STRATEGIES FOR DESIGN:
SHAPING PRIVATE DEVELOPMENT ADJACENT TO TRANSIT STATIONS

By

George John Proakis

Bachelor of Science, Civil Engineering
Northeastern University, 1995

Master of Public Administration
Maxwell School of Citizenship and Public Affairs
Syracuse University, 1996

Submitted to the Department of Urban Studies and Planning in Partial Fulfillment of the
Requirements for the Degree of

Master in City Planning
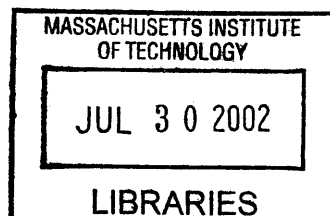
at the

Massachusetts Institute of Technology

JUNE 2002

Signature of Author: _____
Department of Urban Studies and Planning
May 16, 2002

Certified by: _____
Karl Seidman
Lecturer, Department of Urban Studies and Planning
Thesis Supervisor

Accepted by: _____
Professor Dennis Frenchman
Chair, MCP Committee
Department of Urban Studies and Planning

STRATEGIES FOR DESIGN:
SHAPING PRIVATE DEVELOPMENT ADJACENT TO TRANSIT STATIONS

By

George John Proakis

Submitted to the Department of Urban Studies and Planning
on May 16, 2002 in Partial Fulfullment of the
requirements for the Degree of Master in City Planning

ABSTRACT

Most urban planning practitioners agree that development near transit stations should be dense, should mix uses and should be oriented for pedestrians. To spur transit-oriented development, government must do two things: define the elements that make transit station-area design work, and create the regulations and process that ensures these elements become a part of station-area development. This thesis finds the elements that create a superior pedestrian experience near transit stations, and proposes a system of regulations, incentives and processes to make sure that developers integrate these elements into their projects. Design recommendations are based upon a review of successful and unsuccessful design elements at twenty-one case study station areas in California, Virginia and Arizona. Regulatory and process recommendations are based upon a review of four case study communities that have instituted different strategies for design. Conclusions are drawn from these cases and applied to the Tren Urbano system, a new rail system being completed in metropolitan San Juan, Puerto Rico. To successfully spur private development of high quality station-area projects, government must connect the four elements that influence design: the development community, the government institutions, the development process, and the regulatory framework. First, planners must choose to strengthen either development processes or regulatory framework. In places with a more politically volatile culture, it is better to strengthen regulations than to strengthen process. In stable political environments, it is better to rely on a stronger development process than a stronger regulatory framework. Institutional capacity and development community capacity both improve as government and the development community learn from each other. This feedback loop creates progressively stronger results. In San Juan, the regulatory framework needs to be strengthened, while the development process needs to be institutionalized. The institutional capacity, particularly at the Tren Urbano planning office, is strong. This capacity needs to be transferred into other government agencies and into the development community that will build projects in the station area.

Thesis Supervisor: Karl Seidman
Title: Lecturer, Department of Urban Studies and Planning

Thesis Reader: Kenneth Kruckemeyer
Title: Research Associate, Center for Transportation Studies

Thesis Reader: Terry Szold
Title: Adjunct Associate Professor, Department of Urban Studies and Planning

STRATEGIES FOR DESIGN:
SHAPING PRIVATE DEVELOPMENT ADJACENT TO TRANSIT STATIONS
CASE STUDIES FOR TREN URBANO
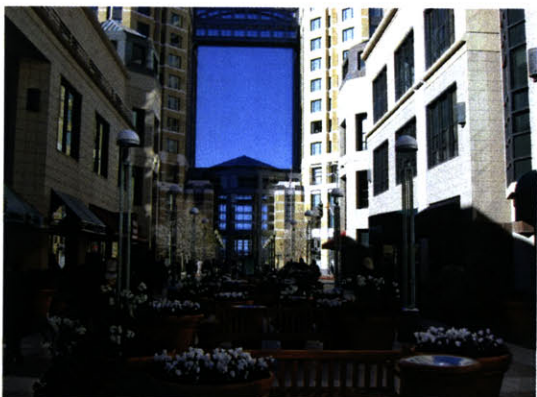
George J. Proakis
Massachusetts Institute of Technology
Department of Urban Studies and Planning
May 2002

Biographical Note

George Proakis is a candidate for a Master of City Planning degree in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology. He is concentrating his studies and research in economic development, regional planning and urban design.

George was born in Cambridge Massachusetts and has lived in the Fenway neighborhood of Boston for eight of the past eleven years. George attended Northeastern University from 1990 to 1995, where he graduated with a Bachelor of Science degree in Civil Engineering and a minor in Political Science. He attended the Maxwell School of Citizenship and Public Affairs at Syracuse University from 1995 to 1996 and graduated with a Master of Public Administration Degree in 1996. At that time, George took a job with the Syracuse Research Corporation (SRC) and its subsidiary, the New York State Technology Enterprise Corporation (NYSTEC). At SRC and NYSTEC, George worked on a variety of alternative fuel, and economic development projects for New York State. George worked with the Alternative Fuels Technology Center at NYSTEC to create economic strategies for the upstate New York farm community, including plans for developing ethanol and biofuels industries in the state. In 1998, George returned to Boston and started Fenmore Consulting Services where he continued to produce economic development studies for New York environmental and agricultural organizations. Working for NYSTEC and the New York Corn Growers Association, George and Fenmore Consulting produced key studies used by the corn farmers in New York to lobby for assistance for ethanol to be produced from New York grown corn.

Since 1998, George has been active in the Fenway community of Boston in a number of roles. He has served as the Fenway representative to the Boston Neighborhood Recycling Coalition, as a member of the Fenway Planning Task Force, as a representative to the Emerald Necklace Citizens Advisory Committee and as a member of the Save Fenway Park. He has also been an active member of Fenway Civic Association and the Fenway Community Development Corporation.

George has been interested in regional development and suburban sprawl issues since 1996, and has been actively participating in the Congress of the New Urbanism (CNU) e-mail lists since 1997. From the CNU he has had the opportunity to connect with many academics and practitioners working on transit-oriented development and transit village design projects around the world.

George was recently awarded one of eight yearlong fellowships by the Rappaport Institute for Greater Boston at Harvard University. Through this fellowship, he hopes to secure the opportunity to work in a Boston area public sector placement that will influence economic development and land use decisions in the Boston area.

Acknowledgements

Although a completed thesis may only have one name on the cover, it is impossible for such a project to happen without the assistance of so many people. I would like to thank everybody who has done anything to help me in completing this project. I'll apologize in advance to whomever I forgot, as I am sure I have missed somebody.

I'd like to first thank my family: my parents and sister Elena as well as my aunts, uncles and my grandmother for their support and their understanding over the past few months when this project has required me to miss many family events. Second, I'd like to thank my advisors Karl Seidman, Ken Kruckemeyer and Terry Szold. Their patience and support has made this project a reality. Thanks are also due to the Tren Urbano project team and the Center for Transportation Studies for providing the financial support for me to complete my studies at MIT, as well as the support for my many productive research trips. Ginny Siggia, the unsung hero of the UPR/MIT program deserves special credit for her patience and assistance.

I have always believed that the MIT experience has allowed me to learn as much from fellow students as I have learned from faculty. I am grateful to my classmates from DUSP and from the Tren Urbano Program for always being willing and able to share their knowledge about everything from land use planning to salsa dancing. The students at the University of Puerto Rico also deserve a thank you for their assistance and support. Special thanks are due to DUSP students Julie Kirschbaum, Frances Switkes and Chong-Yean Teo for their assistance in supplying documents, Kate Fichter for hosting the dinner that inspired my thesis outline, Brent Ryan advising me on starting Chapter 1 and Eli Curtis for accompanying me on the California interview spree.

For sharing their knowledge of station area planning, I am grateful to: GB Arrington, Al Raine, Peter Albert, Patty Hirota-Cohen, Trent Lethco, Steve Bodzin, Phil Scales, Chris Hudson, Bob Brosnin, Greg Walker, Arthuro Lawson, Bruce Liedstrand, Ali Neal and the many contributors to the pro-urb e-mail list. For sharing their knowledge of Puerto Rico, I am grateful to: Rose Bernier, Javier Mirandes, Javier Bonnin, Andres Mignucci, Manuel DeLemos, Graham Castillo, Criseda Navarro, Luis Garcia, Elmo Ortiz and the UPR student team. And, for sharing his stories on planning, politics, Boston and Puerto Rico, I am grateful to Fred Salvucci. Finally, the case studies would never have been possible without the generosity of friends who opened their homes to me and provided me with free places to stay: Robert and Josie Pepe in Virginia and Alice Towey and her roommates in Oakland. Mary and Michael Brewer in Washington, DC also deserve special thanks for spending their Veterans Day wandering the suburbs of Maryland and Virginia with me.

I'd like to thank my professors at MIT, at the Maxwell School, at Northeastern and my teachers in Lexington for providing me with the background to make this project possible. Finally, I would like to thank my neighbors in the Fenway neighborhood of Boston for giving me hands-on planning experience.

I wish the best of luck to the people of Puerto Rico and any other place that is working to put together the challenges of transportation and land use in search of creating better places for people to live work and play. Alan Kay said that 'the best way to predict the future is to invent it', and I believe that solid land-use planning offers an opportunity for us to invent a better way of living our daily lives. In the end, even the place-based interventions are about people, and success in planning will make the pursuit of happiness just a little bit easier.

TABLE OF CONTENTS

> "The World is enormously rich with design that works"
>
> - David Sucher, City Comforts[1]

1 DEFINING SUCCESS IN STATION AREA PLANNING

1.1 A TALE OF TWO TRANSIT STATIONS

Ballston Station on the Orange Line of the Washington DC METRO subway system opened in the suburban community of Arlington Virginia in December of 1979. Six years later, Boston's Massachusetts Bay Transportation Agency (MBTA) opened Alewife Station at the end of the Red Line on the town line between Arlington and Cambridge Massachusetts.

Today, the Ballston station area includes a shopping mall, a significant quantity of office space, the national headquarters of The Nature Conservancy and a series of restaurants and apartments. All are easily within walking distance of the station exits with access on wide sidewalks bordered by street cafes and storefronts. The parking lots, automobile dealerships and other uses that would be unfriendly to the pedestrian environment are gone. Only a few remnants of the 1979 Ballston area remain, a few one-story buildings. The tenants in these buildings find significantly more pedestrian activity at their storefronts than they did in 1979. Additional Orange Line stations at Courthouse and Clarendon, further down the line, have experienced similar successes. Most impressive is the increase in transit users over the last decade. From 1991 to 2000, entries and exits at Ballston station have climbed from about 9,500 to over 21,000 per day, with a near even rate of entries and exits in the AM and the PM peak. Over half the transit users at Ballston station arrive at the station by walking.[2]

Alewife station in Massachusetts has also seen significant nearby development since its opening in 1985. Many industrial properties surrounded the station before its opening. Today, office towers, surrounded by parking, have appeared on the horizon. A new residential building began construction in 2001. Pedestrians exiting the station can access a strip-mall with a supermarket, some pre-existing residential high-rises and a number of office structures. Yet for the pedestrian, this area is very difficult to navigate. Most commuters arriving at Alewife area businesses drive to their offices. Most also must drive between nearby destinations

---

[1] Sucher, p174
[2] Brosnin interview, 03/02

in the station area. Despite the best efforts of local planning agencies, and despite the economic strength of the region, the area development remains uncoordinated.

1.2   INTRODUCTION

On the edge of San Juan, Puerto Rico a new opportunity is being built today. In September of 2003, the San Juan metropolitan area will open its first high-capacity urban rail system. The Tren Urbano[3] system will offer new opportunities to provide connections between major points in metropolitan San Juan. Planners from the transit agency, the Commonwealth and the local communities are looking at station areas for an opportunity to provide integrated mixed-use developments that will encourage transit use and support pedestrian activity. But, San Juan needs to answer one important question: What elements need to come together to make a station area development plan work?

1.2.1   Objectives

This thesis seeks to find the combination of design elements, regulations and development incentives that encourage transit-oriented development (TOD) within walking distance of transit stations. The thesis will review existing conditions at developments next to transit stations seeking out development that has been successful at employing elements of transit-oriented development. Successful transit-oriented development creates a comfortable pedestrian experience for users of the development and the transit station.

The interventions learned from the cases will be applied to station areas on the Tren Urbano system, currently under construction, in San Juan, Puerto Rico. Recommendations will include proposed policies and procedures to ensure that future development interventions and development projects are appropriate for a transit station area.

Key questions for the project include:
♦ What design elements work best to provide a superior pedestrian experience when developing sites near transit stations?
♦ What regulations, incentives and processes are necessary to make sure developers integrate these elements into their projects?
♦ How can these lessons be applied at 'case study' stations in San Juan?

1.2.2   Methodology

To define the elements, regulations, incentives and processes that lead to a successful design, one must first understand what transit-oriented development is and what elements must come together to make a successful transit-oriented development project. This first chapter sets out to define the elements of successful transit-oriented development from the perspective of design, use and density as well as local and regional effects.

---

[3] Tren Urbano translates to 'urban train' in English

The project will then review selected case study stations in the United States. This review will focus on interventions that have been successful as well as attempted interventions that have not been successful at improving pedestrian connections to rail stations in the suburbs and on the fringes of the city through better utilization of private development[4] surrounding the stations.

The thesis identifies the type of interventions, the process used to create them, and the role of the transit agency and local government in this process. The methodology concentrates on site visits and conducting interviews with development participants from the transit agency, the community and the developers.

Through site visits and interviews, the thesis seeks to find key elements that have been brought together to make a project work, such as:
- ◆ Elements of the design that integrate the transit project with the private space.
- ◆ Incentives (funding, zoning bonuses, community support) that assisted the private developer in choosing a transit-oriented approach.
- ◆ Regulations (zoning, design codes, etc.) that led to the development of a transit-oriented approach.
- ◆ Political considerations that surrounded this process, including the role of the transit agency in the development.

This thesis will build upon the previous and current research projects completed through the Tren Urbano program. Previous thesis projects for Tren Urbano have focused on the nature of gated developments near these stations and the potential for participation of the transit agency in development decisions. The product of this thesis may be integrated by the clients, with the current thesis projects by Frances Switkes on public space and pedestrian amenities near the transit stations and the thesis project by Elizabeth Curtis on policies and design of parking around the stations.

1.2.3   The Tren Urbano System

The Tren Urbano will bring a new mass transportation alternative to the San Juan metropolitan area when it opens in September of 2003. The system will use 74 vehicles with a capacity of 182 passengers per vehicle, running at 4 minute headways during peak hours. These will be modern electric rail transit cars using third-rail technology with a 55 mile per hour maximum speed along a fixed guideway. The total route is 17.2 km, with most of the guideway elevated, but some sections at grade and underground.[5]

The route will include 16 stations that are strategically located to provide links between residential and commercial areas with a high population density and traffic

---

[4] For the sake of this thesis, the term 'private development' also includes many developments in which the public sector serves as a partner with a private developer, including 'joint development' projects around stations on land that is often leased by the developer from the transit agency.
[5] Tren Urbano brochure

congestion. Furthermore, these station sites offer the opportunity for strategic links that will allow for integration into a regional transit system including buses and private, licensed jitney vehicles, called *publicos.* Although the initial transit segment provides only limited accessibility to the entire region, the rail system will be integrated with existing bus and publico systems. Furthermore, detailed plans are being created for future extensions of the system. But, the greatest opportunity for success of the Tren Urbano system will come with the integration of this new transit system with a land use plan that maximizes the accessibility of sites of regional importance by locating a dense core of mixed-use developments at each station area.[6]

Development patterns in the San Juan metropolitan area are currently not compatible with high-capacity transit. Furthermore, the use and density of vehicles and congestion of traffic is quite significant. Currently, Puerto Rico has the highest density of vehicles in the world. With 1.3 million people in the San Juan metropolitan area, there are over 4200 cars per square mile and 3.2 million car trips daily. In Puerto Rico, there are more registered vehicles than licensed drivers.[7]

Projections for the future are of particular concern. By the time Tren Urbano opens in 2003, there is projected to be 400,000 additional inhabitants and 210,000 cars. By 2010, daily car trips in the metropolitan area are predicted to increase 45% to over 4.5 million per day.

At this time, the Planning Board of Puerto Rico has decided to retain zoning control of an area of 500 meters surrounding each of the Tren Urbano stations.[8] This will provide an opportunity to shape the future development of station areas, and build new demand for pedestrian and transit trips. This thesis seeks to contribute to that process, and support the discussion about the important elements of station area planning needed by Tren Urbano.

One major issue must be settled to link the transit-oriented developments that have been successful in places like Virginia and California to greater San Juan. Some experts interviewed for this thesis stated that people in Puerto Rico are too committed to living in a single family detached home and will not be willing to live in mixed-use transit-oriented developments.[9] There must be an acceptable niche market, no matter how small, to create sufficient demand for people to live or work in a different environment, even in San Juan. Properly designed, a mixed-use transit-oriented development may be able to include a single-family housing component that is in a different setting than the typical gated community of suburban San Juan. Puerto Rico may be a more extreme case of auto-centered lifestyle than California or Virginia, but this is a matter of degrees. Residents in these other locations may also, more often than not, choose to live on a suburban

---

[6] Elmo Ortiz interview 01/02
[7] Tren Urbano brochure
[8] Luis Garcia interview 01/02
[9] From interviews with Fred Sanchez (01/02) and Graham Casillio (01/02)

cul-de-sac than in a mixed-use setting. But, the demand for transit-oriented development exists in all these places nonetheless.

1.2.4   Station Typologies

For the sake of limiting the study to cases that may be applicable to the Tren Urbano system and to similar systems that may later apply these recommendations, a methodology must first be developed to understand different types of transit station areas for transit-oriented development. For this case, five station area typologies have been identified:
1. Station areas where significant urban development pre-dates the station.
2. Station areas in a dense urban core where development may follow transit, but significant urban real estate markets pre-existed. A natural extension of the core would propel development in this direction, therefore other factors are more primary than transit in the development of the area.
3. Station areas in a secondary urban grid or in a primary urban grid in an auto-oriented city. This may include any development area that, before redevelopment, included significant open sites, surface parking or under-utilized parcels.
4. Station areas in a suburban setting. The primary nearby use is residential, and the street pattern is not a standard urban grid.
5. Station areas with limited nearby uses other than parking and undeveloped land.

This study will focus on areas that are in the last three categories. To ensure that these cases are applicable in an existing real estate financial environment, it will focus on development that has been completed in the last twenty five years, and in most cases on development near transit stations that have opened in the last twenty five years. There are plenty of cases where thriving urban cores are located at transit stations, and it is most likely true that the transit has been a key to the development and sustainability of these cores. But, the study of such areas, as outlined in the first two categories above, is not within the scope of this project.

1.2.5   Thesis Structure

The first chapter establishes a definition of successful transit station-area development. This definition is developed from ideas that have been brought together from a review of existing literature and interviews with experts who have worked in planning and building projects around transit stations. Although it is difficult to create an exact definition, on a general scale, the basic elements of good transit-oriented development can, and have, been defined. By reviewing the definition of transit-oriented development, the advantages that TOD has brought to station areas and the elements that make it successful, this chapter sets the groundwork for more in-depth case studies.

The second chapter is based upon a review of ten key design elements from transit stations with private and joint station-area development. The reviewed design elements are keys to better understanding the groundwork that has been set in the first chapter. From a selection of station sites in Washington DC, the San Francisco

Bay area, San Diego, and Arizona, we learn how the design elements of transit-oriented development should come together to create a successful place. Although success cannot be absolutely predicted, and although design is not the only element that contributes to success, there is much to be learned from the way in which recent projects have been designed, developed and adapted. From minor successful elements in otherwise unworkable places to station areas with pedestrian-oriented places that have minor elements in need of adjustment, this chapter outlines numerous key elements that make TOD work. Successful design elements will lead to a portion of the recommendations in chapter 4.

The third chapter looks in more depth at station area planning in two communities in Virginia and California that have created particularly exciting new places over the past twenty-five years. In each case, elements of the planning process, zoning, design guidelines and development decisions are reviewed in detail. The objective of this chapter is to see what processes and regulations provide better results, and how the processes, regulations and development teams made the decisions that created these places.

The fourth chapter summarizes recommendations for successful development frameworks. This includes recommendations for zoning, incentives, design guidelines and other rules and processes that should help ensure that a station area becomes a successful transit-oriented place.

The final chapter applys these results to the Tren Urbano system in San Juan, Puerto Rico. The chapter outlines the political and social atmosphere in the San Juan metropolitan area, provides information about the additional challenges of developing transit-oriented development in San Juan and reviews current initiatives in station area planning. Then, the recommendations in chapter four are applied to two specific station area cases. The elements of this chapter are developed to provide recommendations to the Tren Urbano planning department and the Planning Board of Puerto Rico as they set out to enact new zoning for the area within a 500 meter radius of the Tren Urbano stations.

1.3   TOD: WHAT IT IS AND WHY IT HELPS

1.3.1   What is TOD?

Despite a comprehensive review of the literature, no simple definition of transit-oriented development has emerged. Peter Calthorpe comes closest to such a definition in the book "The Next American Metropolis". He writes "The TOD concept is simple: moderate and high-density housing along with complementary public uses, jobs, retail and services, are concentrated in mixed-use developments at strategic points along the regional transit systems."[10] Peter Calthorpe and William Fulton, in their book The Regional City, go further by establishing the regional implications of TOD. They write that TOD involves "reorienting the region around a

---

[10] Calthorpe, p41

system of rail lines emanating from a central city hub.[11] Each stop becomes the town center for a mini New Town, a mixed-use community with stores, jobs and diverse housing all within walking distance of the transit stop with its links to other towns and downtown." Calthorpe and Fulton point out that, without TOD, a transit line with its park & ride lots runs a risk of spurring sprawl as much as any highway. By interlinking walkable dense communities developed around each station, the TOD model allows the transit line to increase regional accessibility while simultaneously reducing sprawl and its negative side-effects.[12]

1.3.2   Benefits of Transit Oriented Development

Environmental activists have been concerned for years with the effects of suburban sprawl as the predominant development pattern in many regions in the United States and around the world. Concerns over sprawl have grown beyond environmental issues to include a wide range of problems. The pattern of new residential developments including gated communities, large lot subdivisions and oversized houses has led to a loss of sense of community. Big box retail stores have reduced the efficiency of traditional towns. Office parks surrounded by parking have provided opportunities only to those who can access them by car, while spreading acres of paved surfaces across the landscape. Single-occupancy vehicle trips have become the travel mode of choice, if only because other types of trips are not possible inthe landscape as it has been designed. Income groups are typically segregated, with lower income people trapped in communities with lower quality schools and limited access to suburban jobs. Increased vehicle congestion has led to more pollution problems and lost time in daily traffic jams. Meanwhile, while the quantity of productive farmland in the country may remain significant, much of the farmland near major cities, and the scenic vistas that they provide, continues to be lost to further development.

Transit-oriented development is the antithesis of sprawl. It is part of a greater 'Smart Growth' movement that includes compact suburban site planning, protection of open spaces and historic resources as well as inner-city revitalization. TOD provides benefits for its users as well as for the transportation agency and its subsidiary transit agency. Good pedestrian-oriented design near transit stations will provide:
* incentives for choice riders living and working near these stations to use them;
* opportunities for residents near the station to live without dependence on a car, or at least without the need to use a car for daily convenience trips and for work trips; as well as,
* opportunities for car-free city residents to access jobs at suburban station areas.

Many suburban transit stations provide access for nearby residents and businesses only through 'Park & Ride' lots. Nearby suburban development follows traditional

---

[11] Calthorpe overlooks the idea that other non-rail transit systems may actually provide opportunities for transit-oriented development. The city of Curitiba Brazil has used busses on a fixed guideway and completely transformed their urban form based upon the bus system. Although a fixed guideway may be a required public investment to build developer confidence in the long-term public commitment to the transit system, it need not be a rail system.
[12] Calthorpe & Fulton, p 219

sprawl patterns, while commercial uses are in strip centers. In these areas, suburban developers often do not understand or care about the interconnections between their developments, the transit station and the developments beyond their site. Yet in many other communities, developers are building transit-oriented developments that interconnect with other developments and provide easy pedestrian access to the nearby station.

1.4   CURRENT PERSPECTIVES ON TOD AND THE URBAN CONTEXT

Development of a region in a TOD pattern has a number of advantages that have been outlined in numerous studies and books. These ideas are reviewed in more detail in this section.

1.4.1   Regional Perspective

Peter Calthorpe, an architect and planner who has been working on transit-oriented development, has expanded the scope of his work from individual developments to a regional focus.[13] Calthorpe's vision for TOD reflects earlier ideas of Jane Jacobs and Christopher Alexander. He sees TOD as an opportunity to create a region of neighborhoods, each neighborhood as a community. Calthorpe outlines four elements necessary to complete regions of cities and towns:
♦ Centers: the local and regional destinations
♦ Districts: the special use areas, dominated by a single primary activity
♦ Preserves: the open-space elements that frame the region, protect farmlands and preserve critical habitat
♦ Corridors: the connecting elements based on either natural systems or infrastructure and transportation lines[14]

Calthorpe stresses the connections between protecting open space and developing vital neighborhoods near transit. He provides a blueprint for local governments and a series of proposals for the US federal government to change policies and encourage the development of regions in a pattern of neighborhoods.[15]

1.4.2   Effects on Mode Choice: Pedestrians, Transit & Automobile

Transit-oriented development must first be pedestrian-oriented development. A successful mix of developments around the transit station will provide destinations for pedestrians in the immediate station area as well as transit users. Even in cities of the world with the most comprehensive transit systems, non-motorized trips (mainly walking trips) outnumber trips on the transit system.[16] But it is the combination of walkable convenience shopping and regional accessibility via transit that reduces congestion and provides a ridership base for a transit system.

---

[13]Calthorpe & Fulton, p16
[14] Calthorpe & Fulton, p51
[15] Calthorpe & Fulton, p51
[16] Millennium Database of Cities and Towns

Two studies provide an interesting basis for understanding the impacts of transit-oriented development on the region.

Reid Ewing and Robert Cervero in 2000 completed a review and synthesis of fifty empirical studies on land use and travel behavior. Ewing and Cervero found that, in general, there is a collective effect of multiple design features on travel behavior. For the EPA, they developed a Smart Growth Index model, showing the elasticities of travel with respect to the built environment. The result of this is provided in Table 1-1. A larger negative elasticity indicates a more significant correlation with a reduction in vehicle trips. The element that has the largest effect on reduction of vehicle trips is an element called 'regional accessibility', with an elasticity of -0.20. This element measures the ability to reach other areas of the region through use of the transit system. If the transit system only serves a limited area of the region, the development near it is much less likely to reduce auto trips. While elements of design and density do allow for some trip reduction, the effect is not as strong as the effect of having other regional needs accessible through the transit system.[17]

Table 1-1: Typical Elasticities of Travel with Respect to the Built Environment[18]

	Vehicle Trips (VT)	Vehicle Miles Traveled (VMT)
Local Density	-0.05	-0.05
Local Use Mix	-0.03	-0.05
Local Design	-0.05	-0.03
Regional Accessibility	--	-0.20

While each elasticity on this table is small, the cumulative effects, when summed across regional accessibility, density, design and mix of is significant. Application of Ewing and Cervero's results suggest that there is a strong effect on travel decisions created through developing additional transit villages that, in turn, adjust the regional accessibility of the entire system. If more and more of the activities in a metro area are placed along different station areas of the transit system, the ridership increases and auto trip reductions will be most significant.[19]

In a study by McCormack, Rutherford and Wilkinson in 2000, the University of Washington researchers measured elements that lead to an increase in pedestrian trips and a reduction in vehicle trips in a number of similar neighborhoods in the Seattle area. Their research conclusions have suggested that pedestrian trip increases are seen in many cases, but they do not always correspond to vehicle trip reductions. This suggests that a pedestrian oriented environment may generate its own additional walking trips merely because walking is an option. In mixed-use neighborhoods, 11.3 percent of all trips greater than five minutes were walking trips, compared to 3.6 percent of trips in the King County as a whole.[20]

This provides a key point: Transit-oriented development may be more appropriately named pedestrian-oriented development. By providing a comfortable walking

---

[17] Ewing & Cervero, p14
[18] Ewing & Cervero, p14
[19] Ewing & Cervero, p14
[20] McCormack, et. al., p9

environment between a home or office and the convenience retail that is needed in daily life, a development can have an effect on vehicle traffic and trips without even necessarily impacting transit. Data from the *Millennium Database of Towns and Regions,* a collection of information about transportation trends around the world, confirms the opportunity for pedestrian travel in dense cities. In almost every city in the world, more trips are completed by a 'non-motorized use', such as walking or biking, than by public transit. Furthermore, most transit trips start or end with a walk trip.[21]

Table 1-2: Transit Trips and Non-Motorized Trips by metro area[22]

Key Statistic:	% motorized public transit over all trips	% non-motorized trips over all trips
Units:	%	%
Zurich	19.74%	34.24%
Glasgow	11.79%	33.38%
Stockholm	17.89%	28.00%
Vancouver	5.63%	15.48%
San Francisco	5.45%	11.55%
Chicago	4.50%	10.18%
Toronto	14.21%	6.66%
Phoenix	0.84%	4.48%
Houston	1.16%	3.36%

Even though the European cities have a lower percentage of driving trips as a percentage of all trips, and have fewer trips per capita in general, transit is not the dominant mode. Transit is, in fact, the third choice of trip mode. More than half the trips in Stockholm and Glasgow, as well as about 45% of trips in Zurich are still in private vehicles. The rest are transit trips and non-motorized trips. Even the best transit systems in the world cannot capture a majority of the trips.

Transit trips are outnumbered by non-motorized modes (walking, biking, rollerblading, etc.) in most cities. In Zurich, over 34% of trips are non-motorized. In Glasgow it is over 33%, while in Stockholm over 28%. The lifestyle and urban development patterns in these cities create a mixed-use walkable city experience where a large number of people are able to do daily trips without the need of any motorized transport. This suggests that these cities are quite friendly to those who do not have access to a car.

But, even in Houston and Phoenix, where there is a perception that people can't get anywhere by walking or biking, the non-motorized trips are 3.36% and 4.48% of all trips. These trips may be by the people in these cities without automobile-mobility who need to get somewhere, even if it is inconvenient.[23]

---

[21] Millennium Database of Cities and Towns
[22] Millennium Database of Cities and Towns
[23] Millennium Database of Cities and Towns

This data provides important guidance for a transit agency. The success of a place from the perspective of the transit agency may depend upon how the agency defines its mission. If the agency looks to increase ridership only, this single-minded focus may measure less than half the success of new pedestrian-oriented places at a transit stops. If the goal is to reduce auto trips, the combination of new opportunities on transit and new opportunities for pedestrians can have a much larger effect.

In a regional context, pedestrian-oriented places near transit stations work best when they have a cluster of convenience retail uses located near the station and within walking distance of the homes and workplaces of people who use the area each day. They also work best when the transit station provides a high level of regional accessibility, connecting them to major destinations, workplaces and high-density residential areas of the region as well as intercity high-speed rail stations and airports.

1.4.3 The Transit Agency Perspective

Transit agencies achieve a number of operational and financial advantages from transit-oriented development. Redevelopment of pedestrian oriented suburban stations will allow for further density of office and retail use and better pedestrian access to transit from existing residential areas. This should reduce demand on the bus lines accessing the station, but will increase demand on the subway lines. In particular, it offers the opportunity to increase demand on suburb to suburb commutes and reverse commutes to the affected station. These transportation patterns will bring additional demand in areas where transit systems have additional capacity, while driving economic development towards transit stations and not further burdening the suburb-to-core commute pattern.

Transit agencies also can participate in the financial benefits of station-area development by becoming a development partner. Often the transit agency has significant landholdings around stations after a transit line is constructed. The process by which transit agencies partner with private developers to create station-area projects is called joint-development. Usually, in a joint-development project the transit agency issues a request for proposals (RFP) for developers to submit project ideas. Agencies differ in the level of detailed requirements that they place in RFPs. Usually, the agency will require the developer to enter into a long-term lease, and often the agency will seek additional revenue through a financial arrangement that allows them to participate in the upside of the development returns.

1.4.4 Social Equity and Captive Transit Ridership

In their 2001 book 'The Regional City', Peter Calthorpe and William Fulton connect sprawl and inequity as two linked problems that "emerge from the destructive metropolitan patterns that have shaped our nation for the past half century". They continue by suggesting that sprawl, as a more recent problem, is solvable through an agenda for regional focus and concentrated development, while inequity is a

more timeless and more difficult problem to solve. But the issues are linked, because the problems are similar: issues with transportation, education, crime, pollution, open space and decaying neighborhoods.[24]

Dependence on transit is not just a class and economic issue. Young people who are not old enough to drive and older people who can no longer drive safely may find that driving is not an option, regardless of their social class.

The development of transit-oriented station areas can serve people of all social classes, ages and needs. While the transit-dependant user will find the advantages of increased mobility, the middle-class user will develop the freedom from being stuck in traffic.

1.4.5   Market Niche for Choice Riders

In many markets, the predominant sale and rental of homes and apartments has been in suburban locations on large lots. There has been considerable debate about the demand for alternatives to this suburban lifestyle. While some will argue that the market is providing what people want, others believe that regulatory limitations lead to the development of suburban homes and offer few alternatives to those who would want another development pattern.

Survey data suggests that the majority of Americans are most interested in a detached single family home in a suburban setting. Yet the important issue here is not the demand of the majority, but the ability for the market to provide housing and meet housing demand for different people in different income and age sectors. In some cities, demand for an urban setting has outpaced supply, leading to significant price increases. Recent trends of urban gentrification suggests that there is a demand, albeit limited, for vibrant, diverse mixed-use urban neighborhoods.[25] Even in urban areas without these options available, an underlying demand may exist: demand that is not filled because the option is not available, or demand that is not filled because those who choose the urban lifestyle must choose a different metropolitan area.

Furthermore, some elements of suburban demand are difficult to measure. Some residents of suburban homes may be choosing these locations for reasons other than land use. They may be more concerned about the quality of schools or the use of local taxes than the type of home or lot. These people may be prone to choose denser development if it were to be offered in locations that offer the right mix of municipal services.

Transit-oriented development is not meant to be a one-size-fits-all answer. An appropriate development will step back into less-dense suburban patterns further from transit stops. These sites can offer options that are more palatable for the consumer looking for a single family home, much as commuter rail suburbs have done over more than 100 years. Furthermore, while some consumers may still

---

[24] Calthorpe & Fulton, p11
[25] Miller, pp. 33, 37 and 51.

choose an auto-oriented lifestyle beyond the transit station, the reduced demand for this type of living will have a net positive effect on the overall environment. Transit-oriented development and other 'smart growth' policies can be a significant success when not forced on the public, but offered as a choice for users who are interested in that lifestyle.

1.4.6   Urban Design

Public transportation infrastructure allows for the opportunity to provide innovations in urban design that may not be possible in areas without access to high-capacity transit. Urban densification along a transit line will allow for greater use of the transit system as well as protection of land on the urban fringe that would otherwise be converted to urban land in the near future. Around the transit stop, new levels of density can be tastefully accommodated through design. Numerous studies in the past few years have identified ways to design higher-density development without overwhelming a community that is more comfortable with lower levels of density.[26] While the public transit should reduce fears of additional levels of traffic, the design can reduce neighbors fears that high-density development will change the character of the area. While station area developments may be of higher density, the development pattern must drop off within a few blocks to protect the character of existing areas beyond the station whether suburban or rural. Curitiba, Brazil has been particularly successful in developing in this pattern.[27]

Figure 1-1
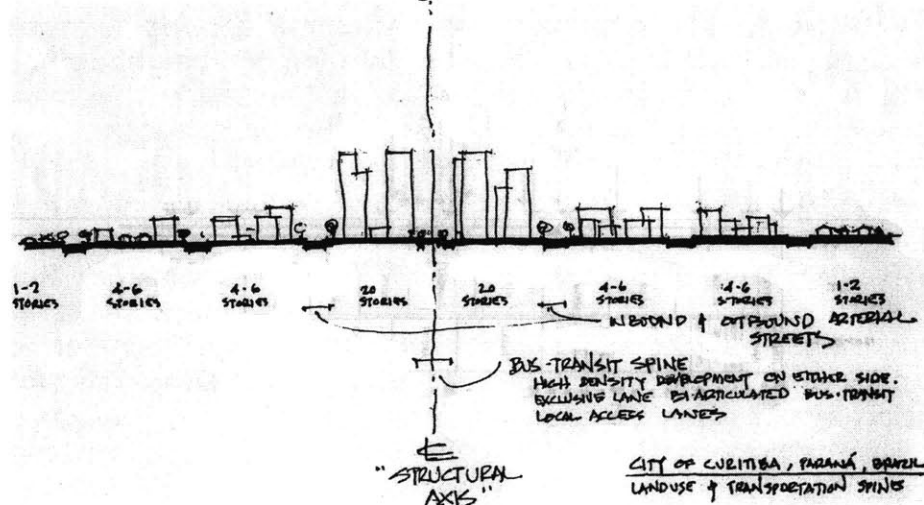
Development Concept for Curitiba, Brazil.[28]

Ideally, a newly designed transit station area will be a destination place, either for local residents or for the regional transit users. The distinctive sense of place that can be developed around a station can provide for additional opportunities to

---

[26] See, for example, Fader's 'Density by Design'
[27] Cervero 1995, p1
[28] Drawn by Kenneth Kruckemeyer

market the place to users, whether residences or businesses. A compact, pedestrian oriented place in the middle of an urban area that is overwhelmed by sprawl can provide its own transit-based market.

1.5   SUCCESSFUL TOD: THOUGHTS FROM THE EXPERTS

A number of well known experts in the field of urban planning and design have provided thoughts on transit-oriented development and its role in an overall 'smart growth' movement. Their recent comments, brought together from literature, presentations and personal correspondence, is reviewed in this section.

1.5.1   Peter Calthorpe[29]

Peter Calthorpe summarized the principles of Transit-Oriented Development in his book "The Next American Metropolis". Calthorpe stresses that these ideas are not new, but a return to a type of traditional urbanism that was a fundamental basis of design patterns in the past. Walkable, mixed-use neighborhoods preserve open space and create a more compact metropolitan form. Calthorpe says that TOD is to:
♦ Organize growth on a regional level to be compact and transit-supportive
♦ Place commercial, housing, jobs, parks and civic uses within walking distance of transit stops
♦ Create pedestrian-friendly street networks which directly connect local destinations
♦ Provide a mix of housing types, densities and costs
♦ Preserve sensitive habitat, riparian zones and high quality open space
♦ Make public spaces the focus of building orientation and neighborhood activity
♦ Encourage infill and redevelopment along transit corridors within existing neighborhoods

1.5.2   Michael Bernick and Robert Cervero[30]

In the book "Transit Villages in the 21st Century" Michael Bernick and Robert Cervero discuss three main elements for transit oriented development: density, diversity and design. In a 1993 survey across the US and Canada, Bernick and Cervero found 26 examples of completed design guidelines prepared by transit agencies that promoted transit-friendly development. These guidelines have been used, along with the participation of local governments, to guide redevelopment in a number of stations. Yet, even some station areas where density and diversity have been achieved, design success has been minimal.

1.5.3   GB Arrington[31]

G.B. Arrington of Parsons Brinckerhoff, who has worked with the Portland METRO rail company on TOD has coined the term 'transit-adjacent development' to

---

[29] From: Calthorpe, p43
[30] From: Bernick & Cervero, p73
[31] From: E-mail communication by GB Arrington to PRO-URB listserve, 01/02

describe development that is near transit stations but does not include the design elements that create synergy between the transit system and the development. Arrington defines the following items as the necessary elements that distinguish transit-oriented development from simple transit-adjacent development:

♦ A compact site design, oriented for the pedestrian
♦ Higher density and intensity of uses in relation to the norm of the community
♦ Buildings oriented to the transit stop
♦ Limited parking (supply has been 'pinched' or placed in structures)
♦ Pedestrian access and high-quality, safe facilities

1.5.4   William Lieberman[32]

William Lieberman, the director of planning for San Diego's Metropolitan Transit Development Board provides a more quantitative analysis of the level of density, the types of uses and the design that must be a part of any transit-oriented development. For example, Lieberman suggests:

♦ Floor-area ratios should be above 1.0 near rail stations, with at least 18 homes per acre with a half-mile walking distance of the station
♦ Commercial space should be focused on convenience retail such as dry-cleaners and day-care centers to support the transit riders
♦ Large retail, such as a shopping mall, can also be a transit focal point – but only if the transit and the mall are not separated by a parking facility
♦ Industrial uses near transit should be labor-intensive, not space-intensive
♦ Highest densities of housing and convenience uses should be closest to the transit station, with lower densities elsewhere in the 'catchment area' from which riders will walk

1.5.5   Andres Duany[33]

New Urbanist architect Andres Duany has been advocating for TOD as well as other compact suburban development patterns on infill sites and greenfield sites. Duany is now linking together these elements into a regional concept of planning and zoning that he calls the 'transact'. His contribution to this dialogue has been the suggestion that smart growth needs a technocratic method of codes and requirements similar to those used by environmental bureaucrats and transportation engineers. He developed the transact as a six-level zoning system that moves from urban to rural. For TOD projects, more urban categories would surround the station, while areas far from transportation resources would be zoned for only rural use. But in all cases, Duany argues that the 'pedestrian shed' is the fundamental basis for planning.

Duany adds an additional, albeit disconnected, thought to the debate on TOD that deserve consideration when developing rules for building near transit. He suggests that environmental regulations that are applicable in more suburban and rural areas may need to be relaxed in places that are to become more urban. The overall

---

[32] Lieberman, p 103
[33] From: Presentation at Local Government Smart Growth Conference in San Diego, CA, 01/02

regional environmental impact would be lower if some regulations are relaxed to allow more density in certain areas.

1.6   DEFINING SUCCESS IN URBAN DESIGN: TWO CASES

Defining successful urban design is often difficult. Each year, a number of organizations bring together juries to study urban design and provide examples of urban excellence. The Rudy Bruner Awards and the Progressive Architecture awards are two examples of well-respected jury awards for urban excellence. Their process and their results serve as a guide for ways to address, define and judge urban places, including new transit station-area development.

1.6.1   The Rudy Bruner Award for Urban Excellence[34]

The Rudy Bruner Award is given every two years by the Bruner Foundation in Cambridge Massachusetts. The award is given to one winner and a few additional finalists based upon the definition of 'urban excellence' as it is crafted by the jury chosen that year. To each Bruner Foundation jury, the definition of urban excellence usually involves the combination of superior urban design with some additional social mission that contributes to the condition of the host city. Jurors are usually some of the more progressive urban leaders of our time. The 1999 Bruner selection committee included the mayor of Pittsburgh, the president of the NJ Performing Arts Center, and a director of a Houston housing project. One of the six members was an architect, while there were two city planners on the selection committee. The 1995 committee had a more academic focus, with a jury that included the mayor of Seattle and three professors (of architecture and environmental psychology).

The winners of the Bruner awards have been some of the leaders in bringing together elements of design and social issues to address the needs of downtowns and urban neighborhoods. Winning projects and finalists have included:
  ♦ The public market in Portland, Maine that has provided new vibrancy in a section of downtown Portland, contributed to the revitalization of the city and provided local merchants and farmers with new access to customers.
  ♦ The NJ Performing Arts Center in downtown Newark, that brings people into the downtown but also reaches out to the neighborhoods by introducing children to art and music programs.
  ♦ The Yerba Buena Gardens project in San Francisco, a project that included redevelopment of 22 acres of a neighborhood with a focus on public amenities, public spaces and community facilities.
  ♦ The Times Square, a project in New York City that converted a previously dilapidated single-room occupancy building into a community facility for low income previously-homeless individuals.

---

[34] Background information on the Bruner Award from: Shibley, pages viii - xvii

1.6.2   *Progressive Architecture*[35]

Progressive Architecture (PA) was a magazine that gave out an award for architectural excellence for many years. Recently, the magazine merged with *Architecture* magazine. *Architecture* continues to grant annual 'PA Awards' for excellence in architecture. Like the Bruner award, *Progressive Architecture* has chosen a jury to pour over a range of applications in any year, searching for the ones that best embody the definition of excellence as developed by the jury. In most years, Progressive Architecture chooses a series of leaders on the cutting edge of architecture. Yet their 1994 jury included a number of more traditional designers including New Urbanist Andres Duany and Boston architect M. David Lee. The lesson of the Progressive Architecture award is that the definition of excellence can vary significantly depending upon the architects chosen to pick the winners of the award. While each jury fights furiously over who should be given awards, the traditionalist 1994 jury was more likely to choose more traditional projects, while the 2000 jury, stacked with new architectural stars, was much more likely to choose from amongst the avant guard designers of the time.

Essentially, the lesson of the awards is that excellence depends upon who defines it. So, when deciding who will define excellence in transit-oriented development, we must find the vision we have for the transit station area. As one thought: the awards from the Progressive Architecture juries are often unbuilt projects, and all the models, diagrams and renderings of these projects focus exclusively on the design. The photos, diagrams and models of projects from the Bruner award books always have both people and buildings. People are as important as buildings in making development around transit stations work. Excellence in urban design is about more than just unique buildings.

1.7   ELEMENTS OF SUCCESS: BEYOND DESIGN

Beyond elements of design, as discussed in the cases in section 1.6, there are a number of additional elements that are just as important for a station area to be successful. These elements include:
♦ Use: The project must include a mix of uses that works for the station area
♦ Marketability: The project must provide a financial success for the developers by being successfully marketable to clients who can contribute to the bottom line
♦ Affordability: The project cannot simply address the needs of one income group, and must not completely shut out the captive riders of the transit system.

These elements, and their consequences, are framed in section 1.8, and discussed in more detail in chapter two and chapter three.

1.8   A COMPREHENSIVE DEFINITION OF SUCCESSFUL TOD

This thesis seeks to find of the best interventions for development that is transit-friendly and the policies that made this development happen. This project is

---

[35] See, for example: Architecture, April 2000 p87 or Progressive Architecture, January 1994, p29.

dependent upon a basic premise that **design matters** – and that good design is the first step to a successful transit-oriented development. But, it is also based upon the simple premise that **design is not all that matters** – and that simply designing an attractive place near a transit station is not all that needs to be done. It needs to be built, it needs to be populated and it needs to develop in a way that contributes to the greater good of the region and the society.

The elements that define a successful transit-oriented development are difficult to define. At some level a good place is best measured by a reaction to the aesthetic feel of it. But at some level, these elements must be measurable and be measured in case studies. Although these elements are not a conclusive list, they take issues from the literature and from preliminary site studies and provide a basic idea of the elements that provide for a successful development:

A: Elements of Design
1. Compact site design, oriented for the pedestrian
2. Buildings oriented to the transit stop but not turning their back on neighborhoods pre-dating the transit stop or on sites for future development just beyond the first ring
3. Development of open spaces and streets as an 'outdoor room', with buildings providing comfortable framing walls. A clear definition of open spaces and their uses as parks, playgrounds and/or courtyards.
4. Limitations on parking
5. Quality without a name (QWAN)[36]

B: Elements of Use
1. Mix of uses, including office and residential uses, over a variety of sites – although each project need not be mixed-use.
2. Elements in the development that serve convenience shopping needs, while elements somewhere along the transit line should serve comparison shopping opportunities for a diversity of users.
3. Concentration of activities matches the size of the neighborhood and its market so that there is a constant level of pedestrian activity, preferably even on weekends
4. Similar uses, or at least similar densities, facing each other on opposite sides of the same street.

C: Elements of Marketability
1. Perception of safety by pedestrians using the station and the neighborhood.
2. Appealing location for retail, and density to support retail.
3. Housing that is of interest to middle and/or high income residents
4. Development of business associations, owners organizations, and/or neighborhood associations to take ownership of the area and care for public and private spaces.

---

[36] The term QWAN comes from Christopher Alexander's 'Timeless Way of Building'. Alexander suggests that that we need to build places that increase feeling of life and wholeness. This will be discussed in more detail in Chapter 2. In some ways, it is difficult to define the 'sense of place' element of successful TOD, but it is noticeable when it is there. Good planning process may be the only way to ensure that the QWAN is a part of the development.

D: Elements of Affordability
1. Opportunities (through offering reasonable housing costs or through a subsidy program if necessary) for lower income residents to live in the place, ensuring that captive riders have access to the transit system
2. Development of convenience retail, not just a 'boutique' environment
3. Density that allows for reduced costs

Success may be defined in many other ways as well. To a transit agency, success may be defined by increased ridership. Yet individual developments may not have a significant effect on ridership at the station, while the overall long-term development plan may have more of an influence. In essence, increased ridership is an effect of the successful development, not a measure of it. These issues will be addressed in more detail as the definition of success is better defined.

1.9   CONCLUSION

The framework developed by GB Arrington identifies the differences between development around stations that is 'transit-oriented development' (TOD) and that which is 'transit-adjacent development' (TAD).[37] But, beyond this basic difference, additional elements are necessary to bring a project from being a 'transit-oriented development' to one that transcends regional issues and becomes a destination neighborhood and a regional asset. I call this type of project 'high-quality station-area development'.

In the second chapter, the elements of successful design are reviewed in more detail. These existing design cases are integrated with other elements for the final recommendations in chapter four.

---

[37] This element has been discussed with GB Arrington in numerous e-mails in 01/02 and 02/02

> "I can think of no nicer place to be living . . . I walk half a block to Metro. I walk one block to the movies. Who wouldn't want to live where I live?"
>
> - Peter Owen, President of the Clarendon / Courthouse Civic Association by Clarendon Station in Arlington, VA[38]

2 A JOURNEY THROUGH STATION AREA DEVELOPMENTS

2.1 A FRAMEWORK FOR STATION AREA DESIGN CASE STUDIES

This chapter provides a different type of insight into transit-oriented development than that of chapter one. The first chapter of the thesis focused upon a review of literature, a background of comments from experts in the TOD field and, finally, a basic definition of items necessary to create successful TOD. This chapter views TOD success from a different perspective. It looks at completed projects in station areas in Virginia, Maryland, California and Arizona, providing a basis for ten specific key lessons that can be applied to new TOD projects. While some of these final lessons are similar to the conclusions drawn from chapter 1, all provide new, different or more detailed insight.

This chapter is the culmination of five months of travelling to research conditions at forty-eight transit station sites on light rail, heavy rail and commuter rail systems in four states. Each site visit included a detailed walk of the station area, generating over 800 photographs. At some station sites, additional investigation included literature and on-line research as well as some personal and telephone interviews.

As a general conclusion, none of these station sites will provide a framework for the 'perfect' station area development. Each station area has design elements that were done right and elements that were not done right. Extensive interviews with leaders in the business of transit-oriented development, proved that there is no site that may provide a 'best case' scenario of transit-oriented development. This business is one of experimentation, and although the station area plans and their implementation have been improving, no development is perfect. So, from a design perspective, this chapter will focus on the highlights of things done right and wrong at certain station areas.

Station area site visits are described in the next ten subsections, organized related to the key element from the particular station that was most important for the thesis conclusions. A series of lessons are drawn at the end of each section, based upon the case study designs and their results.

---

[38] Allen, November 2001, page J-01

2.2   THE STREET GRID

There are a myriad of opportunities to connect streets and pedestrian paths. Some are more successful and less successful than others. Station area projects succed when they keep existing grids open and provide new grids and through-streets where necessary. This ensures that there will be plenty of easy opportunities for pedestrians to access station area amenities from the transit station and from nearby neighborhoods.

2.2.1   *Crystal City Station – WMATA, Arlington Virginia*

Crystal City Station in Virginia is the site of significant new development around a nearby transit station. The station is part of the METRO system in greater Washington, DC, a system run by the Washington Metropolitan Area Transit Authority (WMATA). The station area is surrounded by office and apartment towers. Retail uses also support the development, including a shopping mall with a busy food court. A number of hotels are also in close proximity. This development has been completed by one developer, Charles E. Smith Company, since 1966. The METRO station opened July of 1977. The development and the station are centrally located on the blue and yellow line of the METRO system, one stop from Washington National Airport and two stops from the Pentagon. This location provides easy access for residents and visitors to the airport facilities and the federal offices of Washington DC.

At any time, the Crystal City station area is busy with pedestrians moving between the mall, the offices, the hotels and the housing. But, the development suffers from one significant flaw of design. All the buildings are connected underground. The mall itself is all placed one level below the street level. And, the clear circulation system for pedestrians, with signage and maps are all located in the underground passageways. An elevated expressway runs through the development area, and underground passageways between the Marriott Hotel and the office complex provide the only safe and reasonable way to access the area across the highway from the station. Therefore, most pedestrians never exit to the street, and the activity all occurs at this below-ground level.

At street level is a barren landscape designed like any other automobile-oriented edge city. The towers are surrounded by wide roads, parking ramps and loading docks. On weekends, the development is deserted. All the housing, on the far side of the development, is surrounded by supporting parking areas, creating a sea of 'towers in a parking-lot', a variation on Corbusier's 'towers in the park' theme. While one area of the office development provides some outdoor amenities, it is difficult to find.

Crystal City is oriented to the transit stop, but as an early attempt at transit-oriented development, it does not create street-level pedestrian activity. The wide streets and easy highway access suggest that the developers were as concerned with the car as with the pedestrian. The need to separate grades between

pedestrians and vehicles creates sterile environments for both. The street level can be altogether overwhelming for a pedestrian, providing minimal ability to understand one's location. Finding the transit station from the street level is almost impossible.

Yet what is most difficult of all is finding the gem of the Crystal City area, it's pre-existing grid with a retail and residential community centered around 23rd Street. Some five blocks from the station, beyond the tower parking areas and the 100-foot-wide streets, is a traditional town center that continues to thrive. One block back from the retail of 23rd Street is a neighborhood of single family homes. These homes sit on small lots on a traditional grid of streets that offer easy navigation for pedestrians and vehicles.

People working, living and shopping in the 23rd Street neighborhood can access the train system, but the walk is far from easy. It requires working one's way through the more modern Crystal City developments, across apartment tower parking lots, and – in most cases – eventually through the maze of the underground mall. So, while the area offers much for residents of the traditional old core and the new apartment towers, it could have supported just as much mixed-use development in a pattern that would be much more forgiving to the transit user and the pedestrian.[39]

The County of Arlington, Virginia and the developer Charles E. Smith have both adjusted their development formulas for projects that were built around transit stations after Crystal City was completed. Many of these areas, including Ballston and Courthouse stations in Arlington, have produced more pedestrian-friendly experiences.

Figure 2-1

**Crystal City is a place more comfortable
for the automobile than the pedestrian.**

---

[39] Density can be deceptive. In many cases, grids of small streets can provide more density to support transit than towers in parking lots. The 20 story towers by Alewife station in Cambridge Massachusetts have a floor-area-ratio of about 1.0, while new developments of townhouses in the Cambridgeport grid neighborhoods have higher densities. Design can create high density areas that look to be of lower density than the towers in Crystal City.

Figure 2-2

A map by the transit station provides information for pedestrians to navigate the underground passageways. Little information is available about navigating the auto-oriented street level.

Figure 2-3
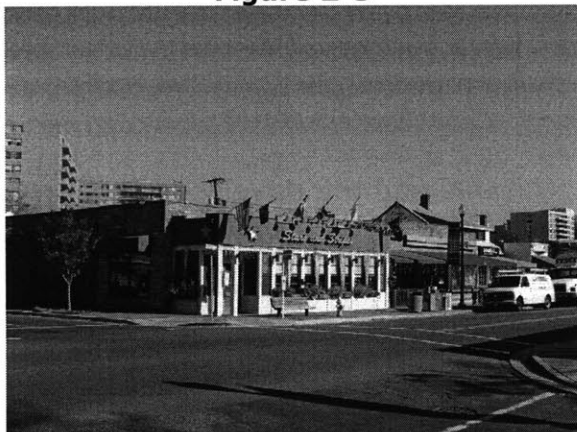
Beyond the transit-station development and the high-rise towers is the traditional fabric of the 23rd Street neighborhood.

Figure 2-4

Single family homes beyond the 23rd Street neighborhood are on a traditional grid of streets.

2.2.2   Grosvenor Station – WMATA, Maryland

Grosvenor – Strathmore station is located in a suburban area in the midst of Maryland's suburban development. It is located on the Washington DC METRO system's Red Line, north of the District of Columbia. The station area includes a large ring road, a huge parking lot, and a number of apartment buildings. The apartments are towers and garden-style buildings. Adjacent to the parking lot is the site of a new performing arts center, and a new residential development. Each of these new developments are directly off the ring road. Grosvenor is a station area in transition. While older developments in the area are adjacent to transit, new projects seek to link to transit through more pedestrian friendly street environments.

Existing development is across an arterial highway from the station. After exiting the station, a pedestrian can cross a pedestrian underpass below the highway and emerge by a map showing the site for these apartments. While their access to transit is good, their access to other services is non-existent. These apartments provide the option to use transit for daily work commutes, but they do not encourage a car-free lifestyle and the other opportunities that come from a true transit-oriented development. This is transit-adjacent development, not transit-oriented development.

The transit agency is working, through its joint development plans, to create new development in this area that is better linked to the station. The transit agency has the advantage of controlling much of the land inside the ring road. A relocation of parking into a structure, plus the use of the remainder of the parking area for additional development will allow for a more pedestrian-friendly transit village to emerge here.[40] Subdivision of the site for joint development requests-for-proposals (RFPs) allowed the transit agency to change the station area design. At least half of this station area will become a grid of streets and blocks inside the ring road with sidewalks to provide access to the new neighborhood, the station and the parking structure. While the grid is only a small part of this suburban landscape, it is more successful design than the surrounding development, allowing connections between the station and a number of new buildings.

---

[40] Scales interviews and discussions 03/25/02 and 03/28/02

Figure 2-5

**A group of highrise apartment buildings located
across the arterial road from the Grosvenor station.**

Figure 2-6

**Garden apartments are near the station,
but require passing through a walkway under the arterial road.**

Figure 2-7
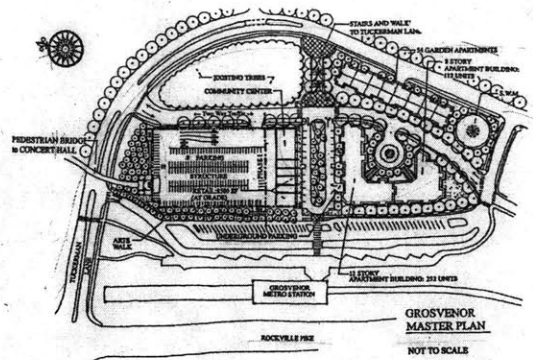
**Map of the proposed transit-oriented development
at Grosvenor station, showing the new
streets inside the ring road.**[41]

2.2.3   Conclusion

Lesson 1: Grids of streets are very important. Keep old grids and create new ones.

A properly designed street grid can do much for making a transit-oriented place work. In some cases, it may be difficult for a government agency to establish that grid when pre-existing patterns are different. But, whenever possible, any new development should:
- include a road system that is as permeable as possible;
- provide numerous at-grade opportunities for both pedestrians and vehicles to go where they need to go;
- provide opportunities for local traffic to have the highest priority; and,
- ensure that cross-through traffic does not overwhelm a station area site.

2.3   WALKING ROUTES

Station areas should provide a comfortable pedestrian walking experience within a 'pedestrian shed', an area that is usually ¼ mile from the station exit. While this experience is mainly up to the control of the public sector, many private sector decisions can influence walking routes.

2.3.1   Wheaton Station – WMATA, Wheaton, Maryland

Wheaton Station is a place where the good and the bad of walking routes can be seen on each side of the station exit. The station is the deepest in the Washington DC METRO system, located below Wisconsin Avenue in suburban Maryland. The area around the station is an auto-oriented sprawling landscape of malls, supermarkets and garages. But, the areas immediately surrounding the station provide different experiences in accessing different developments. Pre-existing residential neighborhoods have access via public sidewalks from the station exit,

---

[41] Map from the WMATA joint development office.

and these sidewalks are quite comfortable (for example, Reedie Drive – see Figure 2-8). Similar comfortable sidewalks provide access to a park-and-ride garage.

Beyond the existing residential neighborhood, new townhouses are being built. Their fronts face a nearby major arterial, University Boulevard West. Access to the station is available to pedestrians through the existing street network, or through a path from behind the development into the existing residential neighborhood on Reedie Drive. Neither connection is convenient, but it works as well as can be expected for this new development in the existing landscape.

Wheaton Station has a major shopping mall (Westfield Shoppington Wheaton) in close proximity to the station exit. But, pedestrians must undergo a strange path to access the mall, across public and private property. The path is reasonably well labeled, but it requires pedestrians to cross past the bus stop area, up stairs or an elevator, over a road on an overpass, through a parking garage, back down a flight of stairs, across another road and into the mall. If the mall were built with the station in mind, the garage could have been located elsewhere, with the mall entrance just opposite the bus waiting area. Such issues illustrate how private development decisions are quite important in creating opportunities for better pedestrian access.
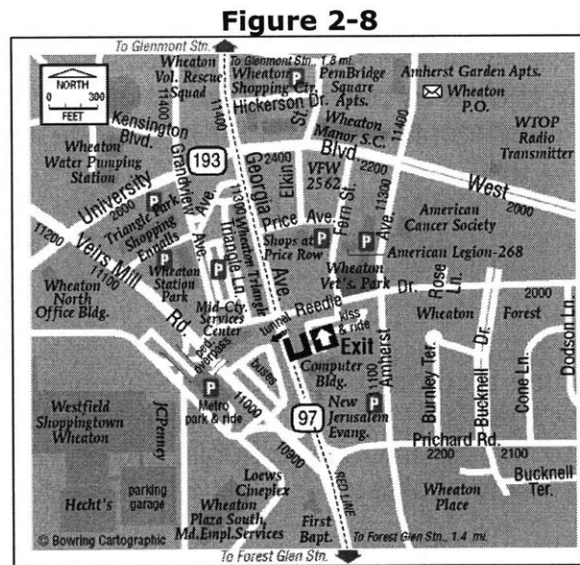
Figure 2-8

Walking routes around the Wheaton Station.[42]

---

[42] Map from stationmasters online: http://www.stationmasters.com

Figure 2-9

Townhouses at Wheaton are on the
edge of a major arterial highway.

Figure 2-10

A small pedestrian link from the back of the
project provides access towards the transit station.

Figure 2-11

Pedestrian access to the mall requires crossing
over a pedestrian bridge and through a parking garage.

2.3.2 *Rosslyn Station – WMATA, Arlington Virginia*[43]

Rosslyn Station marks the area of one of the first TOD projects completed in TOD-friendly Arlington County Virginia. The county generally feels that, although Rosslyn has been an economic success, it has been a design failure. The original plan for Rosslyn tried to keep pedestrians on a separated grade of overpass bridges with retail establishments on upper levels of buildings, off the overpasses. The result was that street grid conditions were not well cared for. Streets go in a mis-matched set of different directions. Overall, the streets were designed for cars because the overpasses were designed for the pedestrians. While many of the overpasses have been torn down, and the upper level retail has been all but completely abandoned, the streets have not replaced the overpasses in becoming a place for pedestrian activity. As the station closest to the city of Washington DC, the road network is designed more to support commuters taking the bridges into the city than to support local traffic to local establishments. The streets are overwhelming, including a high-speed underpass next to one of the metro station exits.

While Rosslyn station is actually the closest METRO station to the pedestrian-friendly Georgetown section of Washington, getting there requires crossing the Potomic on the Key Bridge, and getting to the Key Bridge involves an unpleasant walk on small sidewalks, high overpass bridges and a walk across a major traffic circle. The street network here was designed to speed cars to specific destinations and does little to provide access for drivers or pedestrians to the amenities in Rosslyn itself.

Recently, these activities have led the county planning office to drastically upzone the area in hopes that private developers will be enticed to tear down buildings and start over. It remains to be seen if this strategy will change the auto-centric world around this station area.

---

[43] Background and plan information at Rosslyn come from interviews with Robert Brosnin on March 26, 2002.

Figure 2-12
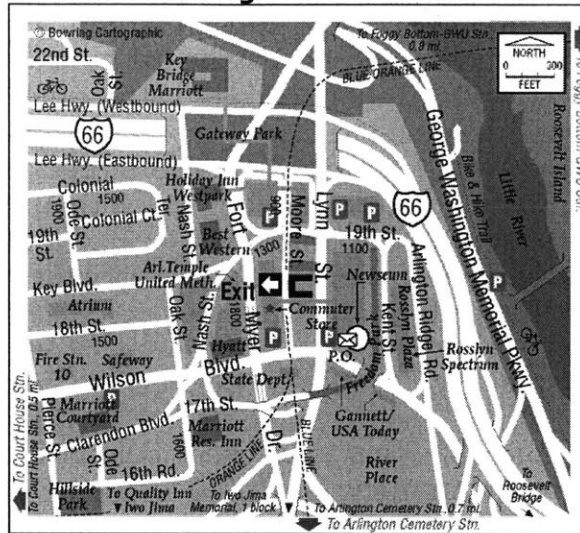
A map of the Rosslyn station area shows the many confusing routes of access around these buildings. [44]

Figure 2-13

The tall office buildings in the Rosslyn area provide significant opportunities to work near transit, but they are not oriented for pedestrians.

2.3.3   Conclusion

Lesson 2: Define a 'pedestrian shed' for each station, encompassing the area within a ten minute walk of each of the station exits. Inside the 'pedestrian shed', develop simple walking routes to major destinations. Make sure they are clear, safe, easy to travel and well labeled. Never separate pedestrians from vehicles on a different grade.

Walking routes from the station should be able to provide seasoned users and new visitors with a clear understanding of how to get from the station to any nearby destination. This can be helped by ensuring that the walking paths are easy to find

---

[44] Map from stationmasters online: http://www.stationmasters.com

and well labeled. This goal can also be furthered by providing a network of streets that allows easy access to all points. More smaller streets are better than fewer large ones. While current street networks may be set by existing pubic sector decisions, some private activities can influence the street network. Public sector planning should ensure that developers:

♦ Avoid encouraging the private sector to turn over streets for closure;
♦ Avoid using existing large blocks for development without creating through streets or through paths for pedestrians; and,
♦ Receive support and incentives for public accessibility for pedestrians through existing and new developments.

2.4   PEDESTRIAN CONNECTIVITY

Blocks should be small, if possible. Large blocks should include multiple buildings, allowing for an interesting environment for the pedestrian. When a large monotonous building occupies an entire block, it does not entice the pedestrian, and therefore reduces the quality of the pedestrian environment.

2.4.1   King Street Station – WMATA, Alexandria, Virginia

King Street station is located on the western edge of the Old Town area of Alexandria Virginia. To the east is the traditional old fabric of Old Town, with its small buildings on small blocks. Residents and tourists like to walk in this area. Closer to the station is a range of new construction from large to small projects. The smaller buildings break up the block, and provide a fabric similar to Old Town, while the larger buildings don't provide the same level of interest for the pedestrian.

Near the station is a new development called, confusingly enough, King Street Station. This development includes a hotel and a group of retail storefronts off a plaza by one entrance. The site is large, but it is broken up by the ability for pedestrians to cross through the hotel lobby to access the retail on the opposite side. This is a popular pedestrian route from nearby offices to the retail establishments. During the lunchtime and dinnertime hours, this offers a convenient connection. But, late at night the connection is not possible, as the private hotel lobby is off limits after 11:00 PM to everybody but the hotel guests with keys.

Figure 2-14

This building looks like a train station, but it is a hotel with retail in the front, right near the King Street station.

Figure 2-15
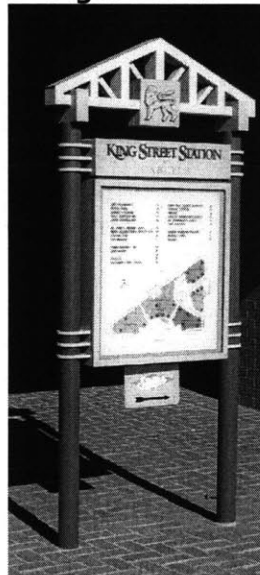
The development has clear wayfinding signs.

Figure 2-16

The development also allows people to cross through the hotel lobby to the next street.

Figure 2-17
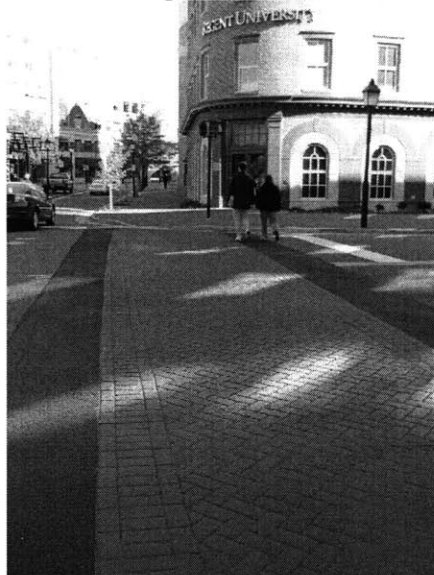
**Sidewalks and crosswalks are
comfortable sizes with retail activities
along the front of many of the buildings**

2.4.2   Conclusion

Lesson 3: Avoid superblocks. When large buildings are necessary, allow them to be permeated by pedestrians.

When possible, buildings should not take up entire blocks or more than one block. As a general rule:
- Create small blocks.
- With larger blocks, encourage smaller buildings that take up less than a full block.
- Large buildings, when necessary, should be able to be permeated by pedestrians.
- Connections through buildings should be accessible at all hours of the day and night.

2.5   FRONT AND BACK OF BUILDINGS

All buildings must create entrances for pedestrians, but most also need to create entrances for loading and structured and/or underground parking. Larger buildings with more intense retail or office uses often need large loading areas capable of handling deliveries from large trucks. Loading docks and parking requires one or more faces of a building to reject pedestrians. Placement of the front side of a building on a major street is often an easy planning decision. But, the placement of the 'back side' of a building often impacts the usability of nearby sites for pedestrians. While buildings need to have loading and parking functions,

placement of these entrances must be well thought out. This has been done better at some places than others.

2.5.1   Bethesda Station – WMATA, Bethesda, Maryland

Bethesda Maryland is often mentioned among the list of top TOD station areas in the country. Bethesda is on the Washington DC METRO red line north of the District of Columbia. Over the time since the station has opened, the Connecticut Avenue area in Bethesda near the station has been transformed into a thriving edge city. The area supports numerous shops, hotels, offices and new residences. Connecticut Avenue and nearby side streets are active with pedestrians on weekdays, evenings and weekends.

The density on the Connecticut Avenue spine drops back within a block or two to single-family and townhouse residential neighborhoods. The station area offers something for everybody, and draws workers from the nearby neighborhoods as well as the metro area as a whole.

But, Bethesda station has two problems. First, the station area suffers from an over-use of pedestrian overpasses. Although these overpasses are well designed, and provide valuable links from the station area, they detract from the street life below. Realistically, these overpasses may work better than in any other station, yet they still questionable elements of station area design. Grade separation of pedestrians has, historically, been problematic. At Bethesda station, the pedestrian exiting the station emerges onto a plaza that is one level above the street. After reaching the plaza, the pedestrian can walk down to street level, or continue across some streets using the pedestrian bridges. While they offer access to some neighborhoods beyond the station without passing ugly loading docks, and they connect some comfortable parks around nearby apartment towers, they also leave storefronts at street level without walk-by traffic to generate business.

The second problem at Bethesda is the effect that Connecticut Avenue buildings have on the neighborhoods that are one block behind. Because these are full-block buildings, their backsides face opposite the neighborhood homes on the buildings behind them. This provides a lopsided street wall, with single family homes on one side and the back of a large office building on the other side. Furthermore, most of these buildings have located their loading docks and garage entrances on the side streets that serve as gateways to the residential neighborhoods. Residents walking from pre-existing homes and from some new townhouse developments must make their way past these building backsides to access the transit station from their homes. Large buildings with ill-placed loading and garage entrances are detriments to the neighborhood and discourage other neighborhoods from welcoming additional density that can be supported by the transit station.

Figure 2-18

At Bethesda station, even the gas stations have appropriate treatment for pedestrians.

Figure 2-19

The core of Bethesda near the station includes a tall spine of office buildings and hotels.

Figure 2-20

The loading dock and parking access for this building is on a side street, creating an unfriendly pedestrian environment.

Figure 2-21

The side street with the loading dock
(see above) is the gateway to the neighborhood of
single family homes behind the main street.

Figure 2-22

Townhouses on a parking pad provide
high-density housing in an appealing format for nearby
lower density residential neighbors.

Figure 2-23

Not far from the townhouses (see above),
the loading dock for the nearby hotel provides a
much less appealing façade.

Figure 2-24

**Pedestrian overpasses may assist circulation,
but often just pull activity off the streets and sidewalks.**

2.5.2   Clarendon Station – WMATA, Arlington, Virginia

Clarendon station, on the WMATA Orange Line is located on a corridor that, before the station opened, was dominated by small retail establishments. The area still has many small retail buildings and, a few blocks away, single family homes. But, new developments have been recently built in this area, and many more are in the design stage.

The new development a few blocks from Clarendon Station, called Market Common Clarendon, has done much to buffer the high-density retail and condominium development from the nearby residential community. The project is wrapped in townhouses on the three residential sides, with architectural details that try to copy from the style of the nearby residential neighborhoods. Garage parking for the retail uses is wrapped into the back of the building.   The garage entrances are still oddly placed – one in the center of the retail development, one on the main street and the third opposite a lot that has already been identified for development. But the mass of parking is not visible from any side of the development, and the only back sides of buildings are in alleys. The placement of garage parking for the townhouses leaves something to be desired. Garage parking is not far enough below grade, causing the front entrances of the townhouses to be located six feet above the sidewalk. While the back row of townhouses is set in front of a park, the park is a good amenity, yet the townhouses lack front street access, and are located behind an awkward six-foot high wall. Yet, overall, the plan is better than many counterparts that have worked to mix retail and residential uses on a similar sized parcel. The development is one of many in the Clarendon station area, and it serves as a retail destination for nearby residents.

Figure 2-25

**The Clarendon Station is located by an older
commercial corridor of one-story retail buildings.**

Figure 2-26

**The neighborhoods near the Clarendon Station
are dominated by traditional single-family residences.
Most, but not all streets have sidewalks.**

Figure 2-27

**Market Common Clarendon brings a new destination
retail development to the Clarendon Station area.**

Figure 2-28
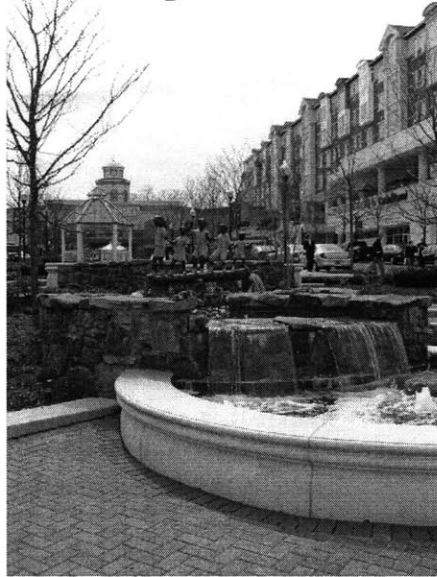
**A fountain and gazebo are in the center
of the Market Common retail area.
Apartments are above the retail stores (on right).**

Figure 2-29

**Market Common includes apartments above the retail
(barely visible in the back), and townhouses facing the traditional
residential neighborhood. This buffers the retail development
from the nearby lower-density residences.**

Figure 2-30

**Townhouses behind the Market Common development
(still under construction) face a small park.**

2.5.3   Conclusion

Lesson 4: Building design effects pedestrian amenities. Use and scale should be consistent across a single street, stepping down at points internal to the block. Loading docks and large parking garage entrances should be located to minimize impact on pedestrian access. Large commercial buildings should not turn their backs to existing or future development beyond the immediate station area.

The most effective way to ensure that back sides of buildings are properly designed is to place them across from the back of other buildings on service alleys. This is only possible when buildings do not fill entire blocks, but fill only half blocks. By doing this, it is also possible to provide buildings of similar use and size on opposite sides of streets. While a major street can have deep blocks with tall buildings, the backs of these buildings can be buffered by the placement of more appropriate buildings across the next road behind the main street. The use of the side streets that connect residential blocks to the main street should also be thought out carefully. While these roads may include access to the service alley, they should not be filled with the back-side uses of buildings. Instead, they should involve some wrapping of the main street activity onto the side street.

Finally, if a loading dock or garage entrance must be placed on a major street, a cross street or a block behind a main street, it should be properly screened to make sure that it does not detract from the pedestrian environment any more than it needs to. If possible, loading can be conducted off a garage, if entrances are of sufficient height to allow trucks into the same entry as parking automobiles. The community, and its planning regulations should do everything possible to encourage creative answers to this situation.

2.6   OPEN SPACE

Open space is a term that is often tossed around by planners as they try to balance the demand for development with the need for spaces in-between. But, while it is important for open space to be included in a development plan for an area, it is also important that the open space have a purpose that will be a benefit to the community. Poorly defined open space can become a barren windswept plaza that wastes valuable land, a dark poorly lit corridor that scares pedestrians, or a useless grassy berm that sets buildings further back from the street than would be otherwise necessary. Therefore, it is important to define the type of open space that would be needed for a successful transit-oriented development.

Rather than using the term 'open space', the station area planner should look to find the types of space that would be appropriate for the station area. Open space can be designed in the form of farms, forests, fields, recreational areas, greenways, plazas, parks, basketball and bocce courts.[45] While a station area is not likely to have a nearby farm, forest or field, most of the other forms of open space could be quite appropriate for a transit station area. Accessibility and walkability of the open space and the routes that connect it to the transit station should be treated just the same as that of any other destination around transit.

2.6.1   *Whisman Station – VIA Rail, San Jose, California*

Whisman station area includes two new residential communities on the edge of the light-rail line that serves San Jose, California. The area does not meet the full standard for TOD, as it is a completely residential neighborhood. Yet, it offers excellent regional accessibility. The light rail offers a convenient connection to nearby office parks and to downtown San Jose in the southerly direction. One stop to the north on the light rail is the Mountain View station at the end of the line, that offers a cross-platform transfer to the CalTrain commuter rail system with direct access to San Francisco.

Whisman offers a valuable amenity to its residential abutters with the inclusion of small city-supported pocket parks surrounded by residences. On a warm weekend afternoon, these parks are populated by families that come out of their homes to participate in games and enjoy the sun. The parks provide well-defined public spaces that enhance the residential community and contribute to the livability of the residential developments. They also provide a greenspace amenity that is a substitute for the larger lawns that are common with most lower-density development. When residents choose to give up the large lawns, they need a comparable public amenity in the form of a public park. Without it, high-density residential development is not palatable to many housing consumers.

---

[45] Concept from: E-mail communication by James Howard Kunstler to PRO-URB listserve, 02/02

Figure 2-31

Homes around Whisman Station are in close proximity to the nearby VTA light rail.

Figure 2-32

Parks around the Whisman Station provide an amenity to nearby residents.

Figure 2-33

Another view of the Whisman neighborhood parks.

Figure 2-34
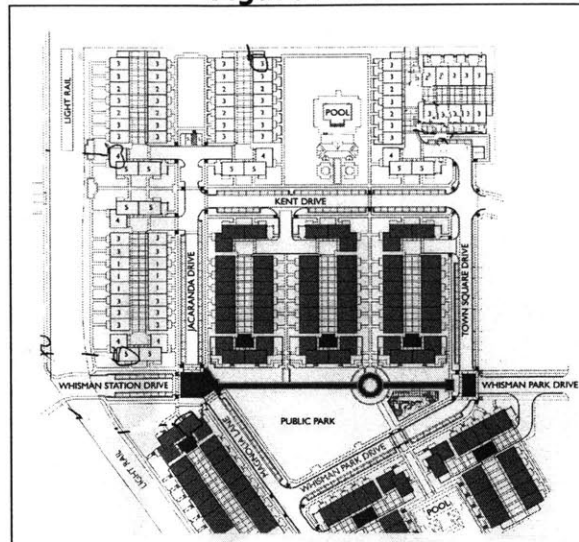
**One of the two developments at Whisman Station.
The light rail is on the right and the other development
is beyond the rail line. The neighborhood is quite dense,
and the parks (one in the lower center of the map)
are a needed public amenity.[46]**

2.6.2   Oakland City Center – BART, Oakland, California

Oakland City Center is a joint-development project that the Bay Area Rapid Transit (BART) system completed above their 12th Street station in Downtown Oakland. The center of the development is 'City Square', three 3-story buildings with 160,000 square feet of retail and office space clustered around a center walkway and a main plaza by the transit station. In the words of the developers, "City Center is a core gathering place and a popular pedestrian plaza for leisure and entertainment events."[47]

The development forms the center of a thriving revitalizing downtown that is seeing new residential renovations and development surrounding existing office buildings and hotel properties. In the center of it all is the pedestrian plaza by the station. This plaza provides a central gathering area for users of the development and the station, and includes outdoor seating for nearby restaurants and cafes. It is framed on the far side by the two towers of Oakland's federal office building. The plaza is a valuable and unique public space that serves as an 'outdoor room' at the exit to the transit station, comfortably framed by the nearby three-story buildings and the taller office structures in the distance.

The station area is busy with pedestrians, and is successful during working hours, but not in the evenings. The area needs to continue to develop of more residential and hotel uses, as well as more evening destinations. With the creation of a stronger evening retail presence downtown, this station exit can develop a stronger

---

[46] Site map from the Whisman Park Phase III development brochure.
[47] From the Oakland City Center Website, www.oaklandcitycenter.com

market for the retail establishments in the station area to remain open after work hours and contribute to a more vibrant downtown.

Figure 2-35

The plaza at Oakland City Center includes restaurants outdoor seating.

Figure 2-36

The plaza links the nearby federal office towers to the station area.

Figure 2-37

The federal office towers also have a courtyard that is a popular siting area for employees on breaks.

Figure 2-38

**A sunken section of the plaza offers
access to and from the transit station.**

2.6.3   Conclusion

Lesson 5: Make open spaces into 'outdoor rooms'. Small parks and public areas can be framed by buildings of appropriate scale, use and style. High-density residential areas should provide public green-space amenities to offset for the lack of large lawns.

Each open space is different, and must be developed to serve the station area users in the immediate development and beyond. When a planning professional reviews the public benefit of open space that is proposed by a private developer, the focus should be on the type of space, the use of the space and the opportunity that it will provide to the entire community. Merely allocating space is not enough. Space is defined by the buildings that surround it, and the uses in and near it.

2.7   PRIVACY

Residents and businesses want an assurance of privacy and security. The problems, or even the perceptions, of crime have led people to seek out housing and businesses in locations with gates, guards, locks, alarms and cameras to protect themselves from the outside world.

The concept of transit-oriented development is based on an idea of community pedestrian activity. Security is provided by eyes on the streets of a mixed-use neighborhood. But, some residents will not be comfrotable that this non-traditional standard provides enough security. One solution may be to restrict more secure communities to the sprawlscape beyond the transit, and let those who feel uncomfortable just live elsewhere. But, another solution would be to look for opportunities to provide the sense of security that will make a resident comfortable while still allowing for the permeability, access and use mix that is essential to a transit village. This, of course, is what has been the tradition of middle and upper

income apartments in Manhattan, where nearly all intra-city movement is by transit.

2.7.1   *Glenmont Station – WMATA, Glenmont, Maryland*

Glenmont is a rather new station on the Washington DC METRO system, at the northwest end of the Red Line. The landscape around the station area pre-dates the station, leaving minimal opportunities for interventions. Yet, some interventions on behalf of the agency, and the local planning department could have linked nearby developments better to the station. As is to be expected, the station is fronted by a large bus transfer area and a parking garage. But, the suburban landscape near the station, although low density, does provide opportunities for many residents to walk to the station. The likelihood of making that walk is limited by poorly placed sidewalks, speeding traffic near the sidewalks, and limited opportunities to take the shortest path to the station from home. Following the 'desire lines'[48] through the grass and vegetation from the station to the nearby garden apartment complexes shows that there are those who walk to the station, however inconvenient it may be.

While the single-family neighborhoods near the station area may not have the opportunity to be served by private intervention, the garden apartment complexes are a different story. These low-density development sites have the opportunity to provide more density of housing and more access through their development areas.

The nearest complex to the Glenmont station is a quazi-gated community called 'Privacy World at Glenmont Center'. Clearly, this is marketed for its security. Although surrounded by large fences with only one entrance, it does not have the typical guardhouse of a gated community. It is possible to come off the METRO and walk into the development. What is not possible is to access the developments beyond 'Privacy World' through a direct route. While other developments are beyond this one, they are not accessible except on circuitous routes on sidewalks by arterial roadways. While a planning agency can require future developments to provide both more access (a public amenity) and more density (an opportunity for more profit), these changes will not occur in the existing complexes without public intervention. Therefore, this changeable landscape may not change, and the area provides little opportunity for even a small level of development oriented towards this station. Historically, the continuity of existing streets was a condition of subdivision approval. Planning agencies need to rediscover this tool.

---

[48] 'Desire lines' are the dirt paths that form where people constantly walk through an area that was not intended to be a walking path.

Figure 2-39

**The Glenmont Station area is surrounded by
single-family homes (visible above) and garden style apartments.**

Figure 2-40

**Higher density apartments are marketed for
both their transit access and their security features.**

Figure 2-41

**Nearby intersections and landscaping are
designed for the automobile, leaving little access
to the station for pedestrians.**

2.7.2 Suitland Station – WMATA, Suitland, Maryland

Suitland station is also a new station on the Washington DC METRO system, located near the southeast terminus of the green line. The station area is similar to Glenmont, complete with nearby garden apartment complexes and pedestrians creating 'desire lines' across the dirt to dash mid-block across arterial highways for access. But Suitland also is home to a large federal office complex, adjacent to the station on the east side. While this area is fenced for security purposes, its nearest entrance is located on an arterial street, far from the pedestrian exit to the station. Transit riders approaching the complex are required to take a shuttle bus to enter the complex. This is an entrance that needs a guard, but it could easily be relocated and provide access for pedestrians as well as vehicles, limiting the need for the shuttle bus service. Despite the need for security, this office complex, like any office complex, can undergo simple short-term interventions to account for transit pedestrians.

Figure 2-42
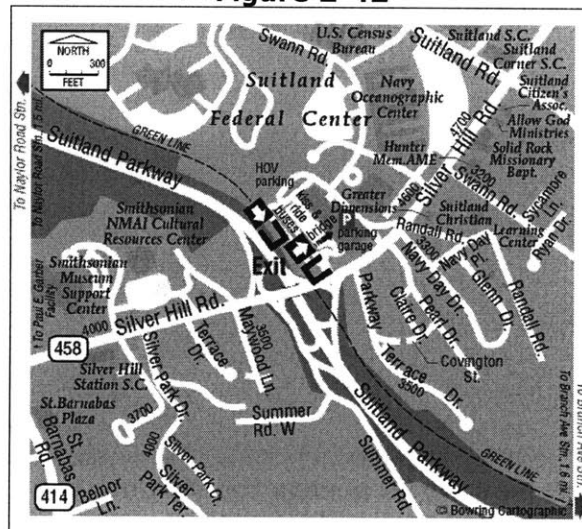
The Suitland station area includes predominantly apartments and a large federal office complex to the northwest of the station.[49]

---

[49] Map from stationmasters online: http://www.stationmasters.com

Figure 2-43

The Suitland station area was designed for fast access by car to the parking garage.

Figure 2-44

Pedestrians try to access the station, but they are forming their own 'desire line' paths to and from the station.

Figure 2-45

The 'nearby' federal office complex is completely inaccessible by pedestrians at the station.

2.7.3   Hazard Station – San Diego, California

Hazard Station on the San Diego light rail line is also a station with gates surrounding a nearby residential community. While this community, right by the station platform, is gated, it has two small separate gated sides. Through the middle is a public path that connects to the waterfront walkway that runs near the light rail throughout this portion of the right of way. Across the street from the station is a retail shopping center with a hotel. While this is not an ideal mixed-use transit-oriented development, it provides opportunities for users in the residential neighborhood and the hotel to have access to a nearby retail destination.

While the residential community is gated, the gated sections are small, limiting the need for pedestrians to take circuitous routes to reach points beyond the community. The public amenity of a path through the center of the gated sections allows for additional pedestrian access between the light rail station and the river. The path and the community are well landscaped. While the community is not a grid, and the gates do create some barriers for pedestrian accessibility, this development is better designed than most gated communities. There are better and worse ways to do gated communities near transit. Although it would be best to do no gated communities by transit, if it must be done it should be done well, and not impede pedestrian access around and beyond the community.

Figure 2-46

The residential neighborhood by Hazard Station is gated.

Figure 2-47

The gated residential neighborhood is broken in
half by a path to the waterfront walkway.

Figure 2-48

The waterfront walkway runs behind the
Hazard Station housing development.

Figure 2-49
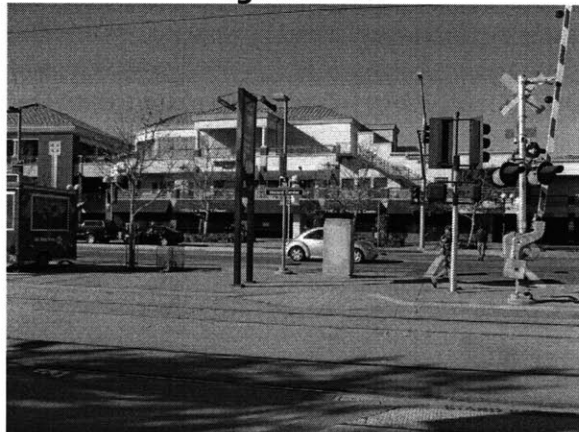
The shopping center at Hazard Station
(and a nearby hotel) are easily accessible from the station.

2.7.4   Conclusion

Lesson 6: Security issues must be balanced with public need for access and comfort in and around the station area.

Privacy needs cannot always be met to the level of comfort for every consumer. But some privacy-conscious consumers will be willing to live near transit if the lower density areas around the line offer opportunities to balance their privacy needs with the needs of other transit users. There are design interventions that make it possible to meet privacy needs. The most important issues in such cases are that:

◆ Gates walls and fences should not become the central focus of the station area. Vegetation can often serve the role of walls and fences with a more comfortable experience for the pedestrian.

◆ Access to points beyond each community must be available, well lit and comfortable. Pedestrians outside the gates deserve as much attention as those inside the gates.

◆ Opportunities to place eyes on the street should be of a higher priority than opportunities to protect individual residential enclaves.

◆ When possible, the closest area to the station should still provide the density, mix of uses and design necessary to create activity. Preferably a retail activity should be in this area. If communities within walking distance from the station have gates, they should preferably be developments that are at the edge of the 'pedestrian shed'.

2.8   RETAIL EXPERIENCES

Regional accessibility is a key element to reducing automobile trips through transit oriented development. This can be best served by ensuring that convenience retail locations are available at almost all stations, while comparison shopping and destination retail experiences are available somewhere along the line. This comparison shopping can be in the form of a traditional shopping mall that serves automobile users as well, but it requires a friendly pedestrian connection to the transit station. The cases below illustrate station areas with a comparison retail shopping area, a unique retail destination and local convenience retail stores located in TOD neighborhoods.

2.8.1   Ballston Station – WMATA, Ballston, Virginia

Ballston station provides access, from the station exit through a series of office lobbies and a pedestrian overpass, to a full-scale shopping mall. The mall replaces an older auto-oriented strip mall that was on the site before the station opened.[50] Although the access is inconvenient, it works well enough to allow mall users to connect to the station. The mall pulls additional users from nearby offices and apartment towers.

---

[50] Bernick and Cervero, p 219

The rest of this station area has a number of destination restaurants, a large coffee shop and some new apartment construction that fronts well-designed public spaces. While the streets on the grid here are wider than ideal and oriented for automobile traffic, pedestrians are buffered by wide sidewalks that also offer spaces for outdoor cafes. The design in this station area is less than perfect, but the mix of amenities adequately meets the shopping needs of transit users without the need to drive.

Figure 2-50
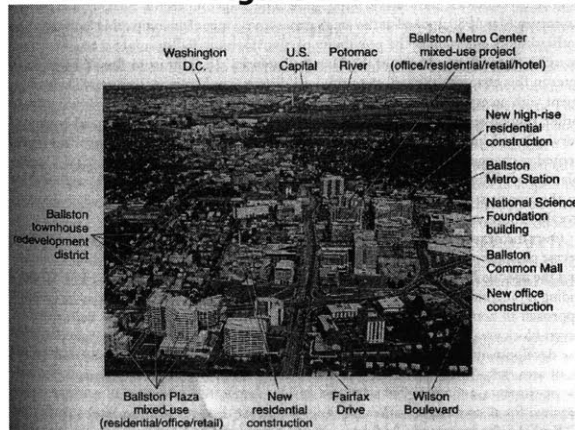
Ballston station area includes residential, retail, office and hotel uses on a variety of parcels. Most have been developed since the station opened in 1979.[51]

Figure 2-51

The mixed-use tower was developed by a private developer over the transit station in conjunction with the transit agency.

---

[51] Bernick & Cervero, p219

2.8.2   Emeryville Station – Amtrak, Emeryville, California

Emeryville is a station on the Amtrak line that connects Oakland to Sacramento. The station area has a significant population of office users. Residential uses are also arriving in the area, first in the form of an apartment building being constructed on top of an existing parking facility.

The Emeryville station area includes a festival marketplace featuring foods from local vendors, connected to a Barnes & Noble bookstore. Beyond this area is a more auto-oriented strip mall and a series of big box retail outlets on a suburban arterial road. But, the market and bookstore are easily accessible from the station, albeit access across a number of parking lots. The marketplace and bookstore are beneficial for users of the area and residents with access to the capital corridor line as well as those who drive to the site.

The area around Emeryville Station is mostly oriented to the automobile. But, it does offer access to those who are on other parts of the transit line. In this way it is a success, as it offers opportunities for transit riders even though the ridership generated by the retail at this time may be minimal. At full build-out, the area around the station will include more office and residential uses that will increase transit ridership. Yet the access to the retail will make the place more appealing for office and residential users and create many more walking trips to these uses.

Figure 2-52

Emeryville station includes a festival marketplace and a large bookstore.

2.8.3   San Antonio Station – CalTrain, Mountain View, CA

San Antonio station is located on the CalTrain line between Mountain View and San Francisco, California. The station is framed on one side by a new residential 'New Urbanist' development designed by Peter Calthorpe. The development is significantly residential, but it includes two small shops by the transit station. One of these is a coffee shop and the other is a hair salon. Each provides a valuable neighborhood service for transit riders and for neighborhood residents.

Beyond the development are additional retail opportunities, including a large supermarket that sits just off the edge of the Crossings site. While this is a traditional retail store with a large parking lot in front, it also serves pedestrians from the development.

Figure 2-53

The Crossings at Mountain View is a popular example of New Urbanism, a compact housing development on the site of a former defunct shopping mall.

Figure 2-54

The Crossings development includes two small retail stores next to the transit station.

2.8.4   Conclusion

Lesson 7: Provide convenience retail at each stop and destination retail at an accessible central point on the transit line.

Small retail stores are often the most difficult elements of a mixed-use development to establish financial feasibility. Sometimes they are built and subsidized by developers who understand the added value to other uses (residential

or office) that come from being located near the retail space. But, the value of even a small coffee shop and convenience store at each station is significant.[52]

The long-term ability to convince a station area resident to part with their car will only work when comparison shopping is available near transit. A transit agency and planning department should work together to identify station areas with the opportunity to host comparison shopping that can serve residents at a variety of transit station areas.

One remaining unaddressed need is grocery shopping. Although some stations like Hayward on BART or Bethesda on DC-METRO do have conveniently located supermarkets, often the shopper is unwilling to carry a significant load of groceries on transit. Similar problems exist when purchasing large items for the home. If a transit system offers a car sharing program with cars parked at or near transit stations, this can alleviate this concern when a station area resident contemplates living a car-free lifestyle.

2.9   DAY AND EVENING ACTIVITY

Station area developments should include a variety of uses that spur activity in the day and evening time. While a twenty-four hour place may not be reasonable for nearby residents, an area that is active for sixteen hours of the day provides a valuable basis for keeping retail stores open and ensuring that services are available for those who live and work near the station. Adding office uses in older business districts near residential areas, and adding residential uses in a traditional office downtown will even out the activity level and create sixteen-hour places.

2.9.1   *Berkeley Station – BART, Berkeley, California*

The Gaia Building, a newly constructed building in downtown Berkeley, California is bringing a new residential element to a primarily retail center. The site is near the college campus of the University of California, and near the downtown Berkeley BART station. The developer of the building, Panoramic Interests, is specializing in new mixed use and residential infill buildings in the City of Berkeley, a location that is infamous for their difficult development approval process.

The building will provide 70 new apartments in downtown, increasing pedestrian activity for the downtown area. These apartments are quite small, but the developer views this as an advantage. Small apartments allow for the dense development to be financially feasible, and they also ensure that apartment dwellers get out of their units and use the building's common social space and roof deck or the many amenities of the nearby streets. Additionally, the building has a reduced parking ratio compared to nearby development and a unique bi-level parking system that allowed the developer to save money on parking spaces and

---

[52] Joseph Duckworth, at his presentation at the Smart Growth Conference in San Diego explained, based upon his experience with similar projects, that it is difficult to keep retail establishments of this size in business. It may sometimes be worthwhile for a developer to subsidize the retail establishments by offering below-market rents to increase the attractiveness of the residential development. (Duckworth presentation, 01/02)

devote a higher square footage of the building to the apartments and the first floor retail space.[53]

The developer has created a unique building that is an asset to the neighborhood, a visually exciting addition to the local skyline and an innovative example for those trying to bring new evening residents to a daytime activity center.

Figure 2-55

The Gaia building has brought a new residential element into the commercial center of downtown Berkeley.

2.9.2   Little Italy Station – San Diego, California

Downtown San Diego had been, for many years, known as a daytime center of activity that does not generate evening pedestrian traffic. This has changed with the development and redevelopment of retail destination districts like Horton Plaza and the Gaslamp Quarter. Now, this development trend is spreading, with new activity in the Little Italy section of San Diego, a short ride on the light rail line from downtown. Little Italy is a neighborhood that has mostly been known for its connections to the San Diego fishing industry and for its small business district and ethnic Italian residential flavor. Now the area is seeing a renaissance, with new live/work units, lofts, luxury apartments and affordable housing units. All this new housing near the transit station has provided a new vibrant market for the nearby commercial district and brought more people closer to the destination retail in downtown San Diego.

---

[53] Chris Hudson interview, 01/02

Figure 2-56

**New lofts in the Little Italy section of San Diego
provide a residential component on the light rail near downtown.**

Figure 2-57
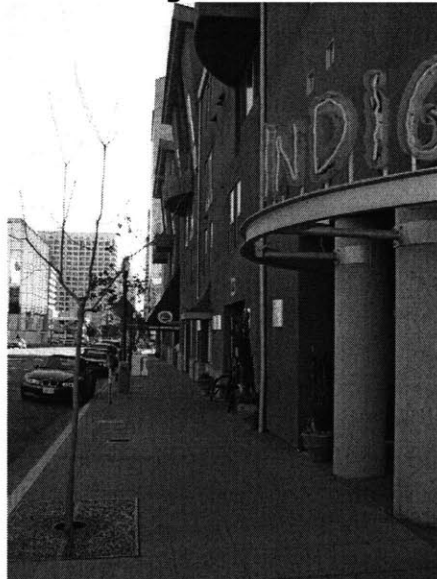
**Retail uses on the first floor of the loft
buildings provide services for residents and visitors.**

Figure 2-58

**Additional residential buildings are under
construction all over the Little Italy station area.**

2.9.3   Conclusion

<u>Lesson 8: Include housing at all station areas to provide for evening activity.
Include office uses at all station areas to provide for daytime activity.</u>

Often station area economics push an area to be developed for one type of use or
another. Furthermore, the economics of the real estate industry usually are such
that one type of use can more easily access financing at any given point in time.
Finally, the development community is full of developers who have become niche
experts in one product area or another without being willing or able to put together
deals using other types of uses than their primary business area. It is a challenge
for government to work against these forces and push for a mix of uses. Even
when it is not possible to mix uses in individual projects, it should be encouraged to
ensure that office and housing uses are properly balanced over several projects to
create a day and evening pedestrian activity at station areas. As retail uses are
often the most difficult to finance, any mix of activities that creates a pedestrian
atmosphere by the retail shops during the day and evening will help make the retail
more feasible for store owners.

With the rise of small home-based businesses, one other development option is
now available to bridge the gap between home and office uses. The development
of live-work units and lofts will allow for different types of home-based businesses
to develop where residents can access local services at any time of day. The home-
based businesses in a neighborhood can also support a number of retail
establishments that provide office supplies, shipping services and other
conveniences for small business. This type of arrangement can be advanced
further by allowing places for lower income people to access a variety of spaces for
additional commercial activities. These activities can be based in the home or small
offices, warehouse spaces or garages that, although not necessarily appropriate for
sites in the highest density core near the station, can be in close proximity to the
station-area business services.

2.10 PLANNING

Station area development does not just happen. In most cases it is very well planned. In some cases, it has even been planned before the transit station opens. A planning process for a station area works best when it is developed early, preferably before the station arrives, when infrastructure needs are assessed, and when the plan is sufficiently flexible to allow for change over time while still being rigid enough to expect pedestrian-oriented design.

2.10.1 *Tempe Town Center – Tempe, Arizona*

The Tempe Town Center plan is unique in that it is twenty years old, and the town center is still served only by local bus service. But the planning for this area has been done with the plan for a light rail system that is now being built. It has turned an area of little development into a strong town center on the edge of Arizona State University in Tempe Arizona. Tempe is a college town, and a suburb of the city of Phoenix, Arizona.

The Tempe plan was built out from the section of the city where the bus system had its central connections. The town never had a strong traditional center, but the bus connections were near the university, where there was already a strong market demand for more entertainment, retail and housing. The plan combined old and new elements, looking for sites where new development could be built to come to the sidewalks and be more pedestrian friendly. Over the last twenty years the plan has been refined as the local government has provided public infrastructure and streetscape improvements. Where necessary, the public sector has acquired land and created development partnerships. The area has developed with a movie theatre, shopping, offices and housing all mixed together in an area that is much different than the dominant auto-oriented style that covers the rest of the Phoenix metropolitan area. Tempe has created a new regional destination, and now the new light rail line will serve that destination providing another transportation alternative to a place that is already oriented for transit.[54]

---

[54] Tempe Urban Design Group

Figure 2-59

DOWNTOWN TEMPE REDEVELOPMENT CONCEPT PLAN
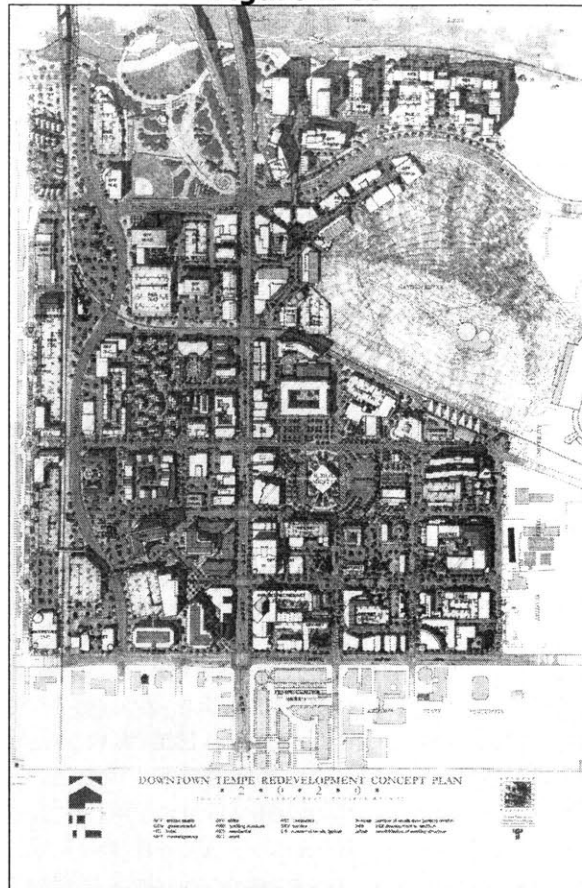
The Tempe Center plans have been evolving over twenty years, and they continue to evolve. This latest plan will guide development until 2020.[55]

Figure 2-60
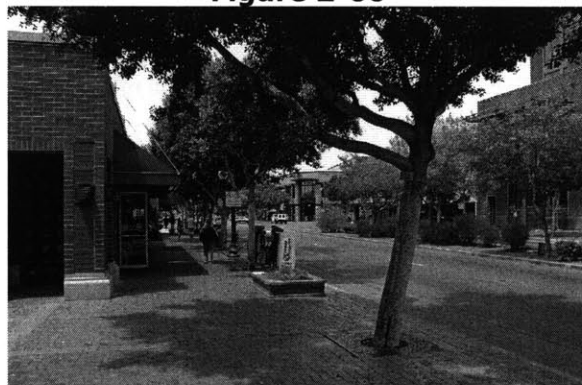
Major public investments include sidewalks, street trees and a landscaped median.[56]

---

[55] Drawing by the Tempe Urban Design Group
[56] Photo by C.Y. Teo

Figure 2-61

Private development has followed the public investment.[57]

Figure 2-62

**This new development in Tempe has brought
the transit-oriented development into the area even
before the light-rail transit has arrived.[58]**

2.10.2 Hayward Station – BART, Hayward, California

The Hayward station area in Hayward California has been carefully planned for redevelopment by the local community. The City of Hayward has taken on a plan that has included land-swaps with the transit agency, joint development, expropriation of existing land, and the revitalization of downtown properties.

---

[57] Photo by C.Y. Teo
[58] Photo by C.Y. Teo

The station area is three blocks from the deteriorating downtown for Hayward. In the interest of developing a new center of activity in the downtown area, the local government made a development plan. The city then traded land behind the station for the parking lot that sat between the station and the downtown. One part of this parcel has become the site for a new Hayward City Hall that opened in 1994. Near the city hall is a park that connects the station and the city hall area to downtown. The remainder of the former BART site has been sold to a private developer who is building a townhouse project that will bring new residents into the downtown area. Nearby low-density areas have been purchased by the city for further high-density housing redevelopment by California developer Olson Properties.[59] Another nearby site has been purchased and developed as a supermarket that will serve the area residents within walking distance. Although the supermarket design, with its standard parking lot in front, is not ideal for a transit station area, it provides a necessary service for nearby residents, and it does have sufficient pedestrian access. Towards the downtown, new retail establishments have filled the gaps in the fabric, while a new pocket park has provided a comfortable amenity in the retail core. While the downtown has not yet sprung to life as a strong retail core, the elements put in place by the city create a stronger market to encourage new retail activity in this area. None of these changes would have happened without the planning initiative from the public sector.

Figure 2-63
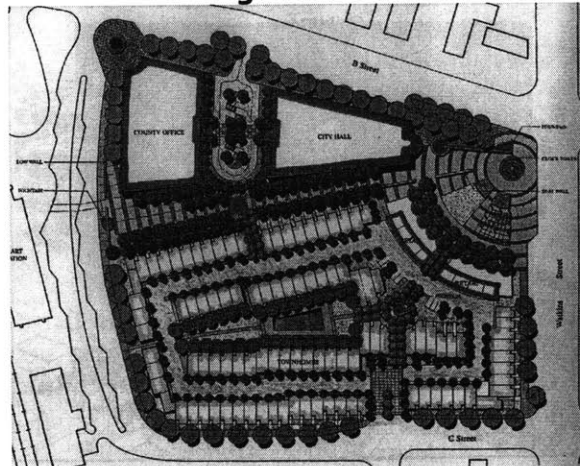
Hayward Station involves an active government strategy for revitalizing the downtown area, including redevelopment of a core area with townhouses and a new city hall.[60]

---

[59] Olsen Properties has also developed much of the TOD around the Little Italy station in San Diego.
[60] From: Bernick and Cervero, p 202. Design and drawing by Jeff Heller based on a station area specific plan by Dan Solomon.

Figure 2-64

New townhouses are located near the station.

Figure 2-65

A new city hall is also located near the station.

Figure 2-66
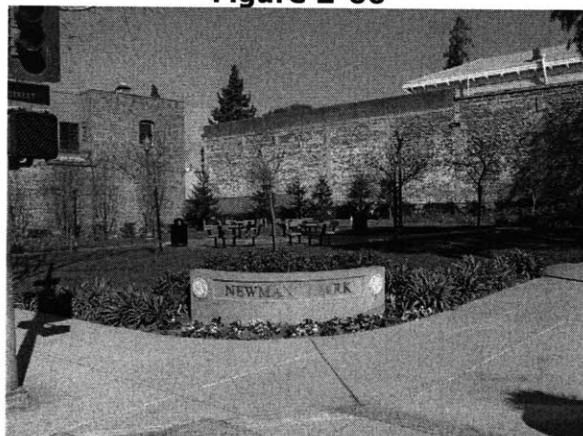
A new pocket park in downtown Hayward
a few blocks from the station.

Figure 2-67

The traditional downtown is being revitalized.

Figure 2-68
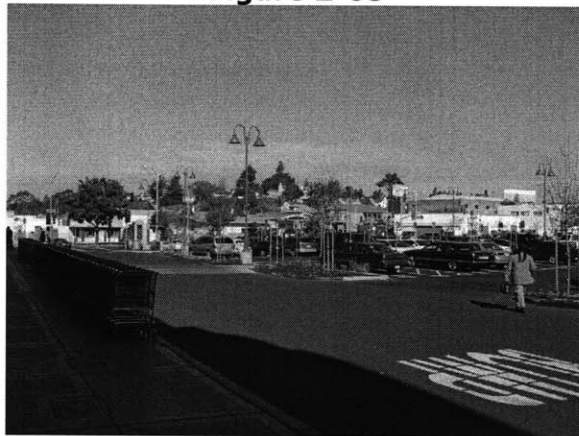
A nearby supermarket provides opportunities
for residents to walk to the grocery store, but it is
oriented for automobile traffic.

Figure 2-69
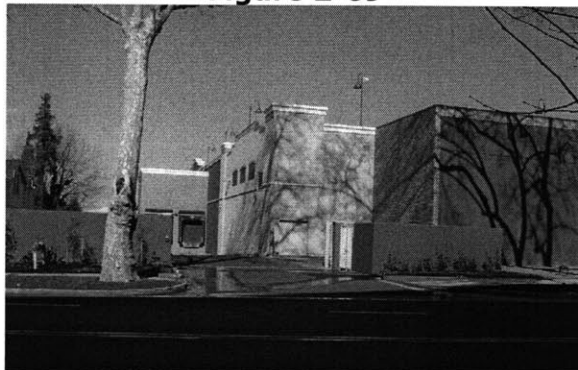
The back of the supermarket is an unpleasant
blank wall near the station, albeit a colorful one.

2.10.3   Conclusion

Lesson 9: Plan for growth and change over time. A good plan will raise the value and perceptions of nearby real estate.

Planning can raise land values and spur the type of private sector development that will create vibrant TOD locations. The Tempe Town Center and the Hayward area development are two examples private investment that would never have occurred if the public sector did not take the lead in planning. A municipality cannot expect that the opening of a transit station will just cause development to follow. Planning will ensure that public investments in transit will spur a successful TOD development to enliven the station area.

2.11 PROCESS

Planning process can help or hinder the development of a station area project. In many cases, communities may be concerned about too much density, even around transit stations. But, successful planning processes have included the buy-in from nearby communities. This often strengthens the TOD elements in the plan, allowing for development that links existing communities better with their nearby transit stations.

2.11.1   Pleasant Hill – BART, Pleasant Hill, California

Pleasant Hill Station in Contra Costa County, California has a large surface parking lot and garage in the area of the BART station. The county has encouraged development of an office complex at the edges of the parking lot. Residential development has also occurred nearby, including some new development close to the station. But still, a sea of parking dominates the station area. County and BART leaders would prefer if it were not this way. They have been working with the community, and a selected developer, Millennium Partners of New York, to create a station area development. The original plan for this site included a large-scale entertainment complex and a mixed-use development of towers, similar to the office buildings beyond the parking lot. The proposed development also replaced existing surface parking with additional structured parking, and provided additional parking for the development.[61]

This proposal was fought by neighboring interests for years. Interest groups didn't support the scale of development and the level of additional traffic that would follow. The neighbors near the site wanted something more comfortable for pedestrians and something that did not create significant additional traffic. Residents from beyond the station, fearing that they would lose their park-and-ride opportunities formed a 'commuters alliance' to advocate for the parking lot.

---

[61] Information about the original project is in Bernick and Cervero's book, pages 189 - 199

The controversy around the development created an impasse until the transit agency organized a community design symposium called a *charrette*.[62] The design *charrette* allowed community members from all of the various interest groups to develop a plan that focuses on developing a transit-oriented mixed use community that is lower in density, but still creates new pedestrian activity around the station area. The project will include an expanded commuter parking garage, but will wrap the garage in townhouses, so it will not be visible from most points on the street. The general consensus for the plan has been strong, and the developer remains committed to seeing the project through to completion.[63]

Figure 2-70

The Pleasant Hill station is surrounded by garage and surface parking. Pedestrians from the station who live and work in the area must cross the parking lot.

Figure 2-71

Large office buildings also surround the station area, creating an atmosphere that lacks any sense of place. Few office workers (less than 10%) arrive by transit.[64]

---

[62] Charrette is a French term.   The architecture firm of Carter & Burgess describes a charrette like this: "At the Ecole de Beauz Arts school of design in Paris in the late 19th Century, students would submit their designs for competition to a proctor circulating with a "charrette" (French for "little cart"), often jumping on the cart to put finishing touches on their presentations minutes before the deadline. The spirit of those fast-paced competitions is alive and well in the modern-day design charrette. Held before plans for a facilities, transportation or land development project are created, the design charrette is a kind of metaphorical cart: during these intensive workshops, input from a variety of interested parties is solicited, collected and, ultimately, integrated into the design itself." (from www.c-b.com)
[63] Patty Hirota-Cohen interview, 01/02
[64] Peter Albert interview, 01/02

Figure 2-72

**A new loft development has brought more residents
to the area. It also is designed to the edge of the sidewalk, providing a model for
future development to be more pedestrian oriented.**

Figure 2-73
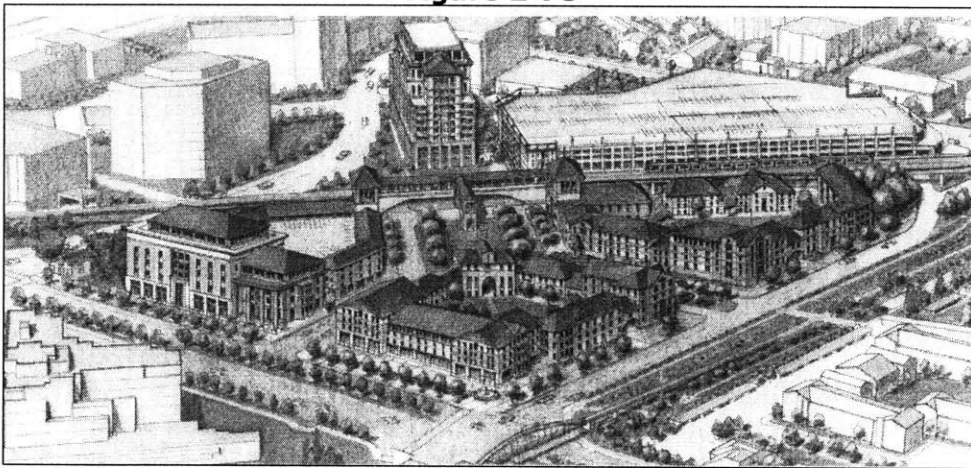
**The long-term plan is for a new transit village,
including many more pedestrian-oriented streets.**[65]

2.11.2 Fruitvale Station – BART, Oakland, California

The Fruitvale neighborhood is located on the southern side of Oakland California. The transit station in this area is a popular park and ride station for suburban commuters to Oakland, Berkeley and San Francisco who live in suburbs south of Oakland. Fruitvale is another BART station area where community planning efforts created a plan that was a vast improvement from the original ideas developed by the transit agency. The Fruitvale station was slated to be the site of increased BART commuter parking, allowing the opportunity for more suburban residents to park in the urban neighborhood.

---

[65] From the Contra Costa County Planning Brochure. Artist unknown.

Neighbors fought the plan, arguing that they preferred the opportunity for a new transit-oriented village at the site, including many services and housing opportunities that would meet community needs. The resulting plan, including offices for service agencies and affordable housing, has received buy-in from the transit agency and the community. The plan also includes a number of community services and ethnic restaurants surrounding a plaza that will showcase local artwork and reflect the feel of the local latino community.[66]

The only problem with this plan has been its financial feasibility. The project required a $100 million investment. It has taken ten years to collect the grant and loan funding necessary to reach the point, in January 2002, when the community could break ground on the major portion of the station area development. While the community will get its asset, they needed to wait a long time to see the financing come through for it.[67]

Figure 2-74
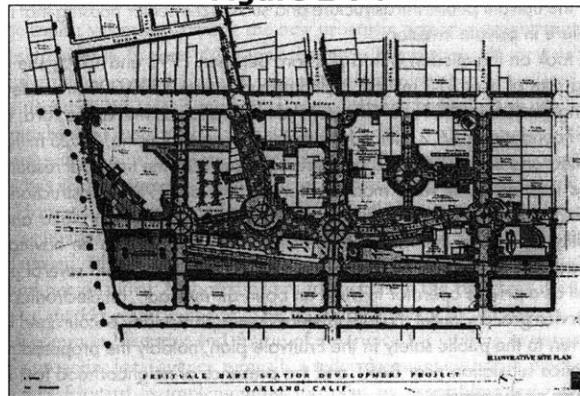
The Fruitvale Station transit village plan is quite complex, including many retail buildings with upper-floor mixed-income housing.[68]

2.11.3   Conclusion

<u>Lesson 10: Keep the process efficient and the project finances open to ensure that costs and financial issues will be available to the public to understand tradeoffs and development time.</u>

The project examples above are two cases where transit agency interests and community interests eventually came together into a development plan. But, in both cases, the time necessary to bring development projects to fruition took many years – probably many years more than necessary. If the Pleasant Hill interests had come together earlier to find a compromise solution that the developer could work with, this project would not have been delayed so many years. If the

---

[66] Unity Council: Fruitvale Transit Village brochure
[67] Peter Albert interview, 01/02 and Chris Hudson interview, 01/02
[68] From: Bernick and Cervero, p 209. Designed and drawn by Ernesto Vasquez.

Fruitvale neighbors had understood the tradeoffs between the financial challenges of developing their plan, and the possible available to them, they may have elected to speed the project by allowing more density or additional profitable uses.

In any transit station area project, the agency, the municipality and the community must work with developers in an atmosphere where the financial feasibility and the design elements of the projects are understood by all players. This can ensure that station area projects are started within a reasonable time frame.

2.12 CONCLUSION

While this chapter offers some well known and less well known concepts on what makes successful TOD, it was necessary to visit many sites in different states to find the details of good and bad decisions in developing a station area. There is no perfectly good or perfectly bad site. The next chapter will look in more detail at the process, the zoning and incentives used in a few station area sites.

Christopher Alexander described the best places as places that have QWAN (Quality Without A Name), an element that you cannot really measure but that "increases the feeling of life and wholeness" in a place.[69] Alexander used hundreds of notes on city building to create his 'Pattern Language', and these ideas still make sense for developing the many details of a successful city and region. For areas around transit stations, this thesis has worked to contribute a list of the ten elements that are most important to creating this quality of place.

For each project that is developed in the transit area, these ten lessons are a guideline. Those that design, develop, review and approve the projects must ask the overarching question: will this contribute to the quality of the station area neighborhood? Will it help develop the sense of QWAN? If the answer is no, then it is probably better to leave the land undeveloped and wait for something better to come along, even if it takes much longer to get a quality place.

---

[69] Alexander 1979, p19

> "We know what the appliance is. Now we need to find the plugs to connect it to the existing power grids."
>
> - Christopher Alexander[70]

3 STRATEGIES FOR STATION AREA DEVELOPMENT

3.1 INTRODUCTION

Few places have succeeded in developing high-quality station area designs in recent decades. While older downtowns with transit have prospered, and while transit has brought back life to existing urban centers in some small and large cities, few places have succeeded in creating new communities on transit lines. Instead, much of the development around transit has had some elements of success, but not all the elements together. While some places have succeeded at creating density around transit, the design has not been pedestrian friendly. Others have needed to rely on single-use districts around transit, unable to attract a market for housing or retail. Some of these places have been successful enough to improve the attractiveness of public transit and generate real ridership to and from their new developments. But without the combination of density, design and a mix of uses it is difficult to create the vibrancy around the line that is necessary to have a real impact on transportation decisions.

3.1.1 Methodology: Strategies for Design

In seeking out codes and strategies that would provide the framework for successful transit-oriented development, this chapter looks at places that have done the most to date. For this chapter, cases have been chosen from Arlington County, Virginia and the city of Mountain View, California. These are two places that have seen more development activity near their transit stations in recent years than almost any other municipality in the United States. This chapter will also highlight a few elements that the municipalities of Hayward, California and West Palm Beach, Florida have used to shape private development, change their landscape, create new destinations around transit and reinvigorate old commercial cores.

---

[70] Comment from Christopher Alexander to Andres Duany as described by Duany in his presentation at the Smart Growth Conference in San Diego, California on January 25, 2002.

3.1.2   Understanding the Power Grids

Author and architect Christopher Alexander has been participating in the debate on transit-oriented development and New Urbanist development over many years. He has observed that planners and designers have made significant progress in understanding how to design pedestrian-oriented places around transit stations. The frustration, in Alexander's mind, is not the designs but the regulation and process that guides development. Alexander has observed that the planning community "know(s) what the appliance is." The appliance is encompassed in the design elements that can be found in the literature and the lessons from existing design, as outlined in Chapter two. What Alexander observes that we need are the "plugs to connect to the existing power grid."[71]

The elements of the power grid depend upon the role that one plays in influencing the development process. To developers who want to do a mixed-use transit-oriented project where one has not been done before, the power grids to plug into are the planners, developers, architects, engineers and community activists that dictate what our built environment looks like. To a progressive government leader, the power grids are the politicians, bankers, developers and other public officials who impact the development process.

Each of the public and private sector participants in development speak in their own language to influence the face of development. A comprehensive land use code system must understand the concerns and issues of the specialists. The code must have the buy-in of the specialists, so as to assure that there are not problems later when the code is to be enforced. The codes should also provide a sense of predictability to the developer.

But, the system of development that influences what is built around a station area is more than just codes. It includes strategies and policies as well as personal interventions in the process that makes sure development happens. It includes master planning processes and station area planning processes with buy-in from a variety of stakeholders. All of these stakeholders are a part of the power grid.

3.2   GOVERNMENT STRATEGIES

Governments, from states and municipalities to transit agencies have taken different approaches to influencing development around transit stations.

3.2.1   Municipal Plans

Municipalities often use one of two municipal planning approaches to influence land development near transit stations. One approach involves creating a general land use plan for the transit station area. The other approach involves creating a 'specific area plan' or 'precise plan' usually for particular parcels, done in conjunction with the landowners who intend to develop the parcels. Both these

---

[71] Andres Duany presentation, 01/25/02

approaches are usually based on a city-wide comprehensive plan that identifies the need for focusing development around station areas and protecting the lower density neighborhoods and the remaining undeveloped land that is far from the transit infrastructure. Ideally, zoning regulations are formed from these plans and instituted into law.

3.2.2   Joint Development

Some of the parcels surrounding a station area are often owned by the transit agency. This is particularly true of heavy rail systems, because of the land taking requirements that are necessary in order to construct the right-of-way for a heavy rail system. Light rail often does not require the takings for construction and staging, so the projects do not often leave the same quality residual land after the completion of construction.[72] Transit agencies that are left with residual land from construction and staging often enter long-term lease agreements for development on these parcels. In rare cases when development of condominiums would be most appropriate, they will sell the parcels. But, in recent years, transit agencies have preferred to only enter into joint development with lease arrangements. These provide a long-term revenue stream, plus the opportunity to collect a percent of rent and participate in the upside of project financing.

In some cases, transit agencies undertaking joint development projects will focus on their opportunity for supplemental funding as an additional source of income as their highest priority – and will not worry as much about the details of planning for optimal design of the station area. For example, until recently the Washington Metropolitan Area Transit Agency (WMATA) employed such a strategy around stations at the DC METRO system.[73] Some transit agencies are more willing to sacrifice lease funding to make sure they get the best development in the transit station area, while others will defer to the local municipality to set land use goals. In these cases, the agency and its chosen developer will participate in the municipal process like any other land owner wishing to build near the station.

3.2.3   Transit Agency Role in Station Area Planning

While some systems, such as WMATA have historically left their station area planning to the local municipalities, others have moved to control much more of what happens around their stations.[74] The Bay Area Rapid Transit (BART) system in the San Francisco Bay area has taken an activist role toward station area planning by employing an office of land use planners to work with communities on planning and zoning issues around transit stations. In the City of San Francisco, the BART station area planning office has worked with the city government and neighborhood leaders to develop the station area exits into new plazas. The plazas are developed and maintained in new public / private partnerships in cooperation

---

[72] GB Arrington telephone interview 04/04/02
[73] Phil Scales interview, 03/24/02
[74] Phil Scales interview, 03/24/02. The result of this is that development patterns near WMATA stations differs by county. While DC, Arlington County VA and Montgomery County MD have many developments near their stations, other counties have opted to encourage WMATA to leave only park & ride lots around their stations.

with abutting businesses. At one station, Balboa Park, the city and BART are working as part of a multi-agency effort to improve connections to the existing neighborhood through transforming public and private parcels. In suburban communities, the station area planning staff has worked with the communities to create visions for the station area parcels owned by the transit system as well as private entities. While the municipality will need to enact these plans, the transit agency has participated in the conversations. Even with new extensions to the transit system, the BART station area planning staff has participated in station siting decisions. The planning staff coordinates discussions with the communities about the opportunities that new stations would bring in each of the alternative locations being proposed by the transit planners.[75]

The transit station area planning staff at BART also takes part in the joint development process with the agency's real estate office. This ensures that station area land use issues are better integrated with all elements of the agency's operations.[76]

Station area planning from inside a transit agency is not always easy, as the agency itself often has internal struggles about the role of the system in development on station area land. In the words of one regional planner "BARTs biggest enemy is its own operations department." Ease of transit-system operations, and the easy location of new extensions are both important, but neither should involve making decisions at the expense opportunities to create transportation and land-use connections that transform daily travel patterns.[77]

3.2.4   Municipal Participation in Development

Municipalities also have a number of opportunities to develop land they own near transit. By choosing station areas to locate municipal services, and by choosing to dedicate municipal land near stations to higher density development, the government is able to encourage efficient use of transit station areas for redevelopment. Arlington Virginia, one of the jurisdictions that will be reviewed in more detail in this chapter, located their county services in new buildings that have served as the anchors for redevelopment of one of their station areas.[78]

Municipalities can offer additional opportunities to participate in development by bringing to the negotiating table a number of elements that are not available to the private sector, including:
◆ Land, as in the case explained above
◆ Infrastructure improvements on public and/or private land
◆ Finance terms that are more favorable than the private market
◆ The power of eminent domain

---

[75] Based on interviews with Peter Albert, Patty Hirota-Cohen and Trent Lethco, 01/02
[76] Peter Albert interview, 01/21/02
[77] Trent Lethco interview, 01/02
[78] Brosnan interview, 03/26/02

3.2.5   Municipal Incentives[79]

Municipalities also have a number of incentives that they can use to ensure that they get appropriate transit-oriented development, including:
♦ Assisting with the cost of replacing surface parking in garages
♦ Providing bonuses in height and density for appropriate designs and mix of uses
♦ Providing bonuses for other desirable activities including environmentally sensitive design and/or affordable housing.[80]
♦ Providing a negotiated development approval process with the opportunity to develop larger projects in exchange for public benefits[81]
♦ Providing tax incentives, including local property tax abatements for new developments that bring economic opportunities and/or affordable housing to the municipality.
♦ Providing cash assistance and/or favorable loan opportunities
♦ Providing predictability through the development process, by ensuring that developers know they will get through the process quickly with a favorable design that meets the stipulations of the plan.

3.2.6   Community Process

Community members will often want to participate in public planning processes and development review. A municipality must decide the appropriate time and place to take public input for development. The process should:
♦ Be initiated by the public sector
♦ Seek out a diversity of stakeholders
♦ Establish, as a basic understanding, that some growth is necessary
♦ Allow the public to contribute to a vision of that future growth
♦ Work with as many of the public sector participants as possible, so there is mutual support for the plan amongst the public sector and the community
♦ Involve community input in design, possibly through a design charrette process

3.2.7   Elements that Bring Success[82]

There are a few other elements that have been identified for government to do so as to ensure that they are getting the best possible opportunity for successful private investment around transit stations. These elements include:
♦ Creating strong partnerships between the transit agency, the municipality, the developers and the community;
♦ Transit system design that supports transit-oriented development;

---

[79] Incentive system from GB Arrington telephone interview 04/04/02
[80] One unique pattern, in West Palm Beach Florita, requires developers to choose an element form both a category of physical design elements and a categroy of social elements in order to receive a bonus of 20% towards the height and density of their project. (Minicozzi presentation, 04/02)
[81] This is often called a 'Planned Unit Development' (PUD) system. It actually can have many problems, as it reduces development certainty for both abutters and developers, provides the opportunity for savvy developers to out-deal their competition, and reduces the incentive to set baseline zoning to match what a municipality would actually want to be developed.
[82] Elements for success are based upon discussions with GB Arrington on 04/04/02

♦ Nurturing economic conditions that include a demand for the elements of transit-oriented development and for mixed-use products[83]; and,

♦ Developing a strong pedestrian environment.[84]

3.3   ARLINGTON COUNTY VIRGINIA

Two case studies will illustrate the strategies used by municipalities and their transit agencies for development around stations. The first is Arlington County, Virginia.

3.3.1   Arlington Station Areas

Arlington County Virginia is located directly west of Washington DC. At 26 square miles, Arlington is small for a county, the smallest county in Virginia.[85] Despite its small size, Arlington has over 170,000 residents. The county and city of Arlington are one and the same, and the county government serves the roles that are often served by cities as well as the traditional county roles. All land use decisions in the county are coordinated in the county planning office.

The METRO heavy rail transit system that serves Washington DC runs through Arlington County with eleven stations on the orange and blue lines. One of the stations, East Falls Church, is in the center of an interstate highway, while one station (National Airport Station) serves Reagan National Airport, one (Pentagon Station) serves the Pentagon and one (National Cemetery Station) serves Arlington National Cemetery. The other seven stations have spurred significant development. The orange and blue lines enter Arlington from Washington DC at Rosslyn, just across the Key Bridge from DCs Georgetown district. The lines then split, with the Blue line serving Arlington Cemetery, the Pentagon, Pentagon City and Crystal City before moving south into Alexandria. The blue line corridor opened in July of 1977, and was developed early around Crystal City and Pentagon City,[86] with a number of large developments including office buildings, residential towers and a large shopping mall. Although these elements are convenient to transit, and do constitute transit-oriented development, they do not have the most sympathetic design. The orange line corridor leaving Rosslyn opened to Ballston in December of 1979, with the rest of the line opening in June of 1986. Leaving Rosslyn, the Orange Line passes stations called Courthouse, Clarendon, Virginia Square, and Ballston before reaching East Falls Church and then continuing in a highway median to Vienna Virginia. The orange line stations between Rosslyn and Ballston will be the subject of this case.

---

[83] This can be difficult for the government to control. There has been significant debate about how this issue may effect opportunities in Puerto Rico. This will be discussed in more detail in Chapter 5.

[84] Although the elements of public sector investment for pedestrian-oriented design are outside the scope of this study, it is important for private investment. These elements can be funded in advance by the transit agency or the municipality, or they can be required of developers as part of the development process.

[85] For the sake of comparison, Washington DC is 68 square miles, Cambridge Massachusetts is 6.3 square miles and the city of San Juan is 40 square miles (see www.placesnamed.com for this data).

[86] Despite the word 'city' in their names, Crystal City and Pentagon City are not separate political jurisdictions. They are both part of the city and county of Arlington.

Of the five types of station introduced in section 1.2.4, most stations on the Rosslyn-Ballston corridor were one of two types. The station type definitions are based upon the conditions of the development and street network at the time the transit station opened. Ballston and Clarendon station were Type 3 stations, 'unfinished grids'. The station areas at these stations were old commercial centers. The station areas at Rosslyn, Courthouse and Virginia Square were Type 4 stations, 'suburban model' stations. While Courthouse has developed a more grid-like style over time, Rosslyn has suffered from a lack of order that is partially due to its confusing suburban style street network.

Currently, station areas on the orange line are quite well developed. The station areas at Rosslyn, Courthouse and Ballston are particularly built up beyond the densities that pre-dated the transit line. The Clarendon station has been called the "donut hole" in the system for its unfinished development pattern, although proposals have been submitted to fill in much of the empty or low-density areas around Clarendon station. While all the station areas have received a significant increase in density, the design in some station areas has been less than ideal. The county planning office expresses significant disappointment with the effect on design at Rosslyn. Therefore, the county is now up-zoning the Rosslyn station area in anticipation of spurring redevelopment that will be more appropriate at the street level for pedestrians using the station and the area businesses and residences.

The new density around the Rosslyn-Ballston corridor station areas is impressive. It includes over 15 million square feet of new office space, over 15,000 new residential units, and additional retail and hotel space all developed since 1970. In addition, the effect on ridership has been significant. Ridership (average daily entries and exits) has more than doubled at stations in the Rosslyn-Ballston corridor since 1991. Equally as impressive is the jobs-housing balance that has been created today in the corridor, where 43% of square footage is dedicated to residential uses. In the AM peak entries slightly outpace exits in the corridor (about 31,000 to about 25,000), and these numbers are reversed in the evening peak. Ballston station provides a snapshot of typical access methods to transit. At Ballston, 64% of users walk, 14% arrive by bus and 16.5% by auto. The auto usage is even lower for stations like Courthouse and Clarendon with few low-cost parking options in the station area.[87]

Few other transit systems have balanced suburban centers of growth where both residential and office elements are well mixed. The unmeasured advantage is the many users that probably walk to work from nearby housing.[88]

---

[87] Based on notes from a previous presentation by Bob Brosnan provided on 03/26/02
[88] Bruce Leidstrand from Mountain View calls this the 'zero commute zone', where it is possible for people to live, work and shop without needing to use any motorized transportation. (Leidstrand interview 05/02)

Table 3-1: Average daily METRO entries and exits, 1991 & 2000[89]

	1991	2000
Rosslyn	13,637	30,115
Court House	5,561	14,676
Clarendon	2,964	5,663
Ballston	9,482	21,892
TOTAL	31,644	72,346

Table 3-2: Rosslyn-Ballston Corridor Development, 1970 – 2000[90]

	1970	2001
Office (square feet)	4,168,033	19,793,263
Residential (units)	6,036	21,813
% Residential to Office	36%	43%

3.3.2 Strategies

The Arlington county planning strategy was based around a proposal to build up the commercial corridor around the METRO stations while protecting the existing fabric of single family residential neighborhoods just beyond the commercial corridor. The plan was based on the idea of guiding specific station area plans that would show developers the conditions under which they could get relief from existing zoning to build at higher densities than would otherwise be allowed.[91]

Arlington County developed a 'smart growth' planning system before anybody had even coined the term 'smart growth'. Before the arrival of the METRO subway, the county lobbied to have the proposed right-of-way moved from an at-grade system through an old rail corridor to an underground system running under their downtrodden commercial corridor. This was done with the intention of focusing activity along the new line to support the transit system and improve the commercial corridor. By shifting this line ½ mile to the south, it ensured that the line would not run through the center of a neighborhood of single-family homes, where it would have either disrupted the fabric of the neighborhood and never would have generated significant ridership. Instead, by bringing the line through the commercial corridor, it spurred a whole new planning and development pattern in the county.

---

[89] Based on notes from a previous presentation by Bob Brosnan provided on 03/26/02.
[90] Based on notes from a previous presentation by Bob Brosnan provided on 03/26/02. Includes Rosslyn, Courthouse, Clarendon and Ballston Stations as well as the Virginia Square / GMU Station.
[91] Brosnan interview, 03/26/02

Figure 3-1
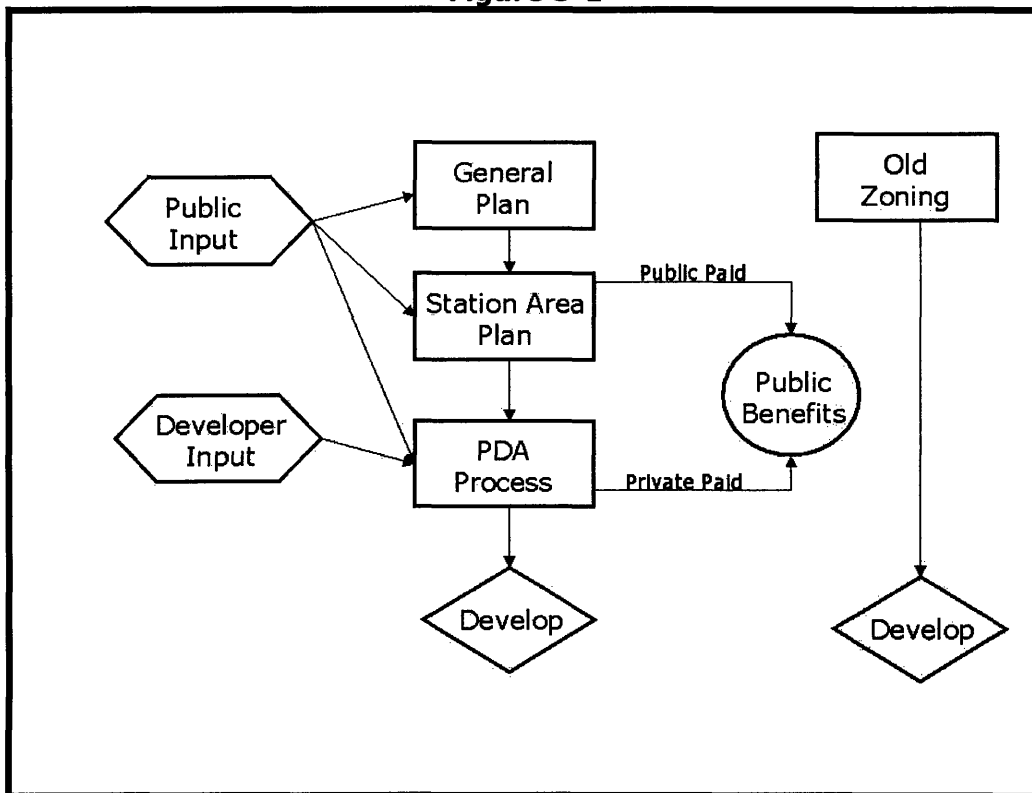
Process for Project Approval: Arlington County, VA

3.3.3   Station Area Plans

Each station area in Arlington has an individual station area plan. Clarendon Station has a 'station area plan' that was approved in 1984. At that time, approval had already been granted for one of the largest developments to date at the station, the Olmsted Building. The Olmsted Building is typical of the use mix and modern amenities that the county was striving to bring to the Clarendon station area. The station area plan specifies elements of use and density for a number of districts around the station. It does not specify details of design. But, it serves as a guideline for developers looking to build near the station. It identifies the strategy of building more dense elements closer to the station and scaling down as approaching the residential neighborhood.[92]

One stop east of Clarendon is Courthouse Station. The Courthouse Station sector plan was adopted around the same time as the Clarendon plan, but has been modified through a Sector Plan Addendum that was approved in November of 1993. At that time, based upon the completion of half of the planned development in the area, the County Board initiated a review with the assistance of the 'Partners for Livable Places'. In 1989, they organized a three-day design symposium called a *charrette*[93] that created the basis for urban design elements that were adopted in the new 1993 addendum. The design team identified a number of issues with

---

[92] Clarendon Sector Plan, 1984
[93] See the footnote in section 2.11.1 for a full definition of the term charrette.

station area development at Courthouse at the end of the 1980's, and identified ideas for fixing these issues. The issues at Courthouse station in 1989 were not unlike problems at other stations in the Arlington corridor.[94] The issues identified by the plan include:

♦ The challenges of developing a suburban edge city feeling rather than a more traditional downtown.
♦ Distribution of open space that is often just identified as the leftover spaces after development rather than the creation of parks, plazas and sidewalks that allow for 'passive and active recreation'.
♦ The lack of a central focus, both physically and economically, for the station area.
♦ The lack of identity as the county government center, although Courthouse station is the site of the county government offices and courts.

New development has continued in the Courthouse station area. A new courthouse building and many new office and residential buildings have been completed. But until a parking lot, located in the most central point of the station area, is removed and replaced the area still lacks a central focus point. Furthermore, the plan has allowed little opportunity to undo mistakes of the past in private developments that were already completed near the station, particularly as it relates to the use and layout of public and private open space.

Each of the stations has had a minimal number of developments completed using the underlying by-right zoning. Over time, fewer and fewer developments have used by right zoning. For example, at Courthouse station, 8 of 14 projects in the 1960s did not need separate site plan approval. Since 1997, only 3 of 33 projects have not needed site plan approval. In addition to the site plan approval process, many areas have been designated through special agreements to be part of special 'districts'.[95] For example, the Virginia Square area includes:

♦ A 'Special Coordinated Mixed Use District' to allow for higher levels of development;
♦ A 'North Quincy Street Coordinated Mixed Use District' for specific requirements in an area of concern that currently provides protection for existing industrial and commercial uses; and,
♦ One of Arlington's many 'Special Affordable Housing Protection Districts' that are used to ensure that developers cannot remove affordable housing in the corridor.

3.3.4   Community Participation

Community groups are active in the Arlington County station areas. Some station areas like Clarendon have a number of community groups representing different neighborhoods in the area. Clarendon station also has an active business alliance group that takes care of some of the privatized public services in the station area, and collects voluntary fees from businesses. All of these groups are active in the development process. In general, the neighbors are happy with the amenities of

---

[94] Courthouse Sector Plan Addendum, 1993
[95] Development in Metro Corridors, 2000: by Arlington County

the new station area projects. But, there are areas of concern, including the following:

♦ Densities and uses across streets have not been consistent. For example, the Market Common project at Clarendon has done much to provide townhouses as a buffer to the neighborhood, but the townhouses are three-stories of housing set on top of a garage level, creating a four story presence across the street from one and two story houses.

♦ Parking has been an issue, but one that can be corrected with better parking policies. During weekends when parking restrictions are not in effect, visitors to the retail area park in the residential neighborhood to save the cost ($1 or $2) to park in the retail garages.

♦ Development process is a concern. There is an underlying belief that all county projects will be approved, and the neighborhood input is limited to detailed issues of design and finishes. Development negotiations have also resulted in some promises to be made by developers that are outside of their control after projects are resold, such as the plantings, care and maintenance in green spaces on the development site.[96]

Arlington County has the advantage of political stability. The leadership of the county is quite stable. The five member county board is elected on a set of rotating terms. Each serves a five-year term and only one member is elected in each year. While other nearby municipalities have dealt with their entire boards fluctuating from being pro-growth to being anti-growth, the board in Arlington County has not changed significantly over time. In general, all the elected leaders in the county are from the same political party, offering an additional level of stability for the government leadership that has overseen these plans. Therefore, rather than taking strong positions for or against growth as has happened in other counties, Arlington has generally been supportive of the strategy to focus growth along the transit corridor.[97]

3.3.5   Results

The Rosslyn area was the first of the Orange Line transit centers to develop, due to its convenient location, across the Key Bridge from Georgetown. Some of the Rosslyn area developed as commercial space before the station. But the largest boom came to Rosslyn in the early 1980s, when over 1600 residential units and 500,000 square feet of office space were built in the station area. The original strategy for urban design at Rosslyn involved a separated pedestrian level above street level that would connect through buildings and include a retail frontage on the pedestrian paths. The retail at this level never worked, and the overpasses are being torn down, leaving inadequate sidewalks and amenities at the street level for pedestrians. The county has decided to up-zone the area in hopes that new proposals will come in to replace early Rosslyn buildings with new larger buildings that will be more agreeable for pedestrian uses at street level. Already two sites have been identified by developers where class B office space will be replaced by

---

[96] Ali Neal interview, 03/27/02
[97] Brosnan interview, 03/26/02

new, denser, development. Had this been done right the first time, this redevelopment process probably could have been avoided.

Ballston station is the site of the Ballston Metro Center, one of the largest joint development projects done by WMATA. The mixed-use project includes 277 condominium units, a 200 room hotel and 230,000 square feet of office space. The development of this site spurred much of the new development in the station area. The request for proposals (RFP) provided by METRO for this site did not dictate the uses, but the county was requiring housing to be in the use mix for this project. As is typical for joint development projects in the Washington DC area, the transit agency relied on the local municipality, its plan and its zoning to dictate the use and density on the site that they would lease for development.[98] At Ballston, two linked projects have followed the initial joint development project. The National Science Foundation has established their headquarters in an office building that is attached by a footbridge to the original Metro Center building. The Ballston Common mall has replaced an aging strip center plaza with a new three-story mall that is linked through a pedestrian passage to the National Science Foundation building.

Ballston suffers from a problem typical of Arlington station-area developments. While individual buildings are designed well, the area as a whole suffers from some of the problems similar to those identified in 1993 for the Courthouse station. Full-block buildings create a monotonous sidewalk experience for the pedestrian. Streets in the area are quite wide, more suitable to a suburban industrial park than a transit station area. While the place is successful economically, and continues to spur continued demand for more office and residential space, the central activity for people walking in the district takes place in the large Ballston Common mall, not on the sidewalks and streets.

At Clarendon station, one large development, the Market Common has recently been completed, while one mixed condominium/office complex is under construction and other office and housing proposals are in the review process at this time. Market Common is different than many developments in the area because it wraps the retail stores with a row of townhouses that are a better match to the single-family homes in the neighborhood behind the development. This solves some of the problems caused by the bulkier buildings in areas like Ballston and Rosslyn. In general, the county planning office has been happy with the result. Neighborhood activists have some concerns ranging from issues about the project density to problems with traffic and parking. The density and uses matching up with the neighborhood have worked somewhat, but details of design could have been better.

The Clarendon area still includes many surface parking lots. While Ballston has built up because it was the far end of the transit development corridor, and Rosslyn built up early for its proximity to Georgetown, the center at Clarendon has been slower to change. One other concern at the Clarendon area has been the protection of historic elements of the village center. In Ballston and Courthouse

---

[98] Phil Scales interview, 03/24/02

station areas, a few one-story *taxpayer buildings*[99] remain mixed into the new fabric. These buildings are probably being held by land speculators or by owners that will some day sell or redevelop these sites to their highest potential when the market conditions are right for them. But, as these building typologies have become rarer, and the tenants in them have become good neighbors to the nearby corporate towers, they have become rare historical features that remain as a reminder to the old commercial core of Arlington.[100]

In the Clarendon station area in particular, there are two elements that make these structures particularly significant. At one end of the Clarendon Common, the central green space by the station exit, is a row of one-story buildings with a number of restaurants catering to the nearby Vietnamese community. The Clarendon area has been nicknamed 'little Saigon' for its concentration of Vietnamese restaurants. Also surrounding the common are a few two-story art deco buildings designed and built in the earlier part of the 20th century. These buildings are of particular concern to the neighborhood. Both the restaurant row and the art deco buildings are not significant enough to be categorized as historic landmarks. But they do form a portion of the historical fabric of the station area and they are threatened by the market forces that are being spurred by the transit station-area plan. Like most parcels in the station-area, owners of these buildings could propose to replace these structures by participating in the site plan approval process and requesting the higher densities allowed around transit stations for developments that go through this process. Residents and business owners are in the process of identifying structures that may need strategies for saving, and seeing if the sector plans can be modified so that these parcels can be restricted from applying for the increased density that otherwise would be allowed in the station area.[101]

Affordable housing also has become a greater priority in Arlington County in recent years. Perhaps because of the popularity of the transit station areas, the county has been a significant beneficiary of the escalating housing prices in the Washington DC area. The result has been that it is very difficult for working-class families to afford housing in the station area, or anywhere in the county.[102] The county is now reviewing new programs for affordable housing components[103], including a proposal for inclusionary zoning, declaration of an affordable housing protection district, and adding a 25% height and density bonus for projects that include affordable housing.[104]

---

[99] The term 'taxpayer' refers to a one-story commercial building. These buildings are often called 'taxpayers' because of the minimal investment in construction. Often these buildings were built by speculators looking to produce income to offset the cost of taxes on a parcel of land until a more profitable building could be constructed.
[100] Ali Neal interview, 03/27/02
[101] Ali Neal interview, 03/27/02
[102] A family making 60% of the median income in the county should be able to pay about $1200 for a three bedroom apartment, but currently it is unlikely they could get one bedroom for this price.
[103] Brosnan interview, 3/26/02
[104] Virginia is a 'Dillon Rule' state where local governments derive authority from the state. The 25% bonus has been approved by the state legislature for Arlington – meaning that the county is authorized to use the tool. But, it has not been enacted by the County's own government board.

3.4 MOUNTAIN VIEW, CALIFORNIA

The second case study area is in Mountain View, California, a growing Silicon Valley city served by light rail and commuter rail.

3.4.1   Mountain View Station Areas

Mountain View, California is 12 square miles in size, with a population of 72,000. The three station areas in Mountain View are very different because of the different types of rail systems that serve them and the different uses that surrounded them before the start of newer construction. Three key transit-oriented development areas have been developed in Mountain View. The center of Mountain View is the location where the CalTrain commuter rail system from San Francisco has its southern terminal. At this point, the VTA light rail system that serves the San Jose metropolitan area meets that CalTrain on a parallel track. The commercial center of the city is located directly adjacent to this transfer station.   The area around the station has always been a traditional grid. While, commuter trains have served the center of Mountain View since 1869, the VTA light rail station opened to Mountain View in December of 1999.[105] Before the City of Mountain View put the redevelopment plan in place, the station area resembled the Type 3 ` unfinished grid' model discussed in section 1.2.4.

Northbound on the CalTrain, the next station is San Antonio, located in the area called San Antonio Center. San Antonio station opened in April of 1999 on the existing CalTrain line, with the hopes of spurring new development around the station.[106] This area has seen some transition from a sprawl-oriented mix of uses to a more transit-oriented center, with the development in particular of 'The Crossings at Mountain View', a development of townhouses and apartments with some small retail uses. The Crossings was built on the site of a former defunct shopping center. Before the transformation at The Crossings, the San Antonio station area resembled the Type 4 'suburban model' station typology outlined in section 1.2.4.

One stop south on the VTA light rail from the center of Mountain View is Whisman Station. Located in a former office-park area, two new developments of housing have been built directly along the light rail line at Whisman. Whisman station opened with the VTA extension to Mountain View in December of 1999.[107] Before development at Whisman, the station area resembled the Type 5 ` wide open spaces' station typology outlined in section 1.2.4.

3.4.2   Strategies

Mountain View has worked with developers to create precise plans around each of the station areas. Precise plans replace traditional zoning with customized standards. In a March 2002 article for Planning Magazine, Laura Thompson

---

[105] Opening information from the VTA and CalTrain websites.
[106] Opening information from the CalTrain website.
[107] Opening information from the VTA website.

102

described the precise plan as follows: "The plans establish broad goals and objectives with detailed development standards. Through flexible design approaches, such plans can encourage a variety of housing types, higher densities, narrow streets, public open space, reduced setbacks and compatibility with the surrounding area. . . it is a cross between a planned unit development and a larger specific plan . . .it allows for flexibility, innovation, and public involvement."[108]

The plan is usually developed in conjunction with land owners that will be future developers, but there is also a role for public input. The plan is approved by the city council. The entire process takes one or two years. Even after completion of the plan, the development requires an additional review with the city's architectural review board and zoning administrator.

The transit agencies have not played a strong role in these developments, although the Valley Transportation Authority (VTA) that runs the light rail has an active planning and joint development department. Most of the work the agency has done is in the City of San Jose. Yet the agency has a focus on transit-oriented development. They have developed numerous station area concept plans for other stations in an effort to get municipalities to work with them to bring new developments to station areas. So, while they did not actively participate in these projects, they continue to try to transform additional rail stations on their line.[109]

Figure 3-2
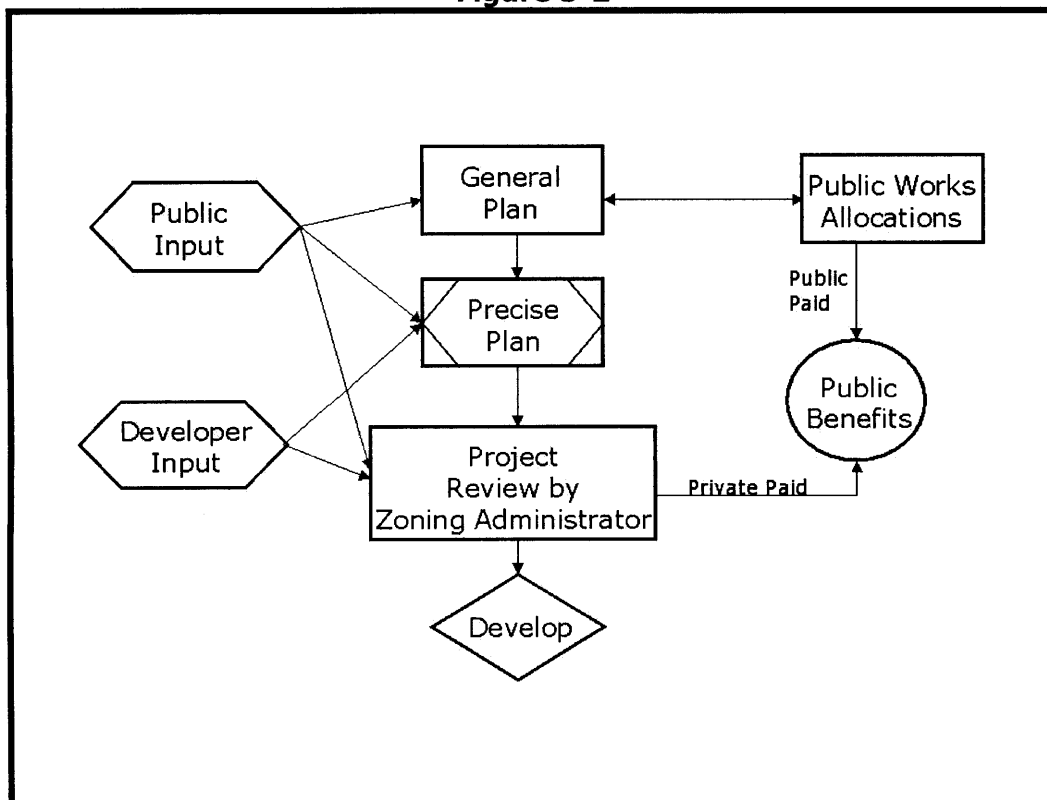
Process for Project Approval: Mountain View, CA

---

[108] Thompson, Planning Magazine, March 2002
[109] For more information, see:www.vta.org/projects/tod.html

3.4.3   Station Area Plans

Precise plans have been developed for each station area that was identified in the Mountain View general plan as an 'Area of Opportunity', where there is a high potential for redevelopment. The city has identified goals from the general plan that should be encompassed in the specific plan, such as encouraging mixed use, encouraging a mix of housing types, and striving for a better balance of housing and jobs.

Precise plans include a high level of detail. For example, the Whisman plan specifies that all garages must be located behind units, that the station area must include 50 parking spaces for transit users and that the units must include recycling containers, bulk storage and bicycle storage. Furthermore, the tree survey conducted in the area identified a specific number of certain types of trees that the developer was required to keep when developing the site plan for the project.[110]

The precise plan for San Antonio Center, the plan that yielded the 'Crossings at Mountain View' development, had a similar level of detail. The plan includes a series of site design guidelines that must be met. The city is allowed to approve storefronts, building facades and pedestrian walkway materials. As at Whisman, certain trees needed to be preserved, and they are prominently featured in the new development. Finally, the first new large-scale development that occurred in the area was required to provide a commemorative element to celebrate the development of the transistor, that was invented at the San Antonio Center.[111]

The plan for downtown Mountain View is much more complicated, as it has involved cooperation of numerous private land owners. Although it was the first of three TOD plans created in Mountain View, downtown is still being developed to meet the plan. The plan works to create a strong mixed-use downtown core for Mountain View. The plan focuses on the need to create a place that is both a physical focal point for the city and a destination for the community to meet. The plan describes the need for new buildings to match the existing fabric, and requires that buildings more than 45 years old go through a historic review before being allowed to be demolished or substantially altered. While higher floor-area-ratios are allowed in some transitional zones, the plan does not encourage replacing the historic core with new higher-density development. Most changes in building designs will require a review with a downtown 'Revitalization Program Manager', as well as the standard reviews from the zoning administrator and the city council. Even occupancy changes, color changes and new pedestrian signs must be approved by the Program Manager. Larger changes such as new construction and new façade changes must be reviewed by the Program Manager and possibly the Revitalization Committee.' New construction that deviates from the plan requires approval by the city council.[112]

---

[110] Whisman precise plan, from the www.ci.mtnview.ca.us website.
[111] San Antonio precise plan, from the www.ci.mtnview.ca.us website.
[112] Downtown precise plan, from the www.ci.mtnview.ca.us website.

3.4.4   Community Participation

The plans in Mountain View were each developed through a task force process that included a variety of stakeholders. Stakeholders, including those who may have been in favor of the proposed projects or opposed to them, were all brought to the table as part of the task force. Each task force works with a consultant to formulate ideas and opinions about the master plan. This process has worked in the past to be as much an educational process as it is a planning process. By choosing consultants who are willing and able to educate the task force on the importance of good urbanism, the city leaders have been able to encourage the support of a more successful transit-oriented development pattern to form in the station area specific plans. This process began with the creation of the Mountain View downtown plan. The local political leaders in Mountain View found that their planning process only met their vision when they found a consultant that understood the values of urbanism and transit. In this first process, the consultant educated the task force as well as the city planning staff and city politicians of the importance of pedestrian-centered mixed-use downtown development.

The community process has focused on planning as the key to community involvement. After the planning is complete, the zoning administrator has 'discretionary design review' for all projects based upon elements set out in the precise plans. This allows the zoning administrator to negotiate with developers to ensure that design is appropriate for the site. While developments often also need to go through a number of public meetings with the city council, abutter opposition is limited when the project inevitably matches the planning that was done with the task force. Often, members of the task force remain engaged in the development approval process and attend meetings to speak in favor of development.[113]

3.4.5   Results

The most drastic results at Mountain View have been the construction of two dense walkable neighborhoods near the transit stations at San Antonio and Whisman. At San Antonio station, a dying shopping mall was replaced with a development called the 'Crossings at Mountain View.' The Crossings includes single-family homes, rowhouses, townhouses and apartments. The areas of the development range in density from 15 to 55 units per acre. A park-and-ride lot serving the station sits underneath the apartment buildings.[114]

The Whisman Station plan supported a 500 unit residential community on a 40-acre industrial site. The site was developed by two separate developers, but was planned by a single master planner and task force in the precise plan process. The precise plan reflected the integration between the two projects. The completed projects have sold all but five of their units by January of 2002. An additional 42 units will soon be built on a parking area that was purchased from a nearby office building.[115]

---

[113] Bruce Liedstrand interview, 05/02
[114] Presentation by Calthorpe Associates at 2002 APA Conference
[115] Thompson, Planning Magazine March 2002

Downtown has developed with new housing along the rail line, and new retail establishments in storefronts in the downtown core. Signage at and around the station provides information for commuters and visitors. The access by light rail and commuter rail offers the opportunity for residents of all ages to access the retail core downtown from the housing by the Whisman and the San Antonio stations without being stuck in the traffic of the local arterial roadways. Furthermore, downtown offers the opportunity for some residents to live, work and shop without needing any form of motorized transportation.

The Mountain View development plans recently won a national award for 'implementation' from the American Planning Association.[116] The developments that have evolved from these plans are a vast improvement on the traditional auto-oriented sprawl that dominates the Silicon Valley landscape. The density is not significant, but is greater than similar nearby developments. The parks and open space provide public community amenities and opportunities to interact. The project at Whisman is not mixed use, and the retail at San Antonio is limited, but the rail connection offers better access to retail in the town center. The rail provides an amenity downtown, but the development of new housing has probably contributed more than the rail to the vibrancy of the pedestrian activity in town. So, while these projects are not a significant reorientation of the landscape, as the projects in Arlington are, they create a better place than the alternatives, and they provide an opportunity for suburban homebuyers to have better access to transit and amenities.

3.5   ADDITIONAL STRATEGIES

Mountain View and Arlington adopted two different strategies for using land use plans and flexible zoning to encourage effective station area development. But, there are a few other lessons that can only be illustrated by looking at strategies taken by other municipalities.

3.5.1   *The Hayward Story*

Hayward California has taken a public sector redevelopment approach for station area development. While the case studies in Arlington and Mountain View have relied mainly on influencing private sector developers, the Hayward plan is one that has required the public sector to take a lead role.

In Hayward, the city government has initiated land takings and land swaps and taken an active role in pursuing desirable developers for redeveloping the area between the station and the traditional downtown. The auto-oriented design of Hayward is being transformed by this public initiative. Before the redevelopment initiative, the traditional downtown, a few blocks from the station, was struggling. Meanwhile, the station area was surrounded by large parking lots. While the area immediately surrounding the station resembled the Type 5 'wide open space'

---

[116] Thompson, Planning Magazine March 2002

typology as outlined in section 1.2.4, the downtown resembled the 'unfinished grid' typology from section 1.2.4.

The most significant public project undertaken in Hayward was the development of the new City Hall on a former BART parking lot near the transit station. Beside the City Hall is a site where the government sold a former BART parking area to The Olsen Companies for development of new high density townhouses. Other lots nearby have been taken by eminent domain and are now cleared awaiting future development under the control of the city government.[117]

The Hayward strategy requires using eminent domain powers for redevelopment. Usually, exercising eminent domain requires declaration of a 'blighted area'. In some jurisdictions, this runs the risk of spurring complicated legal challenges by existing landowners and abutters that may be displaced or affected by the eminent domain. While the Supreme Court has not made a strong statement against the broad interpretation of 'public purpose' for land takings, some lower courts have ruled that municipal government should be more selective in taking land from one private party to sell or give it to another.[118]

Hayward has created a successful balance between old and new elements. They have worked with developers to bring the elements they need into their downtown area. While the use of land takings can be controversial, it was a necessary step for this plan to be successful. Some design elements, such as the auto-oriented supermarket near the town center, could have been better integrated to the urban core, but the housing and the main street retail have been done right. Hayward has repositioned itself from being seen as a dying downtown to being a place that people are seeking out to live by the train.

3.5.2   West Palm Beach: The Code Issue

The New Urbanist movement has been advocating a return to walkable mixed use areas that provide opportunities for urban and suburban lifestyles while mixing incomes and ages in the same neighborhood. Yet communities that follow New Urbanist principles for design have taken two different strategies for turning their visions into regulations.

Some New Urbanists have followed the trend of founder Andres Duany who has advocated for increased regulation of the built environment. While Duany has advocated for throwing out existing zoning codes, his projects have replaced these codes with thick regulation books and deed restrictions that are monitored and enforced by private associations. This pattern is not unlike the private 'shadow government' phenomenon that works in many new suburban master-planned communities to protect the property values of residents. But, what is regulated in a new traditional development like Kentlands, Maryland or Seaside, Florida is different from the regulations in a typical new suburb. It relates to an idea of encouraging interaction rather than avoiding challenges.

---

[117] Peter Albert interview, 01/21/02
[118] Kayden class notes, 05/01/02

Other areas, like West Palm Beach Florida, in its new downtown development strategy, have taken a much different approach. They have thrown away their old zoning code, but replaced it with a much smaller set of regulations and goals. With all projects required to undertake a full design review with a board of professionals and nearby residents and business owners, the review process replaces the coded zoning. The strategy relies on good people instead of good legal language to get what West Palm Beach wants. The West Palm Beach plan and zoning code is filled with more pictures than words, showing the architecture and building typologies that are desired by the review board.[119] West Palm Beach downtown does not have a high-capacity transit system, but it had areas that resembled both the Type 3 'unfinished grid' station areas and the Type 5 'wide open spaces' station areas, as defined in section 1.2.4. Today these areas have been redeveloped according to the new plan.

Figure 3-3
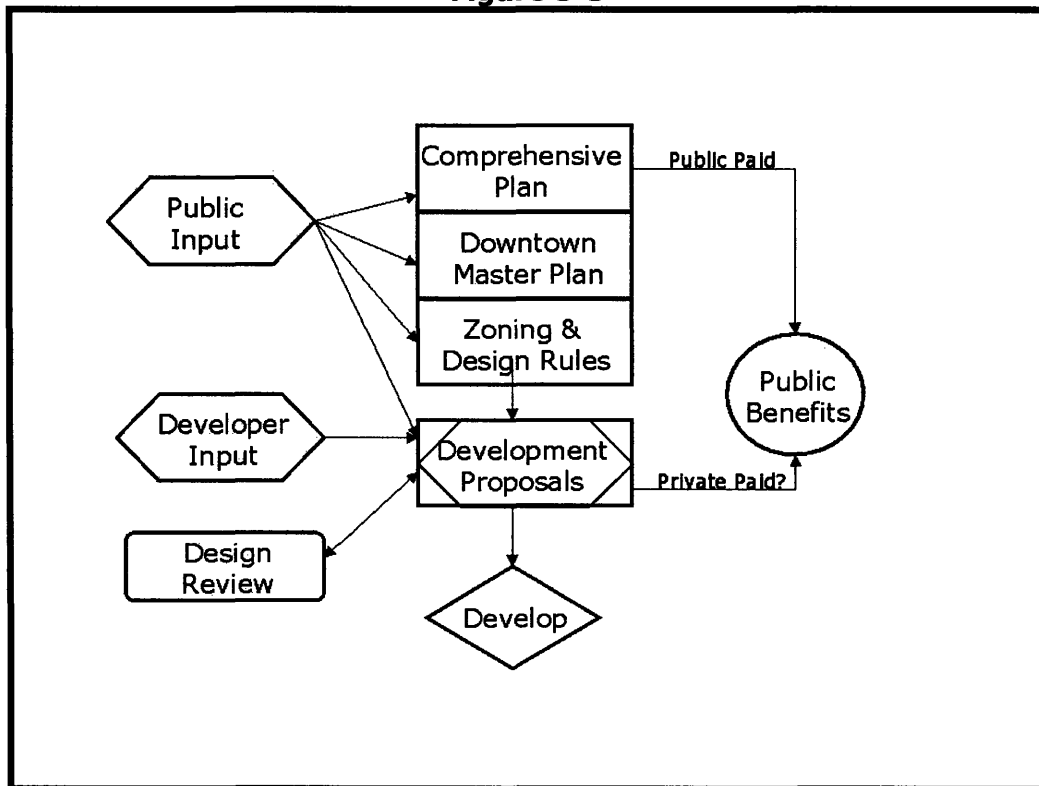
Process for project approval: West Palm Beach, FL

Both strategies have created results that are accepted as spectacular successes by communities and developers alike. Yet the strategies are almost opposites in what they have used to replace the existing zoning. This leaves a question unanswered: which approach is best for a community that is interested in replacing their zoning with a new station-area plan and land use regulation? Different strategies work in different places for different reasons. The pattern of which strategy should be used in each area will be established in chapter four.

_____

[119] Joseph Minicozzi, Presentation 04/02

3.6 LESSONS LEARNED FROM THE CASES

Communities have a number of choices for ways that they can implement high quality station-area development.   As these cases have shown, different areas have used the planning, zoning, finance and implementation tools available to them in different ways. Communities have to settle a number of significant questions as they choose a strategy for station area development:
♦ Should the community take an activist role in developing the transit area, using the tools to gain site control as in Hayward, or should they work with existing owners as in Arlington?
♦ Should communities establish simple regulations and a complicated review process as in West Palm Beach, or should they rely more on regulation like the precise plans of Mountain View?
♦ Should the transit agency take an active role in station area planning as in California, or leave it to the local government as in the Washington DC area?
♦ Should the design for each development be negotiated as in Arlington, or should the it be set in a plan for the station area as in Mountain View?

Obviously, any of these options can still lead to success or failure. The decisions made on these issues may have more to do with the political structure and institutional capacity in a given place than any specific rule. The differences between these places provide the framework for transferable conclusions about these very different cases. The following lessons can be applied to answer the questions:
♦ Communities where the development community has limited capacity, unproven markets or limited confidence in success, as in Hayward, require activist government participation in station area development through land assembly and finance assistance. Communities with a strong market do not require this.
♦ Communities with a stable political culture and shared goals can rely on a review process, while communities where the local government or state government is subject to significant political influence would be better to rely on stricter development regulations.
♦ When the institutional capacity to understand and apply good station area design rests with the transit agency, as it does with BART, the agency should play an active role. In an area like Washington DC, where certain local governments have a better grasp of the design and regulations necessary for good station area design, the local government should set the rules. Joint-development projects participate in the same review process as other developments.
♦ While all communities should do some level of station area planning, those that need to work with developers so that they will better understand the station area vision may find it better to follow the lead of Mountain View and do precise plans with the developers. Areas like Arlington, where developers understand urban dense projects, can rely on a negotiated process for each project.

3.7   CONCLUSION

Communities have taken a variety of strategies to achieve their goals of developing station areas for new mixed-use walkable communities. Communities use different levels of public and private activity, have codes that may be more or less detailed than traditional zoning, have differing levels of public participation in planning and have different strategies for including the transit agency in the process. Yet the success or failure of station area planning in any area is not specifically tied to any one or any group of these activities. Generally, each community must figure out how to use the tools at their disposal to become successful. These tools include:

◆ Municipal Planning:
  ◆ Comprehensive plans and master plans that encourage the development near station areas and discourage development away from station areas.
  ◆ Station area plans created with community input or specific plans for station parcels created with support of the developers.
  ◆ Development of a design guideline program and/or design review process.
  ◆ Development of a station area strategy that may include acquisition of parcels by the public sector for change in use and design.
  ◆ Development of a public realm that supports the pedestrian and the development.
◆ Municipal Incentives:
  ◆ Assisting with the cost of replacing surface parking.
  ◆ Providing height and density bonuses.
  ◆ Providing set zoning to allow predictability in the development process.
  ◆ Developing a process to trade higher density for participation in a planned development program with community input and a negotiated outcome.
◆ Municipal Participation:
  ◆ Providing cash incentives or assisting with financing to allow for favorable loan terms.
  ◆ Developing municipal projects in station areas.
◆ Transit Agency Planning and Participation:
  ◆ Participating in joint development projects at station areas that focus, as a highest priority, on bringing new vibrancy to the station and its surrounding neighborhoods.
  ◆ Participating in station area planning as a partner with the municipality.
  ◆ Identifying and building future extensions with station area development as part of the strategy.
◆ Additional elements for success:
  ◆ Strong partnerships with public and private participants.
  ◆ Strong public participation process
  ◆ Transit system design that supports the development
  ◆ Economic conditions that support development
  ◆ Pedestrian-friendly environment near the transit station

The next chapter will provide recommendations on how a transit agency and municipality can work through station area planning. Not all these tools are created equal, and different station areas need different tools. Chapter five will apply this new framework to station areas on the Tren Urbano system in San Juan.

"The best way to predict the future is to invent it."

- Alan Kay

4 PLANNING FOR STATION AREA DEVELOPMENT

4.1 INTRODUCTION

This chapter serves to provide an opportunity to bring together the lessons from the first three chapters of the thesis and identify the elements that must come together for station area development to work and work well.

4.2 REVIEW OF CONCLUSIONS

This thesis proposes to answer one important question about successful station area design: how can it be done? But, to answer the 'how' question, one must also answer the 'what' question: what is successful station-area design? The elements of success from the first two chapters are reviewed in sections 4.2.1 and 4.2.2. In section 4.2.3 is a review of the government interventions that have formed some of the answers to the 'how' question.

4.2.1   A Comprehensive definition of successful TOD

Chapter one provides a framework based upon the idea that **design matters** – and that good design is the first step to a successful transit-oriented development. But, it is also based upon the simple premise that **design is not all that matters** – and that simply designing an attractive place near a transit station is not all that needs to be done. It needs to be built, it needs to be populated and it needs to develop in a way that contributes to the greater good of the region and the society. The elements that define a successful transit-oriented private development include:

A: Elements of Design
1. Compact site design, oriented for the pedestrian
2. Buildings oriented to the transit stop but not turning their back on neighborhoods pre-dating the transit stop or on sites for future development just beyond the first ring
3. Development of open spaces and streets as an 'outdoor room', with buildings providing comfortable framing walls. A clear definition of open spaces and their uses as parks, playgrounds and/or courtyards.
4. Limitations on parking

5. Quality without a name (QWAN)[120]

B: Elements of Use
1. Mix of uses, including office and residential uses, over a variety of sites –
    although each project need not be mixed use.
2. Elements in the development that serve convenience shopping needs, while
    elements somewhere along the transit line should serve comparison shopping
    opportunities for a diversity of users.
3. Concentration of activities matches the size of the neighborhood and its market
    so that there is a constant level of pedestrian activity, preferably even on
    weekends
4. Similar uses, or at least similar densities, facing each other on opposite sides of
    the same street.

C: Elements of Marketability
1. Perception of safety by pedestrians using the station and the neighborhood.
2. Appealing location for retail, and density to support retail.
3. Housing that is of interest to middle and/or high income residents
4. Development of business associations, owners organizations, and/or
    neighborhood associations to take ownership of the area and care for public and
    private spaces.

D: Elements of Affordability
1. Opportunities (through offering reasonable housing costs or through a subsidy
    program if necessary) for lower income residents to live in the place, ensuring
    that captive riders have access to the transit system
2. Development of convenience retail, not just a 'boutique' environment
3. Density that allows for reduced costs

4.2.2   Ten Lessons for Station Area Design

The second chapter, based upon visits to 80 stations, identified ten lessons for
station area design that should be incorporated into any station area plan, design
review and/or zoning code for station area development. Those lessons are:
♦ Lesson 1: Grids of streets are very important. Keep old grids and create new
    ones.
♦ Lesson 2: Define a 'pedestrian shed' for each station, encompassing the area
    within a ten minute walk of each of the station exits. Inside the 'pedestrian
    shed', develop simple walking routes to major destinations. Make sure they are
    clear, safe, easy to travel and well labeled. Never separate pedestrians from
    vehicles on a different grade.
♦ Lesson 3: Avoid superblocks. When large buildings are necessary, allow them
    to be permeated by pedestrians.
♦ Lesson 4: Building design effects pedestrian amenities. Use and scale should
    be consistent across a single street, stepping down at points internal to the
    block. Loading docks and large parking garage entrances should be located to

---

[120] The term QWAN comes from Christopher Alexander's 'Timeless way of Building'. Alexander suggests that that
we need to build places that increase feeling of life and wholeness.

112

minimize impact on pedestrian access. Large commercial buildings should not turn their backs to existing or future development beyond the immediate station area.

♦ Lesson 5: Make open spaces into 'outdoor rooms'. Small parks and public areas can be framed by buildings of appropriate scale, use and style. High-density residential areas should provide public green-space amenities to offset for the lack of large lawns.

♦ Lesson 6: Security issues must be balanced with public need for access and comfort in and around the station area.

♦ Lesson 7: Provide convenience retail at each stop and destination retail at an accessible central point on the transit line.

♦ Lesson 8: Include housing at all station areas to provide for evening activity. Include office uses at all station areas to provide for daytime activity.

♦ Lesson 9: Plan for growth and change over time. A good plan will raise the value and perceptions of nearby real estate.

♦ Lesson 10: Keep the process efficient and the project finances open to ensure that costs and financial issues will be available to the public to understand tradeoffs and development time.

4.2.3   Government Strategies

Chapter three provided a set of case studies and a series of other examples on the ways that government can manipulate the development of station areas.
Strategies include:

♦ Municipal Planning:
  ♦ Comprehensive plans and master plans that encourage the development near station areas and discourage development away from station areas.
  ♦ Station area plans created with community input or specific plans for station parcels created with support of the developers.
  ♦ Development of a design guideline program and/or design review process.
  ♦ Development of a station area strategy that may include acquisition of parcels by the public sector for change in use and design.
  ♦ Development of a public realm that supports the pedestrian and the development.

♦ Municipal Incentives:
  ♦ Assisting with the cost of replacing surface parking.
  ♦ Providing height and density bonuses.
  ♦ Providing set zoning to allow predictability in the development process.
  ♦ Developing a process to trade higher density for participation in a planned development program with community input and a negotiated outcome.

♦ Municipal Participation:
  ♦ Providing cash incentives or assisting with financing to allow for favorable loan terms.
  ♦ Developing municipal projects in station areas.

♦ Transit Agency Planning and Participation:
  ♦ Participating in joint development projects at station areas that focus, as a highest priority, on bringing new vibrancy to the station and its surrounding neighborhoods.

- ◆ Participating in station area planning as a partner with the municipality.
- ◆ Identifying and building future extensions with station area development as part of the strategy.
- ◆ Additional elements for success:
  - ◆ Strong partnerships with public and private participants.
  - ◆ Strong public participation process
  - ◆ Transit system design that supports the development
  - ◆ Economic conditions that support development
  - ◆ Pedestrian-friendly environment near the transit station

4.3   PLUGGING INTO THE POWER GRIDS: BRINGING THE ELEMENTS TOGETHER

After bringing together the elements and the stories of transit-oriented development in station areas across the United States, there are two clear conclusions:
- ◆ No place has created the perfect transit-oriented development in recent years although there are lessons to learn from many recent developments.
- ◆ No single element of design or regulation is capable of making transit-oriented development work. Instead it only works when a series of elements come together to create a new place.

Zoning without a market, a market without concerned people, a development process without design review, or a policy framework without committed developers can all reduce the elements of high-quality station-area design and create more mediocre pedestrian environments that don't provide adequate services and an environment for transit and walking trips. The most successful station areas involve the convergence of four elements that are necessary for high-quality station area design. When Cervero identified the three elements for TOD (density, diversity and design), he answered the question 'what is TOD'? To answer the question 'how do we build it?', we need to expand the framework. To build TOD that works, a system must plug into all the existing power grids. This requires connecting to:
- ◆ The Development Community
- ◆ The Development Process
- ◆ The Regulatory and Policy Framework
- ◆ The Public Institutional Capacity

The importance of each of these elements, and the public sector tools available to influence them are explained in more detail in the next sections.

Figure 4-1

```
┌─────────────────────────────────────────────────────────────────────────┐
│   ⬡ Development                          ⬡ Institutional                  │
│     Community                              Capacity                       │
│  ┌──────────────────────────┐      ┌──────────────────────────────┐      │
│  │ •Developer Knowledge of TOD│    │ •Pubic Sector Institutional Capacity│  │
│  │ •Joint Development        │      │ •Public Sector Leadership     │      │
│  │ •Site Assembly & Preparation│    │ •Community Support & Knowledge │      │
│  │ •Developer Financing      │      └──────────────────────────────┘      │
│  └──────────────────────────┘                                            │
│                    ┌──────────────────┐                                   │
│                    │  High Quality     │                                  │
│                    │  Station Area     │                                  │
│                    │  Development       │                                 │
│                    └──────────────────┘                                   │
│   ⬡ Development                          ⬡ Regulatory                     │
│     Process                                Framework                      │
│  ┌──────────────────────────┐      ┌──────────────────────────────┐      │
│  │ •Zoning Review            │      │ •Zoning Enabling Laws         │      │
│  │ •Site-plan Review         │      │ •Comprehensive Plan           │      │
│  │ •Design Review            │      │ •Station Area Plan            │      │
│  │ •Community Participation  │      │ •Zoning Regulations           │      │
│  │ •Private-provided Benefits│      │ •Design Guidelines            │      │
│  └──────────────────────────┘      │ •Limitations on Sprawl        │      │
│                                     └──────────────────────────────┘      │
└─────────────────────────────────────────────────────────────────────────┘
```

Connecting to the Power Grids

4.3.1   Development Community

The development community includes the developers as well as their architects, lenders and consultants who work to put together projects that define the built environment. Private developers and their community form one of the four power grid connections to station-area development.

Public and private participants in development must work together to ensure that development actually occurs at station areas. Areas owned by the transit agency or other public partners should be identified, planned for within the framework of existing planning, and developed by the public sector or put out for joint development leases by private partners. Where appropriate, the public sector should also identify areas for site assembly and preparation for additional public or private development. Each of these elements will help ensure development on publicly owned property or property that would be difficult to develop unless the public sector steps in.

With private development parcels, the development process needs to encourage them to be developed. In these cases, the finance community often has as much control over the future of these sites as the development community. Some developers have argued that the finance community will not support projects that

have elements that can not be related to comparable projects in similar areas.[121] Yet, there are some finance institutions that have specifically identified mixed-use and transit-oriented development as a lending category. Other institutions could be persuaded to use funds set aside for community reinvestment in riskier projects in downtown areas near transit.[122] When no other lending options exist, the public sector can assist the private lenders in understanding the extent of risk, can offer loan guarantees or even provide the loans themselves. The public sector should not take a risk on projects that do not appear to actually be financially feasible. Yet, some of these projects may appear to be higher risk if similar projects have not been tried in a given metropolitan area before.

Developers themselves are often unwilling to take on these projects because of their inability to understand the mixed-use elements of the projects. Housing developers may want to build only housing while office developers may want to build only office. There are mixed-use developers out there, and the public sector may need to work hard to find them. When all else fails, individual projects by individual single-use developers can still create mixed-use projects. Single-use developers may be more likely to step into mixed-use development around station areas when they see other developers having success in the station areas.

The public sector may have to play more of a role in a transit-oriented mixed-use private development to make sure that it is successful. Tools that may be needed are in three categories as follows:
♦ Land:
  ♦ Assembling land when needed
  ♦ Making appropriate public-owned sites available for development
♦ Finance:
  ♦ Seeking out for those in the finance community that are willing to work with mixed-use development
  ♦ Providing grants to projects that enhance or revitalize areas[123]
  ♦ Providing loans or loan guarantees, if necessary
  ♦ Participating in project finance, if necessary
♦ Developers:
  ♦ Identifying capable developers to participate in projects in the station area
  ♦ Helping single-use developers who want to work around the station find partners with expertise in other types of development
  ♦ Working to match single use developments to get a mixed-use station area

---

[121] Graham Castillo in San Juan stated that this is an issue in Puerto Rico. Developers doing mixed-use projects in the suburbs have also had difficulties securing financing, as suggested by some at the New Urbanist conferences, although this is becoming less of an issue as these projects regularly out-perform their neighbors. Joseph Duckworth from Arcadia Land Corporation who has developed many mixed-use suburban projects as well as urban infill in Albuquerque New Mexico suggested that overcoming concerns in the finance community requires focusing on how the project is SIMILAR to others, and downplaying any unique elements of the project. Duckworth says that the finance community is very nervous about unique projects.
[122] The Community Reinvestment Act is a federal regulation that requires banks to invest in the communities in which they have branches and offices.
[123] For example, the San Juan metropolitan area has access to significant annual funding through the Community Development Block Grant (CDBG) program. In 2001, Bayamon received $6.7 million, Guynabo received $2.7 million and San Juan received $14.8 million. CDBG monies can be used for neighborhood revitalization, economic development, and provision of community facilities and services. Some of this money could be targeted to projects in station areas.

4.3.2   Regulatory and Policy Framework

The regulatory and policy framework that influence station area development, and the people that create it, form the second power grid connection for station-area development. Regulations on the state level and the local level can influence the ability to succeed in developing station-area projects.

The success of local governments and transit agencies in instituting transit-oriented development may depend on policy elements beyond the initial scope of development and design. For example, state tax policy that influences the demands and finances of local jurisdictions can often have an impact on local land-use decisions. Furthermore, state zoning enabling legislation may limit the local government from entering into public/private partnerships or focusing on revitalization efforts that involve land assembly. As a minimum, the overarching policy framework must include the following elements:

- A tax collection, local aid and finance program that does not discourage localities from development, particularly high density development that includes housing
- A zoning enabling policy that:
  - Demands higher-density development be around stations, including minimum densities
  - Allows for a regional assessment of land use particularly around transit,
  - Allows for a level of creativity in zoning that includes ability to do planned unit developments, transferable development rights, linkages, development bonuses, inclusionary zoning and other creative tools
  - Allows for a design review process[124]
- Regulations that allow public entities to enter into joint developments, and partnerships where the public and private sector can negotiate for allocation of public and private finance to make a project possible
- Power of eminent domain in the control of an agency that understands its value as well as its limitations, and is willing to use it for a legitimate public purpose

At the local government level, the following policy framework items should be in place:
- Zoning:
  - Minimum densities, with FARs from 1.0 to 10.0 depending upon the station type
  - Limits on parking
  - Limits on growth outside the transit area
  - Requirements for inclusion of housing in large projects
  - Use of additional creative zoning tools where appropriate, including transferable development rights and bonuses
- Finance:
  - Ability to use tax incentives
  - Access to capital and loan guarantees
  - Framework for setting up RFP and land lease / sale programs

---

[124] The new 'Growing Smart Legislative Handbook' by APA provides sample zoning and zoning enabling legislation for transit-oriented development.

♦ Opportunities for site assembly and eminent domain powers if appropriate

At the local level, some public participation or public subsidy may be necessary for projects to proceed. These subsidies should balance the public interest that is gained with the funds that will be required for the project to go forward. Harvard professor Jerold Kayden suggests that the municipality set the standard that public participation in private development should be to the level that is "necessary, sufficient but not excessive" for the private sector to develop the project and receive a reasonable development fee.[125] The public sector policy framework for participation in private projects should reinforce this standard.

Design controls must be institutionalized. While one does not want to completely stifle the creativity of the architect, one must be sure that each building fits the context in order to make the station area development work.[126] The design process should put a premium on the streetscape around the building, ensuring that it provides a pedestrian environment. The building height, bulk and materials must also allow it to integrate into the existing abutting neighborhoods. But, in addition to these major issues, minor issues from loading dock to front door locations must also be regulated by people who understand the transit-oriented design standards. In general, the TOD design will work best if designers have two things available to them:
♦ A set of design guidelines, preferably with lots of pictures, that will allow for designers to meet the needs of pedestrians and respect the needs of neighboring residents and developments without losing complete ability to be creative.
♦ Specific rules with minimum and maximum setbacks, heights and linear frontage of active pedestrian-oriented streetscapes.

4.3.3 Development Process

Development process and the individuals who form the review committees are the third connection to the power grid. Site plan reviews, design reviews and other procedural steps can be key elements in influencing station-area project designs.

A comprehensive regional plan should provide the regional framework for transit-oriented development in the station areas. This framework will allow for the development of specific station-area plans with local buy-in. When local zoning matches the plan, and the approval process is based upon the local zoning, it will be easier to ensure that developers understand what is expected of them. By combining the focus on the station areas with a down-zoning or limitation of development outside the station area, developers will be prevented from locating their projects in a non-transit-oriented location just to be subject to an easier project review process..

---

[125] Kayden class notes
[126] Some architects do complain about design review. But many share the opinion of architect Manuel DeLemos in Puerto Rico who suggests that good architects are ones who can design within parameters, including the parameters of a community design review process. (from the DeLemos interview 01/02)

The development process will also be more successful if it includes a discretionary design review process. The design review should be staffed by professionals but overseen by a board that includes design professionals, development professionals and nearby residents. The board should offer regular feedback throughout the design process. Design review should relate to the design guidelines that are created in accordance with instructions in section 4.3.2.

While all projects should have some form of design review or architectural review, the basic height and density should be allowed by-right. The use of liberal variances to set the standard for transit-oriented development creates a 'let's make a deal' atmosphere that suggests unfair advantages to those that play the development game differently than others.

Two design elements may not be controlled by the standard regulations or process. They involve:
♦ Obtaining desired public benefits that would be paid by the private sector; and,
♦ Ensuring that the development over the station area includes a mix of uses, including uses that are not strongest in the market at that time.

If a jurisdiction is looking for privately-provided public amenities, there are a few strategies they could take without making individual trades for uncertain additional development. The public amenity can be mandated, as long as there is a direct link to the impact of the project. Alternatively, the government can offer definitive development bonuses for projects that provide certain public benefits. For example, developers could be required to choose an element from both a physical design category and a social category to receive a 20% height and density bonus on their project.[127]

To solve the second problem, the zoning can require some limited level of a use mix. In the core station area where developers would be required to provide at least 20% of floor area as housing, and at least 20% as office or hotel, and first floor retail. By requiring that just a small amount of a development be of a second or third use, many developers will exceed these percentages to balance a project. If a developer wants to build a single-use project in this area, they can apply for a variance. Sites just beyond the station can be zoned for office, while those closer to existing neighborhoods can be designed for housing, albeit housing of a density higher than the existing pattern.

4.3.4   Public Institutional Capacity

The public institutions, their staff, and their capacity to understand and assess good urbanism form the last power grid connection. Public-sector departments that influence development are staffed by administrators, planners, engineers and

---

[127] This has been done in West Palm Beach, Florida (Minicozzi presentation 04/02). But, in an area where the government is unsure about achieving successful station-area design, bonuses can be a problem. Government is left with a choice between under-zoning an area (and not getting the economic incentive at a level necessary for developers to build) and zoning to the maximum acceptable density (and getting bonus projects that are uncomfortably large for abutters). Bonuses must be instituted with a comprehensive economic analysis of their feasibility.

politicians, all of whom can benefit from understanding and applying the principles of good station-area design.

Even with the correct regional policy framework, an established design review system, and a development community and process that is invested in the concept, there still could be barriers to successful transit-oriented development. There is no replacement for institutional knowledge about the elements of high quality station-area development.

The community planners and development review staff must have a strong understanding of both the design and density of transit-oriented areas. They must also understand economic development and finance elements that are required for the development community to create a project and derive a reasonable fee.

The buy-in from neighborhood leaders, and other local professionals will be necessary as well. Neighborhood activists who have bought into the idea of high density development near the transit, and protection of the their nearby neighborhoods will be long-term allies as they see new amenities being built within walking distance of their homes. But, they must be brought into an early station-area planning process. Early inclusion in the planning process will reduce opposition to individual projects that are consistent with the agreed-upon plan.[128]

Local professionals from the fire chief to the traffic engineer need to understand the advantages of compact development. While they may create more congested streets and roadways that limit access, they will also create safer and more environmentally sustainable communities. In some communities, city engineers and fire departments have been the most difficult to convince of the advantages of transit-oriented development. But, with an early strategy to overcome difficulty, and a comprehensive plan that explains the larger advantages of compact station area design, projects can overcome bureaucratic opposition before it arises.[129]

Economic development agencies that understand the transit lifestyle, can assist with elements of successful station area development. Economic development agencies often recruit and locate businesses in a metropolitan area. They should market transit as an asset for employee-intensive organizations.

By partnering with companies that can bring elements to the community that reduce the need for private automobile ownership, the economic development agency can also assist in bringing community needs to a transit corridor. Two types of businesses are available that help further this goal. Where appropriate, the public and private sectors can partner to bring these services to the transit-oriented communities:

---

[128] Bruce Leidstrand interview, 05/02
[129] Andres Duany, at the Smart Growth Conference in January 2002, explained that there is nothing more frustrating than a development process where all the planners are on board with the idea of narrow streets, slow traffic and compact development, then the fire chief comes along and says 'the road must be 65 feet', and the leadership takes this statement as if it is indisputable. Planners need to be able to defend their standards as well as the more technical experts.

♦ Car sharing for the occasional car user. This particularly helps people who would only need a car for an occasional visit beyond the transit system and/or for an occasional trip to a retail outlet that is beyond the station and that requires transporting large items home. The public sector can help by providing parking, particularly at transit park & ride lots.

♦ Delivery services for food and large items. In particular, transit station areas that do not have large grocery stores nearby may benefit from grocery delivery services. The public sector can help by providing incentives to set up such a program as well as by ensuring that short-term commercial parking is available for these delivery vehicles near any high-density residential areas around transit.

Finally, the political leadership often also needs to be committed to developing the station areas as pedestrian-oriented destinations. Commitment from the top of the political structure will make it easier to bring the institutional participants together in pursuit of this common goal.

4.4   WHERE TO BEGIN?

4.4.1   A New Development Program

With the s many elements that must come together to make successful station area development a reality, it may be reasonable to wonder where to start. First, a jurisdiction, its bureaucracy, transit agency and public participants must agree on a development approval process that everybody will feel is fair. Figure 4.2 shows a system that is a hybrid of the systems from chapter three, taking elements that worked best in each area. But, each jurisdiction is different, and they may need to modify such a system to suit their individual needs. After the relevant actors have agreed upon a system, they should start to work to agree on a plan. The planning process will allow for the opportunity for the participants to agree upon the reasonable level of development, density and public amenities that would be appropriate for the station corridor. Then, station area plans can be created based upon the master plan.
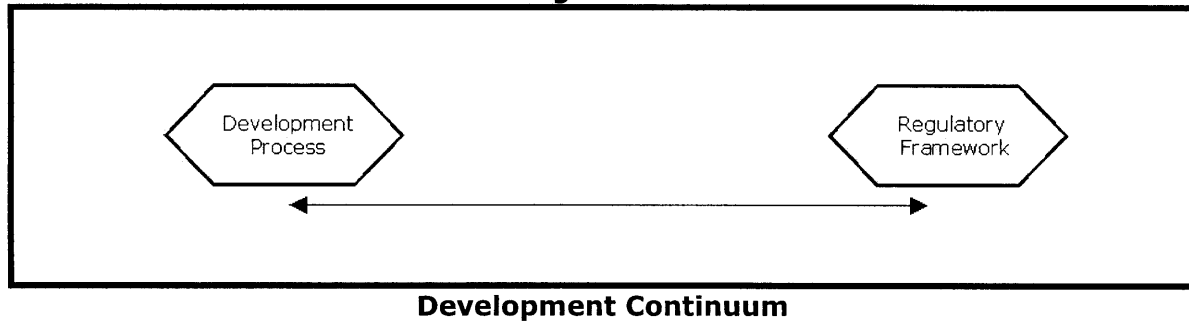
Figure 4-2
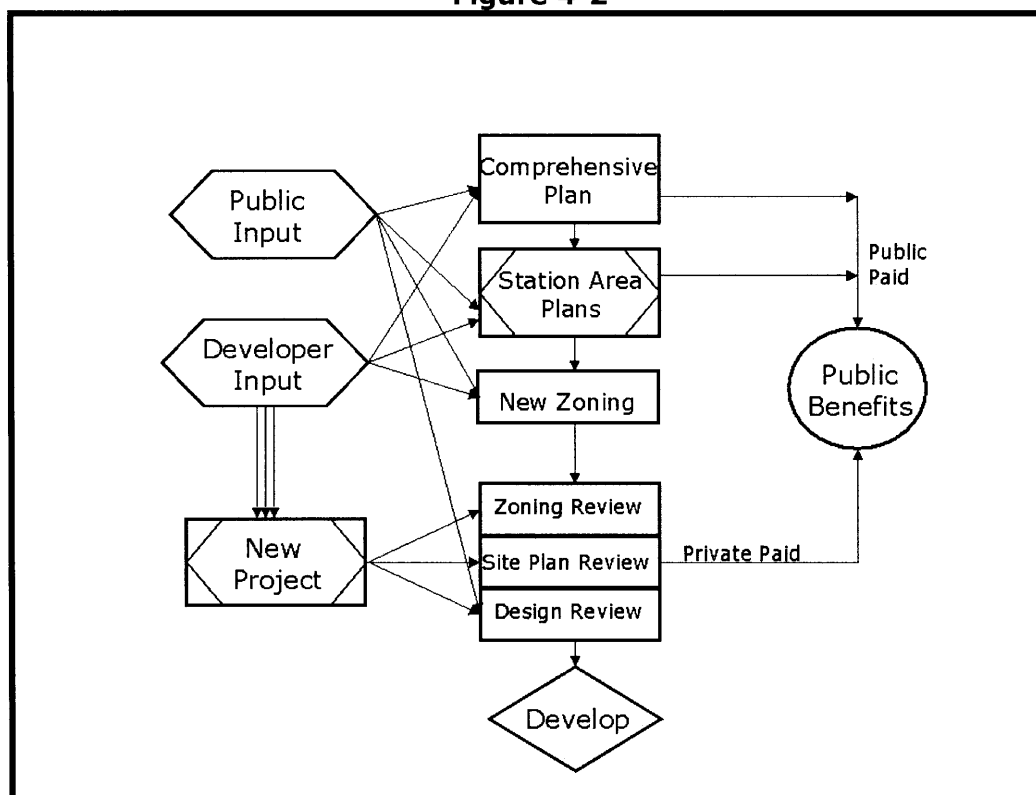
Model system for station area development planning.

4.4.2   Assessing the Power Connections

The case studies in chapter three illustrate that different governments make different choices about their development systems. These choices work best when they match the power grids that are available in their given location. Communities can decide how to proceed by assessing the power connections and the tools they need to connect to this grid.

The first decision that government must make is to decide between an emphases on development process or regulation. While it is possible to have too much or two little of both, most places fall somewhere on a continuum between relying significantly on process and relying significantly on regulation (see figure 4-3). Mountain View relied more on regulation than Arlington, while West Palm Beach relied much more on process. The decision of where to be on this continuum depends upon the political structure in a place. In Arlington, where the political leadership changes slowly over time, the reliance on process works well. In places where the political leadership can change quickly, relying on a structured framework will institutionalize the concepts of good station-area design and insulate them from political whims.
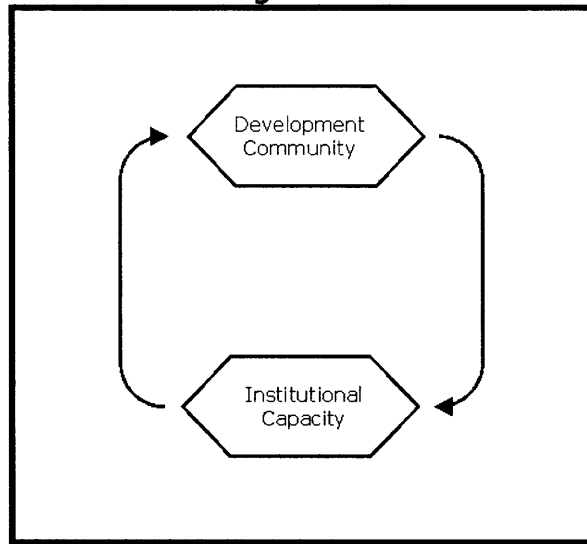
Figure 4-3

Development Continuum

The interactions between the development community and the public institutional capacity can be seen as a feedback loop (See figure 4-4). In communities like Hayward where the local government had the institutional understanding and financial capacity to support new development it was able to entice the development community to do some early projects in the station area. As this process has spurred developer interest in Hayward and as it has brought new vibrancy into the downtown, it has built new strength in development community capacity. In Arlington, where the development community has been able to finance their own projects in most areas, the community has reacted to projects and encouraged more projects with design elements that they like while discouraging project elements that they did not like. The developments have spurred new capacity in the public institutions and the community participants.

Often the public sector must seek developers from outside the community to set the tone for future development. When the framework for station area design has been established by these early developments, the local development community will begin developing in the station areas according to community plans. The feedback loop can use joint development as a tool to bring knowledge and finance of station area projects to the development community. By reducing risk and demanding high quality design in joint-development projects, the transit agency and the local government can begin the process of transferring capacity from the local institutions to the development community.

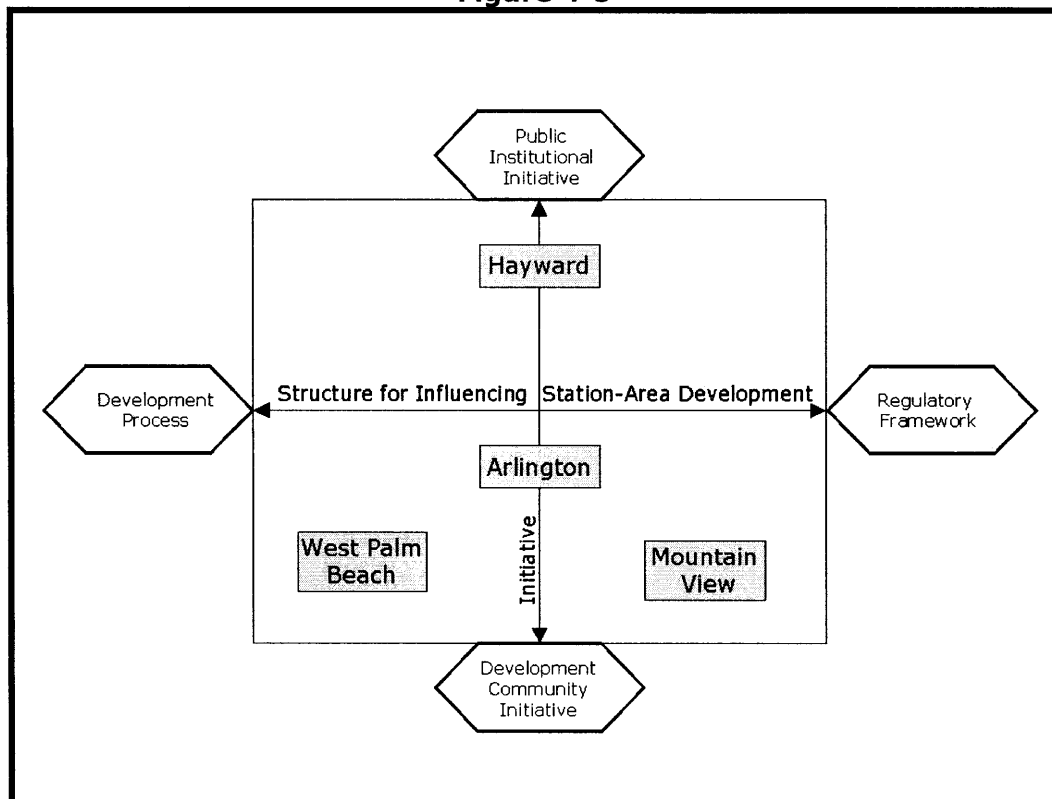Figure 4-5 places the four communities reviewed in this chapter in a matrix, showing where they fall on the spectrum from full public sector initiative to full private sector initiative and where they are on the continuum from relying on development process to relying on a regulatory framework.

Figure 4-4

Feedback Loop

Figure 4-5

Matrix of Communities on the Development Continuum and the Feedback Loop

4.5   FINDING THE RIGHT STATION AREA PLANNING FRAMEWORK

This section provides more detail about the regulations, investments and assistance that would be required for station area development in different types of station areas.

The framework at different stations depends upon the existing station area condition. In chapter one, five station area conditions were described:
1. Station areas where significant urban development pre-dates the station.
2. Station areas in a dense urban core where development may follow transit, but significant urban real estate markets pre-existed. A natural extension of the core would propel development in this direction, therefore other factors are more primary than transit in t3he development of the area.
3. Station areas in a secondary urban grid or in a primary urban grid in an auto-oriented city. This may include any development area that, before redevelopment, included significant open sites, surface parking or under-utilized parcels.
4. Station areas in a suburban setting. The primary nearby use is residential, and the street pattern is not a standard urban grid.
6. Station areas with limited nearby uses other than parking and undeveloped land.

As described in chapter one, the thesis focuses on only the last three types of station areas. Each station area type needs a different strategy of elements to come together and provide new transit-oriented development opportunities. Table 4-1 identifies the needs, plans, zoning, public investments, private sector elements and public subsidies that would be needed for successful transit-oriented development to come to these different types of areas. These are also discussed in more detail below.

4.5.1   Elements Needed in All Areas

Some basic elements are needed for station areas to develop regardless of the existing landscape. First and foremost, there must be a market for the development that is desired. If there is no market for apartments or for offices in the metropolitan area, it is unlikely that the development will occur. If there is a strong market for at least one type of property, it may be possible to use bonuses, incentives and zoning requirements to push some of the more creative developers into building mixed-use projects. But, this will also scare away many developers who know only how to do single use projects. A strong plan dictates design and density, includes required density minimums, as well as a first floor retail requirement where appropriate.

As with the market for residential and office, if the retail market does not exist, or if there is not a sufficient level of pedestrian and vehicle traffic through an area, mandated first floor retail may not succeed. This requires patience, as the development of a strong design and increased density in the area may bring success to the retail element only long after it is built.

Where appropriate, the public sector may find it necessary to support affordable housing in the transit area, so that future development does not price out current residents. Furthermore, the public sector may see it as valuable to require the private developer to provide public paths and arcades to link from the development to the transit station.

4.5.2   Type 3: The Unfinished Grid

In the station area with the unfinished grid, there is often plenty of opportunity to fill in the grid by redeveloping existing parking lots and empty lots. There are two major challenges here. One is to ensure that there is a market for development to come and the other is to provide any necessary incentive to ensure that the development is appropriate for the transit. Often, the existing elements of the unfinished grid are inappropriate to transit – developed in the days of the urban modernist movement that put security and architecturally bold statements ahead of the people who would use the buildings and the streets. Retrofitting the existing grid and providing the public realm within the public right of way is a significant start for spurring development and renovations that will bring people back into the unfinished urban grid. Retrofitting can include supplementing the grid with additional pedestrian connections, building a smaller grid to break up large blocks, as well as re-establishing existing grids where they may have been broken apart.

The unfinished grid will benefit significantly from growth management tools that push growth away from the fringes and make downtown redevelopment more palatable for those looking for new development sites. It is likely that the risk-taking developers will be the first to return downtown, but if recent successes in many cities around the world (San Diego for example) are any sign, there will soon be plenty of opportunity for more risk averse developers and their more traditional financiers to invest. Therefore, public incentives and public participation in development may be a necessary element to tip the financial scales towards developing in the unfinished grid.

4.5.3   Type 4: The Suburban Model

The suburban model must break from the pattern of past development in the transit station area. If the station area is tightly surrounded by a suburban network, only the nearby joint-development sites may be available for redevelopment. Still, planning beyond this area for any empty or changing lots will ensure that the transit-oriented model permeate beyond the station and become a part of the accepted landscape.

In the suburban model, the transit-oriented model can be more suburban than in the unfinished grid, and can focus on additional housing that is higher in density than the existing grid. But it is still possible, as was done around San Antonio and Whisman stations in Mountain View to fill in the suburban model with a grid-like suburban system of housing. Or, if appropriate, the suburban model infill can come in the way of new retail or office opportunities.

Depending upon the market, the public or the private sector can be the one to provide the investment in infrastructure. Regardless of who pays, the public sector should set up the street network to set the scale of development, and all developers should be required to conform to this street network.

4.5.4   Type 5: Wide-open Spaces

With wide-open spaces, there are infinite possibilities for creating a new sense of place around a transit station. The plan will spur private development by setting the public sector expectations and the public infrastructure needs for the area. Depending upon the market, the public or private sector may pay for and install the infrastructure. But, the scale of development, as with the suburban case, will be set by the public sector plan. There may also be a need for developing requirements about mixing uses including housing and offices so that the area does not become a single use district.

If appropriate, a wide-open space may be an ideal location for a new destination site, like a large retail site that will draw visitors by both automobile and transit. But, the parking ratios should be limited so that this project will discourage automobile trips and encourage those who live and work by other transit stations to use the transit to access the new destination. Even a large retail site should abide by the density and design standards that are appropriate for transit-oriented development.

Often, in the wide-open space, the scale of development will be more suburban than in the unfinished grid, but a new dense grid center could also be built if it is deemed appropriate. In any case, a mix of uses is ideal. The level of public sector subsidies necessary to get a mixed-use project must be set by the particular market conditions under which the area is developing, and the speed by which the public sector feels it is necessary to see development. Often, it will be better to put a plan in place and, as long as there are growth controls in other parts of the region, the market will be there when regional growth is necessary.

Table 4-1: Elements needed for development near transit

	All Types	Type 3: Unfinished Grid	Type 4: Suburban Model	Type 5: Open Space
PRE-EXISTING NEEDS	Market for housing, retail and offices.	Limits on growth elsewhere.		Limits on growth elsewhere.
TYPE OF PLAN	Design and density	New housing and retail, with more office.	New circulation plan. Streets to set the scale of development	New roads and infrastructure to set the scale of development.
TYPE OF ZONING	TOD Zoning Required retail on ground floor where appropriate	High FAR No setbacks Limited parking	Medium FAR Minimal setback Limited parking	Medium FAR Minimal setback Limited parking
PROP. FAR		3.0 to 10.0	1.0 to 6.0	1.0 to 6.0
PROP. HEIGHT		Scale down from station	5 – 10 stories in most cases	5 – 10 stories in most cases
PROP. SETBACKS	No superblocks Break up blocks into smaller buildings	Retail on street	Limited front yard No side yard or minimal side yards	Limited front yard No side yard or minimal side yards
PARKING LIMITS		No parking without hardship	1 per resid. unit 2 per 1000 sf off.	1 per resid. unit 2 per 1000 sf off.
PUBLIC SECTOR INVESTMENT		Streetscape Infrastructure	Street patterns	New roads and infrastructure
PUBLIC SECTOR SUBSIDIES	Programs to reduce cost of housing	Bonuses for housing	Infrastructure Incentives for TOD	Mixed-use bonuses if needed
PRIVATE SECTOR PARTICIPATION	Links to transit Pedestrian amenities		New road patterns Infrastructure	New road patterns Infrastructure

4.6   BALLSTON AND ALEWIFE: TWO STATIONS REVISITED

The models developed in this chapter establish a new framework for using the issues that created such different results at station areas around Ballston in Virginia and Alewife in Massachusetts, that were introduced in section 1.1 off chapter 1. Ballston station, part of a grid in suburban Arlington has a strong market and was the beneficiary of strong planning. But, it was the joint-development project at the station, the support of the community for additional housing, and the opportunity for developers to significantly increase density with new development that worked to change the landscape around Ballston. At Alewife, a suburban model area without a strong street grid, the planning has been in place, but a few problems persist:

♦ In the very political Boston area the system has relied too much on process and not enough on regulation.

♦ Institutional capacity in the City of Cambridge planning department has not been successfully transferred to a stubborn development community

- No public sector entity has attempted to participate in joint-development, change circulation patterns or provide incentives for walkability and reduced parking.

While planners in Cambridge probably understand the elements of good station area design, and they have plenty of station area plans and examples to draw from, they have not been successful at applying them to station area projects in the Alewife area.

These theoretical models can be best illustrated when applied in the setting of a region that has limited history of compact development, but a desire to change land use and transportation patterns. Therefore, the final chapter of the thesis applies the framework from this chapter to the land use program and some individual station areas on the Tren Urbano system in San Juan, Puerto Rico. In the real life political world of San Juan, the framework will need to meet the needs of the many political players in the San Juan land-use game.

> " The startling truth about San Juan, a metropolitan area of 1.4 million people in
> Puerto Rico, is that most of it looks like New Jersey. It is a landscape of ugly
> roadways lined with strip malls, American franchise restaurants, and glass office
> towers overlooking impenetrable limited-access highways."
>
> - Alex Marshall[130]

5 STRATEGIES FOR TREN URBANO

5.1 INTRODUCTION

This chapter will apply the conclusions from Chapter four to Tren Urbano, the new rail system under construction in metropolitan San Juan in Puerto Rico. The San Juan area has a number of typical issues of a sprawling metropolis that is retrofitting for rail. It also has a number of unique political and cultural issues that effect the ability to introduce transit-oriented development to the existing metropolitan fabric. Sections 5.2 and 5.3 will address the existing San Juan landscape. Section 5.4 will outline a new development process proposal for Tren Urbano. Section 5.5 will look at three station areas and provide specific recommendations for guiding new development in each station area.

5.2 BACKGROUND

5.2.1 History of San Juan

San Juan has the distinction of being the oldest city in the world that flies a United States flag. The historic old city of San Juan sits at the northwest quadrant of the island of Puerto Rico. Puerto Rico is an island of about 3400 square miles, a little over half the size of Connecticut. Puerto Rico is 1000 miles southeast of Florida in the Greater Antilles archipelago of the Caribbean Sea. Christopher Columbus first landed on Puerto Rico during his second voyage in 1493, and found the 50,000 Taino Indians living on the island. Under the leadership of Juan Ponce de León, the city (then called Puerto Rico or 'rich port') was the most important Spanish presence in the Caribbean. In 1539 the Spanish began construction of a huge fort at San Juan that still stands at the edge of the historical old city. From its first independence revolt in 1868, the island has struggled to find its role in the international arena.[131]

After the Spanish-American War, in 1898, Spain ceded Puerto Rico to the control of the United States where it has remained ever since. Puerto Rico was later declared a US territory and its citizens were granted US citizenship in 1917. The citizenship

---

[130] Marshall, Metropolis article 10/01
[131] History of Puerto Rico timeline website: http://welcome.topuertorico.org/history.shtml

allowed Puerto Ricans to immigrate to the mainland United States in search of better opportunities.[132]

In 1948, Luis Muñoz Marín campaigned for governor under a platform of industrialization for Puerto Rico. The idea of his program, called 'operation bootstrap' was to bring the industrial opportunities that existed on the mainland to the island. Until this point, Puerto Rico mainly relied on an agricultural economy that left most of the island in poverty. The new program would be the start of an industrialization policy that would give Puerto Rico many advantages in securing US manufacturing operations. In general, US companies were given the ability to locate manufacturing in Puerto Rico, a land of lower wages and limited unionization in exchange for a waiver of federal, commonwealth and local taxes. The manufacturing companies also had the advantage of being in an offshore location with the protection of the US military and the reliability of the US postal service. Manufacturers complained only about US *cabotage laws[133]* which elevate the cost of shipping goods to and from the US mainland.

Puerto Rico received its current 'commonweath' status in 1952, and has remained under this system ever since. Popular votes on the island to settle the future of the status with the United States have consistently supported continued commonwealth status. The first vote was in 1967 (60% for commonwealth, 39% for statehood, 1% for independence), and another occurred in 1993 (49% for commonwealth, 46% for statehood, 5% for independence). The most recent vote, in 1998, allowed for Puerto Ricans to choose four different options between statehood and independence. 46% chose statehood, but 50% chose 'none of the above', confirming a slim majority for the current arrangement.[134] So, while Puerto Ricans consistently confirm the existing arrangement, it is often viewed as the most palatable of three not-so-ideal options.[135]

Under the commonwealth arrangement, Puerto Ricans have US citizenship. They have been, and can potentially be, drafted to serve in wartime for the United States. They are able to keep their primary Spanish language and Latin American culture without worrying about movements on the US mainland to mandate English-only education in the United States. Yet most Puerto Ricans learn both Spanish and English, using Spanish in daily conversation and English in some business dealings. They receive some financial benefits from the federal government, but do not participate in many US government programs. They pay relatively high taxes to the Commonwealth, but they don't pay income taxes to the

---

[132] History of Puerto Rico timeline website: http://welcome.topuertorico.org/history.shtml

[133] Cabotage regulations limit the ability of ships to carry cargo between ports of the same country unless they are flying the flag of that country. In the US, cabotage is regulated by the Merchant Marine Act of 1920, also known as the Jones Act. (The Jones Act should not be confused with the Jones-Shafroth Act of 1917 that gave Puerto Ricans citizenship in the US). The Jones Act, requires that all vessels transporting cargo between two U.S. ports be built in the United States, crewed by U.S. mariners, and owned by U.S. citizens. Therefore, foreign flag vessels shipping goods between Caribbean ports cannot load goods in San Juan and take them to the US mainland. While this helps the US merchant marines, it limits the efficiency of maritime transport. Therefore, manufacturers complain about the effect of the Jones Act on their ability to negotiate low cost shipping rates to and from Puerto Rico.

[134] History of Puerto Rico timeline website: http://welcome.topuertorico.org/history.shtml

[135] While we call Puerto Rico a Commonwealth, in Spanish the Puerto Ricans use the term "Estado Libre Asociado de Puerto Rico" that translates literally into "Free Associated State of Puerto Rico."

US government. They have no voting representation in the US Congress. As an independent commonwealth they have their own representation in international competitions such as the Olympics and the Miss Universe Pageant.[136]

Legally, the people of the Commonwealth of Puerto Rico falls under the constitutional protections of the United States, and they are bound by US Supreme Court and First Circuit Court of Appeals decisions. Although their legal system is based on the same English-common-law based American system, they write all their laws and regulations in Spanish and only some are translated into English. But, this framework allows Puerto Rico to utilize the same basic land-use tools that are used in the mainland United States, and limits Puerto Rico to the same land-use limitations and legal restrictions that the US Supreme Court has set for the United States mainland.[137]

5.2.2   San Juan Development

The San Juan metropolitan area developed rapidly during and after the post-World War II economic recovery. With the new economic opportunities in the US mainland and additional benefits from Operation Bootstrap, the Puerto Rican economy found strength in industrial production and the result was a migration from rural areas of Puerto Rico to San Juan and its metropolitan area. Following the pattern of US mainland cities that rapidly expanded during the post-war period, San Juan rushed to build new highways, arterial roads and subdivisions. The result, beyond the historical old city and the traditional center at Santurce, is the development of an auto-oriented sprawlscape that looks little different than any other American suburban landscape.

The design elements that dominate include highrise buildings that are unfriendly at the ground level, surface parking lots in the downtown area, a sea of single family homes covered in gates, gated suburban communities, strip malls, shopping centers with huge parking lots, garden apartments and drive-thru pharmacies. The entire urban fabric is overwhelmed by an obsession with security. Where neighborhoods are not gated, every house is. Parking lot operators pay security details to watch over vehicles.

The redeeming design elements are in the old districts of the city. But nobody has seen to copy the fabric of Old San Juan or Santurce to bring a new development pattern into the suburban fringe. Instead, new development follows the suburban sprawl pattern.

---

[136] Most of this information is from: http://welcome.topuertorico.org/government.shtml. Puerto Rico's entry has won the Ms. Universe pageant in 1970, 1985, 1993 and 2001.
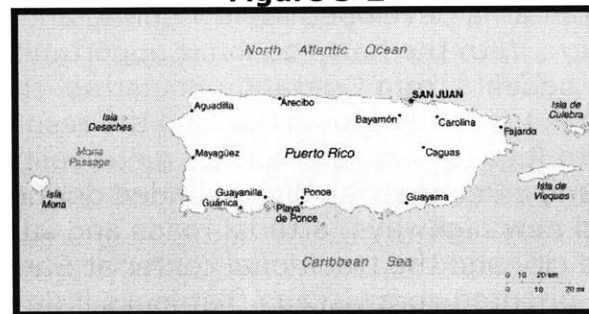[137] Information from various interview sources in Puerto Rico

Figure 5-1
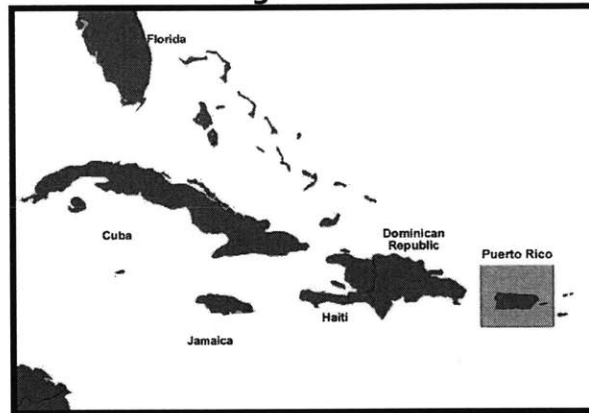
**Puerto Rico one of the islands of the
Greater Antilles archipelago.[138]**

Figure 5-2

**San Juan, the capital of Puerto Rico is a
port city on the northern coast.[139]**

5.2.3   Current Issues

With the sprawl in San Juan has come a series of problems. The metropolitan area today is a strange hybrid of issues from US and Latin American culture. Traffic congestion is legendary. The area has a strong auto-oriented feel. While there are public transportation options, they are all rubber-tire systems that, save for one contra-flow bus lane, get stuck in the same traffic as the private automobiles. Bus route maps and schedules are like the *coqui*[140]: while everybody is sure that they exist, finding one is almost impossible. Private jitneys called *publicos* run on fixed routes, but do not have fixed schedules. Jitneys often do not run after the mid-afternoon, limiting their use for many types of trips.

The industrial economy that supported Puerto Rico for many years is moving on to places with cheaper labor and less threat of unionization. International trade programs that have brought new tax protection for locating in Mexico or Central America has reduced the need for US companies to seek the protection that has

---

[138] Map from Lehman College at CUNY: www.lehman.cuny.edu
[139] Map from PR tourism web site: http://welcome.topuertorico.org/government.shtml
[140] The coquí is a small frog native only to Puerto Rico. It is easily heard all over the island, but it is so small that it is rarely seen.

been available on Puerto Rico. The island has looked to replace its manufacturing economy with a service-based economy.[141]

Traffic congestion, and the associated problems of automobile dependence, are a huge issue in Puerto Rico. Puerto Rico has the highest density of vehicles in the world, over 4200 vehicles per square mile. The traffic congestion problem is only getting worse. Daily vehicle trips, currently numbering 3.2 million, are projected to rise 45% by 2010.[142]

5.2.4   The Vision of Tren Urbano

The Tren Urbano system will bring a new mass transportation alternative to the San Juan metropolitan area when it opens in 2003. The system will link 16 stations over a 17.2 kilometer route providing links between residential and commercial areas with a high population density and traffic congestion. The system will use modern electric rail transit cars with third-rail technology and a 55 mile per hour maximum speed along a fixed guideway. Most of the guideway is elevated, but some sections are at grade and underground.

The system starts in the municipality of Bayamón, west of San Juan. The westernmost station is located near the business center of Bayamón, but also near the convergence of highways PR-5 and PR-29. This station will offer the opportunity for commuters to exit the highways, park at the station and connect by transit to the business core of San Juan. The transit line continues eastbound towards San Juan, serving a coliseum and baseball stadium as well as the Bayamon judicial center, and a number of stations in the suburban communities of Bayamon, Guaynabo and western San Juan. The system serves the medical center, and then turns to the north. It runs under the dense fabric of the old center of Río Piedras, then past the University of Puerto Rico campus at Río Piedras with a stop at the university. The system then serves the business core of San Juan with a number of stops, before ending at Sagardo Corazón. A future expansion has already been approved to extend the train into the Minillas government center area in Santurce, the older business district just east of Old San Juan. Future extensions could bring the main line to Old San Juan and could create additional spurs to serve suburbs to the south and the east as well as the airport. But, other than the Minillas extension, these future plans are not yet complete, and no decision has been made on which extension will be pursued next.

Tren Urbano is more than just a rail system. It is a new way of thinking about transportation for Puerto Rico. While the first segment is only ten miles long, it can serve as the basis for a new transportation and land use arrangement in greater San Juan. Six key elements must come together for the success of the Tren Urbano system:
1. The San Juan metropolitan area economy must remain strong enough to continue to support metropolitan growth.

---

[141] Despite its location in the tropical Caribbean, tourism makes up only a small percentage of the Puerto Rican economy.
[142] Tren Urbano brochure

135

2. The system must use the bus and *publicos* as feeders, bringing passengers to the train to use through the most congested portion of the urban and suburban system.
3. The system must provide easy access for commuters who will drive to some of the outer stations and switch to the train to reach additional destinations.
4. The planned expansions on the system must be built, allowing for additional levels of regional accessibility to be adapted over time.
5. The system must be perceived by the public to be safe, clean and reliable.
6. The commonwealth, the municipalities, the transit authority and the private sector must focus land development efforts towards the land near the stations, building ridership demand as it builds station area developments.

While the first five elements are outside the scope of this thesis, the application of the design strategies in the thesis will be applied as a format to achieve the sixth goal.

Figure 5-3

Tren Urbano Phase I with Phase IA extension at the northern end.[143]

Figure 5-4

Planned extensions.[144]

---

[143] Map from Tren Urbano office
[144] Map from Tren Urbano office

136

5.3   THE SAN JUAN METROPOLITAN AREA DEVELOPMENT PROCESS

5.3.1   Regulatory and Policy Framework

The land use and zoning regulation system in Puerto Rico provides the opportunity to institute a regional 'smart growth' style land use regulation system, if there is political will to do so. Unlike most of the states on the US mainland, the Commonwealth government controls the ability to award zoning powers to individual municipalities. The Commonwealth's overarching planning agency, the Junta de Planificación (Planning Board) grants zoning authority to municipalities only when they have a pre-approved comprehensive plan. The planning board answers directly to the office of the Governor, and is led by seven appointed members. This system allows for the planning board to ensure that municipal comprehensive plans account for regional issues.[145] Yet the ability to control and direct growth is still limited by the political pressures that may be placed on a governor and passed to that governor's planning board. There is widespread frustration with the planning board within the planning and development community. Despite their power, the board has not exercised its full political power to control development. In the words of one architect, the board could be "much more innovative". A local planner suggested that the "planning board has not planned anything since it has been created."[146]

Despite the presence of a central planning agency, standards for setbacks, densities, heights and linear frontages, all issues that would be covered through detailed zoning and design guidelines have been conspicuously absent in the development of San Juan and the metropolitan area for the past forty years. New comprehensive plans like the plan at San Juan and the new Smart Growth plan for Puerto Rico by Estudios Técnicos suggest that Puerto Rico needs such clear guidelines.[147] While there has been discussion on additional restrictions for Tren Urbano stations, such as minimizing parking and requiring minimum densities and setbacks on some lots, these have also not been codified at this time.

The legislation that controls the planning process and municipal rights and responsibilities is called the Independent Municipalities Act of 1991. The Act spells out the details of what Puerto Rican municipalities must do to gain independent zoning control. The act allows municipalities to use innovative features such as transferable development rights, linkages, reparceling, designation of community facilities and exaction.[148] At this time, in the current Tren Urbano service area, the municipalities of Bayamon and Guynabo have received independent status, while the municipality of San Juan has recently submitted its plans for approval.

Each plan is approved for eight years, and then it must be reapproved. The process for developement must be approved every four years. It is hoped that this system

---

[145] Luis García interview, 01/02
[146] Manuel Delemos and Javier Bonin interviews, 01/02
[147] Javier Bonin and Criseda Navarro interviews, 01/02
[148] Independent Municipalities Act of 1991, Chapter 13, as codified in 21 LPRA section 4626

will keep every new local and commonwealth administration from changing the review process and the plan.[149]

The San Juan plan was developed by planner Javier Bonin over the course of 2.5 years. During that time, San Juan kept a building moratorium in place over land on the southern fringe of the city. The plan includes a number of innovative ideas that are suggested for Tren Urbano station areas, including:
♦ Minimum housing requirements in the station areas
♦ Station areas as receptors of transferable development rights from the fringe
♦ Reduced setback requirements
♦ Linkage requirements for areas where future office development may create an upward pressure on the price of housing[150]

Some people, like Luis García of the planning board have an issue with the transferable development rights program. García suggests that requiring transfer of rights to get the highest densities in the transit area will reduce the likelihood that the projects they want will become a reality. In an atmosphere where the government must do all they can to encourage new development patterns, requiring developers to buy the rights for density will put additional hurdles in front of developers that may otherwise be willing to take a risk with a different type of project. The transit system and the municipality need to do everything they can to make it easy to do high density development in the station area.[151] Another potential concern is that linkage may have a negative impact on potential development in the station area if it is only applied near stations. To encourage the best development, the municipality must not establish regulations that make it too difficult to develop near the station.

Despite the level of municipal independence allowed under the law, the Planning Board retains the right to take back the planning responsibilities where it deems appropriate. The planning board, at this time, intends to retain or regain control of the land within 500 meters of each of the Tren Urbano stops. The board will create new zoning and/or overlay districts for the station areas with the assistance of the Tren Urbano planning staff.

5.3.2   Development Community

According to Graham Castillo from Estudios Técnicos, developers in San Juan are interested in building around the train. Some land speculation is already happening in the Tren Urbano station areas. But, market issues may create challenges for development around the transit stations, particularly development of housing.

Castillo explains that the buyer of residential land in San Juan does not want to pay much for it. The apartment market is not strong. Unless the location is a prime upscale condominium site, like in Condato, the buyer does not want to live in an attached unit. Furthermore, developers who do housing have a set development

---

[149] Javier Bonin intervew, 01/02
[150] Bonin interview, 01/02
[151] García interview, 01/02

formula. A developer of housing in the fringes of the metro area can make a 20% return on investment with a high absorption rate cycle.

Mixed use projects provide additional challenges to developers in Puerto Rico. The developers on the island do not have the experience to do them, and the real estate finance industry is reluctant to finance such projects unless there is a way to reduce the project risk. Most projects in Puerto Rico are financed locally. Without locally comparable projects, it is difficult to finance these unique developments.

Luck has not been with the condominium highrise and the mixed-use project in Puerto Rico. The few that have been tried were done towards the end of the development cycle, resulting in problems with fianance. At this point, the only condominiums being built are high-end luxury units.[152]

Castillo does suggest a few opportunities that the development and lending communities may see for projects in the station areas. First, there is an underlying demand for additional government facilities and offices in the San Juan metropolitan area. These offices and service centers should be located near the stations. Public corporations such as utilities that currently have offices located in retail shopping centers could also move these offices to transit station areas. There is a need for more low-income housing, but how much should go near stations is a matter of debate. There is an opportunity to fill a small niche for market rate housing, but this niche will only work for a station areas that are developed into unique destination places.

The greatest challenges for making transit-oriented development work for the developer and finance community include:
♦ Finding developers who believe in mixed use projects or places
♦ Proving that the market exists
♦ Convincing the parties to participate and that they will make money
♦ Finding or creating developer experience in mixed use projects

Tren Urbano has already begun to look for development opportunities for land they own near the station. While reserving the right to refuse all bidders, Tren Urbano has put out a request for proposals on a number of different transit sites ranging from the development near the core and the waterfront by the northern terminus of the system to the industrial and office property that Tren Urbano has acquired by Martínez Nadal station. At this time, it is unclear what criteria Tren Urbano will use in identifying their joint development partners for these project,s but the staff is focused on the idea that this is about more than just revenue raising, and that projects must enhance the rail travel experience.

5.3.3   Development Process

The existing development process in Puerto Rico requires the presentation of variances to the planning board through a locational inquiry process. Personal

---

[152] Castillo interview 01/02

negotiations are popular. Sometimes political or economic influences impact decisions. There is a short turnaround for the process, and many elements are often overlooked. The result is that there is no clear system of consistency for developers, and no certainty of approval or disapproval of a given idea in a given location.[153]

Design review has limited history in Puerto Rico. Most projects have no formal process. Some process of approvals for variances are in place, but they still don't require a review of building and site design. The few areas where review are required are areas of historical significance like in Old San Juan. In the old district, projects need to be reviewed by the Institute of Culture. Federal funds require additional reviews through the Historical Preservation Office. Even the City of San Juan and the tourist office will review these projects. But none of these are 'official' design review processes.[154]

The plan for station area project review looks more promising, although it lacks a formal design review. Yet, without a process that limits high density development in inappropriate places away from the stations, the station area planning process may not have the full effect of moving the development patterns completely into the Tren Urbano corridor area.

The new process for projects to be built in station areas is as follows:
1. Project plans will be submitted to the Planning Board
2. The board will provide a copy to the Tren Urbano office for approval
3. The board will request a presentation and/or meeting from the developer. The board can ask for a public hearing
4. The board will collect input from meetings and from hearings as well as from Tren Urbano
5. The board will have final approval, but will not approve projects without the sign-off from Tren Urbano.[155]

5.3.4   *Public Institutional Capacity*

In the San Juan area, the design and planning communities have embraced the concepts of smart growth and transit-oriented development, the regional land use framework can support such plans and the zoning enabling legislation is innovative enough to allow creative planning. Yet, it may be difficult to change habits, lifestyles and personal preferences. The niche of supporters for living and locating workplaces near stations needs to be identified.

Additional professionals who participate in government decisions must be brought into the station-area planning process. This could include road engineers, economic development agencies and leaders in any government agency that makes land-use decisions. Recently, the government insurance agency completed a building near the Cupay station that is nothing short of an environmental and urban planning

---

[153] Luis García interview 01/02
[154] Based on interviews with Manuel DeLemos and Andrés Mignucci, 01/02
[155] Manuel DeLemos interview, 01/02 with some information from the Luis García interview 01/02

disaster. The effect on station area design and on the remaining nearby natural areas is completely counterintuitive. Yet the building was proposed, designed, approved[156] and constructed. Surely, this suggests that there isn't a 100% commitment, even at the government level, for a station area planning program that respects the principles of good station area design.[157]

Residents, business leaders and other decisionmakers who understand good station area design are still few and far between. Some have decided that the train will never have an impact on urban form. The problem with this thinking is that it is a self-fulfilling prophecy. There is nothing more dangerous than a widespread belief that station area design and a compact urban form cannot work in Puerto Rico. Such defeatist ideas will not prompt confidence from developers and the finance community. Yet, the development and finance community on the island may not believe that a niche market for station area development is real. If this is the case, at least the Commonwealth should work to find developers and a finance community off the island that believes in the future advantages of building near a transit station in a metropolis with mind-boggling levels of traffic congestion.

5.4   OVERCOMING THE ISSUES

5.4.1   Political Considerations

In Puerto Rico, the current governor is very committed to high quality developments in the Tren Urbano station areas. The city of San Juan has proposed a land use plan that focuses development around the stations. The Tren Urbano staff has extensive understanding of the opportunities for new development around the station areas and the Planning Board is committed to participating in this process.

The greatest challenge at Tren Urbano is the fragmented form of planning and regulatory decisionmaking related to station areas. The Tren Urbano staff and the Planning Board need to establish a strategy for station area design. Chapter four outlined elements to review when developing such a strategy, based upon the case studies and the design elements that were reviewed in the thesis.

Two conclusions are most important:
- Government leaders must choose the proper balance between development process and development regulations for the station areas. This decision is often based upon the nature of the political system and the influence that it has on existing development projects.
- Government leaders need to address the condition of the development community and the institutional capacity amongst the public participants and agencies that participate in the station area development process. This assessment can formulate the basis for a strategy of increasing the feedback

---

[156] Some of the approvals were after the fact, and the subject of a lawsuit that was decided against the developer. But, the building construction continued anyway.

[157] I suggest that everybody who has any participatory role in the planning of station areas be given a copy of Christopher Alexander's "A Pattern Language".

loop that supports additional development capacity and institutional capacity for understanding and developing station area developments.
The Tren Urbano system must be placed in the right context based on these conclusions to understand how to develop the station framework.

While the institutional players are on board at this time, the political nature of the development process as it currently works is still a concern. Private development may continue to be approved at the whim of planning board members or municipal agents who are allowed to provide variances. This system does not ensure that private developers are in conformance with a master station-area plan. Essentially, the station areas, as well as the entire metropolitan area, need to be insulated from political decisions about land use. Therefore, on the continuum from development regulation to development review, the system in Puerto Rico would benefit from a clear, stricter and more prescriptive development regulation system to require certain elements in station area design. A review process, including a review of design elements, can also be a part of the process, but this should only come after a project is in compliance with significant regulations set in place to ensure that the project meets the basic standards for good station area design.[158]

The feedback loop that connects development capacity and institutional capacity also needs to be strengthened. Currently, the capacity for understanding and implementing station area development is strongest with the planning staff at Tren Urbano. Other public sector participants also understand the need for good station area design.[159] Capacity for mixed-use pedestrian oriented development is limited within the development community in Puerto Rico. With a few notable exceptions, success in pedestrian-oriented development has been difficult to come by.[160] The feedback loop that has been successful in other cases provides insight into a strategy that should work for Tren Urbano. The capacity for good development can be transferred to the development community by creating successful joint development projects. While these projects should not be exempt from the regulations suggested above, they should also be packaged with the assistance and support of the Tren Urbano planning staff. Any support that is necessary, whether architectural, financial or moral, should be provided to any developer who wants to create projects in the joint development area within the guidelines of the station area plans. Developers who participate in these early projects should have their risk reduced by public support and participation. After establishing the capacity to finance, design, build and manage these projects, the developers can also work

---

[158] Boston Massachusetts and Curitiba Brazil both are cities with a strong risk of political influence in the development process. In Curitiba, the government has instituted a strict regulatory system that focuses development near the transit stations. The regulations in Curitiba are enforced by a planning department that will not bend the rules. The result has been a transit-oriented development pattern as illustrated in figure 1-1. In Boston, where development relies much more on process than regulation it has been difficult to spur good station-area design projects out of the downtown core.
[159] None of the many people interviewed in PR for this thesis disputed the need for pedestrian-oriented places around stations.
[160] This is confirmed by Graham Casillo in an interview (01/02). One noted exception is the Centro Europa in Santurce. This project was developed by a local developer, and is a significant addition to the pedestrian-oriented atmosphere in the area. It will also soon be a transit-oriented development when the Tren Urbano extension reaches this area.

with projects on private parcels with a similar level of success. The finance community will also be more supportive when initial projects are successful.

As an example, the Commonwealth could establish a joint-development project opportunity on a station-area site in the Hato Rey corridor by:
♦ Committing a public-sector agency as an office tenant to reduce rent.
♦ Committing financial assistance and favorable lease terms in exchange for a developer commitment to develop mixed income housing as part of the project.
♦ Paying for public infrastructure improvements including new streets and streetscape improvements.
♦ Assisting the developer in recruiting retail tenants to the project.

The Commonwealth needs to have a way to seek out creative developers, creative finance opportunities and the people who can bring together those opportunities. While the Commonwealth must do what they can to keep as much investment as possible on the island, they should seek out opportunities for local interests to partner with outside developers when necessary. Station area projects are likely to need developers that have the experience with designing and building mixed-use projects, the financial backing and/or the support in the finance community to bring together the elements to make this happen. Like the economic development agencies of the past that brought a manufacturing economy to the island, the future of economic development in Puerto Rico depends upon building new centers around these stations.

5.4.2   A New Framework for Development

The recommendations below provide the format for Puerto Rico to adjust their strategies and ensure that the station areas develop into unique new places that become the center of activity for future development in Puerto Rico.

Regulatory and Policy Framework:
♦ The planning board should continue to pursue its plan to take control of station area planning, and should use the opportunity to work closely with planners who are currently working for Tren Urbano.
♦ The planning board and the municipalities should set specifications that will make it difficult to construct any significant level of density beyond current or future Tren Urbano station areas.
♦ The Commonwealth should approve as official guidelines a set of drawings and statements for station-area development created by Tren Urbano. These guidelines should be provided to all landowners in the station areas and all developers responding to joint-development RFPs. The elements of design outlined in chapter 2 should be integrated into the design guidelines.
♦ Specific station area plans should be finalized. There has already been a significant set of discussions on the vision for each station area. The station area plans developed by Tren Urbano should be distributed to all local land-owners and developers responding to the joint-development RFPs. Station area plans should inform the zoning restrictions based on the station type zoning framework set up in chapter four. Zoning would include: height restrictions,

floor area ratios (minimum and maximum), regulations for provision of public spaces, maximum parking allowed for various uses and use guidelines to ensure housing development and first floor retail. These regulations should be strictly enforced with no exceptions for joint development or private development projects.

♦ Public input for station-area design should be a part of the station-area planning and zoning process. This will reduce public opposition to projects in the development phase if these projects reflect the station-area plan.

Development Process:
♦ The development review system should be a fair public process that ensures station area design is properly reviewed and approved. It should be secondary to approval based upon the regulatory framework that is established.
♦ The Commonwealth should develop a formalized design review process for all projects within the station areas. There is no shortage of architects and planners in Puerto Rico who understand what good station-area planning is. These people should be appointed to a new civic design board by the governor, and the planning board should not approve any project without approval by a majority of the members of the design review board.
♦ Project reviews should proceed in the following order (see figure 5-5):
  1. Approval for meeting basic zoning by the Planning Board
  2. Meeting to collect input from the Design Review Board
  3. Approval by Tren Urbano
  4. Final approval by the Design Review Board
♦ Participants who don't hold a position of power should be allowed the opportunity to participate in planning and comment on projects to the design review board or the planning board. Each station area project should require at least one public meeting.

Public Institutional Capacity:
♦ The Commonwealth government should focus investment through the Community Development Block Grant funding program to provide mixed-income housing and business opportunities in the station areas.
♦ The governor should commit to locating all offices of the Commonwealth, its agencies and public corporations that are in the San Juan area within walking distance of Tren Urbano stations, or at least in an area with a strong bus connection to such a station. No new construction of government buildings in the San Juan metropolitan area should proceed unless they are located in station areas and meet the strict standards of design that are established in station area plans.
♦ The Commonwealth government should seek out funding for affordable mixed-income[161] housing and small business in new retail storefronts by looking to local

_____

[161] While the government may be interested in affordable housing at station sites, it should proceed with caution and make sure not to cluster low income people around the station. This would lose the opportunity to mix in market income and higher income developments in the area. Ideally, incomes should be mixed, but if this is not possible, there should be the opportunity for small low income projects without pushing away other income groups from the station areas.

banks to invigorate station areas through their commitments to the Community Reinvestment Act.
♦ The Commonwealth government should develop a program to create loan guarantees for financial institutions that lend money for local developers to do mixed-use projects.

Development Community:
♦ The Commonwealth government, Tren Urbano and the planning board should seek out mixed-use developers on and off the island for developing private and joint development sites around transit stations.
♦ Joint development should remain focused on creating station-area places as the primary factor for developer selection. Joint development should set the tone for other developments in the station area. The transit agency is required to select the best 'transit oriented' project,[162] and they should not sacrifice regional land use objectives for larger lease fees. Joint development projects should remain competitive processes, allowing the government to choose the best developer and best project only at the time that they feel ready to do so.
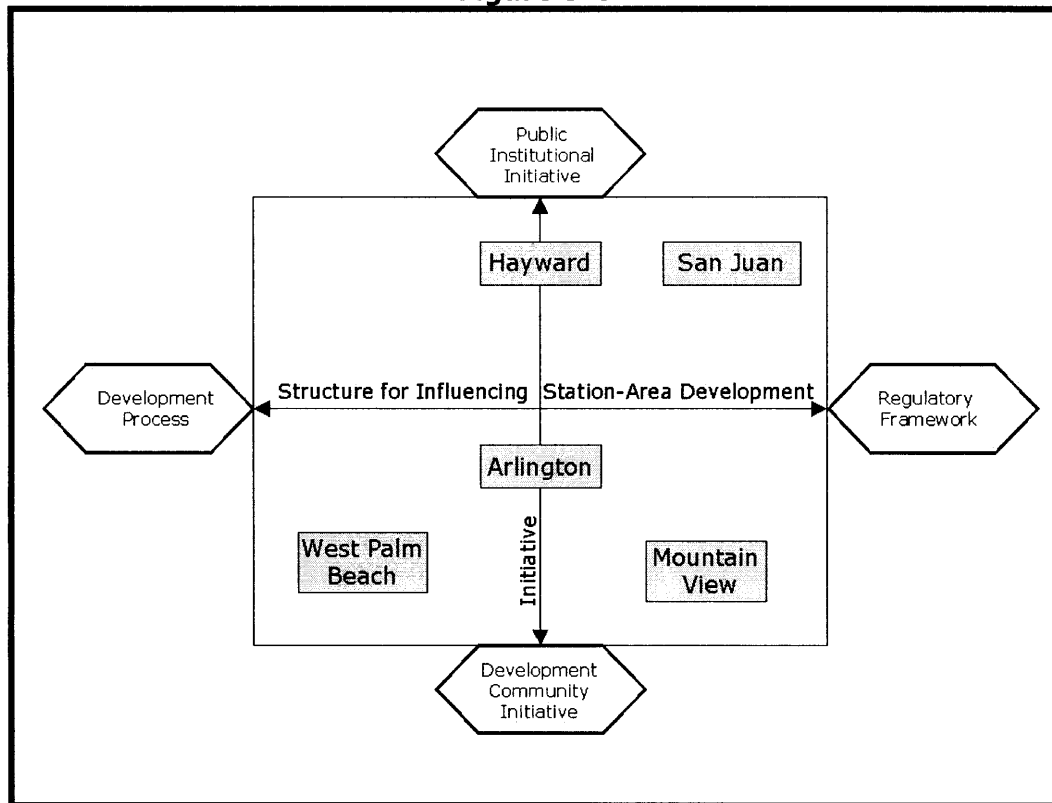
Figure 5-5
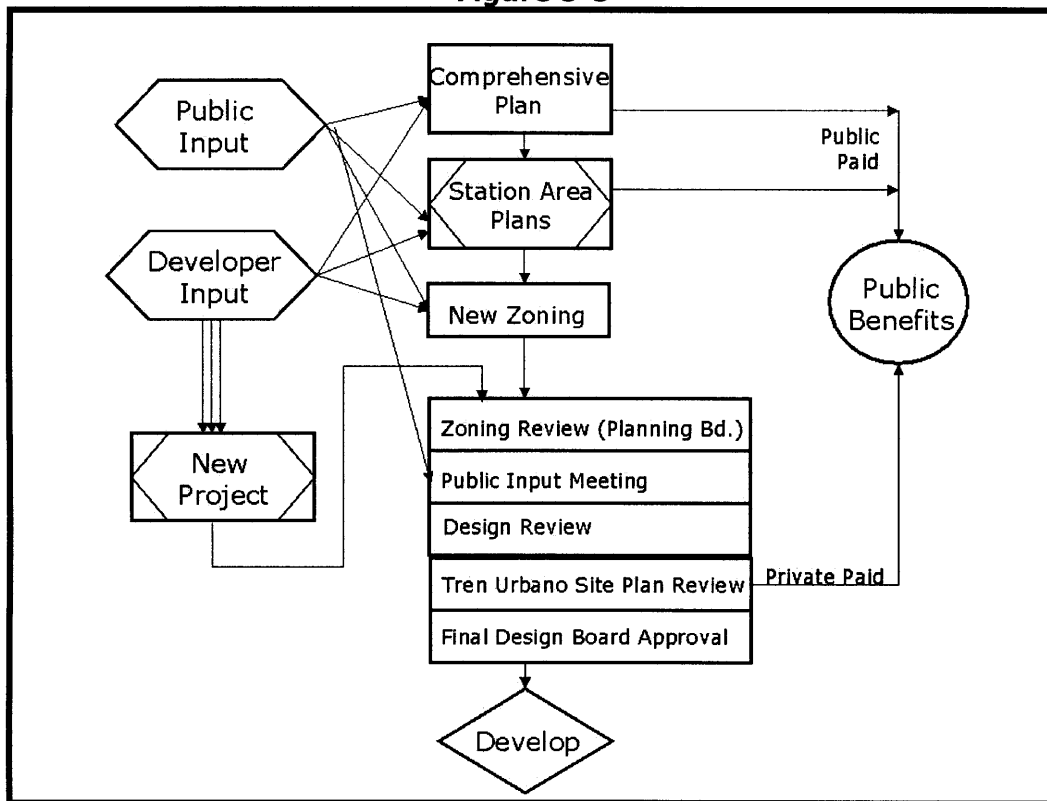
A Development Review Process for San Juan Station Areas

---

[162] Peter Albert interview, 01/02

Figure 5-6

Comparing San Juan to the Chapter Four Case Studies on the Matrix

5.5 STATION SITES

This section reviews three Tren Urbano station sites for proposed redevelopment plans. While each of these station areas have been studied in numerous reports including studies by Tren Urbano and thesis projects by MIT students, this section brings some new elements to the discussion. Discussing station area design and development within the framework of station types identified in Chapter 4, this section looks at these stations in an effort to answer the following questions:

♦ What should this station area become?
♦ What is the market and what are the market failures that will impact this goal?
♦ What specific public and private incentives can be brought to the station areas to encourage private and joint development projects?
♦ What roles should the public and private sector play in development?
♦ What zoning and land use regulations should apply?
♦ How should the station area be marketed to future developers of private and public land?
♦ What should the Design Review Board be concerned about in this station area?

5.5.1 The Unfinished Grid: Roosevelt Station

Roosevelt Station sits in the heart of the Hato Rey business corridor, the center of the financial district of San Juan. East of the station exits are the two major north-south routes that serve the business district, Avenida Muñoz Rivera and Avenida

146

Ponce de León. Each street provides service for traffic, which is becomes gridlocked during the workday. Buses run on both streets in contra-flow lanes, opposite the direction of private vehicle traffic. This system allows the buses to remain out of the main traffic activity.
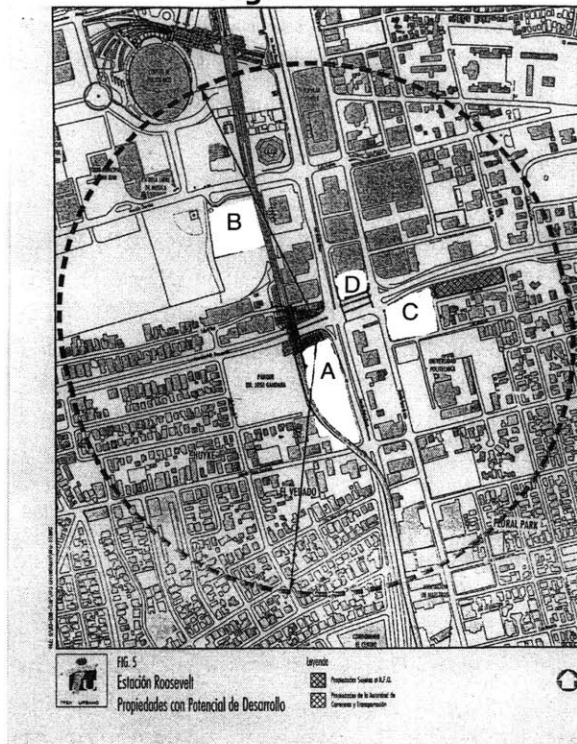
5.5.1.1   Existing Conditions

Currently, while the station remains under construction, there has been a significant amount of disruption to the public and private spaces and development sites in the station area. But, upon completion, the station will provide direct access to a number of the major financial institutions in the area, including towers for Chase Manhattan Bank, Banco de Fomento and Citybank. The Hato Rey Tower is also near the station, along with a bus terminal. The nearby Parque Gandara offers a comfortable greenspace with easy access to the station area and the nearby businesses.

Despite the buildout level of the grid in this area, there are a few opportunities for redevelopment:
- A large site (Site A), the former Metropolitan Shopping Center, is available for joint development, and located between the guideway and Avenida Muñoz Rivera.
- A large surface parking lot (Site B) sits just west of the guideway, and currently serves, among other buildings, the Hato Rey Tower.
- An automobile dealership on Avenida Ponce de León (Site C) sits a mere two short blocks east of the station exit, offers the opportunity for redevelopment into much more significant uses.
- The current intermodel bus transfer station (Site D) sits on a site that could be redeveloped to combine these uses with additional space for other uses.
- In addition to these sites, there are at least six other small sites on the grid within 500 meters of the station that are vacant or are being used for surface parking at this time.

Figure 5-7

**Existing conditions and sites available for
redevelopment at Roosevelt Station.**

5.5.1.2   Proposed Interventions

Each of the available redevelopment sites near the station provides an opportunity to transform the elements of the station area into a new pedestrian-oriented mixed use urban center. The base elements are there in the existing structures. Many of these structures are office towers with retail elements. Where necessary, retail storefronts in these towers should be improved and upgraded. In some cases, retail stores were placed on upper levels in anticipation of the creation of upper-level pedestrian circulation.[163] Retail storefronts in these buildings should be relocated to the ground level. Public streets and sidewalks could use a complete review and improvement program by the public sector.

Roosevelt station provides a particular opportunity to bring housing into the urban core. The housing can offer a new opportunity to bring pedestrian traffic to the station area retail outside traditional business hours. Site A, the former Metropolitan Shopping Center, is a particularly good opportunity for new housing, because it borders on the existing residential neighborhood. The important principle in developing this site is that the housing on the site be oriented towards the pedestrian and avoid the need for daily driving while still offering some parking and a comfortable sense of security. A new loft-style residential component in the

---

[163] This is similar to the design elements that have failed in Rosslyn Virginia.

148

business district could attract a niche market merely by its unique style and placement.

The commonwealth's transportation department owns the site of the automobile dealership. Upon expiration or termination of this lease, the site can be redeveloped. The site could be either office or residential with first floor retail uses. Site B could also be developed for office uses.

A new vision for this area would be to create a 16 hour daily active pedestrian streetscape on Avenida Muñoz Rivera and Avenda Ponce de León as well as on Avenida FD Roosevelt between the station and Calle Chile. The residential neighborhoods beyond, particularly to the southwest edge of the radius should remain protected and affordable. Yet these areas should have the necessary pedestrian improvements to encourage users to walk to the retail and office core near the station.

Height and density need not have a set cap in this area, as there are already a number of tall towers, but the buildings need not be too tall to be successful. A condominium tower in this area may not be as successful as a well designed seven story residential building that offers a unique layout of space and amenities that can serve the needs of a young office worker, couple, family or college student.

5.5.1.3   Strategies for Design

Metropolitan San Juan would first do well to ensure that limitations on construction at the fringes continues to push demand for development to occur in the urban core. This is of particular importance as additional barriers to easy construction in the station area are set – including a more stringent review process. If possible, this station area should be rezoned to require:
◆ A limited parking quantity, yet enough parking for residential uses that it does not discourage residential construction (a delicate balance)
◆ No setbacks on the major street sidewalks and no side yards
◆ No specific height restrictions on parcels near the station, with FAR restrictions in the range of 3.0 to 10.0 (these would be a minimum and maximum for development)
◆ Required first-floor retail on all buildings fronting the two major avenues, the side streets between them and the station headhouses
◆ Public sector investment in streetscape and sidewalks
◆ Private investment in upgrading existing retail storefronts. This could be done through the provision of some public sector grant money.
◆ Funding availability for those who partner with the government to create attractive mixed-income housing on one of the station area sites.

### 5.5.2   The Suburban Model: San Francisco Station

San Francisco station is located in the southern section of the Tren Urbano right-of-way, and serves an area currently surrounded by a few government facilities and a dairy processing plant. Beyond the station area is the typical suburban

developments, grids and gated communities that dominate the San Juan landscape. Some of the most expensive homes in the San Juan area are just south of this station. Neighborhoods to the north consist mainly of small single family homes close together on small lots.

5.5.2.1   Existing Conditions

The station area around the San Francisco station includes a number of planned park and ride lots that could be converted to joint development sites (Sites A and B). South of PR-21, the main roadway in this area, is the AMA headquarters, bus maintenance building and parking area (Site C). The bus maintenance area, if ever moved, would provide a large redevelopment site between the station and existing neighborhoods. Even without moving the AMA facilities, street-front development on the edges of this site may be possible. To the north of the station are three office buildings, one that may be torn down and replaced (Site D), a Gulf service station (Site E) and a large dairy processing facility (Site F). The dairy facility is largely served by truck traffic that creates challenges for development around the area. Yet, as a large employer of working class people, it serves a potential market for users of the train.

Figure 5-8
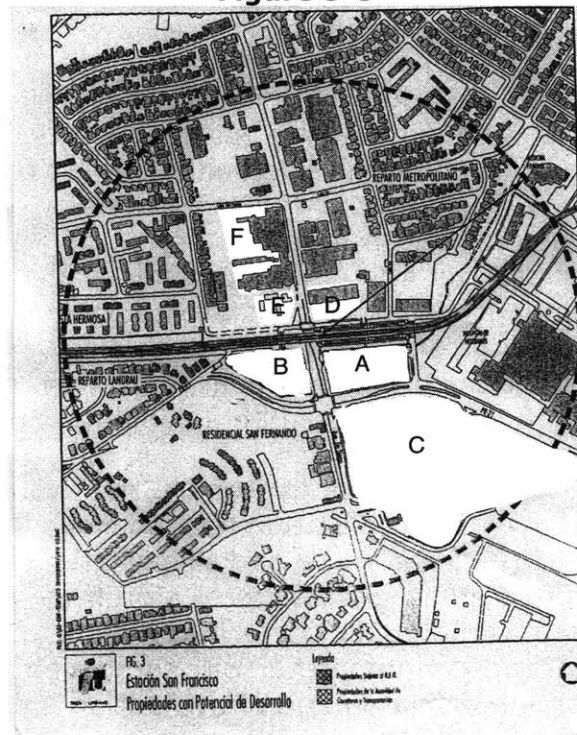
**Existing conditions and sites available for
redevelopment at San Francisco Station.**

5.5.2.2   Proposed Interventions

Large sites that are available for redevelopment here need a clear street circulation plan to ensure that they have comfortable sized blocks. Furthermore, regulations should ensure that these blocks do not become large developments that are gated, so that they do not become an impediment to through-pedestrian circulation and so that they reinforce the sense of security on existing pedestrian paths to the station.

The joint development sites closest to the station can become a new office and retail center to the station area.

The AMA facility site, if ever redeveloped could be done in one of two divergent ways, each offering an opportunity for significant new focus of attention at the station. A medium density new-urbanist style residential development could bring a mix of condominiums, townhouses and rowhouses to this area with a density and design that would bring customers to the retail sites located in the joint development projects. As an alternative, this site could become a significant retail destination site that could serve the needs of users on other portions of the transit line.

If the government office building north of the station is redeveloped, this site can be designed in a more pedestrian-friendly format by locating the building closest to the station with parking in a structure behind. The front of the building could then also provide a new retail presence along the edge of the bus and publico drop-off area.

The Gulf gasoline station site could bring significant new levels of density by redeveloping into a mixed-use project including government or private offices and first-floor retail on the street.

The dairy processing site will require further assessment. If the existing use is a significant enough density of employment so as to allow and encourage employees to arrive by transit, this may remain the best use on this site for some time into the future. With some simple upgrades to the sidewalk and the wall along Avendia Jose de Diego, this site may be able to remain as a dairy processing facility. If the Commonwealth and the Tren Urbano planning staff believe that this use would be more appropriate elsewhere, they should work with the dairy to relocate to a government owned site further onto the urban fringe, and then work with the dairy owners to redevelop the existing site. Regardless of the plan chosen, a series of alternatives should be reviewed as part of the station area planning project so that options for the dairy have buy-in from stakeholders.

5.5.2.3   Strategies for Design

This area could continue to change for the worse if development is not controlled with a new zoning regulation that regulates both the public and the private development in this area. A new zoning and design review system will encourage

development while ensuring that it is focused on the transit station. Specifically, such a program should:

♦ Restrict gated communities in this area
♦ Allow for a high FAR (1.0 minimum, but up to 6.0 maximum) but cap heights at about 8 stories.[164]
♦ Limit front yards to 10 feet for residential properties but require business properties and those with first floor retail to meet the street at all points except where providing public plazas.
♦ Provide design typologies for developers to understand the issues that will be evaluated in the design review process.

The government should also take an active role in station redevelopment in this area, coordinating the many agencies that could convert station areas sites to more appropriate uses and designs for station users. There are difficult decisions to be made about relocating the AMA garage and replacing other government buildings and these decisions may have to account for many factors. But, it is worth remembering that the success of public transportation in San Juan will depend upon building destinations around Tren Urbano stations.

5.5.3   Wide-open Spaces: Martínez Nadal Station

Martínez Nadal station is located on the southern section of the Tren Urbano right-of-way, in an area that is well served by highways as well as transit. The area is not currently a wide-open-space, but the land assembly that has been completed by the transportation agency will allow the opportunity to completely transform the station area into an entirely new land use pattern.
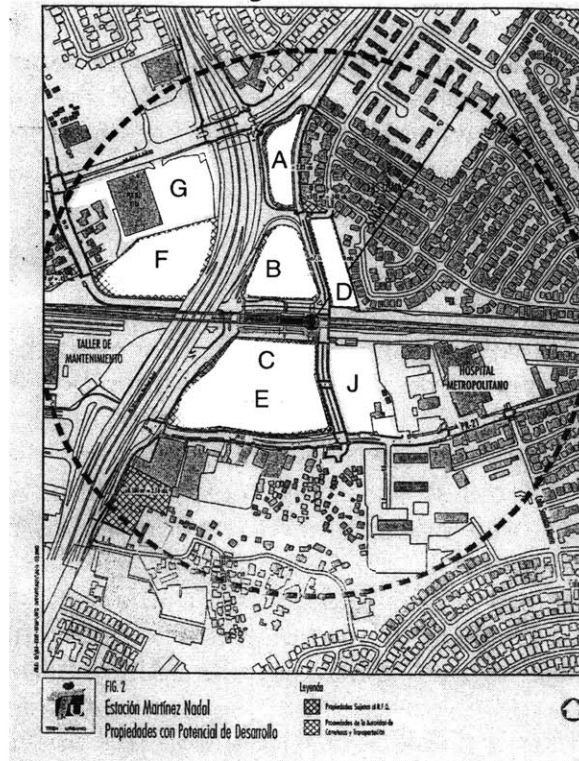
5.5.3.1   Existing Conditions

The Martínez Nadal station is currently under construction. To the west of the station is PR-20 a limited access highway called the Expresso Martínez Nadal. To the south of the station is an important but narrow arterial roadway PR-21, while another major roadway, Avenue Jesus Pinero, sits not far to the north from the station. To the north of the station are three parcels owned by the transit agency. One parcel (Site B) is a large park and ride lot that is available for joint development. Two other parcels are available for development on the edge of pedestrian connections to Avenue Jesus Pinero. One (Site A) is quite steep, while the other (Site D) backs onto an existing dense suburban residential neighborhood. Beyond these sites Avenue Jesus Pinero is currently surrounded by a number of large big-box retailers.

To the south of the station is an old area of office buildings and industrial uses. All of these buildings have been purchased by the transit agency in part for roadway realignment and new station access. Buildings in this area will be torn down, allowing for a huge redevelopment opportunity (Sites C and E). To the west of the

---

[164] This balance of FAR and height will encourage projects to fill lots and not develop as towers with large surface parking areas.

station and the highway are additional redevelopment sites (Site F), and north of those sites is a Pueblo supermarket with a large parking area (Site G). Northeast of the station is an existing suburban subdivision, while southeast of the station is an additional private site available for redevelopment (Site J).

Figure 5-9

Existing conditions and sites available for redevelopment at Martínez Nadal Station

5.5.3.2   Proposed Interventions

Most of the proposals for Martínez Nadal station are framed around development of an office complex with access to the highway and station on the parcels south of the station. This could also include some mixed residential and retail or could include a retail destination site. The parcels to the north are targeted for lower density residential development, to match the existing residential character of neighborhoods to the northeast of the site. These ideas are solid, but the developments must be broken into smaller blocks and small buildings to ensure that the design does not overwhelm the pedestrian. The walking route from the north of the station to Avenue Jesus Pinero should be framed by residential buildings. The area to the south of the station should include office and possibly residential properties, but it should also provide for the retail convenience needs of users. This should include lunchtime destinations on the street to bring people out of their buildings but not out of the neighborhood during the noontime hour.

Sites C and E are of particular concern because they could develop as an auto-oriented office park if the plan and zoning does not specify a pedestrian-oriented design. The area should be developed with structured parking on the edge of the site and narrow pedestrian-oriented streets.

Additional development opportunities are available on the empty parcel to the southeast of the site by the Hospital Metropolitano, the Pueblo Xtra supermarket parking area and the empty lot to the northwest of the station. Each of these sites could bring new housing developments with retail if appropriate. Plans should be prepared that encompass potential redevelopment at these sites. Ideally, the new joint development in this area will create new markets for the private owners of these sites to create their own proposals of transit-oriented development.

5.5.3.3   Strategies for Design

The area at Martínez Nadal will soon be wide open when land clearance on the sites bought by the transit authority is completed. A number of these sites have already been included in an RFP for joint development opportunities. Because some proposals may come back before the zoning is even secured for this area, it may fall to a very informal process to decide the future of some design issues at this station. Therefore, this creates all the more need to call for at least a temporary design review process for this work until a full design review program can be developed for all the station areas.

This area could also use a new circulation plan that creates internal street netowrk on the joint development and private development sites, allowing large sites to be connected to each other, and ensuring that blocks get broken apart into smaller sections. This will avoid superblock development in this area. Ideally, there should also be pedestrian connections from neighborhoods beyond the station into the station area. While some of the fringe streets such as PR-21 may not have active pedestrian frontage today, the development should reserve the ability to create it on the side that is currently controlled by Tren Urbano, and should require it as redevelopment occurs on the opposite side of the street.

While this area will have convenient access from the highway, it should not be a highway oriented office park. Specific zoning and design guidelines should:
◆ Limit parking to structures on designated portions of the site, and require that they not be visible from major streets
◆ Require all office buildings to include retail elements on the ground floor
◆ Designate future street locations and dimensions
◆ Mandate zero lot lines on main streets and zero side lot lines in the office development area
◆ Include a public gathering space as a focal point of the joint-development
◆ Require housing as a part of the development on sites C and E

5.6 CONCLUSION: THE NEW METROPOLIS

Metropolitan San Juan will continue to see growth of population, commercial and retail space as well as a continued reduction in household size. This means that there will continue to be a need for new buildings. If these buildings are constructed along the Tren Urbano rather than at peripheral locations, they can very quickly reinforce the viability of the transit and establish a desire for more transit capacity and hence more development activities. The Tren Urbano system is a new opportunity for San Juan to create a new type of metropolis out of their existing sprawling developments. The combination of the new train, the proposed extensions, the bus and *publico* feeder system, and the station area development will serve to move the public between destinations with an alternative to the private automobile.

Station area developments have been studied in many cities by many people. Even in the San Juan area, there have already been numerous proposals for public, private and joint development around the Tren Urbano stations. Projects have looked to identify the goals, the design elements and the realistic market projections that will allow Tren Urbano to find what is possible and likely to be done in converting the metropolitan fabric from an auto-oriented style to a pedestrian and transit-oriented design. This thesis contributes two elements to that debate. First, it analyzed the of elements of design that help and hurt pedestrian activity in a transit station area. Second, it focuses on the zoning and redevelopment process that has guided developments as they have been proposed, permitted and built.

This chapter has provided a number of suggestions on how Tren Urbano can bring together the forces that create station area plans and developments into a new process for planning and project review. It also has provided proposals for how this concept can be applied at three station areas on the Tren Urbano system. Most important is the idea that the government must form a set of development regulations to be applied in the station areas to ensure that development is of value. Furthermore, the government should use the regulatory tools available to them and the joint-development process as opportunities to build developer capacity for achieving successful transit-oriented projects in the station areas.

Tren Urbano may or may not accept all of the specific station area recommendations provided in this thesis. Although accepting the recommendations will make station area projects stronger, there may be mitigating circumstances that do not make this possible. If only two elements are taken from this thesis project by the Tren Urbano staff and the planning board, it should be these:
♦ Successful station area development will depend upon government agency leadership, cooperation, consistency and control of station area development decisions through establishment of a strong development regulatory system and a companion development review and design review process.
♦ Successful station area development in the San Juan metropolitan area depends upon an institutional capacity to understand pedestrian-oriented design at the agency level and transfer that understanding to the development community. Joint development projects will provide this opportunity. The government would

155

be best off building nothing on the joint development sites rather than settle for a mediocre project that will set a bad tone in the station area for the development community.

Tren Urbano, to be successful, must invent its own future. It must develop its own ridership. It must provide the opportunity for choice transit riders to use the Tren Urbano and its feeder systems because they provide an attractive alternative to automobile trips. To do so, the Tren Urbano must be more than a transportation system, it must be a whole new way of thinking about transportation, about the urban form and about the new economic development opportunities for the future of the San Juan metropolitan area. This will become possible when Tren Urbano links transit, land use and economic development through a station area development process that answers both the what question 'what do we want here?' and the how question 'how do we get it?'.

Alan Kay invented the graphical user interface that was later used for the Macintosh computer and serves today as the basis for most computer operating systems today. In 1971, he made the following inspirational statement to a group of staffers at the Palo Alto Research Center: "Don't worry about what anybody else is going to do... The best way to predict the future is to invent it. Really smart people with reasonable funding can do just about anything that doesn't violate too many of Newton's Laws!"[165] Planning offers the opportunity to invent a new future, a new metropolis in a place where a different paradigm existed before. Inventing one version of this new metropolis can allow for the example to be copied by others.

By taking the good examples from other places, and learning lessons from mistakes, the San Juan area can create that new development paradigm. Other urban areas in the United States and Latin America are becoming more sprawled and more automobile oriented. Yet San Juan need not worry about the direction of those areas. As they invent their new future as a transit-oriented and pedestrian-oriented metropolis, they can do just about anything as long as it does not violate the laws of physics or the land use regulations that have been provided as a framework from higher governments and the courts. Yet within that framework there are infinite possibilities for the future. All that is needed is the cooperation, consistency, control, capacity and the institutional and political will to make change happen. Better land-use planning offers opportunity to invent a better way to live daily lives. In the end, even the place-based planning interventions are about people. Success in land-use planning will provide better opportunities for people to live better daily lives in places that look better, that feel better and that offer more economic opportunities.

---

[165] The full quote and the background on Alan Kay can be found at: http://www.smalltalk.org/alankay.html

References

Books and Articles

Alexander, Christopher. *A Timeless Way of Building.* New York: Oxford University Press, 1979.

Alexander, Christopher. *A Pattern Language.* New York: Oxford University Press, 1979.

Allen, Karen Tanner. "Clarendon-Courthouse is Happily Hemmed In." *Washington Post,*
10 November 2001. Sec J, p. 1.

Bernick, Michael and Robert Cervero. *Transit Villages in the 21st Century.* New York:
McGraw Hill, 1997.

Calthorpe, Peter. *The Next American Metropolis.* New York: Princeton Architectural Press,
1993.

Calthorpe, Peter and William Fulton. *The Regional City.* Washington DC: Island Press, 2001.

Cervero, Robert. *The Transit Metropolis.* Washington DC: Island Press, 1998.

Cervero, Robert. "Creating a Linear City with a Surface Metro – The Story of Curitiba Brazil".
Institute of Urban and Regional Development Working Paper 643. June 1995.

Ewing, Reid and Robert Cervero. "Travel and the Built Environment – Synthesis". Paper
presented as part of the Transportation Research Board Annual Meeting, January 2001.

Fader, Stephen, *Density by Design: New Directions in Residential Development.*
Washington DC: Urban Land Institute, 2000.

Lieberman, William. *Charter of the New Urbanism.* Edited by Michael Leccese and Kathleen
McCormick. New York: McGraw Hill, 2000.

Marshall, Alex. "Train Si Srpawl No". *Metroplois Magazine,* October 2001.

Meck Stuart Ed. *Growing Smart: Legislative Handbook.* Chicago: American Planning
Association, 2002.

McCormack, Edward, Scott Rutherford and Martina Wilkinson. "The Travel Impacts of Mixed
Land Use Neighborhoods in Seattle". Paper presented as part of the Transportation
Research Board Annual Meeting, January 2001,

Miller, Jonathan D. Ed. "Emerging Trends in Real Estate, 2002" New York: Lend Lease
Corp, 2002.

"Progressive Architecture *Progressive Architecture,* January 1994, p29.

"Progressive Architecture Awards" *Architecture,* April 2000, p87.

Shibley, Robert. *Commitment to Place: Urban Excellence and Community.* Cambridge, MA: Bruner Foundation, 1999.

Sucher, David. *City Comforts, How to Build an Urban Village.* Seattle: City Comforts Press, 1995.

Thompston, Laura. "Oustanding Planning: Implementation, Integrating Transit-Oriented Development – Mountain View." *Planning,* March 2002.

Planning Documents

Arlington County Virginia, Department of Community Planning, Housing and Development. *Clarendon Sector Plan.* Arlington County, 1984.

Arlington County Virginia, Department of Community Planning, Housing and Development. *Courthouse Sector Plan.* Arlington County, 1984.

Arlington County Virginia, Department of Community Planning, Housing and Development. *Courthouse Sector Plan Addendum.* Arlington County, 1993.

Arlington County Virginia, Department of Community Planning, Housing and Development. *Development in the Metro Corridors.* Arlington County, 2000.

City of Mountain View Community Development Department. *Whisman Precise Plan.* ONLINE: http://www.ci.mtnview.ca.us/citydepts/cd/apd/whisman_pp.htm. Mountain View, February 13, 1996.

City of Mountain View Community Development Department. *San Antonio Station Precise Plan.* ONLINE: http://www.ci.mtnview.ca.us/citydepts/cd/apd/san_antonio_station_pp.htm. Mountain View, September 10, 1991.

City of Mountain View Community Development Department. *Downtown Mountain View Precise Plan.* ONLINE: http://www.ci.mtnview.ca.us/citydepts/cd/apd/downtown_pp.htm. Mountain View, January 12, 1988.

Contra Costa County Redevelopment Authority. *Community Plan: Pleasant Hill BART Station.* Contra Costa County, Spring 2001.

Tempe Urban Design Group. *Downtown Tempe Redevelopment Concept Plan.* City of Tempe, 2000.

The Unity Council. *Community Planning Brochure: Fruitvale BART Transit Village.* The Council, 1999.

Web Pages

CalTrain Website. ONLINE: http://www.caltrain.com.

Carter and Burgess Website. ONLINE: http://www.c-b.com

Commonwealth of Puerto Rico Tourism Department. *History of Puerto Rico Timeline*. ONLINE: http://welcome.topuertorico.org/history.html

Oakland City Center Website ONLINE: http://www.oaklandcitycetner.com.

Smalltalk Website. *The Full Alan Kay Quote*. ONLINE: http://www.smalltalk.org/alankay.html.

Valley Transportation Authority Website. ONLINE: http://www.vta.org.

Conference and Course Presentations

Calthorpe Associates, "Transit Oriented Development." Presentation at the American Planning Association Conference. April 2002.

Duany, Andres. "New Urbanism and Codes" Presentation at the Local Government Commission Smart Growth Conference. San Diego: January 2002.

Duckworth, Joseph. "Developer Perspective." Presentation at the Local Government Commission Smart Growth Conference. San Diego: January 2002.

Kayden, Jerold. "Public and Private Development." Course Lecture: Graduate School of Design at Harvard University. Cambridge, MA: May 1, 2002.

Minicozzi, Joseph. "West Palm Beach." Presentation at the American Planning Association Conference, Chicago: April 2002.

Personal and Telephone Interviews

Albert, Peter (Planner BART, Oakland CA). Interview by Author. January 2002.

Arrington, G.B. (Planner, Parsons Brinckerhoff, Portland OR). Telephone Interview by Author. April 2002.

Bernier, Rose (Transit Team Tren Urbano, Puerto Rico). Interview by Authori. January 2002.

Bonin, Javiar (Architect, Puerto Rico). Interview by Author. January 2002.

Brosnan, Robert (Planning Director, Arlington VA). Interview by Author. March 2002.

Castillo, Graham (RE Specialist. Estudios Technicos. Puerto Rico) Interview by Author. January 2002.

DeLemos, Manuel (Architect. Puerto Rico). Interview by Author. January 2002.

Garcia, Luis (Associate Member, Junta de Planificacion Puerto Rico). Interview by Author. January 2002.

Hirota-Cohen, Patty (Real Estate Officer, BART, Oakland, CA). Interview by Author. January 2002.

Hudson, Christopher (Developer, Panoramic Interests, Berkeley, CA). Interview by Author. January 2002.

Leidstrand, Bruce. (Consultant, Mountain View, CA). Interview by Author. May 2002.

Lethco, Trent (Planner. Metropolitan Transportation Commission). Interview by Author. January 2002.

Mignucci, Andres (Architect, Puerto Rico). Interview by Author. January 2002.

Mirandes, Javier (Planner, Tren Urbano, Puerto Rico). Interview by Author. January 2002.

Navarro, Criseda (RE Specialist, Estudios Technicos, Puerto Rico). Interview by Author. January 2002.

Neal, Alison (Community Activist, Arlington, VA). Interview by Author. January 2002.

Raine, Al (Manager of TU Joint Development, Boston, MA). Interviews by Author. March and April 2002.

Scales, Philip (Joint Development Manager, WMATA, Washington DC). Interview by Author. March 2002.

E-mail Correspondence

Arrington, GB. Electronic Mail Correspondence. November 21, 2001.

Kunstler, James Howard. Electronic Mail Correspondence. February 19, 2002.

Other Sources

International Association of Public Transport (in collaboration with Dr. Jeff Kenworthy of Murdock University in Australia).   *Millennium Cities Database for Sustainable Transport.* Brussels: 2000.

"Independent Municipalities Act of 1991, Amended." *Laws of Puerto Rico, Annotated.* 21 LPRA 4626.

Tren Urbano Community Relations Office. Brochure: *Tren Urbano Is On The Way.* 2001.