

TRANSIT COOPERATIVE RESEARCH PROGRAM

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TCRP Synthesis 20

Transit-Focused Development

A Synthesis of Transit Practice

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Synthesis of Transit Practice 20

Transit-Focused Development

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TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213--Research for Public Transit: New Directions*, published in 1987 and based on a study sponsored by the Federal Transit Administration (FTA). A report by the American Public Transit Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of vice configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, the National Academy of Sciences, acting through the Transportation Research Board (TRB), and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at anytime. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects. As part of the evaluation, the TOPS Committee defines funding levels and expected products.

Once selected, each project is assigned to an expert panel, appointed by the Transportation Research Board. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, TCRP project panels serve voluntarily without compensation.

Because research cannot have the desired impact if products fail to reach the intended audience, special emphasis is placed on disseminating TCRP results to the intended end-users of the research: transit agencies, service providers, and suppliers. TRB provides a series of research reports, syntheses of transit practice, and other supporting material developed by TCRP research. APTA will arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by urban and rural transit industry practitioners.

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. TCRP results support and complement other ongoing transit research and training programs.

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NOTICE

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The members of the technical advisory panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the Transportation Research Board, the Transit Development Corporation, the National Research Council, or the Federal Transit Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical panel according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

Special Notice

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PREFACE

A vast storehouse of information exists on many subjects of concern to the transit industry. This information has resulted from research and from the successful application of solutions to problems by individuals or organizations. There is a continuing need to provide a systematic means for compiling this information and making it available to the entire transit community in a usable format. The Transit Cooperative Research Program includes a synthesis series designed to search for and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in subject areas of concern to the transit industry.

This synthesis series reports on various practices, making specific recommendations where appropriate but without the detailed directions usually found in handbooks or design manuals. Nonetheless, these documents can serve similar purposes, for each is a compendium of the best knowledge available on those measures found to be successful in resolving specific problems. The extent to which these reports are useful will be tempered by the user's knowledge and experience in the particular problem area.

FOREWORD

*By Staff
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This synthesis will be of interest to transit agency general managers, their planning, operations, and other development-oriented staffs, as well as to various stakeholders in the community development process. It offers information on a variety of municipalities' and transit agencies' attitudes toward the built environment around rail stations. Policy and implementation issues, completed and unimplemented projects are discussed.

Administrators, practitioners, and researchers are continually faced with issues or problems on which there is much information, either in the form of reports or in terms of undocumented experience and practice. Unfortunately, this information often is scattered or not readily available in the literature, and, as a consequence, in seeking solutions, full information on what has been learned about an issue or problem is not assembled. Costly research findings may go unused, valuable experience may be overlooked, and full consideration may not be given to the available methods of solving or alleviating the issue or problem. In an effort to correct this situation, the Transit Cooperative Research Program (TCRP) Synthesis Project, carried out by the Transportation Research Board as the research agency, has the objective of reporting on common transit issues and problems and synthesizing available information. The synthesis reports from this endeavor constitute a TCRP publication series in which various forms of relevant information are assembled into single, concise documents pertaining to a specific problem or closely related issues.

This report of the Transportation Research Board describes public policy and action frameworks used to support transit-focused development. It illustrates some key ingredients to effect positive change in the built environment.

To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, available information was assembled from numerous sources, including a number of public transportation agencies. A topic panel of experts in the subject

area was established to guide the researchers in organizing and evaluating the collected data, and to review the final synthesis report.

This synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that now at hand.

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Valuable assistance in the preparation of this synthesis was provided by the Topic Panel, consisting of G.B. ARRINGTON, Director, Strategic and long-range Planning, Tri-County Metropolitan Transportation District of Oregon, Portland, Oregon; Elizabeth A. Deakin, Associate Professor, University of California, Berkeley; Robert T. Dunphy, Senior Research Director, The Urban Land Institute, Washington, D.C.; Michael Goodale, Manager of Provincial Planning, Ontario Ministry of Transportation, Downsview, Ontario; Alvin R. McNeal, Manager of Joint Development, Washington Metropolitan Area Transit Authority, Washington, D.C.; James Scott, Transportation Planner, Transportation Research Board; Washington, D.C.; Effie S. Stallsmith, Transportation

Management Specialist, Federal Transit Administration, Washington, D.C.; and Darwin G. Stuart, Manager, Planning & Research, Chicago Transit Authority; Chicago, Illinois.

The Principal Investigators responsible for the conduct of the synthesis were Sally D. Liff, Manager, Synthesis Studies, and Donna L. Vlasak, Senior Program Officer. This synthesis was edited by Linda S. Mason.

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TRANSIT-FOCUSED DEVELOPMENT

SUMMARY

The wave of rail transit construction in recent decades has renewed interest in developing transit related land-use patterns in American cities and suburbs. This synthesis describes the public policy and action frameworks that have evolved to support transit-focused development and examines the development that has occurred in station areas in 19 cities and transit agencies.

Transit-focused development can be described as development, generally within half a mile of rail transit stations, that provides sufficient densities and mixes of activities and convenient pedestrian linkages to support significant transit ridership. Focusing development in proximity to transit stations can create interesting and functional urban centers, diminish environmentally damaging urban sprawl, and play a major role in realizing regional development strategies.

Many older cities sustaining rapid growth from the mid 19th century onward developed in conjunction with the invention and spread of rail transit. Development patterns of the older parts of cities like Boston, New York, Philadelphia, and Cleveland are closely integrated with transit service. However, development around transit stations since World War II has been markedly successful in certain areas and not so in others.

Transit-focused development generally occurs under three conditions:

- When stations are located in prime regional and community nodes of activity attractive to typical market forces;
- When the regional and local real estate market is active; and
- When public policies and regulations permit or encourage intensive development in station areas.

Substantial amounts of transit-focused development have occurred where transit routes were designed to serve growing downtown, midtown, and suburban locations previously defined as expanding centers of business and residential activity (as in Atlanta; Miami; Portland, Oregon; San Francisco; Toronto; Vancouver; and Washington, D.C.). When bolstered by booming real estate markets and supportive government actions, transit-focused development has been robust.

When development focuses on areas in which stations are located, governmental action can help promote station-area development. Many regional agencies, local governments, and transit agencies have provided supportive policy frameworks for transit-focused development. In areas attracting development interest, local governments have adopted public programs and regulations that permit an intensively built mix of activities around stations, promote transit-friendly design, and control provision of parking to generate transit usage. Cleveland's Tower City Center, a joint developer/transit/government project, created a 360,000 square foot regional mixed-use center (transit, retail, office, hotel) around restored city landmarks, including its 1920s rail terminal; its success demonstrates the achievements possible. Other public actions have supported development through infrastructure improvements, public facility siting, and public/private ventures, including joint development above or adjoining stations. In station areas where developer interest is lacking, public actions can underwrite redevelopment costs and improve accessibility to and the appearance of the station.

The change in the character of transit-focused development does not diminish its role in establishing mutually supportive land use and transportation patterns. Today's light-rail systems are likely to be constructed on existing streets and railroad rights-of-way; they do not attract the same large-scale mixed-use complexes that were frequently developed in the 1980s around heavy-rail systems. Designed to carry commuting workers to and from centralized employment locations, heavy-rail systems were developed for more urban environments. Today's transit-focused development will continue to benefit from positive public policy frameworks and from specific public/private and joint development actions that support private development. Programs in Chicago and New Jersey illustrate that redevelopment efforts around stations can renew the life of older neighborhoods and community business centers.

Transit extensions into suburban communities can provide opportunities for station-area development as part of community business district revitalization efforts, as several examples in this synthesis demonstrate. Small-scale infill residential projects can build densities and ridership along light-rail lines, as demonstrated in Portland, Oregon. In some areas, it may be possible to retrofit built-up or partly developed neighborhoods to support transit service.

For these efforts to succeed, continued public support in the form of positive policies, regulatory and financial incentives, and action programs is a necessary correlate to market forces. Much of this activity will be focused on negotiation procedures, types of financial assistance, and specific design concerns. Successful transit-focused development will also require the forging of improved relationships among regional agencies, local governments, and transit agencies, all of which play important roles in supporting such development.

The examples of transit-focused development described in this synthesis illustrate that the key ingredients to success, aside from an active market for development, include (1) station-area development designed with features known to enhance transit patronage; (2) regional planning that integrates metropolitan development with provision of transit service; (3) station location decisions that take into account potential local and regional market factors; (4) energetic, positive efforts by local governments to permit and promote development around stations; and (5) the willingness of transit agencies to coordinate station development and operation with development activities in the surrounding area.

CHAPTER ONE

INTRODUCTION

Transit agencies and public officials are increasingly promoting concepts for transit-focused development of commercial and residential land uses. By encouraging concentrations of development around transit lines and stations, transit agencies hope to stimulate ridership and raise system revenues. Public officials also support transit-focused development as a means of corraling development forces and reducing dependence on automobile travel to enhance community livability and air quality.

Since the 1960s, rail transit systems have been planned and built in many of the nation's growing metropolitan areas. In the process, state, regional, and local agencies have been examining possibilities for encouraging development that can take advantage of the mobility afforded by transit systems and provide positive support for transit service simultaneously. Particularly over the past decade, their interests have prompted adoption of policies and programs intended to link development geographically and physically to the availability of rail and bus service.

PURPOSE AND SCOPE OF WORK

This synthesis describes planning and implementation processes leading to development at and near transit stations. It is based on a summary of research and on 19 agency profiles which are found in Appendix A.

Several aspects of the processes are examined:

- The extent and character of development at or around rail transit stations, with some examples of similar developments at bus transfer stations or other multi-modal centers;

- The benefits of transit-focused development, potential obstacles to be overcome, and recommended procedures for achieving it, based on the research findings;

- Policy and planning contexts adopted by transit agencies, metropolitan planning organizations, and local governments to encourage transit-focused development are identified and evaluated;

- Specific elements of a given project, such as the process generating the projects; the roles of the stakeholders, including the institutional setting, the community, the developers, and the landowners; characteristics of the developments, including financing arrangements; and the benefits achieved (both successful and unsuccessful projects are examined);

- Findings and conclusions concerning the conditions conducive to transit-focused development and the tools that public agencies can use to encourage it.

ORGANIZATION

Information in chapter 2 provides a perspective for the transit/land-use connection by placing it in historical context with background influences. Chapter 3 reviews the body of research on the effects of transit and land-use interaction. Governmental policies and actions to support transit-focused development are examined in chapter 4. Chapter 5 provides case studies of station area development projects by four transit agencies. Profiles of transit agencies in 19 regions of the United States and Canada were conducted for this synthesis, and the conclusions drawn from analysis of that work are presented in chapter 6. The profiles are provided in Appendix A.

CHAPTER TWO

BACKGROUND**THE TRANSIT/LAND-USE CONNECTION**

From the mid 1800s to the early 1900s, a number of eastern and midwestern cities developed in parallel with the invention and expansion of rail transit systems; the cities' growth patterns are closely integrated with the availability of transit.

The first explicitly transit-supportive developments in the United States were suburban projects built in the late 19th century along streetcar lines. Often the developers themselves paid for extensions of electric railways to promote their pleasant, secure neighborhoods where residents were within walking distance of transit stations. (1)

Challenged by the tremendous flexibility of travel offered by automobiles, rail and bus transit has steadily lost ground as the chosen means of movement throughout our metropolitan regions. In many cities, rail transit lines were ripped up and rail service abandoned.

Since the 1920s, and increasingly since World War II, the locational freedom offered by automobiles has allowed development to spread out in patterns unsuited for service by rail transit. The steady decline of metropolitan development densities in the last half of the 20th century has been paralleled by decreasing use of bus and rail lines.

Reintroduction of Rail Transit in Metropolitan Development

Interest in urban rail transit revived in the 1950s, propelled by the immense population growth and geographic expansion of metropolitan centers in North America. As summarized in Table 1, by the mid 1990s, rail service was available, under construction, or being planned for more than two dozen metropolitan areas in North America.

The renewed impulse to invest in rail transit came from several sources. Urban planners, environmentalists, and public officials had growing concerns about low-density patterns of metropolitan development and about the related costs in land resources, environmental risks, and tax dollars. Urban development specialists saw a widening social and economic gap between inner and outer sectors of urban regions, as well as the fatal decline of central cities and downtown areas.

In response to these concerns, public decision makers advocated greater use of public transit, combined with more intensive development that would encourage its use. Urban planners have developed design concepts to address these concerns.

TABLE 1

GENERATIONS OF RAIL TRANSIT SYSTEMS

Generation	City or Region (Year Operations Initiated)
Simultaneous city/transit development, continuous since the mid 1800s, including modern extensions:	Boston Chicago Cleveland New York Philadelphia
Mid 1950s to mid 1970s major nationwide systems:	Toronto (1954) San Francisco (1973) Washington, D.C. (1976)
The Third Wave, late 1970s through 1980s:	Atlanta (1979) San Diego (1981) Miami (1984) Buffalo (1985) Pittsburgh (1985) Portland (1986) Vancouver (1986) Baltimore Metro (1987)
New systems: the 1990s	Los Angeles (1990) Sacramento (1990) San Jose (1991) Baltimore LRT (1992) Detroit (1993) St. Louis (1993) Denver (1994) Dallas (1996)

CHARACTERISTICS OF TRANSIT-FOCUSED DEVELOPMENT

Researchers observe that transit-focused development is characterized by the following patterns of transit-supportive land use:

- At the regional scale, concentrations of residential uses with convenient transit connections to concentrations of employment uses;
- Around transit stations, concentrations of development that put many residents and employees within walking distance of stations (generally less than a half mile);
- Within these concentrations
 - mixes of uses that can satisfy daily needs by walking between uses, making use of transit more convenient;
 - building designs and pedestrian pathway systems that provide convenient and attractive access to and from stations;
 - reduction in the amount of free parking, thus increasing the incentive to use transit.

INFLUENCES ON TRANSIT-FOCUSED DEVELOPMENT

Transit-focused development occurs under three types of circumstances:

- Simultaneous growth of development and transit service in cities and inner suburbs, which results in almost complete integration of development patterns with transit service (pre-automobile scenario);
- Development attracted to areas in which transit stations have been sited because of locational attributes; development is often reinforced by permissive public policies, incentives, and regulatory requirements;
- Development supported by market forces but spurred by specific public or transit agency (joint development) actions that provide land and/or financial and procedural incentives.

The Significance of Market Forces

The degree to which real estate market forces will support station-area development is a major factor in transit-focused development. Timing and locational attributes of the station areas are crucial to attracting development (see discussion in chapter 5). Market preferences, which influence public investment policies, in many areas are at odds with the densities and designs most supportive of transit-focused development.

Supportive Actions by Public Agencies

To some extent, public policies, programs, and regulations may guide or even mandate the locations, densities, and other qualities of development in station areas. These actions may be strategic in nature, e.g., preparing plans for station areas in anticipation of future development or adopting policies to focus development in certain areas; or highly specific, e.g., instituting redevelopment actions in station areas or mandating parking restrictions. These measures are identified and discussed in chapter 4. They can entice demand, but they cannot create it; they are most effective when supplementing market forces (public facility siting is an exception).

Significance of Rail Transit Types

Another influence on transit-focused development is the difference between the rail systems being developed. The earlier postwar systems such as those in Washington and San Francisco emulated the subway networks then operating in intensive urban environments in eastern cities. These so-called "heavy-rail" systems were intended to carry commuting workers to and from centralized employment locations. They provide relatively high-speed, heavy-rail service from remote stations to centralized employment centers. To promote rapid service, stations are spaced several miles apart and trains operate at half-hour to hour intervals. Most riders on these

outer lines access stations by car from a wide radius of relatively low-density development.

Many newer systems, however, are light-rail systems, or trolleys, that can run on tracks laid on local streets as well as separate rights-of-way. Light-rail systems usually offer frequent stops, often just a half-mile or mile apart, and their slower service reaches fewer long-distance commuters. These differences between rail systems introduce another element into the already complex interrelationship between transit and development. This study examines the record of transit-focused development in the context of these complexities in order to identify key factors that might be used to improve on past performance.

Stakeholders in Transit-Focused Development

Federal Interests

In the wake of the Intermodal Surface Transportation Efficiency Act (ISTEA), funding became available for developing viable Intermodal forms of transportation; these must comply with requirements of the Clean Air Act Amendments of 1990, which put greater emphasis on non-automotive options. (2) Two smaller programs fund station-area public/private projects and transit-oriented development aimed at increasing transit ridership.

The Federal Transit Administration established the Livable Communities Initiative, which provides for coordinated planning and development of transit facilities and adjacent land to foster development that increases transit ridership and enhances transit service.

State Interests

While state Dots have long been involved in transit projects, ISTEA widens state opportunities for fostering transit service. It requires that even greater attention be placed on promoting multimodal services, considering local land-use plans, and conforming to state air quality implementation plans.

Regional Interests

Regional planning councils and metropolitan transportation planning organizations (MPOs) are charged with regional planning projects that coordinate metropolitan development with regional planning strategies. In an effort to meet air quality standards, reduce automobile use, curb urban sprawl, and protect open space, such plans often propose intensifying development and making greater use of transit.

Local Governmental Interests

The primary interest of local officials is to promote economic development that will improve the tax base and provide employment opportunities. Local governments can move quickly

on projects such as extending a rail line in a specific corridor or redeveloping a specific station area. But they also exert their veto power when development plans are opposed by station neighbors.

Transit Agency Interests

Providing high-quality service, while always a priority, has not prevented the decline in transit ridership. Transit agencies are now highly motivated to explore other ways of increasing their visibility, like reassessing their properties to stimulate station area development.

Other Interests

Developers can take advantage of the heightened accessibility afforded by transit to gain an edge in the marketplace. Business interests often view transit stations as natural focal points for commercial and employment development. Civic activists see transit access as an alternative to traffic congestion. Yet they are committed to transit-focused development that is compatible with and supportive of the surrounding neighborhood. Environmentalists often favor greater use of transit as a means of reducing development impacts on air and water quality.

CHAPTER THREE

RESEARCH REVIEW

Research concerning transit-focused development has examined transit/land-use interactions from two directions: the ways in which transit service can affect or benefit land development and the characteristics of land use that can benefit transit ridership. Most of the research reviewed focuses on rail oriented development, although some studies and findings also pertain to bus transit.

TRANSIT IMPACTS ON LAND DEVELOPMENT

Studies at the regional or community level have analyzed transit's effects on the structure and character of metropolitan development nationwide. Other studies have focused on the ways in which transit service has benefited development around station areas.

The Decentralization Effect

From the 1880s through the 1920s, urban rail lines extended electric streetcar service from city centers to the suburbs, allowing large cities to grow larger and stimulating suburban development. The role of rail transit in decentralizing American metropolitan areas is demonstrated in studies by Warner (3), Vance (4), Middleton (5), and Fogelson (6), that showed how streetcar lines established radial corridors of development and increasingly separated workplaces from residences. Streetcars also made single-family housing popular; Harrison (7), in a study of 28 metropolitan areas from 1890 to 1910, concluded that the regional share of single-family housing increased by 3.2 percent for each mile of new streetcar line per capita.

Studies of the impacts of rail transit on development since mid-century (8-12) have demonstrated that regional rail systems have assisted in promoting the continuing decentralization of both population and employment in metropolitan areas. However, the increasing dominance of highways and automobiles from 1920 onward substantially reduced the effects of streetcars on urban development. Harrison and Kain (7) found that increases in automobile registrations affected urban densities 3.5 times as much as increases in rail transit mileage. Nevertheless, Parsons Brinckerhoff et al., (13) suggest that transit lines have strongly supported development of employment centers in inner suburbs in places like Boston and Washington, D.C. Transit redistributes rather than generates development.

The Clustering Effect

In parallel with transit's tendency to encourage suburbanization, construction of rail transit lines promoted dramatic

increases in downtown employment that firmly established the dominant cores of older cities such as New York, Boston, Philadelphia, and Chicago. The importance of transit in reinforcing the dominance of city cores is substantiated by the recent *BART @ 20* study, which concluded that BART's most significant effect on land use was its strengthening of development in San Francisco's central business district (14). Barney and Worth (15) and Arrington (16) reached a similar conclusion about Portland, Oregon's downtown development. Parsons Brinckerhoff, et al., (13, p. 60) observe that "in Boston, Philadelphia, and Washington, D.C., growth in the central business districts clearly would not have been possible in the absence of large, well-developed rail transit systems capable of delivering a majority of workers by transit every day."

Outside downtown areas, studies by Hilton (17), Meyer and Gomez-Ibanez (18), and Smith (19) found that rail systems produced some clustering of development in keeping with the polycentric development tendencies of modern metropolitan areas. A study of the Washington, D.C. system by Green and James (20) concluded that areas with transit access consistently grew more quickly than areas without transit accessibility. "Even in corridors where development was slowing or declining, station areas still seem to be centers of economic activity and growth (p. 71)." In the San Francisco area, Cervero and Landis (21) found that the BART system has helped to focus suburban office employment in concentrated, mixed-use developments around selected rail stations. In the Atlanta area, David and Holmes (22) found that MARTA appears to have stimulated office and commercial growth in certain station areas, although that growth is only a small part of total development in the areas.

Local Real Estate Market Effects

Transit accessibility confers value on development near rail stations; a side-effect of this accessibility is large-scale decentralization and clustering effects. Studies have measured accessibility value in terms of property value increases, higher densities, and advances in timing of development.

For residential development, Boyce (8), Allen et al. (23) and Voith (24) all found that proximity to rail stations in the Philadelphia area raised residential property values. Studies by Armstrong (25) in Boston, Al-Mosaind et al. (26) in Portland, Oregon, Rybeck (27) in Arlington, Virginia, and Landis et al. (28) in San Francisco and San Diego found similar results. However, Landis et al. (28) indicated that the quality of transit service (speed, reliability, frequency) and station locations in desirable neighborhoods affected residential value increases due to transit, a conclusion also found by Nelson and McClesky (29) in Atlanta. Residential values in Miami, however, were not affected by transit, according to Gatzlaff and

Smith, (30). Parsons Brinckerhoff et al., (13) reflecting on studies of transit effect on development in Washington, D.C. and San Francisco observed that residents in existing housing around station areas, especially in outer suburban areas, may oppose zoning changes that would allow higher-value commercial development.

Commercial real estate values are more affected by accessibility to transit than are residential values. Studies in Washington, D.C. by Damm et al. (31) and Rice Center (32) and in Atlanta by Cervero et al. (33) determined that commercial real estate values had risen faster for properties immediately adjacent to stations than those farther away. Property values also tended to rise faster prior to and during rail transit construction (Fejarang, (34) for Los Angeles; Dyett et al., (11) for San Francisco). Landis et al. (28) found that developers built higher quality projects near transit stations than elsewhere; these commanded premium rents. Parsons Brinckerhoff et al. (13, p. 57), after surveying existing studies and carrying out additional evaluations, concluded that "rail's impact on land use is most evident in highly transit-accessible, non-residential areas."

More evidence of transit-induced value is gained from case studies that have shown that investment decisions have been accelerated in response to new transit service. Studies of projects in Atlanta, Chicago, Miami, and Fairfax County in Northern Virginia, indicated that development and redevelopment efforts had been stepped up due to transit investments (35, 36, and 13, respectively).

Significance of Associated Public Policies and Actions

The consensus of most studies is that transit alone is unlikely to affect development patterns greatly in this automobile age. In summarizing the conclusions of a number of studies, Parsons Brinckerhoff et al., (13, p. 63) cite the significance of supportive public policies and regulatory actions in providing the conditions in which transit can affect land use: "Whatever the accessibility advantage that rail transit confers on a neighborhood or employment center, the political, economic, and institutional context has an overriding influence on the development outcome." Knight and Trygg (38) pointed out the ways that Toronto employed land use controls and redevelopment programs to promote station-area development in Toronto. Dear (39) and Dingemans (40) also found the need for complementary zoning and taxation policies, availability of developable land, an attractive physical setting, supportive public infrastructure, and restraints on use of automobiles (such as parking limits). Pucher (41) points out that most transit-based development results from public efforts to support and even induce development at desirable locations.

Bernick and Cervero (42) found that public-sector policies and incentives were necessary to overcome obstacles to raising residential densities near transit stations. Cervero (43) concluded that much of the residential development that had occurred near BART stations was attributable to aggressive actions on the part of local redevelopment authorities to

underwrite land and infrastructure costs and participate in equity partnerships.

However, Parsons Brinckerhoff et al. observe that the benefits of rail transit investment "are often diminished by both public and private institutional constraints (13, p. 57)." The study cites the extension of rapid transit service through Cambridge, Massachusetts in the 1970s, which was not accompanied by changes in permitted land uses. Not surprisingly, few changes in station-area development occurred.

Economic factors are essential to the development outcome. A weak regional economy will undercut almost any amount of transit investment and raise obstacles to even the most ambitious public efforts. One of the principal factors cited by the 1996 study for effective influence of transit on land use is a positive market for development near stations (13).

LAND DEVELOPMENT IMPACTS ON TRANSIT

Land use characteristics such as density, distribution of population and employment centers, mix of uses, and development design can increase transit ridership by making transit accessible to more residents, workers, and shoppers and by providing attractive and convenient ways for people to use transit.

Effects of Compact Employment Centers

Central business districts (CBDs) in which large numbers of employees are located in a densely built area traditionally afford strong support for transit ridership. Such areas provide a large number of commuter destinations within walking distance of transit stations. Frequently, transit use for downtown destinations is preferable to driving and parking an automobile in terms of cost and commuting time. Zupan (43) found that ridership of light rail increases exponentially with the amount and density of CBD employment. Parsons Brinckerhoff et al., observing that all rail systems in the United States radiate from the downtown core, confirms "the vital role of CBDs in shaping the demand for light rail and commuter rail services (13 p. 10)." The study also observes that concentrations of development in large CBDs generate greater transit usage than in small CBDs.

Conversely, employment that is decentralized in polycentric regions or in a dispersed pattern reduces transit use. Studies by Wabe (44), Daniels (45), O'Connor (46), Ley, (47), Rice Center (48), Bell (49), Douglas (50), and Cervero and Landis (51) determined that workers in central business districts are far more likely to use transit than workers in other types of centers, although average commuting times for downtown versus suburban destinations did not change substantially. Cervero (52) concluded that transit use in campus-style office parks with plenty of free parking averaged less than two percent. Hooper (53) determined that free parking for office workers substantially reduced transit use.

However, workers in more compact suburban activity centers tend to choose transit more than workers in less dense

employment environments. Pill (54) determined that Toronto's dense office and residential subcenters attracted much greater transit use than low-density centers. In two studies, Cervero (55, 56) showed that building densities had the most effect on modal splits. Douglas (50) found that a higher-density suburban center supported more transit use than a lower-density one. Parsons Brinckerhoff et al. (13) conclude that employment densities at stations throughout the system influence the number of transit boardings.

Effects of Compact Residential Areas

Several studies have shown that transit usage increases with the density of residential development. Pushkarev and Zupan's groundbreaking study (57) concluded that transit usage required minimum residential densities of nine dwelling units per acre, connected to a downtown area of at least 20 million square feet of nonresidential uses. Smith (19) found that transit trips increased most when residential densities were raised from seven to 16 units per acre. Harvey (58) and Holtzclaw (59) determined that dense residential areas in the San Francisco area generated as much as one-third fewer miles traveled than residents of less dense neighborhoods, a result of greater transit usage. Frank and Pivo (60) concluded that the percentage of single-occupancy vehicle (SOV) use declines significantly in areas of 2,000 or more persons per square kilometer. A report on findings in several components of the TCRP Project H-1 study, concluded that "a doubling of station-area residential densities increases light rail boardings by almost 60 percent and commuter rail boardings by 25 percent (13, p.23)." The study found that residential densities influence commuter mode choices, transit trips per person, the proportion of personal trips by transit, and rail station boardings.

The effects of density on ridership are related to the distance of potential riders from stations. Parsons Brinckerhoff et al. found that each doubling of distance from a light-rail station reduced ridership by one-third (43, p.25). After evaluating the travel behavior of residents in five California locales, Cervero (33) found that residents living near stations are five to seven times more likely to use transit than residents of other areas.

Effects of Connectivity Between Employment and Residence

The 1982 Pushkarev and Zupan study (57) emphasized the importance of the linkage between concentrations of jobs and concentrations of residents in supporting transit usage. JHK and Associates (61) found that patterns of origins and destinations were critical to the use of transit, and concluded that poor transit accessibility at either end of the trip results in poor transit ridership between those trip ends. Cervero (33) found that the size of the employment destination (and the cost of parking) greatly affected the decision of station-area residents to use transit. Cervero concluded that transit-based housing is an effective originator of transit ridership if matched by substantial, concentrated employment destinations near transit.

Effects of Mixes of Uses

Cervero (55) and Rice Center (32) found that suburban centers with mixed uses generate greater use of transit. Cervero's study determined that more transit, walking, and biking trips were generated by suburban activity centers that incorporated some housing than by centers that had no housing. He also concluded that the presence of a significant amount of retail uses increased transit use. Nowlan and Stewart (62) determined that peak-hour automobile trips from new office complexes in downtown Toronto were significantly reduced by building housing developments in the central area, suggesting an increase in walking and in the use of transit. A more recent study determined from an analysis of 11 metropolitan areas that residents' proximity to nonresidential uses increased the likelihood of their using transit by 1 to 2 percent. Yet the same study found land use mixes most influential on choices for walking and biking; compared to density, its influence on transit choice is insignificant (63). Parsons Brinckerhoff et al. (16) observe that the interdependency of density and land use mix makes the separation of their influences on transit difficult. Ewing (64) observes that the benefits of density may be attributable to the mix of uses that often accompany higher density development.

Effects of Parking Supply

The availability of free or low-cost parking increases the likelihood of SOV use. Cervero (52) found that transit use in suburban office parks was discouraged by the abundance of free parking. Dunphy and Lin (65) determined that employment centers with limited supplies of parking generated lower numbers of vehicle trips. Alverson (66) found that office buildings with similar designs, tenants, and transit service generated much lower SOV usage if parking was restricted. Cervero (56) found that vehicle occupancy rates significantly increased when parking supplies in an office development were reduced by half. A study of three rail transit systems concluded that availability of parking encourages driving and discourages walking (67).

Effects of Development Design

Cervero (55) found site designs and amenities to be among the factors that increased transit usage, although a relatively weak influence. Cambridge Systematics (35) determined in a study of work sites in Southern California that urban design elements such as shade trees and sidewalks influenced mode choice. In a more recent study, Cervero, et al. concluded that "few of the individual design variables proved to be significant in predicting mode choice for non-work trips" (63, p. E-4). Such features as building types, sidewalk and street widths, and building setbacks proved elusive as indicators of transit use.

However, design attributes, combined with density and other characteristics of "traditional" neighborhoods, have been

shown to influence mode choice. 1000 Friends of Oregon (68) found that street connectivity, sidewalk connectivity, street crossings on arterials, and absence of topographic constraints on pedestrian activity increased the likelihood of transit usage. A more recent analysis by 1000 Friends of Oregon (69) concludes that land use mixes and "pedestrian-friendly" design in residential areas can reduce trip generation by up to 7 percent per household. The Maryland-National Capital Park and Planning Commission (70) determined that residents of neighborhoods with transit-oriented designs used transit from 10 to 45 percent more than residents of auto-oriented neighborhoods. Fehr and Peers Associates (71) determined that residents of traditional older neighborhoods made many more pedestrian trips and seven times as many transit trips as residents of typical modern subdivisions.

However, Parsons Brinckerhoff et al. comment that "it is difficult to untangle the effects of land use mix and urban design from the effects of density (13, p. 49)," since most compact neighborhoods display designs and mixes intrinsic to the densities involved.

Conclusions

The interrelationships of transit and land use can be summed up as follows:

Effects of Transit on Land Use

- Rail transit frequently confers a value premium on residential properties near stations, especially in areas where

transit systems are well developed and well integrated into the pattern of development;

- Rail transit also increases the value of non-residential property, in part because developers build higher-quality projects near transit stations;
- Rail transit tends to stimulate intense development, especially in non-residential areas such as central business districts in which transit is highly accessible, auto traffic is congested, and parking is costly;
- Rail transit generally is not in itself sufficient to generate development; strong market forces and supportive public policies are also needed (from 13).

Effects of Land Use on Transit

Higher levels of transit use are supported by:

- Compact urban form having a discrete number of significant employment centers in the region that generate bi-directional flows on the transit system;
- Employment and residences concentrated in transit corridors, with particular attention given to locating residents near stations linked to employment centers;
- Higher densities of development that discourage use of cars and increase personal accessibility to transit;
- A rich mix of land uses that allows workers and residents to walk or use transit to replace separate auto trips;
- An enhanced environment around stations and in corridors for pedestrians and bicyclists.

CHAPTER FOUR

GOVERNMENT SUPPORT FOR TRANSIT-FOCUSED DEVELOPMENT

Research studies underscore the importance of supportive governmental policies and actions to promote transit-focused development. Efforts to establish a positive regional and local policy framework, to prepare and implement plans for station areas, to promote transit-focused design, and to undertake redevelopment and other efforts that stimulate or reinforce market activities are almost always a necessary component of transit-focused development. The policies and actions adopted in the cities studied in this synthesis bear this out.

SIGNIFICANCE OF GOVERNMENT POLICIES AND ACTIONS

Governmental support is often required to overcome a variety of public and private obstacles to station-area development, including locational liabilities, real estate market cycles, regulatory restrictions, institutional barriers, ignorance of design opportunities and the need for effectively relating development to transit service.

Locational Liabilities

The location of transit lines and stations is rarely determined with the potential market for development opportunities near them in mind. This results in many stations occupying areas unattractive to developers. In addition, stations on the outer sections of transit lines may be located in conservation or "greenfield" areas not slated for intensive development.

Rail lines typically radiate outward from a central downtown area to various station stops that are considered to be centers of neighborhood and community activity. In reality, these centers may be relatively inconsequential, within deteriorating areas, or lacking in developable sites. In addition, many rail lines follow old railroad alignments bordered by abandoned industrial buildings and underused tracts of land.

These locations carry with them all the disadvantages of overlooked and underdesired urban properties. Vacant properties have usually remained so for good reason--poor terrain or subsoil conditions, irregular shapes and sizes, complex ownership problems, unattractive neighboring uses, overhead power lines. Underused sites may be developed with buildings too expensive to replace or renovate, or may be burdened by hazardous waste concerns. Their development may be constrained by obsolete zoning or building codes and by attitudes of area residents. Even in areas that might prove attractive for development, community residents may be the obstacle. Planners for the SEPTA transit system in the Philadelphia region report that residential communities around some stations oppose any kind of new development that might attract more traffic.

At the other end of the spectrum, transit lines often run through or into areas that are on the verge of development. Station areas in these locations may offer tantalizing opportunities for future development but many communities have found that this development can prove elusive given the realities of the marketplace. In fact, development in these areas may even be postponed by the presence of a transit station if landowners are motivated to wait for long-term value increases or if public interest in development becomes too intrusive. The prospective multi-use development envisioned for the Gresham station site in the Portland, Oregon area devolved to a far more modest project as public and private stakeholders jockeyed for a consensus position on development standards.

A number of governmental policies and actions can be employed to induce development if private developers are reluctant to initiate projects in station areas. This is described in the next section and illustrated in the case studies.

Real Estate Market Cycles

Many communities discovered the importance of market forces in promoting station-area development during the nationwide real estate recession in the late 1980s. Until then, the robust market had generated a tremendous amount of development in many regions, much of it in the form of mixed-use, higher-density projects well suited to encourage use of transit. Station sites were established in attractive locations, including downtown areas and suburban activity centers, and many benefited from the new, transit-focused development.

The real estate market in many regions is still recovering from the overbuilding of the 1970s and 1980s. The modest pace of development has left station areas that were once considered prime building locations relatively inactive. Multiphase projects around the much-publicized Ballston and Bethesda stations in the Washington, D.C. area, for example, have paused for re-grouping; cleared sites in many station areas throughout the nation await future prospects. In addition, many of the transit systems constructed during the 1980s have been unable to attract either the station-area development or the ridership expected due to tepid market conditions. This underscores the long-term nature of station-area development opportunities, as well as the importance of positive governmental action to spur transit-focused development.

Non-Supportive Government Policies and Regulations

Existing government policies may work against station-area development. Existing zoning in many communities may

disallow the mix of uses, building designs, and densities most suitable for generating transit ridership and for attracting developers' interest to station locations. In addition, public zoning and building provisions may impede design of convenient connections between development projects and station access points. Standards for setbacks and buffering, restrictions on building heights, and density limits all may work against transit-friendly design. Parking standards frequently fail to account for or support transit ridership.

Public planning efforts to support development around transit stations sometimes goes awry by establishing unreasonable or inflexible standards that discourage developers. The resultant delay in market response raises the risk of losing development opportunities altogether. Supportive policies need to be in place prior to initiation of station-area development. Developers can more easily accept plan amendments and negotiations for zoning revisions if a policy direction for transit-focused development is already established.

Institutional Barriers

The cross-jurisdictional cooperation required in transit-focused development is often difficult to achieve. Local and transit planners may interact rarely during transit facility planning and after construction. Local governments may look on transit agencies as foreign organizations with unwelcome agendas and transit stations as alien intrusions in their communities.

These divisions become most apparent in pursuing joint development opportunities involving transit agency properties. Cervero, Hall, and Landis (72) note that transit agencies and development companies have fundamentally different outlooks on real estate. The agencies usually "are unaccustomed to assessing or taking the types of risks inherent in real estate development," and frequently do not understand the potential value of their land holdings. Leveraging property development opportunities is decidedly lower in priority than providing ontime service and often goes unnoticed in agencies' mission statements.

Establishment of regional and local policies that provide positive support for transit-focused development can erect a useful framework for coordination and cooperation among the many agencies and jurisdictions involved in regional development.

Fixation on Automobile-Oriented Design

In the United States today, most local governments' plans and development regulations are written with the automobile in mind. Except in a few large cities, transit service and rail transit in particular serve only a small percentage of travelers. Development in station areas usually must deal with the automobile first and transit second. Design relationships between new buildings and transit stations receive low priority or are ignored altogether.

In most of the rail systems examined for this synthesis, park-and-ride lots, not rider-generating development, are

given top priority for location near stations. (The second priority usually is wide streets that access the parking lots.) Development intended to attract transit passengers is sited in a remote and unattractive manner--pathways through park-and-ride lots, for example.

Transit-supportive public policies and actions can alert public officials, developers, and designers to more transit-friendly thinking to help overcome these obstacles. The case studies in this synthesis identify a range of public measures that can be taken.

COMPONENTS OF POLICY AND ACTION FRAMEWORKS

Governmental policies and actions supporting transit-focused development can be expressed by several governmental entities and through a variety of instruments--state departments of transportation, regional planning councils and metropolitan planning organizations, local governments, and transit agencies. The instruments through which they implement such policies include state, regional, and local policy statements and plans, as well as specific public programs, regulations, development standards, and guidelines (Table 2 lists the types of organizations and instruments in use.)

Although state departments of transportation were not included in this study, most have not incorporated policy statements regarding transit-focused development into state plans and policy documents. At the regional and local levels, the record is very uneven.

The Record of Government Support

Table 3 presents the government policies and actions adopted to support transit-focused development in the 19 rail systems included in this study. Public agencies in 11 of the 19 regions (notably Atlanta, Miami, Portland, Washington, the Californian and the Canadian cities) provide relatively strong government policy and action frameworks to support transit-focused development. Their regional planning agencies, which also function as regional transportation planning organizations, have adopted specific policies supporting transit-focused development. Their constituent cities and/or counties where rail transit service is provided have also adopted significant policies and enacted regulations to encourage station-area development. Additionally, the transit agencies have adopted policies promoting station-area and joint development.

Public agencies in another four regions have taken significant but less forthright steps to encourage transit-focused development. In Chicago, Cleveland, Denver, and St. Louis, regional agencies have indicated interest in transit-focused development, but government support has focused on specific actions by local governments and transit agencies to pursue station-area development. In Chicago, the regional organizations have adopted general policies to encourage intensive development and transit-friendly design in connection with transit lines and stations. But the local governments and

TABLE 2

TYPES OF ENTITIES AND INSTRUMENTS PROVIDING PUBLIC SUPPORT FOR TRANSIT-FOCUSED DEVELOPMENT

Public Entities Contributing to Supportive Policies And Actions	Instruments
State Level:	
State Departments of Transportation	State Transportation Plans State Transportation Improvement Programs Major Investment Studies
State Planning Agencies	Growth Management Statutes State Agency and Local Planning Requirements
Regional Level:	
Metropolitan Planning Organizations	MOP long-range Transportation Plans MOP Transportation Improvement Programs MPO Project Evaluation Criteria
Regional Councils of Government or Planning Agencies	Regional Policy Statements or Strategic Plans Transit-Focused Design Guidelines Discussion Forums and Educational Programs
Local Level:	
Local Governments	Local Comprehensive or General Plans Special Zoning Provisions: Mixed-Use Districts Transit Overlay Districts Parking Restrictions Station-Area Plans Redevelopment Programs
Local (or Regional) Transit Agencies	Transit-Focused Design Guidelines Joint Development Guidelines, Criteria Educational Programs

transit agencies until recently were promoting transit-focused development without a specific policy base. The City of Cleveland and its regional transit agency are encouraging station-area development, including joint development, but regional policy support is extremely general.

Only four regions (Baltimore, Boston, Dallas, and Philadelphia) provide weak government support for transit-focused development. Boston and Philadelphia systems have been in place for many decades and the older segments are well integrated into the region's infrastructure and development patterns. However, new rail extensions into their outer suburban communities have encountered highly fragmented governmental structures and inadequate regional leadership. Baltimore's more recently built system opened as its economy was in serious decline and its regional organizations in disarray. Despite the lack of broad policy support in these three regions, some significant government actions have been taken to encourage transit-focused development. In Dallas, as the rail system development proceeds, decision makers are reluctant to make commitments on supportive policies.

Regional Agency Support

Some regional agencies focus more specifically on promoting development in station areas than others. Portland, Oregon's Metro is implementing a state transportation rule that calls for increasing reliance on transit. Its new 2040 regional

plan centers on transit-focused development as the principal organizing concept for future growth in the region. Furthermore, the regional transit agency, Tri-Met, initiated and funded station-area planning in four local jurisdictions affected by the new western light-rail line and operates an active joint development program.

Portland appears to have replaced Toronto, Canada as a regional model for transit-focused development. For many decades, Toronto has been well known for fostering concentrations of development around rail stations. However, in recent years much of its development has been taking place in areas not well served by transit and several proposed transit extensions have been postponed due to financial difficulties. The other Canadian transit system in this study, Vancouver, was initiated with support from a regional organization's plan. However, although transit and development planning still follows the principles laid down in the regional plan, the regional organization was eliminated several years ago.

A more conventional example of regional support is Atlanta Regional Commission's development plan for the region, which includes a number of policies that "encourage development, redevelopment, and preservation of areas around stations" and supports transportation improvements in areas with development opportunities. By comparison, the Sacramento regional transportation plan states that the agency will favor "proposed transportation projects which facilitate higher-density or mixed use development as a means of affecting travel behavior." This regional statement is strengthened by

TABLE 3
REGIONAL AND LOCAL POLICIES AND ACTIONS SUPPORTING TRANSIT-FOCUSED DEVELOPMENT

City/Region	Regional Planning and/or MPO Transportation Plan Policies	Local Government Policies and Actions	Transit Agency Policies and Actions
Atlanta	<p>Atlanta Regional Commission's (the MPOs), <i>Atlanta Regional Development Plan</i> includes transit policies that:</p> <ul style="list-style-type: none"> • “encourage development, redevelopment, and preservation of areas around station areas in keeping with each station’s function and local plans,” and • support improvements in areas “that present the best opportunities for development and redevelopment.” 	<p>The City of Atlanta:</p> <ul style="list-style-type: none"> • adopted policy to support development in transit station areas; • created “public interest” overlay districts around stations • planned and constructed streetscape improvements to improve pedestrian connections to stations 	<ul style="list-style-type: none"> • Adopted disposition policy that encouraged air-rights development over stations; • Recommended that ARC encourage “land use practices which consider the transportation implication of land use policies/regulations and expand/increase the use of transit services.” • Recommended that local governments “develop land use plans and policies which result in compact growth of moderate to high density mixed-use development around rail stations. . . .”
Baltimore	<p>Baltimore Metropolitan Council, <i>Metropolitan Transportation Plan, 1994</i>:</p> <p>“High density transit-oriented developments should be planned along existing and proposed fixed mass transit lines and designed to make the use of public transportation more attractive.”</p>	<p>The City of Baltimore adopted no specific policies but sponsored design studies</p>	<p>No specific policies, but:</p> <ul style="list-style-type: none"> • Published design guidelines for transit-related development • Implemented state’s incentive program for station-area development.
Boston	<p>Metropolitan Area Planning Council, <i>Metro 2000</i>:</p> <ul style="list-style-type: none"> • “promote the development of local land use policies that result in more efficient use of the regional transportation system,” and • “targeting transportation investments to areas identified in local and regional plans as being suitable for concentrated development.” 	<p>City of Boston adopted no specific policies but cooperated with station-area development planning initiated by other agencies.</p>	<p>No specific policies.</p>
Chicago	<p>Chicago Area Transportation Study and Northeastern Illinois Planning Council (NIPC), <i>2010 Transportation System Development Plan Update</i>:</p> <ul style="list-style-type: none"> • “increase transit use by encouraging intensive developments to locate within easy access to existing or planned mass transit service” and • “promote transit accessible site design in major land developments.” <p>Also, NIPC:</p> <ul style="list-style-type: none"> • published community guidelines for station-area development (with METRA) • is working with local governments to formulate model zoning overlay for station-area development 	<ul style="list-style-type: none"> • City adopted joint policy document with CTA and RTA; • City working with CTA and neighborhood groups to stimulate station-area development; • Some suburban communities working on station-area development as part of wider revitalization programs. 	<p>Chicago Transit Authority (CTA):</p> <ul style="list-style-type: none"> • adopted joint policy document with city and RTA • works with neighborhood groups on revitalization of station areas. <p>Metra, the suburban rail system: no specific policies, but with NIPC published station-area design guidelines.</p> <p>Regional Transit Authority (overall management agency): no specific policies but:</p> <ul style="list-style-type: none"> • Sponsored workshops on TFD; • Developed checklist for project reviews; • Established TFD information clearinghouse.

Cleveland	Northern Ohio Areawide Coordinating Agency (MPO and regional planning agency): "provide an integrated transportation system which will effectively serve and enhance the present and future land use patterns and promote the best balance of land use and transportation development."	City <i>Civic Vision 2000</i> : "Encourage joint public/private development of transit stations and associated amenities."	RTA adopted policy statement on joint development: "Joint development agreements with the private sector will be used to offset transit system real estate acquisition and facility construction costs, provide station upgrades and desired public amenities, and help fund ongoing system operating costs."
Denver	Denver Regional Council of Governments (the MPO) <i>Regional Transportation Plan</i> : Encourage local governments to use zoning and land development techniques . . . to create higher density mixed uses around committed rapid transit stations, and so in <i>Metro Vision 2020</i> : <ul style="list-style-type: none"> • "New development and redevelopment will be designed to encourage use of alternative transportation modes." • "[Development should] anticipate the interdependence between land use and transportation and the effect on air quality, including the need for supportive land use adjacent to a transportation facility . . ." • As a criterion for evaluating alternative urban forms: "promote transit accessible development." 	No specific policies	No specific policies
Dallas	No specific policies. (Considered policies but rejected them as stimulating auto congestion around stations.)	No specific policies	No specific policies, but: <ul style="list-style-type: none"> • 1995 mission and goal statement refers to desirability of DART system stimulating economic development; • Conducting study to determine ways to link system with underground pedestrian network in downtown Dallas.
Los Angeles	Southern California Association of Governments (SCAG), <i>Regional Comprehensive Plan and Guide</i> , 1994: <ul style="list-style-type: none"> • "SCAG shall encourage existing or proposed local jurisdictions' programs aimed at designed land uses which encourage the use of transit . . ." • "SCAG shall support local plans to increase density of future development located at strategic points along regional commuter rail, transit systems, and activity centers." SCAG also commissioned video providing information on transit-focused development	City council adopted Land/Use Transportation Policy proposing to concentrate future development around transit stations and designate transit-oriented districts around stations to encourage higher-density development. Also includes prototype design guidelines for six types of urban centers. City is preparing station-area planning studies. City and suburban redevelopment agencies are working with transit agency to assemble and develop sites around transit stations.	MTA (also MPO for region): <ul style="list-style-type: none"> • cooperates with local governments and redevelopment agencies to sponsor station-area and joint development. • assessing station-area development opportunities at each station, including preparation of master plans in cooperation with local governments. • sponsored community forms to promote station-area development.

Miami	<p>South Florida Regional Planning Council, <i>Strategic Regional Policy Plan for South Florida</i>:</p> <ul style="list-style-type: none"> • Recommends integration of land use and transportation, including transit-oriented development; • Urges Development of “high-density and mixed land use around intermodal connections.” <p>Metro-Dade County <i>Comprehensive Development Plan</i> calls for creation of high intensity activity centers linked to rapid transit facilities, including pursuit of joint development opportunities.</p> <p>Metro-Dade County created Rapid Transit Zone calling for maximizing opportunities for development related to the transit system, including joint development.</p>	<p><i>City Comprehensive Neighborhood Plan 1989–2000</i>:</p> <ul style="list-style-type: none"> • The City’s land development regulations will direct high density commercial and residential development and redevelopment in close proximity to Metrorail and Metromover stations,” and • The City of Miami will “assist Metro Dade County in the completion of the planning and construction of Metrorail Phase II by using the city’s land development regulations to help direct development where it will support the densities required for urban rail transit systems.” 	<p>The Metro Dade Transit Administration adopted:</p> <ul style="list-style-type: none"> • a station-area design and development program to guide private development adjacent to station areas. • joint use policies to encourage joint development (related to Metro-Dade County zoning provisions).
Philadelphia	<p>Delaware Valley Regional Planning Commission (also the MPO), DVRPC YEAR 2020 Land Use and Transportation Plan Urges local governments to:</p> <ul style="list-style-type: none"> • “Utilize existing planning tools to encourage higher densities and different uses at existing transit stations and create new developments that are sensitive to and can accommodate expanded transit service.” • “Grant density bonuses for developers’ improvements, such as transit center or locating adjacent to a regional rail station” or establish an overlay zone that allows more intensive uses or mixed uses or requires special transit-supportive amenities.” 	<p>No special policies. Many communities are resistant to station-area development. City of Philadelphia working with SEPTA to write model zoning ordinance for stations.</p> <p>Two jurisdictions, Montgomery County and Merion Township, have been evaluating opportunities for transit-focused development but have taken no official actions.</p>	<p>No special policies. SEPTA has a program for incorporating retail businesses in stations and for station-area enhancement in station renovations. The agency also has generally supported station-area and joint development but has received little interest from communities and developers.</p>
Portland	<p>Metro regional agency (also the MPO) implements state transportation rule calling for greater reliance on transit. <i>Region 2040</i> plan advocates intensive development in compact centers served by rail transit:</p> <ul style="list-style-type: none"> • Seven regional centers (in addition to downtown) “would become the focus of compact development, redevelopment, and transit and highway improvements,” including light-rail connecting all regional centers to the central city. • Station communities, nodes of development centered around a light rail or high-capacity transit station, would provide for high densities of development, to be implemented through station-area plans. • Metro initiated transit-oriented development program with funds for site acquisition and improvements in station areas. 	<p>City of Portland encouraged transit-related development in downtown plan (siting public facilities near stations and mandating parking limits) and planned for development around other major station areas.</p> <p>Other communities in region are planning for station-area development in cooperating with Metro and Tri-Met transit agency. Three jurisdictions adopted interim development ordinances to allow planning for station-area development.</p>	<p>Tri-Met transit agency:</p> <ul style="list-style-type: none"> • adopted planning and design guidelines for transit-related development • adopted a strategic plan in 1993 that incorporates goal to develop majority of new housing and jobs within five-minute walk of primary transit network. • helped fund station-area plans, working with communities along the existing Banfield line and the new western line under construction to identify and pursue station-area opportunities • has active joint development program.

Sacramento	<p>Sacramento Area Council of Governments <i>Metropolitan Transportation Plan</i>: SACOG will “advance in our funding process proposed transportation projects which facilitate higher-density or mixed-use development as a means of affecting travel behavior.”</p>	<p>Sacramento County:</p> <ul style="list-style-type: none"> • Adopted <i>General Plan Update</i> that includes overall land use goal calling for: “An orderly pattern of land use that concentrates urban development, enhances community character and identify through the creation and maintenance of neighborhoods, is functionally linked with transit, and protects the County’s natural, environmental and agricultural resources.” • Circulation element of plan states as a principle “to align high density development, including infill and redevelopment, along transit corridors.” • Major elements of plan are designations of “urban” and “neighborhood” transit-oriented developments. <p>The City of Sacramento:</p> <ul style="list-style-type: none"> • Adopted a policy to allow higher-density uses near transit stations. • Is integrating transit-oriented development into community plans. 	<p>Sacramento Regional Transit District:</p> <ul style="list-style-type: none"> • Adopted joint development policies. • Working with city and county to encourage joint and station-area development. • Helped organize workshops to identify station-area development opportunities.
St. Louis	<p>East-West Gateway Coordinating Council (also the MPO) <i>Transportation Redefined</i> (regional transportation plan) advocates strategies:</p> <ul style="list-style-type: none"> • Promoting transit oriented development that “mixes and integrates transit and complementary land use in a compact, highly intensive manner.” • Changing zoning “to promote higher density and mixed use, which would result in a land use pattern more compatible with public transit services than are dispersed land use patterns.” 	<p>No specific policies.</p>	<p>Bi-State Development Agency strategic plan states that the transit agency will “develop the internal capacity and act to develop, implement, or facilitate all transit-related development in the region.”</p>

San Diego	<p>San Diego Association of Governments (also the MPO):</p> <ul style="list-style-type: none"> • <i>Blueprint for the San Diego Region</i> recommends changes in land use patterns to make better use of transit and increasing development intensities around transit stations and major bus routes. • <i>Land Use Distribution Element for the Regional Growth Management Strategy</i> recommends that “new office, residential and other development be focused around rail transit stations and in major bus corridors” and incorporates land use policies calling for: <ul style="list-style-type: none"> – higher-density, mixed-use development in transit access areas, – local governments’ adoption of transit design guidelines, – revisions to local zoning and subdivision regulations encouraging such development. • Commissioned five station-area plans. 	<p>City of San Diego:</p> <ul style="list-style-type: none"> • Adopted policy statement calling for proposed transit lines and stations to be reflected in all general plan elements. • Adopted transit-oriented development design guidelines. • Is incorporating design guidelines in street design manual, comprehensive zoning revisions, and community plan revisions. 	<p>Metropolitan Transit Development Board:</p> <ul style="list-style-type: none"> • Adopted joint use and development policies. • Published design guidelines and standards for transit-oriented development.
San Francisco	<p>Association of Bay Area Governments adopted policies in 1990 to:</p> <ul style="list-style-type: none"> • “Encourage development patterns and policies that discourage long distance automobile commuting and increase resident access to employment, shopping and recreation by transit or non-auto means.” • Allow for the development of new communities along transit corridors where interurban transit service and capacity are available or committed. . . .” • A specific action to implement the first policy recommends that “cities and counties should encourage employment and housing in proximity to transit stations.” <p>ABAG also published <i>Design Strategies for Encouraging Alternatives to Auto Use Through Local Development Review</i>.</p>	<p>A number of communities with BART stations have promoted transit-focused development:</p> <ul style="list-style-type: none"> • Oakland’s downtown redevelopment efforts focused on station areas; • Walnut Creek adopted a downtown plan concentrating office and retail uses near its station; • Pleasant Hill and Concord promoted redevelopment, including land acquisition and infrastructure financing, to increase development around their stations; • Fremont zoned station areas for higher-density housing and other uses; • Hayward and Richmond have promoted residential development near stations; • In El Cerrito and Oakland, redevelopment efforts have promoted mixed-use, community-based development near stations. 	<p>The Metropolitan Transportation Commission (the MPO and BART manager):</p> <ul style="list-style-type: none"> • in its 1994 regional transportation plan calls for encouraging “transit investments that are matched and supported by land use plans that designate development intensities sufficient to support viable transit.” • gives priority to transit-focused development in rating proposed projects.
San Jose	<p>See ABAG activities described for San Francisco.</p>	<p>The city’s general plan was revised to provide for higher-density development around transit stations.</p> <p>The planning office has assisted the transit authority in preparing station-area studies and plans.</p>	<p>The Santa Clara Valley Transportation Authority:</p> <ul style="list-style-type: none"> • assists local governments in preparing station-area market data and prototype designs. • is pursuing joint development opportunities on parking areas at stations.

Toronto	<p>Metropolitan Council's newest plan, <i>The Liveable Metropolis</i>, proposes:</p> <ul style="list-style-type: none"> • "to create and maintain a structure of centres and corridors through reurbanization that . . . concentrates population in areas well served by transit and . . . promotes use of transit." • that reviews of development proposals consider integrating development with transit service; • preparation of development plans for all station areas. 	<p>The City of Toronto:</p> <ul style="list-style-type: none"> • regulated provision of parking and parking rates in downtown to encourage use of transit. • initiated a "Main Streets Initiative" in 1994 to stimulate redevelopment along existing transit lines. <p>Other cities and regional agencies in the Toronto area have also prepared studies and plans favoring transit-focused development.</p>	<p>The Toronto Commission is part of the Metropolitan Toronto regional administration.</p>
Vancouver	<p>The Greater Vancouver Regional District adopted a "Liveable Region Plan" in 1975 that called for grouping of regional development around six regional town centers linked by light rail transit. That plan, updated in 1990, has continued to guide development efforts of local municipalities, although since 1983 it has had no legal force.</p> <p>The plan also contained several policies that promoted transit-focused development:</p> <ul style="list-style-type: none"> • a limit on freeway construction; • establishment of an agricultural reserve that constrained the amount of developable land. <p>In addition, high land prices and the lack of mortgage subsidies promote high density development.</p> <p>The provincial government also has promoted transit-focused development by its policies for public facility siting and forming redevelopment corporations for key areas around stations.</p>	<p>Municipal governments have maintained a strong policy of focusing concentrations of development in regional town centers, characterized by:</p> <ul style="list-style-type: none"> • provision of a mix of commercial, business, governmental, and residential uses; • a strong emphasis on pedestrian orientation with minor or no building setbacks; • on-street parking but restricted off-street surface parking. 	<p>BC Transit functions as an extension of the provincial government but has strongly supported the concept of regional town centers served by rail transit. It has taken a proactive approach to generating development around stations, including:</p> <ul style="list-style-type: none"> • the original phase of rail service that connected the 1986 Canadian Expo to downtown Vancouver, Burnaby, and New Westminster. • promoting redevelopment along and under the first rail lines, which were located in underutilized areas; • soliciting developer interest in building stations along its newest line in connection with private project development.
Washington, D.C.	<p>Regional plans in 1960s that provided the policy basis for transit-system development called for radial transit corridors as centers of urban development.</p> <p>Metropolitan Washington Council of Governments (also the MPO) has no regional plan. Its transportation plan calls for developing "a transportation system which promotes economically and environmentally sustainable community patterns by concentrating development at centers along transportation corridors. . . ."</p>	<p>District of Columbia, Montgomery and Prince George's counties and City of Rockville in Maryland, Arlington County and City of Alexandria in Virginia have adopted comprehensive plans and zoning that call for most intensive development around transit stations.</p> <p>Montgomery County's adequate public facility requirements allow greater traffic congestion in station areas to promote development in those areas.</p>	<p>Washington Metropolitan Area Transportation Authority:</p> <ul style="list-style-type: none"> • adopted joint development policies • solicits proposals for joint development • works with local jurisdictions on station-area development opportunities.

pervasive policy support for transit-focused development in Sacramento County's general plan (although the plan puts few restrictions on low-density urban sprawl).

In addition to statements in regional plans and long-range MPO transportation plans, transportation improvement programs adopted by MPOs may include criteria that favor transit-focused development. The regional transportation plan for St. Louis advocates promoting transit-oriented development that "mixes and integrates transit and complementary land use in a compact, highly intensive manner." However, relatively few regional transportation programs include specific language that would give priority to transit projects promoting station-area development.

Local Government Support

Local governmental interest in transit-focused development is expressed in general plans, transportation plans, station-area plans, special zoning provisions, and transit design guidelines. Some examples extracted from Table 3:

- Atlanta created "public interest" overlay districts for station areas that allowed greater densities of development;
- Cleveland's 2020 vision statement calls for encouraging "joint public/private development of transit stations and associated amenities;"
- Metro-Dade County in Miami created rapid transit zones encouraging higher-density transit-related and joint development;
- Detailed station-area development and design plans were prepared by a number of cities, notably in the Portland region where the Metro regional agency and Tri-Met, the transit agency, worked with local governments;
- The City of Sacramento adopted a policy to allow higher-density uses near transit stations and is implementing that policy in preparing community plans and adopting zoning changes;
- In Los Angeles, local redevelopment agencies are working with the transit agency to assemble sites, prepare detailed plans, and attract development adjoining and near transit stations.

Station-Area Plans--Preparation of local plans for station areas appears to offer an important boost to transit-focused development. These plans, usually accompanied by regulatory and funding incentives, establish public policy priorities for development around stations and supply the policy foundation and detailed proposals for increased intensities of development, specific design relationships among proposed buildings and projects, public support required for infrastructure and amenities (such as streetscape improvements, parks, and public art), and phasing of proposed development. Plans may also provide the basis for public/private or intergovernmental agreements for coordinated development and/or redevelopment activities. Once established, they provide guidance for subsequent government actions, including zoning changes.

Through the years, station-area plans have varied widely in detail and scope. Plans prepared in the 1970s for Miami

station areas consisted of little more than land-use maps, hardly sufficient for guiding development. Montgomery County Maryland's sector plan for the Bethesda station area in the 1970s included recommendations for block-by-block use intensities, detailed design specifications, and phasing priorities. Atlanta's rail-state planning in the 1980s identified significant public improvements that would provide useful linkages between private development projects around stations. The 1995 Gresham Civic Neighborhood plan for the Portland area identifies uses and intensities for each block, phasing of development by type of use, illustrations of desired forms of development, and a summary of infrastructure needs and costs.

Joint development plans are considerably more detailed and extensive. The 1993 "BN/I-355 Station Study" prepared for the Chicago Metra suburban transit agency evaluated opportunities for improving transit service, commuter parking, and potential private development on sites near two Metra stations. The study includes an analysis of site conditions (surrounding uses, visibility, access, environmental constraints), an assessment of transportation systems and parking markets in the station area, evaluations of potential land uses, a development plan establishing desired types and amounts of various uses, a traffic impact analysis of proposed development, a parking management plan, and a preliminary financial plan.

These planning efforts for rail station development serve to alert developers to potential development opportunities, to determine needs for public facilities and other supportive public actions, and to define governmental objectives.

Development Incentives--Local governments frequently provide incentives for station-area development through permissive regulations and financial support. The examples of supportive actions listed above indicate some of the zoning, redevelopment, and other efforts local governments have initiated. Other examples include sponsorship by Miami-Dade County of private development on public lands near transit stations, the work of city and transit officials in Chicago with neighborhood groups to promote redevelopment and infill development around stations, the financing by Arlington County in the Washington, D.C. area of a parking structure to support redevelopment around the Ballston station, and siting near transit stations of public facilities such as government office buildings, convention centers, arenas, stadiums, and child care centers by many communities.

Transit Agency Support

Transit agencies have supported transit-focused development in their mission/policy statements, through publication of design guidelines for transit-oriented development, and by adoption of joint development or air-rights policies and procedures.

Station-Area Studies--Transit agencies generally prefer to work through local planning agencies to generate station-area plans; both the Tri-Met agency in Portland, Oregon and the Santa Clara Valley Transportation Authority in San Jose, California have partially funded local planning efforts for

transit station areas. New Jersey Transit works with local governments in redesigning and refurbishing rail stations as part of station-area redevelopment efforts. The MTA in Baltimore provided grants to communities along its light-rail line for improving the appearance of station areas. The Los Angeles MTA, however, has undertaken planning studies for stations throughout its system, although it works with local governments.

Design Guidelines--Many agencies have fostered transit-focused development by publishing design guidelines incorporating standards and illustrations for meshing development with transit service. Cervero (73) found that 26 agencies throughout the United States and Canada had published guidelines by 1993 and another 12 were developing them. (The list included guidelines for bus as well as rail transit.)

Joint Development--Many transit agencies also have adopted procedural and design guidelines for joint development around transit stations. Those used by Miami's transit agency indicate the range of development opportunities being pursued as follows:

- long-term lease of air rights above and around stations;
- private sector dedication of property and other contributions to construction of transit improvements;

- integration of stations into planned and existing developments;
- creation of direct access links between stations and adjoining developments.

Agencies in San Francisco, Chicago, and Denver are leveraging their ownership of land used for parking facilities at stations to promote private development opportunities. Agencies in Baltimore, Washington, D.C., and Portland, Oregon own excess properties that have been marketed for transit-oriented development.

Many of these efforts are backed by marketing programs and publication of guidelines for joint development. Agencies in Boston, Denver, San Francisco, and Washington, D.C. have mounted marketing campaigns for specific station sites within the past year. The Metropolitan Transit Development Board in San Diego has adopted policies to guide joint use and development projects, published design guidelines and standards for transit-oriented development, and sought developer interest for station sites.

Educational Activities--Transit agencies such as the RTAs in Chicago and Denver and the MTA in Baltimore have organized community meetings to build understanding and a constituency for transit-focused development.

CHAPTER FIVE

STATION-AREA DEVELOPMENT EXPERIENCE**THE MARKET AS PRIME MOVER**

Much of the development that takes place around transit stations is dependent on the real estate market, which is influential in determining whether locations are highly marketable development sites. Except in a few cases, station-area development at outer or suburban stations has been less intensive and has involved more difficulties than at downtown stations. In these developing areas, the automobile so dominates travel patterns that transit availability has little effect on development patterns.

A burst of development activity accompanied the construction of several transit systems in the 1970s and 1980s (notably in Atlanta, Portland, San Francisco, and Washington, D.C.). Because high-density, mixed-use projects were favored by developers in the 1980s, outer stations such as Ballston, Bethesda, Friendship Heights, Rosslyn, and Silver Spring near Washington, D.C. and Concord and Pleasant Hill in San Francisco developed well-integrated mixes of uses within walking distance of stations. The real estate recession that began in the mid 1980s significantly slowed development activity in all the regions studied, including development near rail stations. Much of the station-area development in the first half of the 1990s has centered on construction of public and semi-public buildings and facilities instead of on private development.

Locations of Transit-Focused Development

The case studies demonstrate the great variety of experience in transit-focused development, based in part on the location of stations within downtown areas, other in-town areas, and suburbs.

Downtown Transit-Focused Development

Transit-focused development benefited from the renewed interest of the real estate market in downtown development from the 1960s through the 1980s. The tremendous expansion of the service and governmental sectors in the North American economy generated a wave of office development that greatly expanded downtown employment bases in many cities. Much of the station-area development that took place in the case study cities first occurred in their central business districts as new stations opened up, then spread outward to stations in suburban activity centers.

In the District of Columbia, new office and mixed-use projects have created millions of square feet of space in the downtown area since the 1960s. From the existing center, development spread eastward from Connecticut Avenue, over a

mile westward toward Georgetown, and over half a mile north past Dupont Circle. In the path of this development the new Blue and Red Metrorail lines opened four stations, all accessed within new office buildings. Surrounding commercial and business development occurred almost entirely within half a mile of one or more stations. The District's zoning and the transit agency's development policies supported private sector interests in this pattern of development, including reductions of required parking spaces.

Much of the development that occurred during the same period in downtown San Francisco and Oakland followed a similar pattern, with rapid regional access to downtown employment provided by the BART rail transit system. In both downtown areas, the rejuvenation of underused and deteriorated sections of the city cores was an important public objective that meshed with interests in expanding use of transit.

San Diego's downtown development organization promoted downtown development and redevelopment intensely for decades, and provided leadership in attracting developer interest and underwriting land assemblage and infrastructure support. Its success in generating private development provided a positive context for transit service when the new light-rail system was constructed during the 1980s.

Development of downtown projects continues to focus along light-rail lines. Development in downtown Cleveland bloomed during the 1980s as a partial result of convenient transit access from the airport and suburban communities. The construction of a major mixed-use project coupled with the new Gateway Arena and baseball stadium, both directly accessible to the central transit station, strengthened the transit system as well as the downtown economy. The city is currently funding an extension of the light-rail system along the waterfront to major public facilities.

Other In-City Business and Commercial Nodes

In several regions, the coming of transit service stimulated redevelopment in selected outlying city locations deemed attractive by the market and supported by public policies. In Atlanta, much of the transit-focused development that has occurred is located in underused midtown areas that were ripe for redevelopment. Developers seeking inexpensive sites accessible to suburban workers built office and mixed-use projects, particularly at the Midtown and Lenox stations. Their efforts were supported by zoning changes that increased permitted densities.

Portland's record through 1994 shows that over 70 percent of transit station development along the Banfield line occurred outside downtown. Two-thirds of that (\$715 million in

development) is located in the Lloyd district near downtown, where robust economic growth accompanied significant public investments. The Lloyd district had been an established commercial and business center prior to location of the Banfield stations; it has further benefited from governmental decisions on siting major facilities (15).

Toronto established the model for station-area development in the 1950s and 1960s as new development sprang up along both the north-south line and the east-west line. Much of it took place around outlying stations within the city as a result of Toronto's market tolerance of higher-density forms of housing and the municipality's lenient zoning in station areas.

The opening of new stations in Washington, D.C.'s subway corresponded with further public and private development interest in the city and inner suburbs. Although development has occurred adjoining some city stations (e.g., Van Ness on the Red Line), many of those stations were either in areas that were already built up (such as Catholic University or Woodley Park-Zoo), in neighborhoods resistant to new development (e.g., Cleveland Park, which founded an historic district to prevent denser development), or in areas unattractive for new development (e.g., the Rhode Island Avenue and far northeast stations).

Developers felt otherwise about station areas in close-in suburbs like southern Montgomery County, Maryland and Arlington County, Virginia. These station areas had locational advantages, were within relatively wealthy parts of the region and near major road intersections, and had enthusiastic public support for transit-focused development in the form of zoning and other incentives; this stimulated many major developments.

Miami-Dade County, Florida found a considerable amount of developer interest in highly accessible locations near transit stations. Transit-focused development has taken place near stations where major commercial developments were already established before construction of the transit system.

Suburban Development

Transit-focused development in outlying suburban areas has been much less extensive than that in downtown and close-in locations.

In Toronto, while transit-focused development was taking place in downtown and midtown locations, suburbs and new towns evolved that were almost totally dependent on automobile travel. Recent efforts by the Municipality of Toronto to stimulate transit-focused development in North York and Scarborough have fallen short of their goals, in part because of the downturn in the Canadian economy. With most growth now occurring in auto-dependent suburban locations outside the Municipality, transit-focused development is less viable than ever before.

Vancouver, a North American success story, is a city that has doubled in population in 15 years and one where development has followed a regional plan that has guided development to six suburban town centers, four of them inner suburbs served by rail transit lines emanating from downtown Vancouver. Vancouver's intense development within a constrained geography has provided support for use of transit in suburban areas.

Suburban stations on the BART system in San Francisco have experienced relatively little transit-focused development except in a few locations such as Walnut Creek and Concord. This was due in part to the poor locational attributes of stations along former rail lines, in part to community resistance to higher-density development, and in part to BART's emphasis on providing large park-and-ride facilities at transit stations, which discouraged station-related development. BART's new interest in leveraging its property interests in park-and-ride lots is now generating more interest in station-area development in some suburban locations.

Portland has invested considerable effort in planning and implementing development at outer suburban stations. The relatively modest commercial and residential projects resulting from these efforts correspond to the experiences of San Diego's and San Jose's light-rail systems in scale and character.

Occasionally, older transit systems in New Jersey, Philadelphia, and Chicago also generate interest in transit-focused development. This rare occurrence results when a mature suburban town seeks to revitalize its business district.

A Note on Bus-Oriented Development

Most rail station areas also incorporate bus terminals, some quite significant in the regional bus network. The downtown rail station in Cleveland, for example, is also the primary destination of bus routes leading to downtown, and acts as a major multi-modal terminus and interchange facility for a large area. In addition, most transit systems have oriented bus routes to terminate at rail stations to induce greater rail patronage and avoid duplicative transit service. Undoubtedly, the association of bus service with rail access has helped to stimulate development around rail stations, although its precise effects are difficult to measure. In particular, the intensive bus service provided on so-called transit malls in cities such as Portland and Denver, both of which link directly to rail stations, improve overall transit patronage that helps to support related development.

Some cities lacking rail service have spent a considerable amount of effort to stimulate transit-related development around central bus terminals. The Ground Transportation Center in Cedar Rapids, Iowa, for example, was designed as the central terminal for intercity and city bus service with strong pedestrian links to nearby office towers and other uses. Air rights were leased to permit construction of an apartment building over the terminal. Air rights over the Santa Ana, California bus transfer station also were leased to a developer for construction of an office building. In Tucson, public buildings and a child care center have been developed around the downtown bus terminal.

Because transit agencies appear to be promoting multimodal bus transfer facilities in central locations, additional related development is likely to occur in future years.

Inducing Development by Joint Action

Producing a successful joint-development project that incorporates or leads to a rail station is a complicated undertaking,

and one that requires the informed participation of transit agencies. Several regional systems stand out for their achievements. In Atlanta, MARTA helped to bring to fruition at least four development projects located in conjunction with stations and at least three projects providing direct access to stations. In Miami, four projects have been designed in conjunction with rail stations and the MDTA is actively soliciting and negotiating more. In Portland, eight small joint development projects are underway or completed. San Diego's MTDB has sponsored joint development of two spectacular projects downtown. Washington, D.C. probably has completed more projects (22) in conjunction with stations than any other region.

Fewer joint development projects have been attempted in other areas. Baltimore and Cleveland each have completed one, and both are seeking additional projects. Boston's Orange Line planning study identified a variety of uses for land declared excess by elimination of a planned highway along the rail route; redevelopment of part of it has been completed.

Joint development projects are sometimes initiated by developers, but most occur through efforts by transit agencies to market excess properties in station areas or to secure connections with adjoining development. Typically, efforts to attract substantial development over or adjoining stations include market and planning studies, developer solicitation (using previously approved procedures), consideration of design and financing issues, a negotiation process (with local jurisdiction participation), ratification of multi-party agreements, participation in or monitoring of construction, and post-development management responsibilities. Even when stations simply interface with adjoining development (including joint use of parking structures), a knowledge of real estate, construction, and management practices is required.

The following four case studies of joint development demonstrate the potential complexities involved. The Cleveland Tower City Center project exemplifies projects that are large in scale and influence and thrive on heavy transit volumes. The East Burnside project in Portland shows the scale and character of light-rail station projects. Failed (or yet to be realized) projects in Portland and Baltimore are briefly described to illustrate the obstacles that station-area development encounters.

PROJECT CASE STUDIES

Joint Development as the Centerpiece of Station-Area Development: Tower City Center in Cleveland, Ohio

The only downtown station for the Greater Cleveland Regional Transit Authority's rail transit systems was located in a rundown complex built in the 1920s in the southwest sector of Cleveland's central business district. When downtown development began to revive in the late 1970s and early 1980s, Forest City Enterprises, Inc., based in Cleveland but a developer of major commercial projects throughout the United States, saw an opportunity to redevelop the site for a major mixed-use

project that would help rejuvenate the downtown area. As an integral part of the project, the developer worked with the transit agency and the city of Cleveland to develop a program for upgrading the transit station and passenger accessways through the project and for linking it to the adjoining Gateway stadium and arena. The complex organizational and financial relationships between the developer and the various government agencies offer many lessons for planning and implementing joint development in other communities.

The Project--The project site occupies 34 acres centered within a triangular, five-block section adjoining Public Square, an important downtown landmark. The adjoining Dillard's department store anchors one end of the primary retail core stretching east from Tower City. The new Gateway Center stadium is just a few hundred feet west of the site.

The existing complex was historically significant but badly deteriorated and underutilized. When acquired by Forest City Enterprises in 1982, the structures consisted of the architecturally significant Terminal Tower office building in relatively good condition and the abandoned rail terminal, including a partly occupied, 30,000-sq ft retail arcade. The adjacent hotel, long a downtown landmark, declared bankruptcy in 1976, cross-country passenger rail service had been halted in 1977, and the adjacent post office was vacated in 1982. The station platforms were reached from three narrow, winding concourses and the platforms themselves were dark and uninviting. The foundation bridges for city streets through the complex had deteriorated to the point where major repairs were necessary before any new development could take place.

The proposal for joint development at the Terminal Building site came directly from the developer, Forest City Enterprises, Inc. The Ratner family, who founded and controlled the publicly traded company, had long been involved in civic concerns in the Cleveland area. The family was intensely interested in contributing to Cleveland's future growth, and saw an opportunity to apply to this site their expertise in developing large, mixed-use centers across the nation. Motivated by a strong belief in the power of retail uses to inject new life into ailing commercial areas, the developer sought to make Tower City Center a new focal point for downtown shopping. In addition, redevelopment and new development of adjoining office buildings and a hotel would create a "critical mass" of marketable space sufficient to support redevelopment.

The developer also determined at the outset to attract suburban shoppers as well as office tenants by upgrading the functional design and physical attractiveness of the transit station and its connections to and through the proposed commercial complex.

Tower City Center incorporates a 360,000-sq ft regional shopping center on three levels, over 1.4 million sq ft of office space contained in two historic buildings and two new buildings, a 208-room luxury hotel, new transit-station waiting areas, access ways, and platforms, and 3,150 parking spaces. Indoor passageways connected the individual buildings in the complex and linked to Dillard's department store, the 500-room Stouffer Tower City Plaza Hotel, two additional office buildings, and the new Gateway stadium and arena.

The Terminal Tower office building provides a major entranceway for the complex but is under separate ownership from the remainder of the project.

Beneath the retail mall, transit related renovations included moving the old station nearer the center of the project, building new platforms and waiting rooms, improving track and escalator systems, designing pedestrian accessways through the retail spaces, and constructing an atrium to open up the transit space to the retail arcade.

On either side of the retail space, the foundation columns erected in the 1920s for buildings never constructed were used as bases for a new 13-story office building and a Ritz-Carlton Hotel with four additional floors of office space. Both buildings can be entered directly from passenger accessways and the retail arcade.

Significant design elements of the historic structures were incorporated in the structures, including retention of parts of the original bronze storefronts, restoration of the decorated ceiling and wall murals in the Terminal Tower entranceway, and reuse of decorative elements from the original building.

The Development Agreement--The developers entered into extensive discussions with the City of Cleveland, the RTA, and state and federal transportation agencies to work out a public/private agreement for redevelopment of the project. The negotiations were lengthy and complicated by the number of public agencies involved, the developer's need for maximizing public funding from various sources, and the complexity of the project itself. The development process required the city to rehabilitate the underlying bridge structures, for which it obtained \$18 million from several federal sources. The developer and the Regional Transit Authority each employed architects and engineering firms who were cross-contracted with the major clients to coordinate the work. Construction management was contracted by the developer under an agreement that the RTA would acquire the completed transit components of the project after construction. The entire project cost \$388 million, including \$59 million for transit station and pedestrian accessway improvements paid by public funds.

These arrangements required tremendous efforts on the part of the developer, the RTA, and local, state, and federal agencies. Not only were unique procedures being structured for design and construction management, but public funding had to fall into place with the projected schedule of construction. The developer and local officials exercised their networks of contacts with state and federal funding sources to the utmost to achieve the necessary financial backing.

Lessons Learned--The project has been an outstanding success for both the developer and the RTA, and Cleveland's citizens have responded enthusiastically to the new opportunities offered by Tower City Center for shopping and transit service. Most retail tenants have exceeded their sales projections and office rentals were quite successful in the face of a real estate recession. Rail transit ridership rose by 30 percent following the opening of the new shopping arcade, to an average of 30,000 passengers per day. With bus ridership of 90,000 from stops around the station, over 120,000 people are brought to the complex each day, a major reason for the success of the retail and office components of the project. These

numbers are increasing with the opening of the Gateway ballpark and arena, which are expected to draw more than five million people a year, 1.5 million of them by transit.

The fragmented public/private partnership of architects, engineers, and construction managers proved a nightmare to coordinate and constantly presented obstacles to achieving consensus on the many alterations required during design and construction. The public and private project managers for this project, both with long experience, strongly advised that a project of this size and complexity have a single architectural-engineering firm in charge of design, a single construction manager, and a single coordinator for the public side of the project.

The experience of Tower City Center demonstrates the achievements possible when powerful, strongly motivated public and private organizations unite to pursue focused development objectives that offer important payoffs for all parties involved. Tower City Center's joint development project is indeed the "right project at the right place and the right time."

Development Oriented to Light-Rail Transit: The East Burnside Project, Portland, Oregon

The East Burnside joint development project, modest in scale and impact compared to many joint development projects, is a useful example of development related to light-rail transit service. Among its advantages, compared to the much more complex Cleveland project, is that the project required relatively little time and effort from either the transit agency or the developer.

The Project--The Banfield line extends from downtown Portland through a series of neighborhoods to Gresham. About halfway to Gresham, the line meets Burnside Street where, as part of the rail line construction, Tri-Met had acquired excess right-of-way, including three small properties on Burnside Street, a total area of 28,000 sq ft.

Because the neighboring area was developed with relatively small and inexpensive houses and multi-family dwellings, it appeared that the site was most suitable for multifamily development, although it was too small for such a project. In 1989, two years after construction of the line was completed, a developer approached the agency before the agency could prepare a prospectus and advertise for competitive bids for sale of the properties. The developer had begun building housing on a number of sites along the Banfield line, and initially requested an easement through the agency properties to provide access to properties behind them that he was in the process of acquiring. Tri-Met's joint development manager encouraged the developer to explore the possibility of expanding the development by combining his properties with the agency-owned lots.

Accordingly, three properties totalling about 47,000 sq ft were assembled and the Tri-Met parcel of 28,000 sq ft was acquired, providing 1.7 acres for 42 units at a density of 25 units per acre. The purchase price was \$37,500, actually \$5,000 over the appraised fair market value. The property was

just a half block from the 162nd Street transit station, although access to the platform's north side for boarding trains into Portland was about one and one-half blocks' walk from the site.

The Joint Development Agreement--The core argument for joint development is perhaps expressed best in Tri-Met's agreement with the developer of East Burnside:

The purpose of this joint development project is to enhance the participation of the private sector in the Banfield LRT, increase revenue and ridership for the transit system, provide for a more attractive and convenient environment for the transit patrons by the close location of housing units for persons who rely upon transit for their means of transportation....

Tri-Met's own objectives were expressed in a summary memorandum about the project.

1. Be certain a real housing project was actually constructed;
2. Have the developer very satisfied in his relationship with Tri-Met and the project;
3. Utilize excess ROW as a mini-redevelopment tool, including writing off the existing single-family improvements, writing down the land value to apartment value, and absorbing the "carry" cost;
4. Utilize proper procedures for FTA concurrence;
5. Utilize a redevelopment type agreement;
6. Be certain the project can be repeated; and
7. Retain the revenue from the sale or lease of the land for Tri-Met.

The negotiation process was torturous, primarily because it was Tri-Met's first joint development project, which required the establishment of general policies and procedures as well as basic "go/no go" decisions on the whole concept of joint development. According to Tri-Met's joint development manager, the federal transit agency was not organized to support this type of public/private project, and Tri-Met traditionally had been cautious in disposing of properties for which it might have later uses. Various procedural delays caused Tri-Met to stretch its authority by writing assuring letters to the developer. (The U.S. Department of Transportation even sent an inspector general to investigate the land deal, which brought a lower price than Tri-Met had paid.) Tri-Met pointed out that small deals often require as much investment of time and effort as large deals.

The developer waited over a year for an agreement, meanwhile proceeding with strictly private projects at other sites along the transit line. He executed the development agreement with Tri-Met on November 1, 1990 but financing difficulties postponed closing until March 25, 1992. The agreement called for the developer to submit preliminary development and construction plans consistent with design sketches already submitted, submit evidence of financial capability to complete the project, and a variety of other requirements.

The developer, Michael B. Monahan and Associates, designed and built 40 new apartment units in four two-story buildings configured as stacked two-bedroom units. Parking is

outdoors, arranged in small off-street bays. Architectural and landscaping treatments reflected the low-cost nature of the project, which was targeted for renters seeking basic housing values. The units offer 824 sq ft (generally considered small for a two-bedroom unit) at a rent level of \$545 per month. Commented the developer, "It was designed as just a "hangout" place for people who want a new place at rock-bottom prices." Most residents are lower-level office workers who work downtown and value the accessibility of the project to downtown.

Monahan's budget for the development, including land acquisition, development, and soft costs, was \$1.3 million. He invested \$300,000 in front-end equity and obtained a \$1 million construction loan, and later sold the project for a relatively profitable \$1.77 million. Monahan subsequently developed or is planning about eight projects along the Banfield line for a total of 300 housing units. He is negotiating a second joint development project with Tri-Met for 40 units to be developed at a somewhat higher density and income stratum than the Burnside project.

Lessons Learned--However modest in scale, the project can be said to have achieved both the developer's and agency's objectives. The developer was able to combine properties to achieve a more buildable project. He delivered a product carefully attuned to the market and has reaped an appropriate profit. Many project residents have found proximity of the transit line to be valuable.

From the agency's viewpoint, the project permitted reuse of excess land that otherwise might have encumbered the agency's inventory for years. Of greater importance, the project delivers about 70 riders per day to the line, riders who might not have found suitable housing accessible to transit and who do not need park-and-ride space. The agency also contributed toward fulfillment of city and regional policies that encourage infill development and production of affordable housing.

However, the progress of the project demonstrated the difficulties inherent in the standard outlook and policies of federal and regional transit agencies. The agencies tended to downplay the significance of joint development in favor of basic transit service; and they were reluctant to encourage adopting policies and procedures that provided *incentives* not disincentives for transit agencies to work with developers. (Tri-Met's objective of retaining project revenues was not successful given FTA policy requiring the return of grant monies.)

The delay in reaching an agreement with the developer might well have deterred another developer, especially in the face of a changing marketplace. In this case, however, the delay was extended by his financing problems, which were finally resolved in part due to Tri-Met's backing of his participation in this project.

The active participation of Tri-Met staff was essential to the successful completion of this project. Its success was largely due to their ability to identify development opportunities, deal one-on-one with potential developers, and persevere in pressing agency management for decisions.

Finally, Tri-Met's memorandum summarizing experience with East Burnside notes that to use transit frontage effectively

requires that transit related development be more than "skin deep." Such development should reach back into adjacent neighborhoods to create projects large and visible enough to attract a market and to produce substantial numbers of new riders. Frequently this requires that transit agency properties be used with additional private properties to generate developable parcels.

Complexities Confound Consensus: The Winmar Project in Portland, Oregon

In Gresham near the terminus of the Banfield line, the Winmar Company, a nationally known shopping-center developer, proposed development of a \$100 million mixed-use center. To be situated dramatically on a platform over the tracks, which are in a 26-ft-deep cut, the project's centerpiece would be a rail station linking the two halves of the development. To assist in promoting the project, Tri-Met was to acquire and lease back to the developer about 65 acres of land around the station. The developer would then develop a 900,000 sq ft regional mall and entertainment center. Architectural drawings were produced, an environmental assessment was completed, and negotiations were begun between the developer, Tri-Met, and Gresham officials. In addition, the developer began negotiations to determine the six anchor tenants proposed for the mall.

Tri-Met succeeded in obtaining special legislation from Congress to provide funds for site acquisition and infrastructure improvements, in anticipation of the project's generating additional ridership, and lease payments that would reduce Tri-Met operating costs. Tri-Met expected that the shopping center would generate substantial off-peak ridership, given the station's location in the center of the mall.

The public approval process, including obtaining the federal funds, working out purchase and lease agreements, and seeking agreement among community groups in Gresham to support the project, took many months. Regional and local agencies were often at loggerheads on the project. Meanwhile, the developer was having trouble lining up anchor tenants. Finally, in 1991 when the project was to have broken ground, the developer withdrew, citing the lengthy approval process and the worsening market.

In 1995, a public/private group developed a new master plan for the Winmar site that calls for a considerably less dramatic but perhaps more marketable mixed-use project.

Owings Mills: A Promising Project Yet Unrealized in Baltimore

Owings Mills is a community founded in the 1960s in the northwest quadrant of Baltimore County, just outside the I-695 Beltway around Baltimore. The community has been developing slowly but steadily for decades. Designated as a growth

center by the county's comprehensive plan, Owings Mills was a natural western terminus for Baltimore's Metro heavy-rail system that provides service to downtown and eastward to Johns Hopkins Hospital. The route followed an existing railway; the station, opened in 1987, was situated near Northwest Expressway. It was anticipated that many riders would drive to the station's park-and-ride lots from the rapidly developing areas west of Owings Mills (including Columbia) for commuting to downtown Baltimore. In 1995, on an average weekday, about 3,200 riders boarded Metro at the station.

From the beginning, planners envisioned the station as the location for a town center for the Owings Mills area. The state had acquired a 37-acre site around the station to be used primarily for a park-and-ride lot but ultimately for joint development. A development plan for the site was prepared in 1990 that projected high-density, mixed-use development (3.3 million sq ft of office space, 125,000 sq ft of retail space, a 250-room hotel, and 750 dwelling units). Parking structures were proposed to provide 11,300 parking spaces, 3,500 of which would be reserved for transit riders. The components of the town center would be linked to the Metro station via an automated people-mover. Although the Maryland Transit Administration sought developer interest for several years, none was forthcoming.

Three obstacles have discouraged interest in station-area development. One was the presence of several competing developments in the area, including a major regional shopping mall and business park abutting the site about a quarter-mile from the station. Developed by the Rouse Company some years prior to the station's opening, the development and other business parks nearby represent sobering competition for future additional development. (The company's attitude toward further station-area development is probably reflected in its recent erection of a fence between the mall and the station's parking lot, reportedly because a robbery in the parking area raised security issues for mall visitors.)

The second obstacle was the site itself, which is owned partly by the MTA and partly by the Federal Highway Administration. Lengthy negotiations have been required to obtain approval for transfer of the property from the state highway administration to the MTA to allow future leasing of the site to potential developers.

The third and perhaps most serious obstacle is the moribund economy of the Baltimore region. Large-scale development plans prepared in the 1980s now appear considerably over-scaled as regional economic and population growth have tapered off.

The MTA is responding to these circumstances by funding an update of the master plan for the site, to be undertaken in late 1996. The first phase of planning will reevaluate projected development and examine infrastructure needs. The property will be offered on a long-term lease basis as an incentive to development. In addition, MTA is taking the long view that development of the entire site probably will take 15 to 20 years.

CHAPTER SIX

CONCLUSIONS

The major increase in construction of rail transit lines over the past three decades has fostered the current interest in transit-focused development. However, metropolitan regions have continued to develop in low-density patterns generally unresponsive of transit service. In response to these disjunctive trends, public decision makers and transit agencies have promoted development around transit stations to provide a setting conducive to greater use of transit. This synthesis, which studied the practices of 19 regions in the United States and Canada in the area of transit-focused development, presents the following conclusions.

Transit Patronage Is Best Served by Station-Area Development of the Following Character

- Designs of stations to relate entrances as directly as possible to adjoining uses and neighborhoods;
- Densities within a half mile of station areas that approach 7 to 12 residential units per acre and 50 or more employees per acre, with lower but still substantial densities as far as one mile from stations;
- Designs of areas and buildings that promote pedestrian movements between uses and between stations and adjoining areas, including attractive, convenient, and secure pathways; buildings fronting on streets and public spaces; compact development of buildings; parking designed to support rather than interfere with pedestrian movements; and pleasant landscaped areas;
- Mixes of activities that allow satisfaction of multiple needs within a walkable distance from stations, including employment, convenience retail, business services, and public facilities and services; and
- Policies that reduce incentives for parking, including lowering of parking requirements, increasing parking costs, and provision of bicycle paths and storage facilities.

*The significance of transit-focused development as a component in metropolitan development will evolve gradually in most regions--*Decision makers in policy and civic activist circles across North America have expressed great interest in promoting development related to transit. However, when compared to the amount of metropolitan development that has occurred since the 1950s, this interest has not yet translated into significant development in most cities with rail transit systems. The intensive development that has taken place has occurred mostly in central business districts and some midtown and inner suburban locations. Transit-focused development at outer suburban stations is relatively rare. At least six regional transit systems that are relatively new or still under construction have generated little station-area development.

Except in older cities and downtown areas, development around rail stations often falls short of the density and design thresholds needed for generating significant transit ridership; transit-focused development still remains more a concept than a reality in most regions.

The primacy of the automobile and the desire of most North Americans to live and work in low-density surroundings strongly dissuades market forces and governmental policies from producing the densities and forms of development most supportive of transit. The real estate recession that began in the mid 1980s halted development in many regions, particularly affecting those with newly completed or under-construction transit systems.

Although station-area development is at an ebb, the apparent upturn in the real estate market in most regions may well provide new opportunities for development. Changing regional development patterns takes time. The combination of public policy and regulatory support for transit-focused development will prove instrumental in turning the tide in favor of transit.

*The market continues to be the dominant force in realizing transit-focused development--*The recent recession underlined the conclusions of researchers that station-area development is generally more a product of market interest in specific locations than a response to the availability of transit access. In most areas, automobile travel is still the dominant factor in influencing development locations and characteristics. Real estate experts project that most future development is likely to occur as smaller incremental projects. These projects are able to respond to a more disciplined market and can be tailored to existing development and environmental constraints. Those factors will affect transit-focused development as well.

Public officials will wage an uphill fight to attract development to station areas without the market forces to back them up. They can overcome a weak market to some extent by siting public facilities near stations and providing permissive regulatory environments and attractive incentives to development. They will accomplish far more, however, by locating stations in marketable areas and using regulatory powers to shape development into transit-friendly nodes, making their strategy one of augmenting rather than substituting for market forces.

*Today's light-rail systems and multi-nodal development patterns are more likely to generate small, community-compatible projects than "blockbuster" development complexes--*Much of the impetus for transit-focused development arose from early experience in Toronto, San Francisco, and Washington, D.C., where large, intensive development projects created impressive nodes of station-area activity. The heavy-

rail systems in these regions draw large numbers of commuters long distances to central employment locations in downtown's or in mature suburbs. That market, plus the peculiar characteristics of the real estate boom in the 1980s, drove much of the high-profile, architecturally distinctive development that took place around stations.

Unlike heavy-rail systems where the relatively limited number of stations promises major development opportunities at each one, light-rail lines and the multi-nodal development patterns present different opportunities for transit-focused development. With their more numerous stops (and slower trains), light-rail systems will be subject to developers and public officials picking and choosing the most desirable stations for development opportunities. In addition, experience with existing systems shows that many stops will be constrained by requirements for compatibility with existing development. Public officials and developers will be challenged to formulate standards and procedures for dealing with these factors.

*Experience with transit-focused development conclusively demonstrates the desirability of integrating planning for regional development with the design of transit systems--*The most successful examples of transit-focused development have occurred in metropolitan areas where regional planning significantly influenced and integrated development patterns and the design of new transit systems. Vancouver and Toronto, both working within strong regional governance systems, have been able to direct regional development patterns to reinforce transit service in designated areas. In Washington, D.C., federal agencies planning in the 1960s laid out the basic system of rail lines to coincide with corridor development patterns, which were subsequently reinforced by the development policies of several local governments. In Portland, the Metro regional government and Tri-Met regional transit agency have long worked in tandem to mesh transit service with desired patterns of regional development.

The setbacks these regions have experienced in generating transit-focused development have helped to define the effectiveness of integrated regional action. Toronto lost control over regional development taking place outside the municipality at about the same time that economic problems forced curtailment of transit extensions, occurrences that have substantially reduced the amount of transit-focused development in the region. Washington's early federal planning gave way to local control over development, which has produced a mixed record in transit-focused development.

Unfortunately, regional and metropolitan capabilities to direct development are weak or strained. Even under ISTEA requirements for more integrated land use and transportation planning, local governments continue to dominate decision making at the regional level. Furthermore, as transit systems push out beyond the central cities, development in station areas will fall under the control of individual jurisdictions less ready to accept development of the character required to support transit. For transit-focused development to flourish, regional agencies must gain more influence in directing metropolitan development patterns to support transit service.

Local governments play a significant role in promoting transit-focused development. At a fundamental level, local governments can encourage transit-related development in comprehensive planning policies and zoning provisions that allow and even provide incentives for development densities, designs, and mix of uses supportive of transit service. These planning and regulatory actions, which sometimes must override neighborhood opposition, are an absolute necessity to attract private investment in station areas. In a more proactive stance, local governments can work with transit agencies to undertake redevelopment activities, infrastructure improvements, and joint development projects. As described in the case studies, the efforts of local governments are important keys to successful transit-focused development.

Current experience indicates that extraordinary efforts by regional planning and transit agencies to work with local jurisdictions will be required to stimulate transit-focused development under these circumstances.

*The public support required to generate significant transit-focused development is still forming in most regions--*This examination of research findings and experience underscores the fact that transit-focused development is dependent on supportive government policies and actions to reinforce market forces. ISTEA appears to have stimulated some regional planning agencies and MPOs to more clearly address needs for transit-focused development, but the record shows that many regions lack a unified policy base and specific action program to promote intensive development around transit stations.

At the local level, the record of transit agencies and local governments acting forthrightly to support transit-focused development is mixed. In addition, except in instances when state agencies have been assigned direct responsibility for transit service, state involvement in transit-focused development is not in evidence.

The information in this report demonstrates that a variety of regional and local policies and actions are available to pursue transit-focused development; more direction by state or federal agencies may be necessary to stimulate local actions in its support.

*Joint development can offer valuable inducements to transit-focused development--*Among the dozens of joint development and interface projects that have been completed to date, the projects presented in this synthesis appear to show that a proposed joint development project has the best chance of success when the transit agency owns property in a desirable location, employs a property manager eager to capture and leverage asset values, and can offer financial subsidies (through federal and local assistance) to underwrite extraordinary development costs. The benefits of joint development--improving access to stations, enhancing system visibility, improving property assets--are worth the extra effort for transit agencies.

*Most station-area development could be better designed to create a pedestrian-friendly environment that enhances transit ridership--*From the project experience examined in this synthesis, many individual projects over or adjoining

transit stations have been designed to ensure convenient and attractive pedestrian access to stations. Design is often left to chance in the areas that connect a development to the wider station area. Station-area planning by local jurisdictions or transit agencies should place greater emphasis on providing an attractive pedestrian network throughout the area surrounding the station, including park-and-ride facilities.

The combining of physical details like building elements, development design features, and public space can produce a harmonious environment that enhances transit access and ridership; how this is achieved needs to be studied and understood. Local governments could play a major role in providing the standards, regulatory framework, and review procedures necessary for improving those relationships and features.

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APPENDIX A

Agency Profiles

PROFILE: ATLANTA

The Transit System

Atlanta's Metropolitan Area Rapid Transit Authority (MARTA) system incorporates north-south and east-west lines with 38.2 mi of double track and 33 stations, opened between 1979 and 1986. MARTA opened a 7.1-mi northern extension in mid 1995 and other extensions are planned.

Policy Framework

The Atlanta Regional Commission's (ARC) most recent regional development plan includes a number of policy statements supporting rail station-area development. A section entitled "Transit Station Area Policies" encourages transit-related development around rail stations and intermodal facilities, and policies support improvements in areas "that present the best opportunities for development and redevelopment."

The city amended its zoning ordinance in 1982 to create "public interest" overlay districts around stations, which allowed higher densities in return for public amenities such as open space and pedestrian connections. The city planning office also helped to coordinate provision of public improvements in station areas.

In its early years, MARTA pursued joint-development opportunities, including adoption in 1982 of a disposition policy for surplus property that encouraged air-rights development over stations. But more recently, the agency has provided little policy or other support for TFD and has taken no recent role in initiatives to promote development opportunities around rail stations.

Station-Area Development Activities

Early successes at joint development included construction of two state office buildings on air rights over the Georgia State Station in 1982, a land swap with Southern Bell that resulted in development of a \$100 million project over the North Avenue station, lease of air rights over the Ashby Street station parking garage for a nonprofit community organization's retail venture, and interfacing of several stations with adjoining retail stores and office buildings. Most of this activity ended in the late 1980s with the downturn in the real estate market. Construction of Resurgens Plaza in 1988 over the Lenox station, which was to be part of a large development complex, was the last major joint development venture. In general, most development around station areas has stemmed

from market forces, with relatively little public assistance or other support.

Current activities include:

- At the Five Points station in downtown, the crossroads of the transit lines, a substantial amount of development occurred during the 1980s, together with construction of a pedestrian mall connecting the Five Points and Garnett stations and underground connections between the station and adjacent development. The subsequent decline of the adjoining Underground Atlanta area dampened developer interest in this area. Now a multi-modal facility linking MARTA with Amtrak service is being designed in coordination with a planned federal building and the new Olympic park. State funds required for the project appear uncertain, however.
- At the Lenox station about four miles northeast of downtown, an explosion of office and retail development has occurred, driven completely by market forces.

Observations on Obstacles and Opportunities

MARTA's initiation of operation coincided with a major development boom in many parts of the Atlanta region throughout the 1980s. Stations were located in many of the most desirable real estate market areas and thus benefited from a considerable amount of air-rights joint development and nearby development. In recent years, however, neither MARTA nor public agencies have aggressively promoted close linkages between stations and adjoining development. That, coupled with the decline in the real estate market beginning in the late 1980s, has resulted in little station-area activity except that related to the 1996 Olympics.

PROFILE: BALTIMORE

The Transit System

The Maryland Transit Authority (MTA) operates both heavy and light rail lines in the Baltimore area, in addition to commuter rail service and bus service. The 22.5-mi light rail system has 24 stops and an average daily ridership of 20,000. In 1995, ground was broken for 7.5 mi of extensions with eight new stations, to be completed in 1997.

Metro, the heavy-rail subway that opened in 1983, has one 14.5-mi line with 14 stations that is partly underground, partly

surface, and partly aerial. Average daily ridership is about 45,000. MTA also operates 72 bus routes in the Baltimore area.

Policy Framework

The Baltimore Metropolitan Council's 1994 transportation plan for the MPO contains no explicit policy statements supporting TFD but expects its next plan to more fully address station-area development opportunities, including joint development possibilities.

The MTA has taken several actions to provide policy support for TFD:

- Publication of *Access by Design: Transit's Role in Land Development* (September 1988), which provides information and standards for incorporating bus and rail transit lines and stops in development projects;
- Implementation of the state's Transit Station Development Incentive Program, which provides grants to local governments for promoting or enhancing station-area development, including pedestrian linkages, traffic-calming techniques, streetscape improvements, commercial revitalization and redevelopment, and new development.

Station-Area Development Activities

Baltimore's heavy rail system began operation as the regional development market went into decline. It serves important inner city areas, including the revitalized waterfront area, but new development activity along the line is scarce. The light rail system, completed in the market doldrums of the late 1980s, serves the new stadium at Camden Yards in downtown but has attracted little development. The city planning department has sponsored design studies, funded by the state's incentive program, to identify development opportunities and propose design solutions at five rail station sites; so far, the city has taken little initiative in promoting station-area projects.

The MTA has done the following:

- Donated \$10,000 to communities along the lines to enhance station attractiveness prior to opening the light rail system. This resulted in new artwork and landscaping in some communities.
- Completed one joint-development project, a 329,000-sq-ft Bank of Baltimore office tower and parking garage. Built on a remainder parcel of 26,000 sq ft at the Charles Street Metro station, it produces a continuing income stream for MTA.

MTA has pursued several other opportunities with little success. A large underutilized parking area at the Reistertown station has attracted little developer interest, although MTA is designing a daycare center for the site that it plans to lease to a childcare provider. Other development has been pursued at the

Owings Mills station. However, a master plan prepared by the MTA and Baltimore County for a high-density town center at that station has generated no development, although nearby commercial development is quite strong. The MTA has budgeted \$500,000 to study infrastructure needs at Owings Mills, with the hope of laying the groundwork for later development. Johns Hopkins University is preparing a campus plan that focuses more on expanding parking than enhancing transit ridership. However, some station-area pedestrian enhancements at the Westport station have occurred hand-in-hand with housing rehabilitation near the station.

Observations on Obstacles and Opportunities

The combination of a city administration focused on other issues, a relatively weak regional organization, and a transit agency managed by the state has complicated leadership and coordination of transit-focused development. State management and funding has allowed the transit agency to take a regional outlook but local governments appear to be unmotivated to promote station-area development. The downtown and city neighborhoods served by the rail system are fighting decline and Baltimore's regional economy, including its real estate activities, has been flagging for many years. A more supportive market for station-area development may be found around the planned light rail systems extensions in suburban Hunt Valley and Anne Arundel County.

PROFILE: BOSTON

The Transit System

The Massachusetts Bay Transportation Authority (MBTA) oversees a commuter rail network with 102 stations on 11 routes, with approximately 265 route miles total. In addition, the Authority manages five rapid transit lines with 131 stations, with about 80 total route miles. The commuter rail system serves about 80,000 passengers daily and the rapid transit lines serve about 450,000 daily passengers.

Policy Framework

The state's transportation improvement plan has no language specifically endorsing TFD. *Metro 2000*, the regional planning council's 1993 plan, does include a TFD-supportive policy "to promote the development of local land use policies that result in more efficient use of the regional transportation system . . . through targeting transportation investments to areas identified in local and regional plans as being suitable for concentrated development (p.3-8)."

Station-Area Development Activities

The rebuilding of the Orange Line as an alternative to a once-planned new highway (known as the Southwest Corridor Project) was completed in 1987. It replaced elevated service along a 4.5-mi section of the southwest rail corridor and included four commuter rail lines with eight stations and an Amtrak line with three stations.

The project incorporated detailed planning and design for areas adjoining the line, including station areas. Design guidelines were developed for individual stations, including access, seating, signage, and retail space. Development opportunities on excess land were identified and promoted. One of the largest sites was adjacent to Northeastern University, where the design team worked with a diverse group of local developers to plan a major mixed-use development that is now underway. A linear park that connects a series of parks and recreation areas was also developed along the line.

Other station-area development planned by the MBTA is in response to specific market demands:

- At the Wellington station in Medford, construction of a parking deck adjoining a commercial development is planned. The developer will provide a "people mover" to connect the parking garage to the station 800 ft away.
- A trackless trolley (like the one in Seattle) linking South Station in Boston with a proposed courthouse and world trade center in the South Boston Piers area is planned.
- In May 1995, the MBTA advertised for joint development concept proposals on or around its station properties. There have been few responses to date.

Observations on Obstacles and Opportunities

Although the MBTA has not developed an aggressive program to promote station-area development, it has responded to specific opportunities either presented by developers or stemming from community concerns. Like many regions, the fragmentation of Boston-area jurisdictions in planning for development makes it difficult to enunciate and implement a single policy that would promote station-area development. In addition, the depressed real estate market offers little stimulation for joint development and system interface projects in the Boston area.

PROFILE: CHICAGO

The Transit System

Chicago's regional transit network combines operations of four agencies:

- The Chicago Transit Authority, which operates rail and bus facilities in the city, with seven primary rail lines totaling about 225 route miles and 138 rail stations, and about 500,000 passengers on an average weekday, and 139 bus routes with about 900,000 passengers on an average weekday;
- The PACE suburban bus system, with 3,600 mi of bus routes and 184 vanpools;
- The Metra suburban commuter rail system, with 505 route miles and 228 stations on 11 lines carrying an average of 277,000 weekday passengers; and
- The Regional Transit Authority that provides financial and planning oversight for the three operating systems.

Policy Framework

Regional transportation policies are established by the Chicago Area Transportation Study (CATS), which acts as the MPO for the region, related to regional planning activities conducted by the Northeastern Illinois Planning Council (NIPC). Both agencies have adopted policies supporting transit-focused development. The 1994 *2010 Transportation System Development Plan Update* supports improvements to "increase transit use by encouraging intensive developments to locate within easy access to existing or planned mass transit service."

One of the goals in the new *Destination 2020* regional transportation plan is "to encourage local governments to consider land use regulations and development strategies that support transit-oriented development and design."

In addition, NIPC is working closely with Metra to foster TFD, in particular by publishing community guidelines for station-area development and by working with a number of communities to formulate a model zoning overlay ordinance that promotes better access to transit stations and higher-density, mixed-use development around stations.

Although none of the transit agencies has adopted specific policies advocating TFD, they have initiated some TFD-related planning and project developments. RTA has:

- Sponsored four workshops about TFD over the past two years, with subsequent publication of presentation summaries;
- Produced a handbook on parking management strategies to reduce parking demand and supply;
- Developed a checklist for reviewing proposed projects;
- Established a TFD information clearinghouse that includes station-area project opportunities and consultants interested in such development.

In addition, the CTA recently published guidelines for transit-focused development.

PACE published transit development design guidelines in 1988 as part of its program to increase transit usage at new suburban developments.

Station-Area Development Activities

The CTA has begun a major rehabilitation program to renew the oldest sections of its rail system, and is working with the city's planning department and business and neighborhood groups to capitalize on potential opportunities for station-focused development.

It is also working with several community development corporations to improve the business climate in station areas by leasing retail spaces accessible from inside and outside the stations in three stations to developers that renovate spaces and find suitable tenants. Station-area development proposals are being discussed with several other community groups as well.

Metra has promoted TFD by:

- Commissioning studies of appropriate land uses around station areas (November, 1991) and recommendations for improving local economic impacts in station areas (December, 1994);
- Cooperating with the town of Elmhurst in revitalizing its downtown area, beginning with rehabilitation of the rail station, enhancement of its setting, and assistance in financing structured parking. Through redevelopment actions, establishment of a tax-increment financing district, and investments in open space and streetscape improvements, the city stimulated development of several residential and retail projects in downtown near the station;
- Sponsoring a planning study to investigate the possibility of acquiring land for future development at a new station in Downer's Grove and parking;
- Requesting development proposals for a 24-acre site at the Lake-Cook Road station in an upscale retail and office section of the Village of Deerfield.

Observations on Obstacles and Opportunities

Chicago's rail network is now positioned to respond to possibilities for station-area development. However, as Robert Cervero notes in his case study on Chicago-area transit-related development, most of the agency actions to promote TFD in the Chicago area were initiated after the real estate boom of the 1980s had begun to subside. Still, regional planning and transit agencies are laying the policy foundation for more extensive support for TFD, which might also benefit from the long history of public/private ventures in the Chicago area. One problem pointed out by suburban planners is that most rail lines are relatively remote from development corridors along major highways.

PROFILE: CLEVELAND

The Transit System

The rail and bus systems of the Greater Cleveland Regional Transit Authority (GCRTA) serve an area of over 515 sq mi and a population of 1.6 million in the city of Cleveland and 66 suburban jurisdictions. The RTA bus system has 102 routes that total 1,108 route miles. The rail transit system consists of three lines. The 19-mi Red Line, the heavy-rail component of the system has 18 stations. The 13 mi of light rail Blue/Green Lines serve 29 stations.

All these lines converge at the downtown Tower City station which, as a central bus interchange point is the an intermodal facility for the downtown area. The RTA is constructing a light rail extension. RTA plans call for construction that includes a busway, relocating five heavy-rail stations of the Red Line, extending other existing lines, adding lines, and reinstating commuter rail service to northern Ohio communities.

Policy Framework

The five-county long-range transportation plan adopted in 1989 by the Northeast Ohio Areawide Coordinating Agency (the regional MPO) provides very general support for "an integrated transportation system which will effectively serve and enhance the present and future land use patterns and promote the best balance of land use and transportation development (p. 38)."

The GCRTA's 1993 *Transit 2010 Long Range Plan* promotes "the best balance of land use and transit development, including joint development and multiple-use areas (p. 17)" and recognizes the support given TFD by local government policies. The citywide plans in *Cleveland's Civic Vision 2000* include policies to promote transit developments that stimulate economic development, provide access to major traffic-generating facilities, and "encourage joint public/private development of transit stations and associated amenities (p. 37)."

GCRTA also adopted a policy statement in 1993 to guide joint development and station-area development activities.

Station-Area Development Activities

In 1988, the GCRTA initiated a major redevelopment project on a 17-acre site in downtown Cleveland. Called Tower City Center, the project redeveloped the historic rail station serving downtown, introduced a 360,000-sq-ft, multi-level shopping center, a new office building, and a first-class hotel. It renovated the existing Terminal Tower, transformed a former post office into a new office building, and rebuilt the rapid transit station accessways through the complex and the track-age and platforms below the complex. In addition, the Authority built a walkway connecting the transit station to the new Gateway Center stadium and arena through the complex. The

\$388 million project has transformed Cleveland's downtown and attracted a 30 percent increase in rail transit ridership.

The GCRTA also prepared site assessments for two stations that have excess parking capacity and requested indications of developer interest in those sites. As a result, the Authority is:

- Acquiring additional property and completing negotiations with a developer to build a Head Start childcare center at the renovated Windemere station, using funds from an FTA Liveable Communities grant;
- Negotiating to lease excess parking area at the Triskett Station to a developer who in turn will lease the space to the Greater Cleveland Council of Economic Opportunity of Greater Cleveland for another childcare center;
- Planning to construct another enclosed passenger accessway, probably with federal funding, linking the Tower City station to a new federal courthouse.

Observations on Obstacles and Opportunities

Instrumental in the rebuilding of the downtown terminal as a major joint development was the driving force of Forest City Enterprises, a nationwide shopping-center development company headquartered in Cleveland. The developer was able to tap a variety of public and private resources to organize and finance the project. In addition, the GCRTA recognized the need to increase ridership and established both the policy basis and staffing to complete the project. With that positive experience, the Authority was stimulated to pursue other opportunities.

PROFILE: DALLAS

The Transit System

The Dallas Area Rapid Transit (DART) is constructing a 20-mi light rail system in Dallas consisting of three lines. The first 12 mi of the system are scheduled to open in June 1996 and the remaining 8 mi in 1997. The line will have 21 stations. The 20-year plan adopted in 1989 calls for a 67-mi light rail system.

In addition, Dallas and Fort Worth jointly purchased a freight rail line that connects the two cities. Commuter rail operations are to begin in 1996 with the opening of three stations. At the Fort Worth end of the commuter rail line, the city is developing an intermodal center in downtown that will link commuter rail service with the Amtrak station and two interstate highways. At the Dallas end of the commuter line,

commuter service will connect to the light rail line at Union Station in downtown Dallas.

Policy Framework

The North Central Texas Council of Governments, the regional planning agency that performs MPO functions for the Dallas area, has adopted no policies that specifically promote transit-focused development. The most recent transportation plan, *Mobility 2010: The Regional Transportation Plan for North Central Texas*, contains only the most general references to linking land use with transportation. The city has adopted no incentives for development around DART stations.

DART has adopted no specific policies supporting TFD, although its 1995 official mission and goal statement refers to the desirability of the DART system stimulating economic development. However, the transit agency is conducting a study to determine ways to link its stations with the extensive pedestrian network below much of downtown Dallas.

Station-Area Development Activities

Until the system is in operation, DART officials have found little interest among developers in considering joint development or station interfaces. An early experience with joint development has yet to succeed. The City Place project, including twin office towers adjacent to a proposed DART station halted with one tower built when the market soured, and the second tower was never undertaken. Neither was the developer's contribution to station construction, which was nullified by a negotiated agreement. As a result, the opening of the partially completed station will be delayed pending further negotiations with the developer. However, since the opening of the initial segment, restaurant business in the west end entertainment district has improved by 10 to 20 percent.

Two other station-area projects are underway:

- At the Illinois station, DART received a \$26 million federal grant to renovate a historic trolley car storage building to be used as a station and community retail center. The 30,000-sq-ft station will include a transit museum and police office and over 20,000 sq ft of retail space. DART selected the developer and renovations are scheduled to begin in 1996.
 - At the proposed Kiest Boulevard station on the south side, DART used part of its federal grant to pay 70 percent of the cost of a 275-space parking facility that will be shared with an adjacent shopping center. The facility and station are scheduled to open in late 1996.
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PROFILE: DENVER

The Transit System

Denver's 5.3-mi light rail line began operations in 1994 and has 14 stops along the route. It is operated by the Rapid Transportation District (RTD), which constructed and operates the line entirely with local funds derived from a 0.6 percent addition to the local sales tax. Extensions of the rapid transit system are under study for three additional corridors. Seven other transit corridors are recommended in the "Metro Vision 2020" report adopted by the Denver Regional Council of Governments (DRCOG).

Policy Framework

The 2015 regional transportation plan adopted by DRCOG, the MPO for the Denver Region, includes a number of policies favoring TFD through high-density urban centers, new development, and zoning techniques. The vision statement also includes "promote transit accessible development" as a criterion for evaluating four alternative future urban forms for the region (p. 18).

DRCOG's vision statement also includes promotion of transit accessible development as a criterion for evaluating four alternative future urban forms for the region (p. 18). However, in 1995 the DRCOG policy statement contained no specific evaluation criteria pertaining to transit-focused development other than improvements of access to intermodal facilities, including pedestrian and bicycle paths.

The RTD has adopted no official policy statements supporting TFD but is actively pursuing TFD opportunities. However, RTD, the DRCOG, and the Denver Chamber of Commerce prepared a "Suburban Mobility Design Manual" that illustrates ways to accomplish transit-focused development.

Station-Area Development Activities

The RTD has issued a general request for proposals for development at park-and-ride lots owned by the District throughout the region. Several are operating at or near capacity. The RTD is requesting developers' ideas for building structured parking incorporating retail uses, with the hope that the retail opportunities will provide sufficient incentive for private development of parking garages. In addition, the RTD is pursuing changes in state legislation required to allow such uses at state-owned lots. At least two of the park-and-ride lots are at light rail stations.

Observations on Obstacles and Opportunities

Denver's rail system is very new, so development has not yet responded to station-area opportunities. The regional economy is booming but suburban interest in transit-station development

opportunities is still not apparent. The RTD appears committed to pursuing development opportunities even within the limited service area of the LRT.

PROFILE: LOS ANGELES

The Transit System

The Los Angeles Metropolitan Transportation Authority (MTA) began planning a 400-mile, \$183 billion regional rail system in the mid 1980s. The system is a combination of heavy-rail underground and light rail above ground. Due to regional economic difficulties, however, the proposed system is being downsized to about 200 route miles. It consists of Red, Green, and Blue lines as well as a commuter rail system known as Metrolink.

- **Red Line**---This 4.4-mi line has five stations and was completed in 1993. In 1995, it carried 22,150 riders on an average weekday. A 6.7-mi, eight-station extension is expected to open in 2000 and another 11.6-mi section with up to nine stations is planned.
- **Green Line**---Completed in 1995, it has 14 stations, including a crossing with the Blue Line. Average weekday ridership in 1995 was 14,300.
- **Blue Line**---This has 22 stations and was completed in 1990; an extension to Pasadena is planned to open in 2000. Ridership on the Blue Line averages about 40,000 on weekdays, exceeding projections.
- **Metrolink**---The Metrolink system of commuter rail lines extends in all directions and began operations in 1992. It is managed by the Southern California Regional Rail Authority.

Policy Framework

The Southern California Association of Governments (SCAG) adopted a *Regional Comprehensive Plan and Guide* in June 1994 that incorporates several policies encouraging the use of transit, redevelopment, and TFD.

SCAG also commissioned a "Transit Stop Opportunity" Video to provide citizens and public officials with information about how to use transit stops to improve community life. The video discussed ways to create transit districts, attractive transit stops, multi-modal centers, and compact housing near transit, plus descriptions of four communities with successful projects.

In 1993, the city planning commission and city council adopted a "Land Use/Transportation Policy" that focuses the city's future development strategies on "integrating life around transit " The policy statement proposes to concentrate

future development around transit stations and reduce reliance on the automobile. The land use element provides prototype design guidelines for six types of urban centers from heavily built-up areas to neighborhood centers.

In 1993, the planning commission and the city council followed up their land use/transportation policy with station-area studies that identify potential markets and needed incentives for development. Six station-area planning studies are underway but none is completed.

The policy statement also pertains to the MTA, which is the MPO for the Los Angeles area. Thus the MTA is given broad support for promoting transit-focused development. MTA also has sponsored a series of community forums to promote station-area development.

In addition, MTA began an aggressive joint-development program only four years ago. The program's goals are to provide revenue for transit development, increase ridership, and strengthen land use relationships, especially to meet local economic objectives. MTA is particularly interested in leveraging agency-owned properties with adjoining privately owned property to create transit-focused development and MTA has mounted a marketing program to promote development of excess land.

Station-Area Development

Los Angeles' transit system was completed just as the real estate market plummeted in the early 1990s. The lack of market activity has resulted in relatively little development in rail-station areas. However, MTA has succeeded in promoting the following joint development opportunities:

- The Grand Central Market project, located at 4th and Hill Streets at the Pershing Square station on the Red Line, was launched by the Community Redevelopment Agency (CRA) with the MTA serving as a guarantor for \$2.8 million in development loans. The project will incorporate 1,500 dwelling units.
- At the Hollywood Western station, located in a declining neighborhood, the MTA and CRA are collaborating with a developer on a 1.5-acre MTA site in combination with a 0.8-acre site redeveloped after heavy earthquake damage. The first phase will develop 61 housing units, and the second phase will develop the construction staging area for 35 to 40 housing units above a plaza, retail space, and a childcare center. The project's completion will coincide with the station's 1999 opening.
- The Santa Fe Transportation Center project at the Del Mar station in Pasadena, scheduled to open in 2001, will produce 125 dwelling units, up to 300,00 sq ft of office space, and 60,000 sq ft of retail space, plus 600 underground parking spaces, all adjacent to the station. The MTA has signed a memorandum of understanding with the city for this project on redevelopment land.
- The development of a 374-unit Holly Village residential project on a 5.3-acre site directly above a future rail station in Pasadena resulted from combining eight new

apartment buildings (with underground parking and some retail frontage) with renovation of a former government building for artist lofts. The project was completed in 1993. Two additional housing projects are being developed within two blocks of the station.

- At the Sunset-Vermont subway station in Hollywood, MTA worked with three large hospitals, other medical facilities, and local business owners to configure the station plaza and portals, including proposed underground passageways linking the station to two hospital campuses. The MTA board refused to press eminent domain proceedings to acquire a key property, however, so the project has been dropped.

Observations on Obstacles and Opportunities

Although the City of Los Angeles has moved slowly to encourage transit-focused development, two independent agencies, the CRA and MTA, have made some headway in promoting development in rail-station areas. In Pasadena, where the city has strongly supported transit-focused development, major projects have been completed or are underway. Since almost no private development unaided by public financing has taken place in station areas, however, it remains to be seen whether the private market will view rail stations as attractive development sites.

PROFILE: MIAMI

The Transit System

The Metropolitan Dade Transit Administration (MDTA) operates a 21-mi commuter rail system in Miami and Dade County. Completed in 1984, it has 21 stations and serves about 50,000 passengers a day. The downtown component of the system is a 4-mi automated "people mover" with 21 stations. It carries about 14,000 passengers on an average weekday.

Policy Framework

Early in the system's development, the Metro-Dade County Comprehensive Development Master Plan provided a general policy framework for TFD by calling for the creation of high intensity activity centers linked to rapid transit facilities, including pursuit of joint development opportunities. In addition, the South Florida Regional Planning Council's *Strategic Regional Policy Plan for South Florida*, adopted in August 1995, recommends as a major strategy the integration of land use and transportation, including transit-oriented development (p.115), and urges development of "high-density and mixed land use around intermodal connections (p.120)."

The City of Miami also supports TFD. Policies incorporated in the "Goals, Objectives, Policies" volume of its *Comprehensive Neighborhood Plan 1989-2000*, adopted in 1989 and amended in 1991, include "high-density commercial and residential development and redevelopment in close proximity to Metrorail and Metromover stations (TR-1.5.2)" and "using the City's land development regulations to help direct development where it will support the densities required for urban rail transit systems (TR-1.5.6)."

The MDTA adopted a Station Area Design and Development Program in the late 1970s to guide private development adjacent to station areas. It also adopted joint-use policies in 1981 to encourage private development in conjunction with the Metrorail transit system, particularly on properties owned by the county as part of the transit system development. It has pursued joint development by evaluating opportunities and formulating strategies to implement such development, including marketing properties and negotiating mutually beneficial agreements.

Thus, regional agency and MPO plans, and city and transit agency policies have combined to provide a strong framework that encourages TFD.

Station-Area Development Activities

Development has occurred at several stations located in downtown and growing outer centers but not in most innercity stations. MDTA has negotiated a number of joint development and station interface projects with the assistance of Dade County. After the first project, which was initiated as the heavy rail system was being completed, a long decline in the local real estate market ensued. In the past two or three years, however, developer interest revived and MDTA staff is hard pressed to respond to almost daily proposals for station-area development.

- In 1983, at the Dadeland South station, a mixed-use project was constructed on 6.5 acres of county-owned land. The project included 450,000 sq ft of office and retail space, a 305-room hotel, and parking for 3,500 cars, 1,000 of which are owned by MDTA and dedicated for use by park-and-ride patrons. Plans were recently announced for another 420,000-sq-ft, mixed-use project on a 6.5-acre site across the street. The developer has agreed to construct a pedestrian bridge connecting the old and new projects to the Metrorail station; the developer's costs will be credited against required impact fees;
- In 1994, after more than five years of negotiations, the county approved leasing of a 9.2-acre site at the Dadeland North station for development of a three-phase, 650,000-sq-ft, mixed-use project designed to include a transit plaza and 9,600 sq ft of retail space serving transit patrons; the first phase was initiated in August, 1995; the county will receive annual rent and 5 percent of the gross income from the project;
- A skybridge between the Omni Metromover station and the third level of the Omni Mall will be funded by the

owners of the Omni retail/hotel development. MDTA negotiated both the construction agreement and its maintenance by Omni.

- MDTA issued an RFP in 1995 for the lease and development of a retail and residential project on a 45,000-sq-ft site surrounding the First Street Metromover station in downtown Miami; two proposals received early in 1996 are being reviewed;
- MDTA plans to solicit development proposals for the Douglas Road, Coconut Grove, and Allapattah Metrorail stations during 1996;
- An intermodal center on a 140-acre site near the airport is being planned by the state, county, and city. It will link Amtrak and commuter rail lines, bus routes, and airport-related traffic.

Observations on Obstacles and Opportunities

South Florida's sprawling development is generally unsuitable for transit-focused development. However, the Miami system has managed to create significant access linkages between major development projects and a number of transit stations. The MDTA pursued development opportunities from the beginning but an economic downturn and social forces combined to depress development interest. Now, a more robust development market is stimulating a variety of station-area projects, especially at the Dadeland North and South stations near the Dadeland Mall, one of the largest in the nation. (In addition, both stations are located in the special transit overlay zone established by Dade County.) Thus, after a long lull in station-area development, it appears that a reenergized real estate market is allowing MDTA to realize station-area development opportunities.

PROFILE: PHILADELPHIA

The Transit System

The Southeastern Pennsylvania Transportation Authority (SEPTA) operates seven light rail lines, three heavy rail routes, 125 bus and trackless trolley routes, and seven commuter railroad routes. The light rail routes total 51 mi in length and the heavy rail routes are 37 mi long. On an average weekday, the light rail and subway parts of the system carry 400,000 passengers.

Policy Framework

The Delaware Valley Regional Planning Commission (DVRPC), the MPO for the region, includes TFD-supportive policies in its regional transportation plan, *DVRPC Year 2020*:

Land Use and Transportation Plan. However, the DVRPC's plan is only advisory for the 239 municipalities in Pennsylvania and 113 municipalities in New Jersey. Suburban county planning agencies have embraced station-area development in concept, but few municipalities have implemented it in plans and zoning. Many communities with stations are intolerant of further development around stations. Philadelphia's planning department is not actively promoting transit-focused development but is working with SEPTA to write a model zoning ordinance for station areas.

SEPTA has a long history of working with developers to construct transit-related development. The Gallery, an enclosed shopping mall in downtown Philadelphia that opened in 1977, is a well-known redevelopment project over a station serving two SEPTA lines. This project was a forerunner of many later downtown redevelopment efforts involving joint development throughout the nation. SEPTA routinely considers area enhancement when renovating stations and has regularly leased space within stations for private retail businesses. However, it does not actively promote joint development or station interfaces, due to neighborhood opposition to past proposals, a lack of transit-owned developable parcels, a lack of market opportunities in many sectors of its system, and constraints on its authority to work with developers to package joint projects. However, SEPTA has been working with Delaware County and four municipalities to prepare a zoning overlay district for transit-oriented development.

Station-Area Development Activities

No station-related development activities are currently underway and none are planned. SEPTA is working with the cities of Chester and Philadelphia to promote FTA's Livable Communities Initiation at stations in those areas.

Observations on Obstacles and Opportunities

The Philadelphia story represents the common problem of regional agencies espousing TFD with little or no authority to implement action, while a multitude of local governments pay little attention to development opportunities. SEPTA's potential role as a stimulator of station-area development is apparently unrecognized and underused.

PROFILE: PORTLAND, OREGON

The Transit System

The Tri-County Metropolitan Transportation District (Tri-Met) covers 592 sq mi of urbanized Clackamas, Multnomah, and Washington Counties. Originally created to operate the bus system, which now includes 80 routes extending over 760 route miles, Tri-Met completed its first light rail line in 1986.

Known as MAX (metropolitan area express), the 15.1-mi line has 30 stations and serves about 27,000 riders on an average weekday.

Tri-Met began construction of a second line, the Westside MAX, in 1992. The 18-mi line will open in 1998 with a total of 21 stations. A north-south line is now being planned.

Policy Framework

The Portland region provides a unique policy context for transit-focused development. Oregon's 1973 state growth management law called for local governments to plan for development in conformance with state objectives, including establishment of urban growth boundaries.

Metro, the regional MPO, was created in 1978 and unites strategic planning for regional development and transportation systems. The 1991 state/regional adoption of a "Transportation Rule" was important for implementing state transportation objectives and calling for reductions in per-capita car travel and for greater emphasis on travel by transit.

Metro's 1995 Region 2040 plan contains future growth through development and redevelopment of compact centers and corridors served by high-capacity rail and bus systems. The plan calls for concentrating one-third of residential development and two-thirds of new jobs in transit corridors and station areas. Tri-Met, the transit agency, participated with regional and local jurisdictions in a cooperative program of station-area planning and adopted a strategic plan in 1993 that incorporated a goal to locate the majority of new housing and jobs within a five-minute walk of the primary transit network.

Thus TFD in the Portland region is supported by strong state and regional policies that give preference to transit as a transportation mode and direct a considerable amount of future development to station areas.

In central Portland, transit-related development was encouraged by a downtown plan adopted by the city in 1972. Major features of the plan were a bus mall on two one-way streets through the heart of downtown and limits on development of new parking spaces, one result being that 40 percent of work trips to downtown occur by transit.

Station-Area Development Activities

Planning for the east side light rail line was closely related to ongoing development in downtown, so that major downtown projects such as the convention center and sports arena were sited at stations. A 1995 summary of development in rail station areas determined that \$396 million in development had occurred in downtown since the decision to construct the Banfield line (Arrington, 1995).

A similar coincidence of public and private forces occurred in the Lloyd district near downtown. The robust real estate market in that activity center produced \$715 million in development after the Banfield line was announced, over half of all investments along the length of the transit line (Arrington, 1995). Most of this development took place with no direct input from Tri-Met other than station-area planning.

Station-area development outside central Portland has lagged somewhat, due in part to the market decline that began soon after the Banfield line began operation and in part to difficulties in obtaining coordinated agency and local governmental action to promote TFD. Some jurisdictions have enthusiastically planned for station-area development, but found implementation fraught with problems.

Three high-profile proposals for dramatic developments centered around transit stations fell victim to the real estate market decline of the late 1980s and the complexity of the government procedures required. Perseverance has paid off, however, with new plans completed and development proceeding on two of the three sites.

- In Gresham near the terminus of the Banfield Line, a shopping center developer had proposed development of a \$100 million mixed-use center on a platform over the tracks, with the station bridging the two halves of the development. To aid the project, Tri-Met was to acquire and lease back to the developer about 65 acres of land around the station. Through the early 1990s, a lengthy negotiation period included securing special federal legislation allowing the agency to acquire land and obtaining promises of a number of grants to assist in financing the project. Interagency discord and developer delay in signing anchor tenants stymied closure on the project until the market decline killed the development. Under pressure to develop, however, the landowner worked with Gresham and transit officials to prepare a new plan for the "Gresham Civic Neighborhood," a transit-oriented development with a mix of uses and a substantial expansion of city hall. Site infrastructure is being constructed and final designs prepared for the first phase to be initiated in early 1997.
- A second project involved development on the Hillsboro line of a 252-acre parcel under one ownership. Planning for development in 1992 and 1993 required commitments from all parties involved (the landholder, a development company, and a variety of agencies including Tri-Met), as well as agreements about relating rail and highway improvements in the area. After the sites of the station and park-and-ride lot had been changed to accommodate proposed development, disagreements between the parties, aggravated by a soft market, broke the tenuous consensus and put the project on indefinite hold, although Tri-Met is building a park-and-ride garage.
- Beaverton Creek, a residential and retail shopping project on the Hillsboro line, was to be the first project developed under Portland's TFD guidelines and a showcase project for a growing upscale suburb. Involving four landowners but no Tri-Met properties, the project aimed at demonstrating the marketability of transit-oriented design. Dissension among landowners, planners, and neighborhood residents over proposed densities and parking requirements apparently proved too vexing for the major developer involved, who sold his property to the Nike Corporation in 1995. Nike has revealed no plans for the property. On the southern half of the site, however, development has proceeded on two residential projects with about 840 townhouses and apartments designed to be "transit-

friendly" and scheduled to open in late 1996 and late 1997.

Tri-Met has been more successful with small projects. A project on the Banfield line (described in the chapter 5 case study) exemplifies the modestly scaled project that may be most suitable for light rail lines. A developer requested an easement through Tri-Met properties to allow development of adjoining properties a half-block from the 162nd Street station. Tri-Met staff persuaded the developer to acquire and join the properties to develop a multi-family residential project. On the 1.7-acre parcel thus assembled, the developer built four two-story buildings incorporating 42 moderately priced units. Most residents are entry-level office workers who value their accessibility to downtown offices. Since completing that project, the developer has built or is planning eight projects with 300 units along the transit line, including another joint development project.

Tri-Met also worked with another developer to merge Tri-Met properties with adjoining properties in Gresham Center. The resulting 2-acre parcel is being developed for about 95 rental apartments and will be linked to the nearby transit station by a promenade. Tri-Met had to clear a number of easements on its properties and secure several grants to make the project financially feasible. The project is under construction and expected to be completed in early 1996. A previous proposal for a slightly larger project incorporating retail development and a parking structure with the residential uses proved too complex to survive procedural and financial hurdles.

Tri-Met and the Portland Development Commission also selected a developer for a 134-apartment project near the Westside MAX station in Goose Hollow and is pursuing potential development on three other sites in the area.

Observations on Obstacles and Opportunities

An energetic Tri-Met development staff, together with cooperative city and regional agencies, have facilitated development of a number of small projects that have boosted rail ridership. The projects have required significant assistance from Tri-Met in suggesting development strategies, securing financial assistance, and clearing regulatory hurdles. All have involved complex financial and construction procedures. Meanwhile, bolder projects that promised dramatic developments have proved difficult and time-consuming, although results over time have been satisfying. The large number of parties and agencies involved, plus the variety of issues raised, complicates the process for reaching agreement on project details.

PROFILE: SACRAMENTO

The Transit System

The Sacramento Regional Transit District recently completed an 18.3-mi light rail line, primarily serving the center

city. The U-shaped line has 30 stations and a ridership of 25,000 on an average weekday. A 2.5-mi eastern extension is being initiated to a station adjoining a major park-and-ride facility near U.S. 50. Plans have been prepared for further extensions at each end of the loop and for a southern line.

Policy Framework

The local government has an integrated framework of public policy that supports transit use and related development. The Sacramento Area Council of Governments (SACOG) includes several transit-supportive land use goals and policies in its 1993 Metropolitan Transportation Plan.

The county adopted transit-oriented design guidelines prepared by Calthorpe Associates in 1990. This action was followed with adoption in late 1993 of the Sacramento County General Plan Update. The circulation element of the plan lists aligning "high density development, including infill and redevelopment, along transit corridors (p.62)" and incorporates a section on land use and transit relationships, including designations of "Urban" and "Neighborhood" Transit-Oriented Developments that feature higher densities, pedestrian-friendly streetscapes, and mixed uses. The plan requires that development occur at densities of at least 75 percent of zoned density. However, county officials reduced proposed station-area densities in adopting the plan. In addition, the county's zoning ordinance adopted in the 1960s does not contain provisions for mixed-use districts. To remedy this, the county planning office was working on a transit overlay zone (as well as updating community plans to reflect TFD-type land use patterns), ran into budget problems in the early 1990s, but resumed activities with the aid of an STP grant.

One of the most important policies supporting transit-focused development is the state's requirement that all state offices be sited in transit-accessible locations. This has helped keep the major employment center downtown.

Station-Area Development Activities

Despite the massive policy framework established for TFD in the Sacramento area, very little station-area development is taking place.

- The Laguna West development project shows its design as a transit-oriented development in its street layouts and small-lot residential design, but bus service is limited and the central stop was moved away from the community center because park-and-riders were claiming all the parking spaces.
- The city is working with landowners in the R Street corridor to stimulate adaptive reuse of warehouse and industrial buildings along the light rail line. One new office building has already been built near a transit station, but the spread of major office development in this location, well south of the downtown core, is still controversial.
- Discussions are being held with the Sacramento Housing and Redevelopment Agency for development of mixed-

use projects on agency-owned land at the Alkali Flat/La Valentina and 12th and I Street stations.

- Discussions are being held with developers of a proposed major office park (potentially 4 million sq ft) that would absorb an agency-owned parcel next to the Power Inn station near U.S. 50. This might prove to be the first joint-development project for Sacramento.

Observations on Obstacles and Opportunities

Compared with other California cities with rail systems, Sacramento is still developing at fairly low densities on "greenfield" sites on the urban fringe. This fact, plus the tepid real estate market over the past few years, and the lack of transit-agency land available as leverage, has meant a slow start on station-area development. The solid policy foundation laid down by the public jurisdictions, however, could pay off as the market matures.

PROFILE: ST. LOUIS

The Transit System

A new light rail system began operating in St. Louis in July 1993 with 18 mi of track and 18 stations. Known as Metrolink, it was built on existing railroad rights-of-way, structures, facilities, and nearly 14 mi of railroad tracks that had been unused for decades.

The system carries about 40,000 riders on an average weekday, making it the second busiest light rail system in the nation after San Diego. The Bi-State Development Agency owns and operates Metrolink, as well as a large fleet of transit buses.

In 1994, city and county voters approved funds for transportation, allowing the transit agency to expand the system, provide additional park-and-ride lots and transfer centers, and buy new buses. Preliminary engineering studies are underway to extend Metrolink 20 mi. This 25-year capital investment program is being financed by a quarter-cent increase in the sales tax, passed by referendum, and by federal funds.

Policy Framework

Both the East-West Gateway Coordinating Council, the region's MPO, and the Bi-State Development Agency, the regional transit agency, support transit-focused development in concept, but local governments have not yet embraced it. The Coordinating Council's 1995 transportation plan, *Transportation Redefined*, emphasizes the importance of regional parity in mobility and promotes transit-oriented development that

"mixes and integrates transit and complementary land use in a compact, highly intensive manner."

One of the development strategies in Bi-State's strategic plan states that the transit agency will "develop the internal capacity and act to develop, implement, or facilitate all transit-related development in the region." However, despite an Urban Land Institute study that recommends public investment of \$20 million in infrastructure improvements in station areas, for potential leverage of approximately \$150 million in private investment, local governments have not yet embraced TFD.

Station-Area Development Activities

Given the private sector's reluctance to invest in station-area development until Metrolink was proven successful, few projects have been initiated. Two noteworthy projects are underway, however, funded primarily by the public sector:

- At the Wellston station, the long-abandoned Wagner Electric Company facility adjacent to the station is being transformed into a state-of-the-art small-business incubator and job training center for economically disadvantaged workers. The renovation of the 24-acre site is being funded by a \$4.5 million grant from the U.S. Department of Commerce. The facility is scheduled to open in mid 1996. In addition, the Bi-State Development Agency and the Economic Council of St. Louis County received a \$956,000 grant from the Federal Transit Administration's Liveable Communities Initiative to fund improvements around the station, including landscaping, roads and sidewalks, lighting, signage, and a childcare center.
- At the Busch Stadium station, Bi-State is planning to convert an area of historic warehouses into a mix of offices, retail shops, housing, and hotels. A local developer is planning to transform the old Manhattan Coffee warehouse immediately adjacent to the station into a restaurant/retail complex. Additional development may be spurred by the new federal courthouse under construction a few blocks away.

Observations on Obstacles and Opportunities

As a central city that has been losing population and jobs for decades (with deeply depressed East Saint Louis across the river), St. Louis would not seem to offer the kind of centralized job base and high-density residential nodes thought to offer support for rail transit. Yet the line has succeeded in attracting riders from the eastern suburbs across the river to downtown St. Louis, as well as drawing passengers from the areas west of downtown. These circumstances, however, have not generated much interest in development opportunities around station sites. Given the moribund real estate market in areas along the line, station-area development will require strong government support.

PROFILE: SAN DIEGO

The Transit System

The Metropolitan Transit Development Board (MTDB) oversees the planning, design, and operation of transit services in the San Diego metropolitan area. It operates the San Diego Trolley, a light rail system, on three lines, one of which connects downtown to the international border at Tijuana, Mexico. Its two lines total 39.9 mi and have 34 stations. Service began between 1981 and 1995. Both lines are on former railroad rights-of-way. In 1996, the San Diego Trolley carried an average of 50,000 passengers daily.

An 86-mi light rail network will be completed by MTDB in 2010 and the North County Transit District (NCTD) is planning a 22-mi light rail line to be completed by 2000. Other light rail extensions and lines are under study, being planned or under construction.

Policy Framework

The city and regional planning agencies and the transit agencies in San Diego County have taken impressive steps to establish a policy framework for transit-focused development. The San Diego Association of Governments (SANDAG), consisting of all local governments in San Diego County, is both the regional planning agency and the metropolitan planning organization for the region. Its regional growth strategy, found in its 1993 *Blueprint for the San Diego Region* espouses changes in land use patterns to result in better use of transit and increasing development intensities within walking distance of transit stations and major bus routes (p.11). SANDAG's 1995 *Land Use Distribution Element of the Regional Growth Management Strategy* incorporates land use policies calling for higher-density, mixed-use development in transit access areas and for local governments' adoption of design guidelines and consideration of local zoning and subdivision revisions that would encourage such development. SANDAG also commissioned plans for five station areas to demonstrate the physical feasibility of implementing the station-area development policies.

The City of San Diego adopted a TFD-supportive policy statement in May 1986 *and Transit-Oriented Development Design Guidelines* in 1992.

The transit agencies have been aggressive in promoting development in station areas. The MTDB adopted policies and procedures to guide joint use and development in 1984. In 1993, the MTDB published *Designing for Transit*, a manual providing design guidelines for more transit-oriented communities, standards for bus and rail transit, and transit-oriented development policies and ordinances for local government consideration and adoption.

Station-Area Development Activities

The MTDB and the NCTB both have publicized development opportunities for station-area sites. The NCTB has been pursuing an aggressive marketing program for its station sites and

railroad rights-of-way. The MTDB has participated in joint developments in downtown San Diego and in other locations.

- The MTS/James R. Mills Building, a 10-story, 180,000-sq-ft office tower with a 1,000-car parking garage and a 15-story clock tower, was developed as MTDB's headquarters at the junction of three light rail lines in downtown San Diego. The 2.7-acre site was acquired in 1983 for use as a transfer station. The county became involved as a financial partner of MTDB and major occupant of the building. The light rail lines pass through a station under the building; the tracks are bordered on the ground floor by retail space. The \$35 million project was completed ahead of schedule on January 1, 1989. The MTDB receives an income stream from the ground lease and retail rents.
- The 34-story America Plaza was constructed on a site just across the street from the AMTRAK and commuter rail station. As with the MTDB building, America Plaza straddles a light rail station and incorporates retail space. Adjoining the station is a separate building housing the Museum of Contemporary Art/San Diego. It was completed in late 1991. MTDB is responsible only for maintaining the station platforms, trackway, and equipment.
- A developer-built small mixed-use project adjoins the La Mesa station just across the street from an existing shopping area. The project resulted from proactive, cooperative planning for station-area development by the city of La Mesa and MTDB.
- Childcare facilities have been developed at two light rail stations. The 47th Street station facility was a joint-development project. A developer was persuaded to modify a residential project to also include a childcare facility on leased MTDB land next to the station. At the Imperial and 12th transfer station site on the East Line, MTDB encouraged development of a childcare center just a block east of its headquarters. (This center has since closed, a casualty of the economic recession.)
- The Sweetwater Union High School District, working with the Community Development Commission in National City, has proposed development for an adult education center on a 1.5-acre parcel at the 24th Street Station on the South Line.

NCTD's first experience with the cities along the commuter route was in siting. This was controversial and sometimes resulted in poor station locations. Now it is working with several cities to encourage joint development projects in station areas.

Observations on Obstacles and Opportunities

San Diego's light rail lines were built along existing railroad rights-of-way, much of their length through poor neighborhoods or industrial areas--not prime area for real estate activity. Southern California's financial and real estate recession hit just as downtown development had begun to take

advantage of station-area sites and halted development. Voter-approved sales tax revenues are available for another 10 years but securing funding for planned rail extensions remains difficult. Nevertheless, San Diego has an elaborate public policy framework in place to encourage transit-focused development and the transit agencies have positive experiences on which to build future projects.

PROFILE: SAN FRANCISCO REGION

The Transit System

The Bay Area Rapid Transit system, opened in 1973, consists of 72 route miles with 34 stations. The central section between downtown San Francisco and downtown Oakland has six stations. Corridors radiate from this section to Richmond and Concord in the north; both lines have eight stations. The Fremont Corridor in the southeast has nine stations and the Daly City Corridor in the southwest has five stations.

Three extensions are under construction and another is planned. Eight miles and two stations will be added to the Concord corridor; completion is expected in 1997. Extensions are also being added to the Fremont line and the Daly City line.

Long-range plans call for extending the Richmond line, the Fremont/Dublin/Pleasanton line, the Fremont main line, and the Daly City line.

Policy Framework

When the BART system was planned, it was expected to greatly increase the region's mobility, strengthen the Bay Area's urban centers, and guide suburban growth along radial corridors. However, regional policies supporting transit-focused development took years to emerge. In the 1990 "Proposed Land Use Policy Framework" adopted by the Association of Bay Area Governments (ABAG), the regional planning agency for the San Francisco area, there is significant emphasis placed on transit-focused development. Other publications by ABAG, notably *Improving Air Quality Through Local Plans and Programs and Design Strategies for Encouraging Alternatives to Auto Use Through Local Development Review*, also recommend ways to focus development around transit facilities.

The Metropolitan Transportation Commission, the MPO for the San Francisco area, incorporated general references to transit-focused development in its 1994 regional transportation plan, encouraging "transit investments that are matched and supported by land use plans that designate development intensities sufficient to support viable transit (p.51)."

In addition, the MTC's award points when rating proposed projects for land use benefits and relationships to transit service.

Some local governments have promoted station-area development through zoning changes and redevelopment programs. Although many local jurisdictions have been slow to promote intensive station-area development, these efforts have stimulated development at a few suburban stations.

Station-Area Development

BART's impacts on land use patterns have been studied more than those of any other system. An early study in the mid 1970s concluded that BART had a "modest, though not inconsequential" influence on development, particularly when supported by incentive zoning and redevelopment efforts. BART is credited with focusing much of San Francisco's downtown office construction south of Market Street and helping to rejuvenate Oakland's inner city. Studies conducted in the 1970s and again in the 1990s found little development activity around stations outside of downtown. Examples are as follows:

- Downtown San Francisco accounted for over three-quarters of all office construction within a half-mile of BART stations since 1973;
- Downtown Oakland has attracted public and private investments due in part to the regional accessibility provided by BART;
- Walnut Creek adopted a downtown plan in the 1970s that supported development of nearly 4 million sq ft of moderately dense concentration of offices and retail uses near its BART station (and also adjoining a regional highway corridor);
- Concord's redevelopment agency assembled land and financed public infrastructure to promote development of about 2 million sq ft of office development around the station;
- Pleasant Hill used a specific plan and redevelopment powers to attract development of 1.5 million sq ft of office space and 1,600 apartments within 1/4 mi of its station;
- Fremont's station area has developed with a mix of residential, retail, and institutional uses (the amount of moderately dense housing attracted by favorable zoning contrasts markedly with lower-density housing in areas farther from the station);
- At the Richmond and Hayward stations, a considerable amount of residential development is planned or under development.

Other recent development undertaken in station areas includes:

- At the El Cerrito station, Del Norte Place, a 135-unit apartment complex incorporating market-rate, seniors, and low-cost housing units and a retail arcade was developed on redevelopment agency land just a few hundred feet from the station; a similar project one block south is being planned;
- At Oakland's Fruitvale station, the Hispanic community development corporation is initiating a "transit village"

adjacent to the station that includes new housing, a community medical center, and a revitalized retail strip:

- Castro Valley recently adopted a specific plan calling for joint development around its BART station.

Observations on Obstacles and Opportunities

Station-area development in the San Francisco area has been successful where supportive public efforts have been mounted to direct market forces to station areas. On the other hand, local governments in a number of station areas have resisted efforts to intensify development around stations. Stations in other areas have not proved attractive for development.

PROFILE: SAN JOSE, CALIFORNIA

The Transit System

The Santa Clara Valley Transportation Authority, created in 1995 by merging county boards responsible for transit and congestion management, operates a 21-mi light rail line with 30 stations. Construction began in the mid 1980s and the full operation was achieved in 1991. Additional lines have been planned; however, the state's lack of funds is delaying further work.

Policy Framework

The regional policy framework is identical to that of San Francisco, found in the preceding case study.

The city's planning for station-area development was initiated during development of the line and it has become aggressive in supporting transit-focused development, although its efforts are constrained by funding shortages. These efforts are based on an understanding of the advantages of transit-focused development and on adopted official policies included in the General Plan.

- The city's general plan was revised to provide a new category of residential uses for station areas and along rail corridors that encourages relatively high-density development;
- As a followup to the city's housing plan, the planning office has assisted the transit authority in preparing studies of station areas to stimulate redevelopment of infill sites; the planning office has completed three specific plans for rail station areas.

The transportation authority also has been active, preparing station-area plans to provide market data and prototype designs for transit-focused development and pursuing joint

development opportunities offered by its ownership of large parking areas next to stations.

Station-Area Development

Successful efforts in the 1980s to revive downtown resulted in location of some major projects at downtown stations and the transit mall. In general, however, those projects came in response to downtown development opportunities created by a strong redevelopment program more than by the availability of transit service. More recent development efforts include:

- Almaden Lake Village being proposed as a joint development project. This was a result of one of the first station-area studies undertaken by the city and transportation authority. The 7.1-acre residential complex, (5.4 acres of which was owned by the authority), will include 250 units in two- and three-story buildings over subgrade parking plus recreational amenities. The project involves moving an arterial street to provide a unified site. Originally scheduled for construction in 1994, it has been delayed by financial problems but is now expected to begin in 1996.
- The Winfield Hill residential project (248 units) developed in connection with the Almaden Lake project. The city encouraged its development a quarter-mile from the station that also serves a number of addition residential projects developed before or during station construction.
- The Ohlone-Chynoweth station park-and-ride lot project involving residential development. It was planned with the cooperation of an adjoining property owner and a long-term ground lease is being negotiated with a developer.
- Three planned stations on the proposed Tamien line, two in San Jose and one in Mountain View.

Observations on Obstacles and Opportunities

San Jose's Housing Initiatives Program, which aimed to promote more residential development in underutilized areas to improve its jobs/housing balance, has dovetailed with nascent transit line and transportation authority interest in joint-development opportunities. Despite the generally moribund development climate in California, San Jose appears to have been successful in encouraging development of several residential projects in station areas. Joint city/authority coordinated action seems to have been the key to stimulating action.

PROFILE: TORONTO, CANADA

The Transit System

The Toronto Transit Commission operates three rapid transit lines reaching from downtown to suburban areas. The U-shaped Yonge-Spadina subway opened in 1954 and has a total of 71 stations along 18.7 route miles. A 1.1-mi light rail line has numerous surface street stops. The subway lines carried 568,000 passengers on an average weekday in 1991. The transit lines are supplemented by seven commuter rail lines operated by the provincial government, a network of nine streetcar lines, and many bus lines.

In 1994, the Metropolitan Council authorized construction of two new subway lines; construction was begun but current economic difficulties in Canada and the Toronto region have partially postponed construction.

Policy Framework

The Municipality of Metropolitan Toronto was formed in 1953 by the Province of Ontario, creating a federated government for the area's municipalities. Metro (its current name) incorporates the Toronto Transit Commission.

Metro's 1994 plan, "The Liveable Metropolis," stresses "reurbanization," or redevelopment and reinvestment in the existing urbanized area. The plan proposes that local plans and zoning facilitate the concentration of housing and employment in centers and corridors served by and supportive of transit. Development plans are intended to physically integrate stations with surrounding development and produce a high quality of design for pedestrian access, the streetscape, and the built environment. (The provincial government, however, has deferred approval of Policy 30 pending possible revisions.) Also in 1994, the Metropolitan Council approved the initiation of a study and demonstration project of the most effective means of encouraging development at rapid transit stations.

In the 1970s, the City of Toronto also enacted maximum and minimum parking requirements in the Central Area, along with higher all-day parking rates for publicly supported lots, to encourage greater use of public transportation. Its 1994 "Main Streets Initiative" reduced parking and loading requirements. The planning initiative has encountered opposition from neighborhood groups concerned about parking issues, however.

In the Greater Toronto area, three studies (in Burlington and Markham) have been undertaken and two official plans (in Vaughan and York) encourage transit-supportive initiatives.

Station-Area Development

Over the last 10 years, development in suburban North York's downtown has been occurring but at a slower pace than anticipated. Parking restrictions in downtown helped orient development to downtown stations.

In outer areas, however, less station-area development has occurred.

- Scarborough, the terminus of a light rail extension of the Bloor-Danforth line, has experienced some development of offices, shopping, and residential buildings near the station. A major landowner in the area is withholding its property from development. Plans were prepared for a complex of 3,000 housing units with two stations, a bus terminal, and commuter parking. Although a somewhat smaller version of the plan was approved, limited development has occurred.
- A pilot project at the Warden Station on the Bloor-Danforth line was planned by Metro to revitalize an existing commercial center and retain substantial amounts of commuter parking. The project, based on Policy 30, which calls for preparation of station-area development plans, is now on hold pending agreement between public and private participants.
- Planning studies undertaken in connection with the Main Streets Initiative have focused on increasing intensities of development and making streetscape improvements along streetcar lines, most notably on Spadina Street along a new light rail line. These planning efforts have encountered considerable neighborhood opposition to increased densities and reduced parking requirements.
- Two "Gateway" projects promoted by the provincial government have planned intermodal centers and adjoining mixed-use development at the Malvern and Mimico commuter rail stations.

Observations on Obstacles and Opportunities

Toronto's development in close relationship to its transit system has been strongly supported by public policies and actions, as well as its residents' propensity for living and working in high-density urban environments. However, the regional government's firm control over transit-related development patterns has been diminished by extensive growth outside its jurisdiction in regions more tolerant of automobile-dependent development patterns. In addition, although development within the Metro area continues to focus on transit service, and Metro has continued to plan for transit-related development, current economic difficulties have severely restricted plan implementation. The consequence is that most new development taking place in the larger region is not strongly oriented to transit service.

PROFILE: VANCOUVER, BC

The Transit System

BC Transit, established by the British Columbia provincial government, operates a 17.4-mi elevated rail system called

SkyTrain, with 20 stations. BC Transit also manages an extensive network of regional and local buses and high-speed passenger ferries whose routes are planned to support use of rail transit. Extension of rail service to the remaining designated regional centers is still being debated.

Policy Framework

The Greater Metropolitan Area of Vancouver, a conglomeration of 11 cities for which local, regional, and provincial agencies share control, has distinctive policies that restrict new highway construction within the populated area, rely on transit to connect a regional system of development nodes within the built-up area, and constrain development to preserve agricultural resources. Those policies, laid down in the region's *Liveable Region Plan* in the early 1970s, continue to support the use of transit in the Vancouver area.

The early plan and its 1990 updated version proposed to link downtown Vancouver with six regional centers by a rail transit system. Plans prepared for each of the town centers focus intensive development around rail stations, with a strong emphasis on pedestrian-oriented design and restrictions on surface parking. Municipal zoning for these areas allows higher densities than permitted in other areas. Although regional control over development is now weakened, individual municipalities continue to apply the basic policies of the early plan and its 1990 update to guide development.

Station-Area Development Activities

In 1989, BC Transit reported that much of the Can\$5 billions' worth of investment in private development occurring within 10 to 15 minutes of rail stations was encouraged by favorable provincial and local policies to promote transit-focused development, according to a 1989 BC transit report. Its activities focused on

- Development of industrial areas through which rail service passed; no neighborhood opposition existed;
- Development of land adjacent and underneath the railway that still remained in private hands;
- Sale of land along the line to developers through a rights-transfer arrangement, leaving land under the tracks as open public space;
- Siting public buildings in station areas, such as the BC Transit headquarters, and
- BC-initiated projects to develop stations at line extensions.

Observations on Obstacles and Opportunities

Vancouver's unique blending of rail transit with the metropolitan development process resulted from a regional strategy put in place and implemented through significant provincial management of both the transit system and the development

process. The willingness of the region's residents to live and work in high-density environments plays a major role in the cooperative relationships among municipal, regional, and provincial agencies in pursuit of transit-focused development. The regional strategy provides strong public policy support for private development in station areas.

PROFILE: WASHINGTON, D.C. REGION

The Transit System

The Washington Metropolitan Area Transit Authority (WMATA) is responsible for construction and operation of the 103-mi Metrorail system in the District of Columbia, northern Virginia, and Maryland. It also manages a regional bus system. In 1996, 89 mi of the system and 75 stations are in operation. The rail system carries 500,000 passengers on an average weekday. The system consists of four lines, designed to follow existing or planned higher-density development corridors in the various jurisdictions. Many lines are routes along major road and highway corridors, although some follow railroad rights-of-way for all or part of their length. Stations were located at existing and future activity nodes. Much of the system in the District and close-in jurisdictions is underground.

Policy Framework

Overall policy guidelines for relating regional development to rail transit service were formulated in the 1960s by the National Capital Planning Commission. This set the stage for transit-focused planning by defining transit corridors and identifying nodes of intensive development that would serve naturally as station locations.

As construction of the rail lines proceeded, the most immediately affected jurisdictions (the District of Columbia, Montgomery and Prince George's Counties in Maryland, and Arlington County and the City of Alexandria in Virginia) responded with supportive planning, zoning, and joint development actions. The counties have continued to support station-area development through redevelopment actions, parking and other infrastructure funding, and zoning revised to encourage station-area development. The robust real estate market in the Washington region during the 1970s and 1980s also responded positively, since locations of stations were considered prime real estate locations.

The jurisdictions interested in station-area development opportunities were assisted by WMATA's early support for joint development and other transit-related development. WMATA established an office of planning and development in 1981 to "promote, encourage, and assist in the creation of high-quality, more intensive development at or near appropriate station areas." Since then, Metro has pursued development

opportunities; by 1995, 22 joint-development projects had been completed. Marketing efforts for additional projects are continuing.

By contrast, jurisdictions that Metrorail reached later in the construction schedule have shown less enthusiasm for promoting intensive station area development. This occurred in part because major nodes of development arose in other locations (e.g., the Tyson's Corner complex in Fairfax County) and in part due to neighborhood backlash over the concept of intensive development around stations.

The region's local governments have rendered the current regional planning body, the Metropolitan Washington Council of Governments (WashCOG), powerless to prepare a regional plan built on federal agencies' efforts of the 1960s. In addition, the National Capital Region Transportation Planning Board, the region's MPO staffed by WashCOG, has no authority to encourage transit-focused development through its project prioritization. The most recent policies adopted by the Transportation Planning Board provide only general support for transit-focused development.

Station-Area Development Activities

In Washington, station-area development has included general real estate activity in the vicinity of stations and many examples of public-private joint development.

- Development at Friendship Heights, Maryland, on the District of Columbia border. This began in 1973, and included joint development of a 13-story, 240,000 office building with two floors of retail space over the station and bus terminal, plus interface connections of the station with an existing department store, a mixed-use development, and a new enclosed shopping mall. The complex is located at the center of an upscale regional shopping, business, and apartment center in Chevy Chase, an affluent area of Montgomery County.
- Joint development at the Bethesda Metrorail station and bus terminal. This mixed-use project has 370,000 sq ft of office and retail space in a 17-story building, a 380-room Hyatt hotel, 38,000 sq ft in a food court, and 1,400 parking spaces. The project was developed through a competition based on design guidelines prepared by the Montgomery County Planning Board. The development was part of a wave of major office and mixed-use projects during the 1980s that were within a quarter-mile of the station, transforming downtown Bethesda.
- At the Ballston station in Arlington County, private development of a 39-block area. It contained 3.7 million sq ft of commercial space, 4,300 residential units, and three hotels built since 1984 within a third of a mile of the station. One project was a joint development complex over the Ballston station, it consisted of a 12-story, 217,000 sq-ft office and retail building, a 26-story condominium and hotel building, and 760 parking spaces, completed in 1990.

- Construction around the Silver Spring, Maryland, Metrorail station during the 1980s building boom that included 3 million sq ft of office space, 188,000 sq ft of retail space, and 640 residential units within a quarter-mile of the station. The most recent project is a 1.3-million-sq-ft office building for the National Oceanic and Atmospheric Administration, which is linked directly to an intermodal center including the Metrorail and commuter rail stations.

The most recent development prospect is a joint agreement for private development of a new rail station as part of a 342-acre mixed-use complex being developed in old railroad yards in Arlington County, Virginia.

Observations on Obstacles and Opportunities

Washington's station-area development program benefitted from early, integrated planning of regional development with regional rail service, followed up with aggressive promotion of development opportunities by the local jurisdictions and WMATA. The impetus for successful development was provided by a Washington area building boom and by the fact that stations were already located in places recognized by the market and in local plans as regional centers. In locations lacking local and/or market support for intensive new construction, station areas have not proven nearly as attractive for development. In addition, the lack of regional policies and actions to support transit-related development provides no incentive for local action.

APPENDIX B

Questionnaire

Synthesis of Transit-Focused Development
Transit Cooperative Research Program Topic SH-01

Interview Guide for Researchers

Researcher: _____

Title: _____

Address: _____

Telephone: _____ FAX: _____

The Transportation Research Board and the Transit Development Corporation, Inc. (the nonprofit educational research organization of the American Public Transit Association), in cooperation with the Federal Transit Administration, is sponsoring a research project on transit-focused development (TCRP Synthesis Topic SH-1). The research is part of the Transit Cooperative Research Program authorized in the Intermodal Surface Transportation Efficiency Act of 1991.

The objective of the synthesis is to provide information on the planning and implementation process leading to concentration of development at and near rail transit stations.

The purpose of this interview is to identify past and current research and development experience in transit-focused development. The topic encompasses efforts by transit agencies and planning organizations to stimulate concentrations of development near transit stations, including rail stations, bus transfer stations, and multi-modal centers.

I'm interested in work you may be doing related to this topic, including the policies adopted to stimulate such development and aspects of the development process such as interagency coordination and public/private relationships. In addition, you may know about specific projects or case studies.

1. What research have you undertaken in this subject area?

a. Current research

- (1) Title or subject of research project
- (2) Year initiated, year expected to be completed
- (3) Sponsor or funding organization
- (4) Colleagues, if any
- (5) Subjects of case studies, if any
- (6) Summary or outline of research approach
(send if possible)
- (7) Major findings (send summary if possible)

b. Past research

- (1) Title or subject of research project
- (2) Year initiated, year completed
- (3) Sponsor or funding organization

- (4) Colleagues, if any
- (5) Subjects of case studies, if any
- (6) Research approach and findings
(send report if possible)

2. Are you aware of other research being conducted on this subject?

- a. General topic:
- b. Contact person:

3. Other than the activities cited in your research, do you know of other transit-focused development activities and projects being planned or developed?

- a. By transit agencies promoting joint development or station-related development

Community:

Agency and/or contact person:

- b. By local or regional planning organizations adopting policies or implementation programs to promote transit-focused development

Community:

Agency and/or contact person:

- c. By other entities, such as non-profit organizations or developers, who are promoting or engaged in transit-focused development.

Community:

Organization and/or contact person:

Synthesis of Transit-Focused Development
Transit Cooperative Research Program Topic SH-01

Interview Guide for Transit Agencies

Contact Person: _____

Title: _____

Organization: _____

Address: _____

Telephone: _____ FAX: _____

The Transportation Research Board and the Transit Development Corporation, Inc. (the nonprofit educational research organization of the American Public Transit Association), in cooperation with the Federal Transit Administration, is sponsoring a research project on transit-focused development (TCRP Synthesis Topic SH-1). The research is part of the Transit Cooperative Research Program authorized in the Intermodal Surface Transportation Efficiency Act of 1991.

The objective of the synthesis is to provide information on the planning and implementation process leading to concentration of development at and near rail transit stations.

The purpose of this interview is to identify past and current research and development experience in transit-focused development. The topic encompasses efforts by transit agencies and planning organizations to stimulate concentrations of development near transit stations, including rail stations, bus transfer stations, and multi-modal centers.

I'm interested in any efforts by your agency to promote transit-oriented development, either through policies and incentives or through actual participation in development near transit stations.

1. What efforts has the agency made to stimulate concentrations of development near transit stations:
 - a. Development/adoption of development policies (get copy).
 - b. Cooperation with other agencies or developers in encouraging development near stations.
 - c. Marketing program for joint development sites.
 - d. Market analyses, design prototypes, or other background studies to promote station-area development.
 - e. Other
2. What are the principal reasons that the agency is interested in promoting such development?
 - a. Increasing ridership and farebox revenues
 - b. Increasing tax base
 - c. Disposing of excess property
 - d. Cooperate in implementing local development plans
 - e. Achieving air quality attainment plans.
 - f. Other
3. What development or specific projects have been planned or implemented as a result of agency policies and/or actions? [Obtain following data for each development area or project involved.]
 - a. Type of development:
 - (1) Size (acreage, floor space), uses.
 - (2) Building configuration and design.
 - (3) Relationships with surrounding area.
 - b. Development process:
 - (1) Interests involved and their objectives
 - (2) Planning and design process.
 - (3) Funding mechanisms.
 - (4) Development approval procedures, including issues and their resolution.
 - c. Development context:
 - (1) Metropolitan and community population, economic conditions and growth trends.
 - (2) Transit agency organization, route or line length and stations, contributions to the development.
 - d. Summary of issues and problems that arose, obstacles overcome, benefits achieved, lessons learned.
4. What representatives of the other interests involved could be contacted for more information?
5. What transit-related projects were planned and not implemented or failed, and why?

Synthesis of Transit-Focused Development
Transit Cooperative Research Program Topic SH-01

Interview Guide for Planning Organizations

Contact Person: _____

Title: _____

Organization: _____

Address: _____

Telephone: _____ FAX: _____

The Transportation Research Board and the Transit Development Corporation, Inc. (the nonprofit educational research organization of the American Public Transit Association), in cooperation with the Federal Transit Administration, is sponsoring a research project on transit-focused development (TCRP Synthesis Topic SH-1). The research is part of the Transit Cooperative Research Program authorized in the Intermodal Surface Transportation Efficiency Act of 1991.

The objective of the synthesis is to provide information on the planning and implementation process leading to concentration of development at and near rail transit stations.

The purpose of this interview is to identify past and current research and development experience in transit-focused development. The topic encompasses efforts by transit agencies and planning organizations to stimulate concentrations of development near transit stations, including rail stations, bus transfer stations, and multi-modal centers.

I'm interested in any efforts by your organization to promote transit-oriented development, either through adoption of policies and incentives or through actual participation in the development process near transit stations.

1. What efforts has the organization made to stimulate concentrations of development near transit stations:
 - a. Development/adoption of development policies (get copy).
 - b. Initiating or supporting area plans, special forms of zoning, rezoning, or other regulatory changes for station areas.
 - c. Cooperating with other agencies or developers in encouraging development near stations.
 - d. Conducting market analyses, planning and design studies, or other background studies to promote station-area development.
 - e. Assisting with land assembly or providing other forms of financial assistance for station-area development.
 - f. Other
2. What are the principal objectives of the organization in promoting transit-focused development?
 - a. To create more efficient and attractive development patterns in the community or region.
 - b. To Improve air quality by increasing transit ridership.
 - c. To reduce traffic congestion by increasing use of transit.
 - d. To reduce pressures for development elsewhere in the region.
 - e. To improve the tax base for the community.
 - f. To improve transit ridership and farebox revenues.
 - f. Other
3. What development or specific projects have been planned or implemented as a result of agency policies and/or actions? [Answer for each development area or project involved.]
 - a. Type of development:
 - (1) Size (acreage, floor space), uses.
 - (2) Building configuration and design.
 - (3) Relationships with surrounding area.
 - b. Development process:
 - (1) Interests involved and their objectives
 - (2) Planning and design process.
 - (3) Funding mechanisms.
 - (4) Development approval procedures, including issues and their resolution.
 - c. Development context:
 - (1) Metropolitan and community population, economic conditions and growth trends.
 - (2) Transit agency organization, route or line length and stations, contributions to the development.
 - d. Summary of issues and problems that arose, obstacles overcome, benefits achieved, lessons learned.
4. What representatives of the other interests involved could be contacted for more information?
5. What transit-related projects were planned and not implemented or failed, and why?

Synthesis of Transit-Focused Development
Transit Cooperative Research Program Topic SH-01

Interview Guide for Developers and Other Interests

Contact Person: _____

Title: _____

Organization: _____

Address: _____

Telephone: _____ FAX: _____

This interview is part of a research effort to identify development experience in transit-focused development. The topic encompasses efforts by transit agencies and planning organizations to stimulate concentrations of development near transit stations, including rail stations, bus transfer stations, and multi-modal centers. The principal focus of this effort is to identify and describe the planning and implementation process leading to such concentrations.

I would like to obtain some information about a transit-focused development in which your organization was involved.

1. What was your role in the development (including its initiation, approval process, planning and design, funding, management, and completion).
2. What obstacles and issues did you encounter in participating in the development?
3. In what ways has the project been successful, and how has it benefitted the community and the transit system?
4. In what ways has the project been unsuccessful in meeting your objectives and community objectives?

THE TRANSPORTATION RESEARCH BOARD is a unit of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. It evolved in 1974 from the Highway Research Board, which was established in 1920. The TRB incorporates all former HRB activities and also performs additional functions under a broader scope involving all modes of transportation and the interactions of transportation with society. The Board's purpose is to stimulate research concerning the nature and performance of transportation systems, to disseminate information that the research produces, and to encourage the application of appropriate research findings. The Board's program is carried out by more than 270 committees, task forces, and panels composed of more than 3,300 administrators, engineers, social scientists, attorneys, educators, and others concerned with transportation; they serve without compensation. The program is supported by state transportation and highway departments, the modal administrations of the U.S. Department of Transportation, the Association of American Railroads, the National Highway Traffic Safety Administration, and other organizations and individuals interested in the development of transportation.

The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Bruce Alberts is president of the National Academy of Sciences.

The National Academy of Engineering was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Robert M. White is president of the National Academy of Engineering.

The Institute of Medicine was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Kenneth I. Shine is president of the Institute of Medicine.

The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Bruce Alberts and Dr. Robert M. White are chairman and vice chairman, respectively, of the National Research Council.