TECHNICAL MEMORANDUM NUMBER ONE: CONDITIONS OF SUCCESSFUL STATION AREA DEVELOPMENT

Enabling Station Area Development in Florida: Towards More Cost Effective Rail Transit Investment

for

Office of Public Transportation
Florida Department of Transportation
605 Suwanee Street (MS 26)
Tallahassee, Florida 32399-0450

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TABLE OF CONTENTS

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PREFACE

Overview of the Project

This project is being carried out for the Florida Department of Transportation as part of the agency's commitment to a larger role for transit in the state's transportation future. Several Florida metropolitan areas have, or are planning, rail transit services. These services will be financed in part by state funds. *In order to maximize the benefits of rail transit, it is critical to attract the appropriate concentrations and mixes of activities to rail corridors and station areas that will build ridership and contribute to the quality of urban life.* Existing, proposed, and planned rail transit investments in Miami and Southeast Florida, greater Orlando, Tampa-St. Petersburg-Clearwater, and Jacksonville, can be made more cost-effective by utilizing this strategy. This research project will assist in implementing such a strategy by:

1. Examining ways in which this approach can be used to take advantage of potential opportunities on existing or planned Florida rail transit systems.

2. Identifying barriers and constraints that limit or prevent this type of development in Florida, and in particular the communities that have, or are planning, rail transit.

3. Recommending a set of actions to overcome these barriers and constraints at the state and metropolitan levels.

The Role of This Technical Memorandum in the Overall Project

The research will identify what makes station area development successful, where opportunities exist in Florida for such development, and what actions need to be taken to facilitate this type of development. The first step, covered in this technical memorandum, includes examining the range

of development mixes that contribute the most to rail ridership, and isolating factors that have made development successful, or that have limited or prevented it. Existing and planned rail transit systems in Florida will be surveyed to identify their current and future projects where opportunities may occur for similar development as the second stage of the research. Third, factors that work against implementing a station area development strategy in Florida will be identified. These factors will be compared with those encountered in other states, solutions developed elsewhere examined, and recommendations made for dealing with them in the Florida context. Remedies will be suggested that may include legislative and/or policy action at state and local levels.

INTRODUCTION

Scope of This Technical Memorandum

An inventory of station area development projects has been prepared and examples of "best practices"have been selected. The tech memo begins with a brief discussion of the research approach used on this task. The approach combines literature review, examination of recent salient research products and a survey of transit properties. Because this study focuses on Florida, development associated with new rail transit systems is emphasized. Florida's rail transit systems are barely more than a decade old.

The range of definitions of station area development is examined. A promising new approach is highlighted. Material gathered in the literature review and the system survey is used to identify where station area development is occurring, by both metropolitan area and by transit system. Station area developments are examined in a variety of forms and contexts. These include CBD developments, suburban developments, residential developments like transit villages, TODs and others. Great variation exists as to the type and intensity of station area development. Several communities have developed strategies to pursue this type of development very aggressively. Others have taken a very benign approach and let events play out at station sites with minimal intervention. A generally overlooked phenomenon, variation with rail mode technology, is explored in this memorandum. Those parties responsible for station area development are identified, and their roles noted. How public and private sector actions, separately and jointly, have contributed to station area development around the country is noted. The importance of the legal and institutional context in aiding or hindering station area development is examined. A summary of conditions favoring "best practices" of station area development concludes this technical memorandum.

The chapters that follow answers the following questions.

- How is this research approached?
- What is the definition of station area development?
- Where is station area development occurring?
- How do the various rail modes relate to station area development?
- Who is responsible for station area development?

- How do statutes, ordinances, regulations and plans affect station area development?
- What are the conditions favoring "best practices" of station area development?

Defining "Successful" Station Area Development

Transit station area development is not a new phenomenon. The growth patterns of American urban areas between 1870 and 1920 was in large part driven by rail transit. Late 19th and early 20th century streetcar lines were the growth arteries of large and small cities, and even larger towns. Suburban passenger services, which today are called commuter rail, developed as a new revenue source by private railroad entrepreneurs, and allowed city workers to live in smaller, cleaner and less congested towns built by developers some distance from the urban core. The extension of elevated and subway tracks into vacant land on the edge of New York City was carried out as a development tool to attract residents to new urban frontiers in Brooklyn and Queens. Quincy, Scarsdale, Mapleton, Bryn Mawr, Lake Forest and Menlo Park are all suburban communities that developed around a rail station.

The construction of post World War II rail transit began slowly. The first three new systems, Cleveland's red line, the San Francisco Bay area's BART, and the Lindenwold Line linking Philadelphia and New Jersey suburbs were constructed to provide traffic congestion relief, but with the awareness that new activities would congregate around some of the stations. Heavy rail in subway, grade-separated surface or elevated structures was used in these three systems, and was the technology of choice as other cities built rail transit. Atlanta, Washington, D.C., Baltimore, Miami and Los Angeles developed new heavy rail by 1990, and other cities expanded their systems. In 1981 the first new light rail line built since the 1920s, opened in San Diego. By 1998, over a dozen new light rail systems have appeared in U.S. cities, and others are in the development or planning phase, including Orlando, Tampa and Jacksonville. Established commuter railroad systems have undergone expansion and new ones have appeared in Connecticut, Maryland, Virginia, Texas, California and south Florida. By 1996 nearly one third of all transit trips, and 40 percent of transit passenger miles in the United States were on rail modes.

Following the opening of BART in 1972, efforts were begun to determine "success," by measuring the investment benefits of these new systems. Actual ridership, ridership growth, and rail mode share in relationship to automobile and other transit modes, were the initial subjects considered for evaluation. By the late 1970's a the focus of measuring impact had expanded to include examination of changes in population density, land use, and land values. Increases in density, rising land values,

and the particular associated land uses that produced higher values, were considered to be part of "success."

A decade later the definition of "success" began to broaden. Quantitative measures continued to be important. Increased residential and employment densities around transit stations showed a propensity for attracting people to transit. Competition for space close to the stations drove real estate values up, and this in turn resulted in increased tax revenue. A new perception of success began to be expressed in terms of qualitative issues. A definite shift from automobile access to pedestrian access began to be recognized and value was placed on it. This value emphasized the functioning of the area around the station as an integrated whole, or a station community, rather than a series of disconnected parts. The presence of a variety of functions found in the neighborhood around the transit station allowed for a total functioning of many day-to-day elements of life without having to go outside the area . . . except perhaps to work. Linking these functions together with sidewalks, pleasant spaces and public places, all combined to create a new set of perceptions about what is positive and valuable in this kind of neighborhood. "Livability" and "sustainability" are terms which evolved and have been applied to this type of development as the hallmarks of "success."

The new definition of success implies that it is possible to restructure land use and activities around transit stations in a way that creating communities with transit becomes a new tool in the process of urban development and revitalization. This first became articulated in Portland, Oregon with the development of the city's East Side light rail program. Tri County Metropolitan Transit District (Tri Met) carried this theme into the planning and development of Portland's West Side line which opened in September 1998.

"The ultimate measure of success for Tri-Met's MAX light rail is its effectiveness in organizing urban growth. In many cities, as population grows, development spreads over former farms and forest. People live ever farther from work and shopping. Major roads are built and soon clogged with traffic. Air quality and the general quality of community life deteriorate. The Portland region has invested in light rail in large part to help attract new growth to areas easily served by transit. Westside MAX is a test case that already has proven the point: people want to live near light rail. Nearly 7,000 housing units are completed or under construction within a half mile of Westside MAX stations. Vibrant new communities are taking shape around several of the stations. In all, private developers in Westside MAX station areas have invested some $500 million--a heady start, considering trains are not yet running. Roughly $1.9 billion has been invested in Eastside station areas since MAX

opened in 1986." This statement by Tri Met summarizes much of the success of Portland's investment in light rail. However, much of that success is the result of important and crucial complementary policies. Key policies have established a strong urban growth boundary, encouraged in-fill development, and promoulgated various other growth management strategies.

Chapter 1: Research Approach

The research objective in this technical memorandum has been to identify the extent of transit station related development across the United States, and to pick out examples that best illustrate this subject. It is assumed that most of this development has occurred on new systems built since 1970, or on newly built lines that are extensions of older systems. Some new development has also taken place around stations that are part of older systems, but this is relatively rare. In order to conduct this inventory, and identify best examples that illustrate the range of mixes occurring around rail transit stations the following approach has been used to represent the range of possibilities.

Traditional Literature Review

The first step in the research process was to conduct a computer key word search to identify publications and documents available in various data bases. This turned up a limited number of technical items. A more fruitful endeavor was a review of selected publications, including *Passenger Transport, Mass Transit, Metro, Planning, Urban Land, Urban Transportation Monitor* and *ITE Journal*. Numerous citations from these publications are incorporated into the bibliography.

Most of these items are news stories on particular projects, although more comprehensive articles encompassing the range of issues associated with transit related development were found in *Planning* and *Urban Land.*

Recent Research Developments

Growing interest in the interrelationship between transit and urban form, particularly given the recent conceptualization of rail transit as a tool for managing urban growth, has led to a number of related studies published by the Transportation Research Board under the auspices of the Transit Cooperative Research Program (TCRP). Several TCRP reports are noteworthy:

TCRP Report 16, Transit and Urban Form, published in two volumes contains four parts which (1) summarize the knowledge of transit, urban form and the built environment; (2) examine the commuter and light rail transit corridors from a land use perspective; (3) provide a guidebook for practitioners; and, (4) review public policy and transit-oriented development through six international case studies.

TCRP Report 22, The Role of Transit in Creating Livable Metropolitan Communities This report addresses the impact of transit on livability, uses a series of case studies to illustrate how transit can act as a catalyst for downtown and neighborhood renewal, and provides guidelines on how to implement a community based process for creating livable communities.

TCRP Report 33, Transit-Friendly Streets: Design and Traffic Management Strategies to Support Livable Communities. This report examines through a series of case studies how design and management of streets, sidewalks and traffic can create a more favorable environment which is conducive to transit use.

The Center for Urban Transportation Research (CUTR) at the University of South Florida and the Lehman Center for Transportation Research (LCTR) at Florida International University have been carrying out a multi-year project, "Guideway Transit and Intermodalism: Function and Effectiveness," for the Federal Transit Administration. This project examines factors that make investment in rail transit successful. A series of case studies of rail transit systems across the country and three research books are among the products of this effort. Information and materials gathered in the conduct of this large research project have been germane and useful to the "Enabling Station Area Development" project.

Survey of Transit Agency Projects

In order to examine the full scope of station area development issues, a survey has been undertaken of rail transit systems in the U.S. This survey has been based on information gleaned in the literature review, supplemented by material from recent research developments, and further enhanced by phone calls and visits to certain transit properties. The survey has revealed that a number of transit agencies, and/or the communities where they are located, have embarked on new policies and programs to encourage or facilitate transit station area development. As evidence of this is the growing number of manuals, guidebooks, policy documents and planning ordinances produced and adopted across the country in support of what is being increasingly perceived as a powerful new tool in urban growth management and development. These publications and documents have been incorporated into the bibliography at the end of this technical memorandum. Transit systems and local governments were examined in 22 metropolitan areas as part of this approach. These included:

Atlanta	Denver	Pittsburgh	Seattle
Baltimore	Jacksonville	Portland	St. Louis
Boston	Los Angeles	San Francisco	Washington, DC
Buffalo	Memphis	Sacramento	
Cleveland	Miami	Salt Lake City	
Dallas	Newark	San Diego	
		San Jose	

This method has provided updated information on the ever-growing collection of transit station area development activities. Station area development is taking place in virtually all new (post World War II) rail transit properties. Not every new rail station is surrounded by such development. Nor is the support or encouragement of transit related development an adopted policy of every agency, or local government, where new rail transit has been built. However, there is a clear emerging trend that transit related development is playing a bigger role in shifting the character of urban development in many of our cities.

Chapter 2: What is the Definition of Station Area Development?

Definitions are assumed to be commonly held perceptions and descriptions of a particular phenomenon. There are two basic definitions of station area development. The first can be called a traditional land use and zoning approach. Until the post World War II period, and continuing in some cities up until now, the approach has been simply to accommodate market forces by re-zoning, or to not treat station areas differently from any other area and adhere to existing plans and zoning. This approach can best be described as *reactive.* A second definition, and one that involves a very different approach to station area development, has evolved in the last decade and a half. This new approach can best be classified as *proactive.* It assumes that particular types of station area development can be a positive benefit to overall community goals, and should be encouraged and supported. These very different approaches produce very distinct results.

The Traditional Reactive Planning and Zoning Approach

Most new rail transit systems have been constructed in urban areas where specific land use plans, and their reinforcing zoning ordinances, were already in place. The imposition of a rail system on the existing land use patterns and plans usually resulted in areas around the stations changing only in response to market forces. If the rail line passed through a location where the plans and zoning around a station site were compatible with what market forces would expect to develop there, no change in existing plans were required. As an example, construction of BART stations in downtown San Francisco or Oakland were sited in areas where the zoning already existed for intense commercial development.

If a rail station were located in an area where market forces would attract new uses to the station area, then changes to plans and zoning would be considered on an ad hoc basis. Each particular station site was considered individually in response to proposals for new development as they were submitted. This could involve each new use, or each building application, being considered individually. Or it might include re-zoning the area around the station, and modifying comprehensive land use plans, to allow certain kinds of new uses, or more intense use, to accommodate new projects as proposed by developers. In some cities, this involved creation of a transit station area zoning classification. Local ordinances to establish transit station area zoning were passed in many places, including Atlanta, Miami, Alameda County, San Diego, San Jose, Portland, Dallas, Denver, and King County, Washington.

Two factors were considered in the reactive response to these market driven changes proposed around transit stations. The first was the appropriateness of the use. The second is the intensity factor, or increase in density. The latter included higher housing density, more concentrated employment in office buildings, and in some cases activity densities associated with shopping, entertainment or sports facilities. Use appropriateness was often, but not always, considered on the basis of compatibility of the proposed new development to the existing neighborhood patterns. In suburban locations, either where development had not yet occurred, or where the predominant pattern was low-density, single family housing, the increased traveler presence associated with a rail transit station became perceived by investors and developers as an attraction for new and/or different kinds of business.

This particular definition produces visions of station area development as being an intensification of activity, often drawing new retail, office and residential uses into high rise structures and creating serious anomalies in the urban fabric. Parking and automobile traffic are often associated with this view of station area development. It is sometimes viewed as "more of the same" as automobile oriented development, especially in some of the early transit development that took place at park and ride stations in the suburbs on the Bay Area and Washington systems. However, as these stations began to attract more investment, land values rose and surface parking soon became replaced by decked lots and multi-level parking structures. Urban zoning and parking requirements did not take into account the possibility that shifting trips to transit could reduce parking demand.

New Community Based Approaches

By the late 1980's a growing dissatisfaction with the patterns of urban sprawl led to consideration of new alternatives that could provide for more attractive communities and neighborhoods that would be linked by transit to employment and other specialized activity destinations. The area around the station could become a community on its own if a certain critical mass in population were reached which could justify retail businesses and public services at a neighborhood level. Peter Calthorpe introduced the concept of the Transit Oriented Development (TOD) or the transit village. TOD's offer a certain level of self-containment. Basic everyday needs (groceries, gasoline, drugstore, personal care, elementary school, community social center, recreational facilities) would be within the community served by a transit station. The transit service would provide the link to work, to entertainment, specialized shopping, and other services. Automobiles are part of the scene, but needed in fewer numbers as transit and walking become substitutes for some of the trips made in the car.

While only a handful of TODs have actually been built, many elements of the concept have been adopted in the planning of new rail transit system station area developments. These are being incorporated more and more with each new rail system, or extension of existing ones.

A step beyond the concept of the TOD is being taken by a growing number of metropolitan areas in the planning of rail transit. This is to build upon the positive neighborhood elements of pedestrian movement for short trips and maintaining social and community cohesion and to use transit for as many long trips as possible. Few situations actually offer the opportunity to do a TOD. Most systems are being planned to fit into existing urban areas. It becomes important to recognize the existing elements and character around each proposed station site as planning takes place.

An excellent example of this approach has emerged in Tampa, Florida. Hillsborough County has recently completed a Major Investment Study (MIS) that has examined a series of transportation alternatives. One component of the multimodal approach which includes roads, bus transit, pedestrian and bicycle elements is light rail transit. As part of the MIS, the consultant team of BRW and Dover Kohl Associates, and the Hillsborough County Planning Commission developed a set of alternative concepts that recognize differences in size, scale, history and character of particular station areas.

A distinction is made between mature areas and developing areas. Mature areas are the older, established portions of the community where the rail line would be inserted into an already existing set of land uses and activities. Developing areas would be station sites surrounded by vacant land, or land in a use, e.g. agricultural, that would be subject to change.

This approach also recognizes the very critical difference that scale makes in planning what happens around the station. This is incorporated into four distinct station types: local, neighborhood, community, and regional. The approach is outlined below.

Framework for Analysis

Station Types

Setting	Local	Neighborhood	Community	Regional
Mature			*Areas*	
Transit Focus	Walk-up and Kiss-and-Ride	Local Transit Shuttle Service, Line Haul Transit	Multi-Modal Transit Center	Transit Center of Region
Development Focus	Modest Redevelopment Potential, Emphases on Infill	Moderate Redevelopment Potential	Major Redevelopment Potential	Major Activity Center Development/ Redevelopment Opportunities
Developing			*Areas*	
Transit Focus	Large Park-and-Ride Facility	Park-and-Ride, Local Transit Shuttle Service	Park-and-Ride, Local Transit Shuttle Service, Line Haul Transit	Major Park-and-Ride, Local Activity Center Shuttle, Line Haul Transit
Development Focus	Minimum Adjacent Development Potential	Moderate Adjacent Development Potential	Transit-Oriented Village Development Potential	Major Development Opportunities

Each of the station types is further explained as to characteristics and design parameters.

Local Stations

Station Area Characteristics• Simple station structure- platform, shelter ticket vending, etc.

- Walk-up in nature, to serve nearby residential and employment destinations in mature areas
- No additional parking envisioned for mature locations
- Pedestrian connections to adjacent uses
- Limited service from local shuttle busses
- Minimum parking in mature areas; park-and-ride in developing areas

Local Stations are located in established or emerging neighborhoods. These stations well serve walk-up users of the rail transit system who reside in the neighborhoods surrounding the station location, or who are employed in adjacent commercial districts. Design of Local Stations is intended to:

- Have minimal impact on their surroundings,
- Improve pedestrian linkages to adjacent uses,
- Emphasize pedestrian scale and amenities: trees, shrubbery, street furniture, low level lighting, patterned paving, and
- Connect to bus routes.

Neighborhood Stations

Station Area Characteristics
• Primary focus on service to adjacent neighborhoods
• Potential for local shuttle buses, as well as line haul buses from a larger area
• Reduced parking for new adjacent transit oriented uses
• Accommodates development and redevelopment at moderate density
• Minimum parking in mature areas; park-and-ride in developing areas
• Pedestrian connections to adjacent uses

Neighborhood Stations provide opportunities for a low to moderate level of new development or redevelopment. These stations will be accessed by walk-up, kiss-and-ride, and some park-and-ride users of the rail transit system. Adjacent residents may access the transit corridor via shuttle bus or local bus routes. Design of Neighborhood Stations is intended to:

- Provide a focal point for adjacent neighborhoods, including retail and service uses developed around a public square or plaza,
- Foster new residential, employment and commercial development or redevelopment at moderate densities within a distance (1/4 mile) from the station,
- Include pedestrian linkages to adjacent uses, and emphasize pedestrian scale and amenities, and
- Emphasize the linkage with shuttle and local bus connections, with limited park-and-ride facilities.

Community Stations

Station Area Characteristics
• Center for major bus transfer service
• New development or redevelopment may include multi-level buildings containing retail, office, industrial, educational/ institutional centers and medium density residential uses with structured parking
• Park-and-ride site with up to 1,000 spaces provided

Community Stations serve areas larger than their immediate surroundings. These station areas may provide moderate to high levels of new development or redevelopment potential. Community Stations will be accessed by kiss-and-ride and park-and-ride users and local buses. Walk-up use may also be significant. Design of Community Stations is intended to:

- Provide a major public space with substantial, multi-level retail, service and employment development linking the public square with the immediately surrounding are,
- Promote substantial new infill or redevelopment of residential uses within walking distance of the station,
- Stimulate moderate to high density development over time, accommodating retail, office and residential units with structured parking, and
- Serve as a transit hub for the surrounding community accommodating kiss-and-ride facilities, structured park-and-ride spaces, local bus bays, shuttle bus drop-offs, and improved pedestrian access to adjoining development.

Regional Stations

Station Area Characteristics
• A regional destination associated with a regional mixed-use center (e.g. Downtown, regional shopping center)
• Parking shared with parking for mixed use center of activity
• New development may include multi-level buildings containing retail, office, educational/institutional uses, and high density residential uses with structured parking

Regional Stations serve as the destinations for various metropolitan area activities and events. They are located adjacent to or within regional activity center, such as central business districts, major institutions, employment, or retail centers. These stations will provide improved pedestrian connections to the heart of the regional center, including employment, government, retail and services, and residential uses. Design of regional stations is intended to:

- Supplement an extensive system of pedestrian amenities providing walkable connections to all uses in the regional centers,
- Stimulate adjacent redevelopment in mature areas,
- Integrate transit access into large-scale development or redevelopment opportunities,
- Stimulate future infill development closer to station locations in developing areas, and
- Facilitate regional activity located in a public plaza or along a major pedestrian spine.

Chapter 3: Where is Station Area Development Occurring?

Station area development is occurring in virtually all of the metropolitan areas where new rail transit systems have been put in place. There is, however, a large difference from area to area as to the amount of development in terms of the number of stations involved and the intensity of new activity that can be associated with the station.

Station area development sometimes occurs spontaneously as a result strictly of local factors around a particular site. Developers, neighborhood businesses, and others recognize an opportunity and take steps to bring in something new to the station area. The scale and intensity of the new activity will be affected by property availability and the permissive nature of local ordinances and plans to allow for the activity. This can be considered as an externally driven approach. It most likely focuses just on a single station.

In contrast, and the major focus of this research effort, is the range of new initiatives carried out with the full knowledge, support and collaboration of the local transit agency and/or other local government organizations and incorporated as part of public policy. These initiatives involve the entire spectrum of rail transit technologies: light rail, heavy rail, commuter rail and automated guideway. There are differences that do exist among the rail modes and these are explored in a later chapter.

Summary of Developments by Metropolitan Area and Systems

A brief summary of transit station area development related to each of the new rail transit systems by metropolitan area follows. A more detailed breakdown that is station specific is included in the Appendix.

- Atlanta has very actively coordinated station area development on the three route MARTA heavy rail system. All downtown subway stations have incorporated some degree of surface development. The range of downtown activities extends from sports facilities to government offices, from mid-rise office and commercial development to extensive high-rise buildings incorporating several hundred thousand square feet of office space. Some stations are integrated with surrounding downtown blocks through an elaborate system of overhead skyways. Several suburban stations have been the site of large scale real estate development.

- Baltimore has experienced station area development projects at or near MTA heavy rail line stations in downtown Baltimore and in association with the light rail stations in the city center and at stations in Hunt Valley. City center heavy rail stations are underground and provide a set of nodes around which new development and rehabilitation of existing buildings is taking place. The light rail line is entirely at grade. Redevelopment efforts downtown have taken advantage of the presence of rail transit. Public policy has placed major new publicly financed buildings adjacent to these rail lines, such as Oriole Park at Camden Yard, the new Ravens Stadium, and the Convention Center.

- Boston, although having one of the oldest rail transit systems in the country, has added on to its core heavy rail system. The Red Line was extended both to the north and south in the late 1970s and new development has occurred around several stations: i.e., Alewife, Porter and Quincy. The construction of the Orange Line in the mid-1980s has also triggered station area development, and six stations at the southern end of this line are linked by a linear park which provides a community greenway parallel to the rail transit right-of-way.

- Buffalo built its light rail line in part to revitalize the city's downtown area. A one-mile transit-pedestrian mall in downtown Buffalo incorporates commercial retail and office development. The remaining 5 miles of the light rail alignment are in a subway tunnel and varying degrees of development have taken place around the six stations.

- Cleveland operates two rail transit systems. A two route light rail line is the result of upgrading of former suburban streetcar lines in 1989. The Red Line heavy rail route was opened in 1955, the first new urban rail line built since before World War II. An extension of the light rail line in 1996 to serve a downtown entertainment district has been the only recent construction. Station area development has played a minimal role in Cleveland although it is expected to have a greater role in future plans. The areas around three stations on the downtown light rail extension are attracting new investment.

- Dallas opened its initial two route, 20-mile first phase light rail system in 1996 and 1997. The use of a downtown street as a transit/pedestrian mall has helped stimulate revitalization, and three new development projects are underway along this 1.2 mile segment of the system. DART is incorporating station area development planning efforts in the design of extensions of the system north into the suburban communities of Garland and Plano, as well as pursuing

various options on the Oak Cliff segments of the red and blue lines. The commuter rail line extending westward to South Irving offers limited station area development possibilities at the present time. However, extension of this route to Ft. Worth in 2000 will add several stations, and development efforts will be coordinated with local communities.

- Denver operates 5.5 miles of the first phase light rail route which opened in 1994. Development opportunities exist both in the downtown area where the alignment is on parallel city streets and at five other stations. The city and region have adopted transit oriented development regulations and policies. Local government and transit agency plans foresee a greater role for station area development in conjunction with the 8.2 mile second phase light rail route currently under construction.

- Jacksonville opened a short, three station automated guideway system operating over a 1.2 mile route placed on elevated structures in 1992. The system was upgraded and expanded in 1997 and 1998. The expansion is increasing the number of stations from three to eight. New development is taking place in conjunction with four of the new station sites.

- Los Angeles reintroduced rail transit in 1990 after a nearly 30 year absence. The 22 mile Blue Line light rail line opened then to link Los Angeles and Long Beach. The first four miles of the eventual 20-mile heavy rail Red Line opened in 1993 with subsequent sections opening in 1996 and 1998. The Los Angeles County Metropolitan Transit Authority (MTA) opened a second light rail line, the 20 mile east-west Green Line in 1995. The most intense station area activity has occurred at the five Red Line subway stations in downtown Los Angeles. Station area development activity has been minimal on the two light rail lines in the early years. However, MTA is taking a more proactive role with local communities at some Blue Line stations and at a few on the Green Line. Opportunities are somewhat constrained on the latter by its predominantly freeway median location. The second Los Angeles rail operating agency is the Southern California Regional Rail Authority (SCRRA) which began commuter rail service (Metrolink) in 1992 and now operates an extensive five route system in five counties. SCRRA is becoming more involved in station area planning and development largely in response to local initiatives in the communities it serves.

- Memphis opened its historic streetcar line in 1993 on a 2.2 mile alignment along Main Street as part of a downtown revitalization effort. A connecting parallel line was added to the

system in 1996. A new transit terminal at the north end of Main Street, and the railroad terminal, Central Station, at the south end of Main Street are key elements in this effort. Central Station is undergoing renovation as a transportation/commercial/residential mixed use facility with an adjacent transit bus terminal. The two streetcar lines operated by Memphis Area Transit Authority (MTA) are viewed as important contributors to enticing development along their respective routes.

- Miami contains both heavy rail and automated guideway systems which opened in 1984 and 1986 respectively. The heavy rail system is almost entirely on elevated structures and serves 21 stations along its 21 mile route. The automated guideway system also contains 21 stations and is operated as two partially overlapping routes totaling 4.4 miles on elevated structures and functions as a downtown circulator. Station area planning and development options have been built into both systems. Intense development has taken place at four of the Metrorail stations. Other station opportunities are being pursued by the transit agency's real estate arm. Commuter rail services also reach Miami on the 70 mile, three-county service operated by Tri Rail. Tri Rail has not actively pursued station area development, although it has cooperated with local communities in facilitating projects at stations.

- Portland is clearly the leader in the arena of station area development. The initial 18.0 mile Eastside line which opened in 1984 incorporated area development concepts at several station sites. Planning for the entire Westside MAX line which opened in September 1998 has been focused on integration of stations with their surrounding neighborhoods and communities in a very aggressive strategy. Downtown revitalization in Portland, and rehabilitation of the Lloyd Center area across the Willamette River from downtown, have used light rail as a tool. Public facilities investment policies have located a new convention center and sports facilities on the rail line. Strongly supportive land use planning and parking policies incorporated in the 2040 Plan are major factors in an ever-expanding series of successful station area projects.

- Sacramento, through the Regional Transit Authority (RTA), opened an 18 mile light rail line in 1987. This line has recently been extended by 2.4 miles and other extensions totaling nearly 16 miles are in the planning or final design phases. Station area development was only well integrated in the downtown area for the initial light rail segment. A new downtown shopping center, City Plaza, was built at a key station where a segment of K Street had been converted to a light rail/pedestrian mall. Extensions of the current line to the east, and

construction of a south line will involve more aggressive station area planning and development coordination.

- San Diego, like other new builders of light rail, has become progressively more engaged in station area development as its system has grown and matured. The San Diego Metropolitan Transit Development Board (MTDB) opened the nation's first light rail line in 1981 linking downtown San Diego and several suburban communities to the south as far as the international border with Mexico. The opening of subsequent sections through 1997 has increased the size of the two route system to 45 miles. Station area development was initiated as a partnering program by MDTB at two key stations on the original segment and has spread to become a major policy for extensions planned and implemented over the past decade.

- San Francisco introduced the first major new technology rail transit system in the U.S. in 1972 with the opening of the Bay Area Rapid Transit District (BART) 72-mile heavy rail system. Although planning and implementation of the system recognized the relationship between rail transit and development in the surrounding communities it was not until the late 1980s that BART began an active program of station area development. This has been coordinated with the local governments and private developers and has included several large scale projects at city center stations in San Francisco and Oakland. A more active program has developed at suburban communities as they have faced problems of congestion and containment of sprawl. The city of San Francisco experienced conversion of its five historic streetcar routes to light rail in association with the construction of subway tunnels to meet the needs of BART. The Municipal Railway (Muni) placed the downtown segment of these lines in the upper level of the Market Street tunnel in 1974. Muni has become involved in station area development with the construction of the new "E" line along the Embarcadero to the Caltrain commuter rail station and a new baseball park. Recent plans call for a five mile southern extension of this line and eight stations which will provide new development opportunities and a greater role for Muni in planning and development of the area around these stations. The third rail transit operator in the Bay Area is the Peninsula Joint Powers Board (PJPB) which assumed operation of commuter rail service between San Francisco and San Jose in 1993 and extended it further south to Gilroy in 1995. Seventy trains a day operate over the system. Commuter train service (marketed as Caltrain) has existed on this route since the late 1800s serving a chain of towns and small cities between San Francisco and San

Jose. Redevelopment and downtown revitalization efforts in several of these communities have drawn PJPB into station area development issues. Private developers have pursued options for medium and high density housing at or near several stations on the Caltrain commuter rail route.

- San Jose constructed a 20 mile light rail line which opened in 1989. The downtown segment was built in conjunction with urban revitalization efforts. Valley Transit Authority (VTA), worked closely with the city's redevelopment agency and private developers in planning for the transit mall which includes light rail and buses. A major city thoroughfare north of downtown was also rebuilt for light rail and station development focused on the creation of office and housing at several sites. Station area development planning is an integrated part of the construction of a seven mile extension currently underway.

- St. Louis opened the 18 mile first phase of light rail transit in July 1994. The Bi-State Development Authority operates Metrolink trains to 18 stations. Stations were integrated with existing and recent development at several downtown stations and at the former St. Louis Union Station which had been converted to an upscale shopping/entertainment/hotel complex. Other station area integration into existing conditions was very successfully carried out at a major medical complex, at the University of Missouri at St. Louis, and at Lambert International Airport. New development opportunities are being pursued in collaboration with local government agencies and the private sector. Construction of a second phase extension in Illinois is expected to add a dozen stations to the system when it is completed in 2001.

- Washington, DC has experienced exceptional success with station area development. The five route, heavy rail system has been growing incrementally since opening the first segment of the Red Line in 1976. The Washington Area Metropolitan Transit Authority (WMATA) has been involved in station area projects at more than half of the 97 stations on what will be a 101 mile system by 2002. WMATA has benefitted from being able to control a large amount of land around the stations which has made for an attractive development opportunity for investors. The range of development has included office, entertainment, commercial, and residential activities. Most projects involved mixed use development and collaborative financing between WMATA and the private sector.

Identification of Systems and Areas where the Approach has been the Most Successful

All of the metropolitan areas and transit systems listed above have been involved to some degree in station area development. This involvement covers the gamut from responding to externally induced local proposals and efforts to make things happen at a particular station, through coordinated efforts with local governments to achieve overall goals, to a very aggressive role by the transit agency and other parties to take on a systematic approach across the system with the goal of benefitting the entire community.

Six systems stand out as being particularly successful in carrying out a community-wide approach to incorporating station area development as an integral part of planning and implementing new rail transit. Two of these are new heavy rail systems. The other four are all users of light rail technology. No commuter rail agency has yet produced and implemented a system-wide approach to station area development. The six systems and their particular successes are:

Heavy Rail Systems

Atlanta has carried out a very opportunistic program encouraging station area development at many places on its system. MARTA has played a major role in working with the local government planning and development agencies and with private investors and developers in producing a series of very successful projects. In downtown the stations have been nicely integrated into adjacent and nearby development plans. Noteworthy are the developments at Five Points, Peachtree Center, Civic Center, North Avenue, Georgia State, Omni/Dome and Arts Center. Suburban station development has clustered at an intense level at Lennox, Medical Center and Dunwoody stations. MARTA has also very effectively integrated its rail system into the existing suburban community fabric without being disruptive and bringing an improved community quality at the Decatur and Avondale stations. The successful approach has been one based on collaboration and cooperation.

Washington, D.C. offers extensive examples of transit station area development carried out in a variety of contexts by WMATA working with other local government agencies and private developers. By acquiring 2,500 acres of property around stations as the system developed, WMATA was in a position to effectively use this asset in ways that would benefit the agency and create new development in the areas around the stations. Washington Metro serves city center downtown locations with subway stations. Suburban stations include subway, surface and elevated sites. In

downtown Washington, development has occurred around many underground station access points in collaboration with new federal and local government building construction, and with private sector involvement in joint projects. The stations at Metro Center are tied into existing department stores and shops. L'Enfant Plaza is a major transfer center between four of the five Metro lines and the site of new federal offices, a privately funded hotel, office, and shopping complex. Pentagon City station is the site of a major new shopping mall. Ballston station is the focal point of an intense development of commercial office, retail and hotel space accompanied by high density housing which grades into single family uses within a short distance. Prince Georges Plaza station is in an open cut, covered by a parking structure and yet effectively integrated into an adjacent suburban neighborhood by a park and footpaths. Other examples of development abound.

Light Rail Systems

Portland has taken the concept of transit station area development to its greatest level. The Tri County Metropolitan Transportation Agency of Oregon (Tri Met) has worked closely with Portland Metro, the regional government, in developing a totally integrated approach to linking transportation, land use, economic development, growth management and quality of life. Rail transit is viewed as a powerful tool to assist the community in meeting its goals. Tri Met points with pride to nearly $2 billion in new development generated along its Eastside light rail line, with a similar level of investment already committed at stations on the recently opened Westside line. Station development is considered not just in economic impact terms, but in how the ambience, character and accessibility factors contribute to community livability. Grass roots planning efforts with maximum public input and involvement are cited as being key to achieving this level of success.

Sacramento has produced some excellent examples of station area development that are useful for others cities to consider. From a system perspective, RTA and local governments have not adopted as extensive a strategy, nor implemented as many tactics, as either Portland or San Diego, but Sacramento has produced some very valuable lessons about station area development.
The K Street Transit Mall which incorporates two stations has helped bring new vitality to a declining downtown street. A former department store has been converted to a state office building and retail ground floor uses have come back. The Convention Center provides an anchor at one end of the Mall, while City Plaza, a downtown shopping center, is sited at the other end of the Mall. City Plaza contains two major anchor stores, 100 other shops, and a Holiday Inn. RTA has also successfully

developed new stations in older residential areas that are non-intrusive and provide only pedestrian and bicycle access.

San Diego is not only the first new light rail system in the U.S., it is also an early leader in carrying out station area development projects on its own initiative and jointly with private sector investors. The initial approach was characterized by consideration of development on a station-by-station basis after construction of the initial South Line. MTDB constructed a building using adjacent land and air rights over the tracks at its Imperial and 12th Station to house agency offices, but also to provide office space for other tenants and ground floor commercial uses. An extension of the line from the C Street Mall to the Santa Fe Depot involved a joint development project with a 22 story office building/hotel designed around and over the light rail line at American Plaza station. Private developers built some of the first transit oriented housing at the Amaya and Barrio Logan stations on the south line. The planning and design of the Mission Valley East extension which opened in late 1997 incorporated the agency's new strategy for area planning around all stations.

St Louis opened its new light rail system in 1994. Largely constructed on former railroad right-of-way at grade, in open cuts, and even in a former freight railroad tunnel, Metrolink connects numerous important traffic generators. Station development has both successfully integrated older established areas and activities with light rail transit, and provided opportunities for stimulating new development and a reassessment of livability. In downtown St. Louis a subway station has brought additional customers to an urban shopping mall, and the station at the Laclede's Landing entertainment district has helped reshape that area. A major medical complex is undergoing expansion and being complemented with new housing at another station. Two stations at the University of Missouri at Kansas City are providing new opportunities for planning and development on campus. Stations in a former industrial area in the northwest sector of St. Louis are becoming focal points of new and revitalized residential neighborhoods. Station area development is a key component of the under-construction east extension into Illinois.

Chapter 4: How do the Various Rail Modes Relate to Station Area Development?

There is a tendency to lump transit oriented development into a generic rail transit category. This overlooks the important, although sometimes subtle, variations that exist from one rail transit mode to another. The environment that each of the rail modes operates in, the capacity to move people, the location of stations on the system, and the nature of access by users are all important distinguishing factors.

Five types of rail transit technology, and the intermodal linkages where two or more of these technologies share the same station, are considered in the discussion below. The rail technologies include:

- Light rail
- Historic streetcar
- Heavy rail
- Commuter rail
- Automated guideway

Light Rail

Light rail transit (LRT) is the post-World War II adaptation of the electric streetcar to modern urban transit. Electric vehicles operate in one to four car trains drawing propulsion power from overhead wires. Streetcars operated primarily on tracks laid in city streets, hence the name. Light rail vehicles (LRVs) also operate in this environment. However, they also operate on private rights-of-way, frequently former railroad lines converted to exclusive LRV use, or they may operate in tunnels or subways, or on elevated structures. This flexibility has made light rail easier and less costly to insert into already built up environments than heavy rail systems. Light rail operations generally include street operations which may or may not be shared with automobiles, and running on tracks that are in an exclusive right-of-way. The latter may include grade separation from cross streets, or it may not. While streetcars stopped at almost every corner, LRV's even when they operate in streets have stations every few blocks. On private right of way LRT stations are anywhere from a half mile to a mile apart. Light rail vehicles can operate singly or in trains of up to four cars. Longer trains are

precluded by the length of city blocks where track is in the streets and blocking cross streets is unacceptable.

Cities with Operating Light Rail Systems
Baltimore, Boston*, Buffalo, Cleveland*, Dallas, Denver, Los Angeles, Newark*, Philadelphia*, Pittsburgh*, Portland, Sacramento, San Diego, San Francisco*, San Jose, St. Louis
*Pre-1950 streetcar system upgraded to light rail
Under Construction and Funded Planned Light Rail Systems
Hoboken/Jersey City, Orlando, Salt Lake City, Seattle

Several sets of LRT station possibilities exist:

Downtown Stations are usually in city streets, and often only three or four blocks apart. Because of the close spacing, relationships with the surrounding environment tend to be linear, rather than nodal. Any place along the downtown alignment is no more than a block or two from a station. This spreads the development attractiveness potential across a larger linear dimension, but can also be considered to have a depth aspect certainly extending to a block or two on either side of the alignment. LRVs may share the street right-of-way with automobiles, or the street may be restricted to LRVs and pedestrians, or to LRVs, buses, and pedestrians. Downtown LRV stations are located in highly pedestrian environments. Access is almost exclusively by foot, bicycle, or perhaps by transfer from another transit vehicle. Downtown transit malls, or exclusive streets, are part of the LRT scene in Buffalo, Dallas, Denver, Portland, Sacramento, San Diego, and San Jose.

Downtown activities associated with this type of development can range from office buildings to public entertainment and sports locations, ground floor retail, hotels, upper floor residential, and mixed use options. City center shopping malls on or near light rail stations are other strong options. Public spaces and public activities are important here also. Government agencies, financial institutions, other places with high traffic demand and in need of central locations are also possibilities. The mixed nature of downtown activities also increases the possibility for public and private sector collaboration.

Mature Residential Area Stations are located in a street or on an exclusive right-of-way in a well established urban residential neighborhood that intends to maintain the existing pattern. Development potential is limited, and preservation of existing neighborhood conditions is a paramount consideration. Pedestrian and bicycle access predominate, or may be the only access

modes. Parking is not needed, or even tolerated. Baltimore, Sacramento, and Portland offer good examples.

Suburban or New Residential Area Stations have great potential for the creation of new development patterns. The type of pattern created should involve input from local citizens. Here is an opportunity to craft station area development that can be supportive of increased transit use and meet other community goals. In some cases this may involve the location of a light rail station in an existing, but scattered community where the station can become a focal point for revitalizing community life. In other instances the desire may be to stabilize an existing suburban situation. In still others there is opportunity to structure and manage the growth of development by designing what will take place on the vacant land around a new station. Consideration of access will be of paramount importance in any case. If the location is a feeder point for commuter access by automobile, then parking may be an issue. If it is a site which is neighborhood focused then sidewalks and bike paths may be an overriding concern. The chances are very good that it will probably require a mix of access modes. Good planning is essential to accommodate the needs of nearby residents and workers who will walk to the station, and those further away who want to drive, or take a feeder bus. San Diego and Portland offer excellent examples.

Historic Replica Streetcar

New Orleans is the only city in which the classic streetcar operation, the transit mode that aided the growth and development of every U.S. city and many towns in the late 19th and early 20th centuries, has survived in its pure form. Several cities have built replica streetcar lines, or operate streetcars on the downtown segments of new LRT systems. A second line in New Orleans, and lines in five other cities have all been put in service over the past decade. Private organizations operate streetcars over LRV tracks owned by public transit agencies in downtown Portland and San Jose.

Operating Streetcar Systems
Dallas, Galveston, Memphis, New Orleans, Portland**, San Jose**, Seattle
**Streetcars operate on light rail system tracks in the downtown area
Under Construction or Funded Planned Streetcar Systems
Little Rock, Portland, Tampa

In addition to these regular public transportation services, there are a number of other streetcar operations around the country. A short streetcar line is operated by the National Park Service in Lowell, Massachusetts. Volunteer groups have restored streetcars and run them on an infrequent schedule at several museums or in occasional downtown service in several cities.

Operating in city streets, usually on lines of 2 to 4 miles in extent, historic streetcars serve local travel and provide a downtown circulator/distributor function. They are used for short trips, and frequently oriented to tourist and entertainment travel. The original, historic St. Charles line in New Orleans does not have stations, but rather stops every few blocks at street intersections. This pattern is followed in the replica lines in Galveston and Dallas. The other new lines (Memphis, San Francisco and Seattle) have stations spaced 1/4 to ½ mile apart.

The historic replica systems have been constructed in part of serve as economic development catalysts to attract tourism and to enable tourists and local citizens to get to various destinations in entertainment and recreational districts. Hotels, convention centers, aquariums, sports facilities, open air markets, downtown shopping, street side retail, restaurants, movie theaters and other entertainment venues are typical of the activities found along these streetcar lines. The planned streetcar projects in Little Rock and Tampa are designed, like the existing new systems, to connect hotels, convention facilities, sports facilities and entertainment districts Portland, on the other hand, is building its 2.5 mile city streetcar as a downtown circulator linking several neighborhoods with high density residential, employment and activity characteristics. The City Center streetcar project in Portland is another tool in downtown revitalization efforts.

Heavy Rail

The distinguishing characteristic of heavy rail transit is that it operates on exclusive right-of-way that can be either surface, subway, or elevated, but always grade separated from other traffic.
This allows trains to move at a higher speed than streetcars or light rail vehicles where they are mixed in with motor vehicles operating in a stop-and-go environment on city streets. Because heavy rail is on its own exclusive operating environment, trains can travel at higher speeds (up to 70 mph) than LRVs (up to 50 mph on separate right of way, no more than 30 mph on city streets), or streetcars (rarely above 25 mph). Average speeds are much higher also because stations are spaced further apart, except in downtown locations. Stations are spaced from one to two miles apart on most new heavy rail lines. The combination of higher speeds and greater station spacing, plus operating of longer trains, translates into considerably greater throughput capacity for heavy rail.

Like streetcars heavy rail technology dates from the late 19th century. The elevated railways constructed above city streets in Boston, New York, Philadelphia and Chicago were initially trains hauled by small steam locomotives. The new technology of electric propulsion replaced steam by the 1890s, and allowed for trains to be placed in underground tunnels, or subways. Much of the growth of these four metropolitan areas is closely intertwined with the growth of heavy rail transit systems operating under streets and buildings in the center of the cities, and in a grade-separated surface environment in the suburbs.

The expansion of heavy rail technology beyond these four metropolitan areas did not take place until after World War II. Cleveland replicated subway train technology in the construction of its Red Line in 1956. A decade later the San Francisco Bay Area began construction of a 70-mile regional system that would combine subway, elevated and surface running linking San Francisco with several East Bay cities and suburbs. This system would incorporate the basic elements of heavy rail, electric multiple unit trains operating on an exclusive right-of-way serving stations with high level platforms. In building this new system BART brought new innovation and technology to heavy rail. Lighter weight cars, air-conditioned and carpeted with wide windows and upholstered seats, a computer-based train control system, electronic fare turnstiles, new signaling systems, and a service emphasis on automobile and feeder bus access were the legacy that BART left for subsequent systems that followed in other metropolitan areas.

The new heavy rail systems were characterized by station spacing of one to two miles, and higher speed, and extended 10 to 15 miles or more from the core city center. In doing so stations were placed in a variety of urban environments.

Cities with Operating Heavy Rail Systems
Atlanta, Baltimore, Boston*, Chicago*, Cleveland, Miami, New York*, Los Angeles, Philadelphia*, San Francisco, Washington, DC
*Original segments constructed before 1910
Under Construction Heavy Rail System
San Juan, PR

The seven new heavy rail systems all serve the central business district in their metropolitan area, and they all extend into the suburbs. Stations are closely spaced, 1/4 to ½ mile in the city center and from 1 to 2 miles or more apart outside of the urban core. Except for Cleveland and Miami, the new heavy rail systems operate in tunnels underneath the city center. The entire Miami alignment is on elevated structure and Cleveland is at grade or in a very short tunnel shared with other rail lines downtown. Beyond the city center subway environment, the new heavy rail lines are predominantly at the surface or on short elevated or tunnel segments. Subway tunnels are common features of the Atlanta and Washington, DC systems outside of the downtown area because going underground was the least disruptive alternative in densely built-up areas, and because neighborhoods and suburban jurisdictions required this option.

Downtown Stations

Heavy rail station area development in metropolitan urban cores represents some very unique challenges. Two strategies have generally evolved. One is the preservation and/or adaptation of the area around new stations. The other strategy uses the rail station construction, or its subsequent impact, to redevelop the station area. Both strategies have been the most successful where there has been a partnering of transit authority and downtown development agency efforts. The latter has been able to help bring private investors to the table.

Downtown station area development on heavy rail lines involves the same mix of activities as for light rail, commuter rail, or automated guideway transit. Where differences exist, they are primarily the result of the higher densities, and hence more intense scale of activity, within the particular city. The BART/Muni Metro corridor in San Francisco has the highest building densities of all of the new heavy rail systems. Just across the Bay in Oakland, where BART also has subway stations, the densities are much lower. Construction of the MARTA rail system in Atlanta has been perceived as an opportunity to assist downtown redevelopment and revitalization, a strategy that has also been pursued in Baltimore, Oakland, Los Angeles, and Washington, DC.

Office buildings, hotels, retail establishments, and some entertainment venues are the predominant downtown activities for consideration at heavy rail station sites. Housing is not a likely activity. Both government buildings and private offices are key components. Retail establishments are preferred ground-floor uses. The high volume of foot traffic at rail stations will attract and support certain types of retail. The central location of the downtown makes it the repository of many

government functions. It is usually the seat of local government and maybe the home of regional offices of state and federal agencies. This adds to the complexity of players in station area planning and development.

Several BART/Muni Metro stations in downtown San Francisco reflect preservation of existing buildings and/or their adaptations to new uses. Across the Bay in Oakland, new buildings house old functions and attract new activity and business as well. Construction of new federal offices, and other public buildings has taken place at several stations in downtown Washington, D.C. Atlanta has almost totally rebuilt the area around five of its seven downtown MARTA stations. Baltimore has combined preservation and new construction, and particularly the siting of public buildings in a way that enhances opportunities created by the presence of heavy rail. Los Angeles also offers good examples of stations integrated into both existing and new high rise office buildings.

Access/egress at downtown heavy rail stations is almost exclusively by foot, or by other transit modes. Some downtown stations may have direct intermodal links to intercity and commuter rail services, but bus transit connections are made at city street stops. The circulation design focus is for pedestrians.

Existing Urban Neighborhood Stations

Heavy rail systems serve a rich variety of urban neighborhoods. Station area development must recognize neighborhood character, needs and vision and adapt to them. Some neighborhoods may be predominantly residential with a shopping node. Others may include a cluster of office, retail, and residential activity, but at lower density and smaller scale than in the downtown area. Rail will bring some change. The critical issue is managing that change in a way that is most beneficial to the surrounding neighborhood. Examples of this can be found in each of the new heavy rail systems. Like downtown sites, neighborhood stations will depend heavily upon pedestrian and other transit modes to connect them with their service area. However, driving may be the mode of access for some users, and there may be a need for limited parking.

Once again, preservation/adaptation versus development/revitalization concerns are important. Finding the best answers and approaches can only result from cooperative and collaborative efforts between the transit agency and the local neighborhood. Most retail activity will be oriented to neighborhood residents. Business offices may locate nearby to take advantage of lower costs, good

transportation, and an accessible work force. Residential densities may vary greatly, but apartments, condominiums, and town houses are most likely to be close to the station.

New Urban Cluster Stations

All of the new heavy rail systems have penetrated into sparsely settled portions of the metropolitan area. Stations at these locations have provided focal points for new urban development. In many cases a village or other agglomeration has been chosen as the station site. Since the station draws travelers from a large area, automobile access is important, requiring considerable parking space. This can be accommodated initially in surface lots, and as demand increases and competition arises for space near the station it may be more reasonable to think of multi-level structures. Pedestrian access is required, but it may be of less importance early on because few people live or work near the station. As development grows and new housing and other activity fills up the area close to the station, sidewalks become more important. This assumes a slow, evolutionary growth process.

Some station sites have become the focal point of extensive, and intensive, planned development. Here a new community, or large scale activity is created. Lennox and Dunwoody stations on MARTA; Reiserstown Plaza on Baltimore MTA; Dadeland South in Miami; and Ballston, Pentagon City and Crystal City on the Washington Metro are all examples of this type of development. Development can include major shopping malls which serve not only the adjacent suburban community, but draw on a larger market through the rail transit network. Some, but not all of these, include high density housing and major office complexes.

Suburban Park-N-Ride Stations

These stations, at least initially, provide largely a transfer function. They are the access/egress points for the rail transit system where it serves a much larger hinterland. Most people drive their cars to reach these stations. They are intercept points where travelers from the far edges of the metropolitan area transfer to rail transit. Some will ride feeder buses, a few will come by bicycle, but the vast majority arrive by automobile as drivers, passengers, or participants in a shared-ride arrangement. Parking is the predominant land use. Business activity is limited to vendors selling beverages, food, and newspapers during peak travel hours. Examples can be found on the outer segments of rail routes in Baltimore, Miami, Washington, Atlanta, and San Francisco.

However, this type of station must be considered as transitory. As the nearby community grows, although it may be only sprawling single-family development, there will be a need for new commercial activity and new demand for space. The central location of the rail station with its morning and evening ebb and flow of commuters, becomes an attractive site for businesses wishing to locate close to customers. This type of station is a holding pattern for future development. Evidence of this evolutionary development can be seen on WMATA in suburban Virginia and Maryland, and on BART at several East Bay locations.

Commuter Rail

Commuter rail differs from other modes in that trains run on regular railroad tracks, often with intercity freight and passenger trains. Rolling stock, motive power, track, and signal systems are built to standards of intercity rail service. Engineering, signal systems and safety are all monitored by the Federal Railroad Administration. Mainline railroad standards provide for higher rolling stock profiles than light or heavy rail, thereby allowing for double deck cars with greater carrying capacity. Trains are composed either of cars hauled by locomotives, or of self-propelled cars operated singly or coupled into trains. Either electric or diesel power is utilized for traction. Most newer systems use diesel locomotives or rail cars, thereby avoiding the capital and maintenance costs associated with overhead catenary or trackside third rail power supplies. Locomotive hauled trains, both diesel and electric, usually operate with the locomotives assigned regularly to the same end of the consist, pushing the train in one direction, pulling it in the other. Such "push-pull" operations are standard on all of the newer systems and older systems in Boston, Chicago and San Francisco.

Commuter rail services are the heritage of intercity freight and passenger railroads which began operating trains on portions of their lines close to major cities in a collaborative effort with real estate entrepreneurs who developed the first distinct suburban communities in the late 1800s. The trains allowed city workers to live in more pleasant and desirable surroundings away from the noise, congestion, and pollution of cities. By the early 1900s, railroads serving Boston, New York, Philadelphia, Chicago, and San Francisco had developed elaborate commuter train networks on their existing lines, and even extended routes into new suburban markets around these major metropolitan centers. The New York Central, New Haven, Boston and Maine, Pennsylvania, Reading, Long Island, Lackawanna, Central Railroad of New Jersey, Burlington, Chicago and Northwestern, Milwaukee, Rock Island, Illinois Central, and Southern Pacific were all major commuter train operators. Today service is provided on most of these historic commuter lines by public agencies:

MBTA in Boston; MTA Metro North and MTA Long Island in New York, NJ Transit in New Jersey, SEPTA in Philadelphia, Maryland Mass Transit Administration (MARC) in Washington and Baltimore, Metra in Chicago, and Caltrain in San Francisco. Public ownership and/or operation of commuter rail lines spawned new services, and ultimately service upgrading. Automobile competition curtailed the limited commuter rail services operated by private railroads in Cleveland, Los Angeles, Pittsburgh, and St. Louis.

Faced with growing roadway congestion in the 1980s, several Sunbelt metropolitan areas began to explore commuter rail alternatives. Commuter rail offers lower implementation costs that new light or heavy rail systems because it uses existing rail lines that currently have freight and/or intercity passenger trains. The first new commuter rail line was opened in south Florida in 1989 linking West Palm Beach, Ft. Lauderdale, and Miami. Los Angeles, San Diego, northern Virginia, Connecticut, Dallas, and the northern San Joaquin Valley of California have all inaugurated commuter train service in the past decade. Seattle will commence commuter rail operations in 2000. Most of the older commuter rail systems have extended routes deeper into suburban territory. Since 1989 over 100 new commuter rail stations have opened.

Operating Commuter Rail Systems
Boston*, Chicago*, Dallas, Miami, New Haven, New York*, Philadelphia*, San Diego, San Francisco*, San Jose, Washington, DC
* System in operation prior to 1940
Under Construction Commuter Rail Systems
Seattle

From a station area development perspective commuter rail stations fall into four general types:

Downtown City Stations

With the exception of Tri Rail in South Florida, all commuter rail lines and systems have the downtown of the major urban core city as their principal terminal. The downtown city terminal is the destination for most in-bound weekly commuters, and it is the departure point for their homeward journey in the evening. In older systems, and some newer ones, this is a large facility that historically has been used by intercity trains. Sharing by Amtrak intercity and local transit agency commuter

trains is characteristic of stations in Boston, New York, Philadelphia, Baltimore, Washington, Chicago, Dallas, Los Angeles, and San Diego. Some downtown stations formerly were used by intercity passenger trains, but today contain only commuter trains. North Station, Boston; Grand Central Station, New York; Northwestern Station, Chicago, and Caltrain Station in San Francisco, constructed to serve both have seen their intercity trains disappear. Tri Rail riders are required to transfer to Metrorail rapid transit trains at a suburban station in order to reach downtown Miami.

Station area development at downtown city stations is characterized by the urban activities surrounding the station. Large office buildings with street floor retail, government buildings, public spaces, and a scattering of restaurants and entertainment facilities comprise the major nearby land uses. Direct links between commuter rail and other rail transit exist at several larger downtown stations. The high volume of travel resulting from the convergence of various transit services makes these facilities attractive for development. Ground space is limited but building upward is an option that has been exercised in several locations. Office air rights developments have taken place at Pennsylvania Station in New York and at Northwestern Station and Union Station in Chicago. The former Boston Garden built over the tracks at North Station in Boston has been replaced with the newer Fleet Arena. Washington Union Station, served by MARC and VRE (Virginia Railway Express) commuter trains, Amtrak and Washington Metro heavy rail transit and buses, has become a focal point of new development and urban revitalization. Property adjacent to stations in Los Angeles and San Diego have been the site of new office development. Pedestrian access to nearby locations is critical.

In-City Neighborhood Stations

Several larger cities, primarily those with established systems, have commuter rail stations that are pick up and drop off points for those working or living nearby. These stations serve older neighborhoods where redevelopment and even gentrification may be taking place. A few occur in industrial districts that are undergoing change. Change provides opportunities for growth and new activities. In some neighborhoods that are primarily older residential apartments, stability and continuity are concerns. Examples of these types of stations can be found in Boston, New York, Philadelphia, Chicago and San Francisco. Although of much smaller scale than their downtown counterparts, these stations also depend almost exclusively on walking for access, although some exchange also occurs with local bus services.

Suburban Community Nodes

Historically commuter rail stations provided the nucleus of numerous suburban settlements. The railroad lines radiating from older cities like Boston, New York, Philadelphia and Chicago were where developers platted new towns. Melrose, Scarsdale, White Plains, Summit, Chestnut Hill, Hinsdale, and Forest Park are all suburban towns initially clustered around the railroad station. In California, a host of suburban communities sprang up along the rail line linking San Jose and San Francisco, including San Carlos, Burlingame, Redwood City, Palo Alto, and Santa Clara. Newer commuter rail lines are having a similar function, often helping to give better definition to scattered or sprawling suburban growth and strengthening older communities that are now more effectively linked to larger metropolitan centers. Examples include new rail lines northwest of Chicago and in suburban Washington, D.C. as well as in the Los Angeles basin and the San Diego County coast. Two groups of travelers have different access requirements at these stations. Nearby dwellers and workers will walk. Those living or employed further away will drive, carpool or ride local transit. Parking and drop off lanes are requirements at these stations. If the commuter residential shed is large, then demand for parking space may be high and force a dynamic competition with other uses for land around the station. Many of the stations on Florida's Tri Rail system fall into this category.

Suburban Park and Ride Stations

Some commuter rail stations are essentially collection and transfer points where the vast majority of rail riders accessing the system at these points do so by automobile or transit. In contrast to downtown and city neighborhood stations where walking is the access mode for most rail patrons, few passengers live close enough to the station to reach it on foot. Bicycles may be an important access tool for some riders. Interaction between the station and its immediate environs is limited. This type of station is largely found at suburban sites on the newer commuter rail systems, although some exist on older systems as well. They are usually located where a major arterial, or limited access highway, intersects the rail line. These sites provide a collector/distributor function in relation to the road network and riders may drive several miles to use them. Large surface parking lots, kiss-n-ride drop off lanes, bus bays and shelters, and bicycle racks and lockers are predominant features.

Most of these sites are surrounded by single-family residential development. A few may be bordered by industrial property. Some may be in the middle of vacant land. Vacant land may prove to be

attractive to new development that can alter the character of the station site. If land use intensifies around the station, pressures may nibble away at the use of large surface areas for parking. Stations on Tri Rail, Metrolink, Coaster, VRE and MARC exemplify this situation.

Automated Guideway

Applications of "driverless" automated vehicles on a dedicated, grade-separated right-of-way were widely heralded as solutions to downtown congestion problems in the 1970s. Although this technology has been widely adapted in Europe and the Far East, automated guideway transit been adopted by only a handful of U.S. cities. The initial, trial application of this technology was linking three campus nodes of the University of West Virginia in Morgantown in 1972. Detroit, Miami, Tampa and Jacksonville have constructed automated guideway systems that serve primarily as downtown circulators within their respective central business districts. These systems all operate on elevated structures built above city streets and in-between, or even through, buildings.

Cities with Operating Automated Guideway Systems
Detroit, Jacksonville, Miami, Morgantown, Tampa

City Center Stations

Elevated above street level, automated system stations are usually at the second floor level of adjacent buildings. Direct access is sometimes provided into adjacent buildings, but most stations are reached by stairs or escalators and elevators. Pedestrian access is of primary importance, although transfer to and from other transit modes is also critical as riders from outside the downtown core will use the automated system to reach employment sites or other destinations. Miami's Metromover, the largest of the U.S. automated guideway systems, connects with urban rail and or bus routes at three key intermodal stations.

The land use and development opportunities at stations on automated guideway systems are those associated with the particular downtown. Where downtown sites are fully built out there is limited new opportunity. However, Detroit, Miami, and Jacksonville have incorporated automated guideway into downtown revitalization efforts. As older buildings are torn down and new ones built, there are opportunities to more effectively tie in stations through better access to meet customer needs. Miami

and Jacksonville have also constructed portions of their automated guideway systems into areas where vacant land has been created through urban revitalization efforts. New land uses, often supported by public investment decisions, can contribute to even greater use for these urban circulator systems. The use of the systems in turn reduces need for expensive downtown parking. Public investments are providing for a new sports arena and performing arts center at two stations on the Omni extension of Miami's Metromover.

Chapter 5: Who is Responsible for Station Area Development?

A major factor in whether or not station area development will take place is the question of who is responsible for making it happen. Three possibilities exist. Either the public sector takes the initiative and carries out development, or the private sector pursues development on its own, or the two work together in combination to make development happen. It is important to recognize that each possibility has different goals and objectives. If the public sector assumes responsibility for development it will have as an overriding goal the general community good. But there may be variations on that theme depending on the particular public agency, or agencies, responsible for the development. Private sector development has a responsibility for maximizing profit for investors and stockholders, and may pursue multiple goals for different parcels around a station. A sharing of goals and objectives by both public and private sector parties in a joint development of the station area is the possibility that is often pursued in the United States. Joint development involves compromise, but can lead to successful attainment of mutually beneficial goals for both business and government agencies.

The Public Sector

The transit agency is the most obvious responsible public sector agency in station area development. Track, electric power supply, station buildings, platforms and related infrastructure (sidewalks, driveways, parking lots, bicycle racks, stairs, escalators, elevators) are all part of the investment by the transit agency. In the planning and design of the system, land is acquired at each station site to accommodate these elements. Most systems assume that ridership will grow and they plan for that growth by acquiring enough land around the station to meet future needs for parking and access by roadway and pedestrian traffic.

In acquiring land, negotiated purchase is the preferred option. However, condemnation through eminent domain may be required if land owners are unwilling to sell, or if a price cannot be agreed upon by buyer and seller. State and local laws and ordinances may require purchase of an entire parcel even if only a portion of the property is needed for the station area infrastructure. Special requirements may also force acquisition of additional land to provide access to the station from adjacent neighborhoods and major streets.

However, legal constrains also usually limit the amount of land that the agency can acquire to that

needed for the transportation purposes of the transit agency. Most transit agencies are prohibited by law from acquiring land for other purposes, or they are restrained from using public funds for that purpose. Federal funds available to assist in transit capital projects until recently have been limited to transportation only purposes. Most states providing financial assistance to local transit agencies do so with similar constraints. Only with the emergence in the last decade of new concepts about rail transit being a tool for economic growth and community redevelopment have these constraints been modified and relaxed.

Although transit agencies have been constrained in their ability to guide development around their stations by making investments in residential and commercial development, they have been able to work cooperatively with other public agencies to do just that. Local economic development and redevelopment agencies, housing authorities, and special development districts are all options where public sector investment has facilitated development around rail transit stations. These public agencies have powers to raise money, invest it directly or loan it to private sector developers and businesses to carry out projects. They often use a combination of planning and infrastructure investment to guide growth and development by combining property to attract large scale projects, build streets, parking, sidewalks and provide for public spaces that make the area attractive. In addition, they may lease or sell land.

While transit agencies are constrained in the acquisition of land for development purposes, they have been able to successfully take advantage of the land they do own at station sites by building upward. The sale of "air rights" over tracks and station sites has been successfully used by several agencies to facilitate development and generate revenue. In most instances this development has been carried out by private sector investment. An exception is the San Diego Metropolitan Transit Development Board (MTDB) which constructed an office building for its agency over light rail tracks at 12th and Imperial Streets in San Diego. Although the MTDB uses several floors of the 12 story building, office space is leased to other government agencies and private firms, and at the ground floor space is leased for commercial retail, providing a revenue stream. WMATA, MARTA, BART, and LACMTA are among the transit agencies that have made air rights over their stations available for private development.

In other parts of the world, particularly in Asia, transit agencies have assumed a much more important role in station area development. They acquire large tracts of land, plan for the use, finance infrastructure and building construction, make parcels available for private development, act as

developers, builders and landlords for development, build parks and public spaces, and become major players in the urban development process. This approach has been successfully used in Japan, Hong Kong, Singapore and Malaysia.

The Private Sector

An often overlooked fact about transit station area development is the historic role of the private sector. Until the 1930s, first in New York and then elsewhere, most urban rail transit was built and operated by private companies. Streetcar lines, electric utilities, and neighborhood residential development was often carried out by the same, or closely affiliated or commonly-owned companies. Subway lines in New York were the product of private developers who are responsible for much of the beyond-Manhattan growth of the metropolitan area. Queens, Brooklyn, and the Bronx were developed in large part around subway stations (many of which in the outer suburbs were above ground), and local streetcar lines. Private investors, sometimes subsidiary companies of railroads, built many of the suburban communities in New York, Boston, Chicago, and Philadelphia, and even helped finance stations on commuter railroads. Scarsdale, White Plains, Summit, Forest Park, Joliet, Westchester, Downington and scores of other communities grew up around the train station. Banks, city halls, libraries and schools, and stores of all kinds clustered nearby.

Market forces recognized the importance of commuter rail, subway and major streetcar stops where lines coalesced. The large numbers of people pouring on or off of trains and streetcars were an agglomeration of customers to be tapped. In a similar vein, land close to transit stations and stops had value for residential purposes. Apartments, row housing, and other arrangements that allowed more people to live closer to transit were good investments and helped buoy the price of property around stations. If not suburban towns, certainly urban neighborhood business, clustered around the rail transit access points.

In the flurry of new rail transit system construction over the past two decades private investment has once again taken a major role in station area development. But another factor has entered upon the scene that was not present during the late 19th and early 20th century eras of transit development--the presence of urban planning and its resultant delineation of land use controls and zoning. Where early investors responded to market forces unfettered, their late 20th century counterparts found themselves facing constraints in the form of municipal plans that specified what uses were allowed in each sector of the community. One of the major tenets of this new planning and zoning was a strict separation

of land uses. The agencies building new rail transit lines found themselves siting stations in places where the use of the land was already determined--specified in a land use plan map which was backed up by zoning ordinances and regulations requiring compliance. Often stations were located in land zoned residential, usually for single-family homes. Bringing the type of station area development that had taken place under laissez-faire conditions to planned urban areas required rethinking of concepts, and sometimes brought major resistance, particularly in established residential areas or planned low density ones.

On the other hand, where land was available for development, or redevelopment, in downtown or derelict areas, private investors became much more interested in the opportunities that transit access had to offer. Major office buildings, apartment complexes, and even commercial retail development, often in combination with the other two, were large scale investments by private sector that breathed new life and vitality into declining urban centers, or in some cases where large tracts of land were available at suburban locations. To allow these kinds of development to take place required a rethinking of existing land use and zoning strategies. Sometimes this was aided by community redevelopment efforts (San Francisco, Atlanta, Washington, D.C., Baltimore, Los Angeles, Buffalo, Portland, Sacramento, San Jose, San Diego, Pittsburgh). On the new heavy rail systems where redevelopment was actively going on, the private sector became a major player in building up densities and agglomerating activities. Transit provided the ability to move large numbers of people that allowed great concentrations to be built around transit stations. Transit in turn benefitted from the increased ridership generated by the new scale of activity at and near the stations.

The major role of the private sector has been to make the type of investment in the construction of housing, office buildings, and retail space that concentrates activity to take full advantage of the presence of rail transit. The private sector has acted as developer in the broadest sense. This includes taking an idea from concept to plan, to securing financing, carrying out construction, and securing tenants or buyers. Private developers, of their own initiative, have been responsible for carrying out major projects at downtown stations of almost every new heavy rail system and at key suburban points. They have also become active at stations on light rail lines, both in central cities and at suburban neighborhood points. In all cases they recognize market opportunities. To turn those opportunities into reality has usually required changes in local government plans and zoning. Initially these changes were handled on a station-by-station basis. Many cities, however, have taken a broader brush approach to this issue by creating a special zoning category for transit station areas.

Private investment has been slower to become involved in smaller scale projects, although the pace is beginning to pick up in cities which have instituted light rail. First Avenue in San Jose and East Burnside in Portland are linear street developments where low density apartments have replaced single-family housing, initiatives begun by the private sector in both cases.

In Europe and Asia the private sector has assumed a financing role in actual station area construction. In some cases this has included both air rights and adjacent surface developers who agreed to build, or at least pay for, a rail transit station, in order to have this important transportation asset which they consider so essential to the success of their development. This concept is being applied for the first time in the U.S. where a private developer has agreed to fund a $23 million station of Washington Metro's Yellow Line at Potomac Yard. This former railroad yard, encompassing several hundred acres, is being redeveloped as a mixed community with a variety of residential densities, office complexes and a shopping and community center adjacent to the new transit station. In San Diego, the American Pacific Building is a 26 story office, hotel and retail complex built across from the Santa Fe depot (used by Amtrak, Coaster Commuter Rail, and San Diego Trolley light rail) which provides space for a light rail station at the ground floor level, although the line and station were constructed by MTDB. It remains to be seen if private investors will play a more direct role in station funding elsewhere.

Joint Participation

A combination of public and private initiative and funding is the route taken for most station area development in the U.S. over the past two decades. This recognizes the mutual benefits that accrue both to the transit agency and to private developers who's tenants, employees and customers will ride the system. Beyond the transit agency, other public entities may be involved. These agencies can encompass a wide range of responsibilities including providing other transportation infrastructure, utility services, station area planning, financing of certain types of development through low interest loans and grants, tax incentives, public parks, and even other public buildings that may become part of a more broad based development around the rail transit node. The private sector can also bring financing to station area projects, but is able to construct and develop a wide range of elements including housing, office buildings, and property for commercial retail use. Joint participation projects have the advantage of bringing together in a collaborative manner diverse, yet complementary interests. Some projects may involve a handful of key players, others may depend on the successful blending of the interests of dozens of agencies, businesses and interest groups.

In joint participation the public sector, sometimes represented by the transit agency or sometimes by other public agencies, often provides the lead role. The size and scale of station area development however will be strongly influenced by market forces. Local government planning and neighborhood development goals help outline the parameters for the particular station area site.
To an increasing degree station area development is becoming important to transit agencies. Evidence of this can be seen in the growing number of projects taking place across the country, and in the establishment of real estate development units within the administration of the agencies.
The Washington Metropolitan Area Transit Authority (WMATA) reported that in 1997 nearly $15 million in station real estate revenue would flow to the agency. Transit agency staff work closely with other local government agencies to coordinate planning efforts, to ensure that infrastructure is in place to support transit and development goals, and to help identify financing packages that will attract private investment to particular sites.

Often transit, planning, and local economic development agencies will work together to produce a concept plan for a station area. The concept plan becomes refined into a marketing prospectus to attract potential private investors to propose projects in the station area. Rather specific uses may be proscribed for publically held property including the station site. Greater flexibility is allowed for private property, but within general guidelines, in the larger station area. Government agencies work with private developers to modify planning documents and adjust or change zoning regulations to fit the proposed new uses. Federal, state, and local requirements provide for considerable public input to these processes.

Joint participation can range from joint use of a station side alone, or extend beyond it in the planning and development of large areas that may be as much as a half mile from the rail station site. Examples of joint participation encompass a large range of sizes from monolithic projects that have included station sites where thousands of transit users pass every day, and many surrounding blocks where a totally new set of patterns has developed, to small scale projects that include a station with only a few hundred riders and affect only the immediate adjacent blocks.

Ballston, Virginia on the Washington Metro and Lennox Plaza on Atlanta's MARTA are examples of the former. South Florida has an interesting example of a large scale project where Dadeland Mall has developed to the northwest of the two southernmost stations on MDTA's Metrorail system. The mall is about 1/4 mile from both Dadeland South and Dadeland North stations. Dadeland South

station incorporates office and hotel space with a limited amount of ground floor retail. Dadeland North has only parking immediately adjacent, but a new four-story retail structure opened a block to the northwest to take advantage of both transit and automobile access. Insertion of new rail transit into older, established commercial downtowns can be seen in San Francisco where the joint BART/Muni Metro station was constructed in a two-level tunnel under Market Street and adjacent to two former department stores. One of the department stores has been remodeled into a multi-level urban mall with two major anchor stores and over fifty shops. Nearly 85 percent of the mall users arrive by transit. The southernmost 1.5 miles of Buffalo's light rail line is on Main Street which has been made over into a transit and pedestrian mall with new retail businesses, offices and hotels occupying new or renovated buildings.

There are many smaller scale examples of joint participation projects on new rail transit lines around the country. Hazard Center on the recently opened Mission Valley West extension of the San Diego light rail system combines a condominium town house development on the east side of the station and a commercial retail, theater and office complex across a street to the west. Concord and Walnut Creek stations on BART in San Francisco's east bay represent a variety of medium scale, mixed use development.

The first full-scale system element planned to incorporate joint participation in station area development is the Westside line of Portland's MAX light rail line which opened in September 1998. Each of the 18 stations along the line has its own area development plan. Some of the stations sites are in built up sections of downtown Portland or built up areas of the town of Hillsboro. Others are located in nearly vacant land areas where the station is to become a focal point of new community development. Major employers and real estate developers have worked closely with Tri Met and the Metro government in the design and implementation of these plans.

Chapter 6: How do Statutes, Ordinances, Regulations and Plans Affect Station Area Development?

Statutes, ordinances, regulations, and plans affect station area development by allowing certain things to happen and allow each of the various players to do certain things. But they are also limiting and restrictive and limit what can be done and circumscribe the role of the players. It is the latter situation, the restrictions and limitations, that raise questions about the efficacy of station area development in Florida. Transit can clearly benefit from this type of development if it is applied in a manner that is consistent with community and neighborhood goals. And communities can benefit in many ways from transit once the appropriate development is in place. Getting the appropriate development is essential to make transit really work in a region where most of the urban growth has taken place since World War II and is manifest as low density sprawl.

Florida has struggled with the issue of unfettered urban sprawl and concern with preservation of the states unique environments by enacting growth management legislation. The state has been pointed out as a leader in this arena. A major element in this growth management strategy has been the codification of the concept of Concurrency. Basically this requires that growth and development will only be permitted where there is a concurrent effort to build transportation capacity to handle the growth. This is a logical and sensible premise.

Building a new suburban mall requires that the road capacity be in place to handle the anticipated automobile traffic. Streets are widened and parking capacity must be provided to meet peak needs. The developer pays an impact fee to help share the burden of increasing transportation capacity with the public. Building a residential subdivision also requires adequate street capacity leading to and from the development, and space for circulation and parking inside, and again the developer must share in the cost. Construction of a new office building downtown also requires roadway and parking capacity. Parking capacity will largely be paid for by the developer. Roadway capacity may be difficult if not impossible to increase. Adding additional lanes requires widening streets, an expensive undertaking in built-up downtown areas. Construction of high density housing, either as replacement for lower density or in-fill on vacant urban land, also has parking and street capacity concerns. Rather than contain sprawl, the need for capacity for transportation, a seemingly logical condition of Concurrency, has forced much development to go to the only place that transportation capacity can be easily increased, the edge of urban communities. Transportation has been defined

almost solely in automobile terms. Transit has been largely ignored as an alternative, and this makes the provision of public transportation and the implementation of transit-oriented development more difficult. Ironically the state which has touted growth management as a means of combating the evils of sprawl has also created an environment where transit's ability to compete with the automobile is seriously hampered.

Against this back drop of state growth management legislation, it is important to take a closer look at how statutes, ordinances, regulations and plans can help or hinder transit oriented development. What follows in this chapter is a rather cursory conceptual look. A future Technical Memorandum will address the issues in greater detail as they relate to Florida and the major metropolitan areas with rail transit or those that are considering its future implementation.

Permissive Conditions--for the Area, for the Players

There are lots of things that are allowed in urban communities from the perspective of land uses and activities. The players--government agencies and private individuals and corporations--also have considerable latitude in the role they play in the planning and development process. Planning has come to be recognized as an integral part of the process of governing at the community level. Local governments are recognized as being able to enact ordinances and regulations which proscribe the use of land in accordance with a conceived vision that has been translated into concrete plans that delineate in general terms what goes where. Activities are grouped into theoretically compatible uses, discrete but compatible. All single-family residences go in one area; multi-family housing in another; industry in its separate place; small-scale commercial business in neighborhood clusters or on streets where there is traffic to attract customers; etc. Where combination of activities in a single block or neighborhood was the characteristic of 19th century cities, separation of activities has been the hallmark of our cities in the 20th century. Separation has created more travel to get from home to job, to shopping, or to school. Walking is out, distances are too far. Transit is less effective in serving the scattered trip destinations of the modern household.

But it is possible to change this trend, and for nearly three decades a growing number of urban communities are allowing for a return to mixed uses on the same piece or land of in the same area. Zoning for these mixed uses, and for higher densities, around rail transit stations has evolved in cities in several states. The concept of unique transit station zones has created separate land use categories in several cities. In Florida, Miami and Dade County have created a transit station area zone

classification that gives new flexibility. Orlando and Tampa are moving in that direction. In doing so, these communities are taking the first steps toward allowing for station area development, steps that have been successfully implemented in cities in California, Oregon, Washington, Texas, Maryland, New Jersey, Georgia, Colorado, and New York. Both a wider mix of activities and increased densities are allowed under these special station area zones.

Some cities have also effectively allowed tradeoffs in transportation capacity; that is reducing building parking requirements for office, retail, and residential buildings over certain densities in order to encourage transit use. For example rather than require a parking space for every 1.2 employees, some have decreased the parking requirements to one space for every three or four employees. Some cities, such as Portland, Oregon, have placed a cap on the number of downtown parking spaces. Combined with recent changes in federal tax laws that allow employers to take deductions for employee transit benefits equal to that for parking benefits, these actions have helped transit compete with the automobile for work trips.

Allowing communities to take a larger role in their own development or redevelopment through a variety of mechanisms ranging from federal and state financial assistance to being able to create special taxing and/or empowerment zones is another "permissive" action that can facilitate transit station area development on the player side. The use of public funds for major community facilities like stadiums, hospitals, museums, performing arts centers, schools, libraries, colleges and universities, and even public housing puts public agencies in the role of major players in being able to affect the success of station area development. These agencies make decisions about the "where" of these facilities. Locating them on rail transit lines can enhance the success of station area development policies. The converse side of this aspect of the relationship between facilities and transit is to plan the route of new rail transit systems to serve existing facilities, or ones that are being planned.

Examples of the synergy between rail transit and public facility locations can be seen in a number of systems. The coming together of major sports facilities and rail in Atlanta, Baltimore, Boston, Miami, Portland, San Diego, San Jose, and St. Louis has allowed transit to be an important player in moving large crowds of fans and allowed for a significant reduction in parking at the facilities. The location of convention centers in Baltimore, Dallas, New Orleans, Portland, Sacramento, and San Diego has produced similar benefits.

Allowing for the use of state and local financing for transit gives communities greater flexibility in providing for transportation options and opens the door for transit to become a participating partner with other government agencies and the private sector in enhancing communities. In Florida, the designation of a minimum of 14.3 percent of state transportation trust fund revenues for public transportation purposes creates a pool of dollars that can be tapped into by local transit agencies to fund new projects. Furthermore state legislation in Florida allows for the use of local gas tax revenues, sales taxes and property taxes for transportation purposes, including transit. The permissive nature of state legislation to allow local governments to use tax revenues to support transit is an important factor in funding the rail transit component of station area development. In Florida, and in most other states, there are restrictions on how the money can be spent. Generally it must be used for transit vehicles and facilities, and not to directly assist development projects.

Permissive conditions can be summarized into the following key points:

- Communities, as represented by local governments, have the ability to plan their own futures to the extent they can decide the location of various activities as these are expressed in land use plans, maps and zoning of discrete areas for certain activities.

- Creating special zoning categories for transit station areas is one of the options available for local governments.

- Communities to an increasing degree can carry out their own transportation planning, and in Florida transportation and land use planning must be synchronized in a compatible manner to support one another.

- Financing options for transit are quite broad. Federal and state funds are available for transit purposes and Florida communities have several mechanisms at their disposal to raise money locally.

- A rich variety of funding exists for carrying out station area development---if it is tied into other broader community goals. Federal agencies offer grant and loan programs to assist local governments and private investors in undertaking many projects for new business development and for urban revitalization.

Restrictive Conditions--for the Area, for the Players

Just as there are permissive conditions in the arena of statutes, ordinances, regulations and plans there are also restrictive ones that can both benefit and limit transit station area development. Some of these restrictive conditions affect the role of the transit agency, others hamper the development of the types of land uses and activities that exemplify the best of station area development.

Earlier in this chapter, there was a brief discussion of the concept and requirements of Concurrency and how its application in Florida has negated the effective use of transit in achieving the very community goals that growth management is intended to support. Creating exceptions to Concurrency requirements that allow for substitution of transit as a travel alternative to the automobile, thereby lowering the need for additional roadway or parking capacity must be dealt with on a community-by-community basis. There is no systematic statewide approach to this strategy that could help enhance in-fill development and restrain suburban sprawl. Local land use plans in many communities do not accommodate mixed use development strategies that are typical of most successful station area developments. Requirements that land use and transportation plans be complementary and mutually supportive are conceptually beneficial, but enforcement of those requirements is sometimes lax. The Department of Community Affairs (DCA) has responsibility for administration of growth management policies, including Concurrency, and review of local government comprehensive plans for their compatibility with transportation plans. However, other than withholding of approval, DCA has only limited enforcement powers. Furthermore, DCA does not have financial resources to provide for grants or loans for projects that may be implemented by either the public or private sector to help communities achieve goals of in-fill development, or other sprawl-containing strategies.

It is difficult to develop a system-wide approach to station area development when the rail system passes through a number of political jurisdictions. Both of Florida's existing major rail transit systems, Tri Rail and MDTA's Metrorail, operate through multiple jurisdictions each with its own land use and zoning plan and regulations. Tri Rail operates in three counties and over a dozen municipalities. Metrorail operates in un-incorporated portions of Miami/Dade County, and the cities of Miami, South Miami, Hialeah and Coral Gables. The presence of a common urban government, (Metro), with responsibilities for land use and transportation planning has made the development of a regional and system-wide approach possible for the Tri Met light rail system in Portland.

Control of planning and investment in transportation infrastructure has until recently been largely in the hands of the Florida Department of Transportation. Both federal legislation (ISTEA and TEA-21) and policy and state transportation policy have shifted to multimodal approaches over the past decade. A major shift has also occurred in the transportation planning process which gives local communities, acting through their metropolitan planning organization (MPO) a much greater degree of autonomy in preparing local plans. This shift also provides for greater public input into the transportation planning process. Even though these shifts have occurred, there are still many transportation projects developed in the past decade that emphasize roadway and automobile solutions that will be implemented without consideration of transit options. This is a reflection of the long lead times needed to plan and develop major investment projects. For example, projects to increase Interstate freeway capacity through Tampa were planned in the late 1980s, although funding will not be available for their implementation until the first decade of the 21st century.

Limitations exist on the role of transit agencies in station area development. Acquiring land for transit projects using government funds is largely restricted to rights-of-way and sites for stations, maintenance facilities and parking lots. A transit agency cannot acquire land for the purposes of encouraging station area development, even if the development is to be carried out by a third party. This places the responsibility for amassing parcels to encourage development in the hands of other government agencies, or the private sector. In a similar vein, the actual allocation of control and responsibilities in joint development projects between public and private sectors is often a grey area. Differences also exist between horizontal and vertical development projects. While it may be legally permissible to use a government financed station structure as the foundation for an air-rights office building, it may not be possible to use those same government funds to construct the foundation, or even acquire and improve the land, for a private development adjacent to the station. This is a quite different definition, and restriction, of the role of the transit agency from acting in an aggressive manner to carry out development, as is possible in Asia and portions of Europe. While transit agencies do not have this power in the U.S., other government agencies do, especially downtown redevelopment agencies.

Restrictive conditions can be summarized as follows:

- Local land use and zoning policies allowing or favoring transit station area development do not yet exist in some Florida communities.

- Concurrency exceptions to encourage transit-friendly development can be created, but must be approached on a case-by-case basis rather than in a systematic manner.

- Existing transportation plans and projects may have been developed in the recent past which do not yet reflect changes in both state and local policies favoring transit, and particularly encouraging its use as a tool in creating more livable communities.
- The legal role of public and private sector development is murky at best and differences exist between horizontal and vertical development and from community-to-community.

- Transit agencies are restricted in the use of funds beyond the immediate facilities needed for the function of rail transit at stations. They are not allowed to amass property for development purposes, and are severely limited in what they can do to assist development beyond the immediate station property.

Chapter 7: What are the Conditions Favoring "Best Practices" of Station Area Development

"Best Practices" can be defined as those station area developments that contribute to the community, neighborhood and transit system in a positive way. They are vital, dynamic, attractive and pleasant places to live, work, shop or play. They may have a few activities, or many. They may be predominantly residential in character with a few services and shops. They may have a cluster of office buildings with a smattering of retail activity on the ground floor. They may be a major sports facility with supporting entertainment services and parking. They may be a large multiple use complex of offices, high rise apartments, ground floor retail, professional offices, restaurants and movie theaters. Many of the residents, employees, customers, clients and visitors come and go by rail transit. They see the station area and transit as synergistically related and perceive the area as a livable and friendly place. They like living in or coming to this built place.

In the earlier chapters, and in considerable more detail in the Appendix, are many examples of transit station area development. To achieve the benefits of relating transit and development into "best practices" requires certain conditions to be met. These are summarized below.

Vision, Concept and Plan

The players in putting together a good station area development need to have a picture of what they want to achieve. This picture is a vision of the outcome of the planning and investment they are going to make. It will include activities and the buildings and public spaces to house them. It will incorporate routes of access that may be rail and bus transit lines, sidewalks, streets, bicycle paths, perhaps even bridges and tunnels. The vision becomes translated into a concept when these have been identified and grouped together in a meaningful way. The buildings and public spaces take form as designs and include size, materials, textures, landscaping and streetscaping, public art and decoration. The elements coalesce into a plan, and each element requires detailed design to carry out construction and implementation of the activities contained in the original vision.

Whether it is a single station area or an entire system of stations and their adjacent areas vision, concept and plan are all essential ingredients. Old Town, American Plaza, Gaslamp/Convention Center, Qualcom Stadium, Hazard Center, Lemon Grove and Barrio Logan are all examples of station area development along San Diego's light rail system. Each is the product of a vision. As are

Peachtree Center, North Avenue, Lennox, Avondale and Buckhead on Atlanta's heavy rail lines.. Ballston, Bethesda, Crystal City, King Street, L'Enfant Plaza, Silver Spring, and Union Station on Washington's Metro are each the result of a vision. Planning of Portland's Westside MAX line involved visioning on a grand scale for all 18 stations.

Good visioning involves bringing all of the players together at the table. And this includes not just the transit agency and the developers, but involving local residences, businesses and community groups that live and work in the area.

Committed Stakeholders

To have a really good station area development requires commitment from the "stakeholders." This commitment starts with the visioning process and continues all the way through the start-up of rail transit service to the opening of the last residence, business, park or entertainment facility in the area. The transit agency, local governments, federal and state agencies are obvious stakeholders. So are station area property owners, developers, businesses, chambers of commerce, neighborhood associations, service groups and public agencies in the area including schools, libraries and recreation centers. If a major sports or cultural facility is part of the station area development, they are stakeholders. Local residents are essential-to-have stakeholders. Stakeholders need to be involved at every stage of the process in planning and developing the area. They have a vested interest in its future and can contribute in countless ways. Involvement leads to "buy in" and support for the project. At the end the stakeholders will be proud of what they have accomplished and can claim the project as "theirs."

The transit agency is a particularly important stakeholder because working with other government units, the business community and local citizen groups and organizations can be facilitated by the agency assuming a leadership role. Many of the best examples of station area development, whether they be in Atlanta, Baltimore, Buffalo, Memphis, Portland, San Diego, San Jose, St. Louis or Washington, DC are the result of stakeholder involvement and input early on, and "staying the course," throughout the project's implementation. Portland has frequently been touted as the best example of using rail transit as a tool in building a livable community. Portland has approached station area design on a system-wide basis. It's success is in large part the result of stakeholder support over the long haul.

Permissive and Flexible Context

A key condition for successful station area development is having a context that facilitates the exploration of new ideas and approaches. Station area development is a new concept for most communities where rail systems are being considered or planned. In cities with established rail systems the phenomenon may not be new---some station area development may have occurred spontaneously in response to market forces and other factors. Even in these places making the concept into an active tactic championed by community leaders can be challenging. This is especially true if city planning and development has traditionally been very cautious and restrictive. If people are satisfied with the status quo in their community they may not be willing to entertain new ideas. Some may argue that already established plans need to be followed. Business owners may view creating new opportunities as something that will only favor their competitors.

On the other hand frustration over deteriorating neighborhoods, a downtown in decline, flight of business to the suburbs, growing sprawl, or traffic congestion may lead to a willingness to explore new ideas and break with the rigidity of the past. The willingness to recognize problems and consider openly the range of possible solutions sets the stage for change. Exploring alternatives can lead to a relaxation of highly structured rules and regulations. In order to break from the discrete land use and zoning precepts in place in most U.S. urban areas for the past half century a new flexibility must bubble to the surface. The benefits of this flexibility can be brought out by community and business leaders, and even individual citizens, who are innovators of their own, or who are aware of changes for the better going on elsewhere.

An ambience that encourages new ideas and discussion can be assisted by the local press and broadcast media. Community organizations can be forums for further discussion and exploration. An open environment that allows this type of community dialogue to take place is very important. Thorough discussion can lead to revision of rules and regulations to allow approaches that will ultimately lead to actions for community betterment. It is in this kind of environment that station area development can be considered in its most positive light.

It is more than coincidental that communities facing significant growth and future concern issues are the ones that have moved ahead to bring rail transit into their transportation portfolio, and are the cities where station area development has emerged as a local event and grown into a larger strategy for enhancing urban livability. While Atlanta, Baltimore, Sacramento, San Diego, San Jose, and San

Francisco Bay Area have initiated station projects it is Portland which has taken the idea even further and incorporated it into its regional growth strategy as set forth in the Metro 2040 Plan. The openness of the local context to innovation and public discussion was important in all of these communities, but reached its fullest manifestation in the evolution of regional government and planning in Portland.

Leadership and Synergy

Individuals or organizations have stepped forward to lead the implementation of transit station area development in several communities. Where they have been most effective at doing so they have built a synergy with others who recognize the benefits to the city, the neighborhood, their businesses and their personal lives. Sometimes it is the individual political or business leader who has advocated and supported rail transit--and has incorporated the station area development benefits into that advocacy. The leadership of a handful of key political figures was instrumental in this effort in Atlanta, Portland, Sacramento, San Jose and San Diego. They were visionaries who could excite others and enlist their support. Community activism emerged in leadership roles by establishing organizations to advocate rail transit, as in Portland, Sacramento and St. Louis. Government redevelopment and transit agencies worked together to promote station area development and to get the necessary changes in local ordinances and regulations that would facilitate it in Denver, San Diego, St. Louis and Washington, DC.

The business community, led by key developers and investors, can also play an important role in station area development. By putting their energy and money into station projects they lend additional support and enthusiasm. Although banks in many communities have been initially reluctant to finance mixed use projects, they have stepped forward with financing for a growing number of projects all across the land. Residential developers RTKL and Post Properties have made major commitments and built new apartment developments on transit lines in Dallas and Atlanta. A variety of major investors have packaged mall and/or urban shopping developments at transit sites in Atlanta, Cleveland, Portland, Sacramento, San Diego, San Francisco, St. Louis and Washington, DC. Smaller investors can play a major role also. The Round at Beaverton on the Westside MAX line in Portland which incorporates a three story town home development, an office complex, multi-screen theater and retail shopping has been entirely financed by a local developer. Professional sports teams have taken initiatives to support new stadiums and arenas located at transit stations in Atlanta, Baltimore, Boston, Denver, Cleveland, Miami, Portland, San Diego, San Francisco, San Jose, Seattle, St. Louis and Washington, DC.

The coming together of leadership in the political, business and community concerns arenas can help provide a broad based synergy to support general and specific station area developments. This can be strengthened even further by creating opportunity for grass roots involvement and input. Once again Portland provides a quintessential example.

Financial Capability

One of the key components of every one of the station area developments cited as a "best practices" example has benefitted from having adequate financing. There are three types of financing that are important in station area development: public, private and mixed.

Public funding through government grants provides the capital for construction of the transit infrastructure--track, overhead and signal systems, stations, maintenance facilities and parking lots. Other public funding from various government agencies can provide infrastructure, and perhaps even land acquisition and demolition of abandoned buildings, in the area to be developed. If the station area is part of an urban renewal or redevelopment program government agencies can provide further funds for improvements and even loans for certain kinds of businesses. Public funds are also used for the wide variety of public functions that government carries out, if facilities are located in the station area. Schools, libraries, parks, recreation centers, government offices, fire and police stations and day care centers are some examples of government funded activities that can be located in station areas.

Private financing is essential to cover the construction of buildings used exclusively to house private business. The availability of financing is contingent upon the projected success of the business whether it be housing, an office building, a retail store or a food and beverage establishment. Because most station area projects involve one of more of these types of activities private financing will be involved. Therefore the viability of the project is important. Getting banks and other lending institutions to approve loans for station projects may require some strong salesmanship if the project will bring new uses to a neighborhood or district that has not had them before. For certain projects, particularly housing but also small businesses government loans and tax credits may be available.

Mixed financing may also be important for some projects. Sports arenas and stadiums may use public financing for a large portion of the project, but some private equity is also usually required. Some housing and business activities may need a mix of public and private financing. Private investors

may be reluctant to finance the needed share of new types of activities. Social and economic development reasons may justify the use of government guaranteed loans. Mixed financing is not the same as joint development. In mixed financing the funds come from both public and private sectors. Joint development projects involve the public agency and the private developer or investor to fund discrete parts of a project.

Almost all station area projects use public and private funding sources. As an example Ballston on the Washington Metro in suburban Virginia is a development built over and around the rail transit station. Federal funds provided construction of the rail line and the station envelope, platforms and mezzanines plus major access elements including sidewalks, stairs, escalators, elevators and bus transit bays. Air rights over the station were leased to a developer who constructed, with private financing, a hotel, office and retail complex. Air rights over the tracks approaching the station are used by other private developers for additional office and high rise residential towers. Adjacent private development extends several blocks in every direction and steps down from high rise to mid rise to low rise apartments and town houses, and eventually to single family homes. A block away is a major shopping mall, also built with private capital.

Transit agencies and their other public partners, usually the local planning or redevelopment agency, are extremely careful in selecting and supporting private sector development in the station area. They, like financial institutions, are concerned that businesses not fail, and that what is constructed remains viable and contributes to the neighborhood in a positive manner.

Appendix A
Examples of Station Area Development

Atlanta, Georgia

Metropolitan Atlanta Rapid Transit Authority (MARTA) opened in 1979. It was the first heavy rail system in the southeast. Atlanta had a 1990 population of 2,157,344. The Atlanta urbanized area is made up of the city of Atlanta, Cobb County, DeKalk County, Fulton County, Gwinett County and Clayton County. Atlanta has reduced rail transit costs versus bus costs and it was the rail transit that attracted the 1984 Democratic Convention and the 1996 Olympics. The Atlanta regional transportation plan update identified four major issues: cross regional congestion, radial congestion, a transit need, and an activity center congestion.

The MARTA heavy rail system is 49 miles long. There is a northeast-south route, a north-south route and an east-west route. There are currently 36 stations on the system. Most of the lines reach within a mile of I-275, the outer boundary of Atlanta. There is parking at 27 of the 36 stations. Rail is the most popular transit in Atlanta.

There are good directional signs in all stations and there is plenty of space for luggage. There are 15 bus/rail transfer centers.

Downtown Atlanta

Five Points Station is located near major state and local government office buildings and Underground Atlanta.

Omni Station serves the Georgia Dome, Omni Coliseum and the Georgia World Congress-a convention center. **Georgia State Station** is also a major state office building. **Peachtree Center Station** is in the middle of many hotels, retail and office buildings. At least 12 different buildings are linked together by a skywalk. **North Avenue station** is MARTA's air rights station with Southern Bell. **Arts Center Station** is a redevelopment mecca. The Arts Center has 2.5 million square feet of office space. GLG Tower at Arts Center is a 51-story tower with a hotel and office space and 129 residential units. There are a small number of retail and service stores within a third of a mile of the station. The Woodruff Memorial Arts Center, the High Museum of Art and several office buildings

are nearby. **Civic Center Station** is the divider of downtown, commercial and mixed-use development.

Lenox Station has the biggest development with the Lenox Square Mall. This mall has five anchor stores, 200 other shops and food facilities. Grandview Towers at Lenox station has 36 stories. There is a hotel in the mall and two other hotels are close by. There are some apartments and condominiums in the proximity as well. Lenox Station has three million square feet of office space. Resurgens Plaza has 388,000 square feet of office space; Atlanta Plaza has 674,000 square feet of office space and 14,000 square feet of retail.

Dunwoody Station is close to a mall, office complexes, and has planned high-density residential development. The Dunwoody station area is a high rent suburban office and commercial district near a shopping complex. It mainly serves people working in the Perimeter Center business area.

Medical Center Station is between Buckhead and Dunwoody Stations. The Medical Center Station is close to an office park and single family housing.

Baltimore, Maryland

Baltimore, Maryland is made up of the central city of Baltimore and six surrounding counties: Anne Arundel, Howard, Carroll, Baltimore, Harford and Queen Anne's. Baltimore has also benefitted from economic ties with Washington, D.C. The Maryland Metropolitan Transit Administration (later known as Mass Transit Administration or MTA) opened in 1983. Redevelopment projects such as Camden Yards, Inner Harbor and the Charles Center have denoted Baltimore as having historic, cultural and economic importance. There is an abundance of redevelopment happening in Baltimore. Light rail transit was introduced in 1992. In Baltimore, it has been since noticed that vehicles in the Central Business District (CBD) were down 15 percent while traffic rose 7 percent in all other spots.

Three guideway Transit modes serve Baltimore. These include: rapid rail (Baltimore Metro- MTA Metro); commuter rail (MARC); and light rail (CLRL).

Baltimore Metro (Rapid Rail- MTA)

15 miles of track are between Baltimore and Owings Mills. MTA provides bus service at all 14 stations. It serves the central business district and the eastern end of Inner Harbor. The Metro's six

outer most stations have park-and-ride facilities. The Metro has 7,400 parking spaces and half are at Owings Mills.

Maryland Rail Commuter Service (MARC)

MARC is 187 miles long and has 40 stations. MARC serves commuters in Baltimore, Washington, D.C., eight Maryland counties and parts of West Virginia. It has an interchange at Penn and Camden Station. The 40 MARC stations operate on three lines and have 8,500 parking spaces between them. MARC which can be adopted by businesses for planting flowers, landscaping and picking up trash. The station in Aberdeen, Maryland has just been restored for $400,000. The station at **Camden Yards** has new signs, which make customers feel safer and are more convenient. The station also connects the commuter rail, light rail and buses. It was estimated that the MTA brought 15 to 20% of the fans to each Orioles home game- which were all sold out.

Central Light Rail Line (CLRL)

CRCL is 29 miles long and has 31 stations on its line. It travels from Hunt Valley in Baltimore County to Baltimore City to Cromwell/Glen Burnie Station in Anne Arundel County. Each station has handicapped access and is "barrier-free". There is also free parking for about 2,400 cars. Soon the CRCL recently opened an intermodal connection at the Baltimore-Washington International Airport.

Maryland is making a lot of effort for commuters to use transit. There is now a 100-child care center and police sub-station at **Reisterstown Plaza** Metro Subway stop. Maryland is trying to curb urban sprawl by placing businesses where they can be best used. This encourages economic development, protects the environment and improves the quality of life. Baltimore is also looking to develop 40 acres of station property with mixed-use office/government/retail/housing and air rights. Soon they will also develop stations at the Baltimore Raven's stadium and the Baltimore Zoo.

Roland Park in Baltimore is an example of an early transit and pedestrian-oriented neighborhood. It is a planned low-density residential area. It is still a desirable residential area located outside of the central business district of Baltimore. An electric streetcar connected Roland Park to the CBD of Baltimore. The interconnected system of streets provides a direct connection to transit. Thoroughfare traffic was at the edges of the development. Roland Avenue includes a large median and the adjacent houses have large setback to create the illusion that it was a parkway. In Roland Park, there was small retail and mid- and low-rise residential buildings and a church. Single-family detached units predominate in the remainder of the area.

Cleveland, Ohio

The Cleveland area is made up of seven counties: Lorain, Medina, Cuyahoga, Summit, Portage, Geauga and Lake. From 1870 to 1970 the population increased more than ten times from 270,000 to 3,000,000 people. New infrastructure for Cleveland included six new interstate routes, bus service and two higher-speed rail systems. Development of Downtown Cleveland (The Gateway Project) included Jacobs Field, Allen Theater, Public Library, Federal Reserve Bank, the Rock and Roll Museum, Science Center and Aquarium.

Between 1990 and 1993 both bus and rail transit ridership declined, it could be a result of lost jobs. The Choice of using rail is slowly growing as compared to the very popular bus. Rail ridership has increased compared to bus ridership between 1990 and 1993.

The new **Waterfront Line** hopes to bring in a lot of tourism and boost citywide enthusiasm. The north coast of Cleveland is really changing with the new two-mile rail line. There are five stations on the line and two more are being planned. It serves the Government, commercial and business needs on the north side of the CBD. The line links all of Cleveland with access to a sports arena, retail and tourist attractions like the new Rock and Roll Hall of Fame and the Great Lakes Museum. The new Waterfront Line also serves Tower City, the Flats Entertainment District, Lakeside Avenue Govt./Business Center and parking lots. The new line is an economic catalyst for the Flats Entertainment District. Plans include new apartments, office buildings and a hotel, which will connect to the East Ninth Street business corridor. Startup commuter service, which is planned to start in a few years, will connect Canton, Akron and Cleveland. Regional Transit Authority (RTA) bought the Cleveland Transit System in 1975.

Cleveland has a big suburban population with less and less people living in the city. Light rail transit ridership annual unlinked trips has always been between 3900 and 6000 trips per year. Light rail transit are the Green and Blue Lines in Cleveland; the Red Line is the Rapid Rail. In 1995 with the 2.2-mile extension, the RTA light rail expanded between Tower City and South Harbor with four new stations.

The **Red Line** (heavy rail) services Cleveland International Airport, Downtown Cleveland and Windermere Station. The Red Line has 29 stations. The (Light Rail System) **Blue and Green Lines**

have 29 stations; 12 with on-site parking facilities. Some major Cleveland transit areas are: Southeastern Cleveland, Downtown, Shaker Square and Shaker Heights

Station Areas in Cleveland

The **Windermere Rapid Transit Station** will have a child-care facility in the station. This will increase transit incentives. **Red Line Superior Station** is along the Red Line in Cleveland. The **Gund Arena** also connects to a transit station by an enclosed pedestrian walkway. Cleveland has a long range transit plan called Transit 2010 which will expand and upgrade the transit system.

New Orleans, Louisiana

New Orleans has rail history since 1831 when it connected the first rail west of the Alleghenies. New Orleans has used streetcars for years and they served as a vital part of its economic source. After the depression only one railway really survived—the **St. Charles Avenue Line**. The central core of New Orleans is Vieux Carre, which has been dominant for 277 years. The New Orleans urbanized area is made up of Orleans, Jefferson, St. Bernard, St. Charles, St. John the Baptist and St. Tammany Parishes (similar to counties) and has a 1990 population of 1,056,247. Nearly two-thirds of that number live in New Orleans or Metairie. Due to the geographic landscape of New Orleans only 57% is considered dryland so there is high-density development on the dry land. 20% of people in the New Orleans urbanized area reported having no vehicles and as a result 17% use public transportation to get to work.

In 1980, New Orleans recognized the need for new zoning for its city and is still implementing a new system. The new planning measure is to make the CBD a 24-hour business center and will promote transit to develop a more consistent zoning plan and to take into consideration the needs of the environment. Trying to increase transit usage in New Orleans has been tough and slow. Hopefully, with all the new plans and investments, the Regional Transit Authority will be on their way to increased ridership and more routes. New Orleans Transit currently serves the Aquarium of the Americas, the French Market, hotels and the new convention center. New proposed projects, which hope to be served, are the casino, a 20,000-seat sports arena and the new Riverfront streetcar line.

There are three transit systems presently in use in New Orleans:
Regional Transit Authority (RTA) operates a fixed-route bus system in the Parishes of Orleans and

Jefferson. The downtown system includes a circular route especially for downtown. The RTA operates 70 routes including two streetcar lines in Orleans Parish, St. Charles Avenue and the Riverfront in the New Orleans urbanized area.

The **St. Charles Line** is 6.5 miles in length and has 104 stops or stations. It may be perceived as a tourist attraction but it has a 4:1 worker to tourist ridership ratio. The streetcars of New Orleans serve too different populations: a transit dependent work force and tourists. This line serves the **Carollton area** (residential), the universities, the medical district and the commercial and business district. The **Riverfront Line** has 10 stops and is mainly used by tourists and conventioneers. This includes stops at the New Orleans Convention Center, the Aquarium of the Americas, Riverwalk Marketplace, the Jackson Brewery Marketplace, the French Market and several ferryboats, docks and hotels.

When comparing Motorbus data to Light rail-streetcar data from 1989 vs. 1993, ridership on the bus dropped 13% and light rail-streetcar rose 27%. There is no direct linkage between the two streetcar lines, the airport and streetcar, or between the streetcar and the New Orleans Union Passenger Terminal, NOUPT, where the Amtrak/Greyhound terminal is located. This most likely will change with the new multimodal Union Passenger Terminal. The St. Charles Avenue streetcar line interfaces with RTA buses at seven points. The Riverfront streetcar has one transfer point along Canal Street. The New Orleans Union Passenger Terminal will become a multi-modal center. Presently, the New Orleans Union Passenger Terminal is an intercity rail and bus linkage for Greyhound and Amtrak and heliport. The new plans for the NOUPT call for a streetcar maintenance facility, commuter-parking garage, RTA transfer facility and an airport/regional light rail transit facility.

By using intermodalism with the streetcar, the commercial and retail areas would be linked and would be an economic catalyst for downtown New Orleans as part of the Canal Street Corridor project but would also stimulate Loyola Avenue and the Carrollton Avenue/St. Louis nexus. The proposed route would be 7.8 miles in length and would link the CBD, Superdome, aquarium, casino, Union Passenger station and the convention center.

Pittsburgh, Pennsylvania

Pittsburgh has a 22-mile light rail transit system around the city. Pittsburgh is the pioneer in transit-exclusive busways. Buses serve the CBD in Pittsburgh. The Pittsburgh urbanized area has 1.7 million people in Butler County, Armstrong County, Westmoreland County, Washington County and Beaver

County. Pittsburgh has a lot of single occupancy vehicles and depends heavily on the automobile, but is far below the national average. Although Pittsburgh's employment is on the decline, but growth is forecasted for the city. Phase one of the light rail line was completed in 1987 and stage two is still being planned. Light rail is not the primary mode of transportation for the city....the bus is.

The "**T**" is a light rail transit line, which moves people to and from Pittsburgh and Allegheny County. The light rail transit system has 54 stops; all three-subway stations and five of the 11 major stations have bus connections. Seven stations have park-and-ride facilities. The downtown stations are very clean--there is no drinking, eating or smoking. There are also security and information booths. All stations have benches and garbage cans. T ridership has declined though due to service cuts and a lack of parking spaces at stations.

Pittsburgh is in the process of planning an intermodal transportation system to better accommodate transit users. The goal of Pittsburgh transit is to get people to the CBD. There is apparently no need to make the whole city connected.

Light Rail Transit Stage 1

Pittsburgh wants to provide rapid mass transit to the south corridor of Allegheny County. Pittsburgh still uses trolleys because of the hilly terrain and the buses cannot serve the area effectively.

Light Rail Transit Stage 2

Funding did not allow stage one and two to be built at the same time. Stage two needed to upgrade 12 miles of existing trolley lines. Stage 2 in now on hold due to airport and high-occupancy vehicle lane priorities.

The Spine Line is hoping to be developed to serve East-West commuters. It would connect Pittsburgh to Oakland with part of the downtown trolley lines. This will link the port to downtown. It is expected to cost $1.5 billion and be completed in 2009.

Within two blocks of the downtown light rail transit subway stations are all the new downtown office buildings: **Penn Park Station**, Liberty Center- new construction- Doubletree Hotel and office building; **Steel Plaza Station**, One Mellon Center- new construction- Bank Headquarters and office

building, Oxford Center- new construction- Duquesne Light Company headquarters, offices, restaurants and upscale shopping, Steel Plaza Station- new construction- Walkway connection from Steel Plaza Station to USX headquarters building, library, daycare facility, retail and restaurants. **Wood Street Station,** (upper levels)--Redevelopment-art gallery, Gimbels Building re-development-new retail in a former department store, CNG Tower- new construction-office building. Pittsburgh Cultural District- redevelopment and reuse of buildings along Penn and Liberty Avenue for art galleries, theaters and other cultural attractions. There is some small retail, restaurants, and offices.

Gateway Center Station PPG Place--new construction--PPG headquarters and office buildings, restaurants, and retail. Fifth Avenue Place--new construction-- Blue Cross Headquarters, restaurants, upscale shopping and retail. Market Square-redevelopment- is undergoing reconstruction and additional public parking facilities.

Stage 1 Light Rail Transit

Potomac Station, Senior citizen housing-new construction of a high-rise apartment building. **Mt. Lebanon Station,** Rolliers- new construction of a hardware store. Mt Lebanon Parking Garage-parking garages and offices. Main Line- new construction of single family detached housing. **South Hills Village Station**, South Hills Village--new construction and expansion of existing buildings. Shopping complex with main mall building and detached retail structures.

Philadelphia, Pennsylvania

The **Classical/Revival Beaux-Arts station** has been renovated in suburban Chester, Pennsylvania. Chester is in the vicinity of Philadelphia. It was a joint project between the Federal Transit Authority (FTA) and South Eastern Pennsylvania Transit Authority (SEPTA). Residents and commuters were most concerned about cleanliness, ADA accessibility, safety and the potential of retail. People commented that they would use it more if there were a coffee shop and vending machines inside the station. There would also be better bus bays outside and more parking while preserving the architectural integrity of the building.

Portland, Oregon

The Portland area light rail transit is operated by Tri-Met (Tri-County Metropolitan Transportation District of Oregon). Light rail has become more popular than heavy rail due to lower capital costs and greater flexibility. The Portland, Oregon- Vancouver, Washington urbanized area consists of Washington County, Clark County, Multnomah County in Oregon and Clackamas County in Washington.

The first electric streetcars appeared in 1890. Portland Traction Company began to replace the streetcars with trolleys and buses in the 1930s. The initial light rail opened in 1986 called MAX-Metropolitan Area Express. With an increase of urban sprawl, suburbanites began to want commuter rail service again in the 1970s. The Tri-met service area is currently 988,284 people. The Oregon urbanized area population is 1,004,676. The current max lines serve 30 stations. The East-West lines are being expanded and there are plans for a major North-South route for 2002.

There is free parking at Cleveland Ave, Gresham City Hall, 181st Ave, 122nd Ave and Gateway. General parking is at the Lloyd Center and Coliseum stations. Rail service runs 21 hours a day and there are also 75 bus routes. In the early 1970s, Portland City officials wanted to build the Mt. Hood freeway but there was stiff opposition because several hundred homes would have to be demolished. Businesses moved out of the CBD in Portland in the 1960s and then there was a 1970s redevelopment plan to beautify the CBD which worked. Downtown needed retail, commercial, hotels, entertainment, a transit mall, mixed use housing and office buildings which were easy accessible. Balanced Transportation was needed in order to insure this.

Vancouver, Washington provides for small scale commercial uses within walking distance for its residents. These areas are scattered throughout the city and are adjacent to residential neighborhoods no more than one and a half miles apart. Areas are no bigger than two acres and have a minimal traffic impact.

Gateway Station has a good bus/rail interchange at this station. It also has kiss-and-ride and park-and-ride facilities. This station has concessions, telephones and newspaper stands. There is also a mall built nearby and some other isolated retail adjacent to it.

The **Lloyd Center** area is mainly a shopping mall. There are also federal and state office buildings, the Portland Arena, a convention center and two office buildings. The **Lloyd District** near Portland has 1,100 housing units available for transit users of the MAX.

Burnside Corridor has 18 projects over 5 miles and predominately were in the single-family home area. Most of the projects were apartment complexes but some were medical offices, general offices and retail.

The **Coliseum** area has ten bus transit routes. It is target as a major area for growth of housing and employment.

Gresham Central Station is a bus/rail transfer station. It is a small town commercial center without disrupting the local environment. Seven projects for $35 million dollars were created close to MAX stations. There are also a motel, Three small office complexes and a pedestrian retail arcade. There were plans for a huge retail mall built over a light rail station but the project failed.

Downtown Portland has 30 projects with a value of $389 million completed, they were mainly office buildings. New or renovated retail space is also a key to the downtown area. Public investments included Ankeny Park, Pioneer Courthouse Square and Federal Office building and Pioneer mixed office and retail complex. In **Hollywood,** a new $500,000 Elks lodge was developed near the rail station.

NW 23rd Avenue in Portland, Oregon is a commercial district that is adjacent to single family homes and high-rise residences. Retail is on the ground floor and the residences are built above the retail. The sidewalks were extended because people would double park and the buses would not be able to pull out. Also, people waiting for the bus would block sidewalk passage by pedestrians. The sidewalk widths range from 8 to 10 feet. Pedestrians are now enjoying the new NW 23rd Ave. The number of upscale shops have doubled and now includes restaurants, coffee bars, bookstores, pubs and gourmet kitchen and designer clothing stores.

Beaver Creek in Portland will be a mixed-use retail and housing area near the rail station and will be aimed at pedestrian comfort.

Gresham is also 15 miles from Portland and is a high-density complex linked to the light rail system. Light rail stations can have a good impact on the surrounding area financially. Examples are a 90-unit apartment complex which look like townhouses.

Stadium Station apartments- 115 units of affordable housing (less than 60% of the median income) adjacent to two light rail transit stations in the Goose Hollow neighborhood.

Center Commons- 312 units of housing including rentals for seniors and families, market rate apartments, and 24 for-sale rowhouses. This site is close to a light rail station on 60th Avenue.

Russellville School Phase 1- 282 units at 102nd and Burnside.

Sam Slausen- 51 units at SE 162nd and E. Burnside Street.

Portland, Oregon has plans and codes in order to zone certain types of businesses. The **first zone** is for a neighborhood commercial zone which is intended for small sites in or near dense residential neighborhoods to serve the community. There is a variety of retail, services and other stores in the development mix. The stores are there to serve the community and not disrupt traffic flow or make pedestrians feel uneasy about walking along the streets. The **second zone** is applied in neighborhood commercial and mixed commercial/residential districts. Each business is limited to 5,000 square feet of floor area not including parking.

NE 60th Avenue and Banfield Freeway Site is in Northeast Portland about three miles east of Downtown. The site is 20 acres and is both north and south of the freeway. On the north side, there are warehouses and industrial sites; many of which are vacant. To the south side of the highway, there are single family homes and a small commercial area. The freeway has had a negative impact on the property because of the high amount of noise and the visibility of the freeway. The residential plan is to have roughly 76 dwelling units per acre.

102nd and E Burnside Site (Hazelwood) is an area that could be a great transit-oriented development site. On the eastern edge, there would be low-density residential development and the houses would most likely be in the townhouse/rowhouse style. There is not much except an old school and playground currently on the site. On the northwest corner of the site is the existing MAX station, which is served by light rail transit. The Hazelwood Station is located within a quarter mile of a major

shopping mall. Along the southern side, there is some retail and restaurants. The space is basically wide open and would be a nice pedestrian-oriented site. The developers would like to see *diversity* in the form of people who would work and live there, as well as the mixed use of office, commercial and residential buildings. Proposed development would be retail and commercial on the southern and western sides. Above the retail would be office and rental apartments. On the northwest corner there would be a civic plaza with a library and senior citizens center.

Historic Downtown/Riverfront will potentially have a mixed-use commercial, residential, recreational, civic and educational center. Kellogg Creek, Kellogg Lake and the many natural springs and watercourses will be in the parks and public spaces. There will be one seven-story landmark hotel, but the rest of the development will be two, three and four story buildings.

NE Sandy Boulevard from 12th to 40th (Burnside to Hollywood) is a major part of the city that is ready to be developed. Within a close proximity of the Hollywood Light Rail Station, there are a number of under-developed open spaces oriented for the automobile and very little pedestrian accommodations. Developments along Sandy Boulevard range from industrial plants to residences on the same block. There is a strong residential base that will support commercial or retail infrastructure that may come about. It takes only 15 minute to walk to downtown and only 5 by bus.

Los Angeles, California

The Los Angeles region is defined as Los Angeles, Orange, Ventura, Riverside, and San Bernardino Counties and is home to 15 million people. The Metrolink Commuter Rail service currently has five lines and has plans to expand in the future. Amtrak also offers inner-city service. Los Angeles County Metropolitan Transportation Authority (LACMTA) operates the light rail and heavy rail (subway) in Los Angeles. There are also 12 different bus transit agencies in Los Angeles. The bus is the preferred method of transportation at this time; but still nothing replaces the car.

In 1902, the Pacific Electric Big Red Car Lines opened up and were the biggest in the world. The Red Cars stopped in 1961 and the Metro Blue Light Rail opened service in 1990 to Long Beach. The Metrolink Commuter Rail service opened it 1992 and Red Line service began operating in downtown in 1993. The Metro Green Line is between Norwalk and El Segundo and begun service in 1994.

Metrolink Commuter Rail is the operating name of the Southern California Regional Rail Authority

and serves all five counties. It began service 1992. It currently has five lines and 37 stations but hopes to have seven by 1996 and be using 330 miles of track. It acquired its track in 1989 and gained 667 miles of right-of-ways. All lines offer connections to the inner city and other commuter lines through Union Station.

Los Angeles County Metropolitan Transportation Authority LACMTA (or MTA) operates bus, light rail and heavy rail within Los Angeles County. Los Angeles County Metropolitan Transportation Authority seeks out ventures with real estate developers for retail, office, commercial and housing projects in order to encourage more ridership on the new rail lines. This will help provide revenue in the future for the Los Angeles County Metropolitan Transportation Authority.

Metro Blue Line is a light rail line running at grade from a red line connection in Downtown Los Angeles to Long Beach. It is a 22-mile route that serves 22 stations. The Long Beach line will be complemented by a light rail extension eastward from Union Station to Pasadena. There are some intermodal connections on the line.

Metro Red Line is a heavy rail subway system in Downtown Los Angeles. It runs between Union Station and MacArthur Park. It opened in 1993 and runs 4.5 miles. There may be a second station opened for an additional 6.7 miles and eight stations and a third and fourth line is being planned for the year 2000 with 6.4 miles and six stations and four miles and four stations, respectively. Bus transit service is provided at all Red line stations. Parking is only available at Union Station. The red line also connects with the blue line.

Metro Green Line is a light rail system that will extend 20 miles from Norwalk in the east to El Segundo in the west with 14 stations. Its closest point to Los Angeles International Airport is two miles and future plans involve a connection. A major station on the Green Line is the intersection with the Blue Line and the Harbor Freeway Transit way.

Los Angeles Union Station is the central intermodal connection in Downtown Los Angeles. Union Station is the terminal point for five Metrolink lines and Amtrak. You can change from the Blue Line to the Red Line to the Green Line if needed. There is bus and taxi service available at the station. There are also 900 parking spaces available at Union Station. It is 622,000 square feet and is the 26 story headquarters for the MTA. Little Tokyo is within walking distance of Union station (El Pueblo) and is in the middle of the Historic District.

The **Union Station Gateway Center** is next to Union Station and is the bus terminal for the El Monte Transit bus way. Retail space is available to serve passengers in the station. There is 2 million square feet of commercial space by the office towers in the Gateway Center. The MTA headquarters is in this space. It is also home of the Red Line/El Monte intermodal connection and has 2,500 parking spaces.

It appears with all the included costs in the Los Angeles area, rail will not dominate transit service but along side of the buses; it should make it really complete. As more is opened up transit-wise around Los Angeles more transit will be used because there will be more interconnectedness and a better ability to travel.

The new **Blue Line** is 22 miles long and will be 150 miles long by 2020. The new **Blue Line** has open-air stations and six parking lots. The **Metro Green Line** is 20 miles long and has 16 stations along the line and carries 40,000 passengers daily. The **Metro Red line (Phase I)** is 4.4 miles long and will connect Union Station with somewhere downtown. There are five stations along this line. The **Metro Red Line (Phase II)** has two segments: the first segment is 6.8 miles long with eight stations and the second segment is 5.4 miles long. The **San Fernando Valley Rail** project will be 5.6 to 16 miles long. It will be a subway in Downtown and will be aerial in commercial and industrial areas. Ridership is expected to range from 37,900 to 57,800 in 2010. The **Pasadena-Los Angeles Light Rail** project is 9.1 to 13.6 miles long and will carry 56,600 to 68,200 in 1998. The **Metro Green Line extension** from El Segundo to Westchester is 2 to 5.3 miles of light rail with aerial and subway. It will have two to six stations and will carry 10,095 to 16,000 passengers. The **Metro Red Line East/West extension** from Downtown to Westwood is 9.4 miles and Downtown to East Los Angeles is 8.5 miles with 9 to 12 stations. **San Bernardino to Los Angeles Commuter Rail** will connect San Bernardino to Union Station. It will be 60 miles long with 10 to 15 stations and 4,000 riders daily. **Ventura to Los Angeles Commuter Rail** will connect to Ventura County 55 miles away. It would have six to eight stations and have 3000 riders daily.

The Metropolitan Transportation Agency (MTA) in Los Angeles has many plans for future development of about 80 stations. If the MTA shares land with companies both will prosper. Each plan encompasses, market demand, highway, bus, rail connections, available land resources and community needs and characteristics. One specific plan at the **Sunset-Vermont Subway Station** in Hollywood demonstrates these plans. This site is at a major road intersection in a commercial section of town surrounded by three hospitals. All of the agencies worked together for an intermodal/parking

facility that would serve both transit and hospital needs. The MTA is hoping to be able to work with other companies for future retail, commercial and office projects.

The **Vermont/Santa Monica Station** has highly-occupied retail/commercial space in a lower-income multi-ethnic area. There is a need for more retail/commercial space and a grocery store. There is a community college in this area but it appears not to have much of a major impact at this intersection. The development plan includes 300,000 square feet of retail/commercial space with parking at three 1,000 square foot lots. The plan calls for the possibility of newsstands, fast food, coffee shops, a supermarket, a drug store, a dry cleaners and shoe repair. The housing plan calls for 595 units at 43 dwellings per acre for large three or four bedroom apartments. For smaller apartments, there could be 1,240 units at 89 dwellings per acre.

Willow Street Station will have two types of family housing-- rental and ownership. Unit ranges will be from one to three bedrooms. There will also be private recreational space for the residential community and child-care facilities. In regards to retail, there will be a grocery store, drug store and small community-serving stores. The project will be developed in three phases: the first phase is

going to be all retail and the second two phases will be retail and housing. A total of 290,000 square feet of residential space, 202,400 square feet of retail space and 6,000 square feet of office space will be developed.

El Monte is a station along the Metrolink that will have a commercial and housing area (Valley Mall) developed around the station. This area will try to attract mostly young employed adults who have left home to be on their own and some of the elderly. There also will be some entertainment and restaurants nearby. The commercial will be on the bottom floor and the housing will be on the upper stories.

Southern Long Beach provides business and social functions for the Los Angeles area. The city is surrounded by the ocean and other developed areas, so new development is in the form of infill, densification or redevelopment. The city's southern portion has a net residential density of 22.5 dwelling units per net residential acre (residential areas only, not including streets), and medium to high density housing is widespread throughout the community. Southern Long Beach is a very pedestrian-oriented community and there are 15,252 VMT per HH per year. The community is served by local and regional bus routes and a light rail line connects Long Beach to Downtown Los Angeles.

Alhambra is a residential community located six miles east of downtown Los Angeles and is primarily low to medium density. Most of the shopping activity is concentrated in the older downtown, in a regional shopping center and along two main arteries. Pedestrian access is difficult in some areas due to the lack of sidewalks, long blocks, lack of four-way stop signs or stoplights at intersections. The community is served by 13 bus routes and each household averages 21,660 VMT annually.

Moreno Valley is also a residential suburb in which most of the residents commute to Irvine, Los Angeles or to employment along regional freeways. Overall density is 1.1 dwelling units per gross acre and only half of the city's 52 square miles are developed. Mixed-use is rare and residents are more than a mile from the commercial section of town. Sunnymeade (the older downtown) is a two-mile, auto-oriented retail strip. There are no sidewalks and the blocks are very long. Residents live close to Sunnymeade but pedestrian access is difficult. There are plans to allow residential uses on the commercial boulevard and to create mid-block connections between the boulevard and residential areas. The city has a regional mall and community shopping centers. In Moreno Valley, there are approximately 28,700 VMT per HH per year.

Sacramento, California

Sacramento has a light rail transit system which was the cheapest to build using federal funds. The Sacramento area consists of Sacramento County, Yolo County, Sutter County and parts of Yuba County, El Dorado County and Placer County. Population in the Sacramento area is booming. Sacramento is experiencing growth in agribusiness, federal buildings, military construction and computer companies.

Sacramento is a highway, rail and river hub. In 1946, Housing in the Sacramento area sprung up near the electric trolley lines. Sacramento is connected by rail with Stockton and Modesto. Most of the suburban growth is in the east, west and southeast of Sacramento. The first light rail was used in 1987. More rails and lines are being planned and added. Light rail helps minimize commuters, smog and congestion. The Sacramento service area is 931,146 people.

RT light rail serves 29 stations: I-80/Watt Ave, I-80/Watt Ave West, Roseville Road, Marconi/Arcade, Swanston, Royal Oaks, Arden/Del Paso, Globe, Alkali Flat/ La Valentina, 12th &I, Cathedral Square, St. Rose of Lima Park, 7th & Capital, 8th & Capital, 13th St.. And 16th St., 23rd

St, 29th St, 39th St, 48th St, 59th St, University/65th St, Power Inn, College Greens, Watt/Manlove, Starfire, TiberManlove, Starfire, Tiber, Butterfield, and soon to be Mather Field Road.

Light rail continues to serve warehouses, industrial spurs and the Sacramento Bee printing plant. To encourage pedestrians, the city has widened sidewalks, and made the roads vehicle-restricted, except for emergencies. New stations have maps and show the locations of where people are heading: the plaza, the state buildings and bus stops. Rail and bus have good transfer locations within a few blocks of each other: Arden/Del Paso, Watt/I-80, University/65th St, and Butterfield have 4 or more bus routes.

Development of the Sacramento Light Rail had good government funding and public support. The Transit Agency focused on: Traffic congestion relief, Air pollution mitigation, Regional mobility enhancement, Accessibility for disabled people, and improving the quality of life.

Downtown has developed nicely with the light rail transit, there are more hotels and retail anchors stores around the transit area. Sacramento did not have the traditional housing spur that most other cities had.

Downtown Sacramento Transit Mall Area is a 45-block area in downtown Sacramento that is considered the transit mall. An Old Department store has become state office buildings. Also, in the immediate area is the Sacramento Convention Center and City Plaza mall- each one is at the end of the mall.

South Capital: 8th & O Street and Archives Plaza Station Area has seen several new state office buildings built in this area. The light rail was built hoping to serve new potential state facilities. There are also a lot of retail and private office buildings in this area.

29th Street Station Area is the home of the Sacramento Regional Transit District Headquarters, Caftans and other state buildings within a few blocks of the station. The station is under a freeway which protects people from the sun and the rain. There are plans for multi-family residences, office and commercial development.

Laguna Creek Ranch in Sacramento is a medium-density, mixed use neighborhood which is oriented toward rail and express bus service. The goal this development was to have homes, schools,

civic uses and shops within walking distances. The streets and common areas have been designed to be pedestrian-friendly. The streets, open spaces and town center are oriented toward the future use of a transit station. The town hall, shops, library, day care and a range of housing types are located in the town center. For town employment, there is a business park and a light industrial area near the town center. Low density housing is located at the edges of the neighborhood.

San Diego, California

San Diego is the birthplace of light rail transit in the U.S. It connected San Diego to San Isidro. San Diego had electric trolleys from 1898 to 1949. 2.5 million people made 74 million annual transit trips. San Diego is only 18 miles from Tijuana, Mexico. San Diego also has a great natural harbor which spurs employment and transit usage. Two development boards and SANDAL maintain San Diego ridership: North San Diego County Development Board (NCTD) and Metropolitan Transit Development Board (MTDB) and SANDAG is the San Diego Association of Governments. San Diego has experienced a huge population increase over the last 30 years and had decided that light rail would help curtail automobile congestion. A lot of new businesses are also relocating to San Diego for cost benefits. The idea of light rail transit was to use existing freight rail lines for most of the initial route for light rail transit. The San Diego Trolley is the lowest capital cost project in the U.S. The trolley had a great impact on the city and has created a positive image. The "Coaster" commuter rail service is a weekday commuter train, which is 42 miles long between Oceanside and San Diego. The "Coaster" serves eight stations and six additional stations are being built.

San Diego like all cities experienced a decline in the 1960s and 1970s where businesses, retail, office complexes and hotels moved to the suburbs. San Diego needed to revitalize its urban core so they built the Horton Plaza shopping mall/hotel complex, the Seaport Village shopping/entertainment complex, and the restoration of the historic Gas Lamp district. The are two main transit lines in San Diego: the North-South Line and the East Line.

37 stations are located on the two lines and some are shared. 23 on the North-South Line and 24 on the East Line.

American Plaza Station has bilingual signs, wheelchair lifts, bike racks and a good fare collection system. This is a 565,000 square foot, 29-story office building with trolley, bus, and intercity rail

access. This is the largest office building in San Diego with a good supporting retail base. American Plaza is a 912,000 square foot, $200 million mixed use development with hotels, retail and a museum.

Solana Beach Station replaces the former DelMar station used by Amtrak. Lack of adequate parking and limited space for expansion were the reasons to relocate to a bigger site.

Old Town Station is a combined commuter/light rail facility with parking and easy pedestrian access to this historic district with its various tourist attractions.

All stations except the **Santa Fe Depot** have parking facilities. Stations are well marked and include information on train schedules, local shopping, entertainment, recreational activities and some stations have fast food restaurants inside. San Diego Trolley trains connect with buses at 23 of the 35 light rail stations.

The **San Ysidro Transfer Center** has many intermodal connections. There is one MTS bus route, Greyhound coach service, and taxis.

National City, 24th Street Station has an open, covered station with ticket machines, benches, car parking, sidewalks and bike lockers.

The light rail **C Street Transit Mall** has restricted auto traffic, has good intermodal connections and is close to the Santa Fe Depot and the American Plaza complex. A lot of redevelopment is happening around American Plaza, the Santa Fe Depot is a registered historical monument and an 22-story office complex has recently finished construction which has a rail line running through it.

The **Imperial and 12th Transfer Center** is a good example of air-rights development. MDTB decided to run operations from a pre-owned on-site location. This is a 10-story, 180,000 square foot office building, which is part of the East Line.

The **Oceanside Transportation Center** is a low-cost example of a simple intermodal facility. It serves buses, trains, restaurants and has storage lockers, security and a plaza. It is an attractive, well-maintained facility.

San Diego Transit Villages

La Mesa Village Plaza is a mixed-use development containing residential, retail and office complexes in the area. The development was planned before the light rail transit was designed for this area, but shortly after, a transit stop was included as part of the plans.

Rio Vista West is the first planned transit-oriented development implemented in 1992 by San Diego. The idea was to have high-density housing located close to transit stations, with office complexes and retail shops close by. Rio Vista West is a 90 acre mixed use project. It has 1000 housing units, 165,000 square feet of office space. 325,000 square feet of highway-oriented retail, which includes a 120,000 square foot, discount superstore.

Villages of La Mesa is a 380-apartment complex located close to the La Mesa-Amaya Light rail station.

Other Main Areas

Center City Area is a four square mile area is the heart of San Diego. Through public and private investments it has revitalized downtown San Diego with hotels, retail, offices, restaurants and entertainment. The **C Street Mall** is a part of this development. Low, mid and high rise residential developments have been constructed close to the rail line. This is part of the East Line.
The original plans for the **Santa Fe Depot** have changed but for the better. It was better incorporated as station with private and public interest. There would be hotels, retail, commercial and neighborhoods built up around it and a rail museum built inside the station. This was a good move due to the historic nature of the area. It has connections with Amtrak, Santa Fe, San Diego Trolley and the Commuter rail.

Mission Valley in San Diego was supposed to be an area with convention-oriented hotels, two shopping malls, and mid-rise office buildings. Six developers planned millions of square feet of office complexes, thousands of hotel rooms and high-density housing. The recession of the late 1980s changed those plans and now grocery stores and big-box stores replaced office buildings.

The MTS/Mills building is 180,000 square feet of government office space with ground floor retail and a 1000 car garage.

Bay Area (San Francisco/ Oakland/San Jose)

San Francisco has transit in the forms of: light rail, heavy rail, commuter rail, electric and diesel buses and cable cars. The San Francisco Bay Area is made of up nine counties. The San Francisco urbanized area is San Francisco, Oakland and San Jose with a population of 5,094,535. Some other smaller areas add another 587,876 people to the urbanized area population. Bay Area Rapid Transit (BART), San Mateo County Transit District (Samtrans), Santa Clara Valley Transportation (SCVTD), Golden Gate Bridge, Highway and Transportation District, and the Alameda-Contra Costa Transit District (AC District) all serve the Bay Area. 94% of about six million people live in an urbanized area. BART operates heavy or rapid rail over 80 miles in four counties. SCVTD operates a 20-mile local light rail line in Metropolitan San Jose. Peninsula Joint Powers Board (Caltrain) is a commuter rail 76 miles long. Muni in San Francisco operates two guideway modes: about 28 miles of light rail on six routes and four miles of cable car track.

Greater San Francisco has an overall density of 9.7 dwelling units per gross acre. Commercial uses line many of transit corridors and residential units are infill between the transit corridors. The majority of the residences are within a half a mile of a school or neighborhood businesses. Shopping districts are located in concentrated activity centers throughout the city. The city has many more jobs than housing, so new development takes the form of converting old industrial areas into new office, commercial and residential buildings. San Francisco is connected by many pedestrian bridges so that people may get anywhere in the city that they desire. Travel surveys indicate that there are 1,270 VT (Vehicular Trips) and 5,950 VMT per household per year and 40% auto-driver mode share. BART serves many communities and transfers people from their residences to their place of employment.

BART was constructed between 1964 and 1972. There are plenty of intermodal connections in San Francisco between trains, cable cars, ferryboats and buses. Municipal Railway of San Francisco (Muni) operates in the city/county of San Francisco with a population of 790,000. Muni has six routes with 61 bus routes, 11 trolley bus routes and 14 express bus routes. Three cable car lines are a result of the five line restructuring, which serves 40 stations over 4.5 miles of route. BART/Muni **Embarcadero and Powell Street Stations** are good transfer stations for cable cars. However, no areas have parking lots. Muni connects with BART at Montgomery Street, Civic Center and Balboa Park stations.

Peninsula Joint Powers Board (CalTrain) operates in the three peninsula counties of San Francisco, San Mateo and Santa Clara. CalTrain routes operates on 76.8 miles of track. There are 33 stations on the CalTrain line. CalTrains only direct intermodal rail transit link is with the Santa Clara light rail system. Other intermodal stations are the San Francisco and San Jose-Cahill station. Buses connect with CalTrain at 25 stations.

Bay Area Rapid Transit (BART) operates a 80.6-mile heavy rail route in four counties. There are 37 stations in all and includes 14 subway stations. BART also connects with some bus stations in the East Bay stations. The BART service area is in an X shape. The major transfer points are at Embarcadero, Montgomery Street, Powell Street, Civic Center and Balboa Park. Richmond, El Cerrito del Norte, Concord, Walnut Creek, Oakland Coliseum/Airport and Fremont.

Valley Transportation Authority (VTA) operates bus and light rail in Santa Clara County and San Jose. The light rail is 20 miles long and has bus connections at all 31 stations. A major transfer point is the **Downtown Transit Mall in San Jose**. VTA offers childcare at **Tamien Station** at the rail/bus interchange point in San Jose.

BART/Muni Intermodal Connections

Embarcadero, Montgomery Street, Powell Street and Civic Center stations are bi-level underground facilities. BART occupies the lower level and Muni the upper level. Most stations have

bus service within a couple of blocks. Embarcadero Station also connects to the ferry. **Balboa Park Station** is in the southern part of San Francisco and connects with three Muni lines.

CalTrain/VTA is the only other intermodal connection in the Bay Area. CalTrains commuter line links with VTA's light rail at Tamien in San Jose. Some Urban Rail/Intercity Rail and Non Rail Transit station are:

San Jose Amtrak/CalTrain Cahill Station used to be a bus/rail transfer station before Tamien was created. Amtrak also has a few train routes from here.

Richmond Amtrak/BART Station connects with AC Transit, Golden Gate Transit bus service and intercity Amtrak.

CalTrain 4th and Townsend Station, San Francisco is an intermodal facility for CalTrain and downtown travelers. It is 1.2 miles away from downtown.

CalTrain Station, Palo Alto is a major bus/rail intermodal station with CalTrain commuter rail service linked to Sam Trans, SCVTD, Dubarton Express and Marquerite Shuttle bus service.

CalTrain Station, Redwood City has 11 Sam Transbus routes connect with CalTrain at this station.

BART Station/Hayward provides service to 11 AC Transit, one BART express bus and one SamTrans bus route.

BART Station/Daly City provides service to nine SamTrans and three Muni bus routes

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BART Station/Concord provides service to four BART express and 12 "County Connection" bus routes.

BART Station/El Cerrito del Norte provides service to 12 AC Transit, two BART Express, three Vallejo Transit and one Golden Gate bus lines.

BART Station/ Fremont provides service to 13 AC Transit and four SCVTD bus routes.

BART Station/Oakland Coliseum/Airport provides service to six AC transit bus routes and the Oakland/AirBART bus shuttle to Oakland International Airport.

Amtrak Station/Emeryville provides service to 18 Amtrak trains daily and Amtrak Thruway bus service to the San Francisco Ferry Building and CalTrain, 4th and Townsend Station and one AC transit bus route.

Amtrak Station/Martinez provides service to 18 Amtrak trains, three AC Transit, one WestCat and one BART express bus routes.

There is no direct transit service to the San Francisco International Airport, Oakland International Airport or San Jose International Airport. BART will provide rail service to San Francisco International Airport in 2002, and perhaps to Oakland International Airport in the future. Presently

there is shuttle bus service to San Francisco International Airport and Oakland International Airport.

The **Market Street Corridor** is a two-mile long strip between the ferry building and the civic center BART/Muni Metro station. It is a great intermodal example. There is ferry service, BART/Muni Metro stations, 26 bus and trolley routes, AC transit, SamTrans and Golden Gate transit express bus services. There are also street cars, cable cars, Amtrak and Greyhound buses. Ironically, this was a non-planned intermodal exchange area.

The BART **Concord** and **Walnut Creek** Station Area developments are successful due to neighborhood involvement. There is parking and bus transit access. New land uses are allowing for new business development, office and retail space. There is also medium and high-density housing. There are new sidewalks and people feel safer walking to and from the station.

Upper Market Street, San Francisco, California is at one end is the Castro District, which is a vibrant and diverse neighborhood. Market Street is lined with restaurants, bars, cafes, and shops. It is very similar to NW 23rd Avenue in Portland except that the streets are very wide. In the 1970s, Upper Market was beautified with street lamps, trees, and transit shelters. The BART/Muni subway is constructed underneath Market Street. The Market Street Transit Thoroughfare project combined streetcar access with pedestrian and traffic improvements. Some of which are two 11-foot moving lanes, 10 foot parking lane, six foot wide bicycle lane and a beautiful median. The Castro District is

one of the most successful retail shopping districts in the city. A lot of restaurants moved back into the district after the construction was completed.

In **San Francisco**, residential projects range from 30 units per acre at Del Norte Place to 43 units per acre at Park Regency. **Pleasant Hill** in San Francisco has over 1,600 housing units and 1.5 million square feet of office space. In the San Francisco area, transit-based housing is really a hot idea. Some of the transit stations have over 98% rental occupancy within eight months and most have 30 to 50 units per acre. Most stations are being targeted at the more luxurious crowd over the typical commuters. Some of the developments have retail on the bottom floor and some do not.

The Crossings in Mountain View, California is a tentative plan to locate new housing on a failed shopping plaza site. A new transit stop has also be opened in hopes of forming a transit plaza. High density single family houses (16 units/acre) have been built on this site.

Northeast San Francisco includes Nob, Russian and Telegraph Hills, North Beach and Fisherman's Wharf. Northeast San Francisco has the highest density of all the San Francisco areas. Since the revitalization and build up around transit stations in San Francisco, there has been a lot of infill and densification around BART transit stations. Northeast San Francisco is within easy walking distance of to the downtown business and commercial center. Residents of Northeast San Francisco roughly average 5,500 VMT (Vehicle Miles Traveled) per household per year.

Daly City primarily serves as a residential suburb of San Francisco, although there is some business, employment, and region-serving retail. Overall density for the city is 17 dwelling units per gross acre and single family housing predominates. Some development is mixed-use with retail on the ground floor and apartments up above. In some blocks, a shopping center is located at one end with condominiums at the other. There are two regional malls and several smaller malls located within the city. In Daly City, new development is also in the form of infill, densification or redevelopment. There is more housing than jobs in Daly City, most of the people work in San Francisco, or at the San Francisco Airport. Travel surveys approximate 1,920 VT and 14,500 VMT per HH per year, as well as 59% auto-driver mode share.

Richmond is not a city with much employment so more people live there than work there. In Richmond, new development is also in the form of infill, densification or redevelopment. Overall density is eight dwelling units per gross acre, with denser development located closer to transit stations and corridors. There are about 1,930 VT and 14,540 VMT traveled per HH per year, and 63% auto-driver mode share.

Mill Valley is a residential suburb and, like Richmond, more people live there rather than work there. Most of the people commute to San Francisco or other near by towns. The overall density is two dwelling units per gross acre, with downtown apartment density at 29 dwelling units per gross acre and no mixed use is present. Downtown Mill Valley is where most people shop but it does not employ many people. The city has a lot of open space and encourages infill, densification and redevelopment. People from Mill Valley average about 1,700 VT and 14,150 VMT per HH per year and 60% auto-driver mode share.

Fairfield functions as a residential suburb. Many people work at a local military base, but access between it and residential areas are limited. Density is 1.3 dwelling units per unit acre and is constant throughout the city. Most residences are located more than a mile from the shops, which does not

employ many people at all. Commercial uses are located downtown in suburban style centers . Most development is new because the city is not yet built out. Fairfield has joined other cities and Solano County in adopting a greenbelt plan separating city developments. There roughly 2,500 VT and 19,980 VMT per HH and 72% auto-driver mode share.

Oakland is a social, cultural, business and government center. Oakland's overall density is 4.3 dwelling units per gross acre but is much higher around transit stations. Most residences are within walking distances of commercial areas but are sometimes mixed in between commercial and industrial areas. Oakland is trying to strengthen its city core with the development of City Center, an office-retail complex around a rapid-rail BART station. Oakland is also developing middle-income housing next to City Center and is working to employ residents of the older neighborhoods in industrial areas. Most modern development is in the form of redevelopment, reuse or infill. Unlike San Francisco, Oakland has an even balance of jobs and housing. There are roughly 1,710 VT and 10,770 VMT per HH per year and 55% auto-driver mode share.

San Jose wanted to keep the city core strong so they invoked light rail transit as a way to try to prevent suburban business expansion. This kept the downtown commercial and government area strong. There is now 3.7 million square feet of office space, a new convention center, six new hotels were built between 1980 and 1990. A 20,000-seat arena was opened on the edge of downtown. There is also a new transit mall six blocks long. The Guadalupe Corridor light rail line connects with buses and connects downtown with Silicone Valley. There is also a historic trolley loop on the weekends. There is a definite positive impact of transit in San Jose. Economic housing development in the Santa Clara Valley (next to San Jose) is in extreme demand due to the proximity and success of Silicon Valley.

Transit- oriented development is now in demand along the Tasman Light Rail West Line and there is now a child-care center at **Tamien Station**. There will be high-density housing at the Guadalupe Corridor Light Rail line at the **Almaden** park-and-ride lot. Future plans include the same development at **Chenoweth station** to help promote transit ridership. **Champion Station** now serves 180,000 employees as well as residents of area housing and a mobile home park. Cities are now reclassifying land for residential use. Mountain View, California just switched 40 industrial acres into a site for 520 housing units for development purposes at the **Whisman Light Rail station**.

South Florida (Miami)

The South Florida area being considered is Broward County, Dade County and Palm Beach County. South Florida has four transit agencies: Metro-Dade Transit Agency-Miami-bus, rail and people mover, Broward County Transit-Ft. Lauderdale- bus, Palm Beach County Transportation Authority-West Palm Beach-bus and Tri-County Commuter Rail Authority- a commuter rail in all three counties.

Metro-Dade Transit Agency

The **Metrorail** system opened in 1984 and extends from Okeechobee Station to Dadeland South Station. It has 21 stations about one mile apart.

Tri-Rail service began in 1989 and the Metrorail has parking at 17 of the 21 Metrorail stations. Its closest station in 5.5 miles north of Miami's CBD. The Tri-rail does not serve Miami but the Peoplemover does. The Metromover began service in 1986. **Government Center Station** is the main transfer point to the Metromover system.

Brickell Station is a new transfer station between the Metrorail and the Metromover since it opened in 1994. You do have to walk 150 feet from the Metrorail to the Metromover. The Metromover loop includes nine stations, seven stations serve the inner and outer loop. 12 stations have been added (six to each leg) bringing the total to 21 stations. Transfers to the Metrorail can be made at **Government Center Station** and **Brickell Station**. Every Metrorail station is served by at least one Metrobus route.

The **Omni and Brickell extensions** have two new intermodal Metromover-Metrobus locations. At the Omni location, 16 routes accommodate a new 10 bay off-street bus terminal is next to the Metromover station. At the Brickell Station, the four route Metrobus station has five on-street bays a few feet from the Metromover station. The off-street bus stations have shelters and benches while the on-street stations have neither. The only intermodal link between the Tri-rail and Metrorail is at the **79th Street Station** in Northern Dade County.

Tri-Rail was constructed in 1989 as temporary relief of I-95 traffic during a construction phase. It is a 67-mile route that services from Miami to West Palm with 15 stations. Three more stations have

been added since the original plans: one in West Palm and two in Hollywood. The major intermodal linkage is with the Metrorail at **79th Street**. Tri-Rail also had a dedicated feeder bus service.

Broward County Transit is a fixed route bus system in Ft. Lauderdale and Hollywood. Some of the routes serve Dade and Palm Beach County. The Tri-Rail has a connection on **Route Seven** in Hollywood but none serve the Metrorail.

PalmTran is the public transportation bus service for Palm Beach County. The West Palm Beach/Boca Raton urbanized area contains 775,000 people. No routes served Tri-Rail until the 1996 expansion.

There are a lot of intermodal connections between the three public transportation services in South Florida: commuter rail- heavy rail (Tri-Rail- Metrorail), heavy rail- people mover (Metrorail-Metromover), commuter rail- bus (Tri-Rail- local bus/feeder bus), heavy rail- bus (Metrorail-Metrobus), people mover -bus (Metromover- Metrobus), commuter rail- auto (Tri-Rail parking), heavy rail-auto (Metrorail parking), airport connections throughout South Florida

Metrorail-Metrobus

Each of the 21 stations are served by at least one bus route. The big one here is Government Center with 21 routes.

Metromover-Metrobus

The is little exchange (2%) between the two because the Metromover is already in the Center of Miami.

Tri-Rail-Automobile

15 of the 18 Tri-Rail stations have parking lots for rail passengers. There are 1,738 parking spots but 75% of the spaces are at only two lots: Golden Glades and Cypress Creek.

Metrorail- Automobile

There is parking at 17 of the 21 Metrorail stations. Five stations have covered parking garages and there is a 2,000 space new parking garage at Dadeland North Station.

Airports

Tri-Rail offers bus service to all three airports but new extensions will soon serve the airport with rail access.

Boston, Massachusetts

There are transit stops in the health care district and Boston has developed a big retail center at **Downtown Crossing**. **South Station** revitalized Boston's retail and financial center. South Station serves commuter rails and buses. It is now a safe and very prosperous business center in Boston. There is 14,000 square feet of retail that includes food, gift and service providers. The new **Fleet Center** is a sports arena for basketball and hockey as well as a subway station for the T--a great land-use move. Industry and real estate are taking shape in Boston and the markets are starting to redevelop again. Around South Station, vacancy rates are 27.4% and **North Station** and **Fort Point Channel** are both 24% vacant. Boston has converted the **Charlestown Shipyard** into a mixed-use project with 1,200 housing units, a hotel, two million square feet of commercial, office and research space and a marina.

In **Davis Square** in Somerville, a new Boston T-line bisected the community. It used to be an old rail line passing through town which created a traffic backup whenever a train would come through. This area prospered with community cooperation, additional parking, an improved visual appearance and new development opportunities. Some ideas that were in mind were pedestrian safety, wider sidewalks and roads, bike paths and working with an organization that would reuse the old rail line. There are also new brick pavings, upgraded lighting and is now a great meeting spot. Economically, at first some retail stores became vacant but then were used for real estate offices and beauty salons. In 1993, a new 100,000 square foot office and retail plaza was constructed. The Davis Square Transit Station rejuvenated Somerville and was a catalyst to commercial development. Davis Square is pedestrian-oriented and has no commuter parking for transit users; but there is a new plaza, restaurants and theater.

The Southwest Corridor in Boston was a huge, very complicated project which required a lot of assistance from many communities and organizations. The Southwest Corridor Project had to deal with the relocation of four and a half to five miles of track along the Orange Line. It included four commuter lines and Amtrak inner-city service. There are eight transit stations and three rail stations in this area. This spurred a new community college built along the line and two new high schools, 500

new units of housing and 143 acres of parcel-to-parcel development. This also included a 4.7 mile long, 52 acre-linear park with 20 playgrounds, 16 basketball courts and 90 community gardens.

Once the community recognized that it was not a transportation project but a community development project, they were much more willing to get involved. Mixed development was also a big part of the project making sure to revitalize all parts of the community and realizing that there was a need to have in-place demographics. To insure this an 850,000 square foot office complex, hotel, apartment and parking construction with retail space was developed.

The **Back Bay** in Boston is a late 19th century example of a high density, mixed-use neighborhood located along a rail transit line. Back Bay is positioned with Downtown Boston to the east and Kenmore Square to the West. This development has remained a highly desirable transit- and pedestrian-oriented neighborhood for over a century. Because of drainage problems, it was deemed an 'undesirable' place to live. So the planners of Boston needing to accommodate the growing population by carefully locating major institutions, the construction of attractive public streets, parks and a variety of transit options there.

Back Bay evolved from a horse-car to an electric trolley service area. Retail, office and civic uses primarily occur along Boylston Street. Newberry Street has become a specialty retail center. High density attached townhomes and apartment buildings are evenly distributed throughout the Back Bay neighborhood. Higher density housing occurs at street corners and along Commonwealth Avenue. Back Bay functions as a distinct neighborhood with edges and a concise system of streets, open spaces and housing.

Chicago, Illinois

Chicago has several stations located on the newly rehabilitated Green Line. The **California/Lake Station** has access to two sports arenas and an industrial park. Some potential ideas for the area around the California/lake station are low-cost housing, after that moderate priced housing would then be implemented. **Garfield Boulevard Station** is a poor area today that needs improvement. It needs housing and some aesthetically pleasing sites around it. Union Station is a great home for local businesses after its renovation. **Union Station** is adjacent to many offices, retail and 65,000 people. Chicago has transit that has plans that is will to incorporate hotels, businesses, conventions and activities into their new transit routes.

Lake Forest, Illinois is an affluent community that focuses around the importance of transit use and sews a community together in urban society. If transit is easy and accessible people of all income levels and ages will use it.

Elmhurst, Illinois is a community 15 miles west of Downtown Chicago of 42,000 people, that needed to be revitalized in order to have better efficient use of its transit station. This, in turn, would also benefit the City of Chicago. One improvement was the **Metra Station**, which has been remodeled and now has an ornamental setting of trees, flowers, and a congregational area for people to wait in when expecting the arrival of the train.

Downtown Elmhurst also was beautified by the addition of benches and flowers. Grass and trees were used to shield the view of parking lots from inside some of the new open spaces downtown. A public/private ventureship also spawned a new 90-unit apartment building called Elmhurst Place, which was conveniently located adjacent to the railroad tracks and 9,000 square feet of retail in a city parking structure. The York Theater was also renovated and made into three smaller theaters. A few years after the renovation some new retail moved in next store. To accommodate parking, two parking garages were built downtown. Other new editions in downtown included a historic museum, a 20-unit condominium complex and a 60-unit low income senior housing project.

Burlington Northern Line/Proposed I-355 Station was in 1995, a proposed bus/rail intermodal connection so that people could get into Downtown Chicago quickly. The site was also a soft commercial market and it was decided that it would not be sufficient enough to have a high density

retail establishment, so a parking garage was constructed there instead. It was recommended that the Matra have individual parcels so that build-to-suit parcels could be developed in the future.

Wisconsin Central Line/ Antioch Station is a proposed site, where Antioch is at the end of the Wisconsin Central Line. Antioch has two main areas: the first is a 1950s vintage strip and a grocery store and the second is two other "small downtown" streets. This area has the potential to grow from all the people coming in from Wisconsin, but Antioch has been classified as an "old timer" place. Future plans include linking of the resident-oriented transit development area downtown. The goal is to have retail that is pedestrian-friendly and make people want to come there and enjoy their time while in Antioch.

Rock Island Line/Brainard Station is a stop on Chicago's south side on the Rock Island Commuter line. It is an African-American middle-class community that hopes to be transformed into a transit-oriented community. The community wants to shrink the commercial area to less than half the present level and would also like to add a library to the area as well. The major shopping areas are along 87th Street and along Ashland. The community would also like to have traditional single family homes in this area.

The **Riverside** community in Chicago, Illinois is a low density, primarily residential neighborhood oriented towards transit. Riverside is a complex system of curvilinear streets and that was much different from the grid style of the current era. It was one of the earlier attempts to attract residents to the suburbs on a large scale. Riverside is a 1,600-acre site located on the Des Plaines River, nine miles west of the employment center of Chicago. Riverside has a town center with a railroad station, hotel, commercial and institutional buildings and high-density residences. All of the curvilinear streets lead to the railroad station with nice sidewalks. Open space is very accessible from the streets as a series of smaller parks and linear green space. A large park area along the Des Plaines River and a recreation area provides the open space for Riverside. Riverside is mostly made up of single family homes. There are offices, retail, and higher density residences as you get closer to the transit station.

St. Louis, Missouri

In St. Louis, Wellston, Delmar and East Riverfront Stations are currently undergoing changes. **Wellston Station** has the potential for 825,000 square feet of industrial operations in a pre-existing park. The Wellston Metrolink is prospering due to people and economic activity, hopefully it will spread to mixed-use commercial, industrial and housing area, which could also support some retail. **Delmar Station** currently has office plazas and would really be receptive to some landscaping and a transit mall. Some suggestions are a 80,000 square foot convenience center, parking and housing area. **East Riverfront** has created a whole new image for itself. It has potential for a waterfront entertainment center including a gambling boat, entertainment, retail, hotels and nature oriented activities.

Dallas, Texas

A new mixed-use project is being built next to Dallas Area Rapid Transit's (DART) **Mockingbird Station**. It will contain retail, restaurants, 500,000 square feet of office space and a

convention center is planned for the future as well as expanded retail and hotels.

Denver, Colorado

The first light rail transit in **Denver** is a 5.3-mile central corridor project. It entails a 640 space park-and-ride lot, a major shopping center, a higher education campus for three colleges and the 16th Street Transit Mall in the central business district.

Lac Amora is a neighborhood in Broomfield, Colorado, in the northern part of the Denver metropolitan area. It is bounded on the south and west by the Burlington Northern Railroad. It includes a residential subdivision, an industrial employment area and a commercial strip of retail shops, restaurants and auto-oriented services. There are no complete sidewalks in this area. There are roads which break up the streets and lead to industrial and commercial employment centers.

There have been about 1,000 dwelling units built in Lac Amora and two-thirds of them are single-family homes. The rest are a mixture of apartments and townhomes. The resident population is about 2,600 (1995) and has 260 acres with a gross density of 2.8 units per acre. Employment in the commercial and industrial area is 7,000 people. There is about 3.7 million square feet of commercial and industrial space built in Lac Amora. It is expected that infill and development will continue in non-residential areas. There is a park-and-ride in the development since most people commute to work.

Las Vegas, Nevada

Las Vegas is becoming a very popular spot for tourists and businesses. A $25 million project has been completed on an experimental monorail for the MGM Grand Hotel & Theme Park. It can transport 4,000 people per hour along a 3.5-mile loop and it's free. It has no direct access to the airport but could be the start of something big for Las Vegas.

Memphis, Tennessee

Memphis is going to build a pyramid along the Mississippi River with the same hopes that it will do for Memphis what the infamous arch did for St. Louis. There will be a 22,000-seat convention center inside the pyramid. Along with this new development comes tourism, new demand for office space,

hotels, retail and a trolley line. There is presently a theme park near downtown Memphis, but it is losing money year after year. Memphis also hopes to draw the American Music Awards Hall of Fame, National College Football Hall of Fame and a Hard Rock Cafe in the future.

New York, New York

The New York/New Jersey area has decided to renovate its subway system. This is going to improve the transit police, signaling, architecture and will include retail to help boost station area profits. They are trying to get rid of the homeless people from sleeping in the transit stations and will be removing graffiti. They are also trying to get the forty-odd types of businesses to move back to the subway stations. If new companies encourage transit, workers get fare cuts and employers get tax breaks.

Columbus Circle Market is a subway station plaza in New York City. New economic development opportunities are present in the plaza. Safety and cleanliness can raise transit numbers and lower people fears. New York City hopes to have a station manger at each of the 469 stations.

Forest Hills Gardens in New York is an early 20th century medium density, primarily residential neighborhood located in Queens. It is located 15 minutes by rail from Manhattan. Forest Hills Gardens follows the Garden City example from the Hampstead Garden Suburb. It is a sequentially organized neighborhood based on a continuous line of movement from the railroad station to Forest Park. The Russell Sage foundation wanted the appearance of the country but still within commuting distance of New York's employment centers. This was done by the arrangement of streets, structures and open spaces. Three principals guided this development: the first was that the main throughfares should be direct, ample and convenient. Second, all other roads must be quiet, attractive residential streets. The final principal was that the entire neighborhood should be organized around smaller units with quiet streets and small-scale public open spaces.

The combined train station and subway stop establish the main center. The main civic open space, is carefully defined by buildings, located at the transit station. An elementary school and tennis club are also located within the boundaries of this garden suburb. Hotels, retail, civic/institutional, and residential uses are located within Forest Hills Gardens. The highest densities are located around the transit station. The irregular blocks, uniform landscaping, housing types, architectural character and station square separate Forest Hills from the surrounding areas of Queens.

Buffalo, New York

Buffalo is seeking federal funds for a new rail station. If successful, they will abandon the current one and build a new station close to the **Crossroads Sports Arena** and **Inner Harbor** development. This would also transform Lower Main Street into a prime recreational, commercial and tourist area. The former home of the Buffalo Sabers hockey team, **Memorial Stadium**, will become an aquarium, research center, large film format theater and a planetarium. In Buffalo, the new rail system has helped convert Buffalo from a declining manufacturing and port city to a service-oriented city.

Northern New Jersey

Woodbridge Station in New Jersey created and developed a sense of place for a town where people could gather together and relax before work. Woodbridge Station is at a major highway intersection. People wanted to feel safe and clean, they wanted either a coffee shop or newspaper shop in the station. Ask the people what they want and then they will patronize your establishment. Some of the communities have commuting vans that bring people to and from the rail station, which will reduce park-and-ride and congestion. This is a very good and popular idea.

Four other stations that were studied included **Bradley Beach**, a tourist location, **Maplewood**, a suburban station in a residential/business district, **Netherwood**, a historic station in a depressed urban center and **Rahway**, a station with a high volume of passenger usage.

The North Shore of New Jersey is a changing place due to new ferry and bus service. In 1994, about 500,000 square feet of office space was leased at the **Jersey City Waterfront** at Exchange Place and the Newport office towers. There has also been some new retail activity at the Newport Mall. Also, several new large stores opened up on the Avenue of the Americas near the **14th Street Station** and the **23rd Street Station**.

Plans are in the works for the **Meadowlands** for a $850 million sports-theme complex, a business/retail and entertainment center as well as a regional transportation hub. There is 1.4 million new square feet of space for a passenger rail station, a 600-room hotel and 100,000 square feet of office space. There will also be an elevated passenger rail station to accompany the proposed Secaucus transfer station.

In 1992, the state agreed with Allied Junction Corporation to operate a 50,000 square foot rail station at the **Secaucus/Allied Junction**. This station would link together a great part of Northern New Jersey. Allied realized that they had a great potential for land development and wanted to build office complexes. Some 70,000 commuters are expected to use this station throughout the day. Amtrak also serves this station and they are working on a new signal detection system that will allow for an increase in departing trains from 18 to 30 per hour. There are plans for four, 20 to 40-story office towers (3 million square feet), a 600-room hotel and conference center, 115,000 square feet of retail and 4,400 parking spaces. It will be a $1 billion project on 28 acres.

Seattle, Washington

Retail development is being encouraged at the new **Tacoma Dome Station**. Current plans have 74 stores waiting to move in. Seattle express riders will also have a new six level 1,200 space parking garage. It will be added value for the passengers and will provide an economic boost to the community. There is also a Freighthouse Square shopping center nearby and there are hopes that the many closed warehouses and businesses will reopen. This new station will have bus connections and will connect to the Seattle-Tacoma airport.

Washington, D.C./VA/Maryland area

Washington, D.C. has more edge cites than any other city in America, 16 to be exact. The most notable are **Tyson's Square** and the **Rosslyn/Ballston** area. Tyson's Corner has 5,000,000 square feet of office space and over 600,000 square feet of retail. Tyson's Corner sponsors KRS Associates of Reston for development advice. KRS is calling for development at transit stops. It is thought they will recommend three new rail routes. One to the east- West Falls Church Metro Station, one to the west connecting Tyson's Corner to the Dulles-Washington, D.C. to the west, and another could be to Bethesda. Also, three new 100- acre complexes each with up to 10 million square feet of office space and up to 5,000 dwelling units. The Metro in Washington, D.C. definitely has an influence on pulling companies out of the expensive inner-city and to the cheaper office leases in the suburbs. At Lincoln Towers in Washington D.C.'s **Ballston Station** there are two-22 story towers for residences and 2,471 residential units and 3.7 million square feet of office space within a third of a mile- all built since 1984. In Ballston, city planning and zoning ordinances really encourage transit station area growth.

The Ballston Metro Center is a mixed-use retail, commercial, housing, hotel, bus and rail station. The bus and rail station is underneath a huge 26-story building. It has 135 apartment units per acre, 136 to 210 units per acre for hotels and up to 1.9 million square feet of office space, contingent of at least 1,700 new unit dwellings there. These are some of the deals that have happened to expand this area. There has been a lot of build up of other transit-related offices and retail.

WMATA in Washington, D.C. is encouraging joint station area development. Joint development means development of land owned or controlled by the authority, at or near Metrorail stations, often under long-term leases. Two stations that have been proposed are **King Street Metrorail Station** and **Van Dorn Street Metrorail Station**. The King Street Station is a residential project with 160 dwellings and 17,500 square feet of retail. The Van Dorn Street Station would have 340 multi-family units with some retail and a new 410 space parking garage. **Grand Union station** is a very active station with subway and light rail and has turned into a huge retail market place. **Metro Grove Station** incorporated a childcare station facility in the station, which will help attract new users. In Washington, D.C. since Rosslyn station opened up with a direct line to National Airport, there have been 2,500 residential units and eight million square feet of office space built.

Chevy Chase Village is a trolley-oriented neighborhood from 1892 with several stops along a main street. The initial phase of development required the construction of Connecticut Avenue and a trolley line for about five miles to be able to be connected to Washington, D.C. The neighborhood center revolves around Chevy Chase Circle and the trolley station. There are mostly single-family detached homes in this area. Commercial uses were specifically included and a town hall and library are also part of the development.

RF&P Corporation of Richmond is going to pay for a new subway station at **Potomac Yard**, south of Washington National Airport in Virginia. The station will be at the junction of two Metro lines and will be part of a 342-acre development that includes 5,000 housing units, 500,000 square feet of retail and several mid-rise office buildings. It will also link with Amtrak, commuter rail lines, bus lines, pedestrian and bike trails.

Arlington County, Virginia

Arlington County is an urban county located across the Potomac River from Washington, DC. Arlington has maintained their high-quality residential neighborhoods while supporting well-managed

growth. The areas central location in the Washington metropolitan area, its ease of access by car and Metrorail, and the high-quality labor force have attracted an increasingly varied residential and employment mix, which is good for the area. Arlington County has focused high-density commercial and residential development around Metrorail stations in the Rosslyn-Ballston Corridor and in the Jefferson Corridor, which includes Pentagon City and Crystal City. Arlington is an employment and residential center and had a 1993 population of 180,100. In the last 10 years, the office market has generated 15.5 million square feet of new space, bringing the total of office/commercial space to 31.4 million square feet.

There are two corridors in Arlington, Virginia: the Rosslyn-Ballston (RB) and Jefferson Davis (JD). With regard to commercial development: 95% of more than 30 million square feet of office space in the County is within walking distance of metro stations; as well as 100% of hotel rooms.

In twelve years of residential development (1980-1991): out of the 13,207 new units built, 8,908 were built in Metro corridors; 88% of all new units built in the two metro corridors were mid-or high-rise projects; and all of the 2,499 built in the JD Corridor were high-rise units.

Carlyle is a contemporary example of a high density, mixed-use development located next to the King Street Metro Station. Carlyle is an 86-acre site in Arlington, Virginia presently located by rail yards and industrial buildings. The scale of the neighborhood is based on a quarter mile walking distance to transit. Carlyle has been defined as an "urban quarter" which means that it has historic and baroque city scape concepts, a legible pattern of streets, axial views and enclosed circles courtyards and plazas. There are two Metro stations located within walking distance of all portions of Carlyle. The use of transit and car pooling are very encouraged in this community. Five open spaces serve as centers of pedestrian activity. This high-density neighborhood has a balance of housing, retail and office space. There is also a federal court house, a hotel, day care, theater and under-ground parking. There is also retail on the bottom floor of some of the rental units.

Montgomery County, Maryland

Montgomery County is a mixture of urban, suburban and agricultural uses with approximately 750,000 people. Montgomery County is encouraging development along the urban ring of development adjacent to Washington, DC along the I-270 corridor. The county is encouraging new

transit-oriented development, but is disappointed in the fact that the increase of new housing is only 8% within walking distance of a transit station

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Dupont Circle in Washington, DC after receiving a Metro stop is in a great position to be assured mixed-use housing. The average density housing of the Victorian townhouses is 10 to 14 units per acre. These houses have been subdivided to range from efficiencies to 4-5 bedroom homes, while the densities ranged from 22-40 units per acre. Few apartments buildings are taller than five stories and there is a lot of open green space. Activities around the circle include offices, retail, embassies, hotels, groceries, cinemas and private clubs.

Cleveland Park is an old streetcar suburb just outside of Washington, DC. Cleveland Park is a mixed-use community, containing shops, offices and apartment buildings along Connecticut Avenue and single family homes on side streets. Densities of this area range from six to eight units per acre-just north of Connecticut Avenue densities range from 40 to 60 units per acre.

Ellicott City, Maryland is an old mill town and site of the first passenger railroad stop in the U.S. A restoration effort has revived the town shops, restaurants, services and government sector jobs as well as single family houses and loft-style apartments. The demographics could easily support a rail stop but unfortunately there is no longer rail service in this area. There are tracks leading straight to Baltimore but the potential for a stop does exist.

The **Bethesda Central Business District's (CBD)** latest master plan was developed by the Montgomery County Planning Department and the plan was approved in 1994. This CBD has been the site of substantial recent development spurred by the presence of a Metrorail station and a strong office, retail and residential market. There is also a vibrant mixed-use activity center. The pedestrian-oriented nature of Bethesda is a benefit for those who work, live and visit Bethesda. Some specifications concerning the development of the Bethesda CBD is that it covers 405 acres and has 7,000,000 square feet of existing office space and 2,300,000 square feet of existing retail space. There are 39,000 existing jobs with the potential employment of 45,000 jobs. Housing presently has 5,000 units with the potential for 7,300 units.

The NOAA in the Silver Spring CBD covers 268 acres in the southern portion of Montgomery County, and the plan was approved in 1993. Within the CBD there is a potential for approximately three million square feet of commercial development and for 5,600 dwelling units. Transit service is

provided at the Silver Spring Metro station. A new Silver Spring MARC station will be located adjacent to the Metro station to form the Silver Spring Transit Center. The bus transfer facility adjacent to the Metro station is planned to be enlarged. The planned station of the Georgetown Branch Transitway is also to be located at the Transit Center.

The National Oceanographic and Atmospheric Administration (**NOAA**) is located immediately south of the Metro/CSX/AMTRAK tracks adjacent to the Silver Spring Transit Center. The NOAA development area will have a total of five phases with 1,200,000 square feet of office space, 30,000 square feet of retail and 200 apartments.

Rock Spring Centre will be one of the East Coasts premier office parks in Rock Spring Park. Rock Spring Park is bounded by the two spurs of I-270, Democracy Boulevard and Old Georgetown Road. The North Bethesda-Garrett Park Master Plan contains several ideas to improve the functional quality of this important area. This area will be served by the North Bethesda Transitway. This elevated transitway will extend between the Grosvenor Metro station across Rock Spring park to the Montgomery Mall. Rock Spring Center is a proposed mixed-use center that will enliven this important area. By combining the vibrant retail area, multi-family dwellings, office space with civic and institutional uses; this project will establish a transit-supportive center. Rock Spring Centre is 54 acres, and has the potential office space of 830,000 to 900,000 square feet. The potential retail space is 150,000 square feet and potential housing is 1,250 units. There will also be a community center, institutional buildings (places of worship), and a theater or cinema.

The **Shady Grove area** cannot underestimate the potential of future transit service. The master plan designates that there will be three separate transitways as well as regional bus routes. In areas where there are lower intensity employment uses are recommended, the master plan suggests that there will be more buildings built toward bus routes. The land use design concepts are based on traditional neighborhood concepts. Housing, employment, services, retail, and public spaces are integrated at the neighborhood level and are tied together by transitways (rail or bus), streets, bikeways and sidewalks. There will be a potential total of 10,900 housing units and potential office buildings of 24,850,000 square feet and 84,300 jobs.

Transportation Demand Management was incorporated into the new **Rockville Center** in Maryland. By locating a new office complex adjacent to a transit station, it was decided that it would encourage employees to use public transportation; thus not encouraging any more congestion. This philosophy

increased the size of an office/retail project from 450,000 to 825,000 square feet. This region is served by the Metrorail system and by MARC-Maryland commuter rail system.

The master plan for **Courthouse Square in Rockville Town Center's** was approved in 1993. The vision of the master plan is for it to be a "focal point of civic, social, business and government activity where people live, work and participate in entertainment and community activities" and it will be pedestrian-oriented. The proposal is to replace a regional shopping mall which has closed with mixed-use development with traditional design concepts of grid streets and street level retail. There will also be a retail on both sides of a pedestrian plaza. The size of this development will be 8.4 acres, 1,275,000 square feet of potential office space, 192,000 square feet of potential retail space and 117 housing units.

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GLOSSARY

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Activity Centers: Any site that attracts a large number of trips. Activity centers can include major employment centers, commercial districts or malls, transportation hubs and educational institutions.

Arterial Street: A major street (typically with four lanes) that carries traffic to and from collector and local streets to a freeway.

Bus Transfer Station: A transfer station at which passengers transfer from bus to bus (e.g., local line to feeder line, feeder line to trunk line).

Core Commercial Area: A mixed-use commercial area located immediately adjacent to a transit stop containing convenience retail uses, offices, and public uses such as a community center, post office, library, and civic services.

Densification: The practice of developing properties at higher densities than existing properties.

Express Bus Service: Bus service that runs directly between its origin and its destination with few stops.

Feeder Bus Line Network: Network of bus routes providing service to light rail stops or bus transfer stations on the trunk line network.

Gridded Street Pattern: A network of road and streets that are organized in a grid shape (parallel and perpendicular). There are no cul-de-sacs or dead-end streets.

HH (Household): A group of people who live in a single- family dwelling or residence.

Infill Area: An area containing one or more vacant parcels surrounded by urban development.

Jobs/Housing Balance: A community has a jobs/housing balance if the number of jobs and the number of residents are about equal.

Light Rail Stop: Any place where a light rail train stops to pick up or drop off passengers.

Local Street: A small street that carries only local traffic through neighborhoods.

Local Transit Center: A bus stop or a bus transfer station located on the feeder bus line network within a Neighborhood TOD.

Mixed-Use Development: A design approach that fosters integration of compatible land uses, such as shops, offices, and housing and encourages them to locate closer together, or in the same building to decrease travel distance.

Neighborhood TOD: A TOD emphasizing residential and local-serving retail uses that is located on a feeder bus line.

Non-TOD Uses: Uses which reply extensively upon automobile or truck transportation for their business (e.g., heavy industrial uses, warehousing, distribution facilities, and freeway commercial complexes).

Reuse Area: An area containing underutilized retail, office or industrial sites.

Revitalization Area: An urbanized area in which the land is underutilized and/or the existing development is significantly deteriorated.

Secondary Area: An area which contains housing, office or industrial uses that is adjacent to a TOD and is located within one mile of a TOD transit stop.

Thoroughfare: A major street (typically with six to eight lanes) designed to carry high traffic volumes.

Transfer Station: A transit stop at which passengers can change transportation modes (e.g., from bus to light rail, from feeder line bus to trunk line bus, or from local bus to feeder line bus).

Transit-Oriented Development (TOD): A mixed-use community or neighborhood designed to encourage transit use and pedestrian activity.

Trunk Line Network: The major elements in RT's express regional transit system. Trunk lines are generally light rail lines, but may also be streets with high frequency express bus service running at 10 to 15 minute headways at night and on weekends.

Urban Growth Area: An essentially undeveloped area identified for urbanization that is located on the periphery of the developed portion of the county.

Urban Service Area: The area within which the County expects all of its ultimate urban growth to occur.

Urban TOD: A TOD that is located directly on the trunk line network at a light rail stop or a bus transfer station. Urban TODs have higher commercial intensities and residential densities and a higher percentage of job-generating uses.

VMT (Vehicle Miles Traveled): The product of the number of vehicles at any given location or throughout a roadway network multiplied by the number of miles each vehicle travels between its origin and destination.

VT (Vehicle Trip): A one-way movement of a vehicle between two points.