

Downtown Raleigh Intermodal Transportation Center Feasibility Study

FINAL REPORT

F E B R U A R Y 1 9 9 6

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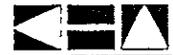


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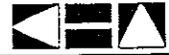


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1 INTRODUCTION, GOALS, AND OBJECTIVES

1.0 Study Purpose

This Downtown Raleigh Intermodal Transportation Center Feasibility Study was originally conceived by the North Carolina Department of Transportation as a way to improve passenger rail service between Raleigh and Charlotte (utilizing Amtrak's *Carolinian*). A 1993 study recommended that "the N.C. Department of Transportation should continue to promote and press for intermodal stations wherever they are feasible." The Department of Transportation's study suggested an examination of new high-speed ground transportation technologies that could meet intercity passenger demand at these intermodal locations.

Concurrently, other regional and local transportation planners and service operators have recognized that a number of other existing and proposed passenger services could be integrated into a proposed intermodal facility. For example, the Triangle Transit Authority (TTA) is currently proposing a regional rail system using existing railroad corridors to serve the citizens of the Triangle communities. A downtown Raleigh passenger rail station has been proposed as part of the regional rail service plan. This station could be located along the Norfolk Southern railroad tracks skirting the west side of downtown.

Amtrak, Greyhound Lines and Carolina Trailways have also been discussing the benefits of a combined intercity station in

downtown Raleigh for bus and rail passengers.

Therefore, the list of existing and proposed transportation services that could (potentially) be coordinated at a single downtown Raleigh facility includes:

- Existing or expanded intercity rail passenger service (Amtrak/NCDOT operations);
- Existing or expanded Capital Area Transit bus service;
- Existing or expanded TTA regional bus service;
- Existing or expanded intercity bus service (Greyhound/Trailways);
- Existing or expanded private taxi/limousine/airport shuttle service;
- Proposed TTA regional rail service;
- Proposed high-speed rail service;
- Proposed parking and auto drop-off service; and
- Bicycles and pedestrians.

In summary, a downtown intermodal transportation center, if constructed, would be designed to improve connectivity among



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EXECUTIVE SUMMARY

This Downtown Raleigh Intermodal Transportation Center Feasibility Study was originally conceived by the North Carolina Department of Transportation as a way to improve passenger rail service between Raleigh and Charlotte (utilizing Amtrak's *Carolinian*). A 1993 study recommended that "the N.C. Department of Transportation should continue to promote and press for intermodal stations wherever they are feasible." The Department of Transportation's study suggested an examination of new high-speed ground transportation technologies that could meet intercity passenger demand at these intermodal locations.

Concurrently, other regional and local transportation planners and service operators have recognized that **a number of other existing and proposed passenger services could be integrated into a proposed downtown intermodal Transportation Center (ITC) facility.** For example, the Triangle Transit Authority (TTA) is currently proposing a regional rail system using existing railroad corridors to serve the citizens of the Triangle communities. A downtown Raleigh passenger rail station has been proposed as part of the regional rail service plan; this station could be located along the Norfolk Southern railroad tracks skirting the west side of downtown. Amtrak, Greyhound Lines and Carolina Trailways have also been discussing the benefits of a combined intercity station in downtown Raleigh for bus and rail passengers. Other transportation modes that could benefit from a downtown intermodal

facility include the Capital Area Transit and Triangle Transit Authority bus systems; private taxi/limousine/airport shuttle services; proposed high-speed rail service; and downtown bicycle users and pedestrians.

In summary, a downtown intermodal transportation center, if constructed, would be designed to improve connectivity among travel modes. The location, function, and design of a transportation center would respond to the need for significant new development that contributes to the quality of life of Downtown Raleigh.

Several goals were established for the downtown intermodal center project:

- Consolidate connections among downtown transportation modes;
- Increase the percentage of transit ridership;
- Minimize travel time to station and increase passenger convenience;
- Implement a cost-effective transportation enhancement for downtown;
- Improve downtown traffic and transit operations; and
- Activate and enhance downtown development.

An extensive analysis was conducted of downtown land uses and zoning, development plans, employment and



population, housing, retail activity, traffic and parking conditions, local and regional bus transit services, and existing and proposed passenger rail service to downtown. As a result of that analysis, approximately 9,640 weekday arrivals and departures were forecast to occur at a new downtown intermodal transit center by the year 2020. Local CAT bus service and the proposed regional rail system would account for almost half of all passenger transfers at the facility.

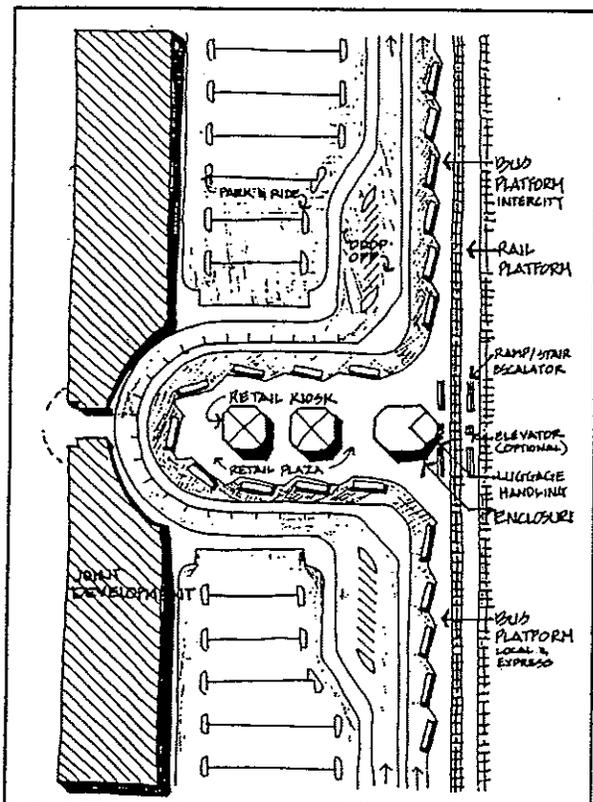
Several design features were recommended for the downtown center, including pedestrian spaces, auto drop-off/pick-up spaces, auto parking spaces, local and express bus bays, intercity bus bays, and intercity and regional rail passenger

platforms. Using those criteria, three **prototypical design concepts** were developed: a minimum concept with no joint development features; a moderate concept with upgraded features and a moderate level of joint development features; and a maximum concept that takes advantage of the joint development opportunities that may exist in a downtown Raleigh facility.

A site option analysis was then conducted, taking into account the downtown area's "center of gravity" with regard to employment and other activities, existing and planned transportation services, existing development, and land size requirements. Nine preliminary areas of analysis were developed, primarily clustered on the west and southwest sides of downtown. After applying several preliminary evaluation criteria, five sites were selected for detailed evaluation on the western edge of downtown bordering several railroad tracks. The evaluation process included an examination of modal connections, transit usage, travel time, cost-effectiveness, impact on traffic and transit operations, railroad operations, and development opportunities. The evaluation resulted in the recommendation of a site southeast of the intersection of Hargett and Boylan, known as the "center of the railroad triangle," for the downtown ITC.

This site has the following key benefits:

- It maximizes the connections among all downtown transportation modes, including local and express bus, intercity bus, intercity passenger rail and proposed regional rail services.
- It is the only site that can *directly* accommodate all potential rail passenger

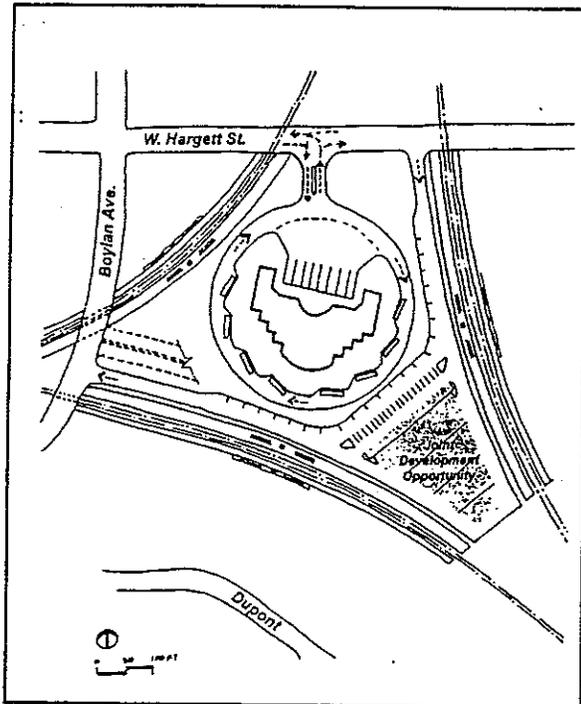


Early Design Concept for Maximum ITC Prototype



transfers at one location, without any special back-and-forth maneuvering of trains.

- The size and location of the site easily accommodates a *staged development*



Recommended Site for Downtown ITC

plan to incrementally develop the facility as the regional transportation system develops.

- Given that the facility must be located along the railroad corridor, this site is as close as possible to the center of Downtown Raleigh's employment, thereby maximizing its development and joint development potential.

Conclusions and Recommendations

In summary, the two biggest contributors of passengers to the proposed downtown ITC are the CAT bus system and the proposed TTA fixed-guideway regional rail system. Rerouting all downtown CAT routes through the ITC is operationally feasible only if the regional fixed-guideway system is implemented. Therefore, a **full-scale downtown Intermodal Transfer Center is feasible only if the proposed regional fixed guideway system is approved, funded, and built.**

If the regional rail proposal is not approved, a reduced-scale project, including a new Amtrak rail station and intercity bus facilities, could be implemented at the same location, with rerouting of some CAT service or establishment of a downtown shuttle service to link other parts of downtown with the center.

A staging and phasing plan was recommended to allow the project to proceed incrementally and to implement portions of the facility only as they become appropriate and cost-effective to build.

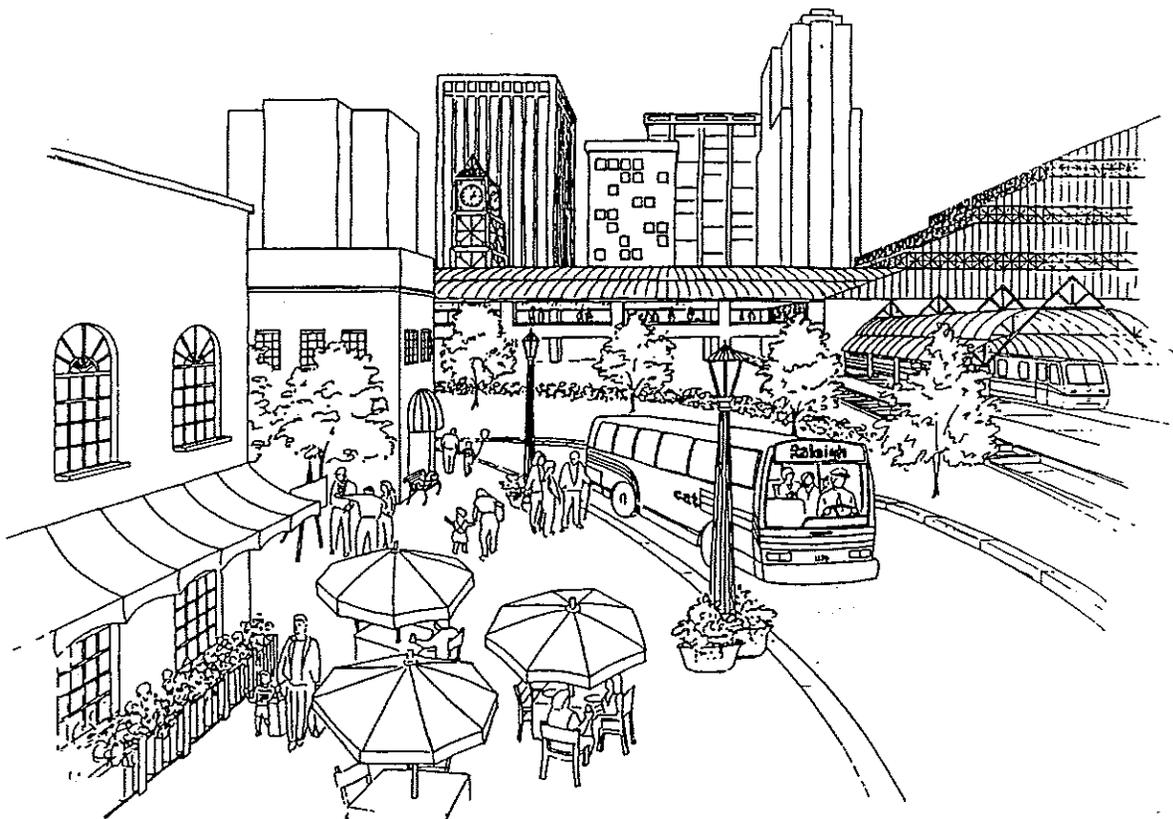
- Phase One would consist of approval by local public agencies of the recommended site as the preferred location for a downtown ITC, communicating the public sector's intent to secure the site for transportation purposes and protecting the site from other development.
- Phase Two would move Amtrak and intercity bus operations to an interim facility on the site, with a minimal amount of local bus service diverted to



the interim facility. Costs would range from \$3.4 million to \$5.4 million, including costs for the purchase of the property (\$1.5 million).

- Phase Three would add additional rail platforms to accommodate regional and intercity rail services, with full local bus service diversion to the facility. **These activities would occur only if the regional fixed guideway system is built.** Costs for this phase are estimated at approximately \$8 million.
- Phase Four would include the solicitation and implementation of joint development features, with the costs to be absorbed by the private sector.

Concept Plan for Downtown ITC





1 INTRODUCTION, GOALS, AND OBJECTIVES

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- Proposed TTA regional rail service;
- Proposed high-speed rail service;
- Proposed parking and auto drop-off service; and
- Bicycles and pedestrians.

In summary, a downtown intermodal transportation center, if constructed, would be designed to improve connectivity among



travel modes. The location, function, and design of a transportation center would respond to the need for significant new development that contributes to the quality of life of Downtown Raleigh.

1.1 Purpose of This Chapter

The purpose of this chapter is to describe a framework for conducting the feasibility study. In addition to documenting the study's purpose, several specific project goals and objectives are outlined. These goals and objectives were derived from a set of project issues developed early in the project by the study's Advisory Committee.

The chapters prepared during the course of this study include:

- Chapter 1: Introduction, Goals and Objectives
- Chapter 2: Existing Conditions and Trends
- Chapter 3: Functional and Spatial Requirements
- Chapter 4: Site Location Options
- Chapter 5: Site Recommendations

1.2 Study Management

The City of Raleigh has agreed to serve as overall study manager. A project Advisory Committee has been established to provide regular study direction and coordination among the various public and private

transportation planning and operating agencies. The Advisory Committee has the following representation:

- City of Raleigh Planning and Transportation Departments;
- North Carolina Department of Transportation and its Rail and Public Transportation Divisions;
- Triangle Transit Authority;
- Amtrak;
- CSX Transportation Corp.;
- Norfolk Southern Railroad;
- Carolina Trailways and Greyhound Lines;
- Downtown Raleigh Development Corporation;
- Raleigh Future Neighborhoods Task Force; and
- Greater Raleigh Chamber of Commerce.

1.3 Study Setting

The study area for this project is shown in **Figure 1.1**. It encompasses all of downtown Raleigh including the railroad tracks bordering the west side of downtown, as well as the railroad yards on the north side.

Since the City's establishment as the State Capital, the downtown has always been the heart of Raleigh and a focal point of the State. It is where business, government and cultural activities have focused their energies. Downtown is a center for corporate and regional offices, for banking and brokerage interests, for government services, and for culture and entertainment.

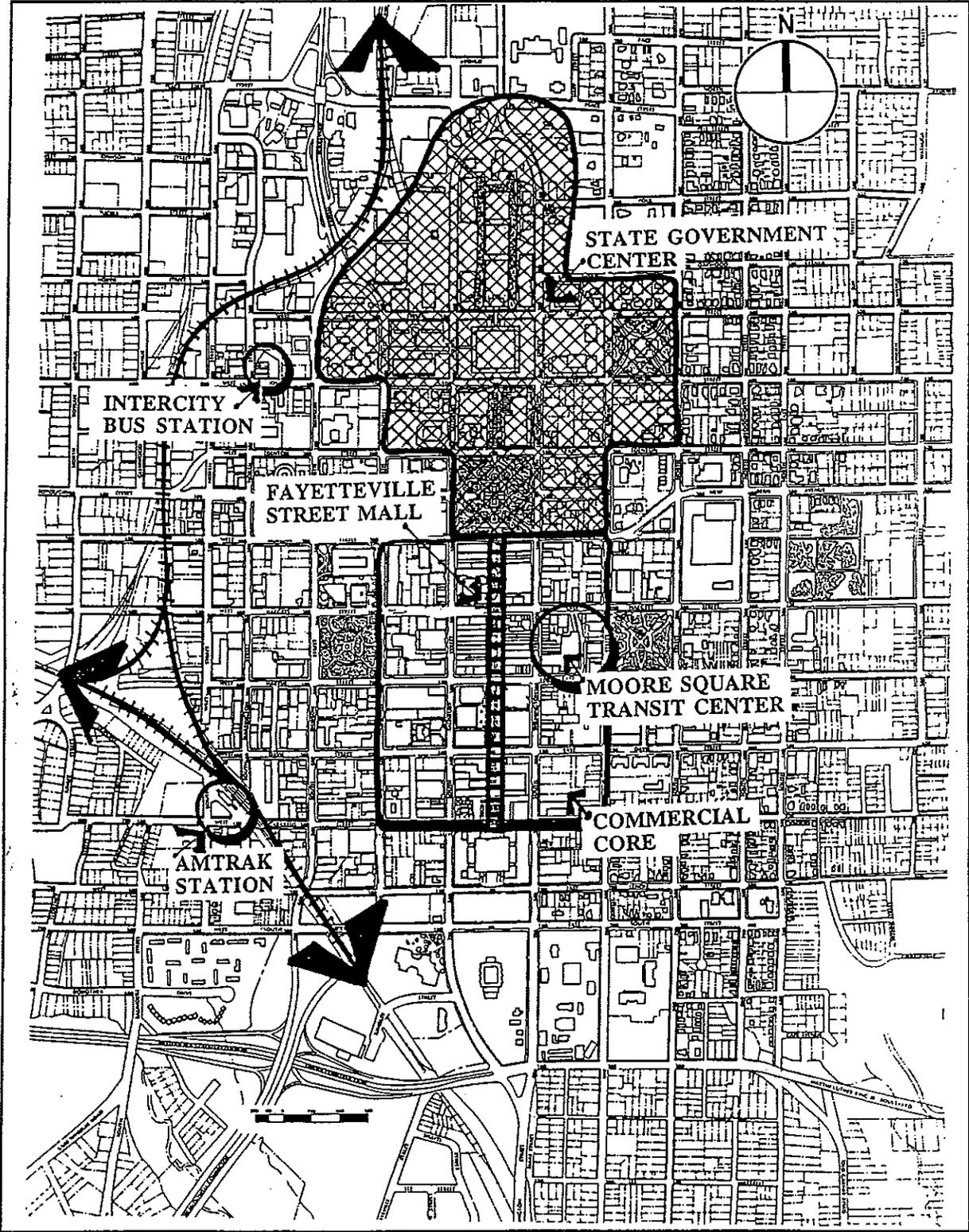


Figure 1.1: Project Study Area



1.4 Study Issues

At the March 31, 1995, meeting of the Advisory Committee, a number of key issues relating to the project were preliminarily framed and discussed. These key issues were intended to help form the basis of a subsequent set of goals and objectives for the study (see Section 1.5 below). Key issues can be grouped as follows:

Facility Location

- There are two distinct types of passengers (i.e., passenger markets) for a downtown intermodal facility: (1) passengers who transfer between routes or modes, and (2) passengers whose trip origin or destination is downtown. Transfer location is largely irrelevant to the former. Facility location in the core area is more important to the latter because they want to be within convenient walking distance of their origin or destination.
- Previous statewide rail passenger studies have questioned the logic of locating a station in downtown Raleigh considering the development and demographics of the region. The issue is regional accessibility versus local accessibility.
- The study area should include the rail yards on the north edge of downtown for potential intermodal facility site options.

Existing and Proposed Facilities and Modes

- The role of the existing Moore Square Transit Center and the potential Triangle Transit Authority fixed-guideway terminal must be considered in the overall planning for a new intermodal facility.
- The study should include, at least initially, all reasonable modes of ground transportation, existing and proposed.
- Amtrak is considering relocating its downtown Raleigh station, creating potential coordination options.
- The study should incorporate the proposed Glenwood/South Saunders Street Connector and the Morgan Street/Hillsborough Street bridge replacement.

Joint Development Opportunities

- Public investment in a new downtown transportation facility could be "a shot in the arm" for sorely needed private or joint public/private development in the core area.

Neighborhood Protection

- Recommendations of the study should strive to preserve and protect the surrounding older, established neighborhoods.



2 EXISTING CONDITIONS AND TRENDS

2.0 Introduction

The purpose of this chapter is to describe in general terms the setting of the study area in Downtown Raleigh in terms of land uses, transportation facilities and transportation operations. Much of the information in this chapter is taken from other data sources, and those sources are referenced and credited, as appropriate. The focus of the data collection was strategic; only the data necessary to perform the feasibility analysis is included.

2.1 Physical Setting and Regulatory Framework

2.1.1 Area Definitions

Raleigh's Downtown District is generally defined as the area from Peace Street to the north, East Street to the east, Western Boulevard to the south, and the railroad right-of-way to the west (see **Figure 2.1**), an area of approximately 600 acres. This was the area evaluated as the downtown district in the City's Comprehensive Plan, and approximates the 1990 Census Tract 501.

The Central Planning District is larger than the downtown district and includes neighborhoods to the north, east and south of the downtown. The boundaries for this district are the railroad right-of-way to the west and north, Brookside Drive, Glascock Street, and Raleigh Boulevard to the east, and Exum Drive, Cumberland Street, Bragg Street, Garner Road and Branch Street to the south.

This report's description of land use and its regulatory framework focused on the downtown. City employment, population, household and housing unit projections were developed at the planning district level. Discussion of general trends concerning employment, population, households and housing units, resident income and retail sales will be presented at the City and planning district level. Data will also be presented on Census Tract 501 (downtown) where available. Specific development trends and issues will be focused primarily on the downtown district.

2.1.2 Existing Land Uses and Zoning

Commercial Space

The commercial office core of downtown is very small in area, and extends four blocks from Morgan Street on the north along the Fayetteville Street Mall to Cabarrus Street to the south. The State Capitol serves as the northern terminus of this district, and the Raleigh Civic and Convention Center is the southern terminus. The office core is two city blocks east to west, with the western boundary being Salisbury Street and the eastern boundary at Wilmington Street, and is centered on the Fayetteville Mall (a landscaped pedestrian-only street). This eight-block area contains 2,780,900 square feet of office space in buildings ranging in height from three stories to 29 stories.

Historically, the Mall was the focus of retailing in Downtown Raleigh and featured a continuous line of retail stores; however,



- Minimize bus route deviation (local, express and intercity)
- Complement adopted downtown transportation plans

GOAL NO. 6:
Activate Downtown Development

Objectives:

- Maximize private development opportunities
- Maximize access and linkages to downtown activities
- Create a transit center that meets community development goals
- Foster transit and pedestrian uses
- Reinforce existing and planned retail and commercial nodes
- Complement adopted downtown development plans
- Preserve and protect neighborhoods and historic resources



the area's retail mix has deteriorated in recent years. The ground level of buildings facing the Mall is generally given over to retail activities. The recent closure of Hudson Belk Department Store, coupled with the clearance of an adjacent parcel, accelerated the deterioration of downtown retail and has broken this retail zone effectively into a two-block northern retail zone and a one-block southern retail zone.

Government Complex

The State of North Carolina government complex lies north of the commercial core and extends from Peace Street south to Morgan Street (approximately six blocks). It is generally three blocks in width, extending from McDowell Street east to Blount Street. State offices are centered on the North Mall. There is almost no private commercial office or retail development in this sector. This zone includes a number of churches and visitor attractions such as the North Carolina State Museum of Natural Sciences, the North Carolina Museum of History, the State Capitol, and the State Legislative Building.

The centroid of downtown employment straddles the boundary between the commercial core and the State government complex at Morgan Street on the axis of Fayetteville Street (see **Figure 2.2**). Even though development intensity is greater to the south of Morgan Street, the government office core to the north of Morgan Street is significantly larger in area.

Neighborhoods

A series of residential and mixed-use neighborhoods are located near the downtown commercial and government core. Adjacent to the government complex at the north end of the downtown lies the residential Blount Street Historic District and the Oakwood Historic District. These two residential districts feature late 19th-century and early 20th-century wood-frame houses, many of which have been restored (this area has experienced some level of gentrification). To the east are low- and moderate-income residential neighborhoods consisting of aging wood-frame structures. The area west of downtown includes the 1920s-era Boylan Heights district.

Other Uses

To the south of the downtown commercial core lie a series of public/institutional uses including the Raleigh Civic and Convention Center, the Memorial Auditorium and Shaw University.

A significant percentage of the downtown core adjacent to the Fayetteville Mall spine consists of surface parking lots and garages. There are 13,819 surface parking spaces in the downtown district, amounting to approximately 103 acres of downtown land, or one-sixth of the total downtown land area (based on 325 square feet per parking space). The 10,539 deck parking spaces provided downtown claim additional acres of downtown land.

The Moore Square Park area is located south of the Blount Street and Oakwood Historic Districts. This district, centered on Moore

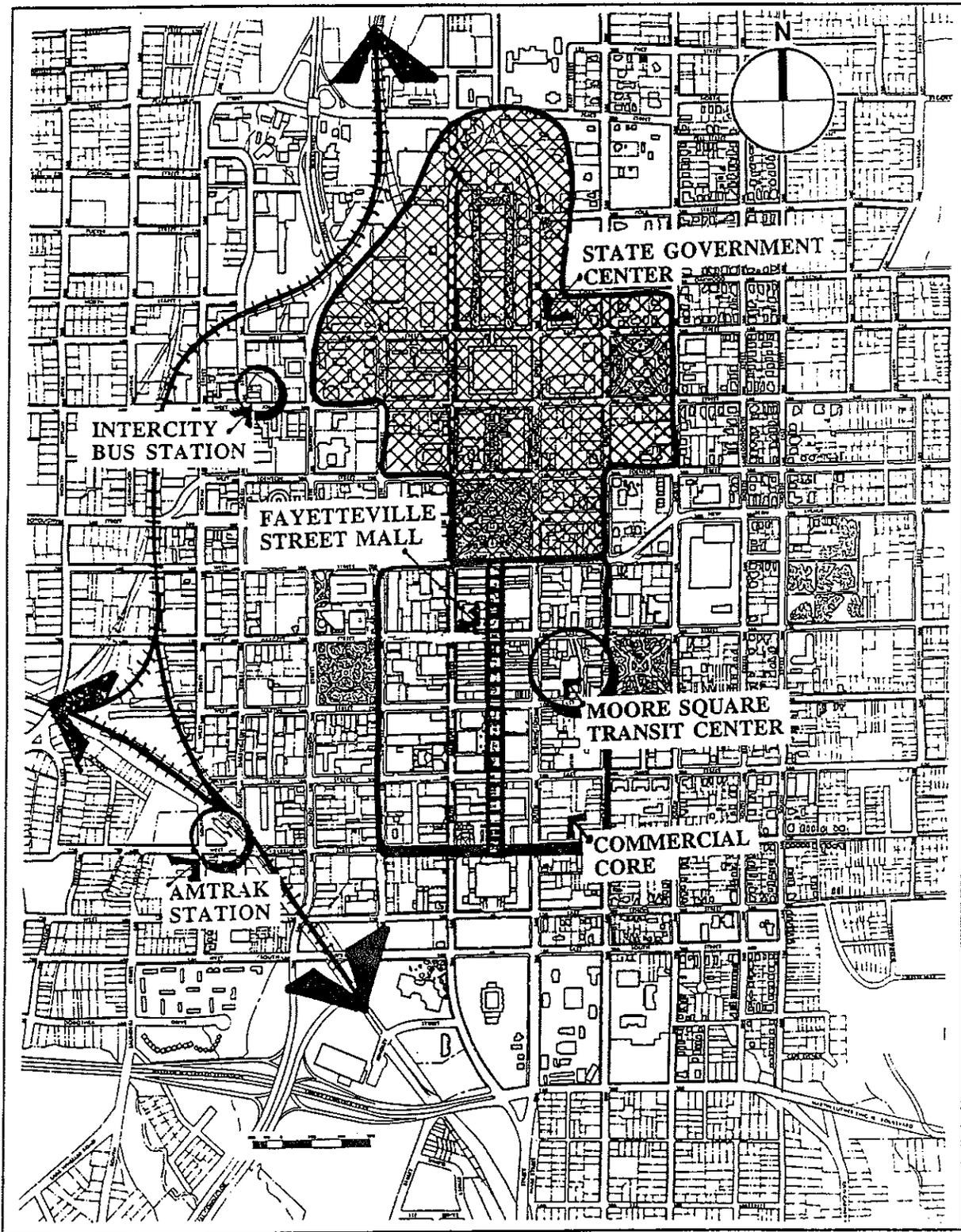


Figure 2.1: Downtown Raleigh



Square, features the existing Capital Area Transit Transfer Facility, a small Arts District (three blockfaces), and the City Market. As downtown's only other significant retail activity center, this area is a focus for restaurants, galleries and artists' studios.

West of the downtown office and institutional core, the area extending roughly from McDowell Street west to the railroad right-of-way (known as the Westside District) can be classified as transitional with a mix of surface parking lots, warehouse facilities, and very limited commercial development. Hillsborough Street, the major east-west arterial that intersects this area, connects the State Capitol and the commercial/government core with the University District to the west. This street features a number of stable-to-marginal retail and service uses extending west from Harrington Street. South of Hillsborough Street lies a very transitional zone of warehousing, services and parking. The anchors in this area are the Greater Raleigh Convention and Visitors Bureau (on the south side of Hillsborough Street), the City of Raleigh Municipal Complex, and Nash Square Park. The west side of downtown features the most significant opportunities for new development given the transitional nature of the area and the number of marginal uses present.

Zoning Categories

Most of Downtown Raleigh is currently zoned under three zoning classifications (as shown in **Figure 2.3**):

- ***Business***

The Business District, which covers most of the downtown south of Morgan Street, permits a wide range of commercial uses including offices, retail establishments, hotels, movie theaters, parking (both lots and decks), single family residential development and automotive services. Intermodal transit centers (such as rail passenger, bus, and freight facilities) are permitted within the zoning classification. Density and bulk regulations generally apply only to residential construction in the district. Minimum setbacks govern development in the zone, and buildings can be developed up to fifty feet in height. Buildings inside the First Fire District may exceed the fifty-foot height limit as set forth on the *City Height Limits Within the Business Zone District and the First Fire District Map*. Buildings or structures may exceed established limits upon site plan approval by the City Council.

- ***O&I-2: Office and Institution - 2***

This zoning district, which covers the northern half of downtown from Morgan St. north to Peace St., permits a wide range of office and institutional uses. It permits single-family residential development and higher densities of housing as either a conditional or special use. The primary difference between this

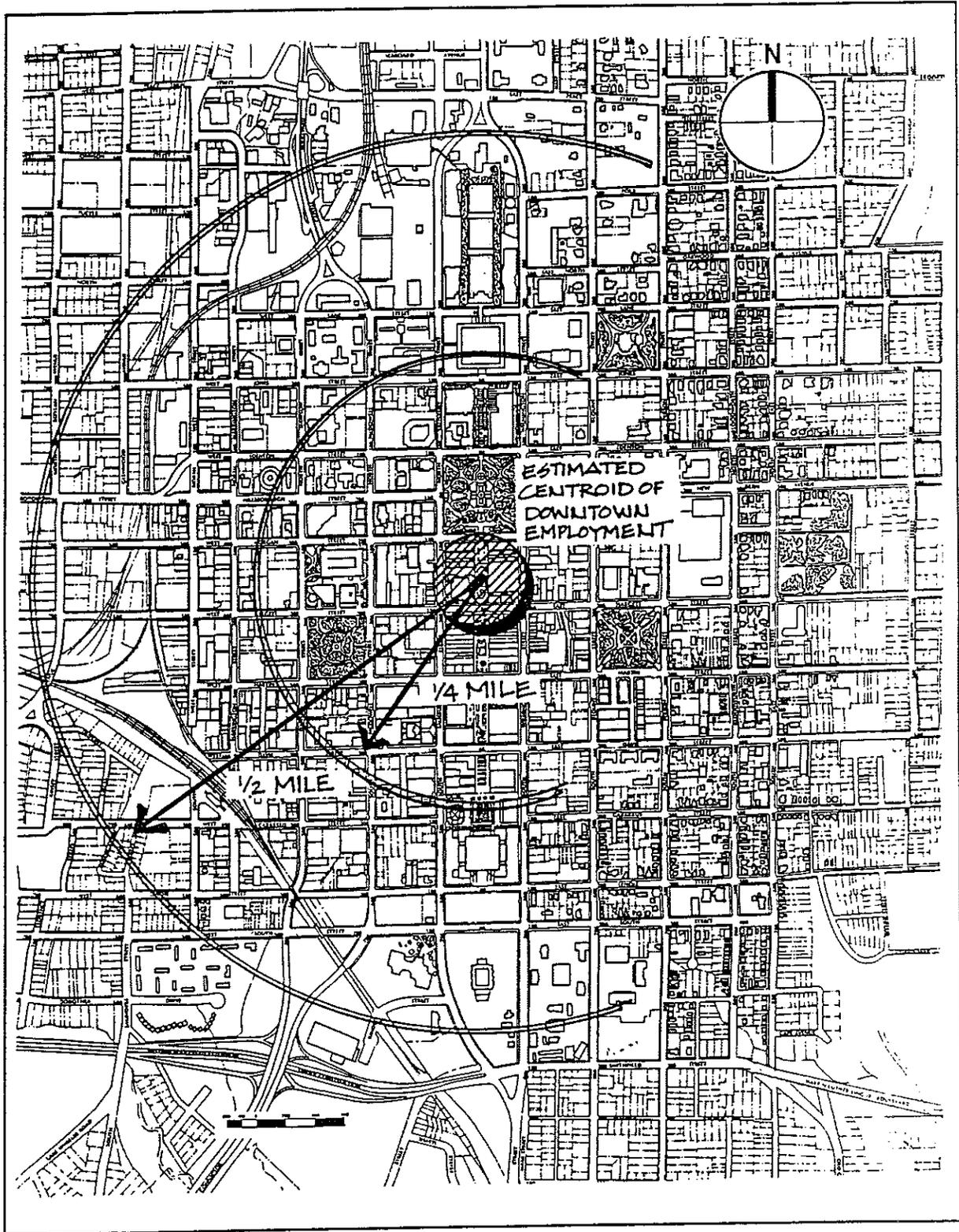


Figure 2.2: Centroid of Downtown Employment



zoning classification and the adjacent Business District that covers the other half of downtown is that the O&I-2 district does not permit retail establishments or hotels without approval as special uses. Industrial, warehousing, and auto service-related uses are specifically prohibited, as are intermodal transportation centers. In general, this zoning classification is more restrictive than the Business District. Buildings can be developed to any height assuming adherence to setback requirements. Buildings and structures greater than 40 feet in height that are located within 50 feet of either a lot line or residential district boundary require the addition of two feet to the building yard setback for every foot over 40 feet in height. Buildings that are approved as a site plan by the City Council are not subject to other height requirements set forth in the code.

- *I - 2 — Industrial*

The I - 2 Industrial District, which generally applies to the areas on the west side of downtown adjacent to the railroad right-of-way, permits warehousing, wholesaling, manufacturing, outdoor storage and other such uses in addition to most uses described in the Business District Zone. Residential development is not allowed. Transportation terminal facilities are permitted in this district. There are no area, density, bulk or yard restrictions in this district. Buildings

more than fifty feet in height must be set back one foot from lot lines for each foot over that height. In circumstances where I-2 parcels are adjacent to residential parcels, more restrictive height and setback requirements apply.

Other issues affecting land use in the downtown area include:

- *Parking Exemption District*

A Downtown Off-Street Parking Exemption area has been established for much of the downtown including most of its west side (as shown in **Figure 2.4**). This exemption waives the minimum parking requirement for all developments inside the Business District Zone.

- *Housing Overlay District*

The Downtown Residential Housing Overlay Zoning District permits greater densities of housing development than allowed within the underlying zoning district. This Overlay District covers almost all of the downtown.

- *Westside District*

A Westside Task Force was convened in 1992 to evaluate land use and development strategies for the Westside District. One subject of discussion was the potential for phasing out the Industrial - 2 classification in the Westside District

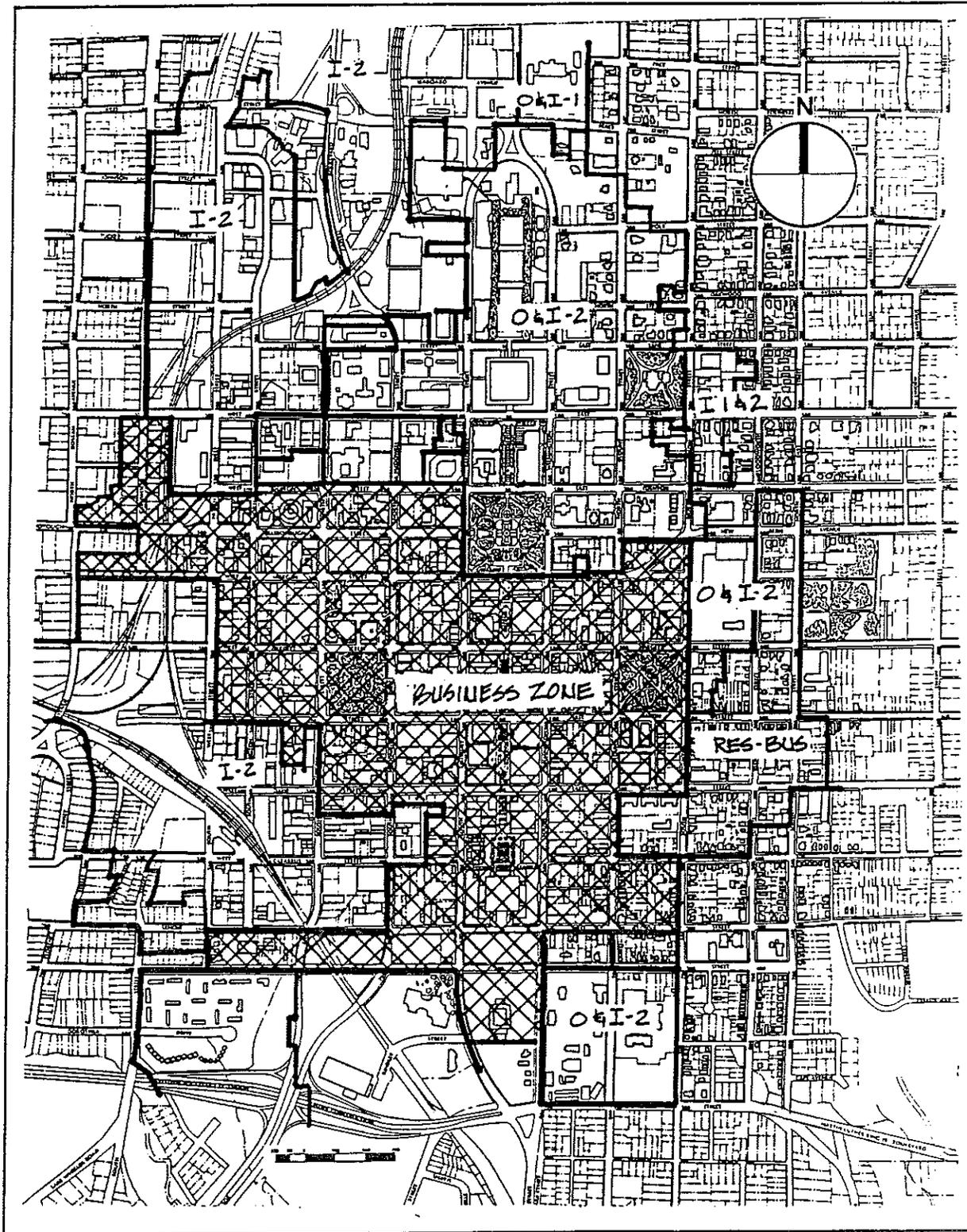


Figure 2.3: Downtown Raleigh Zoning Districts



in favor of a Business Zone classification.

of the World on the north side of Moore Square.

- *Historic Districts*

All of the east side of the downtown and the area around the State Capitol are included within one of five designated historic districts, which could add to the complexity of developing a new intermodal center east of the downtown core. No areas on the west side of the downtown core are covered under existing historic district designations.

For the Westside District, the plan calls for infill mixed-use development with a residential emphasis in the north and central portions of the district, and hotel, restaurant and entertainment facilities in the southern portion of the Westside around Davie and Cabarrus Streets. The recommendation for residential development would require a change from the current I - 2 zoning to Business or Residential zoning.

The plan suggests the exploration of a commuter rail/transit facility in the general area of the of the railroad triangle. This plan element also calls for a future east-west shuttle that could tie this area with Moore Square, City Market and the existing Capital Area Transit Transfer Facility.

2.1.3 Downtown Plans

In 1992, the City of Raleigh updated the Central District Plan as part of the citywide Comprehensive Plan. This plan described a vision for downtown, outlined major new investments, listed opportunity areas, and described special areas in more detail.

The Central District Plan Vision depicted a vibrant downtown that would present opportunities for employment, retail, residential, entertainment, education and cultural venues built upon the basic framework of the historic 1792 City plan, with an emphasis on historic preservation and open space enhancement.

One of the elements arising out of this Vision was a description of major public facility investments to pursue. Two projects included in that document are currently programmed: an expansion of the existing Civic Center; and a new Children's Museum

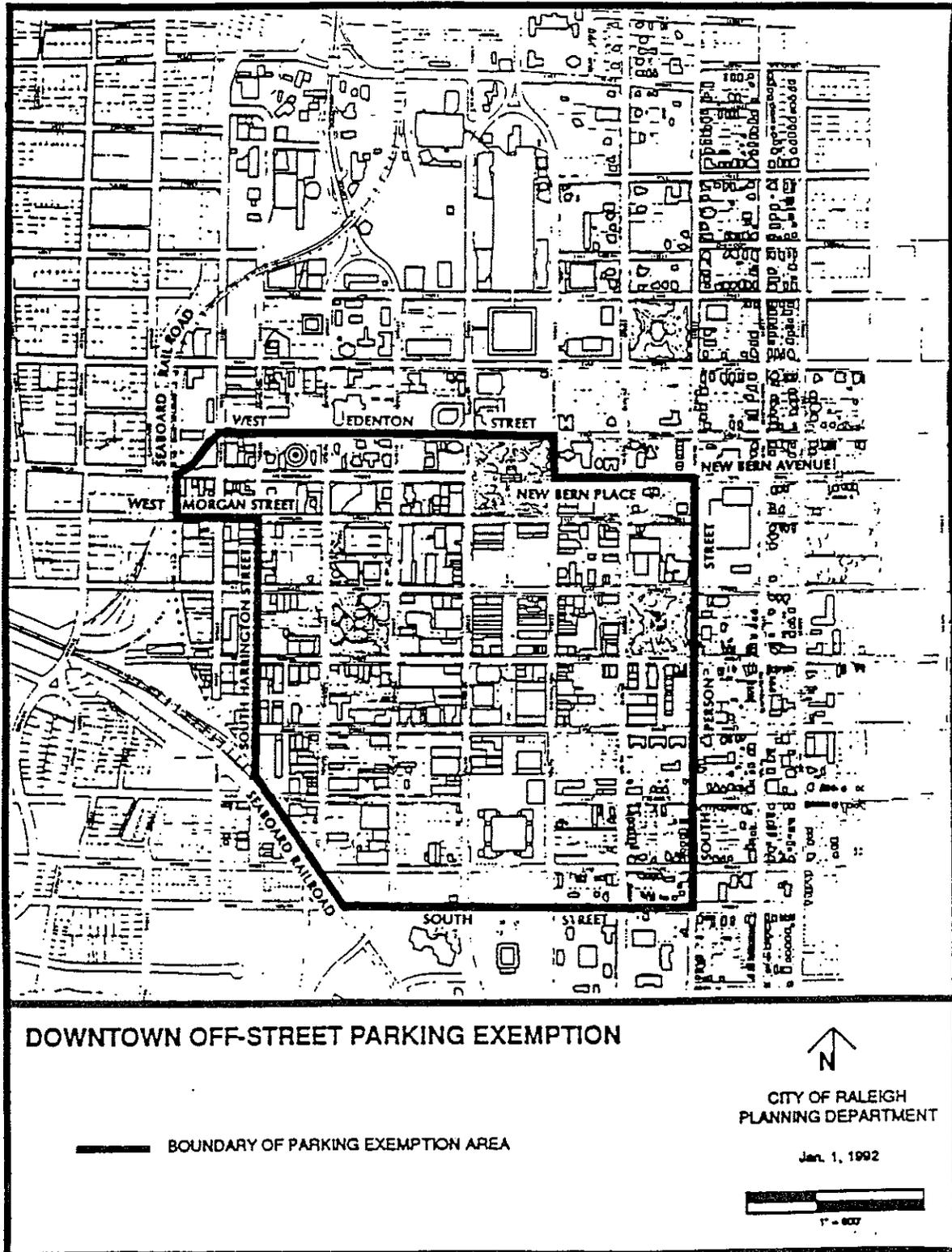
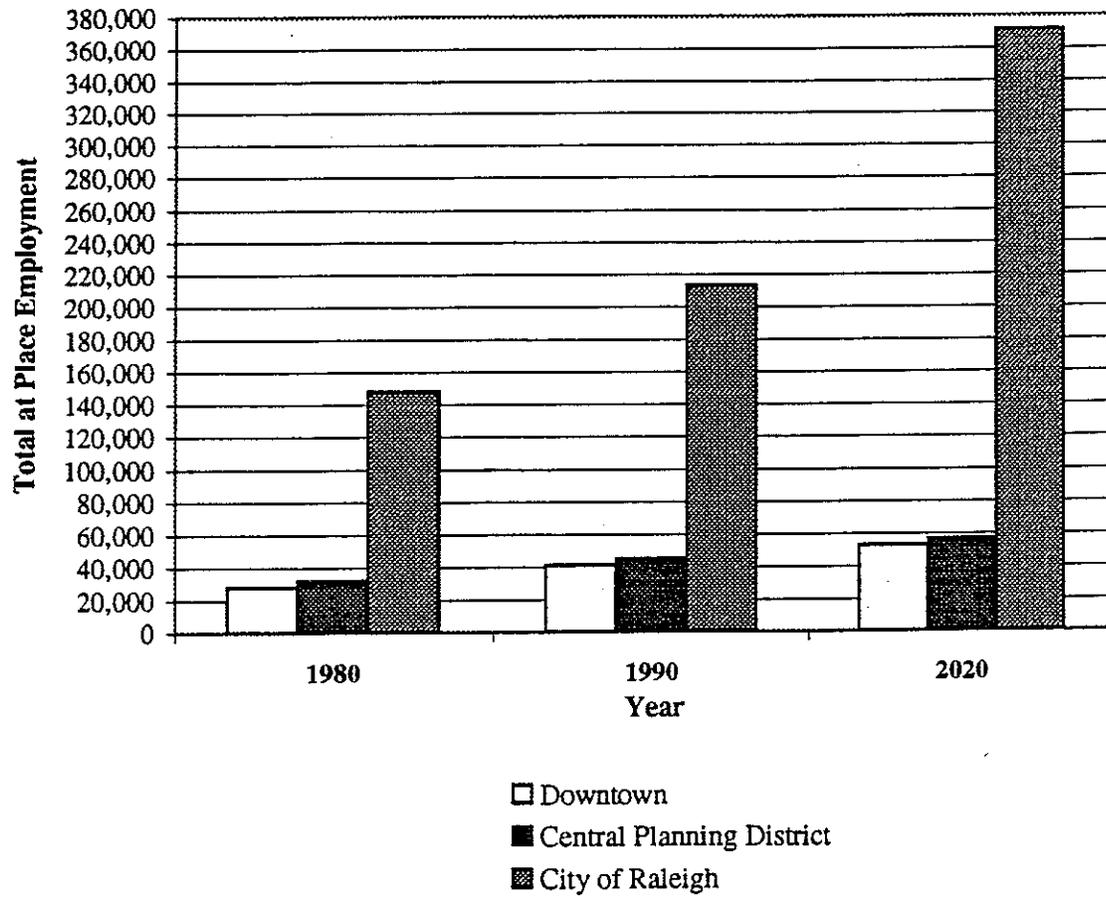


Figure 2.4
Downtown Raleigh Parking Exemption District



Source: Triangle Transit Fixed Guideway Study/City of Raleigh Department of Planning
 1980 Estimates - Research Triangle 1983 Economic Base Analysis

Figure 2.5
 Raleigh Area Employment Trends



2.1.4 Employment and Population

Employment

- *City of Raleigh: Trends*

The City of Raleigh experienced strong employment growth between 1980 and 1990; this growth is projected to continue through 2020 (see **Figure 2.5**). In 1980, there were 148,184 jobs in the city. By 1990, the city's employment base had expanded to 213,401 (including employment gained through annexation). This represents an increase of 65,217 jobs, or a 4.4% annual increase over ten years. According to employment projections made for the Triangle Transit Fixed Guideway Study, 1993/1994, the City's employment base will grow to 371,600 jobs by 2020. This would lead to a gain of 158,200 jobs over the 20-year period, for an annual growth rate of 3.7%.

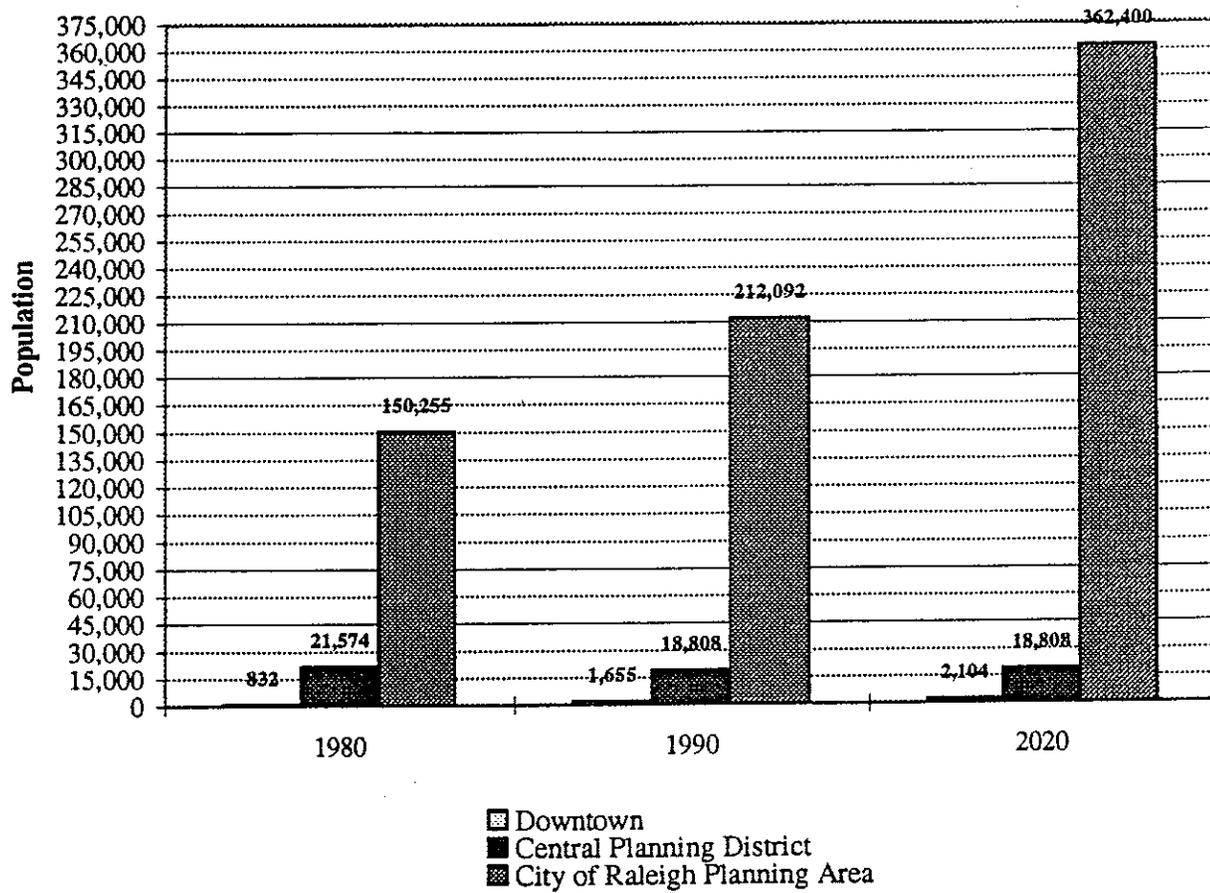
- *Central District: Trends*

In 1990, there were 45,235 jobs reported in the Central District (of which more than 30,000 were located within the boundaries of the downtown). According to a fall 1992 survey, the number of jobs had decreased to 40,585 (a 10.3% decline); much of that loss is attributed to job growth in the suburbs and Research Triangle Park. Even at this reduced number, the district contained 19% of Raleigh's

employment. According to City of Raleigh Planning Department projections, the Central District will soon regain the jobs it lost between 1990 and 1992 and experience an increase of 11,500 jobs by 2020 to a new total of 56,700. This increase is projected to be due to improved access to downtown and stabilization of employment at Research Triangle Park. However, the annual growth rate of employment through 2020 in the Central District is projected to be significantly slower than the city's overall employment growth rate (1.3% vs. 3.7% respectively, assuming the suburbanization of employment experienced over the last ten years continues without any major government policy changes).

Groupings of planning districts show regional employment trends. The "central city" is generally defined as being comprised of the older established Central, East, North Hills and University Districts. The central city's share of the City's overall projected employment growth is modest as employment shifts dramatically towards suburban developments.

The four central city planning districts are projected to gain a total of 32,970 jobs by 2020. The six outer city districts (Northwest, North, Northeast, Southeast, Southwest, and Umstead) are projected to gain 122,200 jobs over the same period. Job growth in the Central District comprises only 7.4% of total city employment



Source: 1980, 1990 U.S. Census, 2020 - Triangle Transit Authority Fixed Guideway Study/City of Raleigh Department of Planning

Figure 2.6
 Raleigh Area Population Trends



growth. Job growth in the four central city districts comprises only 21.2% of the projected job growth.

Based on these trends and projections, even with the projected growth in employment in the Central District, the "central city" will lose its status as the primary employment hub of Raleigh. Raleigh's central business district will be rivaled by other emerging suburban employment centers within the City, which will approach 50,000 jobs in some planning districts.

- *Employment by Sector*

A City of Raleigh Planning Department survey conducted in October 1993 determined the number and types of jobs by sector for each of the ten planning areas. According to the survey, of the 216,587 jobs recorded in the City's planning jurisdiction, 83,743 (or 38.7%) were in the Service Sector. This was followed by 45,272 (20.9%) in the Manufacturing Sector, 40,990 (18.9%) in the Office/Government Sector, and 27,537 (12.7%) in the Wholesale and Retail Trades.

In the Central District, 16,640 jobs (41% of all employment) were in the Office/Government Sector. This reflects the downtown location of State, County and local government offices. This was followed by 13,200 jobs (32.5%) in the Manufacturing/Industrial Sector, and 6,857 jobs (17%) in the Service

Sector. Only 2,747 jobs (6.7%) were in the combined Wholesale and Retail Trade and Service/Retail Sectors. As such, the Central District is more reliant than the city as a whole on the Office/Government Sector and the Manufacturing/Industrial Sector for its employment base. The Central District also has a significantly smaller percentage of Service Sector and Wholesale & Retail Trade jobs than the city as a whole, suggesting that these sectors are underdeveloped.

Population

- *City of Raleigh*

The City of Raleigh has experienced continuous growth in population since the early part of the century through immigration, natural expansion of the existing population, and annexation. From 1970 to 1980, the City's population increased from 122,830 to 150,255, with an average annual increase of 2.2%. From 1980 to 1990, the average annual rate of population growth increased to 4.1% as the City grew to 212,092 residents in 1990, as shown in **Figure 2.6**. Between 1980 and 1990, 34% of the City's total population growth was a result of annexation. Between April 1990 and July 1994, the city experienced an increase of an additional 25,650 residents. According to Triangle Transit Authority/City of Raleigh



- *Population and Household Characteristics*

The number of persons per household has been declining at the city, planning district and downtown census tract level. In the city of Raleigh between 1980 and 1990, the average number of residents per household declined from 2.46 to 2.26. In the Central District, average household size fell from 2.32 in 1980 to 2.20 in 1990. In the downtown census tract, the 1990 household size was 1.55 (excluding residents in group quarters).

According to the 1990 Census, the educational attainment for the City of Raleigh is extraordinary compared to regional and national standards. An estimated 86.6% of Raleigh residents have attained a high school diploma or a higher level of education. Of that total, 40.6% of Raleigh's adult population have attained a Bachelor's degree or higher. By comparison, only 28.4% of Charlotte's residents have attained a Bachelor's degree or higher.

2.1.5 Housing

Because of high levels of sustained population growth over the last 20 years in the City of Raleigh, the housing market remains quite robust. In 1990, the City of Raleigh contained 93,291 housing units (1990 U.S. Census). By July 1994, according to City of Raleigh Planning Department estimates, the number of units had increased to 103,104 units, an increase

of 9,813 units. Of that total, 51% of the units were new construction and 49% came into the City's inventory through annexation. Removing the annexed units, the City's housing stock increased by an average of 1,178 units per year through new construction. Of those units, more than 60% were single family detached units, more than 20% were multifamily apartment units, and the remainder was composed of townhouses, condominiums, duplexes, triplexes and fourplex units.

As a result of brisk construction, most of the City's housing stock is of recent construction. As of 1990, the median year constructed for all units in the City was 1974. Thus, half of the units were 16 years of age or less. The Central District has a much older housing stock (median year constructed: 1952) than the city as a whole.

According to the 1990 Census, 53.1% of all occupied housing in the City was comprised of rental units, with the remaining 46.9% being owner occupied. The vacancy rate for the City was 7.4% (6,821 units). The Central District had 8,125 housing units in 1990 of which 7,138 were occupied (a 12.2% vacancy rate). As of 1990, 14.5% of all vacant housing units in the city were located in the Central District. Of this area's housing stock, 44% is detached, 33% is comprised of two-to-four unit structures, and 21% consists of structures of five units or more.

Of the 703 occupied units in the downtown census tract, 569 (or 81%) were rental. The vacancy rate was 10.2%. Little housing construction has taken place recently in the downtown census tract or its adjacent



Planning Department projections, the City's population will increase to 285,200 by the year 2000, and to 362,400 by the year 2020.

If current projections (which are based on current population and development trends) are correct, most of the city's growth in population and households will occur outside the central city planning districts of Central, East, University and North Hills. Collectively, these central city districts, primarily inside the 440 Beltline, are projected to increase by only 1,100 residents. In contrast, the outer planning districts (Northwest, North, Northeast, Southeast, Southwest, and Umstead) are projected to add 124,000 residents by 2020.

- *Central District*

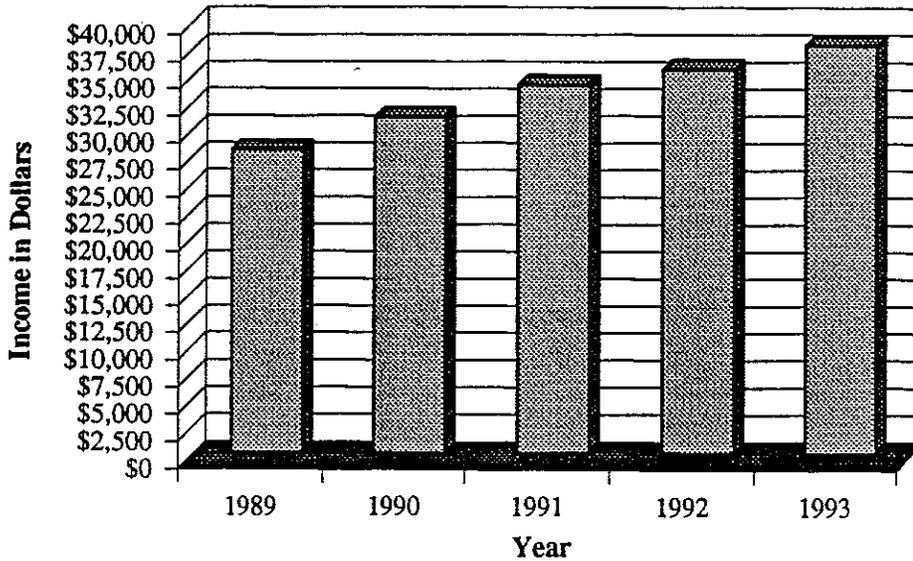
The Central District had a population of 21,574 in 1980, decreasing to 18,808 in 1990, representing a drop of 2,766 persons or 12.8%.

However, this pattern appears to have been reversed between 1990 and 1994 according to the City of Raleigh Population Estimate, July 1994. During this period, the Central District gained more than 1,400 residents, a total four-year increase of 7.4% (or 1.9% annually).

According to Triangle Transit Authority/City of Raleigh Planning Department projections, the Central District's population is anticipated to remain relatively constant through 2020.

- *Downtown Census Tract*

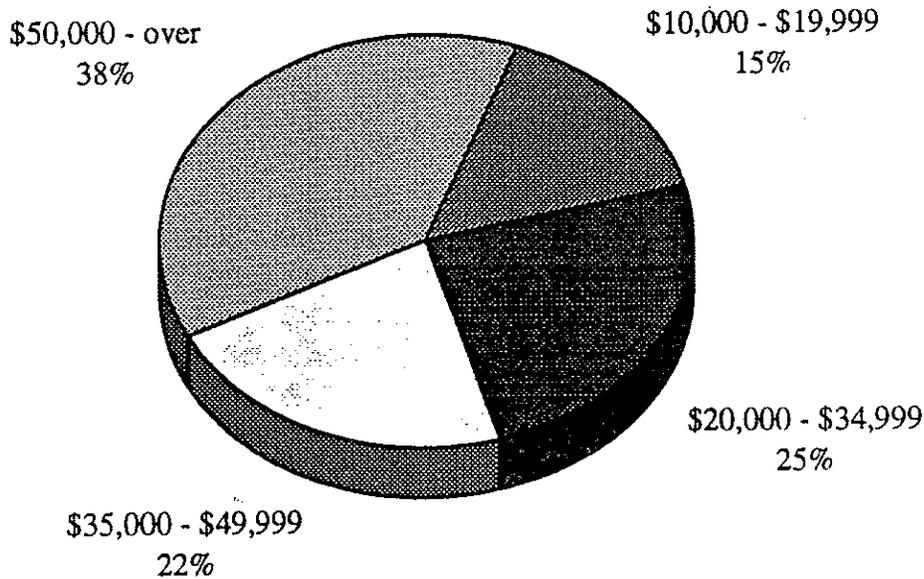
In 1990, the census tract encompassing downtown had a population of 1,655, of which 757 were in group quarters (of that total, 158 were in correctional institutions and 192 were in homeless shelters). Therefore, the number of residents participating in the local downtown economy was 1,305. The total estimated population as of July 1994 had increased to 2,104, a gain of 449 (or 27.1%). Even with the increase, the downtown area is dominated by its daytime work-related population (which exceeds 30,000), and the present resident population has little impact on the downtown economy or the location of an intermodal transit facility.



Effective Buying Income (EBI) = Gross household income after taxes

Source: Sales & Marketing Management 1990-1994

Figure 2.7: Change in Median Household Effective Buying Income, City of Raleigh, 1989-1993



Source: Sales & Marketing Management, 1994.

Figure 2.8: City of Raleigh After-Tax Household Income by Income Class, 1993



neighborhoods. In the downtown tract, only seven units were added between April 1990 and July 1, 1994. If adjacent neighborhoods in the City's Central District are factored in, a total of 184 units were added to the housing stock during those four years, an average of 43 units per year. These additions represented only 3.7% of the total number of new units constructed in the City. Those 184 units also stand in contrast to the increase in population in the Central District of 1,400 people during those four years; this discrepancy could be due to an increase in population per household in the District or an overstock of housing supply.

2.1.6 Resident Income

Residents of Raleigh are relatively affluent compared to residents of other similar-sized cities in the southeast. In addition, Wake County (which includes Raleigh), with a per capita income of \$21,565 as of 1991, surpasses the per capita income of adjacent counties, the average for North Carolina (\$16,252), and the U.S. average (\$19,082).

Resident income in the City of Raleigh has been rising steadily when measured on both a per-capita and a household basis. Between 1989 and 1993, the median household income calculated on an after-tax basis has increased from \$27,900 in 1989 to more than \$37,500 in 1993, a total increase of 34.4%, or 6.9% annually (see **Figure 2.7**). This increase is more than double the inflation rate over the period. In addition, the City of Raleigh contains a large number of households with after-tax incomes greater than \$50,000. In 1993, approximately 34.1% of the City's households had incomes

in excess of \$50,000 (see **Figure 2.8**). This suggests that the downtown's daytime work-related population is likely to have considerable disposable income for services. The small downtown resident population contains a wide variation in income levels. In 1989, the median before-tax (gross) income for the 231 families that reported was \$31,094 according to the Census, considerably lower than the \$42,212 reported for the City as a whole. When all households are considered, the difference is more striking, \$13,197 for the downtown tract vs. \$32,451 for the city.

2.1.7 Retail

Retail Expenditures

After experiencing a 1.2% downturn in retail sales between 1989 and 1991, the City of Raleigh has experienced three consecutive years of growth. Retail sales were up 11.1% in 1992, 9.9% in 1993, and 13.8% in 1994 (source: Sales & Marketing Management, 1991 - 1994). Total retail sales for the City of Raleigh were \$4,805,846,328 in 1994 (source: N.C. Department of Revenue). The most significant gains were made in the category of eating and drinking places where gross retail sales more than doubled over the period. General merchandise and drug sales also expanded over 25% during the five-year period. Other retail sectors tended to lag during the period.

Specific retail sales figures were not available for downtown retail establishments for comparison with City totals. However, it does not appear that the downtown shared in the City's growth in retail sales. During this



64.4% of the total supply. There are currently 3,418,921 square feet of leasable private and publicly held space; of that number, 484,719 square feet are currently available. This represents an occupancy rate of 85.8% for leasable space.

There is only one large block of available leasable space in the downtown. The BB&T/Two Hanover Square Building has a block of 271,330 square feet available, out of a building total of 431,738 square feet. The next largest block of space is in 333 Corporate Plaza with 40,000 square feet available. Thus, any office employer wishing to locate downtown with more than 200 employees would have only two options: locate in BB&T/Two Hanover Square or in new construction.

The occupancy rate for downtown offices has ranged from a high of 97% in January 1985, prior to the addition of One Hanover Square (406,000 square feet) to a low of 75% just after the addition of BB&T/Two Hanover Square and First Union Capital Center (a total of 1,156,393 square feet) in July 1991. The office market has slowly absorbed available space, which is reflected in a gradual improvement in occupancy rates. In general, based on trends from 1983, occupancy rates of between 85% to 90% tends to spur the construction of additional office space.

2.1.9 Pattern of Existing and Proposed Downtown Investments

There was a dramatic downturn in commercial developments in the downtown core after 1991, which marked the completion of the First Union Capital Center

(\$68.9 million) and the BB&T Two Hanover Square (\$60 million). No significant private investments occurred in the downtown core from 1992 to 1994. To date in 1995, there have been modest private investments in five projects with a total value of \$19,425,500. One was the Shaw University Dormitory (\$11 million). The only major privately funded projects in the development pipeline are the News & Observer Corporation facilities expansion project (four phases with a total projected value of \$108 million) and the Center Plaza Building Renovations (\$7.5 million). The 500,000-square-foot First Citizens Bank Corporate Headquarters project has been developed through the design phase, but a date for project start has not been provided.

Significant levels of investment continue to be made in the downtown by the State, Wake County, and the City of Raleigh. From 1987 to 1997, the State of North Carolina will have committed more than \$183 million to building projects in the downtown. Projects in the pipeline for the state include a Museum of Natural Sciences (1997 - \$31 million) and a New Capital Area Visitor Center (1997 - \$15.9 million, funds not yet committed).

Between 1986 and 1994, the City and the County have invested \$130.7 million in buildings, parking and streetscapes. Three major public projects are in the development pipeline. These are improvements to the Civic and Convention Center (1996 - \$7 million), a Performing Arts Center (\$2.1 million - land assembly), and a Children's Museum About the World (no date proposed - \$25 million).



period, the downtown experienced the closure of its only department store, as well as other retail outlets.

Downtown Retail Market

The total supply of downtown non-office retail and mixed use space was 1,027,013 square feet as of January 1995. When the publicly-owned Wake County Public Safety Center (330,000 square feet) is excluded, this inventory drops to 697,013 square feet. This total includes 15,850 square feet of government-owned leasable retail space. Of the 697,013 square feet of leasable retail and mixed use space, 298,204 square feet of space is vacant, representing an occupancy rate of 57.2%. The recently closed Hudson Belk Department Store, at 225,000 square feet, comprises the bulk of that vacant retail/mixed use square footage. There are also several other properties with blocks of 20,000 square feet or more of available retail and mixed-use space. This retail vacancy rate has only exacerbated the recent trend toward overall deterioration of retail in downtown.

According to information provided by the Raleigh Downtown Development Corporation, there is currently a poor fit between existing vacant retail space on the market and the type of space that is in demand by merchants. Most of the existing space is in large blocks that are ill-suited to restaurants and small retail outlets. Retail blocks ranging from 1,500 to 3,000 square feet appear to be more marketable. This observation is consistent with retail conditions in other small to mid-sized downtowns.

The existing downtown generally lacks both breadth and depth in retail establishments. This could be due to a number of factors:

- the small population with low to moderate incomes that resides adjacent to the downtown;
- the increasing suburbanization or "Edge City" trend of the area, a problem common to all metropolitan areas, combined with a redirection in employment (and related residential and retail activity) toward Research Triangle Park;
- the inability to draw more affluent residents from other city districts to shop downtown; and
- the inability to capture retail dollars from the downtown's daytime government and private sector work force.

At present, the healthiest retail nodes in the downtown appear to be the northern two blocks of the Fayetteville Street Mall (which benefits from being close to the centroid of downtown employment), and City Market which is oriented to speciality restaurant establishments. The southern two blocks of the Fayetteville Street Mall and the retail strip on Hillsborough Street are in need of additional investment.

2.1.8 Downtown Office Market

Downtown Raleigh contains a total of 8,277,800 square feet of office space. Of this amount, 5,326,250 is government-owned as of January 1995, comprising

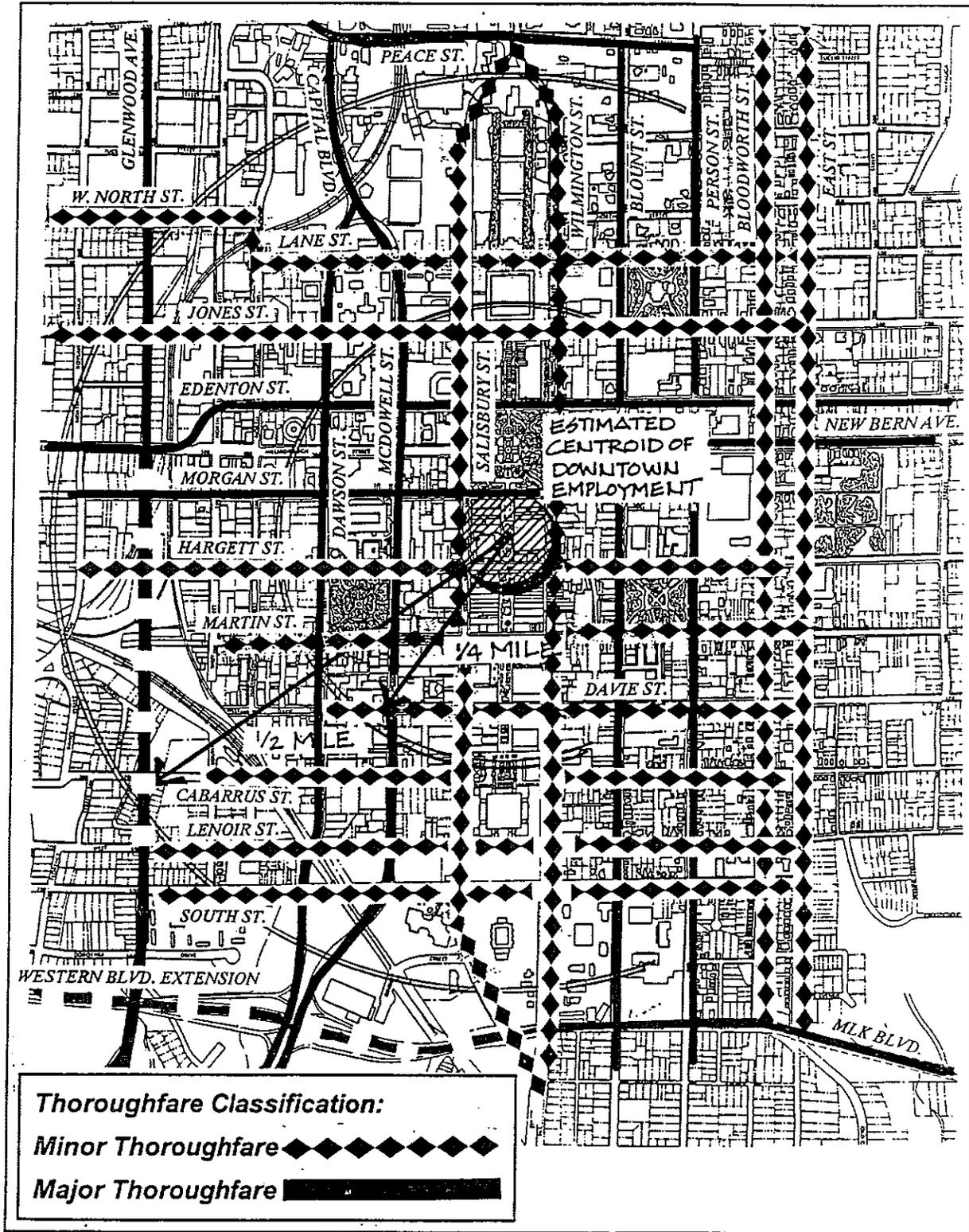


Figure 2.9: Downtown Raleigh Street Classifications



From 1987 to the present, downtown public sector investment has outstripped private sector investment by 40% (public investment of \$327.1 million, vs. private investment of \$233.7 million). As a result, the City of Raleigh is faced with a problem common to other major cities in the U.S., especially those with large government employment centers. To keep the local economy healthy and diversified, it ideally must generate additional private sector development in the areas of retail services, entertainment, residential, hotels and additional office.

2.2 Traffic Conditions

2.2.1 Downtown Street System

Downtown Raleigh has a north-south and east-west grid street system, with one-way streets predominating. The downtown area, which comprises the majority of the study area, is bounded by North, South, East, and West Streets, whose names indicate the streets' locations. Streets in the downtown area classified as major thoroughfares (see **Figure 2.9**) include the following:

- **Major North-South Thoroughfares**

Glenwood Avenue
South Saunders Street
Capital Boulevard
Dawson Street (southbound)
McDowell Street (northbound)
Blount Street (southbound)
Person Street (northbound)

- **Major East-West Thoroughfares**

Western Boulevard/Martin Luther King, Jr., Boulevard
Morgan Street/New Bern Ave.
(eastbound)
Edenton Street (westbound)
Hillsborough Street (west of Edenton)
Peace Street

Almost all remaining continuous downtown streets are classified as minor thoroughfares:

- **Minor North-South Thoroughfares**

Salisbury Street (southbound)
Wilmington Street (northbound)
Bloodworth Street
East Street

- **Minor East-West Thoroughfares**

South Street (eastbound)
Lenoir Street (westbound)
Cabarrus Street
Davie Street
Martin Street (eastbound)
Hargett Street (westbound)
Jones Street (eastbound)
Lane Street (westbound)

Discontinuities in the downtown street system are due primarily to the Norfolk & Southern Railroad tracks in the downtown area (see **Figure 2.1**). Martin Street, Davie Street, and West Street all terminate near the Amtrak station. Most east-west streets west of downtown (except Edenton, Hillsborough, Lenoir, and South Streets) have at-grade rail crossings. The CSX tracks and yards north of downtown form a



2.2.2 Traffic Volumes

Traffic volumes on downtown Raleigh streets are highest on the major thoroughfares, and relatively evenly distributed on other streets. **Table 2.1** summarizes 1993 average daily traffic (ADT) volumes on downtown streets.

Table 2.1
Downtown Raleigh Traffic Volumes

Street	1993 ADT (low-high) in Downtown Area
Glenwood Avenue	8,900-10,000
South Saunders Street	13,700
Capital Boulevard	39,400-51,800
Dawson Street (southbound)	17,700-20,900
McDowell Street (northbound)	17,300-21,200
Salisbury Street (southbound)	5,800-6,000
Wilmington Street (northbound)	7,000-10,900
Blount Street (southbound)	8,700-10,800
Person Street (northbound)	8,300-11,900
Bloodworth Street	count not available
East Street	1,200-5,000
Martin Luther King, Jr., Boulevard	8,000-8,700
South Street (eastbound)	2,400-5,500
Lenoir Street (westbound)	2,900-6,500
Cabarrus Street	count not available
Davie Street	count not available
Martin Street (eastbound)	3,100
Hargett Street (westbound)	2,500
Morgan Street/New Bern Ave. (eastbound)	8,600-12,700
Edenton Street (westbound)	8,200-11,000
Jones Street (eastbound)	count not available
Lane Street (westbound)	count not available
Peace Street	19,800

Source: NCDOT Traffic Count Map



major barrier to east-west travel, with no east-west crossings between Jones Street and Peace Street (a distance of 3,000 feet) and between Peace Street and Wake Forest Blvd. (a distance of 7,500 feet).

Two improvements are currently planned to the downtown street system.

- Along the southern edge of the study area, Western Blvd. is being extended to the east to Martin Luther King, Jr., Blvd., providing a multi-lane east-west thoroughfare with interchanges at I-440 on both the east and west ends. The connector will be primarily at-grade, with an interchange with the Dawson-McDowell Connector. This project is currently under construction.
- Glenwood Avenue is planned to be extended south from Morgan Street to join South Saunders Street near South Street. This project is not currently programmed.



2.3 Parking Conditions

The inventory of parking in downtown Raleigh is shown in **Figure 2.10**. As mentioned in Section 2.1.2 above, a significant percentage of the downtown core adjacent to the Fayetteville Mall spine consists of surface parking lots and garages. There are 13,819 surface parking spaces in the downtown district, amounting to approximately 103 acres of downtown land, or one-sixth of the total downtown land area (based on 325 square feet per parking space). The 10,539 deck parking spaces provided downtown claim additional acres of downtown land.

(as shown in **Figure 2.11**). Approximately 10,000 passengers use the entire CAT system on an average weekday, and approximately 5,800 of those travel in or through downtown. **Table 2.3** summarizes downtown CAT ridership by type of trip.

In addition to regular local service, CAT also operates the Raleigh Trolley. The Trolley uses historic-looking vehicles on weekdays every 10 minutes from 11:30 a.m. and 2:00 p.m. on a prescribed loop through the downtown area. On the third Saturday of each month the Trolley also runs four times on a one-hour tour through Raleigh's historic center city neighborhoods.

2.4 Transit Conditions

For purposes of this study, "transit" is defined as "non-auto" types of transportation. This definition includes both publicly and privately operated bus, rail and other passenger services available to the general public. These are the modes that are considered to be candidates for coordinating operation at a potential intermodal transportation center.

2.4.1 CAT Local Bus Service

The City of Raleigh operates a city-wide network of bus routes known as CAT (Capital Area Transit). The system's network consists of 20 regular bus routes, 6 evening bus routes, 7 "CAT Connectors," and 4 night connectors. The system is "radial" in orientation and focuses on downtown Raleigh. Connections between routes are conveniently provided off-street at the Moore Square Transit Transfer Facility



2.2.3 Street Capacities

Capacities on a downtown street system with numerous signalized intersections are generally limited by the capacities of the individual intersections. These depend on such characteristics as signal timing, lane configuration, and traffic turning patterns. However, a good approximation of capacity of urban arterials for planning purposes can

be obtained based on basic number of through lanes, number of signals, assumed peak hour percentage, and assumed percent of green time at traffic signals. **Table 2.2** provides approximate daily capacities of downtown Raleigh streets based on the above factors, and, based on those capacities and the traffic volumes shown above, the generalized levels of service for these roadways.

Table 2.2: Downtown Raleigh Street Characteristics

Street	1 or 2 Way	Lanes	Capacity	Level of Service
Glenwood Avenue	2	4	29,400	C
South Saunders Street	2	4	29,400	C
Capital Boulevard	2	6	64,400	C
Dawson Street (southbound)	1	3	23,700	D
McDowell Street (northbound)	1	3	23,700	D
Salisbury Street (southbound)	1	3	23,700	C
Wilmington Street (northbound)	1	3	23,700	C
Blount Street (southbound)	1	3	23,700	C
Person Street (northbound)	1	3	23,700	C
Bloodworth Street	2	2	13,400	N/A
East Street	2	2	13,400	C
Martin Luther King, Jr., Boulevard	2	4	32,400	C
South Street (eastbound)	1	3	17,000	C
Lenoir Street (westbound)	1	3	17,000	C
Cabarrus Street	2	4	23,400	N/A
Davie Street	2	2	13,400	N/A
Martin Street (eastbound)	1	3	23,700	C
Hargett Street (westbound between East & West)	1	3	23,700	C
Morgan St/New Bern Ave. (eastbound)	1	3	23,700	C
Edenton Street (westbound)	1	3	23,700	C
Jones Street (eastbound)	1	3	23,700	N/A
Lane Street (westbound)	1	3	23,700	N/A
Peace Street	2	4	23,400	D

Sources: NCDOT Generalized Level of Service Maximum Volumes (two-way streets)
 Florida DOT Generalized Level of Service Maximum Volumes (one-way streets)

Note: All capacities are based on Level of Service E



Figure 2.11: Moore Square Transit Transfer Facility

Table 2.3: Downtown Raleigh CAT Ridership Summary

Type of Trip	Ridership
Trips Ending Downtown	1,500
Trips Starting Downtown	1,500
Downtown Through Trips:	800
• Not Transferring (i.e., same bus)	
• Transferring Downtown	1,800
Internal Circulation Trips*	200
TOTAL AVERAGE WEEKDAY	5,800

**Includes Raleigh Trolley.*

Source: City of Raleigh

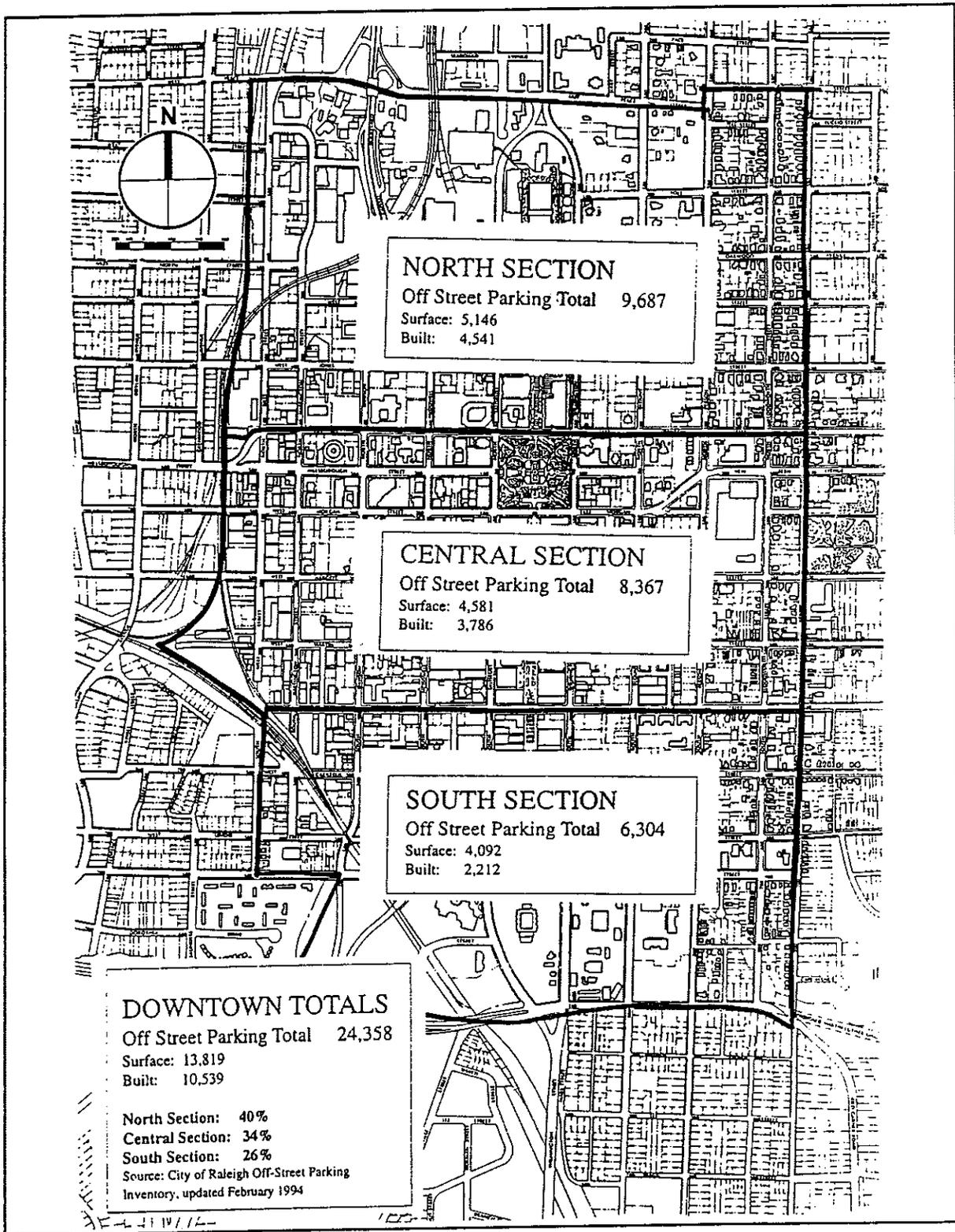


Figure 2.10: Downtown Raleigh Parking Inventory

**Triangle Transit Authority
Regional Bus Service**

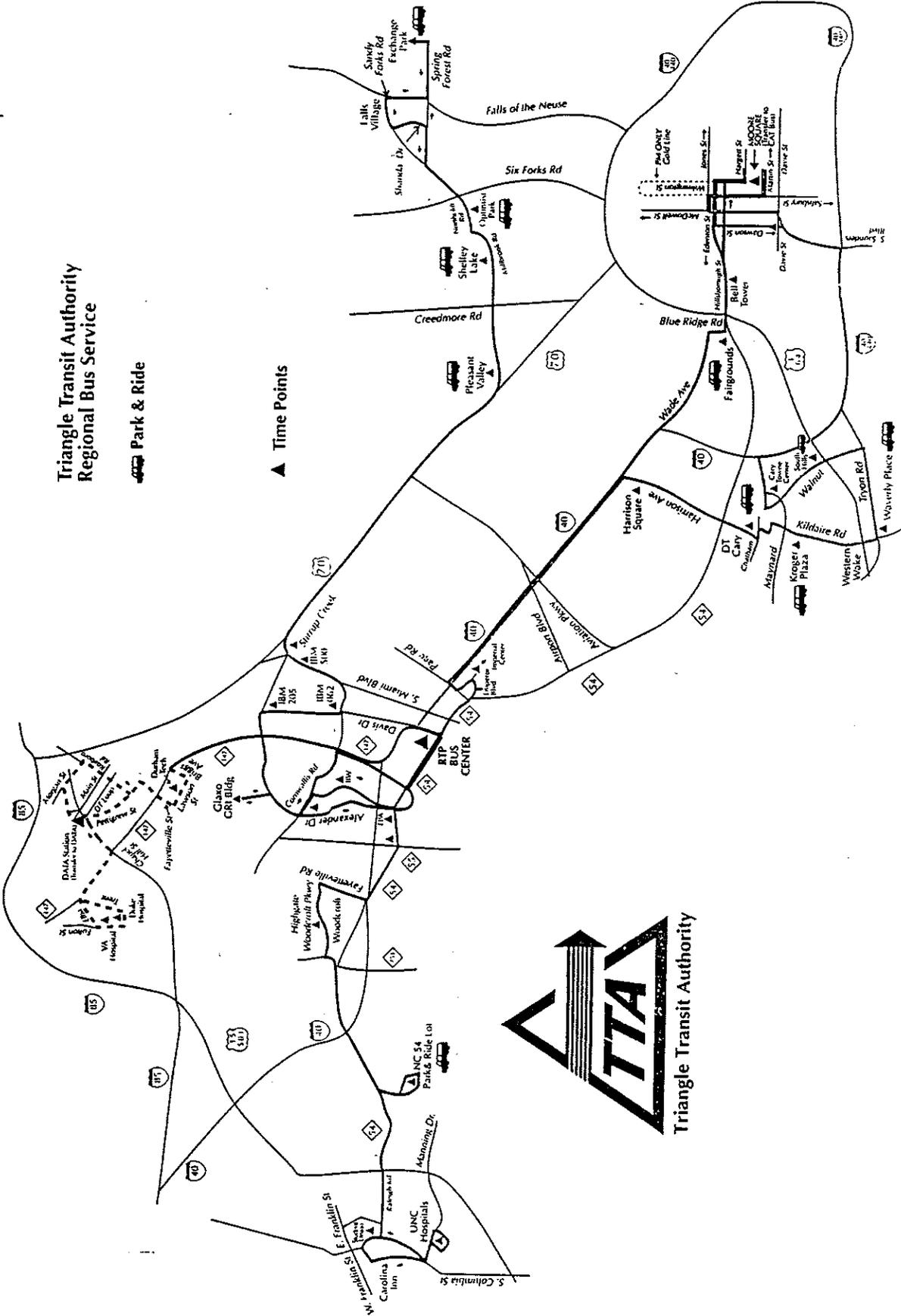


Figure 2.12: Triangle Transit Authority Bus Service



2.4.2 TTA Express Bus Service

As shown in **Figure 2.12**, the Triangle Transit Authority, a regional express bus shuttle system connecting the Raleigh-Chapel Hill-Durham-Research Triangle Park region, operates four regional express bus routes during the morning and afternoon peak commuting times. Two of the routes serve downtown Raleigh; their average weekday ridership is summarized in **Table 2.4**.

All TTA routes operate in two directions during both peak periods, at typical headways of 30 minutes. Several suburban park-and-ride sites have been designated for commuter convenience.



Figure 2.13: Downtown Raleigh Intercity Bus Station

Table 2.5: Ridership at Downtown Raleigh Intercity Bus Station

Types of Trips	Average Weekday Ridership	Average Weekend Day Ridership
Passenger Trips Originating at Station	100	200
Passenger Trips Terminating at Station	120	240
Passenger Trips Transferring at Station	180	360
Passenger Trips Continuing Through Station	350	700

Source: Carolina Trailways and Greyhound Lines, Inc., 1994 statistics, factored from annual to daily.

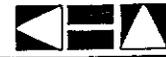


Table 2.4: Downtown Raleigh TTA Ridership Summary

Service	Ridership
Red Line (Raleigh - RTP - Durham):	
<i>Trips Ending Downtown</i>	100
<i>Trips Starting Downtown</i>	100
Gold Line (Raleigh - Cary - RTP):	
<i>Trips Ending Downtown</i>	100
<i>Trips Starting Downtown</i>	100
TOTAL AVERAGE WEEKDAY	400

2.4.3 Intercity Bus Service

Intercity bus service, or bus service between Raleigh and other U.S. cities, is provided at the downtown Raleigh bus station on West Jones Street (its location is shown on **Figure 2.1**; a photo of the station is included as **Figure 2.13**). The bus station is owned by Greyhound Lines, Inc. and both Greyhound and Carolina Trailways jointly operate daily scheduled service to other cities from the facility. (Carolina Trailways uses the bus station through an operating agreement with Greyhound.) Service is provided seven days a week between the hours of 7 a.m. and 1 a.m. Approximately 25 bus trips (12 inbound and 13 outbound) occur on a typical weekday. On Saturday and Sunday, that number increases to 31 per day (15 inbound and 16 outbound.)

Currently, six independent bus "bays" (i.e., loading/unloading spaces) are provided at

the station to adequately handle the volume of bus movements during the peak period.

Table 2.5 shows ridership at Raleigh's intercity bus station.

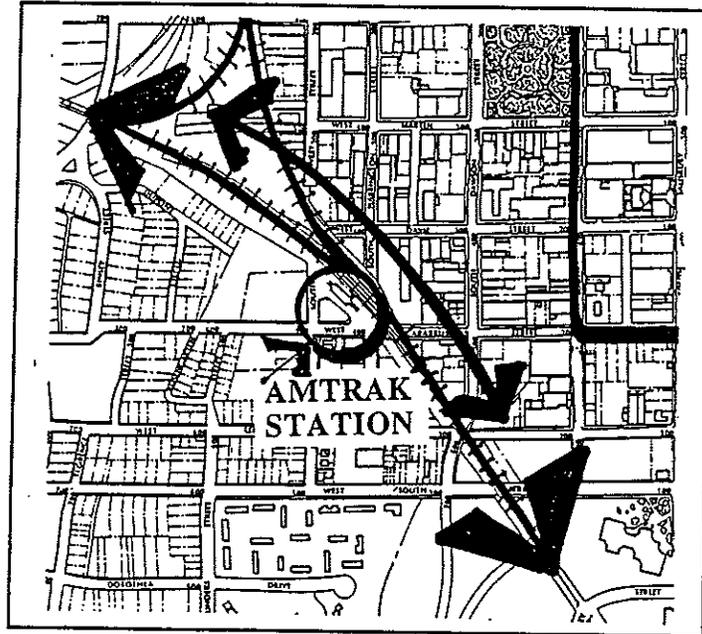


Figure 2.14: Route of Amtrak Service in Downtown Raleigh



Figure 2.15: Downtown Raleigh Amtrak Depot



2.4.4 Amtrak Passenger Train Service

Amtrak passenger service through downtown Raleigh consists of six trains per day, three northbound and three southbound. The *Carolinian* currently operates two-way daily service through Raleigh, between New York City and Charlotte; expansion of that service is currently under consideration. The *Silver Star* also operates two-way daily service through Raleigh, between New York City/Boston and Miami. In May 1995, Amtrak added the *Piedmont* service with one train per day to and from Charlotte. **Table 2.6** shows the current Raleigh timetable for these trains, and **Figure 2.14** shows the route used by Amtrak trains through downtown.

The Raleigh Amtrak station is located on the southwest edge of downtown, as shown in **Figure 2.1**. The depot (**Figure 2.15**), built in 1950, is of Georgian architecture and contains more than 4,000 square feet and has 70 long-term parking spaces.

Amtrak estimates that approximately 300 passengers use the station daily (150 arrivals and 150 departures).

Table 2.6
Amtrak Service in Downtown Raleigh

Service	Timetable	
<i>Carolinian</i>	Northbound	11:55 a.m.
	Southbound	4:27 p.m.
<i>Silver Star</i>	Northbound	4:56 a.m.
	Southbound	9:42 p.m.
<i>Piedmont</i>	To Charlotte	7:10 a.m.
	From Charlotte	9:30 p.m.

Triangle Fixed Guideway Study
Preliminary Regional Transit Plan
First Phase – 1995 – 2002

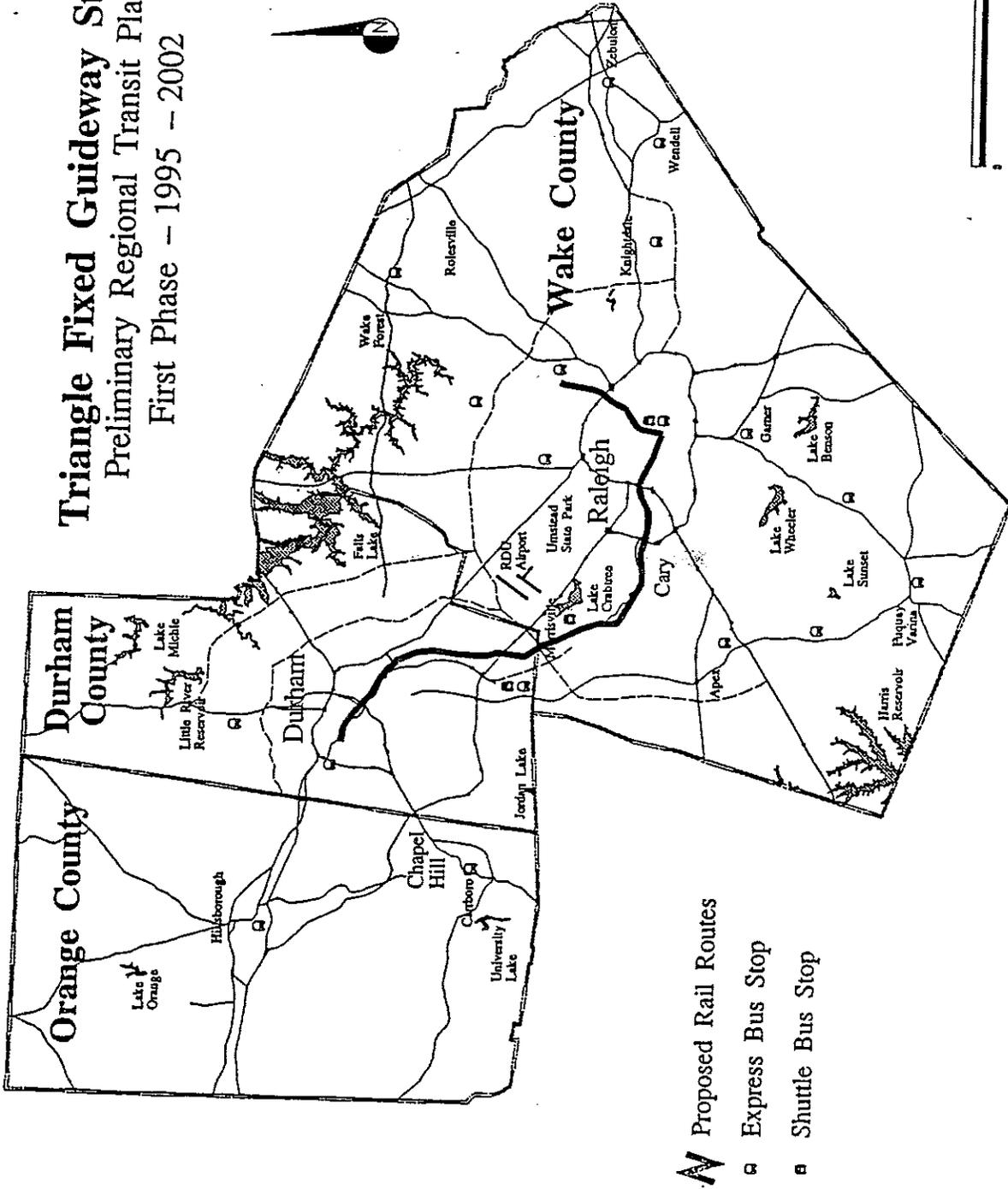


Figure 2.16
TTA Regional Rail Service Plan



2.4.5 Proposed Regional Rail Service

The Triangle Transit Authority recently completed a comprehensive study of the feasibility of building a regional fixed-guideway system connecting the major activity centers in the Triangle. As shown in **Figure 2.16**, the recommended rail plan would initially operate along the existing railroad tracks between Raleigh and Durham, using European-style intercity rail passenger cars. The proposed service plan calls for morning and evening peak period headways of 15 minutes, and off-peak headways of 30 minutes. Assuming this level of service, TTA and its consultants estimate that approximately 1,900 passengers per day (950 boardings and 950 deboardings) would use the proposed downtown Raleigh station in the year 2020.

The downtown Raleigh regional rail station has been conceptually located in the vicinity of the Norfolk Southern railroad track segment along the west side of downtown. **Figure 2.17** shows the general area under consideration for the station.



2.5 Summary of Transit Services

Table 2.7 is a summary of estimated downtown transit activity. As shown, approximately 7,900 transit (or "non-auto" transportation) passengers currently use the bus and rail services and facilities provided in downtown Raleigh on a typical weekday. This number was compiled from several sources:

in the study process, including determining functional and space requirements for a potential intermodal facility.

- CAT local bus ridership comes from **Table 2.3**. The 3,300 arrivals are comprised of the number of trips ending downtown (1,500) combined with the number of downtown transfers (1,800). The same number is assumed to be outbound.
- TTA express ridership comes from **Table 2.4**.
- Greyhound and Trailways ridership comes from **Table 2.5**. The 300 arrivals are comprised of the number of passenger trips terminating at the station (120) combined with the number of trips transferring at the station (180). The same number is assumed to be outbound.
- Amtrak ridership was provided by that organization (150 arrivals and departures daily).

Growth projections for these services were developed by applying compound growth rates consistent with regional population projections. For purposes of this study, these estimates are adequate for the next step

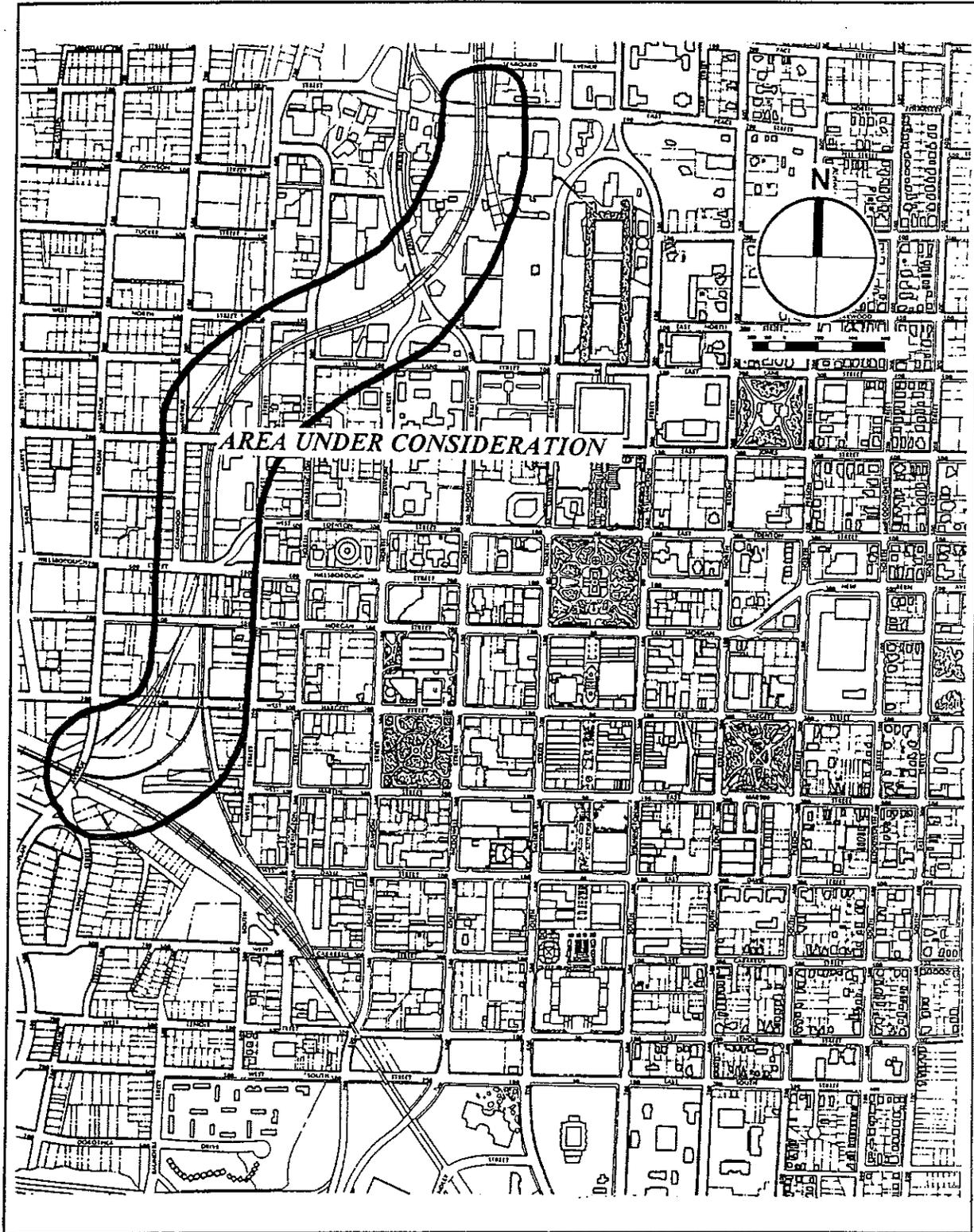


Figure 2.17: General Location Concept for Downtown Regional Rail Station



3 FUNCTIONAL AND SPATIAL REQUIREMENTS

3.0 Introduction

The purpose of this chapter is to develop a physical and operational framework for a prototypical intermodal transportation facility (ITC) suitable for downtown Raleigh. To fully understand the feasibility of implementing such a facility, a conceptual design (or "footprint") of such a facility, what it might look like, and how it might function, is required. This chapter explores the various opportunities for integrating existing and proposed downtown Raleigh transportation activities, as described previously in *Chapter 2: Existing Conditions and Trends*, at a single location. These multi-modal activities are currently scattered through the downtown area.

The next step in the study will be to apply this prototypical plan to a number of specific site options in the downtown area and then evaluate each of them vis-a-vis the project goals and objectives. This step will be documented in *Chapter 4: Site Options*.

The question of feasibility can then be addressed during the final study task.

3.1 Intermodalism

Last year, the U.S. Congress formed a National Commission on Intermodal Transportation and charged it with investigating the intermodal system in the U.S. and making recommendations for improvement. The following selected recommendations are taken from the Commission's final report to Congress:

- "Maximize safe and efficient movement of passengers and freight by incorporating individual modes into a National Intermodal Transportation System."
- "Adopt Federal policies that foster development of an intermodal passenger system incorporating urban, rural, and intercity service, including a viable intercity passenger rail network."
- "Expand innovative public and private financing methods for transportation projects."

It is clear that the federal government is strongly encouraging local and state governments to look for opportunities to coordinate multimodal activities wherever feasible.

3.2 Operational Framework

3.2.1 Methodology

From Chapter 2, the list of potential *primary* transportation modes that could be integrated in the downtown area is assumed to include:

- local bus;
- express bus;
- intercity bus;
- intercity rail; and
- regional rail (proposed).



Table 2.7
Summary of Estimated Downtown Transit Passenger Activity

Mode	Weekday Arrivals	Weekday Departures	Total Weekday
<i>Current Modes:</i>			
CAT local bus passengers	3,300	3,300	6,600
TTA express bus passengers	200	200	400
Greyhound/Trailways passengers	300	300	600
Amtrak passengers	150	150	300
Current Subtotal	3,950	3,950	7,900
<i>Potential Additions by 2020:</i>			
Local bus passengers	3,610	3,610	7,220
Express bus passengers	220	220	440
Intercity bus passengers	330	330	660
Intercity rail passengers	160	160	320
Regional rail passengers	950	950	1,900
Future Additions Subtotal	5,270	5,270	10,540
Total Year 2020 (current plus future additional)	9,220	9,220	18,440

Notes:

1. These figures are “boardings” or “deboardings” and do not include through passengers. Transfers are included.
2. Sources for current data: City of Raleigh, TTA, Carolina Trailways, Greyhound, and Amtrak.
3. Except for regional rail, year 2020 passenger estimates are based on a 3% per year growth rate, consistent with regional population growth rate estimates.
4. Year 2020 passenger estimates for regional rail are provided by TTA
5. Table does not include taxi, limo, airport shuttle, or rental car passengers.



Table 3.1
Summary of Estimated Year 2020 ITC Daily Passenger Activity

Mode	Weekday Arrivals	Weekday Departures	Total Weekday
Walk to/from	530	530	1,060
Auto dropoff/pickup	630	630	1,260
Auto park-and-ride	330	330	660
Subtotal	1,490	1,490	2,980
Local bus passengers	1,330	1,330	2,660
Express bus passengers	110	110	220
Intercity bus passengers	630	630	1,260
Intercity rail passengers	310	310	620
Regional rail passengers	950	950	1,900
Subtotal	3,330	3,330	6,660
TOTAL	4,820	4,820	9,640



All passengers using the facility to transfer between any two of these primary modes will have a "mode of arrival" as well as a "mode of departure." (Passengers simply passing through the facility riding on one of these primary modes, and not transferring, are not included in this analysis.)

However, for another type of passenger who is using the facility as a final destination (or origin), his or her access mode will usually be by either (a) walking or (b) driving to and from the facility. If the passenger is driving, the access mode can be further divided into either (a) driving and parking, or (b) passenger drop-off and pick-up. Passenger drop-off and pick-up activities include personal vehicles as well as taxis, limos, and special shuttles (such as airport shuttle services). Therefore, the list of *secondary* modes at the facility is assumed to include the following:

- walking;
- bicycle;
- auto park;
- auto drop-off and pick-up;
- taxi, limo and shuttle drop-off and pick-up; and
- rental car.

Table 3.1 displays a summary of the estimated daily passenger activity (arriving and departing) that could be expected at a new downtown intermodal transportation center. (Note: this does not include through passengers who do not deboard buses or trains while in the terminal.) This table was developed directly from the summary of estimated downtown passenger activity in **Table 2.7** of Chapter 2 using a number of key planning assumptions that were described following the table.



Table 3.2
Estimated Weekday Access and Egress Mode Splits

Mode	Intercity Bus and Rail	Express Bus and Regional Rail	
	Access and Egress	AM Access/ PM Egress	AM Egress/ PM Access
Walking	5%	10%	50%
Bicycle	0%	5%	0%
Auto park	10%	50%	0%
Auto drop-off/pick-up*	75%	25%	0%
Rental car	5%	0%	0%
Local bus	5%	10%	50%
TOTAL	100%	100%	100%

*Note: Includes personal vehicle, taxi, limo, and private shuttle.

Table 3.3 displays a forecast of the expected transfer activity among all these modes, based on the current and forecasted usage data provided earlier in Chapter 2, as well as the planning assumptions summarized above. The totals shown in Table 3.3 do not match the totals in Table 3.1 due to the mathematical balancing required to create the matrix. Also, to reflect the synergy expected to result from co-locating the intercity rail and the intercity bus services, additional ridership of approximately 10 percent of each mode's total was added to boost the transfer volumes between these two modes. (A literature search showed that no known studies have been conducted to actually try and better quantify this important intermodal effect.)



As the table indicates, the three major users of the facility will likely be local bus passengers, passengers on the proposed regional rail system, and intercity bus passengers, respectively. The most often used mode of access is passenger drop-off (or pick-up), with walking to (or from) following closely.

3.2.2 Key Assumptions

- Due to the importance of including Amtrak passengers and passengers from the proposed regional rail system, the proposed intermodal facility must be located somewhere along the existing railroad tracks on the west side of downtown. It is neither feasible nor cost-effective to move the existing tracks to another location, such as through the middle of downtown.
- To maximize local and express bus passenger transfer opportunities, most, if not all, CAT and TTA buses must serve the facility. This would result in two downtown bus focal points: the Moore Square Transit Transfer Facility; and the proposed intermodal facility. Given a choice, transferring bus passengers will typically transfer at the first available opportunity. Without the benefit of a specific bus operating plan for two transfer facilities, it is assumed for the purposes of this study that, of all the transfers that would have occurred at the Moore Square facility alone, approximately 50 percent would now (randomly) occur at each facility.
- Due to the distance between the railroad tracks and the major employment areas of downtown (four to eight blocks), most downtown-destined bus passengers will not use the intermodal facility as their terminus stop. It is assumed that every local bus route will continue to penetrate downtown and thereby provide a more convenient place to access their route than the proposed intermodal facility. Therefore, it is assumed that only approximately 10 percent of the downtown-oriented bus passengers will use the proposed intermodal facility as their terminus.
- Based on experience in other cities, **Table 3.2** shows the planning factors used to estimate the access and egress volumes at this type of facility in this type of location:



Table 3.4 shows the five intermodal passenger movements with the largest daily volume when modes with similar functional and location requirements are grouped. These priorities will aid the design development process.

Table 3.4
Most Active ITC Passenger Movements by Mode

From Mode:	To Mode:	Daily Passenger Volume
1. Local and Express Bus	Local and Express Bus	900
2. Kiss-and-Ride	Intercity and Regional Rail	442
3. Walking	Intercity and Regional Rail	325
4. Local and Express Bus	Intercity and Regional Rail	285
5. Intercity Bus	Intercity Bus	284

3.3 Conceptual-Level General Design Criteria

This section provides the basic criteria for designing the functional space requirements necessary for providing a "generic" ITC incorporating all the intermodal services described above at the passenger volume levels estimated above. The following discussion is intended to provide an "order of magnitude" perspective to the project, and is **not** intended to suggest a particular design concept. Indeed, without the benefit of a specific site to design for, these design concepts cannot be confirmed (the next chapter will discuss specific site designs in the downtown area).

3.3.1 Pedestrian Space Criteria

The key pedestrian feature of an ITC is its passenger waiting area. The design intent is to consolidate pedestrian activity at a centralized waiting location to facilitate transfers among all the modes. As shown in **Table 3.3** above, approximately 5,000 arriving and 5,000 departing passengers per day could be expected to use the facility on a typical weekday in the year 2020. Architectural standards for pedestrian spaces will be applied to size the various walkways and approaches to and from the central pedestrian areas.

Table 3.3
Estimated Intermodal Transportation Center Passenger Transfer Matrix for Year 2020

TO MODE:	Walk	Auto Pickup	Auto Park	Local Bus	Express Bus	Intercity Bus	Intercity Rail	Regional Rail	TOTAL
FROM MODE:									
Walk	n.a.	n.a.	n.a.	150	36	17	14	309	526
Auto dropoff	n.a.	n.a.	n.a.	0	14	277	223	119	633
Auto park-and-ride	n.a.	n.a.	n.a.	0	28	35	28	238	328
Local bus	150	0	0	900	33	17	14	285	1,399
Express bus	36	14	28	33	0	0	0	0	110
Intercity bus	17	277	35	17	0	284	50	0	680
Intercity rail	14	223	28	14	0	50	31	0	360
Regional rail]	309	119	238	285	0	0	0	0	950
TOTAL	526	633	328	1,399	110	680	360	950	4,986

Notes:

1. A zero entry means "fewer than ten" passengers.
2. "Walk" includes bicyclists.
3. "Auto Park" includes rental car passengers (if provided).
4. "Local Bus" includes circulator bus passengers.
5. "Auto Dropoff/Pickup" includes taxi and limo passengers.
6. Intercity rail-Intercity rail transfers assumed to be approximately 10% of total Intercity Rail passengers.



Also, baggage handling facilities are required for intercity service.

3.3.6 Intercity and Regional Rail Space Criteria

The basic design requirement for these modes is the provision of two dedicated tracks at the ITC for joint use by an expanded intercity rail system (such as Amtrak and/or NCDOT service), and the proposed TTA regional rail (or commuter rail) system. The passenger platforms can be shared by the two modes. Baggage handling facilities also are required for intercity rail service.

3.4 Prototypical Concepts

The next step in this analysis is to convert the utilization, operational and space requirements outlined above into conceptual layouts for a prototypical intermodal facility. For purposes of study only, three levels of design were developed to show a wide range of investment opportunity:

- Minimum;
- Moderate; and
- Maximum.

Recommendations on the feasibility of these investment levels will be conducted later. Analysis of these concepts, when applied to specific Downtown Raleigh site options, will be the subject of the next chapter.

3.4.1 Minimum Prototype

This design concept is the lowest level of investment among the three, yet accommodates all the modes featured above. No joint development opportunity is explicitly provided for. **Figure 3.1** illustrates a conceptual plan for this level of public and private investment.



The waiting area should be a fully enclosed building with climate control, ticket counters, seating, information racks, telephones, lockers, rest rooms, vending machines and all the usual passenger amenities found at centralized train and bus depots.

3.3.2 Auto Drop-off/Pick-up Space Criteria

More than 700 daily passengers are estimated to be dropped off and picked up by private automobile, taxi and limo services at the facility. Assuming a 15 percent peak-hour ratio, a maximum of approximately 100 "kiss and ride" vehicles will need to be accommodated in one hour for this service. Since the turn-over rate for these spaces is lower for picking up passengers than for drop off, the afternoon peak hour (approximately 4 PM to 5 PM) will control the demand. Some overlap of drop-off and pick-up will also occur during this time.

Assuming an average afternoon turnover rate of 5 minutes per vehicle per space, approximately 20 parking spaces are needed for this function.

3.3.3 Auto Parking Space Criteria

As shown in Table 3.3, approximately 330 passengers are expected to "park and ride" at the facility. Assuming some carpooling, this would call for approximately 300 long-term parking spaces at the site. Assuming surface parking, approximately three acres of land is required. Auto access to the park and ride facility must be conveniently provided from the existing surrounding city street system.

3.3.4 Local and Express Bus Space Criteria

Table 3.3 above shows that approximately 1,500 daily local and express bus passengers will use the proposed facility. Assuming operations similar to existing CAT service, this translates to approximately 35 to 40 peak-hour local and express buses stopping at the ITC during the morning and afternoon peaks.

Assuming normal operations and typical passenger loading and unloading times, one berth (or bay) can handle from 8 to 10 buses per hour. Based on that criterion, the number of bus bays that would be required for this service is approximately four or five. Adding two or three bays for special bus services such as the *Raleigh Trolley* and perhaps private carriers, a reasonable maximum planning number to use for these services is **eight bays**. This number is approximate due to scheduling flexibility and other actual operating variables in place at the time of opening.

3.3.5 Intercity Bus Space Criteria

The existing Blount Street intercity bus station used by Greyhound and Trailways has six bus bays and works well. As the analysis in Chapter 2 indicated, intercity bus utilization is expected to double by the year 2020, indicating that 12 bays would be required by the year 2020. Due the significant operating differences between urban bus service and intercity bus service, it is recommended that these operations be separated. Layover times for intercity buses are substantially longer than for urban buses.



3.4.2 Moderate Prototype

This design level builds on the minimum level described above with additional design provisions for (a) a somewhat upgraded facility and (b) a moderate amount of joint development space integrated directed into the facility. **Figure 3.2** shows a prototypical design for this level of public and private investment.

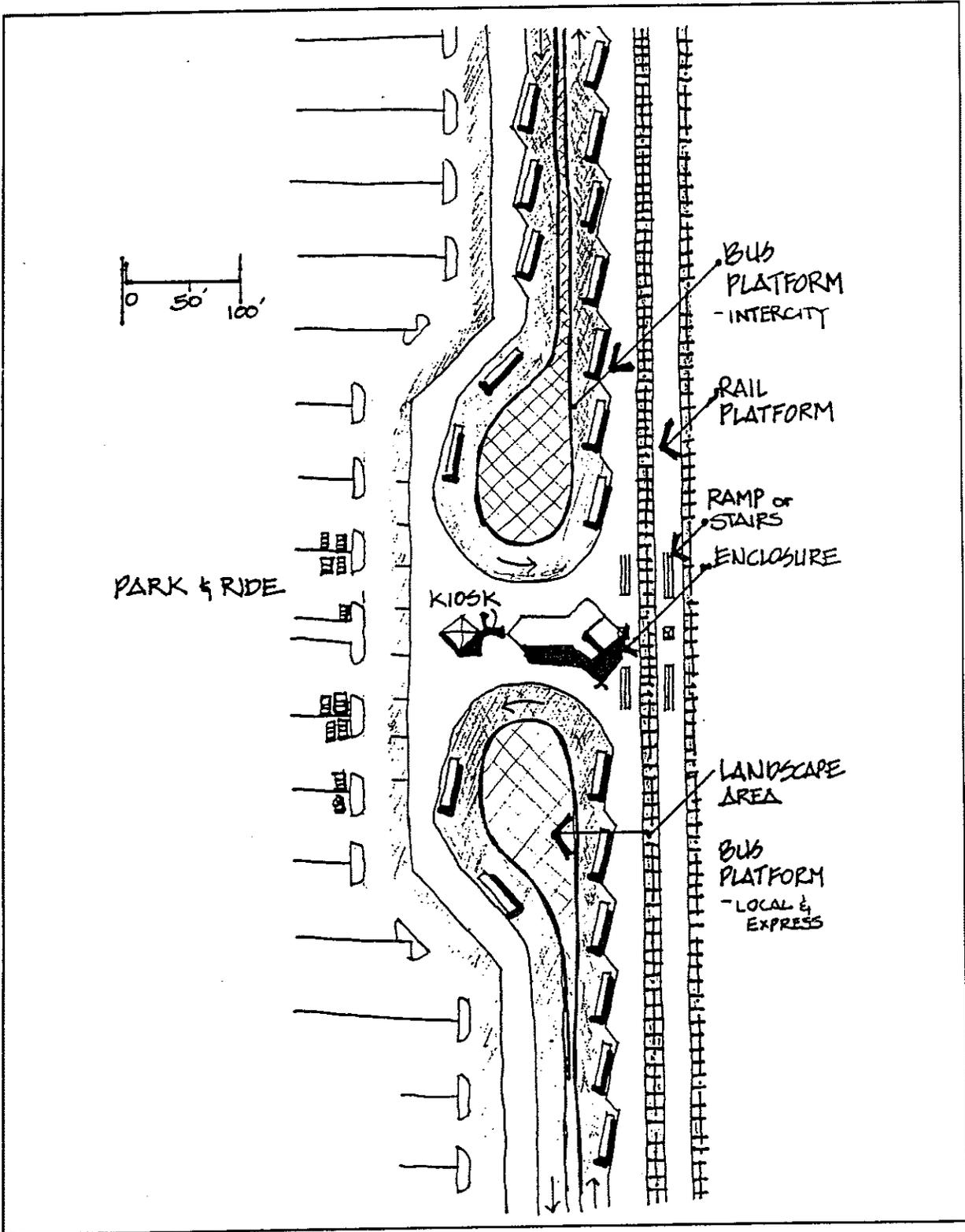


Figure 3.1: Minimum ITC Prototype



3.4.3 Maximum Prototype

This design prototype takes substantial advantage of the joint development opportunities that may be afforded by an intermodal transportation center in Downtown Raleigh. **Figures 3.3a and 3.3b** illustrate two design concept options for this higher level of public and private investment in an ITC.

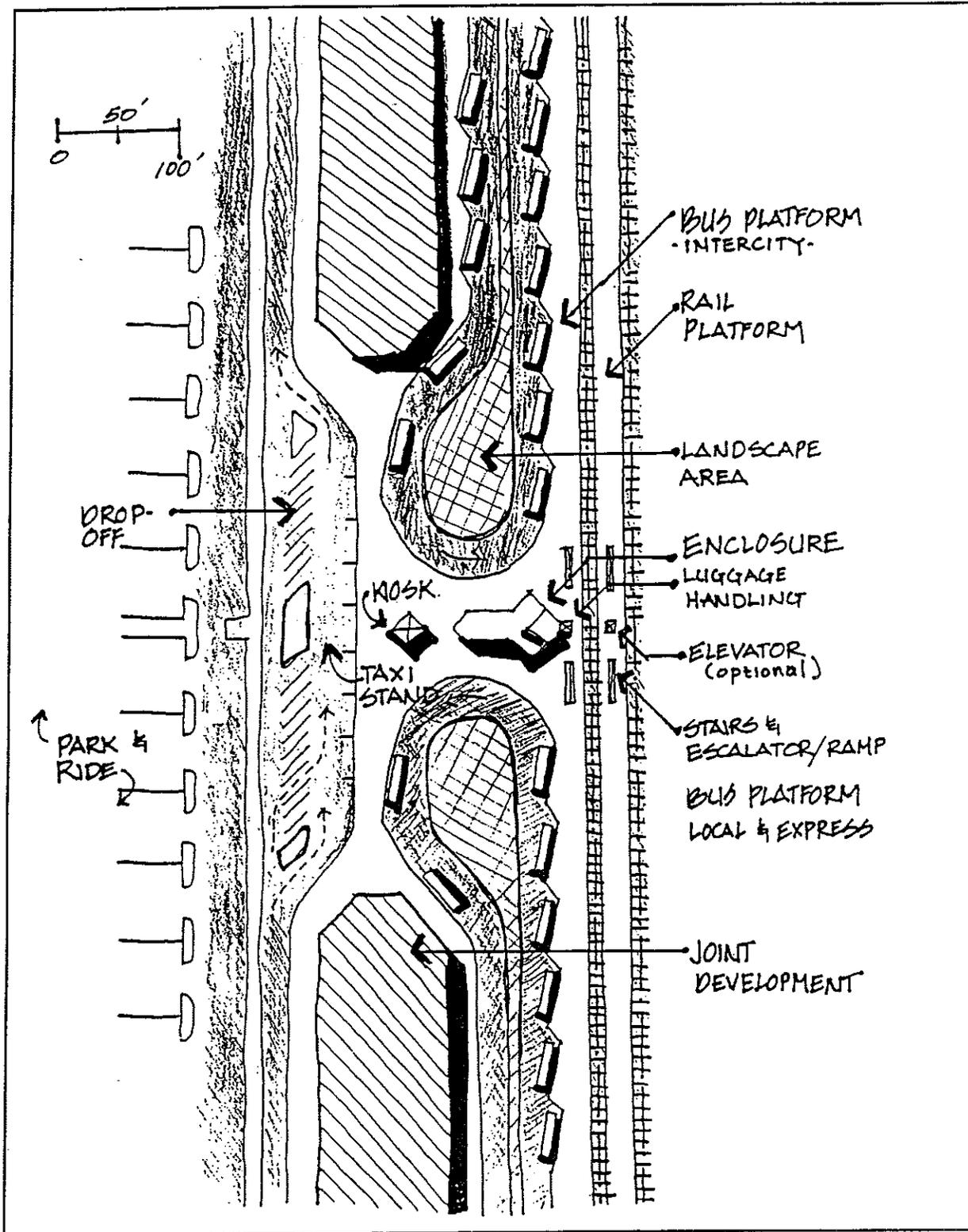


Figure 3.2: Moderate ITC Prototype

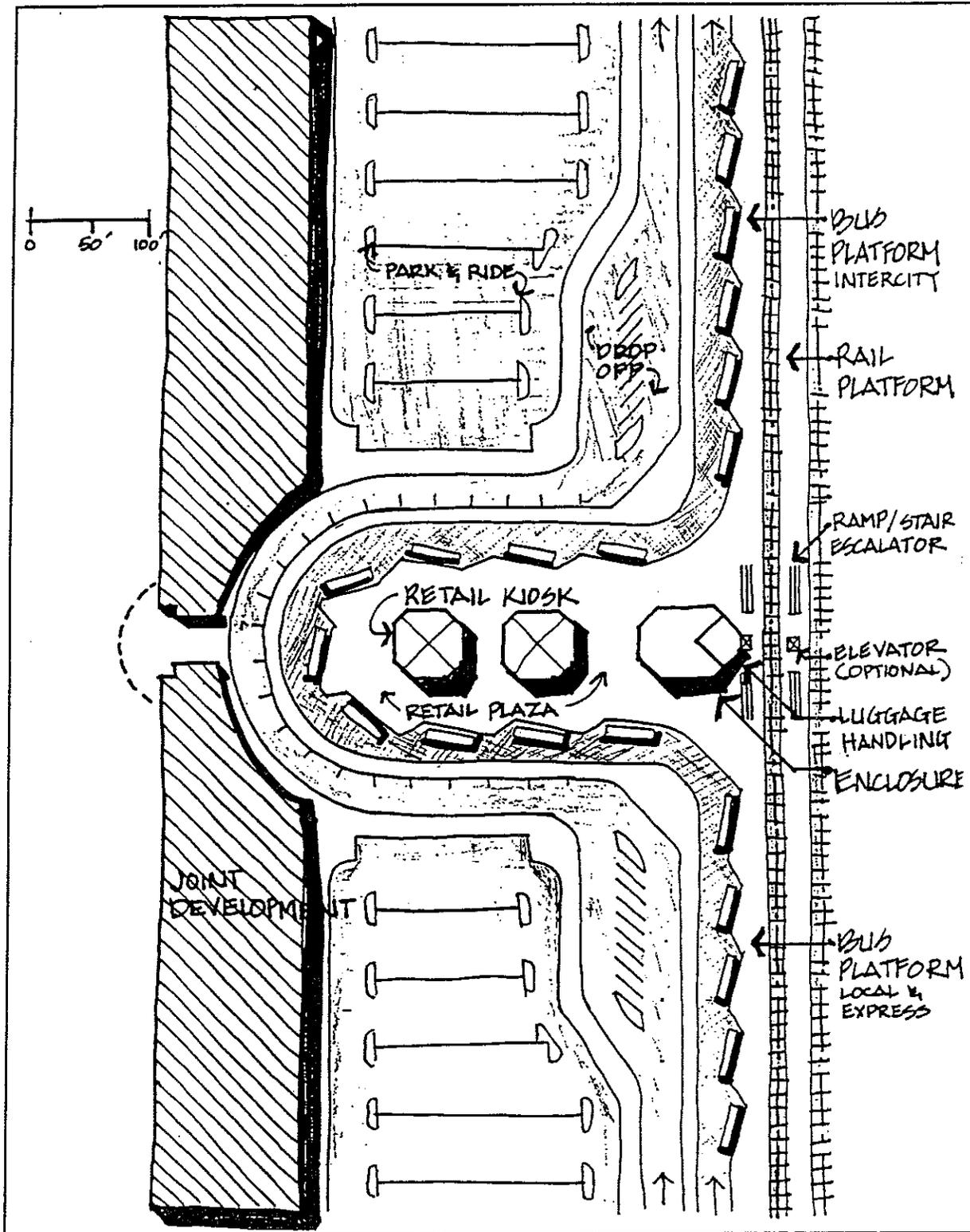


Figure 3.3b: Maximum ITC Prototype (Option 2)

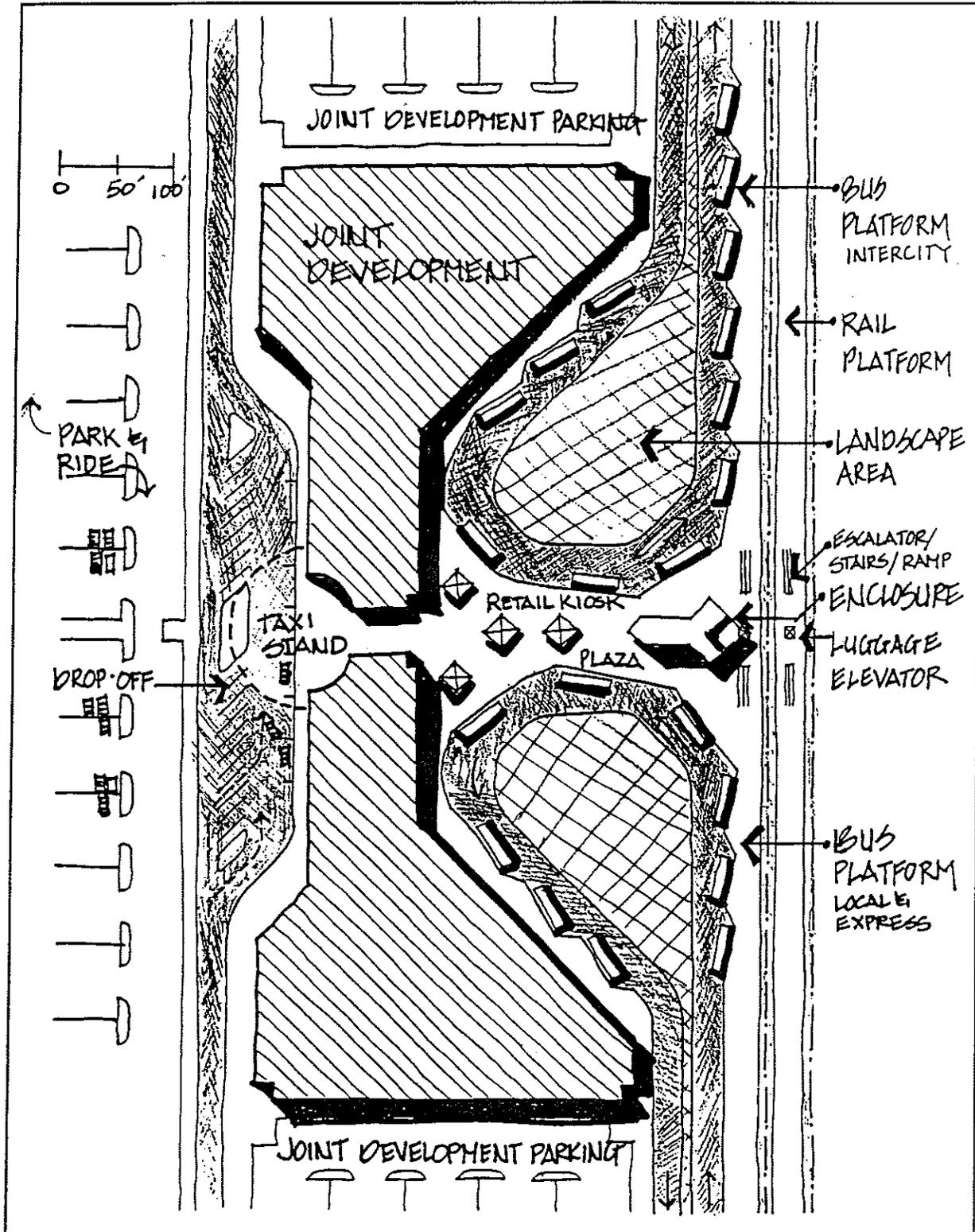


Figure 3.3a: Maximum ITC Prototype (Option 1)



4 SITE OPTIONS

4.0 Introduction

The purpose of this chapter is to describe the development and analysis of alternative sites for a proposed Intermodal Transportation Center (ITC) in downtown Raleigh. It includes a discussion of locational criteria, constraints on site location, preliminary site options, evaluation criteria, and preliminary results of the evaluation. This evaluation process will be used to determine the ultimate feasibility of implementing a downtown ITC and, if feasible, its optimum location and layout.

Previous chapters and discussions with project Advisory Committee members resulted in development of goals and objectives for the ITC (*Chapter 1*), documentation of existing conditions and plans for land use and transportation (*Chapter 2*), and determination of functional and spacial requirements for the proposed facility (*Chapter 3*).

4.1 Development of Options

4.1.1 Principles for Locating an Intermodal Facility

Horowitz, in *Evaluation of Intermodal Passenger Transfer Facilities* (FHWA, 1994), gives two general principles for locating a transfer facility:

- To maximize ease of access from modal markets, and

- To maximize potential transfers between modes.

While Horowitz concedes that there are other considerations, such as cost, environmental impact, site availability, opportunity for joint development, and historic preservation, he states, "*an intermodal facility ultimately will be judged by its ability to serve passengers, and its location is critical to the quality of that service.*"

The location criteria developed in this report are consistent with these two principles. They all relate to access by various modes and to transfers between modes.

The site options developed for this project were based on the consideration of two general factors:

- location **opportunities**, or positive aspects relating to location; and
- location **constraints**, or negative aspects precluding or discouraging certain locations.

Location opportunities relate primarily to proximity to destinations or access by transportation modes, while constraints relate to avoiding sites with factors that would not be conducive to intermodal access and transfers.



3.5 Next Steps

Now that basic design concepts and requirements have been established for the Intermodal Transportation Center, the next step will be to apply those concepts to the "real world." *Chapter 4: Site Options* will apply these prototypical design options to several potential sites in downtown Raleigh. Each option will be evaluated in light of the project's goals and objectives established at the beginning of the study to find the most suitable site or sites.

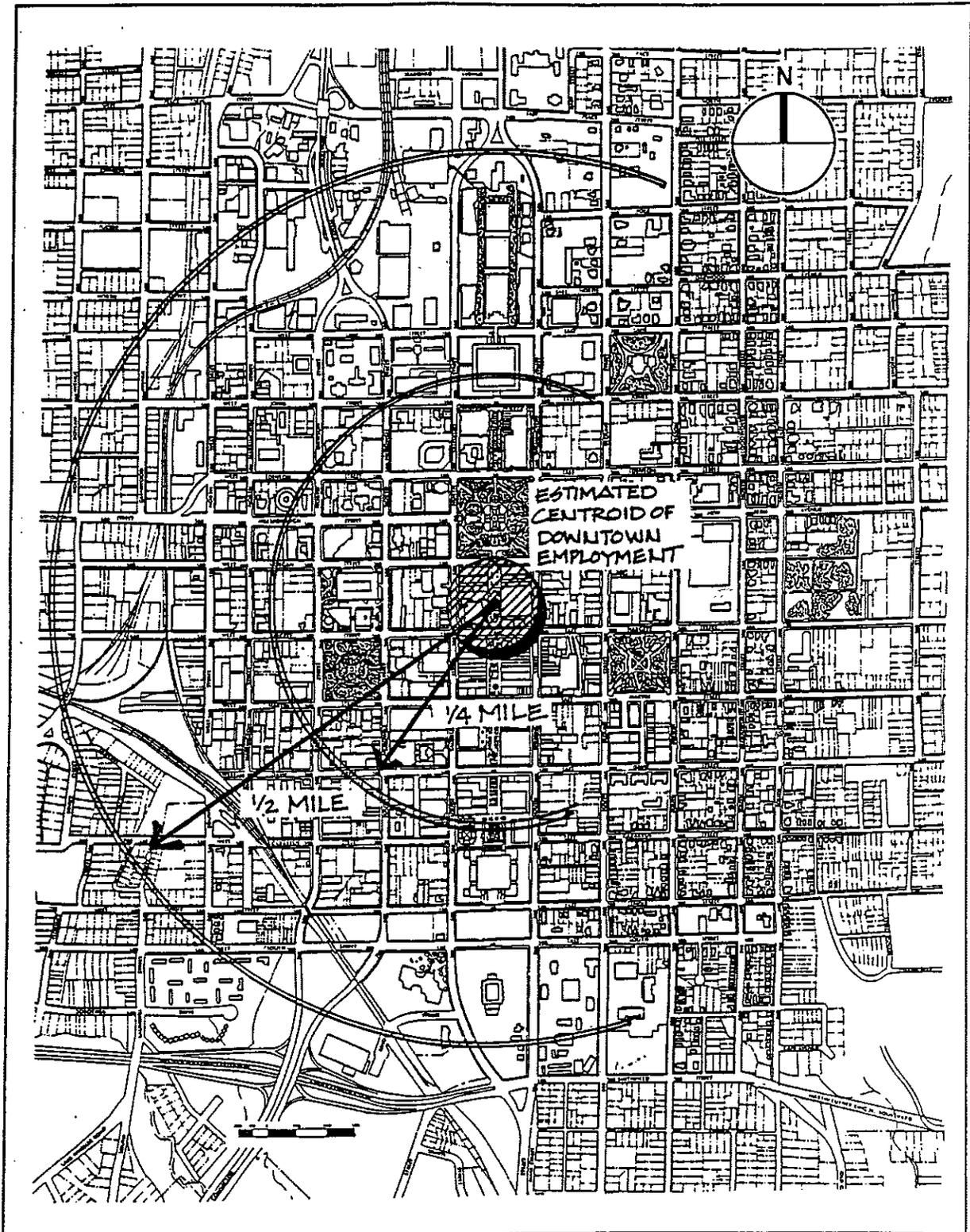


Figure 4.1: Centroid of Downtown Employment



Location Constraints

■ *Existing Development*

A major constraint to the location of the ITC is existing development. This constraint relates to the cost of the land (land with a building on it is usually much more expensive than vacant land) and also to the cost of demolishing an existing building. Because of the unique design and operating requirements of an ITC to serve multiple modes of transportation, it is rarely feasible to use or rehabilitate an existing structure to adequately serve as an ITC.

■ *Land Size Requirements*

Chapter 3 established that the size needed for an ITC in Raleigh could vary from one city block (about four acres) to nearly three city blocks (about 10 acres), depending on the amount of parking and the degree of joint development desired. This size requirement could eliminate otherwise suitable small parcels from consideration.

■ *Existing Railroads*

The project's Advisory Committee has agreed that railroad service is a key component of the study, serving both intercity passenger rail and potentially regional passenger rail. Since it is not considered feasible to relocate railroad tracks in downtown Raleigh, only sites adjacent to existing railroad tracks are considered.

■ *Other Constraints*

Other constraints may dictate against selecting a particular site, even if it ranks highly based on the project's goals and objectives established in Chapter 1. These constraints may include such items as the existence of hazardous materials requiring expensive and time-consuming cleanup, conflict with other plans by the City or other agencies (such as a site previously designated for another desirable public or private use), or other unique situations not specifically accounted for in the evaluation criteria. These constraints will be recognized as appropriate and noted in the site evaluation process.

4.1.3 Preliminary Areas

Based on the location criteria mentioned above, preliminary areas for the downtown Raleigh ITC have been identified. Several of these areas are described in terms of a railroad "triangle," which is the triangle formed by the Norfolk Southern and CSX tracks, roughly bounded by Hargett Street on the north, Harrington Street on the east, Cabarrus Street on the south, and Boylan Avenue on the west. The nine preliminary areas, shown in **Figure 4.2**, are:

- the existing Amtrak station and the other existing modal terminals (the "do-nothing" or "existing" option),
- the south leg of the railroad triangle (expanded Amtrak station area),



4.1.2 Location Criteria

Location Opportunities

■ *Study Area*

An early step in the study process was the definition of the study area. If transportation service provided by different modes is physically separated, the two principles developed by Horowitz can be contradictory, in that maximizing access to a particular mode may imply less access from another mode and thus reduce potential transfers. However, if the terminal is to be located in a Central Business District (CBD), where service is provided by all applicable modes and where most transportation routes converge, good access to all modes can be provided and transfers between modes can be accommodated. Therefore, by defining the Raleigh CBD as the primary study area, both of Horowitz' principals can be adhered to. This study area definition was adopted because of the convergence of the existing and planned transportation modes in the CBD, the strong potential transit market in the CBD, and the joint development opportunities inherent in the area. By adopting this defined study area, an exhaustive study of many other sites outside the CBD was avoided.

■ *Proximity to the Center of CBD Activity*

Another early step in this study was determining the "center of gravity" of existing and projected CBD employment. Employment rather than

population was selected as the primary factor in this determination because the CBD study area has many more employees than residents. Therefore, the target transit (non-auto mode) market at the CBD end of trips includes workers rather than residents. Employment was also preferable to other measures because work trips are more likely to be diverted from auto to transit than are other types of trips, such as shopping or personal business. The center of CBD employment, both existing and short-term future, was determined to be approximately the block just south of the State Capitol, bounded by Morgan, Salisbury, Hargett, and Wilmington Streets (see **Figure 4.1**). Therefore, it is desirable to locate the ITC as close as possible to that location to minimize average walking distance for all downtown employees.

■ *Local Bus Service*

Capital Area Transit (CAT) provides local bus transit service throughout the City of Raleigh. All CAT routes (except CAT Connector routes) converge in the CBD and transfer at the Moore Square transfer terminal. It is desirable to locate the ITC so that as many CAT routes as possible can serve it with minimum route diversion.

■ *Passenger Rail Service*

The Amtrak *Silver Star*, *Carolinian*, and *Piedmont* trains provide intercity passenger rail service in Raleigh. All of these trains stop at the Amtrak station in the southwest portion of the CBD, near



the intersection of South and West Streets. While all three passenger rail routes currently use Norfolk Southern tracks to the southeast and to the west of the CBD, proposed future service could also use the CSX tracks to the north. (The CSX tracks provide a more direct routing to Richmond and the northeast, but have been terminated south of the Virginia border due to a need for major bridge maintenance across Lake Gaston.) It is desirable to locate the ITC so that it serves both existing and planned intercity passenger rail routes.

■ *Intercity Bus Service*

Greyhound and Carolina Trailways bus lines both provide intercity bus service to Raleigh at the bus station at the intersection of Harrington and Jones Streets. Because an objective of the ITC is to provide a *new* facility for intercity bus service, proximity to that existing station is not important. However, the new location should be accessible to intercity bus vehicles from routes leading to and from Raleigh with minimum route diversion.

■ *Express Bus Service*

Triangle Transit Authority (TTA) provides express bus service between Raleigh, Cary, Research Triangle Park (RTP), Durham, and Chapel Hill. Service to downtown Raleigh currently stops at the Moore Square Transfer Station. It is desirable to locate the ITC such that TTA express buses could serve it with minimum route diversion.

■ *Regional Rail Service*

Triangle Transit Authority has proposed a fixed-guideway transit service between Raleigh, Cary, RTP, and Durham. This service is proposed to use the existing Norfolk Southern and CSX railroad tracks. While a station location serving downtown Raleigh has not yet been determined, the area under consideration includes the area between and including the northwest leg of the rail triangle to the old Seaboard station north of Peace Street (see *Chapter 2, Figure 2.17*). It is desirable to locate the ITC so that it also serves this planned regional passenger rail system.

■ *Street System*

Many of the potential users of the ITC would access the terminal by auto, either as park-and-ride or as drop-off ("kiss-and-ride") users. Other modes of transportation, including taxis, bicycles, and buses, would use downtown streets to access the ITC, while pedestrians would use the sidewalks adjacent to public streets. For these reasons, it is important that the ITC is located in proximity to thoroughfares serving the CBD and connecting the CBD with other Raleigh and regional destinations.



- the east side of the railroad triangle,
- the north leg of the railroad triangle,
- an area slightly north of the railroad triangle,
- the center of the railroad triangle,
- an area on the south or west sides of the triangle,
- an area at or near the old Seaboard Terminal, north of Peace Street,
- an area near the State Government complex, and
- an area near the Raleigh Civic Center.

■ ***Existing Sites and Buildings***

This option represents the "do-nothing" alternative -- the option of not building an intermodal terminal facility. Intercity passenger rail services would continue to operate out of the existing Amtrak terminal, CAT and TTA buses would continue to use the Moore Square transfer terminal, and the Carolina Trailways and Greyhound intercity buses would continue to use the Jones Street bus station. Selection of this option would not necessarily preclude use of shuttles or other non-capital intensive means to provide connections between the existing modal terminals. Included in this option is a proposed TTA regional rail station.

■ ***South Leg of the Railroad Triangle***

This area includes the existing Amtrak terminal site plus the area immediately across the tracks from it, on a site bounded by Davie Street on the north, Dawson Street on the east, Cabarrus Street on the south, and West Street on the west.

■ ***East Side of the Railroad Triangle***

This area includes a portion of the Dillon property, along the eastern side of the triangle between the north and south legs. The area is generally bounded by Hargett Street on the north, Harrington Street on the east, Davie Street on the south, and the railroad tracks on the west.

■ ***North Leg of the Railroad Triangle***

This area is adjacent to the portion of the north-south Norfolk Southern tracks just north of the triangle. The area is generally bounded by Hargett Street on the south, the railroad tracks on the west, West Street on the east, and Morgan Street on the north.

■ ***Far North Leg of the Railroad Triangle***

This area is slightly north of the previous site, and is bounded by Hillsborough Street on the south, West Street on the east, Jones Street on the north, and the railroad tracks on the west.

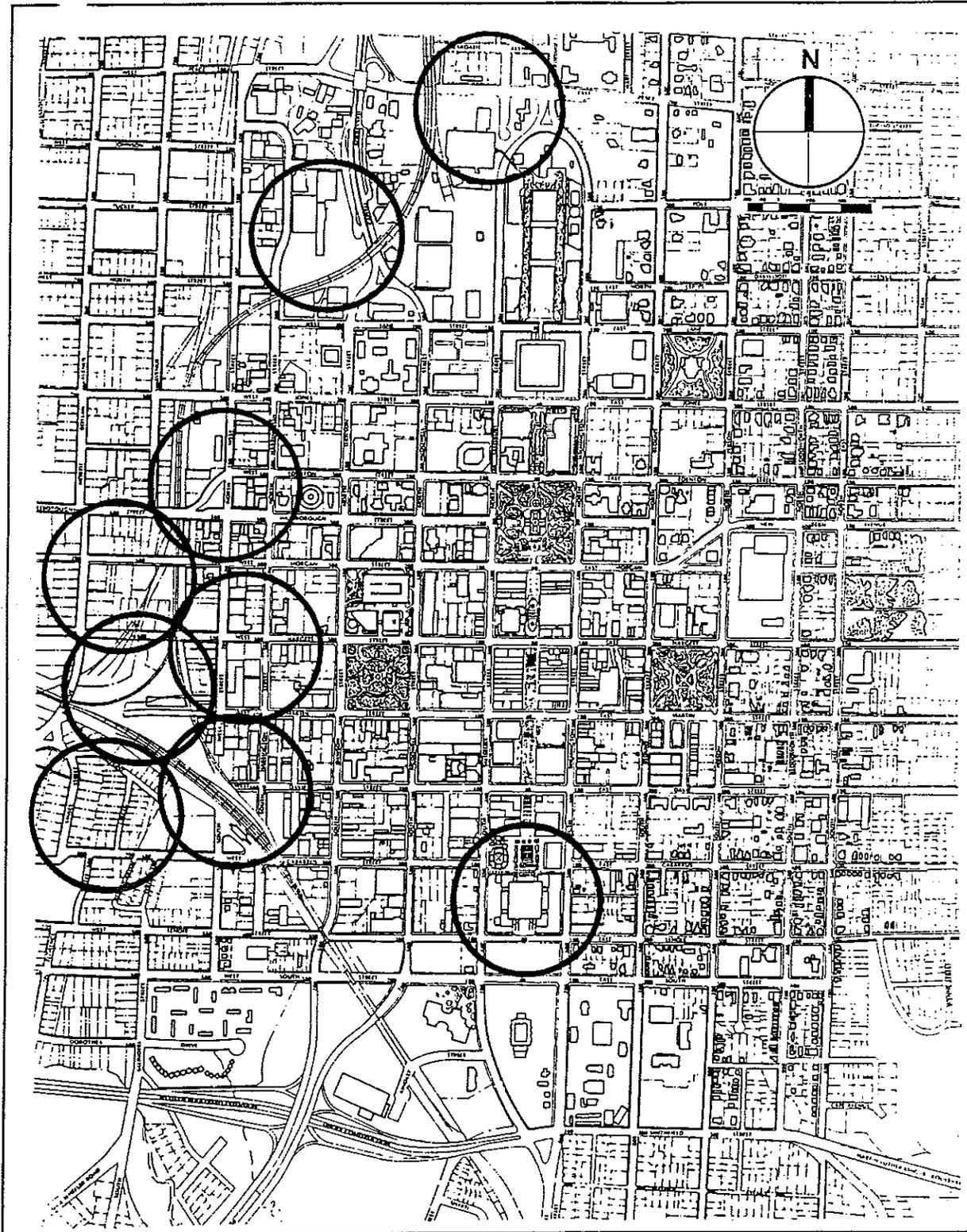


Figure 4.2: Preliminary Areas for Evaluation



4.2 Evaluation Criteria

The criteria used in evaluating the site alternatives are based on the goals and objectives approved by the project Advisory Committee and detailed in Chapter 1. They have been modified slightly in some cases to provide a quantifiable measure of each site's attainment of the goals and objectives.

4.2.1 Connections Among Modes

The site should consolidate connections among downtown modes. Objectives include maximizing modal choice and improving physical and operational linkages among modes.

The measure of satisfying this goal is the number of transit modes accommodated at the facility.

4.2.2 Increase Percentage of Transit Ridership

The site should act as a catalyst to increase the downtown modal split. Objectives include maximizing the use of existing and proposed transit investments, reducing traffic congestion, and alleviating downtown parking demand.

The measure of satisfying this goal is the increase in the projected use of transit with the facility in place, where transit is defined as all non-auto transportation modes.

4.2.3 Minimize Travel Time to Station

The site should be located so that travel time is limited. Objectives include minimizing walking distance for downtown users, maximizing linkages to regional activity centers, and providing adequate access, parking, and drop-off spaces.

The measure of satisfying this goal is a weighted average of the distance to the center of downtown employment, and the number of major and minor thoroughfares serving the site.

4.2.4 Cost Effectiveness

The site should be cost-effective. Objectives include maximizing utilization (including joint development), exploiting shared parking opportunities, and minimizing capital and operating costs.

The measure of satisfying this goal is the capital cost per user (including transfers).

4.2.5 Traffic and Transit Operations

The site should improve or maintain traffic and transit operations. Objectives include maintaining or improving traffic levels of service, minimizing bus route deviation, and complementing adopted downtown transportation plans.

The measure of satisfying this goal is a weighted average of a subjective evaluation of adverse impacts on street traffic and



transit routing (local, express, and intercity). Conflicts with adopted transportation plans will be noted.

4.2.6 Railroad Operations

Railroad operations were added as a goal based on discussions with the project's Advisory Committee. The site must provide for acceptable railroad operations on all affected tracks. Because of the importance of this goal to the affected railroads, alternatives not meeting minimum criteria for railroad operations were dismissed as viable candidate sites.

The measure of satisfying this goal is a weighted average of a subjective evaluation of adverse impacts on railroad operations. Conflicts with freight operations must be avoided to ensure availability of right-of-way.

4.2.7 Downtown Development

The site should help to activate downtown development. Objectives include maximizing private development opportunities, maximizing access and linkages to downtown activities, meeting community goals, fostering pedestrian and transit uses, reinforcing existing and planned retail and commercial nodes, complementing adopted downtown development plans, and preserving and protecting neighborhoods and historic resources. An additional objective stated by the Advisory Committee that best fits within the context of this goal is providing a safe environment for users of the facility and of related development.

The measure of satisfying this goal is a subjective evaluation of compliance with downtown development plans and the likelihood of attracting additional development that would complement the transfer terminal.

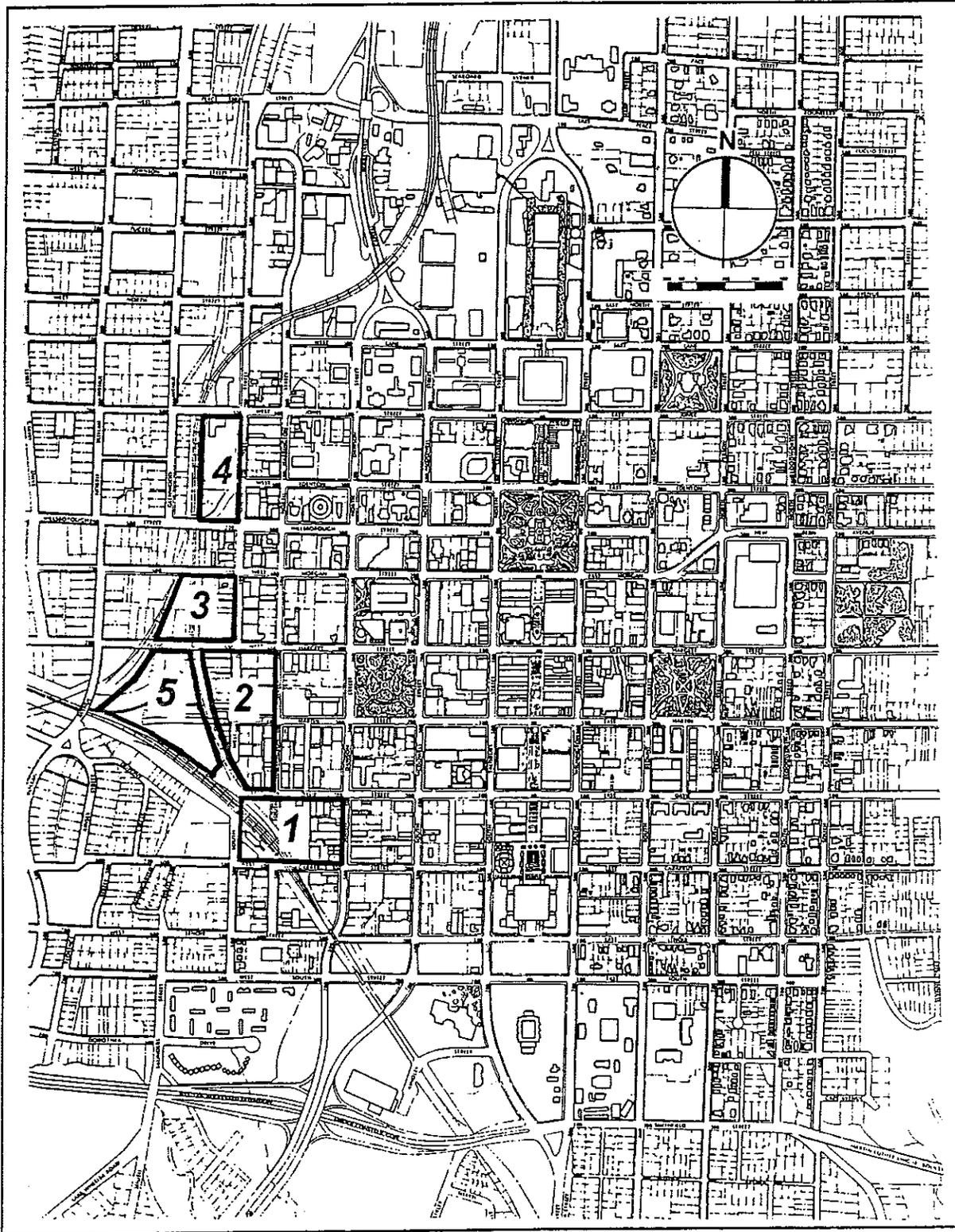


Figure 4.3: Sites for Detailed Evaluation



■ ***Center of the Railroad Triangle***

This area lies within the railroad triangle, enlarged by relocating the existing northwest leg of the triangle to the Norfolk Southern spur tracks slightly farther to the west. Access to the site would be via Hargett Street, a connector to the Boylan Avenue bridge, and/or the proposed Glenwood-South Saunders connector.

■ ***South or West Sides of the Railroad Triangle***

Various sites were investigated in this area. One area, currently occupied by assorted businesses, is south of the Norfolk Southern tracks running east-west, bordered by West Street on the east and Cabarrus Street on the south. The site is just west of the existing Amtrak station. Other sites in this area also were examined but were ruled out. Potential sites west of Boylan Avenue have conflicts with the north-south Norfolk Southern line, are relatively small, are close to residential land use, and are remote from downtown Raleigh. A potential site along the northwest side of the triangle, on which a "ready-mix" concrete plant currently operates, may have too sharp of a radius to provide a raised handicapped passenger boarding platform, which may be required for TTA operation. Moving the curve outward to reduce the radius would not leave a sufficiently large site in this location.

■ ***Old Seaboard Terminal***

This area, currently used by the Logan Trading Company, is located north of Peace Street at Semart Drive and Seaboard Avenue. It is east of and adjacent to the CSX tracks.

■ ***State Government Complex Site***

The draft *Capital Area Master Plan for State Government*, currently being prepared, recommends a "transit node" near the intersection of Dawson and McDowell Streets with Capitol Blvd. This node would accommodate the proposed TTA fixed guideway route and any buses serving the state government center and the CBD. The site would be south of the existing CSX railroad tracks in an area generally bounded by Dawson St. and Capitol Blvd. on the east, Lane St. on the south, and Harrington St. on the west.

■ ***Civic Center Site***

At the suggestion of the Advisory Committee, a site was studied near the Raleigh Civic Center. The existing Civic Center is bounded by Salisbury, Wilmington, Cabarrus, and Lenoir Streets, and is approximately two blocks from the nearest rail track. A proposal was made several years ago to relocate the Civic Center to the west, toward the railroad tracks. The site studied for this project was assumed to be at the site of the proposed Civic Center location.



4.3 Evaluation of Alternative Sites

The seven evaluation criteria described in Section 4.2 were used to determine the relative degree to which each of the sites chosen for evaluation satisfy the goals and objectives. The comparison was best conducted by examining each site individually for each of the evaluation measures, and then combining the scores in a matrix. The raw score for each evaluation measure was normalized with a value between 0 (worst) and 10 (best). For the initial evaluation, each goal was weighted equally to arrive at a preliminary overall score. This weighting may be adjusted later in the study process, if desired.

4.3.1 Assumptions

For purposes of this analysis, several assumptions are key in the application of the evaluation criteria. These include the following:

- TTA will establish Phase I rail transit service as planned, including a downtown terminal serving routes to Cary/RTP and to north Raleigh.
- Intercity passenger rail service will continue to use the same tracks as are currently used for the short term, but will add the CSX route to the north within the study planning period. Within the immediate station area, two sets of tracks eventually will be provided for intercity passenger rail routes. (It is important to note that these assumptions have not been approved by either NCDOT or the railroad companies involved.)
- To facilitate passenger rail service in this area, freight train storage will be relocated away from the ITC.
- It is more desirable to provide direct local bus service to the intermodal terminal rather than use a shuttle to the Moore Square terminal.
- For purposes of this study, land acquisition costs are preliminarily based on current City tax values.

4.3.2 Preliminary Site Evaluations

Before applying the formal evaluation process, the nine sites described above were reviewed in light of the locational criteria and constraints to determine if all were satisfactory. All of the sites except the site on the south side of the triangle, the old Seaboard Station, and the State Government complex passed this review.

- The **South Side** option was eliminated from consideration due to two factors:
 - The site is on the wrong side of the railroad tracks from downtown. All connecting CAT, TTA, and intercity buses would be forced to cross major north-south rail tracks, which would result in scheduling problems when passenger or freight trains occupied the tracks.
 - The site would be adjacent to the Boylan Heights neighborhood, and



would negatively impact that neighborhood.

- **The old Seaboard Station and the State Government Complex site were eliminated from consideration due to:**
 - their distance from the center of the center of CBD employment,
 - their distance from CAT bus routes,
 - the narrow blocks and indirect access to the sites, and
 - the need to divert Amtrak trains a considerable distance from their current routes. (It was the latter factor that caused Amtrak to abandon the Seaboard Station site for the currently used site.)

- Finally, the Civic Center site was eliminated from consideration due to its location several blocks away from the railroad tracks.

The remaining five sites are shown on **Figure 4.3**. Their evaluation is described in detail in Appendix A and summarized below.

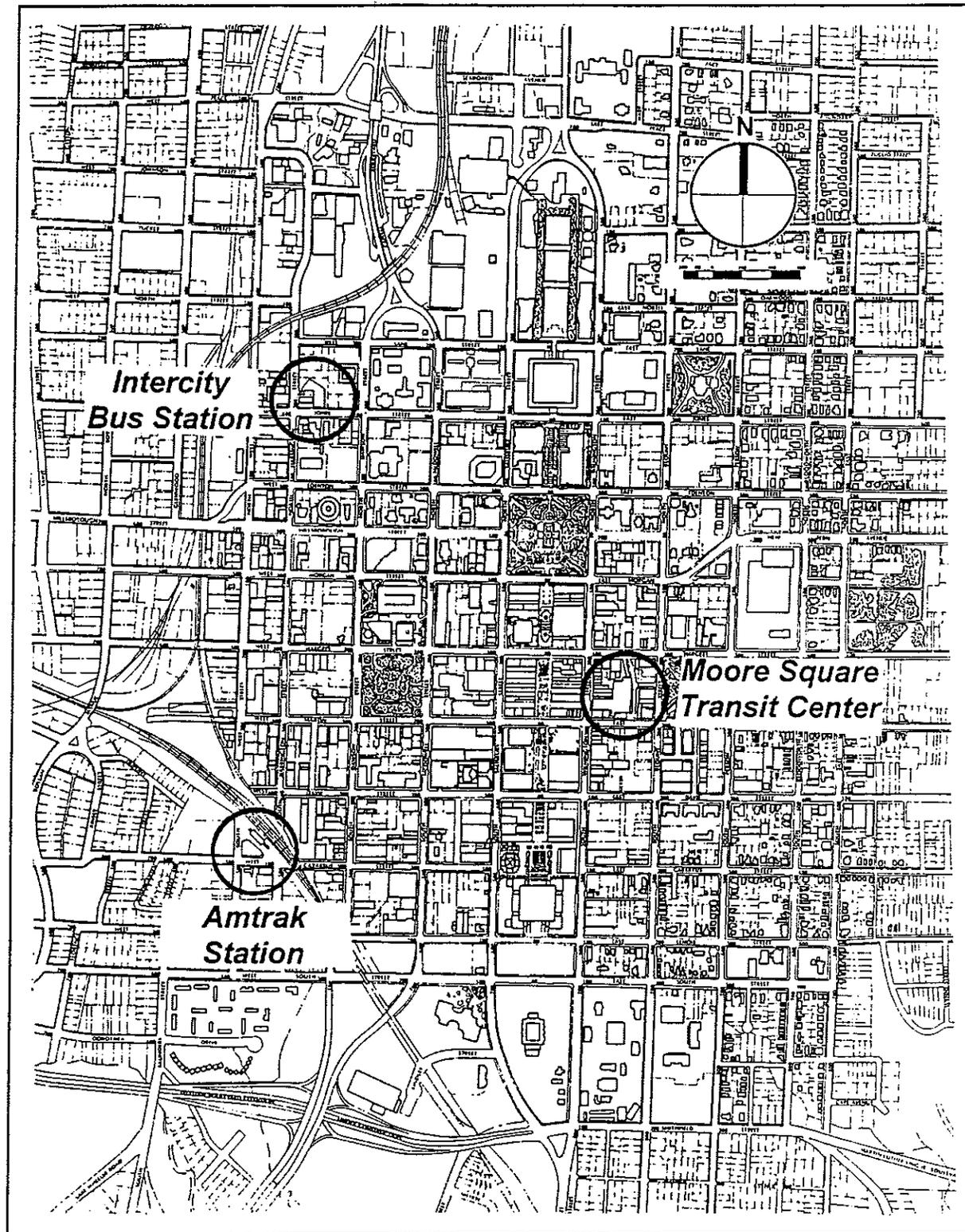


Figure 4.4: Existing Terminal Sites and Buildings



4.3.3 Existing Sites and Buildings

Table 4.1 shows the evaluation of the "do-nothing" or "no-build" option. As illustrated in Figure 4.4, these existing facilities currently serve three different transportation modes.

Table 4.1
Evaluation of Existing Sites

Criteria	Comments	Score
Connections among modes	This option does not improve or consolidate connections among downtown transit modes. Only one mode is served at any location.	2
Increase percentage of transit ridership	This option does not provide any increase in transit ridership due to ease of transferring from one mode to another.	9
Minimize travel time to station	Because of the multiple sites, there is no single average walking distance from the centroid of downtown employment or average daily traffic count. The numbers here are based on numbers for each terminal site, weighted based on projected ridership. It is assumed that TTA rail service would use a site near the north leg of the triangle.	3
Cost effectiveness	The estimated capital cost for adding TTA regional rail to the mix is the capital cost of a downtown rail station. This cost is estimated by TTA to be approximately \$2.5 million, including building, land, and site costs. The capital cost per annual passenger is estimated to be \$4.16.	8
Traffic and transit operations	This option neither enhances nor adversely affects either traffic or transit operation.	10
Railroad operations	Railroad operations are rated fair, as two stations would be used by commuter rail and intercity passenger rail, both of which would have to coordinate with rail freight operations.	5
Downtown development	While this option does not conflict with a downtown plan, it does not complement the proposed Westside redevelopment plan. Keeping transfer terminals at existing locations does not attract additional downtown development.	3

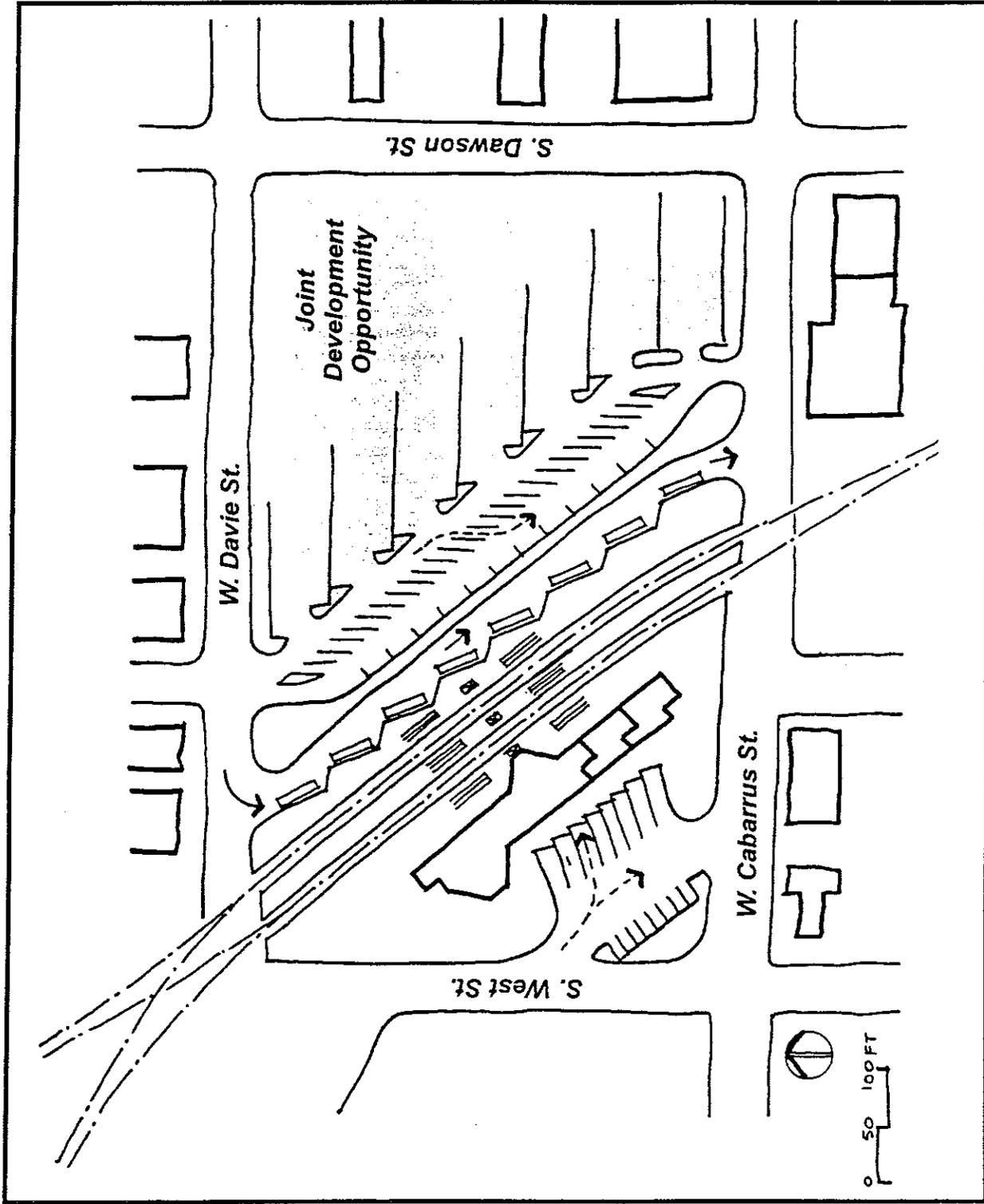


Figure 4.5a: Site 1/South Leg of the Railroad Triangle



4.3.4 Site 1: South Leg of the Railroad Triangle

Table 4.2 shows the evaluation of this site, illustrated in Figures 4.5a and 4.5b.

**Table 4.2
 Evaluation of Site 1**

Criteria	Comments	Score
Connections among modes	This ITC site option would incorporate connections among all five transit modes considered.	10
Increase percentage of transit ridership	Due to the synergistic relationship among the modes due to ease of travel, it is estimated that total transit usage downtown would increase by 10% as a result of this option.	10
Minimize travel time to station	This site option measures 0.4 miles from the centroid of downtown employment. The site is served by Dawson Street (major thoroughfare).	4
Cost effectiveness	The capital cost of the facility is estimated to be \$8.7 million, including land, site preparation, and new structure. The capital cost per annual passenger is estimated to be \$4.35.	8
Traffic and transit operations	Development of this site option would not impact street traffic patterns. This site would have a major impact on transit operations, as eight of the twelve routes passing near the site would have to divert three blocks to serve the site.	6
Railroad operations	Railroad operations are rated fair. There will be only minimal impact on Amtrak operations, since the location is essentially the same as that currently used by Amtrak. Planned TTA rail service would need to divert from the currently planned route and use backing maneuvers to access this site.	5
Downtown development	This site option is composed of the existing Amtrak Station to the west of the rail tracks and a car dealership and miscellaneous warehouse uses east of the tracks. It is zoned entirely I-2 Industrial. The site lacks an identifiable address and is perceived to be remote from downtown (although it is only three blocks from the southern end of the Fayetteville Street Mall). This site is viewed as having some redevelopment potential over the longer term as other sites to the north and east are built out.	4



4.3.5 Site 2: East Side of the Railroad Triangle

Table 4.3 shows the evaluation of this site, illustrated in Figures 4.6a and 4.6b.

Table 4.3: Evaluation of Site 2

Criteria	Comments	Score
Connections among modes	This ITC site option would incorporate connections among all five transit modes considered.	10
Increase percentage of transit ridership	Due to the synergistic relationship among the modes due to ease of travel, it is estimated that this site option would increase total downtown transit usage by 10%.	10
Minimize travel time to station	This site option measures 0.4 miles from the centroid of downtown employment. The site is served by Hargett Street (a minor thoroughfare).	6
Cost effectiveness	The capital cost of the facility is estimated to be \$14.0 million, including land, site preparation, and new structure. The capital cost per annual passenger is estimated to be \$7.00.	5
Traffic and transit operations	Development of this site option would result in severing the western portion of West Davie Street and the southern portion of Harrington Street. The impact to traffic would be minor, because both streets terminate at the existing railroad tracks and the portions closed are within the site boundaries. This site would have a moderate impact on transit operations. Nine of the 12 routes passing near the site would have to divert two or fewer blocks to serve the site.	7
Railroad operations	Railroad operations are rated poor. Northbound trains would have to back from the southeast leg of the triangle to the east side. Likewise, southbound trains will need to pull onto the east side of the triangle and then back down to the main line. Planned TTA rail commuter service would also need to divert from the planned routing to the west and use backing maneuvers to access the site.	0
Downtown development	This site option has a less identifiable address than site three and is also slightly more remote from the state office complex. The northern two blocks of this site are occupied by the Dillon Supply Company office building, warehouses, garage and surface parking. The southern half of the site is occupied by miscellaneous warehouse buildings. The southern half of the site is included in a proposed Westside Historic District. Two thirds of this site are zoned I-2 Industrial, with the northeast block being zoned Business. This site has good long-term redevelopment potential.	6

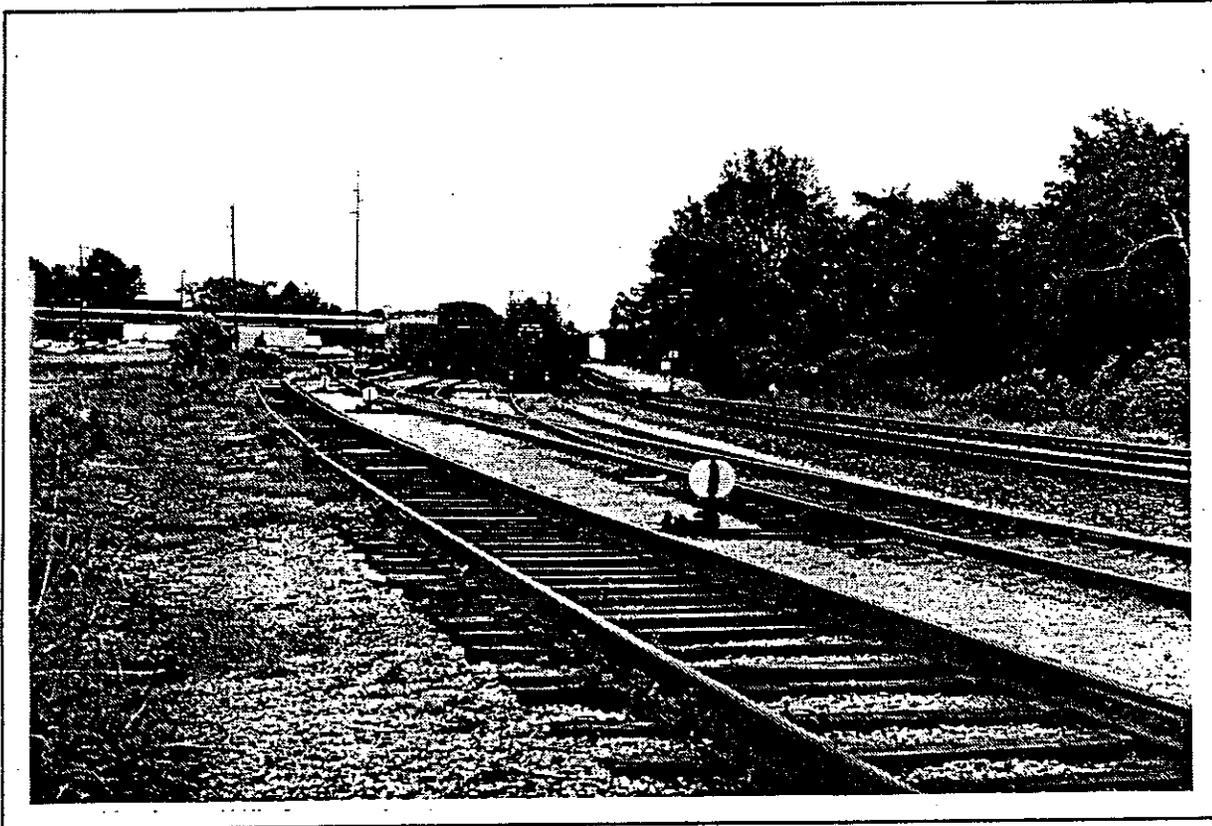


Figure 4.5b
Photograph of Site 1
(looking south -- Amtrak station/platform in center)

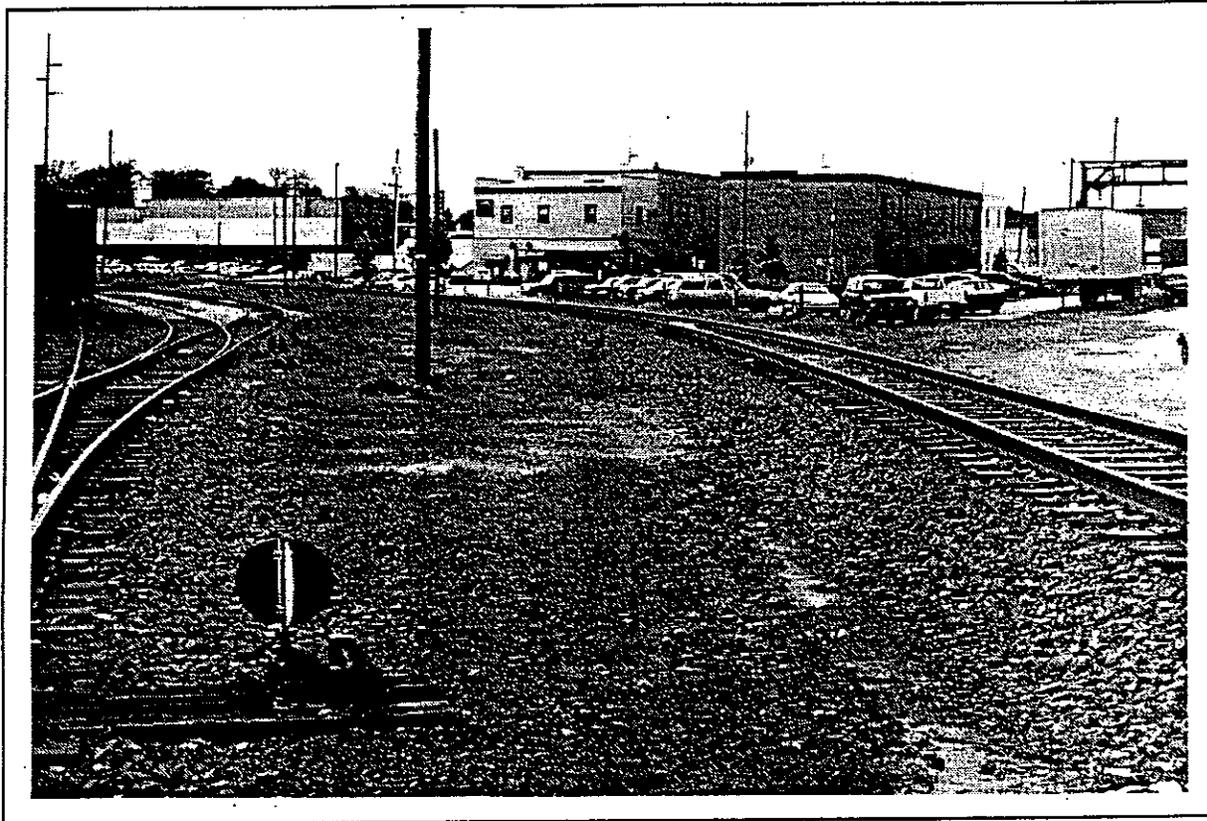


Figure 4.6b
Photograph of Site 2
(looking north)

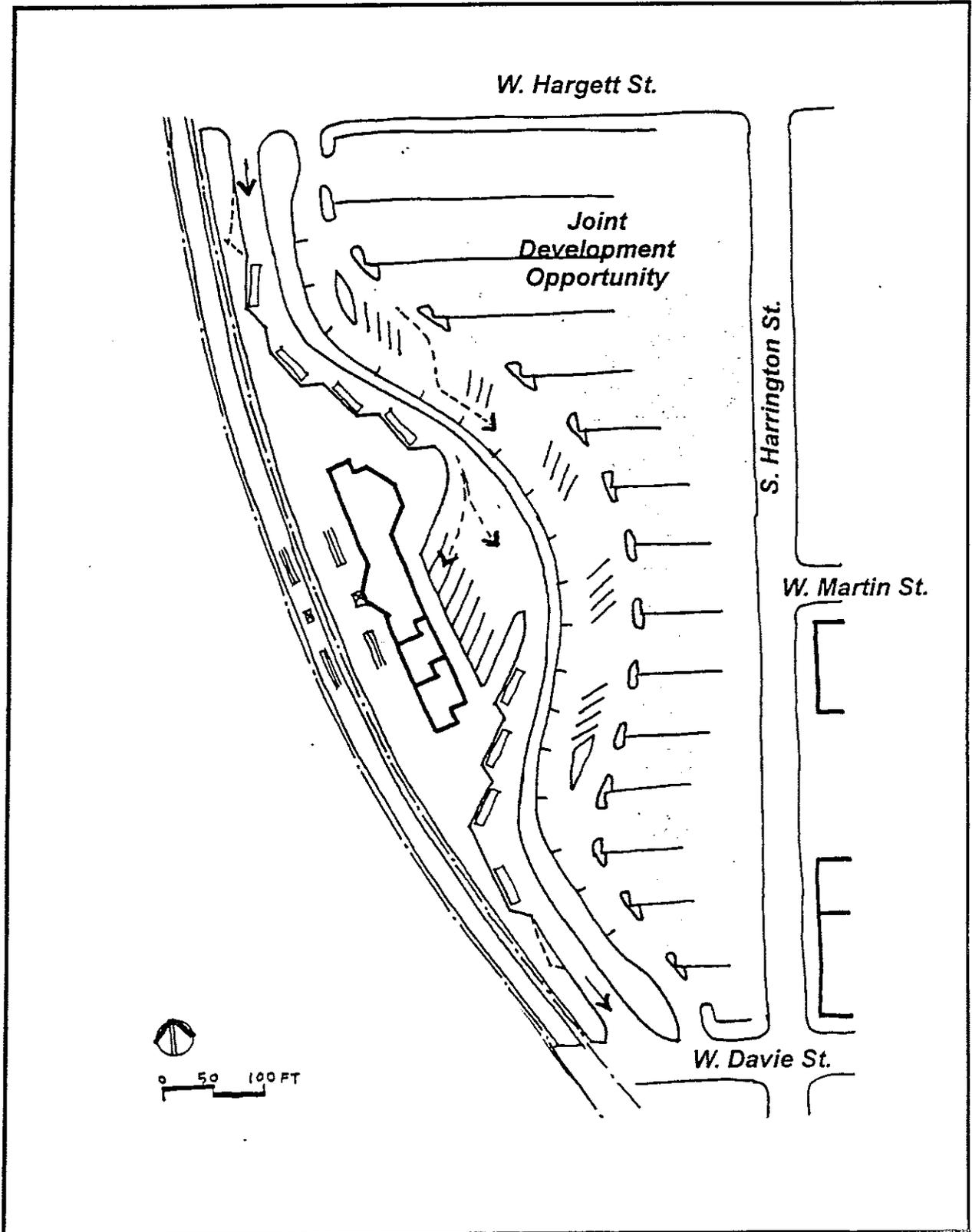


Figure 4.6a: Site 2/East Side of the Railroad Triangle

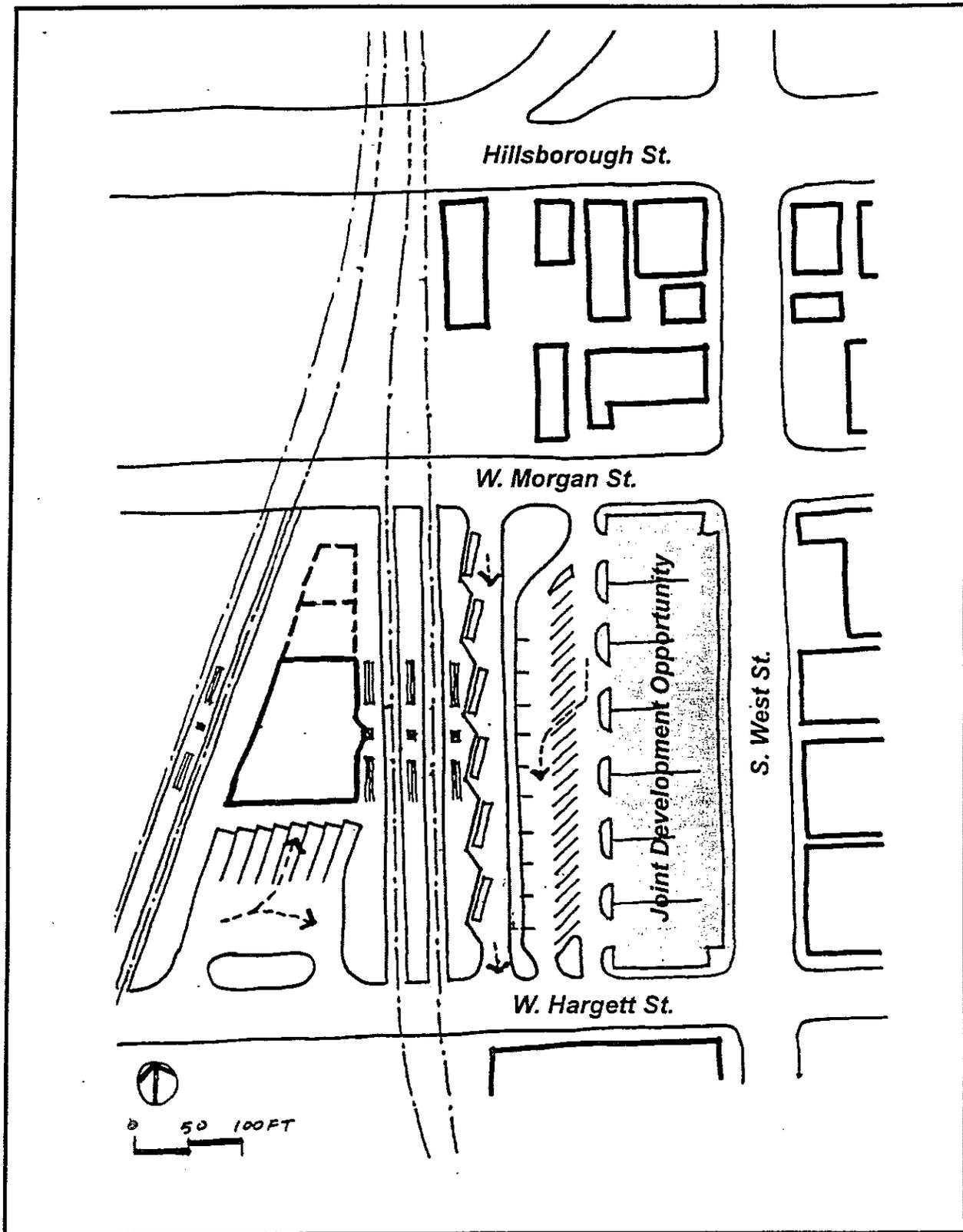


Figure 4.7a: Site 3/North Leg of the Railroad Triangle



4.3.6 Site 3: North Leg of the Railroad Triangle

Table 4.4 shows the evaluation of this site, illustrated in Figures 4.7a and 4.7b.

Table 4.4: Evaluation of Site 3

Criteria	Comments	Score
Connections among modes	This ITC site option would incorporate connections among all five transit modes considered.	10
Increase percentage of transit riders	Due to the synergistic relationship among the modes due to ease of travel, it is estimated that total transit usage downtown would increase by 10% as a result of this site option.	10
Minimize travel time to station	This site option measures 0.4 miles from the centroid of downtown employment. The site is served by Morgan Street (a major thoroughfare) and Hargett Street (a minor thoroughfare).	3
Cost effectiveness	The capital cost of the facility is estimated to be \$9.4 million, including land, site preparation, and new structure. The capital cost per average daily passenger is estimated to be \$4.70.	7
Traffic and transit operations	Development of this site option would not impact street traffic patterns. This site would have a minor impact on transit operations. Six of the 12 routes passing near the site would not have to divert at all to serve the site.	9
Railroad operations	Railroad operations are rated poor. Northbound trains using current track routing will need to back from the southeast leg of the triangle to the east side. Likewise, southbound trains will need to pull onto the east side of the triangle and then back down to the main line. This effect will be slightly greater than for Site 2 due to the greater backing distance required, but less than for Site 4. TTA commuter trains would not have to divert from their planned routes.	0
Downtown development	This site option has the most joint development potential of the five sites considered. It has a readily identifiable address on Hillsborough/Edenton Streets, the primary east-west pair connecting the downtown to the NCSU area. Hillsborough Street features a new office complex on Dawson Street and a hotel on Harrington Street. Some residential apartment construction has taken place immediately to the west on Hillsborough adjacent to St. Mary's College. This site is also in reasonably close proximity to both the state office complex and the Fayetteville Street Mall commercial core. The northern block between Hillsborough and Morgan includes a number of marginal retail and service establishments and is zoned Business. The southern block is occupied by the Dillon Supply Company Service Center Building which is for sale along with the other Dillon holdings. It is zoned I-2.	10



4.3.7 Site 4: Far North Leg of the Railroad Triangle

Table 4.5 shows the evaluation of this site, illustrated in Figures 4.8a and 4.8b.

Table 4.5: Evaluation of Site 4

Criteria	Comments	Score
Connections among modes	This ITC site option would incorporate connections among all five transit modes considered.	10
Increase percentage of transit ridership	Due to the synergistic relationship among the modes due to ease of travel, it is estimated that total transit usage downtown would increase as a result of this site option.	10
Minimize travel time to station	This site option measures 0.45 miles from the centroid of downtown employment. The site is served by Edenton Street (a major thoroughfare) and Jones Street (a minor thoroughfare).	5
Cost effectiveness	The capital cost of the facility is estimated to be \$7.0 million, including land, site preparation, and new structure. The capital cost per annual passenger is estimated to be \$3.50.	10
Traffic and transit operations	Development of this site option would not impact street traffic patterns. This site would have a moderate impact on transit operations. Six of the 12 routes passing near the site would need to divert only one block to serve the site.	9
Railroad operations	Railroad operations are rated poor. Northbound trains using current track routing will need to back from the southeast leg of the triangle to the east side. Likewise, southbound trains will need to pull onto the east side of the triangle and then back down to the main line. This effect will be slightly greater than for Sites 2 and 3 due to the greater backing distance required. TTA regional rail trains would not have to divert from their planned routes.	0
Downtown development	This site option benefits from its close proximity to the 42nd Street Oyster Bar (a major destination restaurant), and its proximity to the state office complex. However, its street address is marginal and it has no direct frontage onto the primary east-west arterial pair (Edenton/Hillsborough Streets) due to grade changes. This site is also more problematic due to the existence of an electrical substation at the north end of the parcel that may need to be relocated.	3
Other factors	This site option contains an electric substation, located at the northeast corner of the site at the intersection of Jones Street and Harrington Street. In addition to the cost of relocating the 0.4-acre substation, there could be substantial environmental cleanup costs and delays resulting from possible PCB contamination. Avoiding the substation is possible, but leaving it in place would detract from the appearance of the site and the potential for joint development.	

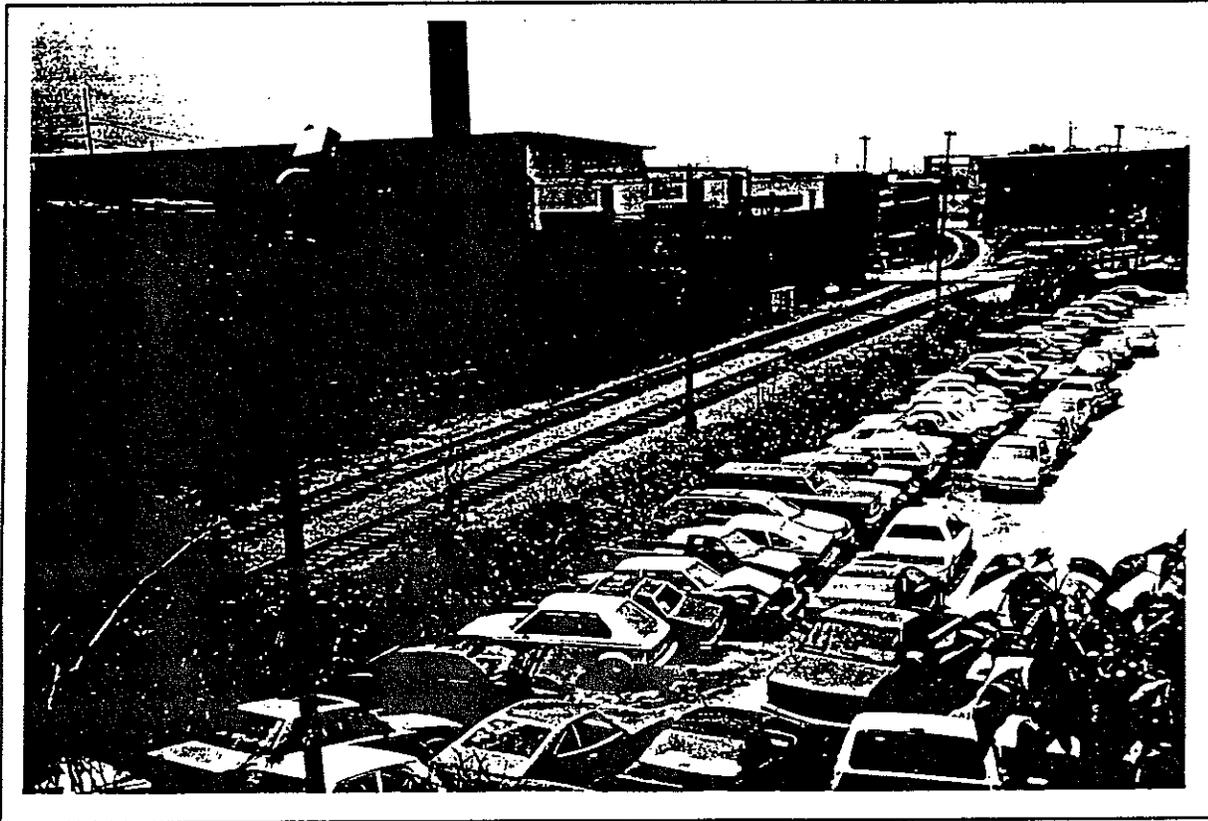


Figure 4.7b
Photograph of Site 3
(looking south -- Hargett St. in upper right)

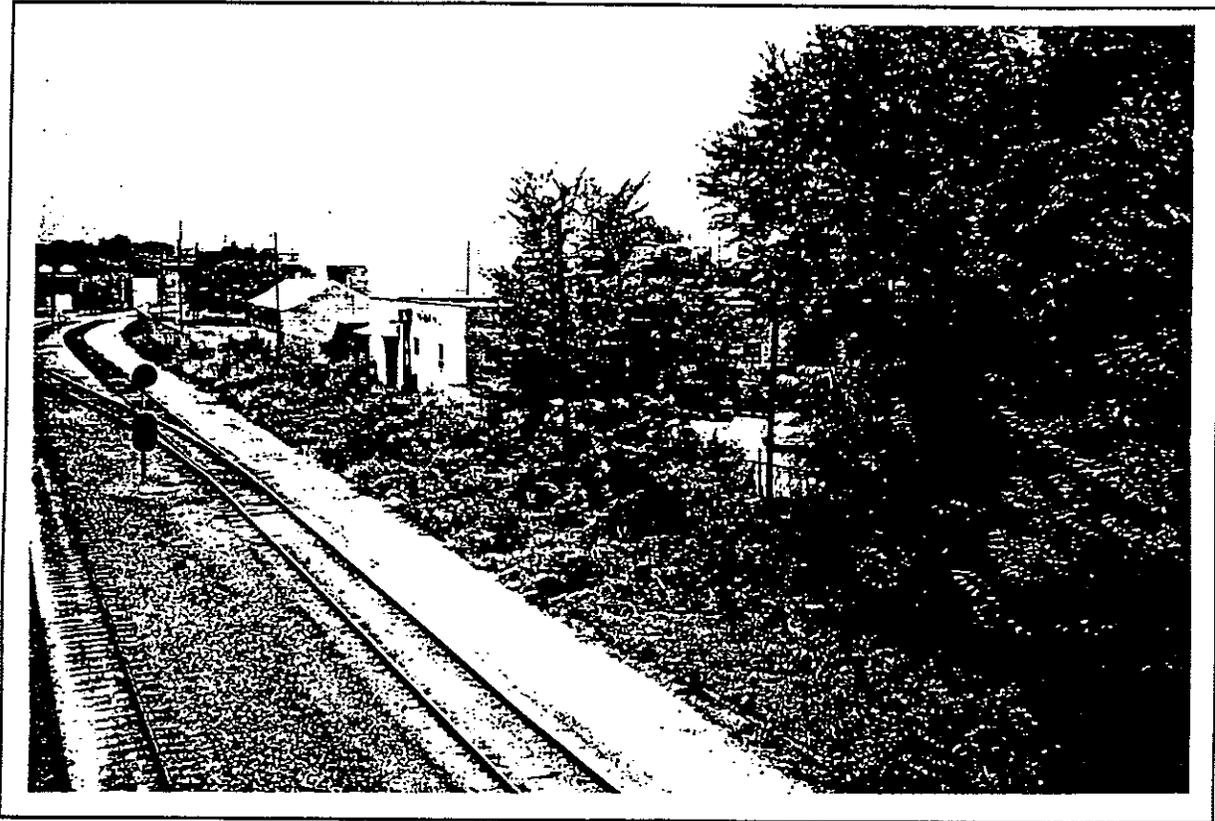


Figure 4.8b
Photograph of Site 4
(looking north -- Jones St. in upper left)

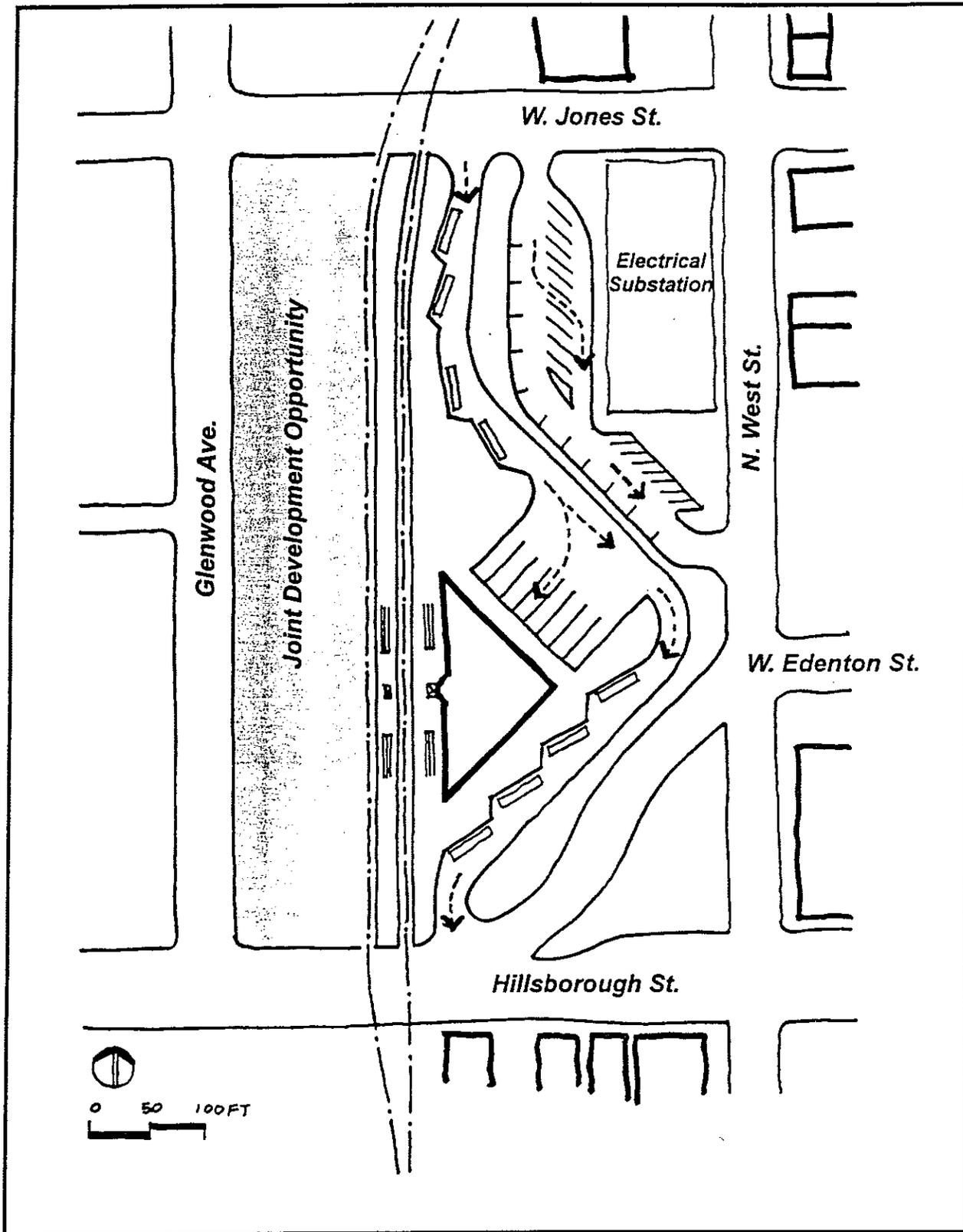


Figure 4.8a: Site 4/Far North Leg of the Railroad Triangle

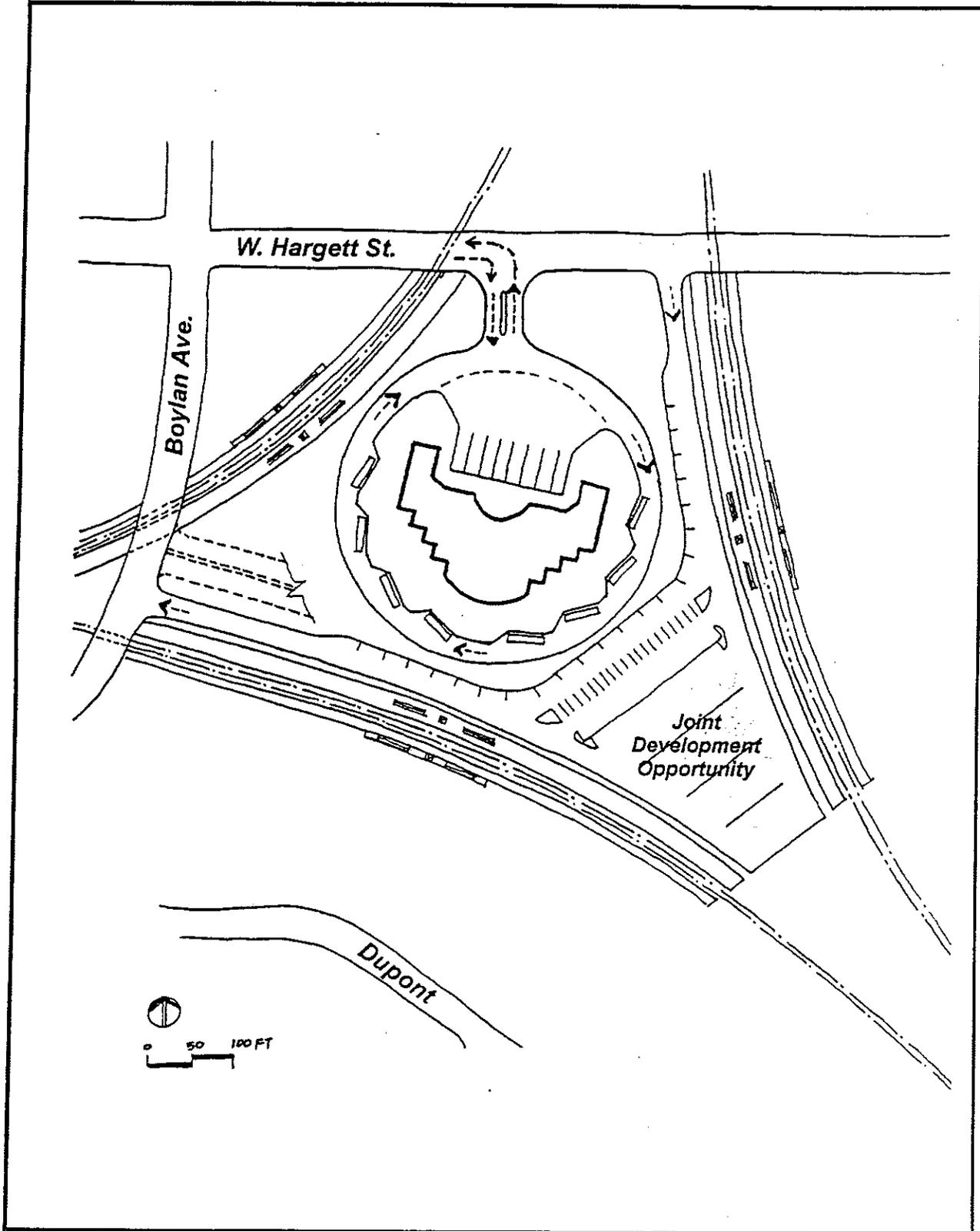


Figure 4.9a: Site 5/Center of the Railroad Triangle



Table 4.6 shows the evaluation of this site, illustrated in Figures 4.9a and 4.9b.

Table 4.6
Evaluation of Site 5

Criteria	Comments	Score
Connections among modes	This ITC site option would incorporate connections among all five transit modes considered.	10
Increase percentage of transit ridership	Due to the synergistic relationship among the modes due to ease of travel, it is estimated that total transit usage downtown would increase as a result of this site option.	10
Minimize travel time to station	This site option measures 0.45 miles from the centroid of downtown employment. The site is served by Hargett Street (minor thoroughfare) and also could be served by the proposed Glenwood-South Saunders connector.	3
Cost effectiveness	The capital cost of the facility is estimated to be \$13.4 million, including land, site preparation, and new structure. This site has a substantially higher site cost preparation cost than others due to the provision of platforms, vertical circulation and canopies for all train movements. The capital cost per annual passenger is estimated to be \$6.70.	5
Traffic and transit operations	Development of this site option would not impact existing street traffic patterns. The proposed Glenwood-South Saunders connector passes through this site. The alignment of the proposed road could be shifted slightly to enhance access to the site rather than conflicting with the site. This site would have the greatest impact on transit operations: five of the 12 routes passing near the site would have to divert four blocks to serve the site. Hargett St. (main access for buses into ITC) is two-way in this area.	9
Railroad operations	Railroad operations are rated good: because this site is bordered by tracks in all directions, all trains, including TTA commuter rail service, could stop here without backing or diverting from planned routes.	10
Downtown development	This site option has little on-site joint development potential due to poor site access (two at-grade rail crossings), no street visibility due to grades, and industrial surroundings. However, the availability of the Dillon property adjacent to the site provides an excellent opportunity for off-site development.	7



4.3.9 Summary of Site Evaluation

The individual evaluations for the existing site and the five proposed new sites are summarized in **Table 4.7**.

Table 4.7
Summary Site Evaluation

Goal/ Criterion	Weight	Site Options					
		Existing	1 (South)	2 (East)	3 (North)	4 (Far North)	5 (Center)
Connection Among Modes	1	2	10	10	10	10	10
Increase Transit Ridership	1	9	10	10	10	10	10
Minimize Travel Time	1	3	4	6	3	5	2.5
Cost Effectiveness	1	8	8	5	7	10	5
Traffic and Transit Operations	1	10	6	7	9	9	9
Railroad Operations	2	5	5	0	0	0	10
Downtown Development	1	3	4	6	10	3	7
Total Unweighted Scores		39	47	44	49	44	54
Total Weighted Scores		44	52	44	49	44	64
Ranking (1 is highest)		4	2	4	3	4	1

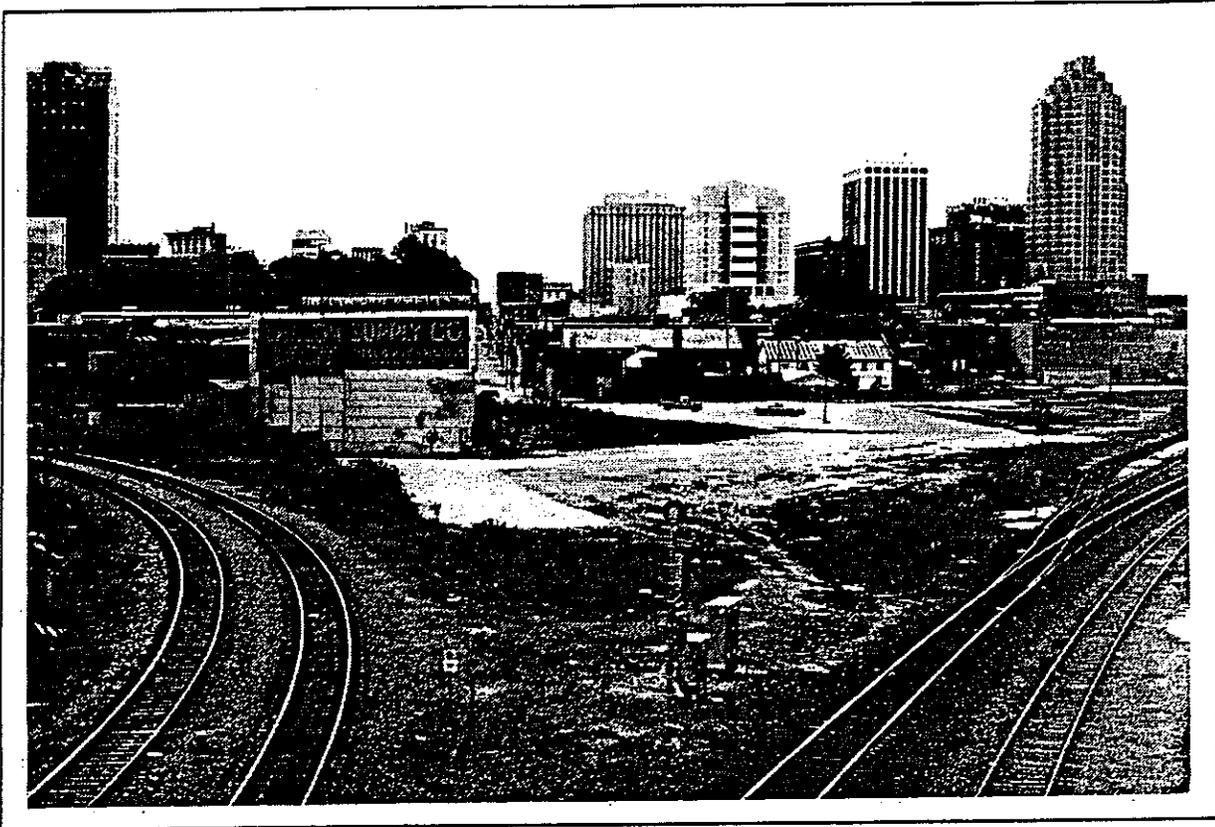
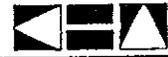
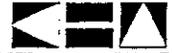


Figure 4.9b
Photograph of Site 5
(looking east from Boylan Ave. bridge)



5 SITE RECOMMENDATIONS

5.0 Introduction

The purpose of this chapter is to discuss the recommended site and development plan for a proposed Downtown Raleigh Intermodal Transportation Center (ITC). This discussion includes a preferred location, a conceptual design, key benefits, joint development opportunities, surrounding development opportunities and a conceptual capital cost estimate. This chapter also includes a discussion of "constraints" to the feasibility of implementing the transportation center.

Based on the development and evaluation of alternative ITC sites presented in the previous chapters, **Site 5** is recommended as the preferred location for the Downtown Raleigh Intermodal Transportation Center.

Discussions of this recommendation at the July 28, 1995, Steering Committee meeting resulted in modifications to the design concept for Site 5, as shown in Chapter 4. The following sections incorporate those modifications.

5.1 Description of Recommended Site

Figure 5.1a is an artist's rendering of a long-range conceptual plan for a transportation center located inside the triangle formed by the intersecting railroad tracks on the west side of Downtown Raleigh. (This rendering maximizes the joint

development potential of the site; other development levels are discussed later.) Site 5 has the following key benefits:

- It maximizes the connections among all downtown transportation modes, including local and express bus, intercity bus, intercity passenger rail and proposed regional rail services.
- Site 5 is the only site that can *directly* accommodate all potential rail passenger transfers at one location, without any special back-and-forth maneuvering of trains.
- The size and location of the site easily accommodates a *staged development plan* to incrementally develop the facility as the regional transportation system develops.
- Given that the facility must be located along the railroad corridor, this site is as close as possible to the center of Downtown Raleigh's employment, thereby maximizing its development and joint development potential.

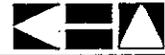
5.2 Feasibility Constraints

The "feasibility" of implementing an intermodal transportation center in Downtown Raleigh is constrained by several regional transportation planning and policy matters:



4.4 Next Steps

The next task in the study (Chapter 5) is to incorporate all the study findings thus far with the Advisory Committee's input and direction. The result will be specific recommendations on the feasibility of the facility and, if found feasible, its location, layout, and staging options, if appropriate.



Local and Express Bus Services

The greatest contributor of passengers to and from the ITC is expected to be from the CAT local and express bus service (28%). There are two ways that CAT could serve the Intermodal Center: (1) by rerouting bus past the proposed ITC, or (2) by connecting CAT's central transfer point at Moore Square to the ITC with a new shuttle route. Because of the inconvenience of transferring, the best option would be to reroute the CAT system. Rerouting CAT service to the Intermodal Transportation Center would impact all CAT regular routes by increasing bus-miles in the downtown area. It is only feasible for CAT to provide a high level of service to the Center if a connection can be made with the regional fixed guideway system. If this CAT connection cannot be made, then a new Intermodal Transportation Center is not feasible.

In addition, as shown earlier in **Figure 4.9a**, buses could enter and exit the proposed ITC from West Hargett St. West Hargett crosses both the CSX and Norfolk Southern railroad tracks serving the site at-grade. The CSX tracks (west of the main entrance into the ITC) are seldom used and would not pose any conflicts with buses using the ITC. However, an average of four freight trains per day use the Norfolk Southern main line tracks (to the east of the main entrance into the ITC), with additional usage proposed in the short term. Although the potential conflicts between trains and buses on Hargett at the Norfolk Southern tracks would be infrequent, the delay caused to a single bus by a stopped train blocking Hargett on those tracks could be significant.

A number of routing options exist to facilitate rapid and convenient bus flow between the new ITC and the Moore Square Transit Transfer Center and throughout downtown. **Figure 5.1b** shows existing traffic flow patterns in downtown Raleigh. Buses traveling between the two facilities will need to follow these traffic patterns, or modifications to existing patterns could be made to better accommodate bus flow. Future ITC planning and design studies will make recommendations on optimum bus operations patterns in downtown Raleigh both between the two facilities and throughout the downtown area.

Regional Rail Proposal

Since 1992, the Triangle Transit Authority has been working on a long-range transportation study to determine the desirability, feasibility and location of a regional fixed-guideway system for the Triangle Region. A key feature of this plan is a proposed regional rail station along the railroad corridor through Downtown Raleigh. It is assumed that this TTA station would be a part of the proposed ITC project. The second largest contributor of passengers to and from the ITC is estimated to be from the proposed regional rail system (19%.) In the event that a regional rail proposal (either the current TTA plan or a similar future plan) is never implemented, the proposed long-range concept plan for the ITC will need to be reconsidered. The scale of facilities, including parking, will need to be modified and reduced to better fit its expected utilization without a regional rail line.

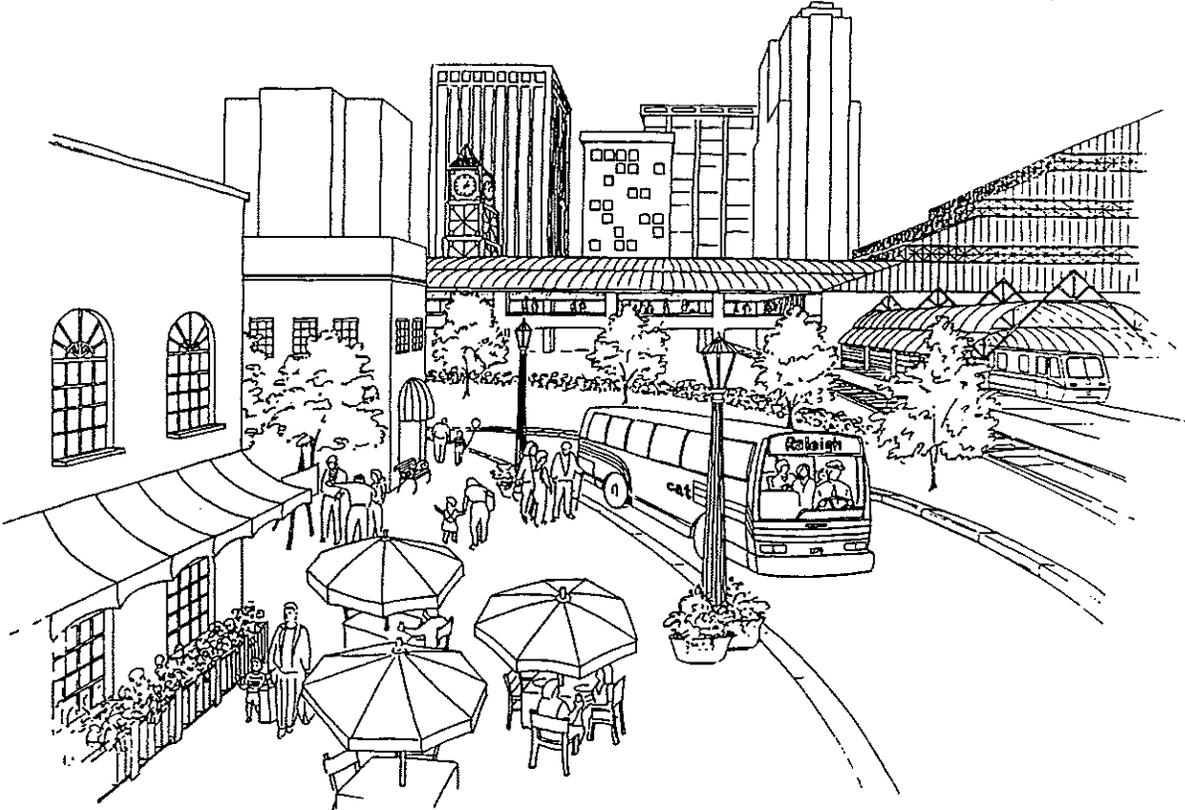


Figure 5.1a
ITC Conceptual Plan



5.3 Joint Development Opportunities

One of the major benefits to constructing a Downtown Raleigh Intermodal Transportation Center is the opportunity afforded by combining public resources with private investments. Indeed, because there are both potential public (local bus, regional rail, intercity rail) and private (intercity bus) transportation elements involved, as well as potential public and private commercial development elements, the ITC proposal is truly unique to the Raleigh area.

To demonstrate the development potential at the ITC site, three levels of joint development are explored. **Figures 5.2a** and **5.2b** display a concept of *limited* or minimal joint development on the site. **Figures 5.3a** and **5.3b** display a concept for somewhat more *moderate* joint development. **Figures 5.4a through 5.4k** display concepts for a *maximum* level of joint development potential on the site. Alternative architectural concepts for a building over the site are presented to illustrate a few design potentials for the maximum project.

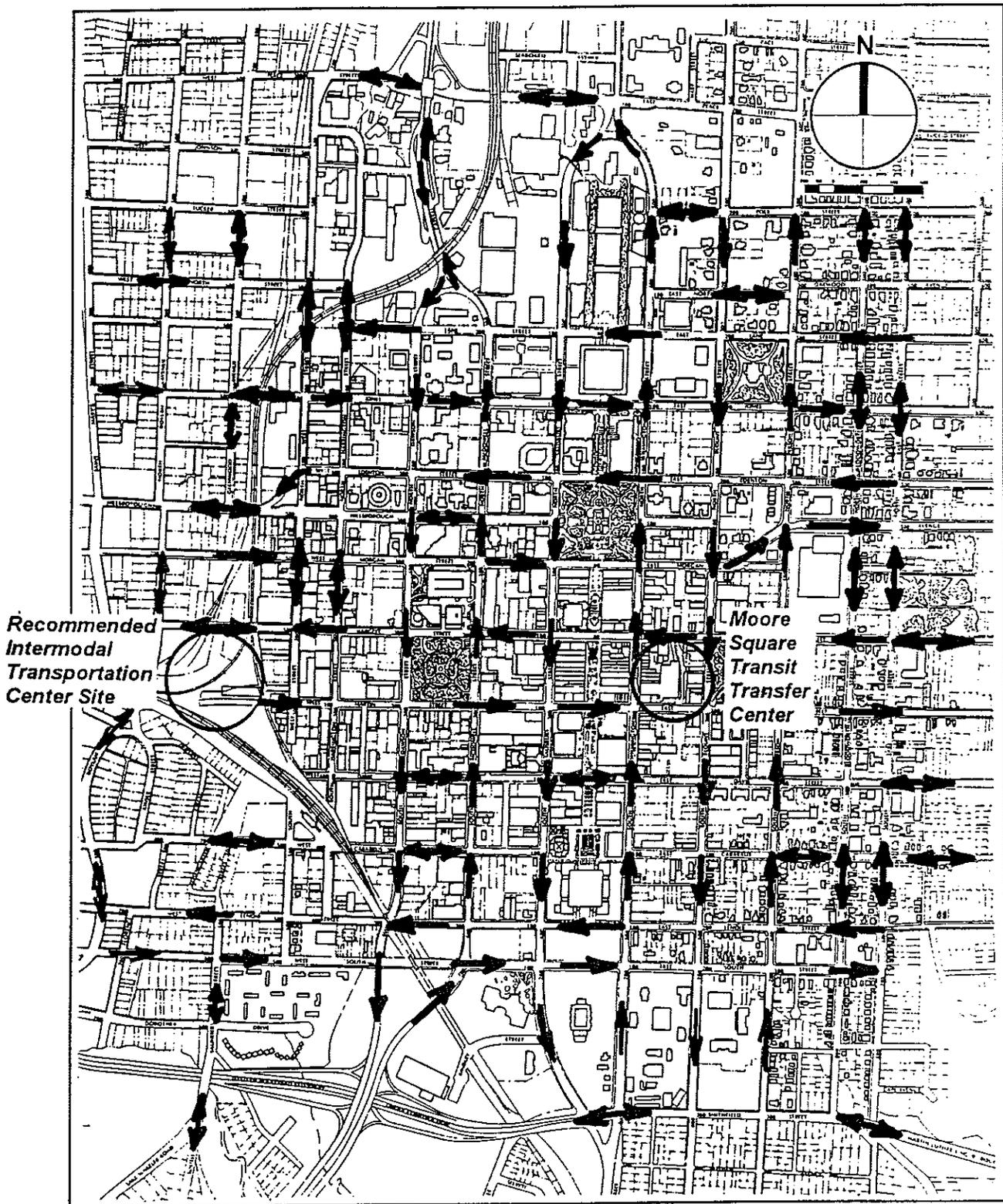


Figure 5.1b
Potential Bus Circulation Patterns in Downtown Raleigh

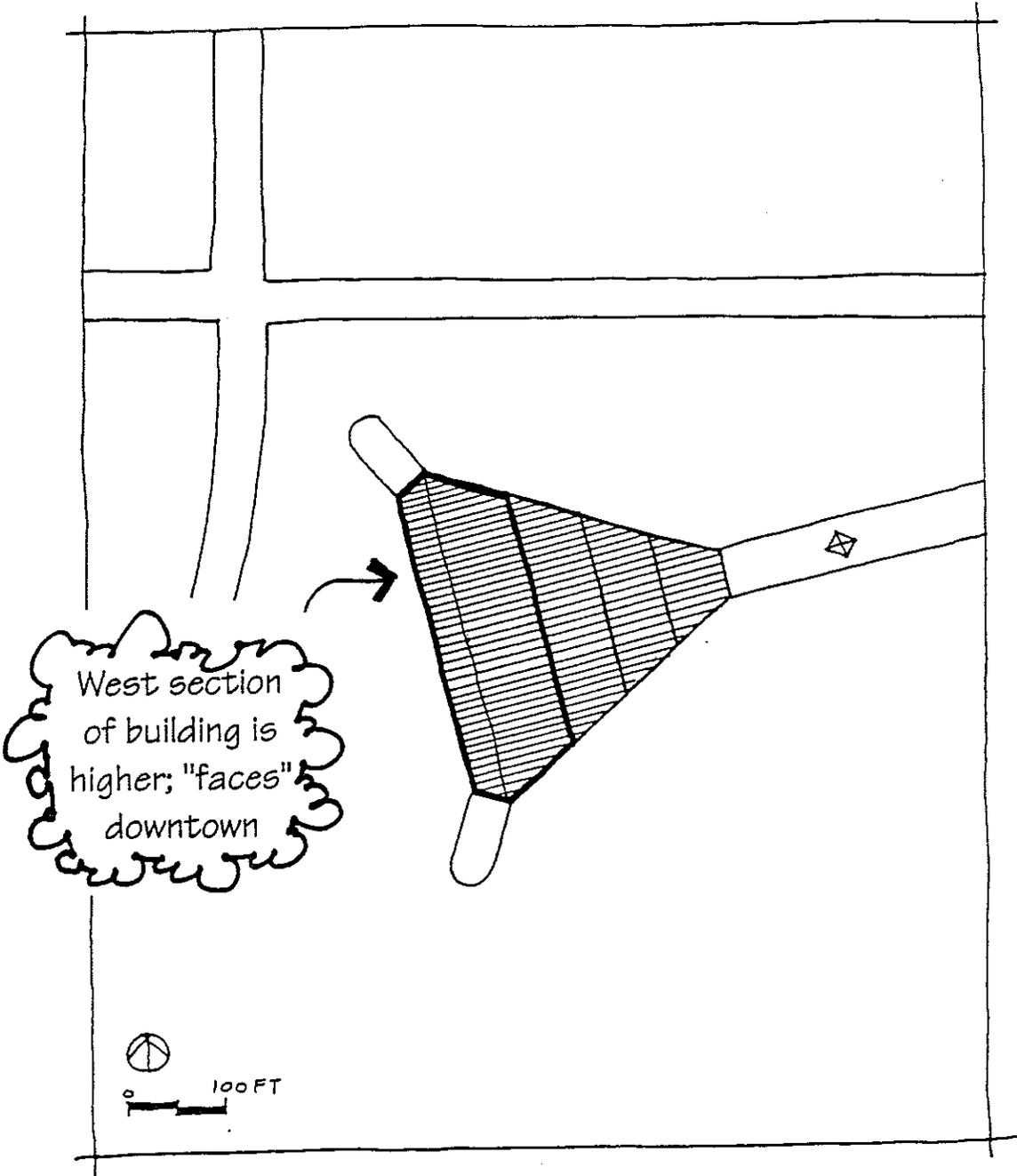


Figure 5.2b: Concept for Limited Joint Development
(Roof Plan Top View)

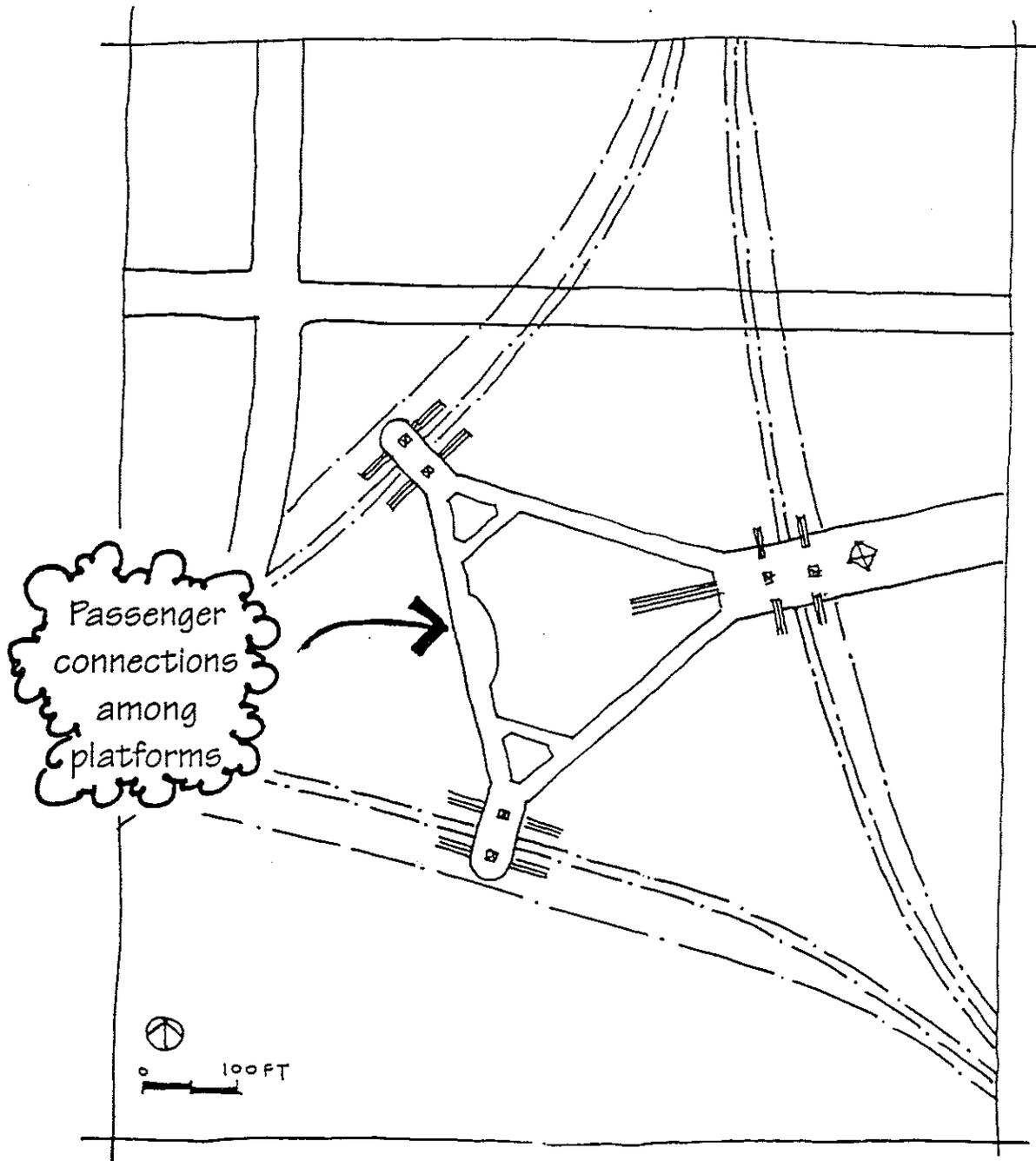


Figure 5.2a: Concept for Limited Joint Development
(CBD Plaza Connector Level)

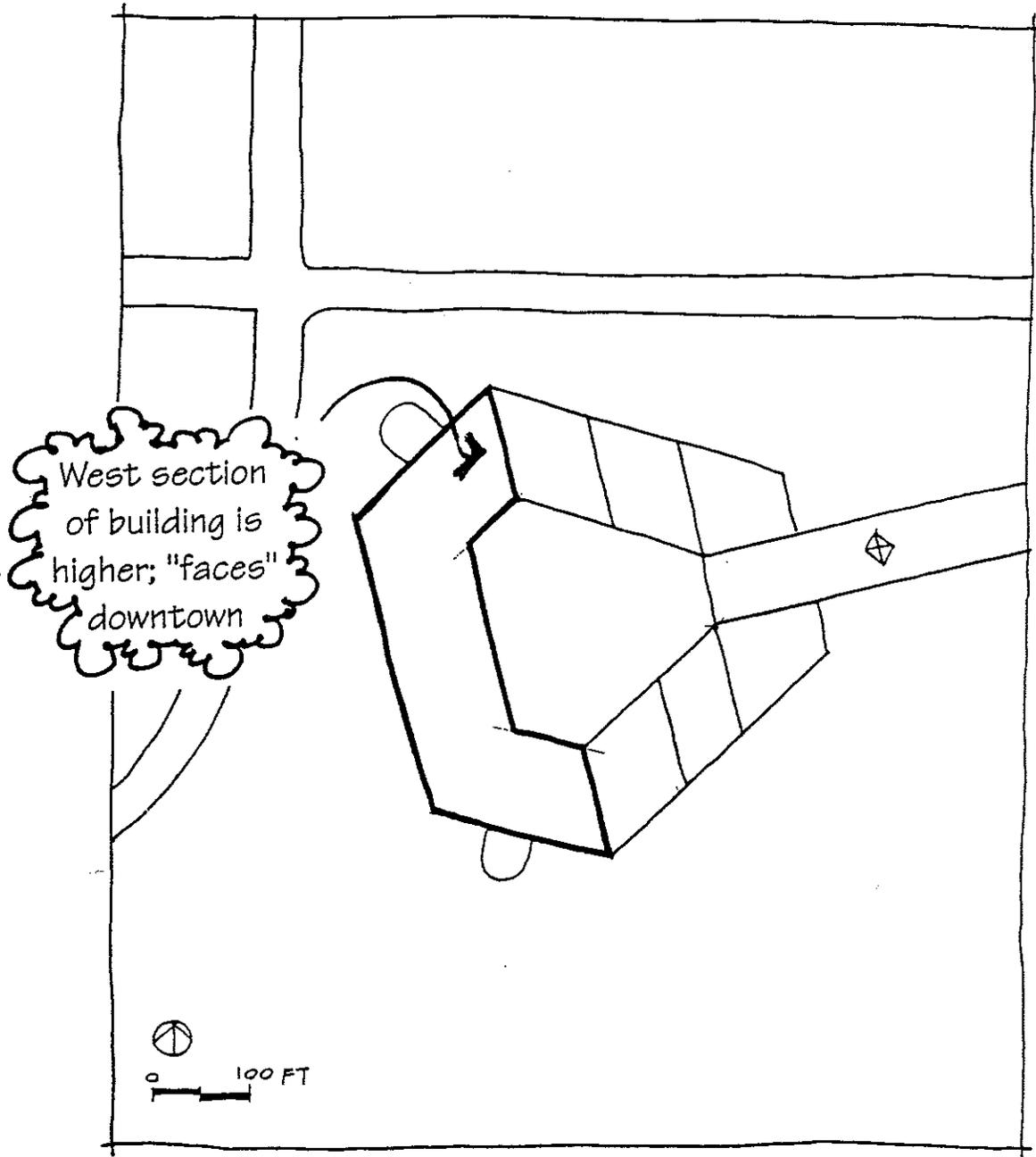


Figure 5.3b: Concept for Moderate Joint Development
(Roof Plan Top View)

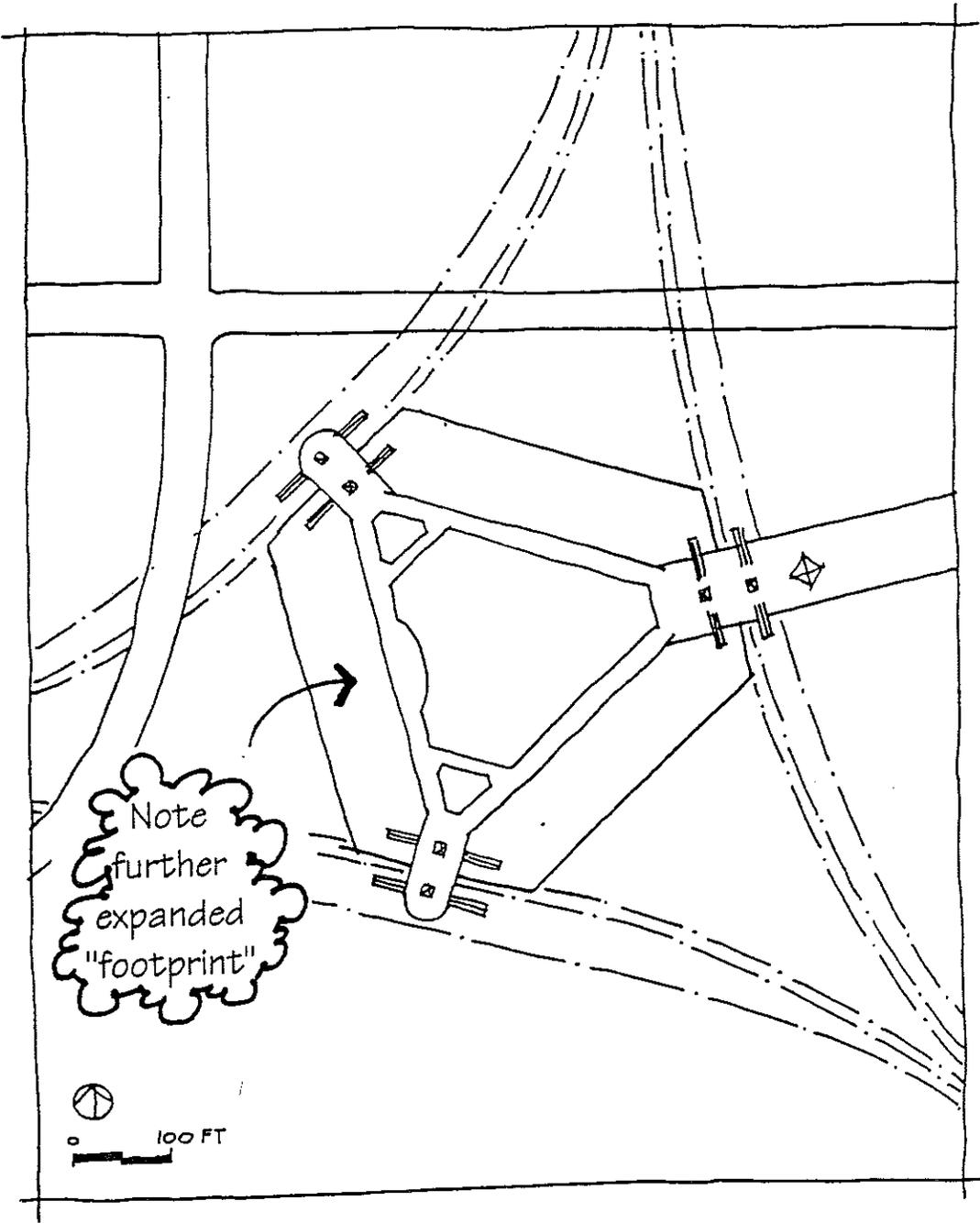
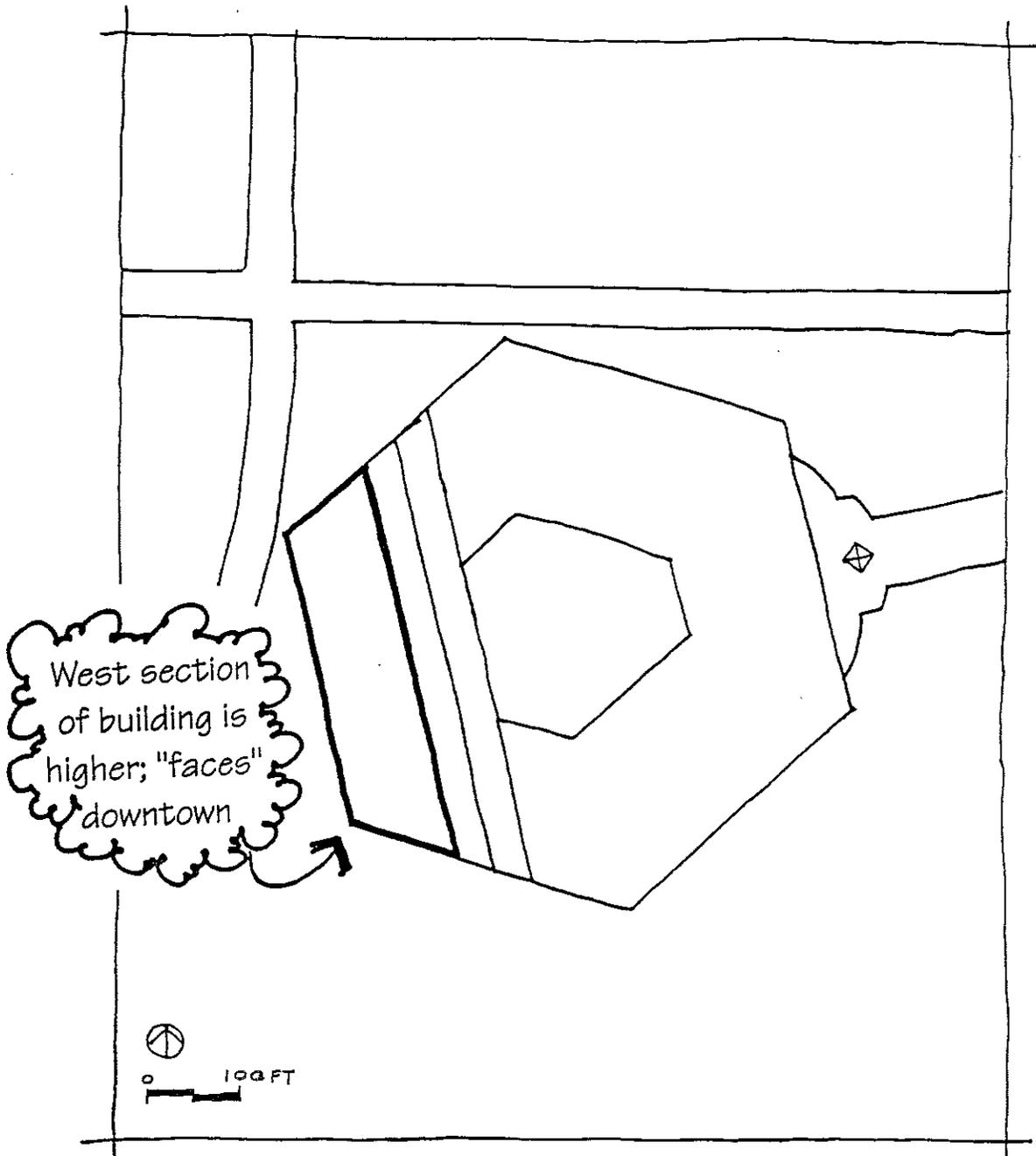
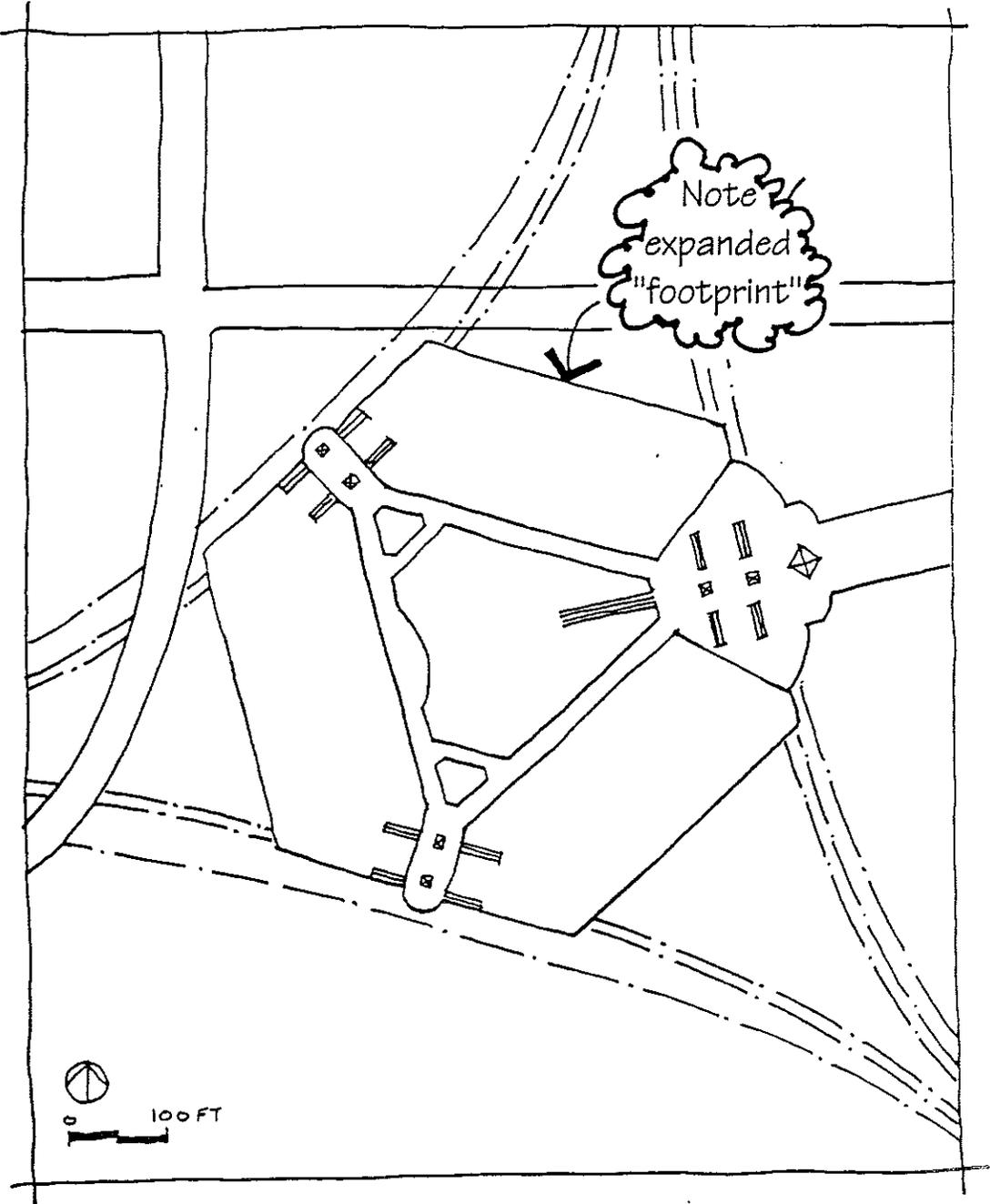


Figure 5.3a: Concept for Moderate Joint Development (CBD Plaza Connector Level)



**Figure 5.4b: Concept for Maximum Joint Development
(Roof Plan Top View - Highrise Farther From and Facing CBD)**



**Figure 5.4a: Concept for Maximum Joint Development
(CBD Plaza Connector Level)**

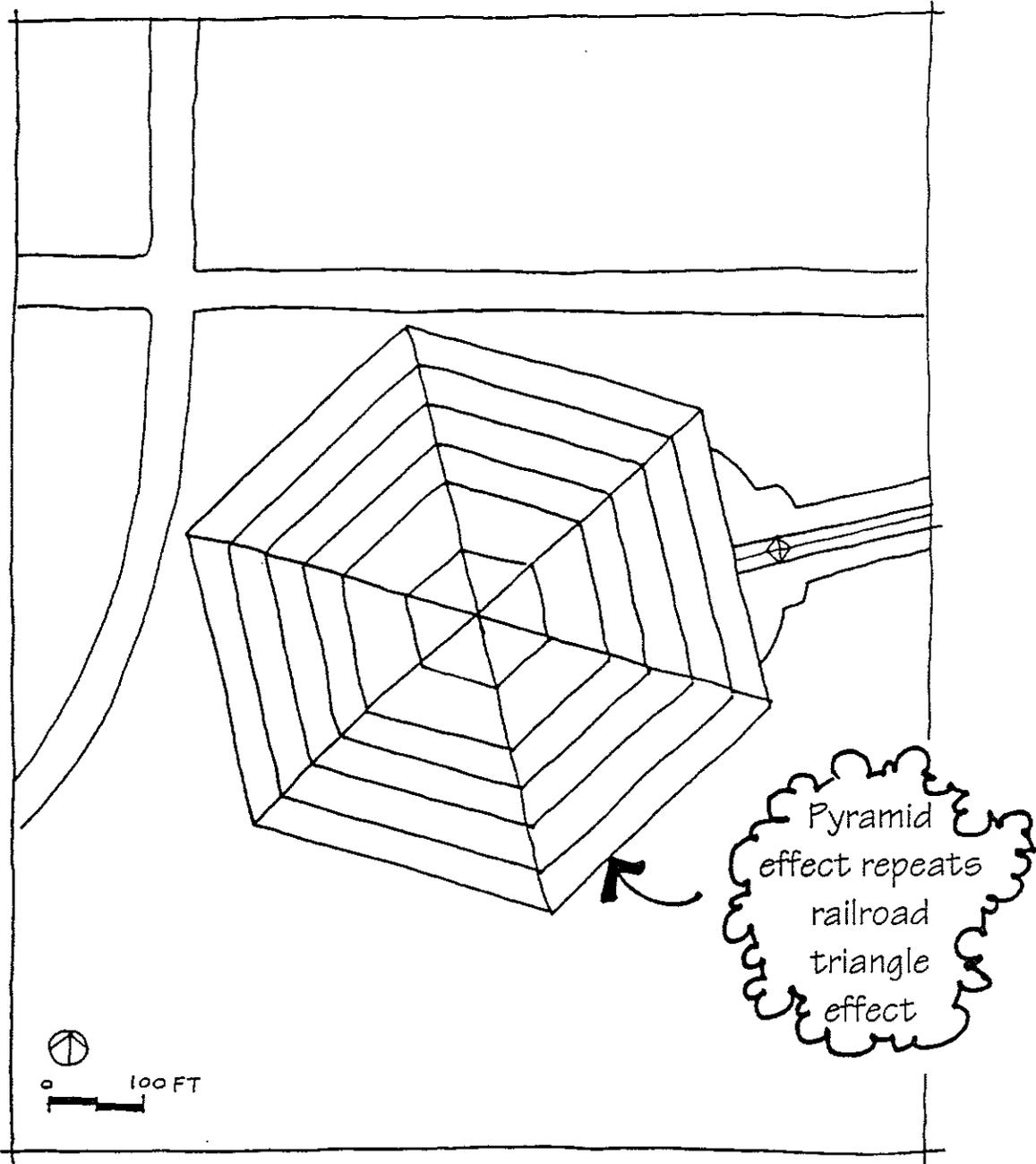
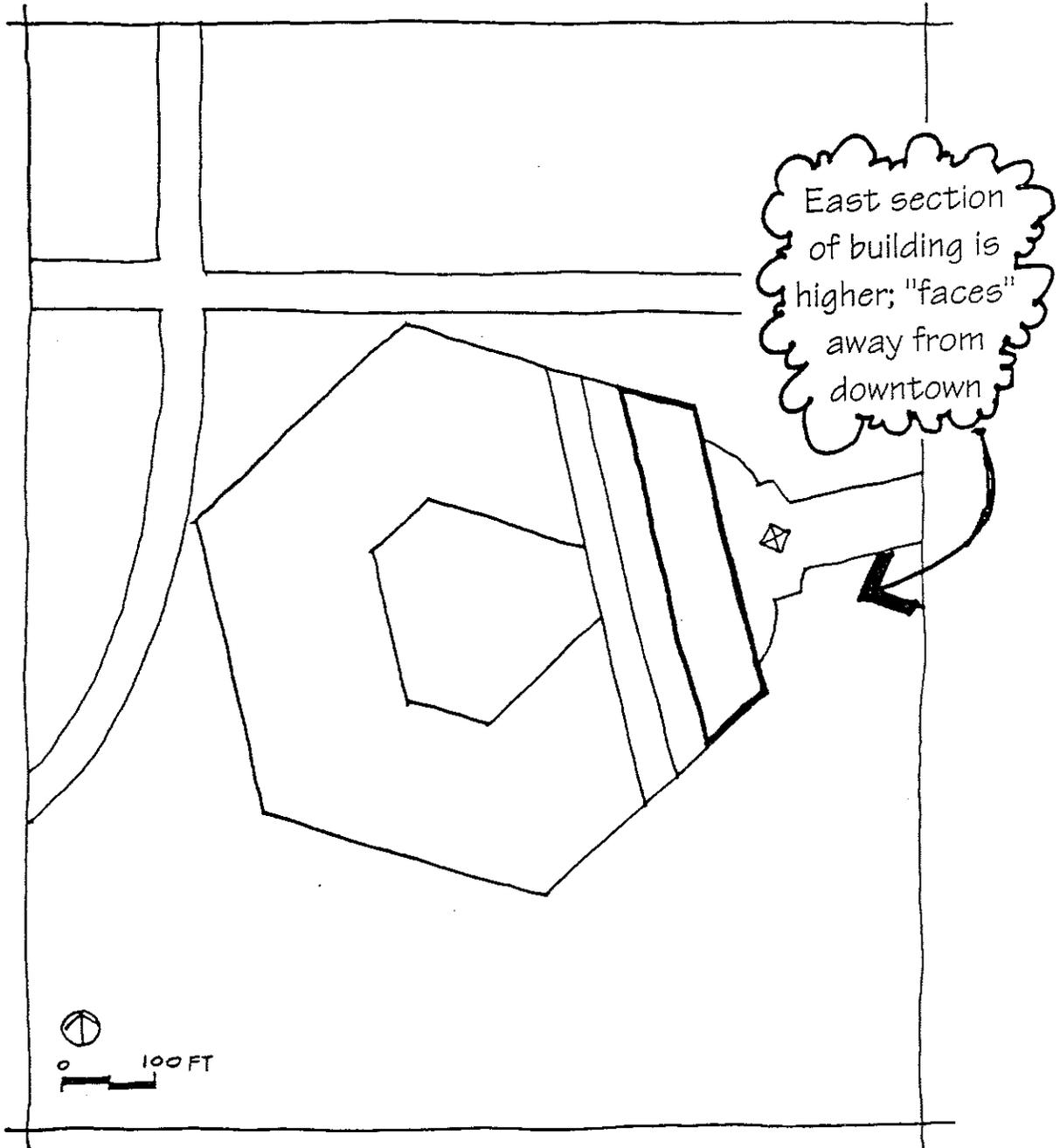
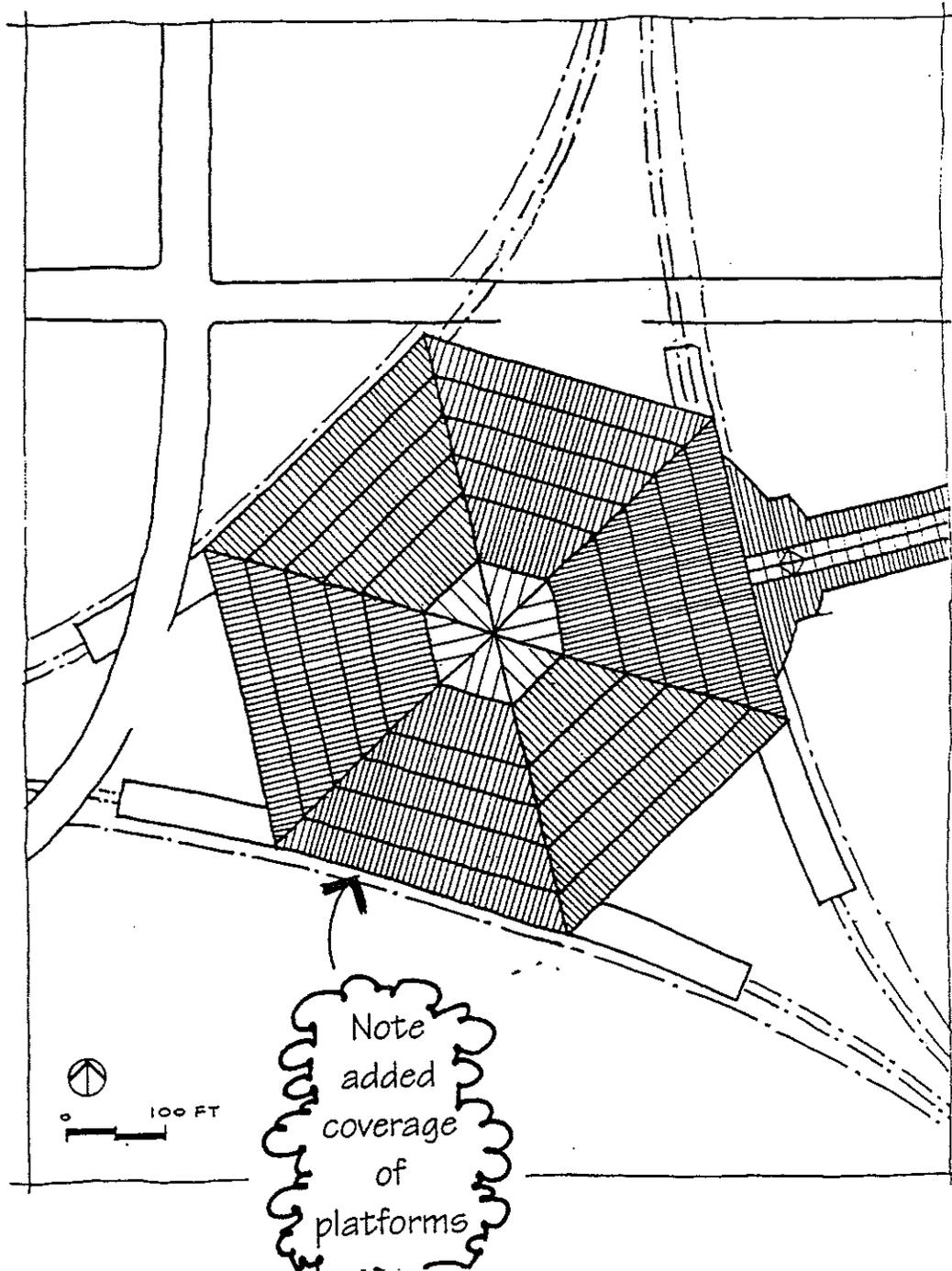


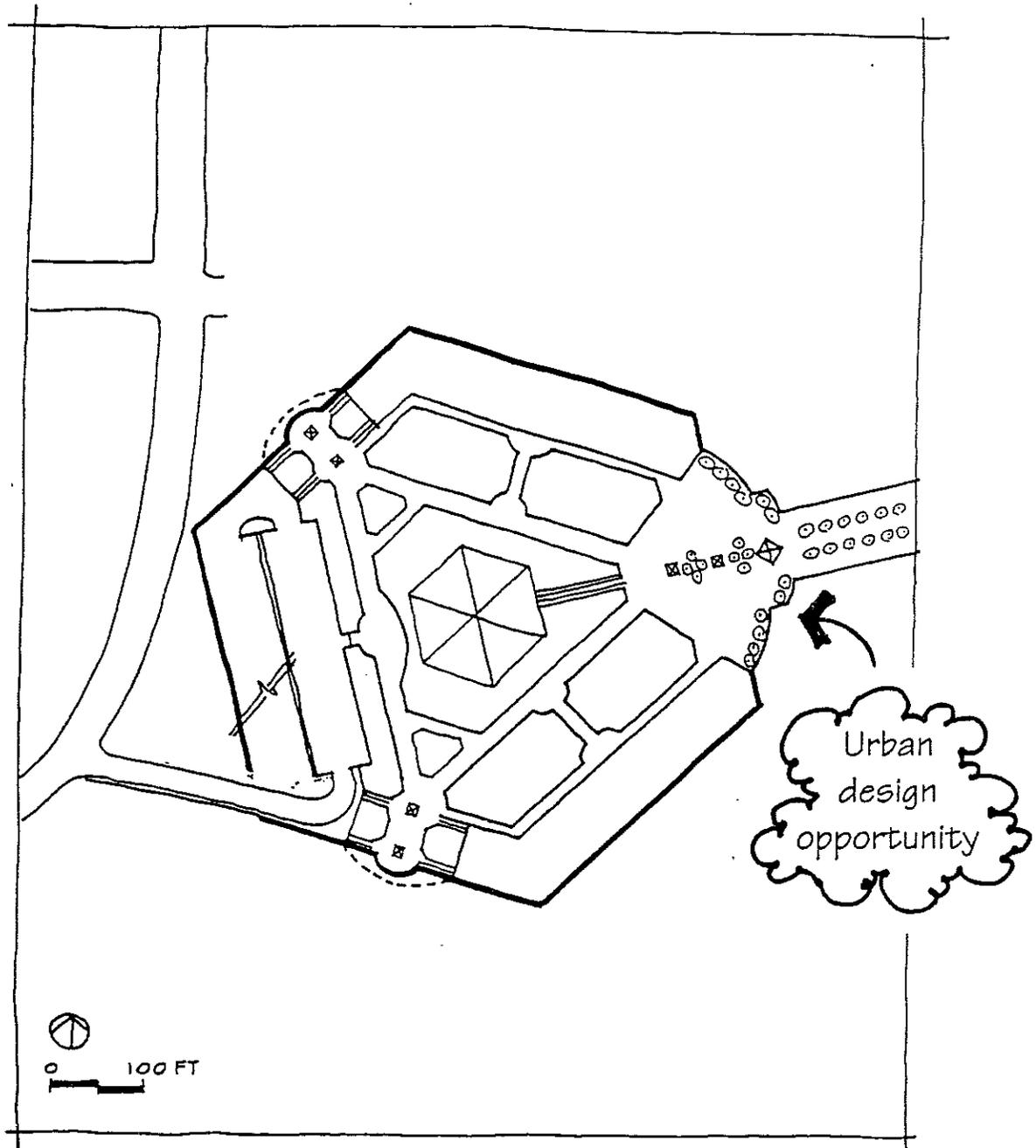
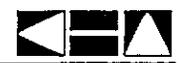
Figure 5.4d: Concept for Maximum Joint Development
(Roof Plan Top View - Pyramid)



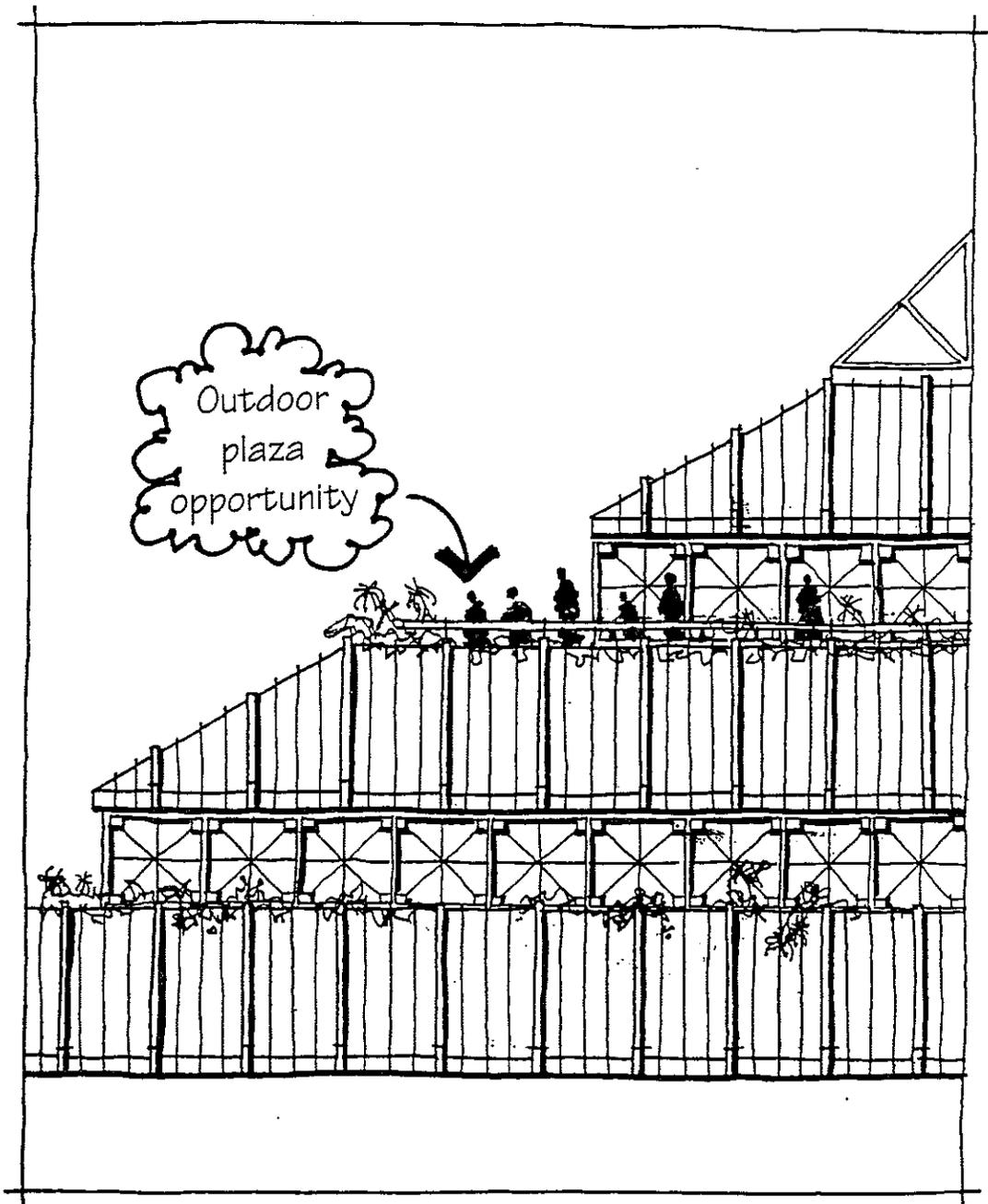
**Figure 5.4c: Concept for Maximum Joint Development
(Roof Plan Top View - Highrise Closer To and Facing Away from CBD)**



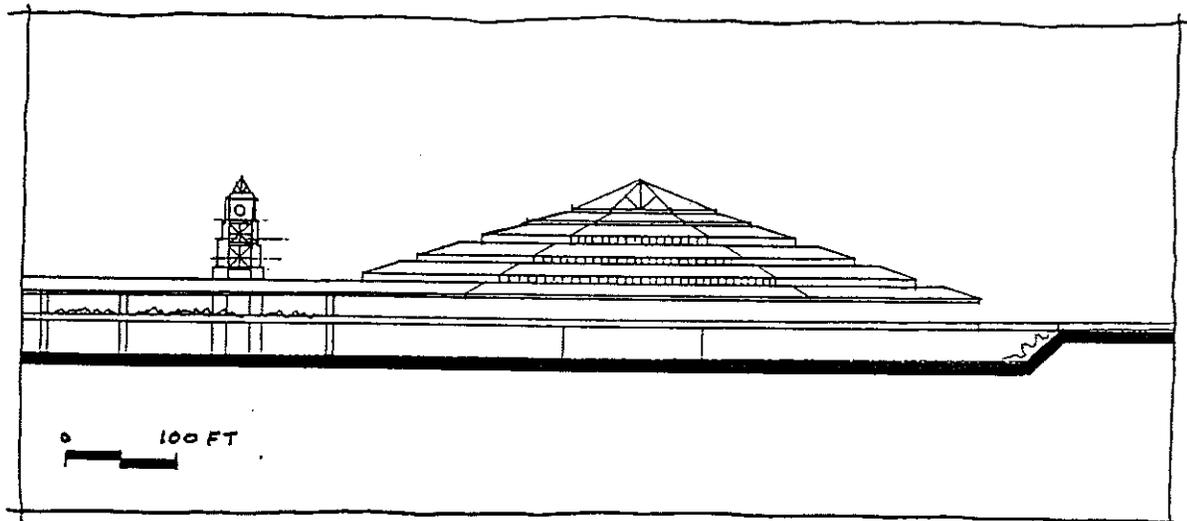
**Figure 5.4f: Concept for Maximum Joint Development
(Roof Plan Top View - Possible Configuration)**



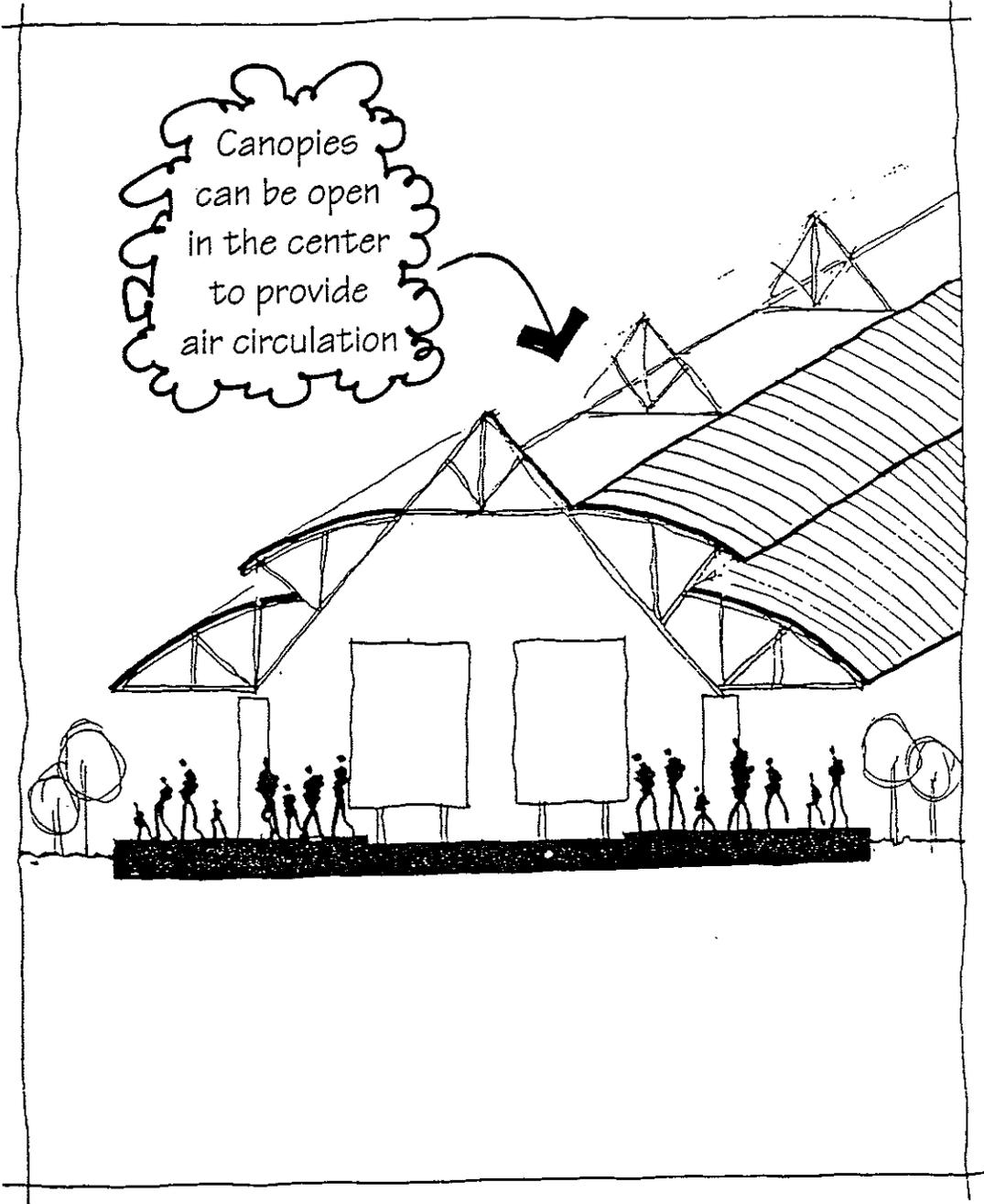
**Figure 5.4e: Concept for Maximum Joint Development
(Possible Configuration for CBD Plaza Connector Level)**



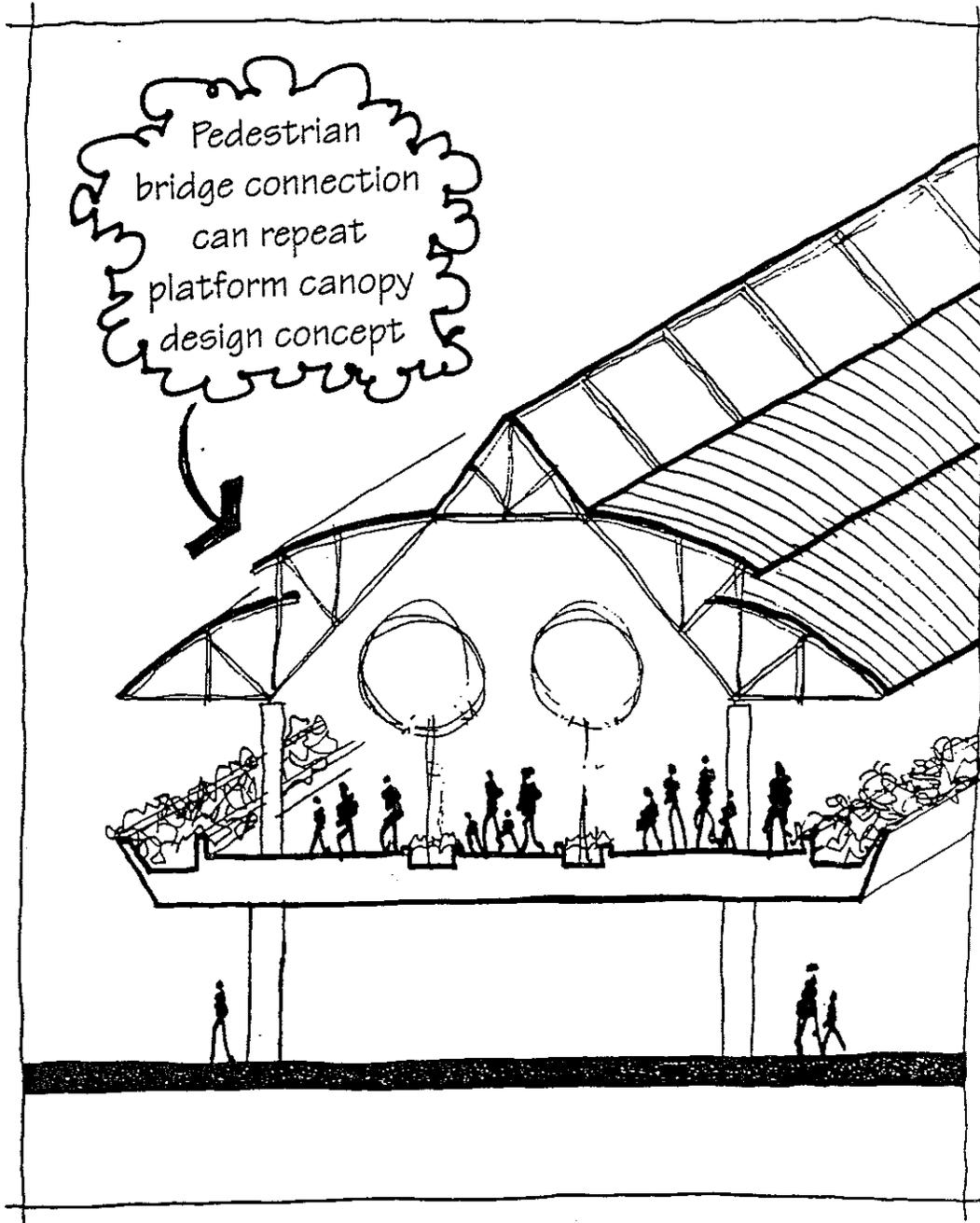
**Figure 5.4h: Concept for Maximum Joint Development
(Suggested Exterior Treatment)**



**Figure 5.4g: Concept for Maximum Joint Development
(Potential Elevation)**



**Figure 5.4j: Concept for Maximum Joint Development
(Suggested Rail Platform Canopy)**



**Figure 5.4k: Concept for Maximum Joint Development
(Suggested Bridge Canopy for CBD Connector)**



5.4 ITC Key Features

Key features of the recommended ITC include:

- All three train stops on the three legs of the triangle have covered platforms and are connected to a central enclosure/station area.
- Each of the three train stops has two directional passenger train tracks and two side-platforms.
- Accommodations for a third track dedicated to freight trains is located outside the passenger tracks and platforms, on all three sides of the triangle.
- Bus and auto parking access to the site is provided by a connection from the Boylan Avenue bridge.
- To enhance the relationship between the ITC facility and Downtown, a positive pedestrian connection to the CBD from the east side of the facility is proposed. This project element would provide for a major downtown urban design opportunity -- to perhaps be landscaped and streetscaped more fully as the site and surrounding historic area develops.

5.5 Surrounding Development Opportunities

An additional potential benefit of a Downtown Raleigh ITC is its ancillary development, or direct and indirect development that can be expected to occur as a result or “spin-off” of the facility’s construction. To determine the potential for ancillary development, a number of sources were used, including:

- documentation of population, employment, income, retail expenditures, and commercial space leasing trends for the City of Raleigh in general and Downtown in particular;
- interviews with City of Raleigh officials;
- interviews with developers and real estate management firms familiar with Downtown Raleigh; and
- a review of intermodal center developments in other cities.

5.5.1 Markets for Ancillary Development

Several categories can be identified regarding potential users of ancillary development, especially retail and entertainment uses, related to the ITC:

ITC Users

As noted earlier, the number of anticipated passenger arrivals and departures is estimated to be 6,660 by the year 2020. Given the experience in other cities with similar facilities, this pool is anticipated to



support only a modest amount of retail space (less than 10,000 square feet). This amount of space would support retail uses such as a newsstand, a coffee bar, fast-food restaurants, or food carts. Therefore, it is improbable that a major retail or entertainment development could be supported solely by ITC users.

Downtown Workforce

This group, estimated at more than 40,000 workers within one mile of the proposed sites, is heavily oriented toward the government sector and is likely to have disposable incomes above the regional average. In addition, it is a “captive” audience during business hours for retail and service activities. Finally, this group is also a potential market for after-work dining and entertainment if attractive venues are provided.

Limitations related to this group include short work breaks (the lunch break for many government employees is only 30 minutes), walking distances to ITC-related venues (the lack of a “critical retail mass” directly adjacent to employment clusters), and potential mismatches between workforce preferences and downtown retail/service offerings. For example, numerous downtown retail outlets, particularly on Wilmington St., are geared toward adjacent low-income residential populations rather than the downtown workforce.

The downtown workforce could potentially support additional retail services, restaurants, and entertainment uses in a centrally located ITC (between 1/4 and 1/2 mile from the centroid of downtown employment). However, a “critical mass” of venues would

need to be coupled with above-average “quality” offerings. In addition, the downtown workforce could potentially support additional residential development at rents at or slightly above the City average if sufficient amenities (such as those potentially related to an ITC) were provided.

University/College Students

There are five universities or colleges within 1.25 miles of proposed ITC sites with more than 32,000 students. This market segment could support entertainment uses (such as movies and live entertainment), low to moderately priced restaurants, cafes, bookstores, music stores, and moderately priced apartments.

However, to attract this group, a “critical mass” of attractions would need to be present. Except for the few venues at City Market, there is nothing in Downtown that caters specifically to students.

Downtown Visitors

Visitors can be categorized into two groups: business travelers, and others (including school groups). The Greater Raleigh Convention and Visitors Bureau does not keep comprehensive statistics on hotel room nights, convention attendees, or attendance at other visitor-oriented attractions. Therefore, it is difficult to evaluate the economic impact of visitors on Downtown. However, business travelers can be expected to generate a modest desire for quality retail, service, entertainment, or other outlets Downtown.



Residents

Downtown's residential population (estimated at 2,100 in 1994) is a very small market for retail or entertainment uses. However, the residents in the Central District and near Westside neighborhoods (approximately 20,000 people) appear to need a variety of services, including supermarkets, specialty food shops, apparel stores, and entertainment.

5.5.2 Potential Ancillary Uses

After an evaluation of potential markets, the following ancillary development uses could be likely candidates for inclusion in or near a Downtown ITC:

Commercial

- Approximately 50,000 square feet of Class B office space (rents in the \$9-\$14 per square foot range, oriented toward small professional firms) could be absorbed in the Westside area.
- "Back offices" for government agencies.
- Branch education centers for universities, allowing local residents and workers to receive graduate education in professional fields without having to travel to campuses elsewhere.

Entertainment

- Multiplex theater.
- Live entertainment (such as a comedy club, or jazz club).

Food Services

- One or more destination restaurants. According to developers, four to five destination restaurants are in the planning stages for the Westside area.
- Food concessions (such as a deli, bakery, ice cream store, coffee house, or produce market).
- Convenience store.

Other Retail Services

- Video rental store.
- Bookstore.
- Newsstand.
- ATM or branch bank.

Community Services

- Information kiosk.
- Small lending library (the closest is the Wake County Popular Lending Library at 334 Fayetteville Mall).
- Police substation.
- Day care center.

Transportation-Related Services

- Amtrak, Carolina Trailways, and TTA ticketing and information.
- Travel agency.



- Parking (to serve transit and other uses).
- Car rental agency.

Residential

- One to two bedroom rental apartments or condominiums oriented toward downtown office workers, artists, and students.
- Conversions of existing warehouse buildings to residential.

New residential construction may require governmental subsidies for land acquisition to “level the playing field” with suburban residential locations. In addition, Downtown residential sites should be developed in proximity to but not directly in the ITC. Finally, the strength of this market is dependent on the level of amenities offered downtown: quality retail services, interesting entertainment activities, quality recreational opportunities, and an environment that is perceived to be relatively safe.

5.6 Staging and Phasing

Clearly, the full development of the ITC, as represented in the maximum development concepts, is not warranted in the short term. However, there are a number of ways to proceed with the project incrementally and postpone unneeded portions until they become appropriate and cost-effective to implement. For illustration purposes, a “pro forma” project phasing could develop as follows:

Phase One

Approve the recommended site as the preferred location for a Downtown Raleigh Intermodal Transportation Center. This approval could take the form of updates to the City’s adopted *Central District Plan* and *Comprehensive Plan*, NCDOT’s Statewide Rail Plan, TTA’s Regional Rail Plan, the regional TIP, and other related agency transportation plans. These actions would communicate the public sector’s intent to secure the property at a future date for transportation purposes, thereby forever protecting it from alternative developments.

Phase Two

Move the existing intercity rail (Amtrak) and intercity bus (Greyhound/Trailways) operations to an interim, expandable facility somewhere near the center of the site. One of the three rail passenger boarding areas could be built to directly accommodate existing Amtrak train movements. Only a limited amount of CAT service would need to be diverted at this time. Passenger parking spaces would be built to accommodate both intercity rail and intercity bus services.



Phase Two costs are estimated to be approximately \$3.4 million to \$5.4 million, depending upon the details of the specific design selected. These costs include the purchase of property (approximately \$1.5 million). Potential funding participants could include NCDOT/Amtrak, Greyhound/Trailways, the Federal Highway Administration, the Federal Transit Administration, and the Federal Railroad Administration.

The City of Raleigh's financial participation would be limited to the additional operating costs associated with diverted CAT service to the facility.

Phase Three

If and when the decision is made to fund and construct the proposed regional rail system, Phase Three would add the second and third rail stop and platform areas to accommodate the west/north and southeast/north train movements planned for regional rail and intercity rail respectively. Full CAT service would be required at this point.

Phase Three costs are estimated to be approximately \$8 million, depending upon the selected design at that time. Potential funding participants could include TTA, NCDOT/Amtrak, Greyhound/Trailways, the City of Raleigh, the Federal Highway Administration, the Federal Transit Administration, and the Federal Railroad Administration.

Phase Four

Either as part of Phase Three or later, a solicitation for joint development proposals

on or over the site could be advertised by the owner to the private commercial development community (perhaps including the public sector, if appropriate). Up to this point, all transportation-related facilities on the site will have been designed and built to accommodate a range of joint development strategies, so as not to unduly constrain the site for this purpose.

Phase Four costs would be entirely incurred by the selected development entity.

5.7 Conceptual-Level Capital Cost Summary

Table 5.1 below summarizes the conceptual-level capital cost estimate for an ITC on the triangle site. These costs are in current (1995) dollars. Unforeseen costs associated with potential hazardous materials or major utility relocations are not included. Building costs shown include an enclosure, canopies, elevators stairs, and other architectural elements, but *do not* include any costs associated with potential joint development over the site.

It is recommended that financing of the project be shared by the ITC service providers, in proportion to their use of the facility, or some other mutually agreed upon funding arrangement.



Table 5.1
Conceptual-Level Opinion of Capital Cost of Recommended Downtown Raleigh ITC

Cost Item	Capital Cost
Land Acquisition*	\$1.5 million
Construction Costs	
<i>Demolition</i>	\$0.4 million
<i>Civil/Site</i>	\$1.6-\$2.6 million
<i>Architectural Features/ Passenger Facilities</i>	\$7.9-\$8.9 million
TOTAL	\$11.4-\$13.4 million

* based on official tax value

5.8 Conclusions

In summary, the two biggest contributors of passengers to the proposed downtown ITC are the CAT bus system and the proposed TTA fixed-guideway regional rail system. Rerouting all downtown CAT routes through the ITC is operationally feasible only if the regional fixed-guideway system is implemented. Therefore, a **full-scale downtown Intermodal Transfer Center is feasible only if the proposed regional fixed guideway system is approved, funded, and built.**

If the regional rail proposal is not approved, a reduced-scale project, including a new Amtrak rail station and intercity bus facilities, could be implemented at the same

location, with rerouting of some CAT service or establishment of a downtown shuttle service to link other parts of downtown with the center.



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Appendix A
Evaluation Worksheets



Goal/Criterion: Connections among modes

Measure: Number of transit modes accommodated at this facility

Site	Raw Score	Normalized Score
Existing	1	2
1 South	5	10
2 East Side	5	10
3 North Side	5	10
4 Far North	5	10
5 Center	5	10



Goal/Criterion: Increase percentage of transit ridership

Measure: Projected use of transit

Site	Raw Score	Normalized Score
Existing	100	9
1 South	110	10
2 East Side	110	10
3 North Side	110	10
4 Far North	115	10
5 Center	110	10



Goal/Criterion: Minimize Travel Time to Station

Measure 1: Distance to center of employment

Site	Raw Score	Normalized Score
Existing	3	3
1 South	3	3
2 East Side	3	3
3 North Side	3	3
4 Far North	3.5	2
5 Center	3.5	2



Goal/Criterion: Minimize Travel Time to Station (continued)

Measure 2: Auto accessibility - major (2) + minor (1) Thoroughfares serving site.

Site	Thoroughfares	Raw Score	Normalized Score
Existing			3
1 South	Dawson (2)	2	5
2 East Side	Hargett (1)	1	8
3 North Side	Morgan (2) Hargett (1)	3	3
4 Far North	Edenton (2) Jones (1)	3	8
5 Center	Future connector	1	3

Combined Rating for Measure 1 and Measure 2

Site	Average
0 Existing	3
1 South	4
2 East Side	6
3 North Side	3
4 Far North	5
5 Center	2.5



Goal/Criterion: Cost effectiveness

Measure: Capital cost per rider

Site Option	Site Size	Land Cost	Demo. Cost	Site Cost	Bldg. Cost	Total Cost	Annual Riders	Cost/Rider	Norm. Score
Existing	--	--	--	--	--	\$2.5 M	0.6 M	\$4.16	8
1 South Leg	4.6 A	\$1.8 M	\$0.8 M	\$1.0 M	\$5.1 M	\$8.7 M	2.0 M	\$4.35	8
2 East Side	6.4 A	\$4.2 M	\$1.7 M	\$1.5 M	\$6.6 M	\$14.0 M	2.0 M	\$7.00	5
3 North Leg	3.4 A	\$1.3 M	\$0.8 M	\$0.5 M	\$6.8 M	\$9.4 M	2.0 M	\$4.70	7
4 Far North	2.4A	\$1.2 M	\$0.3 M	\$0.5 M	\$5.0 M	\$7.0 M	2.0 M	\$3.50	7
5 Center	8.9 A	\$1.5 M	\$0.4 M	\$2.6 M	\$8.9 M	\$13.4 M	2.0 M	\$6.70	5

- Notes: 1. "Building cost" includes enclosure, canopies, elevators, stairs, and other architectural elements. Does not include any private development costs.
2. The estimated capital cost and ridership for the "Existing" option are provided by TTA and only includes the addition of the proposed regional rail station downtown.
3. "Demolition" and "site" costs do not include potential hazardous material or asbestos removal or remediation, geotechnical analysis, on-site underground utility relocations, or off-site utility work.
4. Average daily usage is factored by 300 to estimate average annual usage.
5. The score for Site 4 was reduced from 10 to 7 because the site does not include parking or an on-site joint development area.



Goal/Criterion: Traffic and Transit Operations

Measure: Evaluation of adverse impact

Site	Streets	Transit	Avg.	Conflict
Existing	10	10	10	
1 South	10	2	6	
2 East Side	10	4	7	
3 North Side	10	8	9	
4 Far North	10	8	9	
5 Center	8	10	9	Glenwood Connector

Goal/Criterion: Railroad Operations

Measure: Evaluation of adverse impact

Site	Score	Comments
Existing	10	
1 South	5	Some impact - site marginal
2 East Side	0	Site not acceptable
3 North Side	0	Site not acceptable
4 Far North	0	Site not acceptable
5 Center	10	Little impact on railroad operations



Goal/Criterion: Downtown Development

Measure: Compliance with downtown development plans and likelihood of attracting additional complementary development

Site	Raw Score	Normalized Score
Existing	1	3
1 South	1.5	4
2 East Side	2	6
3 North Side	3.5	10
4 Far North	1	3
5 Center	2.5	7

Note: The scores for sites 4 and 5 have been revised based on discussions with Advisory Committee members

