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Planning for Transit-Supportive Development: A Practitioner's Guide

Section 4: Corridor Planning and Transit-Supportive Development

JUNE 2014

FTA Report No. 0056
Federal Transit Administration

PREPARED BY

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U.S. Department of Transportation
1200 New Jersey Avenue, SE
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Metric Conversion Table

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liter	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C

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"Planning for Transit-Supportive Development: A Practitioner's Guide" is a toolkit of practical and innovative measures to help Metropolitan Planning Organizations (MPO's), regional planners, transit agencies, and local government elected officials, staff, land use planners, and transit planners integrate transit planning with local land use planning. This guide includes best practices, guidance, success stories, useful techniques, transferable examples, and lessons learned, aimed at providing planners at the regional, corridor, and local levels with ideas on how to integrate, accommodate, and assess transit-supportive development and transit investment. Included are numerous success stories for integrating transit planning and land use planning. This guide seeks to go beyond just highlighting case studies by providing a link between the regional, corridor, and local planning processes for integrating land use and transit and examining regions that have successfully developed and integrated plans. The guide is meant to be a resource for planners to assist them in the development and implementation of strategies to integrate transit and land use planning in an effort to encourage transit-supportive development. "Section 4: Corridor Planning and Transit-Supportive Development" presents information on premium transit modes, corridor planning case studies, and guidance on integrating transit-supportive development considerations into the transit corridor planning and National Environmental Policy Act (NEPA) processes.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

LIST OF TABLES

FOREWORD

Public Law 109-59: Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005 identified funding for TELUS for Transit. With that funding, the New Jersey Institute of Technology conducted national research on transit-supportive development which culminated in "Planning for Transit-Supportive Development, A Practitioner's Guide." This guide is a toolkit of best practices, guidance, success stories, useful techniques, transferable examples, and lessons learned designed to assist Metropolitan Planning Organizations (MPOs), regional planners, transit agencies, local planners, and local governments with integrating transit planning with local land use planning. It provides a link between the regional, corridor, and local planning processes for integrating land use and transit. This guide is a resource document.

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ABSTRACT

"Planning for Transit-Supportive Development: A Practitioner's Guide" is a toolkit of practical and innovative measures to help Metropolitan Planning Organizations (MPO's), regional planners, transit agencies, and local government elected officials, staff, land use planners, and transit planners integrate transit planning with local land use planning. This guide includes best practices, guidance, success stories, useful techniques, transferable examples, and lessons learned, aimed at providing planners at the regional, corridor, and local levels with ideas on how to integrate, accommodate, and assess transit-supportive development and transit investment. Included are numerous success stories for integrating transit planning and land use planning. This guide seeks to go beyond just highlighting case studies by providing a link between the regional, corridor, and local planning processes for integrating land use and transit and examining regions that have successfully developed and integrated plans. The guide is meant to be a resource for planners to assist them in the development and implementation of strategies to integrate transit and land use planning in an effort to encourage transit-supportive development.

"Section 4: Corridor Planning and Transit-Supportive Development" presents information on premium transit modes, corridor planning case studies, and guidance on integrating transit-supportive development considerations into the transit corridor planning and National Environmental Policy Act (NEPA) processes.

Planning for Transit-Supportive Development: A Practitioner's Guide

Section 4: Corridor Planning and Transit-Supportive Development

A. Quick Reference Guide to Premium Transit Modes and Their Relationship to Transit-Supportive Development

Prepared by:
New Jersey Institute of Technology
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Transportation infrastructure and urban form are interrelated. Transit can influence the character of a community, providing the interaction of land uses, and creating the potential for more walkable and livable communities. The role of transit infrastructure in shaping urban form is as important as its role in meeting the mobility needs of the corridor it serves. Premium transit alignment and mode choices influence and are influenced by urban form, population densities, and regional land use patterns. Yet, when transit systems are planned and designed, their ability to be influenced by and, in turn, to positively influence urban form at the regional and corridor scales is seldom discussed, documented, or fully incorporated into alignment decisions and mode choices.

This section provides a quick reference to premium transit modes and illustrates how premium transit modes influence, and are influenced by, the urban form, function, population density, land use pattern, and community character of a region and a corridor. Premium transit refers to transit modes that provide higher comfort, capacity, speed, and frequency than typical local bus operations or create a positive perception to users, which is the case with streetcar transit. Premium transit modes examined in this document include streetcar, enhanced bus, light rail transit, BRT, heavy rail transit (rapid rail transit), and commuter rail transit. The typical characteristics of each mode are presented, but it should be noted that enhanced bus and BRT's characteristics overlap, effectively blurring the line designating the differences between them.

Table 4A-1 summarizes the characteristics of each transit mode in terms of typical corridor character, land use densities around the stations and along the line, station characteristics, operational characteristics, and costs and provides a list of communities that have implemented them.

Table 4A-1

General Characteristics of Premium Transit Modes

Transit Technology	Residential & Employment Density Ranges*						Station Characteristics			Corridor Form**	Operational Characteristics						Example Cities
	Core		Centers		Corridors		Typical Spacing Range	Ideal Spacing	Sphere of Influence		ROW/ Guideway	Peak Service Headways (mins)	Route Length (mi)	Capacity (persons per car)	Operating Speed (mph)		
	Res.	Emp.	Res.	Emp.	Res.	Emp.									Max.	Typical	
Streetcar	20–35	200–500	n/a	n/a	n/a	n/a	¼–1 mi	¼ mi	¼ mi	High intensity urban core and /or urban neighborhood and historic urban centers	Mixed-traffic, usually along existing ROW	8–15	1–7	60 (historic streetcars); 100–200 (modern streetcars)	12	6–12	Modern Streetcar – Portland, Seattle, Tacoma. Legacy/Heritage Streetcar – Charlotte, Kenosha (WI), Little Rock, Memphis, New Orleans, Tampa, Toronto, San Francisco
Enhanced Bus	20+	200	10-20	2-5	5-10	2–5	500 feet –½ mi	¼ mi	Adjacent parcel	Various urban centers and industrial corridors	Mixed-traffic or dedicated ROW	10–15	5–10	44 (40 foot bus); 62 (articulated bus)	65	8–60	Albuquerque, Baltimore, Boulder (CO), Los Angeles, Montreal, Reno, Salt Lake City, San Diego
Light Rail Transit	35+	500	25-35	100–150	12–25	30–40	½ –2 mi	1 mi	½ mi	Various urban centers, industrial corridors and established surburban centers	Mixed-traffic or dedicated ROW	5–15	5–25	100 (seated); 200 (with standees)	65	20–60	Buffalo (NY); Charlotte, Dallas, Phoenix, Minneapolis, Portland, Pasadena/Los Angeles, Sacramento, Salt Lake City, Denver
Bus Rapid Transit	35+	500	25-35	100–150	12–25	30–40	½ –2 mi	1 mi	¼ mi	Various urban centers, industrial corridors, established suburban and new suburban corridors	Dedicated right-of-way w/ signal priority preferred	3–30	2–40	44 (street bus); 62 (articulated bus)	60	8–60	Boston, Cleveland, Denver, Eugene (OR), Las Vegas, Los Angeles, Orlando, Ottawa, Pittsburgh, Toronto
Heavy Rail	35+	+500	25-35	100–150	12–25	30–40	1–3 mi	2 mi	1 mi	Various urban centers, industrial corridors and established suburban centers	Exclusive track	3–10	10–30	60-80 (seated); 120–150 (with standees)	80	30-80	Atlanta, Baltimore, Boston, Chicago, Los Angeles, Miami, New York, Toronto, San Francisco/ Oakland, Washington, DC
Commuter Rail	35+	+500	25-35	100–150	12–25	30–40	2–5 mi	3 mi	3 mi	Various urban centers, industrial corridors, established suburban and new suburban corridors	Dedicated track within existing ROW; can be shared track w/ freight or intercity passenger rail	20–30	5–60	80–170	90	30-80	Chicago, Minneapolis, Nashville, New York, San Diego, San Francisco, Vancouver, Washington, DC

* Residential densities expressed in dwelling units per acre (du/ac); employment densities expressed in number of employees per acre (em/ac), presented as minimum suggested densities. Actual densities around transit stations vary based on CBD size, distance from CBD to other centers, and metro area size. Densities based on FDOT TOD Guidelines (www.floridatod.com), from Dittmar and Ohland (New Transit Towns, 2004) and Zupan (Where Transit Works in 2006, December 2005) and from the Charlotte multi-corridor planning effort.

**Cores pertain to high-intensity urban cores, i.e., CBDs. Centers are urban neighborhoods, historic urban centers, and suburban centers, and corridors are links between Core and Centers that include industrial corridors and new suburban corridors.

Corridor Form

The role of premium transit modes, like all modes of travel, is to provide reliable connections between origins and destinations, enabling more efficient movement of people, goods, and services. Urban form, specifically the density and character of land use, impacts the efficiency of various modes of travel within a region or corridor.

Figure 4A-1 illustrates the variety of urban forms in the three typical regional locations—cores, centers, and corridors, as described in Table 4A-1. Cores pertain to high-intensity urban cores such as central business districts. Centers are urban neighborhoods, historic urban centers, and suburban centers. Corridors are the links between cores and centers that include industrial corridors and new suburban corridors. A transit line may traverse several types of locations in a metropolitan area. The path that a transit line could take can be described using a graphic concept called a "transect," as presented in Figure 4A-1. New Urbanist town planners use the term "transect" to refer to the varieties of land use from an urban core to a rural boundary. General New Urban transect classifications (from highest to lowest density) are Urban Core, Urban Center, General Urban, Suburban, Rural, and Natural. The graphic image shows how the street grid and built environment change from the urban core, through neighborhood centers and industrial corridors, to suburban corridors and centers. A corridor's form influences the type of transit service that could most effectively serve a corridor and how transit is laid out, including the mode, alignment, station characteristics, and operating characteristics. Figure 4A-2 (later in this section) builds upon Figure 4A-1 by providing the various transit modes and corresponding lengths. (Note: It is important to view Figures 4A-1 and 4A-2 together with Table 4A-1 to gain a comprehensive understanding.)

Land Use Density

Density is defined as the concentration of residential and commercial land uses that produce trip origins and destinations and is one of the most significant indicators for transit success. A number of research efforts have shown a clear link between increased population and employment density, and increased transit ridership.

High Intensity Urban Core	*Urban Neighborhoods & Historic Urban Centers*	*Industrial Corridors*	*Established Suburban Centers*	*New Suburban Corridors*
Density • Residential densities range from a minimum of 20-35 du/ac • Employment minimum densities begin at 200-500 employees per acre • Densities can support all forms of premium technologies	**Density** • Residential densities range from a minimum of 15-25 du/ac • Employment minimum densities begin at 150-200 employees per acre • Densities can support all forms of premium technologies	**Density** • Residential densities range from a minimum of 10-25 du/ac • Employment densities average 100-150 employees per acre • Densities can support light rail, bus rapid transit and enhanced bus	**Density** • Residential densities range from 10-20 du/ac • Employment minimum densities begin at 10-25 employees per square acre • Densities can support bus rapid transit, enhanced bus, and commuter rail	**Density** • Residential densities range from 5-10 du/ac • Employment densities average 2-5 employees per square acre • Densities can support bus rapid transit and commuter rail
Character • Well established and connected street pattern • Transit stations range from small local stations to large multi-modal stations • Strong TSD/in-fill development market regardless of transit service	**Character** • Connected block system • TSD market varies and may need municipal assistance	**Character** • Centers of employment • Generally well connected street network. However, significant barriers exist. • Some physical barriers to TSD development may require municipal assistance	**Character** • Well developed but lack orientation to public realm • Access usually comes from large roads • Few pedestrian oriented centers of activities • TSD development market varies and may need municipal assistance	**Character** • Areas are quickly developing near outermost edge of transit region • Connections are limited; but opportunities abound • Stations located here will attract riders from a larger area • TSD development varies but generally strong due to low construction cost and available land
Station Spacing • 500-foot to 1/4-mile spacing	**Station Spacing** • 1/2-mile to 1-mile spacing	**Station Spacing** • 1-mile to 3-mile spacing	**Station Spacing** • 1-mile to 3-mile spacing	**Station Spacing** • + 3-mile spacing

Source: Revised and adapted from Charlotte Area Transit Systems (CATS) Systems Plan Land Use Program Station Types Report, December 2006.

Figure 4A-1 *Corridor Form*

Several studies were examined to develop a general density guide for each transit mode (see Table 4A-1). These guidelines are based on the Florida Department of Transportation's Transit-Oriented Development Design Guidelines, Dittmar and Ohland (New Transit Towns, 2004), Zupan (Where Transit Works in 2006, 2005), the Charlotte Multi-Corridor Planning effort, and working knowledge. They are presented as minimum suggested densities. Actual densities for transit stations across North America vary depending on various factors such as, but not limited to, the size of a city's central business district (CBD), distance of a station to the CBD, and size of a metropolitan area.

Corridor Character

Aside from density, the arrangement of land uses along a corridor is a key discriminator in choosing a mode and in predicting its potential for transit success. How land uses are laid out to allow for effective pedestrian, bicycle, and vehicular access and connectivity can influence how successful a transit system is in attracting ridership. The overall development pattern along a transit corridor is referred to as corridor character.

Existing and envisioned corridor character can influence the selection of the most appropriate transit modes. For example, bus rapid transit, light rail transit, and commuter rail have been observed to support similar land-use density ranges. However, the arrangement of densities along a corridor can help determine which mode is most appropriate (see Table 4A-1).

In general, enhanced bus and bus rapid transit are often more effective than fixed guideway transit modes for corridors with dispersed suburban and urban centers. Commuter rail is more effective than other modes in longer corridors with dispersed suburban patterns of development around a larger urban core area. Heavy rail transit and light rail transit are more appropriate modes for corridors that include a series of urban and suburban centers. Streetcar is effective in serving as a transit circulator within an urban core area, especially in support of economic development objectives.

It is important to note that although access from all modes of travel (bicycling, walking, and vehicular travel) is important, a transit system's effectiveness is greatly impacted by the surrounding land use character and its ability to accommodate pedestrian movement. In surveys around the country, individuals who do not ride transit suggest that the reason is often based on convenience or accessibility. Walking distance and the quality of the walking environment are critical factors to transit use.

Building upon Table 4A-1, which summarizes the general characteristics of each transit mode, Table 4A-2 provides real-world examples of the general characteristics from several of the case studies included in Section 4, "Corridor Planning and Transit-Supportive Development."

Table 4A-2

Real-World Examples of Premium Mode Characteristics

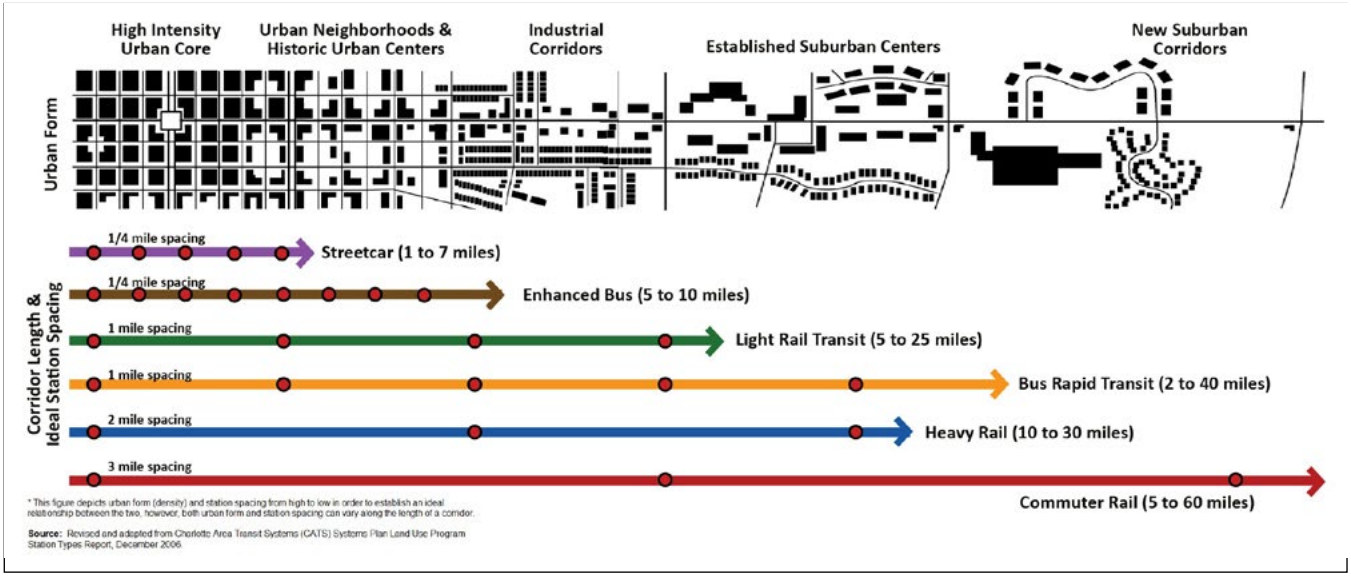
Transit Technology	Residential Density Range along Corridor*		Typical Spacing Range (mi)	Corridor Character	Operational Characteristics					
					Right of Way/ Guideway	Peak Service Headways (mins)	Route Length (mi)	Capacity (persons per car)	Operating Speed (mph)	
	Low	High							Max.	Typical
Streetcar	20**	35**	¼–1 mi	Urban corridor within a concentrated urban center	Mixed-traffic usually along existing ROW	8–15	1–7	60 (historic streetcars); 100–200 (modern streetcars)	12	6–12
Portland Streetcar	5	395	0.15–0.6 mi	Predominantly mixed-use residential w/ hotels, hospital, commercial within downtown area	Existing urban streets	12	4 linear/ 8 loop	41 (seated); 140 (with standees)	31	15
Enhanced Bus	5**	25**	500 ft–½ mi	Corridor w/ dispersed suburban & urban centers	Mixed-traffic or dedicated ROW	10–15	5–10	44 (40 ft bus); 62 (articulated bus)	65	8–60
ABQ Rapid Ride (Red Line), Albuquerque	NA**	NA**	½–1 mi	Predominantly mixed-use residential w/ retail, hospitals, universities, civic centers located throughout length of corridor	Existing urban streets	10	11	86 (seated)	NA*	NA*
Light Rail Transit	12**	35+**	½–2 mi	Corridor w/ concentrated suburban & urban centers	Mixed-traffic or dedicated ROW	5–15	5–25	100 (seated); 200 (w/standees)	65	20–60
Metro Gold Line, Los Angeles & Pasadena	5	80	½–2 mi	Predominantly residential mixed w/ commercial and industrial uses; latter two intensify along corridor towards Union Station	Former Atchison, Topeka & Santa Fe Railway/ Amtrak line	7–8	13.7	76 (seated); 238 (w/standees)	55	25
Bus Rapid Transit	12**	35+**	½–2	Corridor w/ dispersed suburban & urban centers	Dedicated right-of-way with signal priority preferred	3–30	2–40	44 (street bus); 62 (articulated bus)	60	8–60
RTAs "L," Cleveland	Not Available	Not Available	0.16 (avg spacing)	Predominantly mixed-use residential w/ retail, hospitals, universities, civic centers located throughout downtown area	Dedicated bus-only lanes along Euclid Ave between Public Square and E 115th St	5–15	9.4	47 seated; 53 (standing)	35	20
Heavy Rail	12**	35+**	1–3 mi	Corridor w/ concentrated urban centers	Exclusive track	3–10	10–30	60-80 (seated); 120-150 (w/standees)	80	30–80
BART Richmond-Fremont Line, San Francisco	35	200	½–3.75 mi	Predominantly residential w/ intensified commercial, industrial, civic uses in various downtowns	Former Atchison, Topeka, & Santa Fe and Western Pacific Railways	10–15	40	64-72 (seated); 150 (w/ standees)	80	33

*NA = not available

** Residential densities are expressed in dwelling units per acre (du/ac) and are presented as minimum suggested densities. Actual densities around transit stations vary based on CBD size, distance from CBD–other centers, and metro area size and are based on the FDOT TOD Guidelines (www.floridatod.com), Dittmar and Ohland (New Transit Towns, 2004), Zupan (Where Transit Works in 2006, 2005), and the Charlotte Multi-Corridor Planning effort. Cores pertain to high-intensity urban cores, i.e., CBDs, centers are urban neighborhoods, historic urban centers, and suburban centers. Corridors are the links between core and centers that include industrial corridors and new suburban corridors.

Corridor Function

For premium transit modes, variations in station spacing and corridor length can be combined to achieve optimal efficiency. Figure 4A-2 is a guide that can be used to identify which transit modes best fit the variety of densities and community types within a typical transit corridor.



*This figure depicts urban form (density) and station spacing from hight to low in order to establish an ideal relationship between the two, however, both urban form and station spacing can vary along the length of a corridor.

Source: Revised and adapted from Charlotte Area Transit Systems (CATS) Systems Plan Use Program Station Types Report, December 2006.

Figure 4A-2 *Station Spacing and Corridor Length*

Station Spacing

Spacing between stations is influenced by a host of land use, economic, physical, cost, and operational factors. Among these considerations, the distance between stations is most strongly influenced by the land use context and the mode type of a transit alignment. In closer proximity to the urban core, stations occur more frequently to effectively serve higher intensity and density land uses around the core. Farther away from the urban core, stations are located farther apart from one another, as land uses become more dispersed and lower in density (see Figure 4A-1).

The type of transit mode also dictates the range of acceptable station spacing, since it determines the operational and travel time efficiency of a system. Enhanced bus and streetcars have the flexibility to provide more frequent stops, partly because of the ease afforded by the vehicles in frequent stopping. Fixed guiderail systems, such as commuter rail, have less flexibility because of

the added time and associated costs incurred for a train to speed up and slow down at every station. (However, rail systems that use diesel multiple units may be more flexible than those that use locomotive technology.)

While there are no absolute requirements for station spacing, general rules of thumb are used as guidelines: longer spacing between stops provides faster travel speeds, while closer spacing increases overall accessibility and shortens the time needed to get to and from a stop. Station spacing along a corridor is determined by balancing travel time goals with the degree of desired levels of access to activity centers. Figure 4A-2 includes general station spacing and corridor length against the backdrop of a typical corridor form for the six modes discussed herein.

Corridor Length

The length of a transit corridor varies with most modes. In general, commuter rail corridors are the longest, streetcar systems are the shortest, and the other modes fall in between (see Figure 4A-2). Determining optimal corridor length is based on the transit's operational characteristics, land use patterns and densities, and cost.

Figure 4A-3 illustrates how a city might arrange the premium transit modes documented in this Guide. It shows the general corridor length, station spacing, and form for each mode. The figure also demonstrates that within a single urban area, it is possible to apply multiple transit modes in different corridors depending on the local conditions.

(Image Source: www.CABQ.com)

Enhanced Bus

Form: Dispersed suburban and urban centers
Corridor Length: 5-10 miles
Ideal Station Spacing: 1/4 mile

(Image Source: www.charlottetrolley.org)

Streetcar

Form: Urban corridors within a concentrated urban center
Corridor Length: 1-7 miles
Ideal Station Spacing: 1/4 mile

(Image Source: Vincent Desjardins, www.flickr.com)

Heavy Rail

Form: Corridor with concentrated urban centers
Corridor Length: 10-30 miles
Ideal Station Spacing: 2 miles

High Intensity Urban Core
Urban Neighborhoods & Historic Urban Centers
Industrial Corridors
Established Suburban Centers
New Suburban Corridors

(Image Source: AECOM)

Light Rail Transit

Form: Corridor with concentrated suburban and urban centers
Corridor Length: 5-25 miles
Ideal Station Spacing: 1 mile

(Image Source: Glatting Jackson/AECOM)

Bus Rapid Transit

Form: Corridor with dispersed suburban and urban centers
Corridor Length: 2-40 miles
Ideal Station Spacing: 1 mile

(Image Source: www.nmrailrunner.com)

Commuter Rail

Form: Dispersed suburban corridor serving a large concentrated urban center
Corridor Length: 5-60 miles
Ideal Station Spacing: 3 miles

Figure 4A-3 *Corridor Form and Function*

Premium Transit Modes and Transit-Supportive Development Considerations

This subsection summarizes key features of the selected transit modes, their relationship and applicability to various corridors, and their potential to positively interact with transit-supportive development.

Streetcar

Streetcars are self-propelled vehicles that have many similarities to light rail and are designed to serve dense urban corridors. Streetcars often travel through right-of-way shared with other road traffic, since their tracks are laid within streets. Stations are often simple platforms that can be easily integrated into the street and sidewalk environment. Several cities, such as Tampa and New Orleans, have heritage systems equipped with replicas or restored historic trolleys, while others, such as Portland and Seattle (see Figure 4A-4) have incorporated modern vehicles with low floors that are more similar to Light Rail. In some instances, Streetcars and Light Rail vehicles share tracks.

Figure 4A-4

Seattle Streetcar, Seattle

Source: Courtesy of Stephen Rees

Transit-supportive development opportunities along Streetcar corridors are strong. Many of the current streetcar systems operate in established higher-density urban corridors and provide circulator service that can extend the limits of CBDs.

Corridor Form

- Residential density and activity centers – Streetcar systems are generally located in established high-density urban corridors that link employment centers, civic and institutional uses, and recognized tourist destinations.

These corridors are generally 1–7 miles in length, with residential densities of 20–35 dwelling units per acre (du/ac) and employment concentrations ranging from 200–500 employees per acre (em/ac).

- Urban form – The majority of modern and heritage streetcar systems operate along an established, walkable urban corridor within a vibrant activity center. Streetcar systems link multiple nodes within a pedestrian-first environment. Stations typically have a sphere of influence that generally radiates ¼ mile from each station. Newer streetcar systems in Portland and Seattle have become catalysts for major urban infill development that link to the CBDs.

Corridor Function

- Travel shed – A streetcar's travel shed is reliant on walk-up traffic, similar to that of a local bus or enhanced bus. A streetcar system is intended to accommodate short passenger trips with high frequency service.
- Alignment options – The streetcar system differs from most other rail-based transportation systems by its tracks, which are usually laid within existing right-of-way along urban streets.
- Station spacing and typology – Station spacing for the streetcar mode ranges from ¼–1 mile with ideal station spacing of ¼ mile. Streetcar stations generally have simple platforms and shelters with strong "branding" or use of a distinctive market identity to distinguish them from other modes of transit and to emphasize their presence to tourists as well as locals.

Transit-Supportive Development Considerations

- Placemaking – Streetcar systems have been shown to produce positive effects on city placemaking. Many communities, such as Tampa, have incorporated a heritage streetcar system as part of their downtown revitalization effort, while Portland continues to use a modern streetcar as part of its urban infill and redevelopment strategy. In many cases, new development along these corridors has seen a significant return on investment. As with all transit systems, an effective and comprehensive land use program should be developed as part of any transit planning effort to ensure maximum return on the transit investments.
- Permanence – The fixed alignment and distinctive stations build confidence in the permanence of the streetcar system.
- Frequency and reliability – Since streetcar alignments are fixed and operate in mixed-traffic, they may be subject to delays. However, high frequencies and short trip lengths make them popular with riders. Peak-period headways range from 8–15 minutes.
- Benefit and cost – Streetcar systems have been shown to encourage economic development, manage growth, and improve overall mobility

within a city. Since 1997, when the original Portland Streetcar alignment was identified, properties along its length have experienced significant changes.

Economic Development Impacts of Portland Streetcar System since 1997

- $3.5 billion in development has been invested within two blocks of the streetcar alignment.
- More than 10,000 new housing units and 5.4M SF of office, institutional, retail, and hotel have been constructed within two blocks of the alignment. For more information on the economic impacts of the streetcar system in Portland, refer to "Economic Benefits of Transit-Supportive Development" in Section 2.

Enhanced Bus Transit

Enhanced bus transit is typically characterized by high-frequency bus service on arterial streets with enhanced physical and operational characteristics, such as traffic and signal priority, and longer stop spacing, aimed at improving efficiency, reliability, and customer experience. Figure 4A-5 shows Rapid Ride in Albuquerque.

Figure 4A-5

Rapid Ride, Albuquerque

Source: Released to public domain through Wikipedia, http://en.wikipedia.org/wiki/File:Rapid_Ride.jpg

The majority of established enhanced bus transit service operates in medium- to high-density suburban and urban corridors. Transit-supportive development opportunities along these corridors are limited to properties immediately adjacent to stops and historically have not been emphasized in national transit-oriented development discussions and research. Until recently, they have been seen as temporary, and subject to operational change. Attractive features of enhanced bus transit service include shorter trip lengths that link activity centers along urban corridors and alignments that are flexible and adaptable.

Corridor Form

- Residential density and activity centers – Enhanced bus transit services are usually located in established suburban and urban corridors that link employment centers, and civic institutional uses. The transit corridors are usually 5–10 miles in length and have residential density ranges between 5–20 du/ac. Employment concentrations extend up to 200 em/ac in a high-intensity core area, and range from 2–5 em/ac along a suburban or industrial corridor.
- Urban form – Enhanced bus transit service usually supports a linear urban form along arterial street corridors with major terminals serving high-density destinations. Stations typically accommodate walk-up passengers only, and have a sphere of influence extending primarily to adjacent parcels.

Corridor Function

- Travel shed – Enhanced bus transit service can employ multiple routes that use a common corridor with priority treatments and can branch out to capture and serve a larger area. Passengers are usually willing to walk up to ¼ mile or five minutes to reach bus stops.
- Alignment options – Enhanced bus transit service can operate in a variety of corridors, but is best used on arterial streets. Strong branding for enhanced bus transit service to distinguish it from conventional local bus service can focus attention and attract riders.
- Station spacing and typology – Stations along enhanced bus transit corridors can be as frequent as 500 feet or as far apart as ½ mile, with ideal spacing of ¼ mile. Stations typically accommodate walk-up passengers only and have a sphere of influence extending to adjacent parcels. Stations are typically upgraded shelters with customer amenities such as real-time bus arrival information.

Transit-Supportive Development Considerations

- Placemaking – System-design components can strengthen or weaken a community's perceptions, which impact development opportunities. Enhanced bus transit's minimal physical impact on the surrounding environment does not create a significant transit presence. A comprehensive streetscape, amenities package and proper system branding are needed to significantly improve placemaking opportunities by suggesting commitment and stability of the transit investment.
- Permanence – Enhanced bus is a flexible mode that does not always build confidence in the permanence of the system. This can be addressed by upgrading shelters and landscaping, and adding amenities along the corridor in an effort to encourage adjacent transit-supportive development.

- Frequency and reliability – Technological advances and operational improvements can improve the overall reliability of enhanced bus service. Operational improvements include increasing bus frequencies, lengthening the distance between stops, and giving preferential treatment to buses over other traffic. Technological advances include traffic signal priority, electronic fare collection, and real-time passenger information. Peak period headways can range from 10–15 minutes.

Light Rail Transit

Light rail transit (LRT) uses vehicles with steel wheels running on steel rails and is electrically powered from overhead wires. LRT is capable of operating in a wide array of right-of-way conditions. It is distinguished from heavy rail, which is powered by an electrified third rail and has longer trains. LRT systems are intended to accommodate many types and lengths of passenger trips within developed portions of metropolitan areas. LRT typically provides frequent service during weekday peak travel periods, as well as convenient frequencies during mid-day and evening off-peak travel periods and on weekends. Figure 4A-6 shows the Gold Line Light Rail in Los Angeles.

Figure 4A-6
Gold Line, Los Angeles

Source: Flickr, Tim Adams (Transit People), used with permission under Attribution-Non Commercial-No Derivs 2.0 Generic (CC BY-NC-ND 2.0), http://www.flickr.com/photos/36217981@N02/4106892658/

Transit-supportive development opportunities are typically strong along LRT corridors at the stations and their environs. LRT systems convey greater certainty for developers due to their fixed infrastructure and positive public perception. Many LRT stations are located near key activity generators and have greatly influenced the transit-supportive development movement throughout the country.

Corridor Form

- Residential density and activity centers – LRT lines range from 5–25 miles in length, and serve urban and suburban centers. Residential densities of 12–25 du/ac are observed along the corridors outside of station areas, and residential densities in excess of 35 du/ac occur around station areas within CBDs. Station areas generally have employment concentrations up to 500 em/acre in high-intensity urban cores. LRT investments, coupled with proactive land use policies, can help strengthen existing activity centers and expand their economic development benefits. For example, the City of Charlotte has a land use policy that currently requires residential areas around LRT stations to have a minimum density of 25 du/ac and encourages mixed-use development.
- Urban form – LRT systems are usually located in urban corridors that serve denser and more walkable urban and suburban centers, although they have the flexibility to serve a wide variety of environments, from pedestrian-first to auto-oriented conditions. Stations typically accommodate walk-up, bus transfer, and park-and-ride facilities. A station's sphere of influence can extend up to ½ mile from each station.

Corridor Function

- Travel shed – A substantial number of riders access LRT by walking to stations or using a feeder bus service and park-and-ride facilities in outlying stations. Riders typically are willing to walk up to ½ mile to reach a rail station.
- Alignment options – LRT can operate in a variety of corridor but is ideally located in existing urban corridors where it can compete for, and attract, automobile riders. Because of the high costs associated with acquiring right-of-way for LRT, many alignments are located in less-than-desirable development areas, such as industrial corridors, along interstate highways, or in other locations with poor visibility and access. In some cities, LRT lines are placed underground to avoid conflicts with areas of heavy traffic or because of severe topographical conditions.
- Station spacing and typology – Station spacing for LRT typically ranges from ½–2 miles, with ideal spacing of 1 mile. This spacing provides good access along the corridor while maintaining reasonable overall operating speeds. Stations may be in the form of walk-up stations, kiss-and-ride stations, and park-and-ride stations, depending on their location.

LRT stations may take the form of buildings or substantial platforms. Due to the frequency of service with average wait times of 15 minutes, riders tend to not linger at LRT stations. The stations can therefore be modest structures whose design is based on access, security, and weather considerations.

Transit-Supportive Development Considerations

- Placemaking – The positive public perception and permanence of LRT can make this transit mode a catalyst for mixed-use development that supports transit. Although LRT is often located in existing urban and suburban centers, a comprehensive land use plan and infrastructure program is needed to expand the reach of transit and enhance the economic development and placemaking benefits that transit and a station might bring.
- Permanence – A highlight of a LRT system is its permanence. Distinctive and substantial stations and a fixed guideway lead to both public and developer confidence, which encourages additional reinvestment and development of transit-supportive uses.
- Frequency and reliability – LRT operates on exclusive rights-of-way with high frequencies, between 5 and 15 minutes during peak periods. This level of service attracts more choice riders and encourages transit trip-making, which can stimulate more economic activity and development in the station neighborhood.

Bus Rapid Transit

BRT is an evolving type of transit service. It is defined as transit service that uses conventional or special-design buses on mostly dedicated rights-of-way in a manner that closely matches the service characteristics and appeal of LRT. BRT often features improved bus designs, occasionally using vehicles with train-like characteristics. BRT, when located in dedicated rights-of-way with grade separations, can provide levels of service comparable to LRT with similar placemaking influence. BRT can be, but does not have to be, an interim step in a process of increasingly sophisticated transit; BRT also can be a final system in a fixed corridor that provides excellent service in and of itself.

Corridor Form

- Residential density and activity centers – BRT corridors tend to serve residential densities between 12 and 35 du/ac and employment densities ranging from 30–500 em/ac. BRT flexibility allows it to serve more dispersed urban and suburban employment centers. BRT also has many examples of success in denser urban centers such as Cleveland, Ohio's Euclid Avenue Corridor (HealthLine) (see Figure 4A-7), which connects Downtown Cleveland to University Circle.

Figure 4A-7
HealthLine, Cleveland

Source: GCRTA

- Urban form – BRT corridors range from 2 to 40 miles in length, generally serving more dispersed densities in less walkable activity centers. A station's sphere of influence can extend up to ¼ mile from each station. Land-use policy directed at encouraging transit-supportive development should concentrate efforts in developing these identified nodes into more walkable communities. (Refer to "Challenges in Corridor Planning," Euclid Bus Rapid Transit for a discussion on the City of Cleveland's policies.)

Corridor Function

- Travel shed – BRT can serve a broader area than LRT since routes can be "bundled" together to serve a major BRT spine, and can branch out individually in less dense areas to serve a more dispersed population.
- Alignment options – BRT, when designed as an upgrade to enhanced bus transit, is one of the most flexible premium transit modes. It can operate in a variety of corridors—from freeways to arterials to exclusive alignments.
- Station spacing and typology – Like LRT, station spacing typically ranges along a BRT corridor from ½–2 miles. This spacing provides good access along the corridor while maintaining reasonable overall operating speeds. Stations typically accommodate walk-up, bus transfer, and park-and-ride facilities. The stations vary based on the design concept for the system. The stations can follow the enhanced bus transit or the LRT model depending upon the long-term concept for the system.

Transit-Supportive Development Considerations

- Placemaking – Like enhanced bus, BRT may have minimal impact on the surrounding environment and may not create as strong a physical transit presence compared to LRT systems. A comprehensive land use and infrastructure program that integrates the community with the station and the station area can help enhance long-term development opportunities.

There are now more opportunities for placemaking using BRT because of increased interest in redeveloping suburban areas into mixed-use activity centers.

- Permanence – Since BRT is not always on a fixed, dedicated right-of-way or operating as a single route, BRT systems should be carefully designed to incorporate elements that convey permanence of the system. Providing distinctive and substantial stations, and visually defining the transit right-of-way, can improve the perception of BRT's permanence. BRT systems can be a stepping stone to enhancing activity centers and to creating mixed-use opportunities.
- Frequency and reliability – Transit's reliability is a key factor that influences station area development and transit's ridership success. One of the greatest challenges facing BRT is overcoming negative public perceptions regarding bus service and system permanence. One strategy for overcoming this negative perception is to provide as much exclusive right-of-way for BRT as possible. Peak-period headways for BRT systems range from 3–30 minutes.

Heavy Rail Transit

Heavy rail transit (rapid rail transit) (HRT) is a high-capacity and high-frequency mass transit system capable of moving large numbers of passengers in a single train throughout urban areas. Trains consist of a number of electrically powered, self-propelled cars that draw electricity from a third rail. Because of the exposed electrically powered third rail, heavy rail systems must use exclusive rights-of-way and generally have no at-grade crossings. Figure 4A-8 shows the MARTA East Line in Atlanta.

Figure 4A-8

MARTA East Line, Atlanta

Source: Flickr, lazytom, used with permission under Attribution-NonCommercial 2.0 Generic (CC BY-NC 2.0) http://www.flickr.com/photos/39017545@N02/4074108598/in/set-72157622605145111

Transit-supportive development opportunities are robust around most HRT systems. Many heavy rail stations are located near key activity generators and significantly enhance transit-supportive development opportunities.

Corridor Form

- Residential density and activity centers – Heavy rail corridors tend to have the highest densities of all premium transit modes. Densities along corridor segments have been observed to range from 12–25 du/ac. Minimum residential densities in station areas located in neighborhoods, suburban centers, and CBDs generally range from 25–35 du/acre. Densities have been observed to exceed 75 du/ac in station areas within CBDs of larger metropolitan areas, such as New York, Atlanta, and Boston. Heavy rail stations are generally supported by high concentrations of employment, typically exceeding 500 employees per acre, especially within CBDs.
- Urban form – Heavy rail systems generally are located in 10–30-mile corridors serving a concentrated urban framework and strong activity centers. Heavy Rail stations serve walk-up populations within higher density destination centers. In less dense residential areas, auto access may dominate, requiring kiss-and-ride areas and large parking lots or structures. A station's sphere of influence can radiate up to one mile from each station.

Corridor Function

- Travel shed – Heavy rail is best suited to serve a large, dense travel shed (similar to light rail) and its riders often transfer from other transit modes. In most cities, heavy rail lines radiate out from a strong dense CBD where central stations offer riders the ability to transfer among lines, or to other transit modes to distribute them within the CBD. Stations along heavy rail lines often have networks of feeder bus routes which further expand the travel shed.
- Alignment options – The electrified third rail requires heavy rail systems to be completely separated from traffic and pedestrians, causing most systems to be underground or elevated in highly urbanized areas. Therefore, Heavy Rail rights-of-way tend to be the most expensive of all premium transit modes. Alignments should seek to alleviate traffic congestion along major corridors and aid in the development of existing or proposed major activity centers. However, alignments are not always selected based on serving the largest ridership, but on utilizing available rights-of-way to reduce cost.

- Station spacing and typology – Station spacing for heavy rail typically ranges from 1–3 miles. Station types vary considerably depending on the range of access modes serving the station. For example, underground stations with pedestrian-only access generally have the smallest footprint, while park-and-ride stations and those with adjacent bus terminals have the largest.

Transit-Supportive Development Considerations

- Placemaking – Heavy rail offers significant opportunities for transit-supportive development. It carries high volumes of riders, provides frequent service, and is generally located in high-density corridors which support adjacent development. Final alignment decisions can significantly impact the placemaking capabilities of heavy rail. Subway and underground systems offer the highest placemaking opportunities, while elevated structures can present significant challenges. Alignment in a highway median may not offer the walkability connection that is important for transit-supportive developments.
- Permanence – The cost and prominent infrastructure associated with heavy rail alignments enhance public and private confidence in the system, which can lead to significant private investments.
- Frequency and reliability – Heavy rail's high capacity and exclusive, grade-separated alignments lends itself to an overall high-frequency transit service with a high level of reliability and consumer confidence in the system. Peak-service headways can range from 3–10 minutes.

Commuter Rail

Commuter rail service uses diesel or electrically-propelled trains operating on standard railroad tracks. Trains typically serve longer-distance trips between trip origins in the outlying suburban areas and destinations within a CBD. Figure 4A-9 shows the MBTA Commuter Rail in Boston.

Figure 4A-9
MBTA Commuter Rail, Boston

Source: Flickr, Matt Johnson (Tracktwentynine), used with permission under Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0), http://www.flickr.com/photos/lazytom/120053075/

Most U.S. cities have a dense network of railroad corridors, a legacy from the 19th century. Consequently, most commuter rail systems use these corridors and normally do not require new rights-of-way. In many areas, however, commuter rail must share tracks with freight rail, which can impact service. For safety and operational reasons, locomotives and cars must be manufactured to main-line railway standards with respect to size and strength.

Transit-supportive development opportunities vary along commuter rail corridors. Existing and proposed commuter rail stations in established towns and urban core areas can provide better opportunities for adjacent development than stations in suburban and rural areas, since urban station areas generally have more dense, mixed-use environments. Commuter rail stations also often require large park-and-ride lots that may compete for space with transit-supportive development. Urban stations are usually in more dense, mixed-use environments that generate transit-supportive uses and activities.

Corridor Form

- Residential density and activity centers – Commuter rail corridors range in length from 5¬–60 miles. Residential densities along commuter rail corridors range from 12–35 du/ac and, depending on their location, employment densities can exceed 500 em/ac within the central cores.
- Urban form – The urban form of commuter rail corridors can vary greatly since the system is designed to serve a large, urban employment center linked with a series of suburban and traditional residential communities along an extended corridor. A commuter rail station's sphere of influence can radiate up to 3 miles or more from each suburban station, or about a 10-minute drive.

Corridor Function

- Travel shed – Commuter rail's travel shed is the largest of the six modes listed in this section, extending more than 3 miles from each suburban station. The majority of commuter rail stations cater to weekday riders driving to the station areas from outlying areas. At destination stations, pedestrian access to commuter rail typically extends to ½ mile or a 10-minute walk.
- Alignment options – Commuter rail systems generally do not require the acquisition of new right-of-way and can operate in existing right-of-way used by intercity freight and passenger rail service. Corridors can vary in length and number of stations.
- Station spacing and typology – Station spacing for commuter rail varies from 2–5 miles. Longer spacing allows higher running speeds between outlying areas and the CBD, improving its competitiveness with auto commuting. Like LRT stations, the commuter rail station can be an enhanced platform, a building dedicated to the station, or part of a mixed-use building. Pedestrian accessibility, weather protection, and security are important considerations for station design.

Transit-Supportive Development Considerations

- Placemaking – Opportunities for transit-supportive development vary along commuter rail corridors. Freight rail locations, for instance, are not always conducive to the elements required for effective placemaking. Since they are often geared more towards peak-period work trips, they may have infrequent off-peak service and require large park-and-ride lots, which present challenges for transit-supportive development. However, there is a growing realization that park-and-ride lots can be used to reserve space around stations for future mixed-use development. Parking can be replaced with development to change the mix of access to transit from auto-only access to multimodal access. Replacement of some parking is a matter of policy, and depends upon considerations such as the development's ridership potential and land costs.
- Permanence – The extensive track and station infrastructure of commuter rail gives a strong sense of permanence to the system, which can help enhance both public perception and developer commitment.
- Frequency and reliability – The fact that commuter rail uses exclusive rights-of-way and is designed with gentle curves and grades allows it to operate with high speed and high reliability. In a number of cities, peak-service headways range from 20–30 minutes. Additionally, since many of the shared tracks are owned by freight operators, freight rail may take priority over passenger trains, which could affect frequency and reliability.

Conclusion

Transit can play a critical role in determining the character of a community. A transit station can influence the types, densities, and patterns of land uses that can occur in an area. The role of transit infrastructure in shaping urban form is as important as its role in meeting the mobility needs of the corridor it serves. The alignment and mode of the premium transit service will significantly influence the urban form, population densities, and regional land use patterns that emerge over time.

Premium transit modes influence, and are influenced by, the urban form, function, and community character of a region and a corridor. Community goals should be determined early so the full potential of a transit program can reflect the benefits that will accrue to the community. Early determination of the benefits of transit systems improves the chances of success for the system.

Transit systems and station locations should be planned and designed to capture their positive influence on land use and urban form at the regional, corridor, and local levels.

The design process is not always sensitized to this opportunity. The community-building and economic development potential of a new or enhanced transit system should be discussed, documented, and fully incorporated into alignment decisions and mode choices.

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B. Challenges in Corridor Planning: Four Case Studies of Practical, Transferrable Solutions

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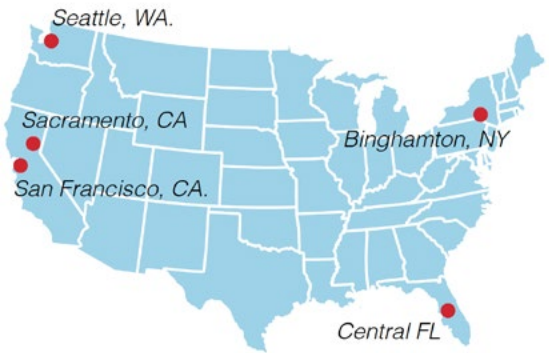
AECOM Planning + Design



This section presents four case studies of corridor planning conducted for different transportation lines. The case studies address common challenges faced by many regions when contemplating, planning, and constructing a new transit line. Each case study below presents a unique story in how challenges were addressed.

- **Case Study 1: Meeting Needs with Interim Improvements and Incremental Planning—Central Avenue (Red Line), Albuquerque**: This case study provides a good example of how transit needs can be met through interim improvements and how transit-supportive development can be achieved through enactment of planning policies and infrastructure improvements. With a pressing need to link employment centers and major activity areas, leaders of the City of Albuquerque decided to pursue transit service improvement along Central Avenue with several small, but effective, measures. Rapid Ride, an enhanced bus service, operates on an 11-mile route providing limited-stop transit service with diesel-electric hybrid articulated buses.

- **Case Study 2: Considering Community Character and Cohesion in Transit Planning—Interstate MAX (Yellow Line), Portland:** Interstate MAX (Yellow Line) is recognized nationally as an example of true community outreach in transit planning and the incorporation of outreach into policy and practice. The planning and construction of the Yellow Line considered the existing community character and engaged the community in a number of innovative ways, recognizing the community's need for light rail transit, selecting the alignment, and instituting redevelopment strategies.
- **Case Study 3: Embracing a New Transit Technology and Proactive Urban Design—Euclid Bus Rapid Transit (HealthLine), Cleveland:** This case study is one of embracing a new transit technology and ensuring that the urban design includes the necessary infrastructure and also conveys a sense of the system's permanence. The HealthLine is a 9.4-mile BRT line that serves Cleveland's main commercial corridor, Euclid Avenue.
- **Case Study 4: Considering Transit-Supportive Development and Infrastructure in Station Area Planning—LYNX Blue Line (South Corridor), Charlotte:** While the City of Charlotte's experience in planning the Blue Line provides extensive examples of how land use considerations can be incorporated into the transit planning process, this case study focuses on the transit-supportive development and infrastructure considerations made during the station area planning process of this 9.6-mile LRT line.

The specific stories in these case studies are unique, but the broader lessons learned are transferrable to regions throughout the country. These lessons include the importance of project champions, creating partnerships, focusing on community needs and community context, and creating visions and goals. While each community has its own approach, embracing these concepts is the foundation for success.

Case Study 1: Meeting Needs with Interim Improvements and Incremental Planning—Central Avenue (Red Line), Albuquerque

This case study of Central Avenue in Albuquerque provides a good example of how transit needs can be met through interim improvements and transit-supportive development can be achieved through enactment of planning policies and infrastructure improvements.

Albuquerque Case Facts

System Name:	ABQ RIDE
Corridor Name:	Red Line
Transit Mode:	Enhanced Bus
Location:	Albuquerque
Region (USA):	Southwest
Corridor Length:	11 miles
Corridor Purpose:	Inter-Urban Commuter
Commuter Municipalities Served:	1
Cost and Funding Sources:	Unavailable
Date Opened:	December 2004

Central Avenue Corridor

Central Avenue is part of Route 66, the historic "roadway to the west" (see Figure 4B-1). While Central Avenue has remained one of Albuquerque's most important transportation conduits and main commercial corridors, its appeal for commercial and retail activities has suffered. The construction of Interstate 40 attracted commercial development away from Central Avenue, and areas north and south of Central Avenue have experienced more retail and employment growth.

Figure 4B-1
Historic Route 66 through Downtown Albuquerque

Source: Albuquerque Convention and Visitors Bureau

A need for high-capacity transit service along the Central Avenue Corridor is driven by a high concentration of population and employment. The Corridor comprises almost ¼ of the population and more than one-third of all jobs for Albuquerque (see Table 4B-1). The area is also largely transit-dependent due to a population characterized by ethnic minorities, persons living below poverty level, and persons age 65 and older.

Table 4B-1

2000 Year Population Characteristics of Central Avenue Corridor

Population Characteristics	% of Citywide Population
Population	24
Employment	36
Minority population	30
Age 65+ population	30
Zero-car households	29
Persons below poverty level	40

Source: Rapid Transit Project Alternative Analysis (based on 2000 Census and MRCOG database)

The Central Avenue Corridor (see Figure 4B-2) also has activity centers with high concentrations of employment. These areas are the University of New Mexico, Downtown, and Uptown. The 2025 socioeconomic projections adopted by the Mid-Region Council of Governments (MRCOG) estimate that employment in the Downtown and University of New Mexico areas is expected to increase by about 3,300 jobs between 2003 and 2023. Employment in Uptown was projected to increase by almost 2,800 jobs during the same period. Much of the projected population and employment growth is expected to involve redevelopment of existing land uses to higher densities and intensities that are supportive of transit service.

Figure 4B-2

Central Avenue, Downtown Albuquerque

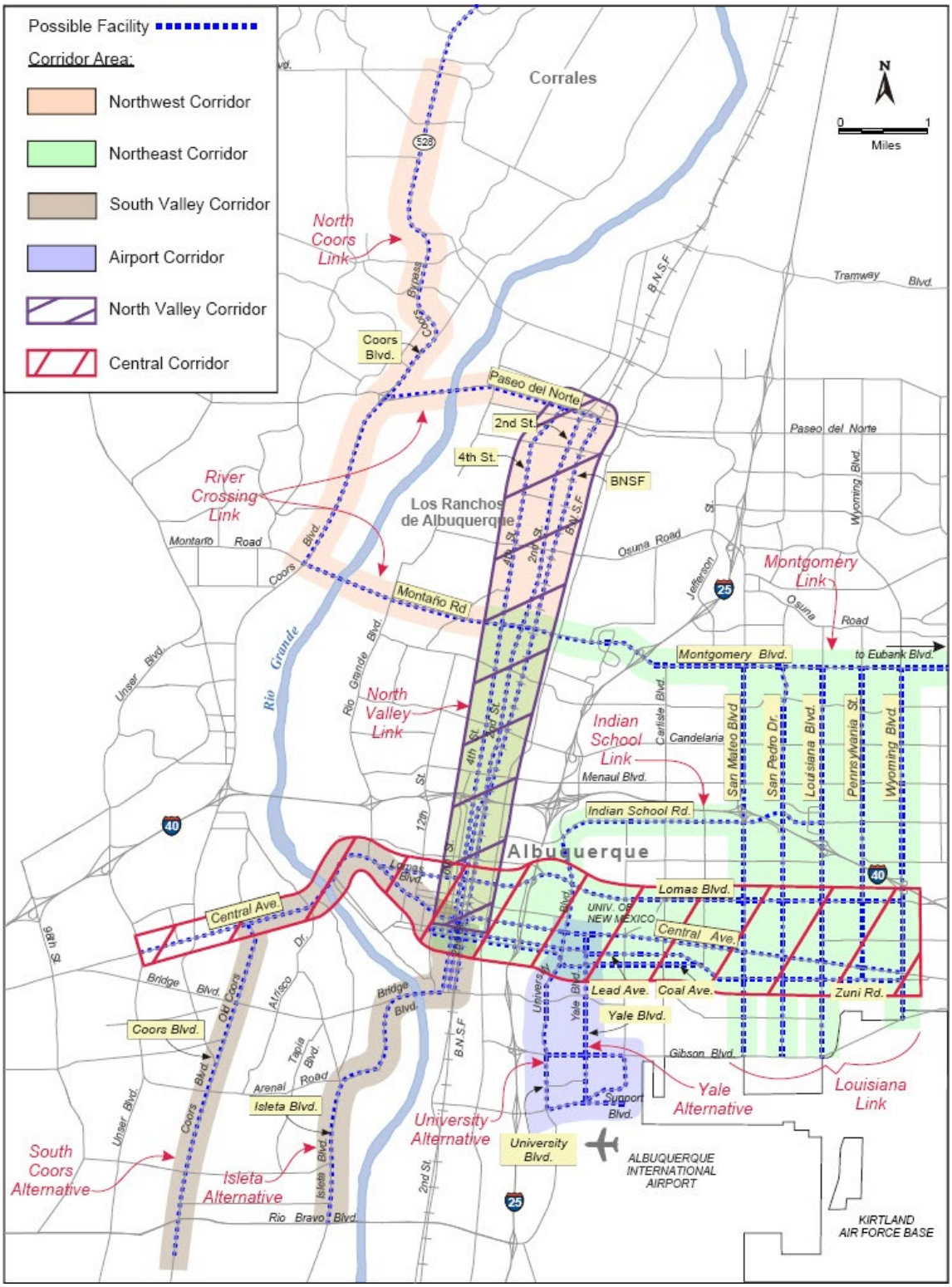
Source: Photo by AsaaVedra32, February 8, 2010, licensed under CC-BY-SA-3.0, http://creativecommons.org/licenses/by-sa/3.0/deed.en, from Wikipedia, http://en.wikipedia.org/wiki/File:Downtown_Albuquerque_Route_66.JPG

Identifying the Need for Transit

The idea to improve transit service along Central Avenue started with a comprehensive transit study called the Middle Rio Grande Connections. Completed in 2002, the study was conducted by the City of Albuquerque, the New Mexico State Highway and Transportation Department, Bernalillo County, and MRCOG. The study identified the need for high-capacity transit service within the metropolitan area and evaluated potential high-capacity corridors and transit technologies. Among other strategies, the study recommended a high-capacity transit system for the Albuquerque urban area and called out Central Avenue as an east-west transit corridor. The Middle Rio Grande Connections System Plan was adopted by the policy board of MRCOG in early 2002 (see Figure 4B-3).

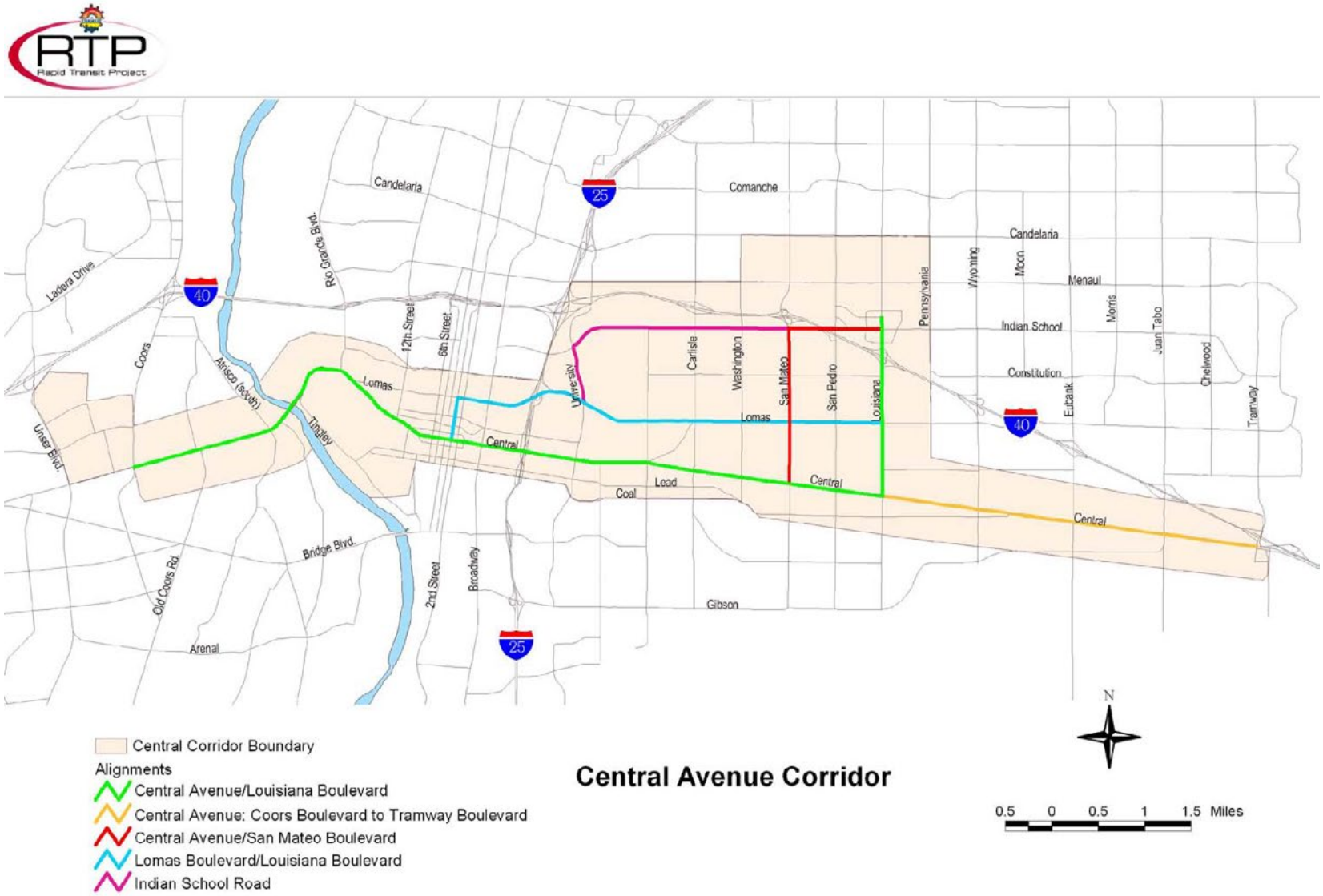
In 2003, the City of Albuquerque, together with FTA and MRCOG, further explored the concept of improving transit along Central Avenue through the Central Avenue Rapid Transit Project Alternatives Analysis (AA). The objective of the AA was to find the transit technologies suited for the corridor and the appropriate alternative alignments for new service.

One alternative, recommended for further evaluation, was the alignment that was eventually used for the Red Line along Central Avenue and Louisiana Boulevard (see Figure 4B-4). The alignment was recommended based on its overall performance and cost effectiveness. The AA concluded that both LRT and BRT could provide improved high-capacity transit service along Central Avenue and recommended that both technologies be advanced for further study. The analysis recommended that LRT and BRT performance be evaluated based on cost and economic development potential.



Source: City of Albuquerque, Alternatives Analysis Report for the Rapid Transit Project, 2003

Figure 4B-3 *Middle Rio Grande Connections High-Capacity Transit System*



Source: City of Albuquerque, Alternatives Analysis Report for the Rapid Transit Project, 2003

Figure 4B-4 *Alignment Alternatives based on Central Avenue Rapid Transit Project AA*

No Time to Wait—Implementing Enhanced Bus as an Interim Transit Improvement

Recognizing the long planning and evaluation processes required to secure federal transit funding and the immediate need to link employment centers and major activity areas, the City of Albuquerque leaders decided to pursue transit service improvement along Central Avenue in a more modest way than the AA's proposed exclusive-lane BRT and LRT options. They pursued several small, but effective, measures of improvement to create an "enhanced bus service" that would differ from the existing local bus service along Central Avenue.

Why Enhanced Bus?

When the MPO and the City had completed the AA that confirmed the need for improved transit service along Central Avenue, ridership levels and prospects for funding resources were low. This prompted the City to take a more modest approach than traditional BRT or LRT. Enhanced bus was an interim step towards full BRT and LRT—bus service that includes some of the features of traditional BRT. The City looked to Los Angeles' Metro Rapid Wilshire Boulevard BRT as an example for planning their new bus service.

Enhanced bus service, often the first stage of BRT service, is referred to as "BRT Light." The City's leadership and ABQ RIDE (the City's transit department) viewed enhanced bus as an interim strategy to encourage transit use. Enhanced Bus was also seen as an opportunity to establish a healthy ridership that would support the case for the city's federal funding application for future rail transit. The initial phase was relatively easy to implement. It entailed lower costs compared to fixed guideway projects, due to limited use of exclusive lanes, advanced Intelligent Transportation Systems (ITS) technology application, and off-board fare collection system. The enhanced bus technology and the route's fewer stops and quicker loading also translated to faster, more efficient service.

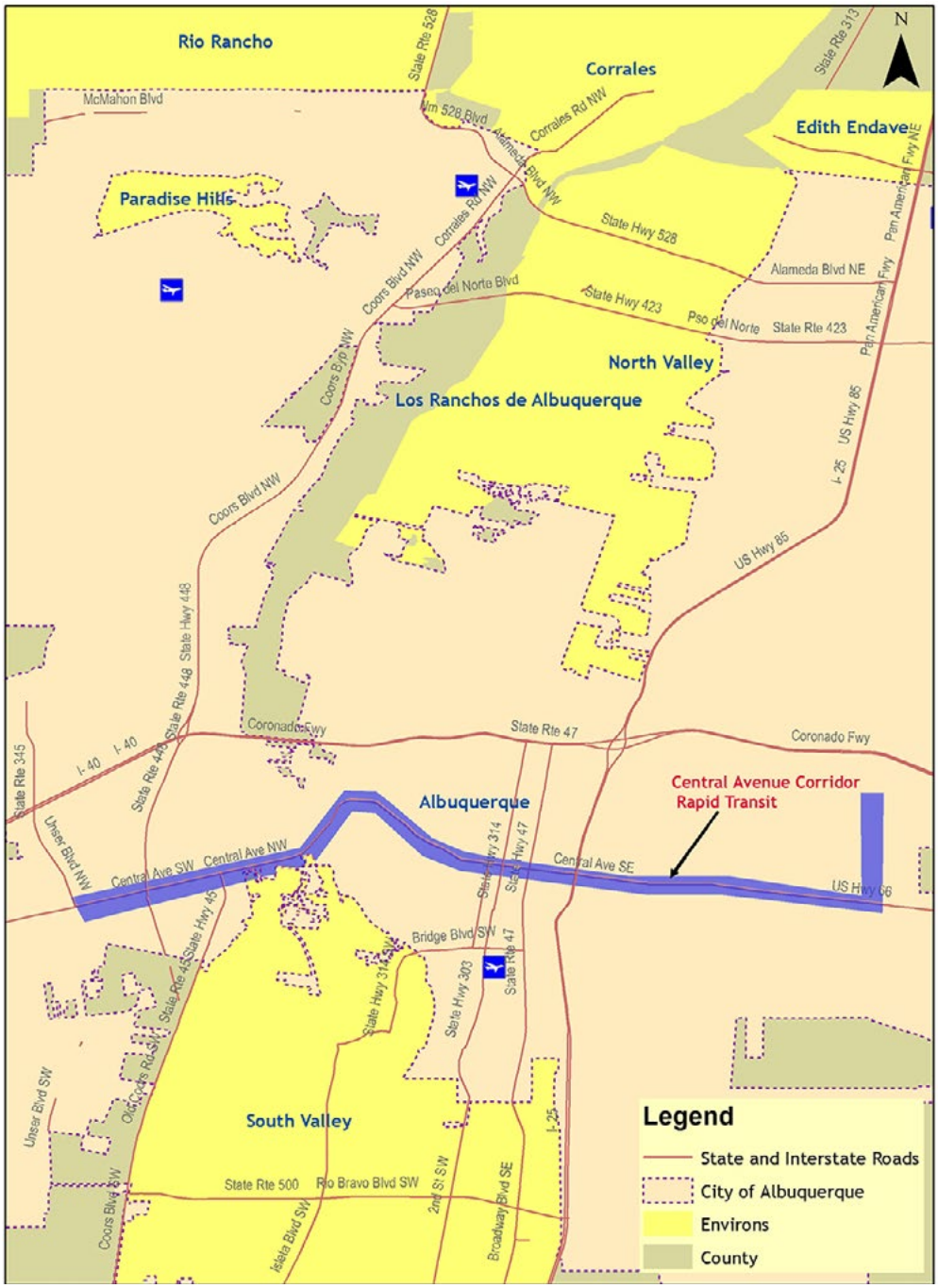
Rapid Ride Red Line

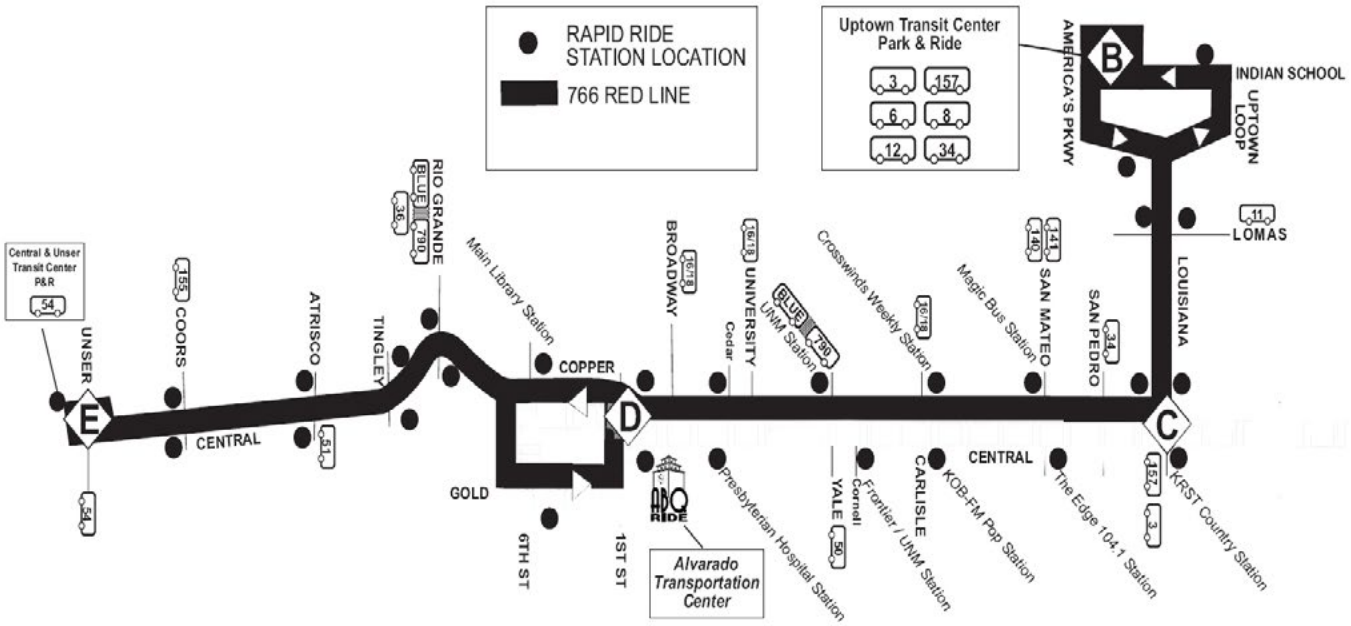
Under the leadership of the city's mayor, Martin Chávez, the transit agency planned and implemented Rapid Ride along Central Avenue within 18 months. Operations began in December 2004, from Unser Boulevard to Louisiana Boulevard along Central Avenue, and north on Louisiana Boulevard to the Uptown Shopping District. Figure 4B-5 shows the location of the Red Line corridor, and Figure 4B-6 provides the Red Line route map. The 11-mile route provides limited-stop transit service (only 10 stops) with diesel-electric hybrid articulated buses. It operates with 10-minute peak headways and 15-minute off-peak headways during weekdays and Saturdays and runs every 20 minutes during Sundays and holidays. (With overlapping service from the new Rapid Ride Green Line route, service along Central Boulevard occurs every 7–8 minutes during peak hour and every 15 minutes during off-peak.) The Red Line includes a small segment of segregated busway (about 0.7 miles), signal priority pre-emption, on-board fare collection, enhanced bus shelters, higher-capacity

buses (articulated buses—see Figure 4B-7), clean-vehicle technology, limited stops, and branding. In 2007, ABQ RIDE implemented wireless secured-Internet access on board the Red Line buses through special communication antennas installed at selected traffic signals.

Figure 4B-5

Red Line Corridor Location Map





Source: City of Albuquerque, http://www.cabq.gov/transit/routes-and-schedules

Figure 4B-6 *Red Line Route Map*

Figure 4B-7

Rapid Ride Red Line in Uptown

Source: Flickr, busboy4, used with permission under Creative Commons License, http://www.flickr.com/photos/busboy4/4614965464/sizes/l/

Albuquerque's Land Use Planning Framework for Transit-Supportive Development

The decisions to pursue transit improvement along Central Avenue and to implement enhanced bus service were preceded by, and integrated with, land use policies and planning to ensure that the right type and pattern of development would occur to support transit use. Beginning in 1998, and continuing through 2010, policies, plans, and strategies have been developed and adopted to create an environment for transit-supportive development.

Red Line Ridership

- In 2007, Rapid Ride Red Line recorded more than 1.6 million passenger boardings, an increase of 28% from 2006.
- The Red Line has a 75% higher ridership compared to the local #66 bus line, which is still in operation.
- An informal survey revealed that the Red Line attracts more passengers that are considered "choice riders," those who have the option of driving instead of taking transit.
- An FTA-funded study found that Rapid Ride had the highest percentage of ridership (68%) coming from private motorized modes compared to 14 other BRT systems surveyed.
- New Rapid Ride Service.
- The City added two new Rapid Ride bus routes—the Blue Line and the Green Line—as well as a nighttime service along the Red Line.
- Launched in 2007, the Blue Line connects the west side of Albuquerque with the University of New Mexico.
- Launched in 2009, the Green Line runs along Central Avenue linking Old Town to East Gateway near the interchange of Central Avenue and Interstate 40.
- Rapid after Dark, the night-time service, runs on Friday and Saturday nights and targets the night-time crowd of Downtown and Uptown. The service, which started in 2010, is available only during the summer time.
- Between 2006 and 2007, the City pursued the idea of a modern streetcar system that would run along Central Avenue. The project, which was to be locally funded, gained preliminary approval from the City Council in 2007 but has not yet been advanced.

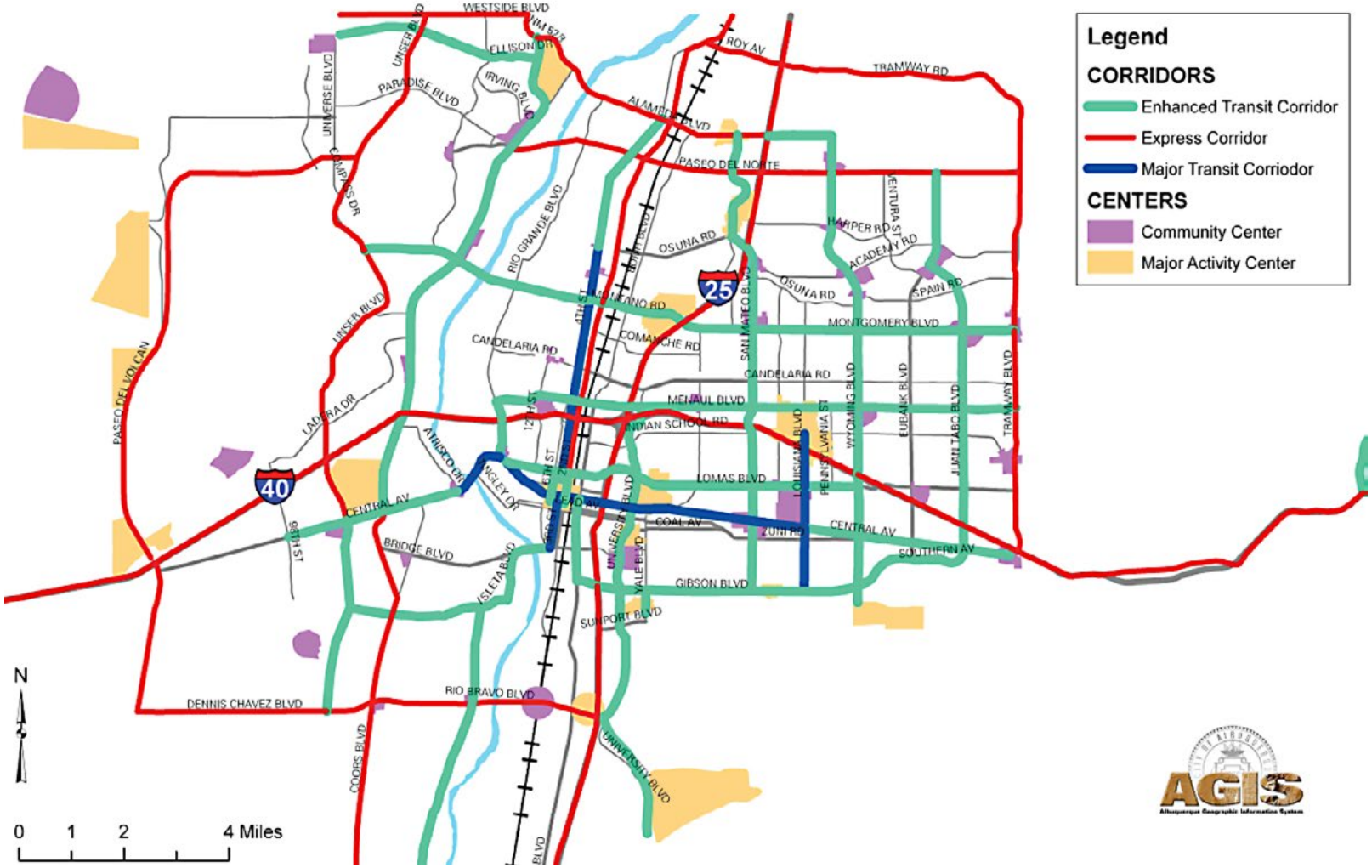
City Land Use and Growth Policies

The City of Albuquerque adopted several transit-supportive policies guiding development location and pattern. Most of these policies call for a more compact urban form that supports transit service as discussed below:

- **City Council Resolution R-70: Centers and Corridors Concept:** Adopted in 1998, City Council resolution R-70: Centers and Corridors Concept established the overarching policy framework for developing and redeveloping community and regional centers connected by major high-capacity transportation corridors. It also called for improved transit service to support these centers and corridors and encouraged a more compact urban form to support the viability of transit. The objectives of the Centers and Corridors concept were to achieve more efficient delivery and maintenance of public infrastructure, allow development that offers greater options and enhances quality of life, and provide more transportation options.
- **Planned Growth Strategy:** The Planned Growth Strategy, which was jointly developed by the City of Albuquerque and Bernalillo County staff, was released in 2001. The report sets the framework for future growth, zoning and design guidelines, financial requirements for infrastructure, and development and transportation linkages. The strategy emphasizes development within existing service areas and connections between employment centers, shopping areas, and neighborhoods by transit, walking, and bicycling.
- **2001 Albuquerque/Bernalillo County Comprehensive Plan:** The recommendations of the Centers and Corridors Resolution were incorporated as an amendment to the Albuquerque/ Bernalillo County Comprehensive Plan's Goals and Policies in late 2001. The Plan's Transportation Corridor Goal was "to develop corridors, both streets and adjacent land uses that provide a balanced circulation system...." The Plan's Activity Centers Goal was "to expand and strengthen concentration of moderate and high-density mixed land use...."

  The Centers and Corridors concept (see Figure 4B-8) established five basic activity center types, three of which relate to the Central Avenue Corridor:

  – Major Activity Centers (five out of eight citywide centers are along Central Avenue Corridor): Downtown, University of New Mexico, Albuquerque Technical Vocational Institute, Uptown, Sandia National Laboratories, Kirtland Air Force Base, Atrisco Business Park
  – Special Activity Centers: New Mexico State Fairgrounds, Albuquerque Bio Park/Zoo
  – Community Centers: Four Hills Village, International Market Center, Highland Center, Nob Hill, Old Town, Atrisco Plaza



Source: City of Albuquerque, Albuquerque/Bernalillo County Comprehensive Plan, 2002

Figure 4B-8 *Centers and Corridors as Designated by City's Comprehensive Plan*

The Comprehensive Plan designated segments of Central Avenue and Louisiana Boulevard as Major Transit and Enhanced Transit Corridors. These two corridor types are intended to provide a mixture of local bus service and some limited-stop transit service. There is emphasis on transit-oriented development, and where feasible, dedicated transit lanes will be provided.

The City of Albuquerque also developed sector plans:

- Nob Hill Highland Sector Plan – In 2006, the City completed a sector development plan for the Nob Hill/Highland Neighborhood, the neighborhood east of Downtown. The plan included streetscape and transit recommendations for Central Avenue and called for curb bulb-outs at all intersections, landscape improvements, street furnishings such as benches and bollards, additional signals, wider sidewalks and outdoor dining areas, and potential streetcar route and stops.
- East Gateway Sector Development Plan and the Green Line – In 2009, the City of Albuquerque developed a sector plan for East Gateway, an area along Central Avenue between Wyoming Boulevard and the eastern limits of the city. The plan was initiated to address future growth in East Gateway based on the transit Centers and Corridors concept. It recommended a combination of public infrastructure projects and new land development regulations that encourage transit-supportive development.

  The plan recommended that transportation priorities for Central Avenue focus on strengthening connections and enhancing streets for multimodal travel and exploring possibilities to reduce the number of vehicular travel lanes to accommodate bicycle, transit, and pedestrian use.

  At the time of the East Gateway planning process, the City decided to implement Rapid Ride Green Line, which would run from Downtown to the eastern boundaries of the city, serving the East Gateway area. The East Gateway Plan incorporated this new service and looked into alternatives for a new park-and-ride transit stop.

  The City began using a shopping center overflow parking area located at Wenonah Avenue and Tramway Boulevard, just south of Central Avenue, as an interim park-and-ride lot during the plan development. The Plan recommended that the city select, acquire, and develop a site for an integrated park-and-ride lot and bus transfer station that would be visible from Central Avenue and highly-accessible for pedestrians and cyclists. The proposed transit stop would allow a modest level of joint development of transit-supportive uses.

Recommendations for public infrastructure additions included new streets, streetscape, trail, and new public open spaces and community buildings. The Plan also established four new zoning districts to allow a variety of building types and associated site development standards for new development and

redevelopment. The up-zoning was made possible with the Sector Plan's designation of this segment of Central Avenue as a Major Transit Corridor. The plan was completed in 2009, and adopted on October 4, 2010.

Building Transit-Supportive Infrastructure

During and after the implementation of the Red Line, the City continued to proactively plan and invest in incremental infrastructure improvements along Central Avenue. The goal was to enable a better pedestrian environment for transit users, as well as encourage development and redevelopment of land uses with patterns and intensity that support transit use.

Red Line Bus Stops

Most stations along the Red Line are more substantial compared to the regular bus stops, with structures that shelter passengers from the elements (see Figure 4B-9). The stops have a consistent Pueblo-Deco inspired design and are located every ½ to 1 mile apart at major intersections and activity centers. The stations have wind screens, "next bus" LED displays that indicate when the next Rapid Ride bus is due, and neon accents in keeping with the historic Route 66 theme. All stops or "stations" along the Red Line also include a Rapid Ride monument (see Figure 4B-10).

Figure 4B-9

Rapid Ride Red Line in Uptown

Source: Photo taken by PerryPlanet, October 23 2006, released to Public Domain, http://en.wikipedia.org/wiki/File:Rapid_Ride_Stop.jpg

Figure 4B-10
Rapid Ride Monument

Source: Flickr, Matthew Cohen, used with permission under Creative Commons License, http://www.flickr.com/photos/mister_goleta/414752497/

Central Avenue Streetscape Plan

Adopted by the City of Albuquerque in 2002, the Central Avenue Streetscape Urban Design Master Plan was intended to serve as a blueprint to guide the redevelopment of Central Avenue and the streetscape. The Master Plan sets out block-by-block recommendations for changes within the public right-of-way and provides illustrative examples of redevelopment projects of properties along Central Avenue. The Master Plan also explores possibilities of reducing the number of lanes along sections of Central Avenue from four to three lanes to improve walkability.

Streetscape construction for Central Avenue started in 2010 in the Nob Hill area. The improvements included the addition of intersection bulb-outs, pedestrian lighting, and landscape enhancements. Proposed streetscape improvements for Central Avenue between Washington Street to Eubank Boulevard were also included in the 2009 rounds of federal stimulus funding applications.

Great Streets Facilities Plan

In April 2010, the City completed the Great Streets Facilities Plan to help implement the City's Comprehensive Plan's goals and policies related to Corridors and Centers. The Plan includes policies, standards, and prototype designs on building streets that are multimodal, safe, visually attractive, and socially and economically vibrant.

According to the Facility Plan, major transit corridors, such as Central Avenue, should be designed to optimize public transit and pedestrian convenience by providing dedicated transit lanes, wide sidewalks, bike lanes, and the future possibility of rail transit service. Aside from specific guidelines based on corridor type, the Facility Plan outlines standards for transit service and transit facilities, including locations and design of transit stops.

Citywide Form-Based Code

In 2009, the City adopted a Form Based Code as one of the tools to implement the Albuquerque/ Bernalillo County Comprehensive Plan. The form based code supports land use patterns and densities that are shaped by, use, and support transit. Form-Based Zones (FBZ) are an alternative to the traditional zoning districts of the city, and property owners can opt to apply for FBZ designation. Aside from a mixed use, infill, and planned neighborhood development zone, the new code includes two transit-oriented development (TOD) zones:

- TOD–Major Activity Center (TOD-MAC): Characterized by high-intensity employment, civic, retailing, and entertainment development, and a complementary mix of commercial and high-density residential functions; design is at a capacity and intensity that is supportive of transit.
- TOD–Community Activity Center (TOD-COM): Serves a large area to provide community-serving retail and services as well as high-density residential with a design, capacity and intensity supportive of transit. Densities and intensities are smaller in scale than the TOD-MAC.

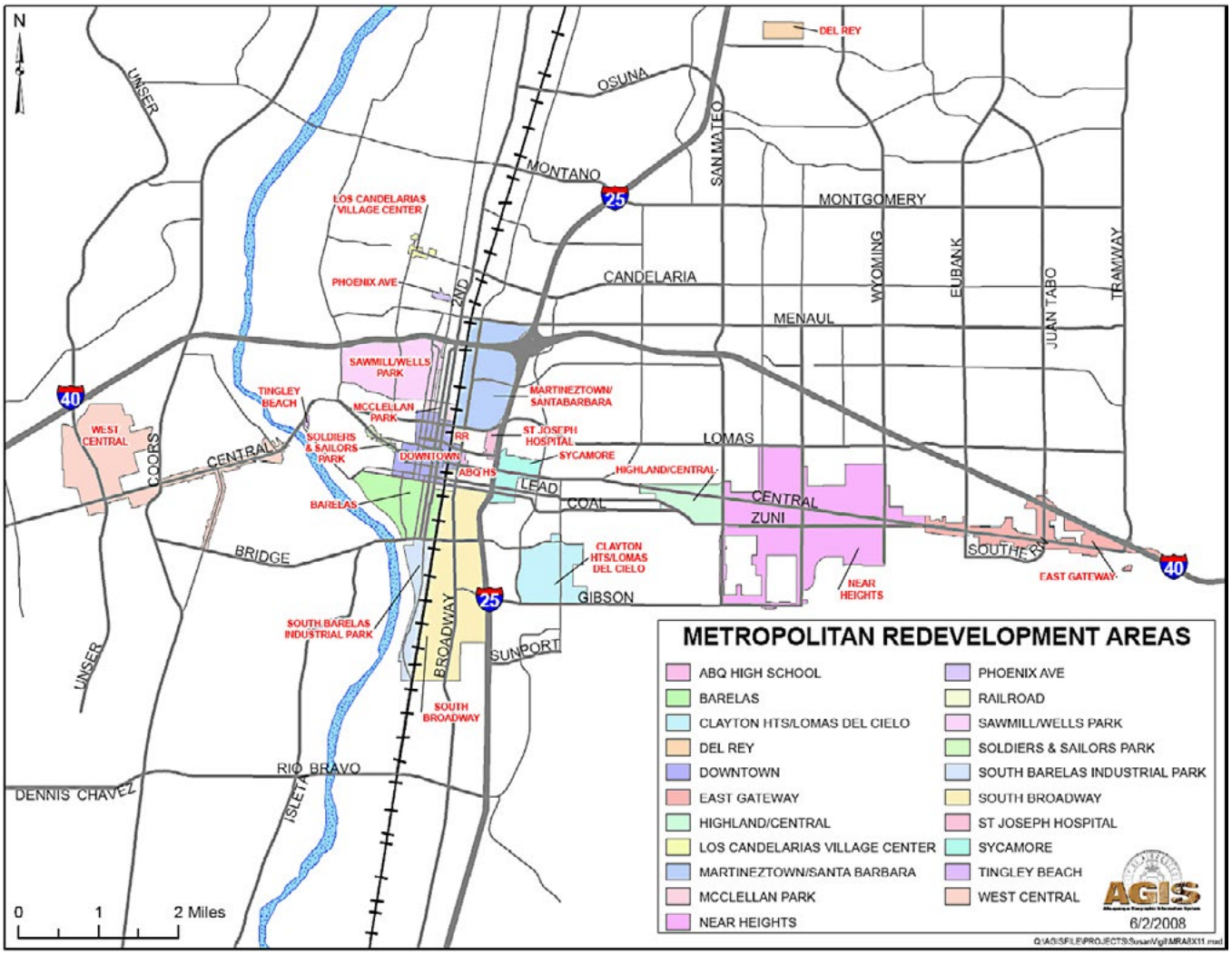
To encourage transit-supportive land use patterns, the two TOD zones require site design and lot layout standards that will accommodate a walkable environment, including requirements for public realm provisions, no maximum or reduced parking requirements, and minimum block sizes.

Redevelopment along Central Avenue

A modest amount of redevelopment has occurred since the Red Line's implementation. These efforts are led and coordinated by the city's Metropolitan Redevelopment Agency, an agency responsible for planning and facilitating redevelopment in established Metropolitan Redevelopment Areas (MRAs). The Agency abides by the Centers and Corridors approach outlined in the

Comprehensive Plan and uses resources from the Metropolitan Redevelopment Fund, Federal Community Development Block Grants, and other local and State capital funds.

Several areas along Central Avenue have been designated as MRAs, which renders them eligible for tax increment financing (TIF) and other government subsidies for infill development. These MRAs include the Downtown, Central/Highland Upper Nob Hill, Sycamore, Near Heights, and East Gateway (see Figure 4B-11). The Metropolitan Redevelopment Authority coordinates closely with other city departments, including ABQ RIDE to ensure that redevelopment efforts along Central Avenue are transit-supportive.



Source: City of Albuquerque, Metropolitan Redevelopment Agency, 2008

Figure 4B-11 *Metropolitan Redevelopment Areas (MRA) Map*

A specific transit-supportive development of note within the Central Avenue Corridor is the reuse of an historic high school. The Old Albuquerque High School is located a few blocks from the Alvarado Transportation Center, the multimodal center for Rail Runner, Amtrak, Grey Hound, and Rapid Ride. Its conversion into loft apartments, condominiums, and live-work units has been lauded as a model redevelopment project (see Figure 4B-12).

Figure 4B-12

Historic Albuquerque High School

Source: Photo taken by camerafiend, March 20 2009, GNU Free Documentation License, http://en.wikipedia.org/wiki/File:Old_Albuquerque_High_School_Albuquerque.jpg

Other notable transit-supportive redevelopment efforts include adaptive reuse of motels, including the American Inn Motel, the De Anza Hotel, and the Nob Hill Motel. The De Anza is an historic 87-room motel that is planned to be redeveloped into a commercial/office mixed-use property while retaining many of its historic features. The Nob Hill is another historic motel, converted in 2009 to office suites (see Figure 4B-13).

Figure 4B-13

Nob Hill Motel Redevelopment

Source: Photo taken by John Phelan, May 2 2010, licensed under CC-BY-SA-3.0 http://creativecommons.org/licenses/by-sa/3.0/deed.en, from Wikipedia, http://en.wikipedia.org/wiki/File:Nob_Hill_Motel,_formerly_Modern_Auto_Court,_Albuquerque_NM.jpg

These new land uses help bring ridership to the transportation system.

Lessons Learned

The City of Albuquerque, together with its regional partners, identified the need for improved transit service. Although the region was successful in bringing the New Mexico Rail Runner Express, a commuter rail serving the metropolitan areas of Albuquerque and Santa Fe, local fixed guideway and rail transit have yet to be realized. Instead, the local leaders took an incremental, yet successful, approach to achieve their transit goals. Based on the experience of the City of Albuquerque, the following lessons learned provide insight to other communities faced with similar needs.

Incremental steps are sometimes needed to reach a transit goal. During the early planning stages for improved transit along Central Avenue, the City realized that a more mature urban development pattern and associated transit ridership could help in their quest for federal funding. Instead of investing substantial resources, time, and effort to go through the long process of environmental analysis and evaluation of fixed-rail transit without guarantee for funding, city leaders decided to take an approach that would provide immediate improvement for local transit service—one that did not compromise the ability to accommodate potential

future LRT or BRT. With a $1 million FTA grant and local funds, the City established its first Rapid Ride line, the Red Line, in an 18-month period.

Through many of the planning efforts (Nob Hill Sector Plan, East Gateway Sector Plan, Great Streets Plan, and others), the City has explored and recommended the reduction of vehicular capacity along Central Avenue to accommodate additional transit lanes and improved pedestrian travel. The incremental and consistent introduction of a relatively radical idea allowed residents, businesses, and political leaders to explore, debate, and understand the potential benefits and issues, and readied the community for infrastructure changes necessary for future fixed-guideway transit along Central Avenue.

Integrate transit investment with land use planning and infrastructure improvements. Concurrent with the City's investment in enhanced bus service, the City conducted continuous land use planning and implemented policies and infrastructure improvements to encourage transit-supportive redevelopment and reinvestment. With its general policies and comprehensive plans, sector plans, and land use regulations, the City reiterated the importance of supporting Central Avenue as a Major Transit Corridor.

Community champions are essential to project success. According to City staff interviewed, the key to Rapid Ride's success was the strong leadership provided by Mayor Martin Chávez. His steadfast commitment to ensuring transit improvement rallied City Council support as well as state legislative support to invest in Rapid Ride. In 2008, U.S. Senators Jeff Bingaman and Pete Domenici helped secure $4.8 million of additional funds from the U.S. Department of Transportation (DOT) that helped in the Green Line's implementation. Aside from Rapid Ride, Mayor Chávez also championed the earlier efforts to pursue LRT and to explore streetcar along Central Avenue.

Mayor Chávez recognized the need to build other leadership in his quest for transit success. In 2005, he appointed Greg Payne, the agency's most vocal critic, to direct the newly-rebranded agency, ABQ RIDE. Director Payne set out to turn the department into a world-class transit agency. As a hands-on director, he personally met with drivers and mechanics and reorganized the agency. He made sure that safety and customer service became the system's top priorities. The reorganization allowed for hiring additional drivers, so new routes were added and service was expanded. ABQ RIDE was able to expand, while the rest of the country was instituting service cuts in bus systems.

Harness partnerships. Another factor that led to the Red Line's success was the partnership among City departments and various agencies. Since ABQ RIDE is an entity of the City, coordination among the transit agency and the other departments, such as planning, was streamlined. Policies to prioritize transit improvements along select corridors and activity centers were incorporated into citywide plans and programs, and translated to street infrastructure investments as well as new transit service. At the same time, the investment in Rapid Ride provided additional impetus for transit-supportive zoning changes and new design guidelines that called for higher densities and mixed-uses. Cross-departmental coordination also facilitated efficient planning activities for route selections and station locations.

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Case Study 2: Considering Community Character and Cohesion in Transit Planning—Interstate MAX (Yellow Line), Portland

Portland's Interstate MAX (Yellow Line) is recognized nationally as an example of true community outreach in transit planning and the incorporation of the outreach into policy and practice. The 5.8-mile LRT line runs mostly along Interstate Avenue, a major arterial and historic commercial corridor located a few blocks west and parallel to Interstate 5 in Portland, Oregon (see Figure 4B-14 for the corridor location and Figure 4B-15 for the line's route map). Completed in 2004, four months ahead of schedule and $25M under budget, the Yellow Line has met and exceeded ridership expectations—weekday ridership is double that of the former bus line that served the Interstate Corridor (see Table 4B-2).

Portland Case Facts

System Name:	MAX
Corridor Name:	Interstate MAX Yellow Line
Transit Mode:	Light Rail (LRT)
Location:	Portland, Oregon
Region (USA):	Northwest
Corridor Length:	5.8 miles
Corridor Purpose:	Inter-Urban Commuter
Commuter Municipalities Served: 1	
Cost and Funding Sources:	Cost $367.5M (federal $257.5M, regional $55M, capital $25M, local $30M)
Date Opened:	May 1, 2004

Figure 4B-14

MAX Yellow Line Corridor Location Map

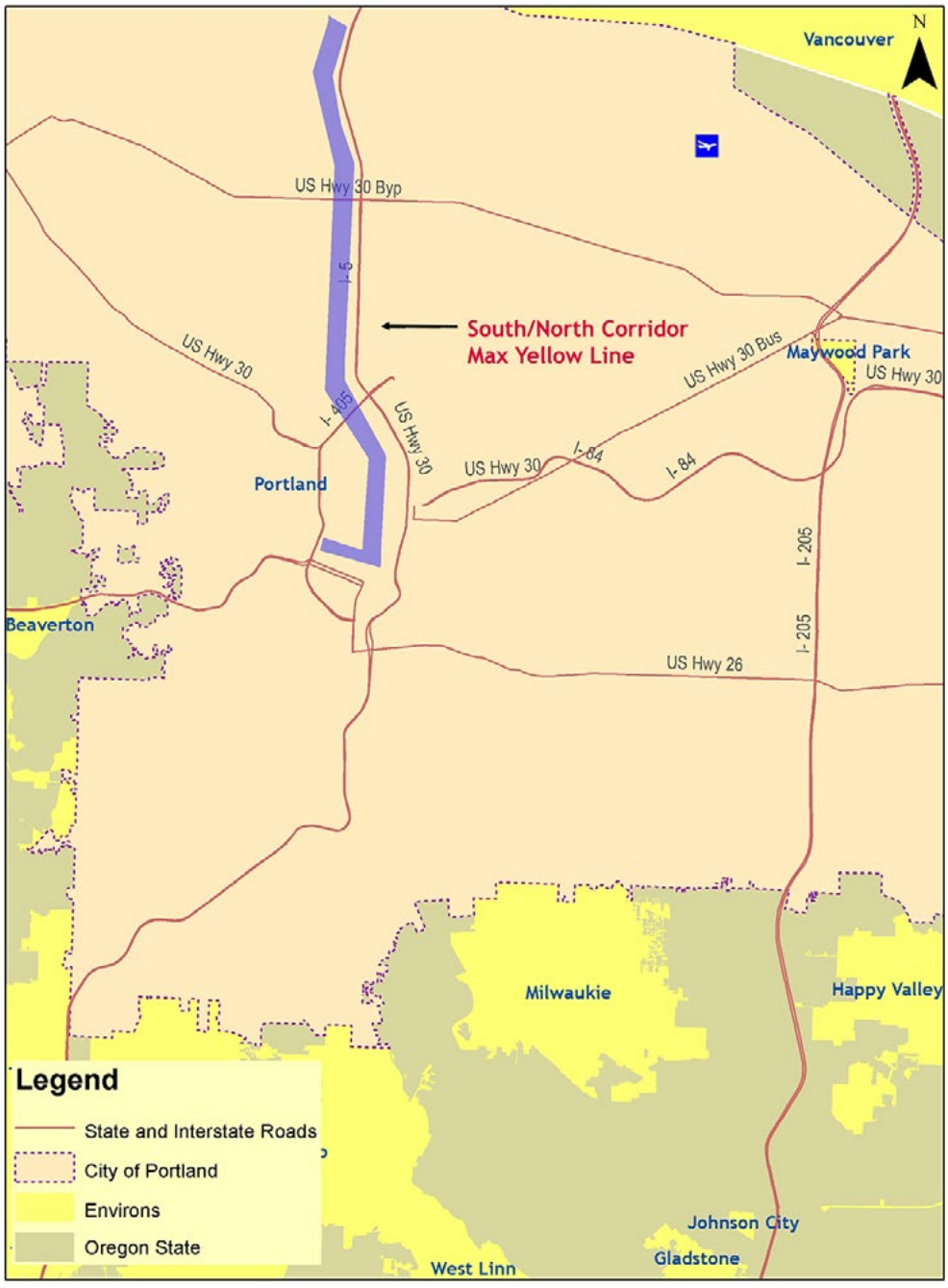


Figure 4B-15

MAX Yellow Line Route Map

Source: TriMet, Interstate MAX Yellow Line Fact Sheet, 2009

Table 4B-2

Interstate MAX Yellow Line Annual Ridership

Fiscal Year	Annual Ridership (millions)
2004	0.7
2005	3.94
2006	3.84
2007	4.18

From recognizing the community's need for LRT, to selecting the alignment, to redevelopment strategies, the planning and construction of the Yellow Line considered the existing community character and engaged the community in a number of innovative ways.

The Need for Light Rail Transit—A Rocky Start

The Interstate Metropolitan Area Express (MAX) transit project was originally proposed as part of the South/North Transit Corridor, a longer LRT extension project. The Corridor was identified as a priority for high-capacity transit improvements in Metro Portland's (the MPO) 2040 Growth Concept (1993). The original line was planned to connect Clackamas County, Oregon, over the Columbia River into Clark County, Washington.

In 1995, Clark County voted down a bond measure to finance its portion of the alignment, which posed the initial hurdle for the South/North line. In 1996, an Oregon statewide ballot on the State's share of the South/North Project was defeated, and in 1998, a regional bond measure to provide local share to implement transit was voted down. In spite of these defeats, community leaders in Portland persevered in bringing transit to the North Portland area, because the Interstate Avenue community wanted improved transit service (55% of voters within a ½-mile radius of the Interstate MAX line voted "Yes" on the 1998 South/North measure).

After a series of public events at which community members expressed support for new transit investment in North Portland, TriMet (Metro Portland's transit agency), Metro Portland, and the City of Portland decided to explore a shorter transit alignment along Interstate Avenue. The line would link the Rose Quarter and Portland State University in Downtown Portland with the Portland Expo Center in North Portland.

The referendum defeats of the larger South/North line constituted a big setback to regional and city leadership in terms of pursuing regional transit improvements, but the rebirth of the project as Interstate MAX was seen by many as the "phoenix rising from the ashes of the South/North project," brought about by strategic leadership and strong community resolve.

Interstate Avenue Community: A History of Urban Renewal Upheaval

In the mid-1990s, Interstate MAX was in the planning stages, and the Interstate Corridor area was a neglected and underserved section of the Portland Metro area. It was home to some of the city's lowest income neighborhoods and had the highest concentrations of ethnic minority population.

Demographics in 1996 along the Interstate Avenue corridor:

- 20% of city's population
- 65% of city's African-American residents

Demographics in 1996 within the Interstate area:

- 38% minority groups (18% of city's population is minority)
- 27% African-American
- 10% Native American, Asian and Pacific Islander, and other race groups
- 7% Latino

From the 1940s to the 1970s, large public works and urban renewal projects in the Interstate Corridor caused disruption and displacement of the community. A section of a two-block residential neighborhood along a 3.5-mile stretch of what is now Interstate 5 was demolished to build the highway. Construction of Emanuel Hospital, and other urban renewal projects, further displaced established neighborhoods and businesses (see Figure 4B-16).

Figure 4B-16

Construction Disruption through North Portland

Source: City of Portland, http://www.portlandonline.com/transportation/index.cfm?a=66097&c=36416

The community's unique character and history presented a set of challenges that the City of Portland and TriMet had not experienced in their previous transit projects. The memories of community displacement remained fresh, and

the Interstate Corridor community was concerned that the LRT line, another federally-funded project, would have similar impacts. The community was also concerned that industrial and neighborhood commercial uses might not survive the construction and subsequent development's gentrification impacts.

Interstate Avenue Transit Planning Process

After the decision was made to pursue the Interstate Avenue alignment, a Supplemental Draft Environmental Impact Statement (SDEIS) was developed by TriMet for the new shorter alignment to append the South/North Draft EIS. The SDEIS was completed in April 1999, and a locally preferred Interstate alignment was approved by the Portland City Council, TriMet, and Metro in June 1999. TriMet completed the Final Environmental Impact Statement (FEIS) and the Portland City Council adopted the FEIS and a Conceptual Design Report in October 1999.

Considering the Community's Needs

Months after the 1998 regional funding election, Metro held a series of "listening posts" to allow community members to express ideas on addressing transportation needs. At the same time, an alliance of North/Northeast Portland business and community leaders came together to develop an alternative transit proposal. The community discussions identified three priorities: (1) build a reliable transit service for North/Northeast Portland, (2) build a quality project with lower costs than the South/North proposal, and (3) no displacements should be required along the alignment.

Choosing an Alignment: Interstate Avenue or Interstate 5?

As part of the South/North project, an alignment along Interstate 5 was considered as an alternative for new transit service. Running transit along the highway proved to be more efficient from a time standpoint, and would cause fewer direct impacts to neighborhoods. However, this alignment would be less accessible and less effective in directly benefitting the local North Portland community. The community outreach efforts demonstrated that support for the new, shorter light rail project was centered on the project's ability to help revitalize a long neglected region of Portland. Eventually, running transit at-grade along Interstate Avenue was deemed by the community as the preferred alignment.

Funding Interstate MAX without New Taxes

The defeat of past transit funding referendums was a clear sign that there was no support for new taxes to fund the required local match. Other sources of a solid local funding match were needed. Regional and local partners collaborated and identified funding contributions from Metro, TriMet, and the City of Portland (see Table 4B-3). The City of Portland's funding comprised $30 million

of primarily tax-increment financing (TIF) funds from the Portland Development Commission (PDC), which was made accessible through the designation of the corridor as an Urban Renewal Area (URA). The designation sent a clear message that the city was investing in the Interstate Avenue Corridor for economic development purposes as well as transit improvement purposes.

Table 4B-3
Interstate Light Rail Transit Funding

Agency	Source	Amount (million)
Federal Transit Administration	New Starts	$257.5 (74%)
Metro	Regional Transportation Funds	$55.0 (11%)
TriMet	Capital Funds	$25.0 (7%)
Portland Development Commission	Urban Renewal Funds	$30.0 (8%)

Source: http://trimet.org

Proactive Land Use Planning

Integrated transit and land-use planning are the hallmarks of much of Portland's transit planning history. The planning process for Interstate MAX Yellow Line was no exception. Prior to, during, and after the National Environmental Policy Act (NEPA) planning process, the City conducted a series of planning studies, each building on the previous effort and providing a vision for regulatory and infrastructure implementation.

Albina Community Plan

The Albina Community Plan was developed by the City of Portland in 1993 as a land-use policy tool for an area in North Portland that includes the Interstate Avenue Corridor. The plan, officially adopted as part of the City of Portland's Comprehensive Plan, sets goals and policies to guide growth and development for North and Northeast Portland. The plan is one of the first documents that suggested the South/North Corridor project's alignment. It later identified the need for the Interstate Avenue alignment. Under "Policy II: Transportation," the Albina Community Plan recognizes the need to improve Albina Community's connections to the rest of the region. It calls for emphasizing "light rail transit as a major transportation investment … and protect(ing) neighborhood livability and viability of commercial areas when making transportation investments."

Urban Renewal Area

The 2000 Interstate Corridor Urban Renewal Plan developed by the Portland Development Commission (PDC) and the City's planning department, builds on the policy framework in the 1993 Albina Community Plan, acknowledging the need for transit-supportive development that would enhance the existing community. Central to the Plan's objectives is that existing and future public investments benefit and enhance the community. The Plan recommended a

set of urban renewal projects and programs to be undertaken by the PDC. These included redevelopment through new construction, rehabilitation and conservation, acquisition and redevelopment, land disposition, public improvements, and joint-development. By mid-2010, the PDC completed several residential and commercial redevelopment projects, as well as parks and open-space projects. As part of the urban renewal effort, PDC partnered with TriMet and other agencies to provide "Community Livability Grants" to neighborhood groups. These grants help fund improvements to community facilities, historic buildings, and other important neighborhood amenities.

Station Area Revitalization Strategy

The Station Area Revitalization Strategy takes the 1993 Albina Community Plan and the 2000 Urban Renewal Plan to an important next step. The LRT and urban renewal planning efforts were structurally combined through the 2002 Station Area Revitalization Strategy. The effort was funded by the Oregon DOT through its Transportation Growth Management grant and managed by the PDC and the Portland DOT (PDOT). The premise of the revitalization strategy is the expectation that public investment must leverage significant private investment, and investments need to be in a form that respects community goals. The Strategy outlined a community vision for redevelopment of key parcels at six station areas, coupled with strategic public infrastructure improvements. It called for more than 1,700 new mixed-income housing units and new commercial development with more than 2,000 new employment opportunities. Its main goal was to encourage reinvestment and revitalization, while protecting and enhancing existing neighborhoods and retail centers.

Interstate Corridor Development

- From 1999 to 2009, the assessed value of new development within ½ mile of the Yellow Line station areas totaled almost $250 million.
- New developments along Interstate Avenue: a grocery store, charter school, new medical clinics, mixed-use and residential projects, and many new small businesses.

Interstate Zoning Project

In 2007, the City of Portland revisited and incorporated the 2002 Station Area Revitalization Strategy into a set of proposed zoning changes to enable transit-supportive development. The Interstate Zoning Project aimed to reduce regulatory barriers to redevelopment and reinvestment and to provide consistency between the policy and the zoning.

New transit-supportive zoning encourages additional neighborhood services, new and expanded local retail, housing, and greater job opportunities for the community. It allows for mixed uses and densities that would support the Interstate MAX line as well as the Interstate Urban Renewal Plan and, at the same time, guide the transition between new high-density development and existing lower-density residential neighborhoods. The new zoning code also encourages provisions for even higher standards for the pedestrian environment. Regulatory provisions address site design and lot layout (reduced parking, build-to lines), density (building heights, FARs, minimum densities), and mixed-use districts, among others (see Figures 4B-17 and 4B-18).

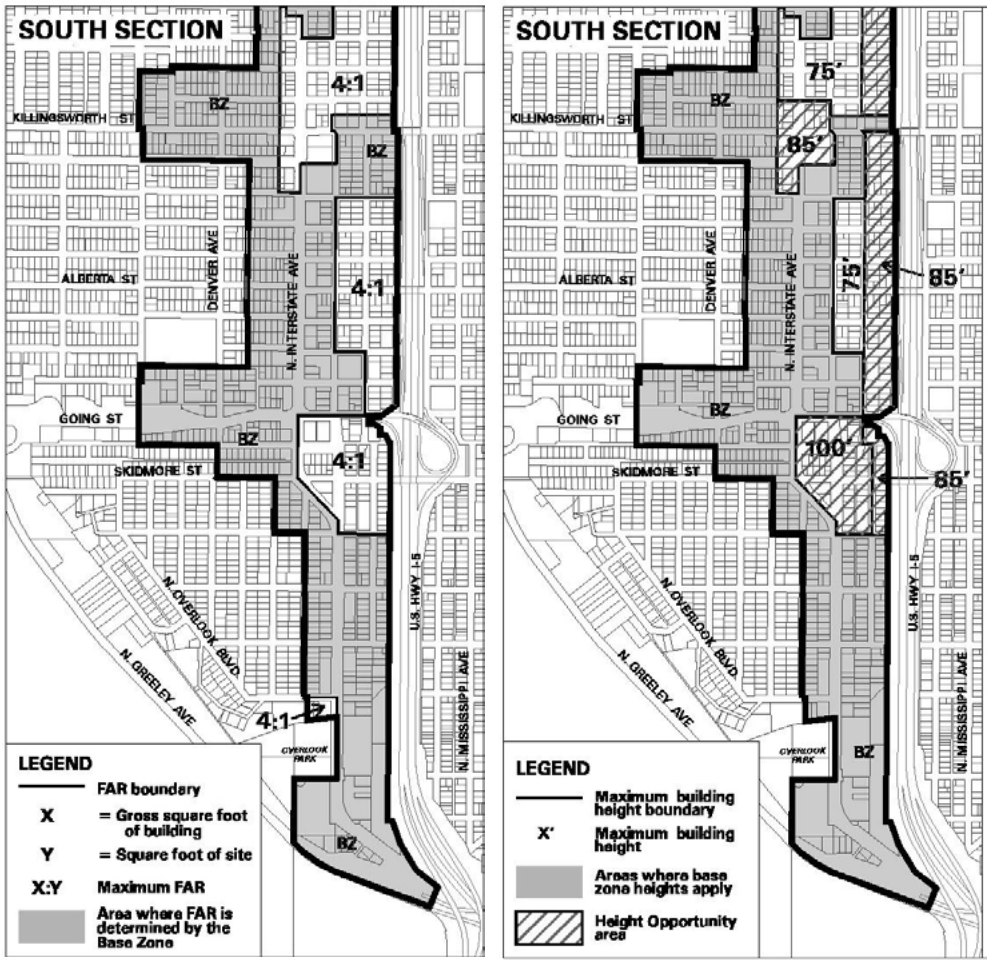
Figure 4B-17

Interstate Corridor Redevelopment Scenario based on 2007 Zoning Recommendations

Source: City of Portland, "North Interstate Corridor Plan," PowerPoint presentation, 2008

Figure 4B-18

2007 Zoning Recommendations for Station Areas (Height and FAR)



Source: City of Portland, Chapter 33.561 North Interstate Plan District, 2008

Innovative, Active, and Consistent Community Involvement

While at-grade transit along Interstate Avenue can positively influence economic development efforts, an alignment on an established urban corridor also presents a complex set of challenges to community preservation. Stakeholder concerns regarding impacts to the existing community and its businesses, during and after construction, were voiced strongly by the Interstate Avenue community and became one of the most important guiding themes for the city and regional transit leadership.

Dedicated Staff for Community Outreach

During Interstate MAX's planning and implementation stages, the City of Portland, TriMet, and PDC dedicated staff specifically to the project's community engagement and outreach. TriMet, which managed the overall public process, had 22 community staff assigned to the corridor, with 4 members solely focused on actively engaging community members throughout the project's life. These

specialists managed day-to-day communication needs and public relations, and helped develop and implement the Yellow Line's innovative business support and joint development programs.

Innovative Community-Building Programs

TriMet began the Interstate Avenue LRT project with a commitment to community environmental justice issues, including business retention, and jobs and economic responsiveness. The agency developed a business-support program to help mitigate possible construction impacts on businesses along Interstate Avenue. This program addressed potential displacements in a positive, proactive manner, by providing residents and business owners with resources and services for better housing, employment, and business opportunities. The program included a broad-based marketing and advertising campaign using advertisements, direct mail, promotions, and technical workshops targeted to attract businesses, and to provide technical and financial support for existing Interstate Avenue businesses (see Figure 4B-19). In addition, TriMet sponsored a "Lunch Bus" event that brought 14,000 people to Interstate restaurants and $12,000 in profit to these businesses. TriMet also distributed coupons to promote local businesses, facilitated loans for small businesses, and adjusted construction schedules to accommodate business needs.

Figure 4B-19
Interstate Avenue Campaign Ad

Source: City of Portland, http://trimet.org/

TriMet partnered with the PDC to create a financial assistance program to assist businesses during the construction periods. Throughout the construction of the transit project, the business support program assisted more than 100 businesses. Of the 106 active businesses along Interstate Avenue, only 2 relocated when construction of the light rail project commenced, and 1 closed due to the light rail construction. At the time of the Yellow Line's opening, approximately 100 new small businesses had opened on Interstate Avenue.

Creative Joint Development

As the Interstate MAX was constructed under budget, TriMet sought and received FTA approval for use of project savings to support transit-supportive development activities. In partnership with PDC, the agency used $4 million to acquire two underused properties with intent for redevelopment. The Crown Motel, identified in the Station Area Revitalization Study as a site in need of improvements, was acquired by TriMet and offered for development in March 2006. The building has been redeveloped as the Patton Park Apartments, with 54 units of affordable housing and ground floor retail (see Figure 4B-20).

Figure 4B-20
Patton Park Apartments

Source: Portland Development Commission

Encouraging Affordable Housing

Community fear of displacement as a result of public investments challenged the public agencies to create policies and programs to prevent displacement and to protect existing neighborhoods. TriMet required permanently affordable housing as part of the redevelopment of the Crown Motel. PDC also required 30 percent of funds used for urban revitalization to be dedicated to permanently affordable housing.

Innovative Disadvantaged Business Enterprise (DBE) Participation Practices

TriMet staff actively worked to get meaningful participation for minority and small business owners through the Interstate Avenue light rail project. The Agency's community affairs staff helped identify potential DBE firms, provided assistance in processing DBE applications, and provided pre-bid technical assistance to DBE firms. As a result, the Interstate MAX project surpassed TriMet's 16 percent DBE

goals, with 19 percent ($35 million) participation by minority and women-owned businesses, with more than $8 million of these contracts going to local DBE businesses within North and Northeast Portland.

Lessons Learned

Interstate MAX is considered a model transit project due to its integration of land use considerations throughout its planning process and its innovative community engagement practices. Following are some of this case study's key lessons learned.

Agency alignment of and commitment to project priorities is important. The strong partnership among Metro, TriMet, and the City of Portland was a major reason for Interstate MAX's success. The shared financial investment in the project translated to a shared responsibility and commitment to ensure that the project not only met its mobility goals, but its economic development and community-building goals as well.

Strong champions and a consistent message are essential. According to TriMet staff, strong commitment from the agency's leadership was a critical factor in the project's success. The commitment to empowering and protecting existing communities and local businesses translated to concrete programs and policies through design and implementation. "The [DBE] model started with management agreeing to a philosophy, and then empowering the team to go out and make it happen, and not look for excuses for it not to happen" (Sheila Holden, North Portland community economic development activist).

An emphasis on protecting and enhancing the existing community is important. TriMet and the City of Portland placed great emphasis on community protection, a goal that would not be compromised. This ambitious goal required commitment, hard work, and creativity from the transit agency and the city's leadership and staff. Clear policies and consistent messages translated to resource allocation, programs, and strategies geared at ensuring that the existing communities along Interstate Avenue were protected and enhanced.

Learn from past experiences. Portland's rich transit history allowed the city government and TriMet to look at past experiences and apply lessons learned. Lessons learned from the Westside, Eastside, and Airport MAX lines assisted in the decision for an at-grade alignment along Interstate Avenue to maximize transit-supportive development. TriMet also proactively sought input from the Interstate corridor community regarding past project experiences. The agency held four "lessons learned" workshops prior to the project's construction to identify which DBE and workforce efforts were successful in the past and which practices to avoid.

Design must reflect community values. Throughout the design and planning process, the City engaged the community in developing a multimodal urban street that serves established diverse neighborhoods with a strong sense of community. The alignment's cross-section was one that preserved existing street trees, maintained on-street parking, maintained access to properties along Interstate Avenue, and provided safe pedestrian crossings. Engaging the community in station placement, station design, and decisions related to public art in station areas helped the community feel a sense of ownership of the project, and helped integrate the light rail system into the community.

There must be a commitment to the community. TriMet recognized the importance of staying committed to the community and that building trust is a long-term process. Its performance on one project might help determine the level of public support they will receive on future projects. As an interstate light rail community involvement consultant said, "I am able to bring those people who went through the Interstate Avenue project to other communities and have them say, 'You know what? TriMet stood by their commitment to me. TriMet kept my business open. Construction was tough, but they were there every step of the way'" (TriMet 2007).

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Case Study 3: Embracing a New Transit Technology and Proactive Urban Design—Euclid Bus Rapid Transit (HealthLine), Cleveland

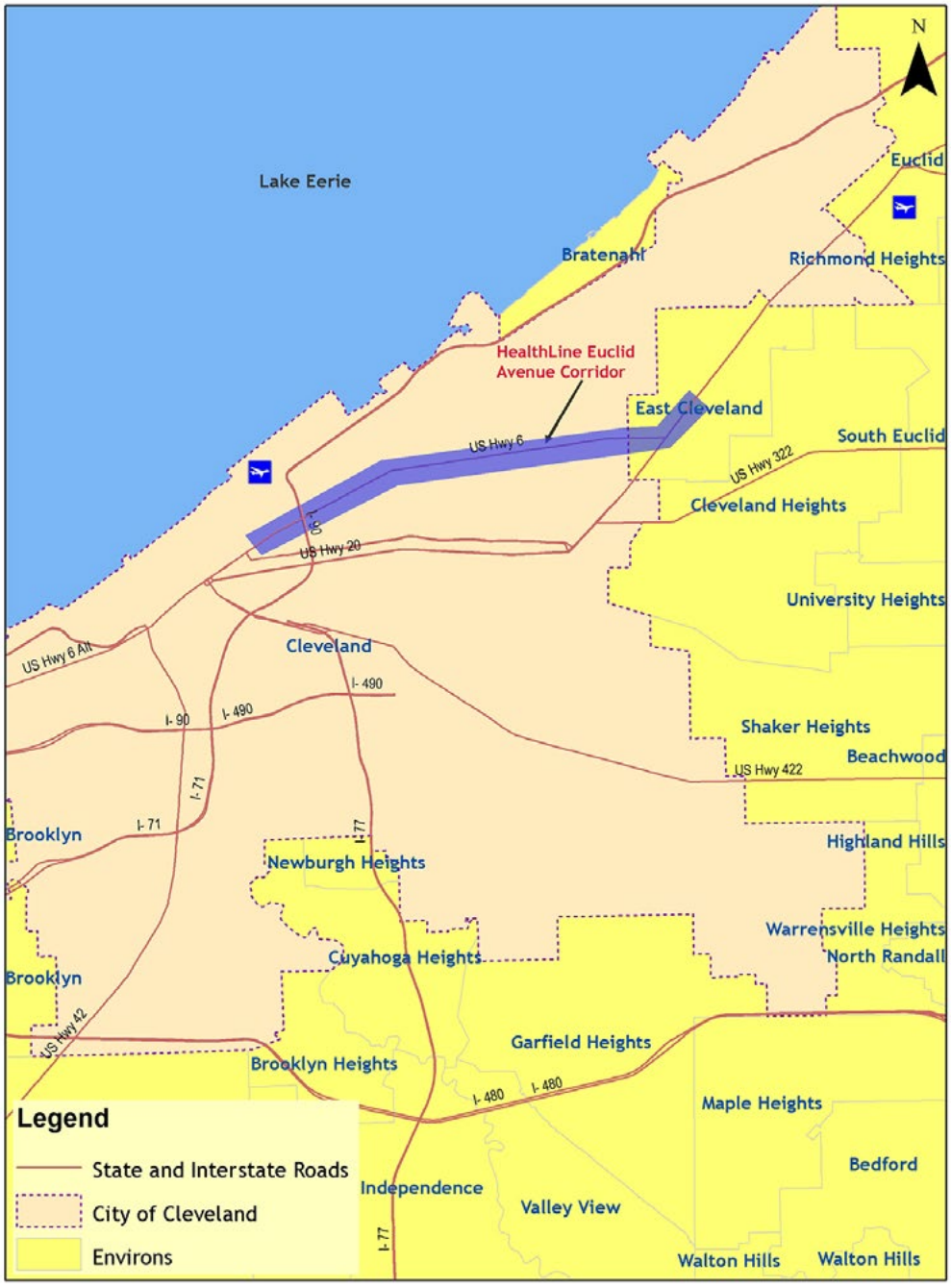
The Euclid Avenue BRT, also known as the HealthLine, is a 9.4-mile BRT line that serves Cleveland's main commercial corridor, Euclid Avenue. Figure 4B-21 shows the corridor location and Figure 4B-22 shows a HealthLine vehicle. Operated by the Greater Cleveland Regional Transit Authority (GCRTA), the line connects the region's two commercial hubs—the City of Cleveland's Downtown and the University Circle area in the City of East Cleveland (see Figure 4B-23). The HealthLine is the first FTA-funded BRT project under the New Starts Program.

Cleveland Case Facts

System Name:	Greater Cleveland Regional Transit Authority (GCRTA)
Corridor Name:	HealthLine
Transit Mode:	Bus Rapid Transit
Location:	Cleveland, Ohio
Region (USA):	Midwest
Corridor Length:	9.4 miles
Corridor Purpose:	Inter-Urban Commuter
Municipalities Served:	1
Cost and Funding Sources:	Cost: $168.4M (federal $82.8M, state $50M, GCRTA $17.6M, local $8M, and NOACA $10M)
Date Opened:	October 24, 2008

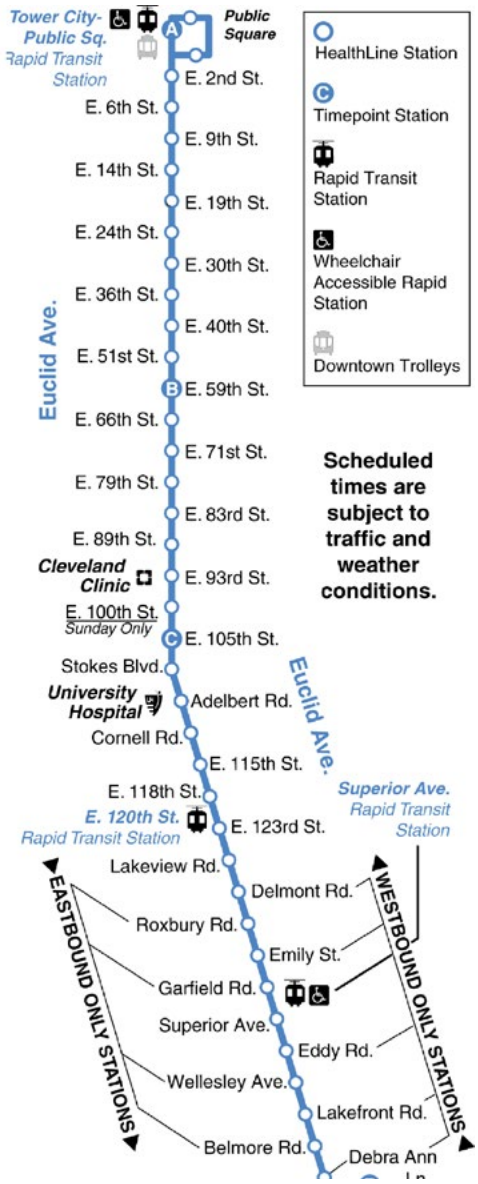
Figure 4B-21

HealthLine Corridor Location Map



Source: Feke, Maribeth, GCRTA, "Euclid Corridor Transportation Project: Economic Impacts," PowerPoint presentation, 2008

Figure 4B-22
HealthLine Today



Source: http://mapsof.net/uploads/static-maps/cleveland_healthline_map.png

Figure 4B-23
HealthLine Route Map

The Euclid Avenue BRT case study is one of embracing a new transit technology, and ensuring that urban design includes the necessary infrastructure and conveys a sense of the system's permanence.

HealthLine Ridership

- Commenced service in October 2008 with a monthly ridership of almost 280,000.
- 38% more monthly riders than when the line opened (according to April 2010 statistics).
- Compared to the original route #6 bus line, HealthLine is enjoying more than 73% increase in ridership (from January 2007 to April 2010).
- Ridership increases are reported to match newly constructed BRT routes in New York City, Vancouver, and Eugene, Oregon.

The Euclid Corridor

The Euclid Corridor is Cleveland's historic main street and to this day functions as its main commercial corridor. The corridor's past is linked to the city's history, which progressed from a mercantile town, to an industrial city, to a metropolitan area that is home to the nation's largest healthcare and research industries.

During the early 19th century, Euclid Avenue was referred to as "Prosperity Street" or "Millionaire's Row," since it was home to many of the grand residences of the nation's industrial barons. At its peak, Euclid Avenue's rich urban residential architecture was considered to be on par with New York's 5th Avenue (see Figure 4B-24). Cleveland's industrial businesses hit a downturn in the 1960s and 1970s due to a decline in manufacturing in the steel, motor vehicle, and metal working sectors. Large areas of the corridor were cleared as part of urban renewal programs as residents fled to the suburbs.

In the 1990s, city leaders undertook a concerted effort to revitalize Cleveland's city center, and achieved some success. Euclid Avenue was always identified as central to this redevelopment effort, with transit investment viewed as a tool for Downtown economic development.

Figure 4B-24
Historic Euclid Avenue

Source: Calabrese, Joseph, GCRTA, "BRT: The Cleveland Experience," PowerPoint presentation, 2008

Today, Euclid Avenue connects Downtown Cleveland's iconic Public Square, travels through MidTown's eclectic mix of industrial uses and residential neighborhoods, and connects to East Cleveland, which includes Little Italy, the Cleveland Clinic (see Figure 4B-25), and Case Western Reserve University. The area adjacent to Euclid Avenue includes high-density commercial uses, a theatre district, Cleveland State University (CSU), and a professional sports complex. The University Circle area, Euclid Avenue's eastern terminus, is a hub of educational and medical facilities including Case Western Reserve University, the Cleveland Clinic, several medical facilities, and four museums.

Figure 4B-25
Cleveland Clinic

Source: Feke, Maribeth. GCRTA. Euclid Corridor Transportation Project: Economic Impacts, PowerPoint Presentation, 2008

The Transit Planning Process

In 1983, the City of Cleveland conducted an Alternatives Analysis (AA) to explore possibilities for transit improvements along Euclid Avenue to connect Downtown and University Circle. The project was later known as the Dual Hub Transit Project. Recommendations from this study were further advanced by the city and the GCRTA between 1989 and 1993 with the Dual Hub Draft Environmental Impact Statement (DEIS). The DEIS examined upgrades to existing bus and rail transit service, as well as various new rail alternatives. The four alternative rail lines considered included both at-grade and subway segments, and one consisted of an LRT alignment along Euclid Avenue. A Transportation Systems Management (TSM) alternative was also included, which called for a number of bus improvements and BRT option along Euclid Avenue. The TSM recommendations were based on service improvements called for in GCRTA's 2010 Long Range Transit Plan.

Choosing an Alignment

The Euclid Avenue alignment was selected for transit improvements because it is the city of Cleveland's main commercial corridor and comprises an important connection between the region's two largest employment centers. Euclid Avenue is also a corridor that has demonstrated clear transit use and need. In 2000, the GCRTA provided transit service to more than 120,000 riders each weekday—60 percent of those boardings occurred within the 6.6-mile Euclid Corridor, from Downtown Cleveland to the Stokes Rapid Transit Station, a heavy rail station in East Cleveland.

Choosing BRT as the Preferred Transit Technology

GCRTA staff initially recommended advancing the LRT alternative because the DEIS analysis indicated LRT outperformed the BRT option in many of the evaluation measures. However, cost was a factor. Since the BRT option was estimated to cost less than half that of the least expensive rail transit alternative, while still addressing many of the transit needs of the corridor, the Northeast Ohio Areawide Coordinating Agency (NOACA, the metro area's MPO) and GCRTA decided to consider BRT (see Table 4B-4).

Table 4B-4

Estimated Construction Costs (1994$)

Alternatives	Estimated Costs
BRT Alternative	$113.6M
Rail 1 Alternative (subway)	$365.0M
Rail 2 Alternative (subway)	$577.9M
Rail 3 Alternative (LRT)	$675.9M
Rail 4 Alternative (LRT)	$749.6M

Source: Final report for Cleveland Dual Hub Corridor Transitional Analysis, December 1995

GCRTA was also influenced by industry excitement regarding BRT success in Curitiba, Brazil, and FTA's desire to fund BRT demonstration projects in the U.S.

In November 1995, the GCRTA Board selected the BRT alternative (which was then referred to as the Rapid Transit System alternative) as their Locally Preferred Alternative (LPA). A month later, NOACA also adopted the BRT alternative. The alternative later became known as the Euclid Corridor Transportation Project (ECTP).

GCRTA's evaluations concluded that BRT would offer more improvements than existing bus service. The original #6 bus line had the highest ridership within the system. However, it was traveling at an inefficient speed (less than 6 MPH on average) due to Euclid Avenue's configuration, outdated traffic signal system, frequent bus stops, and long dwell times resulting in irregular service frequencies. The BRT option offered travel time from Public Square in Downtown to University Circle in 12 minutes, with service every 5 minutes during peak periods.

Euclid Corridor Transportation Project Goals

- Improve service to GCRTA customers by increasing transit system efficiency.
  - Improve connectivity between Downtown and University Circle
  - Improve connectivity to other public transportation services
  - Improve public transit by making it faster, "first class," simple, and affordable to build and operate
- Promote long-term economic and community development and growth in and adjacent to the Euclid Avenue Corridor.
- Improve quality of life for those living, working, or visiting in the Euclid Avenue Corridor.

GCRTA also insisted on the BRT system having a "rail-like" image with permanent stations, not stops. The ECTP would have contemporary vehicles running along exclusive right-of-way, traffic signal prioritization, precision docking, level boarding "stations," off-board fare collection, quiet and energy-efficient vehicles, and vehicles with doors on both sides.

BRT technology was a relatively new transit mode in North America when GCRTA began the planning and design of the HealthLine. Because of this, it was critical that education and outreach to GCRTA's internal staff, regional and local partner agencies, and the community be at the forefront of the planning process. Initially, GCRTA conducted a number of large public meetings as part of the ECTP, but quickly realized that smaller meetings enabled more effective responses to stakeholder questions and comments. The smaller meetings targeted specific stakeholders, such as business owners, neighborhood residents, church groups, healthcare workers, and students.

Joint Financing

The project's total cost of $168.4M was funded from various sources with more than 50 percent of the cost provided by local and regional partners (see Table 4B-5). In FTA's evaluation of the ECTP, the project received a "medium-high" local financial commitment rating because of "the large share and high commitment of non-New Starts capital funding for the project."

Cleveland Clinic and University Hospitals are jointly paying $6.25M over 25 years for the privilege of naming the BRT corridor the HealthLine, promoting the medical and research orientation of the corridor's industry. Funds received from the naming rights will be used for station maintenance.

Table 4B-5
HealthLine Funding

Agency	Amount (million)
FTA	$82.8 (49%)
State of Ohio	$50 (30%)
GCRTA	$17.6 (10%)
NOACA	$10 (6%)
City of Cleveland	$8 (5%)

Source: HealthLine website, http://www.rtahealthline.com/projectoverview-funding.asp

Project Champions

A key champion for the project was Senator George Voinovich, who was also the governor of Ohio and the mayor of Cleveland during different stages of the ECTP process. He advocated for the HealthLine, championing its vision when the City of Cleveland began the formal AA process for evaluating transit options, and lobbying for delivery of funding for the project's detailed planning, design, and implementation (see Figure 4B-26).

Figure 4B-26
HealthLine Ground Breaking

Source: Calabrese, Joseph, GCRTA, "History of the Euclid Corridor Project," PowerPoint Presentation, 2008

Additional champions include the Euclid Corridor Committee (ECC) and local Community Development Corporations (CDCs). The ECC is a sounding board formed to facilitate community engagement. The ECC consisted of 98 stakeholders who were instrumental in getting the buy-in of NOACA and the municipal governments. The ECC also worked with local CDCs responsible for promoting and funding redevelopment along Euclid Avenue. The ECC and

the CDCs became champions of the project and are continuing to advocate and facilitate economic development efforts along the corridor. When GCRTA applied to the FTA for funding, letters of support from the ECC and the CDCs helped make a strong case for the HealthLine.

Proactive Land Use Planning and Urban Design

The Euclid Corridor Transportation Project (ECTP) was considered by GCRTA, as well as by the regional and municipal partners, to be more than a transit project. They considered it an infrastructure improvement project that should go beyond enhancing transit mobility and connections, and improve streetscape, urban design, and catalyze redevelopment along Cleveland's most prominent and historic main street.

Leveraging Investments

Investment in the ECTP leveraged transit funding to reshape Euclid Avenue, re-create a sense of place and identity, and celebrate the corridor's historic and economic prominence. The project involved reconstruction of Euclid Avenue, from building face to building face, and included new sidewalks, on-street parking, roadway improvements, utility upgrades, median construction, traffic signal upgrades, landscaping, public art, improved lighting, and pedestrian amenities (see Figure 4B-27).

Figure 4B-27

Proposed Streetscape Design

Source: Calabrese, Joseph, GCRTA, "History of the Euclid Corridor Project," PowerPoint presentation, 2008

To avoid unnecessary impacts to construction activities and schedules, and to limit disruption to businesses, GCRTA and the City of Cleveland coordinated their respective infrastructure improvement projects. The massive and expensive street reconstruction signaled a commitment and guarantee from the public leadership in ensuring that the BRT was a permanent fixture that would not be moved or discontinued.

Design Matters

Euclid Avenue's elegant design did not occur by chance. A concerted effort by GCRTA and partner agencies began in the preliminary design phases, when the GCRTA design team conducted a series of workshops to solicit community input on desired character for each segment. Community members and stakeholder groups expressed the desire to transform Euclid Avenue into the world-class street that it once was. In addition, the retention of existing on-street parking, addition of new on-street parking to support businesses, and introduction of bicycle lanes and wider sidewalks were deemed important. Incorporating all the elements sought by community members and the new elements for the BRT line within the existing 99-ft right-of-way required careful design.

Euclid Avenue's distinctive station and street design are regarded as vital elements contributing to the HealthLine's success. The redesigned avenue is multimodal and supportive of adjacent land uses. It is comprised of 4.5 miles of dedicated BRT lane running along the median, 2.6 miles of mixed-traffic BRT lanes along the outside traffic lanes, and 4 miles of bicycle lanes (see Figure 4B-28).

Sources: Flickr, EMBARQ Brasil, used with permission under Creative Commons License, Attribution-NonCommercial-Share Alike 2.0 Generic (CC BY-NC-SA 2.0), http://www.flickr.com/photos/embarqbrasil/7216610242/; Flickr, Junior Sam (Sam Bobko), used with permission under Creative Commons License, Attribution-Share Alike 2.0 Generic (CC BY-SA 2.0),

http://www.flickr.com/photos/superiorview/4704549343/

Figure 4B-28 *Implemented Streetscape along Euclid Corridor*

The 36 stations are a combination of median stations serving vehicles traveling in both directions, and curbside stations serving vehicles headed in one direction. The stations are permanent structures that resemble rail stations, rather than conventional bus stops. Station amenities include seating, lighting, fare machines, electronic signage to communicate vehicles arrivals and departures, and audible (beeping) and ADA components at platforms (see Figure 4B-29).

Figure 4B-29

HealthLine Stations

Source: City Planning Commission, City of Cleveland, http://planning.city.cleveland.oh.us/projects/assets/projectID12_78.jpg

The integration of public art in the corridor and station design was an important design detail (see Figure 4B-30). GCRTA developed a public art master plan for the entire corridor that included opportunities for local artists to integrate artwork into final station design. Public art was used as a tool to create continuity in branding throughout the corridor, and to celebrate the unique identity of each district along Euclid Avenue. Artwork drew inspiration from the area's historic past—from Hopewell Indian symbols, to industry, to messages that convey change in the future.

Figure 4B-30
Public Art and Branding

Source: Flickr, EMBARQ Brasil, used with permission under Creative Commons License, Attribution-NonCommercial-Share Alike 2.0 Generic (CC BY-NC-SA 2.0),
http://www.flickr.com/photos/embarqbrasil/7216969806/; courtesy of Sasaki & Associates

Transit-Supportive Land Use Planning

Several of the partner agencies advanced their visioning plans to regulatory and implementation tools that would enable future transit-supportive development along Euclid Corridor. Following are a few examples of these efforts:

- In 1998, the Cleveland Civic Vision 2000 Downtown Plan adopted by the City of Cleveland called for rezoning of the Euclid Avenue Corridor to allow redevelopment of industrial areas for office or commercial uses.
- The Euclid Avenue Revitalization Plan, a privately-commissioned study prepared by the Downtown Cleveland Partnership, developed ways to revitalize retail activity along Euclid Avenue in the Downtown area.
- In April 1999, an Economic Development Plan for the Euclid Avenue Corridor was developed by the City of Cleveland, and included recommendations for parking mitigation, tax increment financing, and redevelopment incentives. This and other plans have been the basis of the Cleveland Health Tech Corridor, an initiative led by area leaders with the goal of facilitating continued investment in research centers, technology transfer, venture capital, workforce programs, and real estate development. The Cleveland Health Tech Corridor is led by an Advisory Committee that includes the City of Cleveland, Cuyahoga County, and various organizations along the corridor.
- In 2005, MidTown Cleveland, Inc., updated its MidTown District master plan called Beyond 2005: A Vision for Midtown Cleveland, to include a zoning overlay district that called for transit as a unifying element of future developments along Euclid Corridor (see Figures 4B-31, 4B-32 and 4B-33). The zoning overlay provided site-design guidelines, minimum floor-area ratio, emphasis on good pedestrian environment, and façade improvements.

Figure 4B-31
Midtown Master Plan

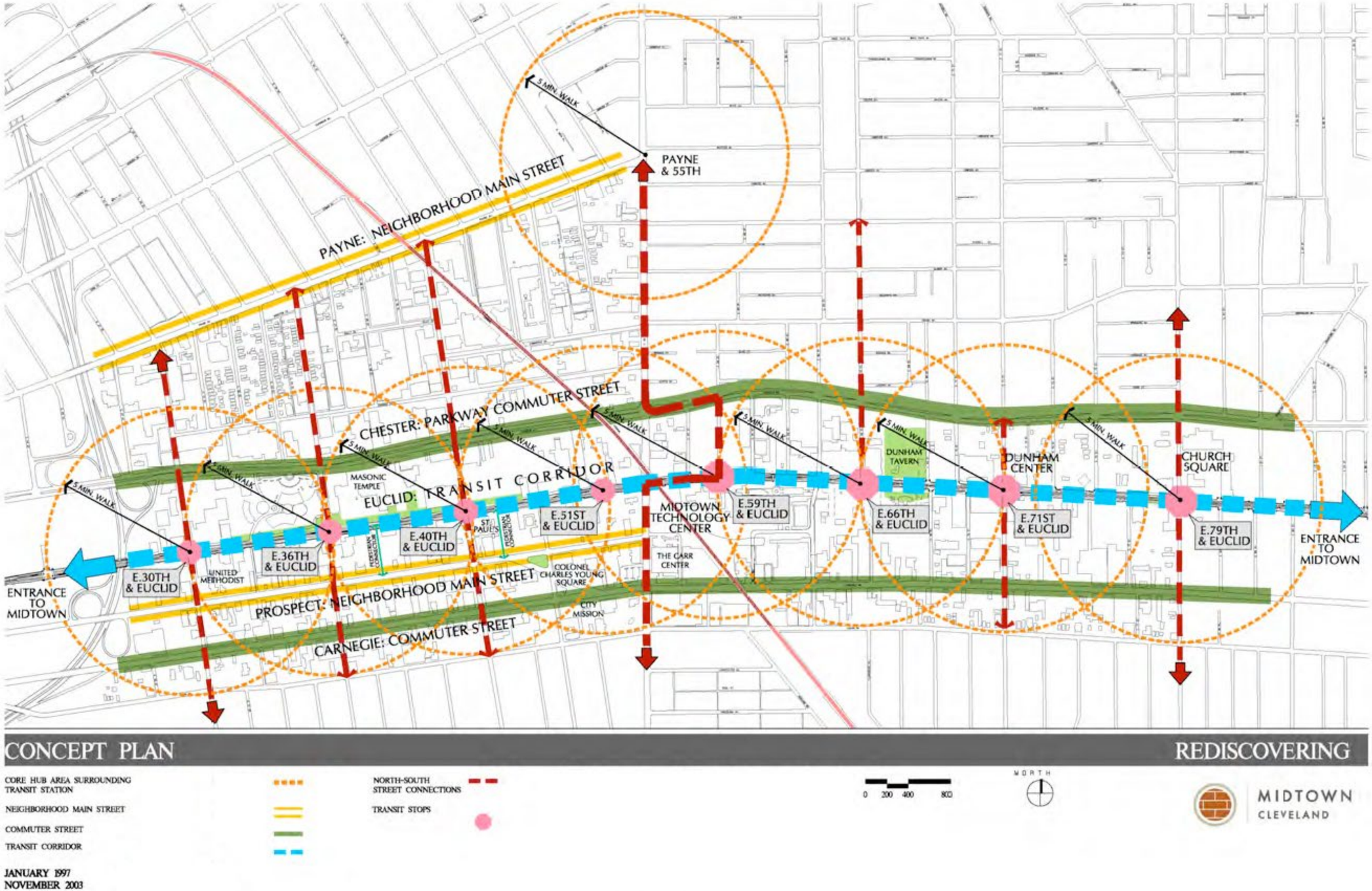
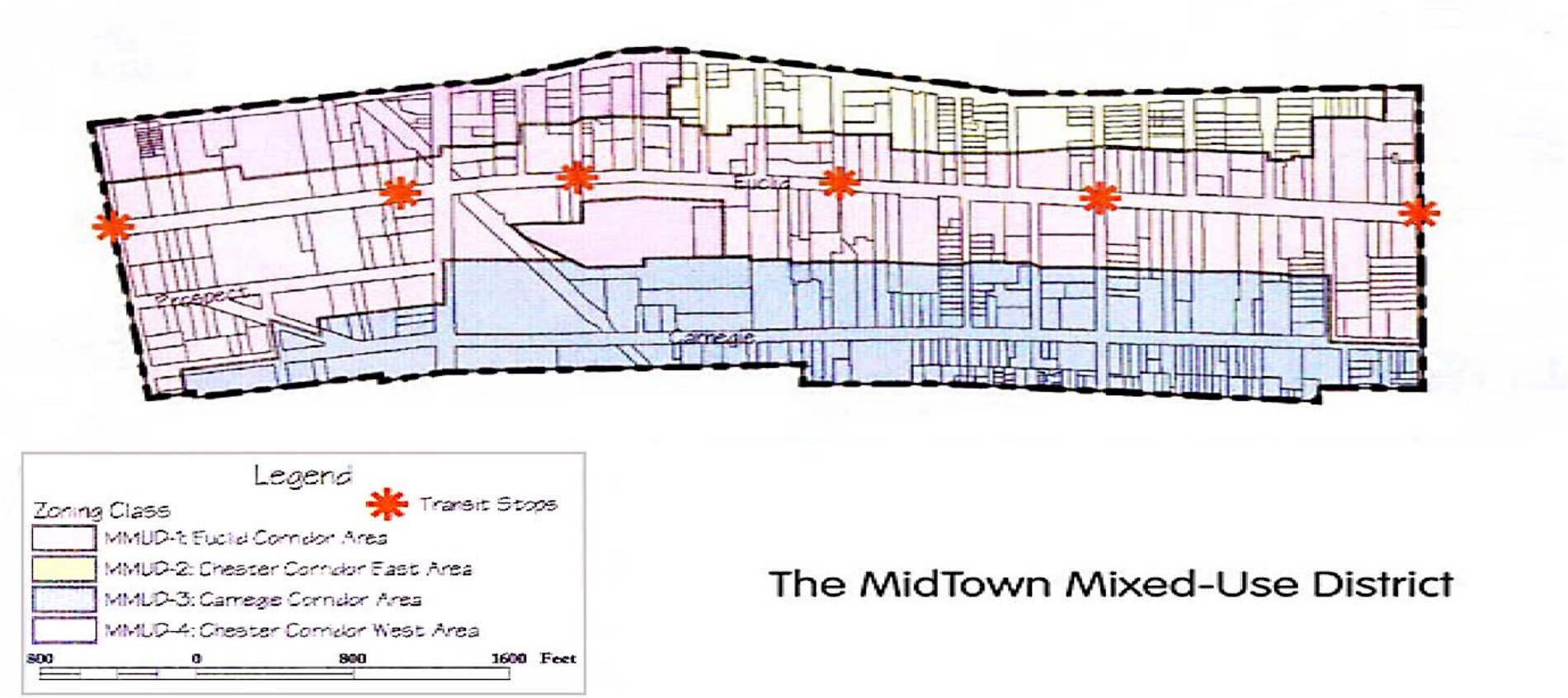
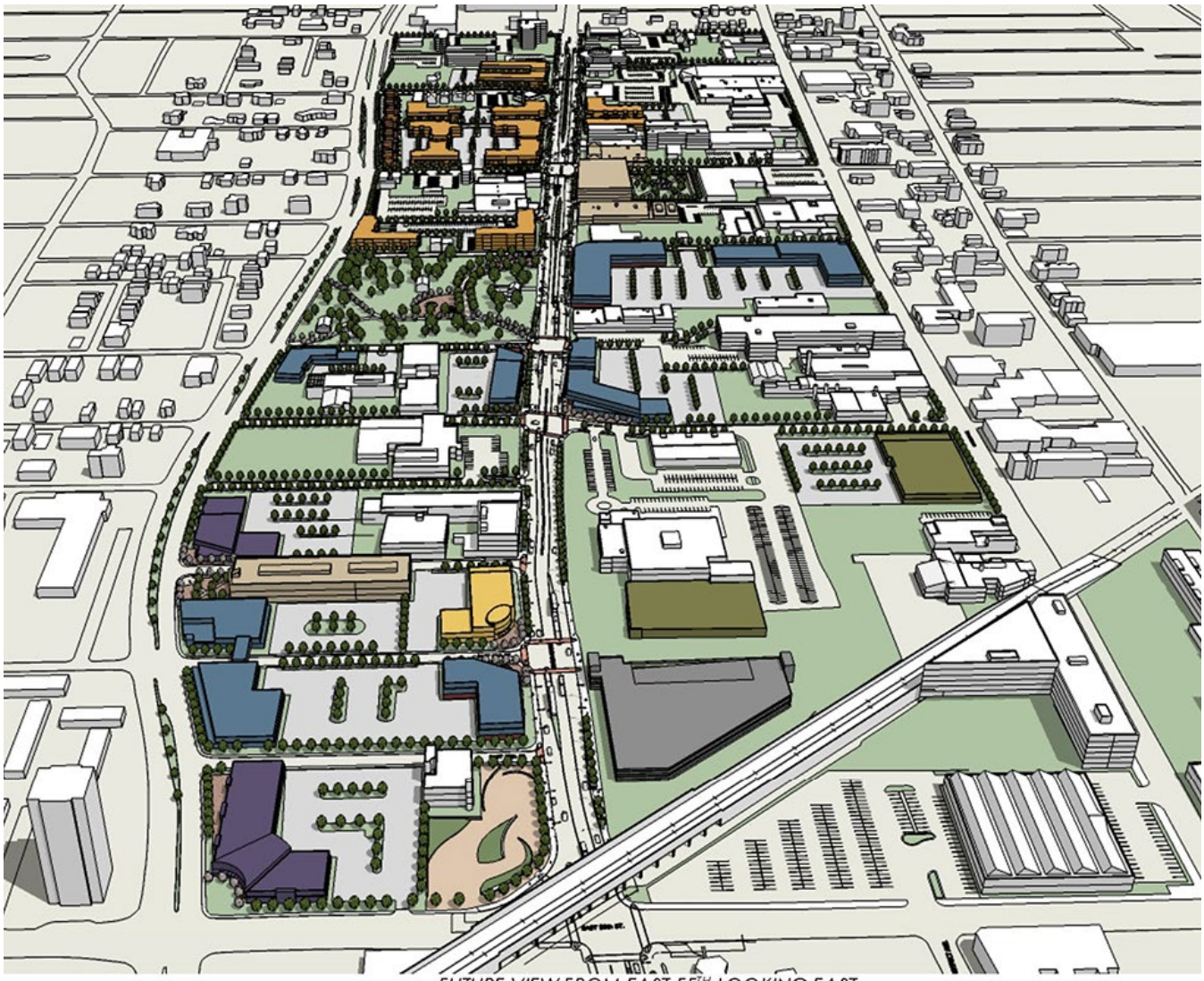


Figure 4B-32



Source: Midtown Cleveland, Inc., Beyond 2005: A Vision for Midtown Cleveland, 2005



Source: Midtown Cleveland, Inc., Beyond 2005: A Vision for Midtown Cleveland, 2005

Figure 4B-33 *Midtown East District Plan*

Two examples of coordinating new construction while actively implementing transit-supportive development associated with the HealthLine stations involve Cleveland State University and the Cleveland Clinic. GCRTA's design team worked with these two key stakeholders to integrate future campus expansion plans. As a result, CSU revised its master plan to orient $180M worth of new development, including the student center, housing projects, and new academic buildings along Euclid Avenue (see Figure 4B-34). Cleveland Clinic designed its new heart center to incorporate a new major HealthLine station, allowing staff and visitors easy access to and from transit. The Clinic opened its new Heart Center in October 2008.

Figure 4B-34
Station at CSU

Source: Feke, Maribeth, GCRTA, "Euclid Corridor Transportation Project: Economic Impacts," PowerPoint presentation, 2008

Economic Development

Since 2000, $4.3B in private investments have been made for developments—some have been completed and some are in the planning stage. Notable economic development activities include the Cleveland Clinic Heart Center ($506M), the University Hospital expansion ($500M), and the Cleveland Museum of Art ($350M). The land prices in the blighted area of Midtown have doubled between 2003 and 2008, from $200,000 to $400,000 per acre.

In 2008, GCRTA released actual and forecasted statistics of economic development along the Euclid Corridor, which are indicated in Tables 4B-6 and 4B-7.

Table 4B-6
Forecasted Economic Development by 2025 (constant 2001$)

Commercial development	9.2M sq/ft
New residential units	7,760
Capital investment	$1.75B
Annual local taxes	$55.8M
Annual GCRTA sales tax	$2.5mz

Source: Euclid Corridor Transportation Project: Economic Development Impacts, presentation at the Rail-Volution Conference, October 28, 2008.

Table 4B-7
Actual 2008 Development vs. Forecasted Development along Euclid Avenue

	No Build	2008	2025
SF of development	3.7M*	2.4M	7.9M
Number of residential units	2,528	2,943	5,428
Total investment	$5.5M	$2.5B	$1.75B

* Forecasted No-Build numbers based on 2001 studies, calculated prior to line's opening.

Source: Euclid Corridor Transportation Project: Economic Development Impacts, presentation at the Rail-Volution Conference, October, 28, 2008.

Lessons Learned

As one of the first communities to plan and implement transit improvement through BRT, Cleveland had to overcome a number of challenges. The HealthLine has proven that BRT is a viable transit alternative, particularly for cities that cannot afford, or do not have the ridership to justify, a fixed-rail system. Following are lessons learned from this experience.

Take on the challenge of a trailblazer. When planning for ECTP began, BRT was not a popular transit alternative. "Selling" this technology to the community and gaining their acceptance depended on the extensive public outreach and education conducted by GCRTA and partner agencies. At the same time, GCRTA worked closely with FTA to understand how the technology should be designed and evaluated. As a pilot BRT project for FTA New Starts, ECTP has helped influence how BRT systems can be evaluated.

Construct permanence. The BRT option for Euclid Avenue was not treated as an interim step to achieving other fixed-rail transit modes. The HealthLine was considered an integral part of the entire transit system rather than a backup for light rail. GCRTA and partner agencies made real commitments to make the project a permanent infrastructure investment. The HealthLine includes all the components of a BRT system—dedicated lanes, passenger-friendly stations, custom low-floor vehicles with near-level boarding, off-board fare collection, precision docking and guidance systems, ITS, enhanced service frequency, and strong branding elements.

Consider the importance of infrastructure. The ECTP leveraged transit funding to reshape Euclid Avenue and bring back the Corridor's previous prominence. GCRTA and its partners committed to the substantial level of infrastructure investment, from reconstructing underground utilities, to quality streetscape, to modern transit facilities and technology, to branding and way finding. In addition to rebuilding Euclid Avenue to cater to multiple modes, the design took into consideration how adjacent existing and future land uses could be supported. Within a tight right-of-way, the design included provisions for pedestrians, bicyclists, transit, vehicles, and landscaping. Business needs for on-street parking and access were also integral to the resulting Euclid Avenue cross-section.

Project champions are essential. Much credit is given to Senator Voinovich for leading the way in getting the HealthLine built. As a mayor, governor, and U.S. senator, Voinovich has consistently backed improved transit service along Euclid Avenue. ECTP also became a venue for various corridor stakeholders to work together to develop a joint vision for the entire corridor. GCRTA, the Cuyahoga County, the cities of Cleveland and East Cleveland, neighborhood groups, educational and medical intuitions, business organizations, churches, and CDCs

all worked closely through the Euclid Corridor Committee to advocate for FTA support, and to influence design and planning decisions.

Leverage and celebrate community diversity. The Euclid Corridor is comprised of a diversity of uses, from the central business district (Downtown District) of Cleveland, to the residential and industrial uses of Midtown, and the large medical and educational anchors in the University Circle. GCRTA, the City of Cleveland, and other agencies capitalized on this diverse corridor by planning and designing around Euclid's historic and current context, and leveraging private investment dollars toward a holistic redevelopment strategy.

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Case Study 4: Considering Transit-Supportive Development and Infrastructure in Station Area Planning—LYNX Blue Line (South Corridor), Charlotte

The Lynx Blue Line (South Corridor) is a 9.6-mile LRT that runs through Uptown and South End to north of I-485 in Charlotte, North Carolina (see Figures 4B-35 and 4B-36). Since the Blue Line's official opening in November 2007, the service has exceeded ridership expectations and has spurred redevelopment along the South Corridor (see Figure 4B-37). Ridership was initially projected to open with approximately 9,000 riders per day and steadily grow to 18,000 by 2025. After only three years of operation, the system was carrying 15,000 passengers per day.

Charlotte Case Facts

System Name:	Lynx
Corridor Name:	Blue Line
Transit Mode:	Light Rail Transit
Location:	Charlotte, NC
Region (USA):	Southeast
Corridor Length:	9.6 miles
Corridor Purpose:	Inter-Urban Commuter
Municipalities Served:	1
Cost and Funding Sources:	Cost: $462.7M (federal $199.3M, state $115.7M, local $147.7M)
Date Opened:	November 24, 2007

From an economic development perspective, the results are even more remarkable. Despite the limited network and reach of LRT, the City estimates that more than $400M in private sector development was realized prior to the line's groundbreaking, and a projected $1.8B of new tax revenue is expected between 2005 and 2011. The Blue Line Extension recently received federal funding for Preliminary Engineering. This extension will double the corridor length, and link several commercial and institutional nodes to Charlotte's Uptown Business District.

While the City of Charlotte's experience in planning the Blue Line provides extensive examples of how land use considerations can be incorporated into the transit planning process, this case study focuses on the transit-supportive development and infrastructure considerations made during the station area planning process.

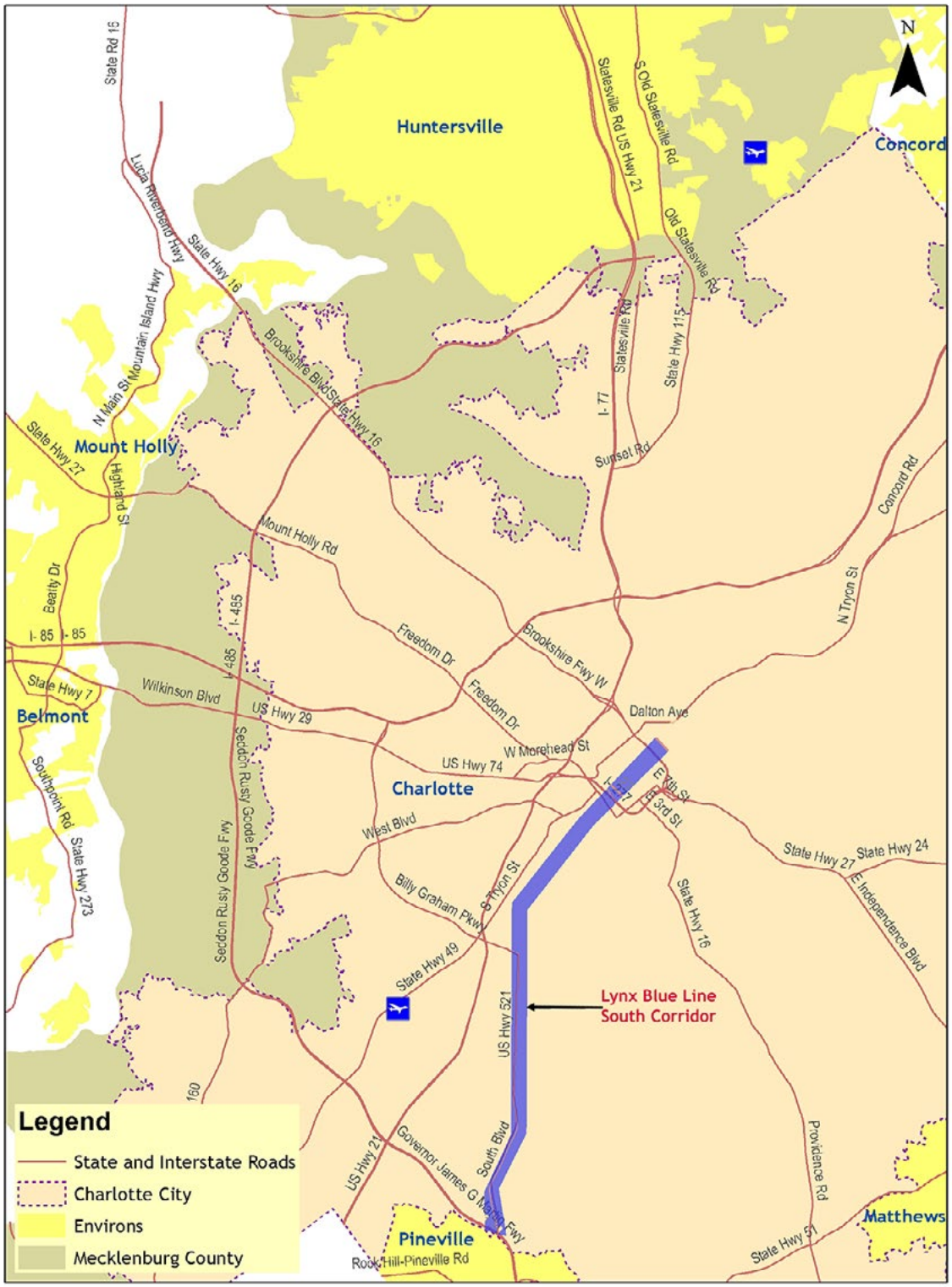
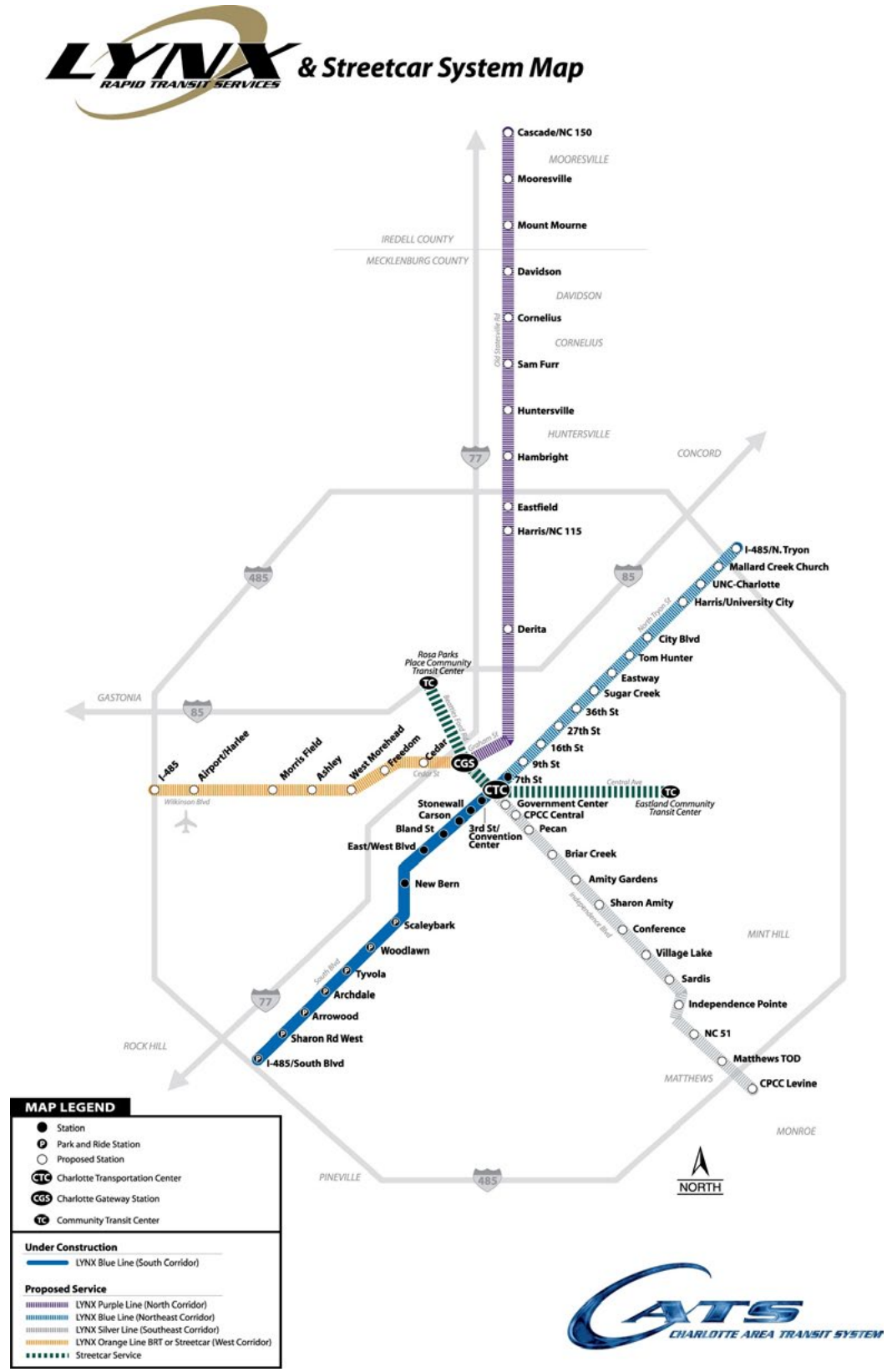


Figure 4B-35 *Lynx Blue Line Corridor Location Map*

Figure 4B-36

Lynx Blue Line Route Map



Source: Charlotte Area Transit System (CATS)

Figure 4B-37
Lynx Blue Line LRT

Source: Glatting Jackson/AECOM

South Corridor Economic Development, 2005 to 2009

- 1,900 new residential units
- 100,000 square feet of retail
- 80,000 square feet of office
- Land prices increased 52% from 2000 to 2007, while the rest of the city increased only 40%

The South Corridor

The South Corridor serves as a critical commuter link between Charlotte's Uptown Business District and the communities along South Boulevard, I-77 and I-485. At the time of the South Corridor planning, South Boulevard was operating at extremely high levels of peak hour congestion. Due to physical constraints of land use and existing infrastructure, expansion of South Boulevard would have been difficult.

The Corridor contains a mix of land uses that include high-density mixed use in Uptown and historic urban neighborhoods in the South End that slowly transition to lower-density, auto-oriented land uses at I-485. Light industrial and low-density commercial uses line the majority of the Corridor with adjacent low-density residential neighborhoods beyond. Several of these neighborhoods are considered Environmental Justice (EJ) populations—defined by the U.S. Environmental Protection Agency as communities that "bear a disproportionate

share of negative environmental, industrial, governmental and commercial operations or policies." Three of the neighborhoods identified as EJ are located in the two most southern station areas. These neighborhoods have a lower median household income and homeownership compared to surrounding areas and are generally heavily transit-dependent.

Integrating Transit-Supportive Development into Planning for the Blue Line

Setting the Stage for Light Rail and Transit-Supportive Development

Charlotte's economy was historically built on its role as a nexus for rail transportation in the South. However, over time, the region's economy, based on railroad-related industrial activity, began its decline. Norfolk Southern Railroad decided to discontinue freight traffic along the South Corridor in favor of routes with fewer grade crossings that bypassed downtown Charlotte.

In the mid-1990s, Charlotte Trolley, Inc., a non-profit group of rail enthusiasts and developers, decided to restore an antique trolley car that ran on portions of unused freight rail tracks along the South Corridor. The operation was a success and developers soon began investing in rail-oriented mixed-use projects. This success eventually helped set the stage for the new LYNX Light Rail service by encouraging transit-supportive development along the abandoned corridor, while the community got used to the idea of passenger rail transit. The City capitalized on the momentum by investing in additional improvements to the line that were designed to be compatible with the eventual introduction of Light Rail trains. Today this line is known as the Blue Line.

The proposed Blue Line originated in Charlotte's CBD (Uptown), followed the abandoned Norfolk Southern Corridor for 4 miles continuing along South Boulevard to I-485, a low-density, automobile-oriented area. Early on, the City of Charlotte understood the importance of integrating land use and transit planning. Prior to receiving the Full Funding Grant Agreement (FFGA) from FTA, the City was aggressively crafting land use policies and regulations that would support the land use vision set out in the 1994 Centers and Corridor plan (today known as the Centers, Corridors and Wedges Growth Framework). In this plan, the South Corridor was identified as one of five growth corridors that should have the infrastructure to support higher intensity development. In addition, multiple public workshops and meetings were held throughout the Draft Environmental Impact Statement (DEIS) process to ensure that communities and local agencies were in sync with the policies and planning along the Corridor.

Integrating the South Corridor Transit and Land Use Planning Processes

The City of Charlotte understood that coordination between the land use planning and transit planning process was vital to the success of the South

Corridor. To address both processes, the City used one team of experts and staff to address both land use and transit planning. The City of Charlotte is unique in that the transit agency is a City department. The team included City departments (planning, transportation and economic development), and the Charlotte Area Transit System (CATS). Working together, the multidisciplinary team ensured that the alignment would be viable operationally and serve as a tool for community building along South Boulevard.

Transit Station Area Principles

Prior to the start of the South Corridor's DEIS, Transit Station Area Principles were adopted by the City. These principles provided the overall framework for the station area planning and corridor urban design. They were categorized into three main areas:

- Land Use and Development: Concentrate a mix of complementary, well-integrated land uses within walking distance of the transit station.
- Mobility: Enhance the existing transportation network to promote good walking, bicycle and transit connections.
- Community Design: Use urban design to enhance the community identity of station areas to make them attractive, safe and convenient places.

Source: Charlotte Mecklenburg Planning Department

The integration of LRT into the South Corridor's community fabric, specifically in terms of the design and function of each transit station, was important to the acceptance and long-term success of the project. Prior to and during the NEPA process, the City worked to develop a series of land use policies and regulations to enable transit-supportive land uses and achieve the vision set forth in the Centers and Corridor plan. The regulations and policies were instrumental in setting the framework during the DEIS process, particularly with the station area planning process. The policies included Transit Station Area Principles, Joint Development Principles, and Station Typologies.

Refining the Station Location

As part of the DEIS process, a Station Location Analysis was conducted by the city's team for the South Corridor, building on the development and redevelopment opportunities outlined in the Major Investment Studies. This analysis evaluated the station locations at a corridor level to determine if any modifications were necessary, such as shifting, adding or removing a particular station. There were 15 proposed stations along the South Corridor. All but two stations were proposed to be at-grade. All stations were evaluated to determine operation spacing, transit-supportive land uses, and effective service area. At the conclusion of the review, all stations were selected for development.

A Transit-Oriented Development Assessment

The transit-oriented development assessment conducted by the team built on the development and redevelopment opportunities identified in the Major Investment Studies (MIS). This assessment considered the physical conditions of the corridor, basic market conditions, and existing and projected development trends. While the assessment was at the corridor level, it identified parcels larger than one acre that were either vacant or "underused." A supporting market analysis also considered the existing and proposed demographic and economic trends for the area.

The transit-oriented development assessment rated each station based on the level of opportunity existing within a ½-mile station area radius and included a discussion of the general timing and intensity of development by land use. Results of the South Corridor assessment, coupled with the station location refinement, informed the more detailed station area planning process.

Investing in Infrastructure to Encourage Transit-Supportive Development

As Charlotte proactively crafted policy and regulations to provide the right setting for transit-supportive development, the city also provided funding to ensure that municipal infrastructure around the stations was sufficient, and ready for transit and transit-supportive development. Through the South Corridor Infrastructure Project (SCIP), the City set aside $50M of bond money to build new streets, sidewalks, and intersection improvements around seven of the South Corridor's industrial and suburban station areas, prior to and during the transit project's construction. Although the $50M covered only a fraction of the $200M for the needed improvements, this investment indicated a public commitment and encouraged private development.

South Corridor Infrastructure Program

The SCIP's $50M has implemented the following:

- Street widening: 8 miles
- Streetscape improvements: 7 locations
- Intersection improvements: 27 locations
- Street connections: 0.5 mile
- Sidewalks: 14 miles
- Multi-use trails: 1.5 miles
- Bicycle lanes: 10 miles

Source: Charlotte Mecklenburg Planning Department

Station Area Planning

The City of Charlotte developed station area plans along the South Corridor to outline a vision for future growth and development around each station. The objective of the station area planning process was to outline a potential future vision that maximized development opportunities relative to each transit station, providing a framework for local development and growth decisions.

Each station area plan examined the physical context of the area within a ½-mile radius of the station, illustrating a growth strategy that integrated the Blue Line into the community context by identifying future development opportunities, reinforcing local and community goals, and creating transit-supportive patterns of development. These plans were organized around the Transit Station Area Principles.

Development Response

Charlotte recognized that transit planning is a long process and that private development opportunities and public infrastructure projects will continue to occur. With that in mind, the City organized a development response team, which included the Station Area Planning consultant, to respond to private initiatives within the station areas. Collaborative workshops were held with the property owner, City staff, partner agency representatives, and other major stakeholders. The intent of these workshops was to collaborate with developers at the early stages of a project to arrive at solutions that were mutually agreeable and would support the City's transit-supportive principles.

Regulatory Tools

The City adopted a series of transit-supportive development regulations to create the compact and high-intensity station areas outlined in the station area plans. The purpose of the transit-oriented development (TOD) district is to create compact and high-intensity station areas with a mix of uses and high-pedestrian activity. TOD use types within the districts include employment (primarily office), residential and mixed. Although this designation is only used when stations are part of a project where FTA has issued a Record of Decision, they can be established prior if a station area plan has been adopted by the City Council. The City also created Transit-Supportive overlay zones to allow areas that do not have a strong market to begin to transition to a more transit-friendly form without having to meet all of the requirements of a TOD district.

Over time the structure of the TOD has changed to respond to the concerns of the City and private land owners. Initially, TOD districts were mandatory, which, in turn, resulted in push back from property owners due to the cost associated with rezoning. Today, the City has established Sponsored Rezonings

that are offered to property owners within station areas who are interested in up-zoning, and waives the fees for application and staff assistance.

Lynx Blue Line Station Experiences

Scaleybark Station – Ensuring Access and Development Potential

Scaleybark Station provides an example of how the land use and transit planning processes worked in unison to frame a pattern of development supportive of Charlotte's policies and principles. Scaleybark's Station area is bisected by the light rail line and South Boulevard. The original station location assessment placed the station between two large vacant parcels and South Boulevard. One of the parcels was owned by CATS and was intended to be used as a 300-space park-and-ride. During the station area planning process, it became clear that South Boulevard was a major barrier and that vacant land adjacent to the CATS-owned property could be assembled by the City for future public-private development if there was access from South Boulevard.

Reducing the Barriers

Accessing the proposed Scaleybark Station in its original location proved difficult for pedestrians from both sides of South Boulevard. South Boulevard's large cross-section was a barrier to those living in the east side of the station area. The abundance of industrial and vacant land created a lack of activity and "eyes on the street" on the west side. During the station area planning process the team worked together and proposed a solution that split South Boulevard. The solution created a new median for the Blue Line and four new LRT crossings along South Boulevard that helped set the stage for redevelopment of the publicly owned land (see Figure 4B-38). In addition, funds from the SCIP were used to extend DeWitt Lane, which created a parallel road to South Boulevard.

Source: Votaw,Tina, "Scaleybark TOD/Joint Development Project," PowerPoint presentation, 2008

Figure 4B-38 *South Boulevard at Scaleybark: Existing and Proposed Solution*

Capitalizing on Publicly-Owned Land

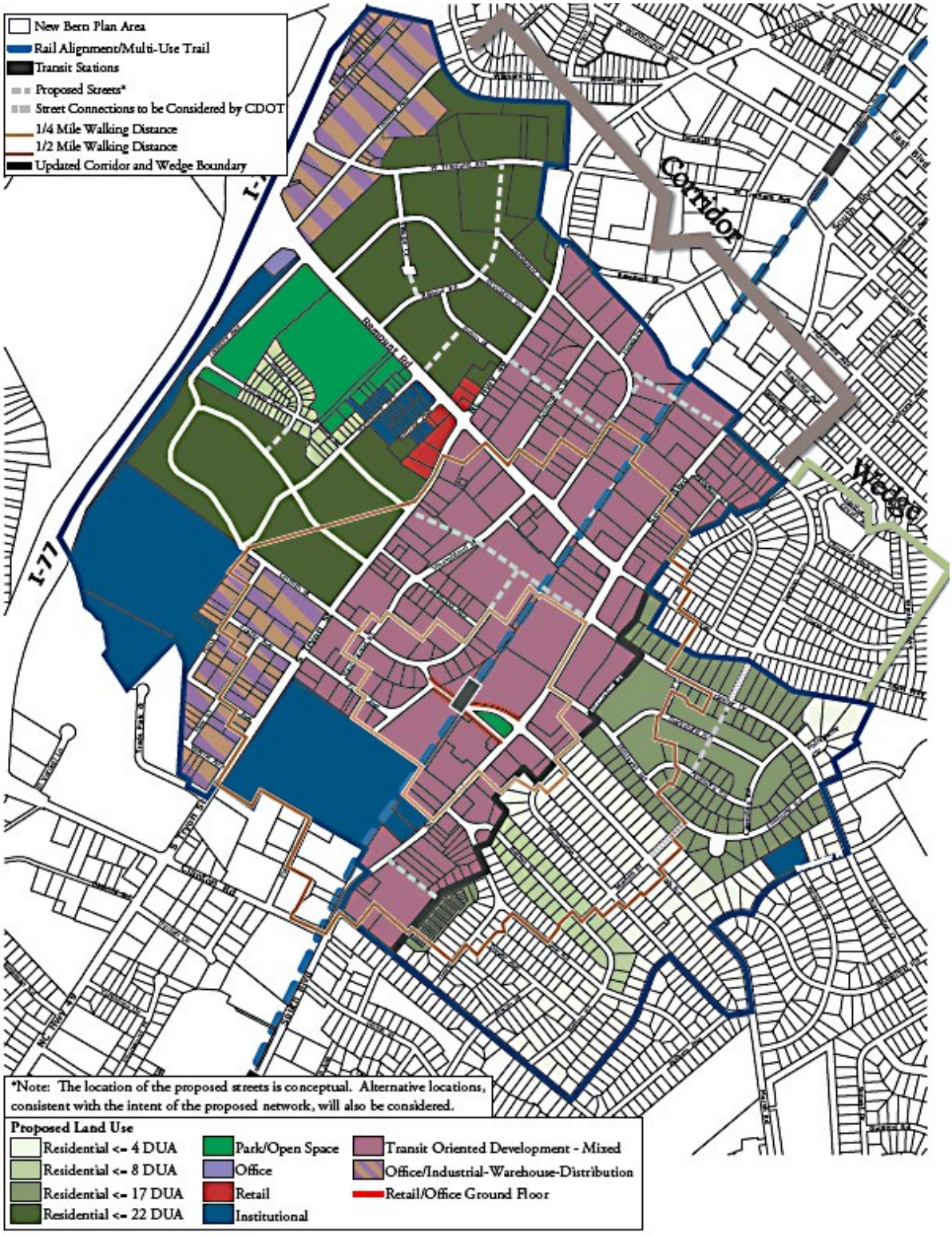
CATS had purchased 10 acres of land near the intersection of Dewitt Lane and Freeland Lane for the proposed 300-space Scaleybark Station parking lot. Once the decision was made to split South Boulevard, the City of Charlotte purchased 16 acres adjacent to the CATS's property for a future public-private development. The City then issued a request for proposals to develop both sites into transit-supportive development that incorporated affordable housing and the required 300 parking spaces.

The winning developer, Scaleybark Partners, proposed to buy the land at a discount, construct the parking deck, and develop up to 80 affordable units of the proposed 500 units.

New Bern Station—Working with a Developer

The DEIS had originally proposed the New Bern Station at the intersection of South Boulevard and Remount Road (see Figure 4B-39). The Crosland Partnership sought to redevelop a large parcel south of New Bern Street into a mixed-use development (3030 South) that would front the proposed South Corridor (see Figure 4B-40). The multidisciplinary team assembled by the City worked with Crosland to develop a new station location. The new location enhanced the Crosland development and other adjacent vacant and underused properties and provided better access to the housing development along New Bern Street.

SCIP funds were used for sidewalks along New Bern Street that connected the station to the proposed 3030 South development and adjacent housing development. SCIP also funded intersection improvements at New Bern Street and South Boulevard.



Source: City of Charlotte, Charlotte-Mecklenburg Planning Department, "New Bern Transit Station Area Plan," 2009

Figure 4B-39 *New Bern's Station Area Plan*

Figure 4B-40

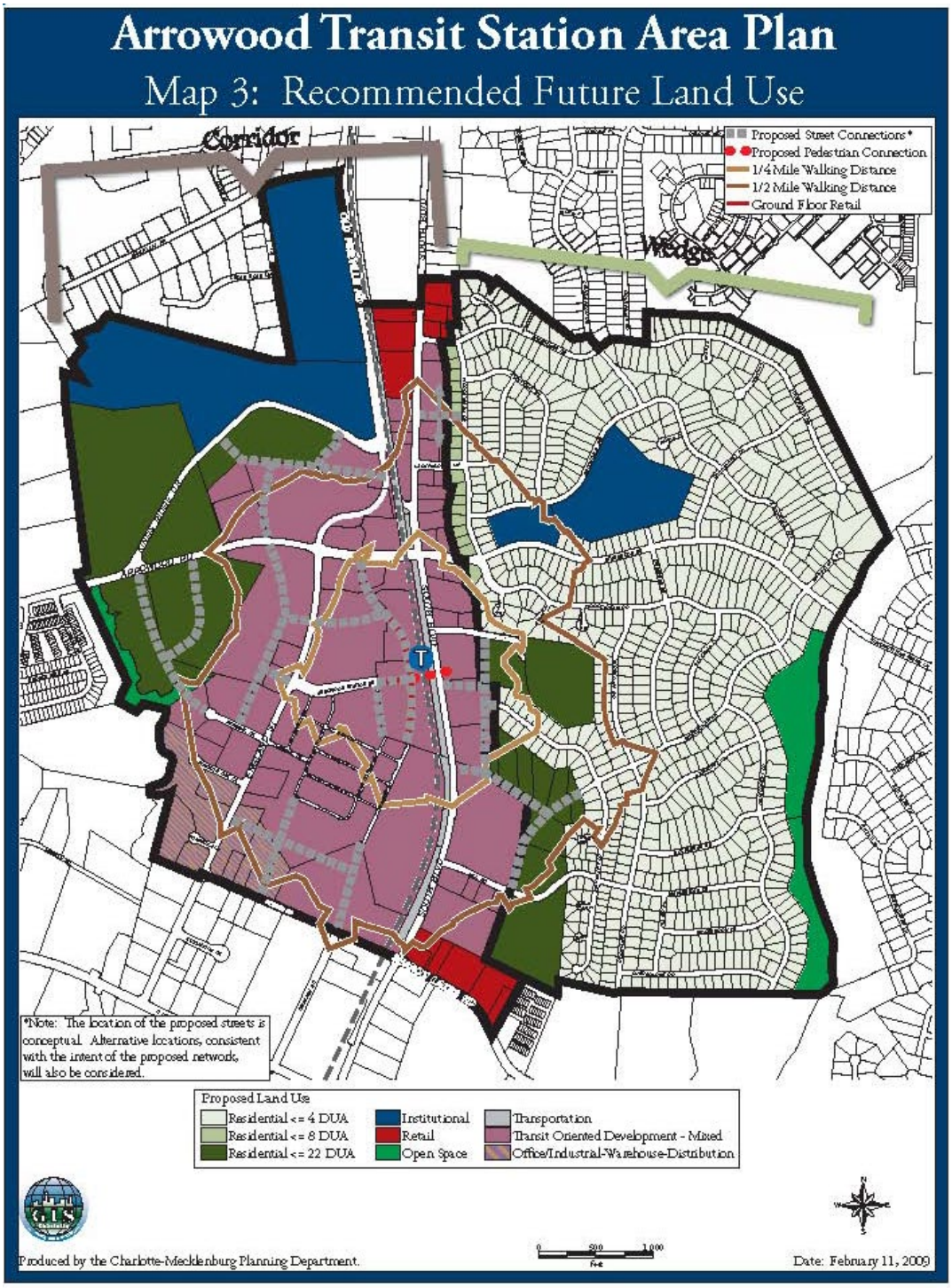
3030 South Development

Source: Glatting Jackson/AECOM

Arrowood Station – Addressing Mobility and Connections

The Arrowood Station Area Plan provided the city and Station Area Planning team with a variety of challenges. The predominant land use was strip commercial that centered on a soon-to-be vacant Walmart, and a station location that had poor access and visibility. The adjacent neighborhoods were stable, but the existing freight line and the proposed Blue Line cut through the middle of the station area, limiting overall connectivity. The station was also identified as a commuter station with a required park-and-ride component (see Figure 4B-41).

The resulting Station Area Concept addressed mobility, land use, and community design within the ½-mile station radius. The plan enhanced the existing single-family neighborhoods by encouraging moderate residential density consistent with existing zoning. The plan created a street parallel to the active portion of the Norfolk Southern Rail Line, and recommended at least four new connections to the new road paralleling South Boulevard that set the stage for redevelopment of the Walmart site.



Source: City of Charlotte, Charlotte-Mecklenburg Planning Department, "Arrowood Transit Station Area Plan," 2008

Figure 4B-41 *Recommended Future Land Use Plan*

Lessons Learned

Charlotte's integration of land use and transit planning is a model for other municipalities around the country. Charlotte recognized that in order to build a successful transit system, land use considerations must be included in the transit planning process. The following are lessons learned as they apply to the South Corridor.

Vision-led transit planning instead of federal process-led transit planning is key. The City of Charlotte's experience illustrates that successful transit implementation is an outcome of a strong community vision and follow-through with consistent and aggressive policies and programs. The Charlotte process went beyond the federally required minimum planning and environmental evaluations, and instead used the vision of community building as a framework for true integrated land use and transit planning. The phased transit investments were borne out of the initial community visioning effort that established the growth corridors and centers of the region.

Throughout project development and implementation, the city ensured that land use considerations were integral to key transit decisions prior to finalization of the EIS documents and cost estimates. The city was also proactive in developing timely and strategic policies and regulations, as well as infrastructure investments, that would ensure the viability of the transit projects and optimize the benefits of the investments to meet the community vision.

Organizational structure and institutional policies can help ensure integrated land use and transit planning and implementation. In many cases, even within a single jurisdiction, it is difficult to work past the silos of multiple departments, each with its own mission and obligations. Charlotte's organizational structure, which places planning, economic development, transportation, and transit all under the City's purview, has greatly streamlined the way that transportation planning (especially transit planning) is coordinated with the multiple concurrent processes that are occurring. The city's overall corporate strategy and organization allows for the greatest level of coordination between transportation and land use issues across City departments.

Because of the strong institutionalized structure which enables interdepartmental cooperation, the programs and resources of the various departments are more easily and closely aligned toward the same "community building" goals. The multi-corridor transit effort was not just a "transit project" for CATS, but a community-building project that addressed economic development and land use goals for all of Charlotte. Each transit corridor had a dedicated interdepartmental team during the entire NEPA process. CATS has dedicated two staff positions

solely to coordinating, planning, and tracking transit-supportive development efforts for the transit system.

Every new step in the process is an opportunity to learn. The many steps involved in transit planning offered various opportunities for each city department to learn and grow beyond their existing knowledge base, and to expand their roles and responsibilities. Lessons learned from the first project, the Blue Line, are now being incorporated into the continued planning and design of the other corridors. For instance, the City planning staff felt the need to have more information and knowledge on transit design to enable them to more meaningfully participate in decisions related to station design for the South Corridor. The Urban Design Frameworks developed for the Northeast and the North Corridors were a direct response to that need and offered a common language that CATS and the planning department can use to address specific design issues along the transit corridors.

Attention to broad community building goals instead of focusing solely on mobility objectives led to overall project success. The joint authorship and ownership of the transit project across various City departments (transit agency, planning, economic development, and transportation) provided a learning opportunity for everyone, broadening the perspective of each department's focus so that transportation was a consideration—but not the only driver—of community goals. In the end, the transit project became a community-building project, and not simply a mobility project. From the regional transit visioning to project construction and implementation, the city was vigilant in ensuring that actions are towards realizing a better, more livable community and not just a functioning transit project.

Community Champions helped advance ambitious Charlotte's transit initiative. A community Champion was needed to help "sell" the concept of a new transit system to a conservative legislature and population. Mayor Pat McCrory became that champion. He was the youngest and the longest-serving mayor of the city. In his 14-year tenure, he made transit a top priority of his agenda, pushing for transit investment as a tool for economic development. He was instrumental in gaining the state legislature's and the public's support of a sales tax dedicated to transit, and successfully helped defeat a referendum to repeal that tax.

The mayor also enabled leadership from the private sector. During his first term, he assembled 10 community leaders from businesses and neighborhoods to review and affirm/revise recommendations from the Centers, Corridors, and Wedges Framework. The recommendations of the committee later led to support of "local option" revenue sources for transit improvements and the enabling legislation for the sales tax.

Charlotte is also known for pioneering developers that championed and helped spur the impressive redevelopment boom along South End, a neighborhood served by the Blue Line. One such developer, Tony Pressley, recognized redevelopment opportunities in the aging industrial buildings along the proposed light rail line. He successfully renovated old textile mills into restaurants, shops, and condominiums, helped push for state legislation easing liability roadblocks to brownfield redevelopment, and secured the City's first EPA Brownfields Grant. He took a leadership role in establishing Charlotte Trolley, Inc., and the South End Development Corporation.

Integrating land use considerations into transit planning can help a transit project qualify for federal funding. The level of land use planning during and prior to the DEIS process has proved helpful in making South Corridor more competitive in terms of securing FTA funding. In FTA's 2003 New Starts evaluation, FTA states that "the overall project rating of Recommended is based upon the strong transit-supportive land use plans and policies in place along the corridor, as well as the strength of the project's capital and operating financial plans." The project received a "Medium-High" land use rating, which recognized the strong polices to implement transit-supportive land use development, the demonstrated results of those policies, and regional and local cooperation to realize the transit goals. The New Starts evaluation also cited the TOD zoning, SCIP, and station area planning efforts as components that made the project competitive.

This lesson is especially important for other communities pursuing transit funding as FTA goes forward with making land use and economic development criteria equally important as other cost and performance criteria in the selection of New Starts and Small Starts projects.

Commitment is needed for both the short and long-term. Charlotte understood that community building takes time and is heavily influenced by regional and local economic drivers. The recent downturn (2009–2012) in the market has affected redevelopment efforts in the South Corridor. Development plans that were funded have been postponed, some indefinitely. However, Charlotte's commitment to transit remains steadfast. The South Corridor Infrastructure Plan improved overall mobility in areas where development has yet to occur. As the economy improves Charlotte has the policies and frameworks in place to structure large, small or incremental growth.

The private sector responds to the predictability and commitment of the public sector. Since transit planning and implementation is a long process, proactive and nimble public sector response to market opportunities and trends is important. Charlotte learned that the demonstration of local public commitment helped garner trust from, and impart a sense of predictability, to the

private sector. The local investments to infrastructure (SCIP), aggressive changes in transit-supportive policies, and proactive planning assistance all created a positive atmosphere for private sector participation in transit-supportive development and redevelopment along the transit corridors, even before a transit project had been built or received federal funding.

Station area planning requires an understanding of community context. The City of Charlotte learned that it is acceptable to have lesser levels of transit-supportive development intensity in some station areas. The goal is to prioritize and understand the roles of each of the various stations based on the community context.

Planning for transit-supportive development requires tools and flexibility. The City of Charlotte learned that providing tools, incentives, and guidance to the private sector to encourage transit-supportive development is essential, as are plans that are descriptive and not too narrowly prescriptive.

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C: Integrating the Local Land Use Planning Process into the Transit Planning Process: Charlotte, NC

Prepared by:
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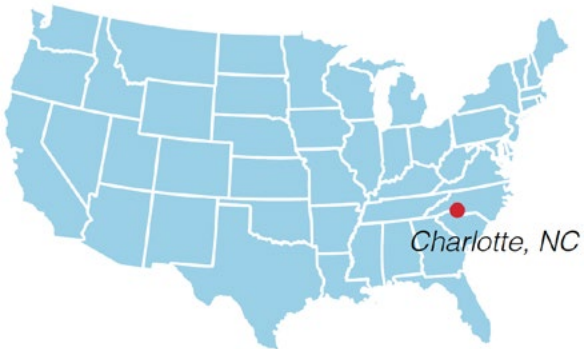
AECOM Planning + Design



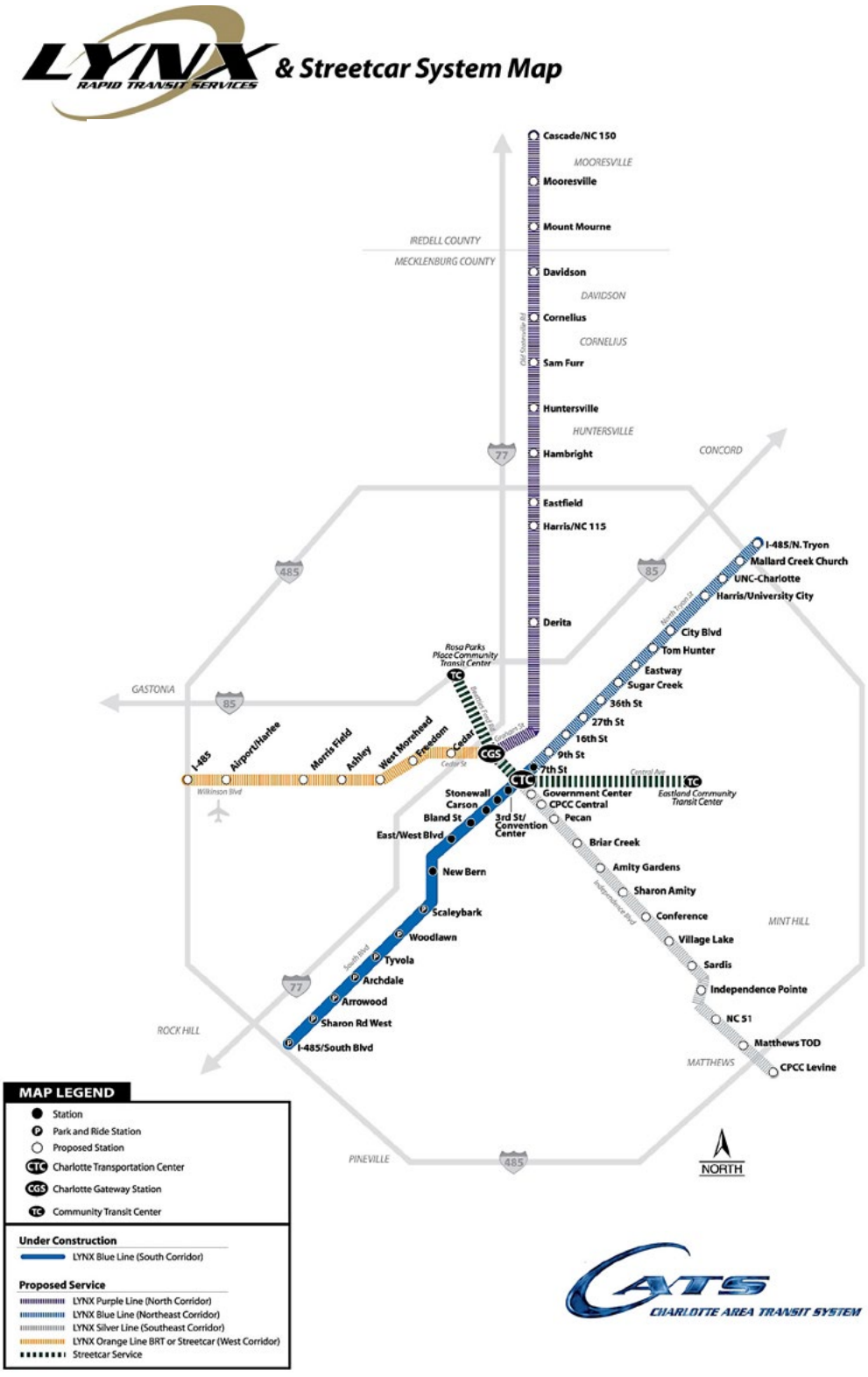
Integrating regional transit planning and local land use planning is essential to encourage transit-supportive development. Design and planning decisions on transit infrastructure related to transit technology, alignment, station locations, and detailed design considerations, dictate the levels of pedestrian and vehicular access of an area as well as its land development opportunities. Likewise, local infrastructure and land development regulations guide a community's evolution over time. The following key elements—regional transit facilities and local infrastructure and land use policy— must be aligned to enable transit-supportive development.

Unfortunately, regional transit decisions and local land use planning efforts often follow independent processes. These efforts are seldom integrated due to the limited scope and technical capabilities that each process entails. On the federal level, NEPA and the federal Capital Investments Program are lengthy efforts that extend many years. On the local level, local government land use

processes that would enable transit-supportive development often occur after key regional or federal transit decisions have been finalized. These key regional or federal decisions include mode choice, alignment selection, and station location. This uncoordinated planning process can cause local governments to miss opportunities that could have benefitted, or at least informed, key transit decisions.

MPOs, transit agencies, and local governments need to better incorporate transit-supportive land use considerations throughout the regional long-range planning process, from early feasibility assessments and corridor planning to final design through construction and land use entitlements.

This section presents the experience of the City of Charlotte, a community that has successfully integrated local land use planning and transit planning and decision-making, resulting in one of the country's most recognized success stories for transit implementation. This story pertains to the City of Charlotte's planning for the Lynx LRT system (see Figure 4C-1). Charlotte's success is not only remarkable in the high levels of transit ridership achieved, but for how the city has accomplished community goals while planning for and implementing transit. It is important to note that Charlotte is somewhat unique because the transit agency, CATS, is a department of the City of Charlotte, and the City of Charlotte, together with Mecklenburg County, controlled the key land use decisions in the project corridor.



Source: Charlotte Area Transit System (CATS)

Figure 4C-1 *Lynx System Map*

Charlotte's Rail History and Context

Charlotte's economy was historically built on its role as a nexus for consolidated railroads when the Southern, Seaboard Air Line, and Norfolk Southern railways brought their flagship trains through the city in the 1890s. However, as banking and other industries took over the region's economy, the railroad industry started to decline. Norfolk Southern discontinued its freight traffic along the South Corridor, opening up opportunities for new passenger transit along the corridor.

In the mid-1990s, Charlotte Trolley, a non-profit group of rail enthusiasts and developers, decided to restore an antique trolley car and run it on portions of unused rail tracks along the South Corridor. In 1996, after eight years of fundraising, Charlotte Trolley launched a 1.8-mile ride, connecting Uptown to South End. Pioneering developers built rail-oriented mixed-use projects, banking on the possibility that proposed light rail service would follow.

The Charlotte Trolley operation eventually helped set the stage for the new Lynx light rail service by encouraging transit-supportive development along the former Norfolk Southern rail line and getting the community used to the idea of passenger rail transit again. The City also later invested in additional improvements to the trolley line that were designed to be compatible with the eventual introduction of light rail trains on the route. In 2001, the City Council created the Historic South End Municipal Service District to leverage the investment in the Trolley upgrades and encourage redevelopment.

The City of Charlotte followed the required federal transit processes and also introduced several local and regional planning and regulatory mechanisms that helped it achieve its community goals. The City of Charlotte, together with its regional partners, began with a comprehensive regional vision for growth, a deliberate and consistent planning and policy response to this vision, and an aggressive local infrastructure investment strategy to ensure that communities around transit stations would benefit from the transit investment.

The City also ensured that early land use planning occurred prior to finalizing key decisions related to transit design and location, so that the creation of land use policies and regulations and development design changes could be accomplished to support these key transit design and location decisions. At the same time, the city's undertaking of substantial transit-supportive land use planning prior to and throughout the EIS process ensured that land use considerations were incorporated into selecting transit alignment, station locations, and transit facility design, prior to completion of environmental and cost assessments.

The Lynx Blue Line

The Lynx Blue line (South Corridor) was the first of the five transit corridors advanced to the Major Investment Study/Alternatives Analysis phase in 1998 and Preliminary Engineering/ Draft Environmental Impact Statement in August of 2000. The project received its federal Record of Decision in May of 2003 and a Full Funding Grant Agreement in May 2005. The Corridor opened for revenue service November 24, 2007.

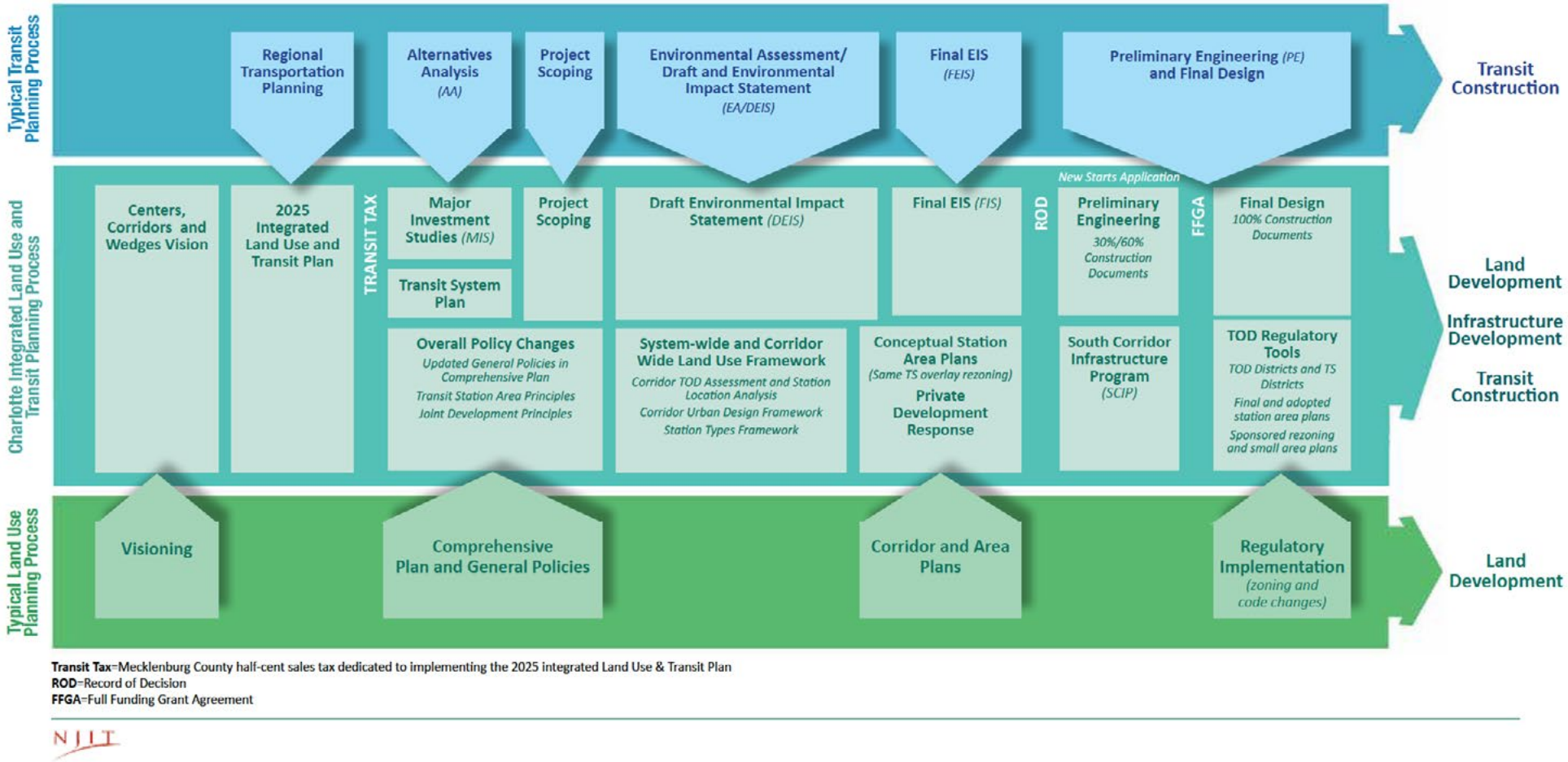
Ridership:

- Projected – 9,000 riders per day (2007) and 18,000 by 2025
- Actual – 13,000 passengers per day (2007), 15,000 (2010) after only three years of operation.

Economic Development:

- Developments between 2005 and 2009, 1,900+ new residential units, 100,000 SF of retail, and 80,000 SF of office constructed.
- Land values from 2000 to 2007 increased 52% (the rest of city increased by 40%.) The City estimates that more than $400M in private sector development was realized prior to the line's groundbreaking and a projected $1.8B in new tax revenue is expected between 2005 and 2011.

Figure 4C-2 illustrates how Charlotte expanded the typical local land use planning process and conducted this within the federal transit planning framework, resulting in true integrated land use and transit planning. Please note that the figure illustrates a combination of activities: those performed as part of the planning process for the South Corridor (Blue Line) and those performed as part of the planning process for the entire CATS system. Figure 4C-2 illustrates how the local land use planning process intersected with the typical transit planning process. The Charlotte planning process began in 1997 with the adoption of the Centers, Corridors, and Wedges Vision (detailed later). The Lynx Blue Line (South Corridor), Charlotte's first premium transit corridor, opened in 2007. Many of the documents noted in the sections below and prepared as part of the local planning process, such as the 2025 Integrated Land Use and Transit Plan have been updated. The process outlined in Figure 4C-2 sets up a framework that can respond when warranted by the market.



Transit Tax=Mecklenburg County half-cent sales tax dedicated to implementing the 2025 integrated Land Use & Transit Plan
ROD=Record of Decision
FFGA=Full Funding Grant Agreement

NJIT

Figure 4C-2 *Charlotte Integrated Land Use and Transit Planning Process*

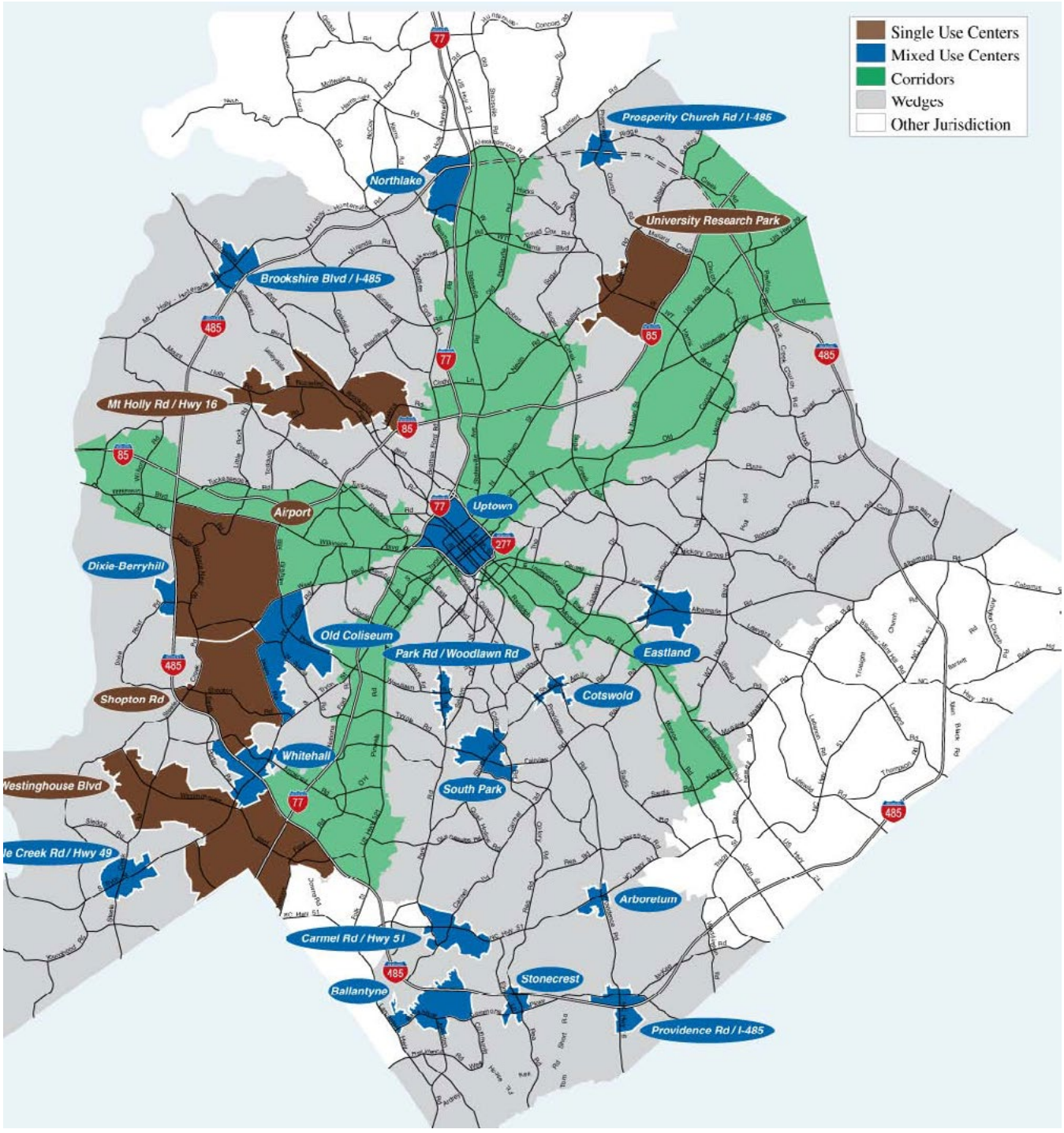
The following discussion follows the major phases of the Local Land Use Planning Process and the Transit Planning Process. Within each of these phases, the specific activities conducted by the City of Charlotte and its partners to integrate the transit and land use processes are described. As a means to guide the reader through this complex, integrated process, the headings below include within parentheses an indication of whether this Charlotte integrated step was part of the Local Land Use Planning Process, Transit Planning Process, or both. The order in which these steps are presented are the relative order in which they occurred, with some exceptions. Some steps overlap others. The reader should reference Figure 4C-2 while reading about the City of Charlotte's integrated process.

Visioning

Centers, Corridors, and Wedges Vision

From the 1970s to the 1990s, Charlotte experienced tremendous population growth as it slowly rose to become one of the nation's banking and financial centers. The city government recognized that a strategy was needed to ensure such growth would enhance the livability of the city and the Charlotte Metro region. The Centers, Corridors, and Wedges visioning effort was undertaken to plan how growth should occur over time and what infrastructure investments would be needed to support this growth. Introduced in 1994 and adopted by the Charlotte City Council and Mecklenburg County in 1997 as part of the 2015 plan, the Centers, Corridors and Wedges Growth Framework is the overarching policy for regional growth in Charlotte and Mecklenburg County.

Planning for the framework was led by the Committee of 100, representing Mecklenburg County and five adjacent counties. The framework identified five radial growth Corridors and a variety of activity Centers that would have the infrastructure necessary to support higher intensity development. Wedges, which fall between Corridors, are reserved primarily for low- to medium-density residential development. Central to the growth vision are proactive and aggressive investment of transit infrastructure that supports the targeted growth areas (see Figure 4C-3).



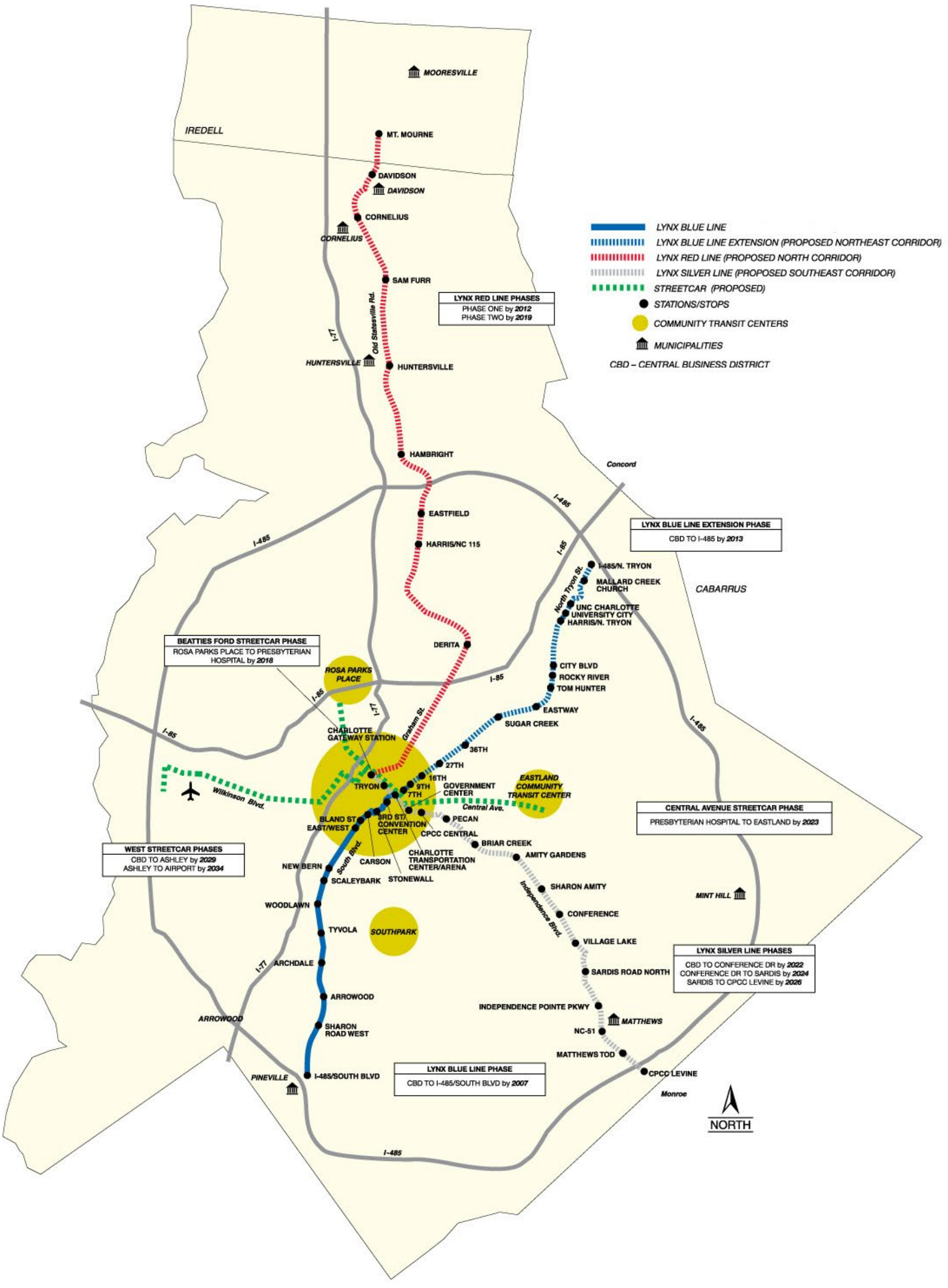
Source: http://www.fhwa.dot.gov/livability/case_studies/guidebook/images/ccwvsnln.png

Figure 4C-3 *Centers, Corridors, Wedges Vision Plan*

Regional Transportation Planning Phase

2025 Integrated Land Use and Transit Plan

The 2025 Integrated Land Use and Transit Plan was developed by the City of Charlotte and Mecklenburg County, with significant participation by the six suburban towns of Davidson, Huntersville, Cornelius, Pineville, Matthews, and Mint Hill. The plan was developed as a direct response to the Centers, Corridors, and Wedges vision. The goals of the plan were: to support the regional land use vision, expand choices in travel modes, develop a regional transit system, and support economic growth and sustainable development. Over an intensive nine-month period, a series of transit/land use alternatives were tested for each of the five radial growth corridors named in the regional vision. An extensive public outreach effort fostered community understanding and consensus for the recommended plan, which recommended a phased implementation of various transit technologies along the five corridors. The plan focused on developing five premium transit corridors to provide commuters with transportation choices and to build more livable communities through the integration of land use and transportation. The CATS 2030 System Map was developed based on the 2025 Integrated Land Use and Transit Plan (see Figure 4C-4).



Source: City of Charlotte, http://www.charmeck.org/city/charlotte/cats/planning/2030Plan/Pages/default.aspx

Figure 4C-4 *CATS 2030 System Map*

Dedicated Transit Tax

The 2025 Integrated Land Use and Transit Plan and the prior visioning effort galvanized the community around a common vision of sustainable growth supported by thoughtful land use planning and transit investments. Consequently, in 1998, the voters in Charlotte and Mecklenburg County elected to create a ½-cent sales tax to be used for the implementation of the 2025 Plan. The tax was projected to yield $1B over 20 years, dedicated to support the development of a comprehensive public transit system.

The approval of the transit tax was a great milestone for Charlotte. It demonstrated the local commitment for transit and enabled the City to have the required local matching funds for an FTA New Starts grant application. The local match for financing construction of the new transit system became a reality, and shortly after, detailed planning for the South Corridor transit project and the other four corridors started. (This planning occurred prior to receiving the Full Funding Grant Agreement.)

As a result of the implementation of the transit tax, Mecklenburg County and its seven municipalities formed the Metropolitan Transit Commission (MTC) as the body that would review and recommend transit system operations and improvements.

Alternatives Analysis/Major Investment Studies, Project Scoping and Comprehensive Plan and General Policies

Major Investment Studies

The City of Charlotte, led by CATS, began detailed planning for the transit corridors immediately after the sales tax referendum passed. The Major Investment Studies (MIS) for all five corridors were conducted by CATS in 1999 and 2000. These studies recommended a combination of light rail, bus rapid transit, streetcar, commuter rail, and extensive bus systems that would serve more than 200,000 riders by 2025.

Transit System Plan

After completion of the MIS in 2002, the MTC adopted the 2025 Transit System Plan that included an implementation plan and a financial plan. The 2025 Transit System Plan included a multimodal package of improvements and fixed guideway transit (light rail, commuter rail, bus rapid transit, and streetcar) for five corridors and the Center City. In 2003, the Mecklenburg-Union Metropolitan Planning Organization (MUMPO), the MPO for metropolitan Charlotte, adopted the System Plan, including the LPAs, into its financially-constrained regional transportation plan for the Charlotte area. The 2025 Transit System Plan has been updated to the 2030 Transit Corridor System Plan and was adopted by the MTC and MUMPO in 2006.

Overall Policy Changes

After implementation of the transit tax, a series of policy changes occurred:

- **Updated General Development Policies in the Comprehensive Plan** – the City of Charlotte's General Development Policies (GDPs) provide guidance for the location, intensity and form of future development and redevelopment throughout the city. Revised prior to the MISs, the GDPs were used as a guide in the development of the MIS alignment selection, station location, and conceptual station area plan for all five transit corridors in Charlotte.
- **Transit Station Area Principles** – The Transit Station Area Principles (2001) component of the GDP provided the framework for the more refined land use and design recommendations integrated throughout the transit planning and design process. These principles provided direction for developing and redeveloping properties around transit stations in a way that increased the convenience of using transit. These policies focused on land uses, mobility, and community design. The policies encourage transit-supportive development that focuses on creating compact neighborhoods with housing, jobs, shopping, community services, and recreational opportunities all within a ½-mile walking distance of a transit station. These principles were adopted prior to the start of the DEIS for the South Corridor and provided the overall framework for the station area planning and corridor urban design for the Corridor.
- **Transit Station Area Joint Development Principle**s – Adopted in 2002, the City of Charlotte, Mecklenburg County, the MTC, and four surrounding towns within Mecklenburg County adopted Transit Station Area Joint Development Principles. The principles provided the policy framework for local governments and CATS to encourage and promote transit-supportive development. The principles include the co-location of complementary public facilities, provision of adequate public infrastructure (i.e., sewer, water, roadways), development of a variety of housing types, and provision of private development incentives.

Draft and Final Environmental Impact Statement and Corridor and Area Plans

Prior to and during the NEPA processes for all four corridors, the City developed a series of land use policies and regulations to enable transit-supportive land uses with the goals of ensuring transit's success and achieving community visions contained in the Centers, Corridors, and Wedges Plan. These policies and regulations are discussed in detail below.

It is important to note that Charlotte conducted the majority of the land use planning efforts in advance of the federal funding commitment and the Record of Decision. Most communities would have waited to conduct these land use planning activities until the certainty of federal funding. However, city leaders

perceived the planning activities to be necessary for community building around the station areas and along the growth corridors, and not simply as a necessary step for the federal funding application. The transit projects in Charlotte were never perceived by city staff and leaders as stand-alone mobility projects. From the start, transit was seen not as the end goal, but as a tool to achieve community building.

> "The [transit planning] process has helped us broaden our perspective. Transportation is not the only driver, but one of many considerations [of community building]."
>
> — Laura Harmon, Charlotte Economic Development Department

Integrated EIS Teams

Ensuring that transit-supportive considerations are incorporated throughout a transit planning effort is a challenging task because of the separate processes followed by local land use planning and regional transit planning (see Figures 4C-1 and 4C-2). The City of Charlotte addressed this challenge by not only coordinating the two processes, but by using the same team of experts and staff for both land use planning and transit planning.

The City of Charlotte assembled an integrated land use/transportation planning team with representatives from various city departments (planning, economic development, transportation, engineering and property management, and CATS) for the EIS processes. Arguably, this coordination was more easily facilitated because the representatives were all part of the city's organization. In particular, the transit agency charged to lead the transit planning processes is part of the city's organization. This is somewhat unusual given that most cities and metropolitan areas have transit agencies that are independent entities.

Thus, a multidisciplinary consultant team that prepared the EISs included transportation and transit experts, land use and urban design professionals, and market analysts and economic development specialists. This multidisciplinary team not only ensured that planning for transit would lead to a viable system from an operational, cost, and ridership standpoint; but that land use issues and opportunities were considered throughout the planning process to create a successful transit system as well as a livable community. Land use considerations helped guide critical decisions on alignment and technology selection, station location, and even on detailed engineering design.

The same team that led the land use planning and urban design components of the EIS processes provided guidance in developing detailed implementing policies and regulations for the city. Products developed by the land use team include Transit-oriented Design assessments, corridor urban design frameworks, station

area plans, and a system-wide station types program. Some of these products were adopted as local policies and were also used as part of the New Starts application package to help strengthen Charlotte's application for federal funding.

Integration of Local Land Use Planning and Transit Planning: Charlotte's Success

Charlotte dedicated much effort in integrating local land use planning with the South Corridor transit planning, even prior to receiving the ROD and FFGA from FTA. Although there was a risk that the City would not receive funding from FTA, city leaders knew that their investment in conducting early coordination of land use and transit decisions would yield more optimum results for the community as a whole. Due to the City's proactive planning and its commitment to follow through with infrastructure investment and regulatory changes, the private sector gained a sense of confidence about the City's commitment to creating better places in each of the station areas and along the entire South Corridor, and this, in turn, generated an enthusiastic private development response. Moreover, results of the station area planning and other land use planning and coordination efforts were incorporated into the New Starts application and have proven helpful in the city's application for federal funding.

System-Wide and Corridor-Wide Land Use Framework

1. **Corridor TOD Assessment and Station Location Analysis** – During the DEIS processes, TOD assessments were conducted for each transit corridor, building on the development and redevelopment opportunities identified in the MIS. Each corridor's TOD issues and opportunities analyses helped inform alignment considerations, assisted in determining station locations, and influenced station area planning. The TOD assessment considered the physical conditions of the corridor, outlined basic economic market conditions, and evaluated existing and recent development trends.

   The assessments included reviewing big-picture trends occurring in the Charlotte region, conditions and developments occurring in the corridor, and the development potential and key issues to be addressed for each station. The following factors were analyzed or examined as part of the TOD assessments:

   - Regional data for various land uses and by submarket to understand existing conditions and directions of growth
   - Demographic and economic data for the corridors and station areas to understand trends and conditions
   - Planned and proposed developments that may impact station areas

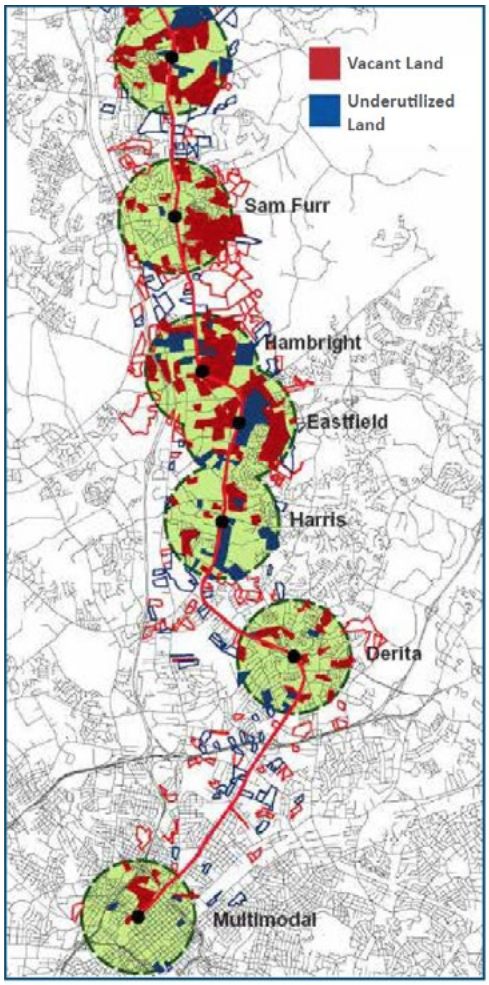
- Access, visibility, level of development, access to source markets, availability of vacant land, planned infrastructure improvements, and other qualitative attributes for each station area

Figure 4C-5 illustrates the transit-supportive development opportunities along the North Corridor's Hambright focus area.

The TOD assessment concluded with a rating system for alternative station locations based on the level of opportunity existing around each proposed station, and a discussion of the general timing and intensity of development by land use. Together with detailed site planning on specific stations, the results from the TOD assessments were used as criteria for station location and alignment selection during the DEIS. (Note: Evaluation of adjacent land uses in identifying a preferred transit corridor is required by an EIS. The metrics to evaluate a particular corridor are developed by the guiding transit agency; TOD Assessment can be included during this step.)

Figure 4C-5

TOD Opportunities within 1 Mile of North Corridor's Hambright Focus Area



Source: City of Charlotte, Charlotte Area Transit Planning, "North Corridor Station Location Refinement, Part 1, MIS Station Location Analysis," 2005

2. **Corridor Urban Design Framework** – The Corridor Urban Design Framework is a set of guidance elements developed by the DEIS team for the northeast, southeast, west, and north transit corridors. The purpose of these documents is to outline how each corridor's urban design and planning contexts can be supported as transit infrastructure is constructed. They provided the City's various departments a common language in designing transit facilities and enabled them to make informed decisions on issues related to detailed design. The framework outlined minimum design parameters based on their contexts and visibility for elements including: transit tracks, bridges, retaining walls, system components, catenary system, utilities, landscaping and fencing, and station design.
3. **Station Types Framework** – Transit stations serve many purposes: mobility (accessibility), placemaking (design), and economic development (creation of value). These roles can sometimes have competing needs. Each station area has different needs and circumstances; and each station must strike a balance among these needs. The City of Charlotte understood the three roles that a transit station needs to fulfill and proactively developed a policy document to assist city staff and the design team in understanding such roles within the entire CATS system. The document also provided CATS a framework for managing resources for future joint-development opportunities at the stations.

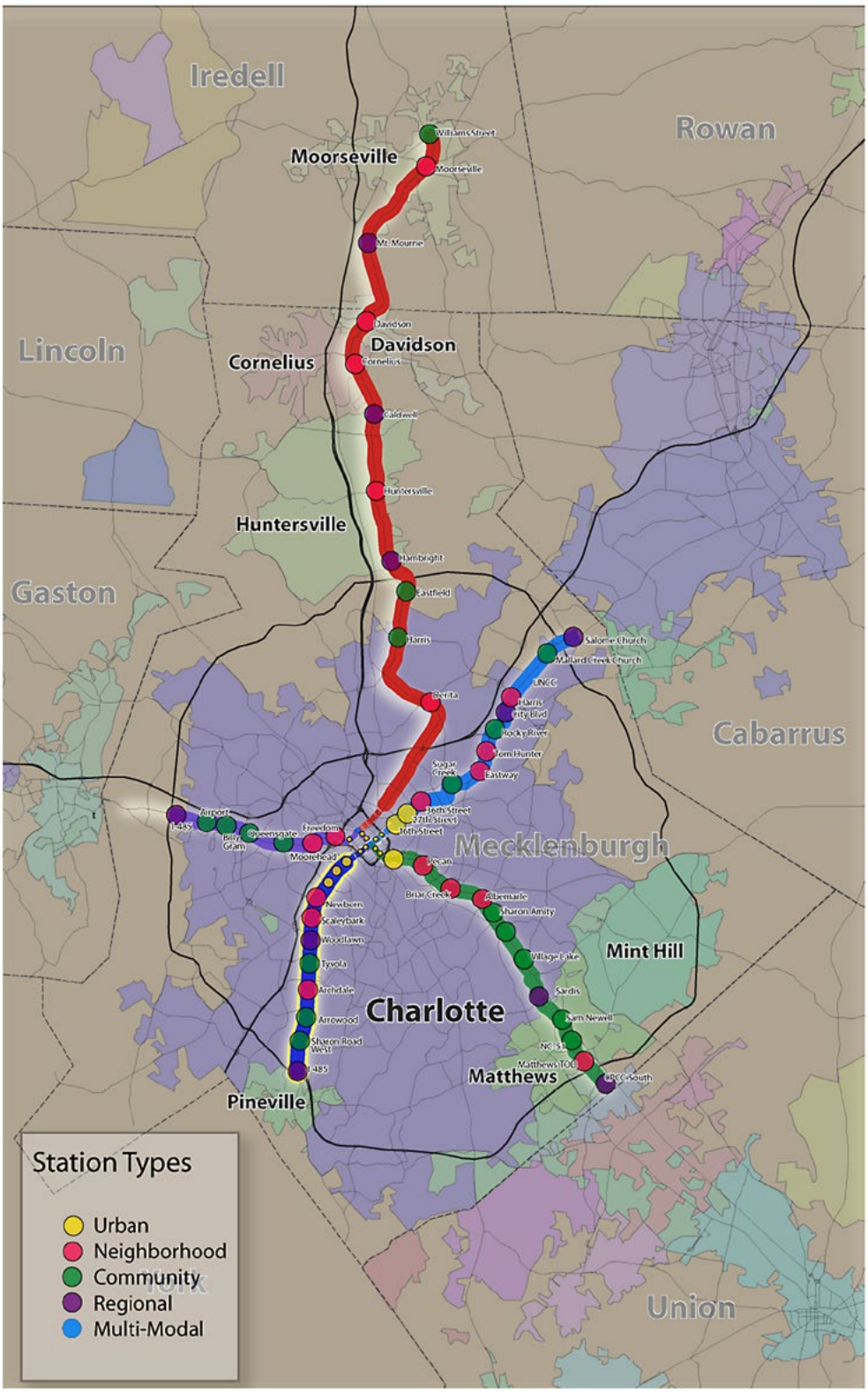
   The Station Types Framework emphasized that the surrounding built form should always be an informing factor in designing transit stations. Transit facilities need to be designed with careful consideration of the community fabric and add to the character of a neighborhood. As different contexts demand different design responses, they also demand different planning and development strategies. In general, the five main types of stations found along the transit corridors in Charlotte are:

   - Multimodal stations
   - Regional stations
   - Community stations
   - Neighborhood stations
   - Urban stations

   Figure 4C-6 illustrates the station types throughout the transit system.

Figure 4C-6

Station Types



Source: Glatting Jackson/AECOM and City of Charlotte

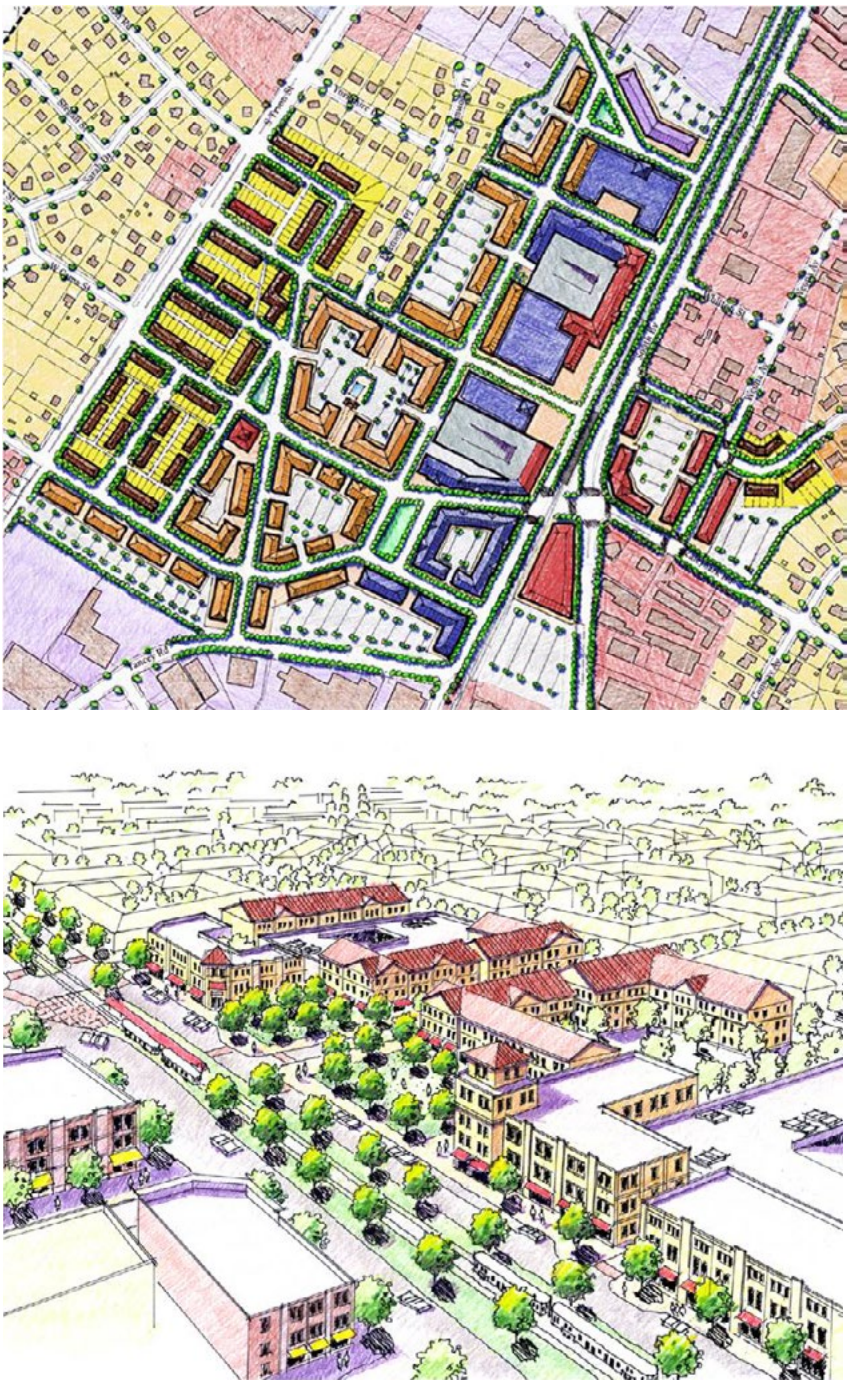
4. **Conceptual Station Area Plans** – The integration of transit into a corridor's community fabric, specifically in terms of the design and function of each transit station, is important to the acceptance and long-term success of a transit initiative. Public acceptance and use of the system relates directly to each station's ability to fulfill the three important roles of a transit station: 1) to provide an effective mobility option for commuters, 2) to add to the character of a community, and 3) to promote transit-supportive development consistent with a community's vision.

   The City developed conceptual station area plans for each of the planned transit stations within the CATS systems plan as part of the DEISs. Together with other policy documents, the station area plans were developed to ensure that each station is successfully integrated with its surrounding community. The plans included an assessment of the physical context of the area within ½-mile of the each station, illustrating a growth strategy that integrates transit with future development opportunities and reinforces local community goals. Each station area plan also identified specific recommendations for zoning and land use changes and targeted infrastructure improvements within each station's half mile service area. Figure 4C-7 provides the conceptual station area plan and rendering for the Scaleybark Station along the Blue Line (South Corridor).

   The objectives of the conceptual station area plan were twofold: 1) to ensure that short-term station location and design decisions took advantage of and did not limit future development opportunities, and 2) to outline a potential future vision that maximized development opportunities relative to each transit station. The conceptual station area plans were further refined and adopted, providing a framework for local development and growth decisions. The planning effort ensured that mobility and connectivity were protected through the formal adoption of the station area plans. This refinement was vetted through a public process before adoption. See the Charlotte-Mecklenburg Planning website for the Area Plan Review and Adoption process at http://charmeck.org/city/charlotte/planning/AreaPlanning/TransitStationAreaPlans/Pages/Home.aspx.

Figure 4C-7

Existing Conditions, Conceptual Station Area Plan and Illustrative Rendering for Scaleybark Station Along Blue Line (South Corridor)



Source: Google Earth and Glatting Jackson/AECOM and City of Charlotte

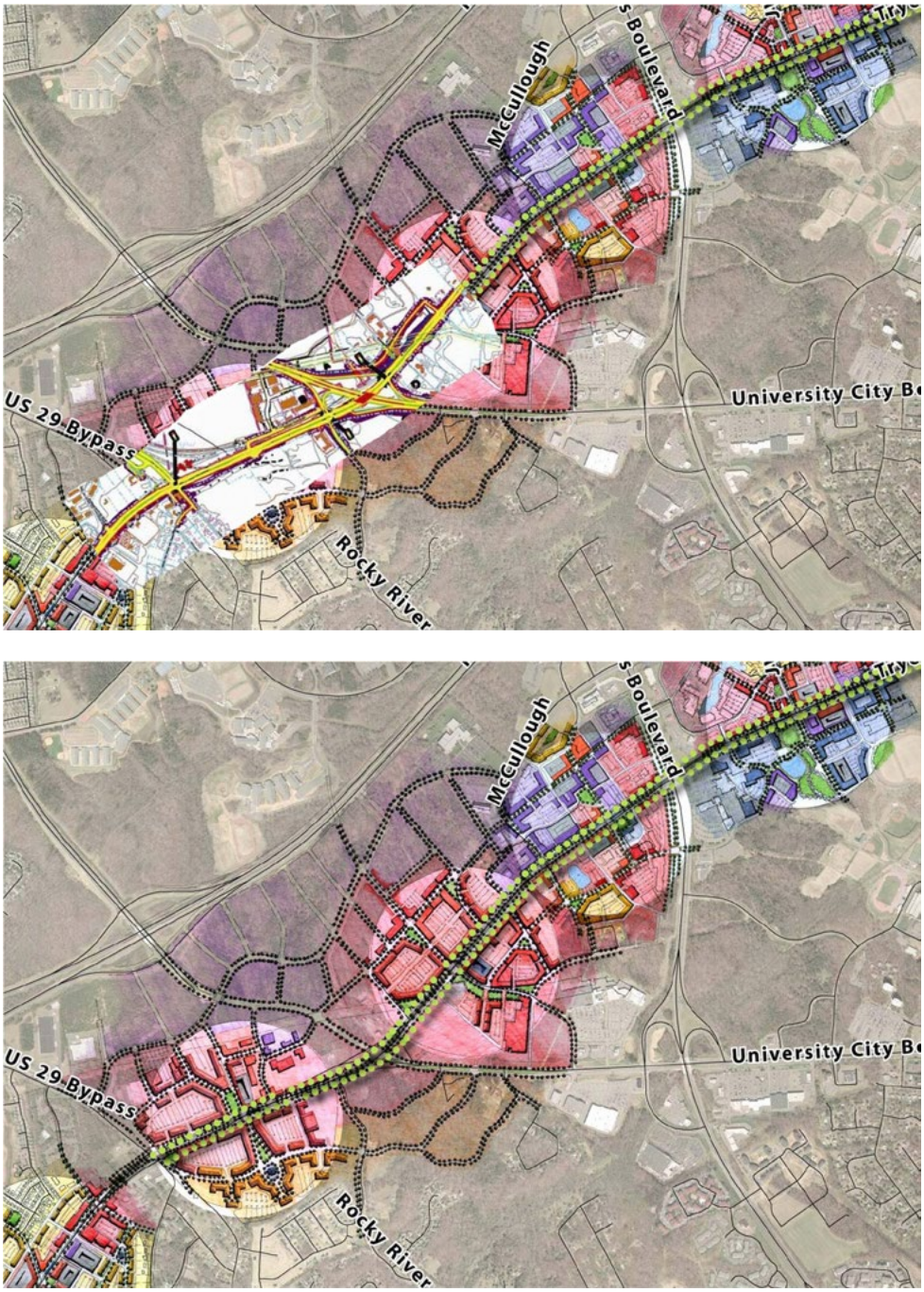
5. **Private Development Response** – The City of Charlotte recognized that transit planning is a long process that could take years due to local planning needs and federal and state funding application requirements. However, in that time period, the City recognized that public infrastructure projects and private development opportunities within each of the proposed transit corridors needed to progress. These types of projects typically are not always aligned with the goals and vision of the proposed transit corridors or station area. To ensure a more cohesive approach, the City undertook a process called the "private development response" to ensure that all opportunities to create new transit-supportive development were advanced even before enactment of enabling policies and securing of funding for transit.

   The City had the station area planning consultant assemble a private development response team that assisted CATS, the Charlotte Mecklenburg Planning Commission, the Charlotte Department of Transportation (CDOT), and the towns in Mecklenburg County in responding to each private initiative requiring planning assistance. Eighteen development response efforts were sponsored by the City of Charlotte. These sessions, developed on an on-call basis, were collaborative workshops held with property owners, developers, City staff, partner agency representatives, and major stakeholders around station areas. The intent of these sessions was to collaborate with the developers in the early stages of a project to arrive at solutions that were mutually agreeable and would help encourage transit-supportive development.

   Several development response sessions were responsible for successfully reshaping projects to be more supportive of community goals and transit ridership, prior to the implementation of transit projects. Examples of development response activities include modifying the design and site plans of a Walmart and an Ikea; refining the design of 3030 South Development, a successful transit-supportive development constructed along the Blue Line; and developing a lower impact and less costly solution to the "weave" at the US 29/NC 49 interchange.

   In 1998, the US 29/NC49 interchange project was approved. However, due to the overall cost for planning, design, land acquisition, and construction, the project was projected to exceed the overall budget. The City worked with NCDOT and several large private land owners to develop a concept for a new at-grade boulevard that improved safety by eliminating the current "weave" conditions, improved overall mobility, minimized impacts to adjacent property, and reduced the needed right-of-way outlined in the original project proposal. This development response effort helped re-direct this $50M planned interchange near the proposed City Boulevard and Rocky River stations. This effort saved the City and State $25M and enhanced the future potential for transit-supportive development. Figure 4C-8 presents the previously proposed interchange for the US29/NC 39 intersection (upper image) and station area plans with the new network of roads (lower image).

Figure 4C-8
US 29/NC 49 Interchange



Source: Glatting Jackson/AECOM and City of Charlotte

Final Design and Regulatory Implementation

South Corridor Infrastructure Program

While Charlotte carefully and proactively crafted policy and regulations to provide the right setting for transit-supportive development, the City also

invested heavily to ensure that municipal infrastructure around stations was sufficient and ready for transit and transit-supportive development. Through the South Corridor Infrastructure Program (SCIP), the City set aside $50M of bond money to construct new streets, sidewalks, and intersection improvements around seven of South Corridor's industrial and suburban station areas, prior to and during the transit project's construction. These stations were lacking infrastructure that could support the regional transit system and enable a walkable, transit-supportive environment.

Although the $50M covered only a fraction of the $200M needed for sidewalks and intersection improvements, the investment helped tremendously in encouraging private development response by demonstrating the City's commitment to the transit project. The investment was targeted to improve accessibility by providing pedestrian, bicycle, and vehicular connections to stations and station area development, and to promote economic development. Figure 4C-9 provides an example of intersection improvements constructed as part of the SCIP.

Figure 4C-9

SCIP Intersection Improvements

Source: Glatting Jackson/AECOM and City of Charlotte

By 2008, SCIP had funded the following projects:

- 14 miles of sidewalks
- 1.5 miles of multi-use trails
- 10 miles of bicycle lanes
- 8 miles of street widening
- 7 streetscape improvement projects
- 27 multimodal intersection improvements

TOD Regulatory Tools

1. **TOD Rezoning and Transit-Supportive Overlay Zoning Districts**– Since 2003, the City of Charlotte has adopted a series of transit-supportive development regulations. These include regulations for TOD zoning districts and transit-supportive (TS) overlay districts. The purpose of the TOD district is to create compact and high intensity station areas with mix of uses and high pedestrian activity. The development standards are designed to require compact urban growth, opportunities for multimodal choices, and an improved pedestrian environment, within ½-mile walking distance from a transit station.

   The three base TOD districts adopted by the City Council are TOD-R (residential-oriented), TOD-E (employment-oriented), and TOD-M (mixed-use oriented). These districts are governed by the following regulations that encourage transit-oriented development and land use patterns:

   - Minimum residential densities of 20 du/a within ¼ mile to 15 du/a within ½ mile of station area
   - Minimum floor area ratio (FAR) of 0.75 within ¼ mile and FAR of 0.50 within ½ mile of station area
   - Maximum of 1.6 parking spaces per DU (residential)
   - Maximum of 1.0 parking space per 300 SF (office)
   - Maximum of 1.0 parking space per 250 SF (retail)

   The TOD district is intended for areas in which stations are part of a project that FTA has issued a Record of Decision. However, because the City recognized that land development will occur at a pace different from transit planning and funding, it created the transit-supportive overlay zoning to address properties within a ½ mile of a proposed station that is not part of a funded transit project or an adopted station area plan. The TS overlay zoning was developed to "introduce transit-supportive and pedestrian-oriented development regulations and uses and encourage properties to transition" to become more transit-supportive. This overlay zoning mechanism allowed for existing uses and their minor expansion while encouraging redevelopment into a more transit-supportive pattern that complements adjacent neighborhoods. The base zoning of a property may still apply but the overlay districts grant additional use or development requirements to allow higher density and transit-supportive mixed uses. The overlay was adopted in early 2005 and includes:

   - List of restricted uses
   - Minimum residential density of 12 du/a with an adopted station area plan and 10 du/a without plan

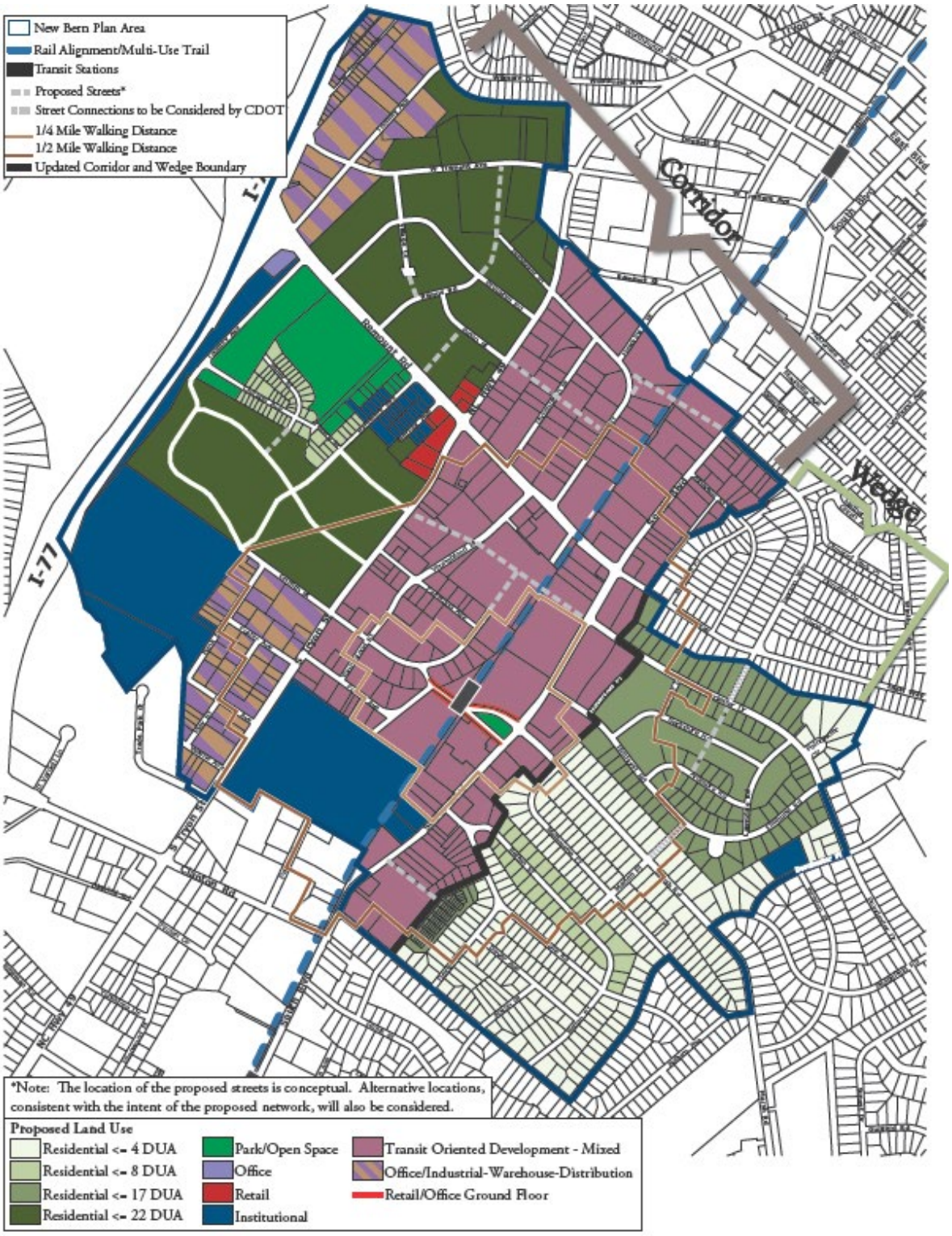
- FAR of 0.5 with adopted plan and 0.35 without plan
- Parking maximums set to allow more parking than TOD District

2. **Final and Adopted Station Area Plans** – The conceptual station area plans developed as part of the DEIS process were meant to be the basis for future public and private investments. City staff had advanced the conceptual plans for a number of the Charlotte transit stations; the City Council has since formally adopted these final station area plans. The station area plans were refined through additional public outreach. Each of these plans include: an understanding and documentation of the study area's context; a station area concept; recommendations for transportation, infrastructure, public facilities, and parks; recommendations for zoning changes; and a comprehensive implementation plan. The implementation plan outlines the responsibilities of both the City and the private sector, the corrective rezoning for various parcels necessary to implement the station area plan, and a list of implementation strategies. Joint Development Principles were adopted in 2002 to provide a framework to encourage and promote transit-supportive development for local governments and CATS. Parking requirements vary and correspond to the station typology.

   By mid-2010, the City had adopted eight station area plans for the South Corridor, three station area plans for the Northeast Corridor, and six for the Southeast Corridor. Figure 4C-10 illustrates the future land use for the New Bern Station area developed and adopted as part of the Final Station Area Plan.

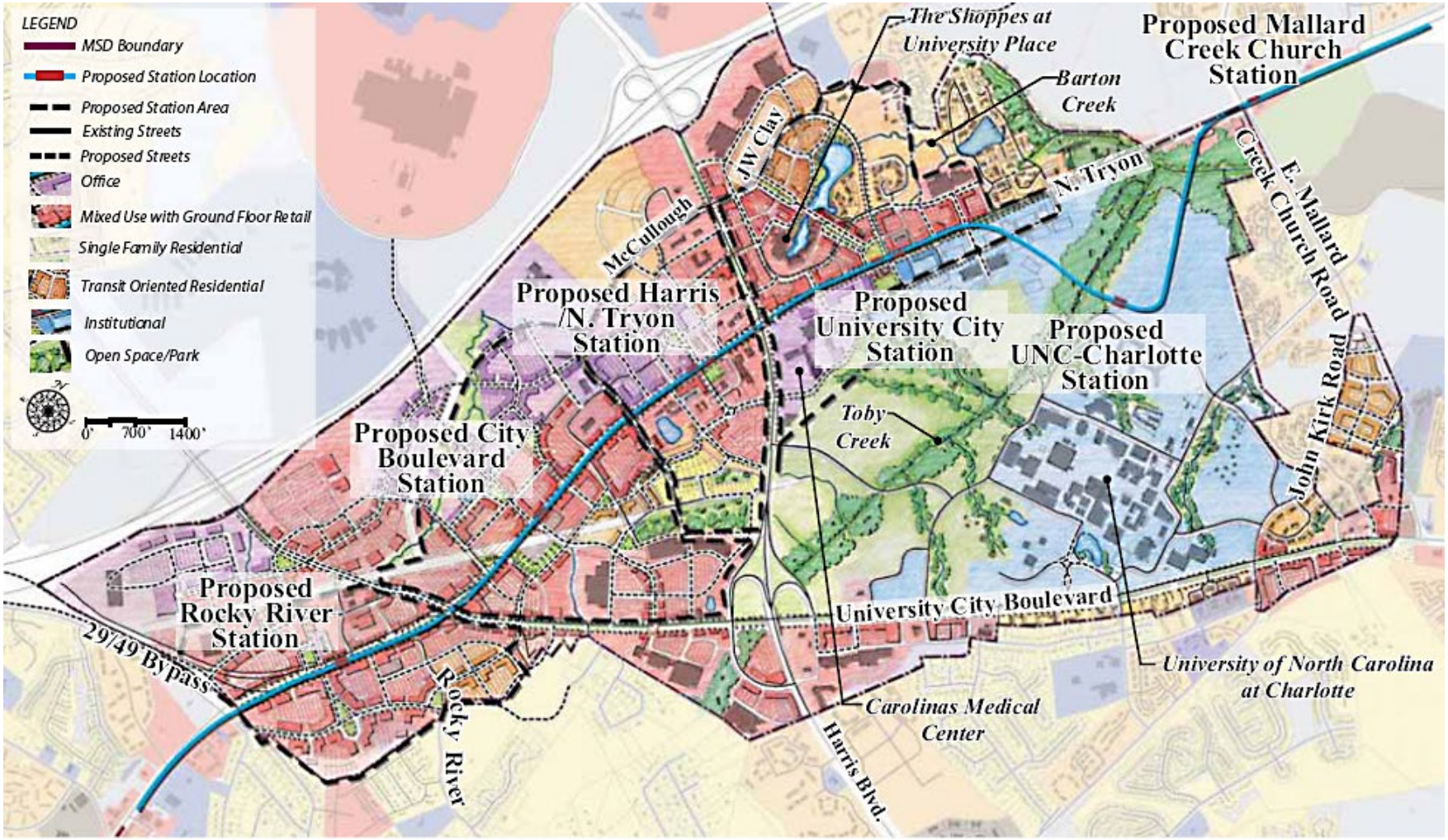
3. **Sponsored Rezoning and Small Area Plans** – The City's Planning Commission has proactively sponsored site-specific rezonings to TOD or TS overlay zoning for properties within station areas. This has been accomplished by offering property owners who are interested in up-zoning (which increases density or allows a commercial use) a waiver of the $3,000–4,000 fees for an up-zoning application and staff assistance for the permitting and application process. This has proven to be a great tool for encouraging property owners to redevelop into a more transit-supportive pattern at a number of station areas along the South Corridor.

   Aside from assisting with transit-supportive rezonings, the City has also been proactive in helping local communities with small area planning efforts focused on stations along the Northeast, North, and Southeast corridors. Like the final station area plans, the small plans are refined conceptual station area plans and formally recommended new TOD zoning or TS overlay zoning on specific parcels within the station areas. Figure 4C-11 shows four station area plans that were completed as part of the University City Small Area Plan.



Source: City of Charlotte, Charlotte-Mecklenburg Planning Department, "New Bern Transit Station Area Plan," 2009

Figure 4C-10 *Future Land Use for the New Bern Station Area*



Source: Glatting Jackson/AECOM and City of Charlotte

Figure 4C-11 *University City Small Area Plan*

Lessons Learned

Successfully implementing one transit project is a large endeavor for any community; advancing five corridors concurrently, as Charlotte has done, is an even bigger undertaking. The following are some of the major lessons learned that were shared by Charlotte's community leaders and staff as they continue to advance the planning and implementation of the multi-corridor transit plans.

Vision-led transit planning instead of process-led transit planning is key. The City of Charlotte's experience illustrates that successful transit implementation is an outcome of a strong community vision and follow-through of that vision with consistent and aggressive implementation policies and programs. The Charlotte process went beyond the required minimum planning and environmental evaluations and instead used the vision of community building as a framework for true integrated land use and transit planning. The phased transit investments were born out of the initial community visioning effort that established the growth corridors and centers of the region.

Throughout project development and implementation, the City ensured that land use considerations were integral to key transit decisions prior to finalization of the EIS documents and cost estimates. The city was also proactive in developing timely and strategic policies and regulations as well as infrastructure investments that would not only ensure the viability of the transit projects, but would also optimize the benefits of these investments to meet the community vision.

Attention to broad community building goals instead of focusing solely on mobility objectives led to overall project success. The joint authorship and ownership of the transit project across various City departments (transit agency, planning, economic development, and transportation) provided a learning opportunity for everyone, broadening the perspective of each department's focus so that transportation was taken as a consideration and not the only driver of community goals. In the end, the transit project became a community-building project, and not simply a mobility project. From the regional transit visioning to project construction and implementation, the city was vigilant in ensuring that actions were towards realizing a better, more livable community, and not just a functioning transit project.

Organizational structure and institutional policies can help ensure integrated land use and transit planning and implementation. In many cases, even within a single jurisdiction, it is difficult to work past the silos of multiple departments, each with its own mission and obligations. Charlotte's organizational structure, which places planning, economic development, transportation, and transit all under the City's purview, has greatly streamlined the way in which transportation planning (especially transit planning) is coordinated with the multiple concurrent processes that are occurring. The City's overall

corporate strategy and organization allows for the greatest level of coordination between transportation and land use issues across city departments.

Community champions helped advance Charlotte's ambitious transit initiative. A community champion was needed to help "sell" the concept of a new transit system to a conservative legislature and population. Mayor McCrory became that champion. He was the youngest and the longest-serving mayor of the city. In his 14-year tenure, he made transit a top priority of his agenda, pushing for transit investment as a tool for economic development. He was instrumental in gaining both the state legislature's and the public's support of a sales tax dedicated to transit, and he successfully helped defeat a referendum to repeal that tax.

The mayor also enabled leadership from the private sector. During his first term, he assembled 10 community leaders from businesses and neighborhoods to review and affirm/revise recommendations from the Centers, Corridors, and Wedges Framework. The recommendations of the committee later led to support of "local option" revenue sources for transit improvements and the enabling legislation for the sales tax.

Charlotte is also known for pioneering developers that championed and helped spur the impressive redevelopment boom along South End, a neighborhood served by the Blue Line. One such developer, Tony Pressley, recognized redevelopment opportunities in the aging industrial buildings along the proposed light rail line. He successfully renovated old textile mills into restaurants, shops, and condominiums, helped push for state legislation easing liability roadblocks to brownfield redevelopment, and secured the city's first EPA Brownfields Grant. He took a leadership role in establishing Charlotte Trolley, Inc., and the South End Development Corporation.

Integrating land use considerations into transit planning can help a transit project qualify for federal funding. The level of land use planning during and prior to the DEIS process has proved helpful in making South Corridor more competitive in terms of securing FTA funding. In FTA's 2003 New Starts evaluation, it states that "the overall project rating of Recommended is based upon the strong transit-supportive land use plans and policies in place along the corridor, as well as the strength of the project's capital and operating financial plans." The project received a Medium-High land use rating, which recognized the strong polices to implement transit-supportive land use development, the demonstrated results of those policies, and regional and local cooperation to realize the transit goals. The New Starts evaluation also cited the TOD zoning, SCIP, and station area planning efforts as components that made the project competitive. This lesson is especially important for other communities pursuing transit funding as FTA goes forward with recently announced changes of making

land use and economic development criteria equally important as other cost and performance criteria in the selection of New Starts and Small Starts projects.

Every new step in the process is an opportunity for learning. City staff expressed that the many steps involved in transit planning offered opportunities for each City department to learn and grow beyond their existing knowledge base and to expand their roles and responsibilities. Lessons learned from the first project, Blue Line, are now being incorporated into the continued planning and design of the other corridors. For instance, the City planning staff wanted more information and knowledge on transit design to enable them to more meaningfully participate in decisions related to station design for the South Corridor. The Urban Design Frameworks developed for the Northeast and the North Corridors were a direct response to that need and offered a common language that CATS and the Planning Department could use to address specific design issues along the transit corridors.

The private sector responds to the predictability and commitment of the public sector. Since transit planning and implementation is a long process, proactive and nimble public sector response to market opportunities and trends is important. Charlotte learned that the demonstration of local public commitment helped garner trust from and impart a sense of predictability to the private sector. Together, the local investments to infrastructure (SCIP), aggressive changes in transit-supportive policies, and proactive planning assistance all worked to create a positive atmosphere for private sector participation in transit-supportive development and redevelopment along the transit corridors, even before a transit project had been built or received federal funding.

Planning for transit-supportive development requires tools and flexibility. The City of Charlotte learned that providing tools, incentives, and guidance to the private sector to encourage transit-supportive development is essential. In addition, having plans that are descriptive and not too narrowly prescriptive provides flexibility to accommodate the changing needs of the market while staying true to the principles of the plan.

Commitment is needed for both the short and long terms. Charlotte understood that community building takes time and is heavily influenced by regional and local economic drivers. The recent downturn in the market has affected redevelopment efforts in the South Corridor. Development plans that were funded have been postponed, some indefinitely. However, Charlotte's commitment to transit remains steadfast. The South Corridor Infrastructure Plan improved overall mobility in areas where development has yet to occur. As the economy improves, Charlotte has the policies and frameworks in place to structure large, small, or incremental growth.

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2025 Integrated Transit and Land Use Plan

In 2002 and 2006 the Metropolitan Transit Commission (MTC) adopted the 2030 Transit Corridor System Plan, further developing the 2025 Integrated Transit and Land Use Plan. The 2025 Integrated Transit and Land Use Plan is no longer available on the Charlotte Area Transit System's (CATS) website. Please see below for the updated version of the 2025 Integrated Transit and Land Use Plan: the 2030 Transit Corridor System Plan.

Source: City of Charlotte, Charlotte Area Transit Planning. 2006. 2030 transit corridor system plan. Retrieved from Charlotte Area Transit System website: http://www.charmeck.org/city/charlotte/cats/ planning/2030Plan / Pages/default.aspx.

Major Investment Studies

Only one study available on-line. Charlotte Area Transit System. 2002. "Northeast Corridor major investment study." Retrieved from http://www.

rideonnews.com/ deistec/NE%20Major%20Investment%20Study %202002.pdf.

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Source: City of Charlotte, Charlotte Area Transit Planning. 2006. "2030 transit corridor system plan." Retrieved from Charlotte Area Transit System website: http://www.charmeck.org/ city/charlotte/cats/ planning/2030Plan /Pages/default.aspx.

City of Charlotte's General Development Policies GDP

Source: Charlotte-Mecklenburg Planning Department. 2007. "General development policies." Retrieved from http://www.charmeck.org/city/ charlotte/ planning/AreaPlanning/ Plans/GDP/Documents/GDP.pdf.

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Source: Charlotte-Mecklenburg Planning Commission [Brochure]. 2001. "Transit station area principles: General development policies." Retrieved from http://www.charmeck.org/city/charlotte/cats/planning/Documents/ TSPbrochure2.pdf.

Transit Station Area Joint Development Policies

Source: City of Charlotte, Charlotte Area Transit Planning. 2003. "Charlotte region transit station area joint development: Principles and policy guidelines." Retrieved from http://www.charmeck.org/city/charlotte/ cats/planning/Documents/ JDPandPFinal.pdf.

Corridor Transit-Oriented Development Assessment and Station Location Analysis

A TOD Assessment and Station Location Analysis was developed for each corridor. These documents are not found on-line but can be obtained by contacting Ms. Laura Harmon, Assistant Director for Development Services, Charlotte-Mecklenburg Planning Department, 600 East Fourth Street, Charlotte, North Carolina 28202. Phone: 704.336.4565. E-mail: lharmon@ci.charlotte.nc.us.

Corridor Urban Design Framework

An Urban Design Framework was developed for each corridor. These documents are not found on-line but can be obtained by contacting Ms. Laura Harmon, Assistant Director for Development Services, Charlotte-Mecklenburg Planning Department, 600 East Fourth Street, Charlotte, North Carolina 28202. Phone: 704.336.4565. E-mail: lharmon@ ci.charlotte.nc.us.

Station Types Framework

Source: http://www.reconnectingamerica.org/public/show/dallasbrief1.

Conceptual Station Area Plans

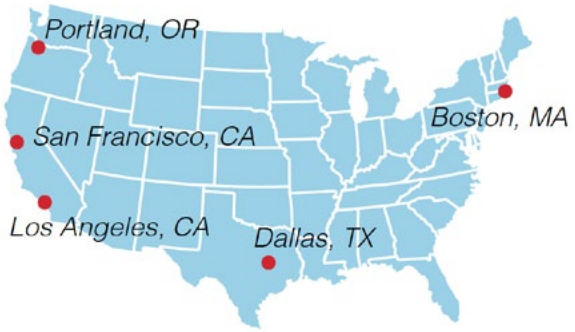
Several of the final adopted plans can be found at http://charmeck.org/city/ charlotte/planning/AreaPlanning/TransitStationAreaPlans/Pages/Home.aspx.

For more information on any other Charlotte planning document, contact Ms. Laura Harmon, Assistant Director for Development Services, Charlotte-Mecklenburg

Planning Department, 600 East Fourth Street, Charlotte, North Carolina 28202.
Phone: 704.336.4565. E-mail: lharmon@ci.charlotte.nc.us

D. Case Studies in Corridor Planning

Prepared by:
New Jersey Institute of Technology



A central theme throughout this Guide is the need to integrate transit planning with local land use planning in an effort to create more sustainable, livable communities. Another underlying theme is that there are no one-size-fits-all, prescriptive methods, or guaranteed solutions. Each region featured (including its transit agency, MPO, governmental entities, and communities) has approached integrating transit planning and local land use planning in a different way. Some regions were proactive, addressing local land use issues at the beginning of the planning process for the transit system or line. Some regions were reactive, addressing local land use issues after the transit system was planned. Similarly, the impetus for coordinated planning may have originated at the regional or the local level, but in the most successful efforts, those involved have worked together. Without strong regional support and interest, a transit line might never be realized, and without compatible land use decisions at the local level, the full potential of the transit line may never be realized.

The case studies in this section provide a reference for any entity or community embarking on a corridor plan. These examples:

- Illustrate the approaches that can be taken in considering local land use impacts as a result of a new transit system or added line.
- Identify the many and varied stakeholders and decision makers involved in corridor and local planning and implementation.
- Discuss the laws, regulations, policies, and plans that can be created and implemented to encourage integration of transit and local land use planning.
- Provide lessons learned that are transferrable to other regions.

The case studies are not intended to reflect all situations, but are meant to be illustrative of various experiences. Not all of the planning approaches discussed at the corridor level will be transferrable to others beginning the process, but there is much to be learned by reviewing what others have done and how they have done it.

The corridor case studies included in this section include the following:

- Bay Area Rapid Transit (BART), Richmond-Fremont Line, San Francisco (heavy rail/rapid rail)
- Dallas Area Rapid Transit (DART), Red Line, Dallas (light rail)
- Massachusetts Bay Transportation Authority (MBTA), Fairmount Line, Boston (commuter rail)
- Los Angeles County Metro Rail (Metro),Gold Line, Los Angeles, South Pasadena and Pasadena (light rail)
- Portland Streetcar, Portland (streetcar)
- Portland Interstate Metropolitan Area Express (MAX) Light Rail, Westside MAX Blue Line, Portland (light rail)

Corridor case studies are also included in "Challenges in Corridor Planning: Four Case Studies of Practical, Transferrable Solutions": RapidRide, Albuquerque (enhanced bus); Interstate MAX Yellow Line, Portland (light rail); HealthLine, Cleveland (BRT); and LYNX Blue Line, Charlotte (light rail).

Bay Area Rapid Transit (BART), The Richmond-Fremont Line, San Francisco, CA

Prepared by:
New Jersey Institute of Technology
Van Meter, Williams, Pollack, LLP

The Bay Area Rapid Transit (BART) system, which serves five counties in the San Francisco Bay Area of California, is a heavy rail (rapid transit) system with five lines—Fremont-Daly City, Dublin/Pleasanton-Daly City, Pittsburg/Bay Point-SFO/Millbrae, Richmond-Daly City/Millbrae, and Richmond-Fremont (see Figure 4D-1). Opened in 1972, and operated by the San Francisco Bay Area Rapid Transit District, the BART system consists of 104 miles, with 37 miles of tunneled track, 23 miles of aerial track, and 44 miles of surface track. There are 44 stations, including 15 surface, 13 elevated, and 15 subway. Four of the subways are a combination of BART and MUNI Metro in downtown San Francisco, and one subway station is shared with Caltrans. Planning for the Richmond-Fremont Line and for transit-supportive development at Richmond-Fremont Line station neighborhoods is the subject of this section.

BART Case Facts

System Name:	BART
Corridor Name:	Richmond-Freemont Line
Transit Mode:	Heavy Rail
Location:	San Francisco, California
Region (USA):	West
Corridor Length:	40 miles
Corridor Purpose:	Inter-Urban Commuter
Municipalities Served:	8
Cost and Funding Sources:	Cost: $1.6B (federal $333M, state and local $1.3B)
Date Opened:	September 11, 1972

Figure 4D-1

BART Rail System

Source: http://www.bart.gov/stations/index.aspx

Planning for the Bay Area Rapid Transit System

Planning for the Bay Area Rapid Transit (BART) system began in 1951, with the California State Legislature's creation of a 28-member San Francisco Bay Area Rapid Transit Commission. Comprising representatives of the nine Bay Area counties, the commission concluded that the best way to alleviate increasing congestion on the area's bridges was to create a five-county rapid transit district. In 1957, the State Legislature acted on the recommendation and established the San Francisco Bay Area Rapid Transit District, granting the district taxing powers. Over the next five years of systems planning, two of the counties withdrew. The remaining three—San Francisco, Alameda, and Contra Costa— appointed four members to the BART Board under enabling legislation updated in 1967. The plan for the system was outlined in the BART Composite Report and called for the development of a 71.5-mile system serving 17 communities. The counties' governing bodies and the voters approved the new system in July and November of 1962, respectively. Initial funding came from $792M General Obligation Bond issues. After several challenges, changes, and resulting cost increases, the system opened in 1972 with a 28-mile link between MacArthur and Fremont. The cost of the original BART system was $1.6B, with only 20 percent of the total from federal funding.

Intermodal Connections for BART

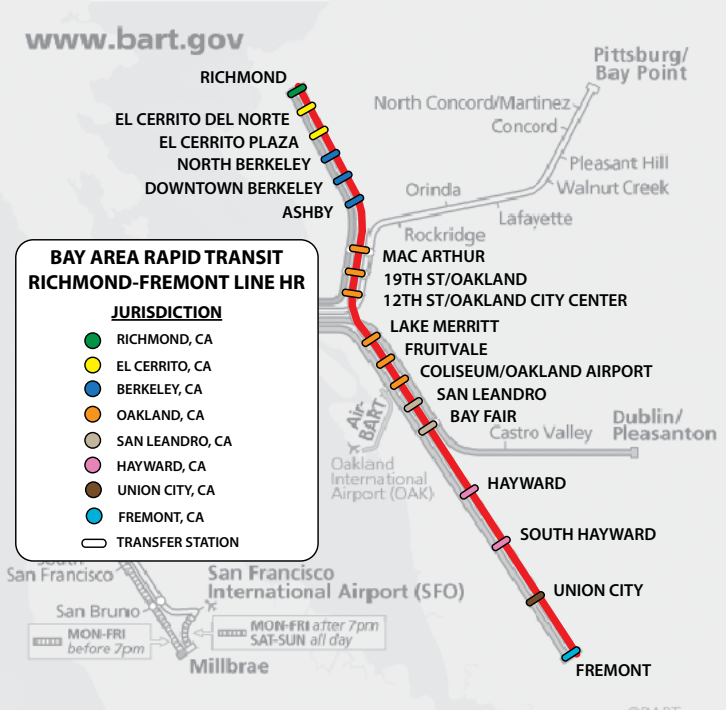
- Capital Corridor Commuter Rail connections being developed at Coliseum BART Station and Union City BART Station
- AC Transit bus connections at every BART station in corridor
- Walk/bus connections to Oakland-Alameda ferry service at Jack London Square from Oakland City Center/12th Street and Lake Merritt Stations
- Amtrak connections at Jack London Square from Oakland 12th Street Station and at Emeryville Amtrak Station from MacArthur BART Station
- AirBART shuttle bus to Oakland Airport from Coliseum BART Station (new rail connection from BART to airport in development)

The Richmond-Fremont Line

The Richmond-Fremont line runs for 34.4 miles from Richmond to Fremont (See table at end of this section for detailed information regarding the Richmond-Fremont line.) The line was constructed in two separate stages—the A line from Fremont to Lake Merritt (23.8 miles), and the R line from Richmond to MacArthur (10.6 miles). The line has 18 stations serving 8 communities (see Figure 4D-2). Additionally, the AirBART shuttle connects the Richmond-Fremont line to Oakland International Airport.

Figure 4D-2

BART Richmond-Fremont Line Stations



Source: http://www.bart.gov/stations/index.aspx and Van Meter Williams Pollack, LLP.

Planning for the Richmond-Fremont Line

Both phases of the Richmond-Fremont line were part of the original BART system plan. The plan, as noted in the introduction, was subjected to a number of challenges and changes that created tension between BART and the communities it served. The first controversy was related to the concept of constructing elevated lines along the entire corridor. Both the cities of Berkeley and Oakland objected to the aerial design and insisted the line be placed underground like the plan for San Francisco. The change could not be accommodated within the original budget, and ultimately the two communities requested voter approval for an additional property tax to cover a portion of the incremental cost.

A second controversy arose over station design. BART's design firms initially proposed a simple, function design consistent with all stations. The San Francisco Chronicle hired architectural writer Alan Temko to critique the BART station design, resulting in a series of scathing articles regarding the lost opportunity of designing stations as civic monuments appropriate to their locations. The BART Board eventually solved the problem with the adoption of a hybrid design that allowed some individuality within consistent guidelines. While both of these controversies were settled, they negatively impacted the relationship between the municipalities and BART, which affected future cooperative land use planning efforts.

Planning for Transit-Supportive Development

Planning for transit-supportive development occurred both proactively and reactively for the BART system. Unfortunately, the proactive planning, while visionary for its time, was ineffective. Between the 1962 voter approval of BART bonds and the 1972 opening of the Fremont to MacArthur line, BART hired a joint venture design firm to prepare proposed land use and zoning plans to accommodate development around the station areas. The well-designed and presented report was released in 1970. It outlined existing zoning around the stations and recommended encouraging transit supportive development through intensifying densities. The communities that would have been impacted by the changes, however, were not consulted during the planning process. The report lost credibility and resulted in increased municipal frustration with BART. Reaction in single-family residential areas was not positive, and in some cases, the communities proposed down-zoning to further reduce densities. The end result of this proactive, but poorly executed attempt at transit supportive planning, was that BART avoided station area planning for the next 20 years. Planners referred to the rail system as "a road with parking lots" and "a road with a rail"'

The reactive planning effort to encourage transit supportive development began in the 1990s and has proven successful. Support for the effort came from various directions, including the academic community. At the Institute of Transportation Studies at UC Berkeley, Robert Cervero and Elizabeth Deakin suggested the need for TOD planning in station areas. The movement toward emphasizing transit supportive land uses around transit stations gained critical momentum as a result of the cooperative efforts from environmentally focused Bay Area community groups and agencies. Support and leadership came from communities that had not been included in the BART proactive planning attempt. Prominent partners in this effort were the Metropolitan Transportation Commission and the Bay Area Council of Governments.

A collaborative effort in 2001–2002 between five regional agencies and the multi-sector Bay Area Alliance for Sustainable Communities resulted in a project known as the Smart Growth Strategy/Regional Livability Footprint Project, which created the first smart growth vision for a major metropolitan area in California. The collaborative approach has continued through the formation of the Joint Policy Committee (JPC), which coordinates the regional planning efforts of the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC, the region's MPO), the Bay Air Quality Management District (BAAQMD) and the Bay Conservation and Development Commission. Together they've provided constant direction for, and emphasis on, land use and transportation planning in the Bay Area. Focusing Our Vision, one of the many projects that has grown out of the partnership, melds regional and local objectives in a more refined and sharper

planning strategy. It has led to the establishment of FOCUS, a development and conservation strategy that establishes Priority Development Areas and Priority Conservation Areas, which while voluntary, has been successful (see www.bayareavision.org for more information). Of course, the key is to transform visions into action. The collaborative effort has been successful in making the region more aware and supportive of good planning at all levels. There has been a multi-agency agreement and adoption of smart growth policies. The agencies involved have made this new direction in planning an integral part of their programs.

The emphasis on coordinating transportation and land use is evident in the MTC Transportation 2030 Plan and the Transportation 2035 Plan for the San Francisco Bay Area, Change in Motion (www.mtc.ca.gov/planning) adopted in 2009, which allocates $218B in funding over the next 25 years, but with only a few examples of how the vision moved forward. Growth forecasts by MTC and BAAQMD now assume, beginning with Projections 2003, that public policy will reshape growth in the future and that trend analysis is no longer the best way to project growth. The MTC officially approved a Transit Oriented Development Policy in 2005 that set corridor thresholds for station area housing development. In the same year, MTC began providing grants to local communities for station area planning. An initial group of eight communities received Station Area and Land Use Planning Grants. As a result of subsequent cycles, 30 communities in total have received funding.

BART has made planning for transit supportive development a priority. The Board adopted TOD and joint development guidelines in 2003, and a formal TOD Policy in 2005 (see www.bart.gov/planning for more information). The agency has emphasized and entered into a number of joint development opportunities. Transit supportive development is increasingly being viewed as a way to improve the livability of station areas and improve ridership.

Other factors have also contributed to the emphasis on transit supportive development. Senate Bill 375, signed into law in 2008, specifically aims to reduce GHG emissions through changes in land use and transportation planning. The legislation sets forth a process to implement a previously passed global warming bill by requiring the development of a sustainable community strategy. Groups outside of government have also contributed to the growing pressure for better land use planning. The Transportation and Land Use Coalition (now known as TransForm), a partnership of more than 90 groups working for a sustainable and socially just Bay Area, published "It Takes a Transit Village" in 2004 (http://www.transformca.org/resource/it-takes-transit-village). The report contains specific recommendations, particularly for Transit Opportunity Zones, with suggestions on densities, land use, parking, and access. It also offers specific recommendations on the steps that MTC should take to realize shared goals.

MTC publications include "Choosing Where We Live," a briefing book of city planners and managers, and "New Places, New Choices Transit-Oriented Development in the San Francisco Bay Area," a report that discusses the benefits of the TOD approach and profiles existing projects (see www.mtc.ca.gov).

Senate Bill 375 calls on regional transportation agencies and local governments to develop strategies for reducing greenhouse emissions by reducing vehicle miles traveled (VMT). These strategies are expected to be utilized in concert with higher density development, alternatives to solo driving, and pricing. The regional agencies have started development of a new long-range plan for the Bay Area to address the Sustainable Communities Strategy mandated by the bill, and have produced the Initial Vision Scenario (see www.mtc.ca.gov/news).

Richmond-Fremont Line Station Area/Corridor Plans

The importance of governmental and nongovernmental agencies and groups pushing for a new planning direction in the Bay Area cannot be overstated. A new planning direction has to be supported and implemented at the local level by communities responsible for regulating land use. The communities profiled below are now moving the process forward.

San Pablo Avenue—the Cities of Richmond and El Cerrito

The cities of Richmond and El Cerrito are located on the northern terminus of the Richmond-Fremont Line. While they have worked individually to cultivate transit supportive development, their most impressive effort is the joint Specific Plan they have developed for San Pablo Avenue. San Pablo Avenue is a major thoroughfare for both communities and presents a unique opportunity to realize shared goals. The communities jointly established, and have supported the efforts of, the San Pablo Avenue Advisory Committee—elected officials, key staff members, residents, business members from both communities, and representatives of regional agencies such as BART. The focus of the committee was to develop a plan to turn an underutilized thoroughfare into a vibrant mixed-use corridor for the mutual benefit of Richmond and El Cerrito.

The two communities provided funding for the planning study, which covers a 2.5-mile stretch of San Pablo Avenue, a vital local connector, which serves heavy regional traffic and runs parallel to a BART line. As is frequently the case in a multijurisdictional corridor, preparing a cohesive vision proved difficult, but by coordinating their planning efforts, the communities saw an opportunity

to maximize the avenue's potential by taking a unified approach to future development.

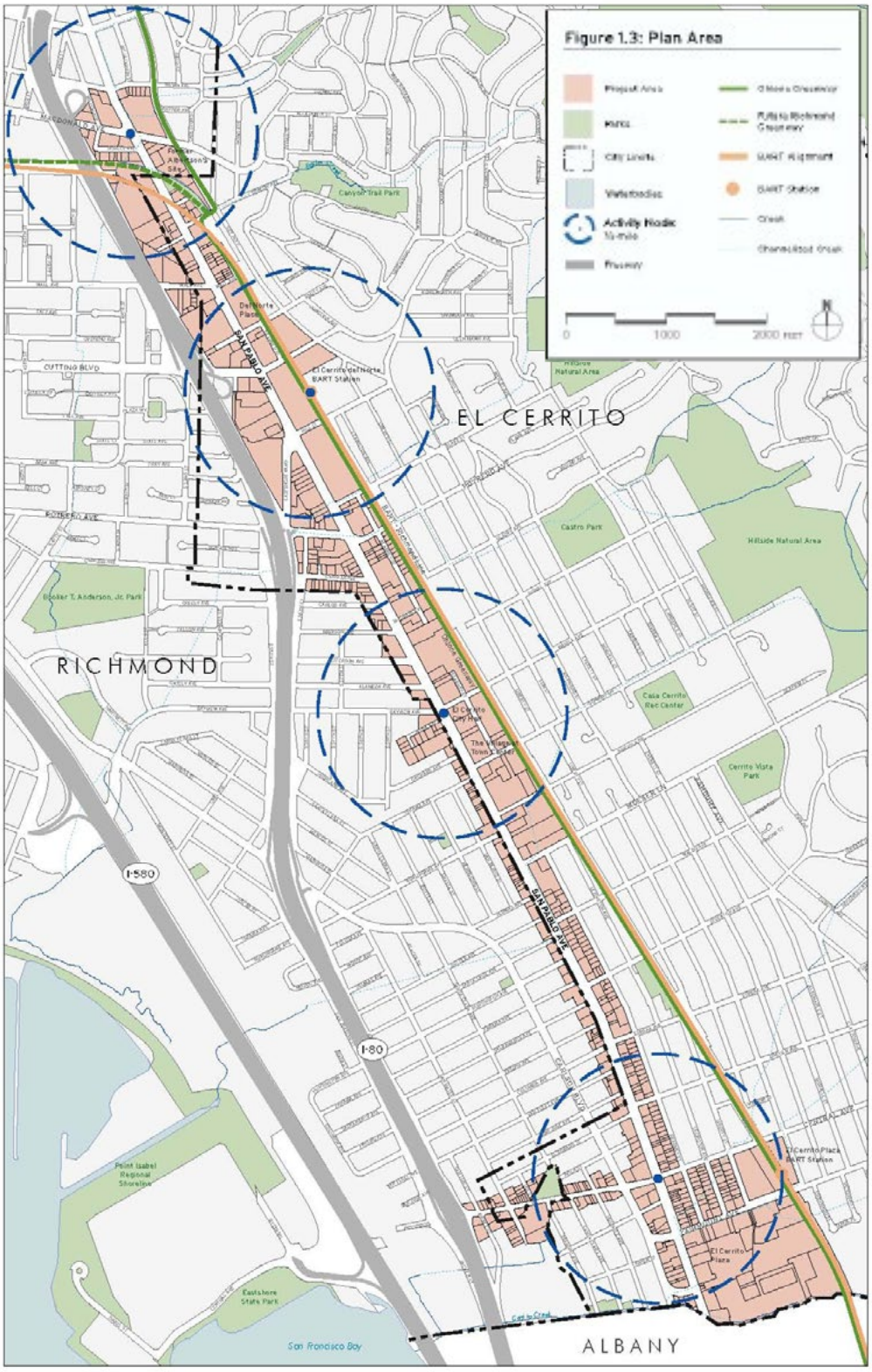
The San Pablo Avenue Specific Plan includes goals to realize the economic revitalization of the corridor, in large part by capturing the potential for transit oriented development while strengthening the avenue's walkability and bike- ability. The key to realizing these goals was developing a cohesive and coordinated approach with implementable objectives. After months of work and community outreach, the committee agreed upon a vision for the avenue and developed the proposed zoning and design controls necessary to realize the vision. The plan is compatible with the General Plans of both communities, which is the requirement for the adoption of a Specific Plan. It provides for transitions between the San Pablo Avenue and existing residential areas. The Plan identifies four activity nodes along the Avenue as primary areas for new investment. MacDonald Gateway, El Cerrito Del Norte BART Station, Mid-town/Civic Center, and El Cerrito Plaza were selected in order to build on existing momentum created by recent projects and/or because of their potential for reinvestment (see Figure 4D-3).

Zoning adjustments as proposed will consist of five overlay districts (see Figure 4D-4). The two districts most directed at transit supportive development are SPA-1 and SPA-2 districts. SPA-1 is proposed for the gateways to both cities and encourages mixed-use development. Residential densities are required to average between 30 and 50 du/ac and maximum average project FAR is 2.0. SPA-2 is designed to support increased intensity around the El Cerrito Del Norte BART station and encourages moderate- to high-density residential and mixed-use development within ¼ to ½ mile of the stations. Average densities of 40 to 70 du/ac would be required with a maximum average FAR of 2.0. Parking requirements are reduced in both overlay districts. Permitted building heights are greater within these two districts, with 55 feet in SPA-1 and 65 feet in SPA-2. The Civic Center area is included in the SPA-3 overlay district, which also encourages mixed use but at lesser densities and heights to reflect the existing residential neighborhood.

The San Pablo Avenue Specific Plan contains design concepts, strategies, and recommendations for each of the four activity nodes and for the overall avenue. This would be an excellent planning effort for any community, but the fact that two communities developed it jointly to address common interests is exemplary.

Figure 4D-3

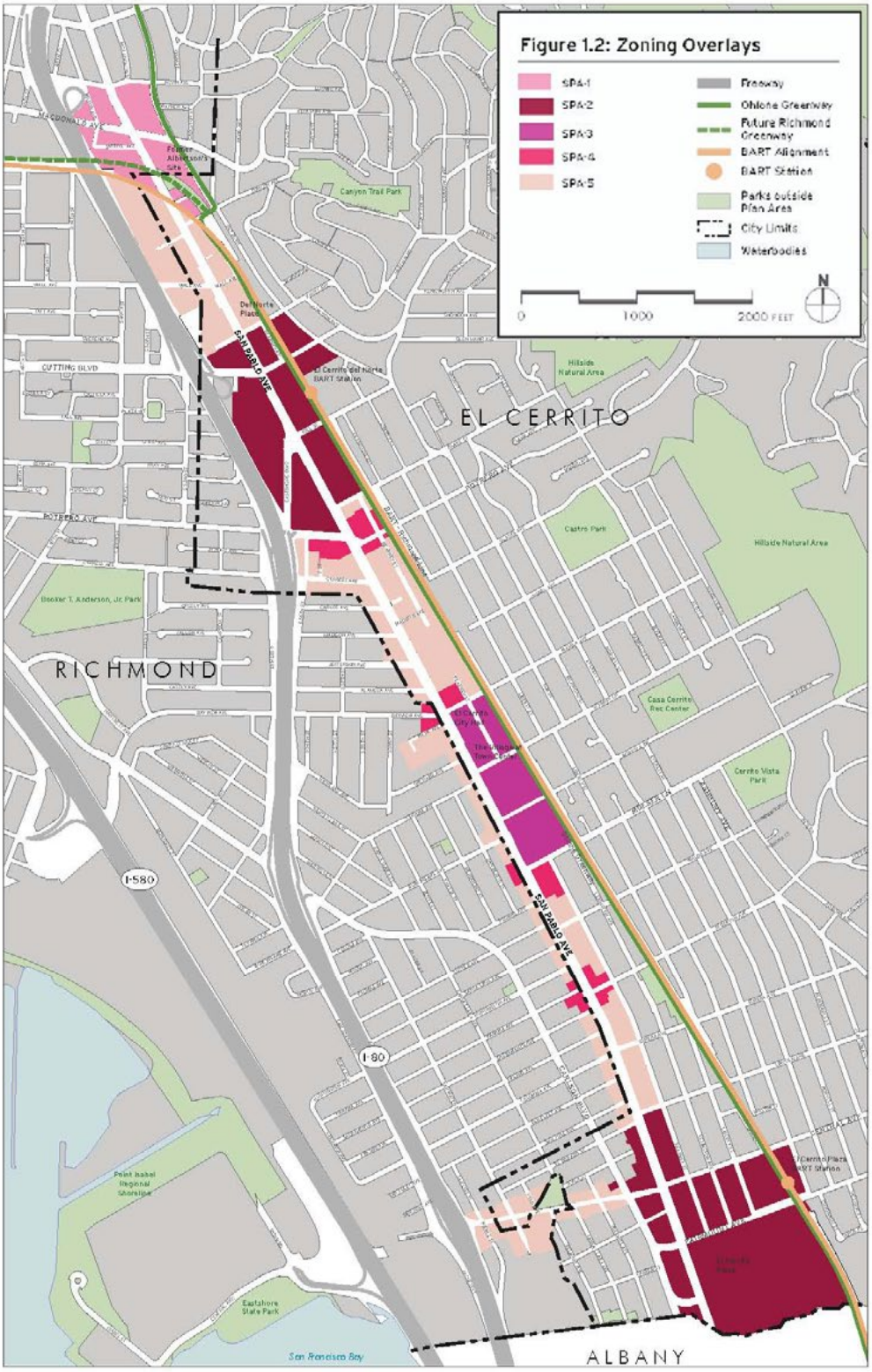
San Pablo Avenue Specific Plan—Plan Area Map



Source: http://www.el-cerrito.org/planning/pdf/draftspa_volume1_chapter1.pdf

Figure 4D-4

San Pablo Avenue Specific Plan—Zoning Overlays



Source: http://www.el-cerrito.org/planning/pdf/draftspa_volume2_chapter1.pdf

The City of Oakland

Four Richmond-Fremont BART stations are contained within the City of Oakland—Lake Merritt, 19th Street, MacArthur, and Fruitvale. Transit supportive development activities involving the Lake Merritt Station neighborhood and the Fruitvale Station neighborhood are discussed in this section.

Lake Merritt Station

The City of Oakland, BART, and the Peralta Community College, with a grant from the Metropolitan Transportation Commission's (MTC) Station Area Planning Grant Program are in the process of developing the Lake Merritt Station Area Plan. The project area is a ½-mile radius around the Lake Merritt BART Station (see Figure 4D-5). BART envisions the area evolving from an Urban Neighborhood Station to a Regional Center station type. The planning area includes a healthy mix of uses, including Chinatown, Laney College, civic buildings, and residential development. The goal of the plan is to build on existing attributes, including Lake Merritt, while emphasizing transit-related development, increased transit ridership, and affordable housing in a sustainable, walkable neighborhood.

Fruitvale Station

One of the better known transit supportive developments in the Bay Area has occurred around the Fruitvale Station. The Fruitvale Transit Village is a 257,000SF development constructed on former BART parking lots. It consists of mixed-income housing, office space, retail, community services (i.e., library, senior center), and a parking structure.

The Fruitvale Transit Village project came about as a result of a strong community-based effort, which began in 1991 when BART proposed construction of a multilevel parking facility next to the station. Led by the Unity Council, a community development corporation that provides focus to issues important to the community's large Latino population, the neighborhood insisted that any development around the station be guided by a broad-based planning process. BART agreed to withdraw its proposal and to work with the Unity Council to develop a comprehensive plan for the area. The Unity Council worked with the neighborhood through a visioning process to lay out a plan that resulted in the Fruitvale Transit Village groundbreaking in 1999.

There were many hurdles throughout the planning process, but key factors of success included the Unity Council's consistent leadership, planning assistance from both the City of Oakland and the US DOT through an FTA planning grant, and a formal partnership between the City of Oakland, the Unity Council, and BART (Fruitvale Policy Committee) to guide planning and development. While many thought a project of this magnitude was unlikely within a lower income inner city community, the project champions felt differently. As noted in the

section "Guiding the Process: Leadership and Champions," few projects are successful without someone providing unique leadership. The Unity Council's Arabella Martinez, who served twice as executive director, filled that role. Ms. Martinez served two terms with the Council from 1969 to 1974, and 1989 to 2004. In between, she served as Assistant Secretary of the U.S. Department of Health, Education and Welfare, among other positions. Manni Silva also played a key role in the project's implementation.

Due to its consistent leadership in the project, in 1996 the Unity Council was awarded an exclusive negotiation agreement for the project and, in turn, formed the Fruitvale Development Corporation to guide the project. To date (2011), more than $82M of public and private financing has been secured for the project, which is expected to cost more than $100M when all phases are complete. Fruitvale opened in 2004 (see Figures 4D-6, 7, and 8). Its mixture of uses includes 47 residential rental units, 37,000 SF of retail space, 27,000 SF of office space, and 71,000 SF of public space in a pedestrian plaza. Another 275 residential units are planned for Phase 2. Since this was largely a negotiated project, no specific planning or regulatory controls were responsible for the design or mixture of uses. The funds that made it possible came from many directions and many partners (see Table 4D-1).

Figure 4D-5

4D-5 Lake Merritt Station Project Area

Source: http://www2.oaklandnet.com/government/o/CEDA/o/PlanningZoning/DOWD008198

Figure 4D-6

Fruitvale Transit Village Train Station

Source: Flickr, neigborhoods.org (Eric Fredericks), used with permission under Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0), http://www.flickr.com/photos/neighborhoods/3158966440/

Figure 4D-7

Fruitvale Transit Village Streetscape

Source: Flickr, neigborhoods.org (Eric Fredericks), used with permission under Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0), http://www.flickr.com/photos/neighborhoods/3158131357/

Figure 4D-8

Fruitvale Transit Village Plaza

Source: Flickr, neigborhoods.org (Eric Fredericks), used with permission under Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0), http://www.flickr.com/photos/neighborhoods/3158963914/sizes/l/in/photostream/

Table 4D-1

Fruitvale Transit Village Funding Sources

Equity	FEMA	$1,045,304
	Ford Foundation	$122,000
	R&R Goldman Fund	$300,000
	Levi-Strauss	$226,881
	E&W Haas Jr. Fund	$400,000
	PG&E	$50,000
	Neighborhood Reinvestment Corp.	$100,000
	NCLR	$25,000
	Land Proceeds	$517,025
	Total Equity	*$2,786,210*
City of Oakland	City EDI	$3,300,000
	EDA Grant	$1,380,000
	Measure K Bonds (Prepaid lease)	$2,540,000
	City Library ($4.5MM prepaid lease)	$4,900,000
	CDBG/Other	$77,339
	EPA Grant	$99,998
	City-BTA Bike Station	$400,000
	Tax Increment Allocation (B) (LISC)	$4,000,000
	Total City of Oakland	*$16,697,337*
DOT/BART	MTC	$47,121
	FTA Child Development Center	$2,300,000
	FTA Pedestrian Paseo	$780,000
	FTA-CMA Bike Facility	$400,000
	FTA-Pedestrian Plaza	$2,228,534
	DOT/BART	*$5,755,655*
Interest/ Miscellaneous	Interest/Other	$643,707
	Additional Bond Funds Interest/Misc.	$176,661
	Total Interest/Miscellaneous	*$820,368*
Debt	Unity Council FTV/Perm Loan	$885,473
	Unity Council Bridge Loan	$911,830
	NCBDC	$750,000
	City Section 108	$3,300,000
	Citibank Subordinate	$1,400,000
	City Housing Loan	$750,000
	501 (C) 3 Bonds	$19,800,000
	Total Debt	$27,797,303
	Total Sources of Funds	*$53,856,873*

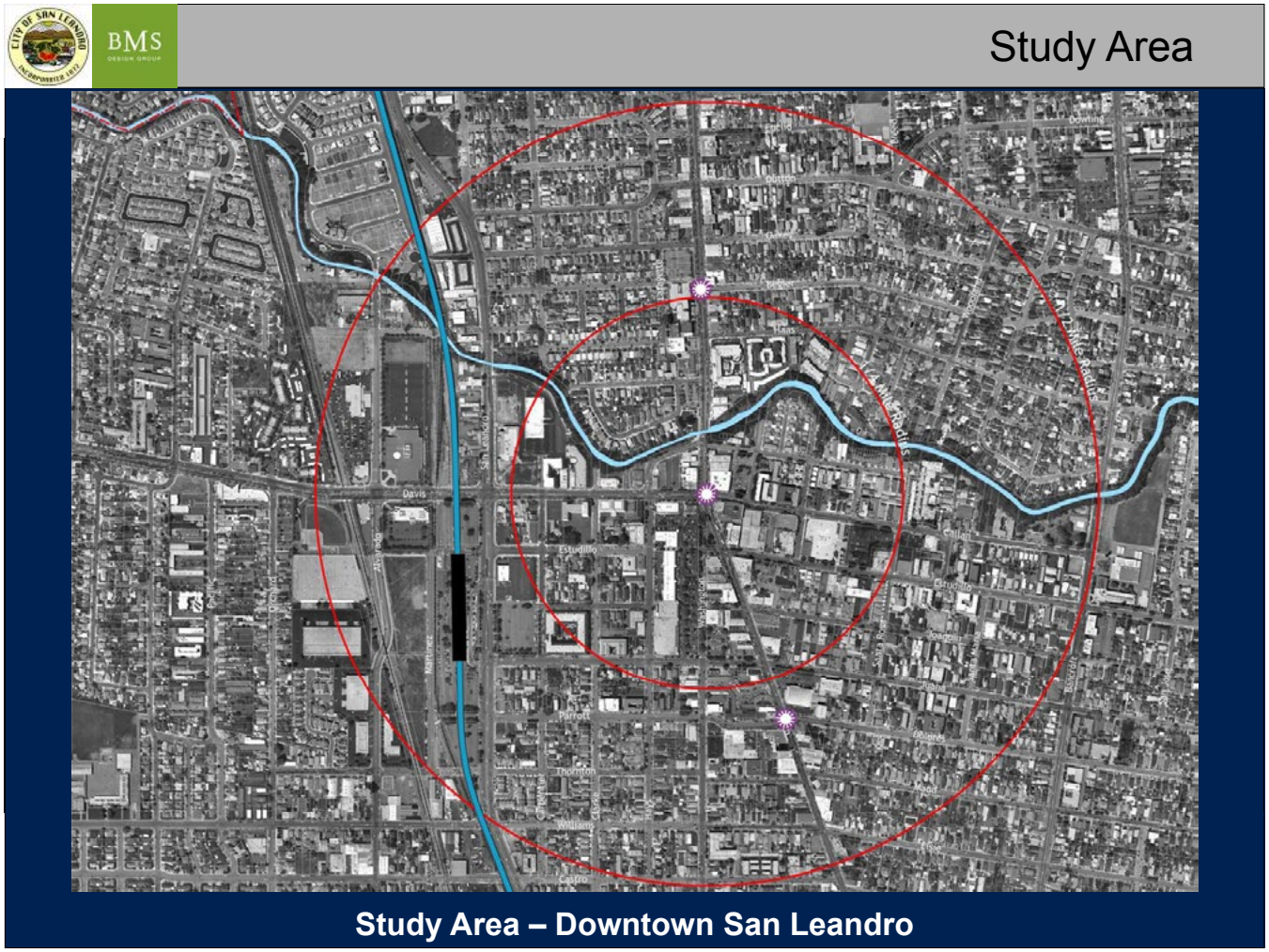
Source: Unity Council, http://www.unitycouncil.org/fruitvale/index.htm

The City of San Leandro

The San Leandro BART station on the Richmond-Fremont Line is located in the City of San Leandro. In 2005, the City of San Leandro applied for and received a Metropolitan Transportation Commission (MTC) station area planning grant for $450,000, as well as a $51,570 grant from the Alameda County Transportation Improvement Authority (ACTIA). The former grant was part of a new program instituted by MTC to encourage planning for transit supportive development, and the City of San Leandro was one of eight communities selected for funding in the first cycle. The grant enabled the city to undertake a project it could not have completed with its own resources. The city immediately started the process of developing the Downtown San Leandro Transit-Oriented Development Strategy to study the potential for transit oriented development within a ½-mile radius of AC Transit's proposed Bus Rapid Transit (BRT) Station at 14th Street and Davis Street. The study area also included the San Leandro BART Station area.

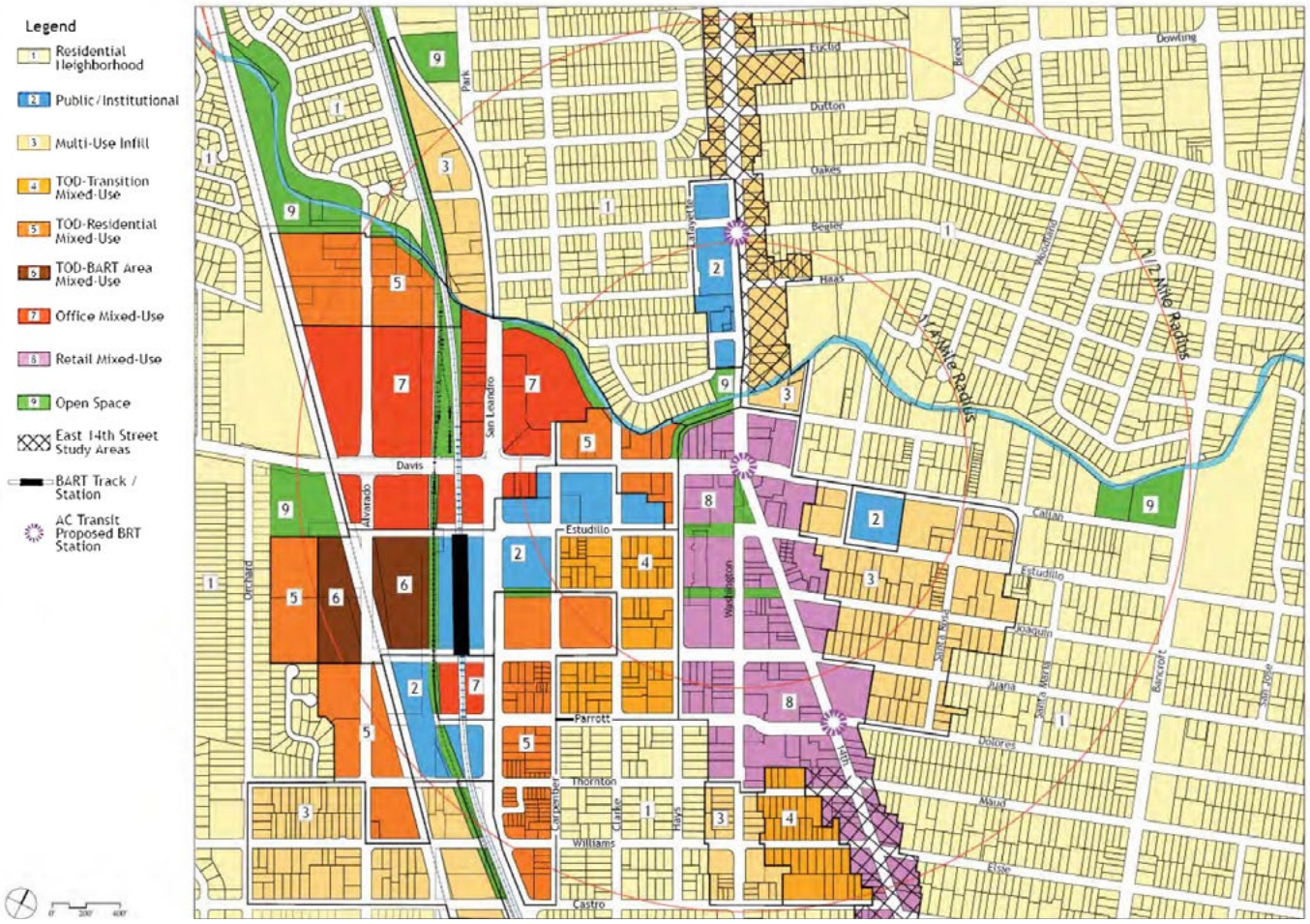
A 27-member Citizens Advisory Committee (CAC) was formed in 2006. The committee was assisted by a Technical Advisory Committee (TAC) consisting of MTC, BART and AC Transit (a bus service provider). All of the CAC meetings were open to the public and well attended, having attracted the interest of many residents, including local environmental and housing advocates. During the course of developing the strategy, the CAC also held three community-wide sessions to gather input and collect feedback. As concepts and ideas were developed, the staff and consultant team shared them with the TAC, allowing four days for comments and changes to better mesh with other regional planning efforts. As various decision points were reached, the CAC also briefed the mayor and city council members in an effort to keep everyone informed of the evolving strategy. The CAC finalized the Downtown San Leandro Transit-Oriented Development Strategy in May of 2007, and recommended it to the city council for action. The city council adopted it in September 2007, with no changes. The success and the relative speed of the planning effort was attributable to the widespread community input and support developed by the CAC outreach program, along with a consistent approach and excellent organization.

The study area includes two project areas administered by the city's redevelopment agency, opening up possible financing options (see Figure 4D-9). The strategy calls for employing TOD's as infill development to fit with, and complement, the existing community. Accordingly, the strategy identifies three different TOD zones that transition from the BART station to the existing neighborhoods (see Figure 4D-10). Suggested densities range from 20 to 60 units/acre with a height limit of 50 feet in the Transition Zone, to 60 to100 units/acre with heights ranging from 60–75 feet in Residential Mixed-Use Zone, to a minimum density of 80 units/acre without height limits for the TOD-BART Zone. It is anticipated that over a 30-year period the study area could accommodate 3,400+ dwelling units (2,400 near BART), 120,000 SF of retail and 718,000 SF of office space.



Source: http://www.todmarketplace.org/MeetingMaterials/San%20Leadro%20Final.pdf

Figure 4D-9 *Study Area Overview–Downtown San Leandro*



Source: http://www.sanleandro.org/pdf/todstrategyfinal.pdf

Figure 4D-10 *Downtown San Leandro–Land Use Plan*

Since the Downtown San Leandro Transit-Oriented Development Strategy was adopted at a time when the real estate market was weak, change may be slow to come. The City of San Leandro, however, is ready for the next phase of growth and the community involvement in the process has encouraged some significant changes to encourage a different kind of future development. One example is found close to the BART station, where land formerly zoned commercial was redesignated for residential. Additionally, density in general has been increased, parking requirements have been lowered, and affordable housing has been addressed with the approval of a 300-unit project, of which one-third (100 units) has been designated as affordable.

The City of Hayward

The City of Hayward contains two BART stations, Hayward Station and South Hayward Station, and has made a long-term effort to encourage transit supportive development.

Hayward Station

Hayward Station has enjoyed some transit-supportive development success through a combination of public and private investments. The development controls and the Downtown Hayward Design Plan both encourage mixed-use development. Most of the key projects and area-wide improvements were the result of public/private partnerships involving the Hayward Redevelopment Agency, and from a regulatory basis were covered by the Planned Development District (PD) standards.

The PD district was created by the city government to encourage development, redevelopment, and rehabilitation (PD section 10-1-2500 of the City of Hayward zoning ordinance). The code is general enough to encourage either residential or nonresidential development, and accommodate a variety of housing types and mixed uses with more flexibility than is permitted in most zoning categories.

The emphasis in the Hayward Station area has been on initiating projects, rather than achieving any specific densities, but the average units/acre for completed projects is in the high 20s to low 30s. The City Hall project, which anchors the area, was built with assistance from BART, which participated in a land swap and a property sale (see Figure 4D-11). The pedestrian connection linking City Hall and the BART station, made possible by the purchase of BART property, greatly improved access and made the station a part of the community.

Figure 4D-11
Hayward City Hall

Source: Van Meter Williams Pollack, LLC

For more information on planning in the Hayward Station area, refer to the "Case Studies in Station Neighborhood Planning for Transit Supportive Development").

South Hayward Station

South Hayward Station area has been slower to develop even though the regulatory controls and design guidelines enable transit supportive development. The City of Hayward concluded that concept plans and design guidelines are an important part of the planning process but such plans and guidelines rarely address implementation. To move things forward, the City of Hayward has developed a new Form-Based Code, which it believes will encourage more diverse development for the South Hayward BART/Mission Boulevard area. The code provides for two TOD overlay districts with minimum densities of 40 du/ac and maximum densities of 65 du/ac for Overlay District 1, and minimum densities of 35 du/ac with maximums of 55 du/ac for Overly District 2 (see Figure 4D-12). For the T5 zone closest to the BART station, densities with the overlay can range from 75–100 du/ac.

Figure 4D-12
Hayward Form-Based Code

SMARTCODE
South Hayward BART / Mission Boulevard

REGULATING PLAN (Figure 1-1)

Legend

- Project Area
- Parcels
- Terminated Vistas
- Mandatory Shopfront Overlay
- Recommended Shopfront Overlay
- T4 Urban General Zone: 17.5 DU/Acre min; 35 DU/acre max
- T5 Urban Center Zone: 35 DU/Acre min; 55 DU/acre
- TOD Density Overlay 1: 75 DU/acre min; 100 DU/acre max
- TOD Density Overlay 2: 40 DU/acre min; 65 DU/acre max
- Civic Space Zone
- Civic Buildings
- Civic Spaces outside of the project area
- 238 Bypass Trail Location
- 5 Min/10 Min Walk (Pedestrian Shed)
- Future pedestrian/bicycle bridge

SmartCode Version 9.2

January 5, 2011

FIG 1-1

Source: http://www.ci.hayward.ca.us/forums/SHBARTFBC/pdf/2011/Revised%203-15-2011%20S%20Hayward%20BART%20Form-Based%20Code.pdf

The City of Union City

The City of Union City long considered the BART station area its best opportunity for redevelopment. This station area had been the subject of a vision plan in the 1980s. The formal development of the Intermodal Station Area and Transit Facility Plan began in 2000 and was adopted in 2001. The planning effort involved a number of parties with an interest in possible future development, including passengers, the rail providers—BART, Capital Corridor, ACE (Altamont Commuter Express Train), and Caltran—as well as AC Transit Bus System. The effort focused on the development of a combined transportation and land use plan for the property immediately surrounding the BART station.

The City's emphasis was to develop an intermodal station in conjunction with current and future providers, while also creating a new mixed-use transit-oriented downtown area. The initial Station Area Plan was made part of the General Plan in 2002. The plan identified a number of opportunity sites in the station area (see Figure 4D-13). Planning for the station area happened to coincide with a second major planning, cleanup and redevelopment effort (the Mill Site), which provided a second catalyst for achieving the City's goals.

Pacific States Steel Corporation had been one of Union City's major employers, operating on a 90-acre site within the BART station area. The Mill Site was the subject of a lawsuit filed to ensure that former employees received promised medical pensions. The court had ordered that proceeds from any future sale be used to compensate the employees and appointed a Special Master to direct a site remediation and sale. The Special Master had encouraged the City to form a redevelopment agency to assist. Union City established a redevelopment agency and adopted its first redevelopment plan in 1988 for a 440-acre project area surrounding the BART station. In 1994, the City adopted a Decoto Industrial Park Study Area (DIPS) Specific Plan for the area. The first Special Master arranged for the sale of the cleanest 30 acres of the site for development of housing. Unfortunately, sale proceeds were not used for either cleanup or to compensate the former employees. This oversight led to the removal and replacement of the Special Master. The redevelopment agency convened a working group, which included the new Special Master, the State Department of Toxic Substances, KB Homes (a private developer), and other agencies to create a remediation and redevelopment concept for the remaining 60 acres. The project, which evolved from this joint effort, now includes 119 single-family homes and 218 townhouses, 30 of which are affordable (see Figure 4D-14).

Figure 4D-13 *Union City Intermodal Station—Opportunity Sites*

Figure 4D-14
KB Home Townhouses

Source: Union City Redevelopment Agency

With the formation of a redevelopment agency, the development of a successful strategy for the Mill Site, and the adoption of a Station Area Plan, the planning efforts of the Union City had merged. In 2002, the redevelopment plan was amended as a future vehicle to finance station area improvements consistent with the Station Area Plan adopted in the same year. Agreement on the approach was the first step, since there were a multitude of hurdles remaining. The hurdles included access issues, major infrastructure improvements, and purchase of a key property involved in bankruptcy proceedings.

The Union City Redevelopment Agency was given the lead by the city government to bring the key elements of the Station Area Plan to fruition. Working with BART and its design team, and with funding assistance from AC Transit Bus System, and the Alameda County Transportation Commission and the Metropolitan Transportation Commission (MTC) livable communities grant, an overall station area improvement plan and a three-phase implementation plan were developed for the BART Station.

On the mixed-use side of the ledger, Avalon Bay Communities became the first private developer in the station area for a six-acre parcel immediately adjacent to the BART station. The company, after a mutually beneficial exchange of easements with BART, constructed 438 residential apartment units, 66 of which were set aside as affordable housing. The project has generated almost $1M per year in tax-increment financing (see Figure 4D-15).

Figure 4D-15

Avalon Bay

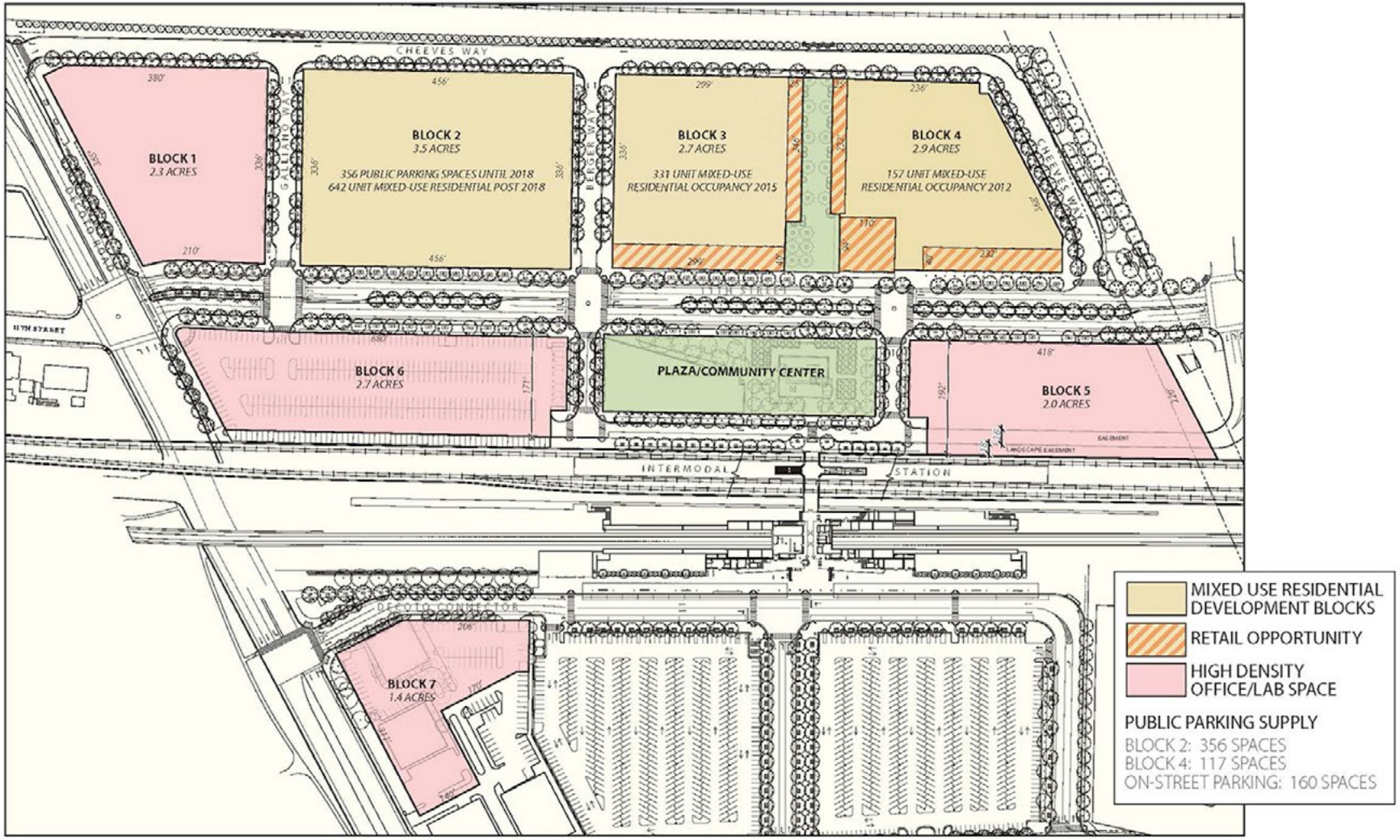
Source: Union City Redevelopment Agency

The Station District Plan was refined by the redevelopment agency and its design consultant, the ROMA Design Group, and now places opportunity sites in a series of blocks containing mixed-use, commercial, and public spaces (see Figure 4D-16). The redevelopment agency and the ROMA Design Group also prepared the construction drawings for the reconfigured BART Station and parking lot, East Plaza, pedestrian promenade, and new local streets within the Station District. After a Request for Proposal process, Barry Swenson Builders was selected for development of three of the blocks, with an eventual build out of 1,200 residential units, including affordable housing, to be managed by Mid-Penn Housing Coalition. In 2008, the developer, Mid-Penn, and Union City successfully applied for a $7.6M Proposition 1c TOD Grant for the construction of streets, a greenway, a pedestrian promenade, and East Plaza.

The downturn in the economy caused a modification in the agreement to break the project into two phases with Mid-Penn constructing Phase 1 with 100 units ready for occupancy in October 2011. More than 1,100 households applied to participate in a lottery for the units (see Figure 4D-17).

Figure 4D-16

Union City Station Transit-Oriented Development Opportunity Sites



UNION CITY TRANSIT-ORIENTED DEVELOPMENT OPPORTUNITY SITES

Source: Union City Redevelopment Agency

Figure 4D-17

Mid Penn Phase 1 (under construction)

Source: Union City Redevelopment Agency

In 2011, Phase 1 of the BART station improvements was complete, and Phase 2 was ready to be advertised for construction. Once again, Union City, Mid-Penn, and Barry Swenson applied for and received a $15M Proposition 1c Infill Infrastructure Grant to aid in the construction of BART Phase 2.

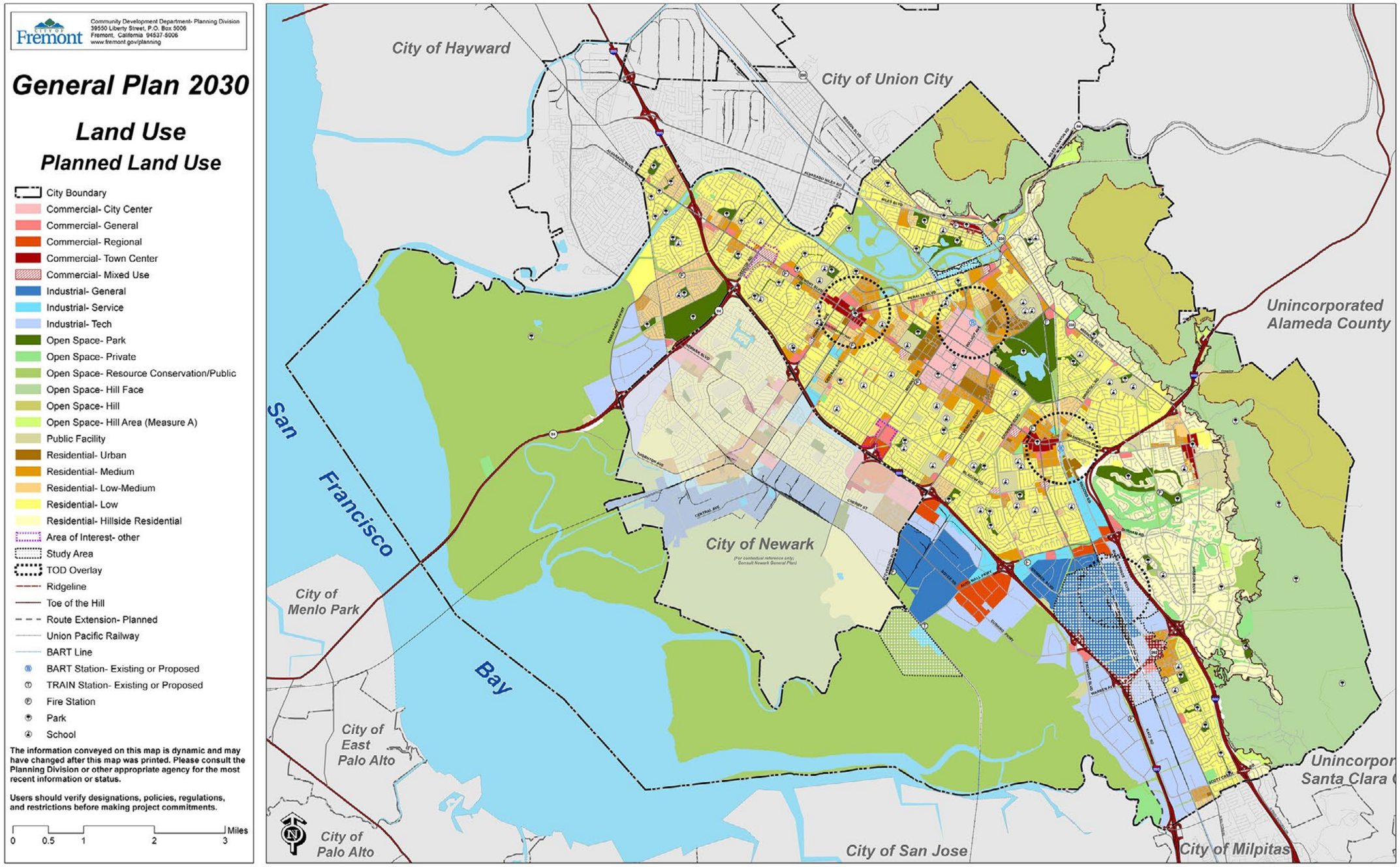
While the Union City BART station area is still a work in progress, the planning, remediation, and financing efforts to date are impressive. More than $56M has been spent by the Union City Redevelopment Agency to date, and the expenditures have been augmented by more than $77M in additional public agency investment.

The City of Fremont

The Fremont BART Station in the City of Fremont is the southern terminus of the Richmond-Fremont line. The City of Fremont has had a relatively slow start at realizing transit supportive development, but has taken a number of steps that should show future success. Initially, development occurred in areas outside of the downtown since they proved less expensive than downtown infill opportunities. Additionally, a considerable amount of property in the downtown has been occupied by surface parking to accommodate a psychiatric hospital and a large medical clinic, which are both parking dependent.

In its new general plan, A Vision for Fremont's Future General Plan 2030, the City places a strong emphasis on transit-supportive development. The stated goal of the plan is to place Fremont in a position to "serve as a national model of how an auto-oriented suburb can evolve into a sustainable, strategically urban, modern city."

The existing station areas and two proposed station areas have been recognized as priority development areas (PDAs) in Fremont's General Plan and have been included in four TOD overlay areas which encourage higher densities (see Figure 4D-18).



Source: http://www.fremont.gov/DocumentView.aspx?DID=3295

Figure 4D-18 *Fremont General Plan 2030—Land Use Plan*

Fremont's General Plan is intended to focus growth by accommodating most of the forecasted population increase in the PDAs while keeping existing neighborhoods much the same. The City of Fremont has not only relied on the General Plan to encourage change, but has been addressing the potential of each of the four station areas individually and investing in improvements to support that potential. The City of Fremont has developed the Downtown Community Plan, intended to result in mixed-use projects throughout the city core covering an area of approximately 110 acres, all within ½- to ¾-mile of the BART station (see Figure 4D-19). The vision is to create a lively mixed-use, transit-oriented downtown by changing the character of the present low density, vehicle-dependent suburban development.

Figure 4D-19

Proposed Downtown Land Use Map

The Downtown Community Plan uses a hybrid, form-based code to encourage and guide future development. The plan calls for the development of new streets and new public spaces, and builds around existing community strengths, such as a new Civic Center, which provides a focal point in the center of the district. The plan calls for increasing the current 0.28 FAR to 0.80 in the near term, and to 1.5 in the long term. Residential development is sparse but in the near term projects with 800 units are permitted, and long-term projections call for 2,500 units.

The Fremont-Centerville Station, which is not a BART station but serves the Altamont Commuter Express, Amtrak, and AC Transit, will be covered by a TOD overlay but has not yet been the subject of a specific plan. A proposed future BART station for Irvington has seen a substantial public investment to prepare for future development, including $55M in infrastructure improvements for grade separation and improved road access. The city had been ready to fund the station with a $100M bond issue, but that action is on hold due to a change in state policy with regard to the role of development agencies. If the station is not developed, the BART line will pass through the city on the way to the Warm Springs Station, scheduled for completion in 2015. In June 2011, the city's redevelopment agency intended to proceed with a $140M bond issue to fund the Irvington BART Station.

This station area has always been considered an excellent site for future transit-supportive development. After considerable debate, the City of Fremont adopted a TOD zoning overlay to the area. Unfortunately, the purchase of a large parcel of land by Union Pacific may make mixed-use development challenging, since a rail yard would be difficult to plan around. The plan for the property is not finalized and the City of Fremont and the land owner have agreed to consider options.

It is clear from the type and amount of planning taking place in the communities along the Richmond-Fremont BART Line that the local jurisdictions are now fully engaged in the process. The level of regional awareness and the efforts of the regional agencies have made the coordination of land use and transportation plans a priority. However, the local communities are making adjustments to ensure the regional vision becomes a reality.

Lessons Learned

It is never too late to plan effectively for transit-supportive development. In the case of the Richmond-Fremont Line, retroactive planning has been very effective due to strong regional awareness and involved communities. Retroactive planning also faces more obstacles, such as challenging access to station areas, and 40 years of development patterns that have not made transit supportive development a priority.

The cooperation of the major regional agencies and their willingness to coordinate actions makes good corridor planning possible. The Bay Area Joint Policy Committee (JPC) is a model that others should consider.

Realizing a regional vision takes time and resources. The MTC's Transportation 2035 Plan for the San Francisco Bay Area, Change in Motion could not place a stronger emphasis on changing the development focus, but like most established areas, 80 percent of funding over the next 25 years must by necessity be directed toward operations and maintenance, leaving limited resources for supporting all of the local plans being developed.

Redevelopment agencies can play an important role. Many of the successful projects in this corridor and along the BART system have benefitted from the leadership and involvement of redevelopment agencies. In 2011, such agencies were dissolved in the adopted state budget (an action which is being challenged). It is premature to say what the absence of redevelopment agencies might mean to the effort to realize transit supportive development, but clearly there will be a void that will have to be filled by other government entities.

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The Unity Council. n.d.. Fruitvale Village at-a-glance. Retrieved from http://www.unitycouncil.org/fruitvale/outline1.htm.

Corridor Data: Richmond-Freemont Line

Transit Operator:	Bay Area Rapid Transit
Transit System Name:	BART
Transit Corridor Name:	Richmond-Fremont Line
Transit Mode:	Heavy Rail (HR)
Location (Metro Area):	San Francisco, CA
Region (USA):	West
Date Open:	September 11, 1972
Corridor Length:	40 Miles
Corridor Purpose:	Inter-Urban Commuter
# of Municipalities Served:	8
# of Stations Served:	18
Construction Sequence:	Simultaneous
Alignment Description:	Former Atchison, Topeka, Santa Fe and Western Pacific Railways
Operating Speed (Max.):	80 MPH (source: http://www.bart.gov/about/history/facts.asp)
Operating Speed (Avg.):	33 MPH (source: http://www.bart.gov/about/history/facts.asp)
Car Capacity:	64-72 seated (source: http://www.bart.gov/about/history/facts.asp) 150 capacity (source: http://www.bart.gov/about/history/facts.asp)
	150 capacity (source: http://www.bart.gov/about/history/facts.asp)
Peak Service Headway:	10-15 Minutes (source: 'Travel Characteristics of Transit-Oriented Development in California')
Projected Ridership:	*155,000 avg. wkdy. (by 1975) (source: www.uctc.net/papers/182.pdf, p.18)
Ridership as of June 2010:	106,450 avg. wkdy. (source: http://www.bart.gov/about/reports/ridership.aspx)
Funding:	Federal: $333M State & Local: $1.3B Total: $1 .6B (source: http://www.bart.gov/about/history/facts.asp)

*Projection is an interpolation from the overall system projection of 258,496 riders (the Richmond-Fremont Line is approximately 60% of total system's miles)

Source: BART (transit agency), unless otherwise noted

Station Area Data: Richmond-Freemont line

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	Richmond	Richmond, CA	29-Jan-1973	Richmond-Millbrae Line (HR); Amtrak Capitol Corridor (CR)	Surface	Suburban	At Grade	START	Predominantly residential	10	35	2002-Station Access Plan; 2004-Comprehensive Station Plan (BART)	Metro Walk Transit Village (1)	Downtown Richmond, MetroWalk, Memorial Park, Richmond Art Center, Nicholl Park
2	El Cerrito del Norte	El Cerrito, CA	29-Jan-1973	Richmond-Millbrae Line (HR); WestCAT (BRT)	Structure/ Surface	Suburban	Above Grade	2.25 Miles	Predominantly residential with some commercial and parking lots	5	65	2004-Comprehensive Station Plan (BART)	Del Norte Place (2, 3)	Del Norte Place, Canyon Trail, Kennedy High School
3	El Cerrito Plaza	El Cerrito, CA	29-Jan-1973	Richmond-Millbrae Line (HR)	Surface	Suburban	Above Grade	2.0 Miles	Predominantly residential with some commercial and parking lots	10	45	2002-Station Access Plan (BART); 2002-Fairmount Streetscape Design (City of El Cerrito)	El Cerrito Plaza, Mission Wells (3)	Albany Hill Park, El Cerrito High School, Albany Middle School, Albany High School
4	North Berkeley	Berkeley, CA	29-Jan-1973	Richmond-Millbrae Line (HR)	Surface	Urban	Below Grade	2.25 Miles	Predominantly residential with a parking lot	10	45	N/A		Cedar Rose Park
5	Downtown Berkeley	Berkeley, CA	29-Jan-1973	Richmond-Millbrae Line (HR)	N/A	Urban	Below Grade	1.0 Miles	Rich mix of uses - educational, civic, mixed use commercial	35	75	2009/2010 Downtown Area Plan, MTC TLC Planning Grant for public space renewal (City of Berkeley)	Berkeleyan Building, Gaia Building (4), Great Western Building (3)	Downtown Berkeley, University of California-Berkeley
6	Ashby	Berkeley, CA	29-Jan-1973	Richmond-Millbrae Line (HR)	Surface	Suburban	Below Grade	1.25 Miles	Predominantly residential with some commercial and parking	10	45	2002-Economic feasibility for workforce housing adj. to station; 2003-Prelim. Station Capacity analysis	Ed Roberts Campus Office Building (5)	Black Repertory Theatre, Judah L. Magnes Museum, La Pena Cultural Center
7	MacArthur	Oakland, CA	11-Sep-1972	Richmond-Millbrae Line, Pittsburgh/ Bay Point-SFO/ Millbrae Line (HR)	Surface	Urban	Above Grade	1.75 Miles	Predominantly residential with some parking	10	45	1993-MacArther BART Transit Village Plan (BART, City of Oakland, and Citizens Planning Commission); 2002/03-West- side Pedestrian Enhancement Project (BART & City of Oakland); 2005-Station Capacity Plan (BART); 2008-MacArthur Access Feasibility Study (BART & City of Oakland)	N/A	Mosswood Park
8	19th Street/ Oakland	Oakland, CA	11-Sep-1972	Richmond-Millbrae Line, Pittsburgh/ Bay Point-SFO/ Millbrae Line (HR)	N/A	Urban	Below Grade	1.5 Miles	Predominantly mixed use commercial with some residential	45	135	2004-Downtown Transportation Study (City of Oakland)	The Uptown (6), Broadway Grand (7)	Lake Merritt, Downtown Oakland, Snow Park

Station Area Data: Richmond-Freemont line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
9	Oakland City Center/12th St.	Oakland, CA	11-Sep-1972	Richmond-Millbrae Line, Pittsburgh/ Bay Point-SFO/ Millbrae Line (HR)	N/A	Urban	Below Grade	0.5 Miles	Rich mix of uses - predominantly mixed use commercial and mixed use residential	65	200	1998-General Plan; current-Citywide Zoning Update (City of Oakland)	The City Center, Rotunda Building (4)	Lake Merritt, Downtown Oakland
10	Lake Merritt	Oakland, CA	11-Sep-1972	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR)	Surface	Urban	Below Grade	0.5 Miles	Predominantly residential with some educational and civic	15	45	2006-Lake Merritt Station Area Plan (BART & CalTrans)	N/A	Kaiser Center, Downtown Oakland, Lake Merritt, Oakland Museum of of California
11	Fruitvale	Oakland, CA	11-Sep-1972	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR)	Structure/ Surface	Urban	Above Grade	2.75 Miles	Residential and commercial mix with some parking	10	35	2002-Station Access Plan (BART); 2005-Fruitvale Alive! Comm. Transp. Plan (City of Oakland & Unity Council); current-International Boulevard TOD Plan (City of Oakland)	Fruitvale Village (2)	N/A
12	Colisseum/ Oakland Air- port	Oakland, CA	11-Sep-1972	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR); Amtrak Capitol Corridor (CR)	Surface	Urban	Above Grade	2.0 Miles	East of station is predominantly res- idential and west of station is light industrial, athletic field (McAfee Stadium) and surface parking	10	35	2002-Station Access Plan (BART); 2003-BART to Bay Trail Plan (Alameda County)	Coliseum Gardens (8)	McAfee Coliseum, Oakland Airport
13	San Leandro	San Leandro, CA	11-Sep-1972	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR)	Surface	Suburban	Above Grade	3.0 Miles	Predominantly residential with some light industrial and parking lots	10	60	2001-Central San Leandro/ BART Area Revitalization Strategy (City of San Leandro); 2002-Station Access Plan (BART); 2007-San Leandro Downtown TOD Strategy (City of San Leandro)	Multi-unit Senior Housing project, Mixed Use Commercial Office project, Cherrywood single family project (7)	Downtown San Leandro
14	Bay Fair	San Leandro, CA	11-Sep-1972	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR)	Surface	Suburban	Above Grade	2.5 Miles	East of station is predominantly commercial and parking and west of station is predominantly residential	10	25	2004-Comprehensive Station Plan (BART); 2007-Bay Fair BART TOD & Access Plan (BART)	N/A	Bay Fair Center Shopping Mall

of California

Station Area Data: Richmond-Freemont line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
15	Hayward	Hayward, CA	11-Sep-1972	Fremont-Daly City Line (HR)	Structure/ Surface	Suburban	Above Grade	3.0 Miles	Rich mix of uses - commercial, civic and residential	5	35	1992-Hayward Downtown Plan; 2000-Cannery Area TOD Concept Plan; 2002-General Plan Update, Design Guidelines, Inclusionary Housing Ordinance, Neighborhood Plans (City of Hayward)	Hayward City Hall, B Street Marketplace, Albertson's Corner, Cinema Place Theater, Public Parking Structure, Renaissance Walk, Studio Walk, Atherton Place Townhomes, City Walk Townhomes, Pinnacle City Center, Grand Terrace, C and Grand Street (9	Hayward City Hall, Public Library, Cinema Place, Hayward Area Historical Society Museum
16	South Hayward	Hayward, CA	11-Sep-1972	Fremont-Daly City Line (HR)	Surface	Suburban	Above Grade	3.0 Miles	Predominantly residential and surface parking	5	25	2006-South Hayward BART Development, Design and Access Plan; S.H. BART/ Mission Blvd. Concept Plan; S.H. BART Form- Based Code; S.H. BART Mixed-Use Project; Mission Blvd. Corridor Specific Plan (City of Hayward)	N/A	N/A
17	Union City	Union City, CA	11-Sep-1972	Fremont-Daly City Line (HR)	Surface	Suburban	Above Grade	3.75 Miles	Predominantly residential with some commercial, parking and a park (new neighborhood under construction east of station)	10	80	2002-General Plan; 2006-Pedestrian and Bicycle Master Plan; 2010-Station Distrcit EIR (Union City)	Union City Intermodal Station District (10)	Union City, Public Library, Charles F. Kennedy Park
18	Fremont	Fremont, CA	11-Sep-1972	Fremont-Daly City Line (HR)	Surface	Suburban	Above Grade	3.25 Miles	Predominantly hospital, commercial uses and surface parking with some residential	10	65	1991-General Plan; 2007/08-General Plan Update; 2005-Rezoned property for high density and mixed-use devel. (City of Fremont)	Mission Wells, Fremont Office Center (3), The Village (4), Benton at Civic Center/UN Plaza (7)	Washington Hospital, Fremont Central Park, Public Library, Kaiser Permanente Hospital, County Court House, City Hall, Police Station

NOTES:

* Dedicated to transit riders
** All distances are measured "as the crow flies" and are rounded up to the nearest 1/4 mile
*** Within 1/4 mile of transit station (source: Google Earth)
**** Residential densities are estimates on net densities per block by looking at particular residential typologies within ¼ mile of transit station. (source: Google Earth)

SOURCES:

1 City of Richmond website
2 ULI Case Study
3 Travel Characteristics of Transit Oriented Development in California
4 California TOD Database
5 http://www.accma.ca.gov/pages/TALUTODSitesAshby.aspx
6 http://www.theuptown.net/
7 BART station info. Sheet
8 http://69.63.138.11/AM/Template.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=3767
9 City of Hayward
10 Union City website

February 3, 2011

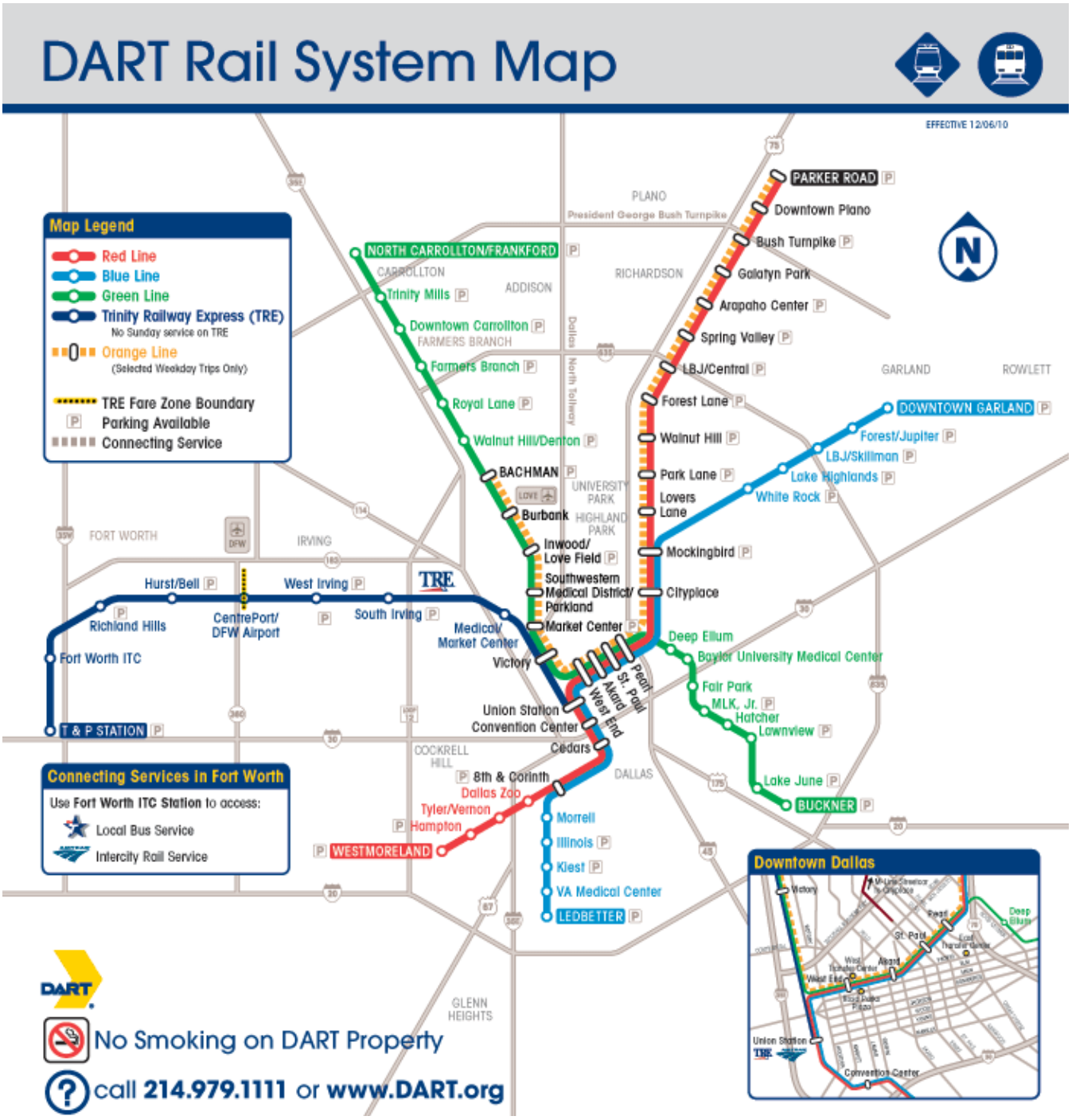
Dallas Area Rapid Transit (DART), Red Line, Dallas

Prepared by:
New Jersey Institute of Technology
Van Meter, Williams, Pollack, LLP

DART was created in 1983 with passage of a 1 percent sales tax by the voters of its 13-member cities. DART replaced the Dallas Transit System, which had been in existence since 1964. The DART Authority, based in Dallas, Texas, operates buses, light rail, commuter rail, and high-occupancy vehicle lanes in Dallas and 12 of its suburbs (see Figure 4D-20). The DART light rail system consists of 3 lines—the Red Line (opened in 1996), the Blue Line (opened in 1996), and the Green Line (opened in 2010)—with 72 miles of track and 55 stations. The Orange Line is scheduled for commencement of services in 2012 with a 9.2-mile link to Irving and a 4.2-mile extension to the airport.

DART Case Facts

System Name:	DART
Corridor Name:	Red Line
Transit Mode:	Light Rail (LRT)
Location:	Dallas, Texas
Region (USA):	South
Corridor Length:	30 miles
Corridor Purpose:	Suburban Commuter
Municipalities Served:	3
Cost and Funding Sources:	Cost: $333M (federal $230.9M, state and local $102.1M)
Date Opened:	December 2004



Source: http://www.dart.org/maps/printrailmap.asp

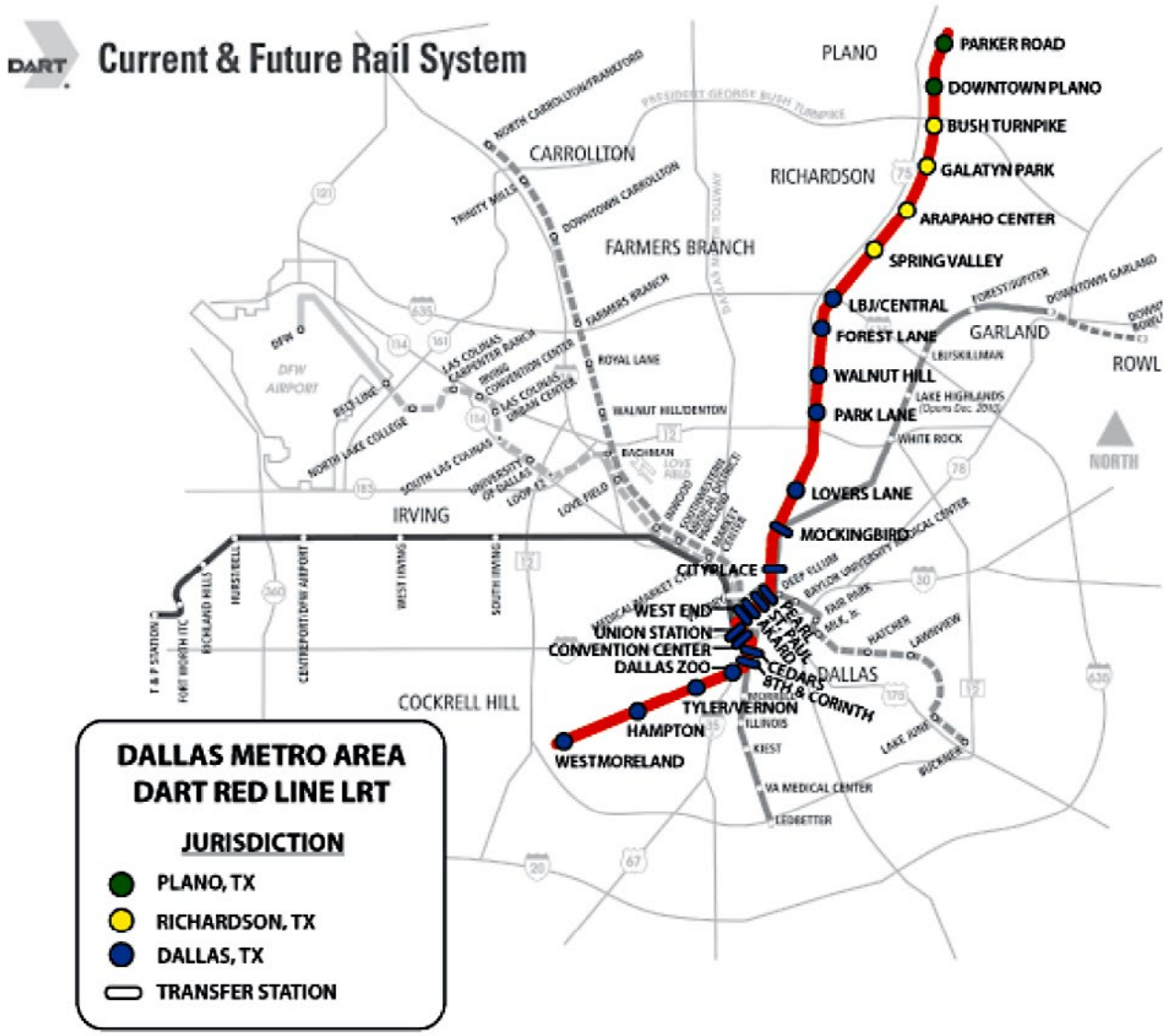
Figure 4D-20 *DART Rail System*

Planning for the Dallas Area Rapid Transit Light Rail

Prior to the 1983 creation of DART, there had been significant discussion in the Dallas region about the need for a transit system. The difficulty in gaining support was attributed to the plans, which were viewed as too ambitious, since they called for development of more than 100 miles of light rail. When the proposals were pared down to a manageable size, they gained voter approval. Ironically, by 2013, the light rail system will approach the concepts discussed prior to the establishment of DART. Planning for the light rail system was complicated by the Dallas community's desire for a subway system, since it viewed a light rail system as intrusive to the existing neighborhoods. DART, however, favored the light rail system. A compromise was reached when DART agreed to tunnel under a portion of Downtown Dallas if a target level of light rail ridership is reached. This agreement made it possible for the first stage of the Red Line to move forward.

The Red Line

The DART Red Line runs from Westmoreland Station in Southwest Dalla, to Parker Road Station in Plano and has 25 stations along its route (see Figure 4D-21). (See detailed information regarding the Red Line and the Red Line stations at the end of this section.) For much of its route, the Red Line follows the right-of-way of the previous Interurban Railway Line, which first began operations in 1908. Commencing service in 1996, the Red Line was part of the first phase of the light rail system developed by DART. The starter line was all within the Dallas city limits, extending first from the Westmoreland Station to the Pearl Station. In 1997, the line was extended to Park Lane Station. In 2002, it was extended 9 miles to Galatyn Park Station in Richardson, and 6 months later, it was extended 3 miles to its current terminus at Parker Road in Plano.



Source: http://www.dart.org/about/expansion/expansionmaps.asp and Van Meter, Williams, Pollack, LLP

Figure 4D-21 *DART Red Line*

Planning for Transit-Supportive Development

In the early years of DART, there was little planning directed at achieving transit-supportive development at the regional level. DART was preoccupied with starting operations, and later, with working out issues with Dallas regarding light rail. By the mid-1990s, however, DART began actively engaging with the inner-ring suburban cities of Richardson and Plano to identify station area locations. The discussions tied into the planning and development strategies already being developed by the two cities and became the foundation of planning for transit-supportive development in the region. Both Richardson and Plano realized the potential of the Red Line in helping them reach their goals. Each city had enjoyed considerable growth in both population and employment, but each faced future hurdles. For years, Plano had been striving towards keeping its downtown area vital. The landlocked city of Richardson wanted to accommodate additional growth while establishing activity centers to provide and retain a sense of community, which was difficult in a loose-knit suburban setting. Dallas spent considerably less time coordinating land use planning with implementation of the Red Line, yet both transit-supportive planning and development did occur in the early years in response to developer proposals.

DART, realizing the economic potential of transit-supportive development in conjunction with a light rail system, began shaping the message and guiding the process. In 2002 and 2007, DART commissioned studies at the University of North Texas' Center of Economic Development. "DART Light Rail's Effect on Taxable Property Valuations and Transit-Oriented Development" (January 2003) focused on increases in real estate values for both residential and office development. The study showed that, from 1997 to 2001, residential properties near light rail lines increased in value 39 percent more than for comparable properties not served by rail. Office buildings near light rail lines increased in value 53 percent more than comparable properties not served by light rail. "Assessment of the Potential Fiscal Impacts of Existing and Proposed Transit-Oriented Development in the Dallas Area Rapid Transit Service Area" (November 2007) was specific to the value of projects directly attributable to the presence of a DART light rail system. It concluded that the total value of projects that were attributable to the presence of the DART light rail system since 1999 was $4.26B. The study also estimated the taxable property values associated with rail stations and tax revenues resulting from the projects, discounting for exemptions and public buildings.

In 2006, DART produced "Transit-Oriented Development (TOD) Guidelines" as a way to promote TODs around its facilities. The guide features successful developments already in place, discusses station types, and describes the elements for realizing success. The guide encourages higher density mixed-use development around stations, but is not prescriptive in setting specific targets, thereby allowing the local jurisdictions to establish goals and regulations for individual station areas.

DART actively promotes and maintains an updated list of station fact sheets on all of the station areas, including the potential for development (for more information, see www.dart.org/economicdevelopment). Similar to many transit agencies across the nation, the financial needs exceed DART's resources. DART's primary interest is in exploring joint development opportunities adjacent to stations in order to generate revenues for the system.

The North Central Texas Council of Governments (NCTCOG), the region's MPO, has also been a major supporter and participant in North Texas 2050, a regional exercise which has taken a look at the future using an extension of current trends as a base. The vision is a first step in discussing possibilities for change with the over 200 communities within the region. NCTCOG has also become actively involved in corridor studies.

While DART has been active in encouraging transit-supportive development for years and NCTCOG appears to be gaining interest, the communities served by the Red Line continue to move the agenda forward.

The Red Line Communities and Transit-Supportive Development

Moving south to north along DART's Red Line are the cities of Dallas, Richardson, and Plano. Each city has taken a different approach to planning for transit-supportive development. This section highlights the efforts undertaken in each of these cities to link transit planning with land use planning. The Cities' planning activities and specific transit-supportive developments are discussed.

The City of Dallas

The City of Dallas, where the Red Line began, encourages transit-supportive development, viewing it as an important economic tool. However, whereas the cities of Richardson and Plano have taken proactive approaches toward planning for transit-supportive development (discussed in the following sections), the City of Dallas has generally taken a reactive stance, letting the marketplace drive the process. One of the early transit-supportive development success stories—Mockingbird Station—located along the Red Line in Dallas, was a developer-driven project. Since the city was well served in that instance, it has stayed with the same planning strategy.

City zoning regulations are generally recognized as outdated, but that is not regarded as a negative since major projects typically require negotiation and specific standards to fit the project, site, and neighborhood. There is a Formed-Base Code in Chapter 13 of the development code, which offers guidance on the types of development that are encouraged.

The City of Dallas has taken a different approach with regard to TIF Districts, which could prove to be an effective tool for other jurisdictions. The city government adopted a linear TIF district covering nine DART stations in the hope that areas enjoying greater success could help fund projects in other areas

that require more substantial public investment to reach potential. The program, referred to as TOD-TIF, is in its early stages. Since it has been impacted by a sluggish economy, it is premature to determine if the concept will prove effective. As the economic situation changes, development in the Mockingbird, Lovers Lane, Cedars, West End, and 8th and Corinth station areas are expected to help fund improvements in the Lancaster Corridor along the DART Blue Line.

Nineteen Red Line light rail stations are located in Dallas; two of these stations—Mockingbird and Cedars—are discussed below.

Mockingbird Station

The Mockingbird Station area features the first transit-supportive development project in Texas, which is recognized as a national model (see Figure 4D-22). It was conceived by developer Ken Hughes, operating as Hughes Development, LP. He began with a base of two older structures, including a historic Western Union telephone assembly building, and envisioned the development of an urban village around this core. It has become a destination area in the region, with more than 600,000 SF of development, including 216 loft apartments, an 8-screen film center, a comedy club, and more than 90 shops and restaurants comprising 220,000 SF of retail space. Additionally, there is more than 140,000 SF of office space. The station area includes 1,580 parking spaces, most of which are in an underground garage. Mockingbird Station is a success. However, from the developer's standpoint, both developers and communities should realize that these types of mixed-use projects take a long time to reach positive returns.

Figure 4D-22

Mockingbird Station Lofts

Source: Flickr, Chet Yeary, used with permission under Attribution-NonCommercial-NoDerivs 2.0 Generic CC BY-NC-ND 2.0 http://www.flickr.com/photos/chetyeary/365121486/

Cedars Station

The Cedars Station area has also enjoyed transit-supportive development success. It is, however, difficult to determine the extent to which its success can be attributed to the DART station, as other variables factor in. For example, while the Red Line was being constructed, Dallas was already in the midst of a construction boom.

Additionally, the Cedars Station area enjoys some unique attractions, such as the Dallas Heritage Village at Old City Park. One project, South Side on Lamar, has acknowledged the importance of transit access. South Side on Lamar, located two blocks from the Cedars Station, is a redeveloped historic Sears, Roebuck & Co. warehouse complex containing 460 loft apartments, with office and retail space, and a hotel.

There is no doubt that light rail has been an extremely strong economic stimulus in Dallas. Studies conducted by DART have shown the impacts, and each station area has enjoyed some development. The potential for future transit-supportive development remains unlimited, with many station areas having substantial amounts of undeveloped or underdeveloped property. Downtown Dallas 360, the City's vision for the future, supports the concept of a city that is less dependent on cars and parking. (For more information, see www.downtownDallas360.com.)

The City of Richardson

The City of Richardson prepared early for the coming of light rail. Its leadership, elected and appointed, realized the potential opportunities for both redevelopment and new development around station areas. As the second largest employment center in the region, the city government was acutely aware of the advantages a good transit system would have in serving its growing employment and residential base. This was especially true given limited property for future development in light of the projected development needs.

In advance of the Red Line's construction, city officials traveled extensively in an effort to learn about other regions' and cities' plans for, and encouragement of, transit-supportive development. With stations proposed for both developed and greenfield areas, city officials recognized that each potential station area was unique, and that fully realizing the advantages of rail would require individual plans. Two of the station areas, Arapaho and Spring Valley, were in developed areas and offered redevelopment and infill opportunities. Two other station areas, Galatyn Park and the Bush Turnpike, were in greenfield areas, but each afforded options from a standpoint of timing and use.

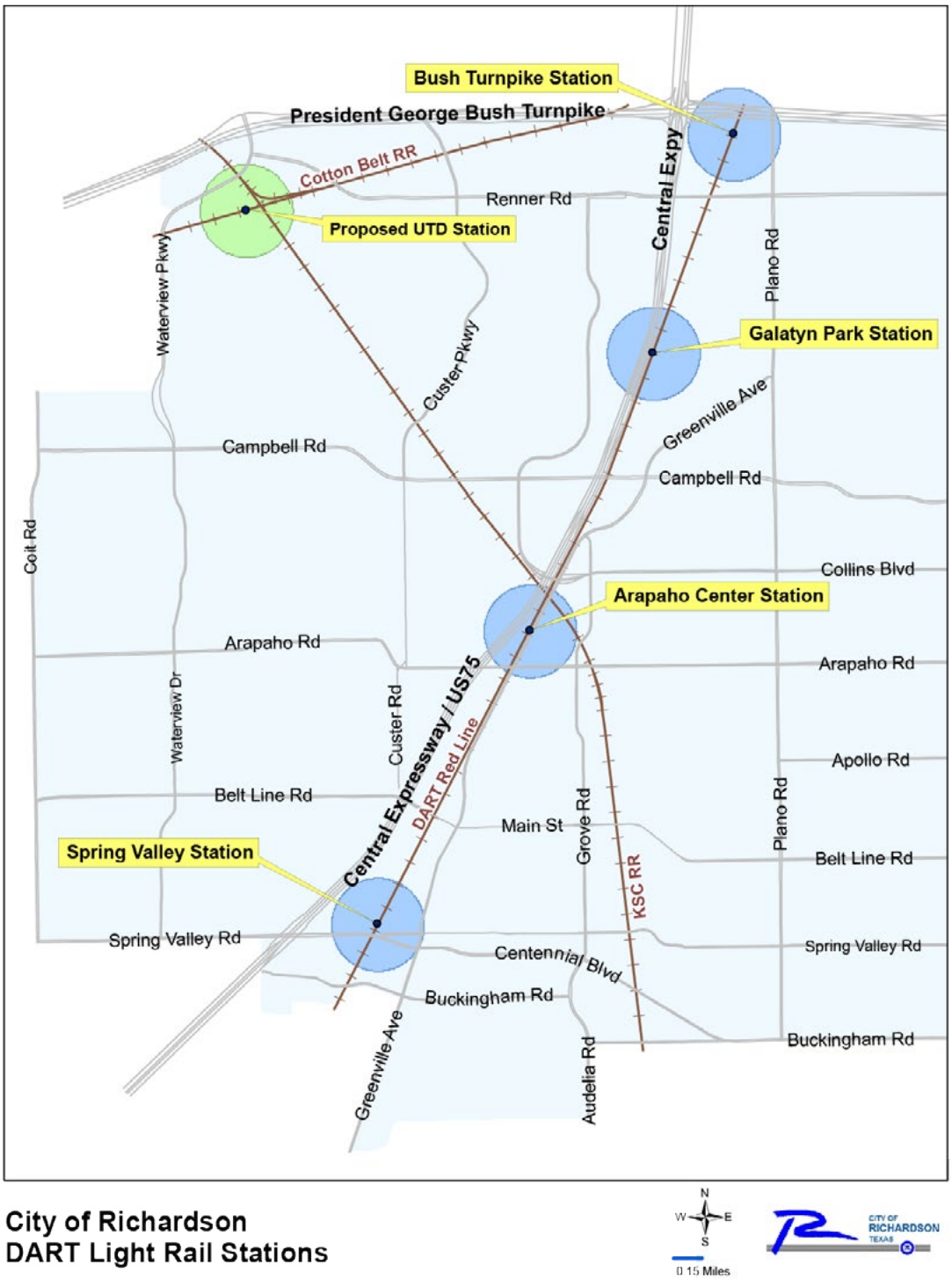
Urban Land Institute Advisory Services Program

Established in 1947, this program is designed to bring the best possible expertise in the real estate field to bear on complex land use planning and development programs. The service is available to and has been contracted by public, private, and non-profit organizations. Panels comprise a wide range of professionals who volunteer their time and expertise to participate in intense five-day assignments that conclude with a series of findings and conclusions presented to the sponsor. The sponsor can additionally request a written report. ULI has provided multiple successful panel studies around the country dealing with transit-related development.

The City of Richardson learned from the experiences of other jurisdictions and took advantage of the annual meeting of the Urban Land Institute (ULI), which was scheduled for Dallas in 1998. The City offered to sponsor a ULI Advisory Services Panel study covering all of its potential station areas (five possible sites). A panel session was held in Richardson in June 2000. The charge of the panel was to consider unique opportunities for TOD development at each prospective station area. The exercise was instructive and full of insightful suggestions, and most importantly, it succeeded in building a broad base of public support for an overall vision that has served as a guide over the ensuing years. The ULI Advisory Services Panel report is available on the City of Richardson's website under Economic Development, Transit-Oriented Development (http://www.cor.net/).

In an effort to maintain the public momentum generated by the ULI Advisory Services, the City of Richardson ran a column for several months in Richardson Today, a city informational newspaper distributed monthly to each household and available throughout the city. The columns explained the concept of transit-oriented development and answered frequently asked questions prior to the opening of the Richardson stations.

Each of the four light rail stations in Richardson (see Figure 4D-23) had its own opportunities and constraints, and each was the subject of a distinct planning effort, beginning with the ULI Advisory Services Panel efforts and continuing as the city moved the vision forward. Common threads among the stations existed. The first involved the barrier created by US 75, a major north-south corridor known as Central Expressway. With the Red Line's alignment running parallel to US 75, careful planning was needed to ensure that the Red Line did not reinforce the barrier, but was planned to bridge the US 75 barrier. A second common thread was to use the advantages of each station to collectively meet the needs of this rapidly growing community, which was facing a depleted land area and ever increasing roadway congestion. Light rail offered a partial solution to roadway congestion, and in conjunction with station-area higher residential densities, could better use land supply. The third common thread was to meet the need for increased retail demand while at the same time creating a town center, which Richardson, like many suburban inner-ring communities, lacked. It was apparent to the city officials that four station areas offered the opportunity to meet multiple community goals in a way that was compatible with existing neighborhoods. A look at the four station areas along the five-mile Red Line suggests that Richardson has made substantial progress in meeting all of its goals.



Source: http://www.cor.net/DevelopmentServices.aspx?id=1422

Figure 4D-23 *DART Light Rail Stations in Richardson*

Spring Valley Station

The southern station in Richardson enjoyed a diverse mixture of uses, ranging from some of the oldest homes in the community to low-density commercial and warehousing. The ULI Advisory Services Panel report indicated that this station area offered an opportunity for both higher-density residential and office development. The city government approached the Spring Valley Station with an eye towards encouraging new and more intense development, while also ensuring compatibility with existing uses. The area was the subject of a separate Station Area Plan completed in 2003, and a separate set of development regulations, the Spring Valley Station District Development Regulations, was adopted in August of 2004, and amended in 2006 and 2007. These documents are available on the City of Richardson's website at http://www.cor.net/. The regulations established an overlay Planned Development (PD) District for 63 acres bisected by the Red Line. Additionally, both the Core Area (closest to the station) and the Interface Area (between the core and the rest of the city) have their own sets of design guidelines. By establishing development-right totals for various uses, the city government encourages certain future uses, such as office, retail/commercial, and condominiums, while not permitting others, such as industrial. The Spring Valley district regulations were the first adopted by the City of Richardson to specifically rezone for transit-supportive development. The 2007 update was undertaken as a means of accommodating Brick Row, a mixed-use development consisting of 950 residential units (townhouses, condominiums, and rental apartments) and 44,000 SF of ground floor retail on the eastern side of Spring Valley Station (see Figure 4D-24).

Figure 4D-24

Brick Row

Source: City of Richardson, Office of City Manager

Arapaho Center Station

The Arapaho Center Station area also had a wide mixture of existing uses, ranging from manufacturing and warehousing to commercial and residential. It was the site of the DART bus transit center serving 16 bus routes with 12 bays and

a park-and-ride with 1,105 parking spaces. With the arrival of the Red Line light rail, the Arapaho Center Station became a major multimodal center. The ULI Advisory Panel study recognized significant potential for the station area to serve as an employment center. A subsequent Arapaho Center Station Area Plan, prepared by the City of Richardson in 2001, looked at ways to advance the concept of transit-supportive development consistent with a market analysis. Since the station area is busy with both Arapaho Road and the Central Expressway carrying heavy vehicle trips, accessibility was and remains a challenge. The ULI Advisory Services Panel report suggested that the City maintain maximum flexibility in the station area in order to respond to future markets. Essentially, that has been the position taken to date. No actions have been taken on constructing specific development regulations since the completion of the station area plan, which is consistent with the City's approach of allowing station areas to attract market interest and then to establish regulations that allow for the advancement of mutually beneficial projects.

Galatyn Park Station

Before development of the station, and well in advance of the Red Line light rail, the city government considered the Galatyn Park Station area as ideal for an activity center that could serve as a focal point for the community and the region. The area had many advantages, including two major property owners (Nortel and the Hunt family) who shared the City's vision. During the Red Line light rail planning stage, one of the property owners offered to provide a station site that the city government deemed more attractive, less obtrusive, and more central. DART concurred. Nortel designed its campus expansion to provide walkways connecting to a two-acre public plaza developed by the City of Richardson, which, in turn, links adjacent development to the DART station and to a nature trail system. To make the link to the trail system possible, DART entered into a unique licensing agreement to provide property in exchange for maintenance. The City of Richardson, DART, and the federal government (CMAQ) provided the funding that made possible the infrastructure improvements for necessary road and bridge upgrades. City funds also paid for other street and infrastructure improvements.

The ULI Advisory Services Panel report had supported the City concept of creating a focal point and envisioned the Galatyn Park Station area as a natural choice for mixed-use higher density development. In addition to participating in direct public investments, the city government agreed to participate in a joint venture with John Q. Hammons Hotels in the development of a full-service Renaissance Hotel containing 336 rooms and a 30,000 SF conference center (see Figure 4D-25). As part of the joint venture, the city government financed the hotel/conference center with debt service paid annually by the hotel in exchange for ownership being transferred to the hotel. A performing arts and corporate presentation center was constructed in the station area in 2002, the same year the Red Line light rail service began. The Charles W. Eisemann Center, named for the gentleman who provided a capital enhancement gift, received assistance from the city government in the form of a City-built and -financed parking garage shared with the Renaissance

Dallas Richardson Hotel (see Figure 4D-26). In short, most of the pieces necessary to create a substantial activity center were either in the planning stage or already in place when the Red Line light rail service was initiated. The area continues to grow with the development of a mixed-use project by Legacy Partners, containing 270 residential units and 7,000 SF of first-floor retail space. On the office front, Blue Cross/Blue Shield of Texas has developed a 1M SF, 15-story headquarters building, which opened in 2010.

Figure 4D-25

Renaissance Hotel and Conference Center

Source: City of Richardson, Office of City Manager

Figure 4D-26

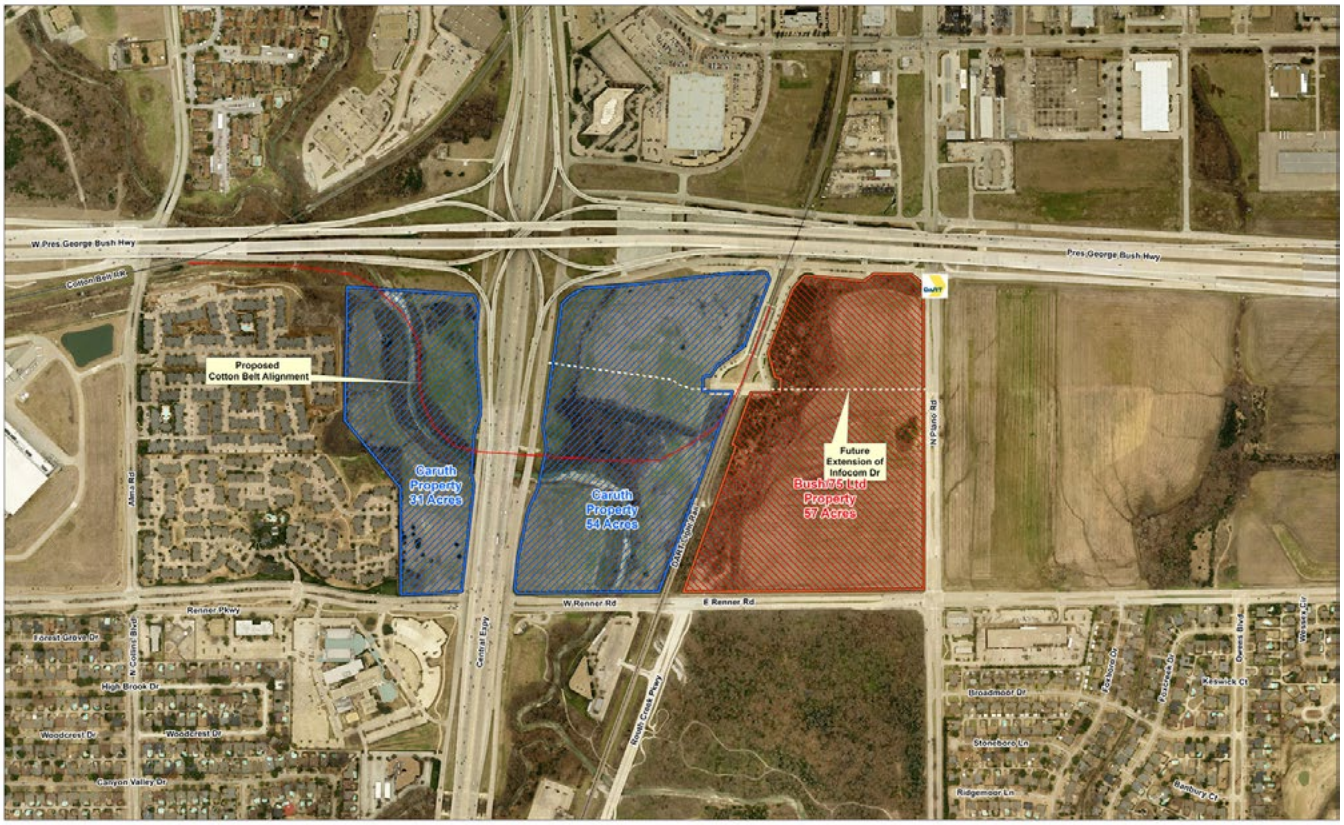
Charles W. Eisemann Center

Source: City of Richardson, Office of City Manager

Bush Turnpike Station

The Bush Turnpike Station area was a relatively blank slate with excellent highway access and considerable vacant land. The ULI Advisory Services Panel Report viewed this area as ideal for a master-planned development, which was made more attractive due to the limited number of land owners with whom to negotiate. Over the years this area has been the subject of many city case studies in an effort to stimulate transit-supportive development, but a weak economy had slowed progress. The economic climate has changed and the City of Richardson approved rezoning two large parcels (140 acres) under a formed based code (see Figure 4D-27). The expected development will include offices, shopping centers, and other retail space with a mixture of residential apartments and townhouses, as well as a hotel (see Figure 4D-28).

DART's decision to locate its park-and-ride lots underneath existing highway overpasses in the Bush Turnpike Station area proved critical in creating major transit-supportive developments. DART's interlocal agreement saved valuable land adjacent to the station, and avoided the visual impact of typical surface parking.



Source: City of Richardson, Office of City Manager

Figure 4D-27 *Bush Turnpike Station Redevelopment Areas*

Figure 4D-28

Bush Turnpike Station Concept Rendering

Source: City of Richardson, Office of City Manager

The City of Richardson prepared early for the Red Line light rail, and it shows. They have planned well for transit-supportive development, adjusted to market opportunities, and invested in projects that were vital to meeting community goals. As with all of the cities on the Red Line, the City of Richardson made excellent use of TIF Districts to help fund improvements. The Texas TIF statutes are more liberal than most which helped the cities include more than one station area in a single district and made it possible to spread the benefits to wider areas than is typically the case across the country.

The City of Plano

Like many communities that benefit from the initiation of light rail service, Plano had a railroad history. Incorporated in 1873, six months after the opening of the Houston and Texas Central Railroad, Plano quickly became the trading center of agriculturally-rich Collin County. Its position was further strengthened with the opening of the Cotton Belt Railroad in 1887, which connected Plano to Fort Worth, and the 1908 opening of the Texas Traction Company (Interurban Electric Service) connecting Plano to Dallas. The Interurban right-of-way now accommodates the Red Line.

Plano has always planned and invested to accommodate growth and economic development. It enjoys a diverse economy and serves as a major regional employment center. Its history of planning has been responsible for the revitalization of downtown Plano, which, like many older central business centers surrounded by suburban growth, suffered from competition from regional malls and big box retailers. By the 1980s, Plano had become a specialty shopping area with antique stores and gift shops primarily serving as the retail base.

Two Red Line stations are located in Plano—Downtown Plano and Parker Road Station.

Downtown Plano Station

Since the initiation of the Red Line light rail service, the Downtown Plano Station area has evolved into a model transit village. But as with most successful transit-supportive development and redevelopment efforts, the construction of the Red Line was only one piece of a larger puzzle. Many of the major factors that made the Downtown Plano Station area successful were years in the making, and in place, prior to the opening of the Red Line. The city government made great strides in keeping the downtown area as a regional focal point. It built and subsequently expanded its municipal complex, acquired and restored a historic bank building to house additional municipal services, and acquired an aging commercial center. The latter was not in character with the core area, but was an acquisition that later proved important to development efforts.

In 1984, a bond initiative was approved by voters for streetscape improvements, including new sidewalks, ornamental streetlights, benches, and the development of a small park. Haggart Park in center city was also expanded to approximately five acres, removing some incompatible land uses in the process.

Building on its commitment to keep Downtown Plano vital, in 1991, the Plano Planning and Zoning Commission prepared a plan to guide future development. The Downtown Plano Development Plan, approved by the City Council in the same year, called for the creation of a mixed-use compact development utilizing infill and stressing diversification via arts and cultural facilities. A new zoning district called Business/Government was put in place for the 80-acre downtown core area. At the time of this planning process, the Red Line was not expected to begin service until 2011, and the location and type of station was uncertain. In 1993, DART revised its service plan and called only for a special event platform in Plano to be used occasionally. In 1995, the service plan was changed to provide for a full-service stop, and the target date for service was moved up to 2003. The station was intended to serve as a destination station without parking, since large park-and-ride lots were planned for Parker Station immediately to the north and Bush Turnpike Station to the south.

To serve as intended and to have the maximum impact on the central city, both DART and the city government realized station location would be critical. In 1997, the city government conducted a study of alternative sites. The study borrowed a concept from the 1991 development plan to create a downtown center block by closing an avenue and acquiring some heavy commercial auto-related uses for additional space. The 3.6-acre site was sufficient to accommodate the station and also provided land for future development. The city government and DART agreed on the location in April 1998. In September of that year, the city government approved a redevelopment concept calling for high-density, mixed-use development immediately adjacent to the station. Using an interlocal agreement, DART agreed to purchase property and transfer any surplus to the City of Plano in exchange for infrastructure improvements.

The City of Plano took advantage of the annual meeting of ULI, which was scheduled for Dallas in 1998, and submitted a proposed redevelopment project to a ULI Advisory Services Panel for comment and review. The panel liked the concept but suggested that the project area might be too small to attract investment unless it was part of a larger vision. Plano decided to test the market, and issued a Request for Proposal for project developers in October 1998. After a selection process, Amicus Partners was granted a 120-day opportunity to negotiate an agreement in January of 1999. Working with City staff and a citizens committee, a development plan was created and approved by the City Council.

During the same time frame, the City of Plano continued to work on a larger vision, and in May 1999 it adopted Downtown Plano: A Vision and Strategy for Creating A Transit Village. The Plan established goals for both retail and residential development within a ¼-mile radius of the station. The existing Business/Government Zoning District accommodated the basic concept, but density was adjusted upward from 40–100 units per acre.

Several transit-supportive developments have either been constructed or are planned for the Downtown Plano Station neighborhood. Eastside Village I, completed in 2001, contains 234 residential units and 15,000 SF of retail space (see Figure 4D-29).

Figure 4D-29

Eastside Village I

Source: City of Plano Planning Department

Eastside Village II, completed in 2002, consists of 229 residential units and 25,000 SF of non-residential space and a parking garage of 416 spaces with 100 of the spaces reserved for city government use (see Figure 4D-30).

Figure 4D-30
Eastside Village II

Source: City of Plano Planning Department

Eastside Station, located at the southeast corner of 15th Street and Avenue I, will contain 230 residential units with 15,000 SF of ground floor commercial space. Construction is scheduled to commence by January 2012. The proposed 15th Street Village project, located at the intersection of 15th Street and Avenue G, will consist of a combination of townhomes and condominiums.

The City of Plano has been successful in keeping its downtown vital and healthy. Its experience offers many lessons on how to develop a transit village, keeping in mind that there are many pieces to the puzzle. Over the years, the city government not only planned, but has invested in the plan. It benefitted from the efforts of groups like the Cultural Arts Council of Plano, a non-profit established in 1981 that purchased and refurbished a former furniture store into a 24,000 SF theater 10 years later. The City of Plano also encouraged and helped fund, under a public/private partnership, the development of the Plano Courtyard Theater, a $6.5M project, with $4.6M of that provided by a TIF. The Plano TIF District includes the City, the Plano Independent School District, Collin County, and Collin County Community College. The TIF District is linear, running along the DART corridor from south to north through Plano, to just north of the Parker Road Station.

Parker Road Station

The Parker Road Station, the end of the line for the original DART Red Line, has a different orientation and different potential than a typical transit center location. It complements an adjacent transit center and serves a variety of retail and commercial uses. The area currently has large-lot retail, an office park, and a considerable number of multifamily residential developments nearby. A substantial amount of land available for development exists, with transit-supportive development a logical future use. In many respects, this station area is similar to the Bush Turnpike Station in Richardson, and may be the next growth area as the economy rebounds. The station is only a mile from downtown Plano and falls under the Plano Comprehensive Code. As market

interests pick up, the city government is likely to conduct the same type of long-term visioning performed for the downtown and adopt specific developmental guidelines to fit the area.

The City of Plano not only pays attention to the larger vision, it also focuses on the small improvements that can make a difference. The city government provides historic preservation tax abatements, waives fees for compatible restoration projects, and helps provide low-cost fire code improvements. It has a strong retail retention plan in place and works just as hard on the small projects as it does on the larger ones, as evident in the renovations that are continually occurring in the downtown area (see Figure 4D-31). The City of Plano continually plans for the future, constantly revisiting its vision and strategy for downtown.

Before ***After***

Source: City of Plano Planning Department

Figure 4D-31 *Downtown Plano Renovations*

Conclusion

Planning for the DART Red Line light rail system, particularly as it relates to transit-supportive development, varied by jurisdiction in approach, timing, and detail. The Cities of Richardson and Plano were aggressive and to a large extent incorporated transit into their ongoing planning efforts in a substantial and positive way. The City of Dallas was and remains more reactive in its approach, but is supportive of market-driven transit-supportive development projects. While both approaches have demonstrated results, it is unlikely that either the city of Plano or Richardson would have realized the same degree of success without constant planning and the willingness to invest in their own plans.

Lessons Learned

- Suburban expansion has challenged the existence of many small inner-ring community centers. These communities can compete as small urban centers, but coordinated commitment and investment are needed.
- While it may sound simple, in interviews several professionals involved in planning for transit-supportive development noted that a key to success on the Red Line is planning for developments where people are, not where you hope they will be.
- For a city to realize the full benefit of transit as a key feature toward attracting development, it is important to either own the land (land bank) or have the ability to easily acquire it. Being a joint-venture partner places the city government in a better position to negotiate.
- A transit line can create spatial relationships from community to community. As one long-time planner observed, "It's like an elevator. You develop linear relationships with other communities along the line that did not exist and there is much more movement back and forth".
- As noted in other case studies, one sentiment repeated by every group of corridor planning professionals is that transit is an important piece but it is not the only piece. Many factors are needed to create a livable community.
- Public investment is critical. Few projects of significance are developed by the private sector alone. Public/private partnerships and public investments in infrastructure (especially parking solutions) are necessary. The planners on the Red Line believe that public subsidy is essential because the small premium that comes from transit-supportive development rents is not sufficient to pay the costs of densities, amenities, and parking.
- These are long-term efforts. The Red Line recoups approximately 20 percent of its cost from the fare box. Cities do not realize returns on their investments for years. Those looking for quick returns are not attracted to transit-supportive development.
- From a developer's perspective, one of the key impediments to realizing transit-supportive development is the location of surface parking lots in station areas. Ken Hughes, the original developer of Mockingbird Station, suggests that those planning to encourage transit-supportive developments should locate surface parking at least 2,500 feet from the stations.
- Many developers and community officials agree that parking is critical, but a delayed solution is more expensive, since construction of a parking structure costs more after the fact. Many in this case study feel that a parking solution will inevitably require a public/private partnership. In suburban locations, many transit-supportive developments are still auto dependent, so while parking may be reduced, communities have to establish a good balance.

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Corridor Data: Red Line

Transit Operator:	Dallas Area Rapid Transit
Transit System Name:	DART
Transit Corridor Name:	Red Line
Transit Mode:	Light Rail (LRT)
Location (Metro Area):	Dallas, TX
Region (USA):	South
Date Open:	June 14, 1996
Corridor Length:	30 Miles
Corridor Purpose:	Suburban Commuter Line
# of Municipalities Served:	3
# of Stations Served:	25
Construction Sequence:	Phased
Alignment Description:	Former Union Pacific Railway and Central Expressway (freeway alignment)
Operating Speed (Max.):	65 MPH (source: http://www.dart.org/newsroom/dartrailfacts.asp)
Operating Speed (Avg.):	25-35 MPH (source: http://www.dart.org/newsroom/dartrailfacts.asp)
Car Capacity:	76 seated (source: http://www.dart.org/newsroom/dartrailfacts.asp) 160 capacity (source: http://www.dart.org/newsroom/dartrailfacts.asp)
Peak Service Headway:	10 minutes in morning/5 minutes in evening (source: http://www.dart.org/schedules/w600no.htm)
Projected Ridership:	*24,750 avg. wkdy. (by 2010) (source: Gary Hufstedler, DART Senior Manager, Planning Information and Analysis)
Ridership as of June 2010:	**32,993 avg. wkdy. (source: Gary Hufstedler, DART Senior Manager, Planning Information and Analysis)
Funding:	Federal: $230.9M State & Local: $102.1M Total: $333M (source: http://www.progressiverailroading.com/news/article.asp?id=10657)

*Ridership projection was interpolated from an overall system projection of 66,000 avg. wkdy. riders (of which the Red Line received 37.5% of overall riders in 2010)
**Ridership figures for DART Light Rail are developed using a statistical sampling process that yields a confidence level of 95% +/- 5% or better.
SOURCE: DART (transit agency), unless otherwise noted

February 3, 2011

Station Area Data: Red Line

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	Parker Road	Plano, TX	9-Dec-2002	Future Orange Line (LRT)	Surface	Suburban	At Grade	START	Predominantly suburban retail and entertainment with surface parking lots and some residential	25	25	N/A	N/A	Collin County Community College, Texas Instruments Spring Creek Campus
2	Downtown Plano	Plano, TX	9-Dec-2002	Future Orange Line (LRT)	N/A	Suburban	At Grade	1.0 Miles	Rich mix of uses - mixed-use commercial, mixed- use residential, community park and single family residential	5	80	1999 - Downtown Plano: A Vision and Strategy for Creating a Transit Village	Eastside Village, 15th Street Village, Lexington Park (1)	Historic Downtown Plano, Haggard Park, Railway Station Museum, Court-yard Theater, Skate Park, ArtCentre of Plano, Georgia's Farmers Market, Children's Medical Clinic
3	Bush Turnpike	Richardson, TX	9-Dec-2002	Future Orange Line (LRT)	Surface	Suburban	At Grade	1.5 Miles	Predominantly vacant land with some suburban retail	N/A	N/A	N/A	N/A	Collin Creek Mall
4	Galatyn Park	Richardson, TX	1-July-2002	Future Orange Line (LRT)	N/A	Suburban	At Grade	1.25 Miles	Predominantly employment with some residential and entertainment	80	80	2000 - ULI Advisory Panel on TOD (focus on Galatyn Park Station)	The Venue (2)	Telecom Corridor, Galatyn Park Urban Center, Charles W. Eisenmann Center for Performing Arts, Richardson Regional Medical Center, The Renaissance Hotel, Blue Cross/Blue Shield
5	Arapaho Center	Richardson, TX	1-July-2002	Future Orange Line (LRT)	Surface	Suburban	At Grade	1.75 Miles	Predominantly surface parking and suburban employment with multiple car sales across the interstate	N/A	N/A	2001 - Arapaho Center Station Area Plan	N/A	Telecom Corridor, Richardson Civic Center, University of Texas at Dallas, Collins Tech. Park
6	Spring Valley	Richardson, TX	1-July-2002	Future Orange Line (LRT)	Surface	Suburban	Above Grade	1.75 Miles	Predominantly suburban employment and light industrial with new urban village	20	80	2001 - Spring Valley and Main Street Station District Plan	Brick Row Urban Village (3)	Telecom Corridor, Greenville Avenue Stadium, Restland Memorial Park
7	LBJ/Central Station	Dallas, TX	1-July-2002	Future Orange Line (LRT)	Surface	Suburban	At Grade	1.75 Miles	Predominantly vacant land and surface parking with some residential	5	30	N/A	N/A	Texas Instruments, Richland College

Station Area Data: Red Line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
8	Forest Lane	Dallas, TX	1-July-2002	Future Orange Line (LRT)	Surface	Suburban	Above Grade	1.0 Miles	Predominantly residential with some commercial and a churchl	1	20	N/A	N/A	Medical City Dallas Hospital
9	Walnut Hill	Dallas, TX	1-July-2002	Future Orange Line (LRT)	Structure	Suburban	Above Grade	1.75 Miles	Predominantly commercial uses and large hospital	N/A	N/A	N/A	N/A	Presbyterian Hospital of Dallas
10	Park Lane	Dallas, TX	January 1997	Future Orange Line (LRT)	Surface	Suburban	Above Grade	0.75 Miles	Predominantly suburban shopping centers with some newer office and residential towers	25	200	N/A	Park Lane Dallas (4)	NorthPark Center Shopping Mall, Argosy University Dallas, The Art Institute of Dallas
11	Lovers Lane	Dallas, TX	January 1997	Future Orange Line (LRT)	N/A	Suburban	At Grade	1.75 Miles	Rich mix of uses - suburban shopping centers, office towers, self storage, and residential	5	30	TOD TIF: Mockingbird / Lovers Lane Subdistrict	N/A	Lovers Lane Shopping Center, Old Town Shopping Center, Love Field Airport
12	Mockingbird	Dallas, TX	January 1997	Fremont-Daly City Line, Dublin/ Pleasonton-Daly City Line (HR); Amtrak Capitol Corridor (CR)	Surface	Suburban	Below Grade	1.0 Miles	Urban retail and office center with residential and educational	5	40	TOD TIF: Mockingbird / Lovers Lane Subdistrict	Mockingbird Station (5)	Southern Methodist University
13	Cityplace	Dallas, TX	18-Dec-2000	Blue Line, Future Orange Line (LRT), M-Line (SC)	N/A	Urban	Below Grade	2.5 Miles	Mix of residential, retail and office, intersected by freeway	60	150	CityPlace TIF District	West Village (6)	N/A
14	Pearl	Dallas, TX	14-Jun-1996	Blue Line, Green Line, Future Orange Line (LRT	N/A	Urban	At Grade	1.5 Miles	Central Business District - predominantly office build-ings	N/A	N/A	City Center TIF District; Downtown Connection TIF District	Bryan Tower (7)	Downtown Dallas
15	St. Paul	Dallas, TX	14-Jun-1996	Blue Line, Green Line, Future Orange Line (LRT	N/A	Urban	At Grade	0.25 Miles	Central Business District - predominantly office and cultural uses	60	200	City Center TIF District; Downtown Connection TIF District	N/A	Dallas Museum of Art, Nasher Sculpture Center

Station Area Data: Red Line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
16	Akard	Dallas, TX	14-Jun-1996	Blue Line, Green Line, Future Orange Line (LRT	Surface	Urban	At Grade	0.5 Miles	Rich mix of uses - high intensity office, retail, residential, and cultural	100	200	City Center TIF District; Downtown Connection TIF District	N/A	City Center District
17	West End	Dallas, TX	14-Jun-1996	Blue Line, Green Line, Future Orange Line (LRT	Surface	Urban	At Grade	0.5 Miles	Rich mix of uses - office, retail, residential, cultural	60	100	Downtown Connection TIF District	Urban Lofts (7)	West End Historic District
18	Union Station	Dallas, TX	14-Jun-1996	Blue Line, Green Line, Future Orange Line (LRT); Trinity Railway Express, Texas Eagle Amtrak (CR)	Surface	Urban	At Grade	0.5 Miles	Predominantly civic uses and hotels	N/A	N/A	N/A	N/A	Downtown Dallas
19	Convention Center	Dallas, TX	14-Jun-1996	Blue Line, Orange Line, Silver Line (under con- struction) - (LRT)	N/A	Urban	At Grade	0.5 Miles	Predominantly civic, office, and hotels	N/A	N/A	N/A	Adam's Mark Hotel (7)	Convention Center, Central Library, Dallas City Hall, Pioneer Park
20	Cedars	Dallas, TX	14-Jun-1996	Blue Line (LRT)	N/A	Urban	At Grade	0.75 Miles	Residential and light industrial	5	100	Cedars Area TIF District; TOD TIF: Cedars West Subdistrict	South Side on Lamar (8)	Old City Park
21	8th & Corinth	Dallas, TX	14-Jun-1996	Blue Line (LRT)	Surface	Suburban	At Grade	1.5 Miles	Residential, light industrial, and open space	1	20	TOD TIF: Lancaster Corridor Subdistrict	N/A	Moore Park
22	Dallas Zoo	Dallas, TX	14-Jun-1996	NONE	N/A	Suburban	At Grade	1.0 Miles	Zoo, residential, and some light industrial	5	20	N/A	N/A	Dallas Zoo, Methodist Hospital
23	Tyler/Vernon	Dallas, TX	14-Jun-1996	NONE	N/A	Suburban	At Grade	1.75 Miles	Predominantly residential	1	10	N/A	N/A	N/A
24	Hampton	Dallas, TX	14-Jun-1996	NONE	Surface	Suburban	At Grade	1.25 Miles	Predominantly residential	5	10	N/A	N/A	N/A
25	Westmoreland	Dallas, TX	14-Jun-1996	NONE	Surface	Suburban	At Grade	1.25 Miles	Light industrial and residential	5	10	N/A	N/A	N/A

NOTES:
* Dedicated to transit riders
"** All distances are measured ""as the crow flies"" and are rounded up to the nearest 1/4 mile"
*** Within 1/4 mile of transit station (source: Google Earth)
**** Residential densities are estimates on net densities per block by looking at particular residential typologies within 1/4 mile of transit station. (source: Google Earth)

SOURCES:
1 http://www.visitdowntownplano.com/live.html
2 http://www.venueforliving.com/
3 http://www.livebrickrow.com/
4 http://www.parklanedallas.com/
5 http://www.mockingbirdstation.com/
6 http://www.westvil.com/
7 http://www.lightrailnow.org/features/f_000003.htm
8 http://southsideonlamar.com/

February 3, 2011

Massachusetts Bay Transportation Authority (MBTA) Fairmount Line, Boston

Prepared by:
New Jersey Institute of Technology

MBTA runs the fifth largest mass transit system in the United States. It serves a population of more than 4 million people in 175 cities and towns. The MBTA system includes 183 bus routes, with 2BRT lines, 3 rapid transit lines, 5 streetcar routes (Central Subway/Green Line), 4 trackless trolley lines, and 13 commuter rail routes (including the Fairmount Line). All 13 lines of MBTA's commuter rail system terminate in Boston—5 in North Station and 8 in South Station. These lines serve the city of Boston, the Massachusetts bay area, and Rhode Island (see Figure 4D-32). Although no commuter rail connection exists between the two aforementioned stations, they are linked via the MBTA subway system. Planning for the Fairmount Line and for transit-supportive development in the Fairmount Line station neighborhoods is the subject of this section.

MBTA Case Facts

System Name:	MBTA
Corridor Name:	Fairmount Line
Transit Mode:	Commuter Rail
Location:	Boston
Region (USA):	Northeast
Corridor Length:	9.2 miles
Corridor Purpose:	Inter-Urban Commuter
Municipalities Served:	1
Cost and Funding Sources:	Unavailable
Date Opened:	Passenger service resumed by MBTA 1979

Source: MBTA, http://www.mbta.com/schedules_and_maps/rail/

Figure 4D-32 *MBTA Commuter Rail System*

Planning for the MBTA Commuter Rail System

The commuter rail system began operating under public control in 1974 and serves a total of 125 stations. From about 1950, in direct correlation with the growing popularity of the automobile, commuter rail ridership across the nation began a steady decline from approximately 7 billion annual passenger miles to just over 4 billion by 1962. Boston's commuter rail system was no exception to this decline and none experienced it as swiftly in service and ridership. However, the formation of the MBTA in 1964 provided the foundation for gaining public support for Boston's commuter rail services, resulting in MBTA's acquisition of the entire commuter rail system by 1976. Upon acquisition, MBTA began an aggressive reinvestment in the system's equipment and infrastructure as well as an expansion of service to meet the steadily increasing ridership demand, a trend that has continued to this day (see Table 4D-2). MBTA's commuter rail service currently carries approximately 148,000 customers round-trip each weekday on 476 trains. The trains are exclusively powered by diesel locomotive equipment while all other commuter rail systems in the Northeast Corridor operate with electric power.

Table 4D-2

MBTA Commuter Rail Total Annual Boardings

Year	Total Boardings
1980	9,339,015
1985	11,803,000
1990	19,208,000
1995	25,495,300
2000	36,417,000
2005	37,890,000
2010	36,909,924

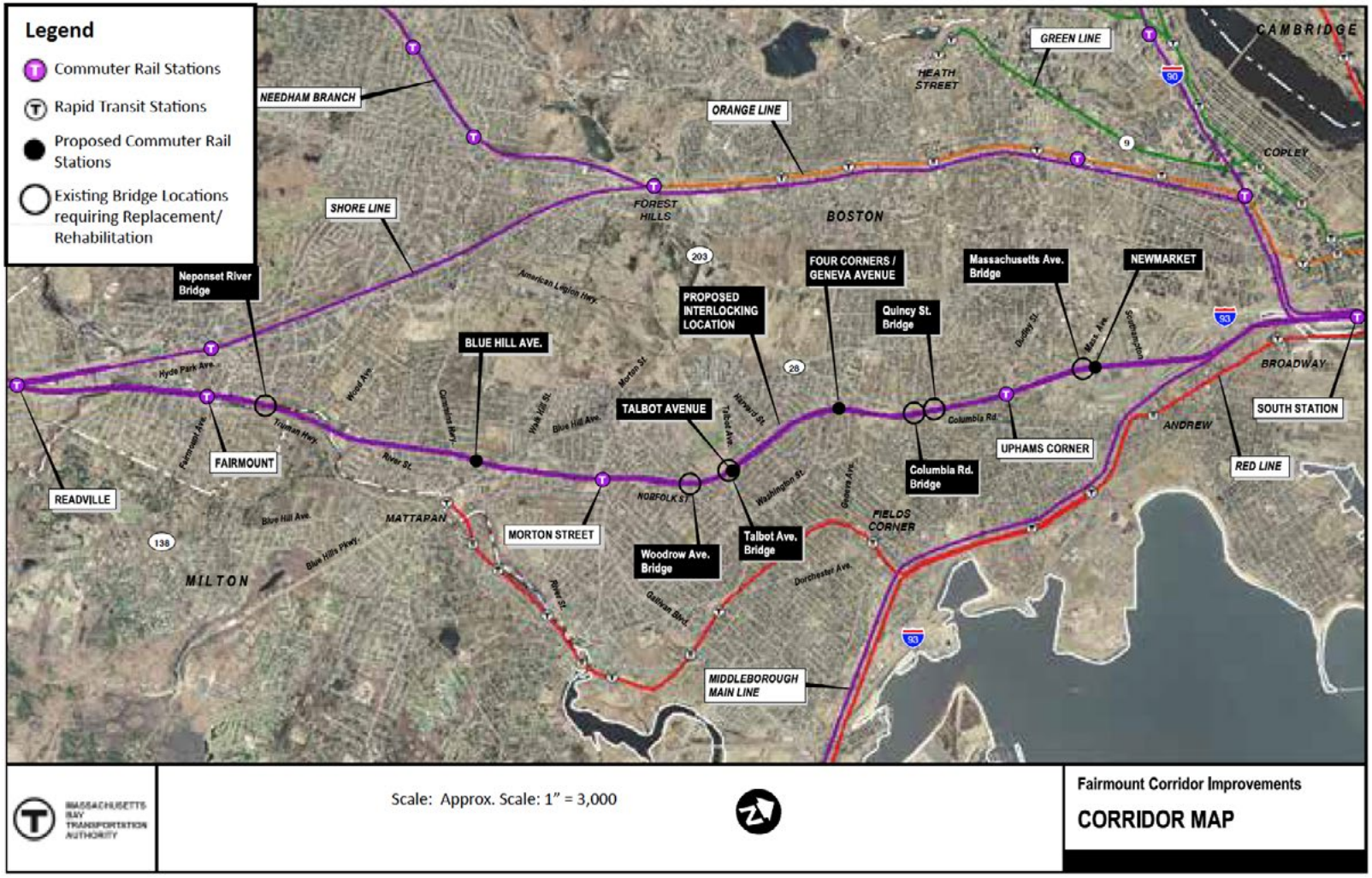
Source: MBTA, Office of Strategic Initiatives and Performance

The Fairmount Line

The Fairmount Line is the shortest of Boston's commuter rail lines at 9.2 miles. Serving only the city of Boston, the Fairmount Line begins at South Station, travels south through the Boston neighborhoods of Dorchester, Roxbury, and Mattapan, and terminates in the Readville section of Hyde Park (see detailed information at the end of this section). In addition to its South Station terminus, the Fairmount Line stops at four stations: Uphams Corner, Morton Street, Fairmount, and Readville (see Figure 4D-33) (see detailed information at the end of this section regarding the Fairmount Line stations).

Figure 4D-33

Fairmount Line



Source: http://www.mbta.com/uploadedFiles/documents/Fairmount_corridor_map.pdf

The Fairmont Line is a remarkable example of the potential that can be created as a result of bottom-up, community driven planning. In fact, community foresight has affected the future of this line a number of times over its 150+ year history, with each intervention laying the foundation for the transformation that is taking place today.

Planning for the Fairmount Line

Service had just begun on the original Midland Railroad Line in 1855 when it was halted due to local concerns regarding the at-grade crossings and their effect on community structure and circulation. Remarkably, service started again in 1856 after the completion of 21 bridges, which eliminated all at-grade crossings. The line had 11 intermediate stations on a four-track right-of-way. It served the communities along the corridor and helped create opportunities for transit-supportive development long before anyone considered it fashionable. It has taken years to return to a point where that potential may once again be realized. Ironically, the line was also probably the first to use the term "rapid transit" (1881) since it provided continuous passenger service under several private operators until 1944 (see Figure 4D-34). Although passenger service ceased, freight rail operations continued on the line.

42 Aug. 21, 1881. **New York & New England Railroad**

Station in Boston, foot of Summer St. Ticket Office, 322 Washington St.

JAS. H. WILSON, *President*	Boston	O. M. SHEPPARD, *Supt. Trans. & E. Div.*	Boston	G.H.WILLIAMS, *Gen. Freight Agt.*,	Boston
J.W. PERKINS, *Secretary*	"	J. C. RAWN, *Division Supt.*	Hartford	A.C. KENDALL, *Gen Pass Agent*,	"
GEO B. PHIPPEN, *Treasurer*	"	L. W. PALMER, *Division Supt.*	Providence	A. G. TUTTLE, *Asst. G. F. A.*	Hartford
E. YOUNG, *Auditor*	"	P. St. M. ANDREWS, *Divison Supt.*	Norwich	Geo. W. LITTLE, *Paymaster*	Boston
F. H. SMITH, *Trav. Auditor*	"	G. E. BOYDEN, *Supt. M. P. & M*	Boston	W. W. McKIM, Purchasing Agent	"

RAPID TRANSIT TRAINS. Outward.

Boston to Hyde Park.

FRS	MLS	LEAVE	A.M.	A.M.	A.M.	A.M.	A.M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	SUNDAY			
$ C.		Boston.....	7 00	7 30	8 30	9 30	11 00	12 17	1 35	2 30	3 35	4 30	5 40	6 00	6 05	6 20	7 00	7 45	10 00	11 15	8 20	12 45	5 15	10 00
*20	3/4	South Boston.....	7 03	——	——	9 33	11 03	——	——	2 33	——	——	——	——	——	6 23	——	——	——	——	——	12 48	5 18	——
20	2 3/4	Dudley Street.....	7 08	7 37	8 37	9 38	11 08	12 23	1 41	2 38	3 42	4 37	5 46	——	6 12	6 28	7 07	7 52	10 07	11 23	8 27	12 53	5 23	10 07
20	3 1/2	Bird Street.....	7 10	7 39	8 39	9 40	11 10	12 25	1 43	2 40	3 44	4 39	5 48	——	6 14	6 30	7 09	7 54	10 09	11 25	8 29	12 55	5 25	10 09
25	4	Mt. Bowdoin.....	7 12	7 41	8 41	9 42	11 12	12 28	1 46	2 42	3 46	4 41	5 50	——	6 16	6 33	7 12	7 57	10 11	11 27	8 32	12 57	5 27	10 11
25	4 1/2	Harvard Street.....	7 14	7 43	8 43	9 44	11 14	12 30	1 48	2 44	3 48	4 43	5 52	——	6 18	6 35	7 14	7 59	10 13	11 29	8 34	12 59	5 29	10 13
25	5	Dorchester.....	7 16	7 45	8 45	9 46	11 16	12 32	1 50	2 46	3 50	4 45	5 54	——	6 20	6 37	7 16	8 01	10 15	11 31	8 36	1 01	5 31	10 15
30	6 1/4	Mattapan.....	7 20	7 49	8 49	9 50	11 20	12 35	1 54	2 50	3 53	4 49	5 57	6 12	6 23	6 41	7 19	8 05	10 19	11 35	8 39	1 04	5 34	10 19
30	7 1/4	River Street.....	7 22	7 51	8 51	9 52	11 22	12 38	1 56	2 52	3 55	4 51	6 00	6 14	——	6 44	7 22	8 08	10 22	11 37	8 42	1 07	5 37	10 22
30	8 1/4	Hyde Park.....	7 25	7 55	8 55	9 55	11 25	12 40	2 00	2 55	4 00	4 55	6 05	6 17	6 28	6 48	7 25	8 12	10 25	11 40	8 45	1 10	5 40	10 25
FRS	MLS	ARRIVE	A.M.	A.M.	A.M.	A.M.	A.M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	A. M.	P. M.	P. M.	P. M.

* A discount of 10 cts. From this tariff will be made when tickets are purchased at the offices.

Source: Boston: Fairmount/Indigo Line: Ernest Zupancic, Operations Specialist, HUD, and Noah Berger, Director of Planning and Program Development, FTA Region 1, PowerPoint presentation

Figure 4D-34 *First Use of Term "Rapid Transit"*

But passenger service was reenacted in 1979 to provide system relief during construction of the Southwest Corridor project. The Southwest Corridor project included rerouting the MBTA Orange Line through right-of-way that was originally to be used for the abandoned I-95 project. Trains destined for South Station were rerouted through Dorchester. Fortuitously, for the corridor's future, the infrastructure along the right-of-way was heavily upgraded to accommodate the renewed temporary service. At that time, due to a lack of stations between Fairmont in Hyde Park and South Station, residents along the line endured all of the negatives associated with renewed line service without receiving any of its benefits. However, the system upgrades associated with the reactivation would prove critical to the line's future.

With completion of the Southwest Corridor in 1987, most rail service was again reassigned to that corridor. In the 1990s, the Fairmount Line stopped only at three intermediate stations, had huge gaps between stations, and did not connect any of the key regional employment or retail centers. Local intervention helped preserve the line's future by pushing for and winning continued service with restored stations at Uphams Corner and Morton Street. Once again, the local benefits of this victory were not immediately realized, but they set the stage for the next and most important round of bottom-up planning.

The line, then known as the Fairmount Branch, was not providing many benefits to most of the communities it traversed, but it was still in existence—it had been upgraded and had unlimited potential. The local communities, having preserved the potential, took the opportunity to begin building a case to make the line an integral part of the corridor's future.

By the 1990s, the following factors were in place:

- The track and right-of-way were in place and in excellent condition.
- The line was double-tracked and had no grade crossings.
- The communities along the line were densely populated, underserved and transit-dependent (almost half of the residents within this corridor did not own an automobile).
- The communities were forward-thinking, already involved in redevelopment efforts, and willing to take the lead in the planning process.

For the neighborhoods along the line, it was more than a matter of realizing the potential of improved transit for development; it was having transit service that would, for the first time, meet the needs of the corridor's residents. Between the Readville Station and South Station, the line travels through portions of Boston's most densely-populated, predominantly working-class neighborhoods, which are beyond walking distance of MBTA's Red and Orange rapid transit lines, as well as other direct MBTA transit options. The corridor has a population of over 160,000. Many of the neighborhoods have large minority populations and

low-to-moderate per capita incomes. Residents abutting the line's right-of-way are highly dependent on public transit, and the routes serving the corridor in the early 1990s were among the most crowded in the system. A total of 29 percent of the households in the corridor did not own an automobile, and that number increases to 40 percent in the section between Uphams Corner and Morton Street. Trains run at 30-minute headways during rush hours, and 1-hour headways off-peak. There is no service on weekends.

The Indigo Vision

In the late 1990s, the Greater Four Corners Action Coalition (a group that works to promote neighborhood stabilization in the Four Corners community of Dorchester) and the MBTA Advisory Board began to champion a vision they called the Indigo, which was intended to turn the Fairmount Line into a rapid transit service system that would once again serve and benefit the communities it traversed. The Greater Four Corners Action Coalition, which was at the forefront of the grassroots movement, recognized the critical role the Fairmount Line could and should play in the revitalization of the communities, particularly around former as well as proposed stations. The Greater Four Corners Action Coalition and MBTA brought complementary perspectives to the process, one imparting sensitivity to community goals and character preservation, and the other having the transportation expertise to help develop a realistic vision. The vision called for the implementation of rapid transit-like service with shorter headways, new as well as upgraded stations at residential and commercial nodes, and fare integration consistent with the existing subway system.

The Indigo vision for the Fairmount Line had several compelling selling points:

- It could be implemented in stages.
- It had existing, usable infrastructure.
- It relied on an existing population that had proven it needed, and would use, transit.

While not inexpensive, the proposal had the ability to realize a real return on investment because it was an upgrade of an existing commuter line. Perhaps most importantly, it had communities that had already proven capable of directing the local planning process and building the types of successful projects needed to realize the new vision. One observer noted that this was not a new line, but a collection of fresh ideas that would fundamentally change the character and use of an existing line. The integrated land use and transit corridor plan that has evolved is a model of community-based urban planning.

By 2002, the Indigo vision for the Fairmount Line had begun to gain traction. MBTA responded to consistent community urging, led by four existing Community Development Corporations (CDCs) and political leadership, by

conducting a 14-month-long feasibility study, the first step toward realizing the corridor's potential. The study described the existing conditions along the Fairmount Line and identified a combination of upgrades to the existing infrastructure that would be needed to bring the line up to a "State of Good Repair." Identified upgrades included rehabilitation of the Uphams Corner and Morton Street Stations, reconstruction of bridges (Columbia Road, Quincy Street, Massachusetts Avenue, Talbot Avenue, Woodrow Avenue, and the Neponset River bridge), and construction of a new interlocking and upgraded signal system. The study concluded that ridership and revenue on the Fairmount Line would be greatly increased with the construction of four new commuter stations at Newmarket, Four Corners, Talbot Avenue, and Blue Hill Avenue. Additionally, the study indicated that improvements to the line would relieve overcrowding and help other service issues associated with bus service in the area. (There is no direct bus service to downtown Boston, and buses that provide service to the Red and Orange rapid transit lines are overcrowded and run on a congested roadway system). MBTA followed up the Fairmount Line Feasibility Study with the Fairmount Corridor Improvements Project, Needs Assessment in 2004, which proposed a conceptual improvement plan for the corridor.

MBTA's proposed Fairmount Line improvements were outlined in two phases. Phase 1 (referred to as the "State of Good Repair" phase) began in 2004 and consisted of three elements:

- Modernization/accessibility improvements to two existing stations—Uphams Corner and Morton Street
- Installation of a new universal interlocking and upgrades to the existing signal system that would allow single track operations
- Painting/repairs to bridge infrastructure

Phase 1 work was completed in 2007 at a cost of $39M obtained from MBTA bond and FTA 5309 Fixed Guideway funds. Phase 2 (which began in 2011) includes expansion/major construction elements centered on the addition of four new stations in the Dorchester and Mattapan neighborhoods and replacement of six major bridges at Columbia Road, Massachusetts Avenue, Quincy Street, Talbot Avenue, Woodrow Avenue, and Neponset River. Phase 2 is estimated to be completed in 2013 at a cost of $143M, the source of which is predominantly the Commonwealth/MassDOT and MBTA formula-funded bridge program. The contracts for three of the four new stations have been awarded; the fourth is delayed while MBTA resolves neighborhood issues and opposition raised during the design process.

The Indigo vision includes rapid transit-like service with high frequency headways and additional stations beyond the four aforementioned proposed new stations.

The vision could be categorized as a long-term goal since the existing commuter rail vehicles and system capacity restraints, even after the completion of Phase 2, would not make the level of service envisioned feasible. Although not in disagreement with the long-term goals of the Indigo vision, MBTA is currently focusing on the near-term commitments to the line and anticipates a significant marketing/rebranding effort to increase ridership at the completion of Phase 2. At this time, MBTA does not want to create unreasonable expectations related to a more rapid transit-like service.

Planning for Transit-Supportive Development—A Bottom-Up Approach

The Fairmount Line corridor is served by the following Community Development Corporations:

- Dorchester Bay Economic Development Corporation
- Codman Square Neighborhood Development Corporation
- Mattapan Community Development Corporation
- Southwest Boston Community Development Corporation

Collectively, these CDCs comprise the Fairmount/Indigo Line Coalition. The CDCs have practiced a practical form of planning, concentrating on projects that are feasible and will mesh with the communities they serve. The CDCs only move forward with plans and projects after substantial community input. For the Indigo Vision, they took a more comprehensive and long-range approach. Together, they created a blueprint fusing the CDC plans developed for the existing and proposed station neighborhoods within their purview. "Boston's Newest Smart Growth Corridor, A Collaborative Vision for the Fairmount/Indigo Line" (February 2006) outlines a strategy for completed, ongoing, and proposed projects to work cohesively in defining each transit station area's mixed-use character, and how best to realize each station area's potential. The completed, ongoing, and proposed projects include the construction and/or rehabilitation of multifamily residential units, construction of community centers, redevelopment of vacant lots, and reuse of warehouse and brownfield sites. The projects are critical in supporting the effort to maintain the manufacturing element that has always existed in the communities, to reinvest in neighborhood centers and squares, and to appropriately place retail and employment centers. This award-winning plan (American Institute of Architects and American Planning Association) represents a common theme vision and has provided a brand for the corridor as "Boston's Newest Smart Growth Corridor."

The Commonwealth of Massachusetts Office of Commonwealth Development announced in May 2005 that its regional transportation plan would include a program of four new Fairmount Line stations: Four Corners/Geneva, Talbot Avenue, Blue Hill Avenue, and Newmarket.

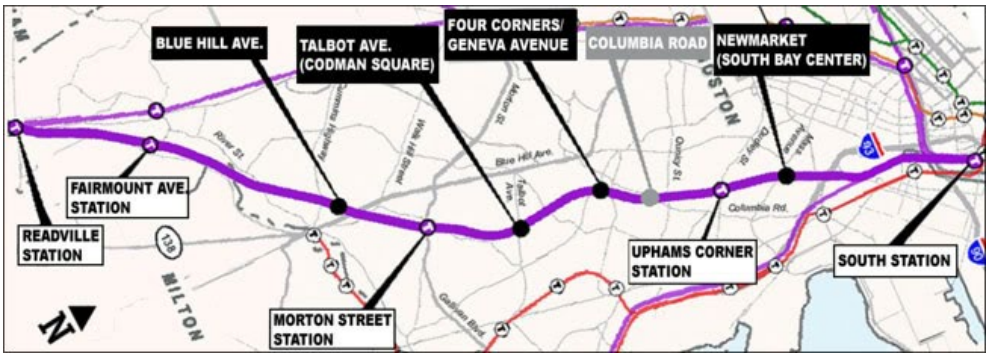
Most impressively, the CDCs consider the corridor a combination of compatible uses and activity centers that should be built upon and expanded while respecting existing community character. The CDCs have planned and constructed projects that reinforce the vision plan and have identified potential parcels where future redevelopment would reinforce the vision of each transit station neighborhood. Through their planning efforts, the CDCs have galvanized the area, created a feeling of success, and attracted funding from all of the major federal agencies now involved in the Partnership for Sustainable Communities (HUD, EPA and FTA). Largely as a result of the CDCs perseverance and demonstration of collaborative planning, the Fairmount/Indigo Line was selected for a Sustainable Communities Pilot Program award. Not only did local communities, represented by the various CDCs, drive the planning process, they took the lead in assembling the pieces necessary to implement a plan and realize a vision.

Fairmount Station Neighborhoods and Transit-Supportive Development

In addition to its terminus at the South Station, the Fairmount Line currently has four stations: Readville, Fairmount, Morton Street, and Uphams Corner. Four new stations are proposed: Four Corners/Geneva, Talbot Avenue, Blue Hill Avenue, and Newmarket (see Figure 4D-35).

Figure 4D-35

Proposed Fairmount Line Stations



Source: Fairmount Corridor Improvements Project, Needs Assessment Executive Summary, June 2004

The Four Corners/Geneva commuter rail station will be located between Washington Street and Geneva Avenue approximately 3.5 miles from South Station in the Dorchester area of Boston. Construction commenced in January 2010 and is expected to be completed by September 2012. Also in the Dorchester area is the Talbot Avenue Station, located approximately 6 blocks from the Codman Square business district. Construction commenced in November 2010 and is expected to be completed by January 2013. Newmarket Station is being constructed next to the South Bay Shopping Center in the Roxbury area. Construction began in January 2011 and is expected to be completed by February 2013. The Blue Hill Avenue Station in the Mattapan section of Boston will be located between the Blue Hill Avenue and Cummins Highway overpasses.

"Boston's Newest Smart Growth Corridor, A Collaborative Vision for the Fairmount/ Indigo Line" (February 2006) viewed the redevelopment/development potential of each of the existing and proposed Fairmount Line stations in a different way:

- Upham's Corner: transit-oriented, mixed-use development at a commercial center
- Morton Street: transit-oriented, compact housing and retail on a large site
- Fairmount: reclamation of brownfield sites near the station
- Readville: creation of a new neighborhood in an underused industrial corridor Newmarket: a center for jobs and services with mixed-use development
- Four Corners: mixed-use redevelopment to support the new station as the centerpiece of the neighborhood
- Talbot Avenue: completing a neighborhood with homes and service retail
- Blue Hill: mixed use and diverse redevelopment

With the exception of the existing Readville Station and the proposed Newmarket Station, the neighborhood stations (existing, under construction and proposed) share a similar urban form. The land-use mix is predominantly residential with a commercial/retail arterial in close proximity, with some light industrial uses. Many of these transit station neighborhoods have had multi-family housing rehabilitation and infill developments, completed by various CDCs, within a short distance of the existing or proposed station areas. These neighborhoods have the potential for transit-supportive developments since there are many existing vacant lots and underused structures.

The proposed Newmarket Station area has a different character, since it is predominantly big-box retail and light industrial, with residential uses existing on the fringe areas. In fact, it comprises the largest industrial area within Boston. The concentration of commercial, retail, and light industrial uses provides the station neighborhood with the potential to be the largest employment center stop on the Fairmount Line. Readville Station, the southern terminus of the Fairmount Line, is predominantly industrial and residential, with underused park-and-ride lots. The Franklin commuter rail Line and Northeast Corridor rail line lie immediately west of this station. Although the Readville Station is a little more remote than the others, a number of vacant lots in the immediate area provide an opportunity for residential and mixed-use development.

Uphams Corner Station

Uphams Corner Station, an existing Fairmount Line station in the Dorchester section of Boston, has achieved notable transit-supportive development success. This station, long in disrepair, was rehabilitated by the MBTA to be more functional, accessible, attractive, and convenient for users. Upgrades were completed in 2007.

The area within ¼ mile of the transit station has the potential for 300–400 new housing units and 40,000 SF of new or renovated commercial space, including the vacant Leon Building, which is immediately adjacent to the train station. A commercial/retail area along Columbia Road is within walking distance east of the station.

Concurrent with the station rehabilitation, a number of projects were either underway or had been completed that supported a transit-oriented, mixed-use station neighborhood. Two of these projects are Dudley Village and the Ray and Joan Kroc Community Center.

Dudley Village, located within ¼ mile of the rail station, is a 50-unit affordable rental housing project that includes approximately 6,260 SF of commercial space. Located on Dudley Street, the development includes five buildings constructed on public and private land. Twenty-four units are contained in Dudley Village North and 26 are in Dudley Village South (see Figure 4D-36).

Figure 4D-36

Dudley Village

Source: Courtesy of Dorchester Bay EDC

The Ray and Joan Kroc Community Center is a 90,000 SF community center on a 6.5-acre site. It includes an education center, worship and performing arts center, aquatic center, gymnasium, outdoor plaza and play park, and a multi-sport athletic field (see Figure 4D-37).

Figure 4D-37

Ray and Joan Kroc Community Center

Source: Courtesy of Dorchester Bay EDC

Blue Hill Station

In anticipation of the new Fairmount Line station at Blue Hill Avenue and in conjunction with the Boston Redevelopment Authority's (BRA) Mattapan Economic Development Initiative (MEDI Plan), BRA created "Gateway Districts" and "Residential Incentives" within Article 60 of the Boston Zoning Code. Both the Gateway Districts and the Residential Incentives promote the height and density and residential development incentives that encourage mixed-use development in designated subdistrict areas.

Two Gateway Districts include the Cummings Highway Gateway Area and the Mattapan Gateway Area. The Cummings Highway Gateway Area is located along Cummings Highway extending north to the MBTA Fairmount line tracks and south to Regis Road. The Mattapan Gateway Area is located within the shopping subdistrict along the Blue Hill Avenue, the east side limits are Landor Road and Frontenac Street and the west side limits are Deering Road and Rhoades Street. The zoning regulations allow these two areas to construct buildings that will serve as distinct visual cues that denote the entrance to the commercial areas of Mattapan. Projects within the areas that are larger than 50,000 SF in size must comply with "Large Project Review—80B" and can have a maximum height of 55 ft and a FAR of 4. Residential Development Bonuses include:

- Residential Height and FAR Bonus—Any Proposed Project in which (a) more than 50 percent of the Gross Floor Area included, without taking into account any additional Gross Floor Area permitted pursuant to this section, is devoted to Residential Uses, and (b) no less than 15 percent of all Dwelling Units

included qualify as Affordable Housing, shall be permitted an increase in the allowed Building Height of 10 feet, and an increase in the allowed FAR of 0.5, provided that any increase in Gross Floor Area resulting from the application of this section shall be allocated to Residential Uses.

- Additional Affordable Housing Bonus—Any Proposed Project in which (a) more than 50 percent of the Gross Floor Area included, without taking into account any additional Gross Floor Area permitted pursuant to this section, is devoted to Residential Uses, and (b) no less than 5 percent of any Dwelling Units included qualify as Affordable Housing, shall be permitted an FAR bonus of up to .25, provided that any increase in Gross Floor Area resulting from the application of this section shall be allocated to Residential Uses.

Conclusion

Although the zoning code applicable to Mattapan is the only zoning along the Fairmount line corridor that encourages transit-supportive development, the Boston Redevelopment Authority anticipates similar land use regulation in the vicinity of the other existing and proposed stations. In reality, zoning controls have never been the key to development in this corridor. The CDCs have proven that working projects through a community-based planning process results in projects that are compatible with and supported by the local neighborhoods. Together, the CDCs have preserved or built 1,500 units of affordable housing and over 700,000 SF of commercial space. Using the same approach with the additional support of transit, the CDCs plan to add 15,000 units of affordable housing in the corridor in the years ahead.

The fact that the Fairmount line even exists is a remarkable credit to community spirit and perseverance. It has a long way to go to fully meet the needs of the communities it serves, including reaching a level of service that makes the line a realistic option. However, since so many hurdles have been overcome, it is not hard to believe that this small line will ultimately be a major national success. The Fairmount/Indigo Line story differs from the other corridors reviewed in this Guide in one significant respect—the communities along the corridor used the prospect of transit development to save a line and build a compelling story for better service.

Lessons Learned

Communities need to look beyond the boundaries of their own neighborhoods and focus on the big picture. The Fairmount/Indigo Line plan, through a coordinated effort, examined the entire corridor and highlighted the potential of a variety of different land use and neighborhood types with the ultimate goal of extending service and benefits corridor wide.

A development-based plan greatly increases a community's influence and ability to motivate others to action. The Fairmount/Indigo Line plan builds on projects that the CDCs had developed or intend to develop as part of their community-wide redevelopment plans.

CDCs with the ability to purchase and redevelop properties is critical. The ability of the four CDCs to buy property and develop projects in the vicinity of the existing and proposed train stations created the foundation for guided development. Such development is consistent with the neighborhood and serves to preserve its character, while achieving transit-supportive development goals. This context-sensitive approach was key in garnering community support of the Fairmount/Indigo vision, and has made other stakeholders more sensitive to the individual community perspectives.

CDCs can play an important role in dealing with the issue of gentrification faced by many communities encouraging transit-supportive development. With proper planning and continuous community involvement, development can ensure opportunities for a wide and diverse range of citizens.

Transit level of service matters to riders and investors. Having service itself is critical—and the appropriate level of service can make the long range vision for the corridor a reality, and provide the certainty needed to attract developers.

Major capital investments can create the type of critical mass that encourages transit-supportive development. As community leaders on the Fairmount line point out, a continuous effort has to be made to guarantee that the services and amenities offered by public sector investments (i.e., community centers) can be enjoyed and afforded by those in the neighborhood.

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Zupancic, E., HUD, and Berger, N. "Boston: Fairmount/Indigo Line," presentation.

Corridor Data: Fairmount Line

Transit Operator:	MBCR - Massachusetts Bay Commuter Railroad Company
Transit System Name:	MBTA - Massachusetts Bay Transportation Authority
Transit Corridor Name:	Fairmount Line
Transit Mode:	Commuter Rail
Location (Metro Area):	Boston, MA
Region (USA):	Northeast
Date Open:	Passenger Service Resumed by MBTA 1979
Corridor Length:	9.2 miles
Corridor Purpose:	Inter-Urban Commuter
# of Municipalities Served:	1
# of Stations Served:	5
Construction Sequence:	NA
Alignment Description:	Double track, heavy residential and commercial development, no grade crossings, carries revenue service and deadhead trains to and from maintenance and storage facility, occasional freight traffic. May be used as alternate route for Franklin and Providence Lines during service disruptions.
Operating Speed (Max.):	60 mph
Operating Speed (Avg.):	*Approximately 20-22 mph
Car Capacity:	Coaches carry 117 (single level) or 180 (bi-level). Trainsets have 5-8 coaches.
Peak Service Headway:	Ranges from approximately 27 min. to 53 min.
Projected Ridership:	NA
Ridership (entire line):	Current ridership is approximately 1,000 daily boardings, all trains, both directions
Funding:	Unavailable

*Average speed estimated by distance/time
SOURCE: MBTA (transit agency), unless otherwise noted

October 2010

Station Area Data: Fairmount Line

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	South Station	Boston, MA	1979	Red and Silver Lines	N/A	Urban	At Grade	START	Mixed use predominantly downtown commercial.	Unavailable	Unavailable	N/A	N/A	Boston Common; Back Bay; Chinatown; Boston Aquarium; Faneuil Hall Marketplace
2	Upham	Boston, MA	1979	NONE	N/A	Urban	Above Grade	2.5 Miles	Mixed use predominantly residential with commercial and retail along major thoroughfares. Some industrial uses and parks.	Unavailable	Unavailable	N/A	Dorchester Bay Rentals; Dudley Village; Alexander-Magnolia Cooperative; Ray and Joan Kroc Community Center	Umass - Boston; Strand Theatre; South Bay Center; New Market Wholesale Area
3	Morton	Boston, MA	1979	NONE	Surface	Urban	Below Grade	2.75 Miles	Mixed use predominantly residential with commercial and retail along major thoroughfares. Some industrial uses and parks.	Unavailable	Unavailable	N/A	N/A	N/A
4	Fairmount	Boston, MA	1979	NONE	N/A	Urban	Below Grade	2.5 Miles	Mixed use predominantly residential with commercial and retail along major thoroughfares. Some industrial uses and parks	Unavailable	Unavailable	N/A	N/A	N/A
5	Readville	Boston, MA	1979	Northeast Corridor; Franklin Commuter Rail Line	Surface	Urban	Above Grade	1.25 Miless	Mixed use predominantly residential with commercial and retail along major thoroughfares. Some industrial uses and parks	Unavailable	Unavailable	N/A	N/A	N/A

NOTES:
* Dedicated to transit riders
** All distances are measured "as the crow flies" and are rounded up to the nearest 1/4 mile
*** Within 1/4 mile of transit station (source: Google Earth)

SOURCES:
1 Massachusetts Bay Transportation Authority (MBTA)
2 Dorchester Bay Economic Development Corporation

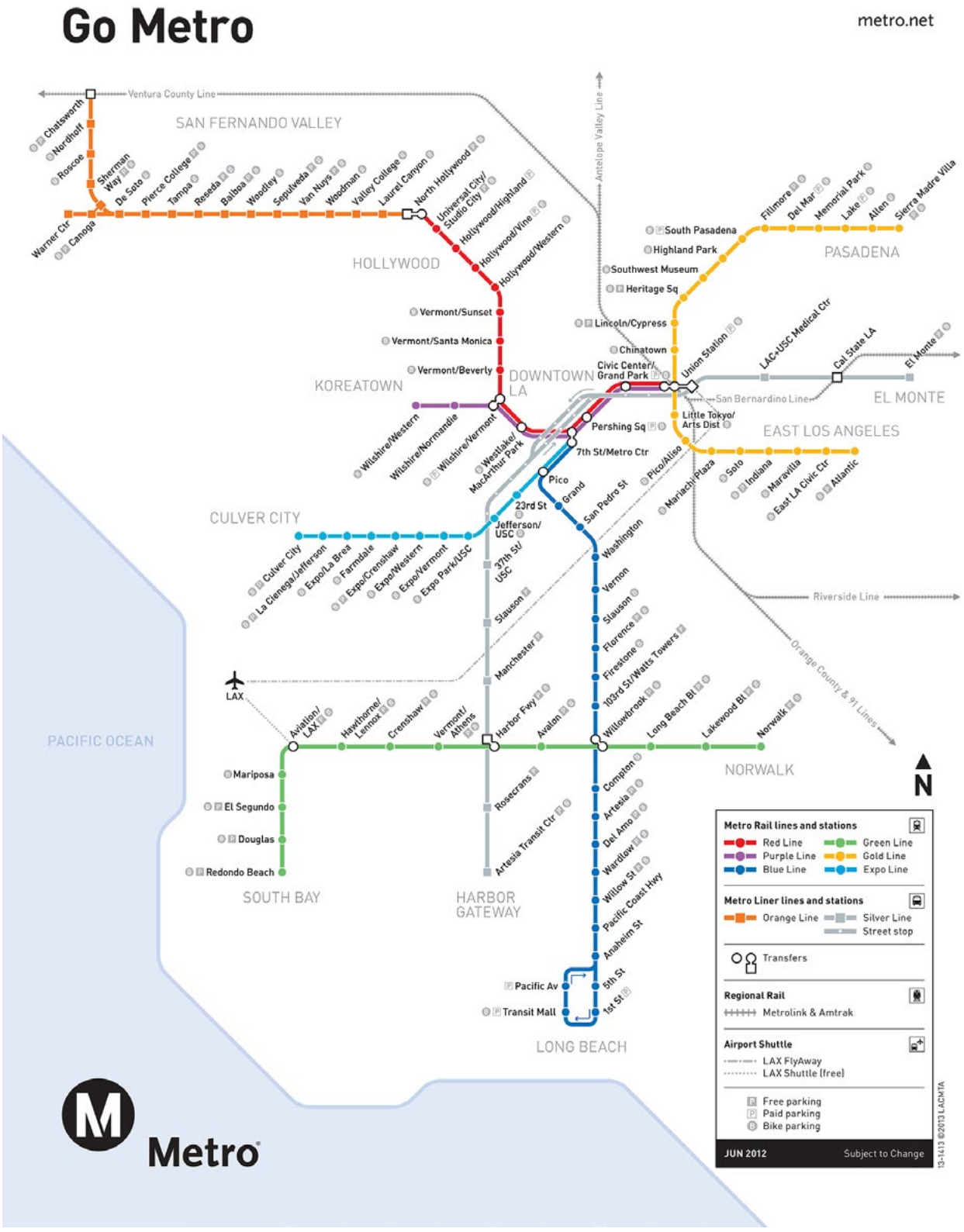
October 2010

Los Angeles County Metro Rail, The Gold Line, Los Angeles, South Pasadena, and Pasadena, CA

The Metro Rail system (see Figure 4D-38) serving Los Angeles County, California, opened in 1990 and is operated by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The system includes two heavy rail subway lines and three light rail lines. The Metro Red Line and the Metro Purple Line are the subways that connect Downtown Los Angeles with North Hollywood and Koreatown/Mid-Wilshire, respectively. The three light rail lines are the Metro Blue Line (Downtown Los Angeles to Downtown Long Beach), the Metro Green Line (Redondo Beach and Norwalk), and the Metro Gold Line (East Los Angeles and Pasadena). Planning for the Gold Line and for transit-supportive development at Gold Line station neighborhoods is the subject of this section.

Metro Case Facts

System Name:	Metro
Corridor Name:	Gold Line
Transit Mode:	Light Rail (LRT)
Location:	Los Angeles
Region (USA):	Southwest
Corridor Length:	13.7 miles
Corridor Purpose:	Inter-Urban Commuter
Municipalities Served:	3
Cost and Funding Sources:	Cost: $859M (federal NA, state and local $859M)
Date Opened:	July 26, 2003



Source: http://www.metro.net/riding_metro/maps/images/rail_map.gif

Figure 4D-38 *Los Angeles County Metro Rail System*

Planning for the Los Angeles County Metro Rail System

Los Angeles has a long history of planning for more concentrated development patterns served by transit. As first mentioned in the Concept for Los Angeles General Plan of 1970, authored by Planning Director Calvin Hamilton, finding ways to concentrate development and connect the evolving development centers with rapid transit was a key planning topic. Ten years later, the Los Angeles County Plan of 1980 made a similar argument in favor of connecting concentrated development clusters with transit. By that time, gains in public support had already led to positive steps for transit system development.

A series of ballot propositions were approved by the voters to establish a funding mechanism for the Metro Rail system. In 1980, county voters approved "Prop A," which permitted a ½-cent sales tax increase and generated $675M. In 1990, "Prop C" permitted another ½-cent sales tax increase, adding $760M. Additionally, in 1990, Proposition 108 (Passenger Rail and Clean Air Bond Act of 1990) provided for a bond issue of $1B for right-of-way acquisition and capital expenditures for the rail system. It should be noted that in the early 1980s, the Los Angeles County Transportation Commission (LACTC) began purchasing non-operating freight railroad rights-of-way, with the hope of eventually using them for a new public rail system reflective of the 1980 county plan. (These purchases did not include the right-of-way for the Gold Line.)

Planning was followed by action. In 1993, the State of California created the Los Angeles County Metropolitan Transportation Authority (LACMTA) by merging the two main organizations involved in transit planning at that time—the Southern California Regional Transit District (RTD) and the LACTC. Prior to the merge, RTD had been responsible for planning and constructing the subway system (Red Line) that opened in 1993, and LACTC had similar responsibilities for the light rail line (Blue Line), which opened in 1990.

The Gold Line

Opened in July 2003, the original segment of the Gold Line runs for 13.7 miles from Union Station in Downtown Los Angeles to Sierra Madre Villa Station in Pasadena (see Appendix Gold Line-A for detailed information regarding the Gold Line). This light rail system connects three municipalities—Los Angeles, South Pasadena, and Pasadena—and has 13 stations (see Figure 4D-39) (see detailed information at the end of this section regarding the Gold Line stations). The Gold Line can be characterized as an inter-urban commuter line, although Downtown Los Angeles and Downtown Pasadena are major destinations for the route.

Figure 4D-39 *Gold Line Corridor Station Locations*

Planning for the Gold Line

Originally, the Gold Line was envisioned as an extension of the Blue Line, which connects Downtown Los Angeles to Downtown Long Beach. It had been identified on rail maps as a desirable corridor since the 1980s. During the EIS process, several alternative alignments were considered. The one selected followed the right-of-way of an existing combined freight and passenger rail line formerly operated by the Atchison, Topeka and Santa Fe Railroad. The line, at the time of its selection, was still being used by Amtrak as an infrequent passenger rail and more frequent freight line. A key decision was to determine if continued passenger rail or light rail was the right mode for future service. Ultimately, light rail was chosen, with a planned construction completion date of 1997.

LACTC planned to begin construction of the Pasadena Blue Line (the original name of the Gold Line) in 1994. However, cost overruns and other complications resulted in delay of the project's construction. Frustrated by the lack of progress, the communities to be served by the line began a concerted push to make it a reality. Representatives of the San Gabriel Valley Council of Governments and the cities of Pasadena, South Pasadena, and Los Angeles formed a coalition, which worked with Senator Adam Smith to pass legislation. In 1998, California State legislation created the Pasadena Blue Line Construction Authority, an entity independent from the MTA, with responsibility for overseeing the completion of the light rail line from Downtown Los Angeles to Pasadena. The impetus was to create a low-overhead authority, which could take the funds already programmed for the line (approximately $800M), and, through efficiencies, make up for the shortfall projected at $123M. The communities, working in concert with the Council of Governments and a newly created Construction Authority, made the project a reality. The confidence generated by the creation of the Construction Authority, and the commitment to finish construction, was a credit to community coordination and cooperation. Construction of the Gold Line began again in 2000, and was completed with service commencing in 2003.

Planning and Implementing Transit-Supportive Development

Planning for transit-supportive development along the Gold Line corridor has been both proactive and reactive. Today, all of the agencies involved along the corridor strongly support planning that encourages and enables transit-supportive development, and the results can be increasingly seen with the subsequent extensions of the Gold Line. However, like the construction of the line, successful planning for transit-supportive development can be attributed to the early leadership of the corridor's three communities. Pasadena, South Pasadena, and Los Angeles were well prepared when it came to putting

together a cohesive, comprehensive, and logical plan to maximize the potential of the Gold Line.

Before the construction of the new transit line began, the three communities involved had developed specific plans (see Figure 4D-40) for many of the proposed station areas. The detail in the plans, the degree to which they reflected the neighborhoods involved, and the extent to which they encouraged transit-supportive development is remarkable. While the approach taken by all three communities was similar, the plans varied in their level of detail and commitment of resources.

General Plan

California law requires every city and county to prepare and adopt a comprehensive, long-range General Plan to provide the overall framework for expressing broad community values and expectations into specific strategies. The General Plan must identify issues and provide policies for seven broad areas, called "elements"—land use, mobility, housing, green space, conservation, noise, and safety.

Specific Plan

Under California Law (Government Code Section 65450 et. seq.), a city or county may use a specific plan to develop detailed regulations, programs, and/or legislation to implement its adopted general plan for a specific area with the local jurisdiction. It can combine zoning regulations and other regulatory mechanisms into one document, tailored to the particular needs of the area.

Source: http://www.metro.net/riding_metro/maps/images/rail_map.pdf and Van Meter, Williams, Pollack, LLP

Figure 4D-40 *Station Area Specific Plans*

The City of Pasadena

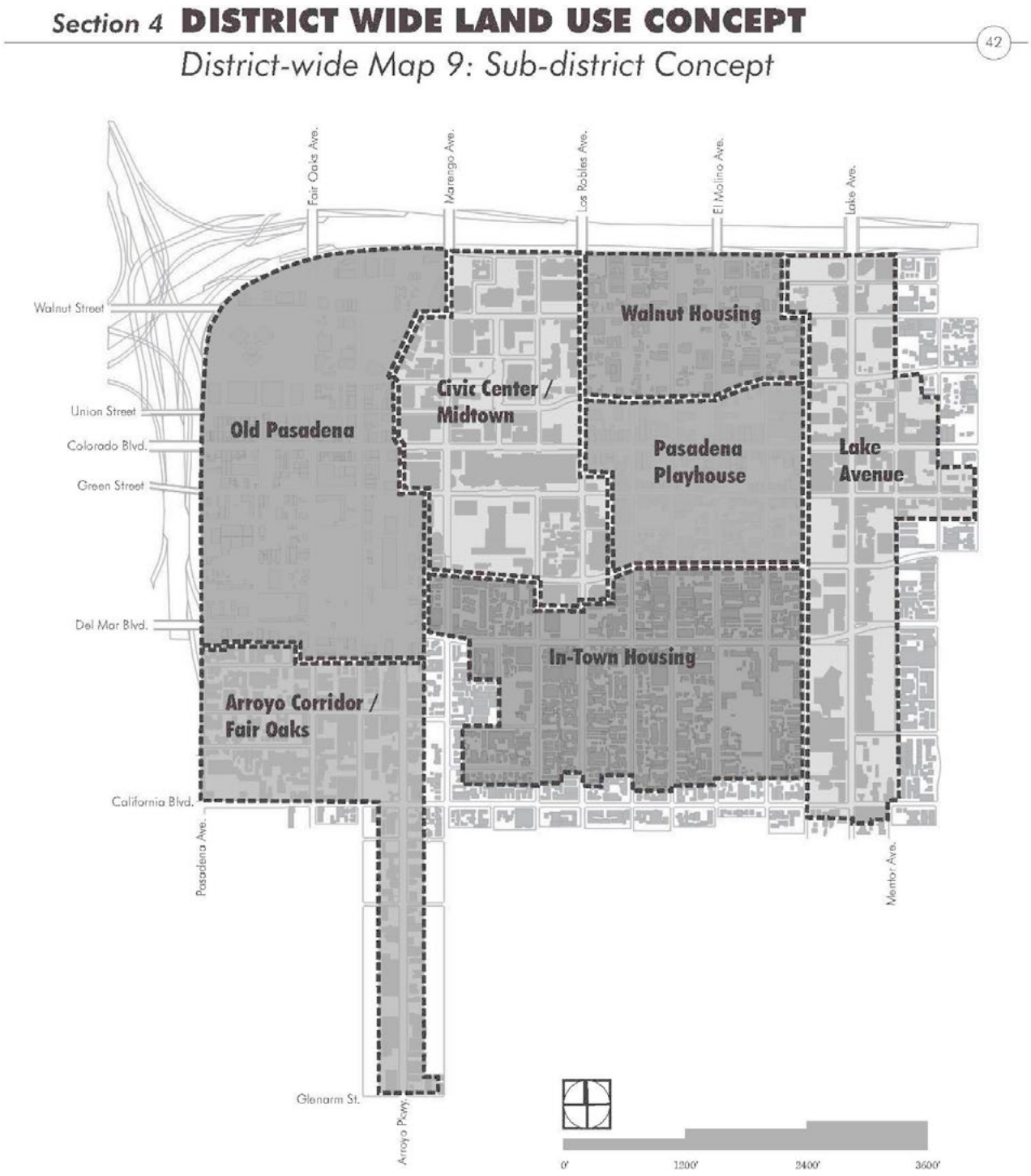
The City of Pasadena was forward-thinking in realizing the potential of the Gold Line. In the early 1990s, while the line was still on the transit agency's back burner, Pasadena was in the midst of updating its General Plan. At the time there was considerable discussion regarding the potential for, and extent of, growth and the impact a rail line could or would make regarding traffic, mobility, and density. The city decided that specific plans were needed for each of the proposed station areas in order to encourage transit-supportive development and build upon the attributes of each neighborhood. The 1994 Land Use Element of the General Plan required preparation of seven Specific Plans, with the purpose of directing new development to areas along major corridors and adjacent to the proposed Pasadena Blue Line light rail stations. Development of these plans at an early stage was a clear acknowledgement that station areas could benefit from different approaches to fully maximize their potential. Each of Pasadena's six stations is included within one of three Specific Plans:

- East Pasadena Specific Plan (for more information, see http://www.ci.pasadena.ca.us/Planning/CommunityPlanning/East_Pasadena_Specific_Plan/)
- East Colorado Specific Plan (for more information, see http://www.cityofpasadena.net/Planning/CommunityPlanning/East_Colorado_Specific_Plan/)
- Central District Specific Plan (for more information, see http://www.cityofpasadena.net/Planning/Central_District_Specific_Plan/)

To prepare the Specific Plans, each station area was subjected to a detailed analysis, which included existing land use, key characteristics, market potential, mobility, environmental considerations, and the potential to support compatible new development, infill and/or redevelopment. Each plan considers the immediate station area and the sub areas, or distinctive neighborhoods in, or adjacent to, the station areas.

The Central District Specific Plan

The Central District Specific Plan, which covers four of the station areas, is provided as an example of how local-area planning can enable and encourage transit-supportive development. Promoting transit use is one of the many objectives outlined in the Central District Specific Plan. Specifically, the objective indicates that regional transit will be supported by transit-oriented development near light rail stations. The Central District was divided into seven sub-districts (see Figure 4D-41). The Specific Plan and Sub-district Plans included a detailed list of the steps needed for implementation. The Sub-district Plans were developed for the neighborhoods and by the neighborhoods, since each was subjected to extensive community outreach and input.



Source: http://ww2.cityofpasadena.net/planning/deptorg/commplng/GenPlan/centdis.asp

Figure 4D-41 *Sub-District Concept Map*

Recognizing that the character of sub-districts overlapped, six of the sub-districts were further divided into precincts (see Figure 4D-42).

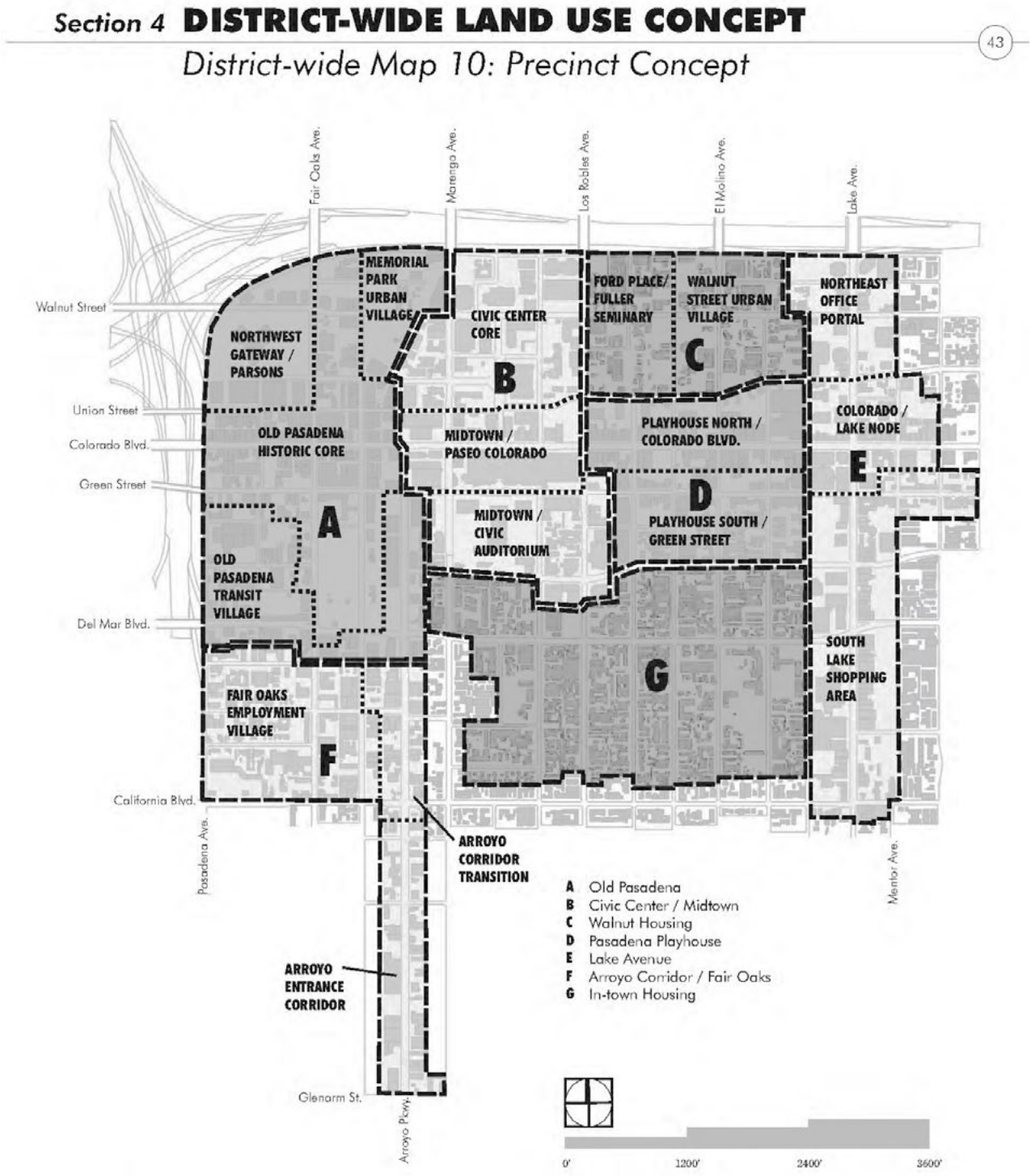
Each neighborhood was studied in depth, which included consideration of its character, the types of land uses that would/should be encouraged to retain its character, its relationship to adjacent sub-districts, and its proximity to proposed rail stations (see Figure 4D-43). As a result, in some areas residential development was discouraged in order to accentuate commercial, retail, and office uses; and in others it was encouraged at a variety of densities to fit existing trends and/or to encourage higher densities in station areas.

The Central District Specific Plan recommended streetscape beautification (and the public improvements required to realize them), land use, and development standards required to realize the area's potential. Development-intensity standards were specific in terms of density, height, and parking. Higher densities, heights, and lower parking requirements were specifically recommended for transit nodes. The recommendations called for changes that were consistent with the existing fabric of the affected neighborhoods (see Figure 4D-44).

The Central District Specific Plan and the Sub-district Plans included a detailed list of the steps needed for implementation, including use and density provisions to support the future vision. For example, residential density was controlled in three ways—use, FAR, and du/acre (see Figure 4D-45). In addition, a 10 percent density bonus provision was available for projects that could demonstrate how increased density would make the project more economically feasible, have no negative impacts on adjacent areas, create a superior design, and be consistent with the plan's objectives.

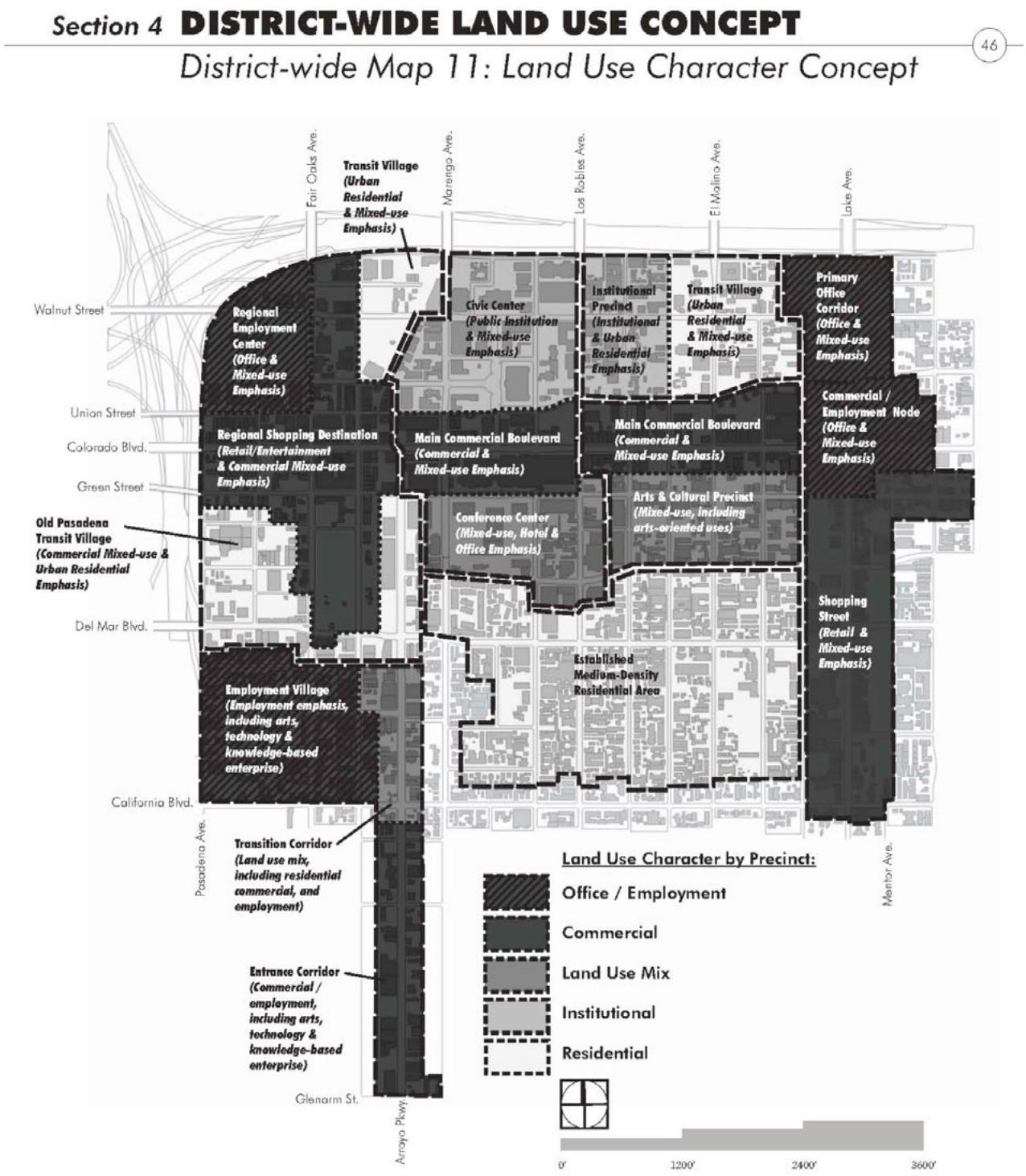
In practice, many of the larger projects have applied for the bonus. However, a number of the highest-density projects preceded adoption of the formal regulations and were approved by variance during a time when projects were being evaluated on a case-by-case basis. For the most part, the regulations have accomplished their purpose. They have withstood the test of time and have not substantially changed the character of the neighborhoods. It is difficult to accurately determine how the density provisions actually changed projects, because during the economic downturn of the 1990s, only 1,100 units were built in all of Pasadena. One-third of those were included in the Holly Street project, which was subsidized by the city to jump-start housing construction and encourage development around the anticipated rail stations.

The City of Pasadena has not relied solely on station area plans to encourage and complement development. It has also used Business Improvement Districts (BIDs), emphasized special neighborhood designations (e.g., Old Pasadena, Playhouse, Civic Center, South Lake) that build upon the key attributes of neighborhoods, and targeted investment in a few key projects, which have become cornerstones for additional development (see Figure 4D-45).



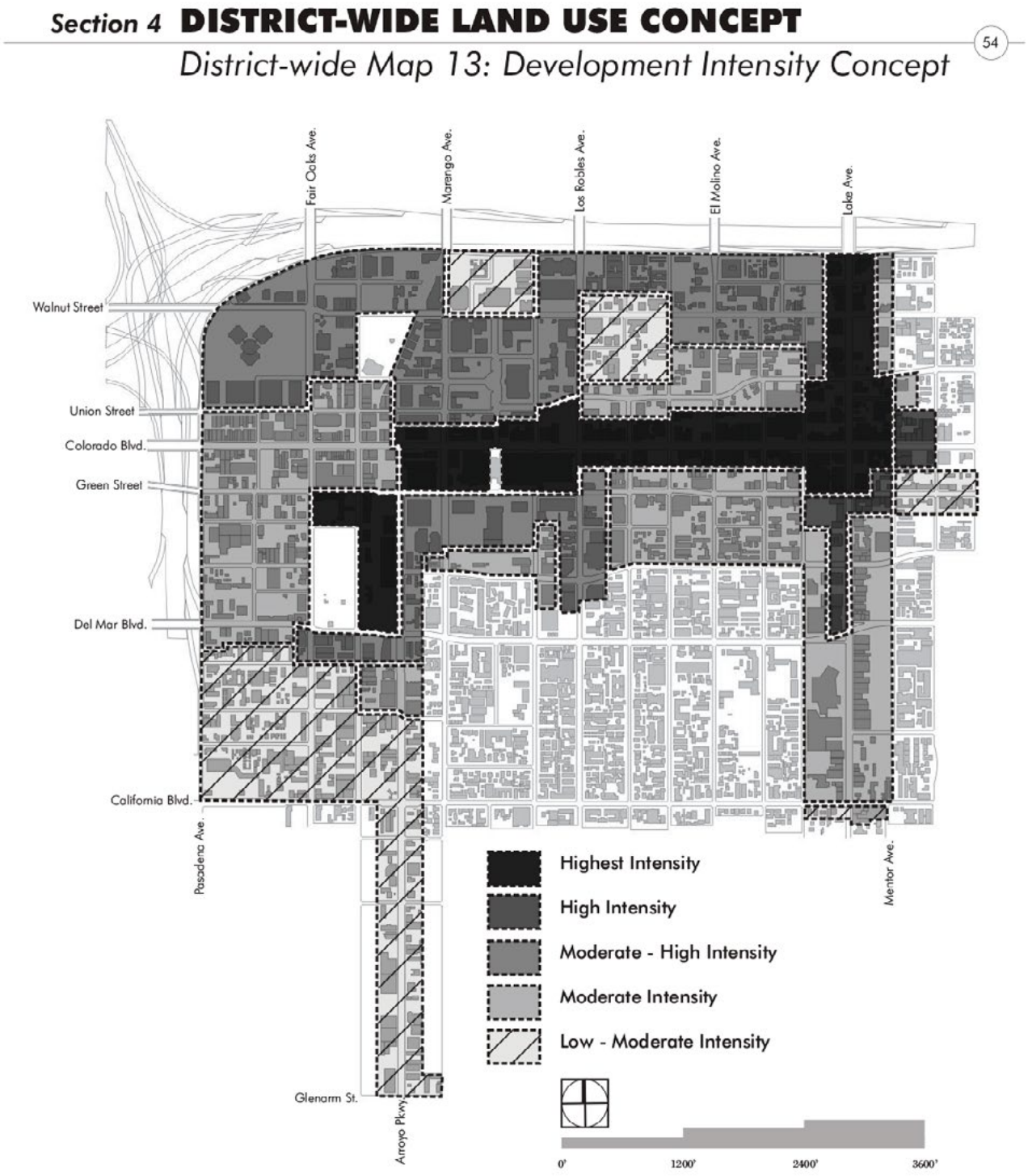
Source: http://ww2.cityofpasadena.net/planning/deptorg/commplng/GenPlan/centdis.asp

Figure 4D-42 *Precinct Map*



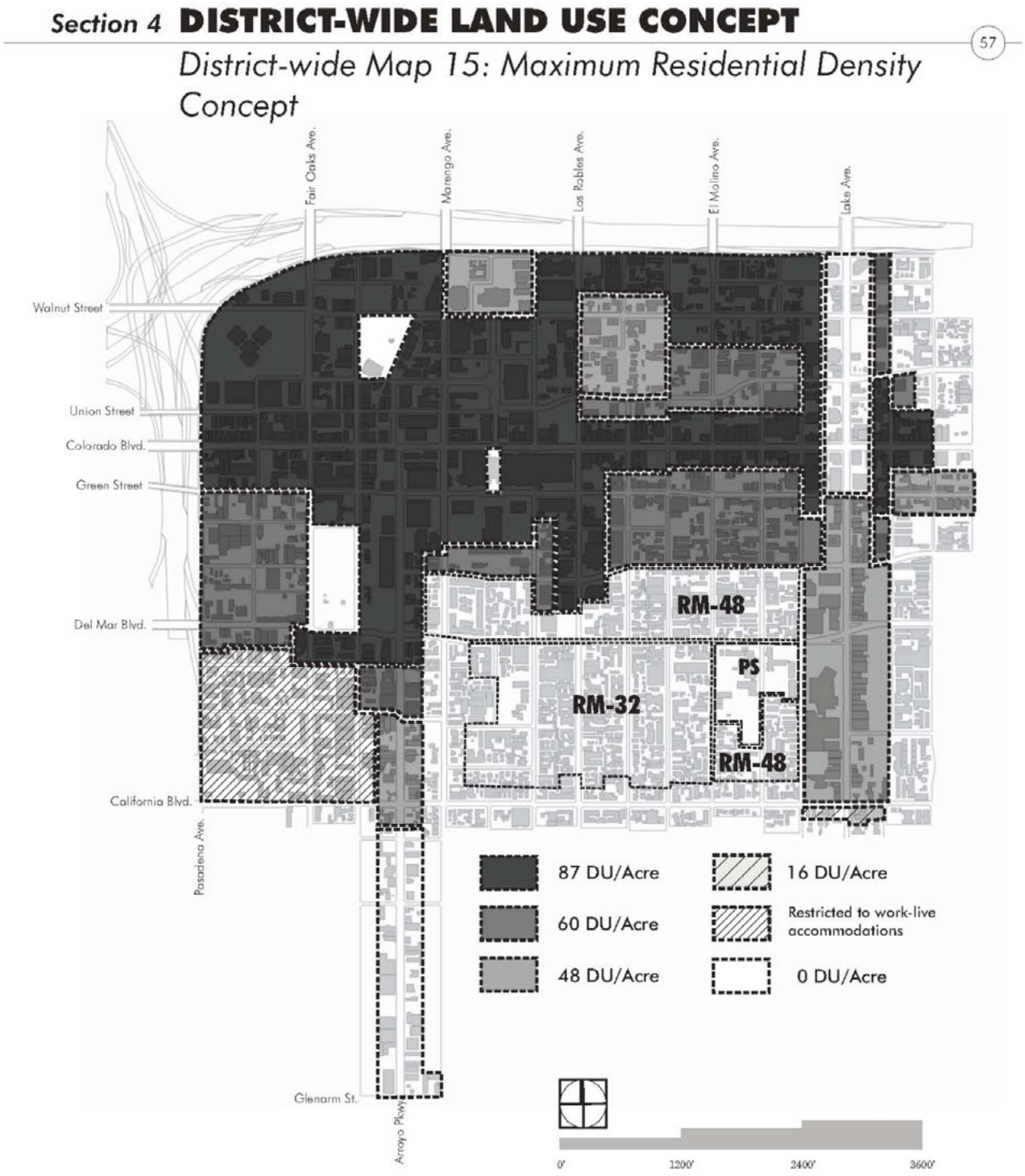
Source: http://ww2.cityofpasadena.net/planning/deptorg/commplng/GenPlan/centdis.asp

Figure 4D-43 *Land Use Character Concept Map*



Source: http://ww2.cityofpasadena.net/planning/deptorg/commplng/GenPlan/centdis.asp

Figure 4D-44 *Development Intensity Concept Map*



Source: http://ww2.cityofpasadena.net/planning/deptorg/commplng/GenPlan/centdis.asp

Figure 4D-45 *Maximum Residential Density Concept Map*

Paseo Colorado: Central District, Sub-district Civic Center (preceded district plan). Within walking distance of Del Mar Station, this former indoor shopping mall was taken down to its steel fabric and converted into a mixed-use development with high-density housing (391units) on top of and around a commercial area with restaurants, retail, a cinema, and department stores. Source: Picasa, Courtesy of Steve Elkins, https://picasaweb.google.com/107562422527137332507/PasadenaPaseoColorado#5455025076380954578.

Stuart at Sierra Madre (also known as Pinnacle): Sierra Madre Villa Station, East Pasadena District. Stuart at Sierra Madre is a one-block redevelopment project with 188 housing units adjacent to a 1,000 car park-and-ride built by the Gold Line Construction Authority. Source: Flickr, LA Wad, used with permission under Creative Commons License CC BY-NC-SA 2.0, http://www.flickr.com/photos/hercwad/2597473746/.

Holly Street Station: Memorial Park Station, Central District (preceded district plan). This mixed-use project accentuated housing with 374 units, 20 percent of which were affordable. The project is considered a great example of blending the old (a former police station and other pre-existing buildings) with the new. The project was timed to start with the opening of the Gold Line, and designed to project over the tracks. In an effort to develop housing, the city contributed $11M. The housing opened in 1997, and included transit passes as a marketing tool. Unfortunately, due to delays in construction of the Gold Line, the project preceded the Gold Line opening by 6 years. Source: Picasa, Courtesy of Jean-Marie Rigotti, https://plus.google.com/photos/102982425801428866946/albums/5604704634469904577/5604705064915543938?banner=pwa.

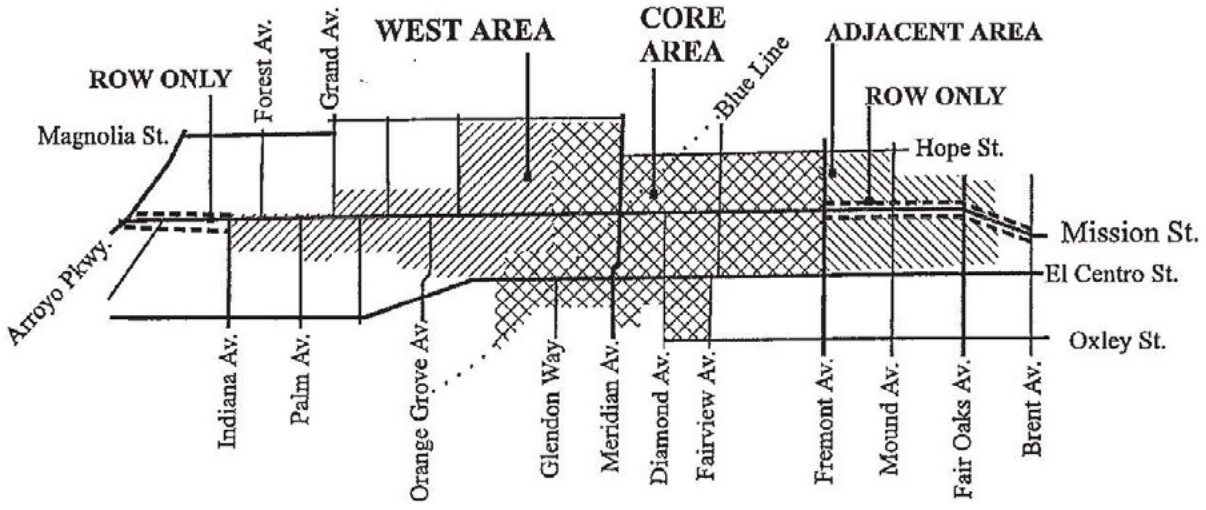
Archstone Del Mar: Del Mar Station, Central District, Sub-district Old Pasadena (preceded district plan). This is a mixed- use development, including retail, residential, subterranean parking, and adaptive reuse of an historic depot building that now houses a restaurant. Source: Courtesy of Moule Polyzoides.

Figure 4D-46 *Key Projects*

As a result of the City of Pasadena's preparation and advanced planning, the city has enjoyed considerable success throughout the corridor. Clearly, not all of its success can be attributed to the Gold Line and the availability of transit. As noted in many sections of this Guide, transit is an important and attractive component, but it is only one of several factors that contribute to the development of a sustainable neighborhood. However, the development of the Gold Line did provide the impetus for the detailed planning process that subsequently created many opportunities. This planning effort was not the first for Pasadena—it built upon years of successive and successful plans. Some have suggested that the Specific Plans and the Sub-district Plans were the recognition and refinement of neighborhood trends, which have been occurring for years. It is clear that thriving neighborhoods with established and desirable character, fabric, and features make planning easier. Whether projects preceded the Specific Planning process or followed it, they have benefitted from the same spirit of community interest and commitment, which has made it possible for the City of Pasadena to enjoy a remarkable increase in transit-supportive development throughout the corridor. The City of Pasadena is an attractive, walkable, sustainable community that has accommodated growth by building upon, rather than changing, the character of its neighborhoods. (For more information on the Del Mar Station see "Case Studies in Station Neighborhood Planning for Transit-Supportive Development.")

The City of South Pasadena

The City of South Pasadena, with a single station along the Gold Line, took a proactive planning approach. In 1996, well before the station's 2003 opening, the city adopted the Mission Street Specific Plan (see http://www.ci.south-pasadena.ca.us/planning/index.html for more information) (see Figure 4D-47).



Source: http://www.ci.south-pasadena.ca.us/planning/index.html

Figure 4D-47 *Mission Street Specific Area Plan*

Similar to the approach taken by its neighbor to the north, the City of South Pasadena conducted a thoughtful analysis of the proposed station area in an effort to determine how best to address issues, such as the anticipated increase in traffic and demand for parking once the Gold Line's station became operational. With its desire to maintain the small-town, pedestrian-oriented character of the existing Historic District, the comprehensive planning effort looked at every aspect of the future station and the potential for compatible future development. A market analysis was performed to give a realistic prospective on what might be possible, specifically eliminating markets already being served successfully in other parts of the corridor. The plan addressed the infrastructure improvements, including water and sewer, which might be required to accommodate new development. An inventory was conducted of building types, styles, densities, heights, and relationships to the street front.

A vision plan, including a narrative and concept sketch, was created encompassing a 15–20-year projection. A set of objectives was prepared, which included the reestablishment of Mission Street as the downtown of South Pasadena, and the intention to preserve, renovate, and reuse historic resources. The plan encouraged a mix of land uses and proposed unifying streetscape character. This common sense approach showed tremendous effort, and included community input, as well as the land use controls necessary to achieve the desired results. While the controls are in keeping with the established area, they offer bonus provisions for infill sites, and modest variations on heights that are consistent with historic patterns to preserve the neighborhood character. Not much is left to chance in the specific district plan, which includes design guidelines, façade treatments, and streetscape improvements.

In addition to the Mission Street Specific Plan, a BID was established to provide overall direction. A catalyst project—Mission Meridian Village—was completed in 2005 at a cost of $25M(see Figure 4D-48). This mixed-use project was a public-private partnership with the following public funds being used for parking—$2.56M from the MTA, $1.5M from the state's Traffic Congestion Relief Program funds (TCRP), and $550,000 from Prop A and C funds. (Note: Proposition A, approved by voters in 1980, and Proposition C, approved by voters in 1990, are both ½-cent sales taxes dedicated to transportation funding.) The developer also contributed $550,000 to the parking. The plan has been successful, providing a new vitality to the area while reusing historic structures and realizing a healthy mix of uses.

Source: Flickr, Umberto Brayj, used with permission under Creative Commons License CC BY-NC-SA 2.0, http://www.flickr.com/photos/ubrayj02/6728874363/sizes/l/in/photostream/

Figure 4D-48 *Mission Meridian Village*

Business Improvement District (BID)

There are several legal forms of BID's authorized by California law. The most common are districts formed under the Parking and Business Improvement Law of 1989. BIDs formed under the 1989 law impose a fee on the business licenses of the businesses (rather than the property owners) operating in the area. The collected funds are used to pay the improvements and activities specified in the formation documents. A similar assessment procedure was authorized by the Property and Business Improvement District (PBID) law of 1994. The distinction is that the PBID makes the assessment on the real property and not on the business itself.

Source: East Colorado Boulevard Specific Plan City of Pasadena

The City of Los Angeles

The City of Los Angeles did not get involved in the planning process as early as its neighbors along the corridor, but it was developing strategies prior to the opening of the Gold Line, including:

- Alameda District Plan (see http://cityplanning.lacity.org/)
- Avenue 57 Transit-oriented District (see http://cityplanning.lacity.org/)

The Alameda District Plan included an area surrounding Union Station, and was intended to guide potential mixed-use development on Terminal Annex and Union Station properties, which is considered the major transit hub for the region. The Avenue 57 Transit-oriented District (one of the first TOD plans approved by City of Los Angeles) includes Highland Park Station. As of 2011,

neither Union nor Highland Park Station areas have seen significant development related to transit. In retrospect, that may prove beneficial for the areas' future development. The recent economic downturn has offered the city an opportunity to take a fresh look at the corridor and to develop an overall strategy.

When the Gold Line began operations in 2003, the neighborhoods around the Los Angeles stations were not necessarily interested in encouraging major developments. The Los Angeles section of the Gold Line corridor is a diverse mixture of land use, including low-density residential and industrial. While the aforementioned plans may have encouraged transit-supportive developments, neither the market nor the community supported such developments. Since then, however, the transit system has matured and become more robust, rail connectivity has improved, industrial land has shrunk, and there is considerable discussion about the introduction of high speed rail, which would have a major impact on the Union Station area. In many respects, the most opportune time for transit-supportive planning in the Los Angeles portion of the Gold Line corridor is now—and that is what is occurring.

The Cornfields/Arroyo Seco Specific Plan—In Progress

A Specific Plan is being developed for the Cornfields/Arroyo Seco neighborhood, a 650-acre area, which is nestled between the Gold Line's Chinatown and Heritage Square Stations, and includes the Lincoln/Cypress Station (see Figure 4D-49). The Cornfields/Arroyo Seco Specific Plan is seen as an opportunity to add definition and logic to development, which until now has occurred in a haphazard, piecemeal fashion. While the Cornfields/Arroyo Seco area is largely industrial, new land uses are emerging. An 800-unit housing development in the Lincoln Heights/Cypress Park Station area was developed via a variance. A 35-acre site, formerly the Cornfields Rail Yard, is being converted into the Los Angeles State Historic Park, and the 2007 Los Angeles River Revitalization Master Plan calls for a series of bikeways and pedestrian pathways along the reemphasized riverfront.

Source: http://sites.google.com/site/cornfieldsla/index

Figure 4D-49 *Mission Meridian Village*

The Cornfields/Arroyo Seco Specific Plan's goals include designating new, mixed-use zoning districts, identifying the types and intensity of uses permitted within these districts, as well as the building heights, massing and façade standards, and revised street designations and standards

Original Gold Line—Just a Start

The original Gold Line and the community-based planning that preceded it and followed its development, is a success. The line provided a focus for planning that considers transit and land use in combination. The Gold Line has proven successful in terms of ridership (almost 35,000 weekday riders), and has shown that transit access and ridership are only part of the process—that livable, sustainable, and walkable communities require many factors that work together. It requires a plan that appreciates individual neighborhood strengths and builds upon them to maximize the potential of transit.

The original Gold Line may have taken years to emerge from concept to reality, but subsequent extensions have developed at a much quicker pace. The "Eastside" extension followed in 2009, and the next phased extension, "Foothills," which originates from the current terminus in Pasadena to Montclair, is well underway, with the first phase expected to open in 2014.

As expected, the same types of community-based planning that proved successful with the original Gold Line are now taking place in the communities served by the extensions. The difference is that support for the planning effort has grown at the regional level with the continued involvement of the San Gabriel Valley Council of Governments, and funding made available from the Southern California Association of Governments. Additionally, since its inception, the Gold Line Construction Authority has taken an interest in regional transit planning and its relationship to land use. The Authority has made a real effort to work with local communities during the planning and design process. They have shown a willingness to consider joint-venture efforts on projects, such as parking, which has resulted in benefits to the communities they serve.

Lessons Learned

Communities can be a positive force in realizing a new transit line, but it takes a cooperative and coordinated effort, and stamina. While the desire for a transit line and the planning approaches differed between Pasadena, South Pasadena, and Los Angeles, the cities agreed to work together and they kept their agreement for over a decade. Individual community gains did not get in the way of a long-term vision for the corridor. Though not all regions and communities require the creation of a new authority, the Gold Line is an example of how that type of effort may be required to implement major projects.

Effective land-use planning requires effective timing and support. Pasadena and South Pasadena created and implemented their Specific Plans early in the transit-planning process, and focused on station neighborhoods. Key elements of their success were community input and attention to community character. Los Angeles was not in the same position nor was it facing the same kinds of pressure, so an early planning process was not needed. However, circumstances have changed, and the city is now looking at the future land use potential of the Gold Line station neighborhoods.

Not all station areas are the same nor do they offer the same opportunities for development. Transit-supportive development should not be viewed with a one-size-fits-all approach. Many uses are given a distinct advantage by having access to transit. The key to creating livable, sustainable communities is to create and implement plans that consider the market and every facet of community compatibility. Pasadena and South Pasadena did an exceptional job at developing realistic plans. Since Pasadena had more stations, it clearly had more of a challenge. By examining and planning each neighborhood separately, and creating separate neighborhood plans, Pasadena is attracting transit-supportive development and realizing compatible, livable, and walkable station neighborhoods.

Coordination is critical to planning and implementing a transit line, and local government and community involvement is needed. From the federal level, to the state, regional, and local levels, early, consistent, and coordinated integration of transit planning and local land use planning can lead to a successful transit system, and the development of livable communities that sustain the system.

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Corridor Data: Gold Line

Transit Operator:	Los Angeles County Metropolitan Transportation Authority (LACMTA)
Transit System Name:	Metro
Transit Corridor Name:	Gold Line
Transit Mode:	Light Rail (LRT)
Location (Metro Area):	Los Angeles, CA
Region (USA):	Southwest
Date Open:	July 26, 2003
Corridor Length:	13.7 Miles
Corridor Purpose:	Inter-Urban Commuter
# of Municipalities Served:	3
# of Stations Served:	13
Construction Sequence:	Simultaneous
Alignment Description:	Former Atchison, Topeka and Santa Fe Railway/Amtrak line
Operating Speed (Max.):	55 MPH (source: 1989 Final Draft EIR, p. 3-16)
Operating Speed (Avg.):	25 MPH (source: http://www.metro.net/news/simple_pr/metro-112107/)
Car Capacity:	76 seated (source: 1989 Final Draft EIR, p. 3-16) 238 capacity (source: 1989 Final Draft EIR, p. 3-16)
Peak Service Headway:	7-8 minutes
Projected Ridership:	26,000-32,000 avg. wkdy. (by 2004) (source: http://findarticles.com/p/news- articles/san-gabriel-valley-tribune/mi_8067/is_20060125/service-expected-boost- stagnant-ridership/ai_n47639723/)
Ridership as of June 2010:	*34,285 avg. wkdy. (Source: Philbert Wong, BART)
Funding:	Federal: N/A State & Local: $859M TOTAL: $859M

*Ridership number includes the Eastside Extension in addition to the Original Gold Line
SOURCE: MTA (transit agency), unless otherwise noted

February 3, 2011

Station Area Data: Gold Line

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	Sierra Madre Villa	Pasadena, CA	26-Jul-2003	NONE	Structure	Suburban	Above Grade	START	Predominantly commercial uses with some residential, transit and	5	60	2000 - East Pasadena Specific Plan; 2003 - East Colorado Specific Plan	The Stuart/Pinnacle at Sierra Madre (1)	N/A
2	Allen	Pasadena, CA	26-Jul-2003	NONE	N/A	Suburban	Above Grade	1.75 Miles	Predominantly residential with some commercial uses	5	25	2003-East Colorado Specific Plan	The Gardens on Hill (6)	California Institute of Technology, Huntington Library and Gardens, Pasadena City College, Pasadena Conservatory of Music
3	Lake	Pasadena, CA	26-Jul-2003	NONE	Structure	Urban	Above Grade	1.25 Miles	Predominantly residential and commercial with some mixed-use buildings	5	80	South Lake Avenue District (BID); 2001 - Playhouse District Association (BID); 2004 - Central District Specific Plan	Alexan City Place, North Lake Lofts, 695 E. Colorado Blvd., Madison Walk Condos (2), Lake at Walnut (3), Trio Mixed Use, Prado on Lake Ave., Pasadena Collection (6), Granada Court (12)	Carnegie Observatories, Lake Shopping District, Pasadena Playhouse District
4	Memorial Park	Pasadena, CA	26-Jul-2003	NONE	N/A	Urban	Below Grade	1.0 Miles	Predominantly mixed-use buildings with a mixture of retail/ restaurants, office and residential and a large park	25	60	2000 - Old Pasadena Management District (BID); 2002 - Old Pasadena Streetscapes and Alley Walkways Project; 2003 - Civic Center/ Mid-Town District Public Improvements; 2004 - Central District Specific Plan	Holly Street Village (5), Western Asset Plaza, One East Union, Montana Resid. Proj. (6)	Art Center College of Design, Memorial Park, Norton Simon Museum, Old Town Pasadena, Pasadena Civic Center, Museum of California Art, Paseo Colorado Shopping Center, Rose Bowl
5	Del Mar	Pasadena, CA	26-Jul-2003	NONE	Structure	Urban	At Grade	0.5 Miles	Predominantly commercial (retail and office) and mixed-use residential with a large park	5	100	2000 - Old Pasadena Management District (BID); 2002 - Old Pasadena Streetscapes and Alley Walkways Project; 2004 - Cen- tral District Specific Plan	The Milan (2), Paseo Colorado (4), Del Mar Station (7), Messina Mixed Use, DeLacey Flats, Green/DeLacey Mixed Use, Pasadena Place, Pasadena Conference Center Expansion, 215 South Marengo Condos, The Renaissance (6), Westgate Pasadena Project (10)	Central Park, L.A. Music Academy, Old Town Pasadena, Pasadena Center, Santa Fe Depot, Rose Bowl

Station Area Data: Gold Line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
6	Fillmore	Pasadena, CA	26-Jul-2003	NONE	Structure	Urban	At Grade	0.5 Miles	Predominantly commercial with some residential and mixed use	5	25	2004 - Central District Specific Plan	N/A	Huntington Hospital
7	Mission	South Pasadena, CA	26-Jul-2003	NONE	Structure	Suburban	At Grade	1.5 Miles	“Predominantly residential with some “”main street”” commercial	5	25	1996 - Mission Street Specific Plan	Mission Meridian Village (4)	South Pasadena Public Library, Meridian Ironworks Museum, Farmers Market
8	Highland Park	Los Angeles, CA	26-Jul-2003	NONE	N/A	Suburban	At Grade	2.0 Miles	“Predominantly residential with some “”main street”” commercial and mixed use”	5	60	1999 - Northeast Los Angeles Community Plan; 2002 - Avenue 57 Transit Oriented District Plan	N/A	Arroyo Seca Regional Library, Highland Park Rec. Center, Highland Theater, Occidental College
9	Southwest Museum	Los Angeles, CA	26-Jul-2003	NONE	N/A	Suburban	At Grade	1.0 Miles	Predominantly residential and open space (steep topography) with a large park	5	25	1993 - Mt. Washington Specific Plan; 1999 - Northeast Los Angeles Community Plan	Glenmary Kinder Care (11)	Southwest Museum of the American Indian, Carlin G. Smith Rec. Center, Casa de Adobe, Ramona Hall, Autry National Center
10	Heritage Square/Arroyo	Los Angeles, CA	26-Jul-2003	NONE)	Surface	Suburban	At Grade	1.0 Miles	Predominantly residential with some commercial and transit parking	5	25	1999 - Northeast Los Angeles Community Plan; 2011 - Cornfield Arroyo Seco Specific Plan	N/A	Heritage Square Museum
11	Lincoln Heights/ Cypress Park	Los Angeles, CA	26-Jul-2003	NONE	Surface	Urban	Above Grade	0.75 Miless	Predominantly residential with some commercial and industrial uses	5	25	1999 - Northeast Los Angeles Community Plan; 2011 - Cornfield Arroyo Seco Specific Plan	Alta Lofts (9), Camino Al Oro, Flores del Valle, Puerta del Sol, Tesoro del Valle (11)	Cypress Park

Station Area Data: Gold Line (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
12	Chinatown	Los Angeles, CA	26-Jul-2003	NONE	N/A	Urban	Above Grade	1.5 Miles	Predominantly commercial and mixed use with a large park and vacant parcel	5	35	1997 - L.A. River Revitalization Plan; 2000 - Central City North Community Plan; 2011 - Cornfield Arroyo Seco Specific Plan	Cesar Chavez Garden Apts., Castelar Apts., Blossom Plaza, Capital Mills (11)	Old Chinatown, Dodgers Stadium
13	Union Station	Los Angeles, CA	26-Jul-2003	NONE	Structure	Urban	At Grade	0.75 Miles	Predominantly transportation and commercial uses	60	20	1996 - Alameda District Specific Plan; 1997 - L.A. River Revitalization Plan; 2000 - Central City North Community Plan	Gateway Center (8), Mosaic Apts. (11)	El Pueblo de Los Angeles State Historic Park, Chinatown, Civic Center

NOTES:
* Dedicated to transit riders
** All distances are measured “”as the crow flies”” and are rounded up to the nearest 1/4 mile
*** Within 1/4 mile of transit station (source: Google Earth)
**** Residential densities are estimates on net densities per block by looking at particular residential typologies within 1/4 mile of transit station. (source: Google Earth)

SOURCES:
1 Project website: www.brethestuart.com
2 ‘The Pasadena Gold Line: Development Strategies, Location Decisions, and Travel Characteristics along a New Rail Line in the Los Angeles Region’
3 Project website: www.lakeatwalnut.com
4 ULI Case Study
5 Project website: http://www.srgliving.com/page cfm?pgid=13&prid=13
6 Pasadena Community Development Commission
7 CNU Case Study
8 California TOD Database
9 City of LA Planning Dept. (Claire Bowen)
10 City of Pasadena Planning Dept. (John Poindexter)
11 SCAG Gold Line Corridor Study Final Report (March 2007)
12 Moule and Polyzoides Architects and Urbanists website

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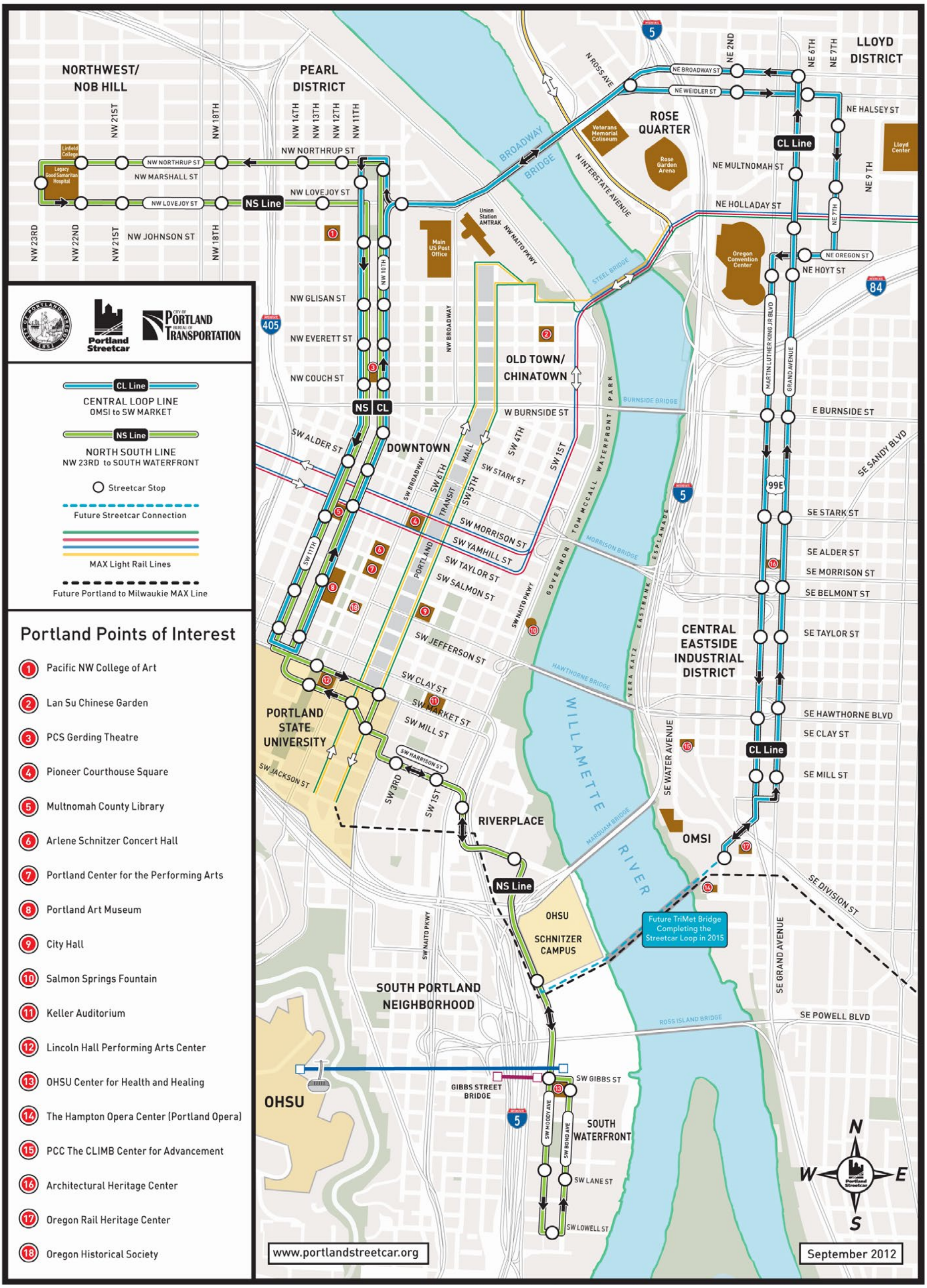
Portland Streetcar

Prepared by:
New Jersey Institute of Technology
Van Meter, Williams, Pollack, LLP

The Portland Streetcar system (see Figure 4D-50) functions as a downtown circulator and runs through the city of Portland, Oregon on an eight-mile continuous loop (four miles each way), from Legacy Good Samaritan Hospital at NW 23rd Avenue on Lovejoy and Northrup Streets through the Pearl District, and on 10th and 11th Avenues to SW Mill and SW Market Streets, Portland State University (PSU) Urban Center, SW Harrison Street, RiverPlace, Oregon Health Sciences University (OHSU), the Aerial Tram, and to a terminus at SW Lowell Street and Bond Avenue at the South Waterfront District. There are 46 stops spaced every 3 to 4 blocks. (See detailed information at the end of this section regarding the Portland Streetcar line and Portland Streetcar stations). The modern streetcars run in mixed traffic and except at platform stops, accommodate existing curbside parking and loading. Portland Streetcar is owned by the City of Portland and is managed by Portland Streetcar, Inc., a nonprofit corporation with a diverse community-based board. TriMet, the regional transit agency, provides operators and maintenance staff and contributes approximately 2/3 of the operating budget. Planning for the Portland Streetcar and for transit-supportive development associated with the Streetcar is the subject of this section.

Portland Streetcar Case Facts

System Name:	Portland Streetcar
Corridor Name:	Portland Streetcar
Transit Mode:	Streetcar
Location:	Portland, Oregon
Region (USA):	Northwest
Corridor Length:	4 miles / 8 mile loop
Corridor Purpose:	Downtown Connector, Urban Housing
Municipalities Served:	1
Cost and Funding Sources:	Cost: $103M (federal $5M, state $12M and local $86M)
Date Opened:	July 20, 2001



Source: http://www.railwaypreservation.com/vintagetrolley/Portland_map_2010.gif

Figure 4D-50 *Portland Streetcar System Map*

Transit Planning in Portland

As discussed earlier in the Portland Interstate Metropolitan Area Express (MAX) Light Rail–Westside MAX Blue Line Case Study, in the early to mid-1970s, Oregon and the City of Portland made a major shift in transportation planning, which resulted in a commitment to consider land use and transit planning in combination. While there were many reasons for this shift, the desire to protect and maximize the potential of Central City Portland was clearly a key determinant. In many respects, the freeway issue was one part of a larger transformation taking place in Portland in the early 1970s under the leadership of first councilman, Mayor Neil Goldschmidt (1973–79). A new public policy approach focused on rebuilding the central city and reinforcing the existing neighborhoods. Goldschmidt created an office of planning, and brought a coordinated approach to planning, economic development, transportation, and housing. His idea was to develop a cycle of growth, renewal, and redevelopment, and to reinvest the proceeds realized by a growing tax base in public services and infrastructure to create momentum for successive cycles.

The concept that a vital and healthy downtown was important to the future prospects of the region began to take hold, and trading a freeway for regional transit was one of the first steps. The move away from a growing dependency on freeway expansion was seen as critical to maintaining and reinforcing the role of Portland as a hub for commerce and cultural activities. The shift resulted in establishing Portland as the transportation hub for the region. Beginning with the development of the transit mall in 1978, which was funded in part by urban renewal funds and followed by the planning and construction of the light rail network, Portland changed from a city in danger of being minimized by freeway construction to one realizing the full benefits of transit within 20 years.

Having established a new direction, Portland's government began to look at ways to improve the potential of Central City, and in particular how to encourage residential development, which the local government deemed as critical to a livable community. The first Central City Plan, adopted in 1972, was followed by a second in 1988. The Central City Plan prepared in 1988 by the City's planning department laid out a vision, which built upon the foundation of the new direction in transportation and land use planning established in the first report. This report contains the first mention of a "trolley system" to connect key attractions. The plan considered the potential of many of the city's unique districts, focused on economic development, and explored ways to encourage private investment.

Planning for the Portland Streetcar

The City of Portland, under the leadership of Transportation Commissioner Earl Blumenauer, had been championing a Central City streetcar project. In 1990, the city government initiated a feasibility study, formed a Citizens Advisory Committee (CAC), and hired a project manager to begin the planning process.

The streetcar concept was viewed as a tool to integrate transit and land use, accommodate greater density in a less intrusive way, maintain the scale of the existing neighborhood, and create a livable community. The CAC explored various alternatives and gained stakeholder input through a series of public hearings. The result was a decision to connect the high-residential density Northwest District and Good Samaritan Hospital with Portland State University. A major question in the early stages of these discussions was how to navigate the new transit line through an area known as the Pearl District.

Meanwhile, discussions on land use for the Pearl District were beginning to take place. By 1995, Hoyt Street Properties, led by Homer Williams, had acquired a 40-acre parcel of former railroad property from the Burlington Northern Railroad—a brownfields site in need of remediation. The area was zoned industrial and had been the subject of discussions about creating an 'employment district' by the city, but the developers had a different vision based on development activities in Vancouver. The developers were interested in creating a high-density residential project that would establish a new focus area while complementing the Central City's role as a commerce and commercial hub. This coincided with the city government's long interest in growing its residential base, and Mayor Vera Katz's vision for downtown living. Fortuitously, at that time there were few property owners in the Pearl District, two of them being public entities—the Portland Development Commission and the Port of Portland. The 1998 adoption of the River District Urban Renewal Plan, prepared by the City of Portland and the Portland Development Commission, reflected the consensus for this new vision.

The CAC made a few adjustments to the streetcar alignment to accommodate the neighborhoods along the route, such as the Pearl District. The original proposed alignment considered placing the streetcar line on 5th and 6th Avenues, which was seen as a conflict with the transit hub and with an established residential area known as Park Blocks. Input from the Northwest District citizens, according to a project planner, was quite direct: "Streetcar is a good idea but you've picked the wrong place to put it. We'll support the plan if you move it to 10th and 11th Avenues." Those avenues were not as well developed at the time, but their potential for development was evident as a result of the streetcar line. The River District representatives indicated that their support was contingent on an emphasis for residential development. The city government and the CAC listened to the communities and changed the alignment, which garnered public support. The public support and the credibility of those coordinating the project proved critical to successful planning and funding processes for the Portland Streetcar.

The CAC's strong commitment to integrating the streetcar line with land use was evident. The CAC reviewed every proposed station area and developed suggestions that made many of the proposed stops more functional and a better fit with the neighborhoods they served. With the CAC's input, every stop was designed to fit the built environment and the neighborhood being served. The Committee's attention to detail continues 20 years later.

In May of 1995, the City of Portland issued a Request for Proposal (RFP) for the design, construction, and operation of the system. Portland Streetcar, Inc., a nonprofit corporation, was selected.

The success of the Portland Streetcar project was obvious before construction began, when PSU asked that the transit line be extended for ½mile to connect to the University's planned urban plaza (see Figure 4D-51). The University, whose vice chancellor was a champion of the project and on the Board of Portland Streetcar, Inc., agreed to make the University a part of the Local Improvement District, and through it contributed $7M for the University's share of the expansion.

Figure 4D-51

Streetcar through Portland State University

Source: Flickr, Steve Boland, used with permission under Creative Commons License CC BY-NC-ND 2.0, http://www.flickr.com/photos/sfcityscape/4998163526/in/set-72157624973562242

Several key features ensured the success of the Portland Streetcar. First, the system's planning process integrated land use considerations. The alignment and station areas were built around neighborhood strengths and potential growth areas. Northwest Portland was a high-density area with considerable redevelopment potential, particularly along the alignment ultimately selected. Access to the Good Samaritan Hospital was needed, but dedicating land to parking uses was undesirable. The River District and particularly the Pearl District were ready for redevelopment, which ultimately ensured future streetcar ridership. Portland State University was building a vision for the future and stood

to gain considerable flexibility if limited developmental property did not have to be dedicated to parking.

Second, a vision was shared by a supportive and coordinated city government, the development community, and a development commission that could match urban renewal districts with growth areas. A local planner associated with the project noted, "You can't just drop a streetcar into the urban streetscape and have it succeed. You have to have all of the pieces in place so that it can become a redevelopment catalyst. If you have the pieces in place, any city can profit and prosper by enabling that demand for walkable urban development."

Subsequent extensions in 2005, 2006, and 2007 followed the initial line's planning principles. The extensions connected neighborhoods and provided access, which encouraged higher-density residential development and redevelopment, and provided solutions to expansion problems faced by major employers.

Funding Portland Streetcar

Portland Streetcar was constructed in phases. The initial segment, which opened in July 2001, ran from Northwest Portland to PSU. The second segment extended the line for 0.6 miles to River Place and opened in 2005. Phase three, an extension to the South Waterfront District to connect with the Portland Aerial Tram serving the OHSU, was completed in 2006. The final phase, an addition to the South Waterfront district, was completed in 2007.

The total capital cost for the completed line was $103,150,000 or $12.9M per mile. The only federal money used was non-FTA funds reallocated to the project through TriMet, which was consistent with federal funding guidelines at the time. As an indication of how things have changed, the newest Portland Streetcar Loop Project currently under construction anticipates federal funding to cover approximately 50 percent of project costs.

Implementing a new transit system, especially without federal funding, is challenging. Portland Streetcar was funded in a patchwork fashion, as shown in Table 4D-3. The City of Portland raised rates at parking garages (for capital based upon the sale of Parking Revenue Bonds) and at street meters (for operating costs). The creation of the Local Improvement District (LID) was a key funding source that levied a one-time additional fee on landowners who were most likely to receive maximum benefit from proximity to the line. Establishment of the LID required approval by signature of more than 50 percent of the impacted owners. Michael Powell, owner of the largest single-site bookstore in America, which covers three square blocks, was instrumental in obtaining the signatures. His pitch was simple, "You can go out of town for three weeks while construction is happening, and while you're gone your property will double in value. Sign here." (For more information on Powell's contribution to the Portland Streetcar, see the "Guiding the Process … Leadership and Champions" section.)

Table 4D-3

Portland Streetcar Total Capital Cost

Cost	Source
$28.6M	Bonds backed by revenues from parking rate increase in the City-owned garages
$21.5M	TIF from the Portland Development Commission
$19.4M	LID taxed non-owner occupied residences
$10M	Regional transportation funds
$8.75M	City funds
$5M	Reallocated transit funds from TriMet
$4.7M	Other funds
$3.1M	Transportation land sales
$2.1M	Connect Oregon
$103.15M	**Total Construction Costs**

Source: www.portlandstreetcar.org

The Portland Development Commission's use of TIF on urban renewal properties played, and continues to play, a major role. (For more information on TIF, see the "Funding and Financing Public Transit and Transit-Supportive Development" section.)

The initial patchwork of funding helped establish the new transit system. In many respects the project's early success made the financing of successive steps easier. Ridership on the corridor exceeded projections (3,500 riders) from the first day. By the fall of 2005, 9,000 riders were using the line, and in the summer of 2010 the number had reached 12,710.

Planning and Implementing Transit-Supportive Development

A key to successfully implementing a new streetcar system is identifying all necessary components. One of the most important components is supportive land use planning. The Portland Streetcar project was augmented by targeted and effective land use planning. Some property (Urban Renewal Areas) had to be reclassified, but the existing zoning districts within the city offered alternatives that were broad enough to accommodate a range of land use options. Planners familiar with Portland's long term success noted that a common mistake made by municipalities is the attempt to create zones to fit every possible project, resulting in an overly complicated and rigid code.

The City of Portland used Urban Renewal Areas and development agreements, rather than zoning instruments, to accomplish the density, mix, and incentives needed to meet the city's land use goals and include affordable housing. The overlapping of Urban Renewal Districts within the city is almost seamless, providing planning flexibility through TIF, a critical funding source. The role played by the Portland Development Commission makes it relatively easy for the city to enter into development agreements. A critical factor in the City of Portland's approach was public sector investments. Rather than having the real

estate development community responsible for all aspects of transit-supportive development, public sector investments were made, signaling to the development community the City's clear commitment. The investments included infrastructure, streetscapes, and parks, which have yielded incredible returns. (For more information on the importance of public-sector improvements for encouraging transit-supportive development, see the "Funding and Financing Public Transit and Transit-Supportive Development" section.) When the original commitments were made, it is unlikely that anyone predicted the extraordinary results.

Northwest Portland

The Northwest Portland community wanted improved access and solutions to its parking problems, but did not want, nor need, to significantly change its land use or character. Access and parking issues were particularly important to Good Samaritan Hospital, which like its institutional neighbor at the other end of the original streetcar line, was relatively landlocked and did not want to use limited available space to add parking capacity. The hospital, similar to PSU, was a willing participant in the Local Improvement District, which provided more than $20M to the streetcar project.

The city government and the CAC promised the community that it would not significantly change. The parts of the community that have experienced growth and redevelopment due to the introduction of Portland Streetcar are those that had room for improvement, especially along the community-selected alignment of 10th and 11th Avenues. Infill projects, such as the Overton Park Apartments, a mixed-use development with ground floor retail, and the Northrup Commons, a 20-unit condominium project, are consistent with the neighborhood. The Inn at Northrup Station, a boutique hotel, is an attractive addition that is scaled to the neighborhood (see Figure 4D-52).

Figure 4D-52

The Inn at Northrup Station

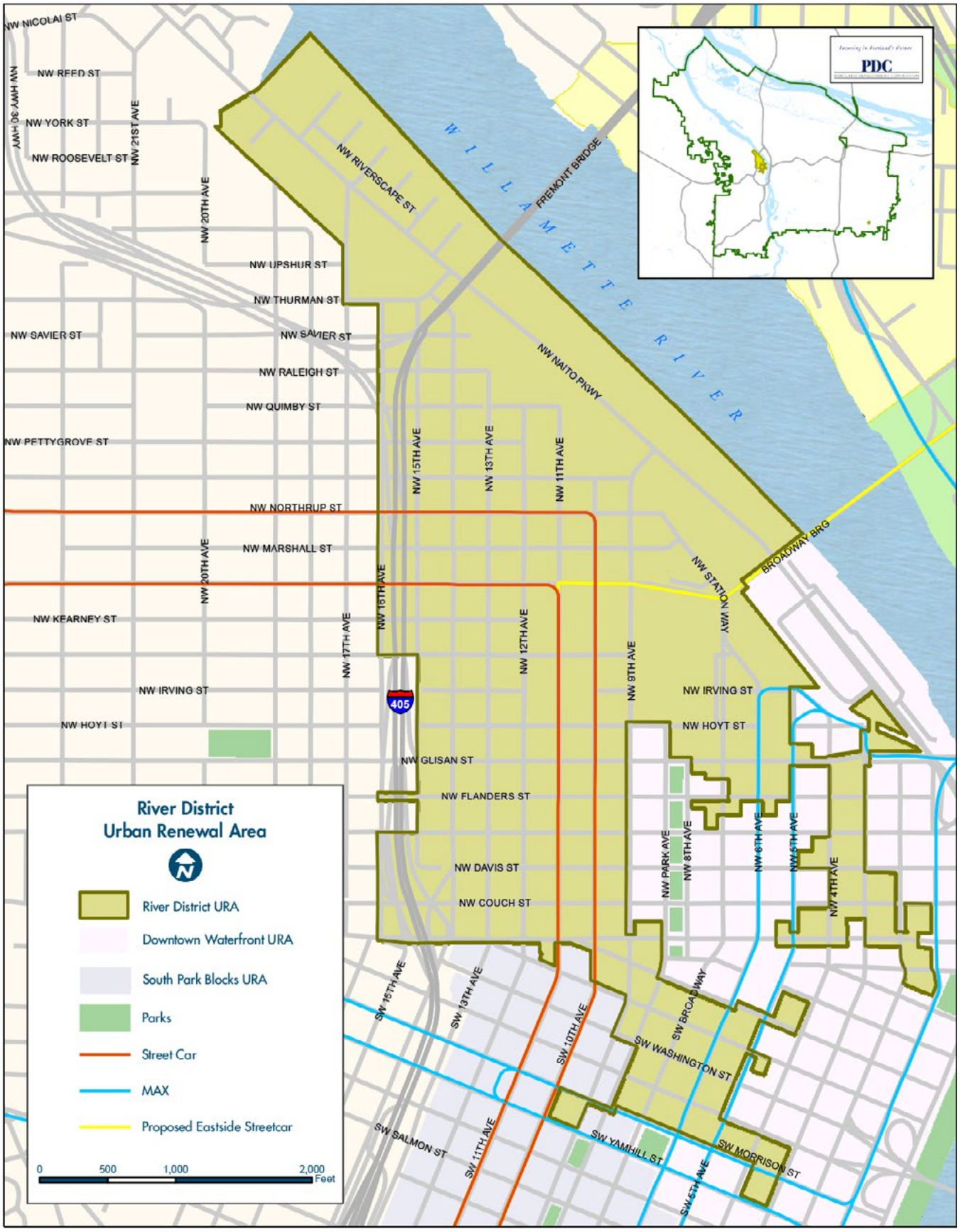
Source: Flickr, Vicki Jean Beauchamp, used with permission under Non-Commercial-Share Alike 2.0 Generic CC BY-NC-SA 2.0, http://www.flickr.com/photos/vj_pdx/149270049/

Pearl District

Unlike the Northwest Portland neighborhood, the Pearl District was in need of redevelopment. Today, it is one of the city's biggest success stories. Its story started with a shared vision between a developer (Hoyt Street Properties) and the city government, which was documented in a 51-page developer's agreement with the Portland Development Commission and supported by an Urban Renewal Plan (see Figure 4D-53). (For additional information on the River District Urban Renewal Area Plan, refer to http://www.pdc.us/pubs/inv_detail.asp?id=594&ty=14.)

The River District includes five distinct neighborhoods—Pearl, Terminal One, Tanner Basin/Waterfront, The Industrial Sanctuary, and Union Station/Old Town. The Pearl District, bounded by Burnside Street to the south, Interstate 405 to the west, Broadway to the east, and the Willamette River to the north, was the first redevelopment-focus area due to a shared vision between the local government and the developer (Hoyt Street Properties). The Pearl District was dominated by abandoned rail yards and decaying industrial buildings. Today, no portion of the neighborhood has been untouched by new development or adaptive reuse of old structures. Among the success stories is the five-block development known as the Brewery Blocks, which includes 365 residential units, 160,000 SF of retail, and 538,000 SF of office. (For more information on Brewery Blocks, see the "Funding and Financing Public Transit and Transit-Supportive Development" section). The Pearl Townhomes are another adaptive reuse project, and Powell's City of Books is a Pearl District staple.

The developer's agreement between the City of Portland and Hoyt Street Properties included certain milestones, and benefits associated with achieving the milestones. The developer's milestones included land for parks and funding for art on a block-by-block basis, as well as 30 percent affordable housing. The city's major milestones included the removal of a viaduct/ramp that visually separated the area, as well as the completion of the Streetcar project. The density of the Brewery Blocks project changed to meet the developer's milestones. The allowable density of the project was subsequently increased, from 34 units/acre, to 84 and then to more than 100 units/acre. Overall, between 1994 and 2010, the Pearl District added more than 4,900 residential units, 1.6 million SF of office space, and 700,000 SF of retail development. At build-out of the Hoyt Properties site, an additional 1,700 residential units will be added.



Source: http://www.pdc.us/pdf/maps/river-district/rd-ura-map.pdf

Figure 4D-53 *River District Urban Renewal Area*

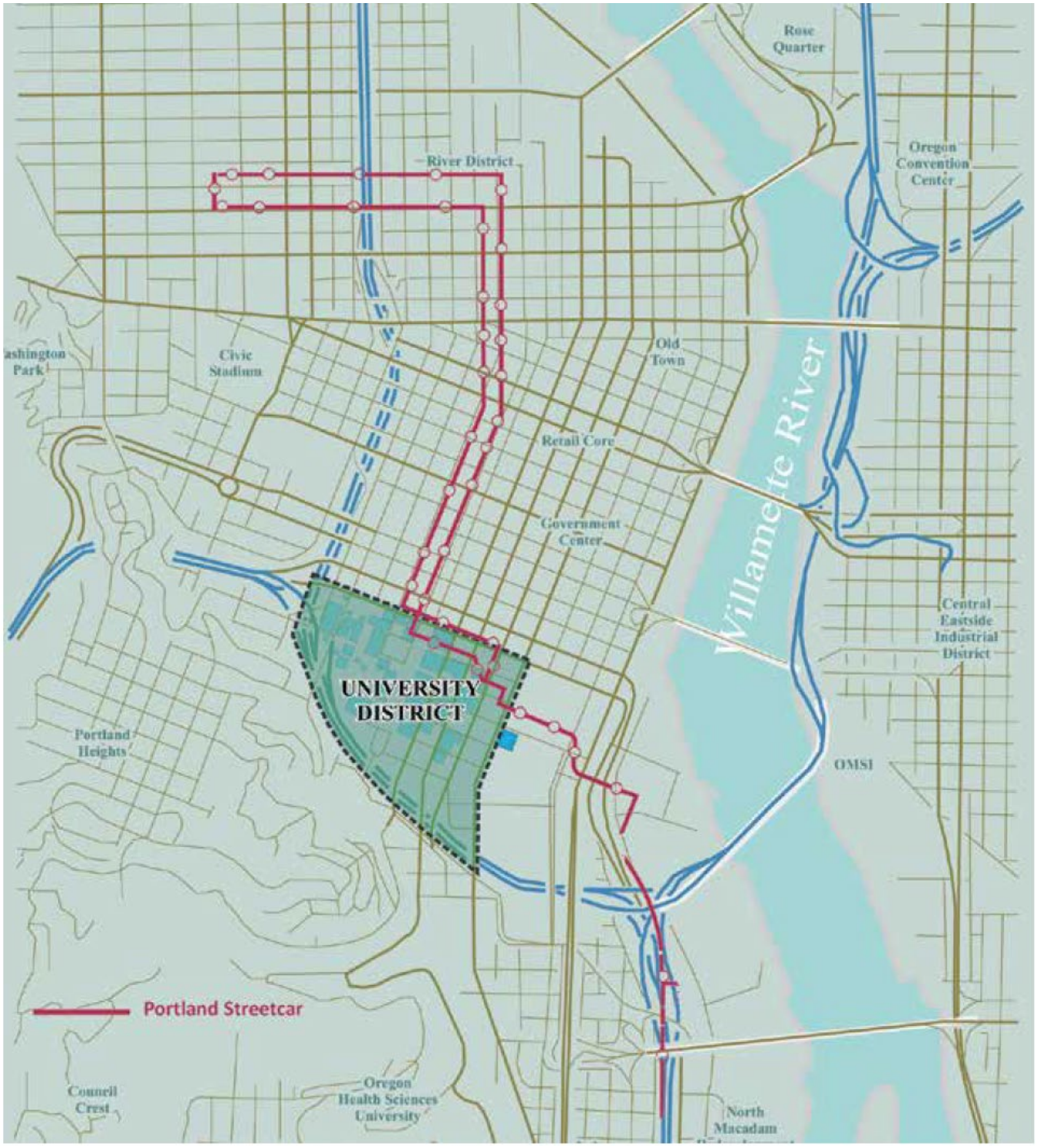
Due to a receptive market and a strong economy, the initial activity level in the Pearl District was so great that the Portland Development Commission had to develop a new vision plan for the evolving neighborhood—the Pearl District Development Plan—an effort to ensure that the original vision for a diverse neighborhood serving a mixed-income population was retained. As planners in the City of Portland and elsewhere point out, it is not uncommon for diversity to be sacrificed as a neighborhood's popularity increases. At this point, the development/redevelopment in the neighborhood is approximately 2/3 complete. In retrospect the developer wishes that they had developed at a rate greater than one block at a time, so that they could have taken advantage of the historically strong market. (For more information on planning in the Pearl District, refer to the "Case Studies in Station Neighborhood Planning for Transit-Supportive Development" section.)

Portland State University/University District

One of the original anchors to the Portland Streetcar system, PSU, has maximized the streetcar's usefulness. Since the opening of Portland Streetcar, the University has added three new buildings. Notably, no additional parking was associated with construction of the new buildings, and some of the buildings were constructed on former parking lots.

The city government and PSU agreed on a separate district plan for the university (University District Plan), which provided for a combination of Central City and Institutional Zones, giving the university sufficient flexibility to grow (see Figure 4D-54). The University's Campus Plan has steered individual site development. As an urban institution, PSU understands the blurred line between city and campus, and emphasizes and takes advantage of being part of a successful and diverse neighborhood.

> The University District Framework Plan proposes a new model of urban development that is neither city nor campus, but a unique fusion of the two. Boundaries between public and private are blurred; uses are not only mixed, but shared, and a transparence permeates the environment, making the academic and social life of the University visible to all. (Portland State University, 2005 Campus Plan)



Source: http://www.fap.pdx.edu/floorplans/campus_maps/University%20&%20City%20Districts.pdf

Figure 4D-54 *University District Map*

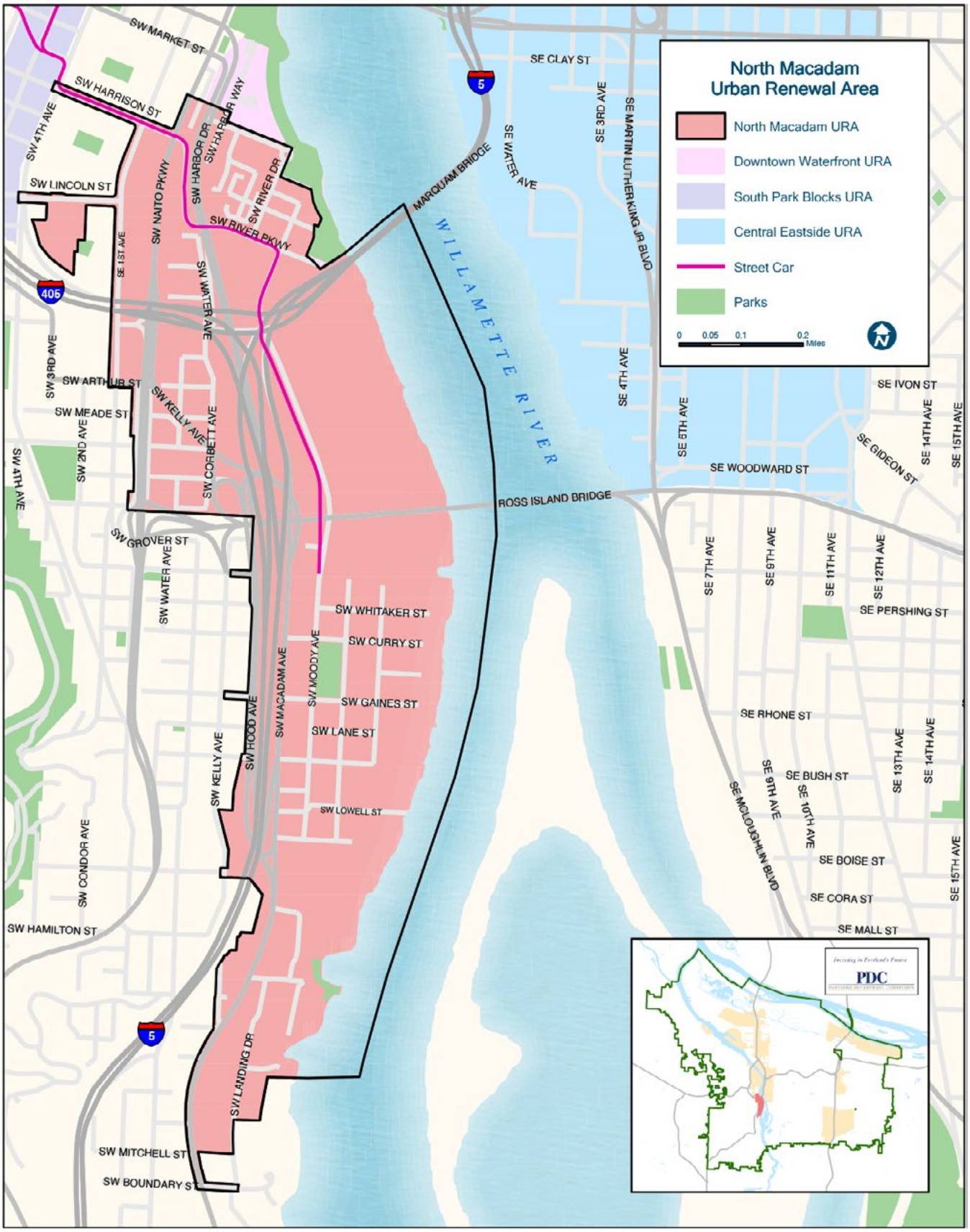
An important lesson learned by the public and private sector developers is that the building's first 30-vertical feet and how the building relates to the street impact the transparency of the environment. The street-level attractiveness and openness of a building makes it more inviting to the neighborhood and enhances the pedestrian experience. (For more information on PSU planning and development, see http://www.fap.pdx.edu/planning/index.php.)

North Macadam—South Waterfront

During the planning of Portland Streetcar, the North Macadam (South Waterfront) area was envisioned as a southern terminus, but the area was still in the formative stages and in need of a land use plan. The area consisted of unconnected uses, including small offices, a restaurant, a barge facility, and decaying industrial buildings. The area was walled off from other neighborhoods by the Willamette River on one side and Interstate 5 on the other. A proposal to the city for a 10-acre gated community next to the restaurant prompted Planning Commissioner Charlie Hales to recognize that an overall area plan was needed for the last major undeveloped (or underdeveloped) area in the city (409 acres) (see Figure 4D-55). Consequently, a permit for the gated community was denied. The North Macadam Urban Renewal District Plan was adopted in 1999. Hales contacted Homer Williams of Hoyt Street Properties, who was finished with the Pearl District project, and said, "Consider this as your next front." Williams once again played a role in the early development of the area.

At about the same time, OHSU, located in the North Macadam district, was assessing its options for expansion within the city. One possibility that gained traction was expansion in the South Waterfront with an Aerial Tram that would connect to the existing campus, and connection to the downtown with extension of the streetcar line. This fit comfortably into the North Macadam Urban Renewal District Plan. The 130-acre site used for campus expansion allowed OHSU to serve as a Portland Streetcar anchor in the south, much like PSU served in the north. In many respects, the Portland Streetcar served as a means of connecting successful neighborhoods and benefitting undeveloped areas along the way.

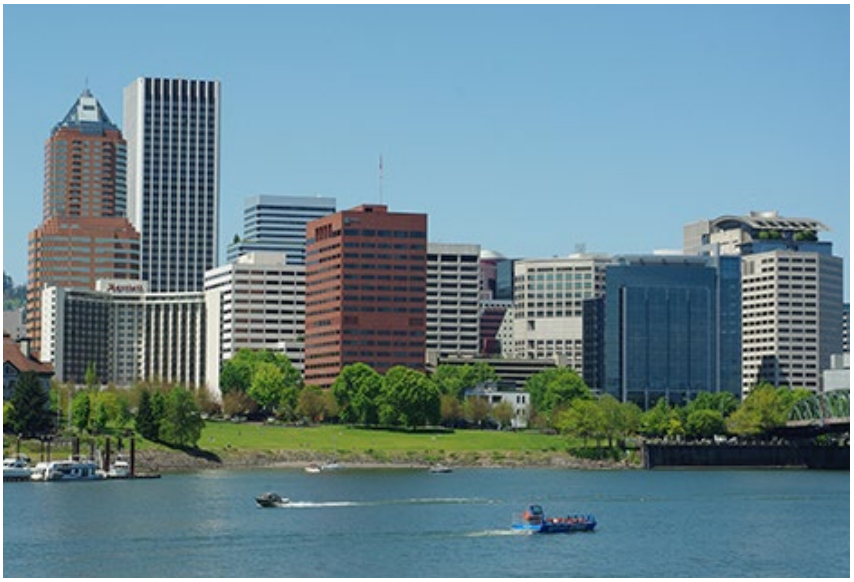
The current South Waterfront District includes three main areas—OHSU; RiverPlace, one of the first projects in the waterfront area, which preceded the streetcar line; and the Harbor-Naito Study Area, six acres of vacant land planned for redevelopment. RiverPlace is located on land originally included in the 1988 Downtown Waterfront Urban Renewal Area. It includes more than 700 residential units, 300,000 SF of retail and restaurant space, more than 300 hotel rooms, 400 shared commercial and public parking spaces, and 105,000 SF of corporate office space. The project includes a marina, riverfront esplanade, and an award-winning, four-acre park known as South Waterfront Park (see Figure 4D-56).



Source: http://www.pdc.us/pdf/maps/north-macadam/nm-ura-map.pdf

Figure 4D-55 *North Macadam Urban Renewal Area Map*

Figure 4D-56
South Waterfront Park



Source: Photo taken by M.O.Stevens, May 13 2010, licensed under Creative Commons Attribution-Share Alike 3.0 Unported, from Wikimedia Commons, http://commons.wikimedia.org/wiki/File:South_Downtown_Waterfront_-_Portland,_Oregon.JPG

The South Waterfront District is a work-in-progress. While it did not start with a retail base or the identity the Pearl District had gained as a growing area for artists, the anchors (including two major OHSU buildings) are in place. When the economy recovers, the area should be ready for its next growth cycle.

Other neighborhoods in the city continue to benefit from the Portland Streetcar and its alignment. The area known locally as the Westend, which is between the Brewery Blocks and PSU, has seen significant infill, including the addition of a greatly needed supermarket. More recently it has become the home of new offices for Zimmer Gunsul Frasca Architects, LLP, one of the city's largest architectural firms.

Portland Streetcar Continues to Grow

Portland Streetcar has clearly served as a catalyst for change. The extent of its success goes beyond highlighting some neighborhoods and developments. As indicated in "Economic Benefits of Transit-Supportive Development," "As a development stimulus, the streetcar [to date] has been a resounding success. By 2008, private developers had invested $3.5 billion within two blocks of the alignment, including over 10,000 new housing units and 5.4 million SF of office, institutional, retail and hotel construction" (E. D. Hovee & Company, LLC, 2008).

Interestingly, the type, density, and value of properties within one block of the project have changed in comparison to other projects within the city.

Portland Streetcar is an important part of future planning. The Portland Streetcar Loop Project, a 3.3-mile, double-track extension, is the most recent addition to the system (see Figure 4D-57). With 28 new stops it is expected to attract an additional 2.4 million sq. ft. of new development. It is expected to transport 3.5 million new riders, thereby reducing regional vehicle miles traveled by 28 million miles per year (www.Portlandstreetcar.org). The Loop project reflects a changing national environment encouraging sustainable communities. Approximately ½of the project cost will be provided by the federal government.

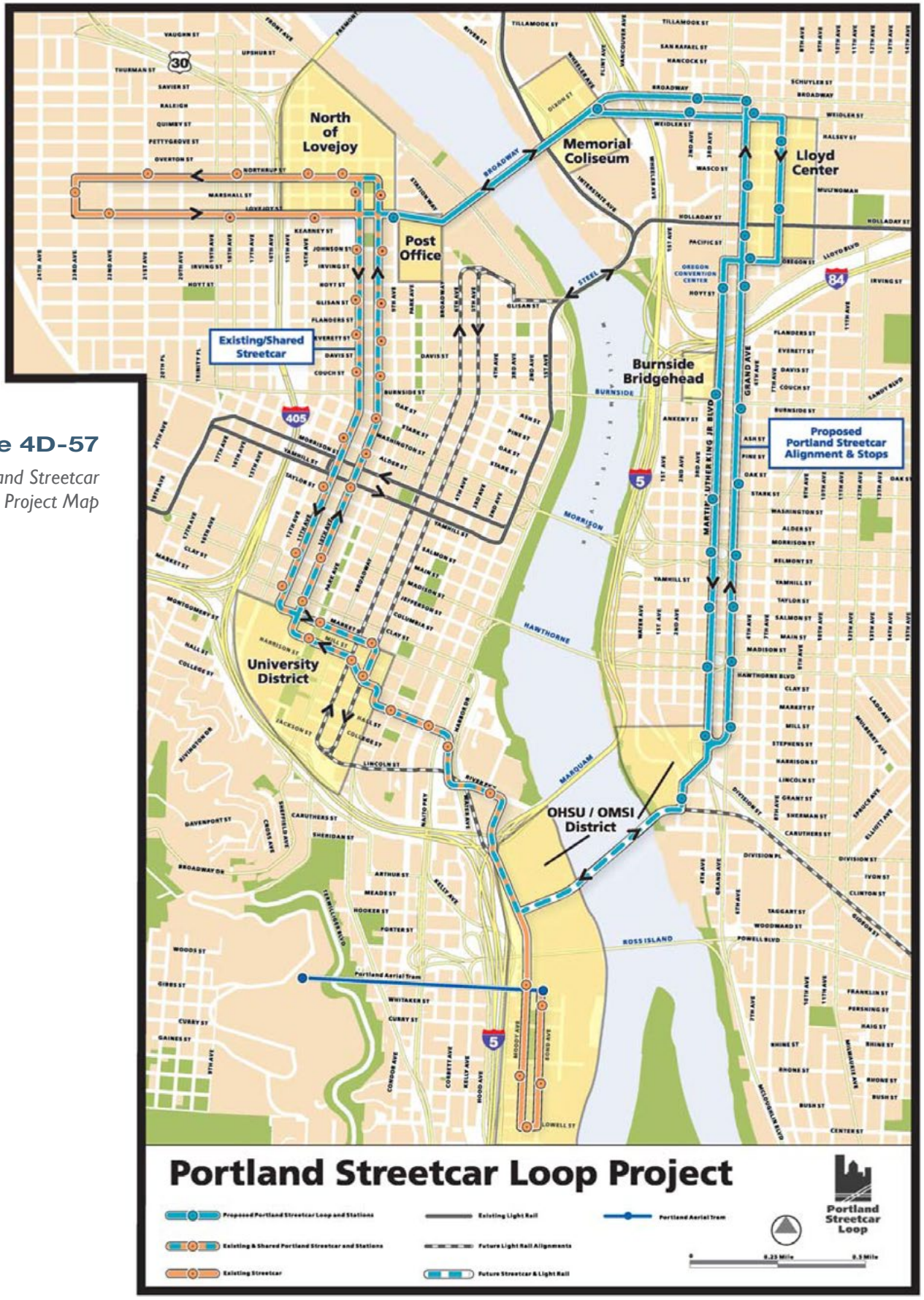


Figure 4D-57

Portland Streetcar Loop Project Map

Source: http://www.portlandstreetcar.org/pdf/loop_map_200906_lores.pdf

Lessons Learned

Start small and build on success. As one early participant noted, there is always an initial pushback on this type of project. During the process, engage the community (each of the neighborhoods in Portland has a citizens committee), learn the funding methods (Portland uses many sources—TIF, parking revenue bonds, meter revenues, LID), and how to bundle the sources.

Put all of the pieces in place. Portland has used Urban Renewal Districts, developer agreements, broad zoning categories, and a coordinated approach to development.

Form an active and involved Citizens Advisory Committee (CAC). The Portland CAC is still active (with some of its original members) 20 years after the project's start. To keep a committee involved, members must be heard and taken seriously—which the Portland city government has done.

Connect the dots. Portland did not just randomly choose this transit mode and assume it would spur development anywhere in the city—the stakeholders began, extended and continue to expand the line by connecting activity centers and potential development areas. They have used these key draws to make other areas accessible and successful.

Support neighborhoods. The purpose of Portland Streetcar is to support—not change—the neighborhoods and their development. Transit is a component, but not the only component. Neighborhood support has helped provide solutions for the expansion of institutions, such as PSU and OHSU, as well as for residential neighborhoods by increasing access without the need for more parking.

Engage citizens. The successful strategy in Portland has been the respect each individual citizen is afforded by the process. Engaged citizens are encouraged to participate in every stage of project development. Citizen involvement has resulted in changes, including the location of the original route for the line, the design and location of stations, and the development of the design criteria for the streetcars. Citizens in Portland are full partners and, as a result, are strong supporters.

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Corridor Data: Portland Streetcar

Transit Operator:	Tri-Met/City of Portland/Portland Streetcar, Inc.
Transit System Name:	Portland Streetcar
Transit Corridor Name:	Portland Streetcar
Transit Mode:	Streetcar (SC)
Location (Metro Area):	Portland, OR
Region (USA):	Northwest
Date Open:	July 20, 2001
Corridor Length:	4.0 Miles / 8.0 Mile Loop (source: http://www.portlandstreetcar.org/history.php)
Corridor Purpose:	Downtown Connector, Urban Housing
# of Municipalities Served:	1
# of Stations Served:	43
Construction Sequence:	Phased
Alignment Description:	Existing Urban Streets
Operating Speed (Max.):	31 MPH (source: http://www.lightrail.com/photos/portland/portlandstreetcar/portlandstreetcar.htm)
Operating Speed (Avg.):	15 MPH (source: http://world.nycsubway.org/us/portland/streetcar.html)
Car Capacity:	41 seated (source: http://www.portlandstreetcar.org/history.php) 140 capacity (source: http://www.portlandstreetcar.org/history.php)
Peak Service Headway:	12 Minutes (source: http://www.portlandstreetcar.org/history.php)
Projected Ridership:	3,500 avg. wkdy. (by 2001) (source: 'Portland Streetcar Development Oriented Transit')
Ridership (entire line):	12,710 avg. wkdy. (source: Kay Dannen, Portland Streetcar, Inc.)
Funding:	Federal: $5M State: $12M Local: $86M TOTAL: $103M (source: 'Portland Streetcar Development Oriented Transit')

SOURCE: Portland Streetcar (operator), unless otherwise noted

February 3, 2011

Station Area Data: Portland Streetcar

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	Legacy Good Samaritan (NW 23rd & Marshall)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	START	Hospital with commercial and residential	5	50	Portland Streetcar Local Improvement District	Northrup Commons Condos, Overton Park Apts. (1)	Nob Hill Neighborhood
2	NW 22nd @ Lovejoy (SB) / NW 22nd @ Northrup (NB	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Hospital with some mixed use and residential	5	50	Portland Streetcar Local Improvement District	N/A	Nob Hill Neighborhood
3	NW 21st @ Lovejoy (SB) / NW 21st @ Northrup (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Predominantly residential with parking for hospital and a hotel	10	50	Portland Streetcar Local Improvement District	The Inn at Northrup Station, Maverick Sports Club (1)	Nob Hill Neighborhood
4	NW 18th @ Lovejoy (SB) / NW 18th @ Northrup (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.3 Miles	Predominantly mixed use and commercial	10	60	Portland Streetcar Local Improvement District	1963 Overton, Lovejoy Office Bldg., Work-space Lofts (1)	Nob Hill Neighborhood
5	NW 14th @ Northrup (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.3 Miles	Rich mix of uses, predominantly mixed-use residential	100	275	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Port-land Streetcar Local Improvement District	N/A	Pearl District
6	NW 13th @ Lovejoy (SB) / NW 12th @ Northrup (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential	125	275	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	Avenue & Marshall Wells Lofts, Bridgeport Condominiums, Cronin Block, Lovejoy Square, RiverTec, Safeway Blocks, The Sitka, The Encore, The Lovejoy East & West (1)	Pearl District
7	NW 10th @ Marshall (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential	100	275	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	Burlington Tower Apts., Lexis on the Park, Lovejoy Station, Streetcar Lofts, The Metropolitan, Park Place Condominiums, The Pinnacle, Station Place, YWCA (1)	Pearl District, Tanner Springs Park

Station Area Data: Portland Streetcar (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
8	NW 11th @ Johnson (SB) / NW 10th @ Johnson (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential with some townhomesl	20	220	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	Crane Bldg., Johnson Street Townhomes, Kearney Plaza Apts., Pearl Court Apts., Pearl Townhomes, Pacific NW College of Art, River- stone Condominiums, Tanner Place, Vollum Natural Cap Ctr, Edge (1)	Pearl District, Jamison Square, Union Station
9	Oakland City Center/12th St.	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential with some townhomes	20	200	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	10th @ Hoyt, Manzana Rotisserie Grill, McKenzie Lofts, 937 Condos (1)	Old Town/Chinatown, North Park Blocks
10	NW 11th @ Everett (SB) / NW 10th @ Everett (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential with some townhomes	20	250	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	The Casey Condos, Elizabeth Lofts, North Park Lofts, Park NW Condos, DeSoto Building, Reed/Harris/ Block 90 (1)	Old Town/Chinatown, North Park Blocks
11	NW 11th @ Couch (SB) / NW 10th @ Couch (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses, predominantly mixed-use residential	80	275	1999 - Pearl District Development Agreement (Portland Devel. Commission and Developer); 2008 - Amended and Restated River District Urban Renewal Plan; Portland Streetcar Local Improvement District	8 NW 8th, Powell's City of Books, Wieden and Kennedy Bldg., Brewery Blocks (1)	Brewery Blocks, North Park Blocks
12	SW 10th @ Stark (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Predominantly mixed-use commercial with a few hotels	N/A	N/A	South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	MU bldg./ZGF office, Gregory, The Ace, Living Room Theaters (1)	O'Bryant Square

Station Area Data: Portland Streetcar (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
13	SW 11th @ Alder (SB) / SW 10th @ Alder (NB)	Portland, OR	20-Jul-2001	MAX Blue/Red Line (LRT)	N/A	Urban	At Grade	0.15 Miles	Predominantly mixed-use commercial with a few hotels	N/A	N/A	South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	Telegram Bldg., Westin Hotel, Galleria (1)	Oregon Children's Theatre, Western Culinary Institute
14	SW 11th @ Taylor (SB) / Central Library (NB)	Portland, OR	20-Jul-2001	MAX Blue/Red Line (LRT)	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses - mixed-use commercial, hotel, library	80	190	South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	Fox Tower, Paramount Hotel, Park Avenue West, Park Block 5 (1)	Central Library, Pioneer Courthouse Square
15	SW 11th @ Jefferson (SB) / Art Museum (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.3 Miles	Rich mix of uses - mixed-use buildings, art museum, park blocks	80	290	South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	Art Museum Renovation, Cornerstone Condominiums, Eliot, Museum Place, Oregon History Center, Outside In Youth Center, St. Francis Apts., The Jeffrey, Ladd Tower, Madison Office Condos, Martha Washington	Portland Art Museum, Portland City Hall
16	SW 11th @ Clay (SB) / SW 10th @ Clay (NB)	Hayward, CA	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Rich mix of uses - predominantly mixed-use residential	80	315	South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	Benson Tower, Hamilton West, Kafoury Commons, Mosaic Condominiums (1)	South Park Blocks
17	SW Park @ Market (SB) / SW Park @ Mill (NB)	Portland, OR	20-Jul-2001	NONE	N/A	Urban	At Grade	0.15 Miles	Predominantly institutional and mixed use	80	250	1995 - University District Plan; South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	Portland State University (1)	South Park Blocks
18	SW 5th @ Market (SB)	Portland, OR	20-Jul-2001	MAX Mall Shuttle (LRT)	N/A	Urban	At Grade	0.15 Miles	Predominantly commercial	N/A	N/A	1995 - University District Plan; South Park Blocks Urban Renewal Area; Portland Streetcar Local Improvement District	N/A	Keller Fountain Park

NOTES:
* Dedicated to transit riders
** All distances are measured "as the crow flies" and are rounded up to the nearest .15 mile
*** Within 1/8 mile of transit station (source: Google Earth)
**** Residential densities are estimates on net densities per block by looking at particular residential typologies within 1/4 mile of transit station. (source: Google Earth)

SOURCES:
1 Portland Streetcar, Inc. 'Portland Streetcar Development Oriented Transit'

February 3, 2011

Portland Interstate Metropolitan Area Express (MAX) Light Rail, Westside MAX Blue Line

Prepared by:
New Jersey Institute of Technology
Van Meter, Williams, Pollack, LLP

Created in 1969, the Tri-County Metropolitan Transportation District of Oregon (TriMet) provides bus, light rail, and commuter rail service in the Portland metropolitan area. MAX is TriMet's light rail system. It comprises 4 lines (Blue, Red, Yellow, Green), which run on 52 miles of track and serve 85 stations (see Figure 4D-58). Planning for the Westside MAX Blue Line and for transit-supportive development at Blue Line station neighborhoods is the subject of this section.

Westside MAX Blue Line Case Facts

System Name:	MAX
Corridor Name:	Westside MAX Blue Line
Transit Mode:	Light Rail (LRT)
Location:	Portland, Oregon
Region (USA):	Northwest
Corridor Length:	18 miles
Corridor Purpose:	Suburban Commuter
Municipalities Served:	3
Cost and Funding Sources:	Cost: $963M (federal $704.1M, state $113.6M and local $145.8M)
Date Opened:	September 12, 1998

Source: http://trimet.org/maps/railsystem.htm

Figure 4D-58 *TriMet Light Rail System Map*

Planning for the MAX Light Rail

In the mid-1970s, the City of Portland began planning the current light rail transit system and considering transit and land use planning in combination. Under the guidance of Governor McCall, proposed freeway projects were rejected and public transit became a preferred mode for Portland. One of two major freeway projects (Mount Hood) was moving forward, and would have negatively impacted Portland in an unalterable way. Displacements in the center city, as well as air quality problems that had already made it impossible to add any additional parking in the downtown, would have resulted. While the Mount Hood Freeway provided focus on these issues, there were hundreds of miles of additional freeways in the planning stage at that time.

In response to growing concerns over the direction that Portland appeared to be headed in terms of transportation and land use, Governor McCall appointed a task force to take a look at future growth, and to establish a new vision for the region. The task force recommended a new direction for transportation planning, which included abandonment of freeway expansions in favor of a multimodal approach that emphasized transit. In 1974, major public outcry resulted in the cancellation of the Mount Hood project. In 1975, the region adopted an Interim Transportation Plan, which rejected the previous plans for 54 new highway projects, and instead proposed modest roadway projects and a network of transit ways along major travel corridors to meet future demand. The City of Portland abandoned the Waterfront Freeway and built a waterfront park on that right-of-way. The region and the Oregon DOT formally withdrew the Mount Hood Freeway from the Interstate system. The federal funds were used instead for local improvement projects and for the construction of the Eastside transit corridor known as the Banfield project.

Originally conceived as a bus transitway, the Banfield Transitway Study analyzed various transit alternatives. In 1979, the community chose the light rail alternative as the preferred mode. That choice fundamentally changed Portland's transportation planning direction. Federal approval, granted in 1980, made Portland's light rail system, named Metropolitan Area Express (MAX), the first federally-funded light rail system in the United States. A new regional transportation plan, adopted in 1981, called for the development of three transit corridors serving the Eastside, Westside, and Southside of the City. The Eastside MAX line was the first part of the new vision and was opened in 1986. The project led to a new direction for transportation planning, and broke new ground nationally by using the funding intended for Interstate freeway construction—a major accomplishment given federal funding guidelines at the time.

During this period of transit planning, land use impacts became a major regional issue. In 1977, the State Legislature approved the creation of the Metropolitan Service District (Metro) as the MPO, a unique, elected regional government with responsibility to plan for the region's future. Voter approval followed in 1978. With strong support from the governor, in 1979, the Portland Urban Growth Boundary was created to manage regional land use and development.

A specific example of transit and land use development integration was the 1978 opening of the Portland Transit Mall. Spanning 22 blocks, the Portland Transit Mall was the nation's first mall that dedicated one-way streets for mass transit (see Figure 4D-59). The project was a catalyst to re-attract offices to center city and help retain retail uses. Funding for the project came from UMTA funds.

Today's extensive public transit system in the City of Portland and the region is a direct result of the change in direction taken by the region in the mid-1970s, the transit-corridor development proposal that grew out of Governor McCall's task force, and the Regional Transportation Plan of 1981, which formalized the new vision. The multi-corridor transit system now in place grew out of a vision built upon controversy, and a growing recognition that public transit was an essential element for the Portland area and for regional mobility. After taking the first step with the Eastside MAX, the City of Portland has never looked back, and has built a series of successful and complementary projects into a comprehensive system.

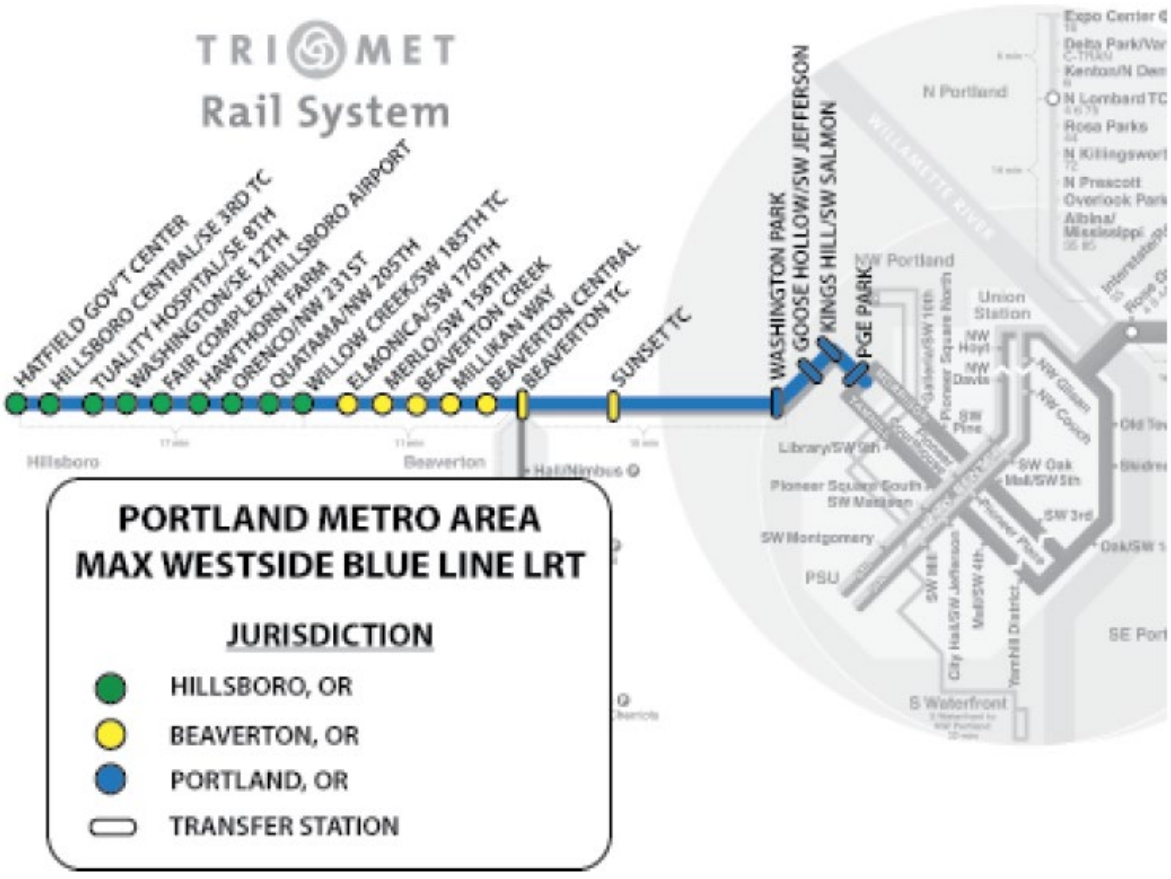
Figure 4D-59
Portland Transit Mall

Source: Photo taken by Steve Morgan, June 12 2009, licensed under Creative Commons Attribution-Share Alike 3.0 Unported, from Wikipedia, http://en.wikipedia.org/wiki/File:Portland_Transit_Mall_with_cyclists_crossing.jpg

The Westside MAX Blue Line

The Westside MAX Blue Line, the focus of this corridor review, was completed in 1998. It is 18 miles long and includes 20 stations (see detailed information at the end of this section regarding the Westside MAX Blue Line and the Westside MAX Blue Line stations). The Blue Line runs through three cities—beginning in Portland (PGE Park Center), through Beaverton and unincorporated Washington County, and terminating in Hillsboro (Hatfield Government Center Station) (see Figure 4D-60).

Table D-2 lists TriMet's MAX Light Rail Blue Line Stations and their intermodal connections (from Western Terminus in Hillsboro to Portland CBD). Planning for the Westside Max Blue Line was unique, because the corridor was planned and designed to accommodate anticipated growth consistent with an overall comprehensive future land use planning effort for the region. According to one of the planners responsible for the corridor planning effort, the Westside Corridor is an example of realizing a future land use vision by utilizing public transit as a tool. It is also an excellent example of a cooperative effort between transit and land use planners in realizing regional goals. The Westside project was responsible for establishing the agency roles that remain in place today, with Metro taking the lead through the Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS), up to the point of adopting the Locally Preferred Alternative (LPA). With the selection of the LPA, TriMet is responsible for delivering the region's selected project.



Source: http://trimet.org/maps/railsystem.htm and Van Meter Williams Pollack, LLC

Figure 4D-60 *Westside MAX Blue Line*

Table 4D-4

TriMet's MAX Light Rail Blue Line Stations with Intermodal Connections (from Western Terminus in Hillsboro to Portland CBD)

Station	Connections
Hatfield Government Center	Terminus park-and-ride lot
Hillsboro Center/SE 3rd	Transit center – bus route connections
Tuality Hospital/SE 8th	Bus route connections
Washington/SE 12th	Bus route connections
Fair Complex/Hillsboro Airport	Park-and-ride lot; bus route connections
Orenco/NW 23rd	Park-and-ride lot; bus route connections
Merlo/SW 158th	Bus route connections
Millikan Way	Park-and-ride lot; bus route connections
Beaverton TC	Connection to WES commuter rail, running south to Wilsonville; bus route connections
Sunset Transit Center	Park-and-ride lot; bus route connections
Washington Park	Bus route connections
Goose Hollow/SW Jefferson	Bus route connections
JELD-WEN Field (PGE Park)	Bus route connections
Library/SW 9th/Galleria/SW 10th	Connections to Portland Streetcar, running north to Union Station (Amtrak, Greyhound); and south to OHSU Aerial Tram
Pioneer Square/Mall/SW 5th	Connections to Portland Mall with dozens of bus routes; MAX light rail Yellow and Green lines, running north to Vancouver, WA and south to Clackamas County; MAX Red Line, running east to Gresham and Portland International Airport connection

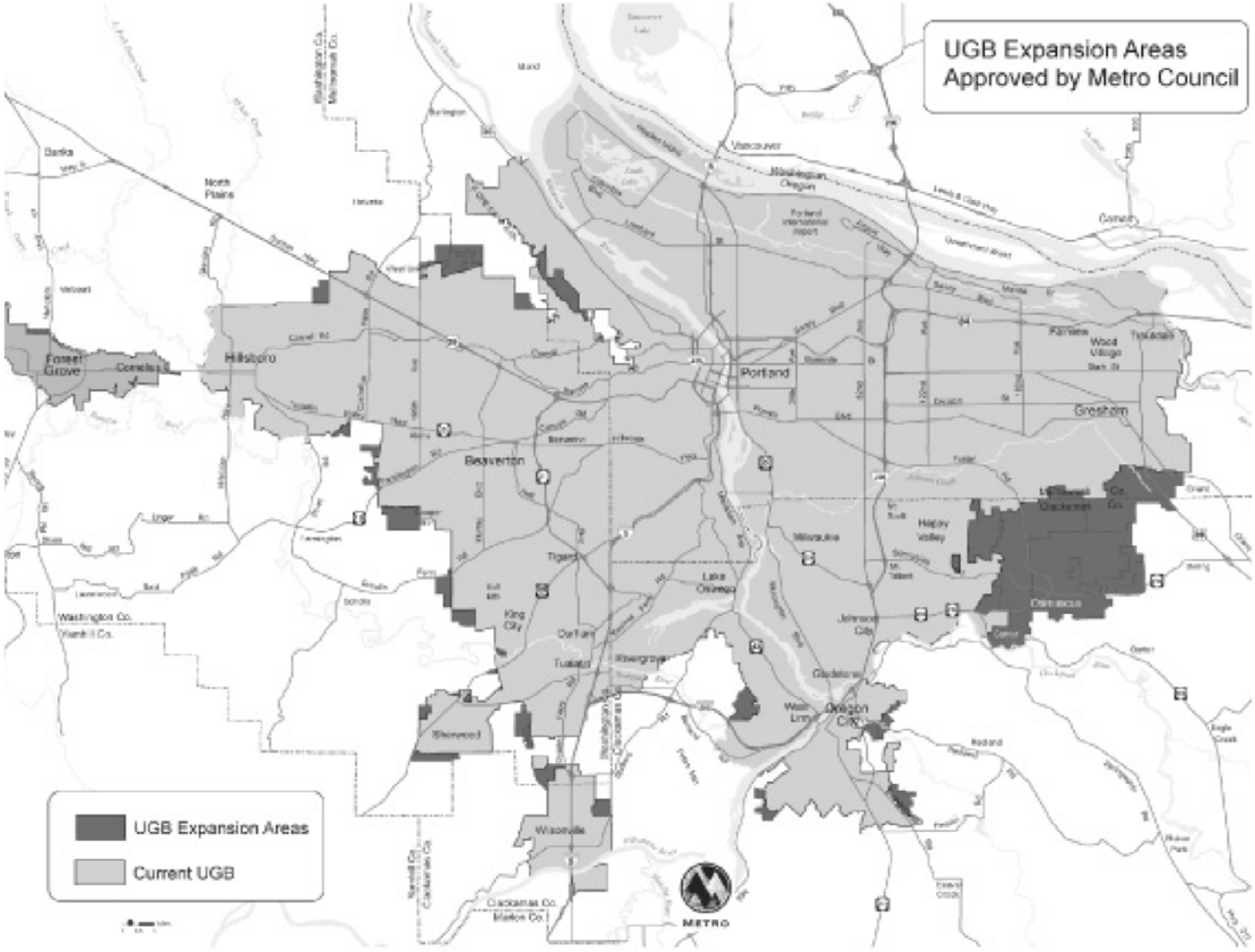
Planning for the Westside MAX Line

The overall planning effort for the Westside MAX Blue Line was led in the formative stages by TriMet, the region's transit agency. TriMet has been a longstanding supporter of integrating transit and land use planning as a way to achieve the major objective of Portland's planning goal—creating livable and sustainable communities. Metro was also a partner in the Westside MAX Blue Line planning process. However, at that time, Metro was still establishing its role in land use, and developing its long-range vision plan, so the clear division of responsibility that exists today—in which Metro creates the vision and guides the planning process, and TriMet implements the transit plan—had not yet been established.

Oregon's Urban Growth Boundary (see Figure 4D-61) helped form the framework for the Westside MAX Line. Additionally, concurrent with planning for the Westside MAX Line was the development of Metro's vision plan, known as the 2040 Growth Concept. While this vision plan, which considered all of the factors impacting land use in the region, had not yet been developed, it was presaged in the Westside corridor's development. In many respects, the joint-planning effort that occurred for the Westside MAX Line was a test case for the regional planning model that has since developed and proven successful.

Figure 4D-61

Metro Urban Growth Boundary (2004)



Portland's Urban Growth Boundary both sets the limits on urbanization and causes densification within the already urbanized area
Source: http://www.spur.org/images/0903_article_1_fig1.jpg

METRO

Through 1978 Oregon legislation, Metro was made possible from the merger of two councils of government organizations—the Columbia Regional Association of Governments and the Metropolitan Services District. In 1978, voters in the metropolitan area of Clackamas, Multnomah, and Washington counties approved a ballot measure that made Metro the nation's first elected regional government and the only elected MPO in the country. The legislation that created Metro established a unit of government with taxing power, regulatory authority over land use, and the operation of some regional services. With voter approval, Metro became responsible for coordinating the land use plans for the region's 27 jurisdictions. State law required Metro to establish a regional urban-growth boundary (UGB), and empowered the Metro Council to make binding policy decisions on development within the boundary. The region's UGB included 24 cities and portions of 3 counties.

In 1991, the Metro Council adopted the Regional Urban Growth Goals as a guide for long-range planning. In 1992, voters approved a home-rule charter for Metro, making regional growth management the agency's top priority. From 1992 to 1994, alternatives for future growth were reviewed in an extensive outreach program. In December of 1995, Metro adopted the 2040 Growth Concept. In November 1996, Metro approved the Urban Growth Management Functional Plan—a toolbox of planning policies for local governments to use in implementing the Growth Concept. In addition to land use, Metro is responsible for developing a comprehensive set of regional policies on transportation, water quality, natural areas, and other issues of regional significance. The Metro board is responsible for regional transportation planning, and managing federal transportation funds. Both state law and Metro's charter require that local comprehensive plans be consistent with Metro's regional plans. They use regional flexible funds for planning grants as an incentive to encourage proactive transit related planning.

Considering land use and transit in combination was a major factor in planning the Westside Corridor, as was the realization that local government had to be actively involved as a full partner. This was important because planning for the Westside MAX Line changed the federal funding rules for transit. Planning the Westside MAX Line was prospective, in that the population and ridership projections depended upon future possibilities, as opposed to existing conditions. Funding a project based upon future land use was a new concept for the federal government. Initially, the White House Office of Budget and Management would not fund a project that included so much vacant land and completely relied on future land use decisions. However, after negotiations, an amendment was added to the Full Funding Grant Agreement, which stipulated that unless TriMet used its best efforts to assure adoption of the regional plan as outlined in the 2040 Growth Concept,

the $75M in federal funds would need to be repaid. The $75M funded one phase of the project, which was augmented with additional FTA funding.

A successful planning and implementation effort was crucial. The cooperative planning process began with the corridor's alignment and the selection of station areas. The selected alignment used the Burlington Northern alignment, which was compatible with the 2040 Growth Concept, and reflected the goals and plans of the communities of Hillsboro and Beaverton. Concerns with aesthetics and environmental impacts in Portland's West Hills and Sunset Canyon sections led to a decision to tunnel a portion of the project between the Goose Hollow and Sunset Stations. Community participation and input came from many directions, and was encouraged and rewarded. The success can in part be attributed to the planning tools at Oregon's state and regional levels that encourage coordinated planning. However, not all of the tools were available when the Westside MAX Line was being planned. The key to the region's success, then and now, is the effective direction and collaboration provided by the agencies responsible for planning and implementing programs. With planning for the Westside MAX Line, first TriMet, and then TriMet and Metro together, approached the corridor with the experience gained from development of the Eastside Corridor. They applied their experience to a new set of circumstances and challenges. While the Eastside Corridor was an established urban corridor with opportunities to reinforce and build upon existing land uses, the Westside Corridor represented a new frontier based on a future vision.

Planning and Implementing Transit-Supportive Development

A full range of planning tools and a major commitment of resources were used to ensure successful planning and implementation of transit-supportive development along the Westside MAX Line. TriMet learned from the Eastside experience that encouraging transit-supportive development by adopting permissive zoning was not sufficient. A station area planning process was needed to ensure that plans would be implemented. TriMet provided the resources and the funding needed to support the three cities and one county within the Westside corridor. TriMet accepted the lead planning role and established the Westside Station Area Planning (WSAP) program, a collaborative effort between Metro, TriMet, and the local jurisdictions. The purpose of WSAP was to update city and county comprehensive plans, and to develop regulations and capital improvement programs for transit-oriented development in light rail station areas. Metro, TriMet, ODOT, Washington County, and the Cities of Beaverton, Hillsboro, and Portland created an intergovernmental management committee that approved goals, work programs, schedules, and budgets. Every station on the Westside MAX Blue Line was included. TriMet, Metro, and ODOT provided more than $2M for WSAP. Additional funding for projects related to WSAP was provided through state transportation and growth management grants, technical assistance grants, local government funds, and other sources, including property owners and/or developers. Overall, it is estimated that $4M has been spent to complement the planning effort. Most of the WSAP and

related funds were provided and spent by the four local governments. However, some federal New Starts funds were used to pay for station area planning, establishing a new precedent for use of such funds.

TriMet dedicated a large staff of experienced transit planners to assist communities in developing compatible station-area plans. TriMet took the lead in meeting and encouraging prospective developers. In this role, TriMet encouraged compatible development, and discouraged projects that were inconsistent with the overall vision. One of the most effective techniques (still used by TriMet) was the unsolicited-proposal option. This allowed developers interested in a particular site to bring a proposal to TriMet. If TriMet was interested, it advertised receipt of the proposal, determined if other developers were interested, and then evaluated all proposals.

Metro was simultaneously developing and adopting the Regional Urban Growth Management Functional Plan, which gave local governments 2 years to agree upon 20-year targets for residential and employment growth by addressing and adjusting permitted densities. Planning for the Westside MAX Line had always been proactive. In the project development stages, Metro and the local communities entered into inter-local agreements, which resulted in the communities' adoption of temporary zoning controls to encourage compatible (and discourage incompatible) development. By coordinating these efforts and providing planning and technical support to the local communities, TriMet and Metro made integrated land use and transit planning a natural byproduct of the process.

The success of the integrated land use and transit-planning approach was obvious before the 1998 opening of the Westside MAX line. Prior to opening, 7,000 new residences and $1B in investments were underway in the Westside corridor. That kind of success requires more than effective planning and cooperation. The strategy involved having a transit-supportive development policy in place, and coordination between TriMet, Metro, and the local communities. The luck was having a market ready to respond, and a strong economy that made it possible.

The results of the coordinated-planning approach are obvious throughout the Westside corridor. All of the station areas have implemented strategies to take advantage of the Westside MAX Blue Line, and all are consistent with the original concepts outlined in the early station-area planning stages. While some of the local plans are still being developed, the direction has been firmly established, with development consistent with the vision. Not every community and station area has experienced the same level of success, but participants realize that time and most importantly, a favorable market, are needed to reach full potential.

The City of Hillsboro

Hillsboro's graduated approach to planning has served it well. Beginning with the original station-area planning process that was incorporated into the

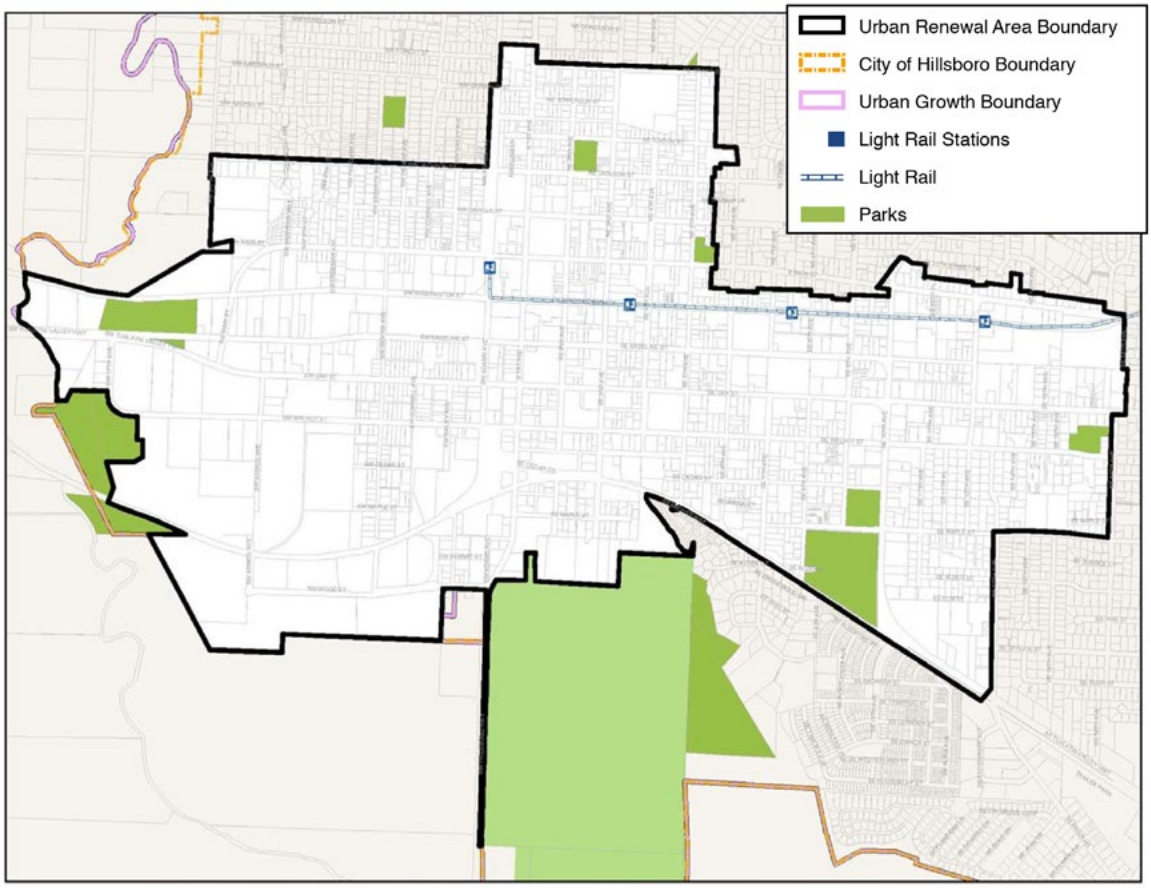
1997 adopted zoning, Hillsboro has continued to add to its transit-supportive development planning process.

The City of Hillsboro has realized that success requires a transitional process, which builds upon success by continuously elevating its standards. The city acknowledges the differences of its station areas—each of the four station areas was analyzed separately. Zoning categories were developed to take advantage of the strengths of each area. Three categories emerged under the general designation of the Central Business District—Station Community Commercial, Station Community Commercial-Highway Oriented, and Station Community Commercial-Downtown Zone. As the designations suggest, Hillsboro did not concentrate solely on the light rail line; it made an effort to take advantage of visible and well-traveled highway frontage. Moreover, Hillsboro did not rely on zoning alone to create the downtown climate. The City used (and continues to use) a number of tools. Prior to the 1996 completion of the Westside MAX Blue Line, property owners supported the creation of a Local Improvement District (LID) designed to complement the downtown. The LID constructed new sidewalks and curbs, and installed lighting, decorative paving, and landscaping.

The Hillsboro 2020 Vision and Action Plan, adopted in May 2000 and revised in 2005 and 2010, developed focus areas and strategies. The "Enhancing Neighborhoods and Districts" focus area involves a strategy for "completing an active transportation system, integrating sidewalks, pedestrian and bike infrastructure to serve the entire city, improving neighborhood connections, access to transit, recreation options and safety," and a strategy for "establishing a coordinated system of buses, shuttles and light rail connecting large neighborhoods, major retail and employment areas" (for more information, see http://www.hillsboro2020.org/FileLib/H2020ActionPlan2010_Web.pdf).

The City of Hillsboro established the Downtown Parking Solutions project, which took a comprehensive look at parking. Recommendations included a series of transit-supportive development strategies, such as minimizing parking requirements, encouraging shared parking, and developing a downtown parking district for the construction of future garages.

The planning process continued with the development of the City of Hillsboro Downtown Framework Plan, which considered the opportunities and constraints of each area within the downtown in an effort to extend the benefits to all neighborhoods. An offshoot of the Framework Plan was the development and adoption of an Urban Renewal Plan, 2010 (see Figure 4D-62), which covers the Downtown Area and helps provide the resources to support development and redevelopment. Another offshoot is a proposal for new zoning for the area, which recognizes the evolving status of the station areas by grouping them within a single zone (see http://www.ci.hillsboro.or.us/EconomicDevelopment/Documents /DowntownFrameworkPlan.pdf for more information).



Source: http://www.ci.hillsboro.or.us/EconomicDevelopment/DowntownByDesign/Documents/Dntn%20Hillsboro%20UR%20PLAN%20FINAL_052010.pdf

Figure 4D-62 *Downtown Hillsboro Urban Renewal Area*

Nine Westside MAX Blue Line stations are located in the City of Hillsboro. The following discussion highlights transit-supportive development activities in four of those stations.

Tuality Hospital/SE 8th Ave MAX Station

The planning process, which started prior to completion of the Westside MAX Blue Line, has never stopped, and has seen successes at all of the station areas. Prominent among the downtown stations is Tuality Hospital/SE 8th Ave MAX Station, which has seen the addition of a satellite Pacific University Campus emphasizing Health Professions, a great synergy with the Hospital (see Figure 4D-63). Washington Avenue has experienced the addition of higher-density housing.

Complementing the Downtown area is a new 358,000 SF Civic Center (see Figure 4D-64) and the privately-developed Glenn and Viola Walters Cultural

Arts Center, as well as a renovated Town Theatre. Metro's TOD program provided incentive grants for the Pacific University and Cultural Arts Center projects.

Figure 4D-63
Pacific University Health Professions Campus Building

Source: Photo taken by M.O.Stevens, December 2009, licensed under Creative Commons Attribution-Share Alike 3.0 Unported, from Wikipedia http://en.wikipedia.org/wiki/File:Pacific_University_Health_Professions_Campus_Building_I_back_-_Hillsboro,_Oregon.JPG

Figure 4D-64
Hillsboro Civic Center

Source: Photo by AboutMovies, released into the Public Domain, http://en.wikipedia.org/wiki/File:HillsboroCivicCenter.JPG

Orenco/NW 231st Ave MAX Station

Planning for the Orenco Station area varied from the norm in a region devoting great effort to integrating transit planning and land use planning. Although the City of Hillsboro designated the Orenco neighborhood as a Station Community Planning

Area, a designation applied to other areas within ½ mile around stations, the 1996 designation only partially explains the resulting Orenco Station development. Pac Trust, a local commercial/industrial developer, had purchased considerable acreage near the abandoned electric railroad right-of-way with the initial intent of extending the high-technology campus concept gaining traction in the region. Through an urban-renewal district, the City of Hillsboro had been assembling ¼-acre lots in an abandoned subdivision property farther north in the area. Plans for the Westside MAX Blue Line altered both the developer's and the city's plans. The City of Hillsboro and Pac Trust shared a new vision for the development of a transit village and began a collaborative planning effort. The result of the collaborative effort was the PacTrust's master plan, and simultaneous adoption of new zoning provisions permitting the proposed development (see Figure 4D-65).

Source: http://www.nahb.org/generic.aspx?sectionID=219&genericContentID=471&print=true

Figure 4D-65 *Orenco Station Site Plan*

The Pac Trust master plan (encompassing a 200-acre neighborhood) called for the development of more than 1,800 dwelling units and 500,000 SF of commercial space. Pac Trust was the primary developer in the planning and development of the 68 acres considered the original Orenco Station with its residential partner

Costa Pacific Homes, but sold the remaining 132 acres to other developers. There is a diverse mixture of residential units, ranging from small-lot single family (3,500 SF) homes, to townhomes, and condominiums (see Figure 4D-66). Higher densities were always envisioned closer to the station, and those parcels are anticipated to be the next phase developed.

Figure 4D-66
Orenco Station Town Center

Source: Flickr, adrimcm, used with permission under Creative Commons License CC BY-NC-ND, http://www.flickr.com/photos/adrimcm/3506290228/sizes/l/in/photostream/

Located immediately south of the Orenco light rail station is a neighborhood known as Orenco Gardens, an 82.6-acre, master-planned community (see Figure 4D-67). The site was sold to West Hills Development, Portland's largest homebuilder, in 2000. The required density under the Residential Village zoning was 24 units per acre within 1,300 feet of the transit station. During public review of the master plan, concerns from the predominantly single-family surrounding neighborhoods pushed the developer to upgrade corner lots with 360° architecture, add Craftsman detailing to a percentage of homes, include uniform fencing throughout the development, and add 10 acres of open space.

Figure 4D-67
Orenco Gardens

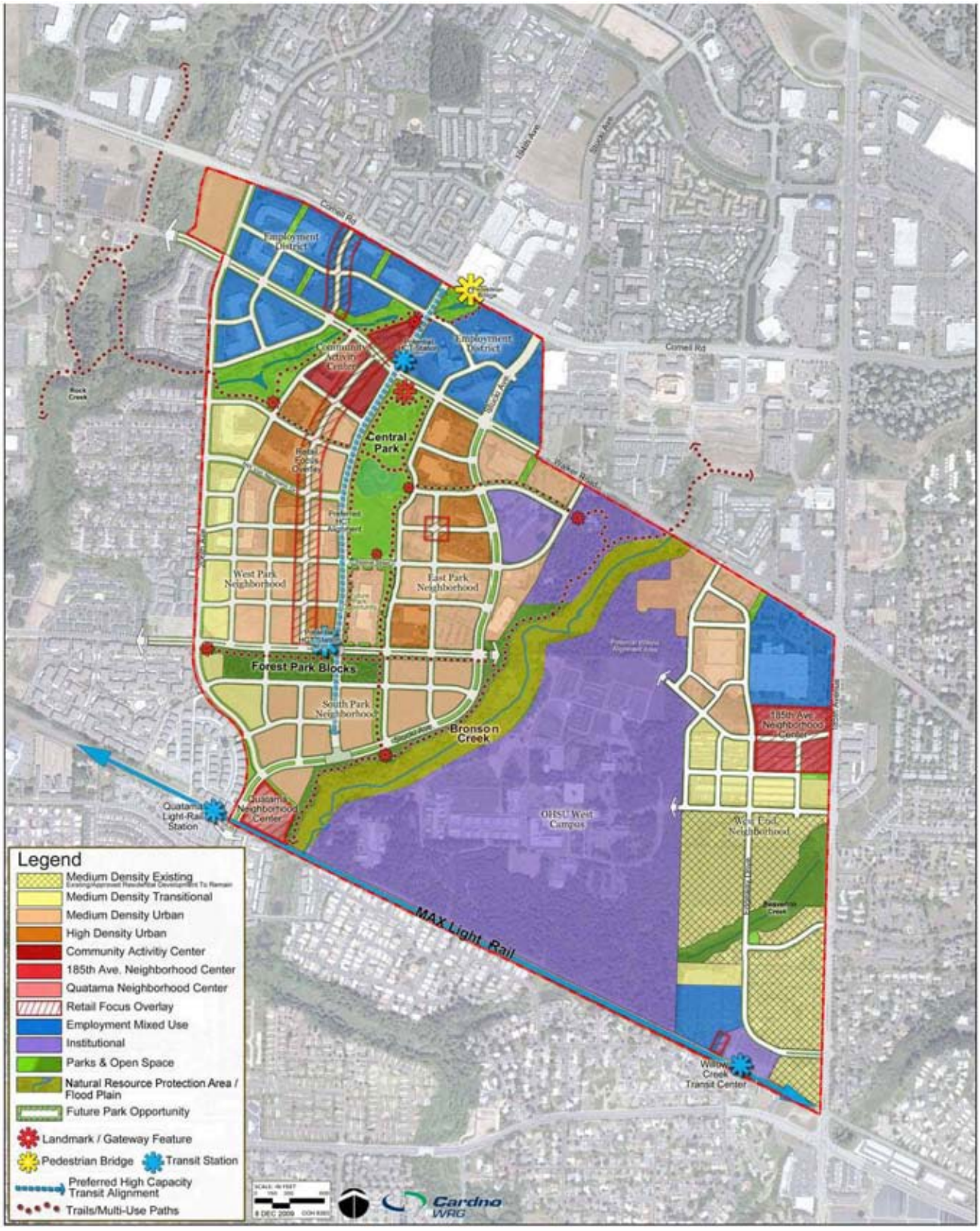
Source: Van Meter Williams Pollack, LLP

(For more information on planning in the Orenco Station area, refer to the "Case Studies in Station Neighborhood Planning for Transit-Supportive Development" section.)

Quatama/NW 205th Ave MAX Station

The Quatama Station sits on a former greenfield site. The station neighborhood contains more than 1,300 new residential units, ranging from apartments to single family houses. Quatama is home to an OHSU campus. Currently in the planning stages, the AmberGlen Community will be located immediately adjacent to the station. The community plan for this 606-acre project, adopted by Hillsboro in January 2010, envisions a mixed-use urban community with 6,000 medium- to high-density residential units, 3 million SF of office, 500,000 SF of retail (shops, restaurants, entertainment), and more than 170 acres of parks and natural areas (see Figure 4D-68) (for more information, see http://www.ci.hillsboro.or.us/Planning/ OHSUAmberGlen.aspx).

The city has pursued designation of the combined Tanasbourne Town Center and AmberGlen plan areas as a Metro 2040 Regional Center. The designation for AmberGlen was approved in 2010.



Source: http://www.ci.hillsboro.or.us/Planning/documents/LandUseConceptMap.pdf

Figure 4D-68 *Amber Glen Land Use Concept Plan Map*

Willow Creek/SW 185th Ave Transit Center

The last station in the City of Hillsboro, which is shared with the City of Beaverton, is Willow Creek, home of a new campus for Portland Community College (see Figure 4D-69). The campus was opened in 2009 and serves as a workforce training center. This project was a major joint venture development with TriMet that used a former park-and-ride site.

Figure 4D-69
Willow Creek Station

Source: Portland State University, http://www.pdx.edu/extended-studies/sites/www.pdx.edu.extended-studies/files/styles/pdx_collage_large/public/willowCreek.jpg

The City of Beaverton

The City of Beaverton, along with the City of Hillsboro, fought for a Westside MAX alignment that would complement its prospective planning efforts. The City of Beaverton developed station area plans for its light rail stations in conjunction with the construction of the Westside MAX. The station plans, and subsequent city regulations, envisioned minimum densities of 24 du/acre. The success of the planning efforts has been mixed, due to a variety of reasons. In some station areas, the difficulty lies with encouraging land owners to participate in the redevelopment efforts. Thus, achievement of the critical mass necessary to impact the neighborhood or to achieve increased densities has been difficult. Since implementation of the light rail system, the Elmonica/SW 170 Station area has seen the development of more than 600 units, including apartments and single-family homes.

Land use in the area of Beaverton Creek Station is governed by the Beaverton Creek Station Area Plan, which has the goals of supporting light rail ridership, fostering a sense of community, and respecting the natural features of the community (for more information on the Beaverton Creek Station Area Plan, see

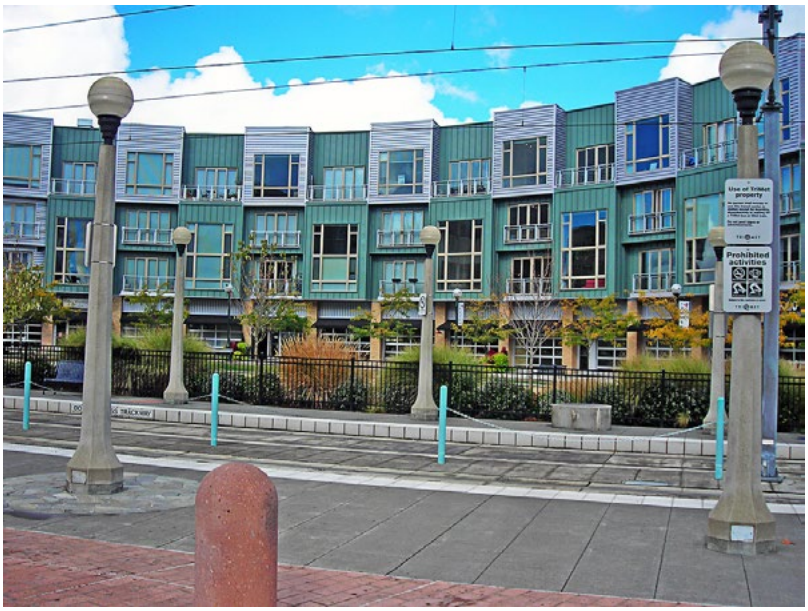
https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/5878/ Beaverton_Beaverton_Creek_Station_Plan.pdf?sequence=1). The Beaverton Creek Station Area Plan sets minimum densities (30/acre) for dwelling units within 400 feet of the light rail station. It also sets minimum FARs for non-residential and multiple-use projects at 0.5, and for uses within 400 feet of the light rail station at 0.6. The area attracted a 23-acre, 2-phase project, which has been completed. Phase One, named Centre Point, includes 276 apartments. Phase Two, named LaSalle, has 554 apartments and 10,000 SF of retail space. Unfortunately, retail space has remained vacant. Part of the problem may be that, unlike the situation with its neighbor Hillsboro, Beaverton's project lacks visibility from nearby streets and has a vacant 100-acre parcel on the north side of the station, which is not encouraging to retail uses. Other projects, including Beaverton Creek V, with 124,000 SF of office, and the Forest Glen Apartments have been completed.

Beaverton Central Station remains a key redevelopment area for the City of Beaverton. The station area was once occupied by a sewage treatment plant. The light rail line bisected the 8-acre site, which is now being redeveloped as "The Round at Beaverton Central," expected to exceed $100M in private investment when complete (see Figure 4D-70). This is a joint development project with funding provided by TriMet for a downtown plan, a market analysis, and project concept plan. Metro provided federal funding (STP) to develop road access to the site. As of early 2011, there has been a public investment of more than $2M. The completed development is expected to include 65 housing units, an aggregate of up to 600,000 SF of commercial space (office and retail), and 2 parking structures. One of the parking structures was completed in 2007 and has 8 levels and 399 spaces. The project has been through two developers and two bankruptcies and the city government has sought a master developer to assist with this project and with the adjacent property, known as Westgate.

An Urban Renewal Plan for the area has been developed, which, if approved, would provide the resources necessary to undertake some of the infrastructure improvements (including the parking garage) seen as critical to the project's success. Parking availability at The Round is perceived as an issue worth considering for other suburban communities. In order to secure tenants, the second developer of the center had to guarantee spaces, which negated the shared-parking concept. Since typical parking requirements for the development had been reduced by 40 percent, due to transit availability, this is likely to be an issue going forward. Securing the right amount of parking is difficult, but in this instance local planners feel that a reduction of 20 percent would have been more realistic. This project is important to the City of Beaverton and to meeting the density goals for the Westside Corridor, and will take time and an improved market to be realized.

Figure 4D-70

The Round at Beaverton Central



Source: Flickr, Pamela Rentz, used with permission under Creative Commons License CC BY-NC-SA 2.0, http://www.flickr.com/photos/pamrentz/1588029700/

Considering the cities of Beaverton and Hillsboro back-to-back is an interesting analysis, because they both approached the planning and development process in the same way, but to date have had different results. This suggests that station area plans are not entirely the key to success, but that there are many components that have to work in unison.

Portland

The City of Portland implemented planning controls as part of the Westside development for the station area that serves the entry to downtown—the Goose Hollow neighborhood. TriMet provided development opportunities on properties it had purchased for the Westside MAX Blue Line's construction-related activities. Three sites have been developed—Arbor Condominiums (27 units), Collins Circle (mixed-use development with ground-floor retail and 5 floors containing 124 residential units), and Stadium Station apartments.

The enactment of the growth boundary, investments in public transit, and increased densities have made a great difference in Portland. As reported by CEOs for Cities, area residents travel four fewer miles per day than the average for the most populous metro areas in the country. With 2 million residents, that equals a savings of 8 million vehicle-miles per day, or 2.9 billion per year, saving 1.4 million tons of greenhouse gases per year. It represents a conservative savings of $1.1B per year in fuel costs (Cortright 2007).

Lessons Learned

There are many transferable lessons to be learned from the approach taken for the Westside MAX Blue Line. In fact, those involved in Portland's planning suggest that people outside of Portland assume that Portland's experience has been easy, but it has not been. While momentum and past success helps, vision, tenacity, and long-term commitment are critical. One Portland planner suggested that saying Portland is unique is simply an excuse. Integrating transit planning and land use planning in Portland has been successful because participants created and used effective planning and policy tools. The lessons learned from Portland include:

- Effective MPOs should take the lead on regional land use planning issues. The MPO should create a vision that local communities can implement with land use controls, and the transit agency should coordinate with the MPO and local communities. Metro, the MPO in the Portland region, achieved this vision for Portland.
- Metro has a solid process for allocating transportation funds in the region. They have biweekly meetings of elected officials to discuss transportation policy and funding. Government officials know that there is a plan and that their projects will get consideration. Decisions on funding are determined by established criteria. In Portland, consistency is a key to success.
- TriMet and Metro placed great emphasis on station-area planning and development. They recognized station areas as special places, and supported the effort with staffing and funding. After the Eastside MAX experience, TriMet and Metro expanded the study areas around the station to ½ mile, rather than the generally accepted ¼ mile. Their regret on the Westside Max Blue Line project was that they could not keep the same level of staff support in place after the corridor opened.
- The Westside MAX Blue Line project set a new standard with FTA on how to judge project proposals, and how to actively move future land use into the evaluation equation. FTA's approval of Section 3 New Starts Funding set a new precedent, but it is important to note that it was based on an agreement requiring the regional and local agencies to back up their future land use plans with the regulations and zoning that made those plans a requirement. The City of Portland and TriMet received the flexibility that other regions would like to have, although the flexibility was granted based on their willingness to take the necessary actions, or face the possibility of repaying federal funds.
- In the Portland region, while transit projects are measured by ridership, the regional system was not developed solely for mobility or ridership purposes—land use is a major consideration. Both transit and land use are seen as ways to achieve community livability.

- The Portland region, like others in the country, has a large number of agencies and communities involved in the planning process who coordinate plans and share the same goals.
- Key to the Portland region's success are these constants—the Urban Growth Boundary, Growth Plan, the decision-making process on funds, and commitment to transit. The methods used to achieve goals are flexible and fit the circumstances.
- Success comes one victory at a time. Achieving supportive densities and a land use mix takes time and wide community support.
- To ensure success, property owners need to be part of the visioning process because they are key participants of implementation.
- The planning process cannot ever stop. Plans, and the resulting public and private investment, have to be constantly updated, augmented, and adjusted to fit the evolving community and the market.

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Corridor Data: Westside Max

Transit Operator:	TriMet
Transit System Name:	MAX
Transit Corridor Name:	Westside MAX Blue Line
Transit Mode:	Light Rail (LRT)
Location (Metro Area):	Portland, OR
Region (USA):	Northwest
Date Open:	9/12/1998 (source: trimet.org/pdfs/history/railfactsheet-westside.pdf)
Corridor Length:	18 Miles (source: trimet.org/pdfs/history/railfactsheet-westside.pdf)
Corridor Purpose:	Suburban Commuter
# of Municipalities Served:	3
# of Stations Served:	20
Construction Sequence:	Simultaneous
Alignment Description:	Former Oregon Electric Railway
Operating Speed (Max.):	55 MPH (source: http://www.railway-technology.com/projects/portland/)
Operating Speed (Avg.):	19.6 MPH (source: http://en.wikipedia.org/wiki/MAX_Blue_Line)
Car Capacity:	64 seated (source: http://www.trimet.org/max/newtrains.htm)
Peak Service Headway:	166 capacity (source: http://www.trimet.org/max/newtrains.htm)
Projected Ridership:	5 - 15 minutes (source: trimet.org/pdfs/history/railfactsheet-westside.pdf)
Ridership as of June 2010:	20,470 avg. wkdy. (by 1998) (source: Joseph Recker, TriMet) 30,553 avg. wkdy. (source: Joseph Recker, TriMet)
Funding:	Federal: $704.1M State: $113.6M Local: $145.8M TOTAL: $963M (source: trimet.org/pdfs/history/railfactsheet-westside.pdf)

SOURCE: Tri-Met (transit agency), unless otherwise noted

February 3, 2011

Station Area Data: Westside Max

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
1	Hatfield Government Center	Hillsboro, OR	12-Sep-1998	NONE	Structure	Suburban	At Grade	START	Predominantly civic and commercial uses with some residential	5	20	1996 - Downtown Station Community Planning Area (amendment to Hillsboro Comp. Plan); 2010 - Downtown Hillsboro Urban Renewal	N/A	Hillsboro Courthouse, Civic Center
2	Hillsboro Central/SE 3rd Transit Center	Hillsboro, OR	12-Sep-1998	NONE	N/A	Suburban	At Grade	0.5 Miles	Predominantly commercial and mixed-use buildings	5	25	1996 - Downtown Station Community Planning Area (amendment to Hillsboro Comp. Plan); 2010 - Downtown Hillsboro Urban Renewal	N/A	N/A
3	Tuality Hospital/SE 8th Ave.	Hillsboro, OR	12-Sep-1998	NONE	N/A	Suburban	At Grade	0.5 Miles	Predominantly medical/ hospital uses south of station and north of the station is predominantly residential	5	15	1996 - Downtown Station Community Planning Area (amendment to Hillsboro Comp. Plan); 2010 - Downtown Hillsboro Urban Renewal	N/A	Tuality Commons Hospital
4	Washington/SE 12th Ave.	Hillsboro, OR	12-Sep-1998	NONE	N/A	Suburban	At Grade	0.5 Miles	Predominantly residential	5	25	1996 - Downtown Station Community Planning Area (amendment to Hillsboro Comp. Plan); 2010 - Downtown Hillsboro Urban Renewal	N/A	N/A
5	Fair Complex/ Hillsboro Airport	Hillsboro, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	1.25 Miles	North of station is Washington County Fairgrounds and south of station is predominantly residential	2	5	1996 - Fair Complex / Hawthorne Farm Station Community Planning Area (amendment to Hillsboro Comp	N/A	Airport, Fairgrounds
6	Hawthorn Farm	Hillsboro, OR	12-Sep-1998	NONE	N/A	Suburban	At Grade	1.0 Miles	Predominantly suburban offices and light industrial/ high-tech industry	0	0	1996 - Fair Complex / Hawthorne Farm Station Community Planning Area (amendment to Hillsboro Comp	Hawthorn Farm Office, Westpark Flex Building (1)	N/A
7	Orenco/NW 231st Ave	Hillsboro, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	0.75 Miles	Predominantly residential	5	50	1996 - Orenco Station Community Planning Area (amendment to Hillsboro Comp. Plan); 1996 - PacTrust Orenco Station Master Plan	Cortland Village, Orenco Station, Villages at Orenco Station, Orenco Place Townhomes 1	Intel Ronler Acres Campus

Station Area Data: Westside Max (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
8	Quatama/NW 205th Ave.	Hillsboro, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	1.5 Miles	Predominantly residential with some surface parking and farmland	5	35	1996 - Quatama Station Community Planning Area (amendment to Hillsboro Comp. Plan); 2010 - AmberGlen Community Plan	Quatama Crossing, Amber View, Briarcreek Apts., Village at Sutherland, Quatama Station Apts. (1)	N/A
9	Willow Creek/ SW 185th Transit Center	Hillsboro, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	1.0 Miles	Predominantly residential with a community college and surface parking adjacent to station	5	35	N/A	Portland Community College	Portland Community College, Oregon Health & Science University West Campus
10	Elmonica/SW 170th Ave.	Beaverton, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	1.0 Miles	Predominantly open space and rail maintenance facility with some residential	5	35	N/A	Clocktower Apts., Elmonica Court Apts., Steel Park Apts. (1)	N/A
11	Merlo Road/ SW 158th Ave	Beaverton, OR	12-Sep-1998	NONE	N/A	Suburban	At Grade	0.75 Miles	Predominantly light industrial with some residential	35	35	2002 - Merlo Station Community Plan- ning Area (amendment to Beaverton Comp. Plan)	N/A	Tualitan Hills Nature Park
12	Beaverton Creek	Beaverton, OR	12-Sep-1998	NONE	Surface	Suburban	At Grade	0.75 Miles	North of the station is open space and south of the station is residential and office	35	35	2002 - Beaverton Creek Station Com- munity Planning Area (amendment to Beaverton Comp.	La Salle (Murray North), Beaverton Creek V, CenterPointe (Murray South), Forest Glen Apts. (1)	Nike World Campus
13	Millikan Way	Beaverton, OR	12-Sep-1998	MAX Blue/Red Line (LRT)	Surface	Suburban	At Grade	0.75 Miles	Predominantly suburban offices and light industrial/ high-tech industry	0	0	2002 - Millikan Way Station Community Planning Area (amendment to Beaver- ton Comp.	N/A	Tektronic Howard Vollum Campus
14	Beaverton Central	Beaverton, OR	12-Sep-1998	MAX Blue/Red Line (LRT)	N/A	Suburban	At Grade	0.75 Miles	Predominantly commercial with a mixed-use center and some residential	35	35	2002 - Beaverton Central Station Community Planning Area (amendment to Beaverton Comp.	The Round at Beaverton Central (1,2)	Downtown Beaverton

Station Area Data: Westside Max (cont.)

Station Profiles												DEVELOPMENT CHARACTERISTICS		
No .	Stations	Location	Date Open	Major Transit Connections	*Transit Parking	Urban Or Suburban	Landing	**Spacing	***Land Use Description	****Residential Density Range (Du/Ac)		Policy Involvement	Transit Supportive Development (Completed)	Destination Elements (Within 1 Mile Of Station)
										Low	High			
15	Beaverton Transit Center	Beaverton, OR	12-Sep-1998	MAX Red Line (LRT) / Westside Express Service (CR)	N/A	Suburban	At Grade	0.5 Miles	Mixture of commercial and residential	5	35	2002 - Beaverton Transit Center Station Community Planning Area (amendment to Beaverton Comp. Plan)	N/A	N/A
16	Sunset Transit Center	Beaverton, OR	12-Sep-1998	MAX Red Line (LRT)	Surface	Suburban	Below Grade	1.75 Miles	Vacant land, freeway interchange and suburban office and retail	0	0	N/A	Sunset Medical Center (1)	N/A
17	Washington Park	Portland, OR	12-Sep-1998	MAX Red Line (LRT)	N/A	Suburban	Below Grade	3.25 Miles	Civic space with parks and open space, surface parking and some residential	0.5	1	N/A	N/A	Washington Park, Children's Museum, Oregon Zoo, Hoyt Arboretum, Inter- national Test Rose Garden, Japanese Garden
18	Goose Hollow/ SW Jefferson	Portland, OR	12-Sep-1998	MAX Red Line (LRT)	N/A	Urban	At Grade	1.25 Miles	Mix of residential, commercial and athletics (minor-league baseball field)	5	100	1996 - Goose Hollow Station Area Plan	Arbor Vista Condominiums, Stadium Station Apartments, Collins Circle (2)	N/A
19	Kings Hill/SW Salmon	Portland, OR	12-Sep-1998	MAX Red Line (LRT)	N/A	Urban	At Grade	0.25 Miles	Predominantly mixed-use buildings and athletics (minor-league baseball field) and some residential	5	100	1996 - Goose Hollow Station Area Plan	Legends (1), The Allegro (2)	Lincoln High School
20	PGE Park	Portland, OR	29-Aug-1997	MAX Red Line (LRT)	N/A	Urban	At Grade	0.25 Miles	Predominantly mixed-use buildings and athletics (minor-league baseball field) and some residential	5	100	1996 - Goose Hollow Station Area Plan	N/A	PGE Park

NOTES:
* Dedicated to transit riders
** All distances are measured ""as the crow flies"" and are rounded up to the nearest 1/4 mile
*** Within 1/4 mile of transit station (source: Google Earth)
**** Residential densities are estimates on net densities per block by looking at particular residential typologies within 1/4 mile of transit station. (source: Google Earth)

SOURCES:
1 ULI Sacramento: Portland MAX
2 TriMet Community Building Sourcebook
3 The TOD Advocate
4 The City of Hillsboro

U.S. Department of Transportation
Federal Transit Administration
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1200 New Jersey Avenue, SE
Washington, DC 20590
http://www.fta.dot.gov/research