Knoxville, TN	17.3	6.9	0.19	0.80	0.10	NA
Lake Charles, LA	NA	NA	NA	NA	NA	NA
Louisville, KY	24.0	12.0	0.27 - 0.43	0.60 - 1.00	0.06 - 0.11	10
Marietta, GA	3.0 - 7.0	0.6 - 1.3	0.60	NA	NA	NA
Nashville, TN	11.5 - 34.8	10.0 - 14.9	0.40	0.90	0.36	20
New Orleans, LA	53.1 - 58.5	8.6 - 8.8	2.0 - 2.3	0.63 - 0.73	0.13 - 0.15	15
Niagara Falls, NY	21.0 - 37.0	6.3 - 11.1	1.7	NA	NA	50 - 1.75
Orlando, FL	12.2	7.9	0.26	0.54	.13	20
San Antonio, TX	27.8 - 47.1	13.3 - 16.9	0.65	2.85	NA	25
Santa Monica, CA	NA	NA	NA	NA	NA	NA
Springfield, IL	11.7	7.3	NA	NA	NA	NA
Trenton, NJ	13.0 - 29.0	4.8 - 10.4 [4]	0.68 - 0.80	0.68 - 0.81 [4]	0.17 - 0.23 [4]	NA

NA = Data Not Available

[1] Ranges are explained in proposal descriptions in Section 5.0

[2] Millions of 1976 dollars except where noted

[3] Calculated from available data

[4] 1975 dollars

The capital cost per single lane mile (Tables IV and V) was obtained by dividing the capital cost of the complete system as quoted in the proposal by the single lane miles of guideway included in the proposed system. For all the proposed systems, the capital cost ranges from the $0.6 million estimate for Marietta, Georgia, to the $26.0 million per single lane mile estimate for Cleveland and Los Angeles.

Considering only the 19 final candidates (excluding Seattle), the lowest capital cost estimate is $5.2 million per single lane mile for Sacramento. Of these 19 cities, 22 percent estimate the cost per single lane mile to fall between $5 and $9 million; 50 percent range from $9 to $16 million, and the remaining percent range from $17 to $26 million.

3.3.2 Operating and Maintenance Cost

Operating and maintenance (O&M) cost estimates are shown in Tables IV and V. The ranges of costs reflect these assumptions: reliability and availability; the coverage, capacity and ridership of the systems; and different component costs. Where data were available, the operating and maintenance per passenger were calculated for each system.

Operation and maintenance cost per vehicle mile for all of the proposed systems range from $0.30 for Ft. Lauderdale to the $2.55 to $5.04 range for New York. For O&M cost per passenger, the estimates range from $0.06 (El Paso and Indianapolis systems) to $0.41 (St. Louis). Of the

25 systems, with data available for calculation, about 60 percent estimated the cost per passenger to be between $0.10 and $0.19. The cities selected for the DPM program are included in this range.

Of the cities that address possible fare structure (25 of the 38 proposals), 80 percent indicate that the fare for a one-way ride on the DPM system would range from $0.10 to $0.25. Three of the cities (Bellevue, Cleveland, and Norfolk) would charge no fare. Based on the operating and maintenance cost estimates and ridership forecasts, roughly 80 percent of the systems are expected to eventually break even or become profitable due to fare box, parking, and value capture revenues. These cities include the Houston and Los Angeles systems.

3.3.3 Value Capture

Potential use of value capture policies is discussed in several of the proposals. Value capture involves techniques for recapturing economic benefits to privately owned facilities that result from public investment in transportation facilities. Techniques cited in the proposals include joint private and public development of station areas, special taxing districts, and air rights leasing. Expected revenues would be earmarked for offsetting both capital and operating expenses.

Two cities identify specific opportunities for application of value capture techniques. Houston identifies the real estate and development potential of the two DPM terminal stations as value capture application sites. At the end of 20 years, the city of Houston expects to recapture $6.9 to $18 million (1975 dollars) from alternative joint development programs and the lease of air rights. These funds have been earmarked for payment of the $10 million loan Houston is receiving from UMTA for construction of the DPM. Los Angeles expects to receive $10 million in value capture revenues from two DPM sites (Union Station and Convention Center Station) to support capital costs.

3.4 Social Acceptability

The candidate cities were not specifically required to include social acceptability issues in the proposals, but many cities did address these issues. Issues frequently discussed are facilities for the transportation handicapped, security and safety provisions, and labor issues.

3.4.1 Barrier Free Access

Most of the proposals contain a commitment to barrier free access by the transportation handicapped. Twelve of the 19 finalist proposals specifically state that elevators or ramps would connect stations with street levels. Vehicle design criteria for several cities (Cleveland, Detroit, and Los Angeles) include provision for wheelchair space. The Baltimore system would have special fare collection gates for the handicapped.

3.4.2 Security

Closed circuit television, two-way voice communication, and public address systems are the security considerations discussed in most of the proposals. St. Paul, Cleveland, Dallas, Houston, Jacksonville, Los Angeles and Miami specify closed circuit television. St. Paul, Cleveland, Miami, and Houston state that all vehicles will be equipped with two-way voice communication systems; Los Angeles specifies that only selected vehicles to be used at night would include such equipment. In addition, several cities discuss station design in terms of security requirements. Measures to improve visibility (i.e., extensive use of glass and placement of entrance and exits points) are the frequently cited station security provisions.

3.4.3 Safety

Many proposals contain discussions on system safety related considerations, such as passenger comfort, maximum jerk, vehicle control, and emergency egress facilities. The majority of the safety items discussed are related to vehicle requirements. Generally, local construction codes would be applied to station and guideway construction. Los Angeles, for example, states that earthquake-proof facilities will need to be installed.

The major safety requirements cited are:

- emergency walkways on guideway that include protection from electrocution or falling,

- emergency on-board manual controls,
- on-board communications systems,
- on-board sensors for monitoring vehicle functions,
- emergency exit doors at both ends of the vehicles,
- bidirectional vehicles,
- use of fireproof materials and shatter proof glass, and
- safety devices on automatic doors.

Cities that have heavy winters note the need for snow and ice removal capability for their DPM systems. Many of the cities specify that the vehicle passenger capacity would permit both seated and standing passengers, but the proposals contain little or no discussion of provisions for passenger safety in the event of collision.

3.4.4 Labor Issues

Cleveland, Detroit, Houston, Jacksonville, Miami, and St. Louis address labor impact issues. These cities generally indicate that acquiring the DPM system would not conflict with the requirements of Section 13(C) of the Urban Mass Transportation Act of 1964 to protect the interest of current transit employees. Where bus routes in the downtown area would be curtailed, expansion of the feeder bus system to the DPM is expected to result in more jobs for bus drivers and

maintenance personnel. Additional operating and maintenance transit jobs would also be available upon the start of DPM service. Houston, for example, states that the DPM system will require 37 to 41 new operating and maintenance jobs. Apprenticeship and upward mobility programs, as outlined in the Detroit proposal, will provide new employment opportunities for current employees.

3.4.5 Citizen Input

At the time of proposal submission, Detroit, Los Angeles, Baltimore, Ft. Lauderdale, Miami, and St. Paul had solicited input in DPM planning from the general public or business community. Several other cities state in their proposals that, if they were selected as candidates for the DPM program, citizen input would be obtained early in the planning stages. The proposals indicate that initial public response to the DPM system is positive.

3.5 Environmental Impacts and Energy Consumption

Environmental and energy consumption issues have a bearing on the social acceptability of the DPM systems in the CBD; the majority of the cities include discussions of potential environmental impacts. In general, they expect the effects to be beneficial. Among the frequently cited environmental benefits are:

- reduction in transit user cost and time,
- lower energy consumption,

- reduction in noise pollution,
- improvements to regional and local air quality,
- reduction in the amount of land devoted to transportation uses,
- increase in CBD mobility,
- increase in employment opportunities,
- growth of city revenue,
- expansion of life style opportunities, and
- improvement in transportation system efficiencies.

Some cities, however, recognize that negative effects could occur, particularly visual intrusion. Several cities (St. Louis and St Paul for example), state that noise and air pollution impacts could be adverse. Detroit, Miami, St. Paul, Jacksonville, and Los Angeles cite potential conflicts with historical sites and park areas. (UMTA has questioned the desirability of extending the St. Paul DPM into the Historical Hill residential district due to this conflict.)

The negative environmental impacts outlined in the proposals are:

- aesthetic appearance of the guideway,
- construction impacts on business activities,
- traffic disruption during construction, and
- vibration effects on adjacent buildings from system operation.

3.6 Transportation System Interface

A major objective of the DPM systems as expressed in many of the proposals is the reduction of automobile usage in the central city. The cities recognize that the DPM system would need to link with other transportation modes, especially those that provide line haul corridor service, in order to accomplish this objective. The candidate cities indicate that the DPM would be directly integrated with existing transportation facilities--bus and commuter rail systems, parking lots, or pedestrian malls and walkways. Improvements in the feeder bus service to the DPM would also be undertaken (i.e., Los Angeles, St. Louis, Miami, Baltimore, and Detroit). In Baltimore, Miami, and Atlanta, the DPM would be integrated with the rapid rail lines planned or under construction.

New transportation facilities--modal transfer terminals, intercept parking lots or pedestrian walkways, would be constructed in many of the cities in conjunction with the DPM. In Houston, for example, regional bus terminals, to be developed as value capture opportunities, anchor each end of the proposed DPM system. (Details on these improvements for the 19 final candidate cities are included in Section 4.0). Sometimes the cost for construction of these facilities is included in the DPM capital cost estimates. For example, the capital cost for Bellevue, Washington includes almost $7 million for intercept parking facilities; Jacksonville estimates $4.5 million for parking

and pedestrian improvements. The Los Angeles cost estimate includes $34 million for special bus/auto intercept facilities at Union Station and the Convention Center Stations.

Other potential measures cited to reinforce DPM use and restrict automobile traffic are: (1) roadway improvements (Detroit, Norfolk, and St. Paul); (2) revision of parking codes and rate structures (Cleveland, Norfolk, Bellevue, Atlanta, and Baltimore); and (3) development of auto-restricted zones (Norfolk, Detroit, St. Paul, Atlanta, and Miami).

3.7 Revitalization of CBD

The candidate cities anticipate that the DPM system would reinforce current public and private CBD renewal efforts or induce new private development. Many of the cities also expect the DPM to reduce the amount of inner city property devoted to automobile uses, especially parking lots. Most of the proposals list specific development projects expected for the CBD by 1985.

Land use in the immediate area surrounding the proposed DPM sites is characterized by retail, office, and entertainment centers. Future developments anticipated--new hotels, convention centers, office buildings, retail establishments--will serve similar land use functions. Some of the cities have pockets of residential development close to the proposed DPM alignments (Cleveland, St. Paul, Miami, Norfolk, Memphis, and Jacksonville). Several cities, Detroit and

Seattle for example, state that development of in-city residential structures is a major near-term objective.

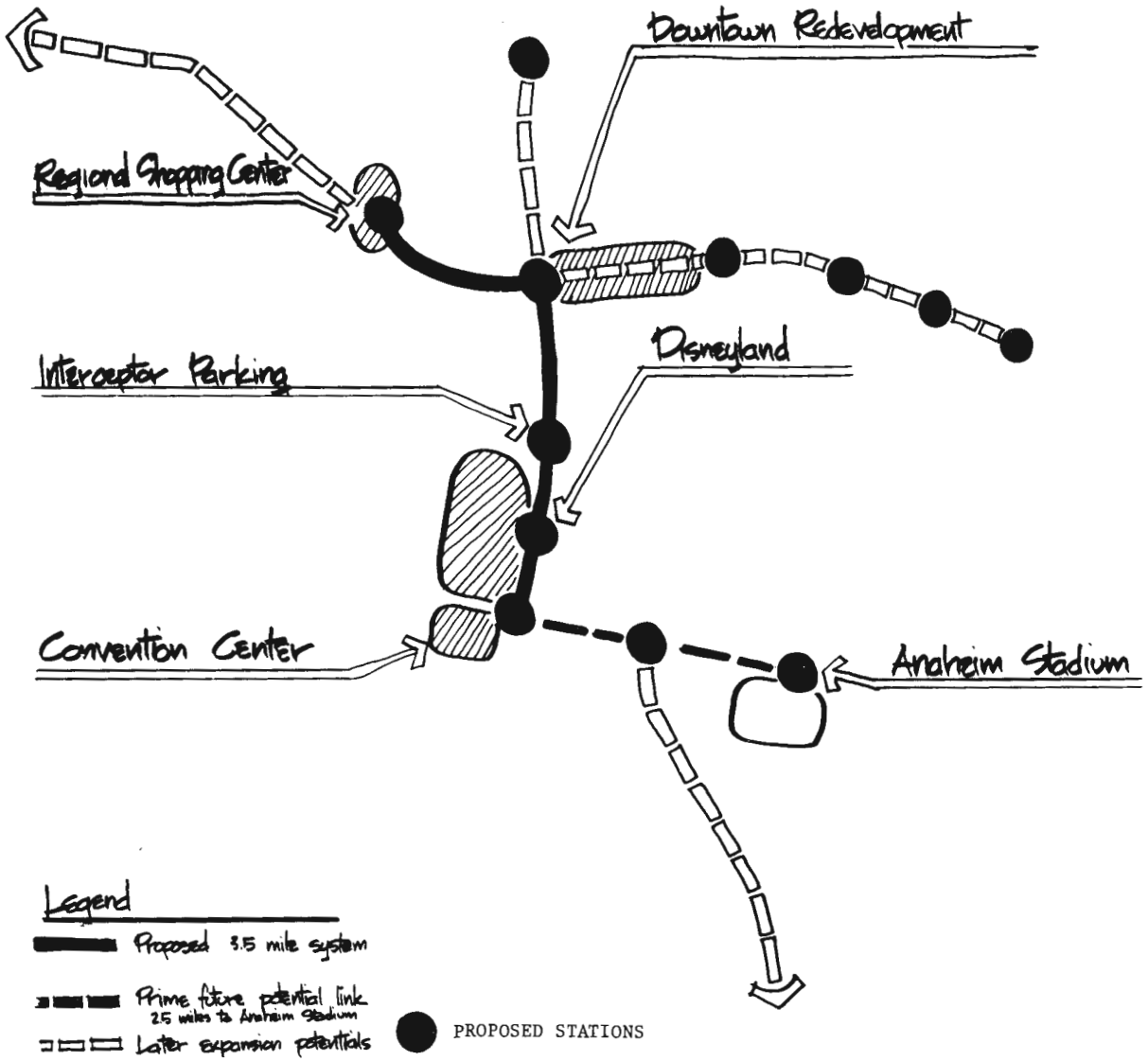
The proposed DPM alignment would serve existing major renewal areas in some cities (for example, Baltimore, Detroit, Norfolk, Miami, and Los Angeles) and areas slated for extensive renewal efforts (for example, Seattle and Ft. Lauderdale). In St. Paul's proposal, for example, the location of the DPM station is expected to reinforce redevelopment of a six-block area in the downtown retail center including the Seventh Place Shopping Mall and Galleria. In many cities, land near the proposed DPM systems is pegged for development. Bellevue has 430 acres available for development; Indianapolis has 37 acres open to development within one block of a proposed DPM station.

Most of the cities expect the DPM system to generate increased retail sales, land values, and taxes. Several include estimates for these increases. Baltimore estimates an increase in retail sales from $10 to $12 million annually due to the DPM system. Los Angeles forecasts an annual increase of $25.5 million in retail sales and a $5.3 million increase in city revenues from property, sales, and hotel taxes. Seattle anticipates a $12.0 million increase in sales and nearly $1.0 million increase in tax revenues.

4.0 CHARACTERISTICS OF CANDIDATE DPM PROPOSALS: PRELIMINARY FINALISTS

The following descriptions of the 19 candidate cities, whose proposals underwent detailed evaluation by UMTA, are based on information provided by the cities in the proposals submitted to UMTA. City population data are based on the 1970 Census. Ridership estimates and operating and maintenance cost projections are for the initial year of operation, except where noted. Information not available in the proposals is indicated.

Anaheim, California


Downtown Redevelopment
Regional Shopping Center
Interceptor Parking
Disneyland
Convention Center
Anaheim Stadium
Legend
Proposed 3.5 mile system
Prime future potential link
2.5 miles to Anaheim Stadium
Later expansion potentials
PROPOSED STATIONS

ANAHEIM, CALIFORNIA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.5
Single Lane Miles	-	NA*
Number of Stations	-	5
Number of Vehicles	-	NA
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	43.5 to 47.5**
Annual Operating and Maintenance Cost (millions of dollars)	-	2.1***
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.20***
Proposed Initial Fare (dollars)	-	0.25 to $0.50

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	7.8
Weekday Ridership (passengers per day)	-	25,000
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	NA
Average Velocity (miles per hour)	-	25-30
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

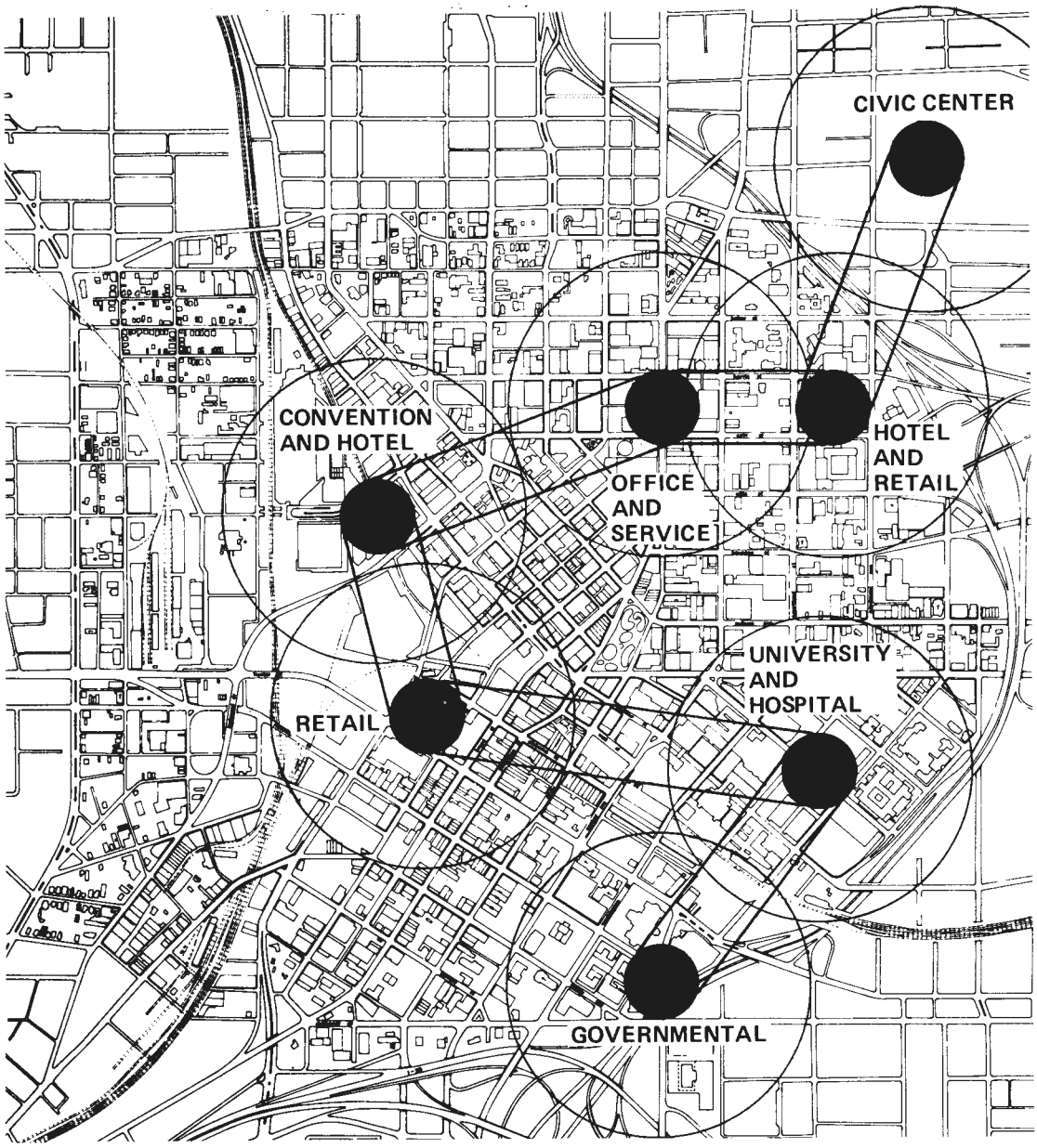
* No indication in proposal whether guideway is single or double lane.
** 1976 dollars, range represents high and low estimates.
*** 1976 dollars, includes maintenance of multimodal terminal.

The City of Anaheim (population 167,000) proposed a shuttle DPM system to serve a regional retail center, convention center, proposed downtown redevelopment, and entertainment/tourist facilities. About 66 percent of all anticipated ridership would be tourist or visitor related.

Past project planning includes a proposal to link Disneyland to the downtown (1960) and a fixed guideway transit proposal to link Anaheim's activity centers and a multimodal terminal (1974). Potential expansion of the DPM to Anaheim Stadium and a proposed Amtrak station is noted in the proposal. Potential sources of local funding are general obligation or revenue bonds, tax receipts from local redevelopment agencies, in-kind contributions of rights-of-way and sites, and general fund surplus.

Existing public transportation service in Anaheim is limited. Major activity centers depend on automobile access. Redevelopment projects currently underway include one million square feet of office space, a municipal complex, a cultural and community center, retail facilities, and low-income housing. No adverse impacts are expected from the DPM system.

Atlanta, Georgia


CIVIC CENTER
CONVENTION AND HOTEL
HOTEL AND RETAIL
OFFICE AND SERVICE
UNIVERSITY AND HOSPITAL
RETAIL
GOVERNMENTAL
PROPOSED STATIONS

ATLANTA, GEORGIA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.0
Single Lane Miles	-	6.0
Number of Stations	-	7
Number of Vehicles	-	37
Vehicle Capacity (persons)	-	30-60*

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	60.0**
Annual Operating and Maintenance Cost (millions of dollars)	-	2.2**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.60**
Proposed Initial Fare (dollars)	-	0.25

SYSTEM PERFORMANCE AND OPERTIONS

Annual Ridership (millions of passengers)	-	14.6
Weekday Ridership (passengers per day)	-	40,000
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	NA
Maximum Velocity (miles per hour)	-	25-30
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*Range provided in proposal
**1976 dollars

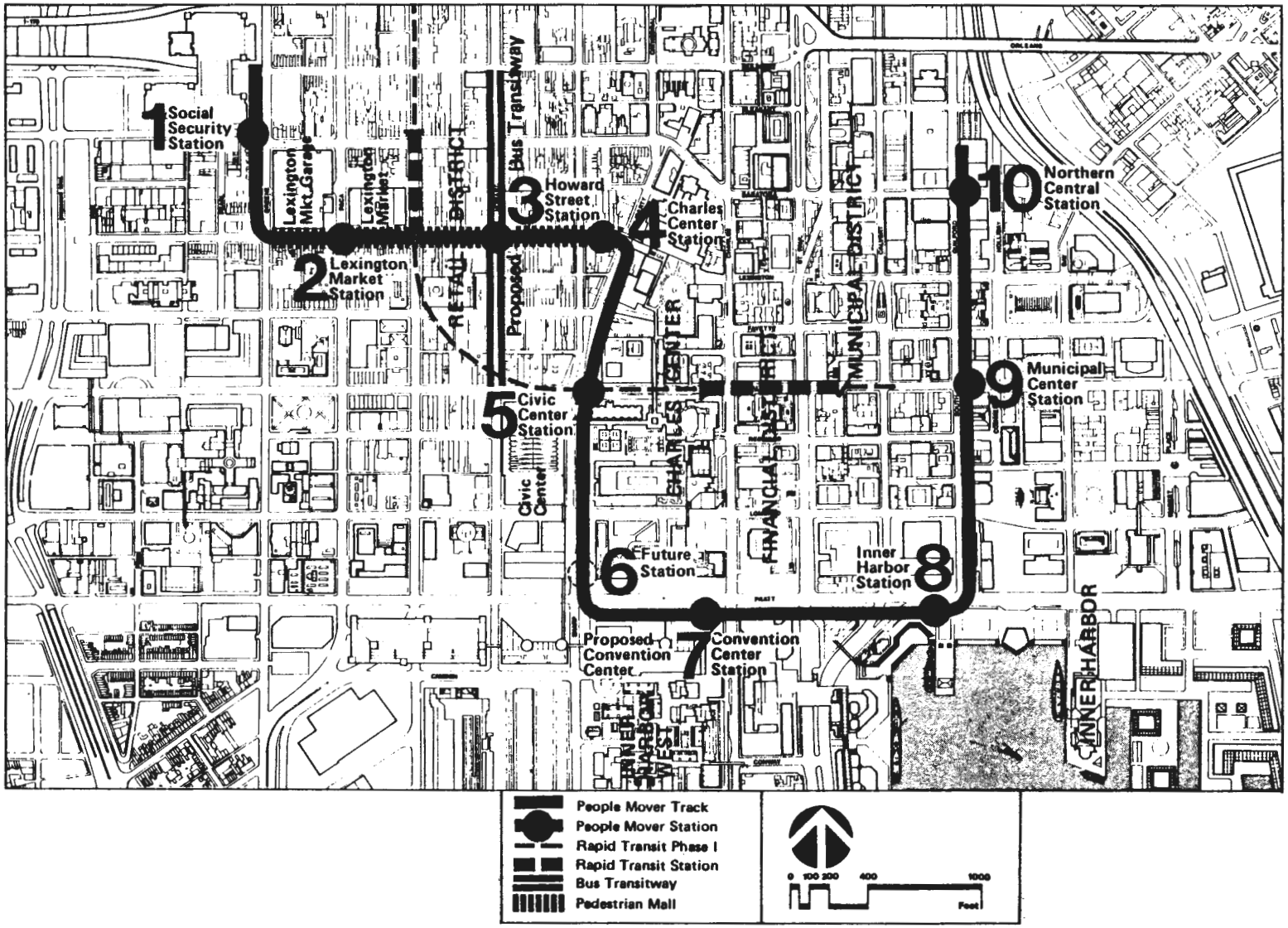
The Atlanta proposal was sponsored by the City of Atlanta (population 490,000), the State of Georgia, and the Metropolitan Atlanta Rapid Transit Authority (MARTA). The system, to be operated by MARTA, would function as a feeder to MARTA rapid rail and line haul bus systems, integrating core activity areas. The system would be constructed of elevated, double lane guideways with on-line, weather protected stations. Proposal specifications include bidirectional vehicles, guideway switching, doors on both sides of the vehicles, and vehicle training capability. The system should be capable of segmented shuttle operation and skipping stations.

Activity centers to be served include a civic center, retail areas, convention and hotel facilities, commercial and government office facilities, hospital and university centers, MARTA stations, and peripheral parking lots. The proposed DPM would be within a five-minute walk of 100,000 employees currently within the CBD and would serve 1.2 million square feet of entertainment/convention space, plus 13.0 million square feet of office space and 3,000 to 4,000 residential units.

Since 1964, circulation systems have been considered for the Atlanta CBD to complement the MARTA rail system. Major sources of local capital funds would be provided by general obligation, state bonds. Value capture techniques, such as a special tax district or tax increment financing would be considered as a revenue source for meeting operations and maintenance costs.

In addition to construction of the MARTA rail system, Atlanta is pursuing development of intercept parking facilities and pedestrian malls and proposes a parking surcharge for downtown spaces to complement the DPM. Extensive private development has been undertaken in the urban core, and the DPM is expected to reinforce planned private development. Positive environmental, economic, and social impacts are expected to accrue from the system.

Baltimore, Maryland


1 Social Security Station
2 Lexington Market Station
3 Howard Street Station
4 Charles Center Station
5 Civic Center Station
6 Future Station
7 Convention Center Station
8 Inner Harbor Station
9 Municipal Center Station
10 Northern Central Station
Lexington Mkt. Garage
Lexington Market
RETAIL DISTRICT
Proposed Bus Transitway
CHARLES CENTER
FINANCIAL DISTRICT
MUNICIPAL
Civic Center
Proposed Convention Center
INNER HARBOR
INNER HARBOR WEST
People Mover Track
People Mover Station
Rapid Transit Phase I
Rapid Transit Station
Bus Transitway
Pedestrian Mall
0 100 200 400 1000
Feet

BALTIMORE, MARYLAND

SYSTEM DESCRIPTION

Route Length (miles)	-	1.7
Single Lane Miles	-	3.4
Number of Stations	-	9
Number of Vehicles	-	12
Vehicle Capacity (persons)	-	20-35

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	25.0*
Annual Operating and Maintenance Cost (millions of dollars)	-	0.88*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.53 to 2.44*
Proposed Initial Fare (dollars)	-	0.15

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	4.2 to 5.2**
Weekday Ridership (passengers per day)	-	16,000 to 20,040**
Peak Line Capacity (passengers per hour)	-	2100
Minimum Headway (seconds)	-	30
Maximum Velocity (miles per hour)	-	25
Fare Collection	-	Automatic
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	Elevators/Special Fare Gates

*1976 dollars

**Higher estimate is a result of links to rapid rail and commuter lines.

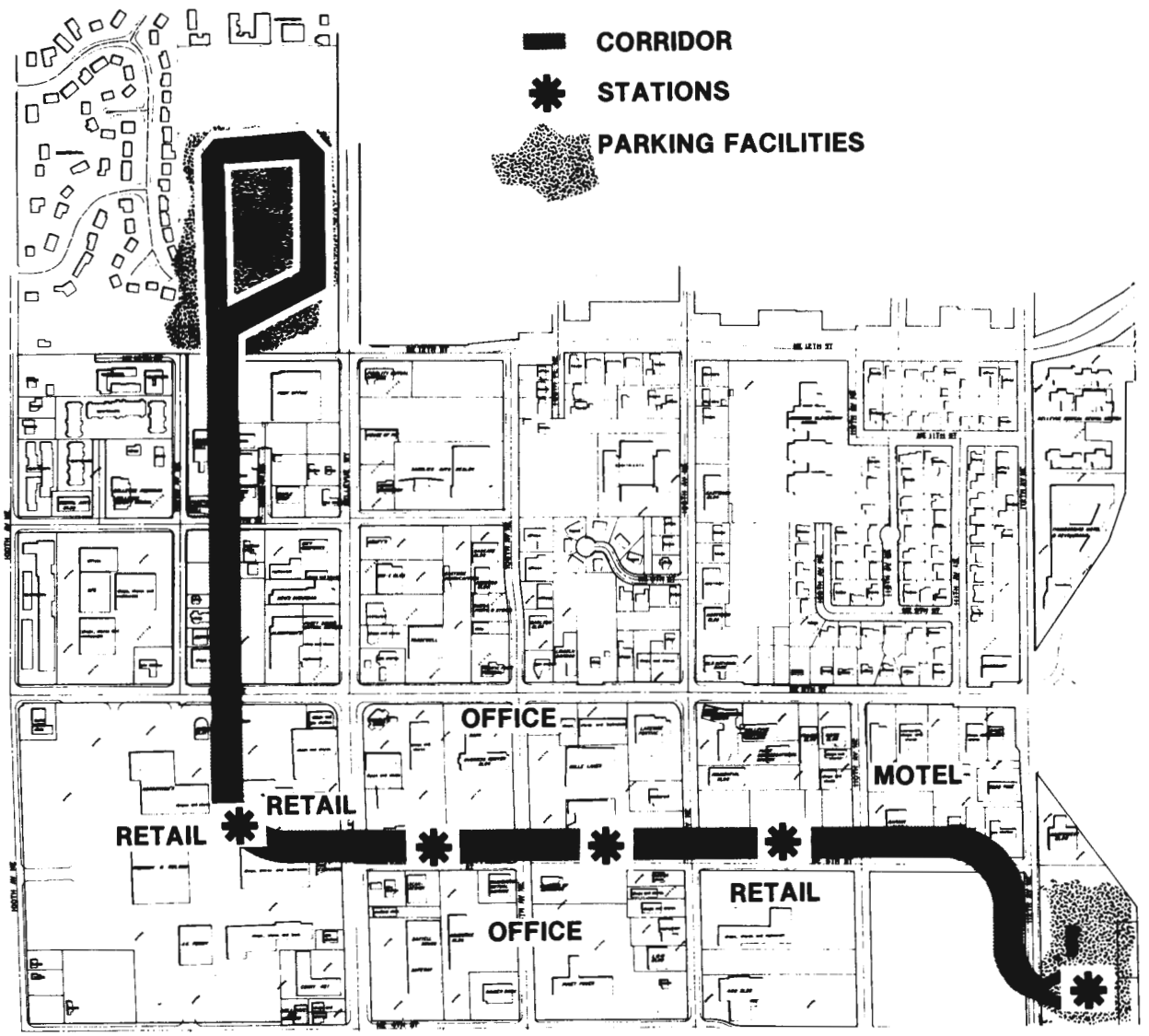
The City of Baltimore (population 905,759) proposed to construct an elevated, double lane shuttle system to provide scheduled service to CBD activity centers with terminal loops at the proposed North Central Commuter Rail Terminal and the proposed Social Security Administration Building. The stations would be on-line and enclosed with transparent canopies. The system would require snow and ice removal, vehicles capable of train operation, and limited switching.

Major trip generators would include existing and proposed government and commercial office facilities, a proposed convention center, retail facilities, educational facilities, existing and proposed residential developments, existing and proposed recreation and tourist facilities, a proposed commuter rail terminal, pedestrian mall, and rapid rail and bus intercepts. About 61 percent of the daily trips made on the DPM would be office based trips, 20 percent tourist related, with the remainder allocated to rail, park and ride, and CBD residential trips. Current employment within two blocks of the guideway is 85,000; 1980 projections for the service area include 120,000 employees and 20,000 residents.

Planning for the DPM system was initiated by CBD economic analysis and pedestrian movement studies completed early in 1976, which identified the need for circulation improvements. Future expansion of the system is discussed in the proposal; and additional stations would be added as demand warranted. The local share of capital funding would be provided through Baltimore Community Development Block Grant Funds. Value capture opportunities would be possible at the convention center station.

The proposed DPM connects two major urban renewal projects that have been under development since 1958--the Charles Center and Inner Harbor Projects. Recent CBD transportation projects include: development of a pedestrian mall, construction of a second-level pedestrian walkway system at Charles Center, and introduction of a 10¢ fare downtown bus loop system. Future innovations include construction of the first eight miles of a rapid rail system, construction of commuter rail facilities on the Northern Central Railroad, a fringe parking program, and consideration of a sliding-scale parking tax. Possible negative environmental impacts from the system include increased energy consumption, visual intrusion, and temporary construction disruption.

Bellevue, Washington


CORRIDOR
STATIONS
PARKING FACILITIES
OFFICE
MOTEL
RETAIL
RETAIL
RETAIL
OFFICE

BELLEVUE, WASHINGTON

SYSTEM DESCRIPTION

Route Length (miles)	-	1.2
Single Lane Miles	-	1.6
Number of Stations	-	6
Number of Vehicles	-	10
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	24.7*
Annual Operating and Maintenance Cost (millions of dollars)	-	0.25*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	Free

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	3.8 to 7.8**
Weekday Ridership (passengers per day)	-	12,560 to 29,930**
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	NA
Maximum Velocity (miles per hour)	-	NA
Fare Collection	-	None
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*1976 dollars

**Range based on DPM service level alternatives

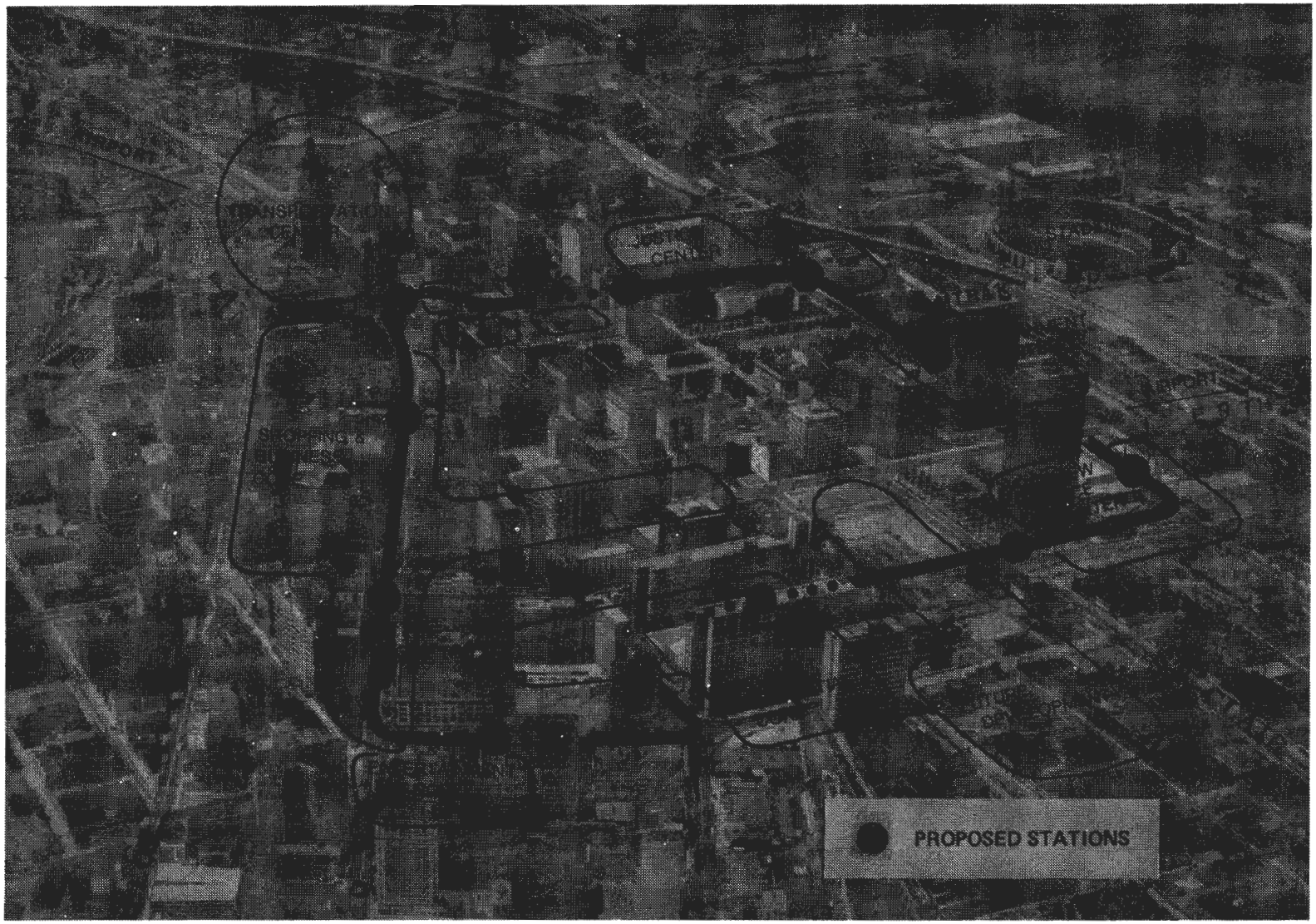
The City of Bellevue (population 61,102) proposed to construct and operate a shuttle DPM system connecting the CBD with proposed peripheral parking and transit terminal facilities. The system would carry passengers on an elevated, single lane guideway (with bypass areas at the peripheral parking sites) between six on-line stations. All stations would be integrated into existing and proposed structures. The bypass area would require switching.

Major trip generators include retail, commercial, and office facilities. The unusually high concentration of retail and commercial floor space (60 percent) in Bellevue and existing travel patterns, indicate that the majority of DPM trips would be off-peak shopping trips.

Previous planning for a DPM system began in 1975 and included an engineering study of alternative alignments. Local funding sources consist of private donations of right-of-way and issuance of revenue bonds. Local government and business leaders have endorsed the DPM system.

The Bellevue CBD is a low density, auto dominated area with an overabundance of parking spaces on surface lots. Revisions of existing parking policies would be considered to compliment the DPM, encourage development of available land, and reduce out migration of existing businesses. The DPM and related reductions in auto travel would help to alleviate the air pollution problems in the city.

Cleveland, Ohio


PROPOSED STATIONS

CLEVELAND, OHIO

SYSTEM DESCRIPTION

Route Length (miles)	-	2.0
Single Lane Miles	-	2.0
Number of Stations	-	10
Number of Vehicles	-	22
Vehicle Capacity (persons)	-	44 or 81*

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	52.1**
Annual Operating and Maintenance Cost (millions of dollars)	-	1.7***
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	3.25
Proposed Initial Fare (dollars)	-	Free

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	13.0
Weekday Ridership (passengers per day)	-	46,500
Peak Line Capacity (passengers per hour)	-	5042
Minimum Headway (seconds)	-	62
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	None
Emergency Egress	-	Guideway Walkways
Security Provisions	-	Closed Circuit Televison/2-Way Radio Communication
Elderly and Handicapped Provisions	-	Key activated elevators

*Two vehicle size options under consideration
**1978 dollars
***1980 dollars

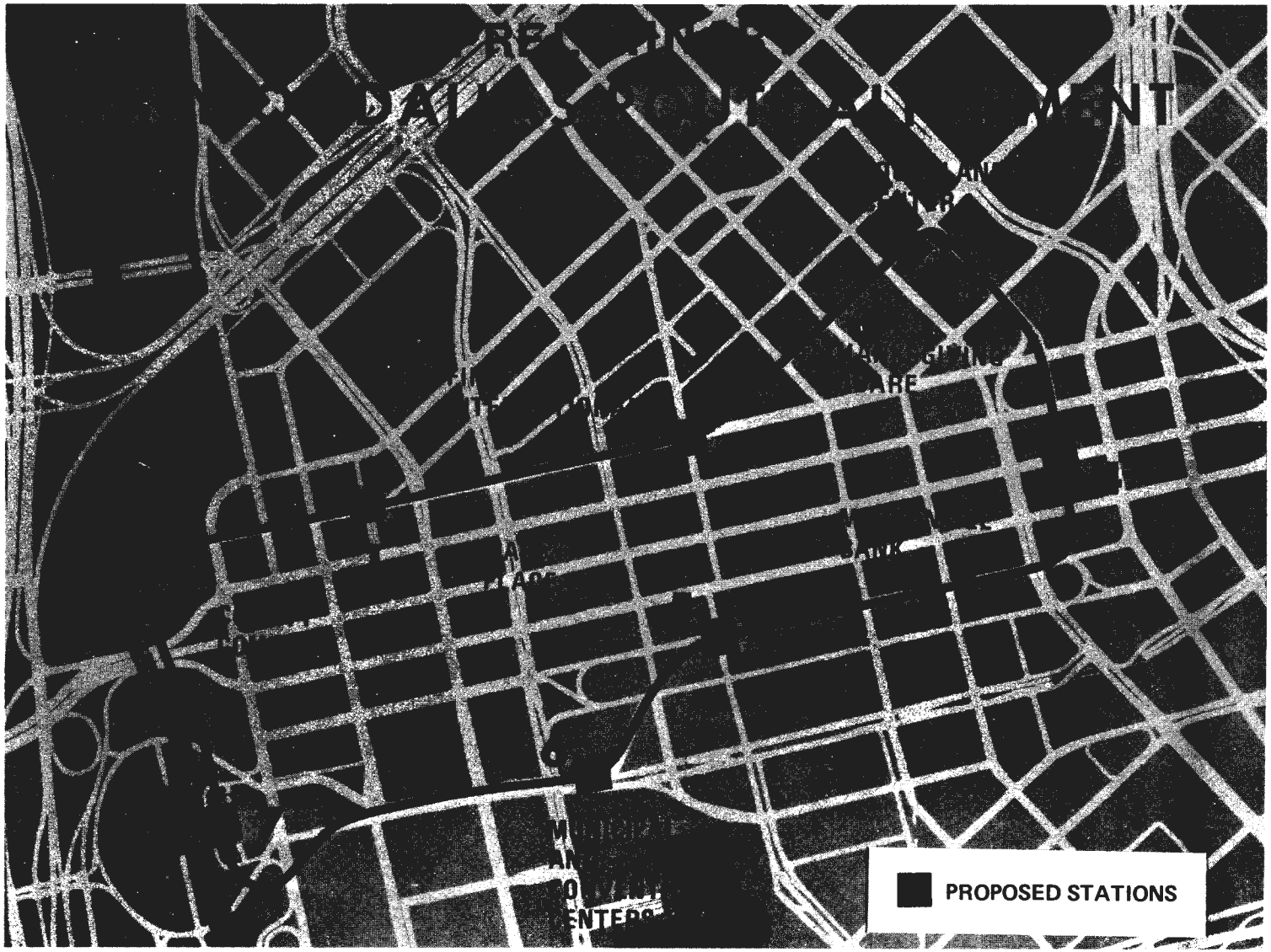
The City of Cleveland (population 751,000) proposed a single-lane, elevated loop DPM system to be operated by the Regional Transit Authority. The system would distribute passengers between four off-line and six on-line stations. Proposal system specifications require snow and ice removal, bidirectional vehicles, doors on each side of vehicle, automatic vehicle coupling, and switching.

System trip generators would be retail, governmental, and office facilities, residential development, and a proposed DPM Transitway Mall to serve existing light rail and heavy rail systems. About 55 percent of the DPM trips are expected to be work oriented, either peak distribution or off-peak shopping, lunch, or business trips. CBD office floor space is 15.3 million square feet; current employment within two blocks of the guideway is 104,000.

Since 1973, local planning studies have included recommendations for improved circulation systems and use of fixed guideway facilities. Demand may necessitate expansion of the proposed system into a two-way loop and up to six additional shuttle links. Local funding for capital costs will be obtained from bonds, right-of-way donations, sales tax revenues, general funds, or a special tax assessment district (under consideration).

The city is currently considering a parking credit assessment to encourage DPM use. The DPM would provide a direct transportation link with a number of parcels of land intended for development or redevelopment. Specific development opportunities include the Tower City terminal complex, State Office Building, and the Great Lakes Gateway Project. Environmental issues addressed in the proposal include negative visual intrusion impacts and improvements in energy consumption, air quality, and the amount of land devoted to auto uses.

Dallas, Texas


PROPOSED STATIONS

DALLAS, TEXAS

SYSTEM DESCRIPTION

Route Length (miles)	-	1.3
Single Lane Miles	-	2.5
Number of Stations	-	7
Number of Vehicles	-	16
Vehicle Capacity (persons)	-	44

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	45.0*
Annual Operating and Maintenance Cost (millions of dollars)	-	1.4*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	0.25

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	9.0
Weekday Ridership (passengers per day)	-	30,900
Peak Line Capacity (passengers per hour)	-	4000
Minimum Headway (seconds)	-	81
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	Closed Circuit Television/ P.A. System
Elderly and Handicapped Provisions	-	Elevators

*1976 dollars

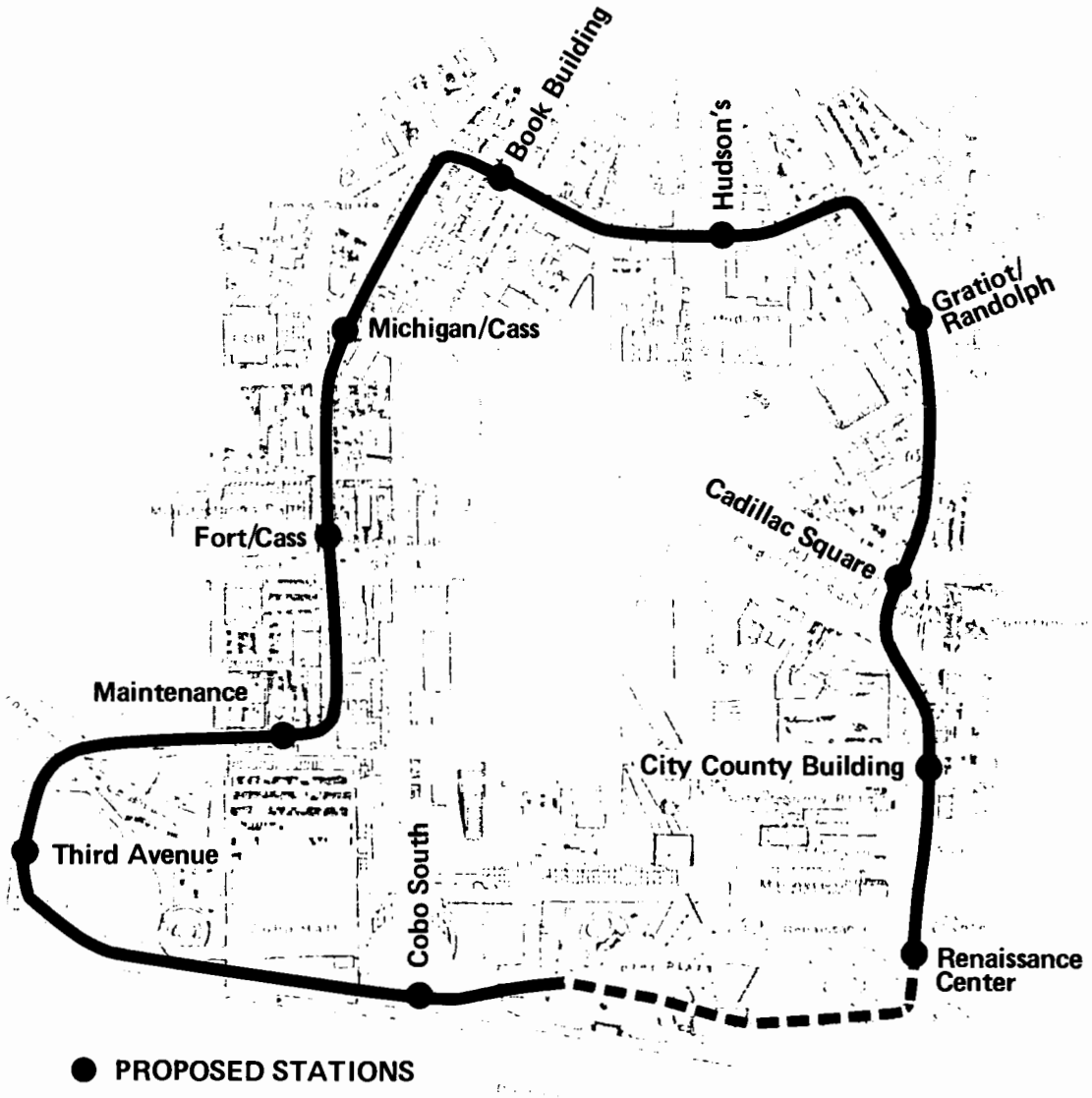
The City of Dallas (population 844,000) proposed a single lane, loop system to serve the convention center, primary hotel and office complexes, the underground walkway system, and the CBD retail centers. Street lights, traffic signals, and associated equipment would be mounted on the elevated guideway, which would have eight bypass sidings (at the stations and the maintenance center). Three of the stations would be placed in renovated, existing structures. Sixteen vehicles, requiring 16 switches, would operate in two-car trains.

Eighty-eight percent of the projected 1990 CBD employment and 77 percent of the 1974 parking spaces are within 1000 feet of the proposed DPM stations. The majority of trips would be work related, along with expected heavy ridership by 2.5 million annual tourists and conventioners.

Since 1957, a series of planning reports regarding CBD redevelopment have been prepared; several of these plans advocate a CBD shuttle system. Funding sources for the local share include city bond revenues, private sector participation, the State Public Transportation Fund, and special assessments. Expansion plans would link the DPM with the Dallas/Ft. Worth Airport and the City of Fort Worth.

The city has adopted an off-street parking plan, which proposes an auto-intercept system of inner circle garages around the CBD core and a system of outer circle garages around the perimeter of the CBD freeway ring. An underground goods distribution system and a pedestrian mall is nearing completion. Increased land value and the development of vacant properties are cited in the proposal as the major benefits to result from the DPM. Visual and noise intrusions during DPM construction are the negative impacts expected.

Detroit, Michigan


Book Building
Hudson's
Gratiot/
Randolph
Michigan/Cass
Cadillac Square
Fort/Cass
Maintenance
City County Building
Third Avenue
Cobo South
Renaissance
Center
PROPOSED STATIONS

DETROIT, MICHIGAN

SYSTEM DESCRIPTION

Route Length (miles)	-	2.3
Single Lane Miles	-	2.3
Number of Stations	-	11
Number of Vehicles	-	30
Vehicle Capacity (persons)	-	40-60 (crush)

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	55.4*
Annual Operating and Maintenance Cost (millions of dollars)	-	1.8**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.68**
Proposed Initial Fare (dollars)	-	0.15

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	7.5 to 9.8***
Weekday Ridership (passengers per day)	-	39,450 to 65,000***
Peak Line Capacity (passengers per hour)	-	10,800
Minimum Headway (seconds)	-	70
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	NA
Emergency Egress	-	Guideway Surface
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*1978 dollars
**1975 dollars
***Ranges are based on pessimistic-optimistic CBD employment levels

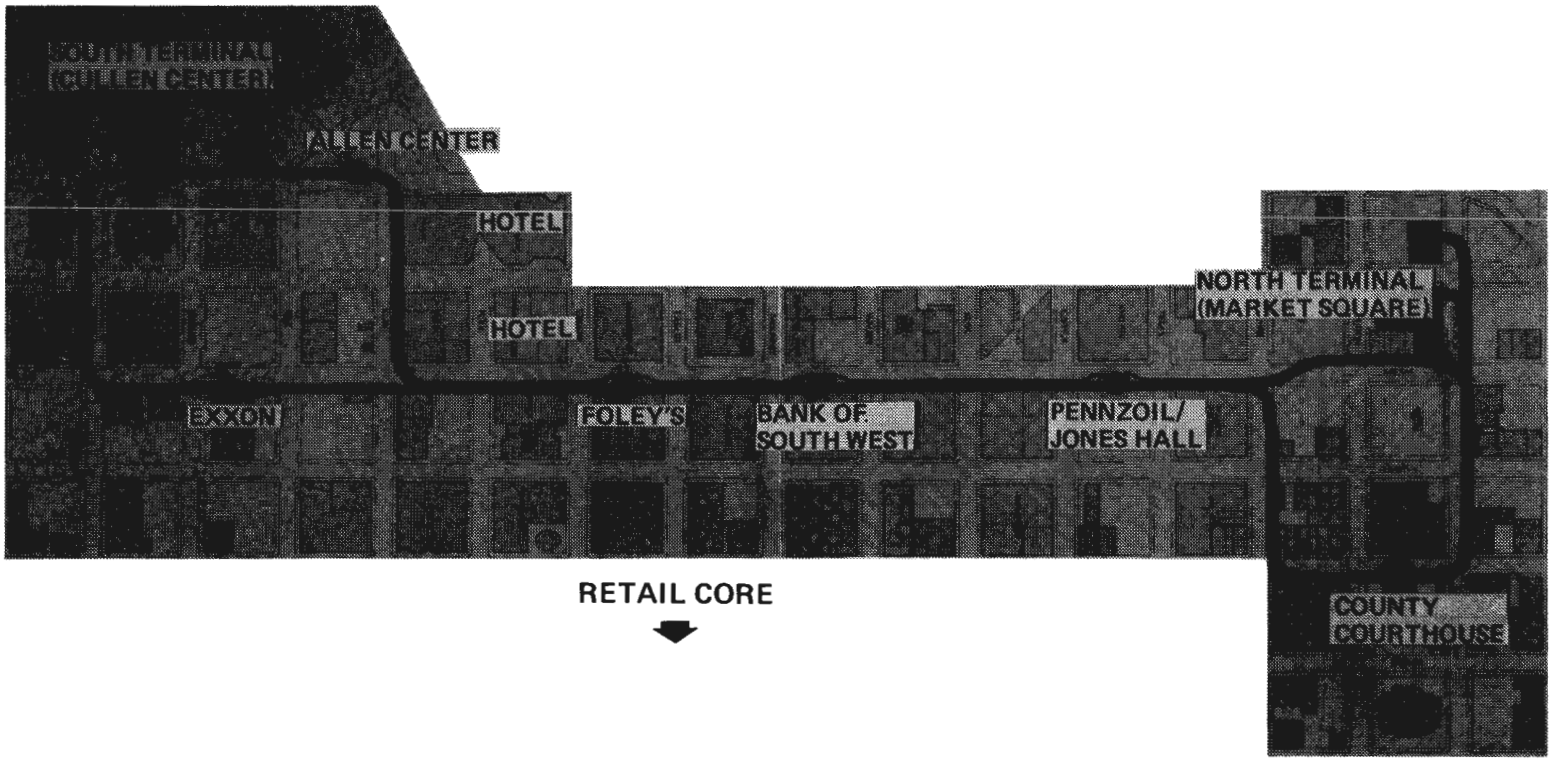
The Southeastern Michigan Transportation Authority (SEMTA) submitted the Detroit proposal, which was prepared jointly with the City of Detroit and the Michigan Department of State Highways and Transportation. The single lane, largely elevated (95 percent) loop system will connect existing and proposed CBD activity centers; 5 percent of the guideway will be underground. Five stations will be free standing, three will be integrated into new buildings, three will be integrated into existing structures. Proposal specifications note that vehicles will have bidirectional capability, automatic coupling, and doors on each side. The guideway will be designed to house street lighting and traffic signals. The system will have switching capability and should be capable of operating as a shuttle.

Major trip generators include retail centers, hotel center, major government and commercial office facilities, present and proposed commuter rail terminals, proposed regional transit system, future auto-restricted zones, possible riverfront residential development, and proposed community college and stadium. Patronage estimates indicate that 41 percent of the DPM trips will be work trips. Projected employment within the CBD range from 110,700 to 135,900 in 1978 and to 169,400 in 1990. Currently, employment within two blocks of the guideway is estimated at 47,000 and CBD floor space is 15 million square feet.

Studies related to DPM date to 1968 and include preliminary engineering, draft environmental impact analysis, preliminary vehicle specifications, and public hearings. The system will be expanded with CBD growth by adding additional shuttles or loops to connect directly or indirectly with station transfers. Local funding for the DPM has been guaranteed by the State of Michigan and a back up pledge from the City of Detroit for monetary and right-of-way contributions has been made.

Present transportation plans include pairs of one-way roads around the CBD and several auto restricted zones, and development of parking facilities at ring road intercepts. Long-range plans call for a six-corridor rapid rail system, commuter rail links, and expansion of regional and local bus systems. CBD redevelopment is underway; vacant and under-used facilities will provide additional redevelopment opportunities. Negative environmental impacts expected from the DPM include noise and vibration from system operation, and sensitivity of historical sites and business relocation.

Houston, Texas



● PROPOSED STATIONS

HOUSTON, TEXAS

SYSTEM DESCRIPTION

Route Length (miles)	-	1.09
Single Lane Miles	-	2.25
Number of Stations	-	8
Number of Vehicles	-	12-28*
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	39.0 to 40.0**
Annual Operating and Maintenence Cost (millions of dollars)	-	1.2**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	2.33***
Proposed Initial Fare (dollars)	-	0.10 to 0.25

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	6.6
Weekday Ridership (passengers per day)	-	25,061
Peak Line Capacity (passengers per hour)	-	4,287
Minimum Headway (seconds)	-	60
Maximum Velocity (miles per hour)	-	NA
Fare Collection	-	NA
Emergency Egress	-	Guideway Walkway
Security Provisions	-	Closed Circuit Television/2-way radio communications
Elderly and Handicapped Provisions	-	Elevators

*Three vehicle size options considered
**1976 dollars, represents low and high ranges
***1976 dollars

The Houston DPM system (population 1.2 million), will be a double lane, loop configuration bisecting the office core. The guideway will be aerial throughout--double lane through the core with single lane loops at each end where transit bus terminals will be located. The DPM system will provide direct access to Houston's regional transit bus system and to the downtown tunnel and skyway pedestrian network. Guideway switches will be required as well as coupling capability for small and medium sized vehicles.

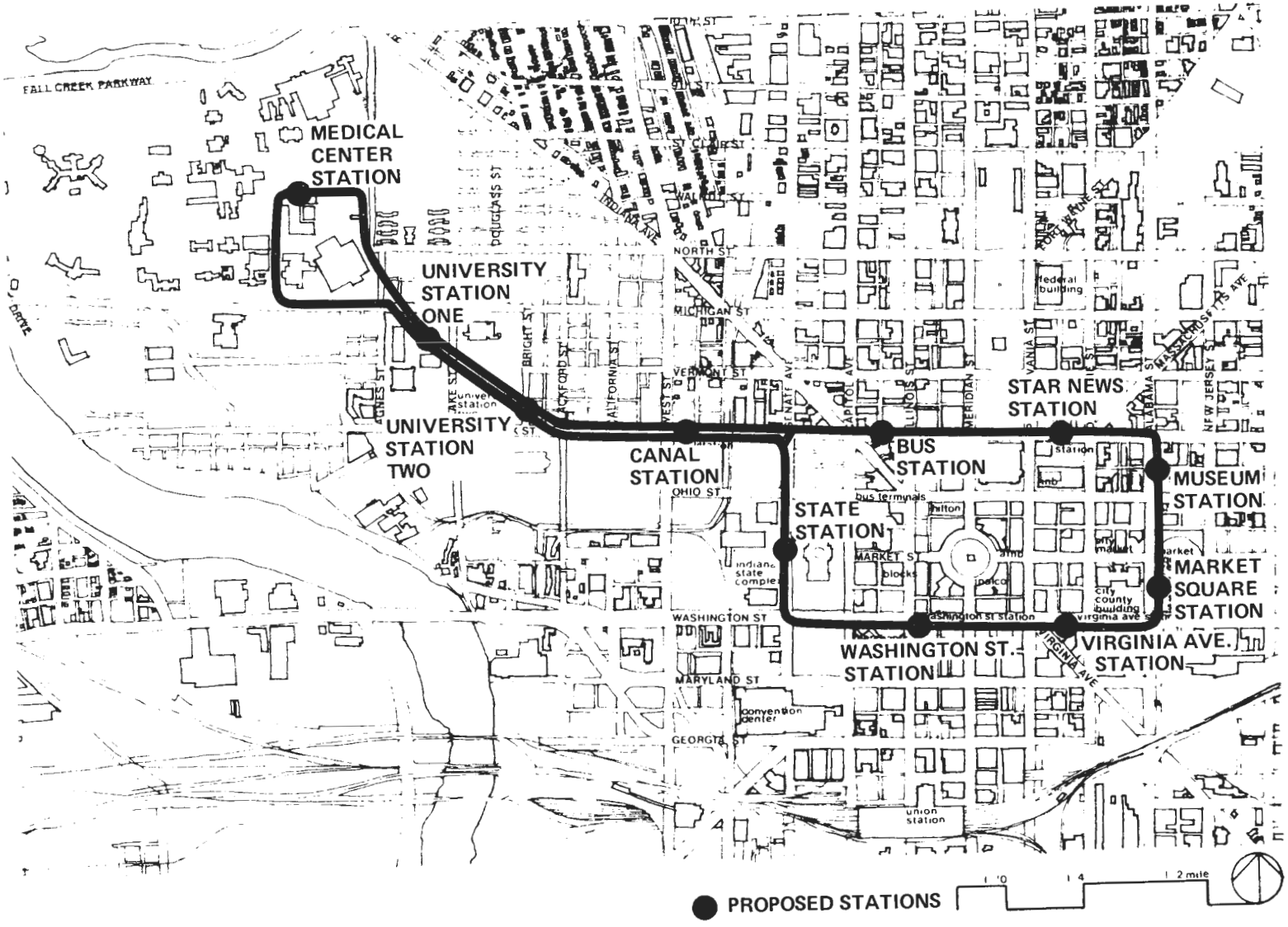
Eight on-line, enclosed stations will connect office and retail activities, a civic center, county administration offices, and restaurant/entertainment facilities. DPM stations are within one block of 40 percent of the CBD's projected 1980 employment population. Current CBD office space is estimated to be 30.3 million square feet, daytime population is estimated between 350,000 and 400,000. When connected with the tunnel and bridge systems, the DPM coverage increases to 75 percent of the population, 33 percent of the parking spaces, and 2200 hotel rooms and related facilities; 76 percent of the DPM trips will be work related.

Need for a DPM system for downtown Houston was initially identified in 1969. The potential of DPM systems for the city has been analyzed in studies completed by private interests; the Chamber of Commerce, the Office of Public Transportation, and others. Local share of capital funds for the Houston system will be supported by a $10 million UMTA loan to be repaid from surplus fare box revenues and value capture funds from leasing revenues at the terminal stations.

Houston has developed a 41-block tunnel and bridge pedestrian system in the CBD which will be accessible to three stations. Since October 1975, Houston has operated a Downtown Mini Bus system with an average daily ridership of 3,500; the DPM will replace two of the routes. The regional bus system will be modified to end many routes at the terminal stations and the city is also pursuing park and ride developments and freeway improvements.

Downtown Houston has grown rapidly in recent years--more than doubling office space in the past 15 years. By 1985, six to fourteen million square feet of new office space is expected. Specific development opportunities associated with the DPM include construction of Market Square, government buildings, parks, and peripheral parking structures, and rehabilitation of older office and retail facilities. Positive social, environmental, and economic impacts are expected to accrue from the DPM. Environmental Impact Analysis was begun in the Fall of 1976.

Indianapolis, Indiana


MEDICAL CENTER STATION
UNIVERSITY STATION ONE
UNIVERSITY STATION TWO
CANAL STATION
STATE STATION
BUS STATION
STAR NEWS STATION
MUSEUM STATION
MARKET SQUARE STATION
WASHINGTON ST. STATION
VIRGINIA AVE. STATION
FALL CREEK PARKWAY
NORTH ST
MICHIGAN ST
VERMONT ST
OHIO ST
MARKET ST
WASHINGTON ST
MARYLAND ST
GEORGIA ST
BRIGHT ST
CALIFORNIA ST
WEST ST
MERIDIAN ST
VIRGINIA AVE
federal building
bus terminals
indiana state complex
convention center
union station
city county building
PROPOSED STATIONS
1 mile

INDIANAPOLIS, INDIANA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.5
Single Lane Miles	-	3.9
Number of Stations	-	11*
Number of Vehicles	-	20 to 50**
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	50.2***
Annual Operating and Maintenance Cost (millions of dollars)	-	0.42***
Operating and Maintenance Cost Per Vehicle Mile (dollars)	-	0.54***
Proposed Initial Fare (dollars)	-	0.10***

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	7.3
Weekday Ridership (passengers per day)	-	23,265
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	30
Average Velocity (miles per hour)	-	15
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	Elevators

*Some portions of proposal indicate 14 stations
**Range dependent on vehicle capacity
***1976 dollars

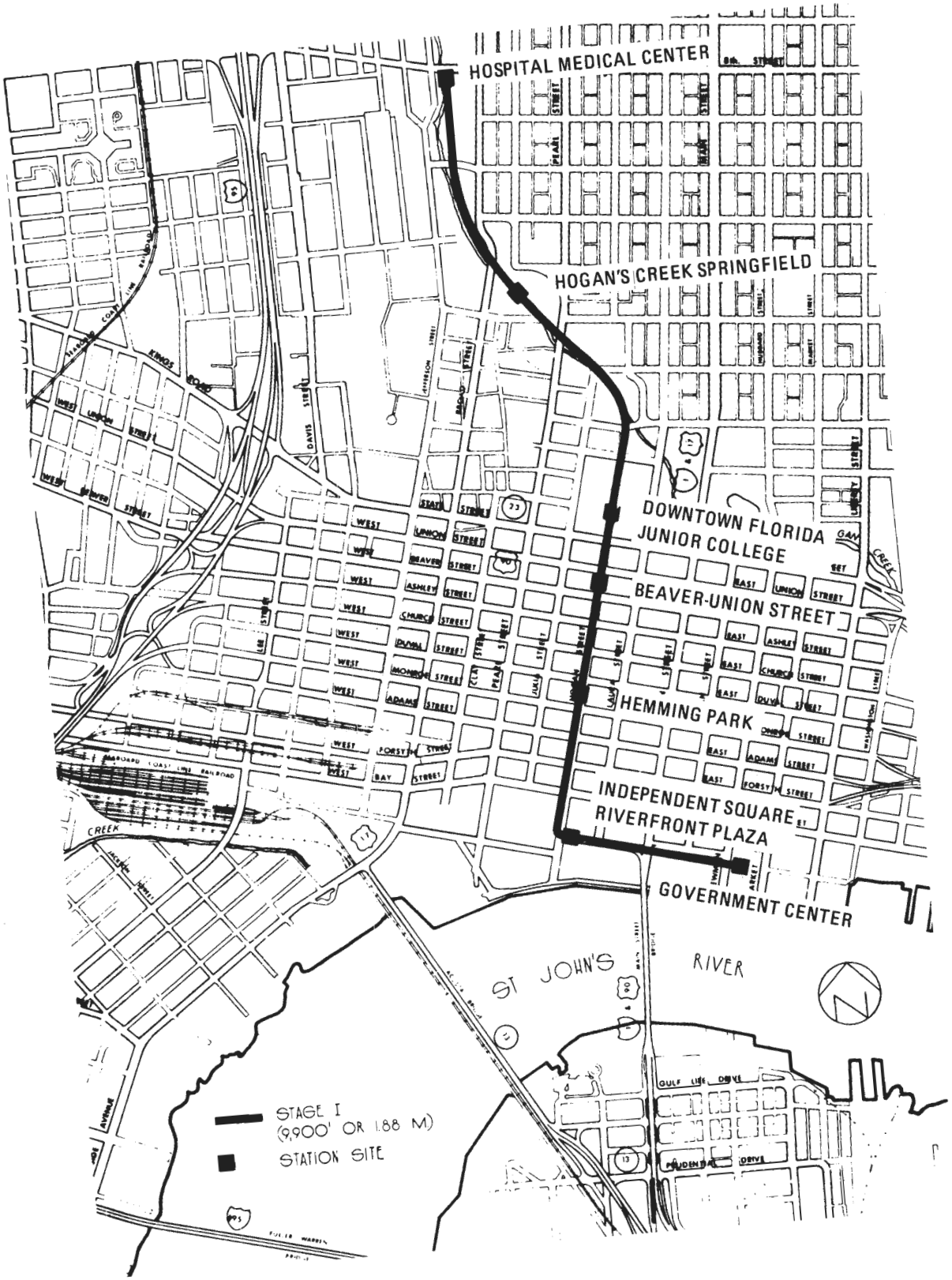
The City of Indianapolis (population 745,000), proposed an elevated DPM system with two single lane loops--one circling the downtown core and the other circling a major hospital/health services complex--interconnected by double lane guideway servicing Indiana University-Purdue University (IU-PUI) campus. The Indianapolis Public Transportation Corporation would operate the system, estimated to serve 60 percent of the total CBD employment, 50 percent (32,000 spaces) available parking, and 65 percent (84,000 per day) of the regional center visitor trips. All stations would be on-line; guideway switching would be required.

Major trip generators for the proposed system would include seven hospitals, teaching and research facilities; IU-PUI campus; state offices; retail facilities; tourist facilities; convention center; and the proposed Washington Street Transit Mall. Special service would be provided for events at the Market Square Arena and the convention center. About 40 percent of the ridership would be work trips; 15 percent shopping trips; the remaining 45 percent would be school, medical and recreational trips. About 60 percent of all trips would take place in the off-peak hours.

Planning support for improved downtown circulation intercept parking and arterial traffic flow stems from a regional transportation and development study (1968) and Regional Center Plan (1970). Four future extensions of the DPM system are outlined in the proposal, with the addition of 11 stations and an unspecified amount of guideway. Local share of capital funds include IU-PUI right-of-way, a bond issue, or revenue sharing monies.

Major transportation improvements in the CBD include completion of the regional center interstate segments; construction of the Washington Street Transit Mall (Environmental Impact Statement under review) serving the regional bus system, and pedestrian mall; development of intercept parking; and initiation of a second-level walkway system. The core area currently has a shortage of parking spaces which is expected to intensify. New development currently planned includes private apartment complexes, public housing for senior citizens, offices, buildings, and historical renovation. The prime redevelopment area in the city is located between the downtown core and the medical center stations. Issues anticipated to emerge in the DPM environment impact assessment include changes in the amount of light of sidewalks and changes in the crime rate.

Jacksonville, Florida


HOSPITAL MEDICAL CENTER
HOGAN'S CREEK SPRINGFIELD
DOWNTOWN FLORIDA JUNIOR COLLEGE
BEAVER-UNION STREET
HEMMING PARK
INDEPENDENT SQUARE
RIVERFRONT PLAZA
GOVERNMENT CENTER
ST JOHN'S RIVER
STAGE I
(9,900' OR 1.88 M)
STATION SITE

JACKSONVILLE, FLORIDA

SYSTEM DESCRIPTION

Route Length (miles)	-	1.9
Single Lane Miles	-	3.8
Number of Stations	-	7
Number of Vehicles	-	NA
Vehicle Capacity (persons)	-	20-40*

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	41.1**
Annual Operating and Maintenance Cost (millions of dollars)	-	1.3**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	0.15

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	14.7
Weekday Ridership (passengers per day)	-	49,000
Peak Line Capacity (passengers per hour)	-	3600
Minimum Headway (seconds)	-	186
Maximum Velocity (miles per hour)	-	NA
Fare Collection	-	Automatic, each station will have an attendant
Emergency Egress	-	NA
Security Provisions	-	Closed Circuit Television
Elderly and Handicapped Provisions	-	Elevators and Escalators

*Seated passengers
**1976 dollars

The DPM system proposed by the City of Jacksonville (population 529,000), to be operated by the Jacksonville Transportation Authority, interconnects a hospital/medical center, junior college, retail and commercial centers within the CBD with an expanding city government center, a high-density residential area, and peripheral parking lots. Two-car DPM trains would carry passengers on elevated, double lane guideways. Seven stations are proposed, some of which would be integrated with existing and proposed facilities.

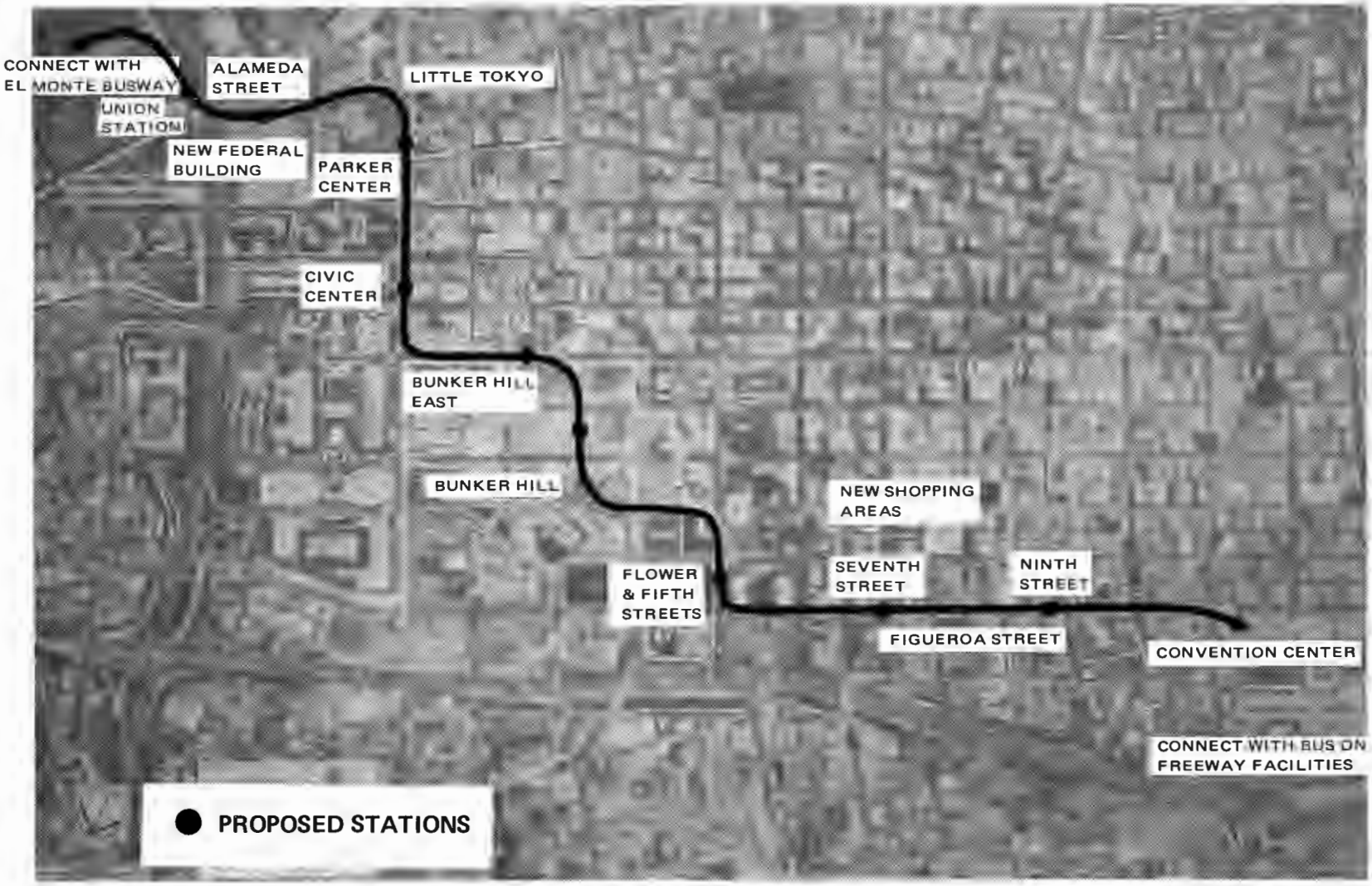
The diversity of activity centers the DPM would serve idicates that students, senior citizens, the young, tourists, workers, and shoppers would use the system throughout the day. About 68 percent of the trips would be non-work trips, about 44 percent of the ridership would be transferring bus riders. Currently about 30,000 employees are located within two blocks of the proposed alignment.

Previous planning for the DPM dates to 1972. Recent studies have encouraged building a people mover system and have resulted in initiation of a downtown shuttle bus service (38,000 ridership per month) and a three-phase mass transportation program for the period of 1974-1990. A people mover task force developed a two-stage DPM plan--Stage I to be operative by 1980 and an expanded DPM system in Stage II by 1990. Stage II would require the construction of a St. Johns River crossing. The Florida DOT would finance 50 percent of the local share, with city bonds or gas tax revenues providing the remainder.

Parking lots located at the fringes of the downtown CBD would be provided for workers to park all day. Each lot would be served by Stage I DPM or the shuttle-bus routes. Projects affected by the DPM include riverfront activity centers, expansion of government facilities, junior college campus, urban renewal areas, and the hospital complex. The people mover system would be expected to accelerate attainment of the 1990 goal for downtown redevelopment by three to five years.

Major environmental concerns identified for the DPM include aesthetic and visual impacts of stations and structures; possible impact on Hogan's Creek flood plain and park; and business and traffic disruption during construction.

Los Angeles, California


CONNECT WITH
EL MONTE BUSWAY
UNION
STATION
ALAMEDA
STREET
LITTLE TOKYO
NEW FEDERAL
BUILDING
PARKER
CENTER
CIVIC
CENTER
BUNKER HILL
EAST
BUNKER HILL
NEW SHOPPING
AREAS
FLOWER
& FIFTH
STREETS
SEVENTH
STREET
NINTH
STREET
FIGUEROA STREET
CONVENTION CENTER
CONNECT WITH BUS ON
FREEWAY FACILITIES
PROPOSED STATIONS

LOS ANGELES, CALIFORNIA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.4*
Single Lane Miles	-	6.4*
Number of Stations	-	11
Number of Vehicles	-	46
Vehicle Capacity (persons)	-	60-70

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	167.0**
Annual Operation and Maintenance Cost (millions of dollars)	-	2.6***
Operating and Maitenance Cost per Vehicle Mile (dollars)	-	1.31***
Proposed Initial Fare (dollars)	-	0.10

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	18.0
Weekday Ridership (passengers per day)	-	58,100
Peak Line Capacity (passengers per hour)	-	7850
Minimum Headway (seconds)	-	60
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	NA
Emergency Egress	-	Guideway Walkway
Security Provisions	-	Closed Circuit Television/P.A. System/2-way radio communication on night vehicles
Elderly and Handicapped Provisions	-	Elevator

*Includes 3.0 miles of double lane guideway plus .4 miles single-lane guideway to maintenance facility
**1980 dollars, includes $34 million for auto/bus intercept facilities
***1976 dollars

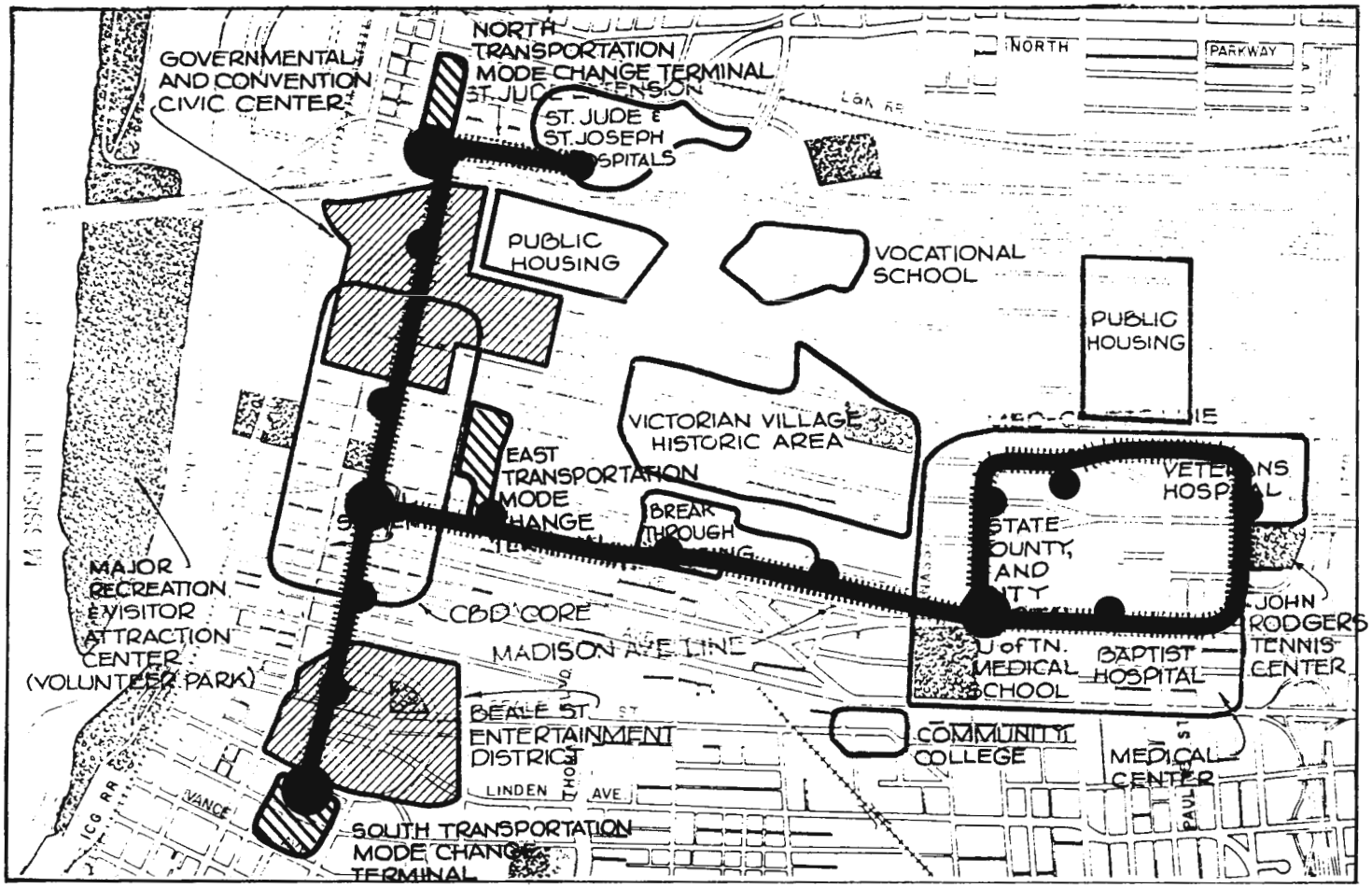
The City of Los Angeles (population 2.8 million) proposed to construct a scheduled shuttle system to link the CBD activity centers with terminal stations with regional bus and auto intercept facilities. The system will carry passengers on a double lane guideway (89 percent elevated; 11 percent underground) between ten elevated, on-line stations and one underground, on-line station. Vehicles will be bidirectional, have doors on each side and should be capable of operation in two- or three-vehicle trains. In addition, the system is to be capable of goods movement.

Major trip generators include tourist and convention centers, governmental/civic centers, retail facilities, and commercial office developments. By 1990, 69 percent of all weekday trips are estimated to be distribution trips transferring at the bus and auto intercepts. Of the CBD circulation trips, 18 percent are expected to be work-based trips. Currently 77,000 CBD employees are located within two-blocks of the proposed guideway. Currently CBD employment is estimated at 200,000 and moderate range estimates indicate an increase to 230,000 by 1990.

Initial planning for improved circulation in the Bunker Hill District began in 1969. More recent studies include comparative evaluation of bus and bus/DPM alternatives, and a preliminary environmental impact analysis for DPM. Future expansion of the initial segment of the DPM to a large service network is noted in the proposal. The system will be funded by State, County, and City Proposition 5 Funds and value capture revenue. Value capture revenue is also expected to partially defray operating and maintenance costs.

Additional transportation improvements to be made in conjunction with the DPM system have been approved by the U.S. DOT to include transportation systems management improvements and bus-on-freeway service. In addition, technical evaluation of a starter rapid rail system in the Wilshire/La Brea corridor is underway. The proposed DPM route lies almost entirely within three redevelopment projects--Bunker Hill, CBD Project, and Little Tokyo--which together comprise most of the downtown area. These projects have generated new and pending development of office, retail, hotel, and residential facilities. Potential environmental issues include future land use development, construction impacts, seismic conditions, visual intrusion of historic sites and other facilities, and system safety and security.

Memphis, Tennessee


NORTH TRANSPORTATION MODE CHANGE TERMINAL
GOVERNMENTAL AND CONVENTION CIVIC CENTER
ST. JUDE & ST. JOSEPH HOSPITALS
NORTH PARKWAY
PUBLIC HOUSING
VOCATIONAL SCHOOL
PUBLIC HOUSING
VICTORIAN VILLAGE HISTORIC AREA
EAST TRANSPORTATION MODE CHANGE
BREAK THROUGH
MAJOR RECREATION & VISITOR ATTRACTION CENTER (VOLUNTEER PARK)
CBD CORE
MADISON AVE LINE
U of TN. MEDICAL SCHOOL
BAPTIST HOSPITAL
JOHN RODGERS TENNIS CENTER
BEALE ST. ENTERTAINMENT DISTRICT
COMMUNITY COLLEGE
MEDICAL CENTER
LINDEN AVE
VANCE
ICG RR
SOUTH TRANSPORTATION MODE CHANGE TERMINAL

MEMPHIS, TENNESSEE

SYSTEM DESCRIPTION

Route Length (miles)	-	4.7
Single Lane Miles	-	6.7
Number of Stations	-	16
Number of Vehicles	-	62
Vehicle Capacity (persons)	-	40

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	48.0*
Annual Operating and Maintenance Cost (millions of dollars)	-	NA
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	NA

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	NA
Weekday Ridership (passengers per day)	-	40,100
Peak Line Capacity (passengers per hour)	-	5000
Minimum Headway (seconds)	-	60**
Maximum Velocity (miles per hour)	-	30-35
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

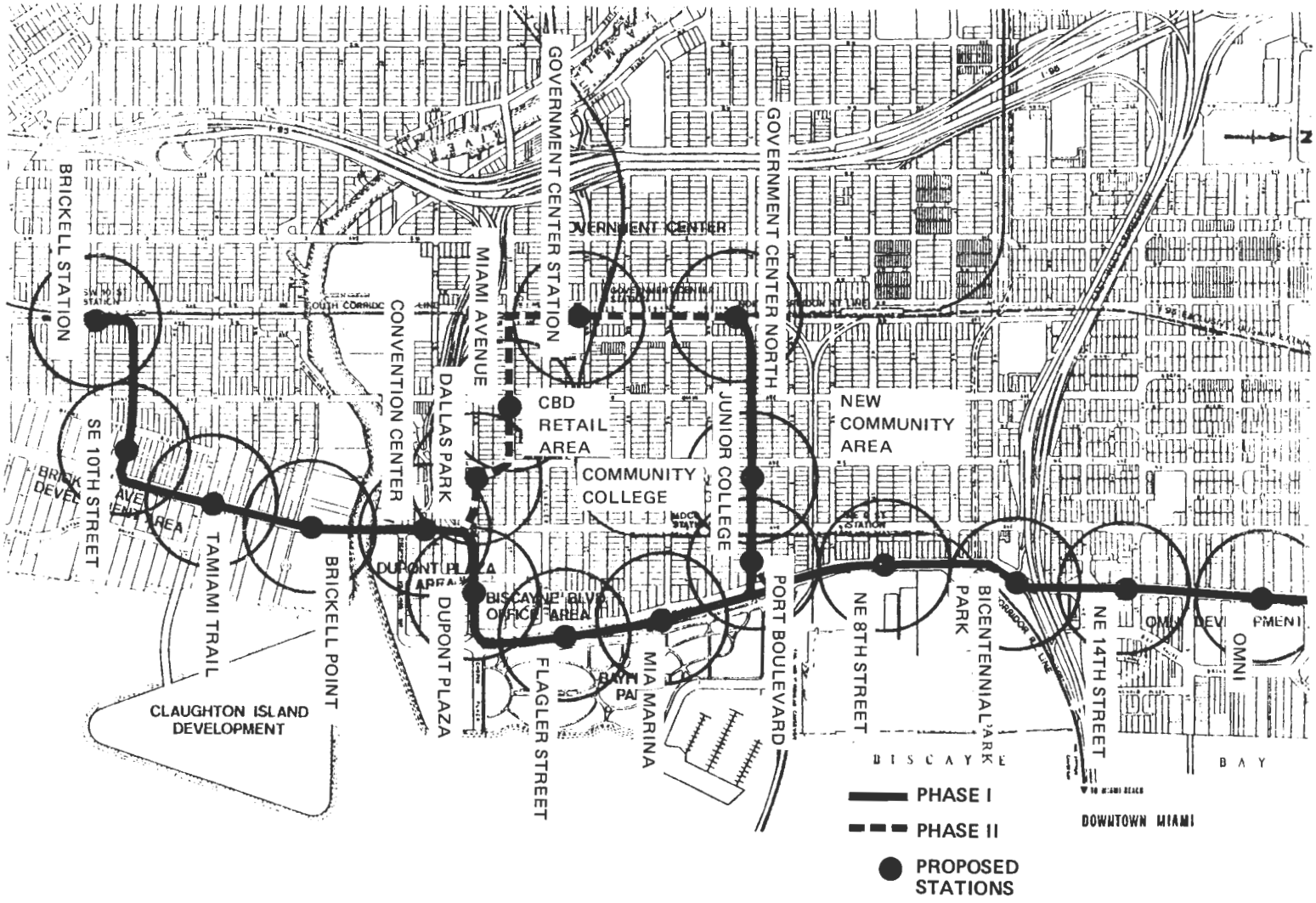
*1976 dollars
**Loop only

The City of Memphis (population 624,000) proposed a four link DPM system to connect the CBD core with major medical centers. The proposed system would carry passengers on elevated (possibly some at-grade) single and double lane loop and shuttle guideway. Sixteen stations would be coordinated with existing supplementary transportation systems and three proposed major multimodal terminals. DPM would replace some auto usage and regular bus transit service. Medical, retail, government, public housing, and educational facilities within and near the CBD core would be served. DPM lines to the medical centers would be operational 24 hours a day. Most major employment centers (over 68,000 employees) are within one block of the DPM route.

Past project planning is evidenced in a number of studies: recommending circulation and rapid transit systems in Memphis; supporting peripheral parking to the CBD; and showing public and private cooperation in achieving downtown renovation. Sources for local funding were not specified. The proposed DPM system could be built in a series of stages, each of which can be an operational component. The proposal also contains possible DPM expansion to the proposed Volunteer Park.

Recent redevelopment in the downtown area has resulted in construction of the Mid-America Mall, Cook Convention Center, and commitments to build Volunteer Park. Development of peripheral intercept parking is anticipated in conjunction with the mode change terminals. DPM is expected to benefit user mobility, and the city's economics, land use, and social and environmental goals.

Miami, Florida


GOVERNMENT CENTER STATION
GOVERNMENT CENTER NORTH
BRICKELL STATION
MIAMI AVENUE
CBD RETAIL AREA
NEW COMMUNITY AREA
CONVENTION CENTER
DALLAS PARK
JUNIOR COLLEGE
COMMUNITY COLLEGE
SE 10TH STREET
TAMIAMI TRAIL
DUPONT PLAZA
BISCAYNE BLVD. OFFICE AREA
PORT BOULEVARD
BICENTENNIAL PARK
NE 8TH STREET
NE 14TH STREET
OMNI
FLAGLER STREET
MIA MARINA
BRICKELL POINT
CLAUGHTON ISLAND DEVELOPMENT
BISCAYNE BAY
DOWNTOWN MIAMI
PHASE I
PHASE II
PROPOSED STATIONS

MIAMI, FLORIDA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.3
Single Lane Miles	-	6.6
Number of Stations	-	15
Number of Vehicles	-	38-40
Vehicle Capacity (persons)	-	50

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	73.8*
Annual Operating and Maintenance Cost (millions of dollars)	-	1.7**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	NA

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	NA
Weekday Ridership (passengers per day)	-	40,200 to 55,500***
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	30-120****
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	NA
Emergency Egress	-	Guideway Walkway
Security Provisions	-	Closed Circuit Television/2-way radio communication
Elderly and Handicapped Provisions	-	Elevators

*1976 dollars
**1975 dollars
***Low estimate does not include ridership gains from future development
****Depends on train size

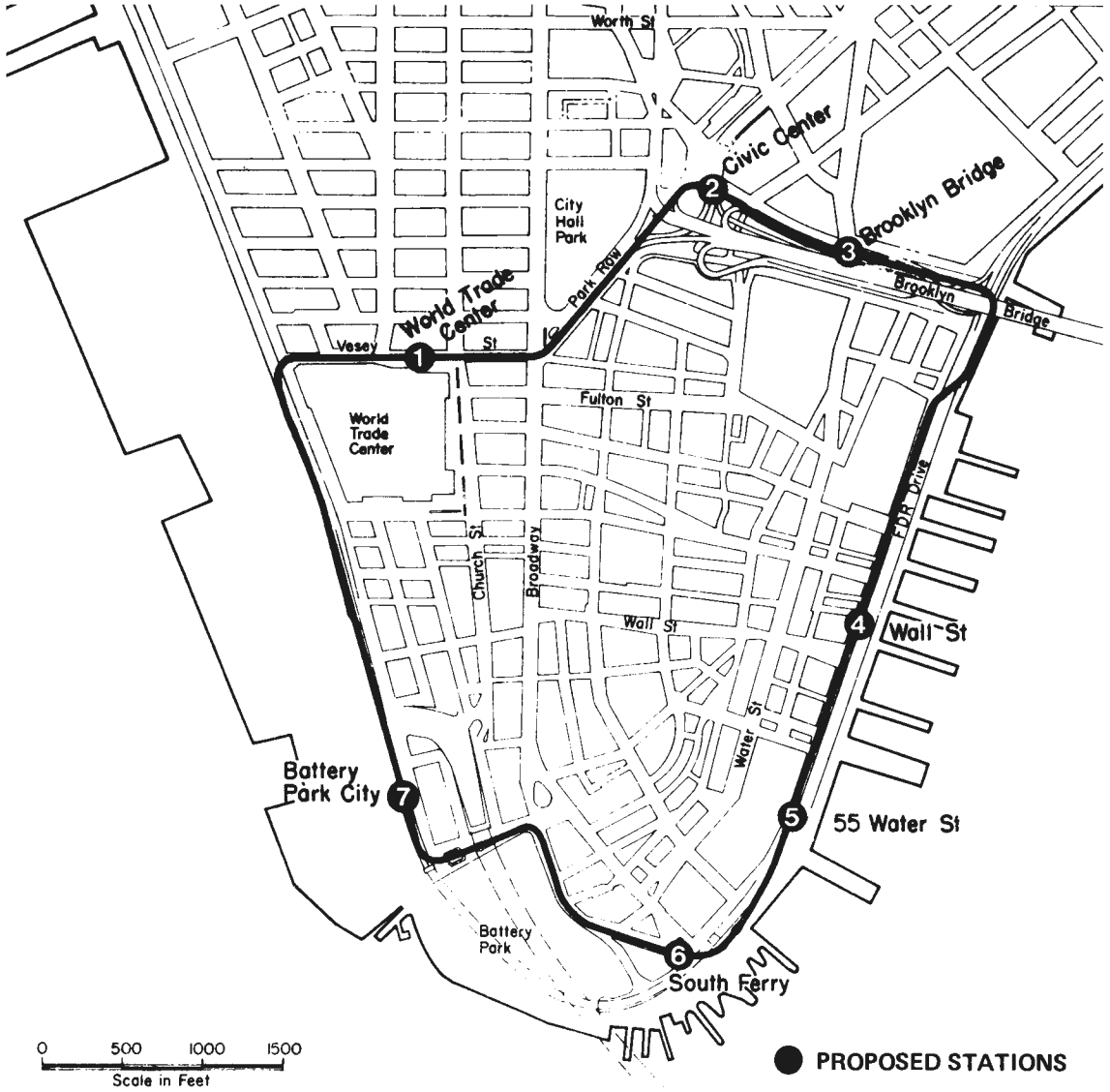
The City of Miami (population 334,859) and Metropolitan Dade County sponsored the Miami proposal. The system, to be operated by the Metropolitan Dade County Transit Agency, would cross the Miami River, connecting activity centers to the north and south of the present downtown core and the developing government center complex with two intersecting shuttle lines. An elevated, double lane guideway was proposed. Proposal specifications note vehicle training capability, doors on both sides of the vehicle, and switching.

Major trip generators for the system would be government and commercial office facilities, hotel facilities, retail cores, and Miami-Dade Junior College, as well as future rapid rail stations, a convention center, government center, residential development, parks, hotel and shopping facilities. About 33 percent of all DPM trips would be work trips. Of all trips, 87 percent would take place in the off-peak hours. Approximately 40,000 current CBD employees are located within two blocks of the proposed guideway. Presently 5.6 million square feet of office space exists in the CBD.

Previous planning activities for downtown circulation systems date back to 1965. Recent planning activities include extensive corridor and alignment evaluation. Local funding for the system would be provided by the Florida State Department of Transportation, City of Miami and Dade County. In addition, a special taxing district to partially defray capital costs would be set up as a value capture experiment. Other joint development strategies could also be developed. Phase II expansion would add 0.4 route mile and three stations to the system at a cost of $9.4 million.

In addition to construction of a rapid rail system, other transportation actions include CBD parking restraint policies, development of auto-free zones, and construction of an elevated pedestrian system. Plans for downtown Miami call for substantial new development through 1985 by the public and private sectors. Specific development opportunities total to 31 projects and over 6.6 million square feet of floor space. A total of $600 million in new projects are presently in the planning stages. Land use planning policies have been identified that will encourage moderate and high density residential development, office space expansion and renovation of hotel and retail facilities. Possible negative effects due to the DPM include traffic disruption from guideway structures, construction disruption, and tree relocation.

New York, New York


Worth St
Civic Center
Brooklyn Bridge
City Hall Park
Park Row
Brooklyn Bridge
World Trade Center
Vesey St
Fulton St
World Trade Center
Church St
Broadway
Wall St
FDR Drive
Wall St
Water St
Battery Park City
55 Water St
Battery Park
South Ferry
1
2
3
4
5
6
7
0 500 1000 1500
Scale in Feet
PROPOSED STATIONS

NEW YORK, NEW YORK
(Lower Manhattan)

SYSTEM DESCRIPTION

Route Length (miles)	-	2.9
Single Lane Miles	-	5.8
Number of Stations	-	7
Number of Vehicles	-	12
Vehicle Capacity (persons)	-	93

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	71.6*
Annual Operating and Maintenance Cost (millions of dollars)	-	2.45*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	2.55 to 5.04**
Proposed Initial Fare (dollars)	-	0.25

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	16.6
Weekday Ridership (passengers per day)	-	61,700
Peak Line Capacity (passengers per hour)	-	2640
Minimum Headway (seconds)	-	50
Maximum Velocity (miles per hour)	-	35
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	Escalators

*1980 dollars

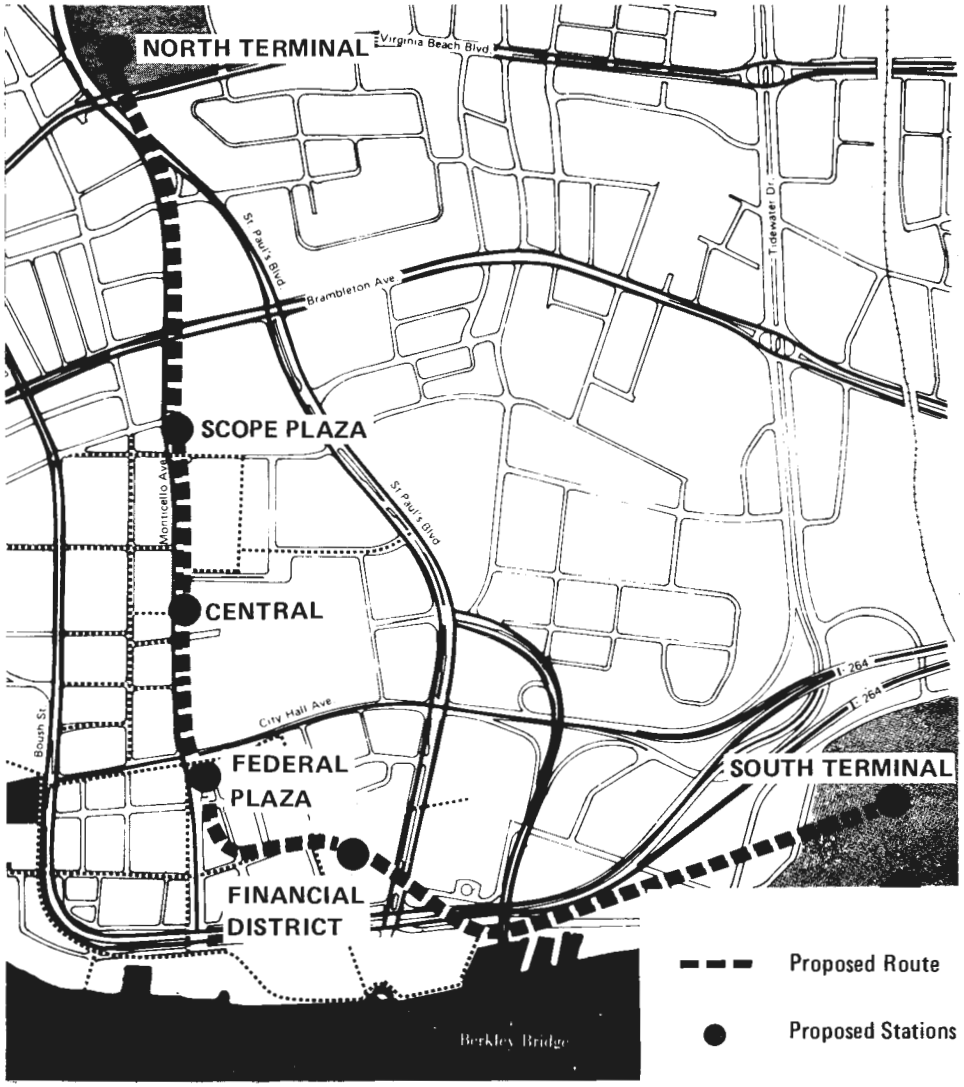
**High Figure includes policing, insurance, administrative, operating and maintenance costs. Low figure is for operating and maintenance cost only.

The Port Authority of New York and New Jersey submitted a proposal on behalf of the City of New York (population 7.9 million) for an elevated, double-lane loop DPM system with some on-line stations to serve existing and proposed developments along a 3.9 mile route. Rubber-tired vehicles would operate as single units or in two-car consists. Snow and ice removal and guideway switching would be required. The DPM, to be operated by the Port Authority, would serve the Manhattan financial district, including new peripheral office centers, shopping and commercial areas, housing, and recreational areas. About 65 percent of all DPM trips would be work and business related; about 51 percent of all trips would take place during peak hours.

New systems to improve circulation and distribution in Manhattan have been recommended in transportation studies since 1968; the DPM system was first proposed in 1971. Commitment of local share of capital funds would be sought for DPM support.

The system would be used in conjunction with existing parking lots and garages on the periphery. Expected effects due to DPM are positive; they include improvements in business/social circulation within the district, reduction in transportation costs to and from the periphery, and reduction in street congestion. Preliminary environmental studies have been conducted.

Norfolk, Virginia


NORTH TERMINAL
Virginia Beach Blvd
St Paul's Blvd
Brambleton Ave
Tidewater Dr
SCOPE PLAZA
Monticello Ave
St Paul's Blvd
CENTRAL
City Hall Ave
Bousch St
I-264
I-264
FEDERAL PLAZA
SOUTH TERMINAL
FINANCIAL DISTRICT
Berkley Bridge
Proposed Route
Proposed Stations

NORFOLK, VIRGINIA

SYSTEM DESCRIPTION

Route Length (miles)	-	1.7
Single Lane Miles	-	3.4
Number of Stations	-	6
Number of Vehicles	-	8
Vehicle Capacity (persons)	-	100

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	30.7*
Annual Operating and Maintenance Cost (millions of dollars)	-	0.5*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	Free

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	7.9**
Weekday Ridership (passengers per day)	-	36,500**
Peak Line Capacity (passengers per hour)	-	2,800
Minimum Headway (seconds)	-	200
Average Velocity (miles per hour)	-	15-18
Fare Collection	-	None
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	Elevator

*1976 dollars
**1987 Ridership

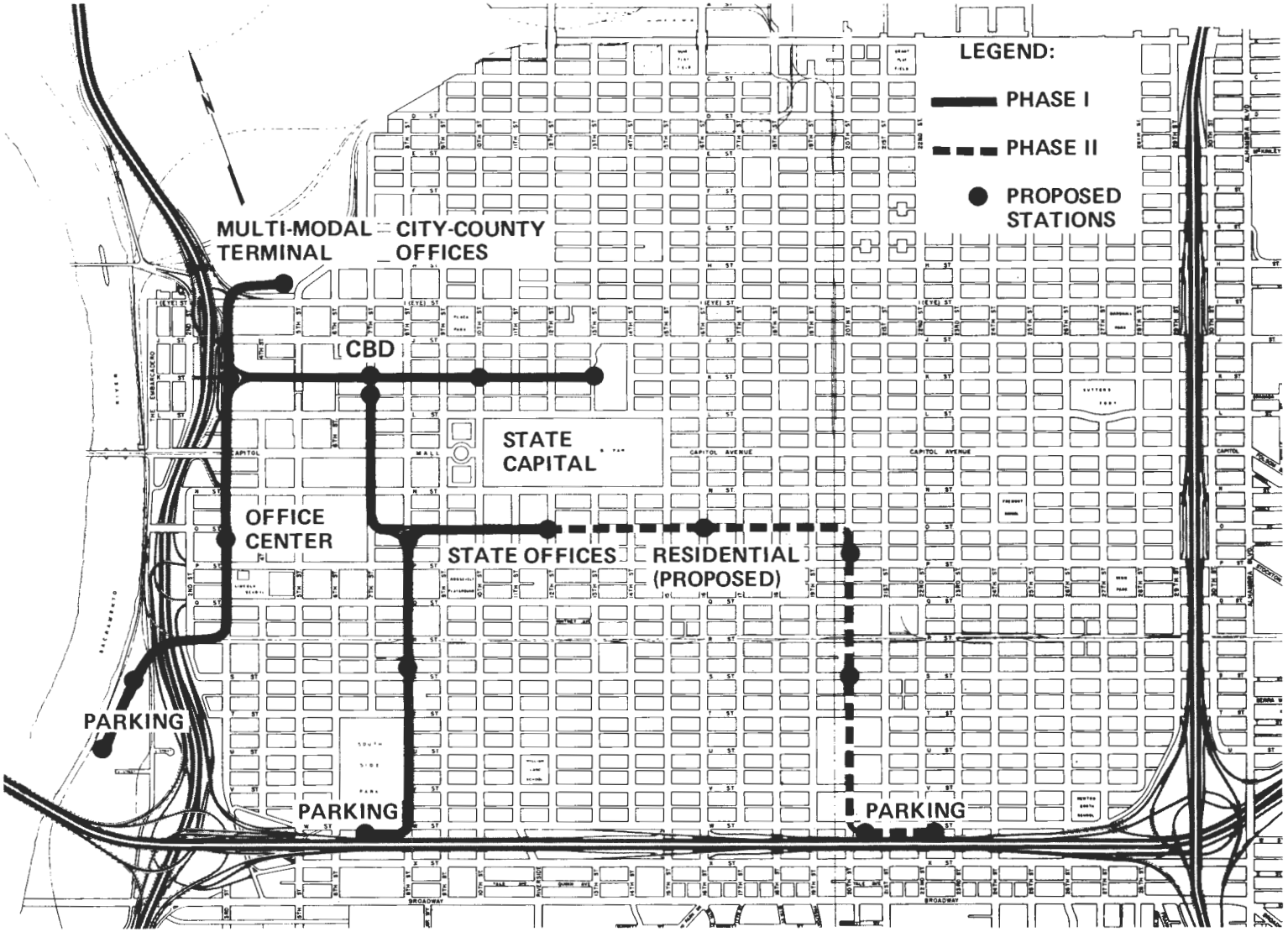
The City of Norfolk (population 290,000) proposed to construct and operate a scheduled shuttle DPM system serving the CBD core with four stations and with two terminal stations at peripheral parking intercepts. The system would carry passengers on an elevated, double lane guideway between elevated, on-line stations. Two stations would be integrated with buildings; one has been constructed to accommodate a second-level station joined to its lobby. Vehicles would be operated in two-car trains.

Major trip generators would include existing and proposed cultural/entertainment facilities, retail district, office facilities, residential neighborhoods within walking distance of the system, and intercept parking facilities. Two-thirds of the anticipated ridership would be CBD employee commuting business trips; the remainder would be cultural and entertainment activities. Downtown employment is expected to increase from 17,000 in 1975 to 26,300 by 1987. Current CBD office floor space is two million square feet.

The DPM proposal is a result of four years of city investigation that included development of system performance criteria and preliminary engineering studies. The system, which will be included in the Regional Transit Development Program, would be funded by existing capital accounts set aside for this purpose. All right-of-way for the system is owned by the city.

Recent transportation developments related to the CBD include development of a ten-block auto-free zone in the retail district served by a partially completed pedestrian walkway system, institution of a free fare downtown bus zone which carried approximately 212,000 persons in the last fiscal year, and development of additional city-owned parking facilities. The City of Norfolk has been actively involved with CBD renewal to include development of retail, entertainment, and residential areas. Additional land development is possible near the DPM system. Visual impact of the guideway is the only environmental problem anticipated.

Sacramento, California


LEGEND:
PHASE I
PHASE II
PROPOSED STATIONS
MULTI-MODAL TERMINAL
CITY-COUNTY OFFICES
CBD
STATE CAPITAL
OFFICE CENTER
STATE OFFICES
RESIDENTIAL (PROPOSED)
PARKING
PARKING
PARKING

SACRAMENTO, CALIFORNIA

SYSTEM DESCRIPTION

Route Length (miles)	-	3.4
Single Lane Miles	-	6.8
Number of Stations	-	12
Number of Vehicles	-	16
Vehicle Capacity (persons)	-	25-30

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	34.9*
Annual Operating and Maintenance Cost (millions of dollars)	-	0.68*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.19*
Proposed Initial Fare (dollars)	-	0.25

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	5.1
Weekday Ridership (passengers per day)	-	16,630
Peak Line Capacity (passengers per hour)	-	1150
Minimum Headway (seconds)	-	30
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*1976 dollars

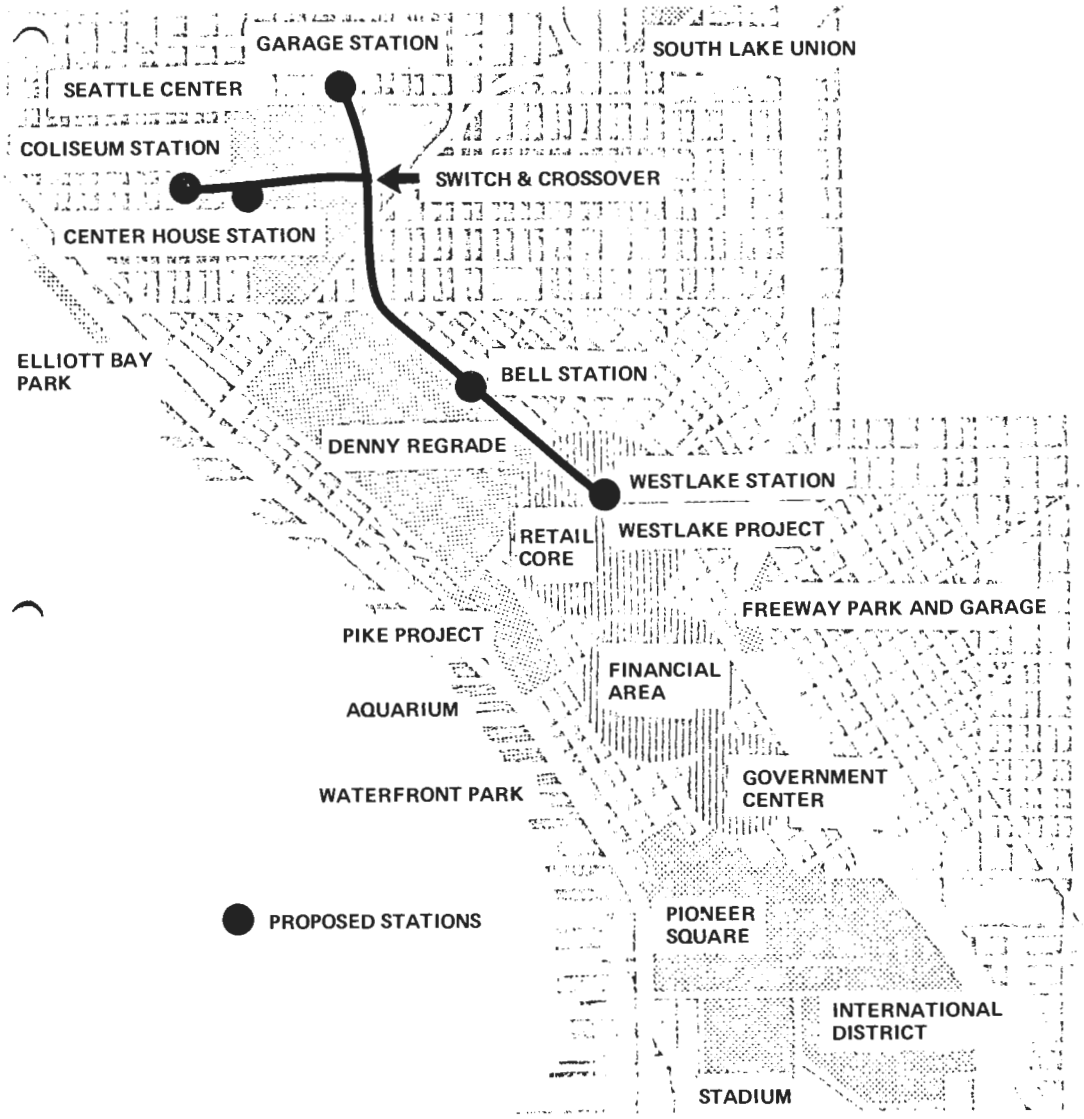
The DPM proposal for Sacramento was sponsored by the City of Sacramento (population 354,000), Sacramento Regional Area Planning Commission, Sacramento Regional Transit District; and the State of California. The proposed system is a multi-link, elevated, double lane system designed to connect the CBD activity centers with proposed peripheral parking facilities. The proposal specifies guideway switching at the maintenance facility.

Major trip generators for the system include government and commercial office facilities, community center and auditorium, historical Old Sacramento, retail facilities, the proposed multimodal terminal, and proposed peripheral parking lots. In addition to serving as a distribution system for auto and bus modes, the DPM would also provide circulation service for employees to retail facilities, which are beyond walking distance for many employees. Current CBD employment is 63,000 and is expected to reach 82,000 by 1990.

Seven alternative routes were outlined in the proposal. The network shown was used as the basis for proposal estimates. This system would be constructed in two phases. The second phase, to be constructed by 1990, would cost $15.7 million (1976 dollars) for an additional 1.4 route miles and 5 stations, and would increase system ridership to 38,500 passengers per day. Potential sources for local funding include parking taxes, a payroll tax or property taxes, as well as state funds.

Related transportation programs designed to complement the DPM include a parking program and construction of a multimodal terminal. The parking program would provide up to 14,000 peripheral parking spaces, with 3100 spaces having direct access to Phase I of the proposed route. The proposed multimodal terminal would serve Amtrak, Greyhound, Trailways, the Regional Transit bus lines, and the DPM. Application for planning funds was pending at the Federal Railroad Administration at the time of proposal submission to UMTA. Planned new development in the Sacramento CBD includes additional government office facilities, hotels, tourist facilities, and medium and high density residential structures. Environmental issues addressed in the proposal include noise, air quality, energy consumption, and visual impacts; net effects were not determined.

Seattle, Washington


GARAGE STATION
SOUTH LAKE UNION
SEATTLE CENTER
COLISEUM STATION
SWITCH & CROSSOVER
CENTER HOUSE STATION
ELLIOTT BAY PARK
BELL STATION
DENNY REGRADE
WESTLAKE STATION
RETAIL CORE
WESTLAKE PROJECT
FREEWAY PARK AND GARAGE
PIKE PROJECT
FINANCIAL AREA
AQUARIUM
GOVERNMENT CENTER
WATERFRONT PARK
PROPOSED STATIONS
PIONEER SQUARE
INTERNATIONAL DISTRICT
STADIUM

SEATTLE, WASHINGTON

SYSTEM DESCRIPTION

Route Length (miles)	-	NA
Single Lane Miles	-	NA
Number of Stations	-	5
Number of Vehicles	-	NA
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	26.0*
Annual Operating and Maintenance Cost (millions of dollars)	-	0.2*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	NA
Proposed Initial Fare (dollars)	-	NA

SYSTEM PERFORMANCE AND OPERATIONS

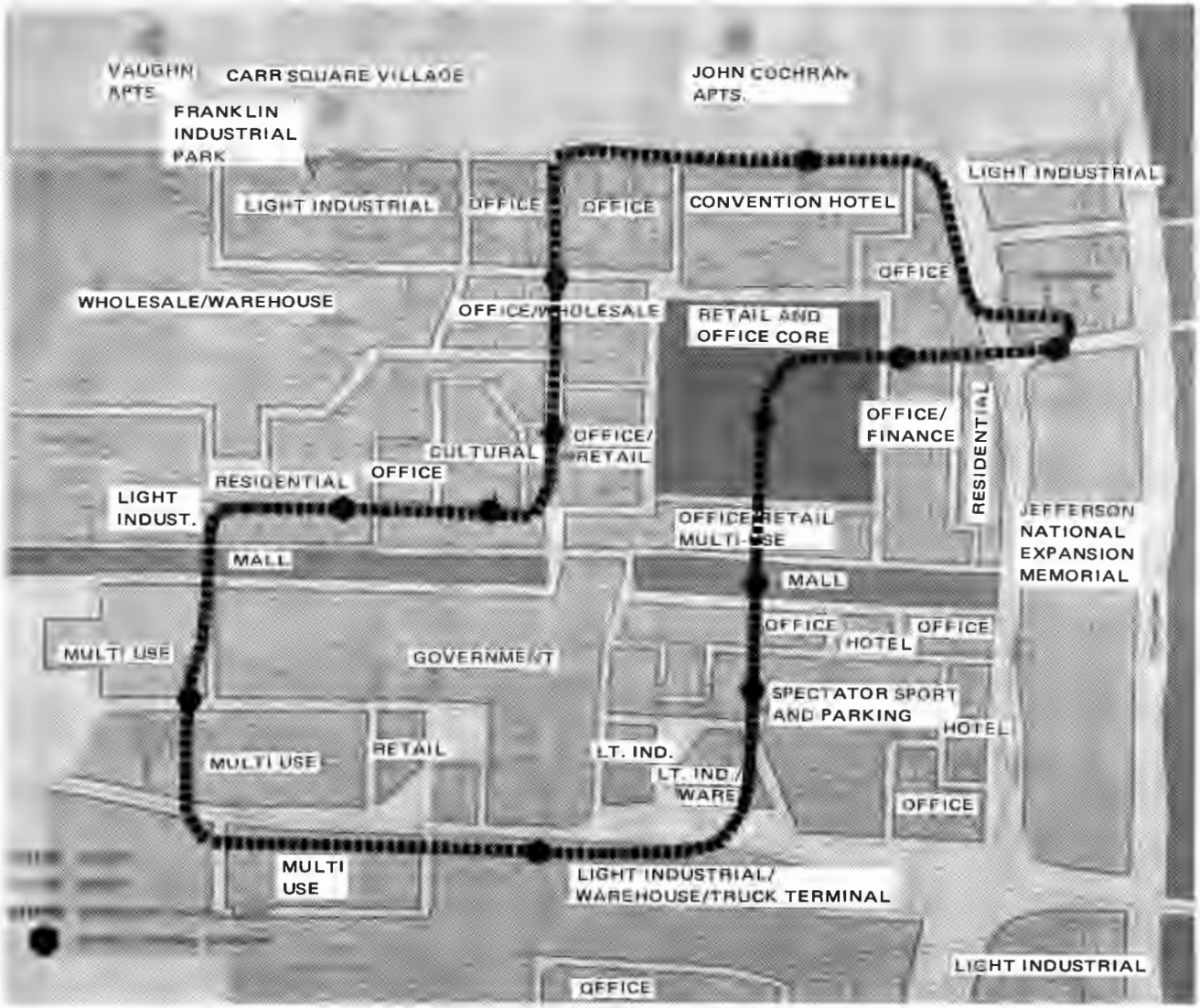
Annual Ridership (millions of passengers)	-	NA
Weekday Ridership (passengers per day)	-	20,000
Peak Line Capacity (passengers per hour)	-	NA
Minimum Headway (seconds)	-	60
Maximum Velocity (miles per hour)	-	NA
Fare Collection	-	NA
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*1976 dollars

The City of Seattle (population 581,000) and METRO Transit proposed to convert and expand the existing Alweg monorail system to a double lane, elevated DPM system, connecting the Seattle CBD and the Seattle center grounds and parking facilities. In the CBD, the system would serve office buildings, proposed residential development, and the retail core, terminating at the West Lake Mall currently under development. The system would incorporate a goods movement function to facilitate the use of the DPM for shopping trips.

Planning for the DPM system was initiated in 1973 and a Phase I report included alignment analysis and patronage estimates. Local share of capital costs would consist of city owned property to be used as DPM right-of-way. The proposed site is located in an area slated for intensive land use changes, particularly residential and convention development. Potential environmental problems would be minimal since the city currently has an elevated monorail.

St. Louis, Missouri


VAUGHN APTS
CARR SQUARE VILLAGE
JOHN COCHRAN APTS.
FRANKLIN INDUSTRIAL PARK
LIGHT INDUSTRIAL
OFFICE
OFFICE
CONVENTION HOTEL
LIGHT INDUSTRIAL
OFFICE
WHOLESALE/WAREHOUSE
OFFICE/WHOLESALE
RETAIL AND OFFICE CORE
OFFICE/ FINANCE
RESIDENTIAL
OFFICE/ RETAIL
CULTURAL
RESIDENTIAL
OFFICE
LIGHT INDUST.
OFFICE/RETAIL MULTI-USE
JEFFERSON NATIONAL EXPANSION MEMORIAL
MALL
MALL
OFFICE
OFFICE
HOTEL
MULTI USE
GOVERNMENT
SPECTATOR SPORT AND PARKING
HOTEL
RETAIL
LT. IND.
MULTI USE
LT. IND./ WARE
OFFICE
MULTI USE
LIGHT INDUSTRIAL/ WAREHOUSE/TRUCK TERMINAL
LIGHT INDUSTRIAL
OFFICE

ST. LOUIS, MISSOURI

SYSTEM DESCRIPTION

Route Length (miles)	-	3.7
Single Lane Miles	-	7.4
Number of Stations	-	12
Number of Vehicles	-	8
Vehicle Capacity (persons)	-	100

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	43.5*
Annual Operating and Maintenance Cost (millions of dollars)	-	2.2*
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.60
Proposed Initial Fare (dollars)	-	0.25

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	5.5
Weekday Ridership (passengers per day)	-	18,000
Peak Line Capacity (passengers per hour)	-	1200
Minimum Headway (seconds)	-	105
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	None
Emergency Egress	-	NA
Security Provisions	-	NA
Elderly and Handicapped Provisions	-	NA

*1976 dollars

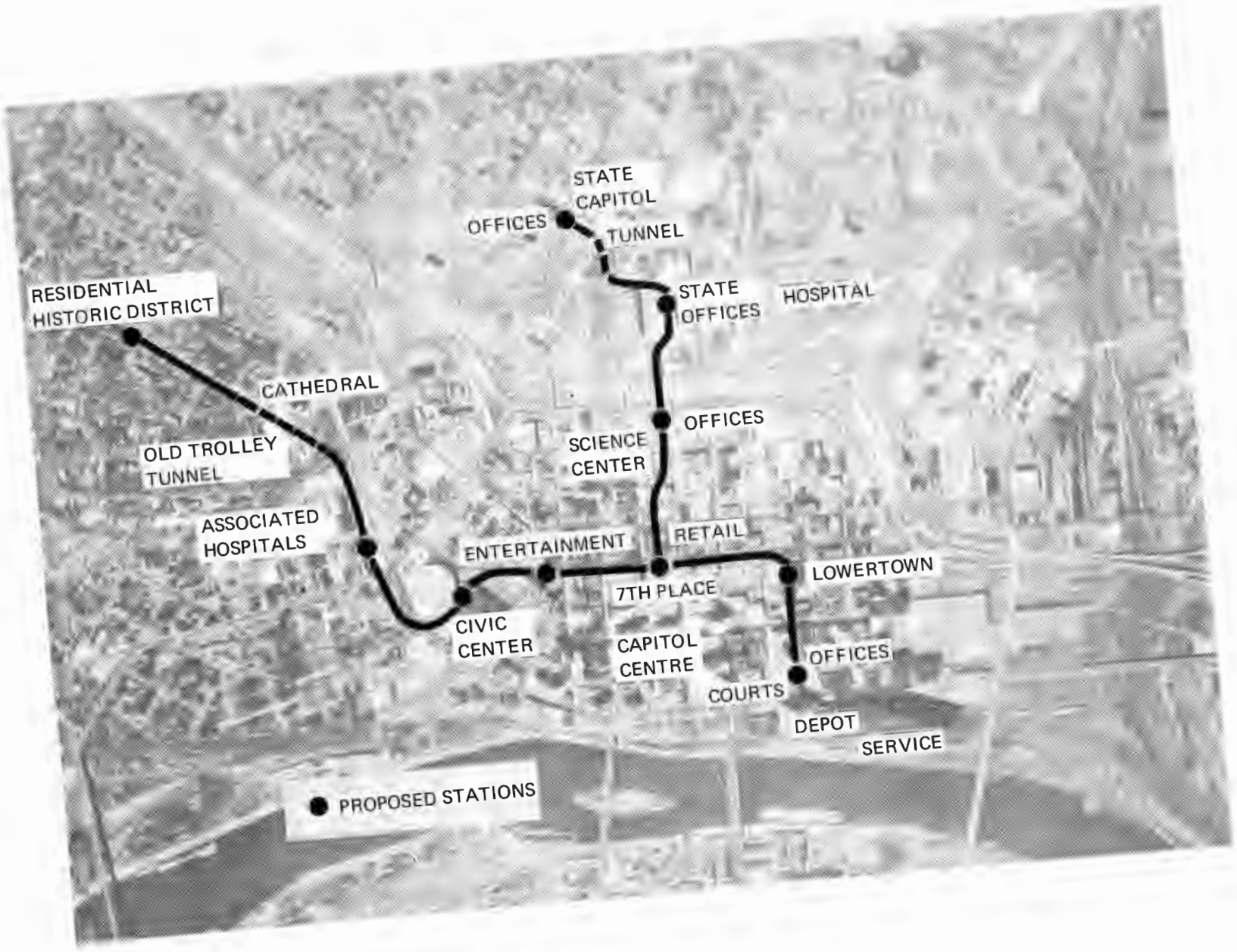
The DPM system proposed by St. Louis (population 622,000) is a double lane, loop system with at-grade (25 percent) subsurface (24 percent) and elevated (51 percent) guideway. The system, to be operated by St. Louis and the Bi-State Development Agency, would provide direct intermodal connection with other transportation modes (including the planned bus concourse and minibus circulation system and Amtrak services). Single unit and trained vehicles are specified. Switching would be required at the Union Station.

DPM routing would connect major employment, tourist, and commercial centers in the CBD. Employment within two blocks of proposed DPM guideway is estimated at 104,000. Current office floor space is 15.3 million square feet. Shoppers would make up 54 percent of the estimated annual DPM ridership, recreational trips 30 percent, and employees 15 percent.

Previous transportation planning includes a long-range transit plan recommending a high-capacity transit system into which DPM would be integrated. Local share of capital funding would be provided through 1/2 cent sales tax revenue collected in the City of St. Louis and St. Louis County. Value capture opportunities in connection with existing and proposed developments in the CBD include dual functions for existing parking lots to serve as park-and-ride lots for DPM patrons, and stations combining retail and small service convenience facilities (construction of the stations possibly to be paid for by building owners).

Much development has occurred in the St. Louis CBD in recent years and more is committed for the future. This development includes new office buildings, an entertainment and recreation center at Union Station, renovation of historical sites and a new convention center. A system of specialized, street-level pedestrian arteries with new paving and landscaping is underway; pedestrianways are to be complemented by expansion of the skyway pedestrian system. The initial segment of the skyway linkage will establish a seven-block shopping complex with more than 1.8 million square feet of retail floor space. A DPM station would be tied to the primary skyway system. The major environmental issues outlined in the proposal was the DPM's visual impact on surrounding facilities.

St. Paul, Minnesota


STATE
CAPITOL
OFFICES
TUNNEL
RESIDENTIAL
HISTORIC DISTRICT
STATE
OFFICES
HOSPITAL
CATHEDRAL
OFFICES
SCIENCE
CENTER
OLD TROLLEY
TUNNEL
ASSOCIATED
HOSPITALS
ENTERTAINMENT
RETAIL
LOWERTOWN
7TH PLACE
CIVIC
CENTER
CAPITOL
CENTRE
OFFICES
COURTS
DEPOT
SERVICE
PROPOSED STATIONS

ST. PAUL, MINNESOTA

SYSTEM DESCRIPTION

Route Length (miles)	-	2.6
Single Lane Miles	-	5.2
Number of Stations	-	10
Number of Vehicles	-	NA
Vehicle Capacity (persons)	-	NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	-	48.2*
Annual Operating and Maintenance Cost (millions of dollars)	-	1.9**
Operating and Maintenance Cost per Vehicle Mile (dollars)	-	1.90*
Proposed Initial Fare (dollars)	-	0.10

SYSTEM PERFORMANCE AND OPERATIONS

Annual Ridership (millions of passengers)	-	13.0
Weekday Ridership (passengers per day)	-	48,000
Peak Line Capacity (passengers per hour)	-	4000 to 6000***
Minimum Headway (seconds)	-	60
Maximum Velocity (miles per hour)	-	30
Fare Collection	-	Honor System
Emergency Egress	-	Guideway Walkways
Security Provisions	-	Closed Circuit Television/ 2-Way Radio Communication
Elderly and Handicapped Provisions	-	Elevators and Ramps

*1976 dollars

**Maximum estimate, 1976 dollars

***Additional capacity for special events at civic center

The City of St. Paul (population 309,980) and the Metropolitan Transit Commission (MTC) proposed a two-line DPM system to be operated by the MTC. One line, 1.9 miles in length, connects major downtown activity centers with seven stations, and a north-south shuttle, 0.7 miles in length, serves the State Capital Complex with 3 stations. The guideway will be 82 percent elevated, 3 percent at-grade, and 15 percent underground; 73 percent of the guideway will be double lane; the remainder single lane. Six stations will be aerial and free standing; one station, depressed grade; three stations will be integrated into new buildings. Bidirectional vehicles, switching at the crossovers and storage siding, and snow and ice removal were included in the proposal specifications.

Major trip generators include existing and proposed residential neighborhoods, commercial and public offices, retail facilities, civic centers, and medical facilities. About 60 percent of all DPM trips are expected to be work related, with the majority of the work trips to be non-commuting downtown employee travel. Current employment within two blocks of the guideway is estimated at 32,000. By 1985, total CBD employment is expected to increase 10 percent from the current 60,000. Current CBD office floor space is estimated at 6.6 million square feet.

Planning for a DPM system has been underway since 1968. The system will be jointly funded by the city and MTC through bonds, right-of-way contributions, and value capture revenues. Value capture techniques to be used include leasing of air rights, connector fees at station sites, and benefit assessment for leased properties at stations. The system has received much local support, to include a "no strike, no-lockout" agreement with the St. Paul Building and Construction Trade Council for construction of the DPM.

Recent transportation developments related to the CBD include a ten-block skyway system, a pedestrian mall at Seventh Street Galleria, and institution of a ten cent fare, downtown bus system. A system of new streets consisting of one-way paired streets connecting to the beltway of freeways is nearing completion. Urban renewal efforts have been strong since the mid-60s and have resulted in new and renovated department stores and office facilities, high-rise apartments, and a civic center; 22 new developments are expected by 1980. A draft Environmental Impact Analysis has been prepared for the system. The major environmental problem expected is the visual intrusion of the DPM link through an historical residential district. UMTA has recommended that St. Paul reevaluate this link of the system.

5.0 CHARACTERISTICS OF OTHER CANDIDATE DPM PROPOSALS

The following data is based on the proposals submitted by other candidate cities; city population estimates are based on the 1970 Census. Ridership estimates and operating and maintenance cost projections are for the initial year of operation. Information not available in the proposals is indicated.

ALBANY, NEW YORK

SYSTEM DESCRIPTION

Route Length (miles)	- 1.5 to 2.5*
Single Lane Miles	- 3.0 to 5.0*
Number of Stations	- 3 to 10*
Number of Vehicles	- 5 to 20*
Vehicle Capacity (persons)	- 12 to 20
Weekday Ridership (passengers per day)	- 16,000 to 21,000
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 10.0 to 35.0**
Annual Operating and Maintenance Cost (millions of dollars)	- 0.55***
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 1.00**
Proposed Initial Fare (dollars)	- 0.10

The City of Albany (population 116,000) proposed a double lane, shuttle DPM system to serve the CBD. The proposal indicates that the system could be built in two phases. The first phase would serve State government facilities; Phase 2 would involve an at-grade moving beltway to extend Phase I, and an additional shuttle to connect the Federal Building with the State Museum and the office tower. The actual system constructed may be one of the two alternative type systems described above or combination of the two.

Sources for the local share of capital funds included bond issues and anticipated financing from the State and County governments. The city has retained a consultant to study downtown circulation problems as part of its Unified Work Program.

*Range indicates Phase 1 and Phase 2
**1976 dollars; low capital cost figure for Phase 1, high capital cost figure for both phases
***O&M cost for both phases

ALTOONA, PENNSYLVANIA

SYSTEM DESCRIPTION

Route Length (miles)	- 0.57
Single Lane Miles	- 1.1
Number of Stations	- 4
Number of Vehicles	- 2
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers)	- 1.5

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 10.0 to 11.0*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.15
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- NA

*1976 dollars; represents range of system costs

The City of Altoona (population 63,000) proposed a double lane, shuttle DPM system to link two CBD shopping areas (which have received urban renewal funds) that are presently bisected by Conrail Tracks. Station locations are not identified. Other possible CBD transportation improvement strategies are development of a pedestrian shopping mall; construction of an intermodal transportation center to serve inter-city and intra-city buses, taxis, Amtrak passenger service, and airport ground transportation service; and construction of a bikeway for the city.

Potential funding sources include the City General Fund, general revenue sharing, city bond issue, housing and development funds, CBD special assessment district, donation of right-of-way, and the State of Pennsylvania.

BOSTON, MASSACHUSETTS

SYSTEM DESCRIPTION

Route Length (miles)	- 3.2
Single Lane Miles	- 3.2
Number of Stations	- 9
Number of Vehicles	- NA
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- 57,000
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 35.0*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.80
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- 0.10

*1976 dollars

A single lane, shuttle and loop system linking the government center with the Naval Shipyard, office facilities, and residential areas was proposed by the City of Boston Redevelopment Authority for the City of Boston (population 641,000). The proposed elevated system (with on-line or off-line stations) would provide direct access to and from local transit, parking facilities, and pedestrian traffic, with major inter-modal interfaces at the Boston Garden Station. Because of high level, short-term demands on the system during peak hours, the system would operate with an inner and outer loop during the peak demand periods. This would be made possible through the use of turnaround lanes.

Local share of capital funds would be raised through a bond issue. Approximately $6 million would be sought from private sources through value capture techniques to develop four or five station facilities.

CLEARWATER, FLORIDA

SYSTEM DESCRIPTION

Route Length (miles)	- 3.7
Single Lane Miles	- 7.4
Number of Stations	- 8
Number of Vehicles	- 9
Vehicle Capacity (persons)	- 69
Weekday Ridership (passengers per day)	- 13,060
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 61.2*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.57*
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- 0.25

*1976 dollars

The City of Clearwater (population 52,000) proposed a double lane, shuttle DPM system that would connect the downtown area of Clearwater on the mainland with the downtown of Sand Key, which is separated by Clearwater Bay. The DPM guideway would be elevated approximately 12 to 16 feet above ground, except for on the Intracoastal Waterway crossing where it must be 65 feet above mean high water. One station would serve as an intermodal transfer terminal, control center, and maintenance facility. Because of the possibility of storms with high winds, tidal waves, and flooding, the DPM must be capable of withstanding water action and uninterrupted operation under wind speeds up to 100 mph.

Local share of capital funds would be provided by the Florida State Department of Transportation (50 percent) and by the City of Clearwater (50 percent) through donation of land, bond sales, or general revenue funds. No specific previous planning for a DPM has been done, but past studies for the area have included recommendations for additional bridge crossings.

DULUTH, MINNESOTA

SYSTEM DESCRIPTION

Route Length (miles)	- 12.1
Single Lane Miles	- 24.2
Number of Stations	- 10
Number of Vehicles	- 14
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 72.5*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.90**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 1.53*
Proposed Initial Fare (dollars)	- NA

*1976 dollars

The City of Duluth (population 101,000) proposed a double lane, shuttle DPM system to be constructed through the city's main transit corridor, to serve a medical center, office facilities, a convention center complex, the retail core and several residential areas. The DPM would be routed through a proposed transit-pedestrian mall and interconnect with pedestrian skywalks under development. The guideway would include elevated and at-grade segments. The proposal indicates manually operated hardware would be considered.

Potential funding sources for the local share of capital funds would include local bonds augmented by special state legislation. Past project planning includes a 1973 evaluation report on mini-loop DPM service by the Duluth Model City Administration.

EL PASO, TEXAS

SYSTEM DESCRIPTION

Route Length (miles)	- 2.0/1.3/1.4*
Single Lane Miles	- 3.5/2.8/2.9*
Number of Stations	- 5/4/4*
Number of Vehicles	- 12/10/10*
Vehicle Capacity (persons)	- 50 to 70
Weekday Ridership (passengers per day)	- 32,270
Annual Ridership (millions of passengers)	- 11.8

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 25.5/18.8/19.4**
Annual Operating and Maintenance Cost (millions of dollars)	- 0.66**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 2.00**
Proposed Initial Fare (dollars)	- NA

The City of El Paso (population 322,000) proposed an elevated, single and double lane, shuttle DPM system with three alternative routes. All three routes originate from the El Paso Plaza and Civic Center area and cross the Rio Grande River to Juarez, Mexico. Major activity centers that would be served include Federal and foreign government offices, tourist facilities, and commercial centers. The system would include direct station access to bus lines and enclosed pedestrian systems connecting station platforms with buildings.

Potential sources of local share of capital funds include the State of Texas. Cost of guideway located in Mexico would be borne by the Mexican government. Past project planning dates to 1964 and included preliminary negotiations in 1974 with the Ford Motor Company for construction of an AGT system. The plans for construction of the system have been deferred for several reasons which include Ford's decision to terminate plans for marketing its system.

*Alternative 1, Alternative 2, Alternative 3

**1976 dollars, U.S. portion of capital cost for each alternative is $20.6M/14.0M/14.6M

FORT LAUDERDALE, FLORIDA

SYSTEM DESCRIPTION

Route Length (miles)	- NA*
Single Lane Miles	- 1.8
Number of Stations	- 9
Number of Vehicles	- 10
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 8.6**
Annual Operating and Maintenance Cost (millions of dollars)	- 0.10**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.30**
Proposed Initial Fare (dollars)	- NA

The Board of County Commissioners, Broward County, Florida, submitted the DPM proposal for the City of Fort Lauderdale (population 140,000). The proposed plan is to purchase the Love Field Jetrail system from Braniff Airlines and to ship it to Fort Lauderdale for installation in the downtown. The DPM system, characterized as a single lane, loop configuration (with two by-passes and nine stations) would connect the major activity centers and peripheral parking areas within the CBD. Construction of a multi-modal terminal to include a DPM station, 40 bus berths, a train station, and heliport is included in the DPM proposal costs.

Past project planning for a DPM system dates to 1974. Long-range plans for the DPM include an extension of the system across the New River to the County Administration building or nearby parking garage. Principal sources of the local share of capital funds are the Florida Department of Transportation (50 percent) and Broward County (50 percent). Most of the Fort Lauderdale area is yet to be built and is scheduled for construction through 1980.

*Guideway is largely single lane, some double lane indicated, percent of each unknown
**1976 dollars

KNOXVILLE, TENNESSEE

SYSTEM DESCRIPTION

Route Length (miles)	- 1.25
Single Lane Miles	- 2.5
Number of Stations	- 8
Number of Vehicles	- 5
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- 77,070*
Annual Ridership (millions of passengers)	-20.0*

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 17.3**
Annual Operating and Maintenance Cost (millions of dollars)	- 0.19**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.80**
Proposed Initial Fare (dollars)	- NA

The proposal for the City of Knoxville (population 175,000) consists of an elevated, double lane shuttle DPM system linking the CBD offices and retail centers with the Civic Coliseum, government facilities, University of Tennessee, and residential areas. The DPM would provide direct station access to parking facilities at the Civic Coliseum and at the planned 1981 International Energy Exposition, and at a proposed spur rail line.

Funding sources include city bonds, business taxes, and the State Bureau of Mass Transit. Future plans for the DPM include direct extensions to the University of Tennessee and the Fort Saunders area. The proposal notes that the DPM is essential to solving transportation problems associated with the 1981 Energy Exposition. The general topography of Knoxville has created transportation problems; however, topographic effects on the DPM system are not given.

*Weekday only--based on 21,000 people using the system 3.67 times a day
**1976 dollars

LAKE CHARLES, LOUISIANA

SYSTEM DESCRIPTION

Route Length (miles)	- NA
Single Lane Miles	- NA
Number of Stations	- NA
Number of Vehicles	- NA
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- NA
Annual Operating and Maintenance Cost (millions of dollars)	- NA
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- NA

The City of Lake Charles (population 78,000) proposed a single lane, loop DPM system to serve the City Hall, civic center, a future transit terminal, beaches, and motels. Station locations and general guideway and vehicle characteristics are not identified. The proposed intermodal transportation center (which would include facilities for the DPM) would consist of two buildings, combining an intra-city bus terminal with a consolidated inter-city bus terminal, the latter including a parking garage and a heliport on the roof.

Potential funding sources are an existing one-cent sales tax, legality of such use not determined; or establishment of a special taxing district for the area served by the DPM.

LOUISVILLE, KENTUCKY

SYSTEM DESCRIPTION

Route Length (miles)	- 2.0*
Single Lane Miles	- 2.0*
Number of Stations	- 13**
Number of Vehicles	- 10
Vehicle Capacity (persons)	- 56
Weekday Ridership (passengers per day)	- 13,640
Annual Ridership (millions of passengers)	- 4.1

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 24.0***
Annual Operating and Maintenance Cost (millions of dollars)	- 0.27 to 0.43****
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.60 to 1.00****
Proposed Initial Fare (dollars)	- 0.10

The Transit Authority of River City submitted a proposal for an elevated, single lane, loop DPM system for the City of Louisville (population 361,472). It would serve the CBD connecting major tourist and convention centers, government office facilities, major hotel centers, and the River City pedestrian and shopping mall. The proposed DPM route, to be completed in two phases, would intersect existing bus routes and provide connections to existing and proposed parking facilities. The proposed system would replace the River City Mall Circulator. Phase I would consist of a single lane loop with a north-south alignment. Phase II would be an intersecting east-west loop, tying high density residential and work areas (including a hospital complex) into the Mall development. The route alignment indicates two off-line stations, the remainder on-line.

Possible sources of the local share of capital costs are: transit monies earmarked from the Occupational License Tax; State Government Funds; and donations (money or right-of-way) by private developers.

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*Phase I only; guideway length based on scaled map of proposed route; does not include guideway to maintenance facility

**Some portions of the proposal indicate 13 stations, others 11 stations

***1976 dollars

****1976 dollars, low and high range costs

MARIETTA, GEORGIA

SYSTEM DESCRIPTION

Route Length (miles)	- 2.4
Single Lane Miles	- 4.7
Number of Stations	- NA
Number of Vehicles	- NA
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- 2500
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 3.0 to 7.0*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.6**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- NA

The City of Marietta (population 27,000) proposed a DPM system with four intersecting shuttles which would connect county government facilities, a medical complex, and several residential areas, including elderly high-rise housing. The proposed system would carry passengers on an elevated, double lane guideway.

Possible funding sources include in-kind service for right-of-way acquisition, construction, management, and maintenance; Community Development Block Grant Funds from the Department of Housing and Urban Development; and City bonds. A redevelopment study of the Marietta Square area is currently underway.

Long-range plans of the Metropolitan Atlanta Rapid Transit Authority (MARTA) and the Atlanta Regional Commission call for two future MARTA transit stations at Marietta. The proposed DPM would be a feeder system to MARTA and could replace one proposed MARTA station. Currently, neither Marietta nor Cobb County has a public transit system, and parking spaces are at a minimum in the CBD.

*1976 dollars, represents range of potential system costs
**1976 dollars

NASHVILLE, TENNESSEE

SYSTEM DESCRIPTION

Route Length (miles)	- 1.2/1.8/2.3*
Single Lane Miles	- 1.2/1.8/2.3*
Number of Stations	- 7/10/14*
Number of Vehicles	- 14/38/28*
Vehicle Capacity (persons)	- 22
Weekday Ridership (passengers per day)	- 3,590**
Annual Ridership (millions of passengers)	- 1.03**

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 11.5/18.1/ 34.8***
Annual Operating and Maintenance Cost (millions of dollars)	- 0.4**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.90**
Proposed Initial Fare (dollars)	- 0.20

The Metropolitan Transit Authority of Nashville and Davidson County proposed three alternative elevated DPM configurations for the City of Nashville (population 448,000)**** Alternative 1 is a single lane, two-way shuttle; Alternative 2, a single lane loop; Alternative 3, which the city considers will best meet its transportation needs, has two single lane shuttles, and a single lane loop integrated into a centralized transportation center. It would serve several hotels, Federal and state offices, entertainment centers, METRO offices, several retail areas, and office facilities.

Past project planning for a DPM includes a 1970 UMTA-sponsored study titled "Transportation Planning in the Central Business District," which discusses the possibilities of a people mover system to connect CBD parking and bus facilities. A current study sponsored by UMTA is expected to identify the DPM concept as an alternative for downtown transportation problems. Funding alternatives are to be developed.

*Alternative 1, Alternative 2, Alternative 3
**Alternative 3 only
***1976 dollars, excluding right-of-way costs for Alternatives 1 and 2
****Population figure includes adjacent Davidson City

NEW ORLEANS, LOUISIANA

SYSTEM DESCRIPTION

Route Length (miles)	- 3.0/3.4*
Single Lane Miles	- 6.0/6.8*
Number of Stations	- 8/9*
Number of Vehicles	- 40
Vehicle Capacity (persons)	- 44
Weekday Ridership (passengers per day)	- 50,000
Annual Ridership (millions of passengers)	- 14.9

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 53.1/58.5**
Annual Operating and Maintenance Cost (millions of dollars)	- 2.0 to 2.3***
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.63 to 0.73***
Proposed Initial Fare (dollars)	- 0.15

*Alternative 1, Alternative 2
**1976 dollars
***Low and high range, 1979 dollars

The City of New Orleans (population 593,000) proposed an elevated, double lane shuttle system to provide circulation between the central area, the CBD, and four proposed peripheral park-and-ride facilities. Two alternative DPM routes were presented. Alternative 1 serves the intense tourist and commercial activities of the Vieux Carre along the riverfront and provides a direct route to the CBD from the park-and-ride garage site farthest from the CBD. Alternative 2 was proposed in the event of public opposition to routing the DPM near the Vieux Carre. Major trip generators include the Superdome, Loyola University, tourist and entertainment facilities in the French Quarter, as well as residential, government, retail, and medical facilities. Both alternatives follow an identical alignment through the CBD.

Potential funding sources include existing property tax receipts or new bond issues. The need for transportation improvements in the central area was identified in 1975 in the Central New Orleans Growth Management Program.

NIAGARA FALLS, NEW YORK

SYSTEM DESCRIPTION

Route Length (miles)	- 3.3
Single Lane Miles	- 3.3
Number of Stations	- 9
Number of Vehicles	- 15 to 45
Vehicle Capacity (persons)	- 45 to 100
Weekday Ridership (passengers per day)	- 20,620
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 21.0 to 37.0*
Annual Operating and Maintenance Cost (millions of dollars)	- 1.7**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- 0.50 to 1.75***

The City of Niagara Falls (population 86,000) proposed an elevated DPM system to primarily serve recreation and tourist facilities. It would be constructed of two single lane loops--(1) a 2.28 mile, 7 station convention center/Prospect Point loop and (2) a 1.06 mile, 2 station Goat Island loop. The DPM would cross the Niagara River at two points. This DPM system would serve the convention center, several hotels, and area tourist attractions. Future plans for the DPM extend the route to the Rainbow Bridge and north along the Niagara River Barge to the Geological Museum, the Aquarium and Whirlpool Park, and up the commercial Main Street corridor.

Principal sources of the local share of funding include the State of New York (50 percent) and local revenue bonds (50 percent). Past project planning for a DPM dates to 1972 with a consultant study of a people mover system.

*1976 dollars, represents range of guideway construction costs and vehicle sizes
**Cost figure includes 30-year amortization of local share of capital costs and 8 percent interest
***Visitor fare of $1.75 and a business/resident rider fare of $.50

ORLANDO, FLORIDA

SYSTEM DESCRIPTION

Route Length (miles)	- 1.6
Single Lane Miles	- 1.6
Number of Stations	- 4
Number of Vehicles	- 12
Vehicle Capacity (persons)	- 12
Weekday Ridership (passengers per day)	- 6330
Annual Ridership (millions of passengers)	- 2.0

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 12.2*
Annual Operating and Maintenance Cost (millions of dollars)	- 0.26*
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.54*
Proposed Initial Fare (dollars)	- 0.20 (round trip)

*1976 dollars

The City of Orlando (population 99,000) proposed an elevated, single lane, loop DPM system to connect shopping centers separated by major highways which bisect the downtown area into quadrants. DPM stations would be on-line and vehicles would be suspended from the guideway.

A Florida DOT grant would cover 50 percent of the local share of capital funds; the remaining 50 percent would be provided by right-of-way donations and local cash from private sources. Past planning for the DPM dates to 1973 with the "Short-Range Transit Study" by the Orange-Seminole Transit Authority recommending a transit shuttle system for the proposed service area.

SAN ANTONIO, TEXAS

SYSTEM DESCRIPTION

Route Length (miles)	- 1.6/1.9/2.5/3.6*
Single Lane Miles	- 1.6/1.9/2.5/3.6*
Number of Stations	- 8/10/11/15*
Number of Vehicles	- 5/5/6/6*
Vehicle Capacity (persons)	- 50
Weekday Ridership (passengers per day)	- 7670 to 9880**
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 27.8/31.7/36.9/ 47.1***
Annual Operating and Maintenance Cost (millions of dollars)	- 0.65***
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 2.85***
Proposed Initial Fare (dollars)	- 0.25

The City of San Antonio (population 654,000) proposed an elevated, single lane, loop DPM system in the CBD and includes four alternative routes. Alternative 1 would serve primarily tourist and convention activity. Alternative 2 would connect tourist, retail, and office centers. Alternative 3 would extend Route 2 to include the Farmer's Market, and new development being built in a major urban renewal program. Alternative 4 would serve all the major trip generators in San Antonio. No route preference is indicated in the proposal.

The State of Texas appears to be a major source of local funds. Past project planning for a DPM includes two 1972 studies, both recommending a people mover system. Some consideration has been given to requiring trash and garbage collection capability in the DPM system.

*Alternative 1, Alternative 2, Alternative 3, Alternative 4
**Low and high range
***1976 dollars

SANTA MONICA, CALIFORNIA

SYSTEM DESCRIPTION

Route Length (miles)	- NA
Single Lane Miles	- NA
Number of Stations	- NA
Number of Vehicles	- NA
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- NA
Annual Operating and Maintenance Cost (millions of dollars)	- NA
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- NA

The DPM system proposed by the City of Santa Monica (population 88,000) would primarily serve retail and office facilities along an existing pedestrian mall.

A DPM is included in the regional transportation plan. A funding plan is not identified; potential sources include allocated revenues from California Legislature, and transportation funds from sales and use tax set aside by City Council. The city's proposal includes a consultant's proposed work plan for a study of the central area circulation system.

SPRINGFIELD, ILLINOIS

SYSTEM DESCRIPTION

Route Length (miles)	- 0.83**
Single Lane Miles	- 1.6*
Number of Stations	- 6 to 8*
Number of Vehicles	- 5*
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- NA
Annual Ridership (millions of passengers)	- NA

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 11.7**
Annual Operating and Maintenance Cost (millions of dollars)	- NA
Operating and Maintenance Cost per Vehicle Mile (dollars)	- NA
Proposed Initial Fare (dollars)	- NA

The Capitol Planning Commission proposed a double lane DPM system for the City of Springfield (population 92,000). The proposed system would be a double lane shuttle between the Illinois State Capitol complex (employing 6,780 persons) and the Springfield CBD. Future expansion of the system (Phase II) would be a loop encompassing and linking with the proposed route. Stations would also provide indirect access with parking facilities. Springfield currently has a CBD shuttle bus system in operation.

Potential funding sources include the State of Illinois, other local government agencies, and commercial interests. Past project planning for the DPM includes a consultant study (1974) recommending a people mover system for the Springfield CBD.

*For Phase I shuttle only
**1976 dollars

TRENTON, NEW JERSEY

SYSTEM DESCRIPTION

Route Length (miles)	- 2.8/2.9/NA/1.4*
Single Lane Miles	- 2.8/2.9/3.3/2.8*
Number of Stations	- 11/12/17/17*
Number of Vehicles	- 18/18/26/21*
Vehicle Capacity (persons)	- NA
Weekday Ridership (passengers per day)	- 11,900/11,800/ 14,600/14,600*
Annual Ridership (millions of passengers)	- 3.5/3.5/4.3/4.4*

SYSTEM ECONOMICS

Total Capital Cost (millions of dollars)	- 13 to 25/14 to 27/17 to 33/15 to 29**
Annual Operating and Maintenance Cost (millions of dollars)	- 0.68/.68/.80/.75**
Operating and Maintenance Cost per Vehicle Mile (dollars)	- 0.80/.81/.68/.75**
Proposed Initial Fare (dollars)	- NA

The Trenton DPM proposal was a joint effort of the City of Trenton (population 105,000), Mercer County Improvement Authority, Mercer Metro, Delaware Valley Regional Planning Commission, and Princeton University. Four alternative multi-loop DPM routes were proposed. The alternatives serve approximately the same portion of the CBD connecting government facilities, residential areas, hotels, and commercial activies. The configurations include variations of single and double lane guideways, as well as at-grade and elevated segments. All four routes would provide direct station access to an existing train station and to a pedestrian mall.

The city expects to meet its share of capital funding through dedication of land use by all levels of government involved in the CBD and by in-kind services where applicable. Previous planning for a CBD circulation system began five years ago with studies conducted by Princeton University.

*Alternative 1, Alternative 2, Alternative 3, Alternative 4
**1975 dollars; low and high capital costs provided for each alternative

REFERENCES

1. U.S. Department of Transportation, Urban Mass Transportation Administration, "AGT Socio-Economic Research Program Plan," URD Document Control Number 76-61, September 1976.

2. Downtown People Mover (DPM) Project: Proposals Review, Letter W24-3570A, The MITRE Corporation, METREK Division, 9 August 1976.

3. "Program Plan: The Downtown People Mover (DPM) Project," Urban Mass Transportation Administration, U.S. Department of Transportation, 21 May 1976.

4. Statement delivered by Secretary of Transportation William J. Colemand, Jr., Downtown People Mover (DPM) Project News Conference, Washington, D.C., 22 December 1976.

5. "Automated Guideway Transit: An Assessment of PRT and Other New Systems," Office of Technology Assessment, United States Congress, Washington, D.C.,: U.S. Government Printing Office, June 1975.

6. "People Mover Profile," Transportation Systems Center and Urban Mass Transportation Administration, U.S. Department of Transportation, 1976.

7. "Preliminary Data Based for Existing AGT Systems," The MITRE Corporation, METREK Division, M77-58, July 1977.

8. "Automated Guideway Transit Data," The MITRE Corporation, METREK Division, M77-99, October 1977.

9. "Survey Shows Cities Want Fixed Guideway Transit," Passenger Transport, American Public Transit Association, Washington, D.C., Vol, 35, No. 24, 17 June 1977.

APPENDIX

DOWNTOWN PEOPLE MOVER PROJECT NEWS RELEASE

DEPARTMENT OF TRANSPORTATION

NEWS

URBAN MASS TRANSPORTATION ADMINISTRATION

WASHINGTON, D.C. 20590

FOR IMMEDIATE RELEASE
April 6, 1976

Contact: Joe Marshall
Phone: (202) 426-4043
UMTA 76-30

A project to demonstrate the benefits of fully automated people mover systems in urban downtown areas was announced today by Robert E. Patricelli, Administrator of the Department of Transportation's Urban Mass Transportation Administration (UMTA).

Up to three cities will be chosen by UMTA in the fall of 1976 for the first public operation of Downtown People Mover (DPM) systems.

Administrator Patricelli stated the DPM project is intended to show whether relatively simple automated systems can provide a reliable and economical solution to the local circulation problems in congested downtown areas. "Such systems have proven effective in controlled environments, such as airports," Patricelli said. "We now want to test their feasibility and public acceptance in the harsher and more demanding environment of a real city."

"We feel this project is important not only because it will provide for the first time hard data on the cost-effectiveness of a simple automated system," Patricelli said, "but also because it responds to one of the broader program goals of the UMTA program, that is, to support the effective economic functioning of our central cities."

The UMTA Administrator explained that the project had three major policy goals:

(1) to test the operating cost savings which automated transit systems might deliver;

(2) to assess the economic impact of improved downtown circulation systems on the central city; and

(3) to test the feasibility of surface or elevated people movers both as feeder distributors and as potential substitutes for certain functions now performed by more expensive fixed guideway systems, such as subways.

The project is expected to provide operating data, planning tools, and experience for use by other communities seeking solutions to similar problems of downtown circulation. The project is also intended to demonstrate the acceptability of modern guideway structures and of driverless vehicles in an urban environment.

The DPM Project is to be funded through local public agencies from funds that are available under UMTA's Capital Assistance program, which will provide up to 80 percent of the capital costs required to implement the project. Local participation for the remaining costs must be provided by or through the sponsoring public agency. In addition, UMTA will fund several research, development, and evaluation efforts in direct support of the project.

A "letter of interest" addressed to the UMTA Administrator is requested by May 15, 1976, from communities interested in participating in the project. These communities must also submit by June 30, 1976, a proposal for the project to the UMTA Office of Research and Development, AGT Application Division.

The proposal must provide sufficient data to permit evaluation of the merits of the proposed project, site opportunities, and the degree to which the proposed project best fulfills the criteria set forth by UMTA (see attachment). Based on its review of the project proposals submitted, UMTA will then select up to three sites to perform project engineering. The number of sites that are selected for construction funding will depend on the engineering results and the availability of funds.

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Information for Applicants

UMTA Downtown People Mover Project

Applicants seeking selection for funding Downtown People Mover (DPM) systems must demonstrate, as a minimum, the following:

(1) The candidate city must be willing to select, through a competitive procurement process, one of the existing people mover technologies with minimum modifications to adapt it for urban deployment. The project is not designed to develop new technology.

(2) The applicant must give assurance that, upon completion of the installation, successful testing, and initial public operation, it will continue to operate the system.

(3) The proposed project should have national relevance; i.e., it should illustrate service patterns that would be widely applicable, show intermodal links, and generally be of a nature that would fairly test the feasibility of urban uses of such systems.

(4) The total cost of the installation of the system, including costs for site acquisition, preparation, and integration, should be commensurate with the anticipated benefits. Such benefits as patronage in both peak and off-peak hours, and attainment of local land use and community development goals will be considered.

(5) The candidate city will have to demonstrate:

(a) that adequate planning for the project has been performed;

(b) that the project is consistent with the approved regional transportation plan;

(c) that there is support from all elements of the community that share in the responsibility for the project and that the project has been endorsed by appropriate local officials;

(d) that adequate financial resources to fund the local share of the capital costs of the project have been firmly identified;

(e) that financial resources to fund any deficits that may result from continuing operations and maintenance of the system have been explored;

(f) that adequate technological resources to implement and operate the system will be provided; and

(g) that the project complies with all requirements under the Urban Mass Transportation Act of 1964, as amended.

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