



U.S. Department of Transportation
Urban Mass Transportation Administration

FILE COPY

Downtown People Mover Detroit, Michigan

Final Environmental Impact Statement

December 1980



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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

FINAL ENVIRONMENTAL IMPACT STATEMENT
AND 4(f) EVALUATION

DOWNTOWN PEOPLE MOVER

DETROIT, MICHIGAN

December 3, 1980
Date

Peter Benjamin
Peter Benjamin
Acting Associate Administrator
for Transit Assistance

COVER SHEET

U.S. DEPARTMENT OF TRANSPORTATION URBAN MASS TRANSPORTATION ADMINISTRATION

FINAL ENVIRONMENTAL IMPACT STATEMENT

This document has been prepared pursuant to Section 102(2)(c), P.L. 91-190 of the National Environmental Policy Act of 1969, Sections 3(d) and 14 of the Urban Mass Transportation Act of 1964, as amended, Section 106 of the National Historic Preservation Act of 1966, and Section 4(f) of the Department of Transportation Act of 1966.

RESPONSIBLE AGENCIES:

Lead Agency: Urban Mass Transportation Administration
Cooperating Agency: Southeastern Michigan Transportation Authority

TITLE OF PROPOSED ACTION: Downtown People Mover, Detroit, Michigan

ABSTRACT:

This Final Environmental Impact Statement (EIS) documents the environmental impacts of alternative distribution/circulation systems in the Detroit Central Business District (CBD) and responds to substantive comments received on the Draft EIS. Two alternatives to improve downtown circulation were examined in detail. The first is an automated transit system that would operate in an elevated, tracked guideway and would be controlled from a central operations facility. This Downtown People Mover system would be a 2.96-mile, single-lane, elevated loop around the CBD and would serve thirteen stations. The second is a circulator bus system, which could range from continuation of the two-route circulator now operating downtown to an extensive new system serving the same thirteen stops as the Downtown People Mover.

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This Final EIS was made available on **DEC 12 1980**

SUMMARY

I. MAJOR CONCLUSIONS

This Final Environmental Impact Statement (EIS) was prepared by the Urban Mass Transportation Administration (UMTA) in cooperation with the Southeastern Michigan Transportation Authority (SEMTA) to document the environmental impacts of alternative circulation systems for downtown Detroit.

The Draft EIS for this project was circulated to various federal, state, and local agencies and to interested organizations and individuals in accordance with the regulations of the Council on Environmental Quality and the U.S. Department of Transportation. UMTA received comments on the Draft EIS for 60 days after the official start of circulation on Friday, March 14, 1980. UMTA and SEMTA have addressed all substantive comments received on social, economic, and environmental issues in this Final EIS. Responses to the substantive comments can be found in Chapter VI of this Final EIS. Major changes in the text resulting from comments received are indicated by vertical lines in the margins.

Two alternatives are examined in this EIS--the Downtown People Mover and circulator bus alternatives.

II. DOWNTOWN PEOPLE MOVER ALTERNATIVE

A. DESCRIPTION

The DPM would consist of an automated transit system operating on a tracked guideway on a one-way route and controlled by a central operating facility. The DPM would be entirely above grade. Automated vehicles would serve the 13 stations, all of which would be aerial. A single-lane, elevated-loop alignment 2.96 miles long would be employed. The route would follow existing city streets in circumscribing a CBD area of approximately 0.3 square miles. The guideway would be constructed primarily within the street right-of-way; it could be built in the curb lanes or on existing street medians and elevated throughout its length. Travel speeds on the loop would range from 17 to 30 miles per hour. The entire loop could be traveled in 14 minutes.

Since several suppliers and manufacturers are qualified to implement the different types of DPM systems, no exact guideway design can be identified at this time. However, it is expected that the selected system would have a single-lane guideway and would be constructed of concrete, steel, or a combination thereof. Single-pier supports would be used, except at stations and in bypass areas.

All stations would have stairs, at least one escalator, and at least one elevator (the latter to provide access for the handicapped). Each station would include a platform area for direct access to DPM vehicles, change machines and vending machines for tokens, and entrance and exit gates to the platform area.

A maintenance and control facility is included as an integral part of the DPM system. The entire facility, requiring approximately 60,000 square feet of space, would be housed inside a building designed to store the entire DPM fleet, protecting it from the weather and possible damage by vandals. This building would be located on the fringe of the CBD.

The Detroit DPM would be designed initially to accommodate 5,000 passengers per hour between adjacent stations. Predicted passenger volumes for the system are 71,000 per weekday in 1990, with 11,500 passengers in the noon peak hour.

B. ESTIMATED COST

The total cost of constructing the DPM is estimated to be \$118.55 million (in escalated dollars). It is proposed that 80 percent (\$94.84 million) of this amount come from capital grant funds of the Urban Mass Transportation Administration and that the remaining 20 percent (\$23.71 million) be provided by the Michigan Department of Transportation. Construction could begin in 1981 and the system could be operating by 1983. The annual cost of operating the system is estimated to be \$6.8 million in 1985.

C. SUMMARY OF EFFECTS

1. Long-Term Beneficial Effects

- . The DPM would encourage continuing redevelopment in the CBD and would stimulate the construction of new housing, hotels, and retail and office space. Jobs would thus be created and tax receipts increased.
- . The DPM would reduce auto miles and travel times within the CBD and improve access to CBD activity centers in comparison to the circulator bus alternative.
- . The DPM would slightly reduce emissions of air pollutants in the CBD in comparison to the circulator bus alternative.
- . The DPM would allow better utilization of the existing parking supply at the fringe of the CBD in comparison to the circulator bus alternative and would displace approximately 750 parking spaces within the downtown core. These changes would encourage the use of fringe parking and transit.

2. Long-Term Adverse Effects

. Two viable businesses with approximately 32 employees would be displaced by construction of the maintenance/storage facility, and property and easements, including all or part of seven parking lots, would be required for construction of the system.

. Maximum noise levels would be expected to increase along portions of the guideway in comparison to the circulator bus alternative.

. The DPM would have an adverse effect on three properties eligible for listing in the National Register of Historic Places (the Buckland-VanWald Building, the Grand Circus Park Historic District, and the Detroit Street Plan).

. The DPM would have an adverse impact on the appearance of several areas, particularly in the vicinity of Grand Circus Park. Also, views from the lower floors of some adjacent buildings would be altered.

. The DPM support pillars would restrict traffic capacity at a number of points and would hamper motorists views of approaching vehicles and crossing pedestrians.

3. Short-Term Adverse Effects During Construction

Construction of the DPM would have short-term adverse effects on traffic and the natural environment. Traffic might have to be diverted, resulting in short-term confusion and congestion. Emissions of air pollutants could increase due to construction operations and traffic congestion. Noise levels would increase in the vicinity of construction. A sense of disorder--an adverse visual impact--would be created.

III. CIRCULATOR BUS ALTERNATIVES

A. DESCRIPTION

This alternative includes a range of services--from the two circulator routes now serving the downtown to an extensive loop circulator route. The loop circulator route is 4.03 miles long and has an alignment similar to that of the DPM. This length is necessary to conform to the existing street pattern and to provide more direct service to activity centers. Nineteen 37-passenger buses would be required for one-way service with two-minute headways. The circulator system's capacity would be 1,770 passengers (including standing passengers) per hour between adjacent stops. The system could be run in two directions with two minute headways with an additional 19 buses; capacity would be doubled. An average wait time of 30 seconds on route segments to allow loading and unloading of passengers would result in an average operating speed of 7.5 miles over the route. The entire loop could be traveled in 32 minutes.

Major stops have been proposed at 13 locations on the modified circulator route. These locations correspond to the activity centers at which construction of DPM stations is proposed. At each location, bus shelters

would be constructed. They would include electric heaters, lights, and coin-operated telephones for passengers. All shelters would be located at grade near street pick-up points and within existing public rights-of-way.

Maintenance of additional buses would be part of the normal operations of the Southeastern Michigan Transportation Authority or the Detroit Department of Transportation at existing garages. No additional maintenance facilities would be required.

It has been assumed that the circulator bus route would operate between 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays and between 10:00 a.m. and 6:00 p.m. on Sundays. For the noon peak hour, projected patronage is 2,700 for the one-way circulator and 3,500 for the two-way system. The average weekday patronage is projected to be 17,000 for the one-way and 21,200 for the two-way system.

B. ESTIMATED COST

Total capital costs for this alternative are estimated to range from zero for continuation of the existing circulator to \$3.37 million for the one-way circulator to \$6.74 million for the two-way circulator (in escalated dollars). Of that total, it is proposed that 80 percent come from capital grant funds of the Urban Mass Transportation Administration and the remaining 20 percent from the Michigan Department of Transportation. Annual operating costs are estimated to range up to \$2.66 million for a one-way circulator and \$5.32 million for the two-way system.

C. SUMMARY OF EFFECTS

1. Long-Term Beneficial Effects

- . The accessibility of activity centers in the CBD would be improved in comparison to the existing bus system.
- . Relatively low capital expenditures would be required and near-term results could be obtained.

2. Long-Term Adverse Effects

- . No impetus for major redevelopment in the CBD would be provided.

3. Short-Term Adverse Effects During Construction

The only construction associated with this alternative is that of bus shelters. Such construction would have only slight impacts.

IV. EVALUATION OF ALTERNATIVES

The alternatives differ in a number of ways:

- . The DPM would result in many more transit trips in the CBD than any of the circulator bus alternatives.
- . The DPM would have the most beneficial effect on the CBD's economy. It would be an impetus for 5.0 to 5.5 percent more office space, 600 more hotel rooms, 1,250 to 1,500 more housing units in 1990, and \$45 to \$65 million more in annual retail sales than the circulator bus alternatives.
- . The capital cost of the DPM would be \$118.55 million and that of the most expensive circulator bus alternative \$6.32 million. The annual operating costs would be \$6.8 million for the DPM and \$2.7 to \$5.3 million for the extensive circulator system.
- . The DPM would result in the displacement of two businesses and portions of seven parking lots. The circulator bus alternatives would not require displacements.
- . The DPM would have an adverse effect on three historic properties (one of them, the Buckland-VanWald Building, would be demolished).

V. SELECTION OF A LOCALLY PREFERRED ALTERNATIVE

After consideration of the information in the Draft EIS and the comments made in writing and orally at the public hearing, the Board of Directors of SEMTA has selected the DPM as the locally preferred alternative.

VI. AREAS OF CONTROVERSY

The substantive comments raised during circulations of the Draft EIS were primarily concerned with the alternatives, impacts on traffic and transportation, air quality and energy, economic impacts, and impacts on historic properties.

VII. ISSUES TO BE RESOLVED

The most important issue to be resolved is whether to commit Federal funds to construct an automated transit system to improve circulation in downtown Detroit or to continue to use buses for circulation. UMTA is considering the significant impacts documented in this EIS, before making a decision.

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I. NEED FOR AND PURPOSE OF ACTION

Downtown Detroit, like other CBD's in older cities, has experienced a decline due to suburban competition, which, to a large extent, contributed to disinvestment in the area. However, with the cooperation of government, labor, business, and the community, Detroit is striving to halt this decline and steer the CBD toward growth and redevelopment. The construction of the Renaissance Center, Joe Louis Arena, Hart Plaza, and other facilities are major indications of Detroit's development potential that have spurred renewed interest in development of other areas in the CBD.

Detroit's CBD is a concentrated major activity center whose physical boundaries are limited by the mobility of its full-time residents and day-time inhabitants. While the area generally referred to as the CBD is defined by a circumferential freeway configuration approximately 1.25 miles square, development within this area is concentrated within a zone approximately one-half mile square (Figure I-1).

The land in the CBD ranges in value from less than a dollar per square foot to over \$130 per square foot in the heart of the financial district. This indicates a difference in value from less than \$40,000 per acre to more than \$5 million per acre for land parcels located less than one-half mile apart. This great range in value is partially a function of accessibility throughout the CBD and of linkages within the CBD. Improvement of such access should result in a significant increase in land value as different areas are connected and benefit from the successes of other locations. This increase in land values will encourage the development of vacant land parcels, thereby further increasing both real estate values and income tax receipts.

Since 1967, the Detroit CBD shopping district has experienced a substantial decline in sales, estimated at over 40 percent. The number of stores and store employees has similarly declined, representing a shift in consumers' preferences to suburban shopping centers, which now rival the downtown in terms of the scope of services offered. The continued viability of the downtown demands that these trends be reversed. Approximately 30 percent of all sales (general merchandise) of the downtown stores are to persons employed in the CBD or visiting the area on other business, 30 percent to other Detroit residents who come downtown to shop, and 40 percent to other regional residents who come downtown to shop. It is estimated that shopping by CBD employees is restricted to those employees having a walk of less than 1,500 feet to the shopping district; longer trips cannot be made without taking time off from work. With total annual sales of \$133 million, shopping by CBD employees and visitors represents approximately \$40 million. Expansion of the CBD marketing district by an improved circulation system to include almost all persons employed downtown or visiting on other business could substantially add to sales of merchandise in the CBD. In addition, it would attract other CBD shoppers by easing the journey between parking lot and store, an advantage now offered by auto-oriented suburban shopping centers.

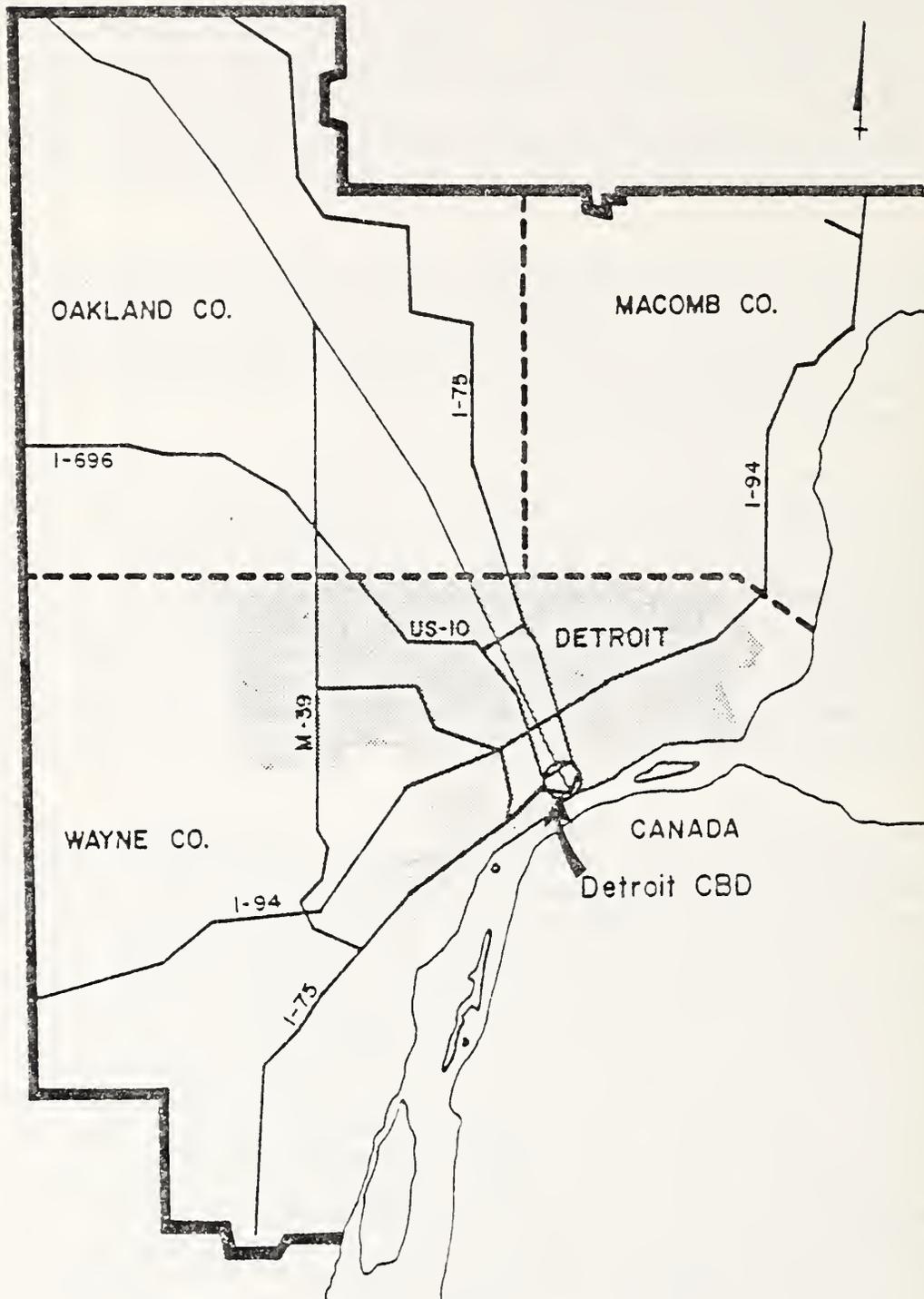


Figure I-1

Detroit City Limits
 Detroit Urbanized Area

LOCATION OF DETROIT CBD

Each year, the city of Detroit hosts more than 500 conventions, totaling over 500,000 delegates. Spending for this purpose in Detroit exceeds \$90 million.¹ An average of 40 of these conventions use the Cobo Hall facilities, requiring shuttle service from the downtown hotels provided by the Metropolitan Detroit Convention and Visitors Bureau, with the cost added to the room rates. An improved CBD circulation system could connect the hotels with Cobo Hall, the Renaissance Center, and other activity centers, giving the city a competitive advantage in attracting large multi-hotel conventions.

Although the Detroit CBD is not large, travel from one point to another is discouraged by the existing street orientation, an abundance of one-way streets, and signal patterns. Thus, trips with both an origin and a destination in the CBD are often difficult and time-consuming.

Transportation problems abound in the downtown. Presently, traffic entering the CBD is equally distributed among three borders of the CBD, with the south side served by the Detroit River Tunnel. Because there are many points of entry into the CBD, including both freeway ramps and surface street arterials, drivers must be well oriented to reach desired parking areas. The auto driver must know which freeway off-ramps to use to reach his parking area or must cross through the CBD over surface streets. Travel through the CBD leads to increased noise, air pollution, congestion, and conflicts between pedestrians and autos. To alleviate this condition, a CBD transportation plan which minimizes disruptive intra-CBD auto travel is under study. This plan, now being formulated, may recommend pairs of one-way roads around the core area of the CBD. Within this core area, several more streets could be converted to pedestrian malls. An improved circulation system is needed to allow auto or transit travelers an easy transition to complete their trips to destinations within or around the core area. This could be accomplished by providing adequate parking areas along the ring roads, while allowing the circulation system to interface with all bus routes. For pedestrians, the design of downtown streets, the land use systems, and signal timing often lengthen travel time and result in convoluted travel patterns.

Another concern involving the Detroit CBD is the inordinate amount of land devoted to surface transportation. Presently, over 65 percent of all land within the freeway ring is allocated to streets or parking. There is a need for both alternative means of access to the CBD via improved regional transit facilities and alternative means of accommodating the parking space requirements and circulation needs of automobiles entering the CBD.

The improvement in accessibility could lead to the redevelopment of the extensive amount of land in the CBD now used for surface parking. A circulation system would interface directly with the existing parking structures associated with Cobo Hall, as well as large public parking lots on the periphery of the CBD and two new publicly-owned parking structures within the CBD. Because these parking facilities are publicly owned and

¹Metropolitan Detroit Convention and Visitors Bureau.

the cost of parking can thus be controlled, the system could promote a shift in CBD parking patterns and allow conversion of surface parking lots in the core area to land uses of higher density.

For these reasons, an improved circulation system would be of great benefit. The system would connect the retail areas, the restaurants, the Renaissance Center, the Cobo Hall Complex, the financial district, the northern portion of the CBD, and proposed developments such as riverfront housing and the Cadillac Center shopping mall, so that travel would be not only easy, but also inviting. There is no question that the vitality of the entire CBD would be dramatically enhanced by improvements in internal circulation.

Improvements in the downtown Detroit circulation system could result in numerous beneficial impacts on transportation and urban development, including increased mobility between various activity nodes in the CBD; development of a collection/distribution system for the downtown; improved interface among parking facilities, highways, bus service, and the planned regional transit system; and reduced reliance on the automobile for trips within the CBD. Improved circulation would contribute to the economic revitalization of downtown Detroit by increasing retail sales, stimulating convention activities, increasing land values, and providing an impetus for redevelopment of underutilized land, particularly surface parking lots, in the CBD.

An improved circulation system would contribute greatly to the revitalization of the city of Detroit and the region. Due to market and aesthetic forces, major development has occurred along or adjacent to Detroit's riverfront. Unfortunately, the emphasis on development in this area has retarded growth in other areas of the CBD, effectively reducing the marketability of these areas. Office buildings once fully occupied are now empty. Many once vibrant hotels have closed their doors due to the convenient location of the Detroit Plaza, the Pontchartrain, and the Radisson-Cadillac Hotels near major activity centers. Numerous businesses, once solvent, have closed and moved to the southern edges of downtown or to the suburbs. Many viable parcels of land have been transformed into parking lots or other underutilized land uses because of lack of interest in the area. If this pattern continues, the only area in the CBD that will be marketable and viable is the southern portion. Optimism must be created in areas other than the southern edge to develop the CBD to its fullest potential and restore it as the major commercial, financial, and recreational center of the region.

Improved CBD circulation would make Detroit a more attractive convention site, and in so doing would benefit downtown hotels and restaurants. It might also entice delegates into the downtown shopping district. The typical delegate in 1973 spent over \$130 beyond any direct transportation costs, so a feature adding to the city's attractiveness would result in an immediate return in terms of increased receipts and higher tax revenues.

An improved circulation system would provide an incentive for development of other less developed areas of the CBD. Hotels, office buildings, and businesses would no longer function as autonomous entities because they

would have a major and accessible link to the convention center, Greektown, and other places of entertainment in the downtown. Instead of walking distances of 30 minutes or more, depending on destination and weather, arrival time could be less than 15 minutes.

Such a system would create an atmosphere conducive to hotel development in the CBD. Because the number of hotels and residential facilities in the CBD is now limited, monopolistic pressures apply to a certain extent. However, the availability of more hotels and residential facilities that are linked to major activity areas of the CBD would create a stronger convention market.

Links to major activity centers and accessibility must be emphasized in concert with development in the CBD. The purposes of an improved circulation system would be: (1) to further the economic revitalization of the CBD by linking major activity centers and by increasing business income and city property and income tax revenues; (2) to serve the collection/distribution function in downtown Detroit; and (3) to aid in the establishment of a transportation system that coordinates parking facilities, automobile traffic, and transit.

II. ALTERNATIVES INCLUDING PROPOSED ACTION

A. DEVELOPMENT OF ALTERNATIVES

Since 1968, studies in southeastern Michigan have addressed the feasibility of an automated people mover system to serve the Detroit Central Business District (CBD). A Downtown People Mover (DPM) for Detroit has been considered for two reasons. One is the opportunity to develop a grade-separated downtown circulation system to facilitate trips in the CBD. The second is to improve the economic functioning of Detroit's CBD. If the CBD is to maintain or enhance its position as the major activity center in southeast Michigan, an improved transportation system that will allow the CBD to function as an integrated unit is needed.

In 1972, the Southeastern Michigan Transportation Authority (SEMTA) assumed responsibility for regional transit planning, including development of a DPM system for Detroit. Planning for the DPM was initiated in November, 1973, with a feasibility study sponsored by the Michigan Department of Transportation (MDOT) as part of the state's New Transportation Technology Demonstration Program. This study established a basic project plan for the Detroit DPM.

In May, 1974, the Detroit DPM proposal was one of four selected by the state for a detailed preliminary engineering study. This study was culminated in June, 1975, with the publication of several major documents, including a Preliminary Engineering Report, a Preliminary Systems Specification, and a Draft Environmental Impact Assessment Report (EIAR).

The DPM defined by the 1975 preliminary engineering study consisted of a 2.3-mile loop with a single lane, allowing normal one-way operation. The study included projections of patronage, route alignment studies, assessment of environmental impacts, urban design studies, definition of the system's operating and performance characteristics, and estimates of operating, maintenance, and capital costs. The DPM was seen as a means to connect new CBD development with the existing core of the center city, encouraging low-cost parking at the edge of the CBD and improving opportunities for development and circulation within the CBD. The EIAR was submitted to MDOT for approval.

While the state-sponsored DPM studies were underway, the federal government was becoming increasingly interested in developing new, fully automated transit systems for urban areas. In 1975, an Automated Guideway Transit program for socioeconomic research was approved by Congress and initiated by the Urban Mass Transportation Administration (UMTA). In April, 1976, UMTA announced the establishment of a Downtown People Mover Demonstration Program--the purpose being to construct DPM's in a number of cities to investigate their feasibility. The major objectives of this program were to determine the potential cost savings in the operation and maintenance of automated transit as compared to bus operations, identify the impact of improved circulation on the economy of the center city, test the feasibility of the DPM to replace more expensive rail systems, and establish the reliability and social acceptability of a DPM

system in the downtown environment. Thirty-eight cities submitted formal proposals as candidate sites for a DPM system. In December, 1976, four were approved as demonstration cities for the DPM program. Detroit's proposal, which was developed from the earlier work sponsored by MDOT, was selected by UMTA as one to be considered further.

In September, 1978, Phase I (Preliminary Engineering) of the Detroit Downtown People Mover project began. Only two types of downtown circulation systems have been considered in detail in the definition of alternatives: a DPM and a circulator bus system. The DPM is a grade-separated, automated, tracked system providing public transportation service of high frequency and capacity to the downtown area. The circulator bus alternative provides service similar to that of the DPM, but operates in mixed traffic on existing roadways.

Other alternative transit improvements have been studied and eliminated because they were not considered feasible for circulation in Detroit's CBD. They include a line-haul bus system, line-haul rail (fixed route) system, heavy rail elevated circulator system, and moving sidewalks. The line-haul bus and rail alternatives would have been the Detroit CBD portion of a regional transit system; they were discarded because they would not have satisfied the circulation needs of the downtown. A heavy rail elevated system lacks the flexibility of a DPM or circulator bus alternative to operate as a circulator system because of its cost, operating characteristics, and the large turning radii required. A moving sidewalk system presents technological difficulties because of the requirement that it operate outdoors and because of the extreme length that would be required to serve the downtown.

1. Stage One DPM Alternatives

A preferred DPM alignment was defined by means of a two-stage evaluation process. Before the first stage of evaluation, goal areas, objectives, and measures of effectiveness were defined by the DPM Technical Task Force, a group of professionals from city, regional, and state agencies, with the assistance of a team of consulting engineers. The DPM goal areas included impacts on the economy, land use, downtown circulation, society, and the environment, as well as cost. Objectives and measures of effectiveness were identified for each goal area to allow a numerical evaluation of each DPM alternative. The relationship between goal areas, objectives, and measures of effectiveness is shown in Table II-1. The criteria and the evaluation process were reviewed and approved by a DPM Steering Committee, composed of twenty people with diverse interests, including representatives of local government and business. The Steering Committee weighted each of the measures of effectiveness and made recommendations to the SEMTA Board of Directors for final action. The alternatives and weighting process were presented at two public meetings held in downtown Detroit to determine public interest and comments. Participants at these meetings usually asked informational questions or expressed their belief in the need for a DPM.

The first stage of the evaluation process was a preliminary evaluation of a variety of alignments in terms of the goal areas and measures

TABLE II-1

DPM GOAL AREAS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS

| Goal Area | Objective | Measure of Effectiveness | |
|---|--|---|--|
| 1. Economic Impacts | • Increase employment developments. | • Total number of jobs located in developments attributable to DPM. | |
| | • Increase retail sale developments. | • Total retail floor area or sales volume attributable to DPM. | |
| | • Increase residential developments. | • Number of dwelling units located in developments attributable to DPM. | |
| | • Increase other developments. | • Dollar volume of cultural, entertainment, and convention facilities attributable to DPM. | |
| | • Support and contribute to revitalization of existing retail/residential/hotel/office base. | • Total floor area of existing residential, retail, hotel, or office establishments within 600 feet of a DPM station. | |
| | • Promote joint development. | • Joint development value at stations. | |
| | 2. CBD Circulation | • Maximize level of service. | • Average trip time. |
| | | • Improve accessibility to selected major activity centers. | • Number and relative priority of identified activity centers with a major entry within 600 feet of a DPM station. |
| • Maximize daily ridership. | | • Daily ridership. | |
| • Interface with regional public transit. | | • Number of line-haul transit vehicle riders on vehicles that stop within 200 feet of a DPM station. | |
| • Interface with private transportation. | | • Number of parking spaces in garages within 200 feet of a DPM station. | |

DPM GOAL AREAS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS

| Goal Area | Objective | Measure of Effectiveness |
|----------------------------------|---|--|
| 3. System Costs | <ul style="list-style-type: none"> • Minimize total system costs. | <ul style="list-style-type: none"> • Operation and maintenance costs; capital cost of total system. |
| 4. Land Use/Development Priority | <ul style="list-style-type: none"> • Ensure compatibility with city priorities for service. • Ensure ability to be expanded to serve future developments. • Minimize use of high value land in CBD core for parking. | <ul style="list-style-type: none"> • Qualitative judgment of identified future development projects with major entry within 600 feet of a DPM station. • Distance to and ease of construction of specific existing and future developments (developments to be prioritized; ease of construction to be qualitatively estimated). • Land area of parking spaces not required in the core due to location of DPM (relative to doing nothing alternative). |
| 5. Environmental Impacts | <ul style="list-style-type: none"> • Minimize impacts on aesthetics. • Minimize noise. • Minimize air pollution. • Minimize impacts on architectural and historical sites. | <ul style="list-style-type: none"> • Number (with qualitative judgment) of areas with obstructed vistas or architectural incongruities. • Qualitative rating of impact. • Qualitative rating of impact. • Qualitative judgment of impact on identified architectural and historic sites. |
| 6. Social Impacts | <ul style="list-style-type: none"> • Maximize service to transportation-disadvantaged. • Minimize disruption of neighborhoods and the total community. | <ul style="list-style-type: none"> • Total floor area of institutions within 600 feet of DPM stations. • Number of dwelling units displaced; assessed valuation of real estate or business establishments displaced. |

Source: GM Transportation Systems Division, "Detailed Analysis of Alternatives," working paper prepared for SEMTA, March, 1979.

of effectiveness.² A loop configuration was determined to be best for serving downtown Detroit. The loop system has the advantage of serving both the fringe and core areas of the CBD, which will encourage expansion of the core, being operationally efficient for one-way service and connecting the dispersed Detroit CBD activity centers in an efficient manner.

The DPM Steering Committee was asked to assign weights to each of the goal areas to be used in the evaluation process, reflecting the relative importance of each one in selecting a preferred alignment. The weights are shown below:

| <u>Goal Area</u> | <u>Weight</u> |
|-------------------------------|---------------|
| Economic Impacts | 27.3 |
| CBD Circulation | 20.0 |
| System Costs | 12.7 |
| Land Use/Development Priority | 23.2 |
| Environmental Impacts | 10.2 |
| Social Impacts | 6.6 |

Through the weighting process, the Steering Committee expressed its view that the most important considerations in choosing a DPM alignment should be economic impacts, land use/development priority, and CBD circulation. These three goal areas were ranked higher than the others. After the goal areas had been weighted, data were developed for each of the measures of effectiveness under each of the goal areas. The Steering Committee evaluated the data and assigned scores to each alternative to express how well it met the objectives in comparison to the other alternatives.

Alternative alignments were developed to analyze different patterns of service to the major activity centers in the CBD (Figure II-1). The service provided by each alternative is summarized below.

Alternative I--Was the original DPM route that resulted from the 1975 preliminary engineering study and was designed to provide one-way loop service in the core of the CBD.

Alternative II--Was an alignment patterned after the DPM configuration in the regional alternatives analysis. It provides service to the CBD core and includes service to the Grand Circus Park area.

Alternative III--Was a shorter loop designed to reduce costs while still serving shopping and other secondary (non-work) trips. The alignment on Larned would more directly serve the financial district.

²Gannett Fleming Corrdry & Carpenter of Michigan, Inc. and GM Transportation Systems Center, "Alternatives Evaluation Methodology--Goals and Measures of Effectiveness" (Draft Working Paper), October, 1978.

Alternative IV--Combined service to the financial district along Larned with service to the Grand Circus Park area to the north allowing for more direct transfers between the DPM and a proposed rail station north of Grand Circus Park.

Alternative V--Was a variation of Alternative IV which provided service on Griswold and Michigan instead of Cass.

Alternative VII--Was developed to maximize service to parking in existing and proposed structures and to maximize transit interaction.

Alternative VIII--Was an expansion of Alternative V which provided service north of Grand Circus Park and west to First Street.

Alternative IX--Would provide loop and shuttle service in the CBD. This alternative would provide improved service to the financial district and Greektown. The city of Detroit developed this alternative as having the most desirable attributes of Alternatives IV and VIII.

Alternative X--Is a double loop alternative formulated to remove the need for many patrons to travel the less densely developed northern portion of the CBD.

Alternative XII--Is similar to Alternative X except that it eliminates the double loop concept.

The result of that scoring process is shown in Table II-2. Alternatives VIII, IX, X, and XII ranked highest in the preliminary evaluation. These alternatives were rated best in terms of economic impacts and land use development. They also had high scores in improving CBD circulation and creating positive social impacts, but had relatively lower scores for system costs and environmental impacts. Alternatives IX and X had the highest score for economic impacts principally because they serve existing hotels, retail areas, and vacant office buildings very well. Alternatives VIII, X, and XII scored high in the land use development category because of the potential for new development. Alternatives IX, X, and XII were recommended for continuation into Stage 2, the more detailed level of analysis. As Alternative VIII was very similar to Alternative IX and Alternative IX possessed many of the positive attributes of Alternative VIII while minimizing the negative features, it was concluded that a detailed analysis of Alternative VIII would not provide additional insight into the final selection process beyond that acquired in the detailed evaluation of Alternative IX. Alternative II was carried into the detailed analysis because that alignment was the configuration shown as a component of SEMTA's regional Alternatives Analysis program. The results of the first level of analysis were also used to develop a new alternative (XIII) for detailed consideration.

TABLE II-2

STEERING COMMITTEE - MEAN VALUE, WEIGHTED SCORES

| Goal Area | Alternative | | | | | | | | | | |
|-------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| | I | II | III | IV | V | VII | VIII | IX | X | XII | Δ |
| Economic Impacts (27.3%) | 10.85 | 13.21 | 10.89 | 14.28 | 13.57 | 14.22 | 15.22 | 16.30 | 16.86 | 14.67 | 6.01 |
| CBD Circulation (20.0%) | 8.29 | 9.98 | 10.33 | 10.58 | 10.53 | 10.60 | 10.56 | 10.70 | 11.15 | 10.76 | 2.86 |
| System Costs (12.7%) | 8.12 | 7.49 | 7.62 | 7.42 | 6.85 | 6.73 | 6.42 | 6.66 | 4.58 | 6.52 | 3.54 |
| Land Use Development (23.2%) | 11.85 | 9.97 | 12.20 | 11.34 | 12.54 | 11.00 | 12.37 | 11.17 | 13.23 | 12.89 | 2.16 |
| Environmental Impacts (10.2%) | 5.46 | 5.53 | 4.88 | 4.74 | 4.75 | 6.14 | 5.14 | 5.00 | 4.06 | 4.76 | 2.32 |
| Social Impacts (6.6%) | 2.83 | 3.34 | 3.54 | 3.44 | 3.77 | 3.49 | 3.70 | 3.66 | 3.39 | 3.67 | 0.94 |
| TOTAL | 47.42 | 49.52 | 49.46 | 51.80 | 52.01 | 52.18 | 53.41 | 53.46 | 53.27 | 53.27 | 6.04 |
| RANK | 10 | 8 | 9 | 7 | 6 | 5 | 2 | 1 | 4 | 3 | |

Source: GM Transportation Systems Center, Gannett Fleming Corddry & Carpenter of Michigan, Inc., Schimpeler-Corrardino Associates, and Robert J. Harmon & Associates, Inc., "Preliminary Evaluation of Alternatives" (Working Paper), December, 1978.

Three other issues were reviewed during the Stage 1 evaluation. First, alternate possible station sites were evaluated to determine whether DPM alignment constraints existed. Sixteen general site locations were identified as applicable to the alternatives evaluated during Stage 2. Second, three alternate alignments were evaluated for a DPM routing near Grand Circus Park. The principal concern at Grand Circus Park was the best means to tie into a rail station proposed just north of these park. The issue was whether to align the DPM through the park or to circle the park's parameter. A third study was a preliminary evaluation of alternate possible maintenance sites to verify that feasible sites were available for each alignment.

As a result of these three special studies, station sites were established for each alternative and a decision was made to align each alternative through a portion of Grand Circus Park. This latter decision was modified later for environmental reasons when the preferred alternative was selected. Sufficient alternative maintenance sites were identified to serve all Stage 2 alternatives without affecting alignments.

2. Stage Two DPM Alternatives

The five second-stage alignments are shown in Figure II-2. The major operational variations considered included a two-way loop, clockwise and counterclockwise one-way service, various numbers of stations, and alternative forms of shuttle service for Alternative IX where it serves station 5, the Joe Louis Arena. The measures of effectiveness were used to evaluate ten operational alternatives for the five alignments.³

Alternative II was an alignment patterned after the DPM configuration in the regional transit alternatives analysis. Modifications of the earlier DPM system were made in the vicinity of Grand Circus Park, where service was extended to make Alternative II consistent with the other DPM alignments. The east-west link between Cass and Third Streets was located on Fort Street rather than Larned. Alternative II is 2.70 miles long and has 11 stations. One-way operation in a counterclockwise direction was evaluated. Alternative II was the only alignment whose southern guideway would run along the riverfront for its entire length. This location would reduce travel time between the Renaissance Center (station 1) and Cobo Hall/Joe Louis Arena (stations 2 and 3). Also, the opportunity for an aesthetically pleasing view of the river from the river from the DPM would be greatly enhanced. The CBD would be well served by the alignment and the travel time between Cadillac Center (station 10) and the Renaissance Center would be less with this alternative than with any other because of the smaller number

³ GM Transportation Systems Division, "Detailed Analysis of Alternatives" (Working Paper), March, 1979.

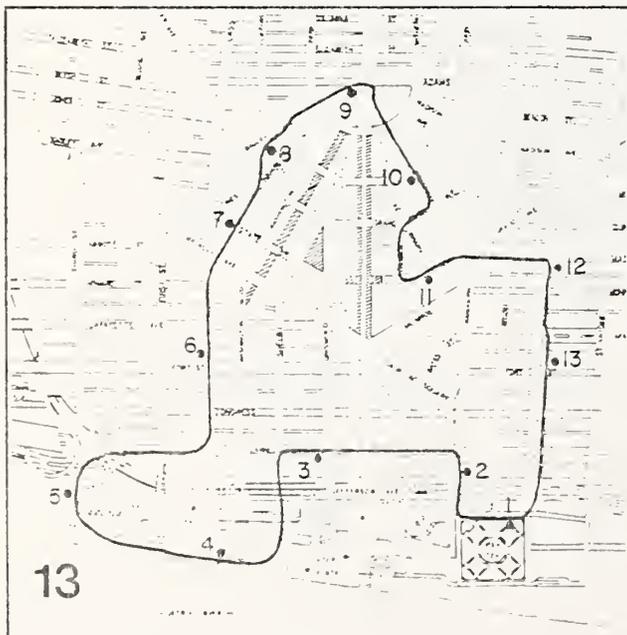
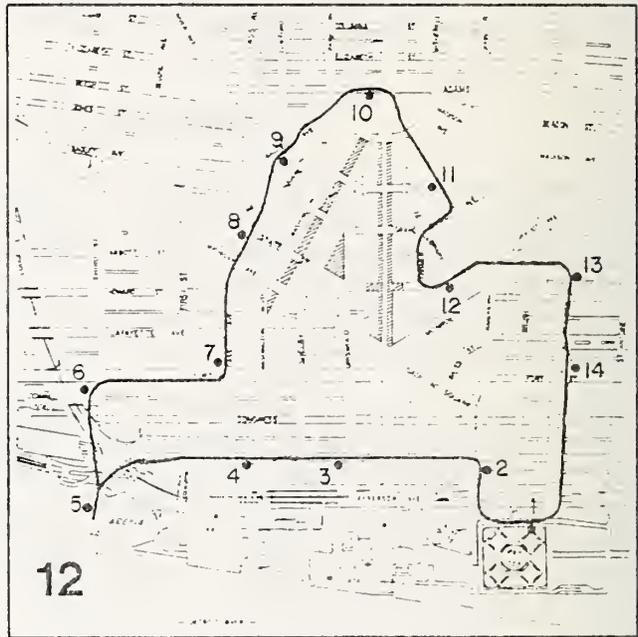
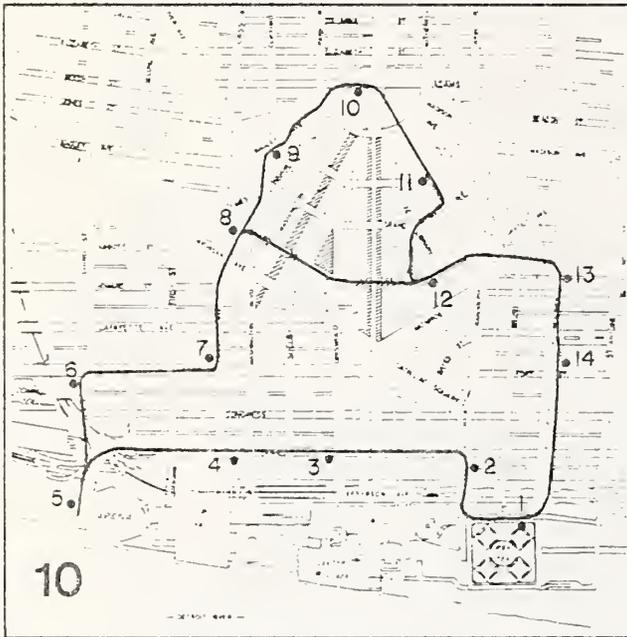
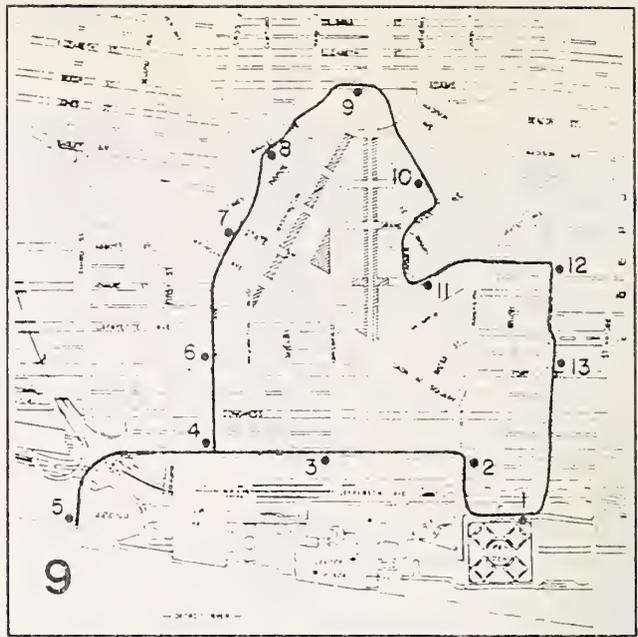
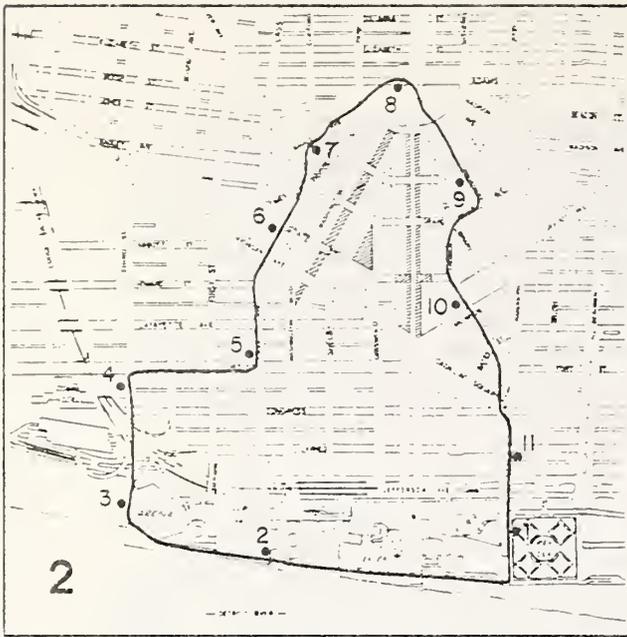


Figure II-2
FINAL DPM
ALTERNATIVE ALIGNMENTS

of stations and shorter distance to traverse the loop. When evaluated with respect to the goal areas, Alternative II was determined to be less effective than the other alignments (Table II-3). It scored best in terms of system costs (both capital and operating costs were low) and social impacts (particularly displacements). In all other goal areas, Alternative II scored lower than the remaining four alternatives.

Alternative IX would provide both loop and shuttle service in downtown Detroit. It would connect the following CBD activity centers: Cadillac Center, Renaissance Center (station 1), the Financial District (station 4), the Joe Louis Arena (station 5), and the Washington Mall/Times Square development (stations 7 and 8). If its alignment were located farther west on Beaubien, there would be more opportunities for stimulating economic development and encouraging fringe parking. The proposed shuttle service to the Joe Louis Arena would have the advantage of reducing the track length to 2.62 miles, the shortest of all alternatives. Alternative IX has 13 stations, compared to 11 for Alternative II. The extra stations would provide improved service in the Financial District (station 3) and Greektown (station 12). Two operational schemes were tested. Alternative IX-A assumed one-way, counterclockwise operation, with every third train approaching the intersection of Fort Street and Cass Avenue (station 4) being switched to the Joe Louis Arena (station 5) spur track. Alternative IX-B assumed that a separate shuttle train would operate on the spur track and that a transfer at station 4 would be required to utilize the main loop. For both Alternatives IX-A and IX-B, operation in a counterclockwise direction was assumed. Alternative IX-B was ranked second best and Alternative IX-A seventh best. Alternative IX-B had better scores than IX-A in the goal areas of economic impacts, CBD circulation, land use development, environmental impacts, and social impacts. The primary reasons for the higher scores are a higher patronage forecast for Alternative IX-B (due to avoidance of a diversion onto the spur track), reduced trip time for mainline service, and the greater displacements for Alternative IX-A required by the switching system at the Fort Street station.

Alternative X is the only alternative involving a double-loop configuration. It was formulated to address the problem of passengers on a large one-way loop (namely, that many travelers in the more densely developed southern part of the CBD are forced to travel through the less densely developed northern portion). The extra time spent traveling is considered unproductive by many patrons. The double-loop configuration was intended to reduce travel time for DPM vehicles; they would use the smaller loop. The alignment for Alternative X is 3.14 miles long and includes 14 stations. While several operational configurations were considered, the only operational scheme evaluated had two routes. Route 1 would cover only the lower loop, serving stations 1 through 3 and 12 through 14. Route 2 would cover the outer loop and serve all stations. Both routes were tested, with the assumption of one-way, clockwise operation. It was assumed that every fourth train would provide service on the outer loop. Thus stations on the lower loop received service four times more frequently than stations on the outer loop.

TABLE II-3

STAGE 2 EVALUATION RESULTS - MEAN VALUE, WEIGHTED SCORES

| Goal Area | Alternative | | | | | | | | |
|-----------------------|-------------|-------|-------|-------|-------|-------|-------|--------|--------|
| | II | IX-A | IX-B | X-A | XII-A | XII-B | XII-C | XIII-A | XIII-B |
| Economic Impacts | 9.06 | 11.54 | 11.92 | 11.82 | 12.14 | 11.89 | 13.83 | 11.63 | 12.07 |
| CBD Circulator | 7.88 | 9.31 | 9.59 | 9.54 | 9.37 | 9.45 | 12.54 | 9.31 | 9.09 |
| System Costs | 8.49 | 7.95 | 7.94 | 7.86 | 7.50 | 7.50 | 5.20 | 7.40 | 7.31 |
| Land Use Development | 8.96 | 11.78 | 12.00 | 12.32 | 12.17 | 12.20 | 13.54 | 11.88 | 11.21 |
| Environmental Impacts | 4.76 | 6.42 | 6.51 | 5.18 | 6.32 | 6.32 | 5.19 | 6.50 | 6.44 |
| Social Impacts | 3.87 | 3.03 | 3.49 | 3.72 | 3.72 | 3.72 | 3.72 | 3.71 | 3.49 |
| TOTAL | 43.02 | 50.04 | 51.45 | 50.44 | 51.22 | 51.08 | 54.02 | 50.43 | 49.60 |
| RANK | 9 | 7 | 2 | 5 | 3 | 4 | 1 | 6 | 8 |

Source: GM Transportation Systems Center, Gannett Fleming Corddry & Carpenter of Michigan, Inc., Schimpeler-Corradino Associates, and Robert J. Harmon & Associates, Inc., "Detailed Analysis of Alternatives" (Working Paper), March, 1979.

Alternative X was ranked fifth best. It has the third highest patronage being exceeded in this respect by Alternatives XII-C and IX-B. In comparison to Alternative IX-B, Alternative X scored much lower in the goal area of environmental impacts, primarily because of the noise it would produce along State Street (the connecting segment between the loops) and its negative effects on historic structures. In the other goal areas, ratings were similar. In terms of land development opportunities, Alternative X scored higher than any alternative except XII-C.

Alternative XII would follow the same alignment as the outer loop of Alternative X and is similar to Alternative IX because it attempts to provide comprehensive service to the CBD. The alignment is 2.92 miles long and includes 14 stations. Three configurations were tested. Alignment XII-A would be a single-lane guideway operating in a clockwise direction; XII-B would be a single-lane guideway operating counterclockwise; and XII-C would be a two-lane, two-way guideway. Alternative XII would have the advantages of Alternative IX, but would improve service to the Joe Louis Arena. An extra station (station 6) would serve the Wayne County Community College. Alternative XII-C was rated the best alternative. Two-way service achieves the highest scores in the goal areas of economic impacts, CBD circulation, and land use development, offsetting its low scores for system cost (both operating and capital costs are the highest of any alternative) and environmental impacts, which, in the confined downtown area, are much worse for a guideway 20 feet wide than for one 10 feet wide. This alignment would generate about 20 percent more patrons than the one-way loop alignments, but this increase would occur at the expense of a 45 percent increase in capital cost and a 20 percent increase in operating and maintenance costs. Alternatives XII-A and XII-B ranked as the third and fourth best alternatives. They had good scores in all goal areas.

Alternative XIII would be a variation of Alternative II and the other three alignment alternatives. It was developed in response to the concern that the configuration of service to the Joe Louis Arena in Alternatives IX, X, and XII might not be feasible due to lack of space for a turnaround loop. Alignment XIII avoids this problem by looping around both Cobo Hall and the Joe Louis Arena. The route for this alternative would be more circuitous than the routes for the other alternatives. Its length is 3.05 miles. Two operational alternatives were evaluated; XIII-A assumed counterclockwise operation with 13 stations, and XIII-B assumed counterclockwise operation with 14 stations, the extra station being near the intersection of Cass and Larned Streets. In the evaluation, the latter two alternatives were ranked as the sixth and eighth best options. Expected patronage would be higher for Alternative XIII-A because there are only 13 stations. As a result, Alternative XIII-A received higher scores for the goal areas of CBD circulation, system costs, land use development, environmental impacts, and social impacts than XIII-B.

After all alternatives had been reviewed, an engineering analysis of possible alignments near the Joe Louis Arena was conducted.⁷ A very tight "teardrop" configuration was identified as the most feasible service pattern for Alternatives X and XII. However, its tight curves would reduce operating speed and would have a severe effect on local development plans, which include a hotel adjacent to the Joe Louis Arena. The loop pattern conveyed in Alternative XIII was determined to be the best way to serve the Joe Louis Arena, given the existing and proposed developments in the area.

The three alternatives considered for implementation were Alternative XII-C (with an alignment around the Joe Louis Arena similar to that of Alternative XIII), Alternative IX-B, and Alternative XIII-A. Alternative XII-C was eliminated from consideration because of its high capital and operating costs and negative environmental impacts. Alternative IX-B was ranked higher than XIII-A, but would involve a shuttle as well as a loop. Because two different operational patterns would exist and the shuttle system would have less capacity than the loop system to handle special events at the Joe Louis Arena, this alternative was determined to have fewer advantages than Alternative XIII.

In summary, the features of Alternative XIII that made it most feasible were:

- Its engineering feasibility for serving the Joe Louis Arena;
- The greater capacity that is possible with the loop configuration around Cobo Hall and the Joe Louis Arena;
- The financial and environmental advantages of a one-way loop configuration as compared to a two-way loop; and
- The service provided to the western fringe of the CBD and to the Financial District.

3. Circulator Bus Alternatives

The circulator bus alternative consists of a range of possible scheduled minibus routes; those that will best serve the CBD will be selected according to transportation improvements implemented as a result of the Alternatives Analysis process. Two circulator bus routes presently serve the CBD; a trolley system also provides specialized transportation service to the CBD. The main circulator bus route has a frequency of six minutes and operates in the Woodward corridor between Grand Circus Park and Jefferson Avenue. Two other routes operating at ten-minute intervals cover the area east of Woodward Avenue to St. Antoine

⁷Ibid.

Street and west of Woodward to Sixth Street. The trolley runs between Washington Boulevard, Grand Circus Park, and Cobo Hall. It is a leisurely mode of transportation, utilized primarily by tourists and people attending conventions. The trolley system is being extended to the Renaissance Center. Existing routes are shown in Chapter III, Figure III-3. A revised circulator bus route that follows the preferred DPM alignment was also studied as a less capital-intensive solution than the DPM. Such a system has the advantage of a greatly reduced capital cost, but does have a higher operating cost than the DPM.

The DPM alternative preferred by SEMTA is the alignment that was developed from SEMTA's evaluation process. A range of possible circulator bus routes will comprise the circulator bus alternative.

B. DESCRIPTION AND IMPACTS OF ALTERNATIVES

1. Downtown People Mover

a. Description

The DPM alternative would consist of an automated transit system operating on a fixed tracked guideway and controlled from a single operating center. The DPM would be entirely above grade. Automated vehicles would serve its stations, all of which would be elevated. The vehicles would have either rubber or steel wheels. Existing people mover systems (most have been installed in airports and amusement parks) vary in appearance and operating characteristics, but all people mover vehicles can be coupled together to form trains. The signal control system permits operating headways of as little as a minute at speeds of 15 to 30 miles per hour. Typical DPM vehicles are shown in Figure II-3.

The Detroit DPM would be a single-lane, elevated-loop alignment 2.96 miles in length. The system would have 13 stations and would follow the alignment shown in alignment sheet 1. The route follows existing city streets in circumscribing an area within the CBD of approximately 0.3 square miles. At least five stations would be incorporated into existing or proposed buildings, at least two others would be connected to major buildings by above-grade walkways, and at least one would connect directly with the proposed light rail system. All stations would have access to street level provided by stairways, elevators, and escalators.

The guideway's horizontal and vertical alignment is shown on alignment sheets 1 through 15. The guideway would be constructed primarily within the street right-of-way; it could be built in the curb lanes or on existing street medians. It would be elevated throughout its entire length. The guideway would be a permanent, fixed structure--an inflexible structure in that it could not be easily modified to meet changing patterns of demand. Travel speeds on the loop would range from 17 miles per hour to 30 miles per hour. Normally, each vehicle or train would stop at each station for 20 seconds; the average travel speed, including the stop, would be 12.6 miles per hour. The entire loop could be traveled in 14 minutes.

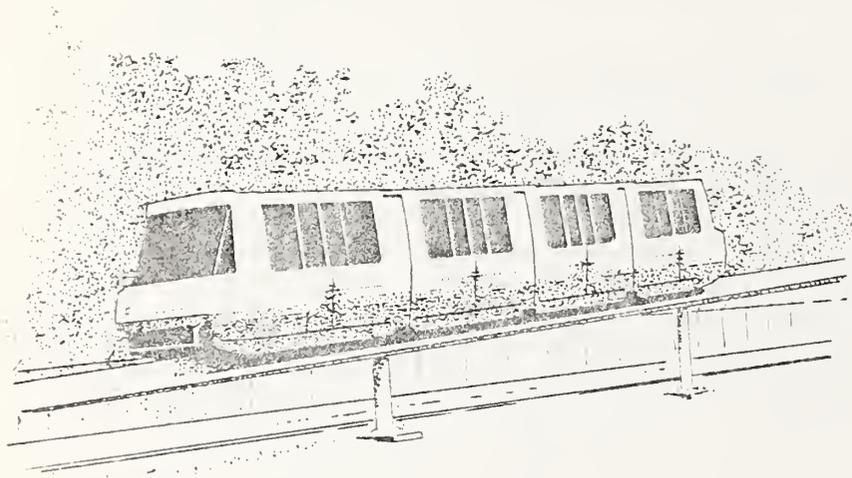
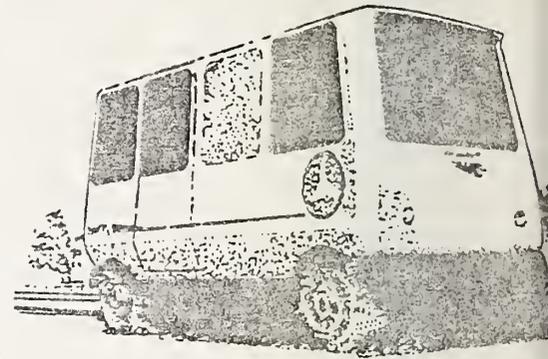
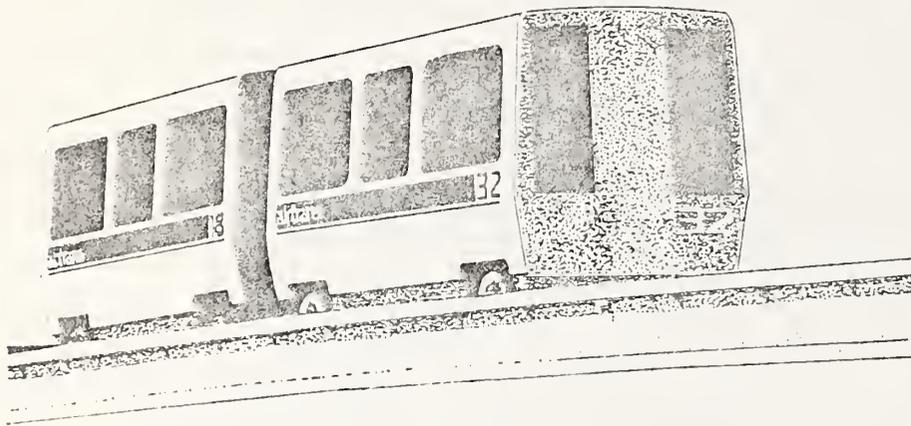
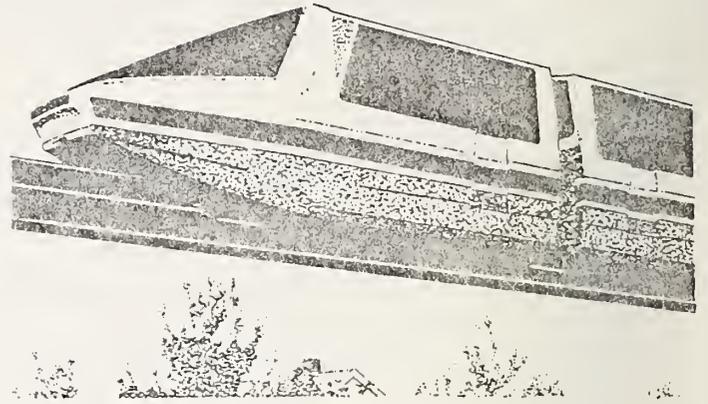
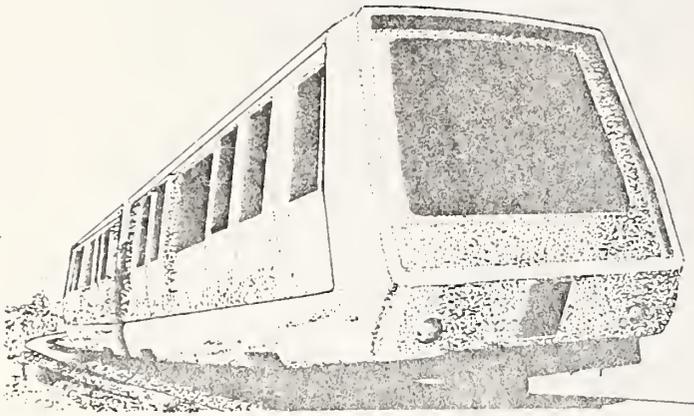
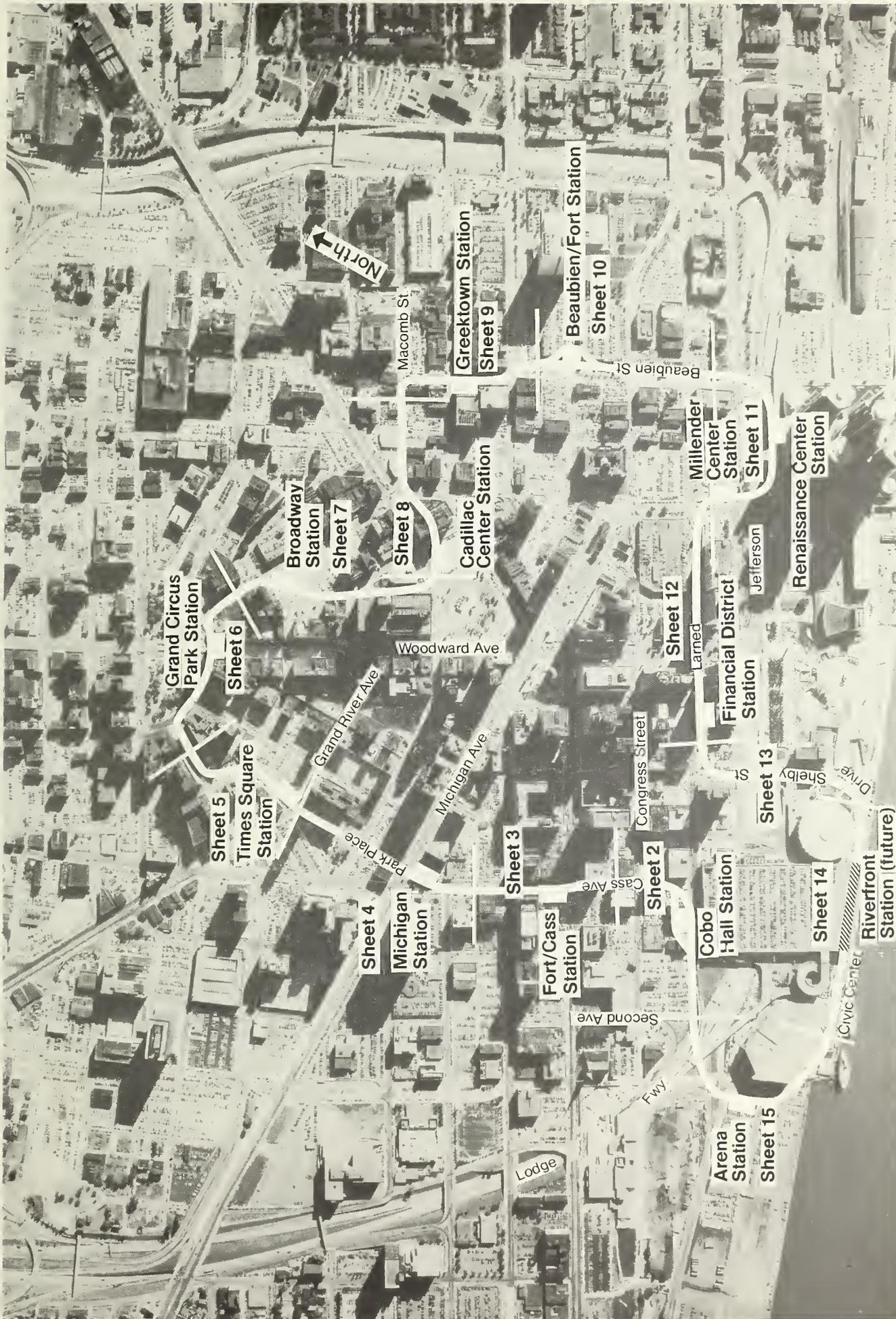


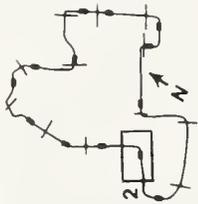
Figure II-3
TYPICAL DPM VEHICLES



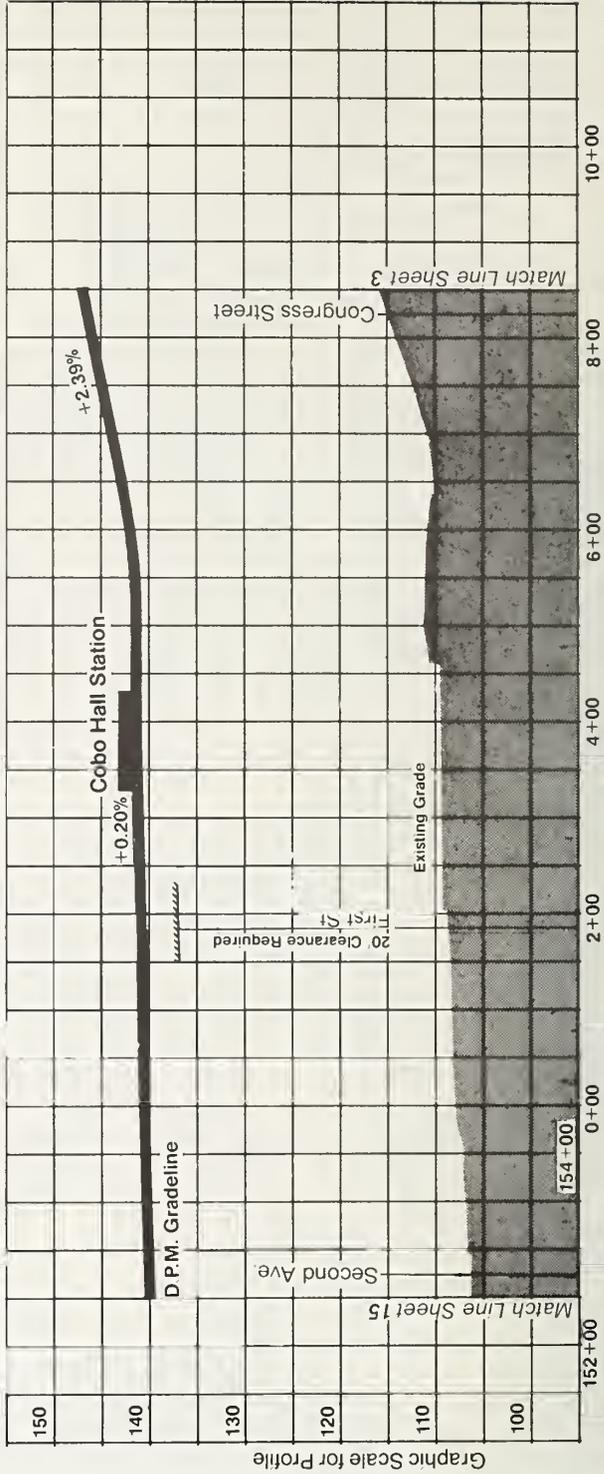
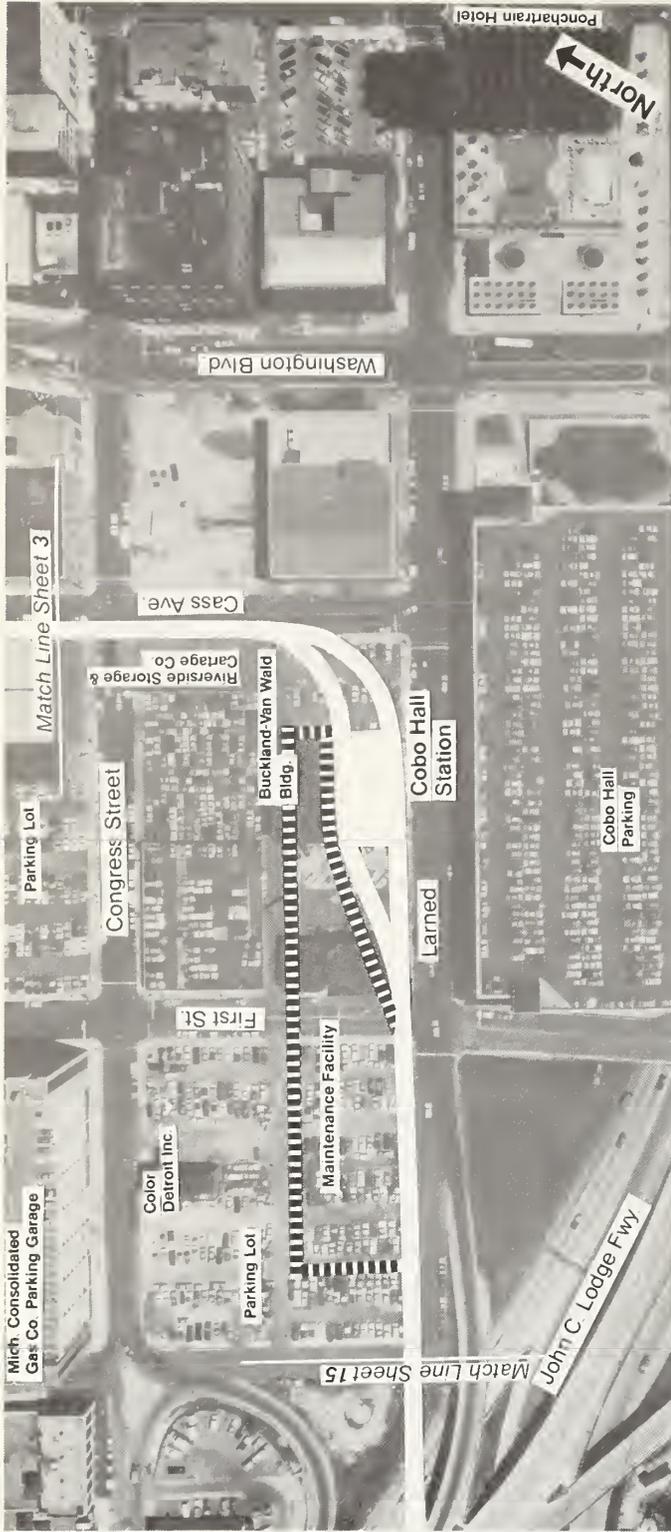
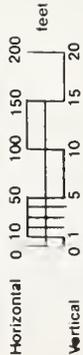
**Downtown Detroit People Mover Project.
Key Map.**

1" = 800 Feet

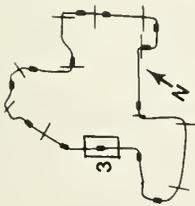
Key Map



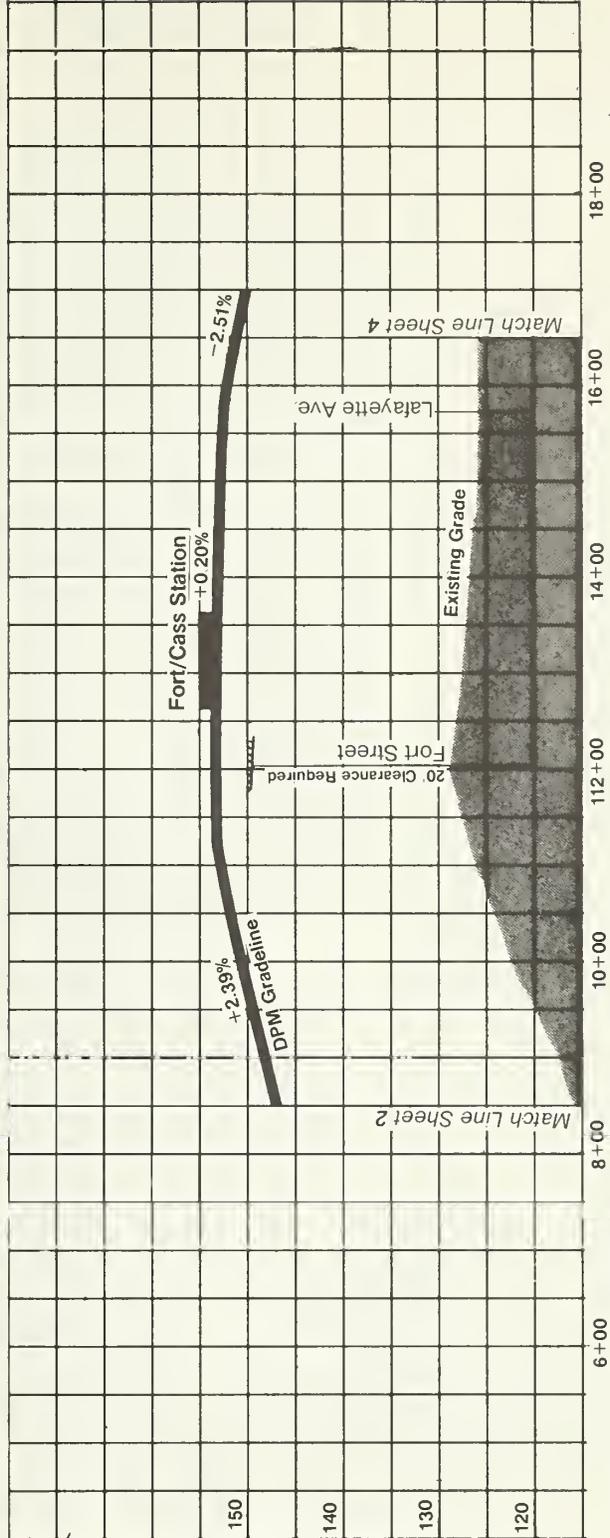
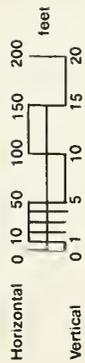
Graphic Scale for Plan



Downtown Detroit People Mover Project.
Cobo Hall Station



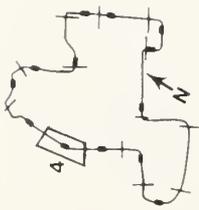
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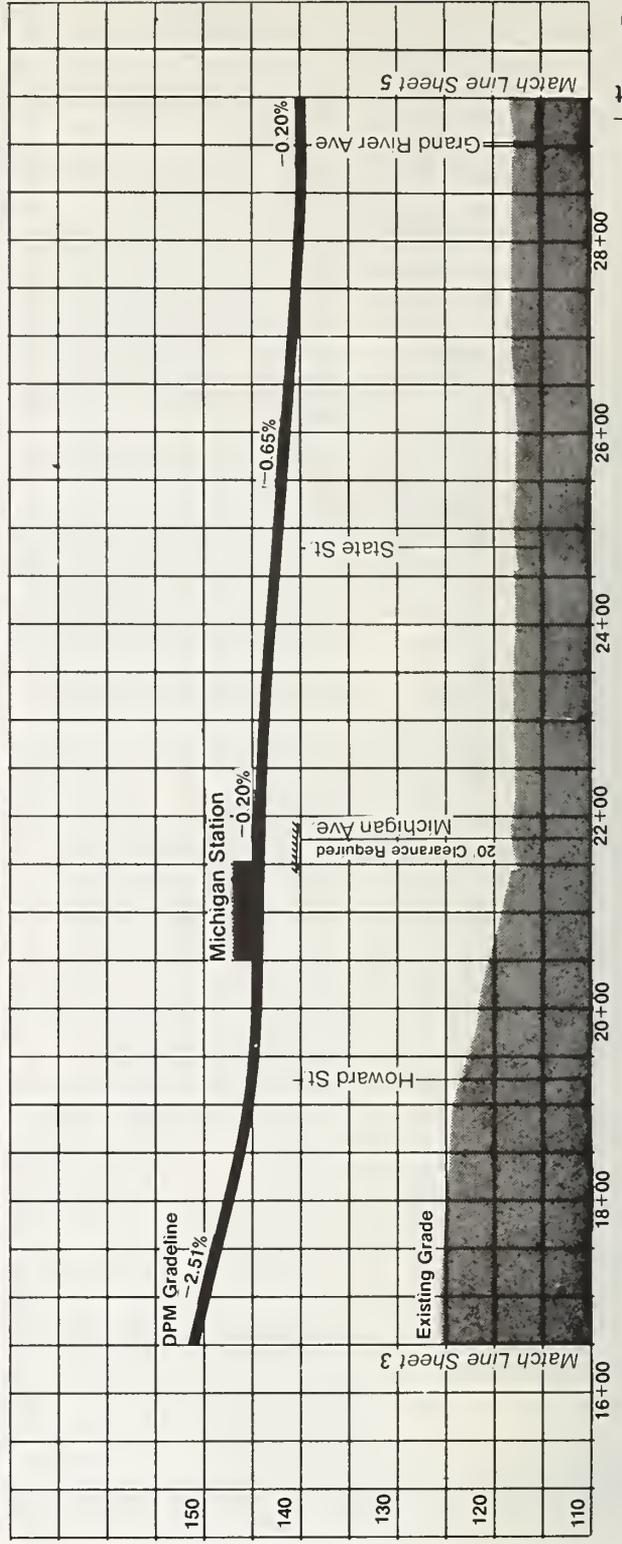
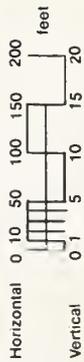
Graphics Scale for Profile

Downtown Detroit People Mover Project. Fort/Cass Station

Key Map

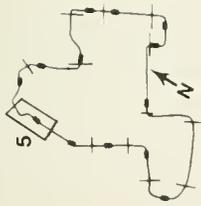


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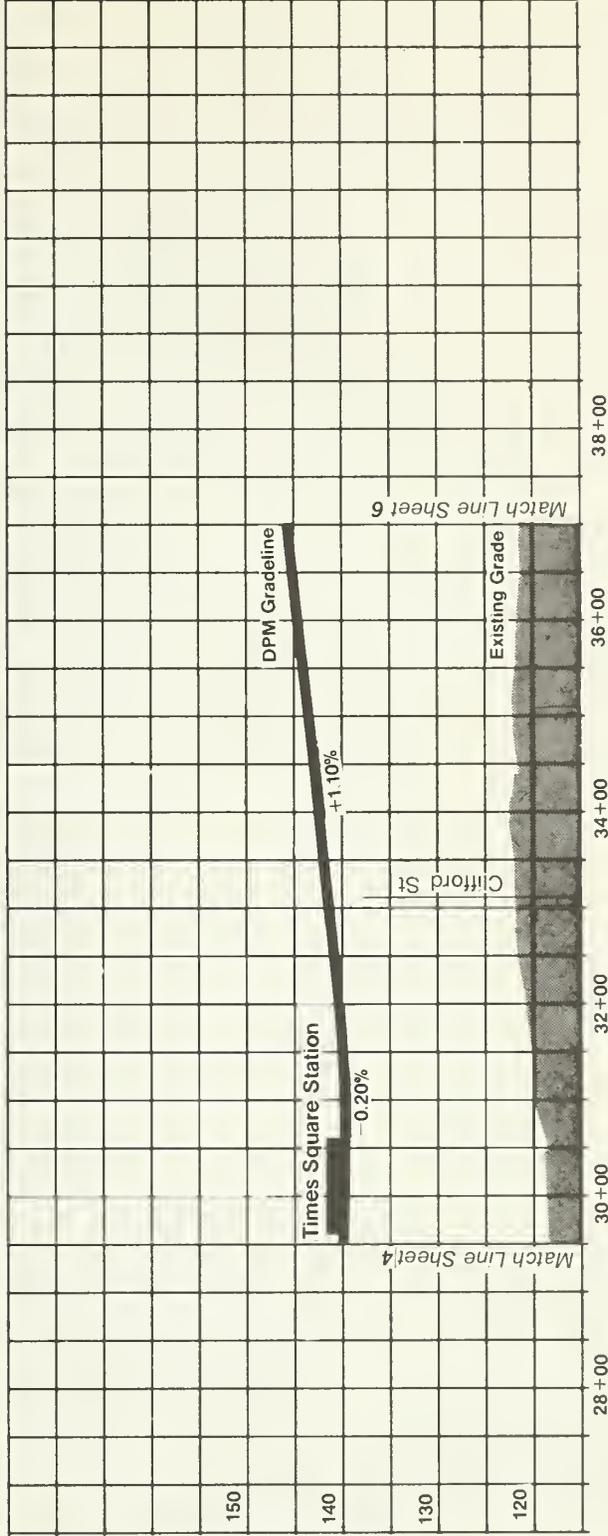
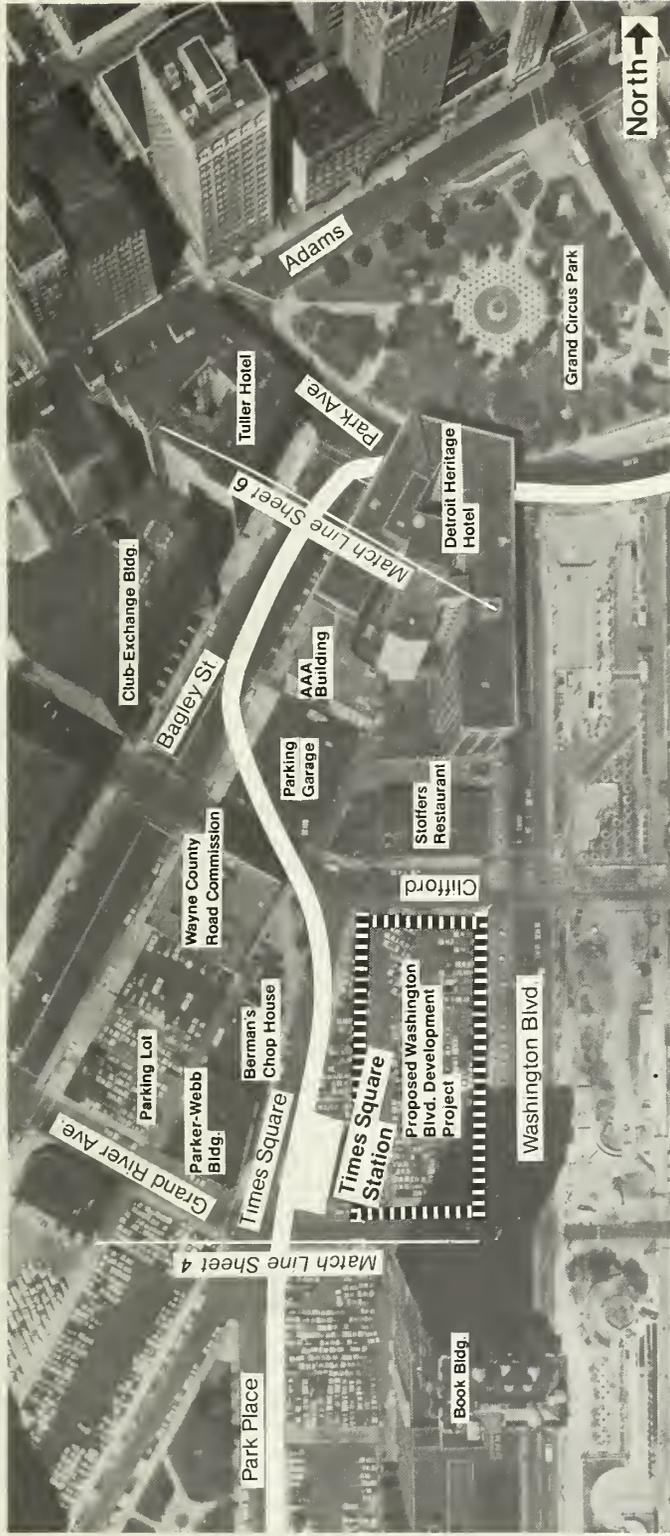
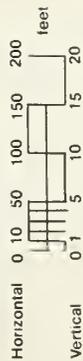


Graphics Scale for Profile

Downtown Detroit People Mover Project.
Michigan Station



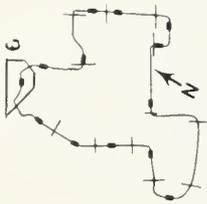
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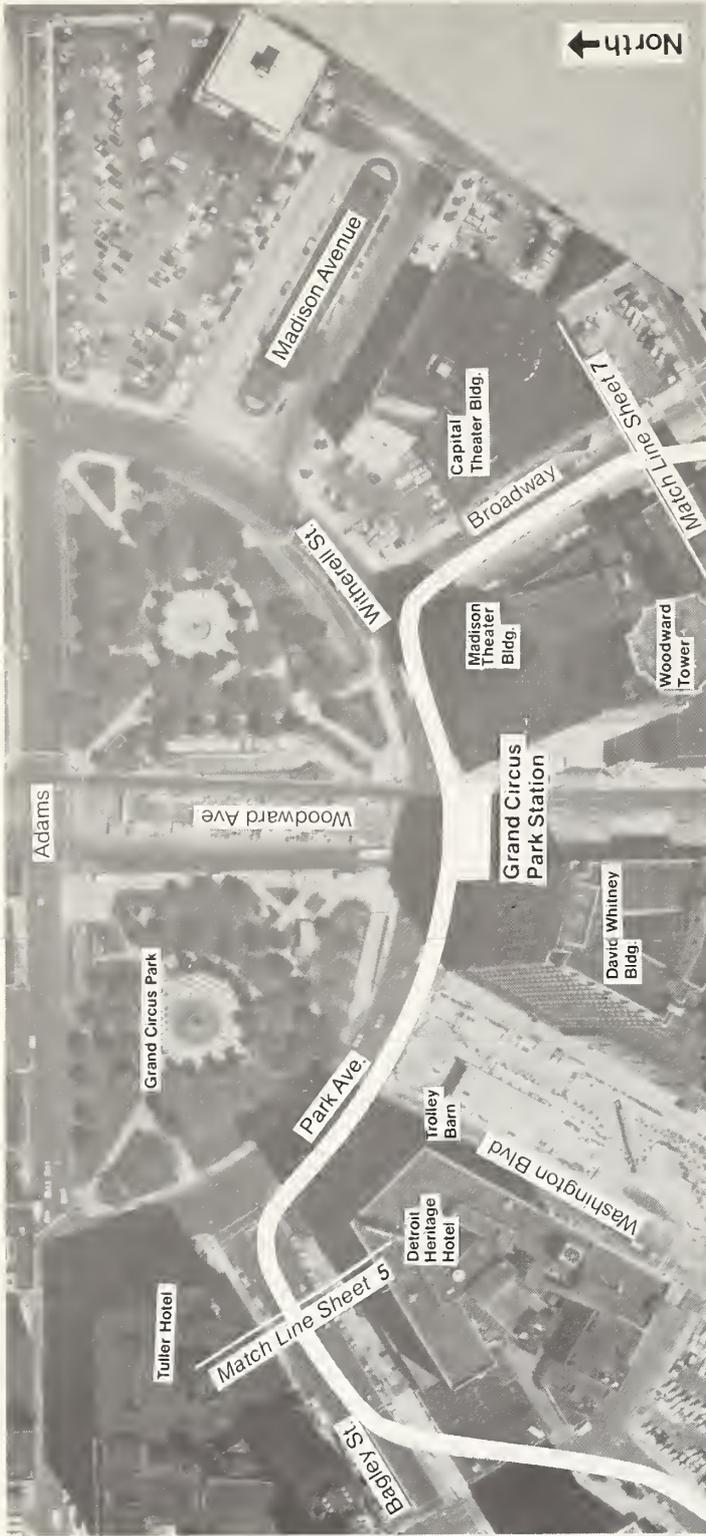
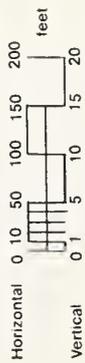
Graphics Scale for Profile

Downtown Detroit People Mover Project. Times Square Station

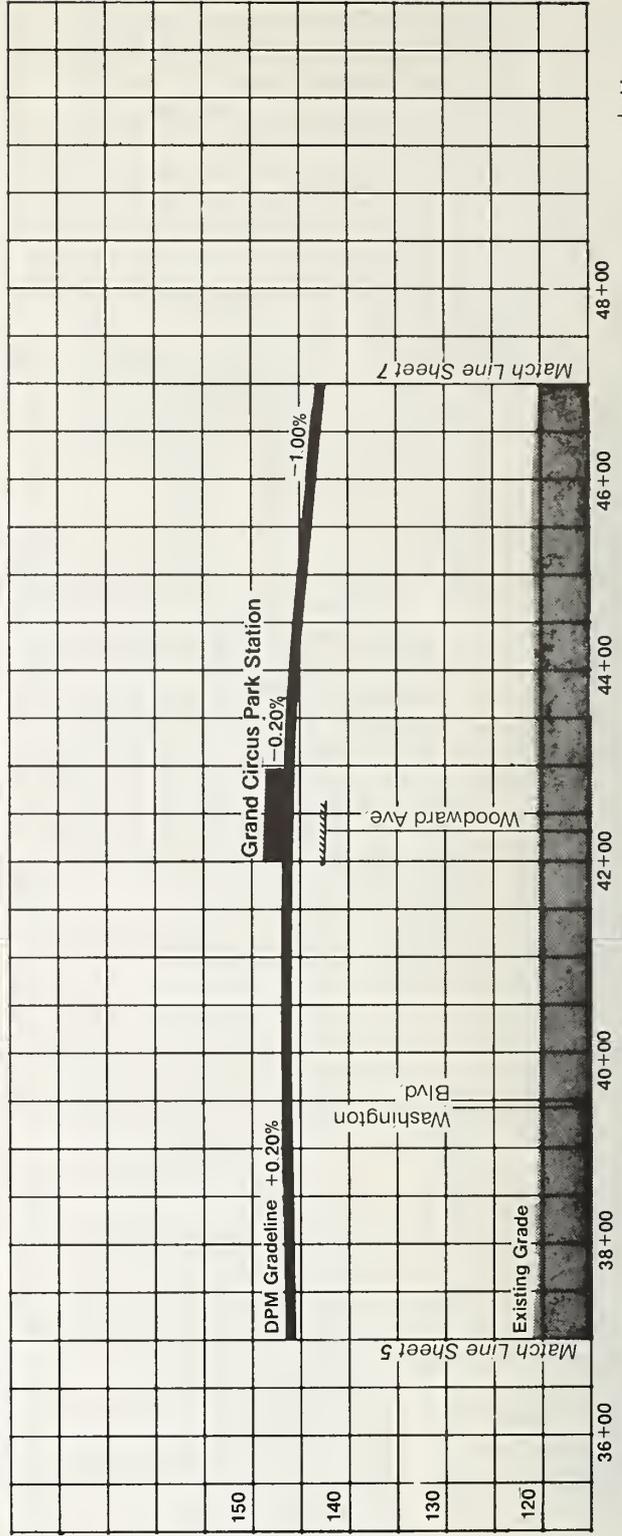
Key Map



Graphic Scale for Plan

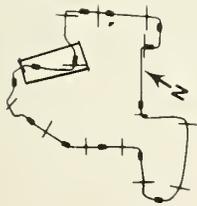


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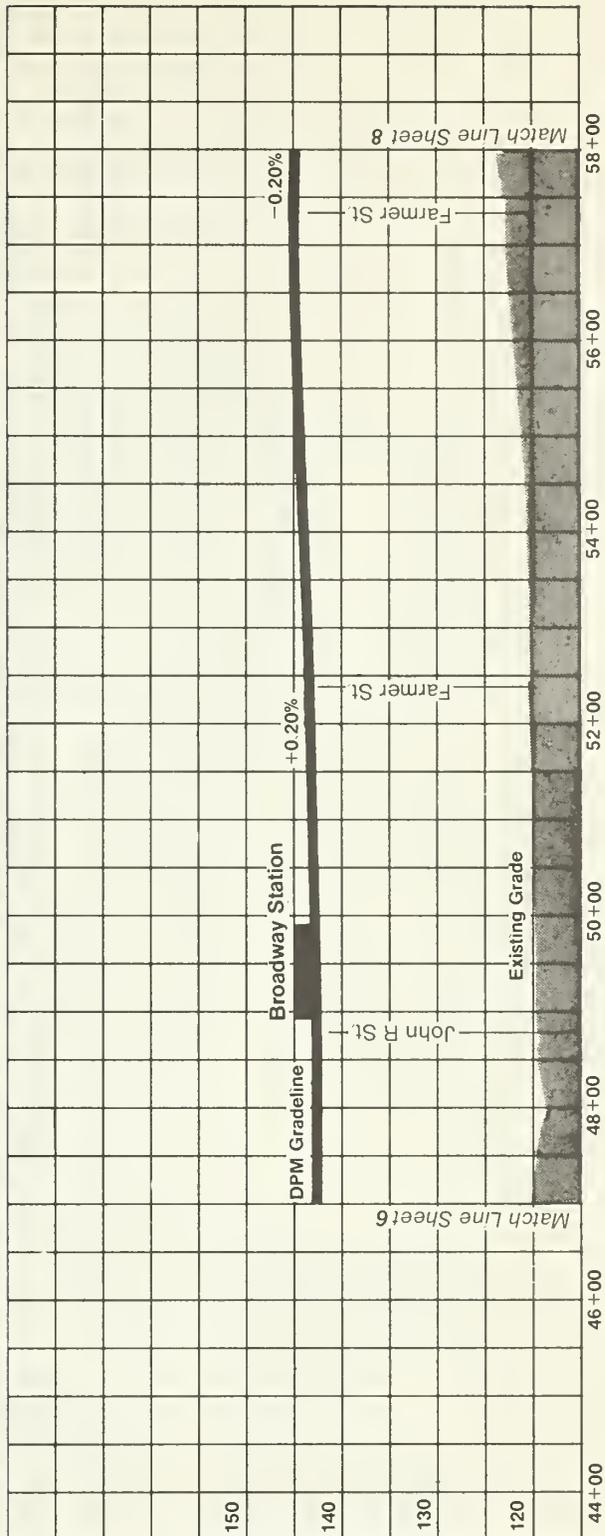
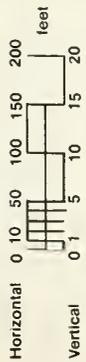


Downtown Detroit People Mover Project.
 Grand Circus Park Station

Key Map



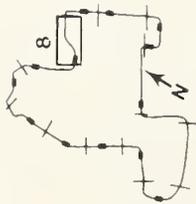
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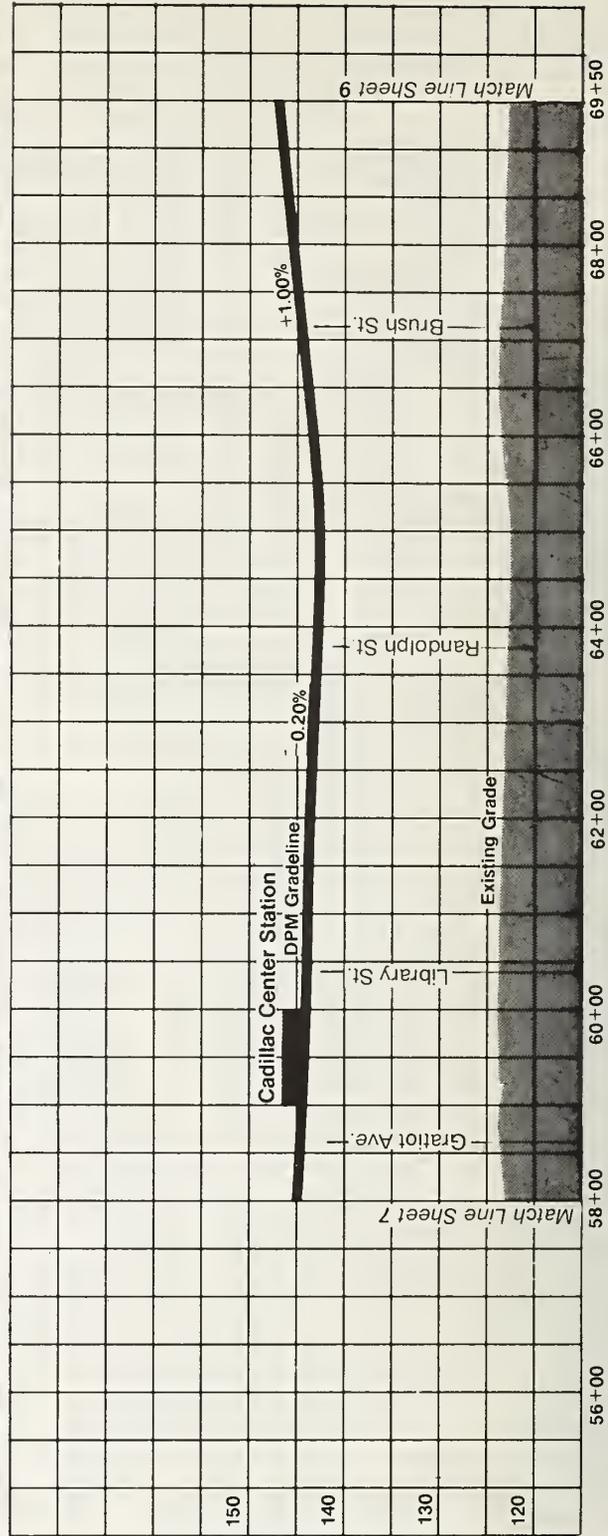
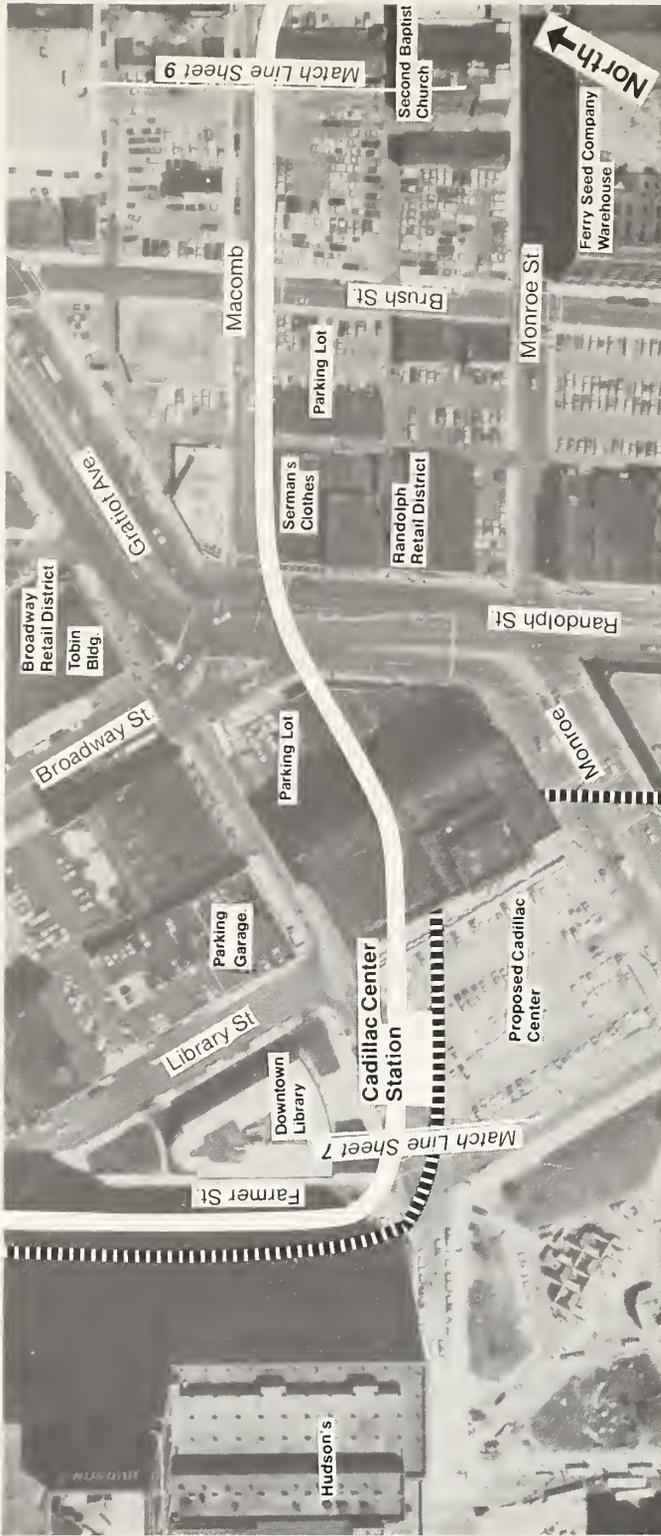
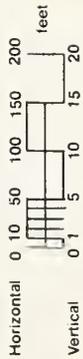
Graphics Scale for Profile

Downtown Detroit People Mover Project.
 Broadway Station

Key Map



Graphic Scale for Plan



Downtown Detroit People Mover Project.
Cadillac Center Station

Key Map

Graphic Scale for Plan

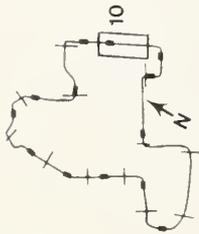
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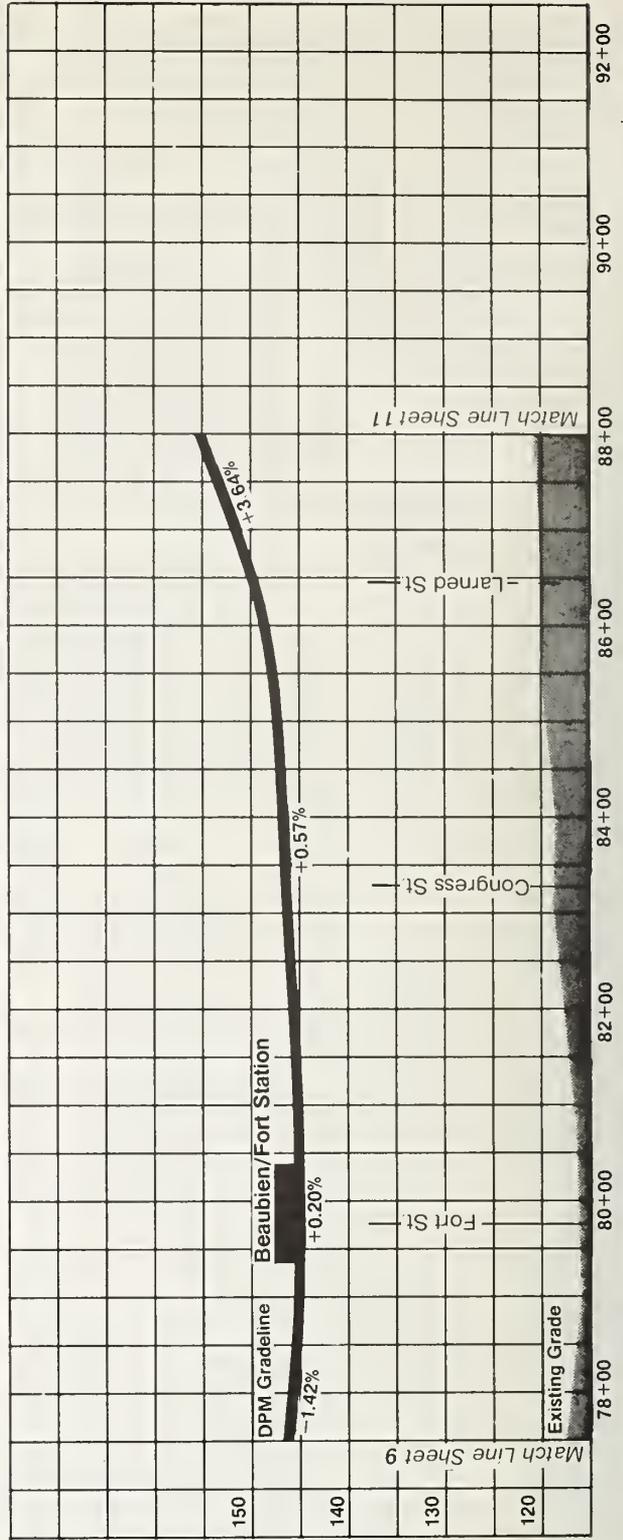
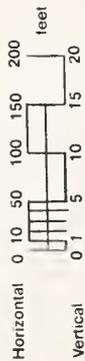
Downtown Detroit People Mover Project.
 Greektown Station

Sheet 9

Key Map

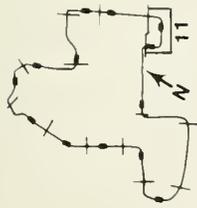


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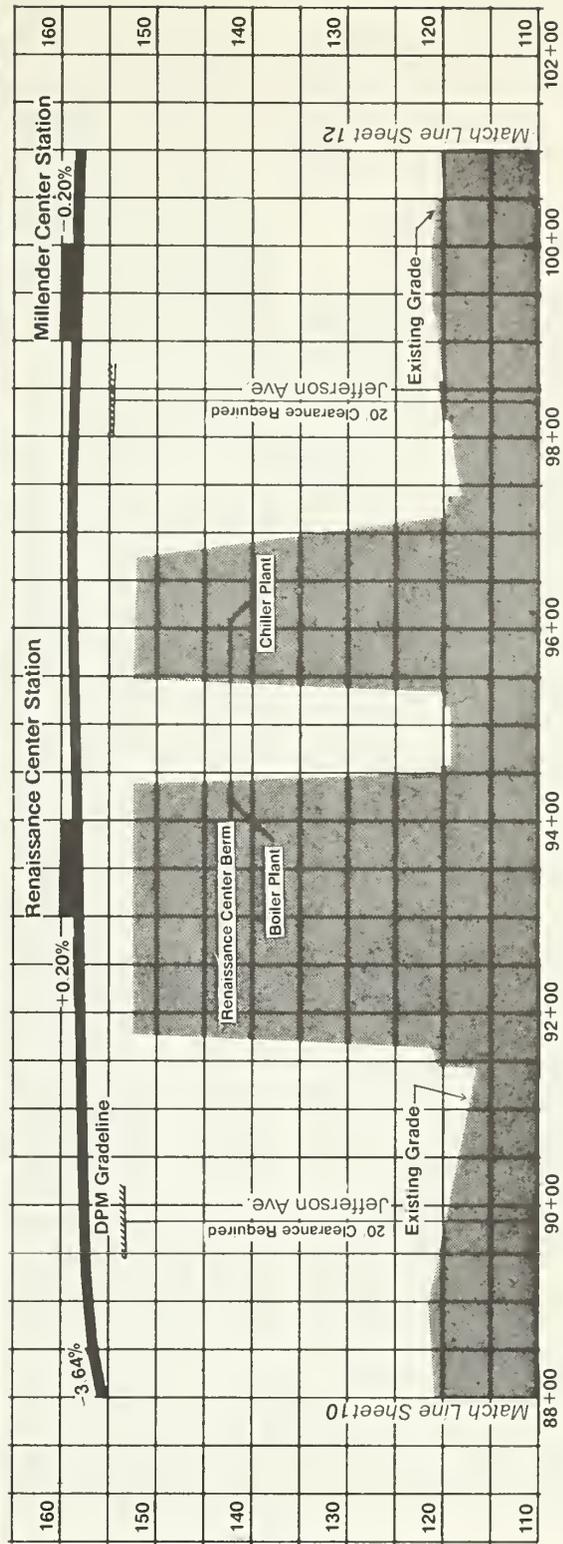
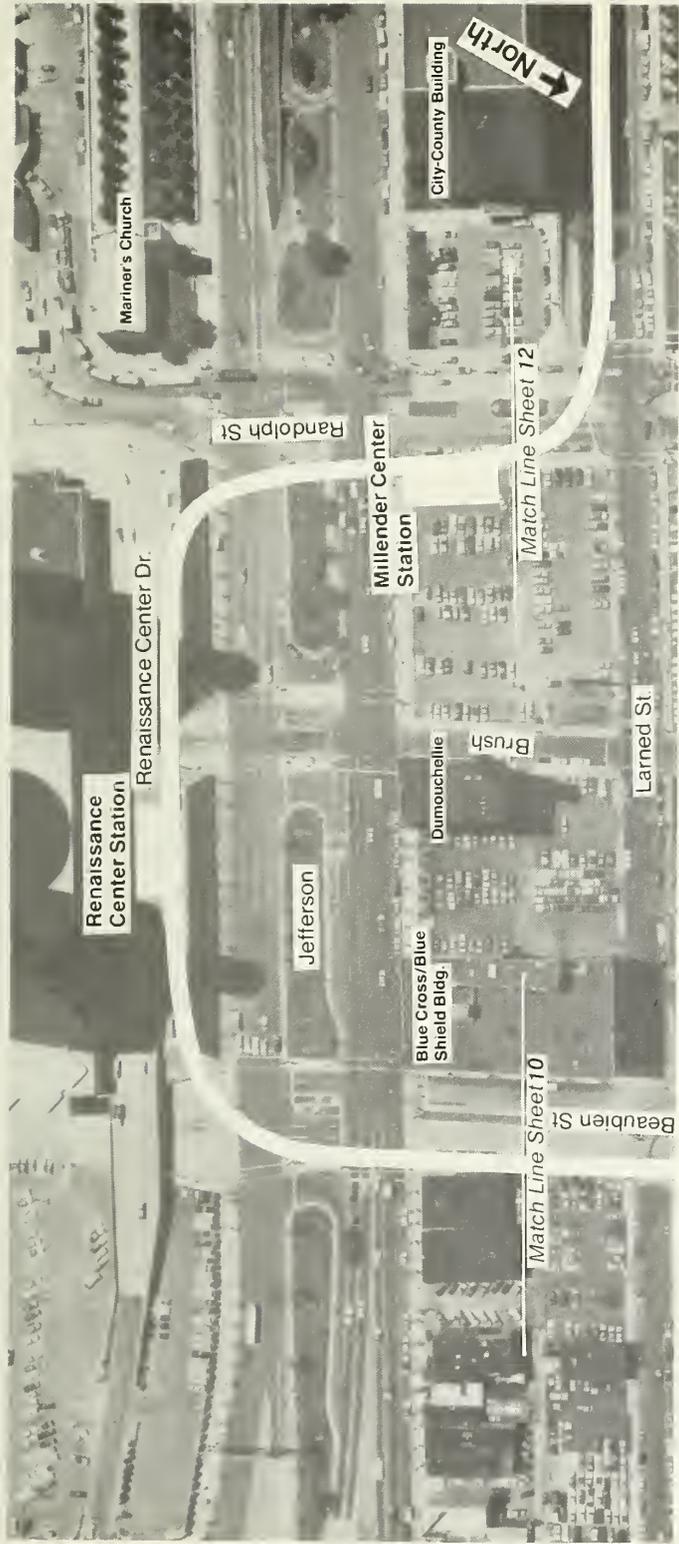
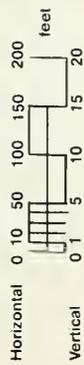


Graphics Scale for Profile

Downtown Detroit People Mover Project.
Baubien/Fort Station



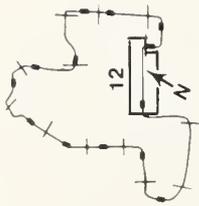
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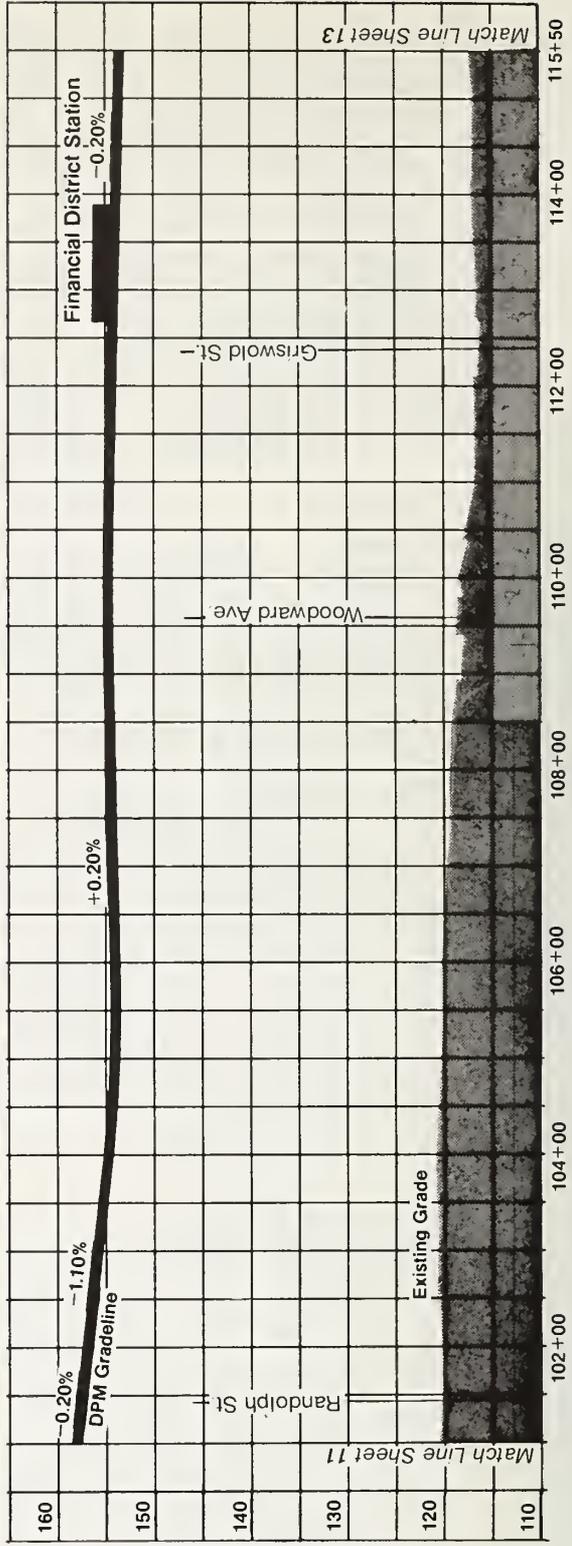
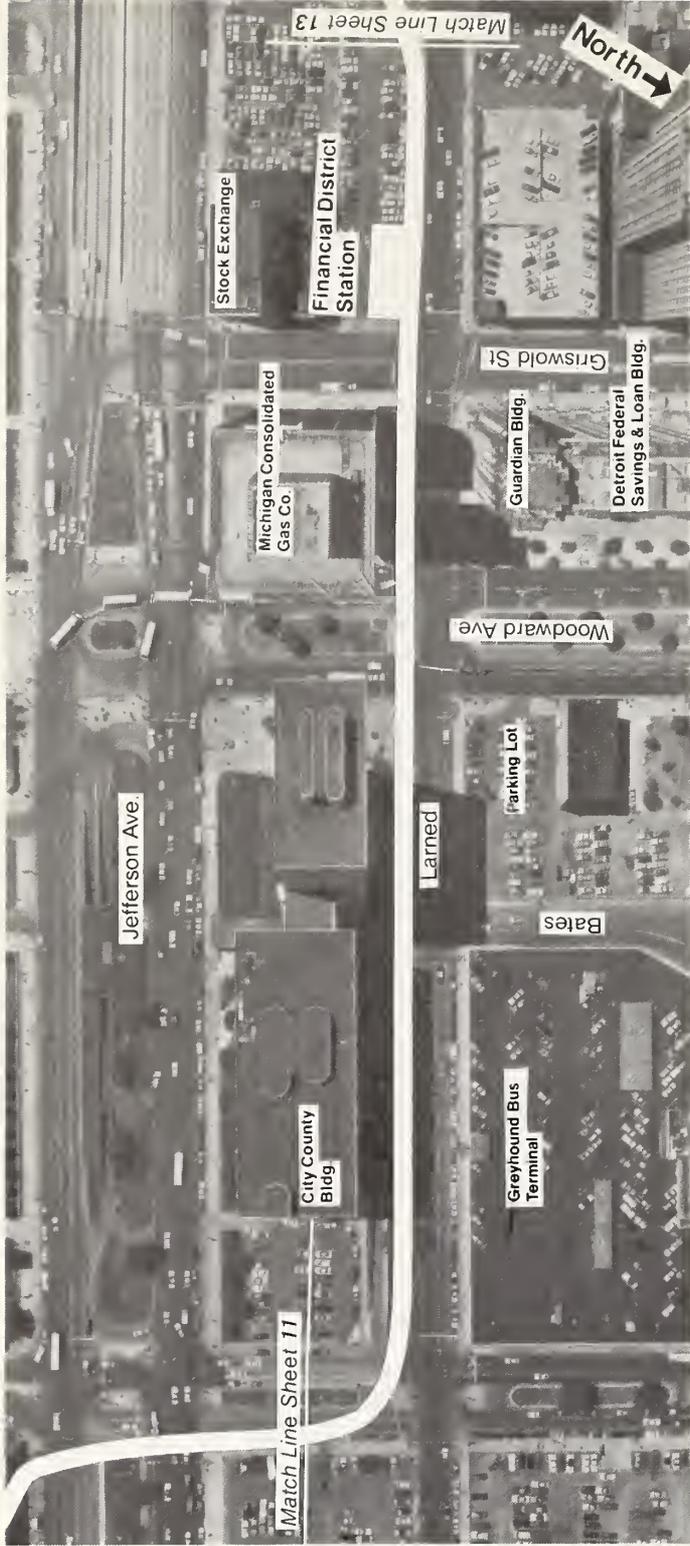
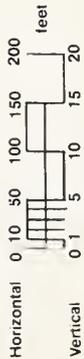
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Downtown Detroit People Mover Project. Renaissance Center Station & Millender Center Station

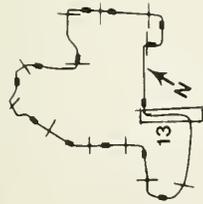
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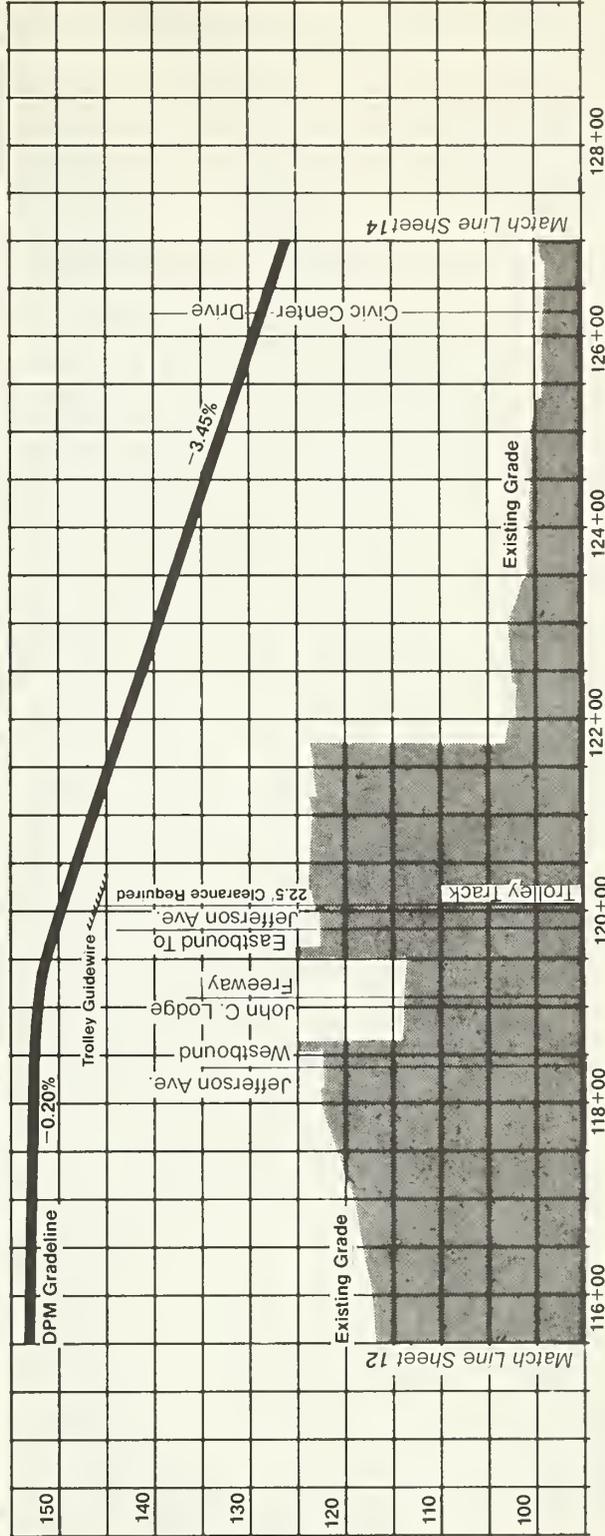
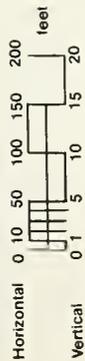
Graphic Scale for Plan



Downtown Detroit People Mover Project.
Financial District Station



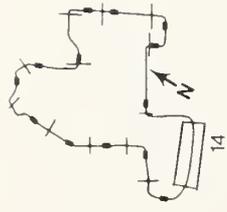
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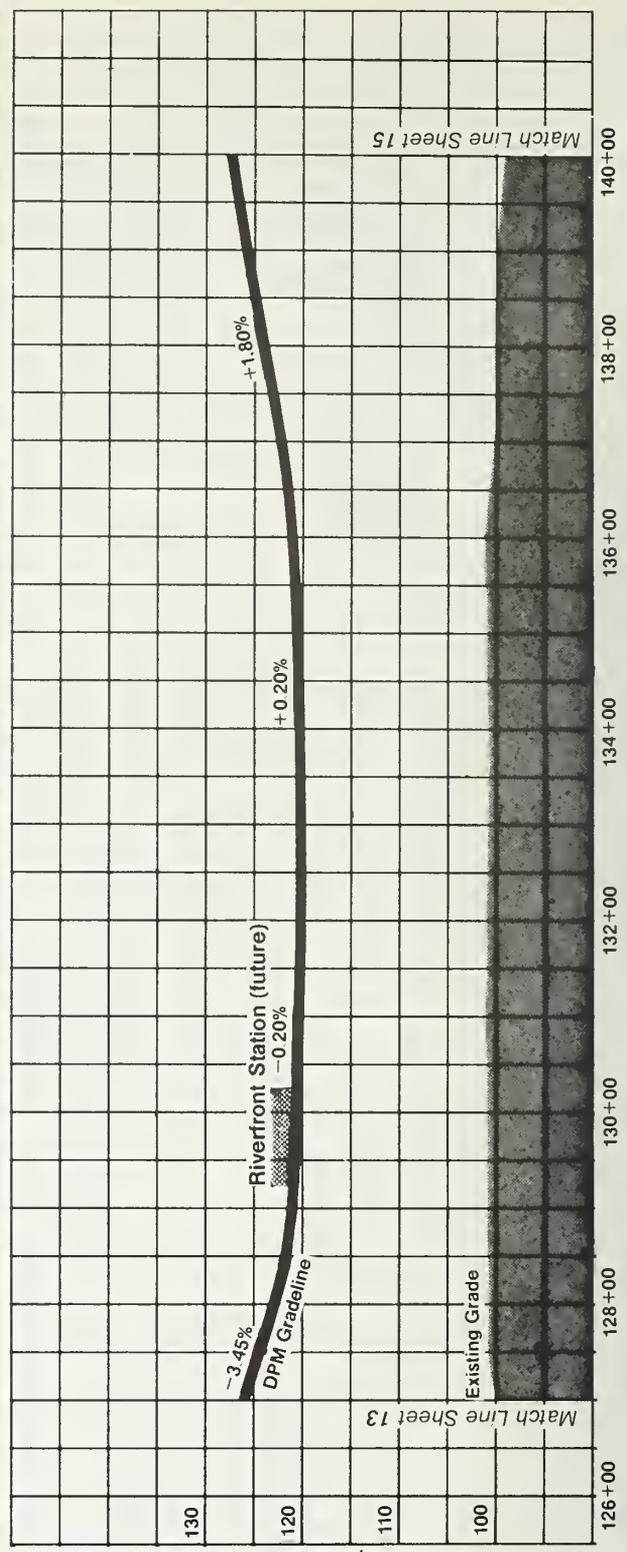
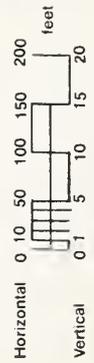
Graphics Scale for Profile

Downtown Detroit People Mover Project. Shelby Street

Key Map



Graphic Scale for Plan



Graphics Scale for Profile

**Downtown Detroit People Mover Project.
Riverfront Station (future)**

Key Map

Graphic Scale for Plan

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 Vertical 0 1 5 10 15 20 feet

Sheet 15

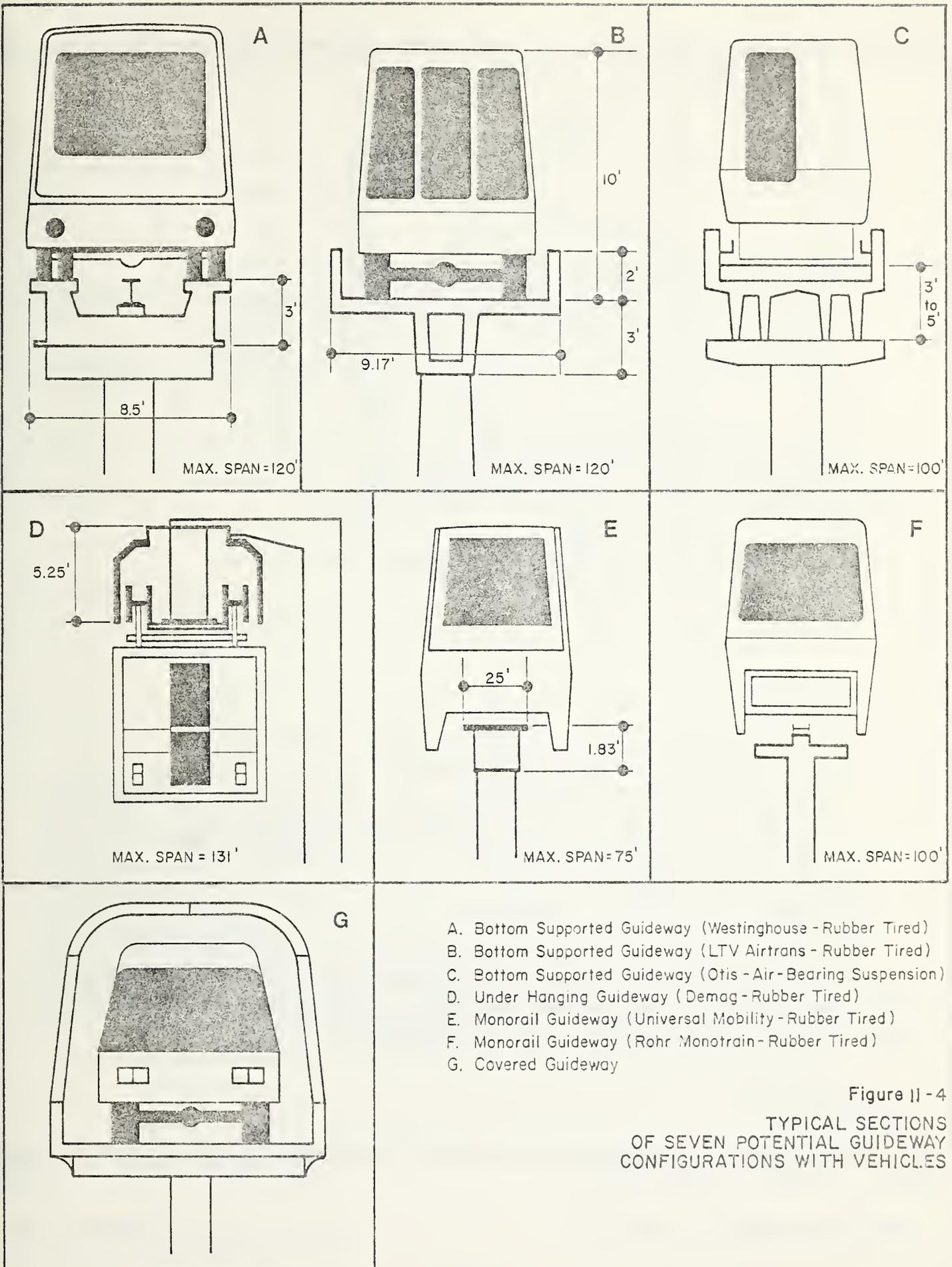
Downtown Detroit People Mover Project.
 Arena Station

Since several suppliers and manufacturers are qualified to implement the different types of DPM systems, no exact guideway design can be identified at this time. However, it is expected that the selected system would have a single-lane guideway and would be constructed of concrete, steel, or a combination thereof. The guideway may or may not be covered. The nominal span would range from 70 to 100 feet, depending on the system selected and physical constraints along the alignment. Single-pier supports would be used, except at stations and in bypass areas. A desirable vertical clearance, ranging from 14.5 to 20 feet over the roadway, would be provided; the actual clearance would be subject to design standards of the state, city, and county, physical constraints, and limitations posed by the urban surroundings. In the vicinity of Jefferson Avenue, greater vertical clearances would probably be required, as the DPM must cross the planned extension of the Washington Boulevard trolley along the south side of Jefferson Avenue from Cobo Hall to Mariner's Church. In addition, the proposed aerial walkway between the Joe Louis Arena and an adjacent parking lot would require that the DPM clear the ground by approximately 35 feet. Also, the DPM guideway on the north side of the Renaissance Center must provide sufficient clearance for a skywalk that may be constructed from that facility across Jefferson Avenue. The final clearances for this area would be subject to final design and implementation of the aerial walkways and entrances to the arena.

Three general types of aerial people mover systems are now being studied for implementation in the Detroit CBD. These systems are described as overriding monorail, overhead supported, and bottom supported. Examples of possible systems and their general dimensions are shown in Figure II-4. Since these sections are only samples representing various manufactured systems, the dimensions may vary, depending on the final operating scenarios and physical constraints along the guideway.

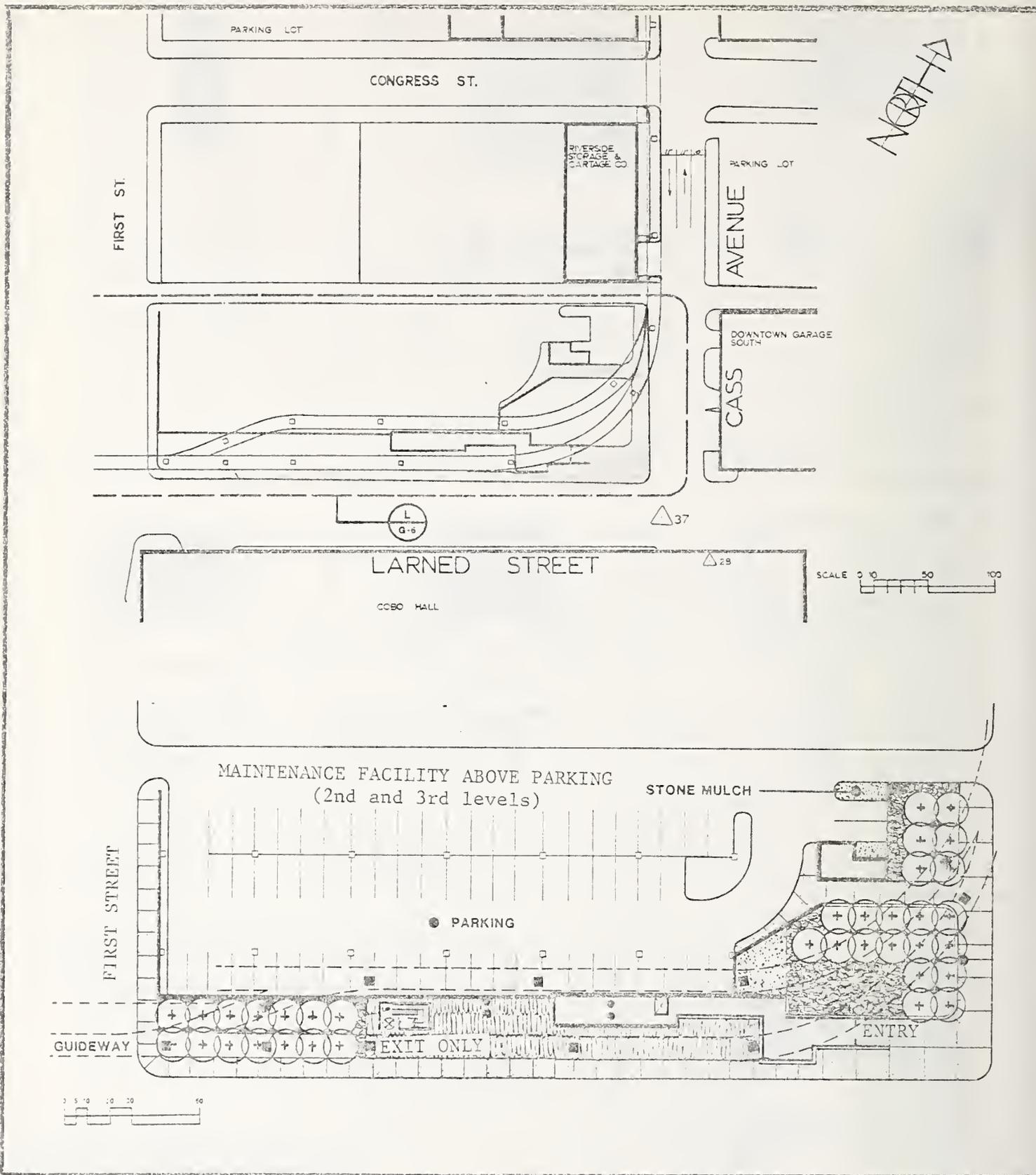
Alignment sheets 16 through 27 show site plans for 12 of the 13 stations. The layout of the Millender Center Station will be completed along with the design of the Millender Center project. Of the 13 stations, 8 are planned to be free-standing; the remaining 5 would be integrated into an existing development (Renaissance Center and Cobo Hall) or would be designed as an integral part of a new development (Cadillac Square, Millender Center, Joe Louis Arena). A free-standing station is completely separated from all other structures. This type of station may be located in existing public right-of-way or on acquired land with any buildings removed.

All stations would have stairs, at least one escalator, and at least one elevator (the latter to provide access for the handicapped). Each station would include a platform area for direct access to the DPM vehicle, change machines and vending machines for tokens, and entrance and exit gates to the platform area. At least one door with a width of 44 inches would be provided on DPM vehicles to allow access for people in wheelchairs. Machines issuing single- and multiple-unit tokens would be installed in the free region of the station adjacent to the fare collection gates. Patrons would activate the gates by inserting a token. The length of the station platform would be 100 feet to accommodate the longest expected train. The number of

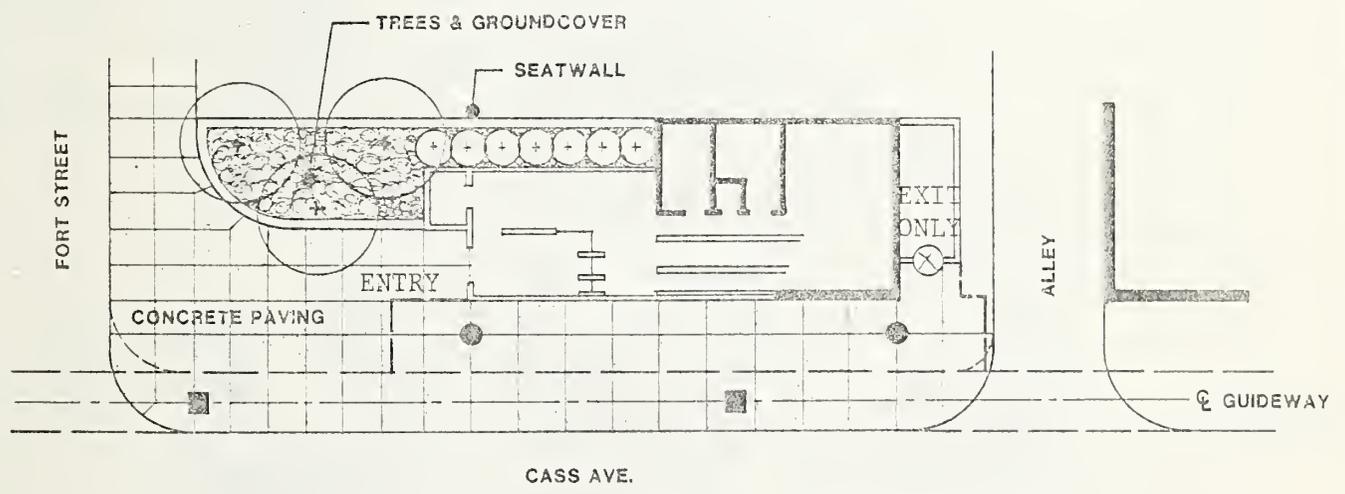
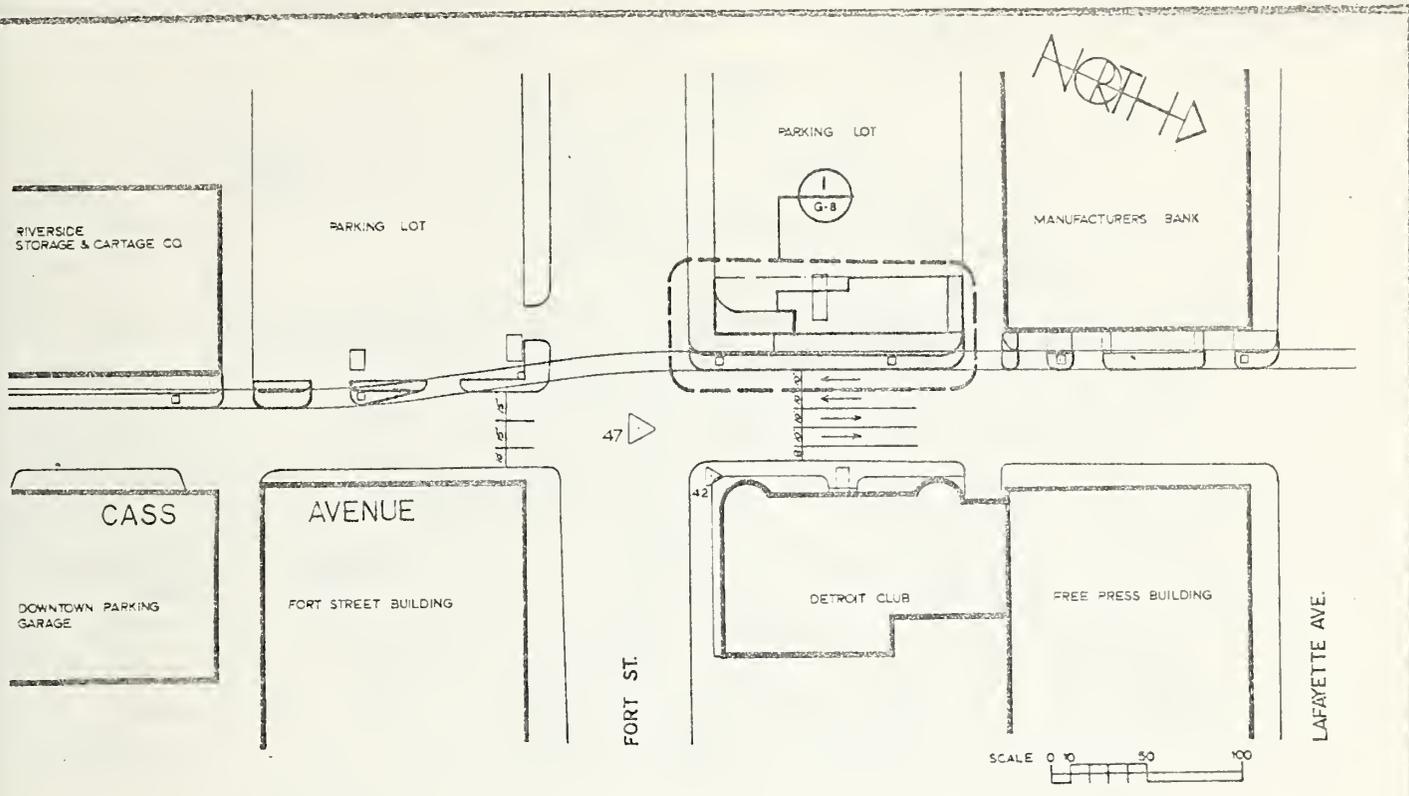


- A. Bottom Supported Guideway (Westinghouse - Rubber Tired)
- B. Bottom Supported Guideway (LTV Airtrans - Rubber Tired)
- C. Bottom Supported Guideway (Otis - Air-Bearing Suspension)
- D. Under Hanging Guideway (Demag - Rubber Tired)
- E. Monorail Guideway (Universal Mobility - Rubber Tired)
- F. Monorail Guideway (Rohr Monotrain - Rubber Tired)
- G. Covered Guideway

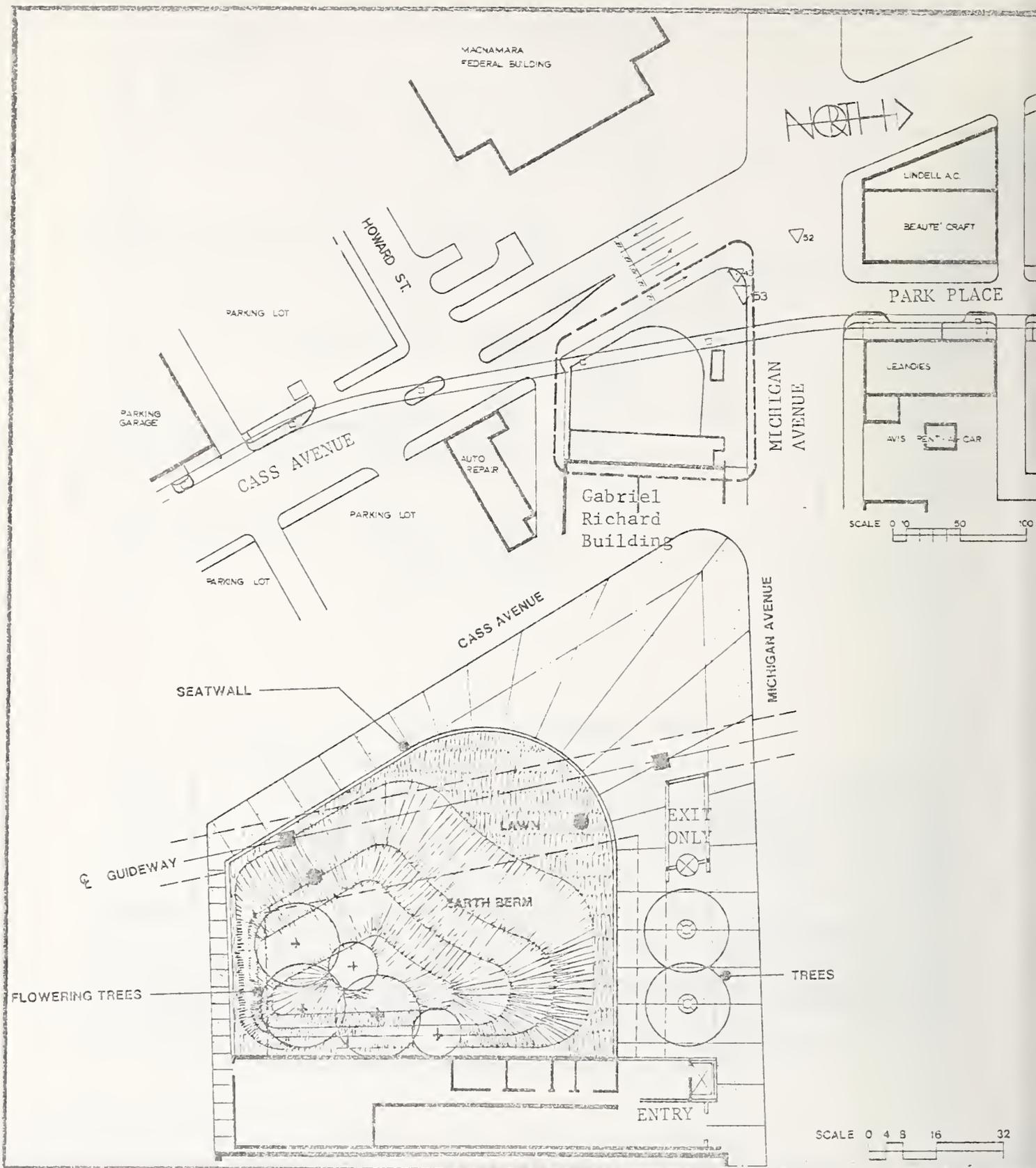
Figure 11-4
TYPICAL SECTIONS
OF SEVEN POTENTIAL GUIDEWAY
CONFIGURATIONS WITH VEHICLES



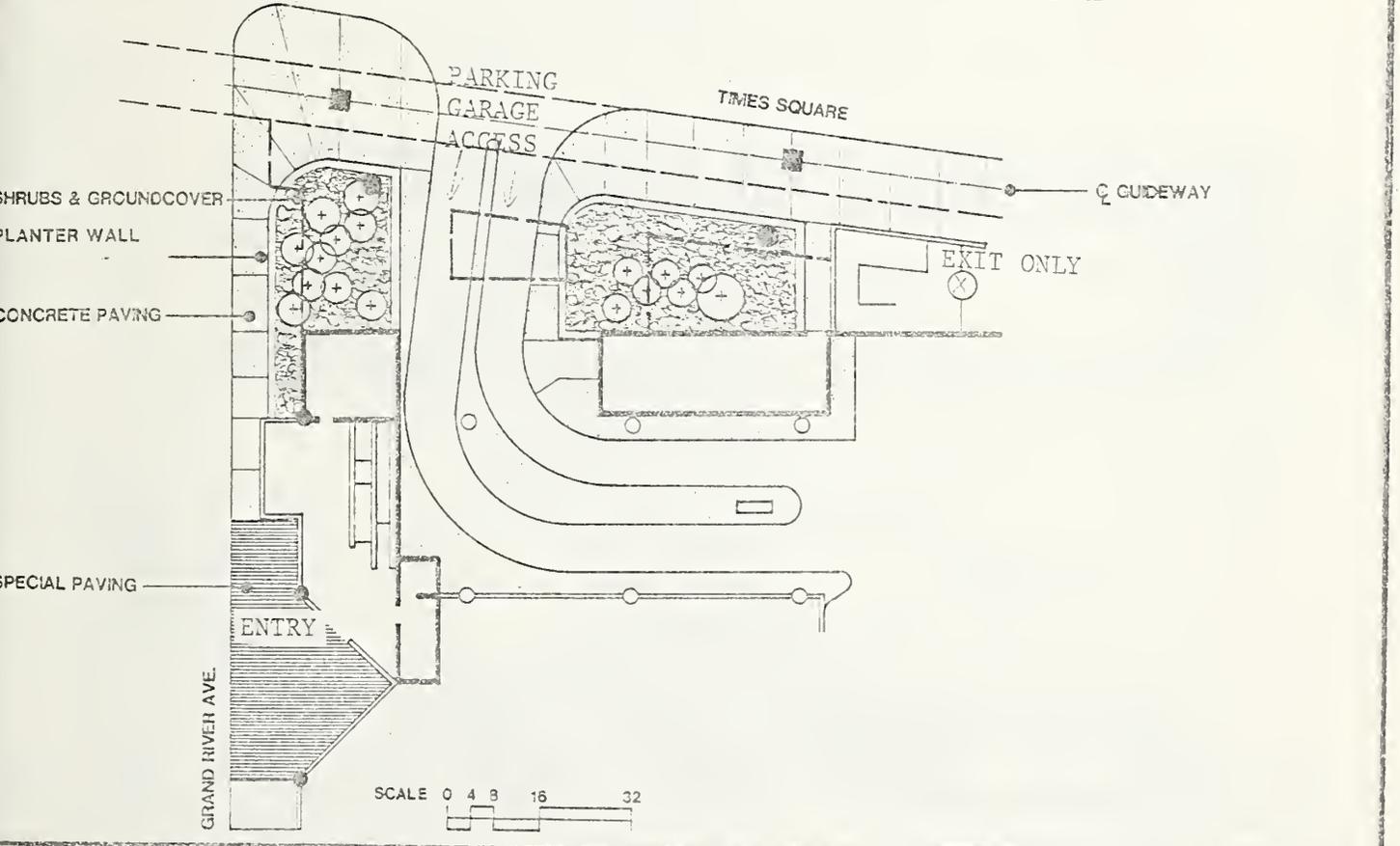
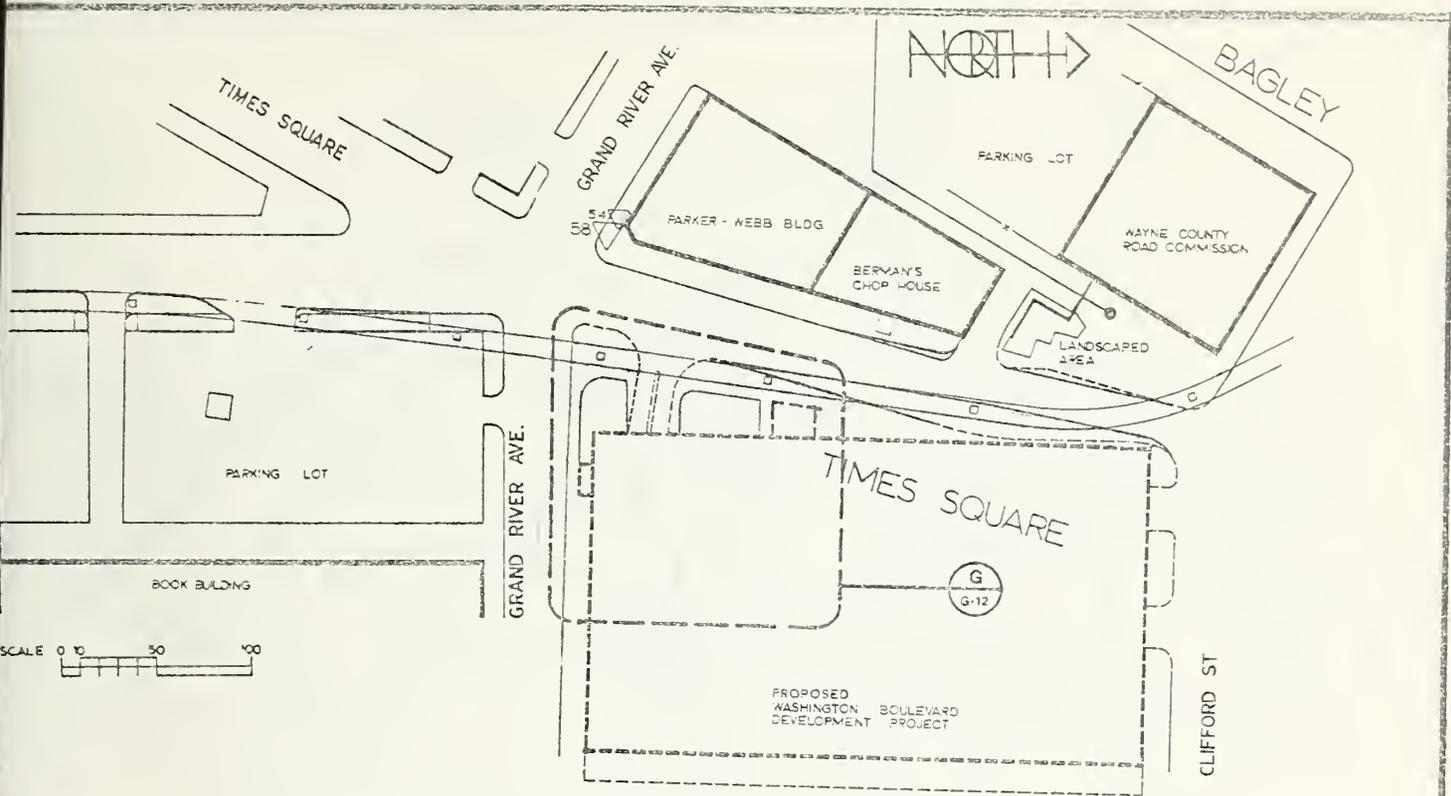
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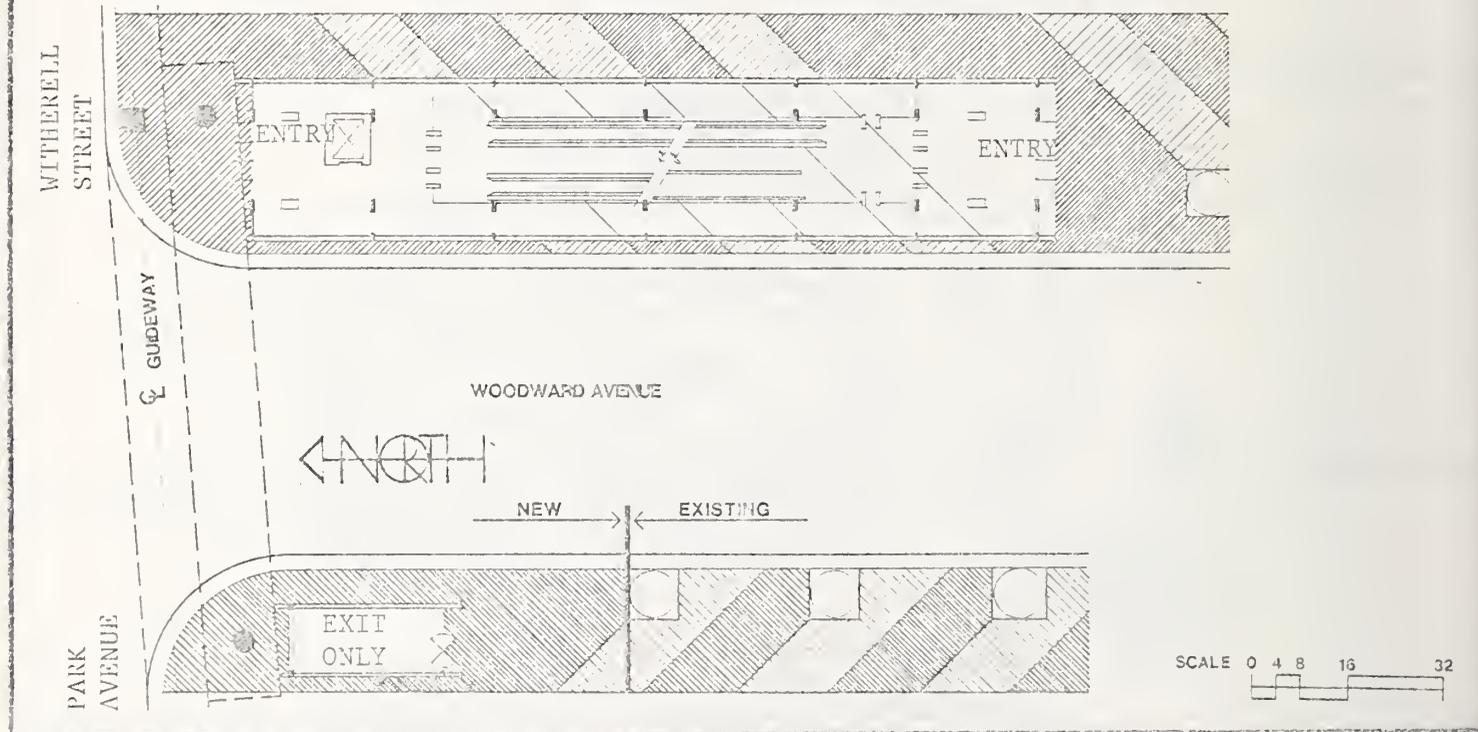
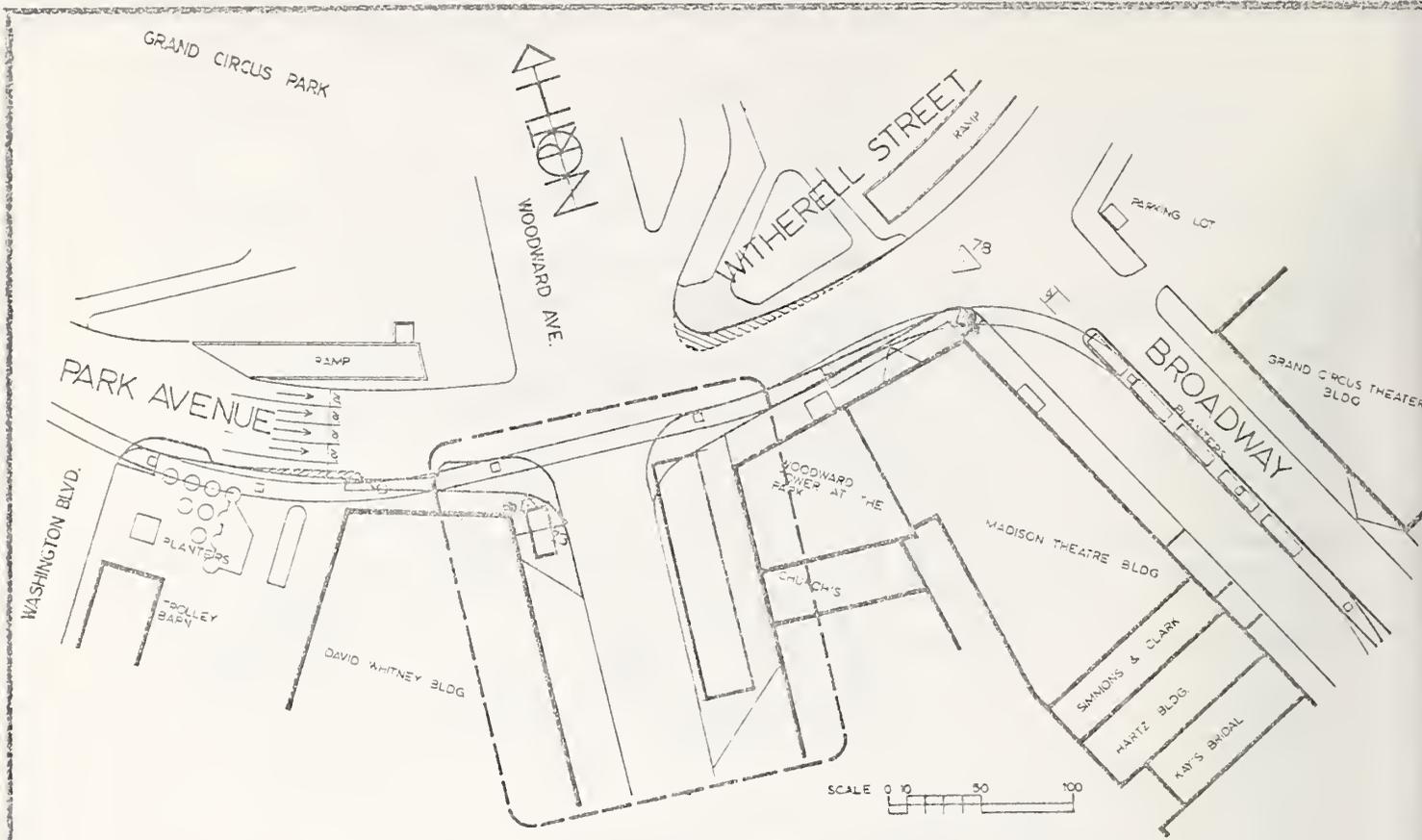
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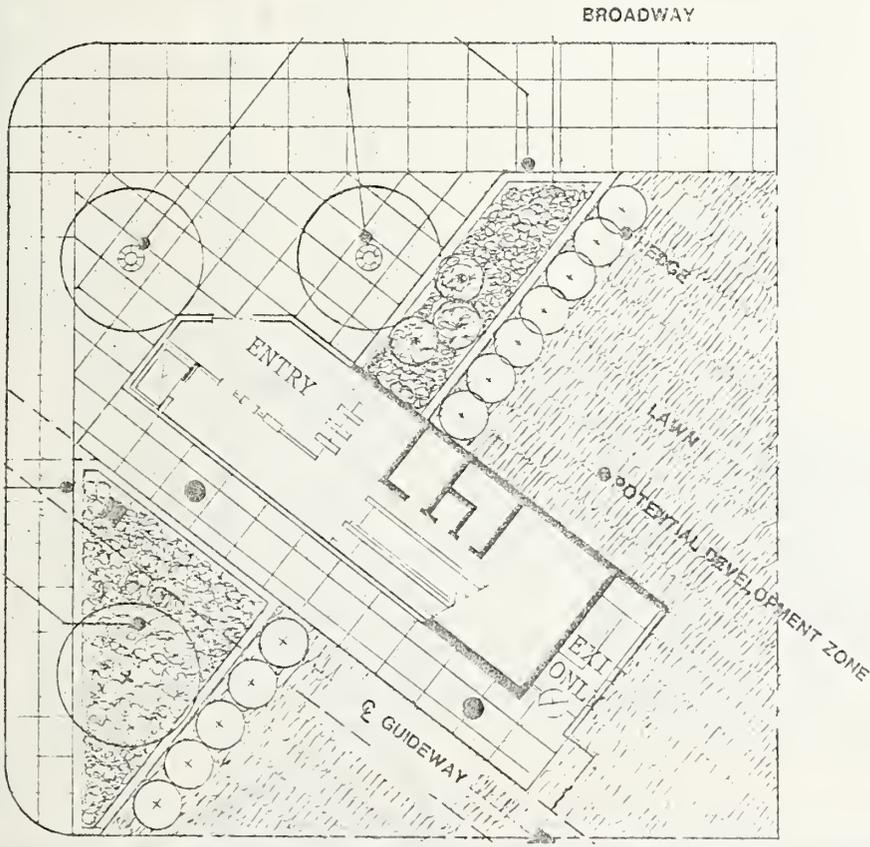
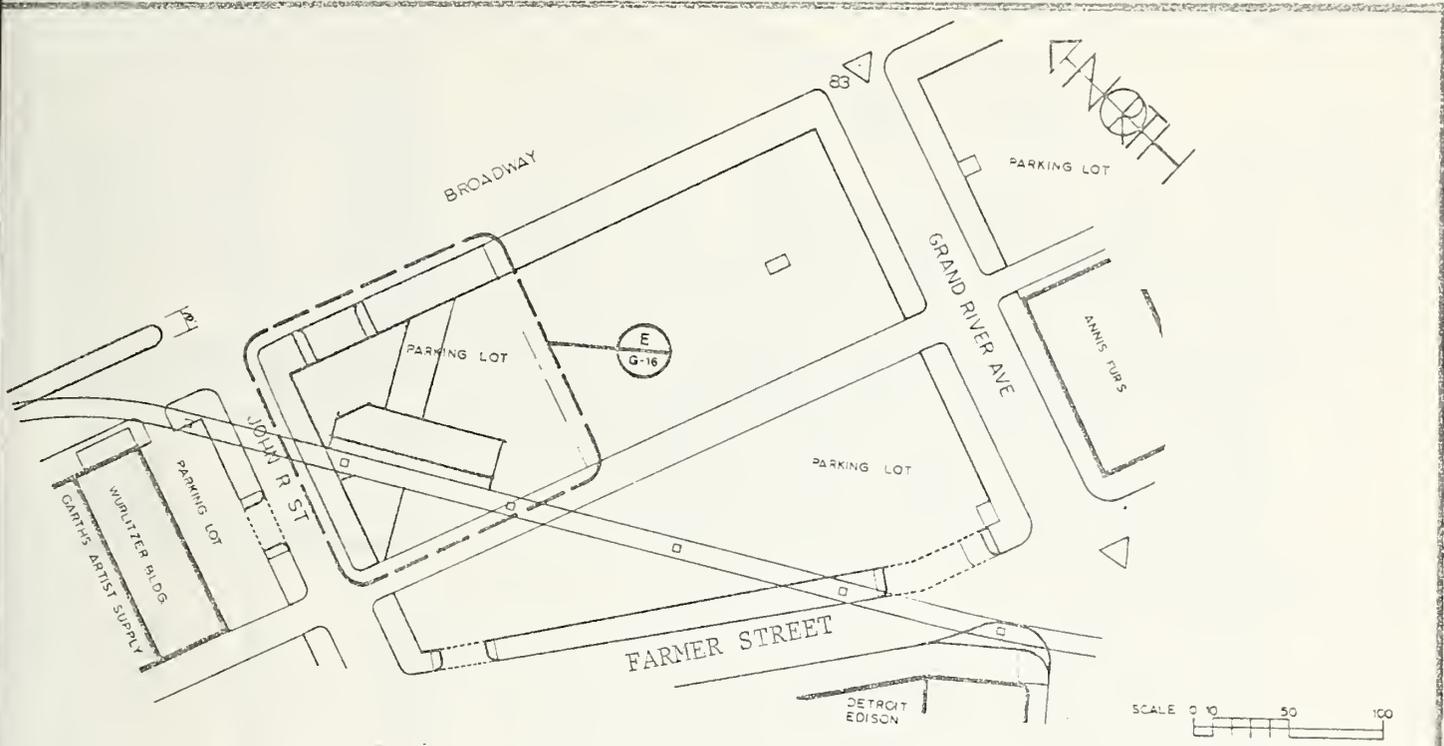
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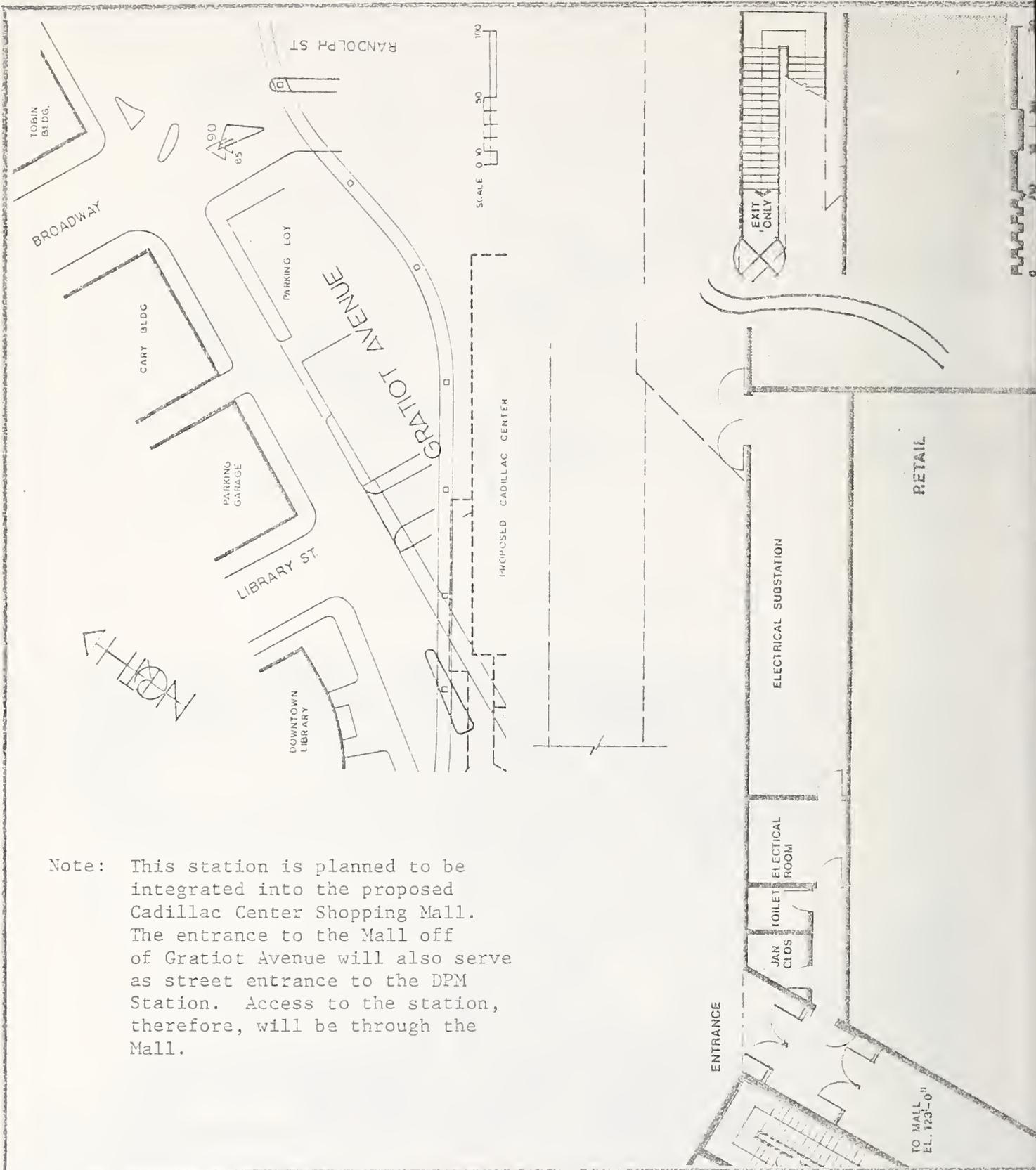
SUBJECT TO CHANGE AT FINAL DESIGN



SUBJECT TO CHANGE AT FINAL DESIGN



OBJECT TO CHANGE AT FINAL DESIGN

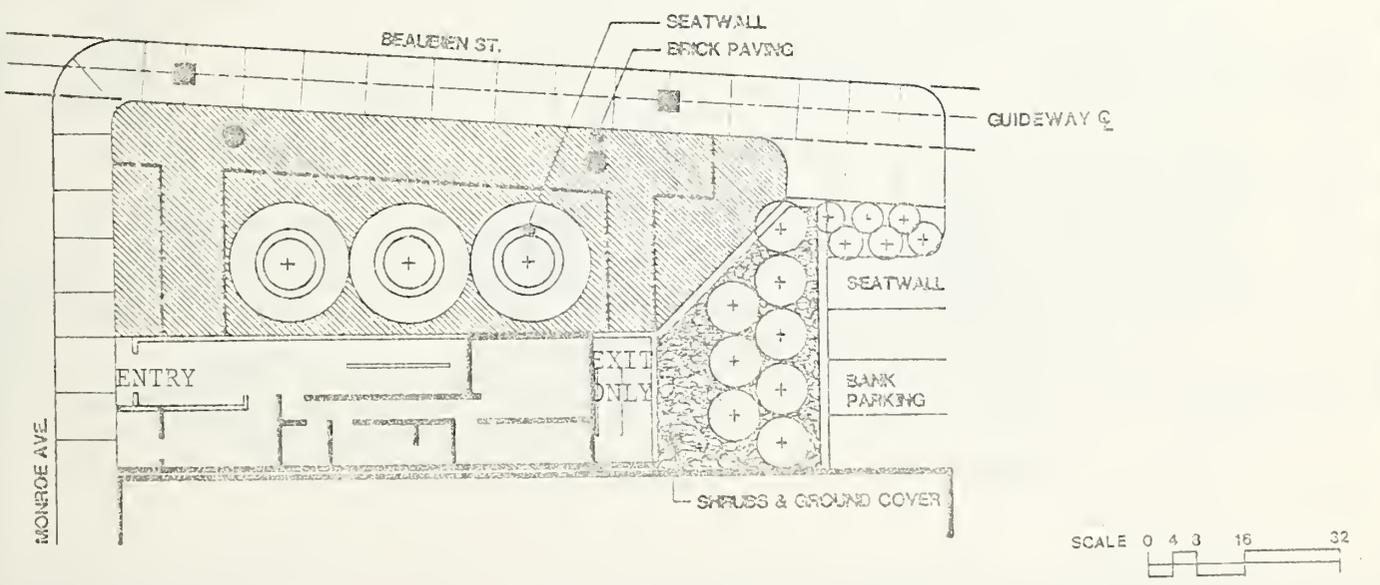
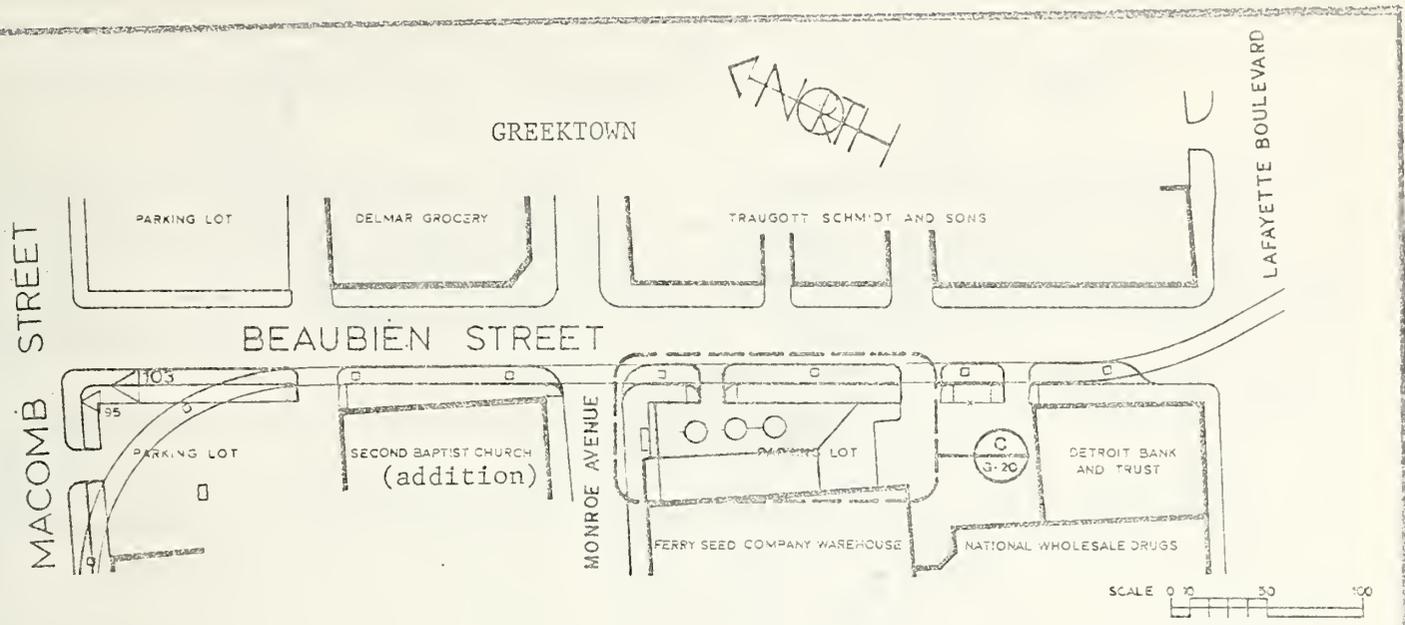


Note: This station is planned to be integrated into the proposed Cadillac Center Shopping Mall. The entrance to the Mall off of Gratiot Avenue will also serve as street entrance to the DPM Station. Access to the station, therefore, will be through the Mall.

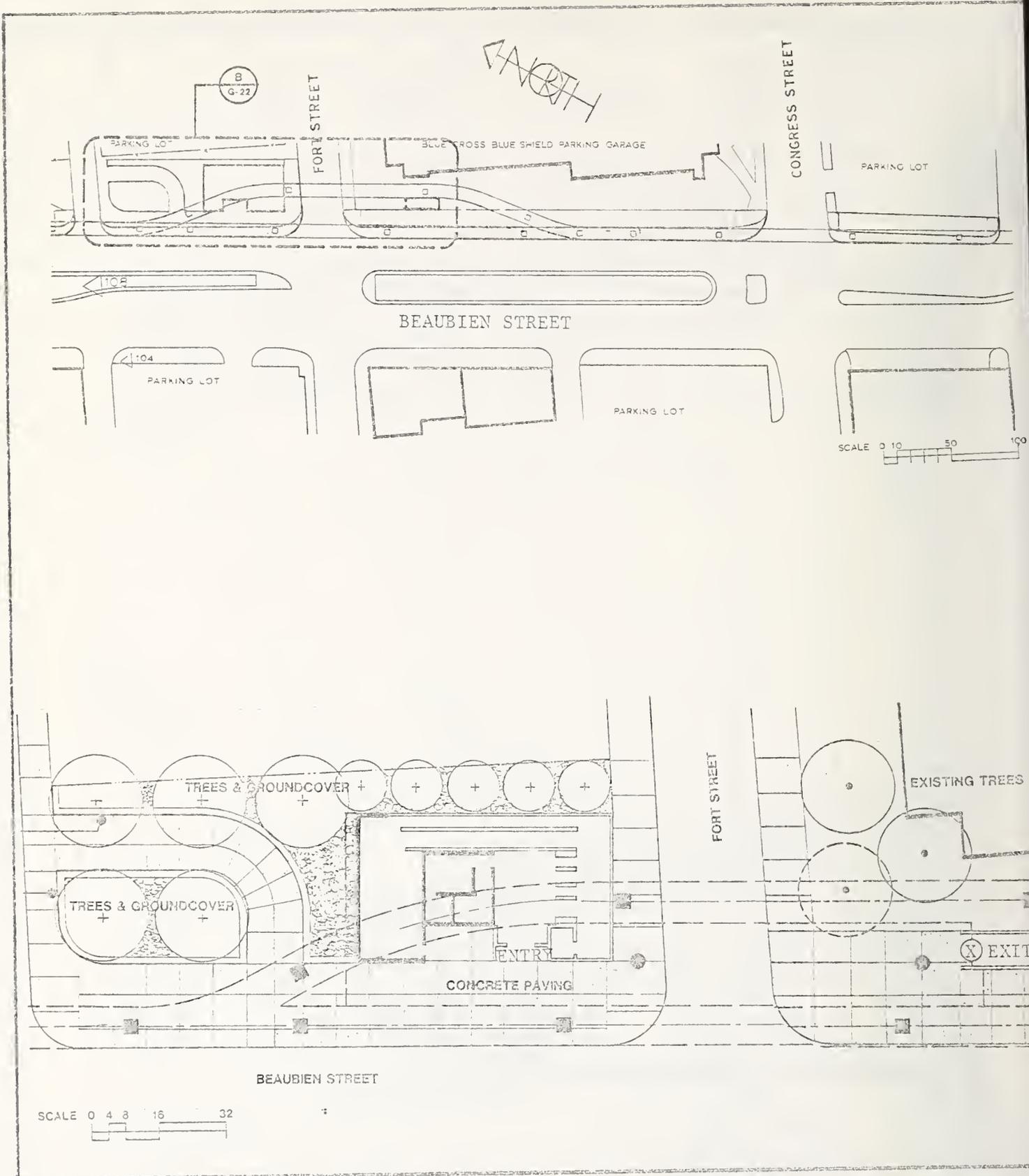
SUBJECT TO CHANGE AT FINAL DESIGN

SITE PLAN: CADILLAC CENTER STATION

Sheet No.: 22



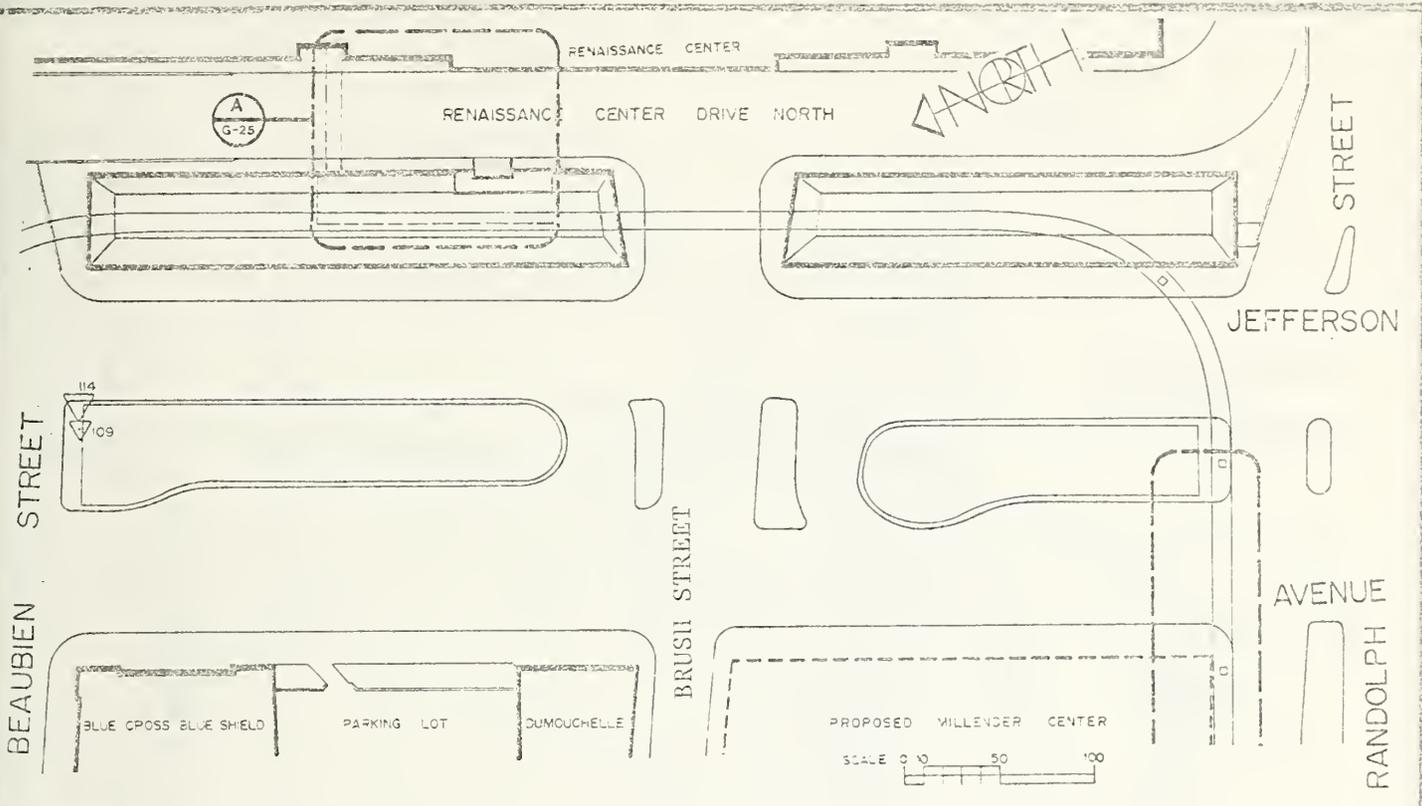
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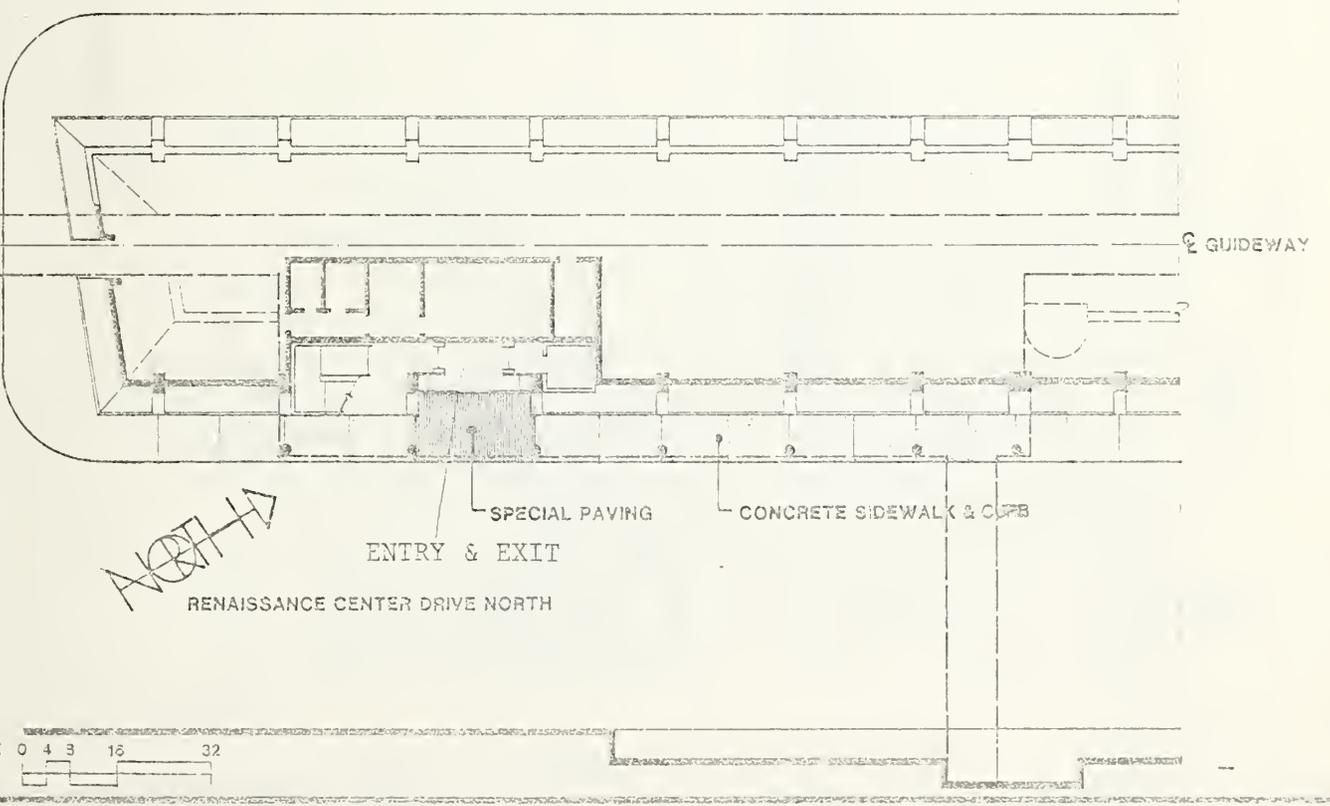
SUBJECT TO CHANGE AT FINAL DESIGN

SITE PLAN: BEAUBIEN/FORT STATION

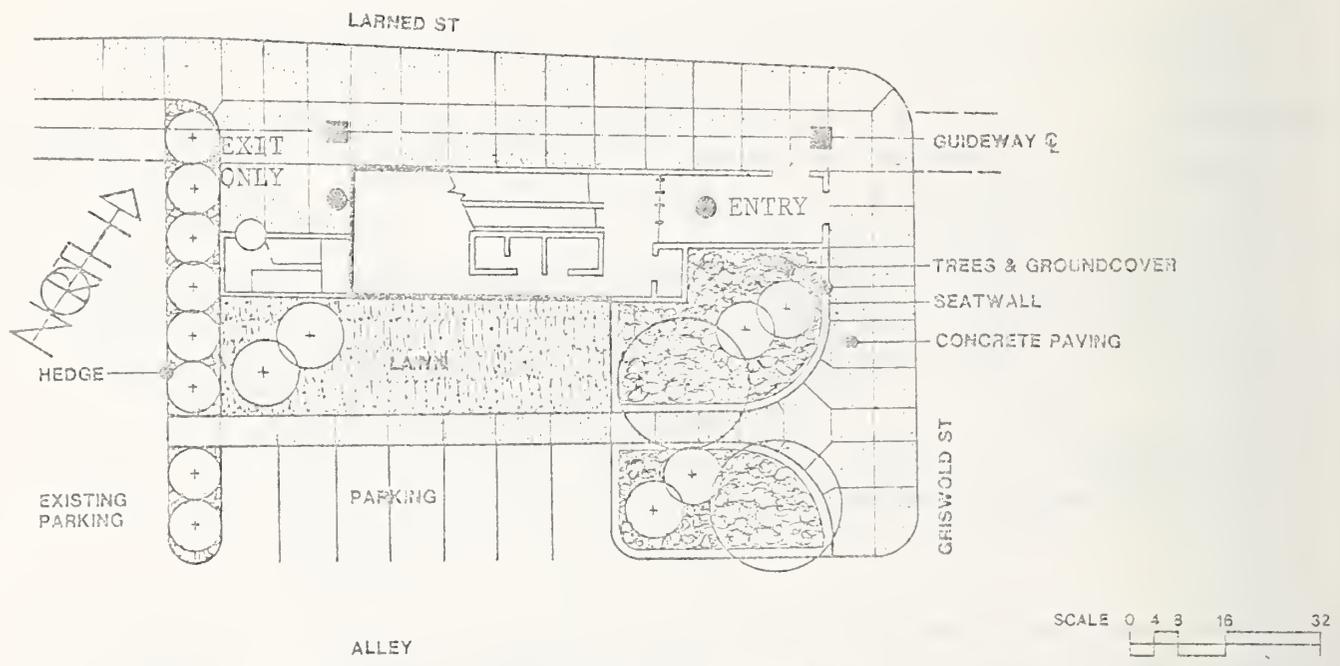
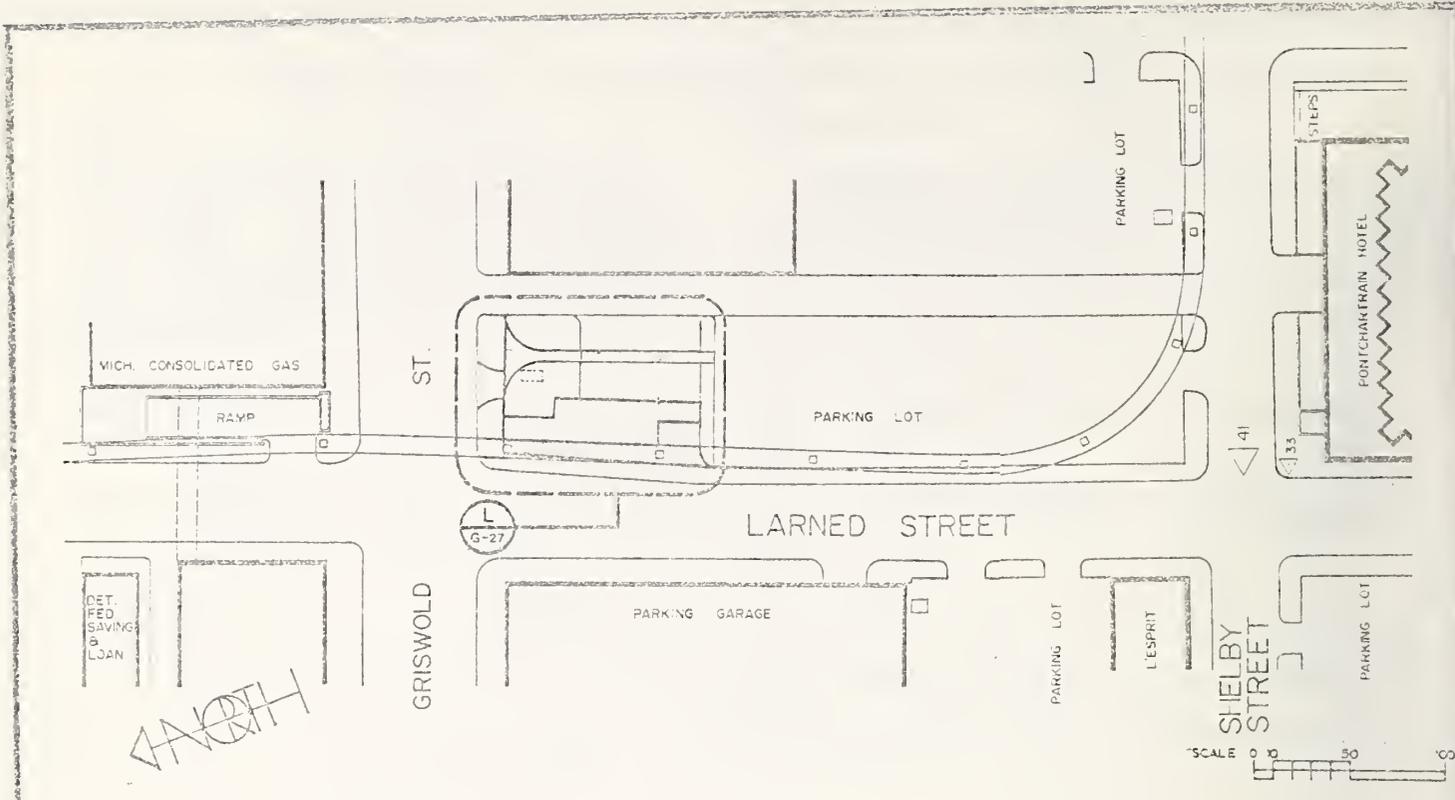
Sheet No.: 24



JEFFERSON AVE.



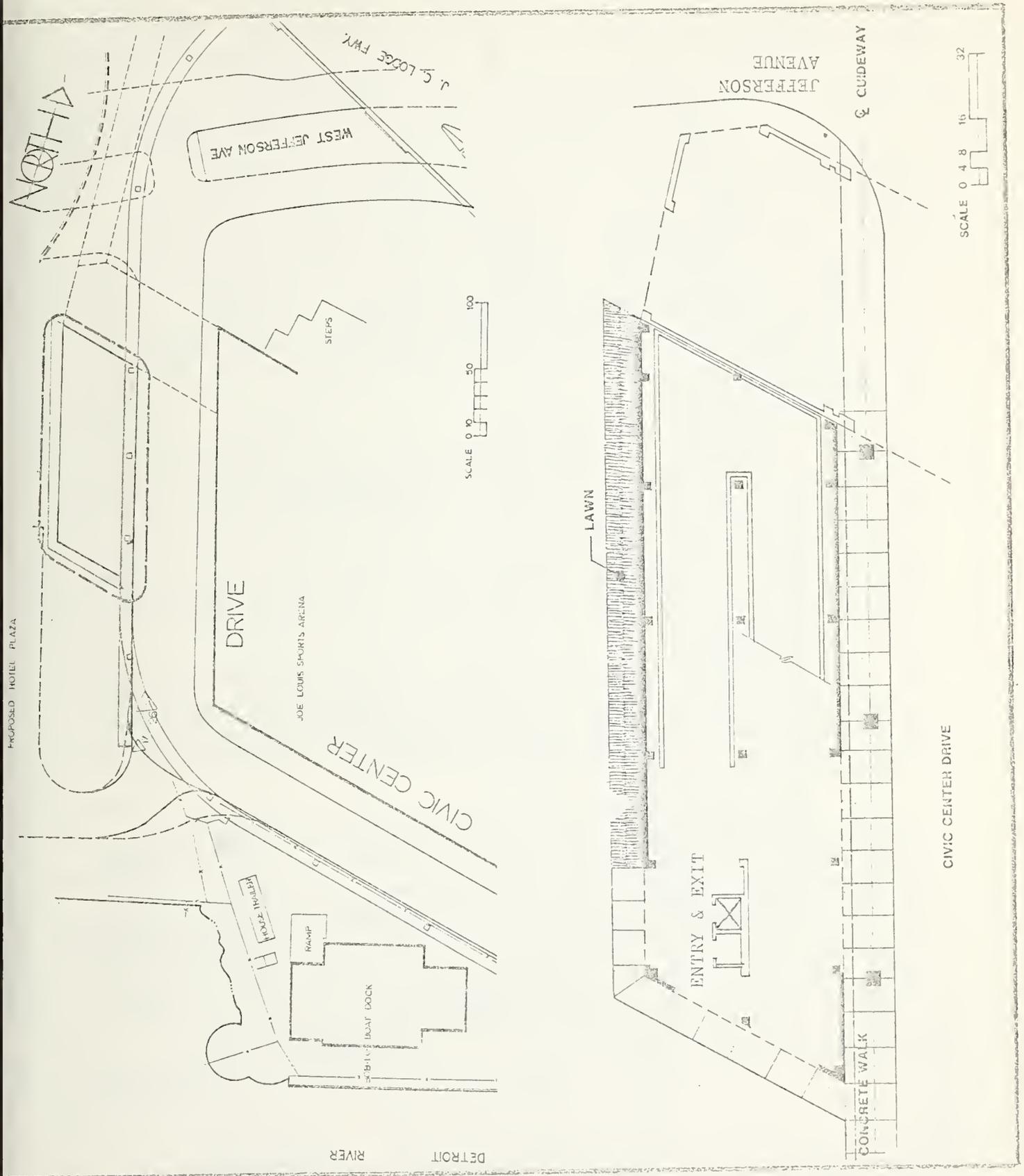
SUBJECT TO CHANGE AT FINAL DESIGN



SUBJECT TO CHANGE AT FINAL DESIGN

SITE PLAN: FINANCIAL STATION

Sheet No.: 26



SUBJECT TO CHANGE AT FINAL DESIGN

SITE PLAN: ARENA STATION

Sheet No.: 27

cars in a train would depend on the type of vehicle selected. The minimum width of the platform would be 10 feet. While the DPM vehicles would normally stop at all stations, bypasses would be provided at two stations to allow temporary storage of vehicles.

A maintenance and control facility is included as an integral part of the DPM system. The entire facility, requiring approximately 60,000 square feet of space, would be housed inside a building. The building would be designed to store the entire DPM fleet to protect it from the weather and possible damage by vandals. The maintenance and control facility would be located on the fringe of the CBD in the blocks bounded by Congress and Larned Streets and Cass and Second Avenues (Figure II-5). This site was selected after a detailed analysis of alternatives. This site is approximately 570 feet by 145 feet, covers an area of 82,650 square feet, and is now primarily used for automobile parking. Three buildings are located on the site. A general site plan for the facility is shown in Figure II-6.

Since a vehicle supplier has not yet been selected, a wide range of vehicle sizes is available (typical vehicles are shown in Figure II-3). Vehicles may range from 13.5 to 39 feet in length and from 6 to 9.33 feet in width. The capacity per vehicle ranges from 12 to 100 people. If one of the smaller vehicles is chosen, longer vehicle trains would be required to provide the same line capacity. The interiors of vehicles would be attractively designed and well lit for both comfort and security. All vehicles would be equipped with a two-way intercom system for easy communication to central control. Vehicles would be accessible to persons in wheelchairs.

Most candidate vehicles have rubber tires and operate on a bottom-supported guideway. One system is mounted above a bottom-supported guideway on an air cushion and is powered by a linear-induction motor; some vehicles use a monorail support system. All DPM vehicles being considered are electrically powered.

Existing people mover systems have been designed to carry 500 to 3,700 passengers one way per hour between stations.⁵ The Detroit DPM system would be designed to accommodate an initial patronage of 5,000 passengers per hour between adjacent stations. To achieve this capacity, two vehicle trains with a 100-passenger capacity would operate at 70-second headways during the hour of peak demand. The proposed system has been planned to operate initially 17 hours per day between 7:00 a.m. and midnight on Monday, Tuesday, and Wednesday. The system would run between 7:00 a.m. and 2:00 a.m. on Thursday, Friday, and Saturday, and between 10:00 a.m. and 6:00 p.m. on Sunday. There are no technical limits to 24-hour service if passenger demand justifies it.

⁵N.D. Lea & Associates, Summary of Capital and Operations & Maintenance Cost Experience of Automated Guideway Transit Systems, report prepared for the U.S. Department of Transportation, April, 1973.

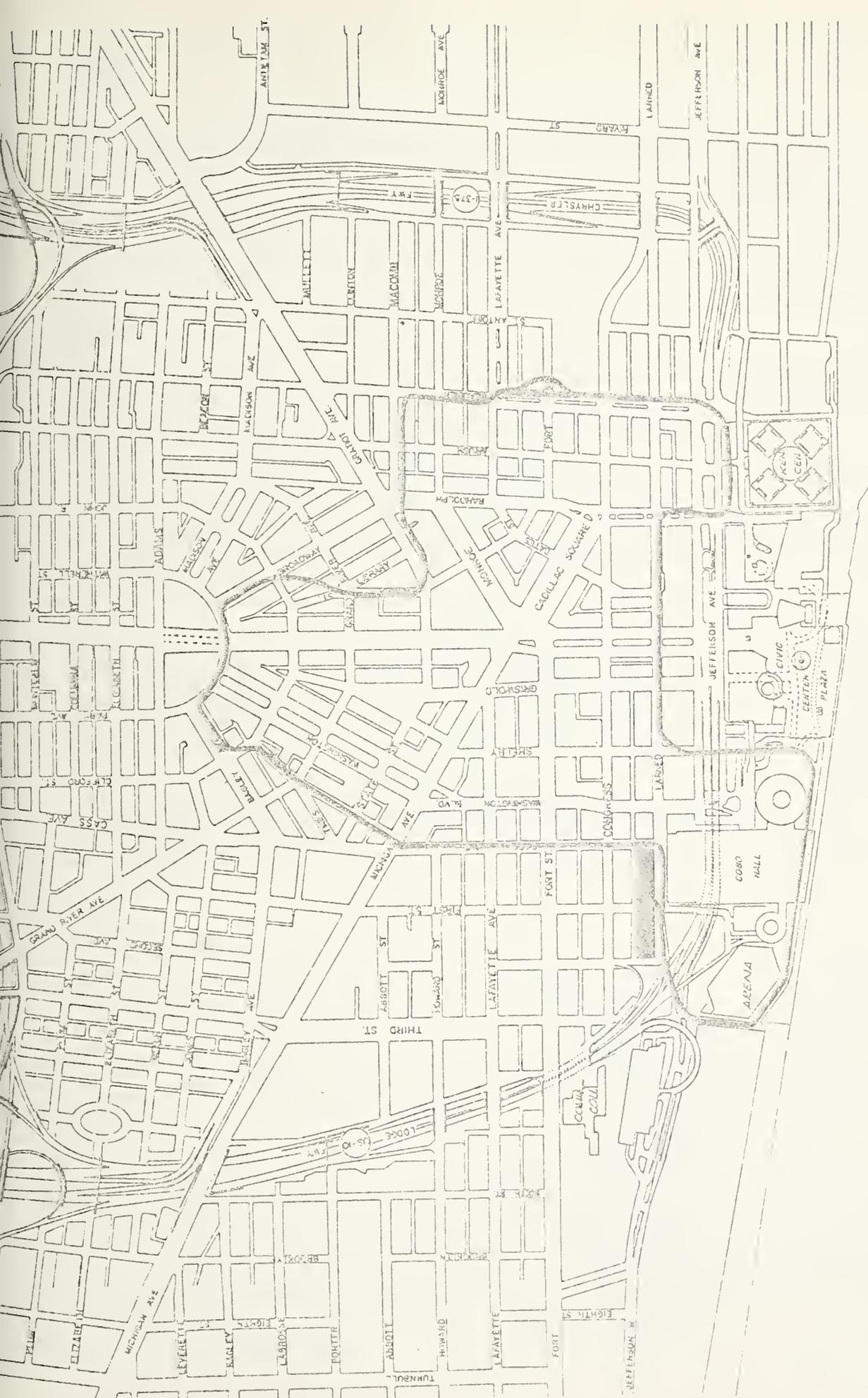
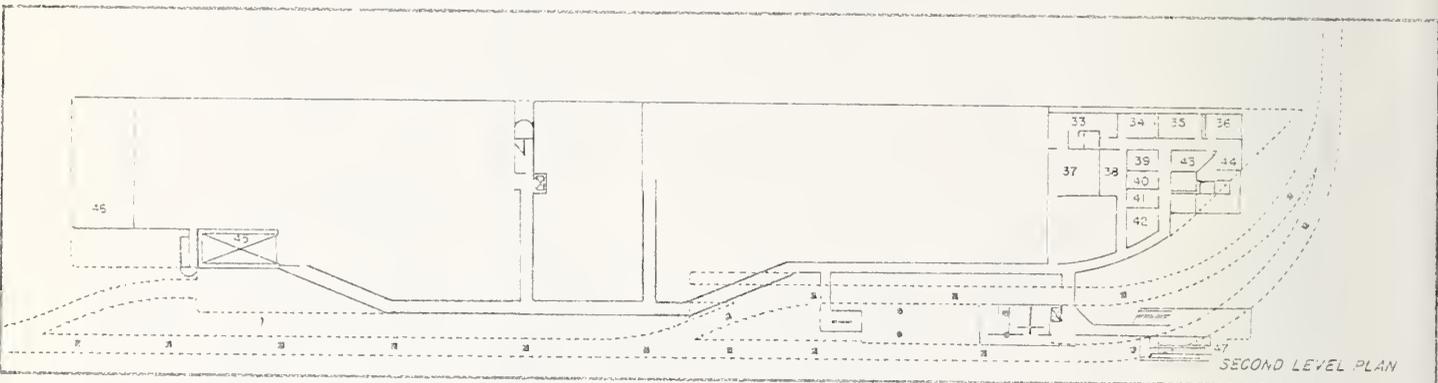
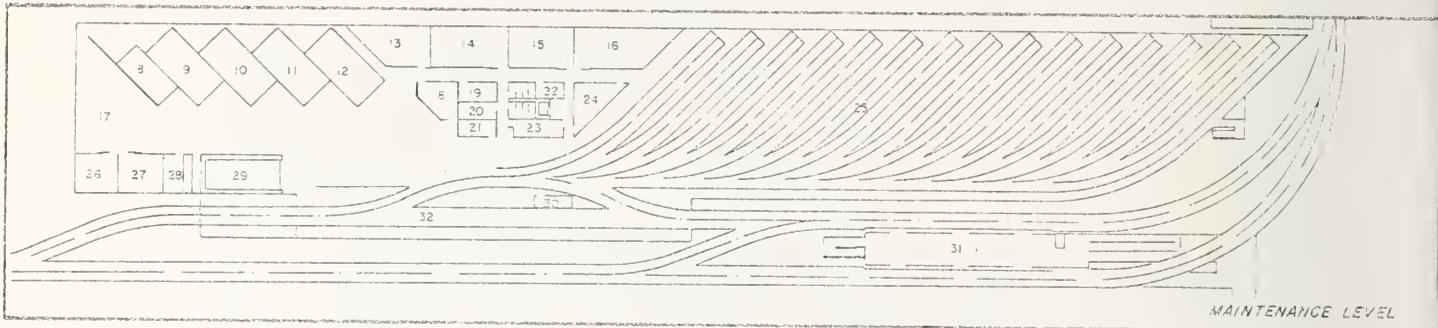
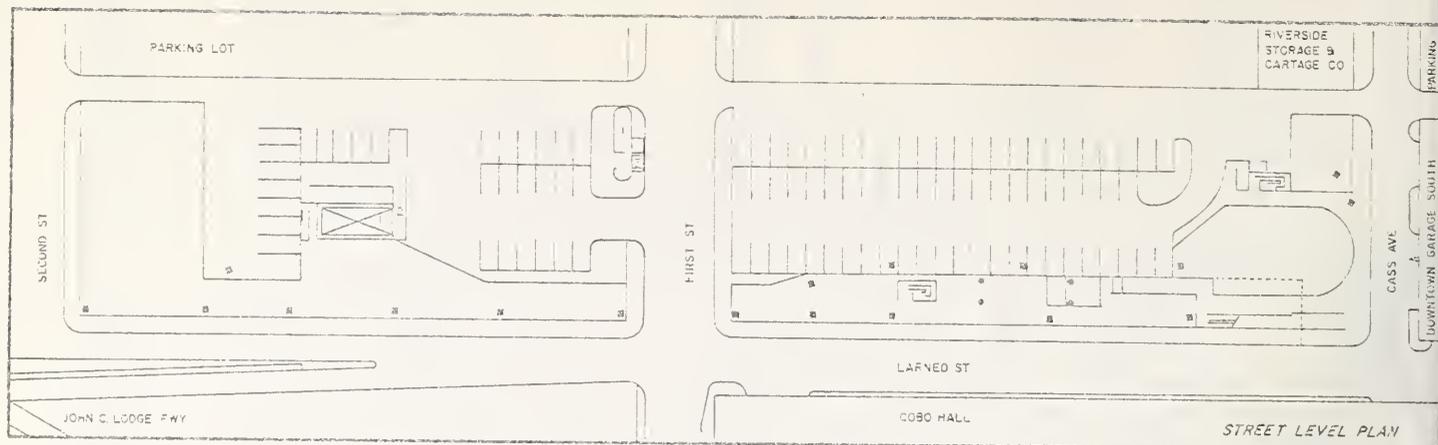


Figure 11-5
 MAINTENANCE FACILITY LOCATION

[Symbol] DPM ALIGNMENT
 [Symbol] MAINTENANCE FACILITY

--- DETROIT RIVER ---



KEY

- | | |
|-------------------------------------|--------------------------------------|
| 1. Service Elevator | 25. DPM Retrieval Vehicle Storage |
| 2. Loading Dock | 26. Small Parts Storage |
| 3. Elevator | 27. Large Parts Storage |
| 4. Elec. Room | 28. Shipping/Receiving |
| 5. Elec. Substation | 29. Service Elevator |
| 6. Ticketing, Fare Gates | 30. Departure & Test Control |
| 7. Elevator | 31. Platform |
| 8. Support Vehicle | 32. Train Make-up Testing |
| 9. DPM Maint. Bay | 33. Office |
| 10. DPM Maint. Bay | 34. System Engineer Mgr. |
| 11. DPM Maint. Bay | 35. Conference Training |
| 12. DPM Maint. Bay | 36. Director |
| 13. Electrical Shop | 37. Control Console Guideway Display |
| 14. Electrical Shop | 38. Observation Area |
| 15. Tire Wheel Shop | 39. Drafting |
| 16. Mechanical | 40. Mechanical Engineer |
| 17. Support Equipment | 41. Electrical Engineer |
| 18. Mech. Equip. Air Compressor | 42. Business Mgr. |
| 19. Tool Crib | 43. Money Vault |
| 20. Combustibles Storage | 44. Secretary |
| 21. Batteries | 45. Service Elevator |
| 22. Utility | 46. Large & Small Parts Storage |
| 23. Maint. Supervisor | 47. Fare Gates, Cobo Hall Entrance |
| 24. Conf., Training, Lunch, Lockers | |

Figure 11-6
MAINTENANCE FACILITY SITE PLAN

With nine trains traveling the guideway, headways are projected to average 94 seconds. The number of vehicles in each train would depend on the capacity of each vehicle and the time of day. A train capacity of 50 passengers would provide a maximum flow rate of 1,800 passengers per hour. A train capacity of between 50 and 100 passengers would satisfy average conditions in Detroit. During the noon peak period (12:00 to 1:00 p.m.), additional capacity would have to be added. Special operating procedures would be defined to satisfy the unusually high peak loads resulting from special events in the CBD. For off-peak service (i.e., after 6:00 p.m.), fewer vehicle units may be operated at longer headways.

Predicted passenger volumes for the system are 71,000 passengers per weekday in 1990, with 11,500 passengers in the noon peak hour. Daily station-to-station passenger volumes are shown in Table II-4. The average length of a trip on the DPM is expected to be about 1.2 miles or slightly less than half the distance around the alignment. With vehicles traveling at 94-second headways around the system, average passenger waiting times of about 47 seconds could be expected under normal conditions. When combined with the average time passengers spend on a vehicle completing their trips (5.4 minutes), the average station-to-station trip time for passengers is just over six minutes.

The estimated capital cost of the DPM is \$118.55 million (in escalated dollars). These funds would be provided by the U.S. Department of Transportation (80%) and the Michigan Department of Transportation (20%). Annual operating costs for the DPM have been estimated to be \$6.78 million (in 1985 dollars); a 30-cent base fare, with a 50 percent discount for elderly and handicapped passengers, would provide revenues of approximately \$6.8 million and allow the system to operate free of subsidy.

Construction of the DPM is expected to begin in the spring of 1981 and the initiation of revenue service in the fall or winter of 1983.

b. Summary of Expected Impacts

The DPM's major impact would be on land use and urban development. Construction of the DPM is predicted to increase investment in office, retail, hotel, and residential land uses within the CBD. Construction of a grade-separated transportation system would encourage all station areas to become activity centers because of the convenient access to them provided by the system. Downtown employees and visitors would begin to make greater use of downtown retail and office businesses because of the convenient access afforded by the DPM.

Since 1966, the downtown has been losing a substantial amount of office business to the region. Projections indicate that the DPM system would decrease the rate at which the CBD has been losing its share of the office market. Between 1983 and 1990, the DPM system is expected to increase total office space by 5 to 5.5 percent (compared to projected demand without the DPM). With the DPM system in operation, demand for additional downtown office space is expected to increase by 450,000 gross square feet per year.

TABLE II-4

TOTAL DAILY DPM STATION-TO-STATION DEMAND MATRIX

| Origins | Destinations | | | | | | | | | | | | | Totals |
|--------------------|--------------------|---------------|-----------|-----------------|----------|--------------------|--------------|-----------------|-----------|-----------|-----------------|------------------|------------------|--------|
| | Renaissance Center | Beaubien/Fort | Greektown | Cadillac Square | Broadway | Grand Cir-cus Park | Times Square | Michigan Avenue | Fort/Cass | Cobo Hall | Joe Louis Arena | Financial Center | Millender Center | |
| Renaissance Center | 0 | 1,431 | 935 | 1,632 | 528 | 281 | 405 | 520 | 606 | 300 | 461 | 464 | 117 | 7,883 |
| Beaubien/Fort | 481 | 0 | 408 | 681 | 267 | 101 | 146 | 181 | 254 | 45 | 125 | 108 | 121 | 2,923 |
| Greektown | 572 | 169 | 0 | 1,296 | 417 | 233 | 332 | 496 | 558 | 50 | 119 | 233 | 257 | 4,733 |
| Cadillac Square | 775 | 264 | 609 | 0 | 1,515 | 314 | 1,395 | 1,884 | 1,295 | 327 | 435 | 452 | 618 | 9,882 |
| Broadway | 384 | 139 | 83 | 5 | 0 | 76 | 563 | 760 | 713 | 59 | 118 | 369 | 363 | 3,633 |
| Grand Cir-cus Park | 178 | 55 | 87 | 119 | 7 | 0 | 738 | 1,196 | 1,232 | 75 | 253 | 1,162 | 123 | 5,224 |
| Times Square | 482 | 181 | 270 | 453 | 217 | 738 | 0 | 671 | 1,123 | 194 | 301 | 403 | 518 | 5,553 |
| Michigan Avenue | 576 | 234 | 374 | 762 | 341 | 1,123 | 37 | 0 | 934 | 504 | 548 | 517 | 625 | 6,571 |
| Fort/Cass | 406 | 156 | 187 | 399 | 249 | 1,197 | 202 | 67 | 0 | 431 | 586 | 186 | 420 | 4,490 |
| Cobo Hall | 372 | 88 | 49 | 289 | 75 | 114 | 143 | 237 | 12 | 0 | 348 | 578 | 602 | 2,907 |
| Joe Louis Arena | 461 | 138 | 98 | 452 | 135 | 295 | 249 | 314 | 194 | 49 | 0 | 945 | 586 | 3,919 |
| Financial Center | 1,251 | 443 | 768 | 929 | 680 | 1,337 | 497 | 481 | 128 | 338 | 393 | 0 | 976 | 8,222 |
| Millender Center | 992 | 444 | 493 | 814 | 360 | 183 | 245 | 332 | 473 | 285 | 360 | 86 | 0 | 5,070 |
| TOTAL | 6,934 | 3,741 | 4,363 | 7,832 | 4,788 | 5,990 | 4,955 | 7,138 | 7,724 | 2,658 | 4,050 | 5,507 | 5,330 | 71,010 |

TOTAL TRIPS = 71,010

Source: Gannett Fleming Corrdry & Carpenter of Michigan, Inc., "Bus Alternative," working paper prepared for SEMTA, June, 1979.

Retail businesses would also benefit from construction of a DPM. While development of the Renaissance Center and the Woodward and Washington Street Malls have stimulated retail development, retail sales still declined an average of 4.4 percent per year between 1972 and 1978. Construction of the DPM would connect the Renaissance Center with the older retail core, office buildings, and the convention area. All retail establishments near stations would benefit. With construction of the DPM, annual retail sales in the CBD are projected to increase from \$295 million in 1978 to between \$350 and \$370 million in 1990, as measured in constant 1976 dollars.

For two other land use elements of residential housing and hotel/motel units, substantial increases are forecast. It is estimated that construction of a DPM would create demand for an additional 1,250 to 1,500 residential units in the CBD between 1985 and 1990, as compared to any circulator bus improvement. Furthermore, the DPM is projected to result in an additional 600 new hotel rooms by 1990--an increase of about 20 percent in the total number of hotel rooms in the CBD. With this expected growth in development, the DPM would stimulate the downtown economy. Operation of the DPM would create 2,900 additional jobs in the CBD. The projected growth in housing would increase the population of the CBD, benefitting the economy and enabling more efficient use of vacant land on the edges of the CBD. Construction of the DPM would be paid for by federal and state tax funds, benefitting southeastern Michigan by returning funds to the area. Operating costs would be met by passenger revenues, advertising income, and participation in joint development by private businesses. The employment and cost analyses clearly indicate a net benefit to be gained by the downtown and the region from implementation of a DPM system.

When considered with the city of Detroit's proposed redevelopment plans, the DPM is an important element. Major downtown redevelopment or expansion projects sponsored or supported by the city have included Phases 2 and 3 of the Renaissance Center, a new riverfront arena with housing and a major parking garage located nearby, rehabilitation and redevelopment of properties along Washington Boulevard, and smaller developments near Greektown and the Financial District. All of these areas would have DPM stations on the site or nearby. It appears certain that each station would stimulate new development, supporting the city's objectives for downtown growth.

The DPM would have a generally positive, but not overwhelming, impact on existing transportation systems. The capacity of the downtown transportation system to move people would be increased, but benefits would not extend outside the CBD. The mobility of travelers with trip ends inside the DPM loop would be increased because of reduced congestion and direct use of the DPM. Persons traveling to the CBD would be more likely to park in fringe areas--an action that would reduce congestion in the CBD core and lower the cost of parking. Relocation of existing parking lots to the edges of the CBD would become more attractive to parking lot owners; buildings could then be constructed on vacated parking areas in the CBD core. The overall impact of the DPM would be to improve mobility within the CBD and improve access to the CBD core.

The DPM would have slight adverse impacts on visual resources and noise levels. The identified visual impacts of the DPM would be disruption of the views of Grand Circus Park from Washington Boulevard and Broadway. Figures II-7 through II-10 show an artist's conceptions of the DPM at Larned Street, Woodward Avenue, the Renaissance Center, and Jefferson Avenue. Guideway crossings in front of buildings along the route could detract from their appearance. Also, the views from the lower floors of some adjacent buildings would be altered. To mitigate this impact, the guideway and station facilities would be designed to harmonize with the existing horizontal and vertical lines of buildings, wherever feasible. Changes in vertical grade would be minimized to produce a smooth, flowing appearance. All storm drains, heating system components, and power supply and train control cables would be hidden. The noise and vibration caused by the DPM and affecting buildings in the CBD are expected to be minor. Passengers within DPM vehicles would experience noise levels higher than those of an automobile, but not high enough to create discomfort.

Since the DPM would be built primarily within existing public right-of-way, displacement of businesses would be kept to a minimum. Only three buildings on the site of the maintenance garage would have to be demolished and the businesses relocated. Seven parking lot operations might be discontinued, but a number of these businesses may continue to operate, since impacts would be limited to construction of piers on the lots. No residential properties would be displaced by the DPM.

Air pollution would generally be improved by construction of the DPM. Total annual emissions of carbon monoxide, hydrocarbons, nitrous oxide, sulphur oxide, and particulates would be lower if the DPM were built.

Energy consumption in the CBD would be higher with implementation of the DPM. However, the DPM would be powered by electricity generated by burning coal. Actual gasoline consumption with the DPM alternative would be less than it would be with alternatives that do not include a DPM as a transportation improvement. No impacts on the existing topography, geology, soils, floodplain, vegetation, or climate are expected to result from the DPM. Water quality would not be affected, as most pollutants would be discharged into the Detroit sewer system. Industrial wastes would be adequately treated before discharge into the sewer system to avoid creation of any problems for normal treatment of wastes.

The DPM would have adverse effects on historic elements of the CBD. Three historic properties eligible for inclusion in the National Register of Historic Places would be involved: the Buckland-VanWald Building, the Grand Circus Park Historic District, and the Detroit Street Plan. The Buckland-VanWald Building, designed and constructed in the 1880's, consists of two buildings with a common wall. This building is located on the site of the proposed maintenance facility. Following studies of alternative maintenance sites and the possibility of incorporating the existing buildings into the maintenance facility, demolition of the structure was determined to be the only feasible option. SEMTA has agreed to record the building according to the standards of the National Architectural and Engineering Record prior to demolition and to allow the State Historic Preservation Officer (SHPO) to review the design of all construction on the site.

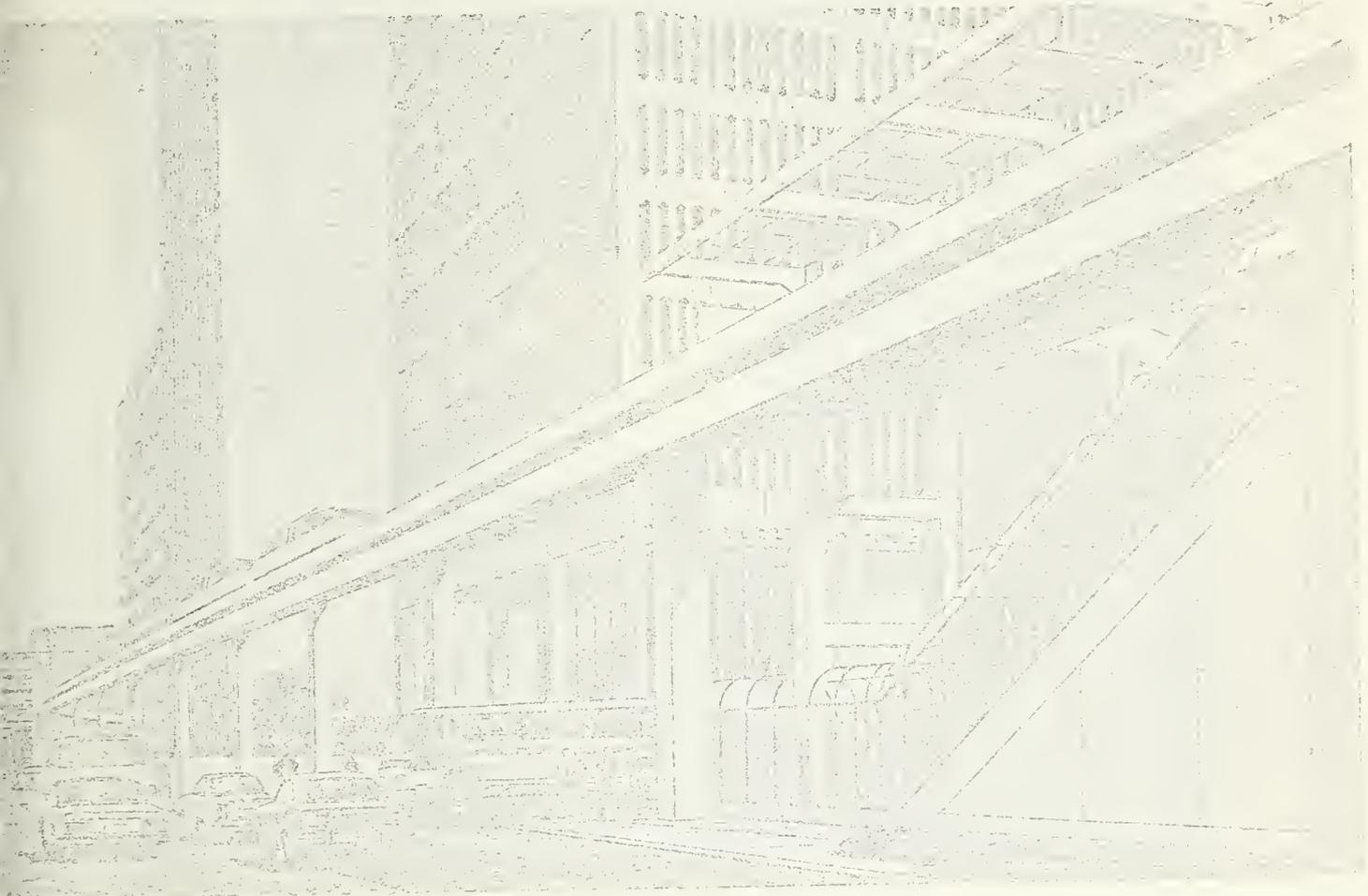


Figure 11-7
DPM ALIGNMENT ON LARNED STREET
NEAR FINANCIAL DISTRICT STATION



Figure II-8
DPM AT WOODWARD AVENUE



Figure II-9

DPM RENAISSANCE CENTER



Figure II-10
DPM AT JEFFERSON AVENUE

The DPM's adverse impacts on the Grand Circus Park Historic District and the Detroit Street Plan would be less severe. The DPM would pass through the Grand Circus Park Historic District, but would not require demolition of any historic property or the taking of any part of the park. Members of the Grand Circus Park Development Association believe that any negative effects would be offset by economic benefits that would revitalize this historic area. The DPM would interrupt the broad avenues and views of open spaces originally designed as part of the Detroit Street Plan. An overhead structure such as the DPM would have some negative effect on the view of Grand Circus Park from Woodward Avenue and the Detroit River from Woodward Avenue. The SHPO has noted that the location of a station across Woodward Avenue near Grand Circus Park could create the impression that the street terminates at the station. For both Woodward Avenue crossings, SEMTA planners and engineers have indicated that these locations are the most viable options. Alternative locations for the Grand Circus Park station would be worse than the location at the northern end of Woodward Avenue.

2. Circulator Bus Alternative

a. Description

If the DPM is not constructed, a circulator bus system will continue to serve the Detroit CBD. This alternative includes a range of service-- from the two circulator routes now serving the downtown to extensive service such as the loop circulator route shown in Figure II-11. The circulator route shown in the figure was developed to satisfy the same projected CBD conditions and intra-CBD travel patterns as the DPM. A number of alternative route and operational configurations were analyzed in developing the extensive circulator bus route. The operational patterns assessed included:

- . Closure of an entire street to automobile traffic and using it for buses;
- . Closure of an existing traffic lane in the street and using it as an exclusive lane;
- . Elimination of curbside parking to install an exclusive bus lane; and
- . Mixed traffic operations.

Mixed traffic operations was found to be the most cost-effective way for a bus circulator to serve the same travel demands as the DPM.⁶

The modified circulator route is a one-way or two-way loop 4.03 miles long and has an alignment and operational pattern similar to that of the DPM. This length is necessary to conform to the existing street pattern and to provide more direct service to activity centers near Greektown. Nineteen 37-passenger buses would be required for one-way service with

⁶Gannett Fleming Corddry & Carpenter of Michigan, Inc., "Bus Alternative" (Working Paper), June, 1979.

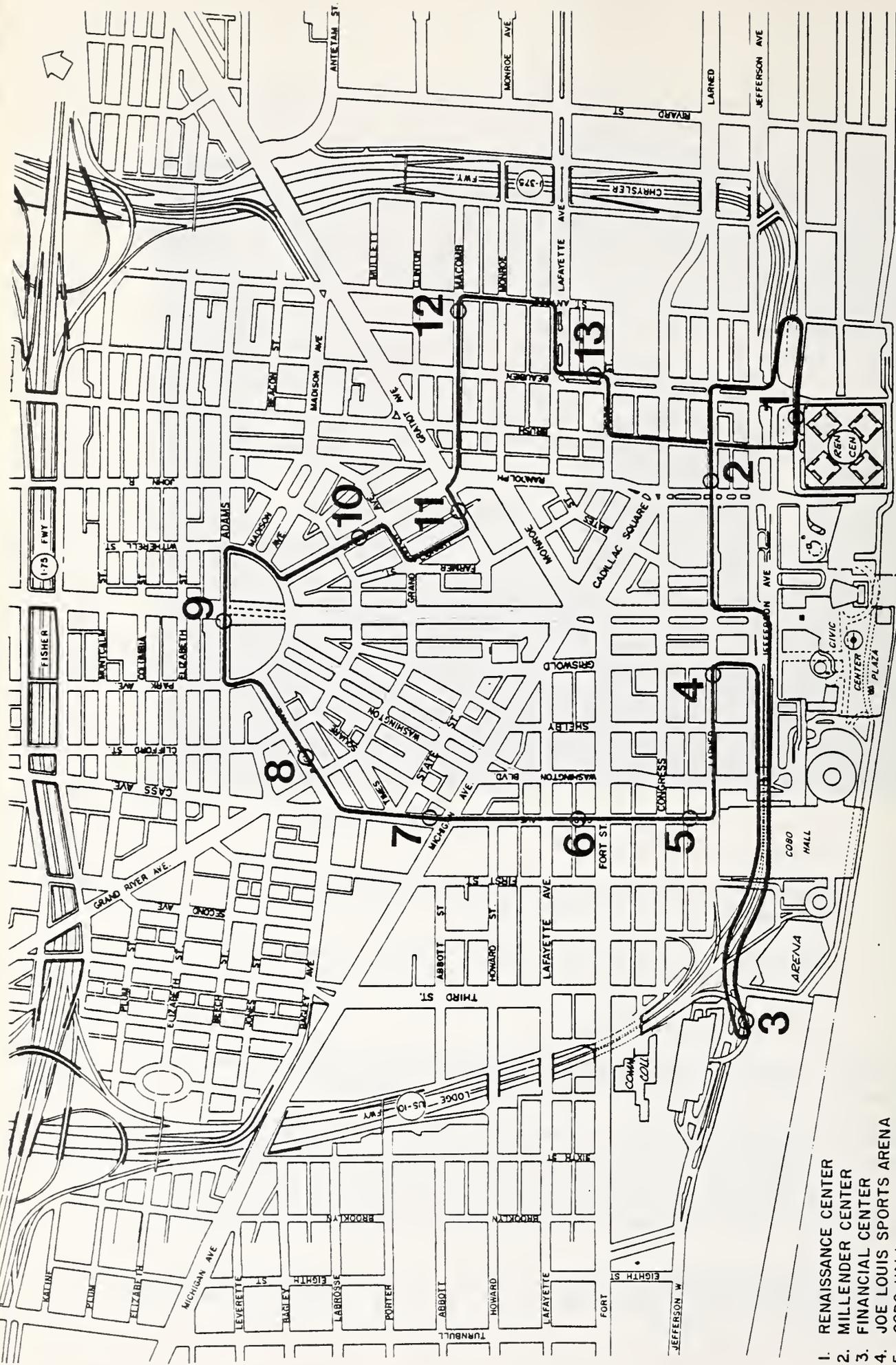


Figure 11-11
 LOOP CIRCULATOR BUS ALTERNATIVE
 WITH STOPS

- 1. RENAISSANCE CENTER
- 2. MILLENDER CENTER
- 3. FINANCIAL CENTER
- 4. JOE LOUIS SPORTS ARENA
- 5. COBO HALL
- 6. FORT/CASS
- 7. MICHIGAN AVE.
- 8. TIMES SQUARE
- 9. GRAND CIRCUS PARK
- 10. BROADWAY
- 11. CADILLAC SQ.
- 12. GREEKTOWN
- 13. BEAUBIEN / FORT

— DETROIT RIVER —

two-minute headways. The circulator system's capacity would be 1,770 passengers (including standing passengers) per hour between adjacent stops. The number of buses could be doubled to provide two-way service. An average wait time of 30 seconds on route segments to allow loading and unloading of passengers would result in an average operating speed of 7.5 miles over the route.

Major loading stops have been proposed at 13 locations on the modified circulator route. These locations correspond to the activity centers at which DPM stations are proposed. At each location, bus shelters 30 feet long would be constructed. They would include electric heaters, lighting, and coin-operated telephone facilities for passengers. All shelters would be located at grade near street pick-up points and within existing public rights-of-way.

Maintenance of buses would be a part of the normal operations of SEMTA or the Detroit Department of Transportation at existing maintenance garages. No additional maintenance facilities would be required.

It has been assumed that the circulator bus route would operate between 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays and between 10:00 a.m. and 6:00 p.m. on Sundays. Longer operating hours are possible, but travel demand did not appear to justify additional hours of service. The total weekday patronage predicted for the one-way circulator system is 17,100; the station-to-station demand matrix is shown in Table II-5. For the noon peak hour, projected patronage is 2,736. The two-way circulator system would carry approximately 21,000 patrons on an average weekday with 3,500 passengers in the noon-hour.

The estimated capital cost of the one-way circulator bus alternative is \$3.37 million (escalated dollars). Annual operating and maintenance costs are estimated to be \$2.66 million in 1985. The base fare of 40 cents, with discounts for the elderly and handicapped, would provide revenues of approximately \$2.05 million, resulting in a deficit of \$610,000 in 1985. The capital costs for the two-way system would be \$6.74 million with an annual operating costs of \$5.32 million resulting in a deficit of \$2.78 million.

The circulator bus system has the advantage of flexible service. Routes can be changed to accommodate unanticipated development in the downtown. However, a circulator bus system is labor-intensive; a driver is needed for each vehicle. Such a system's passenger capacity is limited because buses cannot maintain headways of less than two minutes when operating in mixed traffic.

The extensive circulator bus route could be put into revenue service immediately. Construction of bus shelters could be accomplished in less than four months.

b. Summary of Expected Impacts

Any circulator bus system would have only a minor additional impact on the environment. Continuation of the existing system on improvement of

TABLE II-5

TOTAL DAILY STATION-TO-STATION DEMAND MATRIX - CIRCULATOR BUS SYSTEM

| Origins | Destinations | | | | | | | | | | | Total | | |
|--------------------|--------------------|---------------|-----------|-----------------|----------|-------------------|--------------|-----------------|-----------|-----------|------------------|-------|-----------------|------------------|
| | Renaissance Center | Beaubien/Fort | Greektown | Cadillac Square | Broadway | Grand Circus Park | Times Square | Michigan Avenue | Fort/Cass | Cobo Hall | Financial Center | | Joe Louis Arena | Millender Center |
| Renaissance Center | 0 | 423 | 259 | 406 | 84 | 68 | 154 | 194 | 101 | 45 | 62 | 252 | 77 | 2,125 |
| Beaubien/Fort | 65 | 0 | 259 | 195 | 47 | 32 | 42 | 68 | 63 | 4 | 19 | 45 | 32 | 873 |
| Greektown | 108 | 15 | 0 | 393 | 86 | 39 | 72 | 77 | 66 | 8 | 49 | 30 | 63 | 1,007 |
| Cadillac Square | 149 | 46 | 25 | 0 | 328 | 357 | 417 | 504 | 239 | 75 | 51 | 69 | 158 | 2,417 |
| Broadway | 50 | 8 | 9 | 15 | 0 | 95 | 252 | 242 | 201 | 16 | 154 | 82 | 27 | 1,150 |
| Grand Circus Park | 64 | 11 | 9 | 14 | 0 | 0 | 131 | 210 | 100 | 9 | 58 | 27 | 81 | 714 |
| Times Square | 171 | 37 | 26 | 33 | 105 | 20 | 0 | 308 | 357 | 102 | 170 | 86 | 177 | 1,591 |
| Michigan Avenue | 220 | 34 | 43 | 85 | 160 | 65 | 15 | 0 | 283 | 150 | 218 | 87 | 226 | 1,587 |
| Fort/Cass | 127 | 38 | 44 | 36 | 128 | 41 | 39 | 27 | 0 | 173 | 63 | 99 | 176 | 991 |
| Cobo Hall | 100 | 21 | 17 | 31 | 16 | 9 | 19 | 4 | 2 | 0 | 306 | 47 | 201 | 774 |
| Financial Center | 257 | 67 | 96 | 25 | 141 | 54 | 50 | 52 | 7 | 115 | 0 | 265 | 285 | 1,413 |
| Joe Louis Arena | 256 | 53 | 30 | 51 | 86 | 27 | 39 | 36 | 23 | 9 | 0 | 0 | 334 | 945 |
| Millender Center | 533 | 139 | 119 | 164 | 48 | 51 | 52 | 78 | 56 | 44 | 2 | 190 | 0 | 1,477 |
| TOTAL | 2,101 | 892 | 936 | 1,449 | 1,229 | 858 | 1,282 | 1,800 | 1,499 | 750 | 1,152 | 1,279 | 1,837 | 17,064 |

TOTAL TRIPS = 17,064

Source: Gannett, Fleming, Corddry, & Carpenter Michigan, Inc., "Bus Alternative," working paper prepared for SEMTA, June, 1979.

the existing circulator bus system would have little impact on additional development in the downtown. No changes in demand for office floor space would be attributable to the existing or a revised circulator bus system. Projected increases in hotel rooms and retail space would occur independently of such a system. However, new hotel and retail developments would require service by a circulator bus route, perhaps necessitating route modifications. With the circulator bus system, demand for residential development in the downtown is projected to total up to 3,600 to 4,200 housing units by 1990. Only minimal growth in downtown employment would result from the circulator bus system; such growth depends primarily on regional transit improvements which serve the downtown and stimulate development.

The circulator bus system would not significantly affect the transportation system. Even with extensive improvements, the circulator bus system would carry only 25 to 30 percent of the projected DPM ridership. Impacts on auto circulation, regional transit service, and downtown parking would be minimal. Travel time would be shortened if the modified circulator bus system replaced the existing system, as the modified system would provide good service to more areas of the CBD.

The circulator bus system would have no adverse effects on historic sites and would not displace any residential or business properties since it would not require the acquisition of any property. All proposed circulator bus routes (existing or modified) would operate on existing public rights-of-way. This alternative would not have significant positive or negative impacts on community services in the CBD. The safety and security of transit riders and visitors to the CBD would be maintained at its present level.

The circulator bus alternative would not worsen the present natural environmental situation in the downtown. In comparison to the existing circulator system, air quality would be slightly improved by the system of extensive improvements. Noise and vibration would be unchanged from existing conditions. Operation of the circulator bus alternative would require less total energy than the DPM, but would increase the amount of petroleum-based energy consumed. If the total amount of energy required by both systems is converted to gasoline, operation of the circulator bus system would use the equivalent of 240,000 to 600,000 fewer gallons of gas each year. No adverse effects on aesthetics, water quality, topography and geology, waterways, or the ecology of the CBD would occur. No short-term impact due to construction would result since no construction would be required.

C. EVALUATION AND COMPARISON OF ALTERNATIVES

The relative impact of each alternative on CBD activities is summarized in Figure II-12. The DPM would have its greatest impact on the potential for development in the CBD; demand for downtown office space would increase by about 450,000 square feet per year between 1983 and 1990 under the DPM alternative. There is approximately 17.4 million square feet of office space in the CBD. Annual retail sales in the CBD would increase by about \$60 million to \$360 million by 1990. This increase would offset the decline in CBD-based retail sales that has existed since the mid-1960's. If

DPM Alternative

Circulator Bus Alternative

| Factor | Impact Level | Description of Impact | Impact Level | Description of Impact |
|----------------|--------------|---|--------------|--|
| Land Use | ● | Increased investment in CBD office and hotel space; increased levels of CBD retail sales; support of new development in preferred areas of CBD. | ● | Support of current development proposals by a modified circulator bus system. |
| Displacements | ◆ | Demolition of three buildings, one having an operating business. | — | No displacements. |
| CBD Cohesion | ● | Connection of scattered CBD activity centers by an improved transportation system; increase in CBD residential development. | ● | Connection of activity centers by a modified circulator bus system. |
| Transportation | ● | Increase in trip capacity of transit; decrease in auto traffic congestion; decrease in travel time within CBD. | — | Some increase in transit capacity, but slight decrease in travel time and no change in congestion. |
| Air Quality | ● | Slight improvement in CBD air quality. | — | Negligible change in CBD air quality. |
| Noise | ◆ | Slight increase in noise levels along DPM alignment. | — | Negligible change in noise levels. |
| Water Quality | ◆ | Mitigation of industrial pollutants from maintenance facility by pre-treatment. | — | No significant impact. |
| Visual | ◆ | Design of lines to conform to buildings, thereby mitigating obstruction of views of buildings and open space. | — | No significant impact. |
| Historic | ◆ | Demolition of two common wall historic buildings; adverse impact on the Grand Circus Park Historic District; partial obstruction of views of some historic buildings. | — | No significant impact. |
| Energy | ◆ | Increase in total energy consumption, but reduction in actual amount of gasoline consumed in CBD. | — | Slight increase in gasoline consumption with a modified circulator bus system. |

Positive Impact: ●
 Negative Impact: ◆

● Small
 ◆ Small
 — No Significant Impact

the DPM were implemented, up to 600 additional hotel rooms would be constructed by 1990, a twenty percent increase. These rooms would benefit tourists and people attending conventions. The DPM would also stimulate more residential growth in the CBD than is projected for the circulator bus alternative. Between 1,250 and 1,500 additional residential units would be built in the CBD by 2000 if the DPM were constructed.

In achieving this growth, the DPM is consistent with redevelopment plans for the city of Detroit. All DPM stations and stops for the circulator bus alternative would be located near existing or planned centers of downtown activity. The circulator bus system would neither induce the levels of development projected to occur with the DPM nor direct this development into locations desired by the city of Detroit.

The DPM would carry more than 25 to 30 percent more passengers of the extensive circulator bus system and more than 20 times more than the existing circulator route ridership. Weekday patronage is predicted to exceed 71,000, compared to 17,000 - 21,000 for the extensive circulator bus alternative and 3,000 for the existing route. This difference in patronage is attributed to two factors. First, the DPM has a higher average speed (12.6 miles per hour versus 7.5 miles per hour), shorter loop length (2.96 miles versus 4.03 miles), and shorter travel time for a full circuit of its loop (14 minutes versus 32 minutes). The average trip on the DPM would take six minutes, as compared to 8 to 9 minutes on the extensive circulator bus alternative. Second, the DPM would attract patrons because it has advantages over bus operations in terms of comfort, quality of ride, and reliability.

The DPM would improve traffic circulation more than the circulator bus system. The DPM would divert more trips from city streets and would encourage more owners of parking facilities to locate their businesses outside the DPM loop; this land use change would increase opportunities for development in the CBD core.

The circulator bus alternative would have fewer adverse visual and noise impacts than the DPM. However, the DPM's impacts are not considered major and every effort would be made to minimize them through careful design of the guideway and stations. These facilities would be designed to harmonize with the lines of existing buildings, wherever feasible. While the view of Grand Circus Park from streets to the south would be interrupted by the DPM structure, businesses around Grand Circus Park would greatly benefit from the transportation improvement. Adverse noise impacts are not expected to be great.

The DPM would require demolition of only three buildings at a single site; one of these buildings is of historic interest. Seven parking lots would be purchased to allow construction of the DPM, but there are no buildings on any of these sites. All owners of property to be acquired would be fairly compensated for their properties; parking lot operators whose businesses are terminated would be compensated for the terms of their property leases to avoid financial loss to their business. The circulator bus system would not disrupt any existing businesses or require demolition of any buildings.

Air pollution reductions in the CBD would be slightly greater with the DPM than with the bus alternative. For the most part, DPM trips would replace walking trips; trips would be diverted to the DPM because of the greater mobility it affords. The DPM would require more energy than the circulator bus alternative. However, the power source would be coal-fired power plants outside the CBD. Actual consumption of gasoline would be less with the DPM than with the circulator bus alternative.

Three historic properties would be adversely affected by the DPM. The Buckland-VanWald Building would be demolished to accommodate the maintenance facility. The DPM alignment would intrude into the Grand Circus Park Historic District. The Detroit Street Plan would be affected by certain visual interruptions created by the DPM. A Memorandum of Agreement concerning the use of the properties has been negotiated with the Advisory Council on Historic Preservation. The circulator bus alternative would avoid these adverse impacts, but would not encourage the business investment in the CBD called for in city and regional plans.

Short-term, adverse impacts resulting from construction of the DPM would be significant. However, various mitigation measures would be applied to limit impacts on existing businesses and the CBD transportation system. Off-site prefabrication of parts, control of interruption of traffic flows, and control of noise and air pollution levels could reduce these impacts to reasonable levels. These impacts would be only temporary; the benefits of improved mobility would offset them.

The short-term construction effects of the circulator bus alternatives would not be significant. The only construction required would be that needed to install thirteen bus shelters for the extensive circulator system.

D. SELECTION OF LOCALLY PREFERRED ALTERNATIVE

On May 6, 1980, the SEMTA Board, after considering the information in the Draft Environmental Impact Statement, the written comments received by SEMTA and UMTA during circulation of the DEIS, and the comments made at the public hearing, selected the DPM as the locally preferred alternative. This selection was based upon predictions of higher daily ridership than the circulator bus; greater increases in office space, retail sales, residential units, hotel rooms, employment, and population in the CBD than the circulator bus alternative; and an expected reduction in the demand for parking spaces in the center city.

III. AFFECTED ENVIRONMENT

The study area for the project is defined as that portion of downtown Detroit, Michigan bounded by the Chrysler Freeway (I-375) on the east, Fisher Freeway (I-75) on the north, the Detroit River on the south, and a combination of the Lodge Freeway (US 10) and Trunbull Street on the west. The area includes the Detroit Central Business District (CBD), plus a parcel of land on the west side of the Lodge Freeway. The CBD core, which is defined as the area bounded by Adams Street, Jefferson Avenue, Brush Street, and Cass Avenue, is also included in the study area (Figure III-1).

A. LAND USE CONDITIONS

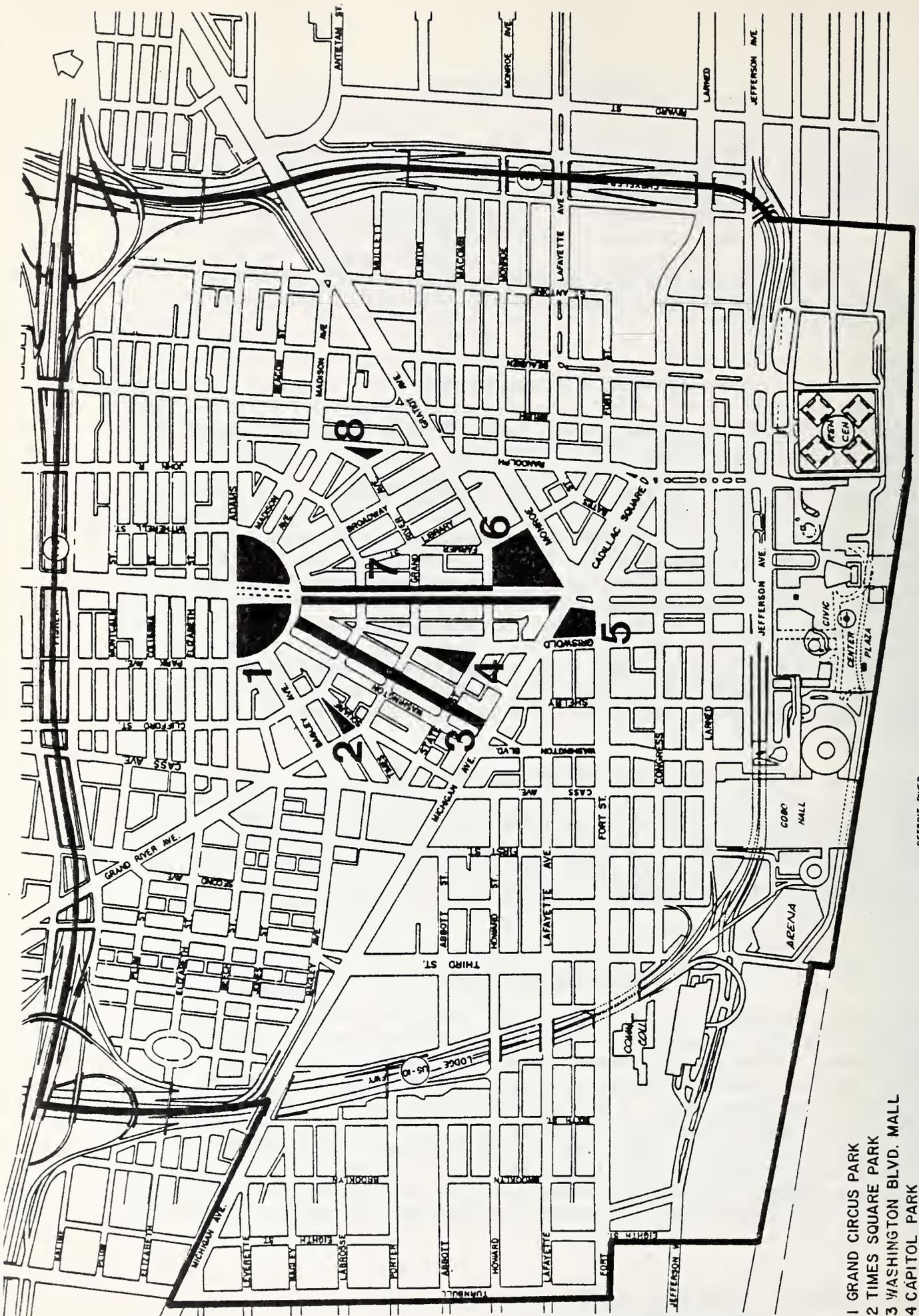
Land use planning for the study area is primarily the responsibility of the Planning Department of the City of Detroit. The city's future land use objectives are documented in The Detroit Master Plan⁷, as revised in April, 1976. More specific land use plans has been formulated in preliminary drafts of the sector plans for the CBD, the riverfront, and the Woodward Avenue corridor. Although they have not yet been adopted, they represent the city's thinking on the future direction of development in these areas. These plans include development of the Detroit riverfront to capture more fully the potential of the Detroit River as Detroit's most outstanding natural resource. The plan encourages development of the riverfront with land uses that derive a particular benefit from a riverfront location, such as parks, recreational areas, and residential developments. The Woodward corridor plan element includes provisions for guiding development along Woodward Avenue from the CBD northwest to the city limits.

The Southeast Michigan Council of Governments (SEMCOG), to a lesser degree, also influences land use planning in the CBD. Because it is a regional planning agency, SEMCOG's plans are not binding on development patterns in Detroit. SEMCOG does, however, provide advice and guidance for planning and its plans are especially helpful in coordinating land use development with transportation system planning and development in the CBD.

1. Existing Land Use

Approximately 65 percent of all land in the study area within the freeway ring is devoted to surface transportation in the form of streets and parking areas. High-density commercial buildings used for retail, office, service, and governmental purposes characterize the nontransportation land uses in the study area. A map of general functional areas (Figure III-2) shows a major retail core centered on Woodward Avenue and a major office core bordering the retail core in the northwest and extending to the CBD's western section. The fringe area, with the exception of the Renaissance Center, consists of varied land uses such as offices, institutional buildings, retail establishments, residences, convention facilities,

⁷City of Detroit, The Detroit Master Plan, April, 1976.



- 1 GRAND CIRCUS PARK
- 2 TIMES SQUARE PARK
- 3 WASHINGTON BLVD. MALL
- 4 CAPITOL PARK
- 5 KENNEDY PARK
- 6 KERN BLOCK
- 7 WOODWARD AVE. MALL
- 8 HARMONY PARK

Figure III-1
STUDY AREA

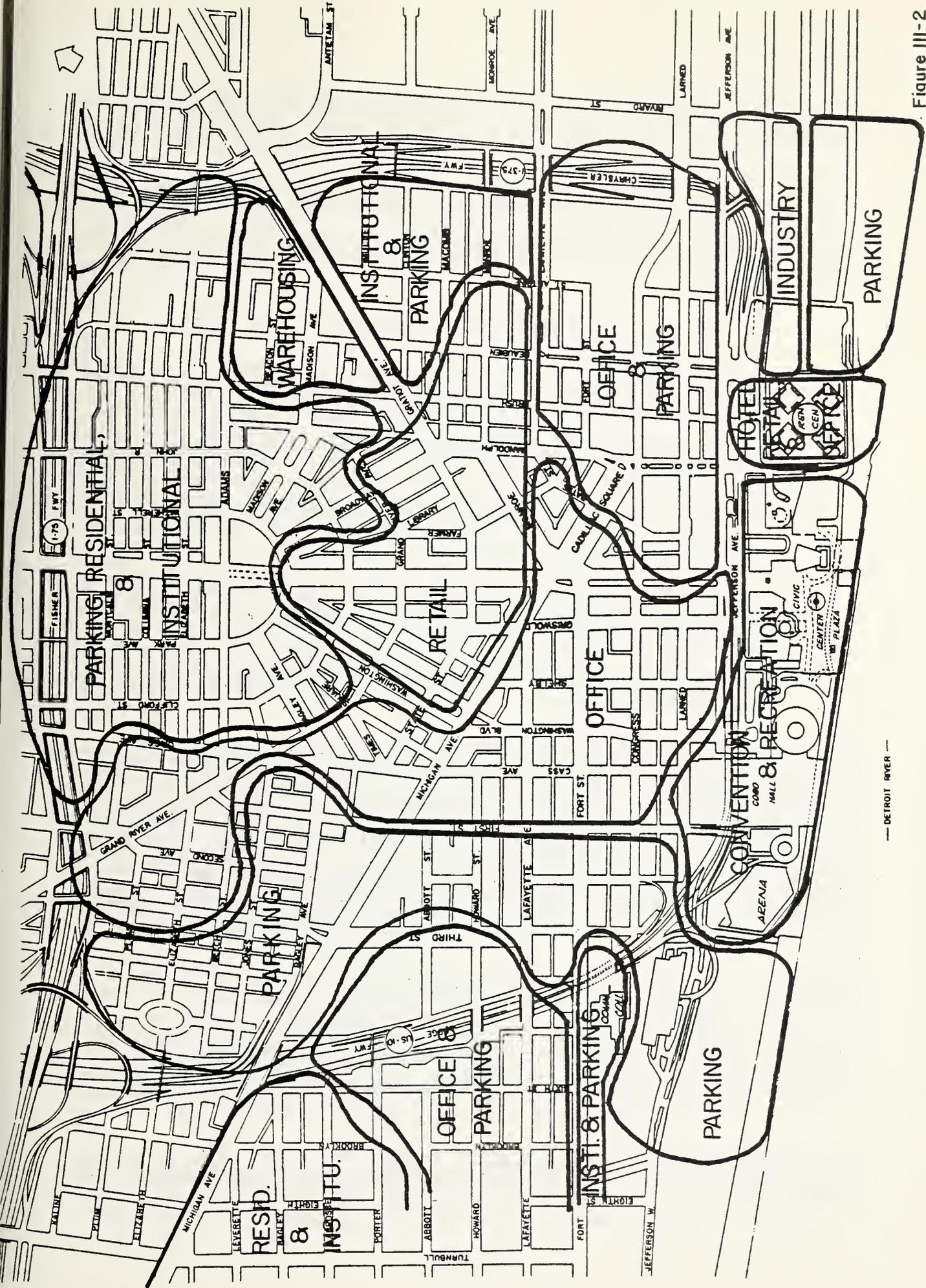


Figure III-2

EXISTING FUNCTIONAL
GENERAL LAND USE AREAS

SOURCE: GM TRANSPORTATION SYSTEMS DIVISION,
"DOCUMENTATION OF EXISTING CONDITIONS" Nov. 1978

— DETROIT RIVER —

industries, and parking. The Renaissance Center is a multi-use complex consisting of hotel and convention facilities, retail shops, and offices.

2. Revitalization of the Study Area

The City of Detroit and its CBD are the focus of a major revitalization effort. Overall planning for the future of downtown Detroit is based on the following goals:

- Downtown Detroit will continue to be the financial center for the region;
- Downtown Detroit will remain the focus of cultural, civic, and convention activity for the metropolitan region;
- Downtown Detroit will continue to grow as an important regional retail center;
- Downtown Detroit will have a transportation network which facilitates movement in and out of the city and permits efficient intra-CBD circulation;
- Downtown Detroit will concentrate a variety of activities in one general locale to create a 24-hour center for living, working, and entertainment; and
- Downtown Detroit will encourage the development of new residential communities.⁸

Several recently implemented and proposed major developments have had positive impacts on the revitalization of the study area in general and the CBD in particular. The Civic Center Plaza and fountain is a major pedestrian plaza connecting Civic Center convention facilities. It provides pedestrians direct access to the river and contains the \$2 million Dodge Fountain. Phase I of the Renaissance Center development, with its 70-story hotel and four 39-story office buildings, has greatly aided revitalization. The project's second and third phases will consist of four 19-story office buildings, 1,000 apartment and condominium units, and an additional hotel. Construction of the second phase will begin in 1980.

The Washington Boulevard Plaza, now complete, has converted a five-block roadway to a pedestrian plaza containing fountains, stages, and facilities for active and passive recreation. The Washington Boulevard trolley line is an integral part of this facility. This trolley line is now completed and fully functional on a nine-block length of Washington Boulevard from hotel and shopping areas to Renaissance Center. The new

⁸City of Detroit Planning Department, "Downtown Detroit Development 1979," March, 1979..

Joe Louis Arena, a 20,000-seat sports, concert, and convention arena adjacent to the Cobo Hall convention facility, has recently been opened. Other developments, such as the Woodward Transitway and Mall, will aid revitalization of the CBD. The Mall, now being constructed, will be a four-block area that emphasizes public transit, provides amenities for pedestrians, and excludes private automobiles. In addition, efforts are being made to revitalize the residential land use element by renovating existing structures and constructing new residential units within the study area.

B. TRANSPORTATION CONDITIONS

SEMOG is responsible for the coordination of long-range transportation planning in the southeast Michigan region and provides advisory services for public transportation and highway planning to both public and private agencies. The Southeastern Michigan Transportation Authority (SEMTA) is responsible, as a legally constituted agency of the state of Michigan, for public transportation planning and operations in the seven counties within its jurisdiction. This responsibility is in accordance with Act 204 of the Public Acts of 1967, as amended.

SEMTA's basic task is to refine and implement the public transit element of SEMOG's Regional Plan. This interrelationship of the two agencies' planning functions extends to and is possibly best exemplified by the funding process. SEMTA is responsible for conducting the transit studies in accordance with applicable federal requirements in SEMOG's Unified Work Program. SEMTA conveys its own work programs to SEMOG; after reviewing the programs, SEMOG submits them to the appropriate federal agencies.

The City of Detroit Department of Transportation (DDOT) is responsible for the planning, coordination, and implementation of transit service in the study area. DDOT's staff maintains a close working relationship with SEMTA. SEMTA and DDOT coordinate their budgetary and programming decisions so that a single regional assessment of public transportation, including plans to consolidate the region's bus services, is presented. This close relationship has been formalized through a purchase-of-service agreement which ensures that all modifications of both DDOT's and SEMTA's services are coordinated.

1. Auto Traffic

Primary access to the study area is provided by a highway system that includes three freeways surrounding much of the Detroit CBD and six major arterials extending from a common focal point in the center of the downtown. In addition to these major access roads, secondary arterials and principal one-way streets also provide access to the CBD.

The majority of traffic on downtown surface streets is local traffic having either an origin or destination in the CBD. In most instances, through-traffic utilizes the freeway network to avoid traffic congestion in the CBD. The combination of the extensive freeway network serving

the CBD and the location of parking facilities near the numerous freeway entrances and exits results in high traffic volumes within a few blocks of the freeway access and egress points. This traffic pattern renders the major CBD streets (Woodward, Michigan, Gratiot, and Grand River Avenues) relatively free of traffic congestion during the morning and afternoon peak periods. Most of the streets have adequate levels of service to handle traffic demands in the absence of unusual conditions. The congestion that does exist results more from conflicts between pedestrians and autos and an inefficient street pattern than an excess of traffic. The most evident exception is Jefferson Avenue between the Chrysler and Lodge Freeways, where heavy traffic congestion due mainly to traffic volumes is a common occurrence during peak periods.

2. Parking

The existing (1978) supply of parking in the study area is estimated to be approximately 52,400 spaces, according to a recent parking survey.⁸ Approximately 56 percent of the total parking is contained in surface lots. The more than 29,000 surface parking spaces reflect the great amount of land in the study area dedicated to parking. This estimate includes on-street parking and surface lots located within the freeway system.

If the study area is considered as a unit, the parking supply is approximately equal to the demand.⁹ There are, however, significant localized deficits. The Renaissance Center, the government center, and the financial district have deficits of 4,750, 4,290, and 1,000 spaces respectively, while other portions of the study area have a surplus of parking. Effectively, then, the distribution of parking is inconsistent with the pattern of demand.

In addition to the localized deficits, there is an overall shortage of short-term parking in the study area. Of the 52,400 spaces, only an estimated 5,300 are available for short-term parking (4 hours or less).¹⁰ Short-term parking is designed to accommodate shoppers and those making personal or pleasure trips of relatively short duration. The remaining 47,100 spaces are used for long-term parking primarily by CBD employees.

The parking situation in downtown Detroit is being closely scrutinized. Parking policies which could affect the supply and/or price of parking, with the objectives of reducing the amount of land dedicated to parking and encouraging the use of mass transit, are being considered.

⁹ Wallace, McHarg, Roberts, and Todd, Downtown Detroit Parking, report prepared for the Downtown Development Authority, January, 1978.

¹⁰ Ibid.

3. Transit

Surface bus is the primary mode of transit access to the CBD. Public bus service to the CBD is provided by DDOT and SEMTA. Approximately 25,000 passengers enter the CBD by bus each morning and leave each afternoon. This is approximately 30 percent of CBD work trips.

In addition to bus routes for the DDOT and SEMTA systems, two minibus loops and a trolley system are operated by DDOT. The minibus routes are shown in Figure III-3. The fare for the minibus is 25 cents. Approximately 3,000 persons per day use this service. The trolley system operates on Washington Boulevard and provides service from Grand Circus Park to Cobo Hall and is being extended to the Renaissance Center. Daily intercity bus service to and from the downtown area is provided by the Greyhound and Trailways bus companies. Bus service between Detroit and Windsor, Ontario is provided by the Detroit-Windsor Tunnel Company.

Two commuter rail lines provide service from the northern suburbs of Oakland County and the Ann Arbor/Ypsilanti area to downtown Detroit. The Grand Trunk Western Railroad (GTWRR) provides morning and afternoon service along a 26-mile route from Pontiac through Oakland County to the Detroit CBD station. Amtrak provides service from Jackson, Chelsea, Ann Arbor, and Ypsilanti to the Detroit station located one mile west of the CBD. It is a 35 mile trip from Ann Arbor to Detroit. The Pontiac line averages 815 passengers per one-way trip, while the Ann Arbor line averages 200 persons per one-way trip. DDOT provides feeder bus service to the passengers of both the GTWRR and Amtrak systems.

4. Pedestrian Areas

Three principal pedestrian areas already exist or are being constructed in the Detroit CBD: the Woodward Transit Mall extending along Woodward Avenue from Grand Circus Park to the Kern Block area; the Washington Boulevard Mall extending along Washington Boulevard from Grand Circus Park to Michigan Avenue; and the Civic Center Plaza located along the riverfront between Cobo Hall and the Renaissance Center. Other pedestrian areas and their locations include:

- Capitol Park (Griswold Street and State Street);
- Kennedy Square (Griswold Street and Michigan Avenue);
- Harmonie Park (Randolph Street and Grand River Avenue);
- Times Square Park (Cass Avenue and State Street);
- Grand Circus Park (Adams Street and Woodward Avenue); and
- Kern Block (Monroe Street and Woodward Avenue).

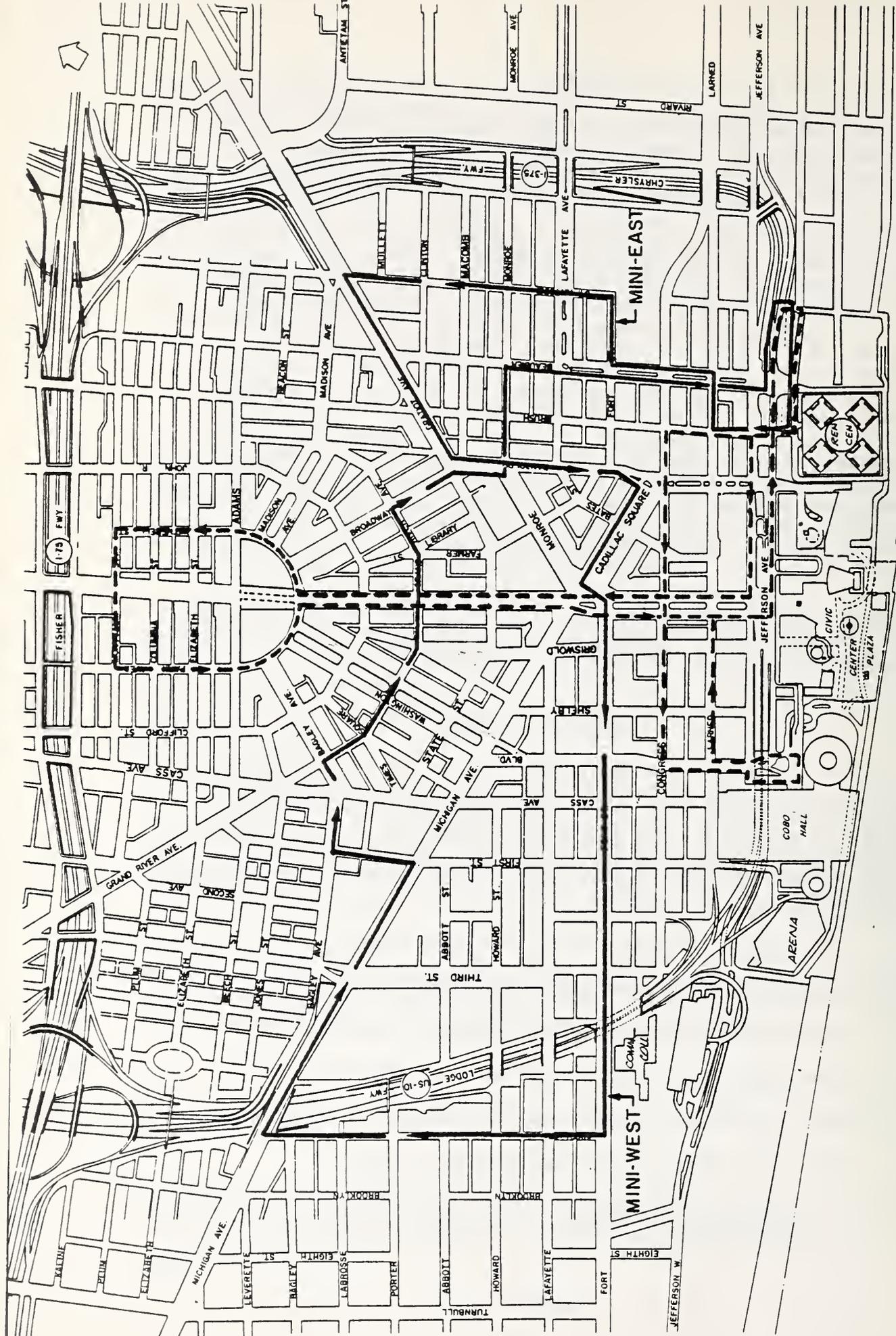


Figure III - 3
EXISTING MINIBUS NETWORK

- MINI-BUS - ROUTE 1
- MINI-BUS - ROUTE 2

SOURCE: GM TRANSPORTATION SYSTEMS DIVISION, "DOCUMENTATION OF EXISTING CONDITIONS" NOV. 1978

--- DETROIT RIVER ---

In addition to the at-grade pedestrian areas mentioned above, there are two enclosed skywalks in the CBD. One spans Larned Street, connecting the sixteenth floors of the Guardian Building and the Michigan Consolidated Gas Building. The second spans Shelby Street, connecting the second floors of the Manufacturer's National Bank Building and the Manufacturer's Trust Building. The City of Detroit is presently conducting a study to analyze the feasibility of additional skywalks in the CBD.

5. Travel Patterns¹¹

Surveys of downtown travel conducted in the fall of 1978 indicate that about 65 percent of the employees in the CBD reach their place of work (primary trip destination) by automobile, 30 percent by regional bus, 2 percent by commuter rail, and 3 percent by other modes, such as walking, bicycling, or taking a taxi.

The surveys indicate that there are approximately 119,000 auto trips (person trips) to the CBD during the 12-hour period from 7:00 a.m. to 7:00 p.m., 81 percent of which are work-related. Of the auto trips, approximately 65 percent originate within the city of Detroit, 17 percent within the remainder of Wayne County, 8 percent within Oakland County, 9 percent within Macomb County, and the remaining 1 percent from other areas. The vehicles used for approximately two-thirds of the auto trips are parked for more than 8 hours and motorists destined for the CBD reach their final destinations by walking an average of 2.2 blocks.

The survey results led to the estimation that approximately 48,000 transit trips (person trips) are made to the CBD from 7:00 a.m. to 7:00 p.m. The average walk from the transit stop to the final destination is 2.2 blocks. About 19 percent of commuter rail passengers coming to the CBD transfer to a bus to reach their final destination and the other 81 percent walk. Almost 90 percent of the rail passengers reach their final destination within a 15-minute walk from the CBD rail station. Approximately one-third of the rail passengers on the GTWRR line work in the Renaissance Center and thus walk less than two blocks. Walking is the predominant mode of secondary trips (those that begin and end in the downtown). Eighty-three percent of the workers' secondary trips and 48 percent of the nonworkers' secondary trips are made by this mode.

About 8 percent of the workers' secondary trips (trips with origins and destinations within the CBD) and 33 percent of nonworkers' secondary trips are made by auto. Seven percent and three percent of the workers' secondary trips are made by minibus and regional bus, respectively. Insignificant numbers of secondary trips are made by other modes (e.g., taxi, trolley, etc.).

¹¹Information in this section drawn from "Documentation of Existing Conditions" by the General Motors Transportation Systems Center, November, 1978.

Almost 84 percent of the secondary trips are made by 43 percent of the CBD workers (57 percent of the workers do not make secondary trips), indicating that CBD employees are responsible for most of the travel in the downtown. Almost all workers who make secondary trips make only one per day.

C. SOCIOECONOMIC CONDITIONS

1. Population

The residential population of the study area is estimated by the City of Detroit Planning Department to be approximately 5,300 persons.¹² One of the city's goals is to establish the downtown as a concentrated, 24-hour residential and employment center by increasing the population of the CBD. Several residential projects, both committed and proposed, indicate that the residential population will increase substantially; by 1990, between 9,000 and 13,000 full-time residents are expected. Through use of the 1970 Census, it was estimated that approximately 25 percent of the study area's present population is over 65 years of age.

The "transient" population, consisting of commercial representatives, tourists, and other visitors to the CBD, is, for the most part, limited to available hotel facilities in the downtown. These hotels represent approximately 3,000 rooms.

Conventions are thriving in the CBD. Convention facilities are available at Cobo Hall and the Detroit Plaza, Radisson-Cadillac, and Pontchartrain Hotels. One hundred and sixty conventions, constituting about 39 percent of the convention activity in the Detroit metropolitan area, were held in downtown Detroit in 1977. The Metropolitan Detroit Convention and Visitors Bureau estimates that, of the total of 143,000 delegates attending conventions in Detroit, more than 85,000 are from out-of-town. The Bureau also estimates that the out-of-town delegates stay in downtown hotels for an average of 3 1/2 days.

2. Employment

The City of Detroit Planning Department estimates that the number of people presently employed in the study area is approximately 105,000.¹³ This is approximately 8,000 more employees than the number indicated in a survey conducted in 1968. Although new growth has occurred and continues in the study area, it is not sustained consistently by either geographic location or employment sector. For example, there has been a loss of more than 4,000 jobs in the retail sector since 1967. Overall, then, the growth of about 8,000 in people employed since 1968 has resulted primarily from the addition of 3.6 million square feet of office space in the CBD. The Renaissance Center contributed largely to this growth.

¹²GM Transportation Systems Division, "Documentation of Existing Conditions," November, 1978.

¹³Ibid.

It now includes 2.5 million square feet in four 39-story towers. Ultimately, the Center will contain five million square feet of office space, if present plans are realized. By 1990, employment is expected to grow to 131,045.

3. Economic Characteristics

The Detroit CBD, with the region's tallest buildings and greatest land values, is the hub of the region's urban activities. Land values in the CBD range from a low of \$100 per front foot along the northern edge to \$7,500 per front foot along Woodward Avenue at Jefferson Avenue. In general, property values in the CBD have declined over the past 25 years. This decline can be traced, in part, to the decrease in the city's population and the location of many competitive commercial establishments in the suburbs.

The strength of the Detroit CBD as a retail center has generally declined in recent years. In 1967, the area accounted for more than \$532 million in retail sales. By 1978, retail sales had declined by 45 percent to \$295 million annually in constant 1967 dollars.¹⁴ Retail employment has declined proportionately, with more than 4,000 retail jobs lost in the CBD since 1968.

The leasable net office space in downtown Detroit is approximately 17.4 million square feet, of which approximately 17 percent (3 million square feet) is vacant. Approximately 40 percent of the leasable office space in the Detroit metropolitan area is located in the CBD.¹⁵ An analysis of the types of businesses occupying office space in the CBD indicates that finance, banking, and professional services account for most of the space. These same types of businesses will probably experience the greatest rates of growth in the future.

4. Housing

Present residential developments tend to be in older buildings concentrated in the CBD core; most are converted hotels. Six residential developments account for approximately 1,400 residential units. Major residential developments are planned for the riverfront area; they include the Renaissance Center with its 1,000 apartment and condominium units and a site west of Cobo Hall with approximately 2,500 units. The Millender Center development on the two blocks north of the Renaissance Center is planned to contain approximately 300 residential units. There are commitments for over 400 housing units, of which 80 are being constructed in the Capital Park area. A 380-unit housing project is also being constructed on Washington Boulevard.

¹⁴Hammer, Siler, George Associates, Private Investment Generated by Mass Transit Alternatives, Detroit, Michigan, report prepared for the City of Detroit, June, 1978.

¹⁵Ibid.

There are five major hotels in the study area (a total of 3,049 rooms). Their average occupancy rate is approximately 61 percent.¹⁶ Hotels in downtown Detroit are oriented primarily to the convention trade stimulated by Cobo Hall and other developing facilities and commercial trade generated by companies with offices in the CBD. In Detroit's CBD, 1,200 hotel rooms have been closed during the 1970's (no new facilities opened during the period from 1969 to 1976). However, the Detroit Plaza Hotel (Renaissance Center), containing 1,400 luxury rooms, opened in early 1977. It is one of the largest convention-oriented hotels in the country. The Radisson-Cadillac Hotel, with approximately 800 rooms, was reopened in 1978, after being closed in 1977 for extensive renovation.

D. NATURAL ENVIRONMENTAL CONDITIONS AND STANDARDS

1. Air Quality

National ambient air quality standards promulgated by the U.S. Environmental Protection Agency define maximum allowable concentrations for six pollutants:

- . Carbon Monoxide (CO);
- . Hydrocarbons (HC);
- . Nitrogen Oxides (NO_x);
- . Ozone (photochemical oxidants) (O₃);
- . Total Suspended Particulates (TSP); and
- . Sulfur Dioxide (SO₂).

These standards have been adopted by both the state of Michigan and the Wayne County Air Pollution Control Division. The primary standards are designed to protect public health; the secondary standards were developed to protect the public health and welfare, which includes damage to buildings, plants, and animals and impairment of visibility.

Pursuant to the Clean Air Act Amendments of 1977, the state of Michigan has designated portions of Wayne County as nonattainment areas for suspended particulates and carbon monoxide; the entire county has been designated a nonattainment area for photochemical oxidants. The study area lies within the designated nonattainment areas for all three pollutants. The areas that have not met national ambient air quality standards by July 1, 1979 must develop plans and programs, which may include transportation solutions, to reduce air pollutant emissions and attain and maintain these standards by December 31, 1982. SEMCOG is in the process of preparing the regional portion of the State Implementation Plan (SIP) which addresses the means that will be employed to attain the standards. Severe limitations in federal funding will be imposed for nonattainment areas that do not develop acceptable approaches to their air quality problems.

¹⁶Ibid.

Existing air quality in the study area can best be described through an examination of actual monitoring data for the area and comparison of these data with the ambient air quality standards. In 1978, there were three air quality monitoring stations (014, 80, 81) in or near the study area (Figure III-4). Data from these stations show that the primary standards for carbon monoxide (8-hour), ozone (1-hour), and particulates (annual), and the secondary standard for particulates (24-hour) have been exceeded (Table III-1). Hydrocarbon levels are not monitored in either the study area or in Wayne County.

Transportation emissions are the major source of air pollutants. In 1977, for Wayne County as a whole, transportation emissions accounted for 58 percent of the carbon monoxide and 47 percent of the hydrocarbon pollutants.¹⁷ The automobile's effect on the study area's air quality is the most significant of all sources of pollution.

2. Noise

The quality of the environment can be measured, in part, by the level of background and/or peak noise. The Environmental Protection Agency (EPA), through the Federal Noise Control Act of 1972 (P.L. 92-574), has been delegated the responsibility to coordinate natural noise control practices. EPA has developed outdoor noise level criteria based upon land use which should not be violated if the public health and welfare are to be adequately protected (Table III-2).

Noise levels are generally measured in decibels (dB), with the "A" weighting network (dBA) which excludes noise that is not very annoying to the human ear. Noise levels may be reported by use of the terms which include, but are not limited to, L_{eq} , L_{dn} , L_{max} , and L_{10} .¹⁸

¹⁷Southeastern Michigan Transportation Authority, Preliminary Final Environmental Impact Statement, Public Transportation Alternatives Analysis.

¹⁸ L_{eq} : Average sound level over a given time period (usually 24 hours); normally used for comparative purposes.

L_{dn} : Average sound level over a given time (usually 24 hours); noises in the nighttime hours are given a 10 dB penalty.

L_{max} : Maximum sound level over a given time period (hourly as used in this analysis).

L_{10} : Noise levels exceeded 10 percent of the time (hourly).



Figure III-4
 NOISE AND AIR QUALITY
 MONITORING LOCATIONS

— DETROIT RIVER —

● NOISE
 ■ AIR

SOURCE: SCHIMPELER-CORRADINO ASSOCIATES

TABLE III-1
1978 AIR QUALITY DATA

| Pollutant | Primary Standard | Secondary Standard | Maximum 1978 Readings and (Station Number ^a) | Air Quality Standard Exceeded |
|---|------------------|--------------------|--|-------------------------------|
| <u>Particulate Matter</u> (micrograms/cu. meter) | | | | |
| annual geometric mean | 75 | 60 | 94 (014) | Primary |
| max. 24-hour concentration ^b | 260 | 150 | 250 (014) | Secondary |
| <u>Sulfur Oxides</u> (parts per million) | | | | |
| annual arithmetic mean | 0.30 | -- | 0.017 (014) | None |
| max. 24-hour concentration ^b | 0.14 | -- | 0.080 (014) | None |
| max. 3-hour concentration ^b | -- | 0.5 | 0.124 (014) | None |
| <u>Carbon Monoxide</u> (parts per million) | | | | |
| max. 8-hour concentration ^b | 9 | 9 | 10.1 (080) 15.0 (081) | Primary |
| max. 1-hour concentration ^b | 35 | 35 | 19.7 (080) 22.0 (081) | None |
| <u>Ozone</u> (parts per million) | | | | |
| max. 1-hour concentration ^c | 0.12 | 0.12 | 0.17 (014) | Primary |
| <u>Nitrogen Dioxide</u> (parts per million) | | | | |
| annual arithmetic mean | 0.05 | 0.05 | 0.036 (014) | None |

^aThe locations of the air quality monitoring stations are shown in Figure III-4.

^bNot to be exceeded more than once a year per site.

^cNot to be exceeded, on an average, more than one day per year, based upon readings from the last three years.

Source: Environmental Protection Agency Regulations on National Primary and Secondary Ambient Air Quality Standards.
Wayne County Air Pollution Control Division.

TABLE III-2

EPA EQUIVALENT SOUND LEVELS REQUIRED TO
PROTECT THE PUBLIC HEALTH AND WELFARE

| Land Use | Measure | Outdoor Level (dBA) |
|---|-----------------------------------|---------------------|
| a. Residential with outside space and farm residences | L _{dn} | 55 |
| b. Residential with no outside space | L _{dn} | -- |
| c. Commercial | L _{eq} (24) ^a | 70 |
| d. Industrial ^b | L _{eq} (24) | 70 |
| e. Hospitals | L _{dn} | 55 |
| f. Educational facilities | L _{dn} | 55 |
| g. Recreational areas | L _{eq} (24) | 70 |
| h. Farmland and generally unpopulated land | L _{eq} (24) | 70 |

^aL_{eq} of a 24-hour period.

^bAn eight-hour L_{eq} of 75 dBA may be identified in these situations as long as exposure over the remaining sixteen hours per day is low enough to result in a negligible contribution to the 24-hour average (i.e., no greater than an L_{eq} of 60 dBA).

Source: Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," March, 1974.

In 1979, a noise monitoring program was conducted in the study area. The monitoring sites shown in Figure III-4 were selected as locations which would be affected by any modifications of circulation in the study area. The results of the monitoring at the 25 locations are presented in Table III-3. Both the L_{10} and L_{max} values shown were calculated on an hourly basis during peak traffic conditions.

The L_{10} values ranged from 60 dBA at the Ford Auditorium to 92 dBA at site 21, which is adjacent to the construction site of the Woodward Transitway and Mall. In general, the values were around 68 dBA--a typical noise level for a busy CBD. The L_{max} values are higher than the L_{10} readings, indicating brief periods of high noise levels. For the most part, the monitored levels fall within the Environmental Protection Agency's noise level criteria for commercial areas such as the study area.

3. Water Resources

The Detroit Area Water Quality Management (208) Study conducted by SEMCOG has shown that the major contributing factors to water pollution in the study area are storm water runoff, overflows of combined sewers, and industrial and municipal point source discharges of wastewater.

The Detroit River's condition is generally good, due primarily to its large flows that dilute incoming sources of water pollutants. Phosphorus and fecal coliforms are the only major sources of pollution in the Detroit River that either do not or will not meet federal water quality standards. The major sources of phosphorus in the Detroit River are municipal and industrial wastewater. Phosphorus levels in the Detroit River near the CBD do meet water quality standards. Fecal coliform levels in the Detroit River at and below the CBD are higher than the water quality standard of 1,000 per 100 milliliters (ml). Present levels of fecal coliform range from 1,600/100 ml to 2,200/100 ml. Runoff and combined sewer overflows are the major sources of fecal coliform.

The City of Detroit has a primary sewage treatment capacity of 1,200 million gallons per day (mgd) and activated sludge secondary treatment capacity of 450 mgd. An additional oxygenation secondary treatment plant with a capacity of 600 mgd is being constructed and is planned to begin operating in 1980. The system's average daily flow in 1975 was 890 mgd.

Detroit's treatment facilities discharge to the Detroit River, which is rated by the Michigan Water Resources Commission as suitable for recreation involving partial body contact, municipal water supply, and agriculture. After the additional 600 mgd secondary facility has begun to operate, the city is expected to meet all secondary treatment standards set by EPA, except the phosphorus standard of 1 mg/l of discharge.

TABLE III-3
1979 NOISE LEVEL SURVEY, DETROIT CBD

| No. | Location | <u>L₁₀</u> | <u>L_{max}</u> |
|-----|--|-----------------------|------------------------|
| | | 1979 Existing | 1979 Existing |
| 1. | N. side of Jefferson, W. of Beaubien | 77 | 86 |
| 2. | E. side of Randolph, N. of Jefferson | 68 | 87 |
| 3. | S. side of Larned, W. of Griswold | 69 | 79 |
| 4. | W. side of Civic Center Drive at Arena Station | 68 | 79 |
| 5. | N. side of Larned, W. of Cass | 68 | 79 |
| 6. | W. side of Cass, N. of Fort | 72 | 88 |
| 7. | E. side of Cass, S. of Michigan | 69 | 82 |
| 8. | E. side of Times Square, N. of Grand River | 69 | 82 |
| 9. | S. side of Park Avenue, W. of Woodward | 67 | 81 |
| 10. | W. side of Broadway, S. of Clifford | 66 | 73 |
| 11. | S. side of Gratiot, E. of Farmer | 67 | 73 |
| 12. | W. side of Beaubien, S. of Monroe | 66 | 80 |
| 13. | E. side of Beaubien, N. of Fort | 62 | 67 |
| 14. | W. side of Randolph, at Mariner's Church | 79 | 96 |
| 15. | At Ford Auditorium | 60 | 67 |
| 16. | E. side of Woodward, N. of Larned | 79 | 85 |
| 17. | E. side of Cobo Hall area | 65 | 76 |
| 18. | S. side of Congress, W. of Cass | 68 | 80 |
| 19. | S.E. corner of Times Square Park | 69 | 83 |
| 20. | Washington Boulevard Mall at Grand River | 69 | 86 |
| 21. | N. side of Park Avenue, W. of Woodward | 82 | 86 |
| 22. | S. side of Grand River, E. of Woodward | 73 | 83 |
| 23. | E. side of Farmer at Library | 68 | 77 |
| 24. | W. side of Woodward, S. of Adams | 69 | 89 |
| 25. | S. side of Witherell, W. of Broadway | 74 | 78 |

Source: Schimpeler-Corradino Associates.

4. Energy

In accordance with the Federal Energy and Policy Act of 1977, the state of Michigan has implemented the State Energy Conservation Program (SECP) to reduce the state's consumption of energy by 1980. The transportation sector presently accounts for approximately 22 percent of the total amount of energy consumed in southeast Michigan and the SECP states that almost 13 percent of the total reduction should come from this sector.¹⁹ The state is well on its way toward meeting this goal. Conservation measures proposed for transportation include:

- . Production of more fuel-efficient automobiles;
- . More efficient use of automobiles through carpooling, vanpooling, and multipurpose trips, thus reducing the number of auto vehicle miles traveled; and
- . Diversion of travel from automobiles to mass transit, further reducing the number of auto vehicle miles traveled.

Because the SECP deals only with a near-term target (1980), attainment of the proposed energy efficiency level is more dependent upon carpooling and vanpooling programs than capital-intensive mass transportation, which would take longer to implement. Only 1.8 percent of the savings in transportation energy projected for 1980 is to come from diversion of auto travel to mass transportation. However, in the years following the target year of 1980, it is anticipated that there will be a greater reliance upon mass transportation to provide a larger portion of the total reduction in energy.

5. Geology, Soils, Seismic Risk

The bedrock of the study area is composed of sedimentary rock and consists primarily of limestones and shales, with some dolomite, sandstone, and minor amounts of salts. The City of Detroit and its surrounding area are located on deep glacial drift material overlying bedrock. The thickness of the glacial drift varies from 110 to 170 feet. The ground generally slopes toward the Detroit River. A layer of stiff, yellow or brown, sandy clay extends from ground surface to a depth of 10 to 20 feet. This layer contains occasional pockets of sand and fill which may include some construction refuse. Underlying the top layer is a soft to medium-stiff, blue or gray, sandy or silty clay, which extends to a depth of 100 feet from the ground surface at the southern end. Underlying this clay is a layer of hardpan which overlies bedrock. The existing soil conditions of the area will require no special foundation design measures for construction of the guideway piers.

¹⁹Southeastern Michigan Transportation Authority, Draft Environmental Impact Statement, Public Transportation Alternatives Analysis.

On the Uniform Building Code Seismic Risk map of the United States, the state of Michigan is in Zone 1, which indicates that the area has a history of seismic activity and a probability of minor risk of damage. No special earthquake mitigation measures or design considerations are usually implemented in constructing facilities in this region.

6. Ecosystems

In Detroit, as in most large cities, the natural biotic community has long since disappeared. Only flora and fauna that can adapt to an urban environment find the center city a favorable habitat.

Flora in the study area is generally concentrated in one of several "green areas" on streets such as Woodward and Jefferson Avenues, Randolph Street, Madison Street, Cadillac Square, and Washington Boulevard, which contain planting islands with various species of trees and shrubs. Among the city's miniparks with grassy areas, trees, and shrubs are Harmonie Park, Telephone/Pioneer Park, Capitol Park, Grand Circus Park, and Kennedy Square. The fauna in downtown Detroit includes the domesticated pigeon, English sparrow, and a few species of songbird, as well as the gray squirrel, the house mouse, and the Norway rat. These species proliferate rapidly and may become health hazards.

7. Visual Characteristics

One of the most important visual characteristics of the study area is the unique street pattern that results in two main focal points: Grand Circus Park and Kennedy Square. Both of these spaces, as well as the street patterns that create them, were included in the original plan for Detroit (circa 1807). The street system creates a series of uniquely shaped urban spaces and provides excellent sites for individual structures.

Because of its unique street patterns and the type of construction that has occurred over the past decades, downtown Detroit contains numerous well-defined urban street spaces. Such areas are characterized by the harmonious proportions of the public right-of-way and the adjoining structures. The Capitol Park block is an example of a well-defined and well-proportioned urban street space.

The downtown also contains several unique landmarks that are important elements of its character and setting. Obvious examples are Grand Circus Park and the Detroit River. Other important landmarks and their locations include:

- . Capitol Park (Griswold Street and State Street);
- . Kennedy Square (Griswold Street and Michigan Avenue);
- . Wayne County Building (on Randolph Street between Fort and Congress Streets);

- Renaissance Center (Jefferson Avenue between Randolph and Beaubien Streets);
- Washington Boulevard (Washington Boulevard between Michigan Avenue and Grand Circus Park); and
- Woodward Avenue (plaza area) (Woodward Avenue between Michigan Avenue and Grand Circus Park).

8. Historic Places and Parklands

a. Historic Sites and Structures

The Detroit CBD is rich in historic buildings and sites. The Detroit Historic Designation Advisory Board maintains an up-to-date file of all properties listed in the National Register of Historic Places and the Michigan State Register of Historic Sites. At present, nine sites on the National Register and sixteen sites on the State Register are located in the study area. The City of Detroit also develops and maintains information on a variety of landmarks that may be considered eligible for designation to these two registers. Recently, the Department of the Interior has designated an additional ten properties as eligible for inclusion in the National Register.

b. Parkland

Several parks and landscaped malls are being developed in the Detroit CBD, especially in the core area from Grand Circus Park on the northern edge at Woodward Avenue and Adams Street south to the Civic Center Plaza. Existing parks include Grand Circus Park, Telephone/Pioneer Park, Capitol Park, J.F. Kennedy Square, and Harmonie Park. Woodward Avenue is being developed as a transit mall and Washington Boulevard is becoming a mall. In addition, there is street landscaping on Cadillac Square, Park Place, Monroe Street in Greektown, and Jefferson Avenue. The Kern Block (between Monroe Street and Woodward Avenue) is a temporary park located in an urban renewal parcel that is programmed for commercial use as part of a downtown shopping center. In general, the City of Detroit is deficient in park space. A survey of 65 large cities indicates the average recreational acreage per 1,000 people is seven acres. Detroit has an average of 3.8 acres per 1,000 people.²⁰

²⁰Bureau of Outdoor Recreation, National Urban Recreation Study Detroit Ann Arbor, 1977.



IV. ENVIRONMENTAL CONSEQUENCES

The implementation of circulation improvements in any form would have environmental consequences within the study area. This chapter presents both the positive and negative impacts that would occur with introduction of either the DPM alternative or the circulator bus alternatives as described in Chapter II. Direct and indirect impacts are described and a summary of unavoidable adverse impacts is provided.

A. IMPACTS ON TRANSPORTATION

This section presents the impacts of the DPM and the circulator bus alternatives on transportation within the southeastern Michigan region and the Detroit CBD. Consideration is given to consistency with adopted plans and impacts on regional transportation, CBD circulation, auto and bus movements, and CBD parking.

1. Conformance with Transportation Plans

a. DPM

The DPM is fully consistent with adopted transportation plans for southeastern Michigan and the Detroit CBD. As discussed in Chapter II, planning for an automated people mover system in the CBD has been underway since 1968. The DPM is an integral part of the 1990 Transportation Plan for the southeastern Michigan region. The DPM has been a component of each regional transportation alternative studied since December, 1975.

b. Circulator Bus

The circulator bus alternatives do not conform to adopted transportation plans. The plans call for an automated, fixed-guideway system, not a bus circulation system, for the Detroit CBD.

2. Impacts on Regional Transportation

a. DPM

The DPM is not expected to have a great, direct impact on regional transportation patterns in the southeastern Michigan region. The DPM would not in itself significantly affect the modal share of transit trips to the CBD. The DPM would, however, be an important component of any future regional transportation system. The DPM would have a collection/distribution function within the Detroit CBD for the overall regional system (bus or light rail). Integration of the DPM with the remainder of the regional system has been fully considered. If a light rail system were developed, a direct connection between the DPM and the light rail station at Grand Circus Park and the Renaissance Center would be constructed. If a regional bus alternative were adopted, routes along major arterials may tie into DPM stations for circulation within the CBD.

A DPM located in the CBD may have indirect impacts on regional transportation. The DPM would result in additional development in the CBD, which would increase the CBD's share of regional trips. As the CBD again becomes an attractive regional center, trips that would otherwise be made to alternative destinations would be made to downtown Detroit. The novelty of the DPM may also draw additional trips from the region to downtown Detroit, particularly in the first year of the system's operation.

b. Circulator Bus

The circulator bus alternatives are not expected to have significant direct or indirect impacts on transportation within the region. A circulator bus alternative would serve as the portion of a new regional transportation system providing circulation in the Detroit CBD, but would not fulfill that role as effectively as the DPM.

3. Impacts on CBD Circulation

a. DPM

The impacts of the DPM on CBD circulation were estimated using computer modeling techniques. The results for 1990 are shown in Table IV-1. As shown in the table, 8.32 percent of all person trips to a final destination within the CBD would be made on the DPM during the a.m. peak hour. Of 4,344 total DPM trips during that period, 2,718 would be transfers from other transit modes, 704 would be made by persons who drove autos to the CBD and then took the DPM to their final destination, and the remaining 922 trips would be made by CBD residents traveling to work.

In the noon peak hour in 1990, an estimated 54,846 person trips would be made in the CBD. Of those trips, 11,503 (21%) would be made on the DPM. More than 80 percent of the DPM trips would be made by CBD workers going to lunch, shopping, or on personal business. In comparing the DPM with the circulator bus alternative (Table IV-2), it is evident that the DPM would induce more activity during the noon hour than would the circulator bus. Almost 55,000 trips would be made with the DPM scenario, as compared to approximately 49,000 with an extensive circulator bus system. Although the DPM would result in 12 percent more total trips than even the extensive circulator bus, it would result in 10 percent fewer person trips by auto within the CBD in the noon hour.

The placement of support columns in sidewalks would be done in such a way that pedestrian circulation is not impaired. In most cases, the DPM alignment would not conflict with corridors that have a great deal of pedestrian traffic. In areas where pedestrian flows are heavy (i.e., around stations), adequate sidewalk space would be provided.

In summary, the simulation model has shown the DPM to be an effective mode of circulation within the CBD. The DPM is expected to draw ridership from persons who drive and ride transit to the periphery of the downtown, as well as from CBD residents. The DPM is expected to increase mobility in the area, particularly for CBD workers during noon time, resulting in increased numbers of trips.

TABLE IV-1
MODE SPLIT AND BASIC RIDERSHIP
DPM ALTERNATIVE

| Mode | A.M. Peak Hour | | | | | | | |
|-------|----------------|--------|------------|--------|-----------|--------|--------|--------|
| | Transit Users | | Auto Users | | Residents | | Total | |
| | # | % | # | % | # | % | # | % |
| Walk | 15,134 | 78.49 | 25,963 | 93.75 | 3,620 | 69.28 | 44,717 | 85.66 |
| DPM | 2,718 | 14.10 | 704 | 2.54 | 922 | 17.65 | 4,344 | 8.32 |
| Bus | 1,429 | 7.41 | 1,028 | 3.71 | 683 | 13.07 | 3,140 | 6.02 |
| Auto | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 19,281 | 100.00 | 27,695 | 100.00 | 5,225 | 100.00 | 52,201 | 100.00 |

| Mode | Noon Peak Hour | | | | | |
|-------|----------------|--------|-----------------|--------|--------|--------|
| | CBD Workers | | Non-CBD Workers | | Total | |
| | # | % | # | % | # | % |
| Walk | 29,949 | 66.78 | 4,901 | 40.92 | 34,040 | 62.20 |
| DPM | 9,281 | 20.69 | 2,222 | 22.22 | 11,503 | 20.90 |
| Bus | 1,049 | 2.34 | 772 | 7.72 | 1,821 | 3.30 |
| Auto | 4,569 | 10.19 | 2,913 | 29.14 | 7,482 | 13.60 |
| Total | 44,848 | 100.00 | 9,998 | 100.00 | 54,846 | 100.00 |

TABLE IV-2
MODE SPLIT AND BASIC RIDERSHIP
CIRCULATOR BUS ALTERNATIVE (EXTENSIVE SYSTEM)

| Mode | A.M. Peak Hour | | | | | | | |
|-------|----------------|--------|------------|--------|-----------|--------|--------|--------|
| | Transit Users | | Auto Users | | Residents | | Total | |
| | # | % | # | % | # | % | # | % |
| Walk | 17,071 | 88.54 | 26,427 | 95.42 | 4,057 | 77.65 | 47,555 | 91.10 |
| Circ. | 505 | 2.62 | 205 | 0.74 | 360 | 6.89 | 1,070 | 2.05 |
| Bus | 1,705 | 8.84 | 1,063 | 3.84 | 808 | 15.46 | 3,576 | 6.85 |
| Auto | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 19,281 | 100.00 | 27,695 | 100.00 | 5,225 | 100.00 | 52,201 | 100.00 |

| Mode | Noon Peak Hour | | | | | |
|-------|----------------|--------|-----------------|--------|--------|--------|
| | CBD Workers | | Non-CBD Workers | | Total | |
| | # | % | # | % | # | % |
| Walk | 30,713 | 79.43 | 5,156 | 49.89 | 35,869 | 73.20 |
| Circ. | 2,204 | 5.07 | 532 | 5.15 | 2,736 | 4.48 |
| Bus | 1,056 | 2.73 | 981 | 9.49 | 2,037 | 4.16 |
| Auto | 4,693 | 12.14 | 3,666 | 35.47 | 8,439 | 17.06 |
| Total | 38,666 | 100.00 | 10,335 | 100.00 | 49,001 | 100.00 |

Source: GM Transportation Systems Center, Working Paper on Bus Alternative, 1979.

b. Circulator Bus

The results of CBD circulation modeling for the one-way extensive circulator bus alternative are shown in Table IV-2. The results assume a high-level circulator bus system with 120-second headways and an alignment similar to that of the DPM. The results show that, in the a.m. peak hour, only 1,070 person trips (2% of total trips) would be made to final destinations by circulator bus, as compared to 4,344 (8% of total) on the DPM. Only 205 of those trips would be made by auto users, as compared to 704 for the DPM. During the noon hour, 49,001 total person trips would be made, 2,736 (4.5%) on the circulator bus. A two-way circulator would only increase circulator bus patronage by approximately 24 percent. It is expected that the existing circulator bus would carry approximately 200 passengers in the morning peak hour and 500 during the noon hour. The circulator bus resulted in fewer total trips, but more auto trips, than the DPM.

4. Impacts on Auto Traffic

a. DPM

The DPM would not interfere with auto circulation in the downtown. The guideway would either be placed off-street or in lanes used for curb parking. There would be no reduction in the number of traffic lanes on any street.

The DPM is expected to result in a slight reduction in downtown traffic during peak periods and the noon hour. With the DPM, motorists would have the option of parking at major facilities near the freeway (e.g., the Joe Louis Arena garage) and then taking the DPM to their final destination. If some trips were intercepted at the periphery of the CBD, traffic in the CBD core would be reduced during morning and afternoon peak hours. The DPM would also slightly reduce auto traffic in the CBD during the noon hour by providing improved transit service for short trips to shopping areas or restaurants. The cumulative impacts on traffic in the CBD would be approximately an eight percent reduction in traffic levels expected without the DPM. The estimated annual vehicle miles of travel in the CBD with the DPM are 84.92 million.

b. Circulator Bus

The circulator bus alternatives would have only a minimal impact on auto circulation. The expected annual vehicle miles of auto travel in the CBD with the circulator bus range from 85.53 million to 91.87 million, depending on the type of bus service offered. This is an increase of zero to seven percent of the mileage anticipated without the circulator bus.

A new circulator bus system operating at headways comparable to the DPM would result in increased congestion at some locations along the route because of the relatively large number of buses operating in a single

lane. However, the number of buses would not be sufficient to justify an exclusive traffic lane for circulator bus operation in the downtown.

5. Impacts on Bus Service

a. DPM

The DPM would have minimal impacts on existing and proposed bus service in the CBD. Some routes would be modified to serve as feeders to the DPM system. In general, routes entering the CBD would pass by DPM stations for ease of transfer. The largest numbers of bus/DPM transfers are expected at the Grand Circus Park, Beaubien/Fort, Cass/Fort, Times Square, and Michigan DPM stations. The existing circulator bus system in the downtown would be replaced by the DPM. For the DPM alternative, 2.37 million bus miles a year would be traveled in the CBD, including local and express bus service.

The complete downtown transportation system is now being examined. One goal of the study is to improve the interface among all modes of transportation: bus, DPM, rail, auto, and walking. The study includes consideration of the application of additional transportation system management elements in the CBD. A detailed feeder bus study is planned as part of the preliminary engineering program for the proposed light rail system.

b. Circulator Bus

These alternatives are not expected to involve modification of any routes other than the existing circulator bus system. Experience indicates that modifying bus routes and forcing patrons to transfer from local or express buses to a circulator bus would have an overall adverse impact on system ridership. The circulator bus alternatives would include a total of between 2.40 and 3.10 million bus miles a year in the CBD.

6. Impacts on CBD Parking

a. DPM

The DPM would have an overall positive impact on parking in the CBD. It is estimated that there will be 49,750 parking spaces in the CBD by 1990, in comparison to approximately 52,400 in 1978. This supply will probably be sufficient to meet total demand; however, the supply is not ideally distributed and shortages are expected to occur in the vicinity of the Renaissance Center and within the retail core surrounding the Woodward Avenue Mall and the Cadillac Center shopping development. The DPM would reduce the need for downtown parking and would allow better utilization of the existing supply. It is estimated that the DPM in operation would create a demand for 45,300 parking spaces in the CBD. This total demand would allow a reduction of 4,420 spaces in the anticipated 1990 supply.

The DPM would serve a distribution function between parking facilities outside the CBD core and workers' final destinations. Parking facilities, such as the garage for the Joe Louis Arena, could be used by persons working or shopping at the Renaissance Center or Cadillac Center; the DPM would provide comfortable and convenient service linking parking with major activity centers.

The DPM system itself would reduce the CBD parking supply; approximately 600 off-street parking spaces (1% of total supply) and up to 150 on-street spaces (8% of total supply) would be displaced. The location and number of off-street displacements is shown in Figure IV-1. Over half of the total loss in off-street parking would occur as a result of the maintenance facility. Other significant displacements would occur near Michigan and Cass, Griswold and Larned, Broadway and John R., and Beaubien and Monroe. All off-street parking spaces that would be eliminated are in surface lots; no spaces in parking garages would be taken. The reduction in surface parking that would occur as a result of the DPM is fully consistent with the City of Detroit's CBD parking policy. The policy calls for a reduction in the amount of surface area used for parking and consolidation of parking into structures. Planned CBD parking structures would add more than 10,000 spaces by 1985, providing an impetus for a reduction in surface parking through redevelopment of underutilized CBD land. The DPM would add to the economic pressure for developing such properties.

Placement of the guideway would also result in a loss of up to 150 on-street parking spaces. At many locations along the route, the guideway would be placed in what is now a curb lane. A new curb would be constructed in cases where curb parking was eliminated. The loss of curb spaces is not a significant impact. The spaces to be lost constitute approximately eight percent of the curb spaces in the CBD. Like the off-street spaces, the lost curb spaces would be more than replaced by parking garages to be built in the CBD over the next five years.

b. Circulator Bus

The circulator bus alternatives would also have a positive impact on parking. With these alternatives, demand for parking in the CBD would range from 45,300 to 47,970 spaces (compared with an expected 1990 supply of 49,750 spaces and a 1978 total of 52,400), depending on the range of the circulator bus system. The circulator bus could also be used to link parking garages with major CBD activity centers. However, the travel of buses in mixed traffic makes this option less desirable than the DPM. Bus travel speeds are slow, and experience with the existing system has shown that the circulator bus is not a particularly attractive mode of travel for CBD workers. It is anticipated that not even an improved circulator bus system would encourage large numbers of workers and shoppers to park at peripheral locations and take the bus to their final destinations. The circulator bus alternatives would improve only minimally the current pattern of localized shortages of parking spaces in the CBD.

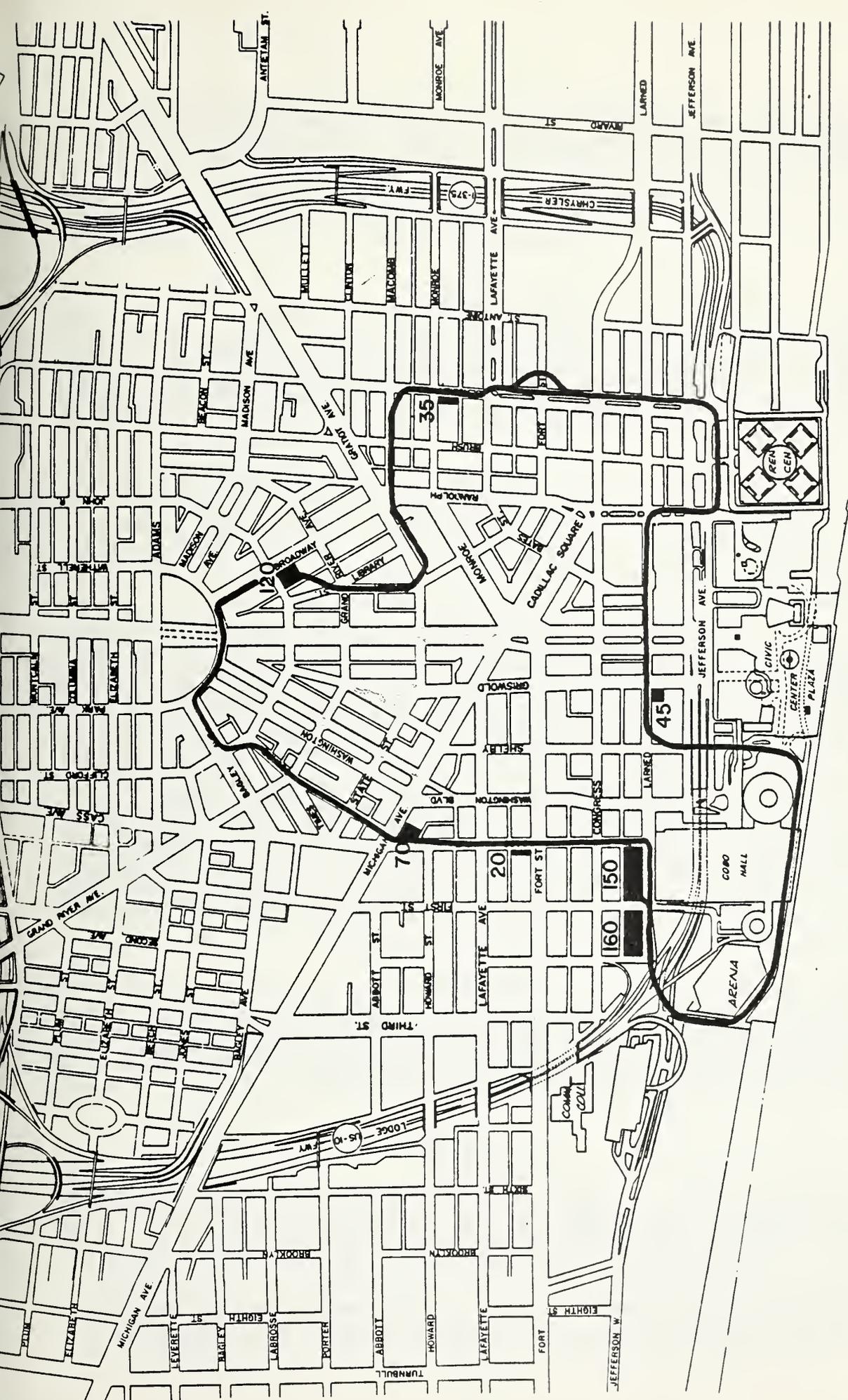


Figure IV-1
 OFF-STREET PARKING DISPLACEMENTS
 RESULTING FROM DPM

--- DETROIT RIVER ---

DPM ALIGNMENT
 ESTIMATED NUMBER OF OFF-STREET
 PARKING DISPLACEMENTS

160

The circulator bus alternatives would not result in the loss of any on-street or off-street parking spaces. They would also not further the policy of reducing the amount of land in the CBD used for surface parking.

7. Impacts on Pedestrians

a. DPM

The DPM would have a positive impact on pedestrian traffic in the CBD. The DPM would reduce the total number of pedestrian trips downtown by substituting DPM trips for walk trips and would provide added amenities for pedestrians. The DPM would concentrate pedestrians in the vicinity of stations, but this could be accomplished without adversely affecting pedestrian or automobile traffic.

Table IV-1 (presented earlier) shows the total number of walk trips expected to occur in the CBD if the DPM is implemented. In the noon peak hour, 34,040 walk trips are expected; this is slightly less than the number expected with the extensive circulator bus system. In total, there would be fewer pedestrians in the CBD during the noon hour with the DPM than with the extensive circulator bus system.

As indicated in the station area diagrams in Chapter II (alignment sheets 16 through 27), the DPM would result in a substantial increase in pedestrian space in the form of sidewalk area in what was previously a parking lane and in pedestrian amenities around the station entrances. The DPM would also make use of skyway connections at key stations to ensure easy access to the stations and to reduce the number of points at which pedestrians and vehicle could conflict. Skyway connections to the arena station would be provided (from the Arena, parking garage, and from across the Lodge Freeway), the Renaissance Center station (from the Renaissance Center and from across Jefferson Avenue), and the Millender Center station (from Millender Center, across Jefferson Avenue, and maybe across Randolph to the City-County Building). In addition, the Cadillac Center station will be designed as an integral component of the Cadillac Center development. Other stations are located near the major developments they are to serve.

Pedestrian traffic to the DPM stations is not expected to cause great changes in the level of service at intersections for automobiles. Intersections in the vicinities of all stations are equipped with signals that have "walk" phases, allowing pedestrians adequate time to make desired movements, while preserving sufficient green time for auto maneuvers.

b. Circulator Bus

The impacts of the circulator bus alternatives on pedestrians would range from no change in the present situation to slight improvement of it. During the noon hour in the CBD, approximately 37,000 pedestrian trips would be made if the existing circulator system were continued and 35,869 with the extensive one-way circulator system (see Table IV-2). The two-way system would reduce pedestrian trips to approximately 35,538. The extensive circulator bus system would provide an alternative to walk trips,

but would not do so as effectively as the DPM. The existing circulator bus system would provide no additional pedestrian amenities. The only such amenities associated with the extensive system are the bus shelters at thirteen locations around the downtown. The Circulator Bus alternatives would also make use of planned improvements in the skyway system. No great increase is expected in pedestrian/vehicle conflicts in the vicinity of circulator bus stops.

B. ECONOMIC IMPACTS

This section presents the impacts of the DPM and circulator bus alternatives on the economy of the region and the CBD. Consideration is given to potential for redevelopment, opportunities for joint development and/or value capture, impacts on population and employment, and the ability to finance each of the alternatives.

1. Regional Economy

a. DPM

Construction of the DPM would have a greater effect on downtown economic growth than on regional growth. Most residential, retail, and office construction that would occur in the downtown as a result of the DPM would be diverted from other areas of growth in the region. However, the DPM would create a demand for up to 600 additional hotel rooms in the region.²¹ Concentration of a greater portion of development within the downtown area has significant advantages because of the central location of the CBD.

The DPM would provide the community with new revenue because it would be constructed primarily with federal funds. The DPM's capital cost for construction materials and local labor and engineering would be provided by money from federal and state sources. Income and employment generated by construction of the DPM would create a cycle of additional employment and business activity.

b. Circulator Bus

All circulator bus options would have fewer impacts on development within the region. Shifts of development from other parts of southeastern Michigan would be fewer. In addition, the federal funds for construction of the DPM would probably be lost to the region if the DPM were not implemented.

2. CBD Economy

The economic impacts of the two alternatives would be focused on the Detroit CBD. Impacts in the areas of redevelopment, joint development/value capture opportunities, population, and employment are expected.

²¹Robert J. Harmon & Associates, Real Estate Profile - Hotel Development in Downtown Detroit, February, 1979.

a. Potential for Redevelopment

The city of Detroit is committed to major redevelopment of its downtown.²² Key areas where new construction is underway or proposed are as follows (see Figure IV-2):

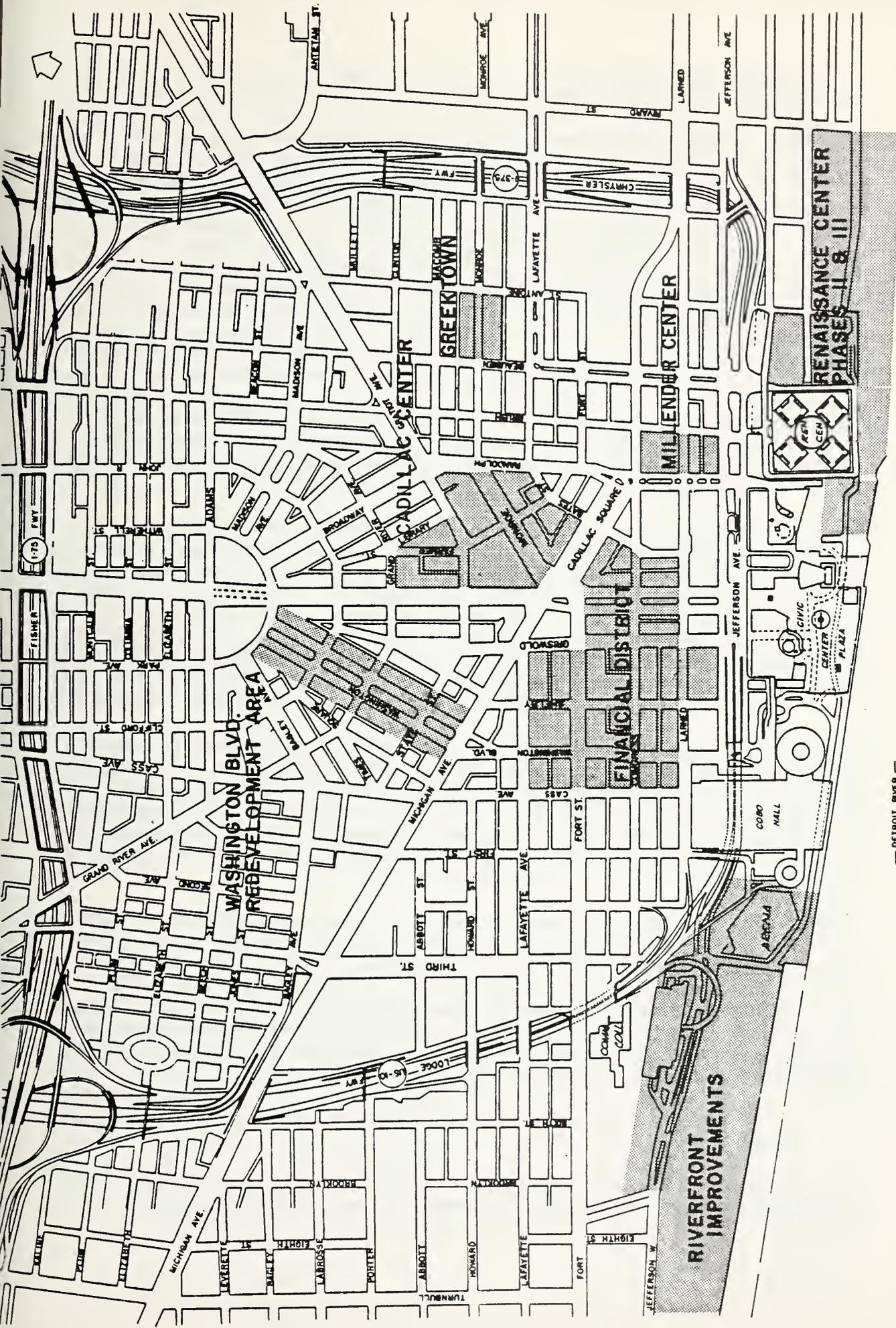
- . Phases II and III of the Renaissance Center (proposed incorporation of 580,000 square feet of office space and 45,000 square feet of retail space);
- . Riverfront improvements, including the completed Joe Louis Arena, an Arena parking garage which will house 3,500 cars, the Riverfront Housing Project containing 2,500 housing units, and a new commuter rail terminal near the Arena garage;
- . The Washington Boulevard redevelopment area, which includes a recently completed pedestrian mall, a proposed 380-unit housing development, space for a future 1,600-unit housing development, a rehabilitation plan to convert older office buildings to apartments, and renovation of the Grand Circus Park and surrounding buildings;
- . The Cadillac Center shopping mall, which will connect with a mall and busway along Woodward Avenue and include a new shopping area of 600,000 square feet with a 3,000-car parking garage; and
- . Other smaller developments and improvements proposed near Greektown and within the Financial District.

i. DPM

The DPM would connect these major redevelopment areas with its low-headway, loop service. The Renaissance Center area would be served by the Renaissance and Millender Center stations. The Riverfront would be served by the Joe Louis Arena and Cobo Hall stations. The Times Square station would serve Washington Mall. A station at Grand Circus Park would serve both the park and Woodward Mall area. Cadillac Center would have a station integrated with the shopping development and with easy access to the shopping area. Greektown would have a station at its western edge. The Financial District would have a station near Larned and Griswold.

The DPM is a crucial element in the redevelopment of downtown Detroit. The station locations are designed to provide reliable, fast access between major activity centers where new development is planned. Implementation of the DPM is a major factor in establishing the viability of these redevelopment projects. One drawback of the DPM is its lack of flexibility.

²²Wallace, McHarg, Roberts, and Todd; and Hammer, Siler, George Associates, Downtown Detroit Development, March, 1979.



— DETROIT RIVER —

Figure IV-2
 MAJOR PROPOSED REDEVELOPMENT AREAS
 IN DOWNTOWN DETROIT

If the system were constructed, it would be expensive and time-consuming to adapt it to serve new development.

The DPM would have a positive impact on office space within the CBD. Projections indicate that the DPM system could decrease or stabilize the rate at which the CBD has been losing its share of the office market to other parts of the region. Between 1983 and 1990, with the operation of the DPM system, demand for additional downtown office space is expected to increase to about 450,000 gross square feet per year. This is an increase of 5 to 5.5 percent over projected demand without the DPM. Over the life of the DPM system, the cumulative net gain in total office space should be at least four to five times greater than the amount anticipated without the DPM.

The DPM's impact on the downtown is expected to result in a demand for approximately 600 additional hotel rooms by 1990. This would require the construction of one or two additional hotels and would increase the total number of hotel rooms in the CBD by twenty percent. The DPM would also make renovation of the Tuller Hotel at Grand Circus Park more attractive. The hotel would be served by the Times Square station.

The DPM would also boost residential development in the CBD. Seven major market-rate residential projects in various stages of commitment and design are now planned for downtown Detroit. These projects include approximately 5,400 units of new market-rate housing planned for construction by 1990, with a net absorption rate of 450 units per year. It is estimated that implementation of the DPM system would increase the annual CBD residential unit absorption rate between 1985 and 1990 to a figure between 550 and 600 units. This increase represents 1,250 to 1,500 more housing units by 1990 than the number that could be achieved with the circulator bus alternatives.

The DPM would have a positive impact on retail sales. Increased retail sales caused by implementation of the DPM would result from the combined effect of a larger client base (e.g., more downtown employees because of induced office development and increasing per capita or annual expenditures). Improved access to retail services for individuals working, living, or visiting in the downtown would result from operation of the DPM and could significantly modify patterns of retail expenditure.

Projections of retail sales derived from downtown employees and residents, visitors, and metropolitan area residents indicate that CBD retail sales would rise from \$295 million in 1978 to between \$350 and \$370 million in 1990, as measured in constant 1976 dollars, if the DPM were constructed. This is a net gain of \$45 to \$65 million dollars over the circulator bus alternative. This increased potential for sales stems from the superior accessibility that the DPM would provide to downtown employees, residents, visitors, and metropolitan area shoppers.

ii. Circulator bus

The circulator bus improvements would not be as effective as the DPM in achieving proposed downtown redevelopment. Circulator buses cannot

serve the redevelopment areas as efficiently as the DPM because they would operate at slower speeds in mixed traffic with autos rather than on exclusive guideways. They would provide less capacity for handling heavy loads resulting from major events at the Renaissance Center, Joe Louis Arena, or Cobo Hall. Their reliability would be reduced by the slow speeds and the potential for accidents resulting from congested downtown streets.

The circulator bus system could be modified to improve service to any of the major proposed projects. Also, any circulator bus system has the flexibility to change routes as long as a street right-of-way is present. However, these modifications would not provide the quality of transit service the DPM can offer at station locations and they would provide no permanent "anchor" that would spur redevelopment.

The number of office projects for which commitments have been made or which are presently in the advanced stages of development is relatively low in comparison to recent levels. An improved circulator bus alternative is not expected to increase projected office development.

Implementation of the circulator bus alternatives is not expected to create demand for new downtown hotel rooms. These alternatives would not enhance the chances for renovation of the Tuller Hotel located near Grand Circus Park.

Circulator bus improvements would not enhance the market for housing in the CBD. A decision to implement this alternative would be expected to result in 1,250 to 1,500 fewer residential units in the CBD than would result if the DPM were constructed.

With the circulator bus alternative, a more modest growth in CBD retail sales would occur. Retail sales would be expected to increase from \$295 million in 1978 to \$305 million in 1990. This is \$45 to \$65 million less than the amount expected with the DPM alternative. The lower expected retail sales with the circulator bus alternative are due to the reduced accessibility it provides, as compared to the DPM.

b. Opportunities for Joint Development/Value Capture

i. DPM

Under the concept of joint development (economic cooperation between the public and private sector in making the improvement viable), stations are designed with direct access to businesses and shops in their vicinity. This access benefits businesses by increasing shopping and travel opportunities for customers. In almost all cases where such preferential access is provided, businesses are asked to contribute to construction of the system since they would receive special benefits from the transportation improvements.

Joint development may be considered only at permanent fixed stations of the DPM. Opportunities for joint development exist at stations where integration of the DPM system with new or existing structures is clearly

possible. In addition, wherever street-level land is taken for use in construction, the remaining open spaces may be valuable for future development.

Participation by private developers in joint development appears possible at seven of the thirteen stations in the system. Stations that would be designed to provide direct access to adjacent buildings are the Renaissance Center, Cadillac Center, Cobo Hall, Joe Louis Arena, Times Square, and Millender Center stations. Stations where joint development is being considered are the Grand Circus Park, and Fort/Cass stations.

Joint development stations would be governed by an agreement between the transit operator and the private owners for provision of certain services by the businesses receiving special benefits from the transit system. Services would vary among stations according to the type of access provided. Possible services to be assumed by private businesses would include station maintenance costs and lighting, heating, and cooling costs. In addition, the private sector would be asked to finance all or a portion of special station access improvements, particularly if pedestrian bridges are constructed. Capital cost assistance by the private sector for escalators, sidewalks, kiosks, and future station modifications is also possible if businesses would derive major benefits from these improvements.

Assistance by the private sector to the DPM would be proposed only if direct benefits to both the public and private sectors from the DPM are apparent. An advantage of joint development to both the DPM operator and private developer is that the possibility of an operating deficit in the DPM system is reduced.

ii. Circulator bus

It is not very likely that joint development opportunities would arise from any bus circulator system. The forecasted ridership of the circulator bus system and less direct access to businesses would not justify participation by the private sector in the system's operating cost.

c. Population and Employment

i. DPM

The DPM would have a positive impact on the residential population in the CBD. With the DPM, population is expected to increase from 5,300 to approximately 13,000 by 1990. This is 2,000 to 4,000 more residents than would be expected with the circulator bus alternative. The expected growth in population is due to the demand for housing; the CBD would become a more attractive place to live and work as a result of redevelopment stimulated by the DPM. The DPM would also have a positive impact on employment in the downtown. Operation of the DPM would increase the present CBD employment of 105,000 by 2,850 jobs (this figure does not include jobs for approximately 50 employees who would be directly responsible for operating the DPM system).²³ These jobs

²³Hammer, Siler, George Associates, Private Investment Generated by Mass Transit Alternatives, June, 1978, p. 69 and Appendix Table SA-68.

would be created because new development would become more feasible with the connection of major downtown activity centers. More than 1,100 new jobs are expected in the retail sector and over 1,100 additional office jobs and 600 hotel jobs would be created. Employment in housing construction would increase only slightly because the downtown market is limited. Before operation of the DPM began, the economic benefits of its construction would be evident. Implementation of the DPM program would add 2,480 temporary person-years of work between 1978 and 1990.²⁴ Many of these jobs would be in the downtown area where the DPM would be constructed. Although employed only temporarily, these workers would aid the downtown economy by making purchases from downtown businesses.

ii. Circulator bus

The circulator bus alternatives would have fewer impacts on both population and employment than the DPM. Population would increase from 5,300 to approximately 9,000 residents by 1990 if the extensive circulator system were implemented and there would be a moderate, steady growth in employment from CBD developments for which commitments have already been made. The circulator bus alternatives would create little impetus for major new investments in the CBD and thus would have only a slight impact on population and employment. Continuation of the existing circulator bus system would not have an impact on population and employment.

3. Ability to Finance

a. DPM

Two aspects of financing the alternatives--capital costs and annual operating costs--must be considered. The capital cost of the DPM is estimated to be \$118.55 million in escalated dollars. Table IV-3 summarizes capital cost estimates for the DPM, assuming construction begins in 1981 and the system begins operating in 1983.

Eighty percent of the cost would be funded by the U.S. Department of Transportation's Urban Mass Transportation Administration. The remaining twenty percent of the cost would be provided by the Michigan Department of Transportation. The issuance of revenue bonds to obtain matching funds was authorized by the Michigan state legislature in 1979.

Annual operating costs for the DPM are projected to be \$6.78 million in 1985 dollars, as shown in Table IV-4. These costs would be met primarily by revenues collected from users of the system. Operating revenues are estimated to be \$6.09 million, based on a patronage of 71,000 daily riders and a base fare of 30 cents. Other revenue sources, which are shown in Table IV-5, are advertising and participation in joint development.

²⁴Richard Greffe Associates, The Implications of Transit Investment on Urban Development in Southeastern Michigan, February, 1979, pp. 35-50.

TABLE IV-3
DPM CAPITAL COST ESTIMATES

| Equipment Category | 1985 Escalated Cost ^a (Millions) |
|---|--|
| Guideway, stations, maintenance building | \$ 57.02 - |
| Vehicle fleet | 14.86 - |
| Power system, command equipment, security equipment | 16.69 |
| Engineering and administration | 12.48 |
| Contingency | 12.52 |
| System testing and acceptance | <u>5.48</u> |
| TOTAL | \$118.55 |

^aEscalated cost assumes varying inflation rates of 13.2 percent for 1979, decreasing to nine percent after 1981.

TABLE IV-4
DPM ANNUAL OPERATING AND MAINTENANCE COSTS

| Category | 1985 Escalated Cost ^a (Thousands) |
|--|---|
| Maintenance of guideway, stations, and equipment | \$2,237.8 |
| Operations | 1,600.1 |
| Labor | <u>2,937.1</u> |
| TOTAL | \$6,775.7 |

^aEscalated cost assumes average inflation rate of nine percent to 1985.

Source: General Motors Transportation Systems Center, "Cost Estimates - Baseline System," November, 1979, pp. 2-1 through 2-4.

TABLE IV-5
SOURCES OF DPM OPERATING FUNDS

| Category | Projected 1985 Operating Sources ^a (Thousands of 1985 Dollars) |
|--------------------------------------|---|
| Farebox revenues | \$6,089.0 |
| Advertising revenues | 244.0 |
| Participation by private development | 465.0 |
| Federal operating assistance | 0.0 |
| Local and state operating assistance | <u>0.0</u> |
| TOTAL PROJECTED REVENUES | \$6,798.0 |

^aAssumes a 1985 base fare of 30 cents, with elderly and handicapped passengers paying half fare.

Source: Schimpeler-Corradino Associates, "Financial Alternatives Working Paper - Detroit Downtown People Mover," November, 1979, p. 37.

With a daily patronage of 71,000 riders, the DPM system is not expected to require local, state, or federal subsidization for operating costs. If patronage were not as great as projected due to unforeseen economic conditions such as downtown population and employment that does not meet predicted levels, alternative sources of revenue would be sought (e.g., increase in fares, application for assistance from the federal government, or request for assistance from the private sector). If necessary, cutbacks in evening service could be implemented as a cost-saving measure.

b. Circulator Bus

The existing circulator bus system would not require additional capital expenditures except to replace old buses. Operating costs are presently subsidized by the federal government and the Detroit Department of Transportation.

A modified one-way circulator bus system would greatly increase the quality and frequency of service. In addition to existing circulator buses, nineteen additional vehicles would be needed to provide the improved service. Recent bids for buses indicate that the capital cost to purchase the required vehicles and provide improved bus shelters at stops along the routes would be \$3.37 million in 1982 dollars, the year the buses could be in operation. The two-way system would require a total of 38 buses with a system capital cost of \$6.74 million.

Annual operating and maintenance costs for the modified one-way circulator bus system are estimated to be \$2.66 million in 1985 dollars.²⁵ These costs are based on operation at two-minute headways between 7:00 a.m. and 7:00 p.m., 260 days a year. Operating revenue has been estimated to be \$2.05 million, based on a patronage of 17,000 daily riders paying a fare of 40 cents in 1985 dollars. The two-way circulator would cost \$5.32 million annually to operate with an expected revenue of \$2.54 million. The deficit between revenues and costs for a modified circulator bus system would be met by federal, state, or local funds in accordance with the current procedure.

C. SOCIAL IMPACTS

This section presents the impacts of the DPM and circulator bus alternatives on the social structure of the study area. Displacements, disruption of communities, accessibility and mobility, and safety and security are considered.

1. Residential Displacements, Business Displacements, and Acquisitions

All public actions requiring purchase of private property and necessitating relocation of a business or residence must be in compliance with Act 31 of the Michigan Public Acts of 1979, Act 227 of the Michigan Public Acts of 1972, and the federal Uniform Relocation Assistance and Land Acquisition Policies Act of 1970 (Public Law 91-646, dated January 2, 1971), as well as

²⁵GM Transportation Systems Center, "Bus Alternative (Working Paper)," June, 1979.

any current directives of the Urban Mass Transportation Administration. These Acts require that private property owners receive fair compensation for the loss of their property.

a. DPM

No residences would be displaced by the DPM. Of the nine businesses that would be displaced, seven are parking lots (the loss of parking was discussed in section A.6 of this chapter). Because of the small number and the type of businesses to be moved and the fact that no residences would be affected, minimal relocation impacts are expected.

Only two of the nine business displacements would require demolition of a building. The main business, a furniture store located on the site of the proposed maintenance facility, employs about thirty people. Most of the parking lot businesses that would be displaced are located on city-owned property. Past experience in Michigan indicates that acquired parking lots are generally not relocated. Rather, the present value of the parking lot's future income is capitalized through purchase of the remaining time period of its lease.

Most of the guideway and several stations would be built on existing public rights-of-way. Land acquisition and easement requirements have been identified (see Figure IV-3). A total of 2.5 acres would be acquired for the DPM; seven-tenths of an acre, which is also needed, is already owned by the city. Easements on an additional six-tenths of an acre would be required. A parking lot on the southwest corner of the intersection of Beaubien and Macomb would have to be acquired to locate the guideway. The Greektown station, between Lafayette and Monroe on Beaubien, would require the acquisition of land presently used as a parking lot. Acquisition of a parking lot on Larned between Shelby and Griswold for the Financial District station would probably be necessary. Because this property is large, negotiation for an easement would substantially reduce land acquisition costs.

Construction of the Cobo Hall station and maintenance shop would require acquisition of a large parcel of land along Larned. It would be necessary to acquire all parcels on the north side of Larned between Second Street and Cass Avenue. Two buildings would be demolished to construct the maintenance shop. Two businesses with a total of under 35 employees would have to be relocated.

Construction of the Fort/Cass station would require acquisition of land located on the northwest corner of the intersection of Fort and Cass and now used as a parking lot. A parking lot on the southeast corner of the intersection of Michigan and Cass would also be acquired to construct the Michigan station. A small parking lot at the northeast corner of Bagley and Clifford may be acquired to accommodate the guideway.

The Southeastern Michigan Transportation Authority (SEMTA) has prepared a Conceptual Relocation Plan for the residences and businesses that would be relocated as a result of construction and operation of a Detroit DPM.²⁶

²⁶Richard Grefe Associates, "Conceptual Relocation Plan, Detroit Downtown People Mover Project," 1979.



- > EASEMENTS
- LAND ACQUISITION
- DPM ALIGNMENT

Figure IV-3
 LAND ACQUISITION
 & EASEMENT LOCATIONS FOR DPM

--- DETROIT RIVER ---

The Conceptual Relocation Plan defines procedures for the relocation of businesses and residences displaced by the transportation improvement. The Plan also defines requirements for determining the eligibility of businesses to receive relocation payments. Businesses to be relocated are assured that assistance will be available to them in finding a new location. The Plan delineates the options available to displaced business owners and the relocation payments provided by each option.

The Conceptual Relocation Plan establishes an appeal procedure for displaced persons who wish to take issue with a determination of eligibility for relocation property or the amount of a relocation payment. The Plan also defines procedures for determining easements to be acquired from private property owners. The final section of the Plan establishes SEMTA's right of eminent domain and provides procedures for just compensation to owners who are unable to reach an agreement with SEMTA for relocation payments.

b. Circulator Bus

The circulator bus alternatives would not require relocation or acquisition of any property as they would operate on existing rights-of-way. New bus shelters for the extensive circulator system would be located on public right-of-way.

2. Community Disruption

a. DPM

The DPM alternative would have a positive impact on the CBD community by unifying the area and linking community facilities with a rapid circulation system. Major downtown facilities providing social, public, community, or municipal services are shown in Figure IV-4. The DPM system would make these services more accessible to the public.

b. Circulator Bus

The circulator bus alternatives would also link community facilities, especially with the extensive circulator system. The link would not be as effective a unifying agent as the DPM because of the slower speeds of the bus system.

3. Accessibility and Mobility

a. DPM

The positive impacts of the DPM include increased accessibility to the CBD core, which occupies an area of about 0.5 square miles, and to the overall CBD area of about 1.5 square miles. The layout of the CBD includes several unconnected activity centers surrounded by parking lots. Access for

pedestrians is difficult, since the activity centers are isolated from peripheral areas of the CBD. The activity centers needing the interconnection provided by the DPM are listed in Table IV-6 and shown with the DPM alignment in Figure IV-5. Estimated travel times between DPM stations are shown in Table IV-7. As shown in the tables, travel time for the entire loop has been estimated at 14.1 minutes.

Downtown hotels are clustered in three separate locations, with little interconnection except by auto. Each concentrated area offers its own eating, drinking, and entertainment facilities. The DPM would connect the hotel areas and provide a link between the hotels and retail areas, entertainment establishments, and restaurants in other parts of the CBD.

The DPM alternative would greatly increase mobility in the CBD, especially between activity centers. Since the DPM would intercept highways, bus services, and other planned regional systems and would be located near major parking facilities, the efficiency of all types of travel would increase. The DPM is being designed as a one-way loop. This arrangement does create some inconvenience in the form of longer travel times for passengers wanting to travel between stations that are close together, but in the direction opposite that of the system's movement.

The DPM would also provide greater mobility to the transit-dependent groups of the very young, the elderly, the handicapped, persons without access to private cars, and low-income families. These groups would be provided access to shopping areas, government offices, and recreational areas. The DPM is being designed in such a way that it can be easily reached and used by all handicapped persons.

In summary, the DPM system would have only positive impacts on accessibility and mobility. The structure would not create a traffic barrier at any location.

b. Circulator Bus

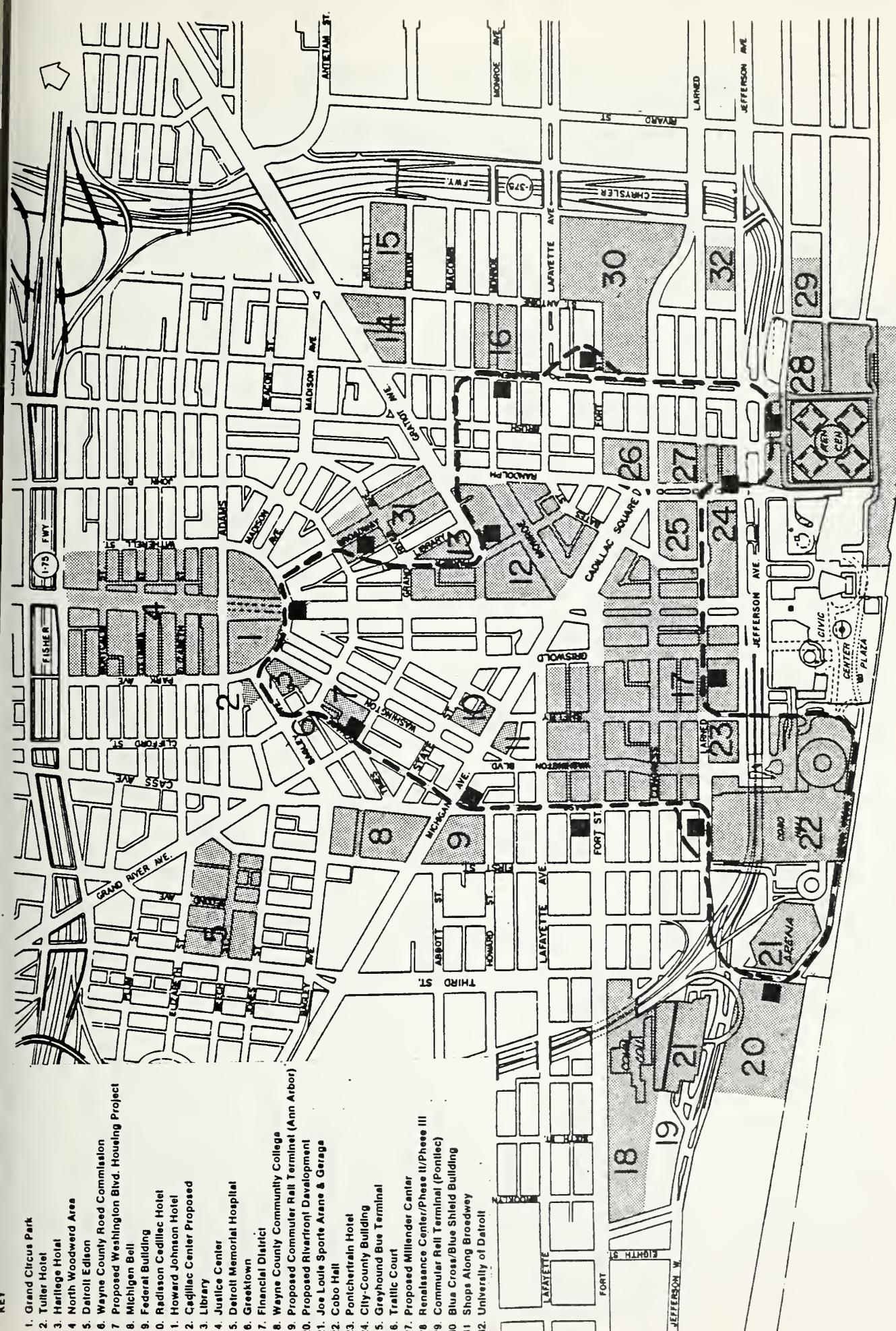
Both accessibility and mobility would be improved by an extensive circulator bus system in a similar manner, but to a lesser degree, than by the DPM. The relationship between a modified circulator bus alignment and the previously identified major activity centers is illustrated in Figure IV-6. Estimated travel times between circulator bus stations in the one-way system are shown in Table IV-8. The total travel time by circulator bus has been estimated at 32.3 minutes, which provides improved access to all areas of the CBD, but is considerably slower than the 14.1-minute travel time of the DPM alternative. However, travel times between all activity centers and social service facilities would be improved by the extensive circulator bus alternative. A two-way circulator bus system would reduce travel times between many stops and in fact would have shorter travel times between some stations than the DPM. The average travel times with the bus system would, however, be greater than for the DPM. The existing circulator bus system has similar travel times between some activity centers, but does not serve others at all. The new circulator buses would be accessible to the handicapped. Continuation of the existing circulator bus system would not improve accessibility or mobility.

TABLE IV-6

ACTIVITY CENTERS SERVED BY DPM STATIONS
AND EXTENSIVE CIRCULATOR BUS STOPS

| Station Location | Activity Centers Served |
|------------------------|--|
| Renaissance Center | Renaissance Center Commuter Rail Terminal |
| Beaubien/Fort | Blue Cross/Blue Shield Building Greektown |
| Greektown | Greektown Justice Center Detroit Memorial Hospital |
| Cadillac Square | Cadillac Center Library |
| Broadway | Shops along Broadway |
| Grand Circus Park | Grand Circus Park North Woodward Area Tuller and Heritage Hotels (when reopened) |
| Times Square | Wayne County Road Commission Proposed Washington Boulevard Housing Project Detroit Edison |
| Michigan Avenue | Federal Building Michigan Bell Radisson Cadillac Hotel Howard Johnson's Hotel |
| Fort/Cass | Financial District |
| Cobo Hall | Cobo Hall Pontchartrain Hotel |
| Joe Louis Sports Arena | Joe Louis Sports Arena Proposed Riverfront Development Proposed Commuter Rail Terminal Wayne County Community College |
| Financial Center | Financial District |
| Millender Center | City-County Building Greyhound Bus Terminal Traffic Court Proposed Millender Center |

Source: Schimpeler-Corradino Associates.



- KEY**
1. Grand Circus Park
 2. Tuller Hotel
 3. Harlidge Hotel
 4. North Woodward Area
 5. Detroit Edison
 6. Wayne County Road Commission
 7. Proposed Washington Blvd. Housing Project
 8. Michigan Bell
 9. Federal Building
 10. Radisson Cadillac Hotel
 11. Howard Johnson Hotel
 12. Cadillac Center Proposed
 13. Library
 14. Justice Center
 15. Detroit Memorial Hospital
 16. Greektown
 17. Financial District
 18. Wayne County Community College
 19. Proposed Commuter Rail Terminal (Ann Arbor)
 20. Proposed Rivarion Development
 21. Joe Louis Sports Arena & Garage
 22. Cobo Hall
 23. Pontchartrain Hotel
 24. City-County Building
 25. Greyhound Bus Terminal
 26. Traffic Court
 27. Proposed Millender Center
 28. Renaissance Center/Phase II/Phase III
 29. Commuter Rail Terminal (Pontiac)
 30. Blue Cross/Blue Shield Building
 31. Shops Along Broadway
 32. University of Detroit

Figure IV - 5

DPM ALIGNMENT, STATIONS,
& MAJOR ACTIVITY CENTERS

— DETROIT RIVER —

TABLE IV-7

ESTIMATED STATION-TO-STATION TRAVEL TIME^a IN MINUTES FOR DPM

| | Arrivals | | | | | | | | | | | | |
|------------------------|--------------------|---------------|-----------|-----------------|----------|-------------------|--------------|-----------------|-----------|-----------|------------------------|------------------|------------------|
| | Renaissance Center | Beaubien/Fort | Greektown | Cadillac Square | Broadway | Grand Circus Park | Times Square | Michigan Avenue | Fort/Cass | Cobo Hall | Joe Louis Sports Arena | Financial Center | Millender Center |
| Renaissance Center | 14.1 | 1.1 | 1.9 | 2.9 | 4.3 | 5.2 | 6.3 | 7.2 | 8.1 | 8.9 | 9.9 | 12.1 | 13.1 |
| Beaubien/Fort | 13.0 | 14.1 | 0.8 | 1.8 | 3.2 | 4.1 | 5.2 | 6.1 | 7.0 | 7.8 | 8.8 | 9.8 | 12.0 |
| Greektown | 12.2 | 13.3 | 14.1 | 1.0 | 2.4 | 3.3 | 4.4 | 5.3 | 6.2 | 7.0 | 8.0 | 10.2 | 11.2 |
| Cadillac Square | 11.2 | 12.3 | 13.1 | 14.1 | 1.4 | 2.3 | 3.4 | 4.3 | 5.2 | 6.0 | 7.0 | 9.2 | 10.2 |
| Broadway | 9.8 | 10.9 | 11.7 | 12.7 | 14.1 | 0.9 | 2.0 | 2.9 | 3.8 | 4.6 | 5.6 | 7.8 | 8.8 |
| Grand Circus Park | 8.9 | 10.0 | 10.8 | 11.8 | 13.2 | 14.1 | 1.1 | 2.0 | 2.9 | 3.7 | 4.7 | 6.9 | 7.9 |
| Times Square | 7.8 | 8.9 | 9.7 | 10.7 | 12.1 | 13.0 | 14.1 | 0.9 | 1.8 | 2.6 | 3.6 | 5.8 | 6.8 |
| Michigan Avenue | 6.9 | 8.0 | 8.8 | 9.8 | 11.2 | 12.1 | 13.2 | 14.1 | 0.9 | 1.7 | 2.7 | 4.9 | 5.9 |
| Fort/Cass | 6.0 | 7.1 | 7.9 | 8.9 | 10.3 | 11.2 | 12.3 | 13.2 | 14.1 | 0.8 | 1.8 | 4.0 | 5.0 |
| Cobo Hall | 5.2 | 6.3 | 7.1 | 8.1 | 9.5 | 10.4 | 11.5 | 12.4 | 13.3 | 14.1 | 1.0 | 3.2 | 4.2 |
| Joe Louis Sports Arena | 4.2 | 5.3 | 6.1 | 7.1 | 8.5 | 9.4 | 10.5 | 11.4 | 12.3 | 13.1 | 14.1 | 2.2 | 3.2 |
| Financial Center | 2.0 | 3.1 | 3.9 | 4.9 | 6.3 | 7.2 | 8.3 | 9.2 | 10.1 | 10.9 | 11.9 | 14.1 | 1.0 |
| Millender Center | 1.0 | 2.1 | 2.9 | 3.9 | 5.3 | 6.2 | 7.3 | 8.2 | 9.1 | 9.9 | 10.9 | 13.1 | 14.1 |

^aIncludes average station dwell time.

Source: General Motors Transportation Systems Center, "Description of Selected DPM System," June, 1979.

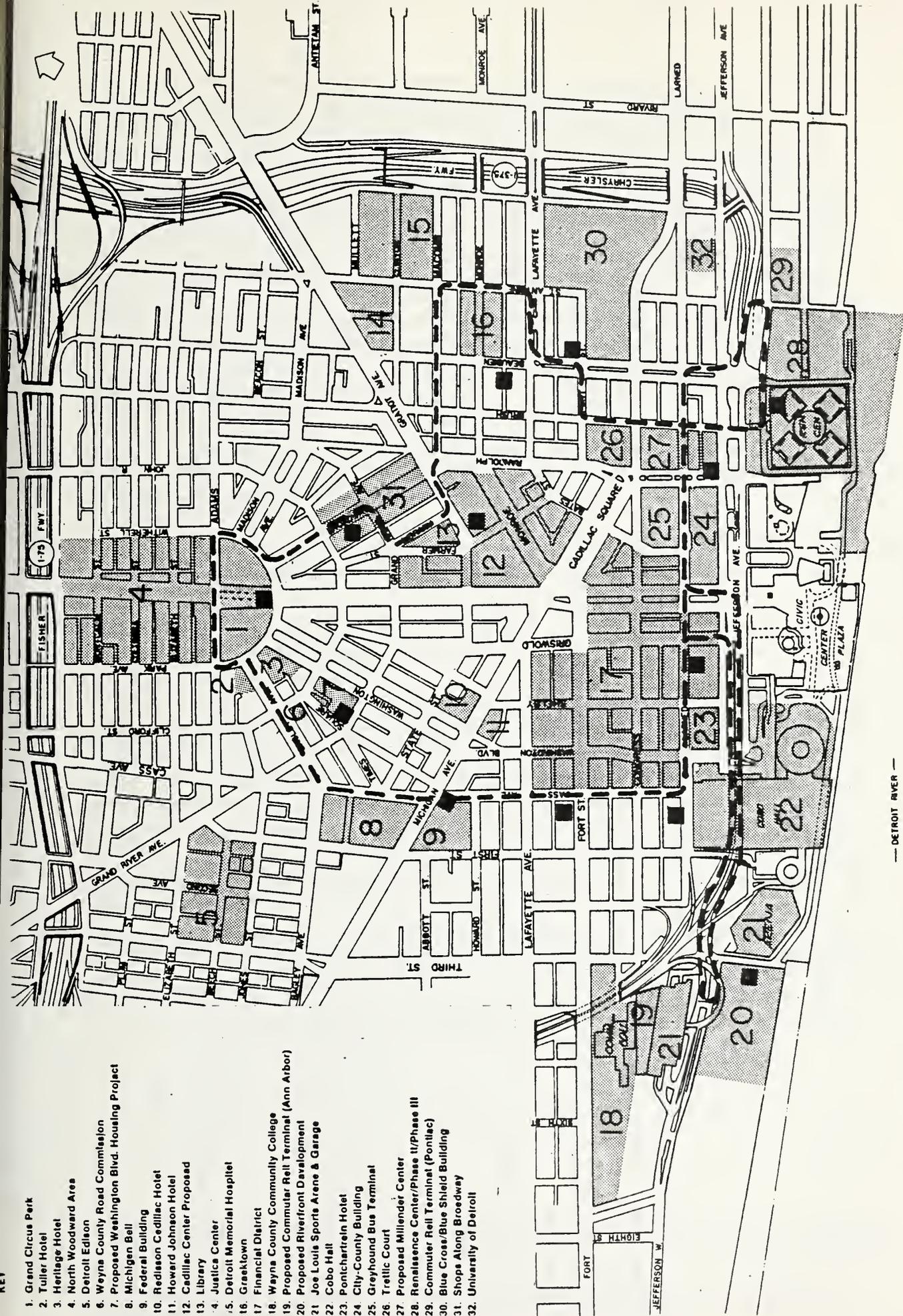


Figure IV-6
CIRCULATOR BUS ALIGNMENT, BUS STOPS,
& MAJOR ACTIVITY CENTERS

KEY

1. Grand Circus Park
2. Tuller Hotel
3. Heritage Hotel
4. North Woodward Area
5. Detroit Edison
6. Wayne County Road Commission
7. Proposed Washington Blvd. Housing Project
8. Michigan Bell
9. Federal Building
10. Redlson Cadillac Hotel
11. Howard Johnson Hotel
12. Cadillac Center Proposed
13. Library
14. Justice Center
15. Detroit Memorial Hospital
16. Graektown
17. Financial District
18. Wayne County Community College
19. Proposed Commuter Rail Terminal (Ann Arbor)
20. Proposed Riverfront Development
21. Joe Louis Sports Arena & Garage
22. Cobo Hall
23. Pontchartrain Hotel
24. City-County Building
25. Greyhound Bus Terminal
26. Trellic Court
27. Proposed Millender Center
28. Renaissance Center/Phase II/Phase III
29. Commuter Rail Terminal (Pontiac)
30. Blue Cross/Blue Shield Building
31. Shops Along Broadway
32. University of Detroit

— DETROIT RIVER —

TABLE IV-8

ESTIMATED STATION-TO-STATION TRAVEL TIME^a IN MINUTES FOR ONE-WAY CIRCULATOR BUS ALTERNATIVE

| | Arrivals | | | | | | | | | | | | |
|------------------------|--------------------|---------------|-----------|-----------------|----------|-------------------|--------------|-----------------|-----------|-----------|------------------|------------------------|------------------|
| | Renaissance Center | Beaubien/Fort | Greektown | Cadillac Square | Broadway | Grand Circus Park | Times Square | Michigan Avenue | Fort/Cass | Cobo Hall | Financial Center | Joe Louis Sports Arena | Millender Center |
| Departures | 32.3 | 3.9 | 6.7 | 9.3 | 11.1 | 13.7 | 15.3 | 17.1 | 18.6 | 19.8 | 21.9 | 25.2 | 29.7 |
| Renaissance Center | 28.4 | 32.3 | 2.8 | 5.4 | 7.2 | 9.8 | 11.4 | 13.2 | 14.7 | 15.9 | 18.0 | 21.3 | 25.8 |
| Beaubien/Fort | 25.6 | 29.5 | 32.3 | 2.6 | 4.4 | 7.0 | 8.6 | 10.4 | 11.9 | 13.1 | 15.2 | 18.5 | 23.0 |
| Greektown | 23.0 | 26.9 | 29.7 | 32.3 | 1.8 | 4.4 | 6.0 | 7.8 | 9.3 | 10.5 | 12.6 | 15.9 | 20.4 |
| Cadillac Square | 21.2 | 25.1 | 27.9 | 30.5 | 32.3 | 2.6 | 4.2 | 6.0 | 7.5 | 8.7 | 10.8 | 14.1 | 18.6 |
| Broadway | 18.6 | 22.5 | 25.3 | 27.9 | 29.7 | 32.3 | 1.6 | 3.4 | 4.9 | 6.1 | 8.2 | 11.5 | 16.0 |
| Grand Circus Park | 17.0 | 20.9 | 23.7 | 26.3 | 28.1 | 30.7 | 32.3 | 1.8 | 3.3 | 4.5 | 6.6 | 9.9 | 14.4 |
| Times Square | 15.2 | 19.1 | 21.9 | 24.5 | 26.3 | 28.9 | 30.5 | 32.3 | 1.5 | 2.7 | 4.8 | 8.1 | 12.6 |
| Michigan Avenue | 13.7 | 17.6 | 20.4 | 23.0 | 24.8 | 27.4 | 29.0 | 30.8 | 32.3 | 1.2 | 3.3 | 6.6 | 11.1 |
| Fort/Cass | 12.5 | 16.4 | 19.2 | 21.8 | 23.6 | 26.2 | 27.8 | 29.6 | 31.1 | 32.3 | 2.1 | 5.4 | 9.9 |
| Cobo Hall | 10.4 | 14.3 | 17.1 | 19.7 | 21.5 | 24.1 | 25.7 | 27.5 | 29.0 | 30.2 | 32.3 | 3.3 | 7.8 |
| Financial Center | 7.1 | 11.0 | 13.8 | 16.4 | 18.2 | 20.8 | 22.4 | 24.2 | 25.7 | 26.9 | 29.0 | 32.3 | 4.5 |
| Joe Louis Sports Arena | 2.6 | 6.5 | 9.3 | 11.9 | 13.7 | 16.3 | 17.9 | 19.7 | 21.2 | 22.4 | 24.5 | 27.8 | 32.3 |
| Millender Center | | | | | | | | | | | | | |

^aIncludes average station dwell time.

Note: Travel times for two-way system can be estimated by reversing station sequence. Example: travel time from Cadillac Square station to Beaubien/Fort stop for two-way system would be approximately equal to time from Beaubien/Fort to Cadillac Square for one-way systems (5.4 minutes).

4. Safety and Security

a. DPM

The elevated guideway on which the DPM would operate would provide an exclusive, traffic-free environment, virtually eliminating the probability of conflicts with other transportation modes. The DPM system would meet strict safety standards that have been included in the system design specifications. Special provisions would be made for the elderly and handicapped. Acceleration and deceleration would be controlled. Possible hazards would be analyzed in the design, test and acceptance, and operations and maintenance phases. The safety of the lateral and street-level environments would be maintained by barriers installed between the elevated structure and adjacent buildings, ensuring that no vehicle, part, loose tool, or trash could reach the street.

Mechanical and design safety considerations of the DPM have been defined in a report on safety criteria.²⁷ Safety guidelines have been defined for the following elements of the DPM:

- . Guideway equipment;
- . Stations and station equipment;
- . Vehicles;
- . Switches;
- . Maintenance shops and equipment;
- . Train control; and
- . Computer hardware.

A proposed safety organization and the responsibilities of the agency and its employees have also been defined.

Random police operations would be employed and closed circuit television surveillance of all station areas would be provided. Stations would be designed to include alarms and provisions for direct verbal communication between all stations and a central control to minimize emergency response time. Suitable on-board radio equipment would be installed to ensure the security of patrons on moving vehicles.

Security arrangements for passengers, equipment, and facilities have been detailed in a working paper on security criteria.²⁸ Specific security measures to be used for the system are:

- . Police deployment strategies;
- . Electronic and mechanical communication and observation devices;
- . Special design features to minimize the potential for crime;
- . Selective operating procedures; and
- . Support activities.

²⁷Frank C. Smith and Associates, Working Paper on Safety Criteria, January, 1979.

²⁸GM Transportation Systems Division, Working Paper on Security Criteria, January, 1979.

The design of the DPM structure and supports would discourage loitering in the vicinity of stations. Stairways, ramps, and escalators would not create blind spots that might offer hiding places to criminals and derelicts. The intensity of lighting would be sufficient to discourage criminal activity. The materials used in vehicles and stations would be selected to limit the potential for vandalism.

b. Circulator Bus

The safety measures of the circulator bus alternatives would be less sophisticated than those of the DPM and similar to those of the existing transit system in the Detroit CBD. Circulator buses would operate in a less safe environment of mixed traffic on downtown streets; therefore, more accidents involving pedestrians and vehicles should be expected with this alternative than with the DPM. There are many opportunities for collisions with circulator buses (other buses, autos, trucks, pedestrians, fixed objects, debris, etc.). With the DPM, the threat of collisions is reduced to the potential for collisions between DPM vehicles (which is slight because of vehicle control systems); the DPM is physically separated from other transportation modes. The security provided to patrons of the circulator bus system would be similar to that provided to patrons of the existing transit system in the Detroit CBD.

D. IMPACTS ON NATURAL RESOURCES

This section presents the impacts of the DPM and circulator bus alternatives on the natural environment. Visual impacts, noise, impacts on water and air quality, flooding, energy consumption, impacts on parks and historic sites, and other environmental concerns are considered.

1. Visual Impacts and Aesthetics

An analysis of the impacts of the DPM and circulator bus alternatives on the appearance of the downtown must concentrate on the three-dimensional character of the downtown. In contrast to most cities west of the Allegheny mountains and large sections of the city of Detroit itself, downtown Detroit departs from the common gridiron street pattern with a unique arrangement of radial streets that directs attention to public open spaces. Private parcels served by the street pattern were developed as thriving centers of commerce. The majority of the buildings forming the vertical or third dimension superimposed on the two-dimensional street system were constructed in the first half of the century. Constructed primarily of brick, these buildings exemplify all of the significant architectural design styles for high-rise commercial buildings that were prevalent in the first half of this century.

a. DPM

To measure the impact of the DPM system on the visual character of the downtown, the positive and negative visual attributes of the area must be analyzed.

An important characteristic of the area is considered to be the unique street system that results in two main focal points: Grand Circus Park and the Kennedy Square area. Both of these spaces, as well as the street pattern that creates them, were included in the Detroit Street Plan (circa 1807).

Because of its unique street pattern and the type of construction that has occurred in the Detroit CBD during the nineteenth and twentieth centuries, downtown Detroit contains many well-defined urban street spaces. Such areas are characterized by the relationship between the public right-of-way and the adjoining private structures that enclose the street space. The Capitol Park block at Griswold and State Streets is an example of a well-defined and well-proportioned urban street space. The downtown also contains several unique landmarks that are important elements of its character and setting. Obvious examples are Grand Circus Park and the Renaissance Center.

With the introduction of the DPM system, the view from some structures adjacent to the proposed alignment would be altered. This impact would be particularly pronounced at approximately the second floor level.

The positive and negative impacts of the DPM on the appearance of the downtown were measured. Figure IV-7 depicts a series of summary judgments about these impacts.

i. Compatibility with Grand Circus Park

SEMTA is still in the process of finalizing the design of the Grand Circus Park Station. A study will be made with the participation of historic preservation interest to finalize the details of location and design treatment. As presently configured, the DPM system skirts the edge of Grand Circus Park, following the south edge of the Park Avenue/Witherell Street pavement between Bagley Avenue and Broadway. The guideway structure would be separated from the park by the street pavement and would be adjacent to the buildings facing the park. The separation of the system from the park and the proximity of the system to adjoining buildings and sidewalk activity occurring at their bases makes the guideway structure a part of the structures and activity that surround the park. The guideway structure would not interfere with the park's visual characteristics.

The guideway structure would not significantly hinder the view or disrupt the appearance of adjacent buildings (see Figure IV-8). The Detroit Heritage Hotel, the David Whitney Building, and the Woodward-Tower-At-The-Park are each massive structures exceeding 200 feet in height. Also, each building has a repetitive horizontal or cubic architectural design motif along its lower floors, a feature that would be compatible with the linear guideway structure. The view of the Madison Theater Building at the corner of Witherell Street and Broadway would not be adversely affected, although the building is less massive than others in the vicinity, having only five floors.

A final visual feature associated with Grand Circus Park is the view into the park from the four radial streets (Bagley Avenue, Washington Boulevard, Woodward Avenue, and Broadway). Each of the four streets directs the attention of the viewer into the green park space. Different views of the park



NEGATIVE IMPACTS

EXISTING SIGNIFICANT VIEWS

— DETROIT RIVER —

Figure IV-7
VISUAL ANALYSIS



Figure IV-8

BEFORE & AFTER DPM
AT GRAND CIRCUS PARK

would be disrupted to varying degrees by the location of the DPM guideway. The disruption is more likely to affect northbound traffic and pedestrians on Bagley (approaching the park) than the view on any of the other radial streets. The guideway would be located in the center of Bagley Avenue and would disrupt the view of the park by crossing the field of vision of northbound traffic. The guideway structure is expected to be less disruptive as it crosses each of the other streets. Washington Boulevard has recently been reconstructed, with the installation of overhead lighting structures, landscaping, and a trolley located within its wide right-of-way. This construction restricts the pedestrian's view of the park along Washington Boulevard. The guideway would tend to blend into the existing overhead elements within the field of vision.

A situation similar to that of Washington Boulevard would exist along Woodward Avenue. The guideway structure and station located over Woodward Avenue may function as the top of an urban "doorway" for pedestrians passing from the relatively confined pedestrian environment of Woodward Avenue into the open expanse of Grand Circus Park.

At Broadway, the guideway would leave the Witherell Street right-of-way and enter the center median of southeast-bound Broadway. At this location, the view of the park is most disrupted for pedestrians on the southwest side of Broadway. The view of the park by pedestrians and traffic approaching on the northeast side of the street would be only partially impaired.

ii. Compatibility with the original Detroit Street Plan

In recognition of the unique character of the original Detroit Street Plan, the compatibility of the DPM system with that plan was measured. A positive visual relationship between the DPM and the Street Plan would occur in areas where the system follows the original street pattern (e.g., for the portions of the system that follow Park Place, Bagley Avenue, Park Avenue, Broadway, and Farmer Street). Negative visual relationships would occur at locations where the system cuts diagonally through a block (e.g., between Broadway and Farmer Street). This negative impact would be offset by the positive visual impacts described in the section immediately following. Also, the DPM at this location may be integrated into a building.

iii. Improvements of negative areas

In assessing the impact of the alignment, it was recognized that the location of certain DPM stations may make parts of the downtown more accessible, resulting in development adjacent to those stations. For DPM stations located in the immediate vicinity of negative visual areas, it is assumed that positive impacts could result from redevelopment of the negative areas, thus filling in the visual voids in the downtown. New development designed in concert with the operation of three DPM stations (Times Square, Broadway, and Cadillac Center) would help remove negative visual areas at these locations. The construction of buildings harmonious with

the area in the vicinity of the Times Square and Broadway stations would help offset the negative impacts cited in the immediately preceding section.

iv. Relationship to Kennedy Plaza and adjoining structures

The large open space adjacent to the intersection of Woodward and Michigan Avenues includes the John F. Kennedy Square and the Kern block, which are major open areas in the downtown and are located at the confluence of six streets. The DPM guideway structure would be located along the west side of Farmer Street at its intersection with Gratiot Avenue. The guideway would then turn east to enter the Cadillac Center station. The guideway would not penetrate the existing open space and would not disrupt the appearance of Kennedy Plaza, but would follow a route along its edge. Along Farmer Street, the guideway would parallel the facade of the J.L. Hudson Building, a massive fifteen-story brick structure with a linear design motif in stone along its first two floors. The guideway would be visually compatible with this building. The guideway would also trace a path around two sides of the Downtown Library. The library building, a stone structure 35 feet high, is generally protected from direct visual disruption by a guideway location on the west side of Farmer Street. However, the view of the library from the Kern block and from Monroe Street would be disrupted by the guideway as it turned from its alignment on Farmer Street to a location on the south side of Gratiot Avenue.

v. Compatibility with the Renaissance Center

The proposed DPM guideway located on Beaubien turns west as it crosses Jefferson Avenue and enters the Renaissance Center station. The guideway and station would be located on an existing mechanical equipment berm that was constructed as an integral part of the Center's contemporary design. A bridge connecting the station to the second level of the Renaissance Center would permit passengers to move directly between the station and adjacent buildings. The guideway and station should be compatible with the Renaissance Center and add a positive visual element to the Center's massive base.

vi. Compatibility with crossing of Woodward Avenue at Larned Street

The DPM guideway would parallel the southern edge of Larned Street as it crosses Woodward Avenue (Figure IV-9). This portion of Woodward Avenue is an extension of the part of this street contained in the city's original plan. At Larned, the Woodward Avenue right-of-way is approximately 200 feet wide, with a median located off-center from the portion of Woodward Avenue that enters Grand Circus Park. One block to the south of Larned Street at Jefferson Avenue, Woodward Avenue reaches the top of a gentle grade and terminates, with a view of the Civic Center Plaza and the Detroit River in the distance. A vertical monument is located in the plaza opposite the end of Woodward Avenue; the monument is placed approximately on the axis of Woodward Avenue at Grand Circus Park, but it is not on the center axis of the portion of Woodward Avenue that intersects Jefferson Avenue.



Figure IV-9
BEFORE & AFTER DPM CROSSING
WOODWARD AT LARNED

The crossing of Woodward Avenue at Larned Street creates minor negative visual impacts, although Woodward Avenue was not designed with a formal symmetrical pattern that would be greatly disturbed by the guideway crossing. While Larned Street crosses at a location on Woodward Avenue with a lower ground elevation than the high point at Jefferson Avenue, the horizontal guideway structure crosses Woodward Avenue at a point where the street is defined by adjacent corner buildings (about 300 feet high), making the impact of the guideway on this space noticeable, but not overwhelming.

b. Circulator Bus

The circulator bus alternatives would have no additional positive or negative visual impacts on the downtown area. The only physical features that would be introduced are the thirteen bus shelters proposed under the extensive circulator system. These shelters would not be visually disruptive to the CBD.

2. Noise and Vibration Impacts

To retain or improve the quality of life in urban areas, it is important that the noise produced by any new transit system be minimized. It is difficult to define "acceptable" noise levels, especially since the noise created by transit is comparable to existing urban noises such as street and highway traffic. However, transit systems do add to the "noise pollution" problem and this issue must be addressed.

Several "noise exposure level" evaluation schemes have been devised to provide a basis for determining design goals and acceptable levels. These evaluation procedures depend on several variables, including maximum single-event transient noise levels and number of events occurring at different times of the day. Because such factors are not necessarily available at the time of design and because the exposure level measures do not generally address maximum permissible single-event noise levels, the use of a single-event maximum level is more appropriate for transit design. Vehicle noise levels, because of their short duration, may appear acceptable on the basis of calculated exposure levels, but because of the possible large differences between maximum passby levels and average ambient noise in a community, the vehicle noise may be unacceptable because of its magnitude. Therefore, single-event maximum noise levels are to be used for design of the transit system. The noise guidelines chosen for transit operations are those of the American Public Transit Association (August, 1976), which defines the following five general categories of community areas.

General Categories of Communities Along Transit System²⁹

| Category | Description |
|----------|---|
| I | Low-density urban residential areas, open space parks, suburban areas. |
| II | Average urban residential, quiet apartments and hotels, open space suburban residential, occupied outdoor areas near busy streets. |
| III | High-density urban residential areas, average semi-residential or commercial areas, parks, museums and non-commercial public buildings. |
| IV | Commercial areas with office buildings, retail stores, etc., primarily daytime occupancy. Central Business District. |
| V | Industrial areas, freeway and highway corridors. |

The transit alternatives being considered (DPM and circulator bus) are to be located in the CBD, a category IV area. Guidelines for single-event maximum airborne noise levels in the area and for several types of buildings or occupancies are given below:

Guidelines for Maximum Airborne Noise From Transit Operations³⁰

| Community Area Category | Design Goal for Single-Event Maximum Noise Level | | |
|-------------------------|--|------------------------|----------------------|
| | Single-Family Dwellings | Multi-Family Dwellings | Commercial Buildings |
| IV Commercial | 80 dBA | 80dBA | 85 dBA |

²⁹American Public Transit Association, "Guidelines and Principles for Design of Rapid Transit Facilities: Noise and Vibration," August, 1976.

³⁰Ibid.

| Noise-Sensitive Sites | Design Goal for Single-Event Maximum Noise Level |
|--|--|
| Amphitheaters | 60 dBA |
| "Quiet" outdoor recreation areas | 65 dBA |
| Concert halls, radio and TV studios, auditoriums | 70 dBA |
| Churches, theaters, schools, hospitals, museums, libraries | 75 dBA |

Single-event transit noise that exceeds these standards is considered to be an adverse impact.

The analysis of potential noise impacts included estimation of noise levels at the 25 survey locations described in Chapter II and calculation of expected maximum noise levels and L_{10} noise levels around both the DPM alignment and the extensive circulator bus route. The extensive circulator bus alternatives were selected for analysis from the potential bus alternatives as worst case conditions. Noise levels with continuation of the existing system would closely follow the 1979 existing levels. The maximum noise levels were compared to the standards of the American Public Transit Association to determine the extent of any adverse impacts. The L_{10} levels were compared with existing noise levels in the study area.

a. DPM

The results of the noise analysis for the DPM and circulator bus alternatives at the 25 noise survey locations are shown in Table IV-9. The results for the DPM, using the L_{10} descriptor, indicate that the system would have little impact on noise levels at the 25 locations. Only for locations 12 and 17 would the increase in L_{10} be more than the 3 dBA increase, which is generally regarded as significant. At locations 12 and 17, the L_{10} levels with the DPM would be 70 dBA and 69 dBA, respectively; these levels are acceptable in an urban environment.

The DPM would result in a significant increase (greater than 3 dBA) in L_{max} at 12 of the 25 locations. The 1979 survey produces results of L_{max} levels between 67 and 96 dBA in the CBD, with an average reading of 81 dBA. The range with the DPM would be the same, but the average would increase to 85 dBA.

The expected noise impacts of the DPM on surrounding land uses were also analyzed with reference to the guidelines of the American Public Transit Association. The adopted system specifications were used to develop noise

TABLE IV-9
DAYTIME NOISE IMPACT ANALYSIS
(dBA)

| No. | Location | L ₁₀ | | | L _{max} | | |
|-----|---|------------------|-------------------|-------------|------------------|-------------------|-------------|
| | | 1979 Existing | 1990 Circ. Bus | 1990 DPM | 1979 Existing | 1990 Circ. Bus | 1990 DPM |
| 1. | N. side of Jefferson, W. of Beaubien | 77 | 77 | 77 | 86 | 86 | 86 |
| 2. | E. side of Randolph, N. of Jefferson | 68 | 68 | 68 | 87 | 87 | 89 |
| 3. | S. side of Larned, W. of Griswold | 69 | 71 | 72 | 79 | 79 | 87 |
| 4. | W. side of Civic Center Drive at Arena Station | 68 | 68 | 69 | 79 | 79 | 87 |
| 5. | N. side of Larned, W. of Cass | 68 | 69 | 70 | 79 | 79 | 83 |
| 6. | W. side of Cass, N. of Fort | 72 | 70 | 70 | 88 | 88 | 88 |
| 7. | E. side of Cass, S. of Michigan | 69 | 69 | 70 | 82 | 82 | 87 |
| 8. | E. side of Times Square, N. of Grand River | 69 | 70 | 71 | 82 | 82 | 87 |
| 9. | S. side of Park Ave., W. of Woodward | 67 | 67 | 68 | 81 | 81 | 87 |
| 10. | W. side of Broadway, S. of Clifford | 66 | 67 | 68 | 73 | 73 | 86 |
| 11. | S. side of Gratiot, E. of Farmer | 67 | 68 | 69 | 73 | 73 | 86 |
| 12. | W. side of Beaubien, S. of Monroe | 66 | 69 | 70 | 80 | 80 | 87 |
| 13. | E. side of Beaubien, N. of Fort St. | 62 | 62 | 63 | 67 | 67 | 87 |
| 14. | W. side of Randolph, at Mariner's Church | 79 | 82 | 82 | 96 | 96 | 96 |
| 15. | At Ford Auditorium | 60 | 60 | 60 | 67 | 67 | 67 |
| 16. | E. side of Woodward, N. of Larned | 79 | 82 | 82 | 85 | 85 | 85 |
| 17. | East side of Cobo Hall | 65 | 68 | 69 | 76 | 76 | 86 |
| 18. | S. side of Congress, W. of Cass | 68 | 68 | 68 | 80 | 80 | 80 |
| 19. | S.E. corner of Times Square Park | 69 | 69 | 69 | 83 | 83 | 83 |
| 20. | Washington Blvd. Mall at Grand River | 69 | 68 | 68 | 86 | 86 | 86 |
| 21. | N. side of Park Ave., W. of Woodward | 82 | 82 | 82 | 86 | 86 | 86 |
| 22. | S. side of Grand River, E. of Woodward | 73 | 72 | 72 | 83 | 83 | 83 |
| 23. | E. side of Farmer at Liberty | 68 | 70 | 70 | 77 | 77 | 77 |
| 24. | W. side of Woodward, S. of Adams | 69 | 70 | 70 | 89 | 89 | 89 |
| 25. | S. side of Witherell, W. of Broadway | 74 | 76 | 77 | 78 | 78 | 87 |

contours. In capsule form, the single-event maximum passby noise levels expected to result from the DPM are:

- . 87 dBA at 12.5 feet from centerline;
- . 81 dBA at 25 feet from centerline; and
- . 75 dBA at 50 feet from centerline.

The noise contours were overlaid on the DPM alignment and areas that would be adversely affected were determined. The results indicated that no nearby land uses would be negatively affected. In all cases, the DPM would be either far enough from commercial structures that the standard of 85 dBA is not violated or noise barriers are sufficient to reduce noise impacts below the standard.

The nearest commercial structure would be the David Whitney Building located at the southwest corner of Woodward Avenue and Park Avenue. Depending on final design of the guideway, the northwest corner of this building could be 10 feet from the guideway centerline, the minimum horizontal clearance defined for baseline design purposes. If the guideway centerline ultimately is 10 feet from the structure and the deployed vehicle system's noise level at the maximum allowed under system specifications, then noise barriers would be incorporated into the guideway design. The noise barriers would reduce the expected noise impact of 90 dBA at 10 feet to approximately 82 dBA.

The nearest hotel would be the Ponchartrain Hotel, situated between Larned Street and Jefferson Avenue on the west side of Shelby Street. The DPM alignment would be on the east side of Shelby Street. Distance from the centerline of the guideway to the hotel would be 66 feet. At this distance a noise level of 71 dBA would be expected to be experienced at the Ponchartrain Hotel. This would be well below the 80 dBA standard for multi-family residential areas.

The DPM guideway and Times Square Station would be integrated with the Washington Boulevard Housing Project. This new downtown housing currently is under construction in the block bounded by Washington Boulevard, Times Square, Grand River Avenue, and Clifford Street. The over 300 residential units in this project would be nearest to the DPM system, but would be separated from DPM Operations by a multi-story parking structure. Noise impacts therefore, would be between 70 and 75 dBA, well below the recommended standard of 80 dBA for multi-family residential areas.

The alignment passes close to Telephone Pioneer Park (see alignment sheet 4, Chapter II). However, this park is not a "'quiet' outdoor recreation area" and an adverse impact level of 75 dBA was used in the analysis. The DPM would not cause noise levels in the park to exceed the standard of 75 dBA. The alignment would also pass near the Federal Building, the Wayne County Road Commission, the City-County Building, the Tuller and Heritage Hotels, and the Downtown Library. However, analysis has indicated that these properties would not be adversely affected. No other sensitive sites are near enough to the DPM to be adversely affected.

To attract and retain patrons on the Detroit DPM system, the vehicles and stations must be designed to provide passengers a comfortable environment. There are two basic ways to minimize the noise experienced by passengers in vehicles and stations: suppression and insulation. Noise can be suppressed by improving design, using mufflers, or enclosing the noise generator. Areas occupied by passengers can be insulated to reduce the transmission of noise.

Noise Criterion Alternative (NCA) curves, which measure noise in terms of permissible octave-band levels and the magnitude of noise, were analyzed with respect to the DPM vehicle. An NCA level of 60 would ensure noise levels that would permit conversation (at a 3-foot distance) among small groups traveling together.

The Detroit DPM vehicles and stations would be designed to meet the following interior noise limits:

- . Within a stationary or moving vehicle, the noise level should not exceed NCA 60 when the vehicle is operating in any mode (including acceleration and deceleration), over all load ranges, and with all equipment operating.
- . At the station platform area, the noise level from the system's operation should not exceed NCA 60.
- . Within general station areas, the noise level should not exceed NCA 50.

Use of these criteria will minimize the system's noise impacts.

Vibration caused by the DPM system would be minimal. The most severe impact would probably occur at connections of the guideway to a station that is within or attached to a non-system structure. The severity of vibrations depends upon several factors, including the strength of the vibration source, design of the guideway and supports, proximity to the vibration source, soil conditions, and the mitigation measures employed. All of these factors would be taken into account during final design to ensure minimum vibration levels.

A criterion for the DPM system has been adopted to limit vibrations to the values specified in "Basic Threshold Acceleration Values for Acceptable Vibration Environments."³¹ This level was chosen because the Detroit CBD consists primarily of office space, which represents a more restrictive requirement than retail shopping or other commercial space. This criterion will ensure that vibrations produced by the system would be within acceptable limits.

b. Circulator Bus

The extensive circulator bus alternatives would have no significant noise or vibration impacts (Table IV-9). Since circulator buses would operate in mixed traffic along streets that are already traveled by buses, no significant increases in either L_{max} or L_{10} levels are expected at any of the 25 locations. The noise produced by operation of any of the circulator bus alternatives would not exceed the standards of the American Public Transit Association at any point in the CBD.

3. Water Quality

a. DPM

The DPM would have little impact on water quality since nearly all water pollutants associated with the system would be discharged into the Detroit sewer system. Possible sources of water pollution include stations, drainage outlets along the guideway, and power-generating facilities. Wastewater produced by the cleaning of stations would be discharged into and treated by the municipal sewer system. Public comfort stations would not be provided on transit vehicles or at stations (with the exception of the Cobo Hall station).

The discharge of liquid wastes from the maintenance facilities would conform with existing local and state regulations. Industrial wastes would be adequately treated before being discharged into the sewer system. Domestic wastes from employee comfort facilities would be discharged into and treated by the municipal sewer system.

³¹ CHABA Working Group #69, "Guidelines for Preparing Environmental Impact Statements on Noise," February, 1977.

Pollutants such as lubricants, tire rubber, and asbestos brake linings that would result from operation of the transit vehicles and could be washed into the drainage system would be kept to a minimum by means of a vehicle inspection and maintenance program. De-icing salts would not be used to melt snow and ice on the guideway, thus avoiding a possible adverse effect on water quality. Instead, the guideway's running surface would be heated by a system of hot, circulating fluids, while other guideway components would be heated by electric resistance wires. To remove large quantities of snow, snow removal equipment would be used. Snow would not be dumped on streets. These snow removal methods would eliminate any water quality problems that might result from the use of de-icing salts.

The net impact of the DPM on water quality would be insignificant because any water quality pollutants associated with it would be discharged into and treated by Detroit's municipal sewer system.

b. Circulator Bus

The circulator bus alternatives would have only a very slight impact on water quality. The pollutants resulting from the operation of transit vehicles would be handled in the same manner as described for the DPM alternative.

4. Flooding

a. DPM

Operation of the DPM would have an insignificant impact on storm runoff and the existing drainage system in the project area. Minor modifications of drainage patterns would be required to accommodate the foundations of the DPM system. Since the downtown area contains little open ground, the new facility should not increase the amount of storm water runoff. The minimum clearance of the DPM guideway structure would be fourteen feet and six inches. At this elevation, any impacts of at-grade flooding or drainage problems on the DPM structure would be insignificant. The Detroit River is part of the Great Lakes system and does not flood; each year, the river rises and falls about two feet, as indicated by comparison of the mean monthly levels. The greatest difference between the highest and lowest mean monthly level since 1900 has been five feet. A review of Flood Insurance Rate Maps indicates that the DPM system is not located in an area prone to flooding.

b. Circulator Bus

The circulator bus alternatives would not cause flooding or be susceptible to flooding.

5. Air Quality

The state of Michigan has identified the Detroit CBD as a nonattainment area for suspended particulates, carbon monoxide, and photochemical oxidants because this area had not met the National Ambient Air Quality Standards by July 1, 1979 (see Table III-1).

An air quality analysis was performed to show the effects of the DPM and circulator bus alternatives on air quality in the CBD. For the circulator bus alternatives, a range was calculated to show the variation in impacts that could result from continuation of the existing system to implementation of the extensive circulator bus system. Air quality was evaluated by means of a total pollutant burden analysis for the CBD. The total load of pollutants in the area was analyzed; no attempt was made to calculate concentrations of pollutants at individual locations. Individual concentrations are difficult to predict in any Central Business District due to the complex air movement patterns resulting from the effect of tall buildings on wind patterns. In such a situation, a pollutant burden analysis gives a truer representation of actual air quality conditions than a micro-scale dispersion analysis.

In calculations of the total pollutant burden, the variable with the greatest effect on air quality is the number of vehicle miles traveled (VMT). The VMT that has been estimated to occur in the Detroit CBD is shown below.

ANNUAL VEHICLE MILES TRAVELED IN THE CBD (1990)

| Option | Miles (in Millions) | | | Total on Streets |
|-----------------------|---------------------|---|---|-------------------|
| | DPM | Auto | Bus | |
| Circulator Bus | -- | 85.53 ^a to 91.87 ^b | 2.40 ^b to 3.10 ^a | 88.63 to 94.27 |
| Downtown People Mover | 1.42 | 884.92 | 2.37 | 87.29 |

^aExisting circulator.

^bExisting two-way circulator.

Vehicle miles traveled in the CBD would be lowest under the DPM alternative.

a. DPM

The results of the air quality analysis are shown in Table IV-10. In all cases, the emissions associated with the DPM alternative for auto and transit are lower than corresponding values for the circulator bus alternatives. Results indicate that the DPM would further the attainment of air quality goals for downtown Detroit.

TABLE IV-10

1990 ANNUAL POLLUTANT EMISSIONS IN THE CBD (TONS)

| Alternative | Transit | Auto | Total |
|-----------------------------|---------|-------------|-------------|
| CARBON MONOXIDE | | | |
| Circulator Bus ^a | 97-125 | 2,540-2,729 | 2,665-2,825 |
| DPM | 95 | 2,523 | 2,618 |
| HYDROCARBONS | | | |
| Circulator Bus | 11-15 | 277-298 | 292-309 |
| DPM | 11 | 275 | 286 |
| NITROUS OXIDES | | | |
| Circulator Bus | 41-53 | 168-180 | 221 |
| DPM | 41 | 166 | 207 |
| SULPHUR OXIDES | | | |
| Circulator Bus | 7-9 | 22-24 | 21 |
| DPM | 7 | 22 | 29 |
| PARTICULATES | | | |
| Circulator Bus | 3 | 14-15 | 17-18 |
| DPM | 3 | 14 | 17 |

^aEmissions for circulator bus are a range reflecting the impacts of all potential alternatives between maintenance of the existing system and implementation of the extensive system.

Source: Schimpeler-Corradino Associates.

b. Circulator Bus

The total amount of pollutants emitted under any of these alternatives would be greater than under the DPM alternative (Table IV-10). The numbers in Table IV-10 reflect a range of circulation improvements, from maintenance of the existing circulator bus system to the extensive circulator system described in Chapter II. In general, the more extensive the circulator bus system, the greater the transit emissions and the lower the auto emissions, resulting in a decrease in total emissions.

6. Energy

a. DPM

By 1990, the DPM would have a total annual energy requirement of 20,016,000 kilowatt hours. This power would be only 0.04 percent of the 1990 production capacity of Detroit Edison. The DPM's energy requirements would not necessitate an increase in generating capacity.

A comparison of the total energy required to operate transportation within the CBD for the DPM and the circulator bus alternatives is shown in the following table. In comparison with existing conditions, implementation of the DPM alternative would, as expected, result in a decrease in the energy consumed by automobiles for travel within the CBD and an increase in the energy consumed by transit vehicles in the CBD.

TABLE IV-11

ENERGY CONSUMED ANNUALLY IN 1995 BY TRANSPORTATION IN THE CBD

| Alternative | Equivalent Gallons of Gasoline (Millions) | | |
|--|--|-------|-------|
| | Transit | Auto | Total |
| Downtown People Mover | 1.273 | 2.327 | 3.600 |
| Existing Circulator Bus System | 0.552 | 2.446 | 2.998 |
| Extensive One-Way Circulator Bus System | 0.783 | 2.345 | 3.128 |
| Extensive Two-Way Circulator Bus System | 1.014 | 2.344 | 3.358 |

The DPM would slightly decrease the amount of energy consumed by autos for travel in the CBD. The DPM would also result in an increase in total energy consumption due to the high level of transit service provided. The desirability of the DPM as an energy-saving mechanism is somewhat distorted, however, by the information shown in Table IV-11. For the purposes of the overall comparison shown in the table, energy consumption was converted to equivalent gallons of gasoline. Because the DPM would be electrically powered, it would not consume gasoline or diesel fuel as would the circulator buses. The electrical power for the DPM would

be generated by burning coal. Therefore, even though the DPM would require more total operating energy than the circulator buses, it would result in the conservation of petrofuels.

b. Circulator Bus

The energy requirements for the circulator bus alternatives are shown in Table IV-11. The extensive circulator system would result in more gasoline being consumed by automobiles than would the DPM alternative, but the increase would be less than present consumption. Overall energy consumption of the extensive circulator system would be less than for the DPM, but consumption of petrofuels would be greater. The existing circulator system would result in the lowest total amount of energy consumed, but the greatest consumption of gasoline by automobiles.

7. Parks and Historic Properties

a. DPM

The impacts of the DPM on parks and historic sites are discussed in detail in Chapter V. In summary, the DPM would not adversely affect any significant parklands. However, it would have adverse effects on the following properties, which are eligible for inclusion in the National Register of Historic Places: the Grand Circus Park Historic District, the Buckland-VanWald Building, and the Detroit Street Plan.

b. Circulator Bus

The circulator bus alternatives would have no impacts on parks or historic properties.

8. Other Concerns

Other potential impacts of the alternatives were investigated. It was determined that neither the DPM nor the circulator bus alternatives would have significant impacts in the following areas: geology, soils, seismicity, vegetation, wildlife, endangered species, meteorology and climate, navigable waterways, coastal zones, wetlands, and ecologically sensitive areas.

E. SHORT-TERM IMPACTS DUE TO CONSTRUCTION

Major urban construction projects cause short-term interruptions of a community's activities. The magnitude of these interruptions depends on their length and the type of service affected. While mitigation measures are always planned by agencies responsible for providing service, all impacts must be identified to ensure that adequate adjustments are made in advance.

1. DPM

All impacts presented in this section are expected to be short-term and may occur in varying locations and degrees during construction. Short-term construction impacts would generally be related to one or more of the system's three major components: guideway, stations, and storage/maintenance facility.

a. Impacts of Construction on Transportation

Construction of the DPM is not expected to disrupt traffic in the CBD to any great extent. Some temporary street closings may be necessary. If feasible, work that would normally disrupt traffic would be performed during off-peak traffic hours (at mid-day, at night, or on weekends). Other mitigation measures that would be utilized include public information campaigns to inform downtown residents and employees of construction plans, schedules, and alternate paths; adequate use of signs and traffic control personnel, including flagmen and police officers; use of multiple work crews; and off-site prefabrication of materials. Additional traffic impacts and mitigation measures are discussed throughout this section.

b. Impacts of Construction on Economic Environment

Construction of the DPM is expected to convert a substantial portion of the \$118.55 million capital cost (escalated dollars) into local wages during the construction period. This would not only benefit the construction employees receiving the salaries, but would also increase the amount of goods sold in the business community. Employment in the construction trades would increase and the anticipated high unemployment rate in the Detroit/Wayne County area could be reduced.

Construction of the DPM system might adversely affect businesses in the vicinity of the guideway, stations, and/or construction staging areas. The nature and severity of such impacts would depend on the alignment, the timing and duration of construction, and the construction techniques employed. Construction can disrupt normal business activities, delivery of goods, access (for both vehicles and pedestrians), and views.

The major disruptions that construction might cause include:

- Loss of parking because of elimination of off-street parking or temporary blockage of entrances to parking lots or buildings;
- Loss of pedestrian access because of sidewalk closures, construction barriers, etc.;
- Reduction of vehicle access because of land or street closures, detours, temporary pavement covers, and similar construction activities;

- . Loss of efficiency in shipments and deliveries because of rerouting of traffic, blockage of loading ramps, etc.;
- . Potential for damage to storefronts or inventories from dust and vibration;
- . General inconvenience to customers, clients, and hotel guests as a result of noise, rerouting of traffic, and congestion; and
- . Relocation of businesses located on property needed for right-of-way.

The susceptibility of individual businesses to temporary disruption will vary. The following types of businesses would be most sensitive to disruption: small convenience stores that do not offer unique products and rely heavily on walk-in trade, small specialty stores whose sales rely on window displays and "impulse" shoppers, moderately-priced luncheon facilities, and hotels. The first three of these types of establishments tend to have low customer loyalty; customers can easily shift to similar establishments not affected by construction. Therefore, such establishments would be most likely to lose business temporarily if the impacts of construction are great. Hotels would suffer less financial loss from temporary disruption, but would be likely to receive more complaints from guests if mitigation measures designed to adjust the schedule of construction were not implemented.

Office buildings, professional service establishments, and quality stores selling "unique" merchandise are usually least sensitive to disruptions caused by construction. Businesses not located near residential or employment centers in the CBD may lose customers temporarily if disruptions of parking and traffic are severe and prolonged.

Generally, the length of disruption on any single block along the route is expected to be short (4 to 5 months) to preclude permanent adverse impacts on established businesses. During the construction period, some access to all businesses would be maintained and interruptions of utilities and other public services would be as brief as is technically feasible. Temporary pedestrian paths would be constructed as necessary.

The following mitigation measures would be implemented, where feasible, to minimize disruption of CBD businesses:

- . Multiple crews working simultaneously at several critical locations throughout the DPM system to shorten the construction period;
- . Measures to reduce noise and dust near fast-food restaurants, small businesses, and service stores;
- . Careful scheduling to minimize circuitous routes for pedestrians trying to reach businesses located near the guideway and its supports;

- Merchant and media programs to provide information on alternate street approaches and parking locations; and
- Scheduling of construction to enable retailers to make plans for special sales and events.

c. Safety and Security

Public safety is a major concern during construction. People may be injured by heavy equipment that malfunctions because of mechanical breakdown or human error. The movement of construction vehicles such as dump trucks, concrete mixers, large transport trucks, and cranes to and from the construction site(s) poses potential problems for motorists. Public safety is also a concern for pedestrians and workers at all sites where excavation is necessary.

To ensure proper safety and security on the construction site, the contractor would be required to establish construction procedures and operating requirements in accordance with the regulations of the Occupational Safety and Health Act (OSHA), the state of Michigan, Wayne County, and the city of Detroit. These regulations would include, but would not be limited to, safe storage of equipment to avoid creation of obstructions; provision of appropriate signs, lights, flares, and barricades throughout the work area; and assignment of flagmen and guards to control traffic.

Construction of the maintenance facility would produce additional safety hazards for traffic because of the demolition it entails. The capacity of Larned Street would be temporarily reduced during demolition and also during construction of the new maintenance facility.

d. Disruption of Utilities

The determination of necessary utility adjustments would involve a field survey to locate all utility manholes and a thorough review of the plans of utility companies. By correlating the manholes with the locations of underground facilities, a set of utility maps would be prepared. Preliminary judgments about utilities to be relocated would be based on guideway locations. If appropriate, foundations would be moved or specially designed to minimize relocation costs. After the determination of preliminary relocations, meetings would be held with the appropriate utility companies to obtain comments and cost estimates.

Final adjustments would be made after receipt of comments from utility companies. For some locations, additional field surveys may be necessary to reduce further the number of relocations. The utility companies that could be affected by construction of the DPM are listed below according to area of responsibility:

- Detroit Edison (electric);
- Detroit Edison (steam);
- Metro Water (water);

- . Metro Water (sewers);
- . Michigan Consolidated Gas;
- . Michigan Bell Telephone;
- . Public Lighting Commission (electric); and
- . Detroit Department of Transportation (traffic signals).

e. Law Enforcement and Fire Protection

Some construction activities may temporarily impede vehicular access to certain streets, which could affect both police and fire services. Temporary street closures and narrowing of lanes could delay emergency services unless emergency service agencies are notified of alternate access routes. Therefore, close coordination with both police and fire departments would be required. Some construction impacts, such as traffic congestion, could be mitigated if some construction activities were scheduled for nights and weekends, thus reducing delays in providing emergency services.

f. Impacts of Construction on Natural Resources

Construction of the DPM would require excavations at station and column locations to build necessary foundations for structures. This excavation would not affect the topography, geology, soil, or seismicity of the area.

Water pollution resulting from construction would occur at the stations, the maintenance facility, and controlled points along the guideway. Water pollution, both thermal and chemical, would not exceed state and federal guidelines. The contractor would be required to provide adequate safeguards to prevent erosion of exposed soils and movement of sediments into the storm water system. If necessary, basins would be used to trap sediment which might be transported by water. Refuse and wastes resulting from demolition and excavation would be prevented from entering the storm water system. Trucks arriving at and departing from the site would be loaded or unloaded in a manner precluding spillage of materials or debris onto streets. Materials spilled accidentally would be promptly removed by the contractor.

Construction of the DPM alternative would cause the following short-term adverse impacts on air quality:

- . Pollution from emissions produced by construction vehicles and equipment;
- . Dust from construction; and
- . Increased emissions from traffic congestion caused by disruption of normal vehicle patterns.

Every effort would be made to minimize air pollution from these sources.

i. Emissions from construction vehicles

The contractor would be required to use appropriate emission control devices on gasoline- or diesel-powered construction equipment. Unnecessary idling or operation of equipment would be prohibited. All equipment would have air pollution controls in accordance with criteria issued by the Environmental Protection Agency.

The effects of emissions in the immediate vicinity of a construction site would be slightly greater than the effects of emissions in the overall CBD area.

ii. Dust control

Dust would be produced during most phases of construction that require street excavation, earth hauling, and street restoration. Construction of the aerial guideway and stations would subject adjacent areas to increased levels of dust because of the foundation required. Dust would also be generated at the construction site for the maintenance facility. Because the maintenance facility site is larger than any of the free-standing station sites, effects on air pollution are expected to be more localized.

Mitigation measures for adverse impacts from dust during construction (controlled by city or county code or ordinance) would be included in all construction contracts. Although measures for dust abatement would be required of all contractors, construction activities would still produce some quantities of dust. Therefore, some tolerance on the part of residents, business owners, pedestrians, and motorists affected by the construction phase would be required. Examples of mitigation measures that would be taken to minimize dust pollution are:

- . Watering on exposed surfaces that generate dust;
- . Watering during periods of high winds and construction activity;
- . Restriction of traffic on unpaved surfaces;
- . Use of tarpaulins on loaded trucks to reduce the effects of wind during transport; and
- . Minimization of the period during which soils are exposed.

During demolition of the Buckland-VanWald Building and the buildings attached to it, care would be taken to ensure that dust is controlled by such measures as watering the structure during demolition, limiting the work on windy days, and covering haul trucks to prevent the resuspension of dust.

c. Control of Emissions Resulting from Congestion

Construction has the potential to increase traffic congestion, thereby increasing pollution (especially local concentrations of carbon monoxide). The adverse impact of such congestion would be mitigated by traffic control measures designed in coordination with the local traffic jurisdiction to limit interference with the flow of vehicles and pedestrians. These measures would include, but would not be limited to, the following:

- Provision of maximum number of lanes for peak hour traffic;
- Provision, maintenance, and removal of all required temporary traffic control devices to allow free and safe flow of traffic;
- Efficient and well-publicized rerouting of traffic; and
- Scheduling of construction activities that seriously restrict traffic flow at times other than peak traffic hours, when emissions of carbon monoxide are greatest.

The five categories of construction activity that may produce significant adverse noise impacts are listed in Table IV-12, along with equipment used and the L_{10} and L_{eq} noise levels measured fifty feet from the source. According to the composite noise levels, relocation of utilities, preparation of foundations, and restoration of streets would all cause similar noise impacts, and all could be significant. These three activities would be conducted along the entire DPM route during the various construction phases for the aerial guideway.

Considering the duration of activity and noise levels, it can generally be stated that L_{10} noise levels of 100 dBA would be emitted during construction unless mitigation measures are enforced. Land uses along the DPM route that are particularly sensitive to noise must be carefully noted. Site-specific mitigation measures might be required to reduce interior noise to allowable maximum levels. The most severe impacts would occur at sensitive locations immediately adjacent to the DPM route.

Noise mitigation measures for the DPM construction period are divided into two categories: measures to reduce both indoor and outdoor noise impacts upon the general public and measures to ensure the health and safety of construction workers. Noise impacts on the general public may be reduced by:

- Providing acoustical enclosures around stationary construction equipment;
- Scheduling equipment operations to maintain the lowest possible overall noise levels (e.g., activities with high noise levels should be performed during peak noise periods) and maintain uniform operating noise levels; and

TABLE IV-12

CONSTRUCTION ACTIVITY NOISE LEVELS
(dBA at 50 Feet)

| Activity | Equipment | L ₁₀ | L _{eq} |
|--|-----------------------------|-----------------|-----------------|
| Location or relocation of utilities | Jackhammer/Pavement Breaker | 98 | 84 |
| | Backhoe | 93 | 89 |
| | Truck | 93 | 84 |
| | Composite | 100 | 91 |
| | | | |
| Preparation of column foundation | Jackhammer | 98 | 84 |
| | Backhoe | 93 | 89 |
| | Truck | 93 | 84 |
| | Compressor | 87 | 79 |
| | Composite | 100 | 91 |
| Modification or restoration of streets and sidewalks | Jackhammer | 98 | 84 |
| | Front Loader | 84 | 82 |
| | Truck | 93 | 84 |
| | Light Crane | 88 | 78 |
| | Paver | 89 | 88 |
| | Composite | 100 | 91 |
| Clearing and grading | Tractor | 96 | 92 |
| | Grader | 93 | 84 |
| | Front Loader | 84 | 82 |
| | Backhoe | 93 | 89 |
| | Truck | 93 | 84 |
| | Composite | 100 | 95 |
| Mobilization of equipment at excavations | Crane | 88 | 78 |
| | Truck | 93 | 84 |
| | Generator | 81 | 75 |
| | Compressor | 87 | 79 |
| | Composite | 95 | 86 |

Source: Urban Mass Transportation Administration, Draft Environmental Impact Statement, Los Angeles Downtown People Mover Project, July, 1979.

- Modifying pedestrian access routes to provide the greatest possible distance between pedestrians and construction operations with high noise levels.

The mitigation measures available for reducing occupational noise levels are generally easier to enforce than measures taken to protect the private sector. They include:

- Use of construction equipment that generates minimal noise whenever possible;
- Use of prefabricated structures to eliminate assembly of materials on the site;
- Use of machinery with flexible mountings and shaft couplings;
- Specification of maximum noise levels for any new equipment ordered;
- Provision of protective equipment to workers (e.g., ear protectors and sound isolation booths); and
- Arrangement of work schedules to correspond to OSHA's limits for occupational noise levels and durations.

Noise abatement measures would be taken during construction to protect both employees and the public. Noise levels to which workers at the construction site are exposed would meet regulations set by OSHA and the state of Michigan.

Compared to the visual impacts of the system in operation, visual impacts during construction are short in duration, but severe in intensity. Negative impacts include torn-up streets, exposed utility conduits, temporary plywood barriers, and the general visual disorder that accompanies heavy construction. Trucks rumbling through downtown streets have a negative impact. Temporary street closures may cause visual disorientation, particularly when detours are used.

These negative impacts are offset to some degree by the fascination with which most people regard heavy construction. People enjoy watching earth-moving machines, columns being erected, and cranes lifting giant guideway spans. This inherent mitigating factor can be augmented by the provision of windowlike openings in construction screens and planning of pedestrian routes to take advantage of interesting views. The number of people negatively affected by construction can be reduced if the most disruptive activities are performed during off-peak hours and work is scheduled so that the construction period at any given location will be brief.

Debris would be generated by groundbreaking, demolition of buildings, and actual construction of the guideway, stations, and maintenance facility. Demolition wastes would be generated at the maintenance facility

site, where three structures would have to be razed. Most of these wastes would be inorganic, consisting of wood, brick, glass, stone, and metal. The contractor would be required to dispose of all material at designated landfills and to comply with all rules and regulations of the city of Detroit and the state of Michigan for disposal of solid waste. Construction wastes such as asphalt or concrete slabs, curbs, and gutters excavated during the removal of existing pavements, as well as cement and concrete spills, bituminous waste, oils, and miscellaneous wastes (including wood, rock, wire, nails, pipe, and steel cuttings), would be disposed of in a similar manner. Haul vehicles would be permitted to use only designated routes to transport fill and debris from the construction site. Truck loads would be covered or watered as necessary to prevent the dispersion of dust and debris.

2. Circulator Bus

The existing circulator bus alternatives would involve no new construction and thus would have no short-term construction impacts. The only construction associated with the extensive circulator bus system is the placement of thirteen new bus shelters at major stops along the route. Construction of these shelters would involve only minimal short-term impacts such as disruption of pedestrian movements on sidewalks, the release of small amounts of dust to the atmosphere, and an increase in noise levels as the shelters are put in place.

F. UNAVOIDABLE ADVERSE IMPACTS

1. DPM

Operation of the DPM system would result in several unavoidable adverse impacts:

- . Displacement of two businesses, one being an office furniture store with approximately thirty employees;
- . Acquisition of all or part of seven parking lots in the Detroit CBD;
- . Loss of approximately 600 off-street and 150 on-street parking spaces;
- . Annual loss of property tax revenues resulting from properties acquired for the DPM;
- . Increase in maximum noise levels at some locations;
- . Some obstruction of views and other visual annoyances resulting from the location of DPM guideways, stations, and vehicles;

- Increased traffic congestion at parking lots near DPM stations;
- Loss of parking lanes along some streets containing the guideway;
- Visual intrusion into the Grand Circus Park Historic District and disruption of the Detroit Street Plan;
- Increase in demand for electricity; and
- Potential increase in safety and security problems associated with DPM stations and vehicles.

Construction of the DPM alternative would cause the following temporary, but unavoidable, adverse impacts:

- Increase in noise and vibration levels near construction sites;
- Reduced capacity for automobile and pedestrian traffic, resulting in increased congestion and lower travel speeds near construction sites;
- Reduced access to some residences and businesses, resulting in slightly lower retail sales (however, no business closures are expected);
- Minor increase in solid wastes;
- Minor increase in air pollution due to the operation of construction vehicles; and
- Possible temporary restrictions on the access of emergency vehicles to roads near construction sites.

2. Circulator Bus

Operation of the extensive circulator bus alternatives (as a worst case example of the possible range of bus alternatives) would result in the following unavoidable adverse impacts:

- Slight increase in noise resulting from increased bus operations;
- Slight increase in air pollution, including carbon monoxide, arising primarily from expanded transit operation;
- Increased consumption of petrofuels and decrease in overall CBD energy consumption;
- Low level of mobility and accessibility within the CBD under existing circulator bus system; and only slight improvement with the extensive circulator system; and

- . Increased accidents due to additional bus miles in the CBD.

Since the circulator bus involves only a minimal amount of construction, no temporary adverse impacts would result.

G. SHORT-TERM USE OF THE ENVIRONMENT VERSUS LONG-TERM PRODUCTIVITY

The relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity must be considered. This comparison distinguishes between the temporary adverse impacts of construction and the long-term benefits of the system's operation. Impacts on transportation, land use and urban development, the economy and society, and natural resources have been analyzed. These same categories are used in this section to illustrate the short- and long-term relationships associated with the DPM and circulator bus alternatives.

1. DPM Summary

a. Impacts on Transportation

SHORT-TERM ENVIRONMENTAL USES

- . Temporary decline in accessibility to certain CBD bus destinations
- . Possible temporary rerouting of CBD buses
- . Temporary increase in travel time within CBD
- . Temporary reduction in capacity, slower speeds, and increased travel time on downtown streets affected by construction
- . Possible rerouting of downtown trips
- . Slight increase in potential for vehicle accidents

LONG-TERM PRODUCTIVITY

- . Increased potential for connection with other modes of travel
- . Improved CBD travel times for DPM and bus patrons
- . Incentive for carpools
- . Increased efficiency of transit service
- . Potential for improving CBD bus service
- . Reduced travel time for trips made in the CBD
- . Increased accessibility to CBD activity centers
- . Reduced auto trip miles in downtown area
- . Improved safety for DPM patrons

b. Impacts on Urban Development

SHORT-TERM ENVIRONMENTAL USES

- . Temporary disruption caused by construction, slightly reducing effective use of existing improvements along route

LONG-TERM PRODUCTIVITY

- . Increase in office space of 150,000 gross square feet per year
- . Accelerated development of several proposed projects
- . Demand for 600 additional hotel rooms
- . Increased occupancy of existing hotels
- . Opportunities for physical links between buildings and activities
- . Increase of 1,250 and 1,500 resident units

c. Impacts on the Economy

SHORT-TERM ENVIRONMENTAL USES

- . Increased employment in construction trades
- . Increased sales to regional suppliers of materials
- . Increased business activity resulting from multiplier effect
- . Temporary decline in local business activity resulting from disruption
- . Benefits to CBD from spending by construction workers

LONG-TERM PRODUCTIVITY

- . Increase in permanent employment in the region
- . Additional employment in CBD
- . Increase in property sales and business tax revenues for city, county, state, and federal jurisdictions
- . Additional employment in CBD
- . Increased employee spending induced by DPM, resulting in regional multiplier effect
- . Increase of \$60 million in annual retail sales
- . Increases in payrolls and local per capita spending

d. Impacts on Society

SHORT-TERM ENVIRONMENTAL USES

- . Temporary disruption of some residential locations due to visual intrusion and reduced access (would affect both permanent residents and hotel guests)
- . Possible temporary interference with routes used by vehicles

LONG-TERM PRODUCTIVITY

- . Increased access to activity centers
- . Increased access for the elderly and handicapped to special services in CBD and region
- . Improved mobility of all elderly and handicapped residents due to barrier-free system
- . Additional police service required (some problems in access to files)

e. Impacts on Natural Resources

SHORT-TERM ENVIRONMENTAL USES

- . Temporary increase in emissions from construction equipment
- . Increase in fugitive dust
- . Use of small amount of energy for manufacture and installation of DPM components
- . Temporary high noise levels at sensitive receptors near construction, exceeding recommended maximum levels
- . Temporary visual intrusion by construction activities and equipment
- . Sense of disorder

LONG-TERM PRODUCTIVITY

- . Reduction in emissions
- . Decrease in gasoline consumption
- . Flexibility of energy source, should shortages require shift to alternate fuel
- . Change in cityscape; opportunity to use DPM as unifying architectural element as land uses are recycled
- . New vistas for DPM passengers

2. Circulator Bus

The existing circulator bus alternative would not have short-term impacts on the environment since it involves no construction. The extensive circulator system would involve construction of thirteen bus shelters. The short-term impacts of that construction would not be significant, especially in a city like Detroit with many redevelopment projects underway. Therefore, the long-term benefits of the circulator bus alternatives, such as energy savings and some improvement in mobility, could be obtained without having to endure adverse impacts over the short term.

Most of the long-term positive effects of DPM operation do not apply to the circulator bus options. Implementation of any of the circulator bus alternatives would not significantly influence any transportation, land use, urban development, economic and social conditions, and natural resources of the Detroit CBD. These conditions have been shown to be in need of improvement. The circulator bus options would not provide the transportation system necessary to promote this improvement.

H. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS

1. DPM

Construction and operation of the DPM in the Detroit CBD is an extensive and costly project that would require the irretrievable commitment of certain natural and financial resources. Major commitments would include construction materials, manpower, land, money, energy, and future development options. The impacts resulting from consumption of these resources should be weighed against the benefits of improved transportation to residents of and visitors to the region and the consequences of no investment in comprehensive transportation improvements.

a. Natural Resources (Materials)

The consumption of sand, cement, gravel, soil, and steel for construction of the DPM would constitute an irretrievable commitment of natural resources. The use of lumber would not be an irretrievable commitment since lumber is a renewable resource. Other finite resources, such as steel, aluminium, and copper, could be used conscientiously to minimize waste. Most construction materials required are available in adequate supply locally. Although supplies of these materials may not be abundant, the quantities needed by the DPM project would have little effect on their overall availability. Furthermore, use of these construction materials to build a transit system that would have numerous social and economic benefits for the community (such as increased accessibility and mobility, economic expansion, and increased employment) can be justified.

b. Manpower

Labor used in designing and constructing the DPM represents an irretrievable commitment of resources. Numerous benefits would justify this commitment; they are the provision of jobs to unemployed or underemployed workers in the region, the social benefits resulting from such employment, the multiplier effects of increased spending in the region, and expansion of the regional construction industry.

c. Financial Resources

The expenditure of funds to construct the DPM represents an irretrievable commitment of \$118.55 million (escalated dollars). On the federal level,

tax dollars used to fund transit improvements would be viewed as monies that could be spent on other mass transportation projects funded by the federal government. Similarly, local tax dollars could be used for other purposes. However, the use of these tax dollars for the DPM, as well as taxes from other levels of government, would help achieve the national and local objectives of urban revitalization and economic development.

Economic expansion in the region, increased employment (due to construction and operation of the DPM and induced economic development), increased mobility for the transit-dependent, increased accessibility for residents of the region, and savings in time and money to transit riders are all social and economic advantages that justify large commitments of funds.

d. Future Development Options

Selection of the DPM alternative at this time could have an irreversible and irretrievable impact on future developments. Implementation of a DPM system now could also have an irreversible impact; it could rechannel a portion of the region's future growth into the underutilized urban core, providing the capacity to meet future needs with little additional cost to the public.

2. Circulator Bus

Unlike the DPM system, the circulator bus options would not entail irreversible and irretrievable commitments of construction materials, manpower, money, energy, or land. Since only minimal construction is required to implement the modified circulator bus options, commitments of money and manpower would essentially be for transit vehicles that would not be irretrievably committed to the Detroit CBD.

With regard to future development options, the circulator bus options could have the irreversible impact of encouraging a more decentralized growth pattern within the region. Scattered development would be less efficient than development in the CBD. The modified circulator bus options would be more likely to focus the region's growth in its underutilized urban core. The CBD has the capacity to serve future development at little additional cost to the public.

V. HISTORIC PROPERTIES (SECTION 106) DETERMINATIONS
AND PARKLAND (SECTION 4[f]) EVALUATION

A. HISTORIC PROPERTIES

Section 106 of the National Historic Preservation Act of 1966, as amended, requires that federal agencies consider the impact of proposed projects on any district, site, building, structure, or object listed in or eligible for inclusion in the National Register of Historic Places. The Act also requires that federal agencies afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on undertakings that affect such properties. The ACHP has established procedures for the "Protection of Historic and Cultural Properties" (36 CFR, Part 800). The purpose of this chapter is to document compliance with the Section 106 process and the procedures of the ACHP with regard to the potential impacts of the Detroit DPM on historic properties. The circulator bus alternatives would have no "106" or "4(f)" impacts. This chapter contains the preliminary case reports, documentation of no adverse impact, and Memorandum of Agreement required by the ACHP.

1. Identification of Historic Properties

The first step was to identify the historic and cultural properties that may be affected by the DPM and are listed in or eligible for the National Register. This step was initiated at the outset of planning for the DPM. The National Register was consulted and the following references and studies were examined:

- . CBD Study--Buildings of Architectural and Historical Significance;
- . 1971 American Institute of Architects' Guide to Detroit Architecture;
- . 1976 Detroit/Urban Conservation Project;
- . Urban Designer's List Based on Conspicuousness;
- . Landmarks Most Frequently Mentioned by Detroiters in an Image Survey;
- . W. Hawkins Ferry, The Buildings of Detroit; and
- . Michigan History Division Recommendations.

In addition, the Southeastern Michigan Transportation Authority (SEMTA) hired a consultant (approved by the Michigan History Division) to conduct a search for additional historic properties in the Detroit CBD. The result of the literature and field searches was the compilation of a list of more than 120 places in the Detroit CBD that possessed some degree of historic significance. This list was referred to in the development and evaluation of alternative DPM alignments. From the outset of the project, every effort was made to avoid impacts on the historic resources of downtown. The

Michigan State Historic Preservation Officer (SHPO) has been involved throughout the planning process. The SHPO reviewed and commented on preliminary alternatives and assisted in the "fine-tuning" of the final alignment to minimize impacts on historic properties.

The list of historically significant sites and the final DPM alignment were discussed with the SHPO. The SHPO identified sites eligible for the National Register that may be affected by the DPM. In a letter (Figure V-1) dated December 14, 1979, the SHPO expressed the opinion that the following properties are eligible for the National Register and may be affected by the DPM:

- . Guardian Building;
- . Detroit Club;
- . Detroit Free Press Building;
- . Parker-Webb Building;
- . Greektown Historic District;
- . Buckland-VanWald Building; and
- . Grand Circus Park Historic District.

A letter requesting a determination of eligibility for these properties was submitted to the U.S. Department of the Interior in January, 1980. All properties were found eligible for the National Register in February and March, 1980.

Figure V-2 depicts the DPM alignment and nearby properties which are listed in the National Register or have been determined to be eligible for inclusion in the Register. In addition to the properties discussed above for which a determination of eligibility was submitted as a part of planning for the DPM, the following properties (listed in the National Register or eligible for inclusion therein) are located near the proposed DPM system:

- . Mariner's Church (National Register);
- . Second Baptist Church of Detroit (National Register);
- . Beaubien House (National Register);
- . Alexander Chapoton House (nominated for National Register);
- . J.L. Hudson's Department Store (eligible);
- . Randolph Street Commercial Buildings (eligible); and
- . Downtown Public Library (eligible).

The Street Plan of Detroit has also been determined by the Keeper of the National Register to be eligible for inclusion.

2. Application of Criteria of Effect - Determination of No Effect

The ACHP has developed criteria to determine whether a proposed project would have an effect on properties listed in or eligible for inclusion in the National Register (36 CFR, Part 800.3[a]). A project is determined to have an effect when it ". . .changes the integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contributes to its significance. . ."

The Criteria of Effect were applied, in consultation with the SHPO, to the properties listed in or eligible for the National Register. It was determined that the DPM would have no effect on Mariner's Church, the Second



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505 N. WASHINGTON AVENUE
LANSING, MICHIGAN 48226

December 14, 1979

Mr. David J. McDonald
Southeastern Michigan Transportation Authority
First National Building
600 Woodward Avenue
Detroit, Michigan 48226

Dear Mr. McDonald:

This letter is a follow-up to our discussions on November 8, 1979, at the SEMTA offices in Detroit concerning the impact of the proposed Downtown People Mover on above-ground historic cultural resources in Detroit.

It is the opinion of the State Historic Preservation Officer (SHPO) that the currently proposed alignment of the People Mover (August 10, 1979 Plans) will have no effect on the following National Register listed (and nominated) properties:

- The Mariner's Church - 170 E. Jefferson (listed 3/19/75)
- The Second Baptist Church of Detroit - 441 Monroe (listed 3/19/75)
- The Beaubien House (Charles Trombley House) - 553 E. Jefferson (listed 8/13/79)
- The Alexander Chapton House - 511 Beaubien (this nomination is being submitted to the National Register on December 12, 1979)

It is the SHPO's opinion that the following properties, which have already been determined eligible by the Keeper of the National Register, will not be adversely affected by the proposed People Mover alignment. For these three properties you should prepare the documentation for a determination of no adverse effect for submission to the Advisory Council in accordance with 36 CFR 600.13a.

Mr. David J. McDonald

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- The J. C. Hudson Department Store - 1206 Woodward Avenue
- The Randolph Street Commercial Buildings - east side of Randolph between Monroe and Macomb
- The Downtown Public Library - 121 Graftiot Avenue

Although the following five properties are considered to be eligible for listing in the National Register by the State Historic Preservation Officer, you will need to seek a determination of eligibility for each from the Keeper of the National Register in accordance with 36 CFR 63.2 (2) & (3). It is our opinion that the People Mover will not have an adverse effect on these sites. You should prepare the documentation for the determinations of no adverse effect in accordance with 36 CFR 600.13a.

- The Guardian Building - Larned at Griswold (N.E.)
- The Detroit Club - 712 Cass
- The Detroit Free Press Building - 321 W. Lafayette
- The Parker-Webb Building - Grand River at Park Place (N.W.)
- Greektown Historic District - Monroe between Brush and St. Antoine including the St. Mary's Church complex (see attached map)

The SHPO believes that the Buckland-Van Wald Building at 426 W. Larned and the Grand Circus Park Historic District (see attached map) are eligible for listing in the National Register and requests that you seek a determination of eligibility from the Keeper of the National Register in accordance with 36 CFR 63.2 & 3.

It is our opinion that these properties will be adversely affected by the proposed project. We request that SEMTA prepare a preliminary case report for each of these two properties for submission to the Advisory Council in accordance with the regulations for determinations of adverse effect outlined in 36 CFR 600.4(4d) and 36 CFR 600.13(b).

The SHPO has applied the Criteria of Adverse Effect as outlined in 36 CFR 600.3(b) to both of these properties. For the Buckland-Van Wald Building, criteria 36 CFR 600.3(b) applies since the proposed project calls for the demolition of the property.

In the case of the proposed Grand Circus Park Historic District, criteria 36 CFR 600.3(b) 2 and 3 directly apply. The People Mover alignment will inevitably alter the environment and visually isolate the structures on the south side of Park and Witherell from the surrounding district. It will also introduce a visual and audible element out of character with the historic fabric of the district.

Mr. David J. McDonald

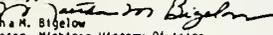
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The street plan of Detroit, which has already been declared eligible for listing by the Keeper of the National Register, will be adversely impacted by the location of the station spanning Woodward Avenue at its intersection with Park and Witherell. This siting will interrupt the vista out Woodward Avenue, a key element of the original city layout, by possibly creating the visual impression that the street terminates at the station when looking north from downtown. The SHPO requests that SEMTA submit a preliminary case report to the Advisory Council in accordance with the regulations for determination of adverse effect outlined in 36 CFR 600.4(4d) and 36 CFR 600.13(b). As we discussed in our meeting on November 8, 1979, the Michigan History Division feels very strongly that the adverse effect upon both the proposed Grand Circus Park Historic District and the Detroit Street Plan could be more easily mitigated if the station were located on the edge of the park opposite the David Whitney Building. It is our opinion that the park, which has already been significantly altered in the past twenty years by the construction of a parking facility under it serviced by surface pedestrian entrance structures and ramps that form a barrier around portions of its perimeter, can better integrate the ribbon of track and the station into its fabric than can the building facades across the street.

If you have any questions, please contact Les Vollmert, Historic Preservation Coordinator, at (517) 373-0510.

Sincerely,


Martha M. Bigelow
Director, Michigan History Division
and
State Historic Preservation Officer

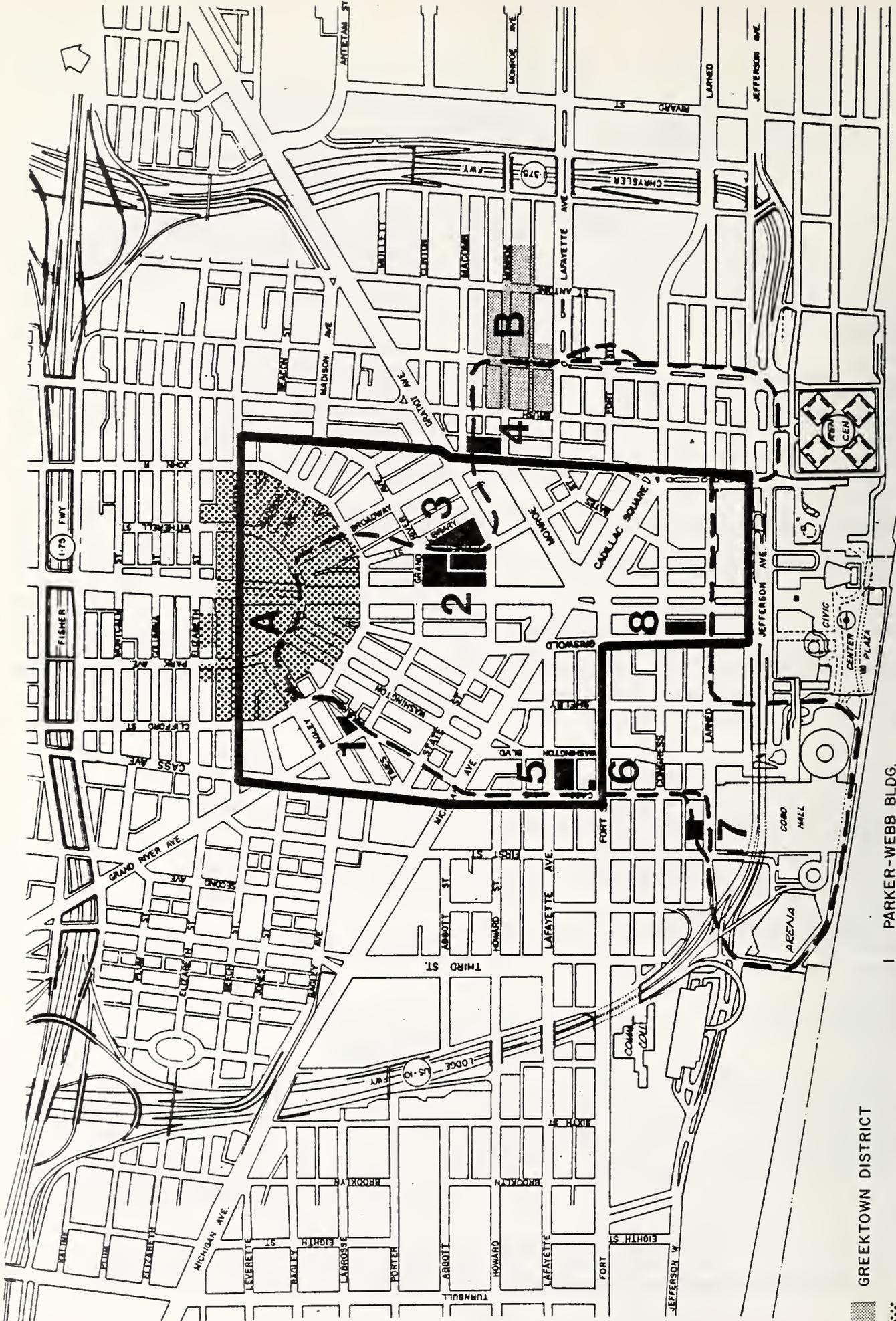
BT: Michael J. Wasno
Deputy State Historic Preservation Officer

MJM/LJV/cw

cc: Thomas Rushfeldt, SEMTA
Ms. Maureen S. Craly
Mr. Steven Beard
Ms. Patricia Steel

enc.

Figure V-1
LETTER FROM SHPO
TO DPM PROJECT MANAGER



- B** GREEKTOWN DISTRICT
- A** GRAND CIRCUS PARK DISTRICT
- DETROIT STREET PLAN BOUNDARY
- DOM ALIGNMENT

- 1 PARKER-WEBB BLDG.
- 2 J.L. HUDSON'S DEPT. STORE
- 3 DOWNTOWN BRANCH - DETROIT PUBLIC LIBRARY
- 4 RANDOLPH ST. COMMERCIAL BLDG.
- 5 DETROIT FREE PRESS BLDG.
- 6 DETROIT CLUB

Figure V-2

LOCATION OF NATIONAL REGISTERED HISTORIC DISTRICTS

Baptist Church of Detroit, the Beaubien House, and the Alexander Chapoton House. At all times, the guideway would be at least 150 feet away and across a street from Mariner's Church. The guideway would not cross in front of the Second Baptist Church. The guideway would be located more than 200 feet from the Beaubien House and buildings would intervene between it and the house. The guideway would be across Beaubien Street and approximately 100 feet away from the Alexander Chapoton House. Because of these distances and separations, determinations of no effect were made in consultation with the SHPO.

3. Application of Criteria of Adverse Effect - Determination of No Adverse Effect

The ACHP has developed criteria to determine whether a proposed project would have an adverse effect on a property listed in or eligible for inclusion in the National Register (36 CFR, Part 800.3[b]). These Criteria of Adverse Effect include, but are not limited to:

- . Destruction or alteration of all or part of a property;
- . Isolation from or alteration of the property's surrounding environment;
- . Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- . Neglect of a property, resulting in its deterioration or destruction; and
- . Transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use.

The Criteria of Adverse Effect have been applied in consultation with the SHPO to the properties that would be affected by the DPM. It has been determined that there would be no adverse effect on the following properties:

- . Guardian Building;
- . Detroit Club;
- . Detroit Free Press Building;
- . Parker-Webb Building;
- . Greektown Historic District;
- . J.L. Hudson's Department Store;
- . Randolph Street Commercial Buildings; and
- . Downtown Public Library.

a. Guardian Building (500 Griswold Street)

i. Description and significance of affected property

The Guardian Building (Figure V-3) is a brick, 36-story, rectangular office building. The shape of the property (270 feet by 80 feet) dictated the



Figure V-3
GUARDIAN BUILDING

narrow, slab-like form of the building. The main portion of the building is faced in orange-tan brick, specially formulated for this application. As accents, bands of earth-toned terra cotta were introduced at the sixth floor level, acting as a visual transition from the buff-colored Mankato stone facing of the lower stories to the brick above. The terra cotta appears again at the thirty-first level and around the northern tower, where it was suffused with a golden glaze. The terra cotta ornamentation is in the form of interlocking hexagons, with angles of 60 and 30 degrees, alternately. This pattern and the stepped arch (corbelling of bricks to form an arch without a curve) are unifying decorative motifs that appear throughout the building.

The building was called the "Cathedral of Finance" during and after its construction. There is some physical basis for this name. The long north-south slab of the building suggests the lofty nave of a cathedral. The southern end breaks from the slab in an apse-like projection. The northern part culminates in the polygonal penthouse tower, which extends sixty feet above the rest of the building and originally served as the base for a multi-colored beacon.

The main entrance from Griswold Street is placed beneath a recessed semi-dome of Pewabic tiles. A central winged figure representing Aviation (at that time synonymous with progress) is surrounded by various other symbols-- a beehive for thrift and industry, an eagle to represent money, and a caduceus to symbolize authority and commerce. The lobby rises to a vault of Rockwood tile in green, red, buff, and blue, lit by arched windows at the side. The elevators are set in two short hallways and their doors, of polished Monel metal, are inset with favrille glass (from New York's Tiffany Studios) forming the letters "U" and "T". The main banking room is lit by arched windows along either side. The central feature of the room is a mural map of Michigan. Designed by Ezra Winter of Manistee, the work portrays the diversity of Michigan's industry--lumber, mining, agriculture, and manufacturing. A brightly decorated plaster ceiling, the work of Detroit's Thomas Dilorenzo, arches above this space. Since the banking room occupies an open space the length of the building, 26 floors of office space above are supported by eight trusses of sixty tons each.

The Guardian Building was constructed in 1928 as an office building for the Union Trust Company. It was designed by Wirt Rowland of the prominent Detroit architectural firm of Smith, Hinchman and Grylls. As an angular Aztec structure, it is a prominent example of the high-rise architecture of its day. "The influence of early twentieth century Dutch architecture is apparent in the fine brickwork, and there are reminders as well of the skyscraper designs of Ralph Walker and Raymond Hood in New York. Certainly the Arts and Crafts movement and the Paris Exposition of Decorative Arts of 1925 left their mark upon the decorative scheme. Everywhere the gaily colored patterns and rich materials are redolent of the ebullient twenties."³²

³²W. Hawkins Ferry, The Buildings of Detroit (Detroit: Wayne State University Press, 1968), p. 331.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would not result in the destruction or alteration of all or any part of the Guardian Building. The guideway is located across Larned Street from the building. The DPM would not isolate the property from its surrounding environment, nor would it significantly alter that environment. The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the property or alter its environment. The main entrance of the building is on Griswold Street; the DPM would pass the building on the Larned Street side, more than sixty feet away across three lanes of traffic. The DPM would not lead to neglect of the building, resulting in its deterioration or destruction. The location of a DPM station across the street from the Guardian Building would increase the economic viability of this commercial office building. Implementation of the project would not require transfer or sale of the building.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated that, in his opinion, the DPM would have no adverse effect on the Guardian Building.

iv. Determination

The Urban Mass Transportation Administration (UMTA), in consultation with the SHPO, has determined that there would be no adverse effect on the Guardian Building.

b. Detroit Club (712 Cass Avenue)

i. Description and significance of affected property

The Detroit Club (Figure V-4) is a symmetrical four-story building with a rounded bay at each end of the entrance facade. The exterior reflects dignity and restraint. On the ground story, the walls are faced with rock-faced brownstone. Above, Roman brick with terra cotta trim was used. The entrance porch is recessed behind a round arch; round- and flat-headed Renaissance windows alternate between floors. There is a generous Richardsonian hall with a broad, rambling stairway and a fluid plan of large connecting rooms. The elegant dining room, with its high ceiling, black walnut paneling, and red brocade curtains, recalls the era of Edward VII.

The Detroit Club was built in 1891 to the design of Wilson Eyre, Jr. of Philadelphia. Mr. Eyre was awarded the commission as the result of a competition with prominent architects of the day. The work of Eyre was a vindication of the benefits to be derived from academic training. It was only in 1866 that the Massachusetts Institute of Technology offered the first course in architecture to the American student, and it was there that Eyre pursued his studies in the late 1870's--a time when most American architects relied upon self-education.



Figure V-4
DETROIT CLUB

The building houses Detroit's oldest social club. The Detroit Club was formed in 1882 by many of the city's prominent businessmen. The first clubhouse was a two-story frame structure on the north side of Lafayette between Wayne and Cass Avenue. The structure was refurbished as ". . . a meeting place where men of culture could associate to mould into form that atmosphere and enthusiasm which are important factors in Club welfare, and where they could give disinterested attention to the development of art, civics, literature, and other important elements in the permanent upbuilding of the city."³³ The goals of the Club today remain unchanged. By 1890, the original clubhouse had become too small for the constantly increasing membership. An arrangement was made to trade the original property for the site now occupied by the Club. The Club contracted with Mr. Eyre and the new club was opened in 1892. To this day, members of the Club include the leaders of business and industry in Detroit.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM is located across Cass Avenue from the Detroit Club and thus would not result in the destruction or alteration of all or any part of the Club. The DPM would not isolate the Club from or alter its surrounding environment. Accessibility to the Club would be maintained. The station located across the street from the Club would improve the ability of members to reach the Club.

The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the property or alter its setting. The DPM would be approximately seventy feet from the building, across four lanes of traffic. The DPM would not lead to neglect of the Club, resulting in its destruction or deterioration. Implementation of the DPM would not require sale or transfer of the property.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Detroit Club.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse effect on the Detroit Club.

c. Detroit Free Press Building (321 West Lafayette Avenue)

i. Description and significance of affected property

The Detroit Free Press Building (Figure V-5) is a rectangular building composed of a thirteen-story central tower and two six-story wings. The

³³ Detroit Club, "Articles of Association," "By-Laws, and House Rules for Officers and Members."



Figure V-5
DETROIT FREE PRESS BUILDING

building has been described as "modern American" based upon European motifs. Its exterior of Indiana limestone forms a series of unadorned vertical panels rising without interruption from the street to the top of the 187-foot tower. Gargoyles protrude from each panel. Flanking the huge arched entry are two large allegorical figures. One holds a scroll and has an eagle at the base, representing knowledge and power. The other holds a torch and has an owl at the base, symbolizing the search for truth and light. Other symbols carved into the archway and decorating the window recesses all around the building include owls, dolphins, birds, snails, mermaids, human figures, and gargoyles.

Across the front of the building is a series of plaques containing the likenesses of two distinguished journalists (Horace Greeley and Charles Dana), James B. Angell (former president of the University of Michigan), Lewis Cass (Michigan's first governor), Austin Blair (Michigan's Civil War governor), Benjamin Franklin, George P. Goodale (former drama critic of the Detroit Free Press), and General George Custer. The carvings were executed by a New York sculptor, Ulysses Ricci, and are a combination of "built-in" carving and sand casting.

The sides of the building are adorned with plaques representing modes of transportation: a galleon, locomotive, motor truck, and airplane. The back of the building has no ornamentation, except for the gargoyles at the top.

The lobby and the Public Relations Room inside the building were decorated by other famous artists of the day. Murals by Roy Gamble and DeJong Smith on the walls of the Public Relations Room represent the history of the printing trade, the early history of Michigan, and a tribute to Benjamin Franklin, probably the world's most famous printer. Hanging from the ceiling of the Public Relations Room and the lobby were large, bronze chandeliers, described as "gems of artistic design and utility." The chandeliers in the lobby were later replaced with fluorescent tubes, but the colorful and ornate vaulted ceiling remains intact.

In 1923, Albert Kahn designed the Detroit Free Press Building to house the offices and manufacturing plant of the Detroit Free Press (and some rental space). The news plant, one of the largest and most modern in the world, was constructed from 1924 to 1925 at a cost of \$6 million. Kahn was a prominent Detroit architect of the period. The Free Press Building is actually one of the "cleanest" of the many structures in Detroit designed by Kahn.

To appreciate the architecture of the Free Press Building, it is helpful to know something of Kahn himself, one of the most prolific and highly regarded designers of his time. He was best known for his sprawling industrial complexes--remarkably functional factory structures that showed the influence of Louis Sullivan. Kahn's regard for Sullivan's principle, "form follows function," did not extend to his concept of commercial office buildings and skyscrapers, however. According to W. Hawkins Ferry in his book The Buildings of Detroit, Kahn "deplored the individualistic towers that were rising in New York. He objected to their excessive height and lack of relation to one another." He also felt that tall buildings, when crowded together,

created a "reign of terror." As he grew older, Kahn began to question the validity of the whole modern movement. His mind was a storehouse of knowledge of architectural styles of the past and he objected strenuously to the modernists who were abandoning much of what the people of past ages had considered beautiful.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would be located across Cass Avenue from the Detroit Free Press Building and would not require the destruction or alteration of all or any part of the property. The proposed project would not isolate the building from its surrounding environment or alter that environment. The DPM would be more than sixty feet away from the building, across four lanes of traffic. Therefore, it would not introduce visual, audible, or atmospheric elements that are out of character with the building or that would alter its setting. The main entrance to the building is on Lafayette Avenue; the DPM passes on the Cass Avenue side of the property. The DPM would not lead to neglect of the building, resulting in its deterioration or destruction. With its nearby station, the DPM would have a positive effect on the economic viability of the area, lessening the chances for neglect. Implementation of the proposed project would not require transfer or sale of the property.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Detroit Free Press Building.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse effect on the Detroit Free Press Building.

d. Parker-Webb Building (400 West Grand River Avenue)

i. Description and significance of affected property

The Parker-Webb Building (Figure V-6) is a three-story, flat-roofed, brick structure with classical detailing, built in 1901. The building forms an irregular rectangle, with architecturally designed elevations facing approximately east and south. The other two sides were originally abutted by neighboring structures, but the building on the northwest side has been demolished.

The first floor elevation is divided into storefronts. The corner unit has been faced with gray, simulated granite panels. Another important feature of the first floor is the monumental street entrance to the upper floors with its Gibbsian door surround and flanking pilasters.



Figure V-6

PARKER-WEBB BUILDING

The upper floor fenestration is grouped into unified, arcaded bays of one-over-one sash windows with Gibbsian surrounds. The third floor windows have arched tops to follow the curve of the arcading. The boldly projecting classical modillion cornice is formed of metal. Another decorative feature of the elevation is the false balcony in wrought iron over the street entrance to the main staircase. There are shops on the first floor, with two levels of offices and storage rooms above.

The Parker-Webb Building is of architectural significance as an unusually accomplished example of a turn-of-the-century commercial structure in the Palladian Revival style. The building was constructed in 1901 for industrial and commercial use during Detroit's pre-automobile period; the architect is not known. As one of the few remaining buildings of its period in the Detroit CBD, the Parker-Webb is a rare example of the Palladian Revival style popularized by English architects such as Richard Norman Shaw. This style relied on a "heavy-handed" use of large scale and classical detailing to create an imposing and powerful effect. This style was generally used for banks, hotels, and commercial buildings, but it enjoyed only a short-lived popularity in Detroit before being supplanted by other styles. The location of the Parker-Webb Building makes it a prominent visual landmark. It is sited at the intersection of five streets at the head of Times Square Park. The massing of elements and the overscaled classical detailing enable the structure to dominate its environs in spite of its relatively small size.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would be located across Times Square from the Parker-Webb Building and would not result in the alteration or destruction of all or any part of the property. The proposed project would not isolate the property from its surrounding environment, nor alter that environment. The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the property or that would alter its setting. The Parker-Webb Building is located at the intersection of five streets, with its main entrance on Grand River Avenue. The DPM would be located on the side of the building and across Times Square from it.

Implementation of the DPM would not result in neglect of the property, or its deterioration or destruction. The Times Square station would be located across from the property, adding to the general economic vitality of the area. The proposed project would not require sale or transfer of the property.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Parker-Webb Building.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse effect on the Parker-Webb Building.

e. Greektown Historic District

i. Description and significance of affected property

The Greektown District (Figure V-7; boundaries shown in Figure V-2) contains a number of architecturally and historically significant structures. The heart of the district is the Monroe Street commercial area with its numerous ethnic restaurants and shops. Other key components of the district are the Second Baptist Church (listed in the National Register) and various properties of St. Mary's Roman Catholic Church. To the historian, the architecture of Greektown is simple, yet there is a sprinkling of detail there that gives the area a certain charm. The Greek community is strong, full of determined businesspeople, and unwilling to let go of its ethnic heritage. This could explain why this area of Detroit has survived intact through several generations.

The French and Germans were just two of several ethnic groups to settle in this area of Detroit. Monroe Street is the main focal point of the area. During the past century, first- and second-generation Greeks, French, and Italians have made up the work force in Detroit and their businesses and craftsmanship shaped the area.

The Greeks first began to come to Detroit in the late 1800's with other southern European groups. They settled primarily on Macomb Street near Randolph; the colony gradually spread to include parallel streets to the south. Between 1910 and 1929, coffee houses and churches served as social and political centers. These buildings also welcomed new arrivals into the country, served as mailing addresses, and acted as employment agencies.

The first Greek immigrants who arrived in the late 1800's established themselves in the shoeshining and hat blocking business. Between 1912 and 1913, many more Greeks were attracted to Detroit by the wage of five dollars per day offered in Henry Ford's automobile factories. The vast majority of Greek settlers established their own businesses (usually groceries, confectionaries, restaurants, or coffee houses). These people wanted to become successful in business and make the area economically productive.

Today, Greektown is one of the few downtown areas that is lively both day and night. Special efforts by concerned citizens have kept Greektown alive. A Greek festival is held each year in the downtown and many people attend. The streets are well lighted and maintained. The people of Detroit appreciate the atmosphere and beauty of Greektown, which is a vital part of the downtown area.



Figure V-7
GREEKTOWN DISTRICT

The DPM would not result in the destruction or alteration of all or any part of the Greektown Historic District. The guideway would be located on the west side of Beaubien Street as it passes through the District between Macomb Street and Lafayette Boulevard. The guideway would be in what is now a curb lane. The proposed project would not isolate the District from or alter its surrounding environment. The DPM would not create a barrier to movement to or within the district.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the District or that would alter its setting. The DPM would be on Beaubien Street, which is already a major transportation corridor. Use of Beaubien as the path for the DPM would not be out of character with the roadway's present function. The DPM would not have significant visual impacts because it would be constructed along a street and because the focus of the Greektown Historic District is Monroe Avenue, not Beaubien Street. The DPM would not contribute to neglect of the District, resulting in its deterioration or destruction. The DPM would add to the attractiveness of the District by enabling patrons from other areas of the city to reach it, particularly during the noon hour. Implementation of the DPM would not require the sale or transfer of any property within the District.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Greektown Historic District.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse effect on the Greektown Historic District.

f. J.L. Hudson's Department Store (Block Bounded by Woodward, Grand River, Farmer, and State)

i. Description and significance of affected property

J.L. Hudson's Department Store (Figure V-8) has been synonymous with Detroit for nearly a century. Mr. Hudson opened his first department store on the first floor of the Detroit Opera House in 1882. Increasing business prompted Hudson to erect a new eight-story department store on Farmer and Gratiot in 1891. Mortimer L. Smith & Son, the architects, created a handsome Richardsonian structure in red brick, trimmed in brownstone.

A condition that was to become a continuing Hudson theme--to provide the best for the customer--was begun in this building and carried through each successive addition. To provide ample light, there was an extraordinary



Figure V-8

**J.L. HUDSON
DEPARTMENT STORE**

concentration of window surface, with widely-spaced piers continuing through each story and joined at the top by massive arches. Highlights of this early building that were continued in future projects included large ground-floor display windows, few interior partitions to impede circulation, and elevators (among the first in Detroit).

It was only a matter of time, however, before this building was outgrown. The first "breakthrough" to Woodward Avenue came in 1911 with the construction of the two-bay Stevens Building. An additional Woodward frontage was acquired and compatible buildings were erected: Brooks-Clark & Lewis No. 1 in 1914 and Whitney & Lewis No. 2 in 1917. The Prentice Building on Woodward was completed in 1923. By 1928, the Hudson Building, as it stands today, was substantially complete. That year saw the erection of the Grand River frontage and the lofty, 25-story Library Street tower.

The J.L. Hudson Building is a successful blending of many disparate components into a distinguished whole. The surface brick was skillfully laid, creating unbroken piers to contrast with elaborate recessed window spandrels. Pressed metal panels and terra cotta cornice are also present. The building does not fit readily into any stylistic category, although certain elements, such as the tower, have a Norman or Romanesque precedent.

Rather than illustrating a good example of a style, the building was designed in direct response to the merchandising needs of the client, and is thus unique. The engineering accomplishments of the building are considerable. Advances in structural engineering, such as load-bearing masonry, cast iron, and reinforced concrete and steel frameworks, were utilized as each was proved effective. The latest advances in the fields of heating, cooling, ventilation, and electrical engineering were also applied.

Quite aside from its architectural significance, the J.L. Hudson Building has become of great value to the people of Detroit, who associate it with shopping trips, the World's Largest Flag, memorable window displays, and the annual Thanksgiving Parade.

ii. Inapplicability of the Criteria of Adverse Effect

The Detroit DPM would not result in the destruction or alteration of all or any part of the J.L. Hudson Building and it would not take any part of the property on which the building stands. The proposed project would not result in isolation of the property from its surrounding environment nor alter that environment. No existing access routes to Hudson's for pedestrians or vehicles would be altered. The main entrance to Hudson's is located on Woodward Avenue. The DPM would be located on the Farmer Street side of the building.

The proposed DPM would not introduce visual, audible, or atmospheric elements that are out of character with the property or would alter its setting. The centerline of the guideway would be located approximately 20 feet from Hudson's. The guideway along Farmer would be about 22 feet high. The DPM would not detract from the visual character of the property, because of the visually imposing nature of the massive building. Noise from the DPM, as measured inside

the building, is expected to be indiscernable from existing traffic noises. The DPM would not introduce pollutants into the atmosphere. The proposed project would not precipitate neglect of the property, resulting in its deterioration or destruction. The transportation system would enhance the downtown's function as a retail center. Implementation of this project would not require sale or transfer of the property.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on J.L. Hudson's Department Store.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse effect on J.L. Hudson's Department Store.

g. Randolph Street Commercial Buildings (East Side of Randolph Street Between Monroe Avenue and Macomb Street)

i. Description and significance of affected property

The importance of the Randolph Street Commercial Buildings (Figure V-9) is their position as one of the last remaining nineteenth-century commercial streetscapes. The individual structures illustrate a variety of architectural styles, ranging from modest vernacular to elaborate Victorian.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would not result in the destruction or alteration of the Randolph Street Commercial Buildings, which are eligible for inclusion in the National Register. The guideway would be located along the south side of Macomb Street, which is at the northern edge of the property. No part of the property would be taken for construction of the DPM. The proposed project would not result in isolation of the property from its surrounding environment, nor would it alter that environment. Full access to the buildings would be maintained if the proposed project were implemented. The buildings are oriented toward Randolph Street, whereas the DPM would be located on Macomb Street.

The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the property or that would alter its setting. The DPM would be built along the south curb of Macomb Street, a major downtown street. The character of the street would not be changed; it would continue to be used for transportation. The DPM would not result in adverse noise impacts on any of the buildings. The proposed DPM would not contribute to neglect of the property or result in its deterioration or destruction. The DPM would have a positive impact on commercial activities. Implementation of the proposed project would not require transfer or sale of the property.



Figure V-9
RANDOLPH STREET
COMMERCIAL BUILDINGS

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Randolph Street Commercial Buildings.

iv. Determination

UMTA, in consultation with the SHPO, has determined that there would be no adverse impact on the Randolph Street Commercial Buildings.

h. Downtown Library

i. Description and significance of affected property

The small triangular piece of property on which the Library is located (see Figure V-2) has played a role in Detroit's history since it was originally plotted in Judge Woodward's plan of 1807. It first served as the site of a prison, sheriff's office, and jail (where the last public hanging in Michigan took place). In 1879, the penitentiary was replaced by Detroit's first public library.

In 1932, a new building was erected on the Library site (Figure V-10). This structure is a superb example of the style, often called "stripped classic," which served as the transition from the eclecticism of the 1920's to the modern styles of the 1940's.

The Library conforms to its triangular site; it is of similar shape, with a rounded apse at the northern side. The decoration, modeled after classical antiquities, was created by Detroit sculptor Corrado Parducci. The designer was William Kapp, of the firm of Smith, Hinchman and Grylls.

ii. Inapplicability of the Criteria of Adverse Effect

The DPM would not result in the destruction or alteration of all or any part of the Downtown Library. The guideway would be placed 50 to 60 feet from the Library and, to the west of the building, would be across Farmer Street. The proposed project would not isolate the property from its surrounding environment or alter that environment. The DPM would not result in any change in the relationship between the Library and its immediate surroundings. Full accessibility to the property would be maintained.

The DPM would not introduce visual, audible, or atmospheric elements that are out of character with the Library or that would alter its setting. The Library is a triangular island surrounded by major streets. The DPM, another form of transportation, is not inconsistent with the building's present setting. The DPM would not cause neglect of the property that would result in its deterioration or destruction. Implementation of the proposed project would not require transfer or sale of the property.



Figure V-10
DOWNTOWN LIBRARY

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would have no adverse effect on the Downtown Library.

iv. Determination

UMTA, in consultation with the SHPO, has determined that the proposed project would have no adverse impact on the Downtown Library.

4. Application of Criteria of Adverse Effect -
Determination of Adverse Effect

The Criteria of Adverse Effect have been applied in consultation with the SHPO to the remaining properties listed in the National Register or eligible for such inclusion that would be affected by the DPM. It has been determined that the following properties would be adversely affected:

- . Buckland-VanWald Building;
- . Grand Circus Park Historic District; and
- . Detroit Street Plan.

a. Buckland-VanWald Building (430 West Larned Street)

i. Description and significance of affected property

The Buckland-VanWald property (Figure V-11) consists of two buildings with a party wall. The six-story (plus basement) building to the west is of timber construction with wood posts and large wood beams on all floors. Gusset plate-type connections are used at the posts. The entire structural system is exposed. The building consists of three bays.

The building to the east has two bays and is five stories tall (no mezzanine). It is also of heavy timber construction with wood columns, beams, and joists. Cast iron columns are present on the first floor and cast iron or wood-bearing caps top the wood columns. The interior of each floor is a large open space with elevators and stairwells. There is no architectural detailing except for the exposed structural system. The exterior of the building is of brick. The west, east, and north facades are relatively plain; the north facade has the only fenestration. The south or front facade along Larned is of decorative brick and red sandstone.

The building was designed in the late 1880's by Gordon W. Lloyd for William Reid as a warehouse and industrial building. Gordon Lloyd was a renowned local church architect who also designed the David Whitney House on Woodward Avenue. The west portion of the building was probably completed first and occupied by the William Reid Glass Company, the largest plate glass supplier west of New York. Mr. Reid was among the prominent businessmen whose biography appeared in a history of the day. The west building was completed one or two years later and was first occupied by the Detroit Confectionary and Fruit Tablet Company.



Figure V-II
BUCKLAND-VANWALD BUILDING

The interior of the building is the key to its architectural significance. It is an outstanding illustration of late nineteenth century commercial construction. The construction is a coherent structural system, fully exposed, open to the public (most floors are sales floors), and in original condition. Few buildings of this type remain in the CBD today.

ii. Application of the Criteria of Adverse Effect

The Criteria of Adverse Effect have been applied in consultation with the SHPO and it has been determined that the Buckland-VanWald Building would be adversely affected as a result of the first criterion, destruction of the property. The proposed project would result in destruction of the building to make way for the maintenance and storage area for the DPM system.

iii. Views of the State Historic Preservation Officer

The SHPO, in a letter dated December 14, 1979, has expressed the view that the building would be adversely affected, since the proposed project calls for demolition of the property (Criterion 36 CFR 800.3[b]1). The SHPO has reviewed the various alternative alignments, station locations, and maintenance facility sites for the DPM.

iv. Views of others

The proposed DPM has received wide support in the City of Detroit from both the general public and the downtown business community. Prior to circulation of the Draft Environmental Impact Statement (DEIS), no concerns about the project's effects on historic resources had been expressed by either group.

After distribution of the DEIS, the comments made were still basically supportive of the DPM. Some special considerations presented at the public hearings are mentioned below.

Mr. Robert C. Hayes, one of the owners of Buckland-VanWald, Inc., spoke at the public hearing on April 24, 1980. He said that his company had presented a position paper on the location of the maintenance facility site. He was very impressed with the layout of the DPM. In fact, he said he was "...97 percent for it. I think 97 percent of the total layout for the DPM is excellent. And, again, I say SEMTA is to be congratulated." However, as a businessman who has operated a firm downtown for 52 years, he opposes the taking away of his business. Mr. Hayes presented a letter, dated April 24, 1980, to be made a part of the official record. This letter indicated dissatisfaction with the location of the maintenance facility across from Cobo Hall and addressed the historic significance of the Buckland-VanWald Building.

Buckland-VanWald, Inc. stressed the length of its commitment to the CBD and its determination to support urban growth. The style and structure of the building was mentioned and the SHPO's determination that destruction of the Buckland-VanWald Building would create an adverse effect was cited. It was requested that the location of the maintenance facility be reconsidered (the letter presented alternative sites).

Another businessman in the area of the proposed maintenance facility, Mr. Robert C. Maul, stated for the record that he agreed with the overall concept of the DPM and that the building he owned on the maintenance facility site also housed a small business operation.

During the evening hearings, Mr. Harold E. Stieg, representing Thomas W. Reardon, owner of 466 West Larned, entered into the record a formal statement of objection to the maintenance facility site on the grounds of adverse economic impact.

A series of letters commenting on the DEIS was received from both the public and private sectors. Most of the comments indicated enthusiastic support for the DPM and hope for enhanced economic growth. One letter, however, objected to the removal of the Buckland-VanWald Building on the grounds that the business is a viable and long-standing company and the building is historically significant.

v. Alternatives that would avoid adverse effect

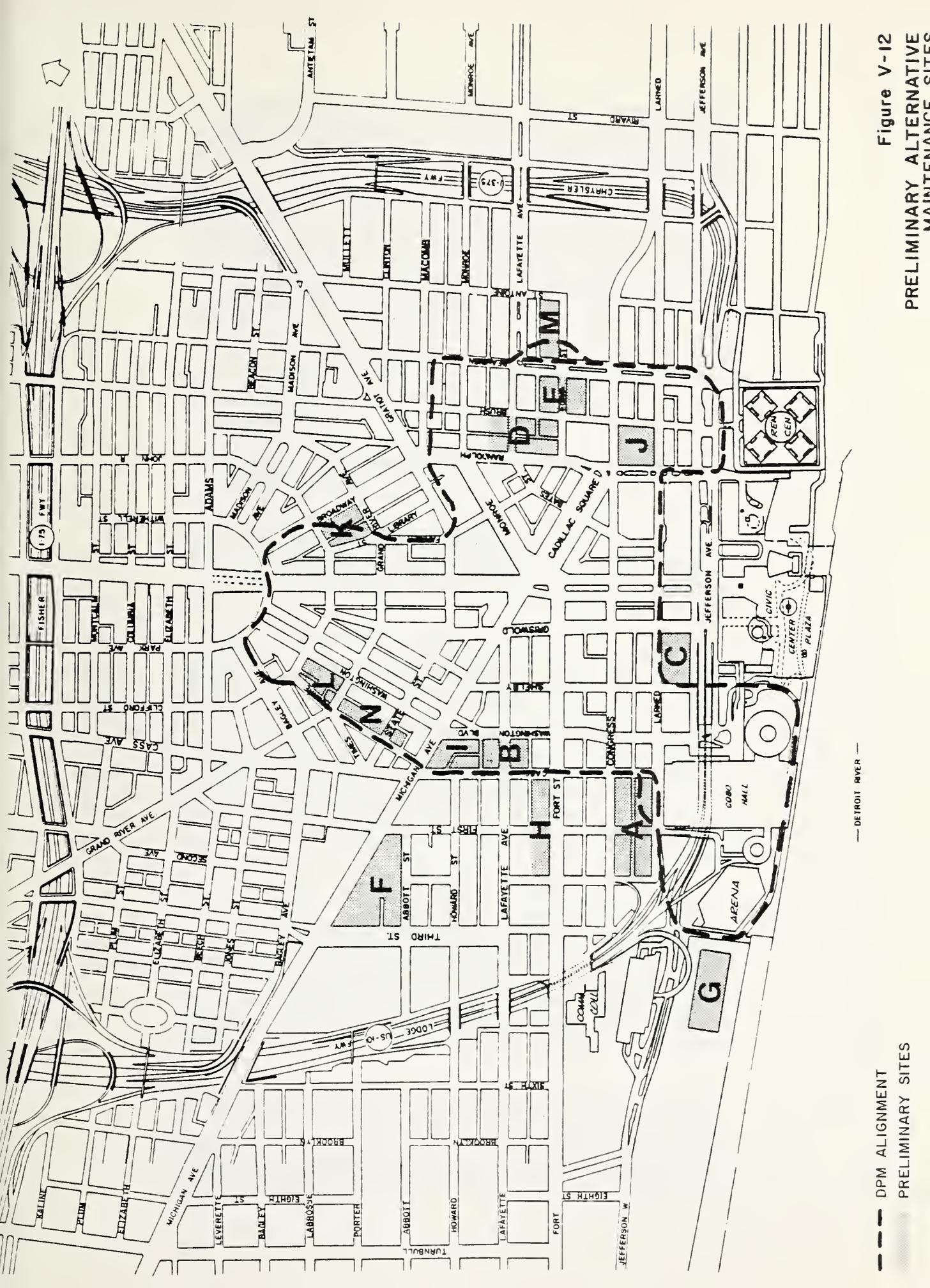
The circulator bus alternatives would not have an adverse effect on the Buckland-VanWald Building. These alternatives were described in Chapter II and a discussion of their impacts was presented in Chapters II and IV. After analysis, these alternatives were dropped from further consideration because they would be unable to provide the required degree of circulation within the CBD and would contribute much less to the economic revitalization of the downtown than the DPM. In addition to the analysis of circulator bus alternatives, other studies were undertaken to determine ways to avoid adverse impacts on the Buckland-VanWald Building. Alternative sites for the maintenance facility were examined in both the preliminary and detailed evaluations of alternative DPM systems.^{34,35}

In the working paper entitled "Preliminary Evaluation of Alternatives" dated December 22, 1978 and prepared as part of the DPM preliminary engineering effort, seven maintenance facility sites were proposed and evaluated on the basis of facility description and design requirements. Their locations are presented in Figure V-12 and they are described below.

- Site A is located in the blocks bounded by Congress and Larned Streets and Second and Cass Avenues. The site is approximately 650 feet by 270 feet and has an area of 175,000 square feet. Automobile parking is the primary land use, but there are also five structures ranging in height from 12 to 62 feet. In subsequent analyses, the size of Site A was reduced by half. The portion of Site A fronting on Larned was preferred and has three structures, all of which would require demolition or relocation.

³⁴ GM Transportation Systems Center, "Preliminary Evaluation of Alternatives" (Working Paper), December 22, 1978.

³⁵ GM Transportation Systems Center, "Detailed Analysis of Alternatives" (Working Paper), March 15, 1979.



- - - DPM ALIGNMENT
 ■ ■ ■ PRELIMINARY SITES

— DETROIT RIVER —

Figure V-12
 PRELIMINARY ALTERNATIVE
 MAINTENANCE SITES

Site A can serve any alignment using Larned or Congress Streets. The potential for joint development at this site is high because of the site's proximity to Cobo Hall and the Joe Louis Arena.

- Site B spans Lafayette Avenue between Washington Boulevard and Cass Avenue. The site is approximately 400 feet by 230 feet, with an area of 92,000 square feet. The portion of Site B south of Lafayette Avenue contains the Detroit Free Press Building, which is deemed eligible for inclusion in the National Register. The Free Press has acquired new facilities on the riverfront and expects to move much of its operation. However, it is possible that the administrative offices will remain in the existing building.

This site is acceptable in terms of space requirements, but presents difficulties because it would require acquisition of the Detroit Free Press Building. It straddles Lafayette, a major thoroughfare, and by requiring a crossing of Cass Avenue just north of Fort Street, it might intrude on the Detroit Club, another building declared eligible for the National Register.

- Site C is in the block bounded by Jefferson Avenue and Shelby, Larned, and Griswold Streets. This site is 370 feet by 210 feet, with an area of 77,700 square feet. Although it is of the required size, this site was not considered adequate because a significant portion of it is occupied by a site of potential historic significance (Stock Market/Standard Savings Building). The DPM Financial District station would also take up much of the site. In addition, there were other plans for development that made acquisition of this site infeasible.
- Site D, in the block bounded by Brush, Randolph, Monroe, and Fort Streets, is approximately 500 feet by 250 feet; its area is 125,000 square feet. This site was eliminated from consideration because it is not near the selected alignment and would affect the Court House, a registered historic site. If the maintenance facility were located away from the mainline guideway, additional capital and operating costs would be substantial.
- Site E, on both sides of Fort Street between Brush and Beaubien Streets, is 350 feet by 300 feet, with an area of 105,000 square feet. There was a serious obstacle to selection of this site for a maintenance facility. If the guideway were to progress along the west side

of Beaubien from that station to the Renaissance Center, it would pass directly in front of a building declared eligible for the National Register, the Alexander Chapoton House. Such an alignment would also force the location of the DPM station at the Renaissance Center to the west, away from the commuter rail station. To avoid this configuration, the guideway would have to be moved to the east side of Beaubien, meaning that it would have to cross the street four times (at Lafayette, twice at the maintenance facility, and at Jefferson). This would constitute a negative impact on the street vista.

- . Site F is within the block bounded by Abbott Street and Michigan, First, and Third Avenues. Its area is 182,250 square feet, but its triangular shape conflicts with the design requirements for the facility. However, the primary objection to the site was that it is away from the selected alignment, which would increase both capital and operating costs.
- . Site G is on a large parcel of land bounded by Civic Center Drive, Sixth Street, Fort Street, and Third Street. It was eliminated from consideration as a maintenance facility site because it is already committed to other uses and would be difficult to reach from ramps to the mainline.

During the detailed analysis, two additional sites were identified and considered, but were found to be less desirable than Sites A to G during baseline design. Site H, bounded by Fort Street, Second Avenue, Cass Avenue, and the alley between Fort and Lafayette, would eliminate the Fort Street station, but poses the problems of difficult access to the DPM and requires demolition of one building, now housing the Hannon Florist Shop, that might be considered of historic and architectural significance. An alternate Michigan Avenue site (Site I) would require a crossing of Cass at Lafayette, thereby still affecting the Detroit Free Press Building. The site is too small and narrow for both a station and a maintenance facility. It would also require demolition of several buildings.

Several other sites were briefly considered, but were dismissed because they were too small or site development plans were not consistent with dual use as a DPM maintenance facility site. These locations include:

- . Area J adjacent to the Millender Center Station, bounded by Randolph, Brush, Larned, and Congress.
- . Area K surrounding the Broadway Station, bounded by Broadway, Library, Grand River, and John R.
- . Area L adjacent to the Times Square Station, bounded by Washington Boulevard, Grand River, and Clifford.

- Area M adjacent to the Beaubien/Fort station, bounded by Beaubien, Lafayette, St. Antoine, and Fort. This site also contains a registered historic building, the Detroit Cornice and Slate Works.
- Area N bounded by Park Place, Grand River, the Book Building, and the alley between Grand River and Michigan. This site abuts the Book Building and is adjacent to Pioneer Park.

The various sites having been eliminated from consideration because of developmental conflicts, space deficiencies, or various impacts, only Site A remained for final scrutiny. However, during the final definition of DPM alternatives, two additional promising sites for the maintenance facility were reconsidered in more detail in light of the selected alignment.

Descriptions and a summary of the analysis of Site A and the other two final sites are presented below.

- Site A is located in the blocks bounded by Larned Street, Cass and Second Avenues, and the alley between Congress and Larned. The proposed use of this area for the DPM has been redefined to cover a space of 650 feet by 135 feet (an area of 88,000 square feet). Automobile parking is the primary land use, but the site also contains three structures ranging in height from 12 to 62 feet. One of these buildings is vacant.

This site has more than the 70,000 square feet of land required for the maintenance facility. Joint development is also highly feasible due to the proximity of Cobo Hall and the Joe Louis Sports Arena. A maintenance facility located on this site would be required to span First Street. The site also contains the Buckland-VanWald Building, a structure of potential historic and architectural significance.

- Site I (new location) is bounded by Washington Boulevard and Lafayette, and Cass and Michigan Avenues. The size of this block is approximately 210 feet by 450 feet and its usable area is about 78,000 square feet. The usable area of this site contains a three-level parking structure for a car leasing company, a service station, and surface parking lots.

This site is on a single block along the route of the proposed DPM alignment. Joint development with the car leasing company and the service station on the site is feasible. The three structures on this block need not be demolished to make way for the maintenance facility.

- Site H is in the blocks bounded by Fort Street and Lafayette, Cass, and Second Avenues. This site is composed of two usable areas, one approximately 290 feet by 130 feet and the other area about 370 feet by 130 feet. The total area of the two parcels is approximately 85,800 square feet. There are two structures on this site: the Hannon Florist Shop, a structure of potential historic and architectural significance, and a service station. This area does not include the Hotel Fort Shelby. The DPM maintenance facility would be required to span First Street.³⁶

The final three sites considered for the DPM maintenance facility are shown in Figure V-13.

To conduct a more comprehensive and objective review of the final three proposed maintenance facility sites, the system engineering consultant prepared a detailed evaluation of the merits of the aforementioned sites.

A three-phase procedure for final site selection was established. The first phase involved a complete walking tour of the then-proposed horizontal alignment for the guideway. The tour was organized to allow representatives of all key interested groups, including the City of Detroit and SEMTA, to have a firsthand look at the sites proposed for all of the system's fixed facilities and thereby to be able to act from a similar base of experience in the collective consideration of final sites. The tour also gave the participants an opportunity to discuss the relative merits of the sites while actually observing them.

In preparation for the tour, the consultant team prepared an analysis matrix, arraying each proposed fixed facility site against a list of items to be used in the evaluation. The evaluation items had been decided upon after discussion among all concerned project team members. The evaluation items were as follows:

- Horizontal and Vertical Alignment - Each site was evaluated from the standpoint of the engineering difficulties or opportunities it presents for the establishment of an acceptable horizontal and vertical alignment of the guideway.
- Urban Design - Each site was evaluated in terms of its potential impact on the immediate urban environment.
- Availability of Property - The degree of difficulty that would be involved in acquiring each site was gauged.

³⁶GM Transportation Systems Center, "Description of Selected DPM System" (Working Paper), Report No. DD-79 3.2.6, 3.3.1-14, EP-79071, June 6, 1979.



— DETROIT RIVER —

— DPM ALIGNMENT
 ALTERNATE SITES

Figure V - 13
 FINAL ALTERNATIVE MAINTENANCE

- Location of Utilities - Each site was examined to identify potential problems or interferences with existing public utilities.
- Circulation Patterns - Each site was evaluated in terms of its potential impact on existing patterns of pedestrian and vehicular circulation, and on the patronage of nearby public and private services.
- Effect on Patronage - The ability of each site to enhance ridership patterns and the interface of patrons with the commercial district was assessed.
- Capability for Expansion - The potential for expansion beyond the initial space required for construction on each site was evaluated.
- Potential for Bypass Station - The sites were assessed in terms of their potential to hold, in addition to the maintenance facility, one of the required bypass stations. The primary consideration was the guideway alignment required to provide for interface of the station and the maintenance building.
- Current and Future Development Projects - Each site was examined in light of known development projects and the probable relationship between such projects and the maintenance facility.
- Relative Cost - The probable cost of construction on each site was assessed, given such considerations as access to the site, demolition and clearance, and the potential for
- Interface with Regional Transit - Each site was evaluated in terms of the ease with which transfers to other modes of regional transit could be made from it.
- Economic Potential - This measure concerned the impact of site development in terms of the potential for residual or adjacent land to be developed.
- Potential for Joint Development - Each site was evaluated in terms of its potential to allow development of the maintenance facility jointly with some compatible function or functions.
- Noise Impact on Adjacent Structures - Facilities adjacent to each site were examined to determine any potential problems caused by noise produced within or around the maintenance facility.
- Impact on Historic Sites - The sites were examined to assess their potential impacts on structures of historic significance or potential historic significance.

- Environmental Impact - Each site was evaluated to assess the potential impact of development on the micro-environment of that site and its immediate environs. The possible effects of new shade planes and the destruction of existing plant life were also considered.³⁷

The participants in this review analyzed the elements of the evaluation matrix and evaluated the proposed sites in terms of the sixteen items listed above. It was recommended that Site A be selected. It was concluded that Site H was not feasible because the extremely difficult guideway access to the site would force elimination of the Cass/Fort station. Additionally, the Hannon Florist Shop Building, a structure of architectural interest, would have to be demolished. Site I was not selected because it severely restricted the satisfactory location of a bypass station on the site. To provide space for a bypass would require relocation of the Michigan station to the south along Cass, meaning that the remainder of the site would no longer be large enough to accommodate the maintenance facility. Also, location of the maintenance facility at this site would require a higher guideway crossing at Michigan Avenue, which would adversely affect the vistas of Michigan Avenue and Washington Boulevard. Site A surpasses Sites H and I in several ways. First, it fits the alignment best in terms of enhancing both vertical and horizontal alignments. Second, it presents the least difficult urban integration problems. Third, Site A would affect the CBD circulation patterns more favorably than the other sites. Fourth, Site A has the best capability for expansion and provides the best location for a bypass station. Fifth, Site A has excellent potential for joint development because of its location near important activity centers. Finally, Site A would cost less to develop than Sites H and I. A project memorandum stating the recommendation was prepared by the consulting architect and submitted with a copy of the evaluation matrix. A DPM Technical Task Force meeting was convened to assess the results of that evaluation and this group concurred with the recommended location. The evaluation matrix is shown in Table V-1.

vi. Alternatives that would mitigate adverse effect

Once the preferred site for the maintenance facility had been identified, the next task was to collect sufficient information about the development of that site to facilitate the final layout of the maintenance facility. This required evaluation of the site in terms of possible horizontal guideway alignments and bypass station locations. Of particular concern was the potential impact on existing structures.

To accomplish this task, a variety of site plan schematics was prepared to show various building and site configurations that responded to the following considerations:

³⁷ DPM Baseline Design Handbook, Process and Analysis, Report No. DD-79-3.4.1-23, EP-79126-1, December, 1979.

| Criteria | Michigan Avenue Site | Fort Street Site | Cobo North Site |
|---|---|--|---|
| Horizontal and Vertical Alignment | No apparent problems. | Extremely short tangent with guideway on Cass Avenue. | Generous potential tangents. |
| Urban Design Considerations | Possible blockage of views onto Washington Boulevard and inappropriate termination of Washington Boulevard. Site is at transition point between Financial District and Washington Boulevard/Bell Telephone area; maintenance facility seems out of character with both areas. | Difficult urban integration problem presented by the adjacent Manufacturer's Bank Building; less severe problem than Michigan Avenue site. | Least difficult urban integration problem. Some concern about potential tunnel space between Cobo Hall and maintenance facility. |
| Availability of Property | Privately owned and partially cleared; would require some demolition. | Private property; significant demolition involved. | Privately owned and partially cleared; some demolition required. |
| Circulation Patterns, Parking/Bus Interface | Potential increase of heavy vehicle traffic in area that is already heavily traveled. | Fewer problems from increased heavy vehicle traffic than at Michigan Avenue site. | Potential integration with second-level pedestrian system. Potential pedestrian bridge to Cobo Hall. Least heavy vehicle impact. Best exploitation of regional arterials. |
| Effect on Patronage | Removal of existing businesses. | Removes three apparently viable commercial establishments from site. | Removal of some existing retail businesses. Potential ground-level commercial establishments linking future riverfront development with existing development in CBO. |
| Capability for Expansion | None. | None. | Best capability for expansion of three sites (estimated 30% to 50%). |
| Potential for Bypass Station | Small space available on site to manipulate guideway for required bypass. | Appears feasible. | Appears most feasible due to long tangents and flexibility of building plan geometry options at this site. |
| Current and Future Development Projects | Faces future federal criminal justice facility; does not positively reinforce Washington Boulevard development. | Not applicable. | Potential link of arena and apartment/hotel complex to downtown. |
| Relative Cost | Access to construction site is awkward because of congestion in area. Possibility for on-site stockpiling is limited. Otherwise, cost is probably comparable to that of other sites considered. | High cost for razing Shelby Hotel. Better access to construction site than at Michigan Avenue site. | May require demolition of two existing buildings. Demolition cost comparable with that of Fort Street site (possibly somewhat less). |
| Economic Potential | Would completely cover site with a great deal of economic potential. | Site has fewer commercial establishments than Michigan Avenue site. Area is somewhat nondescript; difficult to assess economic potential. | Site has fewer commercial establishments than Michigan Avenue site. Area is somewhat nondescript; difficult to assess economic potential. |
| Potential for Joint Development | Not applicable. | Potential integration (i.e., parking) with future high-rise development on Lafayette. | Possible air rights development on top of maintenance facility itself. Possible integration with Buckland-VanKald Building. |
| Noise Impact on Adjacent Structures | Possible impact on existing office building. | Possible impact on adjacent bank building. | Possible impact on Buckland-VanKald Building. |
| Impact on Historic Sites | Disturbs vista from Washington Boulevard to Detroit Free Press Building. | Would require demolition of Iliamon Flowers Building. Afternoon shading of main entrance facade of Detroit Club. | Site contains three historic structures. Possible integration of one or more of these structures as centers for support services (administration and central control, for example). |
| Visual Impact | Significant shading of busy pedestrian spaces. | Shading a long Cass Avenue under structure. | Shading a long Congress Avenue under structure. |

- . The distance from the bypass station to Cobo Hall;
- . Comparative development cost;
- . Size and configuration of residual or adjacent land;
- . Development potential of residual or adjacent land;
- . Potential impact on existing structures, particularly those of historic interest;
- . Paths for vehicle circulation inside the facility;
- . Horizontal guideway alignment; and
- . Special problems or opportunities.

Another consideration was that the maintenance facility and the Cobo Hall station had to be located as close as possible to the corner of Cass and Larned to allow access via the DPM to the western portion of the Financial District and to the northeast corner of Cobo Hall. This location facilitates use of vertical movements within Cobo Hall; it provides access to rooftop parking and an entrance to the east corridor, where there is a lot of activity.

Various site layout alternatives were prepared and analyzed to determine feasibility of accommodating the station and maintenance facilities on the site and avoid the taking of the historic structure (Alternatives 9, 8, 7, 6, and 5). Other alternatives were also considered that would mitigate the impacts on the historic structure (Alternatives 4, 3, and 2). The result of the study of layout alternatives was that there are no prudent and feasible alternatives to demolition of the Buckland-VanWald Building. There are, however, steps that can be taken to mitigate the impact. Information describing each of the layout alternatives and why they were rejected follows. Alignment Layout No. 1 was the selected alignment.

Layout No. 1 in Figure V-14 has the advantage of a Cobo Hall station location which is close to Cobo Hall and to the Financial District Building on the east side of Cass Avenue. It has the advantage of permitting easy future expansion on the site to the west and north. It also has the most convenient operational arrangement in that the layout of the maintenance facility allows for easy charging and discharging of vehicles to and from the mainline guideway. In addition, the layout with the station immediately adjoining the maintenance facility enables the operating crews to gain quick access to the station during emergency situations. It has a disadvantage of requiring a demolition of the Buckland-VanWald Building and two other nondescript buildings on the site. The cost of this alternative is approximately \$8.34 million (1978 dollars).

Layout No. 2 in Figure V-14 has the advantage of requiring no relocation or demolition of the Buckland-VanWald Building. It also eliminate demolition of the other buildings on the east side of First between Larned and the alley north of Larned. It has an operational disadvantage difficulty

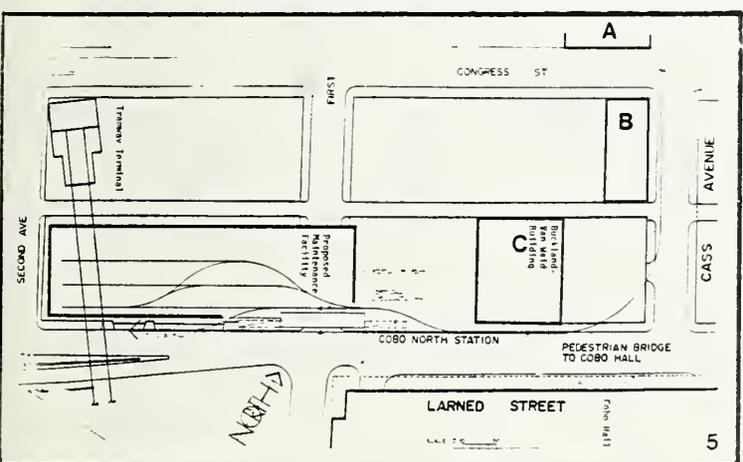
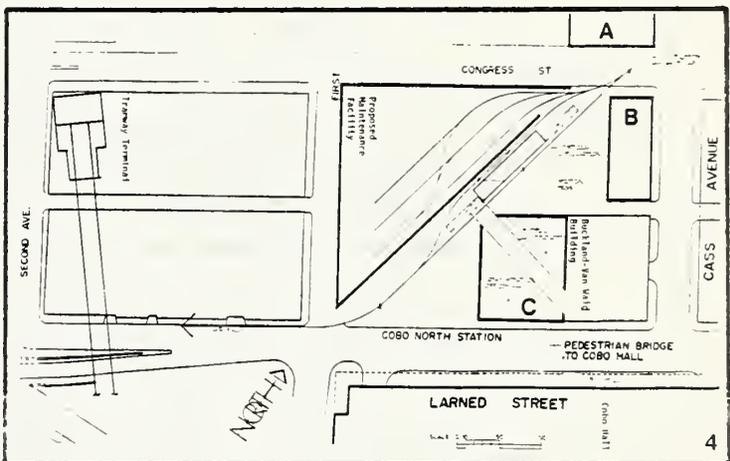
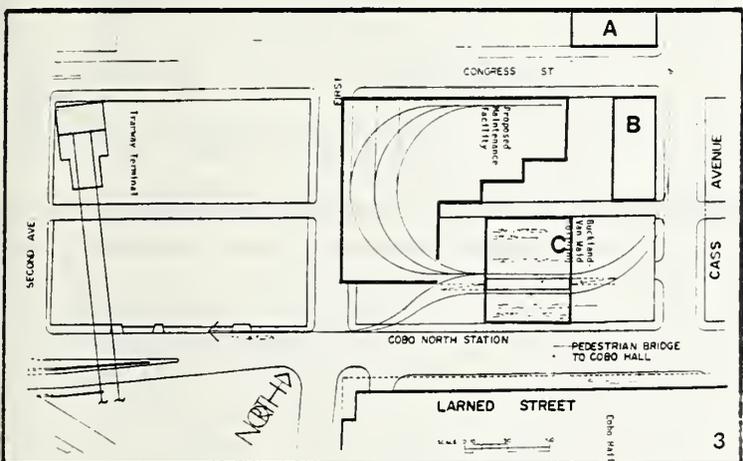
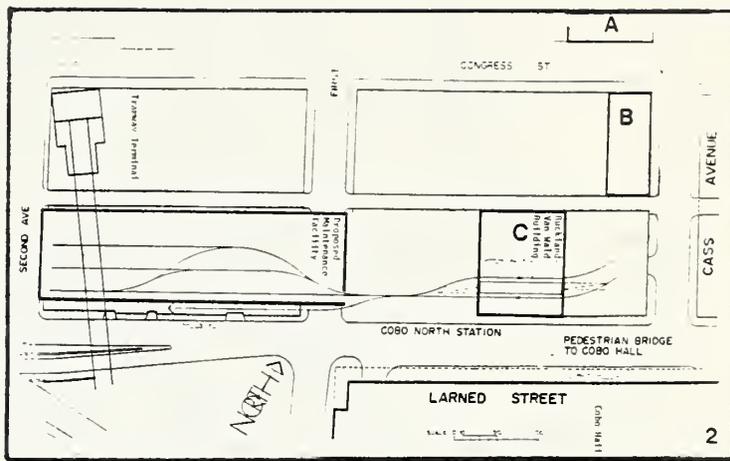
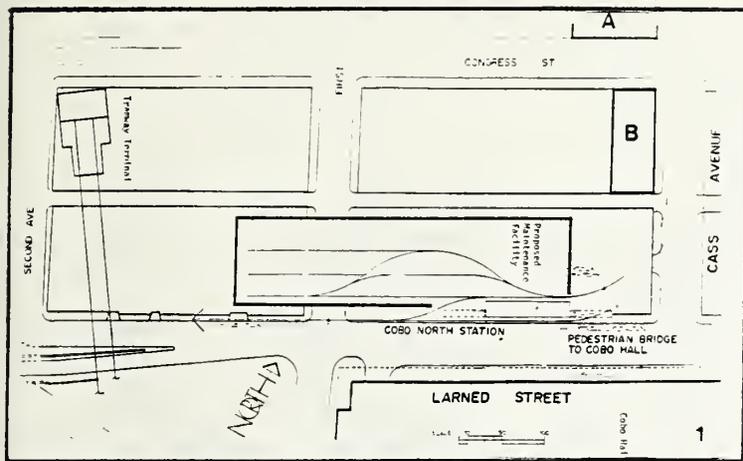


Figure V-14
 ALTERNATIVE MAINTENANCE
 SITE LAYOUTS

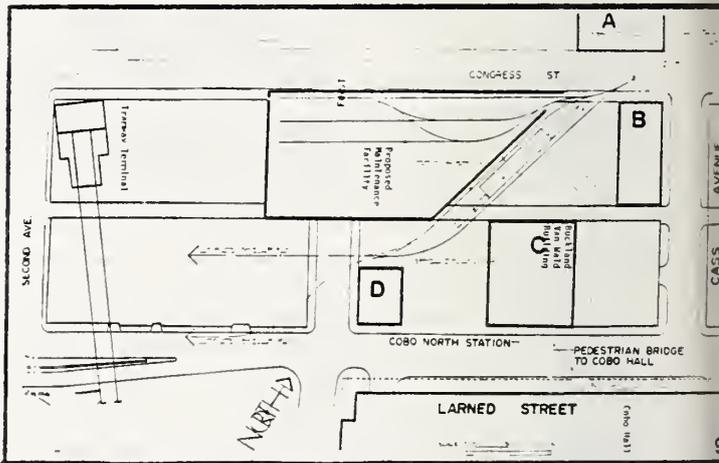
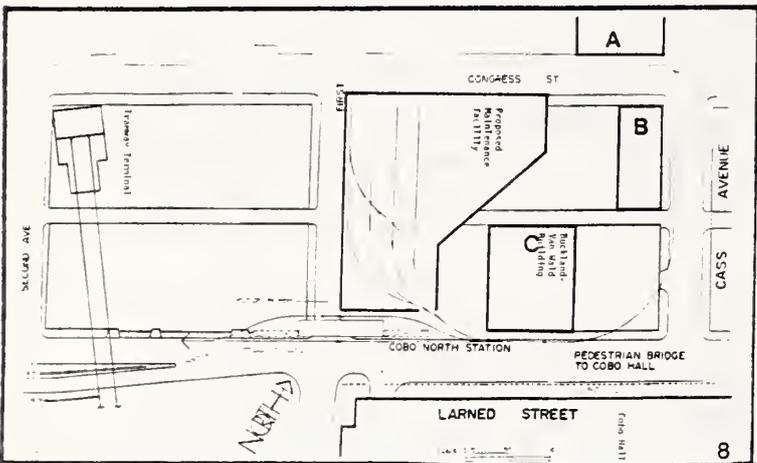
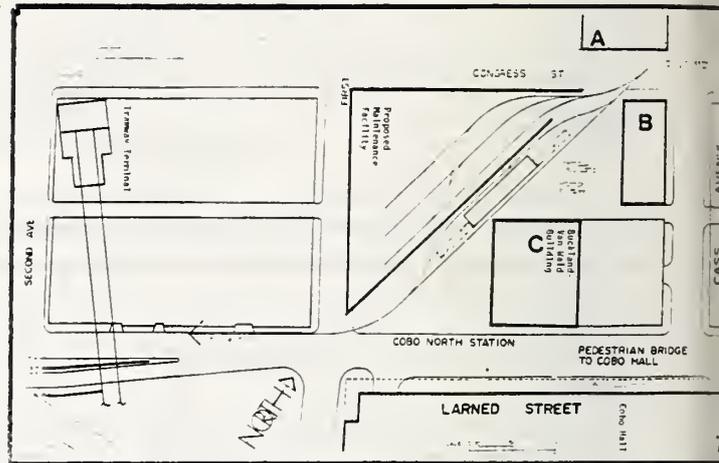
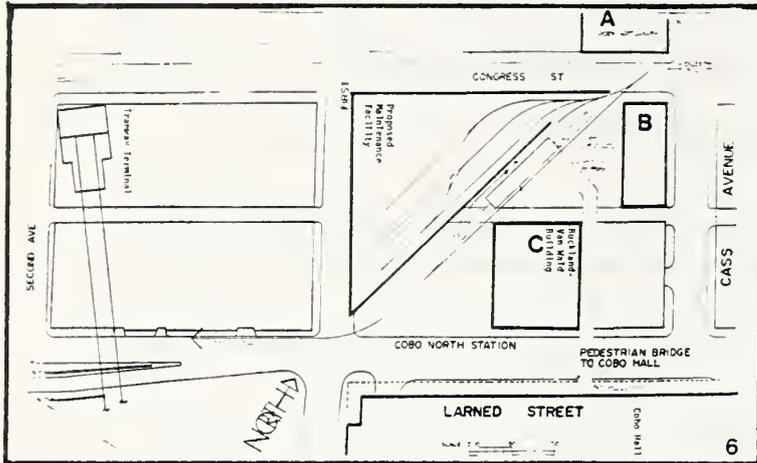


Figure V-14 (cont.)
 ALTERNATIVE MAINTENANCE
 SITE LAYOUTS

in charging and discharging vehicles from the maintenance facility to and from the mainline guideway; all of the vehicles leaving and entering the maintenance facility from the mainline guideway must pass over a short section of single lane track. Thus, some of the vehicles would be moving against the normal direction of vehicle flow until they cleared the two switches on the east side of the maintenance facility. This arrangement has a disadvantage in that it is more difficult for the operating personnel to gain access to this system during emergency situations. The biggest disadvantage of this layout is that it will require modifications to the internal open beam construction of the Buckland-VanWald Building. It saves, however, the facade of the building. The station is further from Cobo Hall, but is not significantly further from the Financial District. Pedestrian access must go along the east side of the Buckland-VanWald or penetrate its front. The cost of the required modifications to the Buckland-VanWald Building should be substantial depending on the ease with which the upper three floors of the building can be supported after the necessary opening is cut through the building for the DPM guideway and station. This alternative would cost approximately 10 to 25 percent more than Layout No. 1 due to the bridging of First Street and the modifications of the Buckland-VanWald Building. This alternative, like No. 5, was eliminated due to conflicts with the Detroit-Windsor tramway.

Layout No. 3 in Figure V-14 would not require relocation or demolition of the Buckland-VanWald Building. It would require the demolition of several structures fronting on Congress. The layout has the same connection to Cobo Hall as Alternative 1 and is expected to have the same patronage. It has the disadvantage of operational difficulty in charging and discharging vehicles from the maintenance facility and to and from the mainline guideway, in that all of the vehicles both leaving and entering the maintenance facility from the mainline guideway must pass over a short section of single lane track. Some of the vehicles would be moving against the normal direction of flow until they cleared the two switches on the east side of the maintenance facility. This arrangement also has a disadvantage in difficulties operating personnel have in gaining access to this system during emergency situations. The biggest disadvantage of this layout is that it will require modifications to the internal open beam construction of the Buckland-VanWald Building. However, it saves the facade of the building. The station is somewhat further removed from the Cobo Hall, but is not significantly further from the Financial District. The pedestrian access must go along the east side of the Buckland-VanWald Building or penetrate its front. This alternative would cost approximately 10 to 20 percent more than Layout No. 1 due to extensive structural change to the building and the irregular configuration of the maintenance facilities. The cost of the required modifications to the Buckland-VanWald Building should be substantial, depending on the ease with which the upper three floors of the building can be supported after the necessary opening is cut through the building for the DPM guideway and station.

Layout No. 4 in Figure V-14 would involve modification rather than destruction of the Buckland-VanWald Building. Pedestrian traffic would be accommodated through the building. However, the station location is somewhat further removed from Cobo Hall and the Financial District. This will adversely affect DPM patronage (15 to 30 percent reduction over Layout No. 1).

Vehicle access to and from the guideway would be similar to that of Alignment No. 1. This layout would also require demolition of the buildings facing Congress between Cass and First. Geometry rules out this layout because the guideway would not be able to make a turn from Cass and across Congress to the maintenance facility (i.e., around Building A). An alignment on the east side of Cass Avenue would allow the turn to be made, but would result in adverse impacts on the Detroit Club and the Detroit Free Press Buildings. This alternative would cost approximately 20 to 25 percent more than Layout No. 1 due to the extensive pedestrian bridging and structural modification to the building to allow penetration of the pedestrian way.

Layout No. 5 in Figure V-14 offers good operational flexibility and avoids demolition of those buildings of historic significance. However, it forces the Cobo Hall station location to the extreme far end of Cobo Hall, where it is least likely to be used by persons traveling to Cobo Hall. It is a full block further removed from the Financial District, a fact which would significantly affect patronage from that area (20 to 40 percent reduction). This extreme westerly location of the Cobo Hall Station also places it much closer to the Joe Louis Arena Station, thereby reducing station spacing to the point where these two stations begin to duplicate access to the system and compete with one another for passengers. Closer spacing would also reduce speeds on the loop which would result in longer loop travel times. The cost of this alternative would be approximately 10 to 15 percent greater than Layout No. 1 due to the need to bridge First street.

Layout No. 5 in Figure V-14 was eliminated due to a conflict with the tramway that will be built across the Detroit River connecting Detroit with Windsor, Ontario. The tramway will consist of an aerial suspension system, with its Detroit landing in the block bounded by First, Second, Larned, and Congress. A minimum depth of eighty feet from Second Avenue is needed for the tramway facility, thereby eliminating the viability of this alternative. Figures V-15 and V-16 are letters from the cities of Detroit and Windsor expressing their commitment to the tramway project.

Layout No. 6 in Figure V-14 takes the building at the northeast corner of First and Larned, but preserves the Buckland-VanWald Building. The Cobo Hall Station is located behind the building, approximately 265 feet further from Cobo Hall than Layout No. 1. Station patronage is expected to be reduced by 15 to 30 percent. The cost of this alternative would be similar to that of Layout No. 7, approximately 15 to 30 percent greater than Alternative No. 1. This layout was determined to be impractical due to the inability of the DPM to make the sharp turns required to gain access to the maintenance facility from Cass Avenue. An alignment along the east side of Cass Avenue would allow the turn to be made, but would result in negative impacts on the Detroit Club and Detroit Free Press Buildings.

Layout No. 7 in Figure V-14 is a simple variation which provides access to the Cobo Hall Station from Cobo Hall by going west of the Buckland-VanWald Building. This means that the tie between the station and Cobo Hall is to an even more remote part of the Cobo Hall facility and the



City of Detroit Executive Office

Coleman A. Young, Mayor

September 22, 1980

Mr. Larry E. Salci, General Manager
Southeastern Michigan Transportation Authority
First National Building
660 Woodward Avenue
Detroit, Michigan 48226

Dear Mr. Salci:

The City of Detroit supports the development of an aerial tramway connecting the Detroit and Windsor Central Business Districts (CBDs).

The tramway, in addition to providing convenient access to and from the respective CBDs, would serve as a catalyst for increasing the number of regional visitors, tourists and convention delegates to the Detroit CBD. It would provide impetus for new development, including hotel, commercial and restaurant facilities, and serve as a major transfer point to and from the proposed Downtown People Mover (DPM) system. Finally, it would serve as a highly visible international link between two countries.

In regard to your concerns as to the location of the DPM maintenance facility, the City strongly objects to moving the facility further west, because it would impede the development of the proposed tramway terminal, which is located adjacent to the maintenance site.

The City of Detroit will continue to work with the Windsor government in pursuing all avenues to assure that the aerial tramway will one day be a reality.

Sincerely,


COLEMAN A. YOUNG
Mayor

Figure V-15

LETTER FROM MAYOR OF DETROIT
CONCERNING THE TRAMWAY

THE CORPORATION OF THE
CITY OF WINDSOR

J. B. ADAMAC, C.M.C.
CITY CLERK



OFFICE OF THE CLERK

CITY HALL
WINDSOR, ONTARIO
N9A 6S1
TELEPHONE 255-6211
255-6215
PLEASE REFER
TO FILE NO. (10A-1)mq
B/F 594

September-5, 1980

The following resolution was adopted by Council at its meeting held on: Sept. 2, 1980

1150/80 That C. L. Mallett, Director, Department of Transportation, City of Detroit, BE ADVISED that City Council supports, in principle, the construction of the Aerial Tramway as set forth in the Feasibility Study, Detroit-Windsor Aerial Tramway System, prepared by Smith, Hinchman & Grylls Associates Incorporated, subject to the cost of construction being borne by sources other than the City of Windsor. (10A-1)mq B/F 594 7

left

City Clerk
/dd

Mr. H. Smith, Principal City Planner
Smith, Hinchman & Grylls Associates Incorporated
801 City County Building
DETROIT, Michigan
48226

Figure V-16

RESOLUTION FROM THE
WINDSOR ONTARIO CITY COUNCIL
CONCERNING THE TRAMWAY

Financial District. Walking distances would be approximately 200 feet greater than Layout No. 1, with a resultant expected 15 to 30 percent decrease in station patronage. Costs would be similar to Alternatives 9 and 8. The cost of this alternative would be similar to Alternative 6, approximately 15 to 30 percent greater than Alternative 1. Finally, this layout was determined to be infeasible due to the inability of making the sharp turns required to gain access to the maintenance facility from Cass Avenue. As previously mentioned, an alignment along the east side of Cass Avenue would improve geometrics of the curve, but would result in adverse effects on two historic sites.

Layout No. 8 in Figure V-14 is another variation which has the disadvantage of the Cobo Hall station location, which is further removed from Cobo Hall and the Financial District than Layout No. 1 in Figure IV-14. The additional (approximately 190 feet) walk would be expected to reduce station patronage by 20 to 40 percent. While it does not require demolition of the Buckland-VanWald Building, it would require demolition of the other buildings on both Larned and Congress. The cost of this alternative is similar to Layout No. 1 with the exception of increased costs for the pedestrian bridge and the more complex building shape. The cost is expected to be approximately 15 to 30 percent greater than Layout No. 1. Operational flexibility is difficult with this layout since cars traveling between the maintenance facility and the mainline guideway must move in both directions on a short length of single lane track. This would mean cars moving from the maintenance facility to the guideway would travel along the mainline guideway for a short distance against the normal directional flow. This could reduce schedule reliability and have adverse impact on systemwide patronage.

Layout No. 9 in Figure V-14 avoids both the Buckland-VanWald Building and the building at the corner of Larned and Second Avenue. It has the disadvantages of having the Cobo Hall Station approximately one-half block from Cobo Hall and the Financial District. The additional 200 foot walk to Cobo Hall is expected to reduce station patronage by 15 to 30 percent. This arrangement would have the additional cost of the 200 foot pedestrian bridge to Cobo Hall. The cost would be 15 to 25 percent more than the cost for Layout No. 1. The configuration was finally eliminated due to geometric considerations. It is impossible for the mainline guideway to make the turn into the facility at the northwest corner of Congress and Cass. Moving the alignment to the east side of Cass would ease the ability to make this turn, but would result in adverse impacts to the Detroit Club and Detroit Free Press Buildings, properties eligible for inclusion in the National Register of Historic Places.

The technical task force and the involved consultants met and presented the site analysis for review and discussion. The task force agreed that alternatives to the demolition of the existing structures on the site represented solutions which were financially and/or operationally untenable. This conclusion, based on the fact that the other configurations would involve lengthy walks from Cobo Hall to the DPM station (thereby reducing patronage to an unacceptable level), would necessitate unusually and difficult operation and maintenance procedures in transferring vehicles between the maintenance facility and the mainline guideway.

The Technical Task Force and the consultant team met to review and discuss the site analysis. A summary of the site analysis matrix which was used in the evaluation is shown in Table V-2. The Task Force agreed that the alternatives to the demolition of structures on the site were financially and/or operationally untenable.³⁸ Site treatment number 1 was selected as the only feasible alternative. Following the designation of an alignment and a preferred site, the project architect (during preliminary engineering) further evaluated and refined the design of the maintenance facility. The design requirements of the maintenance and storage area are depicted in Chapter II.

As a mitigation measure, SEMTA has agreed to record the building according to the standards of the National Architectural and Engineering Record prior to its demolition.

SEMTA recognizes the possibility that archaeological remains might be discovered during excavation for the maintenance facility. A qualified archaeologist would be on call to examine any archaeological resources unearthed during excavation.

SEMTA will relocate the businesses housed in the property in accordance with the provisions of the Uniform Relocation, Assistance, and Real Property Acquisition Policies Act of 1970 (P.L. 91-646).

vii. Determination

The proposed project would demolish the Buckland-VanWald Building and, thus, have an adverse effect. Alternatives that would mitigate adverse impacts on the property have been analyzed and the project as proposed includes measures to minimize harm to this property, which is eligible for the National Register. A Memorandum of Agreement concerning the Buckland-VanWald Building has been signed by the ACHP (Figure V-17).

b. Grand Circus Park Historic District

i. Description and significance of affected property

The Grand Circus Park Historic District is composed of buildings of a variety of architectural styles, including Victorian Italianate, Gothic Revival, Neo-Classical Revival, Commercial Style, Italian Renaissance, Pueblo Style, and Art Deco (Figure V-18). The focus of the District is Grand Circus Park itself (Figure V-18). The park is an integral part of the CBD street pattern, which is deemed eligible for listing in the National Register. The monuments located in the park include:

³⁸GM Transportation Systems Center, DPM Baseline Design Handbook, Process and Analysis, Report DD-79-3.4.1-23, EP-79126-1, December, 1979.

EVALUATION OF ALTERNATIVE MAINTENANCE LAYOUTS

| ALT. MAINTENANCE SITE LAYOUT | DISTANCE IN FT. FROM STA. MAIN ENTRY | COST CONSIDERATIONS | DEVELOPABLE LAND AREA IN SQ. FT. | DEVELOPMENT POTENTIAL OF REMAINING LAND | IMPACT ON HISTORIC STRUCTURES | INTERNAL VEHICLE CIRCULATION | GUIDEWAY - HORIZONTAL ALIGNMENT | SPECIAL PROBLEMS AND/OR BENEFITS | REMARKS |
|------------------------------|--------------------------------------|--|---|--|---|---|--|--|--|
| 1 | 800 FT. | Allows straight forward bldg. design Requires demolition of Structures C & C See comment No. 4 | 119,000 SQ. FT. | Highly visible - Contiguous Parcels - Good continuity of Useful land area | Demolishes structures C & D | Good comparatively simple geometry and vehicle movement | No Problems | Minimizes vehicle slow down thru site | Least costly solution - Allows greatest flexibility in facility design solution |
| 2 | 800 FT. See comment No. 4 | Potentially very high cost in alterations to Structure Code requires compliance of entire bldg | 84,000 SQ. FT. Plus Existing Building | Moderate Visibility - -Long narrow sites - -Poor continuity of useful land area | Conserves Structure C Adds long term use Demolishes Structure C | See comments for No. 1 | No severe problems | Difficult / Costly "Sterile" corridor thru Building C | Requires Engineering Study to establish existing building condition and Feasibility of solution |
| 3 | 800 FT. | See comments for No. 2 - More complex Building & Guideway Geometry | 81,000 SQ. FT. Plus Existing Building | See comments for No. 1 | See comments for No. 2 Demolishes D | More complex geometry and vehicle movement | No severe problems | See comments for No. 2 - slow vehicle passage thru site | See comments for No. 2 |
| 4 | 1150 FT. | Costly Ped. Passage & Bridging | 81,000 SQ. FT. Plus Existing Building | See comments for No. 1 | See comments for No. 2 Demolishes D | See comments for No. 1 | Excessive encroachment on Cass - cannot make through into site of Cass | Infeasible solution due to extreme difficulty in turning from main line to maintenance facility. | |
| 5 | 1400 FT. | Requires Building over First Street | 84,000 SQ. FT. | See comments for No. 2 Moderate Visibility | Conserves Structure C Demolishes D | See comments for No. 1 | No severe problems | See comments for No. 1 | Very bad tie to Cobo Hall |
| 6 | 1180 FT. | See Comments for No. 2 and No. 3 | 81,000 SQ. FT. Plus Existing Building | See comments for No. 1 | Conserves Structure C Demolishes D | See comments for No. 1 | See comments for No. 1 | See No. 4 | |
| 7 | 1200 FT. | See No. 6 | See No. 6 | See No. 6 | See No. 6 | See No. 6 | See No. 6 | See No. 4 | |
| 8 | 1400 FT. | More Complex Guideway and Building Geometry | 76,000 SQ. FT. | See comments for No. 1 | Conserves Structures C & D | Very complex inefficient vehicle movement | Very complex switching and guideway construction | See No. 4 | See comments for No. 5 |
| 9 | 1180 FT. | See comment for No. 5 | 126,000 SQ. FT. | See comments for No. 1 | Conserves all Structures | See comments for No. 1 | See comments for No. 4 | See No. 4 | |

Advisory Council On Historic Preservation

1522 K Street, NW
Washington, DC 20005

PROPOSAL FOR INCLUSION IN A MEMORANDUM OF AGREEMENT

STIPULATIONS

UMTA will ensure that the following measures are carried out during the final design and construction of the Detroit Downtown People Mover project.

I. Buckland-VanWald Building

1. SEMTA will complete the feasibility study (working paper) of the alternative site locations for the vehicle maintenance facility and the alternative design studies that would incorporate the existing Buckland-VanWald Building into the proposed station and vehicle maintenance facility. This study will be submitted to the Council and the Michigan SHPO for review and written comment. Written comments will be received by SEMTA and UMTA within fourteen (14) working days of receipt of the working paper by the SHPO and the Council. If that study results in a finding that there is no prudent and feasible alternative to new construction on the cleared site of the Buckland-VanWald Building, then, SEMTA will complete a feasibility study of the relocation of the Buckland-VanWald Building to another location for rehabilitation and reuse. This study will be submitted to the Council and the Michigan SHPO for review and written comment. Written comments will be received by SEMTA and UMTA within fourteen (14) working days of receipt of the feasibility study by the SHPO and the Council. If relocation of the building is considered feasible after consultation with the SHPO and ACHP, SEMTA will advertise the availability of the Buckland-VanWald for relocation and rehabilitation to anyone interested in the following manner.
- 2.

- (a) SEMTA will prepare a marketing brochure with pertinent information on the property, including the cost of moving the structure, parcel map, photographs, and information on Section 2124 of the Tax Reform Act of 1976 (P.L. 94-445) and the Secretary of the Interior's "Standards for Rehabilitation". It will also contain information on public and private sources of funding for rehabilitation and preservation of the property. The brochure and a distribution list of potentially interested parties will be submitted for review and comment to the Michigan SHPO prior to printing. The review and comment process will be conducted in the following manner"

Upon completion by SEMTA of the material to be reviewed and commented upon, copies of these materials will be provided to the SHPO and the Council. Within fourteen (14) working days of receipt of these materials the SHPO and Council shall conduct their reviews and provide written comments to SEMTA and UMTA. If either the SHPO or the Council object to any elements of the materials in their comments, SEMTA shall arrange for a meeting of the SHPO, the Council, SEMTA and UMTA in an effort to resolve such objections. In the event any objections remain unresolved, UMTA will ensure that the views of the SHPO and the Council are incorporated to the maximum extent feasible before the material is released.

MEMORANDUM OF AGREEMENT

WHEREAS, the Urban Mass Transportation Administration (UMTA), Department of Transportation, proposes to fund a Downtown People Mover in Detroit, Michigan; and,

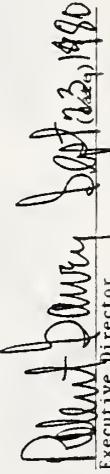
WHEREAS, UMTA in consultation with the Michigan State Historic Preservation Officer (SHPO), has determined that this undertaking as proposed would have an adverse effect upon Buckland VanWald Building, the Detroit Street Plan and the Grand Circus Park, properties eligible for the National Register of Historic Places; and,

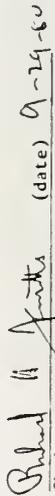
WHEREAS, pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) and Section 800.4(d) of the regulations of the Advisory Council on Historic Preservation (Council), "Protection of Historic and Cultural Properties" (36 CFR Part 800), UMTA has requested the comments of the Council; and,

WHEREAS, pursuant to Section 800.6 of the Council's regulations, representatives of the Council, UMTA, and the Michigan SHPO have consulted and reviewed the undertaking to consider feasible and prudent alternatives to avoid or satisfactorily mitigate the adverse effect; and,

WHEREAS, the Southeastern Michigan Transportation Authority (SEMTA) was invited and participated in the consultation process;

NOW, THEREFORE, it is mutually agreed that the undertaking will be implemented in accordance with the attached stipulations as submitted by Mr. John B. Barber, Acting Chief, Planning and Analysis Division, UMTA, to satisfactorily mitigate adverse effects on the above-mentioned properties.


Executive Director
Advisory Council on Historic Preservation

 (date) 9-24-80
Chairman
Advisory Council on Historic Preservation

- (b) The Buckland-VanWald Building will be offered for a period of forty-five (45) days after distribution of the marketing brochure. The property will be advertised in local and state newspapers and Preservation News. Details of the advertising, such as its frequency and the specific publications in which it will appear, will be worked out with the SHPO. If a seriously interested and capable party comes forward during the forty-five (45) day period, an additional forty-five (45) day extension to this period will be granted for this party to finalize the arrangement for relocating the building.
- (c) The recipient of the Buckland-VanWald Building must agree to rehabilitate and maintain the building in accordance with the Secretary of the Interior's "Standards of Rehabilitation".
- (d) The Buckland-VanWald Building will be transferred subject to restrictive covenants (Attachment 1) regarding the property's preservation and maintenance.
- (e) The Michigan SHPO will be given the opportunity to review all offers for the property.
3. If no recipient for the Buckland-VanWald Building is found in the time agreed upon in stipulation 2(b), SEMTA may demolish the Buckland-VanWald Building. Prior to the demolition, SEMTA will record the Buckland-VanWald Building so that there will be a permanent record of its existence. SEMTA will first contact the National Architectural and Engineering Record (NAER) Heritage Conservation and Recreation Service, Department of the Interior, Washington, D.C. 20240, (202) 343-6217. All documentation must be accepted by NAER and the Council notified of that acceptance prior to the demolition. SEMTA will provide copies of this documentation to the Michigan SHPO.
4. Prior to the demolition of the Buckland-VanWald Building, the Michigan SHPO will be given a reasonable opportunity to select representative architectural elements in reasonable numbers and of reasonable value from the Buckland-VanWald Building for curation or use in other projects. SEMTA will be responsible for insuring the careful removal of these elements and will convey them without cost to the Michigan SHPO or his designee. The Michigan SHPO will notify SEMTA and the Council in writing within fourteen (14) working days after receipt of these representative elements that all these architectural elements have been salvaged before demolition will be permitted.
5. After completion of the above measures, SEMTA may demolish the Buckland-VanWald Building.
6. If the Buckland-VanWald Building, is demolished, SEMTA will notify the Keeper of the National Register within 90 days so that it will be removed from the list of National Register eligible properties.

II. Grand Circus Park Historic District and Detroit Street Plan

1. In the design stages for the DPM alignment through the Grand Circus Park Historic District, plans and design considerations will be developed in consultation with the Michigan SHPO and the Council. Final design plans and specifications will be submitted to the Michigan SHPO and the Council for review and written comment prior to the initiation of construction activity. The review and comment process will be conducted in the manner described in stipulation 2(a) of Section I of this Memorandum. The following design considerations will be taken into account to minimize the impact of the DPM System on the Grand Circus Park Historic District: Choice of materials, the placement of supports, the construction techniques, the horizontal alignment, the elevation alignment, and the design of the station to minimize its intrusiveness on the historic properties.
2. Further engineering studies will be completed before the finalization of the design and location of the Grand Circus Park station. These studies will include:
- (a) Alternative vertical circulation systems as part of the current station design. Elevators may be utilized instead of escalators to reduce the mass of the station at the street level.
 - (b) Alternative locations for the vertical circulation systems to remove them from Woodward Avenue by locating them at the side of the street or by incorporating them into an existing building.
 - (c) Alternative location for the station by incorporating it into an existing building.
3. All design considerations for all alternatives will be developed in consultation with the Michigan SHPO.
4. The selected alternative station design will be made compatible with the surrounding historic buildings to the maximum extent feasible and will be submitted to the SHPO for his/her review and comment prior to the initiation of construction activity. The review and written comment process will be conducted in the manner described in stipulation 2(a) of Section I of this Memorandum.

III. Archeology

1. SEMTA will prepare a research design and scope of work for an archeological survey of the project area in consultation with the Michigan SHPO. The scope of work will provide for phased implementation of the following elements, which SEMTA will ensure are carried out prior to construction.

- (a) Documentary research to identify areas of historic archeological potential along the DPM alignment, with particular attention to areas that would be distributed by placement of footings, station construction, and the DPM maintenance facility.
 - (b) Limited subsurface testing prior to construction, in areas cleared of structures or otherwise accessible, based on the predictions derived from the documentary research.
2. In the event that significant archeological resources are identified by the onsite archaeologist, in consultation with the SHPO, that meet the National Register criteria, a data recovery program for these resources will be developed and implemented prior to construction in accordance with the Council's "Guidelines for Making 'Adverse Effect' and 'No Adverse Effect' Determinations for Archaeological Resources" in accordance with 36 CFR Part 800 (Attachment 2).
 3. An archeologist meeting the professional qualifications for supervisory archeologist set forth in 36 CFR Part 66, Appendix C, "Professional Qualifications" (Attachment 3) will be retained to monitor clearing and ground disturbing activities. The archeologist will be kept informed of the construction schedule and progress as work proceeds. In the event that significant archeological resources are identified that appear to meet the National Register criteria, and preservation in place is determined to be infeasible, a data recovery program will be developed and implemented as in Stipulation 2 (above).

4. All archeological work will be conducted in accordance with 36 CFR Part 66, Appendix B, "Guidelines for the Location and Identification of Historic Properties Containing Scientific, Prehistoric, Historical or Archeological Data". Supervisory personnel will have experience in the historical archeology of these areas, and will meet the requirements contained in Appendix C, "Professional Qualifications" (Attachment 3).

IV. General

1. Failure to carry out the terms of this Agreement requires that UMTA again request the Council's comments in accordance with 36 CFR Part 800. If UMTA cannot carry out the terms of the Agreement, it shall not take or sanction any action or make any irreversible commitment that would result in an adverse effect with respect to National Register or eligible properties covered by the Agreement or would foreclose the Council's consideration of modifications or alternatives to the Detroit DPM that could avoid or mitigate the adverse effect until the commenting process has been completed.

2. If any of the signatories to this Agreement determine that the terms of the Agreement cannot be met or believes a change is necessary, that signatory shall immediately request the consulting parties to consider an amendment or addendum to the Agreement to be executed in the same manner as the original Agreement.
3. Within 90 days after carrying out the terms of the Agreement, UMTA shall provide a written report to all signatories to the Agreement on the actions taken to fulfill the terms of the Agreement.

Eward R. Thichman (date) Aug. 28, 1980
 Urban Mass Transportation Administration

Donna M. Bigelow (date) 8-19-80
 Michigan State Historic Preservation Officer

Jerry E. Berlin (date) 9-1-80
 Southeastern Michigan Transportation Authority





Figure V-18
GRAND CIRCUS PARK DISTRICT

- . Russell A. Alger Fountain (Daniel Chester French, 1921);
- . Edwin Darby enlistment site;
- . William C. Mayberry Statue (Adolph Weinman, 1912)
- . Hazen S. Pingree Statue (Rudolph Schwartz, 1903);
- . Edison Memorial Fountain (1929); and
- . The Entrance (John Pitt, 1975).

From the early to middle 1800's, the land in the District was devoted primarily to residential use. Churches were built in the area in response to that residential population. The churches, which were built in the 1860's, are the oldest buildings still existing in the area. By 1884, the area west of Woodward Avenue was dominated by small hotels and rooming houses. The west side community also had a higher density than the area east of Woodward Avenue, where units for one to four families predominated. The residential buildings north of Adams were not as grand as those south of the Grand Circus Park Historic District. Most of the buildings that form the Historic District were constructed between 1915 and 1928, when this section of Woodward Avenue was a theatre district. During the first quarter of the twentieth century, the area underwent a steady change from its earlier low-density residential use to residential use of higher density with the construction of major hotels along Grand Circus Park. With the introduction of elegant theatres, the area evolved into an entertainment district. Commercial uses also began to permeate the area during that time due to the attractive setting of Grand Circus Park and a demand for office space that could not be accommodated in the city's financial district.

The boundaries of the proposed district were established with the purpose of including properties that had contributed to the early history of the area (i.e, churches such as the Central Methodist on the northeast corner of Adams and Woodward), to the redevelopment of the area as a theatre district of the early 1920's, and to the character of the area as a serene park surrounded by examples of the day-to-day commerce of a city that is one of America's most dynamic. The district is distinct from its immediate surroundings due to its focus on Grand Circus Park, the design qualities of the buildings included, and the sense of community derived from both past and present land uses.

The following is a list of some of the most significant buildings in the area:

- . Tuller Hotel on Park between Adams and Bagley: A fourteen-story brick building constructed in 1905 and added to in 1909 and 1914, the Tuller is Detroit's oldest major hotel.
- . Heritage Hotel on Park between Bagley and Washington Boulevard (formerly Wayne): When Ellsworth M. Statler, owner of the Statler chain of hotels, decided to build in Detroit, he was astute enough to realize that the

fashionable retail business was moving uptown. Consequently, he located his new hotel at Grand Circus Park and Washington Boulevard on the site of the old Bagley homestead. The building was designed by George B. Post of New York, a pupil of Richard Morris Hunt. This in itself would have been sufficient recommendation for the quality of his work, but he also designed such memorable landmarks as Cornelius Vanderbilt's French Chateau on Fifth Avenue in New York City and the Manufacturers and Liberal Arts Buildings at the Chicago World's Fair of 1893. The hotel was opened in 1914. The eighteen-story building was efficiently planned. There were 800 guest rooms, each with a bath. The subtle Italian architectural details gave the hotel an atmosphere of luxury. A new standard of excellence for hotels had been established in Detroit.

. The David Whitney Building on Park between Washington Boulevard and Woodward: The building was designed by Daniel Burham and completed in 1915 as an office for doctors and dentists. Corridors face an inside court, thus permitting an outside exposure for all offices. The Italian Renaissance provided motifs for the architectural ornaments on the exterior. The increasing architectural detail was an indication of the decline of the Chicago School's influence in Detroit.

. The Grand Circus Theatre (previously the Capitol Theatre) on the east side of Broadway between Park Boulevard and John R. Street: Designed by C. Howard Crane and built in 1922, the Capitol Theatre was the city's first large theatre.

. R.H. Fyfe's Shoe Store Building on the northwest corner of Adams and Woodward: Designed by the architectural firm of Smith, Hinchman and Grylls and completed in 1919, this Gothic landmark on Grand Circus Park is noted for the figures of shoemakers on its facade. This handsome example of Gothic commercial architecture, with its soaring vertical lines and deep window reveals, stands as a landmark at the head of the busy thoroughfares that converge on Grand Circus Park.

. The Women's Exchange on the north side of Adams between Park and Woodward: In 1916, the firm of Smith, Hinchman and Grylls gave the north side of Grand Circus Park a distinctly medieval flavor with this half-timbered building. The profusion of gables and the bay windows jutting out, one above the other, are reminiscent of an old English inn.

. The Detroit Athletic Club on the north side of Madison east of John R. Street: Albert Kahn was the architect for this building (circa 1915). Inspired by the design of Renaissance Roman palaces, Kahn derived most of the fenestration from the facade of the Palazzo Farnese, with its arcaded loggia court furnishing the design for the windows of the fourth floor dining room. This imposing structure was built as a club for Detroit's early automobile magnates and remains closely tied to that industry. The interior sports sumptuous club rooms, a fabled bar, a gymnasium, a pool, handball and squash courts, and rooms for overnight guests.

. The Central Methodist Church on the northeast corner of Woodward and Adams: This building, designed by Gordon W. Lloyd and constructed in 1867, is a splendid example of Gothic Revival architecture by a Detroit

architect trained in England. Restrained ornamentation and rugged masonry characterize this church with broad, semi-octagonal transepts and large gables. A strong vertical accent is provided by a corner tower with a broach spire.

The significance of the Grand Circus Park area rests in both the style and construction of its buildings and its design as a community developed from predetermined principles. The layout of the Grand Circus Park area is shown on the original Detroit Street Plan prepared by Judge Woodward and Governor Hull, who based their plan upon the layout of Versailles (streets radiating from the palace of the French king Louis XIV). Detroit's streets were designed to radiate from Grand Circus Park. The Detroit street plan has been determined eligible for inclusion in the National Register.

The buildings within the area are a unique example of commercial buildings designed by famous architects, including Albert Kahn, Daniel Bernham, George W. Post, C. Howard Crane, the firm of Smith, Hinchman and Grylls, and Gordon W. Lloyd.

The street pattern in the area dates from 1805, Grand Circus Park from the mid-1800's, and most of the buildings from the late nineteenth to early twentieth centuries. The Grand Circus Park area was a well-defined community as early as 1850 and continued as a community, becoming an extension of, though aesthetically distinct from, the remainder of the CBD. The sense of community continues today. An association of property owners has been formed to speed rehabilitation, instilling once again in the area the activity it enjoyed in the late 1920's.

ii. Application of the Criteria of Adverse Effect

The Criteria of Adverse Effect have been applied in consultation with the SHPO. Criteria 36 CFR 800.3(b)2 and 800.3(b)3 apply directly. The DPM would alter the environment and visually isolate the structures on the south side of Park Avenue and Witherell Street from the surrounding historic district. Some feel that the DPM would also introduce a visual and audible element that is out of character with the historic fabric of the district.³⁹ The DPM would not result in the destruction or alteration of any historic structures.

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO expressed the view that the Grand Circus Park Historic District would be adversely affected by the DPM project. In the same letter, the SHPO expressed the opinion that the impacts on the District would be minimized if the alignment were located in Grand Circus Park, rather than along the south side of Park Avenue and Witherell Street.

³⁹Letter from Michigan SHPO to SEMTA Project Manager, dated December 14, 1979.

iv. Views of others

In a letter to the Department of the Interior accompanying the request for determination of eligibility for the National Register, the city of Detroit questioned the boundaries of the proposed Grand Circus Park Historic District. Members of the Grand Circus Park Development Association, an organization of property owners, have been actively involved in planning for the DPM and have welcomed the introduction of the DPM as a positive step in revitalization. As construction of the DPM would not result in destruction of any buildings, the Association has not expressed any reservations about the project on grounds of historic preservation. Rather, the Association views the DPM as a way to preserve historic structures by encouraging their refurbishment.

v. Alternatives that would avoid adverse effect

The circulator bus alternatives (described in Chapters II and IV) would avoid adverse effects on the Grand Circus Park Historic District. After consideration of the impacts of the circulator bus alternative, this option was dropped from consideration because it would be unable to provide the required degree of circulation within the CBD and would contribute little to the economic revitalization of the downtown, including the Grand Circus Park area.

During the early phases of planning for the DPM, alternative alignments that did not penetrate the District were considered (see Chapter II). The results of this analysis are discussed in detail in the GM Transportation Systems Center's working papers referenced in the previous section. In summary, the alternatives that did not penetrate the Grand Circus Park Historic District were eliminated from consideration because the SEMTA Board of Directors felt that DPM service there was essential to both the viability of the DPM itself and the economic health of the Grand Circus Park area. It is also desirable to have a station at Grand Circus Park to tie the DPM into the proposed light rail system station at that location. Transfers between the DPM and the light rail system will help the DPM serve its essential function as a collection and distribution system within the CBD. The Board of Directors also felt that construction of a DPM station at Grand Circus Park was the most cost-effective way to serve the residents living around the park. It would not be economically feasible to extend the DPM to the north around the Historic District, as the additional guideway required would cost more than \$1 million. Finally, the Board of Directors agreed with the property owners in the Grand Circus Park area that a DPM station was an essential component of efforts to bring new economic life to the area. There is no viable alternative to DPM service in the District. The DPM's impact on the District would include minimal alteration of the environment and visual isolation of one portion of the District from another.

vi. Alternatives that would mitigate adverse effect

The location of the proposed alignment is the result of a comprehensive effort to minimize the impact of the DPM on the Grand Circus Park Historic

District. Studies of the area indicated that the key to the significance of the District is Grand Circus Park itself and the definition of the park by the towering buildings that surround it. It was established early in the study that the DPM would have the greatest negative impact if the alignment were located within the park. Such an action would seriously affect the integrity of the park as the focus of the Historic District. An elevated alignment would place a major structure out in the open between the buildings and the park, disturbing the definition of the park now accomplished by the surrounding buildings. Such a placement would also be a "taking" of parkland, as defined in Section 4(f) of the Department of Transportation Act and would require a finding by the Secretary of Transportation that there is no prudent and feasible alternative to location of the guideway in the park and that all possible planning had been undertaken to minimize impacts on the park. Instead, it was concluded that there were prudent and feasible alternatives and that the park had to be ruled out as a location for the guideway. To minimize visual impacts, the guideway should be located away from the park. To do this and still achieve the transportation and economic goals of the DPM system, two alternatives were considered: location of the alignment north of the park on Adams or south of the park along Park Avenue and Witherell Street. The northern alignment would result in increased costs and would surround about two-thirds of the park with the elevated guideway, disrupting the visual whole of the park and its immediate environs and increasing the cost of the system by adding to its length. The alignment would also have required tight curves, reducing the speed of the transit vehicles, and would have had to cross the park. The alignment along the south side of the park would reduce the amount of the park that would be affected by the DPM system and the cost of the system, while still providing needed transportation service. The south side of the park is also a much better location for the alignment and station in terms of the DPM's ability to facilitate the economic recovery of the historic hotels and office buildings in the area. Placement of the guideway along the south side of Park Avenue would disrupt the view of the structures south of the park, but would minimize impacts on the park's appearance and preserve the view of the park from all surrounding buildings. Impacts on some of the buildings along the south side of the park, while adverse, would not materially affect the qualities that make them historically significant. This is especially true of buildings such as the David Whitney Building, whose significance resides in its interior, rather than exterior, opulence.

The importance of the DPM in revitalizing the Grand Circus Park area is a significant factor in mitigating its impacts on this area. Many of the historic structures in the District are empty and in disrepair. The activity generated by the DPM is expected to allow many of the old buildings to become useful again as offices or hotels. With a DPM link to the Cobo Hall/Joe Louis Arena convention area, hotels in the Grand Circus Park Historic District would have a chance to operate profitably again.

Every aspect of design (including elevation control, choice of materials, etc.) will be considered, with the goal being to minimize the intrusion of the guideway structure into its surroundings. In addition to the mitigation measures described above, SEMTA has agreed to allow the SHPO to review the design of improvements to be constructed in the District.

vii. Determination

The proposed project would adversely impact the Grand Circus Park Historic District. Alternatives that would mitigate adverse impacts on the historic area have been analyzed and the project, as proposed, includes measures to minimize harm to this district, which is listed in the National Register. A Memorandum of Agreement concerning the Grand Circus Park Historic District has been signed by the ACHP (see Figure V-15).

c. Detroit Street Plan (see Figure V-2)

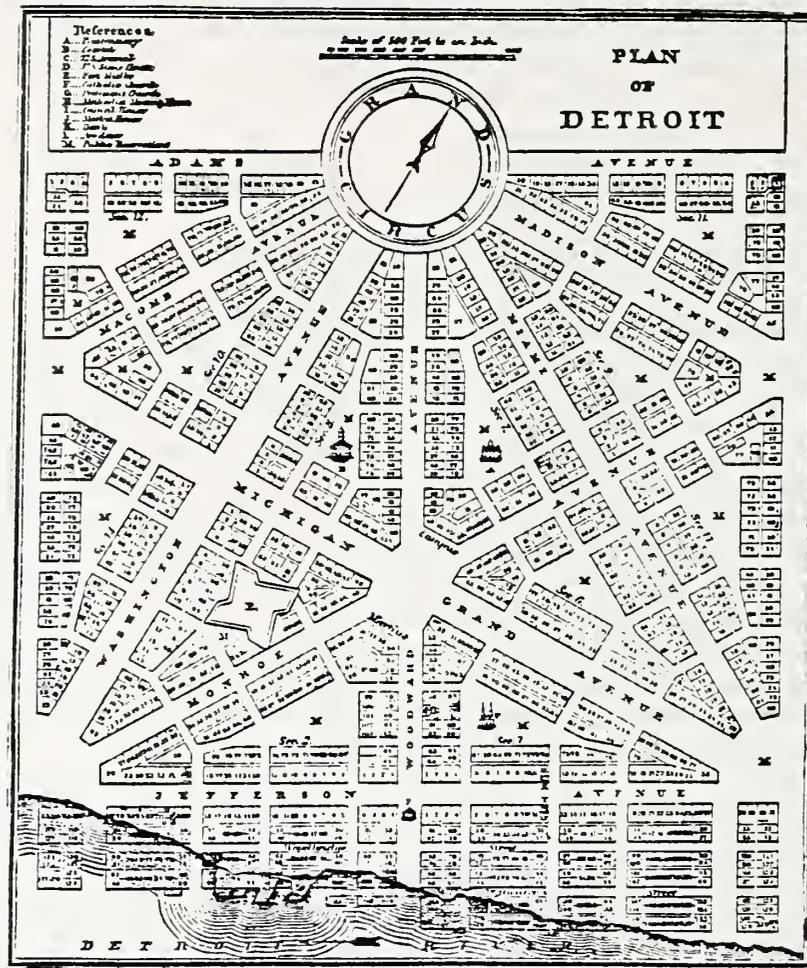
i. Description and significance of affected property

Judge Augustus B. Woodward was a man of extraordinary intellectual curiosity, aware of the latest developments in city planning and possessed of the imagination to visualize a metropolis of the future on the site of Detroit's 1807 frontier post. A friend of Thomas Jefferson and Major L'Enfant, Woodward based his street plan for the city on a hexagon, divided into twelve sections which could be repeated ad infinitum (Figure V-19). The plan included principal parkways 200 feet in width (Washington and Madison) and secondary diagonals 120 feet wide (Monroe), with circuses (or circles) and other open spaces. The work of surveying and laying out the streets proceeded slowly from 1807 onward. Unfortunately, uncooperative landowners prevented all but a fragment of the original plan from being carried out. Only a few blocks on either side of Woodward Avenue between Jefferson and Grand Circus Park remain as originally planned. These broad avenues and open spaces contribute today to the distinctive quality of downtown Detroit.

Even within the area where the plan was consummated, there have been alterations in the original design. When a new City Hall was built in 1871 on the west side of Woodward Avenue, it encroached upon the rectangular Campus Martius. In 1919, the City Planning Commission was formed and set out to develop a Thoroughfare Plan for the city. Planning in the 1920's was dominated by review and laying out of new housing areas, annexation, dedication of highways and streets, and widening of Woodward, Gratiot, and Michigan to 120 feet. Randolph Street was also widened. More recently (about 1950), construction of the parking garage at Monroe and Randolph obliterated Library Street south of Monroe.

ii. Application of the Criteria of Adverse Effect

The Criteria of Adverse Effect were applied in consultation with the SHPO. Criterion 3 was found to apply. The proposed project would introduce a visual element that is out of character with the Detroit Street Plan. The proposed project would not result in the alteration or destruction of any part of the property. The DPM would not isolate the property from its surrounding environment. It would not result in neglect of the historic property, nor require sale or transfer of that property.



REDUCED FAC-SIMILE OF THE LEWIS MAP OF THE GOVERNOR AND JUDGES' PROPOSED PLAN.

SOURCE: A HISTORY OF DETROIT & WAYNE CO. & EARLY MICHIGAN, BY SILAS FARMER, 1890.

Figure V-19

iii. Views of the State Historic Preservation Officer

In a letter dated December 14, 1979, the SHPO stated his opinion that the DPM would "...interrupt the vista out Woodward Avenue, a key element of the original city layout, by possibly creating the visual impression that the street terminates at the (DPM) station when looking north from downtown." The SHPO feels that the impact would be more easily mitigated if the station were located on the edge of the park opposite the David Whitney Building.

iv. Views of others

The DPM Steering Committee has expressed the position that location of the Grand Circus Park DPM station on the south side of the park at Woodward Avenue is the best course of action, given the impacts of all the other alternatives considered and the need to provide for transfers between the DPM and the proposed light rail station at Grand Circus Park. The property owners' association has been active in planning for the DPM in this area of the downtown. The association has not expressed reservations about a station located across Woodward Avenue and favors DPM service to Grand Circus Park. During circulation of the DEIS, several individuals and agencies commented that they would like to see the visual impact of the station minimized.

v. Alternatives that would avoid adverse effect

Alternatives that would avoid adverse effects on the Detroit Street Plan are the same alternatives that were discussed in the section on the Grand Circus Park Historic District. They include a circulator bus alternative, DPM alignments that stay south of the Historic District, and alignments that run north of Grand Circus Park. As discussed in the previous section, these alternatives were analyzed in detail and finally rejected because of their inability to provide adequate circulation within the CBD and the economic (cost and redevelopment) reasons.

vi. Alternatives that would mitigate adverse effect

The location of the Grand Circus Park DPM station at Woodward and Park Avenues was chosen as the alternative with the least impact on the Grand Circus Park Historic District and on individual buildings such as the David Whitney and Fyfe Buildings. Among the alternative station sites that were considered are two on the north side of Park Avenue and two on the south. The sites on the north were eliminated because of their impacts on the park and church. The sites on the south included one adjacent to the David Whitney Building on Washington Boulevard and the other spanning Woodward Avenue. Integration of the former alternative into the Whitney Building was considered. This alternative was dropped from further consideration as integration into the Whitney Building would have resulted in adverse impacts on the interior lobby of the building, which is the key to its architectural significance. Placement of the station outside of the building would have obscured the facade. The alternative that spans Woodward Avenue was preferred because it has the least impact

on historic properties. This location would not affect the park and would not require alteration or destruction of any historic property.

Additional mitigation of visual impacts will occur once the Woodward Transit Mall has been completed. The mall will include plantings and street furniture, reducing site distances along the mall and, therefore, reducing the distance from which the guideway and station would be visible. The portion of the mall south of Grand River Avenue may be covered in the future, thereby also reducing the visibility of the DPM from Woodward Avenue to the south.

SEMTA has agreed to fund, in conjunction with UMTA, a special engineering study to address ways of lessening the impact of the Grand Circus Park station. The study will consider alternative locations for the station and for placement of vertical circulation equipment. Every attempt will be made to minimize the obtrusiveness of the station. The SHPO will be afforded an opportunity to participate in the study. SEMTA has agreed to allow the SHPO to review the design of structures and stations in the Grand Circus Park area.

vii. Determination

The proposed project would adversely affect the Detroit Street Plan. Alternatives that would mitigate adverse impacts on this historic property have been analyzed and the project, as proposed, includes measures to minimize harm to this property, which is included in the National Register. A Memorandum of Agreement concerning the Detroit Street Plan has been signed by the ACHP (see Figure V-17).

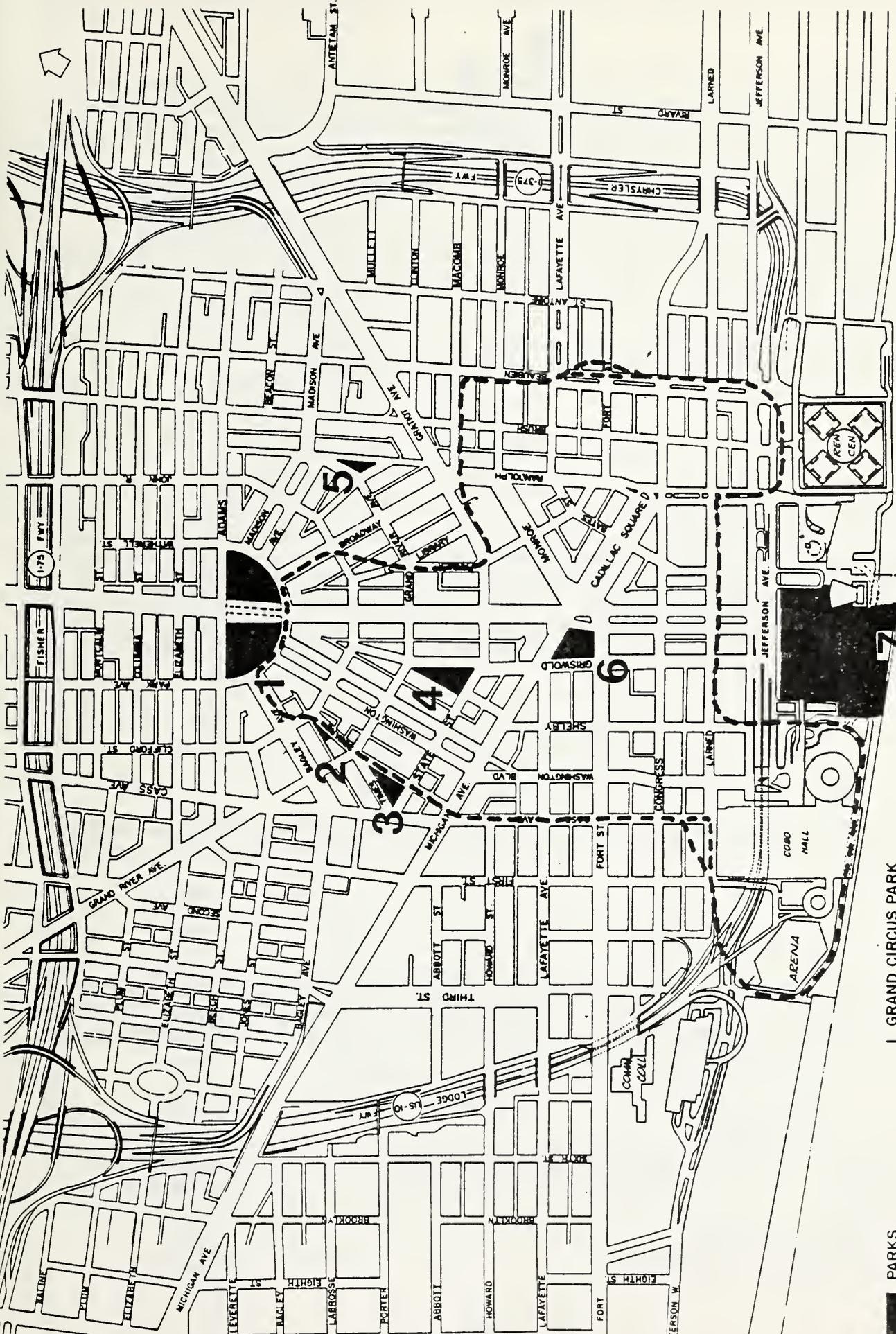
B. 4(f) EVALUATION

1. Introduction

Section 4(f) of the Department of Transportation Act of 1966 states that: "It is hereby declared to be the national policy that special effort should be made to preserve the natural beauty of the countryside and public parks and recreational lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of National, State or local significance as so determined by the Federal, State or local officials having jurisdiction thereof, or any land from an historic site of National, State or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use."

2. Impacts on Parks

The parks within the CBD that are in the vicinity of the proposed DPM are shown in Figure V-20. The DPM would not involve the taking of any property from Capitol Park, Kennedy Square, Telephone/Pioneer Park, Harmonie Park,



- 1 GRAND CIRCUS PARK
- 2 TIMES SQUARE PARK
- 3 TELEPHONE PIONEER PARK
- 4 CAPITOL PARK
- 5 HARMONIE PARK
- 6 KENNEDY SQUARE PARK
- 7 CIVIC CENTER PLAZA

PARKS

--- DPM ALIGNMENT

Figure V-20
 CBD PARKS NEAR DPM ALIGNMENT

Grand Circus Park, or Civic Center Plaza. A footing for the guideway would be placed on the corner of the landscaped area on the southwest corner of Clifford Street and Times Square. Placement of the footing would reduce the sidewalk at that location, but would not require that any of the park's land be taken.

Improvements in the Grand Circus Park area (Alignment Sheet 6) would require that a portion of the sidewalk along the northeast corner of Woodward Avenue and Witherell Street be taken to maintain an adequate street width at the intersection. The Director of the Detroit Recreation Department has reviewed the plans for this area and has expressed his view that the sidewalk is not of great importance for park purposes (Figure V-21). The green space of Grand Circus Park would not be affected.

3. Impacts on Historic Properties

The DPM would have impacts on three historic properties: the Buckland-VanWald Building, the Grand Circus Park Historic District, and the Detroit Street Plan. The Buckland-VanWald Building would be demolished to make way for the DPM maintenance/storage facility. The DPM would detract from the character of the Grand Circus Park Historic District by introducing an incongruous element. The Grand Circus Park DPM station would disrupt the vista out Woodward Avenue, a key element of the city's original layout. Analysis required by Section 4(f) of the Department of Transportation Act for these properties is presented below.

a. Buckland-VanWald Building

i. Description and significance of property

The description and significance of the Buckland-VanWald Building were presented in section A.4.a of this chapter. The property is shown in Figure V-11.

ii. Proposed use

The Buckland-VanWald Building would be demolished and a maintenance/storage facility for the DPM constructed on its site. The proposed use of the site is shown on alignment sheet 2 (Chapter II). A site plan for the maintenance facility is presented in Figure II-5.

iii. Alternatives

Alternatives to the proposed use were discussed in section A.4.a of this chapter. Circulator bus alternatives that did not require demolition of



Recreation Department
Water Board Building
735 Randolph Street
Detroit, Michigan 48236
(313) 224-1100

Coleman A. Young, Mayor
City of Detroit

December 11, 1979

Mr. Edward R. Fleischman, Chief
Planning and Analysis Division
Urban Mass Transportation Administration
400 Seventh Street, S. W. (UTA-32)
Washington, D. C. 20590

Re: Detroit Downtown People Mover Project -
Impacts on Public Parks

Dear Mr. Fleischman:

The Southeastern Michigan Transportation Authority (S.E.M.T.A.) recently discussed with me the design plans for the Detroit Downtown People Mover (DPM), for which S.E.M.T.A. is requesting Federal financial assistance. This letter summarizes my assessment of the DPM's impact on the three public parks which it will pass near: Telephone Pioneer Park, Times Square-Clifford Park, and Grand Circus Park.

Telephone Pioneer Park, 0.52 acres in size, occupies the entire triangular city block bounded by Times Square, Park Place, and State Street. The DPM design plans show the DPM guideway will pass by the park along the east side of Park Place (on the far side of this street from the park). A DPM station will be located on the northeast corner of the intersection of Park Place and Grand River Avenue (also across the street from the park).

Times Square-Clifford Park, 0.09 acres in size, occupies a triangular parcel at the intersection of Times Square and Clifford Street. The DPM design plans indicate that a support pier for the DPM guideway would occupy a corner of the park.

Grand Circus Park, 4.59 acres in size, occupies two semi-circular city blocks surrounded by Park Avenue, Witherell Street, and Adams Avenue, with the two halves of the park separated by Woodward Avenue. Within the last 25 years, this park was excavated for the construction of an underground parking facility, after which the park was reconstructed. Surface pedestrian entrance structures and vehicular ramps around its perimeter significantly altered its appearance. The DPM design plans indicate that the DPM guideway will pass adjacent to the park along the south side of Park and Witherell on the far side of these streets from the park. A DPM station will be located on the south side of the guideway in the vicinity of Woodward Avenue, and this station location may necessitate the removal of some sidewalk space on the Witherell side of the park, in order to maintain a satisfactory street width on Witherell itself.

It is my opinion that the DPM project would neither take nor impair the park-related use of the three public parks discussed above.

Sincerely,

DANIEL H. KRICHBAUM
Director

DHK:JJ:km

Figure V-21
LETTER FROM DIRECTOR OF
DETROIT RECREATION DEPT.

which would negatively impact other buildings including the building on the southwest corner of Congress Street and Cass Avenue. The facility layout shown in Figure II-5 proved the viable alternative (Alternative V in Figure V-14).

As a mitigation measure, SEMTA has agreed to record the building in accordance with the standards of the National Architectural and Engineering Record prior to its demolition.

v. Coordination

The Michigan SHPO has been active in reviewing and responding to alternative DPM alignments and alternative locations for the maintenance facility. After reviewing the location studies, the SHPO has not objected to the proposed use of the property. A copy of the DEIS was sent to the Michigan Department of State's History Division, the Advisory Council on Historic Preservation, the Department of the Interior, the Detroit Recreation Department, the Sierra Club, and the Michigan United Conservation Clubs. In accordance with the procedures of the Advisory Council on Historic Preservation, a Memorandum of Agreement concerning use of the property and the mitigation measures to be applied has been negotiated by the ACHP, UMTA, and SEMTA.

b. Grand Circus Park Historic District

i. Description and significance of property

The Grand Circus Park Historic District and its significance were described in Section A.4.b of this chapter. The location of the property is shown in Figure V-2. Photographs of the District are shown in Figure V-18.

ii. Proposed use

The DPM would pass through the District; one of its stations would span Woodward Avenue on the south side of Park Avenue (see alignment sheet 6 in Chapter II). No parkland or historic buildings would be taken. The Michigan SHPO is of the opinion that the DPM would introduce a visual element that is out of character with the historic fabric of the District (see Figure V-1, letter from SHPO).

iii. Alternatives

Alternatives to the proposed use were discussed in section A.4.b of this chapter. Most of that information is repeated here. Circulator bus alternatives, considered to be one means of avoiding impacts on the District, were analyzed. The description and impacts of the circulator bus alternatives are presented in Chapters II and IV. After a detailed analysis, these alternatives were discarded because they would be unable to provide the required degree of circulation within the CBD and would contribute much less

to the economic revitalization of the downtown than the DPM. The circulator bus alternatives would not aid in the badly needed revitalization of the Grand Circus Park area.

During the early phases of planning for the DPM, alternative alignments that did not penetrate the District were considered. The results of this analysis are discussed in the GM Transportation Systems Center's working papers (referenced in the preceding section on the Buckland-VanWald Building). In summary, the alternatives that did not penetrate the Grand Circus Park Historic District were eliminated from consideration because the SEMTA Board of Directors felt that DPM service there was essential to both the viability of the DPM itself and the economic health of the Grand Circus Park area. It is also desirable to have a station at Grand Circus Park to tie the DPM to the proposed light rail station at that location. Transfers between the DPM and the light rail system would help the DPM serve its essential function as a collection and distribution system within the CBD. The Board of Directors also felt that construction of a DPM station at Grand Circus Park was the most cost-effective way to serve the residents living around the park. It would not be economically feasible to extend the DPM to the north around the Historic District, as the additional guideway required would cost more than \$1 million. Finally, the Board of Directors agreed with the property owners in the Grand Circus Park area that a DPM station was an essential component of efforts to bring new economic life to the area. There is no viable alternative to DPM service in the District. The DPM's impact on the District would involve only slight alteration of the environment and visual isolation of one portion of the District from another.

iv. Mitigation

The location of the proposed alignment is the end result of a comprehensive effort to minimize the impact of the DPM on the Grand Circus Park Historic District. Studies of the area indicated that the key to the significance of the District is Grand Circus Park itself and the definition of the park by the towering buildings that surround it. It was established early in the study that the DPM would have the greatest negative impact if the alignment were located within the park. Such an action would seriously affect the integrity of the park as the focus of the Historic District. An elevated alignment would place a major structure out in the open between the buildings and the park, disturbing the definition of the park now accomplished by the surrounding buildings. Such a placement would also be a "taking" of parkland, as defined in Section 4(f) of the Department of Transportation Act, and would require a finding by the Secretary of Transportation that there is no prudent and feasible alternative to location of the guideway in the park and that all possible planning had been undertaken to minimize impacts on the park. Instead, it was concluded that there were prudent and feasible alternatives and that the park had to be ruled out as a location for the guideway. To minimize visual impacts, the guideway should be located away from the park. To do this and still achieve the transportation and economic goals of the DPM system,

two alternatives were considered: location of the alignment north of the park on Adams or south of the park along Park Avenue and Witherell Street. The northern alignment would result in increased costs and would surround about two-thirds of the park with the elevated guideway, disrupting the visual whole of the park and its immediate environs and increasing the cost of the system by adding to its length. The alignment would also require tight curves, reducing the speed of the transit vehicles, and would have to cross the park. The alignment along the south side of the park would reduce the amount of the park that would be affected by the DPM system and the cost of the system, while still providing needed transportation service. The south side of the park is also a much better location for the alignment and station in terms of the DPM's ability to facilitate the economic recovery of the historic hotels and office buildings in the area. Placement of the guideway along the south side of Park Avenue would disrupt the view of the structures south of the park, but would minimize impacts on the park's appearance and preserve the view of the park from all surrounding buildings. Impacts on some of the buildings along the south side of the park, while adverse, would not materially affect the qualities that make them historically significant. This is especially true of buildings such as the David Whitney Building, whose significance resides in its interior, rather than exterior, opulence.

The importance of the DPM in revitalizing the Grand Circus Park area is a significant factor in mitigating its impacts on this area. Many of the historic structures in the District are empty and in disrepair. The activity generated by the DPM is expected to allow many of the old buildings to become useful again as offices or hotels. With a DPM link to the Cobo Hall/Joe Louis Arena convention area, hotels in the Grand Circus Park Historic District would have a chance to operate profitably again.

Every aspect of design (including elevation control, choice of materials, etc.) will be considered, with the goal being to minimize the intrusion of the guideway structure into its surroundings. In addition to the mitigation measures described above, SEMTA has agreed to allow the SHPO to review the design of improvements to be constructed in the District.

v. Coordination

The SHPO and the city of Detroit have been consulted throughout the preliminary engineering phase of this project. A copy of the DEIS was sent to the Michigan Department of State's History Division, the Advisory Council on Historic Preservation, the Department of the Interior, the Detroit Recreation Department, the Sierra Club, and the Michigan United Conservation Clubs. Copies were also provided to the Detroit Community and Economic Development Department, the Chamber of Commerce, the Central Business District Association, New Detroit, and the Grand Circus Park Property Owners Association. In accordance with the procedures of the Advisory Council, a Memorandum of Agreement concerning use of the property and the mitigation measures to be applied has been negotiated by the ACHP, UMTA, and SEMTA.

c. Detroit Street Plan

i. Description and significance of property

The Detroit Street Plan and its significance were described in Section A.4.c of this chapter. The location of the area described in the original plan is shown in Figure V-2. A facsimile of the plan is shown in Figure V-19.

ii. Proposed use

The DPM would pass through the Detroit Street Plan area. The proposed Grand Circus Park station would span Woodward Avenue on the south side of Park Avenue (see alignment sheet 6 in Chapter II). No parkland or historic buildings would be taken. The SHPO is of the opinion that the Grand Circus Park DPM station would ". . . interrupt the vista out Woodward Avenue, a key element of the original city layout, by possibly creating the visual impression that the street terminates at the station when looking north from downtown" (see Figure V-1 for the complete text of the letter from the SHPO). Figure IV-8 presents views of the Grand Circus Park site before and after construction of the DPM station.

iii. Alternatives

Alternatives to the proposed use were discussed in Section A.4.c of this chapter. They are essentially the same as those presented in the previous discussion of the "4(f)" impacts on the Grand Circus Park Historic District. In summary, the alternatives include the circulator bus alternative, other DPM alignments that would not cross Woodward Avenue at Grand Circus Park, and locations for the Grand Circus Park station that would not span Woodward Avenue at Grand Circus Park.

The circulator bus alternatives and their impacts are described in Chapters II and IV. After a detailed analysis, these alternatives were eliminated from consideration because they would be unable to provide the required degree of circulation within the CBD and would contribute much less to the economic revitalization of the downtown than the DPM. The circulator bus alternatives would not aid in the badly needed revitalization of the Grand Circus Park area.

Alternative DPM alignments were analyzed (descriptions of them were presented earlier in this document). In summary, the alternatives that did not penetrate the Grand Circus Park area were eliminated from consideration because the SEMTA Board of Directors felt that DPM service to the area was essential to both the viability of the DPM itself and the economic health of the Grand Circus Park area. The location of the Grand Circus Park DPM station at Woodward and Park Avenues was chosen as the alternative with the least impact on the Grand Circus Park Historic District and on individual buildings such as the David Whitney and Fyfe buildings. Among the alternative station sites that were considered are two on the north side of Park Avenue and two on the south. The

sites on the north were eliminated due to their impacts on the park and church. The sites on the south included one adjacent to the David Whitney Building on Washington Boulevard and the other spanning Woodward Avenue. Integration of the former alternative into the Whitney Building was considered. This alternative was dropped from further consideration as integration into the Whitney Building would have resulted in adverse impacts on the interior lobby of the building, which is the key to its architectural significance. Placement of the station outside of the building would have obscured the facade. The alternative that spans Woodward Avenue was preferred because it has the least impact on historic properties. This location would not affect the park and would not require alteration or destruction of any historic property.

iv. Mitigation

Selection of the proposed location for the Grand Circus Park DPM station was the result of an extensive effort to minimize the impact of the DPM on parkland and historic properties. A station spanning Woodward Avenue is, in effect, an alternative that mitigates the impact of the system in the Grand Circus Park area.

Additional mitigation of visual impacts will occur once the Woodward Transit Mall has been completed. The mall will include plantings and street furniture, reducing site distances along the mall and, therefore, reducing the distance from which the guideway and station would be visible. The portion of the mall south of Grand River Avenue may be covered in the future, thereby also reducing the visibility of the DPM from Woodward Avenue to the south.

SEMTA has agreed to conduct a detailed engineering study to review the design and placement of the Grand Circus Park station. SEMTA has agreed to allow the SHPO to review the design of structures and stations in the Grand Circus Park area. In the final design, every effort will be made to reduce the obtrusiveness of the DPM. Also, as part of the Cadillac Center Mall project, the City of Detroit is about to begin recording the Street Plan to the standards of the National Architectural and Engineering Record. This is stated in a Memorandum of Agreement, dated January 16, 1980, between the city, the SHPO, and the ACHP.

v. Coordination

The SHPO and the city of Detroit have been consulted throughout the preliminary engineering phase of this project. A copy of the DEIS was sent to the Michigan Department of State's History Division, the Advisory Council on Historic Preservation, the Department of the Interior, the Detroit Recreation Department, the Sierra Club, and the Michigan United Conservation Clubs. Copies were also provided to the Detroit Community and Economic Development Department, the Chamber of Commerce, and the Central Business District Association. In accordance with the procedures of the Advisory Council, a Memorandum of Agreement concerning use of the property and the mitigation measures to be applied has been negotiated by the ACHP, UMTA, and SEMTA.

C. ARCHAEOLOGY

No sites known to be of archaeological significance would be affected by the DPM project. However, excavations within the CBD for recent projects, particularly the Renaissance Center along the Detroit River, have resulted in the discovery of archaeological remains. SEMTA would make every effort to preserve archaeological finds made during construction of the DPM. The only potential impacts on archaeological resources would occur during placement of the footings and construction of the maintenance facility. SEMTA has agreed to hire a qualified consultant to research the applicable literature and identify areas of the CBD in which archaeological remains are likely to be located. In those areas, SEMTA would make qualified personnel available to determine the presence of archaeological remains. If such material were discovered, construction would be delayed, allowing archaeologists to evaluate the find and salvage any artifacts. A similar procedure would be followed during excavations at the proposed maintenance site.

VI. COMMENTS AND RESPONSES ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

A. INTRODUCTION

The Draft EIS was circulated between March 14, 1980 and May 12, 1980. During that period, ten commenting letters were received from federal, state, and local agencies. The official public hearing was held at the Pontchartrain Hotel in Detroit, Michigan on Thursday, April 24, 1980. Nine people made oral comments. A total of 16 different commentors responded:

U.S. Environmental Protection Agency, Region 5 Office,
Chicago, Illinois;

U.S. Department of Transportation, Federal Highway Ad-
ministration, Region 5 Office;

U.S. Department of Health, Education and Welfare, Public
Health Service;

U.S. Department of Interior;

Advisory Council on Historic Preservation;

Michigan Environmental Review Board;

Southeast Michigan Council of Governments;

Wayne County Planning Commission;

Cityscape Detroit;

Robert C. Hayes;

Ernest A. Barstow;

James A. Wilkins;

Robert C. Maul;

Thomas W. Reardon;

Robert Thibodeau; and

Alex C. Aho.

All substantive comments received on the Draft EIS and the responses to them are listed below. The comments are paraphrased, the author is identified, and the page(s) in the text on which the comment is addressed in more detail is noted. The changes in the text are identified by a vertical bar in the margin.

B. COMMENTS AND RESPONSES

1. Impacts on Historic Properties

Comment #1: During demolition of the Buckland-VanWald Building and the building attached to it, care should be taken to ensure that dust is controlled by such measures as watering the structure during demolition, limiting work on windy days, and covering haul trucks to prevent a re-suspension of dust (U.S. Environmental Protection Agency, Region 5).

Response #1: The air quality portion of the construction impacts section of Chapter IV (page IV-53) reflects the measures suggested by the U.S. Environmental Protection Agency (EPA) to control dust during demolition of the Buckland-VanWald Building.

Comment #2: Two businesses are located in the immediate area of the proposed maintenance facility (Robert C. Maul).

Response #2: All references to one business being located in the immediate vicinity of the proposed maintenance facility have been changed to indicate that there are two businesses on the property.

Comment #3: The proposed maintenance facility would require acquisition of the land and demolition of the building at 466 West Larned (Thomas W. Reardon).

Response #3: Acquisition of the property at 466 West Larned was mentioned in the Draft EIS and the property is shown in Figure IV-3.

Comment #4: Why can't sharp 90-degree turns be used in locations other than Beaubien (for instance, near the Buckland-VanWald Building) to minimize disruption? (Cityscape Detroit).

Response #4: As indicated on alignment sheet 1, which depicts the alignment of the DPM, several 90-degree turns have been used to minimize disruption and the taking of private property, while still allowing service to important activity areas in the downtown. In fact, a 90-degree turn has been used at the intersection of Cass Avenue and Larned Street near the site of the Buckland-VanWald Building to minimize disruption in that area.

Comment #5: The Draft EIS contains no adequate explanation of why the maintenance facility and the Cobo Hall station could not be located elsewhere, thereby avoiding destruction of the Buckland-VanWald Building (Robert C. Hayes).

Areas immediately west and north of the proposed maintenance facility include large tracts of vacant land and should be reconsidered as alternative sites for the maintenance facility (Cityscape Detroit).

I am concerned about demolition of the Buckland-VanWald Building to construct a maintenance facility. Perhaps one of the many parking lots on the route could be used to construct the facility. To remove

a fully-occupied building whose owners and lessees have had the courage and conviction to remain in Detroit during good times and bad is disconcerting. This does not seem the correct way to treat a viable business or to encourage new investment from a long-standing company that should be benefitted by a system such as the DPM. The building in question is also very attractive and is of historical importance, which adds to the character of our city (Alex C. Aho).

Response #5: The information in Chapter V has been expanded to provide additional justification for the determination that the Buckland-VanWald site is the only prudent and feasible site for location of a DPM maintenance and storage facility for the downtown. Eleven alternative sites were developed and analyzed, and the conclusion was that the Buckland-VanWald site was the only suitable one for the maintenance facility. The other alternatives were eliminated due to unacceptable impacts on ridership, joint development possibilities, cost, and/or geometric constraints such as those imposed by the proposed Detroit-Windsor tramway. A Memorandum of Agreement has been signed by the Michigan State Historic Preservation Officer and the Advisory Council on Historic Preservation, allowing SEMTA to use the site of the Buckland-VanWald Building, with the provision that it be recorded according to the standards of the National Architectural and Engineering record prior to its demolition and that a comprehensive archaeological survey be conducted prior to construction.

Comment #6: Is it not possible to locate the Woodward Avenue station in a portion of the David Broderick Building, thereby incorporating an existing structure into the plan? The obstruction of the sight line on Woodward Avenue would be detrimental to the appearance of the street. Incorporation into the Broderick Building would have the added benefit of allowing direct access to an office building and offering a creative approach to a station location (Alex C. Aho).

The DPM station at Grand Circus Park appears to obliterate the northward vista on Woodward Avenue. We prefer that the station design respect that vista, that it not block off Woodward Avenue, and that engineering and architectural means to avoid that visual barrier be further explored (Cityscape Detroit).

Response #6: SEMTA has agreed to undertake further detailed engineering studies of the Grand Circus Park station before proceeding with final design of the DPM system. Alternative locations for the station will be considered, as will design measures to minimize the obtrusiveness of the station as it spans Woodward Avenue at Park Avenue. The State Historic Preservation Officer and the Advisory Council on Historic Preservation have agreed to participate in the study and accept the findings of the engineering studies.

Comment #7: The Draft EIS does not support the proposed determinations under Sections 106 and 4(f) because it fails to present sufficient consideration of alternatives to the proposed actions and measures to minimize impacts (USDOT, Office of the Secretary).

Response #7: Additional information has been incorporated in Chapter V supporting the Sections 106 and 4(f) analysis. In addition, a separate report describing the maintenance site selection process has been prepared and forwarded to the Office of the Secretary as justification for the Section 4(f) finding. A Memorandum of Agreement has been signed with the Advisory Council on Historic Preservation fulfilling the Section 106 requirements.

2. Impacts on CBD Transportation

Comment #8: We suggest that consideration be given to the incorporation of a pedestrian mall in the CBD area defined by Adams Street, Cass Avenue, Jefferson Avenue, and Beaubien Street (U.S. Environmental Protection Agency, Region 5).

Response #8: The planning department of the City of Detroit is presently studying pedestrian movements within the CBD. The products of this study are expected to be definitions of additional pedestrian areas in the central city and modifications of and additions to the existing skyway system. Pedestrian malls are not within the scope of the present study to determine an alignment for a downtown people mover system or a circulator bus system.

Comment #9: Intersections near stations that cannot accommodate increased numbers of pedestrians without having adverse effects on existing levels of service for vehicles should be identified. Similarly, intersections at which an increase in pedestrians would reduce levels of service should be identified and the impacts analyzed. Such an analysis should also identify proposals for mitigating the potential safety and operational problems resulting from unacceptable levels of service and conflicts between vehicles and pedestrians (U.S. Department of Transportation, Federal Highway Administration, Region 5).

Response #9: New information has been added to the section describing impacts on transportation (Chapter IV, page IV-8). In summary, the numbers of pedestrians at DPM stations are not expected to have any negative effects on vehicular traffic. Several of the heavily used stations would be reached either through new or planned buildings or through a skyway system separating pedestrians from auto traffic. Pedestrian volumes at other stations and at intersections near proposed DPM stations could be accommodated without adverse effects on traffic.

Comment #10: Page IV-2 of the document states that additional sidewalk space will be provided in areas of heavy pedestrian traffic. These areas should be identified and the effect on traffic of converting roadway space to new sidewalk areas should be analyzed (U.S. Department of Transportation, Federal Highway Administration, Region 5).

Response #10: The additional sidewalk area provided is shown on the station area plans contained in the section of Chapter II that describes alternatives. No existing traffic lanes would be taken to provide the new sidewalk areas; therefore, no effect on traffic is anticipated.

Comment #11: The documents indicate that curb lanes will be eliminated in some locations to accommodate pier supports. Additional clarification is necessary. The removal of curb lanes affects traffic operations and level of service in areas where such lanes are utilized during peak hours such as travel lanes or bus stops (U.S. Department of Transportation, Federal Highway Administration, Region 5).

Response #11: Removal of the curb lanes would affect only on-street parking. Some on-street parking would be removed for placement of the pier supports. The curb lanes that would be used are not presently utilized during peak hours as travel lanes. Bus stops can be accommodated within the present design of the DPM system.

Comment #12: Page IV-4 of the document indicates that traffic in the CBD would be reduced by eight percent with implementation of the DPM, as compared to the no-build alternative. This reduction is based on the substitution of DPM trips for the trips to the CBD once made by auto. The impacts on regional traffic were quite different; the Draft EIS states (pages IV-1 and IV-2) that the CBD will attract more trips as a result of the DPM and additional development. The effects of these additional trips are not discussed in the documents (U.S. Department of Transportation, Federal Highway Administration, Region 5).

Response #12: It is difficult to assess the impacts on traffic of development spawned by implementation of the DPM. It is also difficult to separate the impacts of the DPM on regional traffic from those of other regional transit improvements, be they rail or bus. It is likely, however, that the additional auto trips attracted to the CBD as a result of increased development would be more than offset by the reduction in intra-CBD auto travel due to the DPM. The development stimulated by the DPM is expected to include 600 additional hotel rooms, a 5 to 5 1/2 percent increase in office space, an additional 15,000 residential units, and more retail space (due primarily to the increased mobility of CBD residents and workers, not to visitors to the downtown from the region). This extent of development would not increase traffic by nearly as much as the eight percent that would be necessary to offset the direct reduction in CBD traffic due to the DPM. The traffic reduction due to the DPM would be a reduction in intra-CBD auto trips as well as regional trips to the CBD.

Comment #13: The Draft EIS indicates that the DPM will provide an incentive for carpools (page IV-54). The basis and extent of such a relationship should be identified. The document should also identify the relationship of the DPM to other regional transportation system management actions (U.S. Department of Transportation, Federal Highway Administration, Region 5).

Response #13: While it is impossible to quantify the effect of the DPM on carpooling, the DPM would provide an incentive to carpools to the extent that inadequate transit circulation in the CBD now requires that an automobile be used for many trips within the CBD. Some persons may be reluctant to carpool because their mobility is limited if they are

downtown without an automobile. The DPM would improve circulation in the CBD, giving those who need mobility in the CBD the choice of car-pooling.

Comment #14: Why doesn't the DPM have ready access to the bus station? (Cityscape Detroit).

Response #14: The bus station does have ready access to the DPM system. The bus station is located less than one block away from the proposed DPM station at Millender Center.

Comment #15: Even though the DPM could be an important component of any future regional transit system, the EIS should state whether it is more important to improve the circulation pattern in the CBD or improve access to regional transit to and from the CBD. Which of the two options would best ensure long-term revitalization in the CBD and improve regional air quality? (U.S. Department of Health, Education, and Welfare, Public Health Service).

Response #15: The city of Detroit and SEMTA believe that an improved regional transportation system and an improved circulation system within the CBD are necessary to ensure long-term revitalization. Neither component would, by itself, have the desired effect. Improved regional access to the CBD would not be effective without a better CBD circulation system to move those people to their final destinations. Similarly, the latter circulation system would be enhanced by an improved regional transit system that could move large numbers of people into the Detroit CBD.

3. Natural Environmental Impacts

Comment #16: On page II-55 of the Draft EIS, it is noted that concentrations of air pollutants may increase near some of the DPM stations. The significance of these increases should be determined, and if concentrations are expected to exceed the standards, mitigation measures should be noted (U.S. EPA, Region 5).

Response #16: Further analysis has indicated that no increase in concentrations of air pollutants would be expected in the vicinity of DPM stations. The DPM stations include no provisions for automobile access. Pedestrians at the DPM stations are not expected to cause increased automobile congestion at nearby intersections. Therefore, air quality would not be affected.

Comment #17: In one of the designs for the DPM, the guideway is enclosed in a glass tube. This alternative should be explored further, since it might reduce the amount of energy used by lowering wind resistance, it would require less maintenance during the winter, and would reduce the noise levels that would be experienced in adjacent buildings (U.S. EPA, Region 5).

Response #17: SEMTA will advertise for and accept bids from suppliers for the DPM system and will consider alternative systems that include a covered guideway.

Comment #18: National ambient air quality standards (page III-12) are promulgated by the EPA; they are not contained in the Clean Air Act (Southeast Michigan Council of Governments).

Response #18: The appropriate change has been made on page III-12.

Comment #19: Transportation emissions for Wayne County as a whole are mentioned on page III-12. These percentages, referenced as information from the preliminary Draft EIS for the alternatives analysis, were far out of date and should be revised in accordance with our comments on the preliminary DEIS (Southeast Michigan Council of Governments).

Response #19: The appropriate changes have been made in the air quality section of Chapter III.

Comment #20: Table IV-10 (page IV-42) should be checked. The emissions appear to be in error by a factor of ten when compared to the data on CBD emissions that we have gathered (Southeast Michigan Council of Governments).

Response #20: Table IV-10 has been revised, with the inclusion of more up-to-date emission factors. This change still does not increase the emissions enough to make them compatible with the data generated by the Southeast Michigan Council of Governments. The differences between Table IV-10 and the Council of Governments' data are due to the fact that the latter data include auto traffic on the freeways surrounding the CBD and the data in Table IV-10 do not.

Comment #21: No information is presented to describe the additional energy consumed by the DPM (James A. Wilkins).

Response #21: Information about the expected energy consumption of the DPM and circulator bus alternatives is contained in Section D.6 of Chapter IV.

4. Economic Impacts

Comment #22: The DPM is, in effect, an elevated railway. Doesn't this drastically reduce the value of adjacent properties? (Robert C. Maul).

Response #22: The DPM is not expected to have adverse effects on adjacent properties. In fact, because of the increased accessibility it will afford, the DPM is expected to increase the value of adjacent properties, especially in the vicinity of stations.

Comment #23: The means of covering the operating deficit of the DPM should be ascertained and made public before final approval of the project is given (James A. Wilkins).

Response #23: It is the policy of SEMTA's Board of Directors that the DPM will not operate at a deficit. However, if operating costs are not covered by farebox revenues, the DPM's hours of operation may be reduced, fares raised, or a subsidy out of the general SEMTA operating budget may have to be instituted.

Comment #24: Is the cost of constructing parking garages included in the total capital cost of \$109 million? (James A. Wilkins).

Response #24: The cost of parking garages is not included in the total capital cost of \$109 million. There are no parking garages directly associated with the DPM alternative.

Comment #25: The assumption used in the Draft EIS of 127,000 CBD employees in 1990 does not seem realistic to me, given the economic conditions of the automobile industry today (James A. Wilkins).

Response #25: In the past few years, the Detroit CBD has shown significant strength in employment. Current estimates range from 105,000 to 110,000 employees. SEMTA believes that the projected employment level is very realistic, especially as energy costs continue to rise and as committed and planned developments are completed. The impact of any changes in Chrysler's number of employees would be strictly secondary, as Chrysler presently has almost no CBD-based employees.

Comment #26: What would the operating deficit be if, instead of 107,000 employees, there were only 75,000 employees in the CBD in 1990? (James A. Wilkins).

Response #26: In that case of course, the number of patrons would be reduced with a resultant drop in operating revenues. This drop in revenues could be offset by reducing hours, increasing fares, or subsidies.

5. Alternatives

Comment #27: Have alternative circulator bus schemes and designs been considered? (U.S. Department of Health, Education, and Welfare, Public Health Service).

Response #27: The bus alternatives described and analyzed in this EIS range from continuation of the existing circulator bus system to a new, extensive system patterned to duplicate as much as possible the service provided by the DPM. The extensive circulator bus system resulted from the analysis of several bus alternatives. These alternatives and the selection process are documented in a working paper prepared by the systems engineering consultant which is available at the project offices of SEMTA. In addition, the section of Chapter II describing alternatives has been modified to include more information about the development of bus alternatives.

Comment #28: The do-nothing alternative is not mentioned in Chapter II, Section A, "Development of Alternatives." It is understood that other

transit improvements have been studied and eliminated; however, the do-nothing alternative should be included in the EIS as a viable alternative, as well as a basis for comparing the impacts of other alternatives (Southeast Michigan Council of Governments).

Response #28: The do-nothing alternative is included in the EIS. This alternative is referred to as continuation of the existing circulator bus system, as described in Chapter II, and is analyzed in Chapter IV as one of the various circulator bus alternatives considered.

Comment #29: Are there solutions other than the crossing of Jefferson Avenue at three separate locations that could be considered? (Cityscape Detroit).

Response #29: To serve the Renaissance Center, the DPM must cross Jefferson Avenue at a minimum of two locations. The third crossing of Jefferson is necessary to serve the Financial District and the Cobo Hall/Joe Louis Arena area. Alternative DPM alignments were developed and analyzed in detail; the resulting selection of an alignment is described in the EIS.

Comment #30: The Final EIS should include a more thorough consideration of alternate alignments for the DPM (USDOT, Office of the Secretary).

Response #30: Alternative DPM alignments were considered in detail during the study and were fully documented in several working papers which are referenced in this document. Additional information from those working papers has been included in Chapter II.

Comment #31: The EIS does not present any information which would indicate that two-way circulator bus service is not feasible. The Final EIS should accurately reflect the full capacity and service potential of a circulator bus system alternative.

Response #31: Appropriate changes have been made to the summary and Chapters II and IV to reflect the impacts of a two-way circulator bus systems.

6. Miscellaneous Impacts

Comment #32: A brief discussion of the type and frequency of accidents associated with people mover systems and bus systems would be desirable (U.S. Department of Health, Education, and Welfare, Public Health Services).

Response #32: Because DPM systems employ a relatively new technology, there is little information available about the type and frequency of accidents that can be expected, particularly about systems that operate in a concentrated urban area such as the Detroit CBD. UMTA's DPM program is designed to be a demonstration program. One purpose of that program is to assess the reliability and accident characteristics of DPM technologies in a CBD environment.

Comment #33: We are interested in learning what measures are proposed to prevent falls into oncoming vehicles and from elevated stations, as well as measures to prevent vehicle collisions (U.S. Department of Health, Education, and Welfare, Public Health Service).

Response #33: Passenger safety was the subject of a detailed study during preliminary engineering for the DPM. An overall safety plan was prepared by Frank C. Smith & Associates, a safety consultant to SEMTA. This plan includes criteria that have been incorporated into the specifications for the system. The DPM would operate on an elevated guideway; the only access points to it would be the 13 stations. To prevent passengers from falling into oncoming vehicles or falling onto the ground from elevated stations, the platform surfaces in the passenger traffic areas would be treated to minimize the possibilities of slipping (non-skid surface). In addition, all platforms would have at least partial barriers to reduce the possibility of persons entering or accidentally falling into the guideway. An automated train protection system would be employed to perform the following functions:

- . Prevent rear-end collisions caused by one vehicle overtaking another;
- . Prevent head-on or sideswipe collisions caused by admitting vehicles onto conflicting routes;
- . Prevent derailments or collisions that occur when switching equipment is moved while a vehicle is approaching or occupying a switching point;
- . Prevent derailments or collisions caused by vehicles traveling at speeds too great for guideway conditions; and
- . Reduce the risk to passengers on board a vehicle if any unsafe condition occurs. The automatic train protection system would be a failsafe one and would operate independently of other train control functions.

Comment #34: Several of the buildings in Figure IV-4, "Location of Major Community Services and DPM Route," are shown in the wrong locations. In addition, at least seven major governmental offices are not shown on the map: Detroit Water Board Building, Murphy Hall of Justice, Detroit Police Headquarters, Old Federal Building, IRS Service Center, Wayne County Road Commission, and Wayne County Building Annex (Wayne County Planning Commission).

Response #34: The appropriate changes have been made on Figure IV-4.

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Washington Boulevard Plaza: II-50, III-4, III-21, IV-10 through IV-12, IV-34.

Water quality impacts: II-55, II-60, III-17, IV-42, IV-44.

Wayne County Building: III-20.

LIST OF RECIPIENTS OF FINAL ENVIRONMENTAL IMPACT STATEMENT

FEDERAL AGENCIES

Department of Transportation, Assistant Secretary for Policy and International Affairs
Department of Transportation, Regional Representative of the Secretary
Department of Transportation, Federal Highway Administration, Michigan Division, Lansing, Michigan
Environmental Protection Agency, Office of Environmental Review, Washington, D.C.
Environmental Protection Agency, Region V Office, Chicago, Illinois
Department of Housing and Urban Development, Region V Office, Chicago, Illinois
Federal Emergency Management Agency, Washington, D. C.
Federal Emergency Management Agency, Region V, Chicago, Illinois

Department of Interior
Department of Agriculture
Department of Commerce
Advisory Council on Historic Preservation
Department of the Army, Corps of Engineers, District Engineer
Office of Management and Budget
Department of Health, Education and Welfare, Public Health Service
Advisory Council on Historic Preservation

STATE AGENCIES

Department of Agriculture
Department of the Attorney General
Department of Civil Rights
Department of Civil Service
Department of Commerce
Department of Corrections
Department of Education
Department of Labor
Department of Licensing and Regulation
Department of Management and Budget
Department of Mental Health
Department of Military Affairs
Department of Natural Resources, Environmental Enforcement Division
Department of Public Health, Environmental Health Division
Department of State, History Division
Department of State Police
Department of Transportation
Department of Treasury
Michigan Environmental Review Board

MICHIGAN STATE LEGISLATIVE COMMITTEES

Appropriations
Highways and Transportation
Taxation
Roads and Bridges
Urban Affairs

LEGISLATIVE OFFICIALS

Members of the Michigan Legislature who represent Wayne, Oakland, and Macomb Counties

Members of the U. S. House of Representatives who represent Wayne, Oakland, and Macomb Counties including:

- James J. Blanchard 18th District
- David E. Bonior 12th District
- William M. Brodhead 17th District
- William S. Broomfield 19th District
- John J. Conyers 1st District
- Charles C. Diggs, Jr. 13th District
- John D. Dingell 16th District
- William D. Ford 15th District
- Lucien N. Nedzi 14th District
- Carl D. Pursell 2nd District

U. S. Senator Carl Levin

U. S. Senator Donald W. Riegle

REGIONAL AGENCIES

Southeast Michigan Council of Governments

COUNTY AGENCIES

County Executives, Road Commissions, and Planning Departments of the following counties:

Livingston
Macomb
Monroe
Oakland
St. Clair
Washtenaw
Wayne

LOCAL AGENCIES

Executive Offices of the following cities:

Detroit
Highland Park
Hamtramck
Detroit Departments

- Recreation
- Planning
- Community and Economic Development
- Transportation
- Parking
- Engineering
- Police
- Fire

CIVIC ORGANIZATIONS

Chamber of Commerce
Sierra Club
League of Women Voters
Michigan United Conservation Clubs
United Auto Workers
AFL-CIO
Teamsters
Statewide Coalition for Transportation
Metropolitan Fund
Central Business District Association
New Detroit
Michigan Council for Senior Citizens
Council of Churches
NAACP
Urban League
Urban Alliance
Civic Searchlight
Grand Circus Park Property Owners Association
Cityscape Detroit

INDIVIDUALS

Robert C. Hayes
Ernest A. Barstow
James A. Wilkins
Robert C. Maul
Thomas W. Reardon
Robert Thibodeau
Alex C. Aho



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