Transit Oriented Development for High Speed Rail (HSR) in the Central Valley, California: Design Concepts for Stockton and Merced.

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The Center for Global Metropolitan Studies
University of California Berkeley

Authors:

Principal Investigator: Elizabeth Deakin
Report Concept: Elizabeth Deakin

Urban Design:	Nicolae Duduta, Manish Shirgaokar, Elizabeth Deakin, Megan Kanagy, Cornelius Nuworsoo
Policy Recommendations:	Elizabeth Deakin, Sebastian Petty, Nicolae Duduta, Manish Shirgaokar, Laura Stonehill, James Rubin, Karen Frick
Data Analysis:	Sebastian Petty, Laura Stonehill, Megan Kanagy, Jennifer Yeamans, James Rubin, Matthieu Mourroux, Ye Kang Ko
Book Design:	Shivang Patwa, Nicolae Duduta, Manish Shirgaokar, Elizabeth Deakin

The Center for Global Metropolitan Studies
University of California Berkeley
2614 Dwight Way
Berkeley, California 94720-1782

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The authors are responsible for all the work and content.
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES (Cont.)

LIST OF FIGURES (Cont.)

LIST OF TABLES

1.1. Statewide system map of the High Speed Rail system.

Sources -
Elevation Image (NASA), State Borders (California Dept. of Forestry and Fire Protection),
HSR Rail Alignment (CAHSRA, Summer 2007),
Urbanized Areas (California Resources Agency, Legacy Project. Published 7/1/2003.
Available through
http://casil-mirror1.ceres.ca.gov/casil/uncategorized/legacy.ca.gov/Geography_Cultural/urban/)

1. INTRODUCTION

In 1996 the California High Speed Rail Authority (CHSRA) was established and charged with planning, designing, constructing and operating a state of the art high speed train system.

This report, prepared with the financial support of the CHSRA, examines the potential for transit-oriented development (TOD) around high speed rail (HSR) stations in the Central Valley. The report focuses on proposed stations sites in the Northern San Joaquin Valley cities of Stockton and Merced, and presents planning approaches and design concepts for land use, urban design, and multimodal access and circulation in and around the proposed HSR station areas.

High speed rail will provide the Central Valley with unprecedented access to the rest of the state, putting the Valley's residents only one to two hours away from California's major employment and population centers. Such a dramatic change in the Central Valley's geography of access will in turn impact the course of future development within the region. At the regional scale, the increased accessibility afforded by high speed rail could serve to concentrate development in and around communities that have stations. In the case of the Northern San Joaquin Valley study sites, such demand could shift the impetus of new growth away from the Valley's western fringe and reorient it towards the established urban centers of Stockton and Merced.

High speed rail presents a tremendous opportunity and impetus for communities with stations to revitalize their downtowns through enhanced urban design, a diversity of development, and improved transit connectivity. By using bustling rail stations as focal points for walkable, transit-oriented downtown development, communities such as Merced and Stockton stand to gain economically, socially and environmentally. For such development to be successfully realized, however, careful consideration and planning must be given to the density of development, parking accommodation, and multimodal transit connections.

This study examines land use, urban design, and access options for Stockton and Merced and recommends policies for HSR station areas. For each study site, diagrams and analyses of the HSR station area are presented, showing new retail, offices and housing. The design concepts are based on a detailed analysis of existing station area conditions, CHSRA documents, current city plans, and regional trends. Most importantly, the design concepts presented here are intended to increase HSR ridership and enhance Stockton and Merced's downtowns without overpowering their existing character and landscape elements.

The Proposed System

As proposed, California's 800 mile High Speed Rail system would traverse California's Central Valley to connect Sacramento and the San Francisco Bay Area in the north with Los Angeles and San Diego in the south. Much of the system would share rail alignments with other rail services, requiring safety, operations and design improvements to joint facilities, including grade separation. Overall, however, the HSR system would provide a predominantly separate transportation system connecting Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County and San Diego to one another and to air, rail and highway systems. The HSR system would provide a modal alternative to air or auto travel for long distance trips and the diversion of trips to HSR would reduce pressures for costly road and airport expansion. HSR also is expected to improve mobility and accessibility to several parts of the state that are not well served by air or conventional rail transportation.

As currently conceived, high speed rail trains would operate at speeds up to 220 mph, with express services traveling between downtown San Francisco and Los Angeles in 2 ½ hours. Between California's major, longer-distance intercity markets, door-to-door travel times would be comparable to air transportation and less than half as long as automobile travel times. For trips of intermediate length, HSR

INTRODUCTION (Cont.)

trips would be quicker than either air or automobile transportation, taking into account total travel times including waiting and check-in. Fares would be competitive or lower than the costs of travel by auto or air. Riders are anticipated to include business travelers, tourists, and leisure travelers as well as commuters for city pairs such as Los Angeles and Anaheim, Palmdale and Los Angeles, Riverside and San Diego, Sacramento and the Bay Area. In addition, the HSR system would offer both interregional and intraregional travelers convenient connections to airports and to regional transit services. Forecasts are for 88 - 94 million passengers per year by 2030. The HSR system would also carry light-weight, high-value freight.

The High Speed Rail Authority envisions that stations would be multi-modal transportation hubs linked directly to local and regional transit, airports, and highways. Their location raises important possibilities for joint and coordinated development, including development of mixed-income housing, retail and office uses. Successful transit-oriented development could produce numerous additional benefits including higher HSR ridership and improved air quality, reduced energy consumption, and preservation of natural resources. TOD could thus increase the overall cost-effectiveness of the HSR system.

While California has adopted smart growth principles, state law currently does not require local government policies to conform to these principles. As a result, there is a great deal of variation among local governments in their growth policies and practices. Some are pursuing infill, revitalization of existing urbanized areas, compact growth, and green buildings and neighborhoods, while others pursue low density development at or beyond the urban fringe. Variations in development practices also reflect both market and policy differences. As a result, some locations will be stronger candidates than others for dense infill development around HSR stations. Greater attention to these land use issues and options is thus an important step in HSR planning and policy.

High Speed Rail in the Central Valley

In the Central Valley, HSR stations have been proposed for Downtown Sacramento, Stockton, Modesto, Merced, Fresno and Bakersfield. With the exception of Sacramento, these cities have limited commercial air service and the introduction of HSR to the Valley would dramatically improve their access to the rest of California.

Ridership projections for the individual stations were recently completed for the year 2030. Stockton's ridership is projected at approximately 1.7 million annual boardings, or about 6,300 per weekday with assumed service by 70 trains daily. Merced's station is forecast to have 1.2 million annual boardings, or about 2,400 per weekday with service by 52 daily trains.

The Central Valley is experiencing rapid population growth that, for the last two decades, has been accommodated primarily through low density greenfield development of single family homes. This pattern of development cannot be effectively served by transit and is poorly positioned to take full advantage of the opportunities afforded by HSR. Within the context of such development, most station access will be by private car and the station areas run the risk of being surrounded by parking lots and devoid of pedestrian activity. Yet other development trajectories are possible. For example, several of the cities slated to receive HSR stations have recently completed smart growth studies, have participated in the Mayor's Institute on City Design, or have expressed a commitment to strengthening their downtowns. Thus while current low-density development patterns in the Valley may not be transit-oriented, the introduction of the HSR system provides an opportunity to consider more centralized and compact forms of development that will benefit both the rail system and the communities it serves.

1.1. STUDY OBJECTIVES

In the chapters that follow, we present a series of design concepts for the Stockton and Merced HSR station areas. These design concepts are intended to achieve the following goals:

•Capitalize on the investment in HSR in a way that also strengthens cities
•Provide a variety of housing types, affordable to many different income groups, within walking distance of the HSR station
•Provide sites for economic development near the HSR rail stations
•Encourage more compact, transit-and pedestrian-friendly development that promotes the viability of alternative modes
•Limit the size of cities' urban footprints and thus reduce their environmental impacts and the development pressure on agricultural lands
•Create station areas that are attractive, vibrant, and functional.
•Increase HSR ridership from the local population.

1.2. STUDY METHODOLOGY

The design concepts presented in this report were developed in several stages. The initial stage was to develop a clear understanding of the context in which HSR would be operating in California and in the Northern San Joaquin Valley in particular. We used CHSRA reports on system concepts, service levels, and demand forecasts to delineate the opportunities that would be offered by HSR. We also reviewed historic and current land uses and patterns of growth in the Valley, drawing upon Census and State data sources and local plans and documents. This information helped us better understand current development issues, which we also examined through news reports and contacts with local planners and stakeholders. In particular, we noted the patterns of low density growth occurring at the edges of cities and towns on land formerly used for farming, the high rates of long distance commuting, and the efforts by Stockton and Merced to improve their downtown areas and economic bases.

In the second phase the study team conducted detailed site analyses. This included multiple visits to the proposed station sites and surrounding areas and extensive mapping and photographing of the two cities' downtowns. Through this data gathering and subsequent analyses, the study team was able to identify key structures and design elements in each downtown that could be preserved and enhanced. The analysis of existing conditions also focused on cataloging vacant and underutilized lots to asses each station area's potential for infill development.

In the project's third stage, the study team focused on developing a series of transit-oriented design concepts for each city. These design concepts rely heavily on the analysis of existing station area conditions and attempt to show how new development can be

INTRODUCTION (Cont.)

integrated into the existing downtowns. To that end, design concepts focus on infill development and consciously replicate or build from many of the positive design elements and architectural features observed in the existing downtowns. Similarly, design concepts respond to regional issues identified in the first stage of the project by focusing on transit and pedestrian-oriented development that encompasses a broad variety of housing types.

The final stage of the project evaluates the design concepts in a more quantitative fashion, showing how different infill development typologies might impact parking and add housing units and retail space within each city's downtown.

Finally, the study recommends a series of steps that cities could take to encourage high quality station area development and maximize the benefits they receive from having an HSR station.

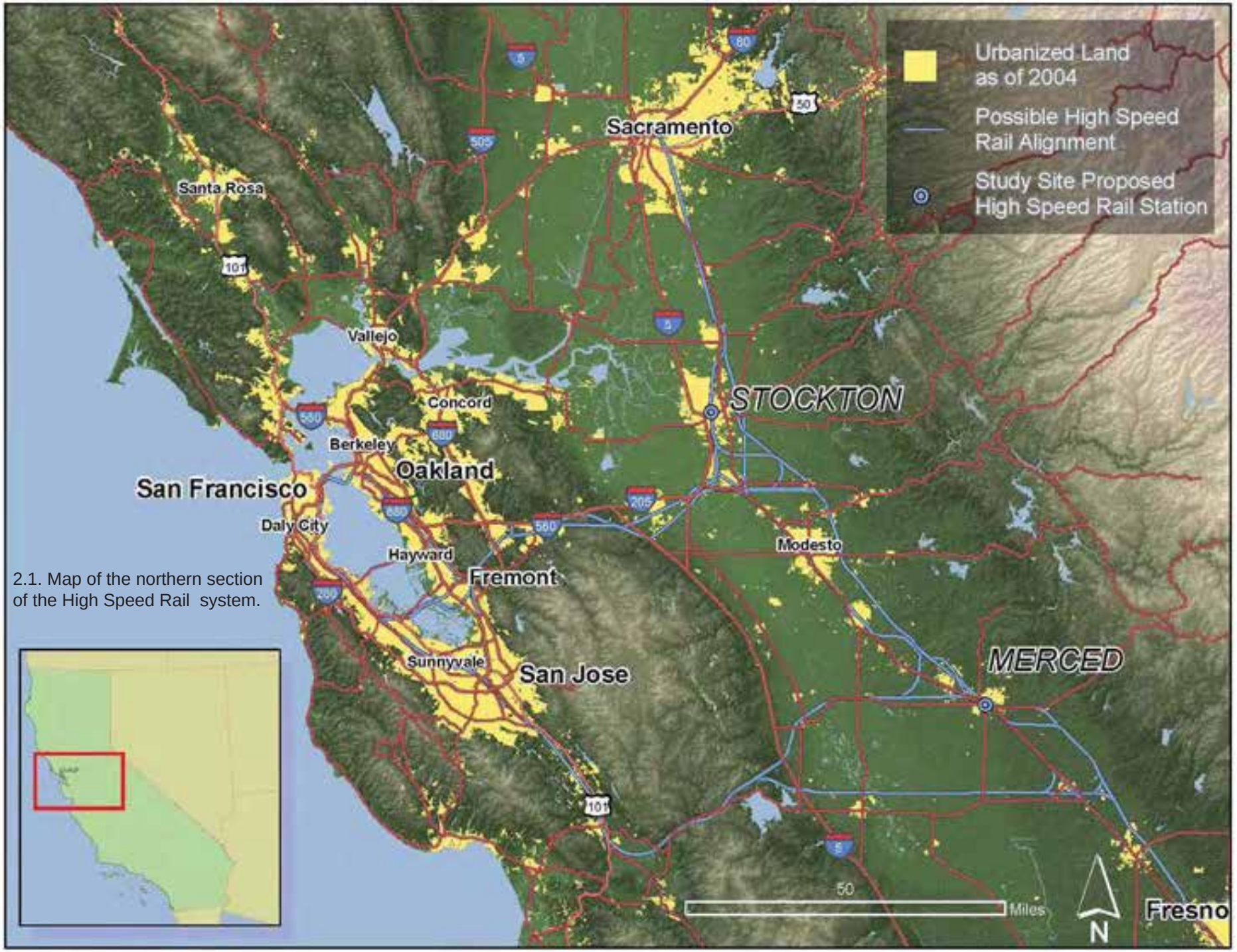
2. BACKGROUND: REGIONAL CONTEXT AND ANALYSIS

California's proposed HSR system will run the length of the State's San Joaquin Valley, linking Sacramento and the San Francisco Bay Area with Southern California. The cities of Merced and Stockton, whose stations are the focus of this study, are located in the Northern San Joaquin Valley, south of Sacramento and just to the east of the San Francisco Bay Area. In order to plan and design for HSR in Stockton and Merced, it is critical to understand how each of these cities fits into the Northern San Joaquin Valley region. The following brief analysis relies on data and projections produced by a variety of government and private entities. It is intended as a contextual framework for the specific station area and urban design concepts for HSR stations in Stockton and Merced.

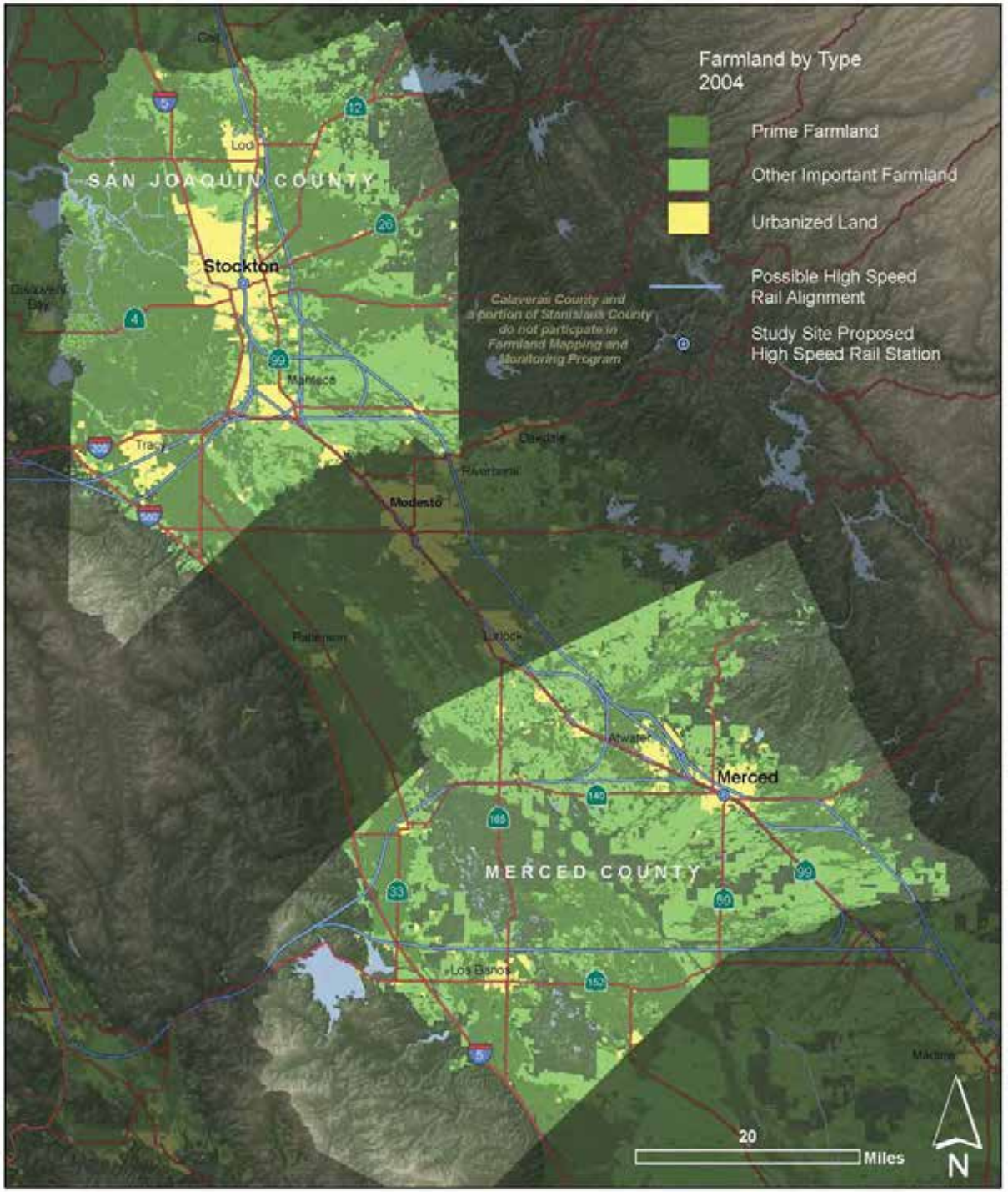
The Northern San Joaquin Valley is comprised of three counties: San Joaquin, Stanislaus, and Merced. San Joaquin County is the most urbanized of the three, with an estimated 2007 population of 680,000. Stockton, the county seat, has a population of 286,000 and is the largest city in the Northern San Joaquin Valley region as a whole[1]. Merced County lies to the south of San Joaquin and Stanislaus Counties and is the least populous of the three counties, with only 251,000 residents in 2007, most living along the Highway 99 corridor. The City of Merced, the county seat, had a 2006 estimated population of just over 76,000[2].

Between 1970 and 2000, the Northern San Joaquin Valley more than doubled its population, adding over 600,000 new residents[3]. Between 2000 and 2030, the Valley is projected to double its number of residents again, adding 1.2 million people, a pace of growth that far exceeds projections for surrounding regions and the state as a whole[4]. The study sites of Stockton and Merced are anticipated to reflect these regional trends, and by 2030 the San Joaquin County Council of Governments estimates that Stockton will have some 420,000[5] residents while the Merced County Association of Governments puts the city of Merced at an estimated population of 120,000[6].

For notes see page 24



2.1. Map of the northern section of the High Speed Rail system.

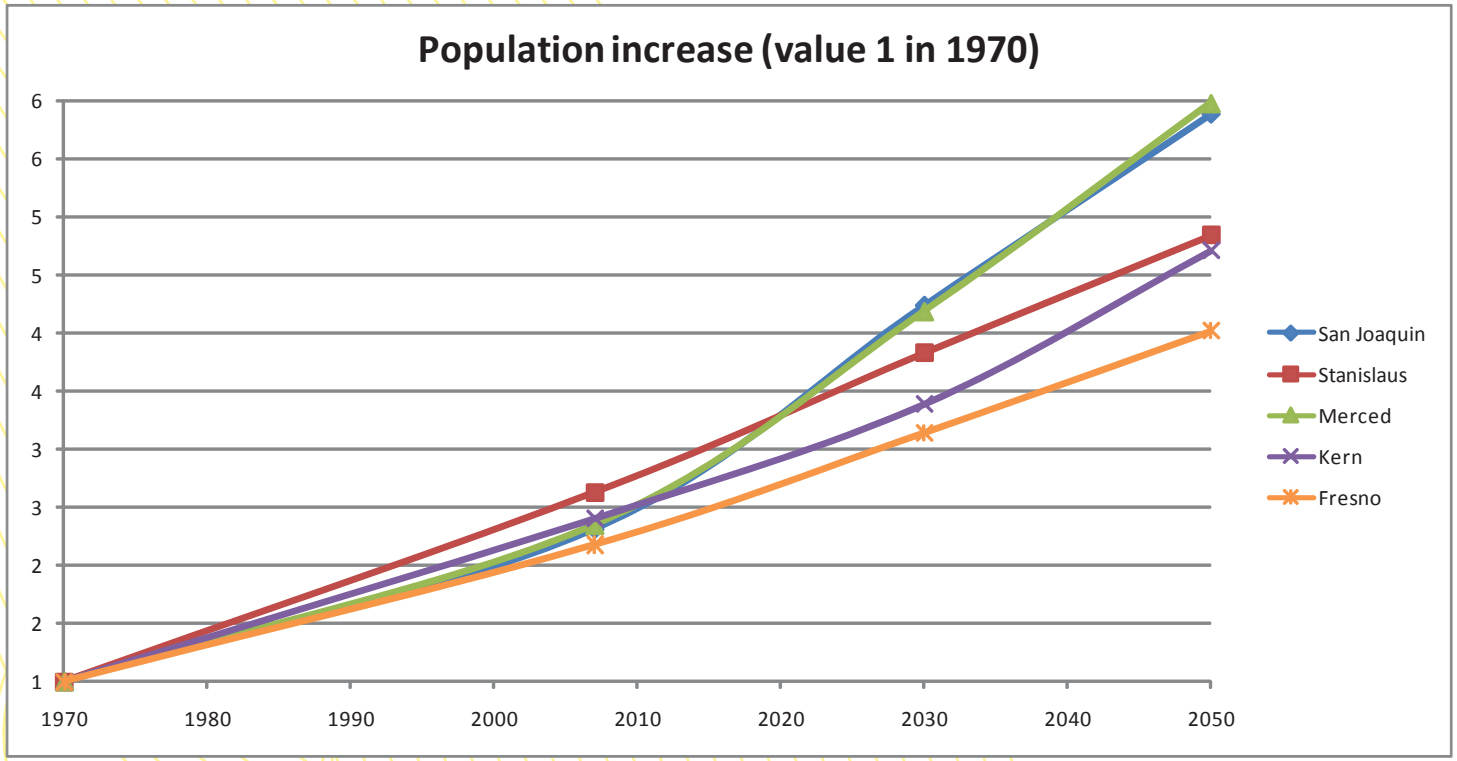


2.2. Overview of San Joaquin and Merced counties.

Sources
Elevation Image (NASA), Roads (Tiger 2000), Lakes and reservoirs (California Resources Agency, Legacy Project), County Borders (California Dept. of Forestry and Fire Protection), HSR Rail Alignment (CAHSRA, Summer 2007), Urbanized Land as of 2004 (State of California, Department of Conservation, Farmland Mapping and Monitoring Program. Published 2004. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP)

	Population				Increase since 1970 (value 1 in 1970)			
	1970	2007	2030	2050	1970	2007	2030	2050
San Joaquin	290,208	670,990	1,229,757	1,707,599	1	2.31	4.24	5.88
Stanislaus	194,506	511,263	744,599	941,562	1	2.63	3.83	4.84
Merced	104,629	245,514	437,880	625,313	1	2.35	4.19	5.98
Kern	329,162	790,710	1,114,878	1,549,594	1	2.40	3.39	4.71
Fresno	413,053	899,348	1,297,476	1,658,281	1	2.18	3.14	4.01

Table 2.1. Population increase in the Central Valley (1970-2007) and forecasts for 2030.

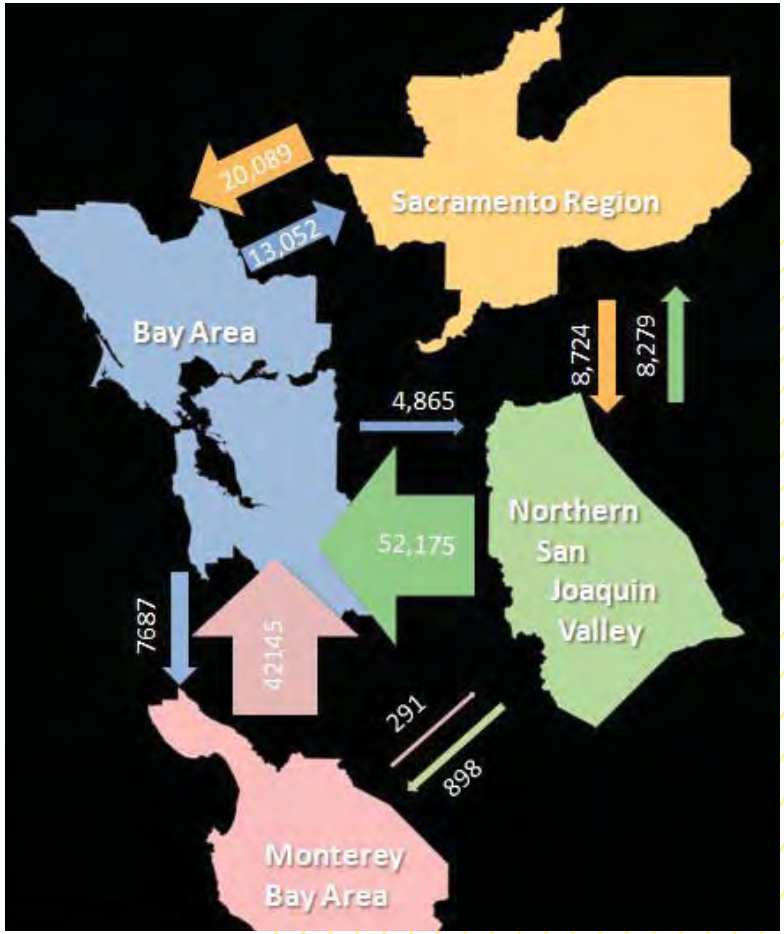


Sources: US Census, California Department of Finance [7], [8]

all from 1960 to 1990 (by 10 years): *http://www.census.gov/population/cencounts/ca190090.txt*

all from 2000 to 2007 (by year): *http://www.census.gov/popest/counties/tables/CO-EST2007-01-06.xls*

all from 2020 to 2050 (by 10 years): *http://ca.rand.org/stats/popdemo/popproj.html*



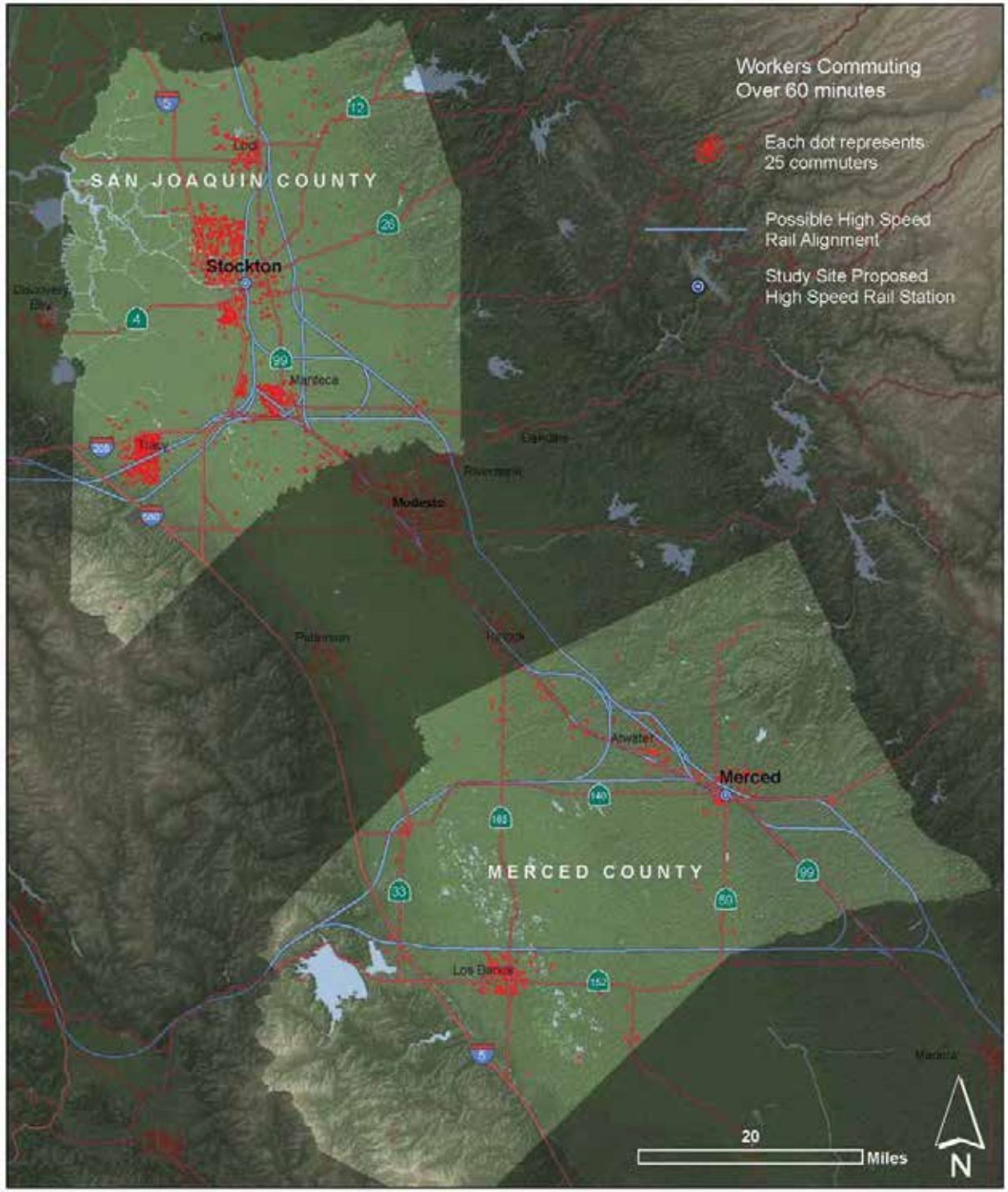
2.3a.
Left:
Flows of domestic migrants between Northern California regions (1995 - 2000).

2.3.b
Right:
Flows of commuters between Northern California regions (2000).

Sources:
Migration
US Census Bureau. (2000). County to County Migration Flow Files. retrieved April 9, 2008, US Census Bureau <http://www.census.gov/population/www/cen2000/ctytoctyflow.html>
Commuting Metropolitan Transportation Commission. San Francisco Bay Area & Northern California County-to-County Worker Flows Based on Census 2000.Metropolitan Transportation Commission. 24 July. 2008
http://www.mtc.ca.gov/maps_and_data/datamart/census/county2county/table5coco.htm
http://www.mtc.ca.gov/maps_and_data/datamart/census/county2county/table7coco.htm

Population growth in the Northern San Joaquin Valley is driven by natural increase, foreign immigration, and domestic migration from elsewhere in California and the United States. While natural increase and foreign immigration play the driving role in growth at the state level, data produced by the US Census Bureau and the California Department of Finance suggest that domestic migration is a critical and very rapidly increasing component of growth in the Northern San Joaquin Valley[9]. Analysis of place of residence data recorded in the US Census for the 1995 to 2000 period reveals that much of the Valley's population growth related to domestic migration came from the Bay Area. Indeed, the Northern San Joaquin Valley experienced a net inflow of nearly 50,000 former Bay Area residents between 1995 and 2000[10].

The pattern of migration from the Bay Area to the Northern San Joaquin Valley has been accompanied by a growing trend toward long distance commuting by Valley residents to job centers outside of their region and particularly to the Bay Area. In 2000, some 52,000 workers commuted from the Northern San Joaquin Valley into the Bay Area. In that same year, only 5,000 Bay Area residents worked in the Valley. As the map shows, long distance commuters reside throughout San Joaquin and Merced Counties. 14% of workers residing in San Joaquin County and 11% in Merced County travel over 60 minutes to get to work, while such commute patterns are exhibited by 10% of the workforce in California as a whole and 8% nationally[11]. Such long distance commuters tend to be concentrated in the western part of the Valley, clustered along major transportation corridors into the Bay Area, but about 7,500 Stockton residents and 300 Merced residents commuted to the Bay Area in 2000[12].



2.4. Long distance commuters in San Joaquin and Merced counties (2000).

Sources
Elevation Image (NASA), Roads (Tiger 2000), Lakes and reservoirs (California Resources Agency, Legacy Project), County Borders (California Dept. of Forestry and Fire Protection), HSR Rail Alignment (CAHSRA, Summer 2007), Workers Commuting Over 60 Minutes - calculations based on: Census 2000 TIGER/Line Data, California Blockgroups. US Bureau of the Census. Published 2000. Available through http://www.esri.com/data/download/census2000_tigerline/index.html And Census 2000, Summary File 3, P.31: Travel Time to Work for Workers 16+ Years. US Bureau of the Census. Published 2000. Available through http://factfinder.census.gov

The rapid population growth in the Northern San Joaquin Valley is closely associated with an even faster expanding urban footprint. In the 10 years between 1994 and 2004, nearly 35,000 acres of land were urbanized in the Northern San Joaquin Valley, increasing the overall amount of urban land in the region by 24%. While the majority of this growth occurred in smaller communities along the Valley's western edge, the City of Stockton added over 5,000 urban acres within its sphere of influence and increased its footprint by 15%, while the City of Merced increased its urbanized area by 1,600 acres or about 17%[13]. Using recent aerial photographs to compare urban footprints from 1994 and 2004 reveals that a majority of this newly urbanized land has been devoted to single family home construction. Further analysis reveals that the density of homes constructed appears to average around 5 units an acre but is as low as 1 or 2 units per acre in some areas.

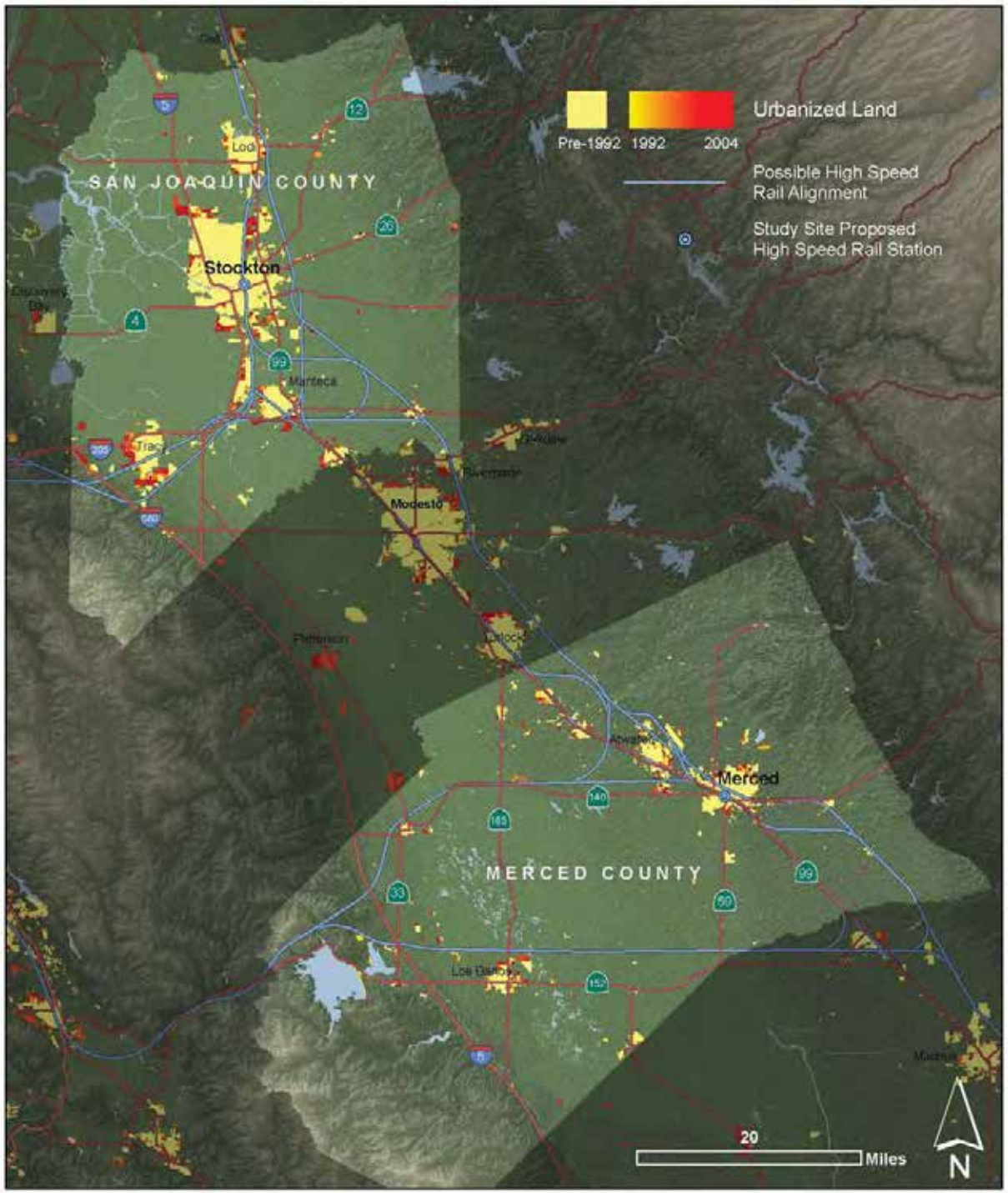
2.5. Urban fringe growth outside Stockton (Image courtesy USGS).

Data collected by the California Department of Finance confirms the trend of single family home construction in the Valley. In 2006, according to California Department of Finance estimates, the Northern San Joaquin Valley had approximately 472,000 housing units, 78% of which were single family homes. Recent housing development over the last ten years in the Northern San Joaquin Valley has consisted almost entirely of single family homes. The Northern San Joaquin Valley added some 82,600 housing units between 1996 and 2006, only 3% of which were multi-family homes. By contrast, 20% of the units added statewide during that same period were multifamily units[14, 15].

2.6. PM peak hour along I-580.

While housing in the Central Valley remains inexpensive relative to California's coastal areas, an analysis of Census data suggests that housing in Stockton and Merced is not affordable for a large proportion of these cities' residents, especially those who are not home owners. Over 50% of renting households in the cities of Stockton and Merced meet HUD's definition of being "cost burdened," (meaning they spend more than 30% of their income on housing costs), a proportion exceeding even that observed in the costly Bay Area housing market[16]. Crowding, as evidenced by a ratio of occupants to rooms exceeding 1.0, is also an issue in the cities of Stockton and Merced. 18% of Stockton's and 20% of Merced's occupied housing units are crowded compared to a national rate of 6%[17]. Such statistics indicate the inadequacy of the current housing stock in both cities, especially for lower income populations.

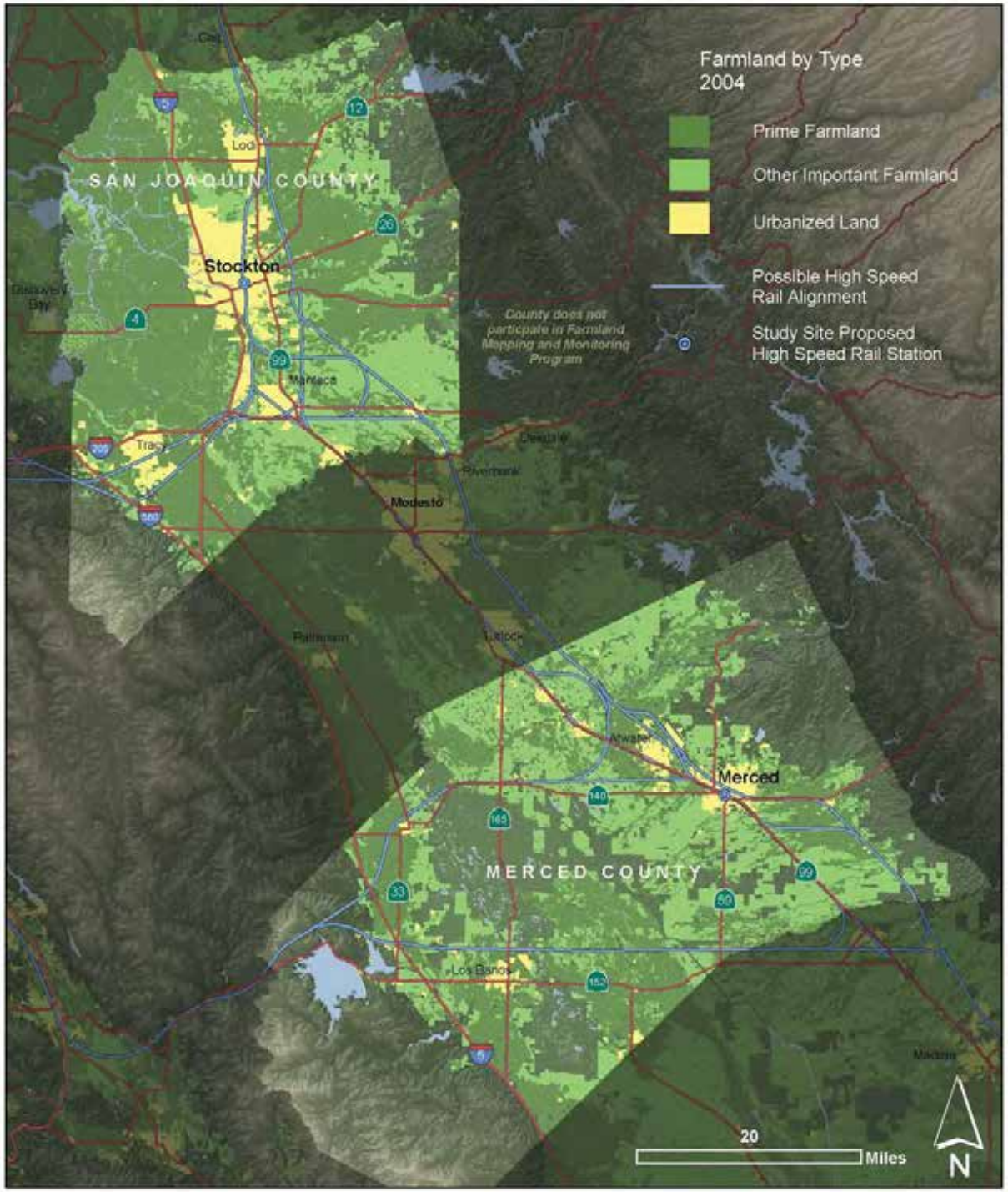
In addition to the housing affordability and crowding measures that can be determined using Census data, the National Association of Homebuilders (NAHB) in conjunction with Wells Fargo generate a quarterly "Housing Opportunity Index" (HOI) for more than 200 metropolitan areas in the U.S. This index evaluates "housing opportunity" by comparing the percentage of homes sold in a given area that are affordable to families earning that area's median income during a specific quarter. The index for both Stockton and Merced has declined precipitously since the late 1990's and by 2006 just 7 percent of homes in the Stockton area and 4.7 percent of homes in the Merced area were affordable to median-income earners. This is a dramatic change from Q1 1999, when 56.4 of homes in Stockton and 67.4 percent of homes in Merced were affordable to median-income earners. By the first quarter of 2008, Stockton and Merced ranked 185th and 201st respectively in housing opportunity out of the 223 regions ranked by the NAHB[18]. Within California, some rankings of interest were - Bakersfield (190th), Oakland-Fremont-Hayward (194th), Fresno (203rd), San Jose-Sunnyvale-Santa Clara (210th), Santa Cruz-Watsonville (213th), Santa Ana-Anaheim-Irvine (216th), Napa (218th), San Luis Obispo-Paso Robles (219th), San Francisco-San Mateo- Redwood City (221st), and the most unaffordable metro area was Los Angeles-Long Beach-Glendale (223rd).



2.7. Urban growth in San Joaquin and Merced counties (1992 - 2004).

Sources
Elevation Image (NASA), Roads (Tiger 2000), Lakes and reservoirs (California Resources Agency, Legacy Project), County Borders (California Dept. of Forestry and Fire Protection), HSR Rail Alignment (CAHSRA, Summer 2007), Urbanized Land Pre1992 to 2004 (State of California, Department of Conservation, Farmland Mapping and Monitoring Program. Tabulations based on data produced by the FMMP for San Joaquin, Stanislaus, and Merced Counties,1992 and 2004. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP.)

While urbanization is advancing rapidly, agriculture remains the most important economic driver in the Northern San Joaquin Valley; this is an extremely productive farming region. In 2004, this was home to 2,778,325[19] acres of land devoted to agriculture and in 2006 the agricultural output of the Northern San Joaquin Valley Region totaled over 6.1 billion dollars[20]. Milk, chickens, almonds, grapes, and tomatoes rank among the region's most valuable crops. Additionally, there are many specialty crops grown in the Northern San Joaquin Valley that are not widely produced elsewhere. San Joaquin County farms account for over 50% of California's cherry production and over 40% of the state's asparagus crop. Similarly, 98% of California's sweet potatoes are grown in Merced County[21].



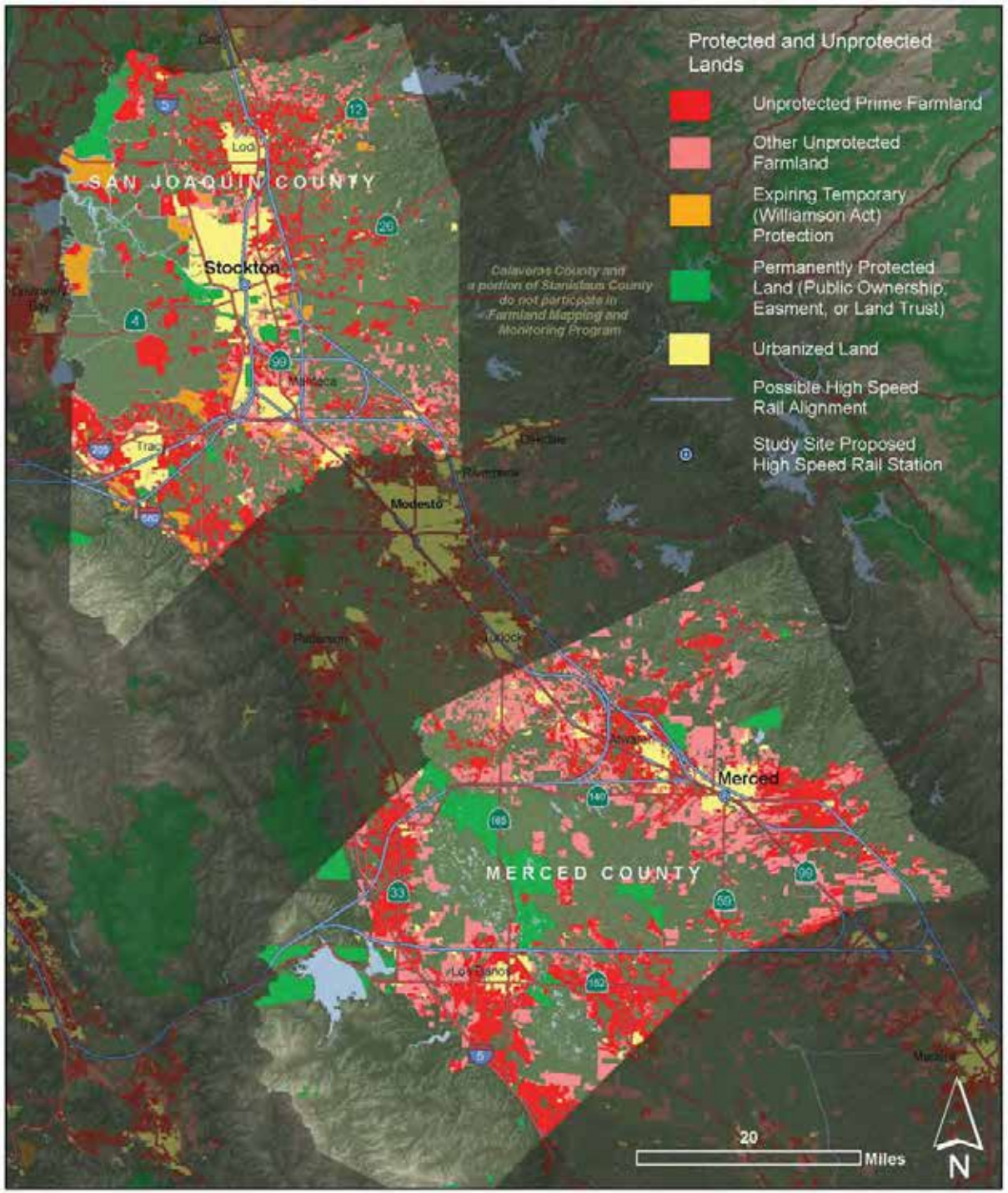
2.8. Farmland in San Joaquin and Merced counties (2004).

Sources
Elevation Image (NASA), Roads (Tiger 2000), Lakes and reservoirs (California Resources Agency, Legacy Project), County Borders (California Dept. of Forestry and Fire Protection), HSR Rail Alignment (CAHSRA, Summer 2007), Prime Farmland, Other Important Farmland & Urbanized Land as of 2004 - State of California, Department of Conservation, Farmland Mapping and Monitoring Program. Published 2004. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP.

2.9. Mountain House Parkway, Tracy, along I-580.

Growing populations and expanding cities have had a substantial impact on agricultural lands in Merced and San Joaquin Counties. Between 1994 and 2004, Merced and San Joaquin Counties lost 16,000 and 21,000 acres of agricultural land respectively. In Merced County some 7,000 acres of this land was converted directly to urban uses, while in San Joaquin County over 15,000 acres of farming and grazing land was urbanized[22].

The map shows farmland that is susceptible to urbanization. Currently, there is no adequate mechanism in place to protect farmland from development and encourage Northern San Joaquin Valley communities to grow in a compact and efficient manner. Voluntary enrollment of farmland under the tax protections of California's Williamson Act remains the most widely used agricultural preservation technique in the Valley. Over 500,000 acres of agricultural land are currently enrolled under the Act in San Joaquin County and over 400,000 acres are enrolled in Merced County. The Williamson Act's rolling ten-year contracts offer only temporary protection for agricultural land, however, and San Joaquin County in particular has one of the highest rates of de-enrollment of any county participating in the program[23]. Because enrollment in the Act is voluntary and occurs on a parcel-by-parcel basis, many of the lands protected by the Williamson Act are in far reaches of the Valley, while parcels near the urban fringe that are more likely to actually be developed go unprotected. The Northern San Joaquin Valley also has a significant amount of land that is protected through public ownership, land trusts, and conservation easements. Again, however, such protections often shelter land in peripheral areas and have not been applied in a coordinated manner to shape growth and preserve open space at the immediate urban fringe.



2.10. Protected and Unprotected Lands in San Joaquin and Merced counties (2004).

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Permanently Protected Lands: Public, Conservation and Trust Lands, v05_2. California Resources Agency, Data developed under contract by VESTRA Resources, Inc. Published January 2007. All Other non-background layers: Calculations based on: Prime Farmland, Other Important Farmland & Urbanized Land as of 2004 State of California, Department of Conservation, Farmland Mapping and Monitoring Program. Published 2004. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP. And CA_williamson_act_2004, California Department of Conservation, Division of Land Resource Protection. Published 2004.

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ftp://198.31.87.7/pub/mtc/census2000/CTPP/flowdata/CTPP2000_California_CountyFlow_AllVars.zip

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3. DESIGN METHODOLOGY

The urban design concepts around the proposed High Speed Rail stations in Stockton and Merced focus on making these areas more attractive pedestrian and transit friendly spaces. This would be achieved by adding a mix of retail, office space, and various types of housing to increase overall density, and by redesigning streets for multi-modal transport. In each case, the design concepts aim to build on local character, by identifying the historical buildings as well as other buildings or places of merit in the downtown areas and using those forms as a source of inspiration to guide the design ideas. A careful analysis of each city also helps identify specific assets upon which to build a strategy for revitalizing downtown. In the following pages, we discuss three such assets in more detail.

1. Street Width
Streets in downtown areas have very ample dimensions, varying from around 75' to 100' or even 120' for major thoroughfares. They are currently used almost exclusively for car traffic. However, their dimensions would allow them to be redesigned as multi-modal transport facilities, offering more space to pedestrians, adding bike lanes, and introducing exclusive lanes for buses. Such a redesign would make the streets a better environment for alternative transportation modes, making them safer for bikes and pedestrians, while creating the conditions for a better quality bus service. In the case of quieter streets next to higher density land uses, street width can allow for the provision of perpendicular parking, thus significantly increasing on-street parking capacity and accommodating infill while moderating the need for new parking structures.

2. Historic Buildings
A key element and a major asset in making the cities' downtowns attractive are the historical buildings present in the cores, which could contribute to the character of the surrounding area if they were renovated. Specifically, elements from historic building facades, awning details, and floor heights are used as guides for new buildings.

3. Underutilized Parcels
In most Central Valley city downtowns, a large percentage of land is underutilized in parking lots and other empty parcels. In Stockton, for instance, these areas amount to almost 40% of the entire downtown area. That is twice the footprint of the existing buildings (figure 4.13. p.45). These spaces could be used for infill development, thus adding housing and jobs and creating a market for the downtown retail, an essential step in revitalizing the downtown. This could be achieved without having to demolish existing buildings.

A Side Note: Managing Noise along Rail Corridors in Urban Areas

A High Speed Rail corridor in a downtown area raises the question of noise levels and of their compatibility with the land uses portrayed in these design concepts, especially quiet residential streets. UC Berkeley researchers took sound level measurements of a French TGV train slowing down and entering a station in Paris (a train using comparable technology to the California HSR, steel wheels and catenary) which showed a maximum of 75 decibels. For comparison, this is lower than the maximum noise level that can be registered along Pacific Ave. in Stockton (79.6 decibels) and even Waterfront Park in the Civic Center (79.9 decibels) on an average weekday. High speed trains are thus less likely to be a nuisance in terms of noise than car traffic on a busy city arterial.

3.1. Assets: Street Width. The Example of 16th Street in Merced (76').

16th Street as it looks today.

Step 1: Adding a landscaped median and bike lanes.

Step 2: Adding infill development.

Outcome: a revitalized street, with two lanes for car traffic in each direction, wider sidewaks, bike lanes, and infill development that can support a better transit service.

3.2. Assets: Street Width. The Example of Miner Avenue in Stockton (110').

The 110' of right of way on Miner Avenue can accommodate two lanes of car traffic in each direction, ample sidewalks on both sides, as well as one dedicated lane for buses in each direction, to be used by a Bus Rapid Transit service. The different lanes and the sidewalks are all separated from each other by landscaped medians and rows of trees.

The high density land uses shown in the lower right image would increase parking demand, while the curbside Bus Rapid Transit could remove parking spaces. The lower left image shows how street width can be an asset in dealing with that situation and meeting the need for additional parking. The image shows how a quieter street (such as Sutter St. or California St. for example) can be redesigned with perpendicular on-street parking, adding, for the length of a typical Stockton block (300 feet) up to 21 additional on-street parking spaces as compared to that available with parallel parking.

3.3. Assets: Historical Buildings. Example from Weber Avenue, Stockton.

Across the street from the Downtown Transit Center on Weber Ave.

Boarded-up buildings between Stockton's waterfront and the proposed HSR station detract from the area's appeal and indicate a weak market. But many of these buildings have strong design appeal, and as part of a revitalization effort, could prove to be a significant asset.

This photo was taken across from the Downtown Transit Center on Weber Avenue. Prime locations such as this could be revitalized if investments, including housing and commercial uses, were to be focused around the HSR stations instead of built at low densities in outlying areas. Buildings such as these often can be restored. They not only have historic character, but also are of a good size for first floor retail or offices with upper floor offices or housing. They could contribute to a thriving downtown if a stronger market could be developed in the downtown station area.

3.4. Assets: Underutilized Parcels. Example from Weber Avenue, Stockton.

Above: Parking lot on Weber Avenue.
Below: Possible infill development on the existing parking lot.

If investments focused on the downtown area and around the proposed HSR stations, then parking lots such as the one from the image on the left, within walking distance of the HSR station, could become prime locations for development. Parking lots allow for infill development, adding housing and jobs to the downtown.

4. URBAN DESIGN CONCEPTS FOR STOCKTON

Taking into consideration the local and regional context of the Central Valley, design concepts were developed for Stockton's and Merced's station areas. Concepts for Stockton are presented in this chapter and for Merced in the following chapter. In both cases, the design concepts build upon local character, using elements from historic buildings and other places of merit, as well as expanding upon the quality of some existing urban spaces.

Stockton is located at the head of a shipping channel, east of the San Joaquin River and approximately 90 miles from the San Francisco Bay. The city is roughly bounded on the west by Interstate 5 and on the east by State Route 99. Stockton is home to both the University of the Pacific as well as the California State University Stanislaus Campus. It is the seat of San Joaquin County and in 2008 has a population of approximately 290,000. Over the past decade, Stockton and the nearby cities of Tracy and Manteca have experienced substantial population growth. However, employment growth in San Joaquin County is expected to occur at half the population growth rate. Stockton is thus a city of commuters, most of whom drive alone to work and many of whom have very long commutes. Not only is the number of long-distance commuters in San Joaquin County growing, but their commutes are getting longer.

This chapter begins with an introduction to Stockton, focusing on the 1 square mile around the proposed HSR station location and the land uses, activities, and transportation systems in that area. Building upon this review of current conditions, proposals are presented that show how density could be added to a typical city block in Stockton. The chapter ends by showing multi-block design concepts, presenting an overview of a revitalized urban area.

4.1. INTRODUCTION TO STOCKTON

Stockton Statistics

	Stockton City 2000	Stockton District 2000	Stockton District 2030	% Change 2000-2030
Total Workers Residing in Stockton	86,519	96,500	206,691	114%
Work within the city of Stockton	52,335	65,567	142,434	117%
Work elsewhere in San Joaquin county	22,190	15,543	34,749	124%
Work in Merced or Stanislaus Counties (remainder of Northern San Joaquin Valley)	1,286	2,960	6,328	114%
Work in Sacramento Region	2,691	2,178	2,261	4%
Work in Bay Area	7,428	7,593	17,898	136%

Population 2007	287,245
Employment 2008	112,100

Table 4.1. Stockton population and commute statistics.

Place data ftp://ftp.abag.ca.gov/pub/mtc/census2000/CTPP/flowdata/CTPP2000_California_PlaceFlow_AllVars.zip

District data ftp://ftp.abag.ca.gov/pub/mtc/planning/forecast/commuter2006/Commuter_Forecasts_2006.xls

We use MTC's defined districts for norther California as a basis for the "Stockton District".
Refer http://www.mtc.ca.gov/maps_and_data/datamart/gis/corr1.htm

CENSUS, Annual Estimates of the Population for Incorporated Places in California
http://www.census.gov/popest/cities/tables/SUB-EST2007-04-06.xls

Stockton:
The HSR Station Area within the Regional Context

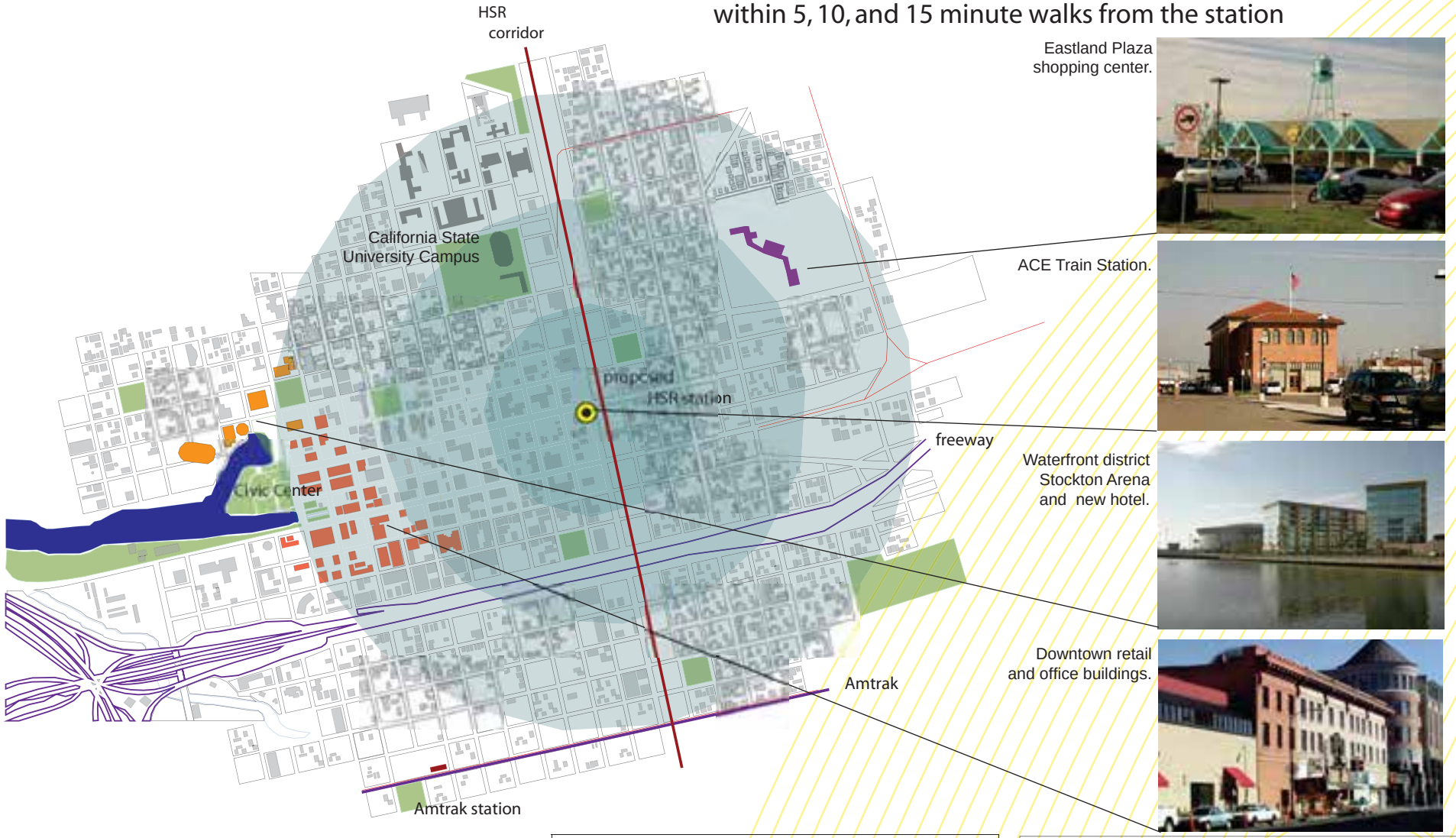
This aerial photo shows the regional context of Stockton and its location at the intersection of I-5, CA-99 and several smaller highways (4, 26, and 88). The proposed HSR corridor (shown as a red line) extends north-south, with the station location (shown as yellow dot) about half a mile east of the current civic center. The current ACE (Altamont Commuter Express) train station is at the same location as the proposed HSR station. The City also has an Amtrak station that is located just under a mile southwest of the proposed HSR station location.

4.1. The location of the proposed HSR station in Stockton and the regional context.

4.2. Weber Avenue, 10 min. walk from the future HSR station.

Weber Avenue, shown above, is the heart of downtown Stockton. The avenue is lined with 2-5 story buildings in the downtown area, most built to the sidewalk, with first floor retail and upper story offices and housing. The map and photos on page 35 show major activity centers such as the Eastland Plaza shopping center to the east, the downtown parks near the “Waterfront District,” the renovated building for the ACE train station and the character of the downtown retail. The images show activity centers within 5, 10, and 15 minute walking distances from the proposed station. Overall land uses within the mapped area are mostly residential, but there is a large mix of principally retail and office space in the southwest quadrant (note location of Amtrak station in this graphic). City and County offices are at the edge of the 15 minute walk to the west edge of the largest circle, and the California State University - Stanislaus/Stockton campus is located to the north of the station.

Stockton: Station Area Analysis, showing major destinations within 5, 10, and 15 minute walks from the station



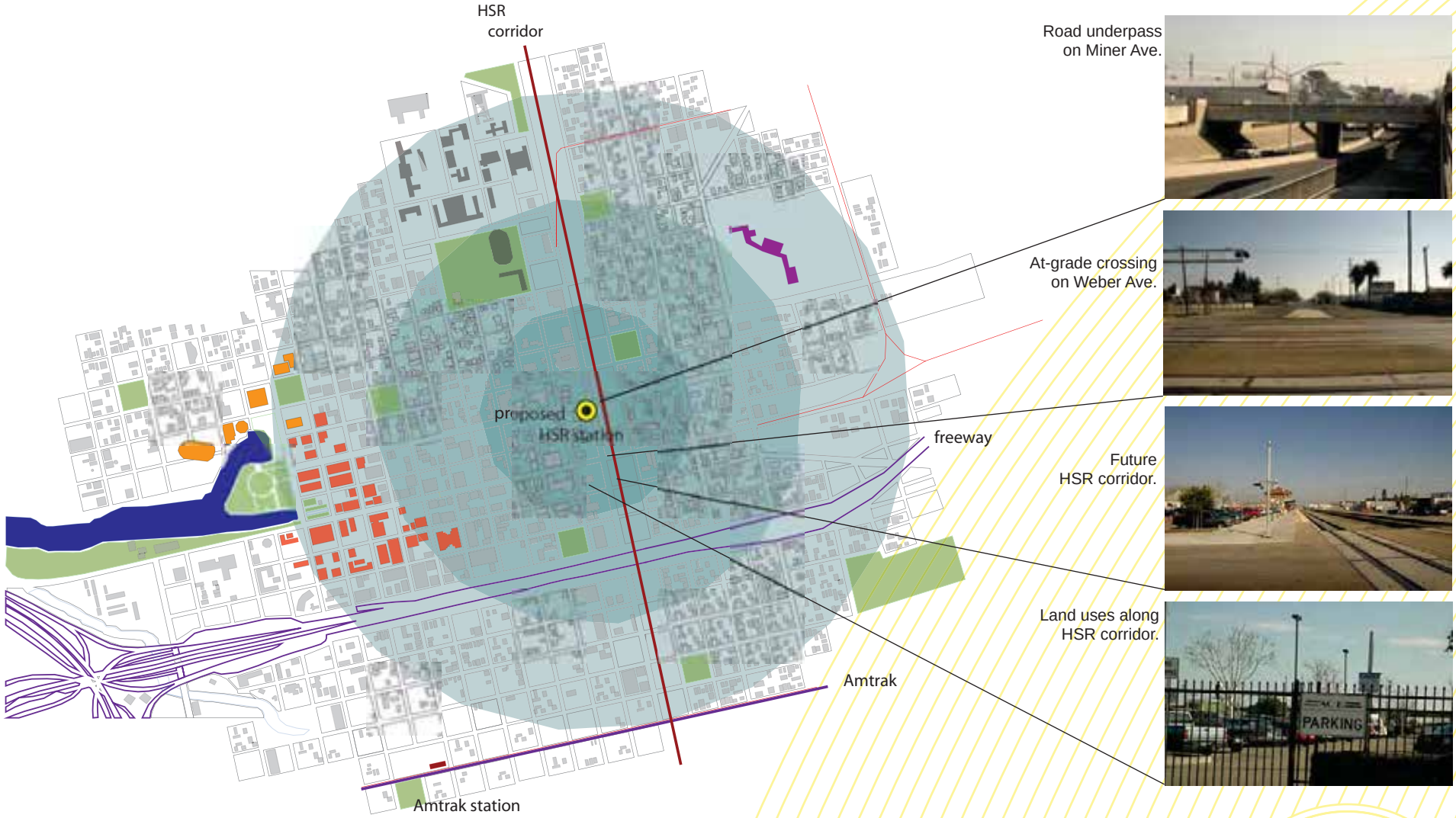
4.3. The HSR station area and the major destinations situated within a 15-minute walk.

4.4. The future HSR right of way.

The images to the right of the map overleaf show the existing rail tracks through the City of Stockton. The CHSRA also proposes to operate HSR in this corridor by building additional tracks on purchased ROW or easements. The vehicle volume on-streets that cross this large expanse (about 225 feet across) is currently low enough to allow at-grade crossings at most intersections. However, depending upon the frequency and speed of operations of the HSR system and other rail traffic in the future, grade-separated crossings may be needed.

Land uses along the corridor include light industrial, vacant properties and empty lots and parking for the ACE train. To the north of the station location, the California State University (CSU) campus dominates the western edge of the corridor. The eastern edge has light industrial uses.

Stockton: High Speed Rail Corridor



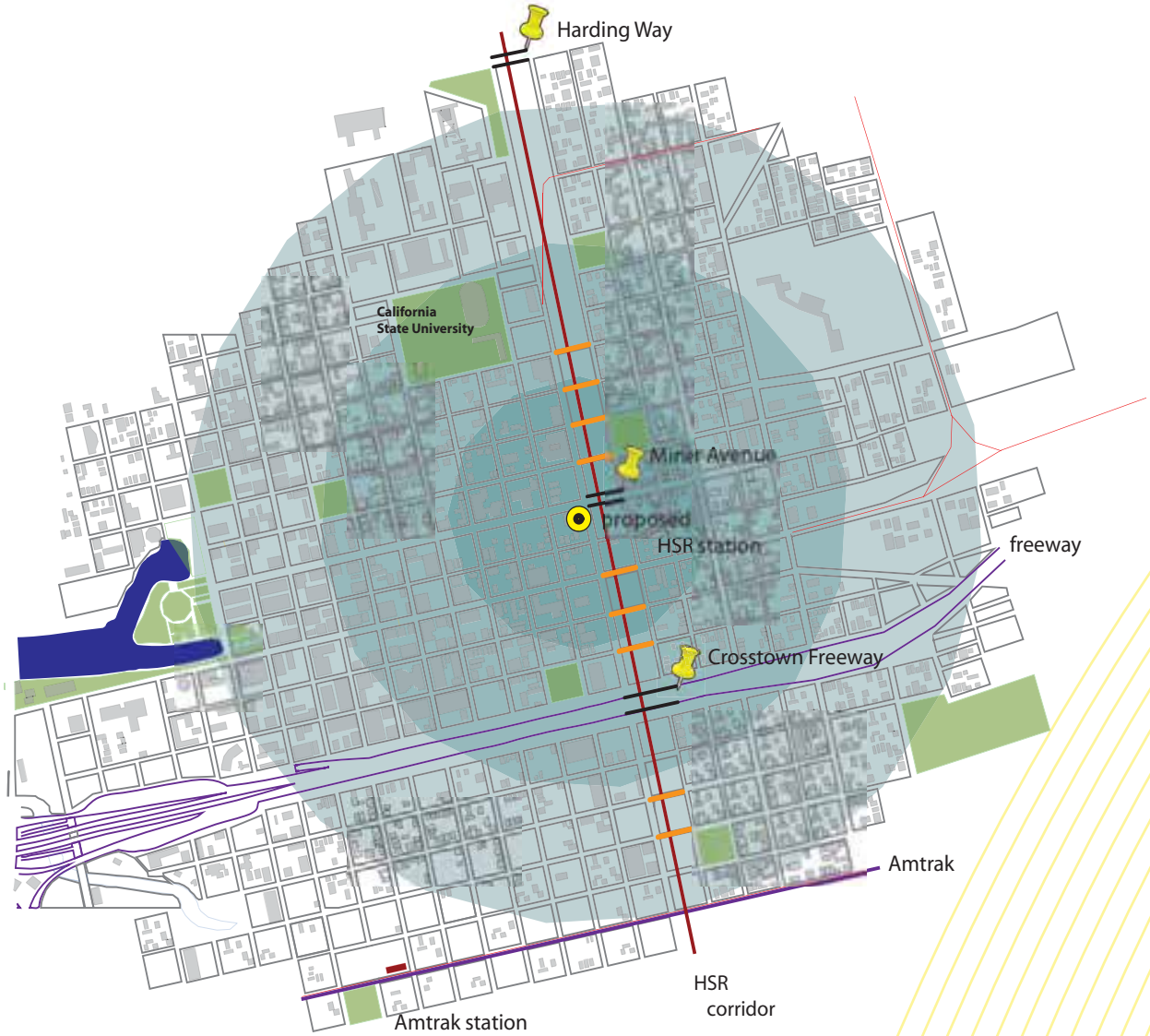
4.5. Map of the future HSR corridor within the study area.

4.6. Road underpass on Miner Avenue.

Currently, the only grade-separated access points are underpasses along Miner Avenue and Harding Way plus the Crosstown Freeway (Hwy 4) overpass. There are a few more grade-separated access points to the north of the 15 minute zone, but the south side has no such access points.

Large urban infrastructure such as freeways and rail corridors can split cities and communities. Grade-separated crossings often can be hostile environments for pedestrians and bicyclists. Hence, there is a need to carefully redesign the grade-separated access points along the corridor to more fully connect the east and west side of Stockton.

Stockton: Road connections across the HSR corridor.



0 2 4 miles

4.7. Map showing the existing road and rail overpasses in the city of Stockton, across the future HSR corridor.

N

0' 500' 1000' 2000'

5, 10, 15 minute walk from station

freeway

current at-grade crossings

HSR station

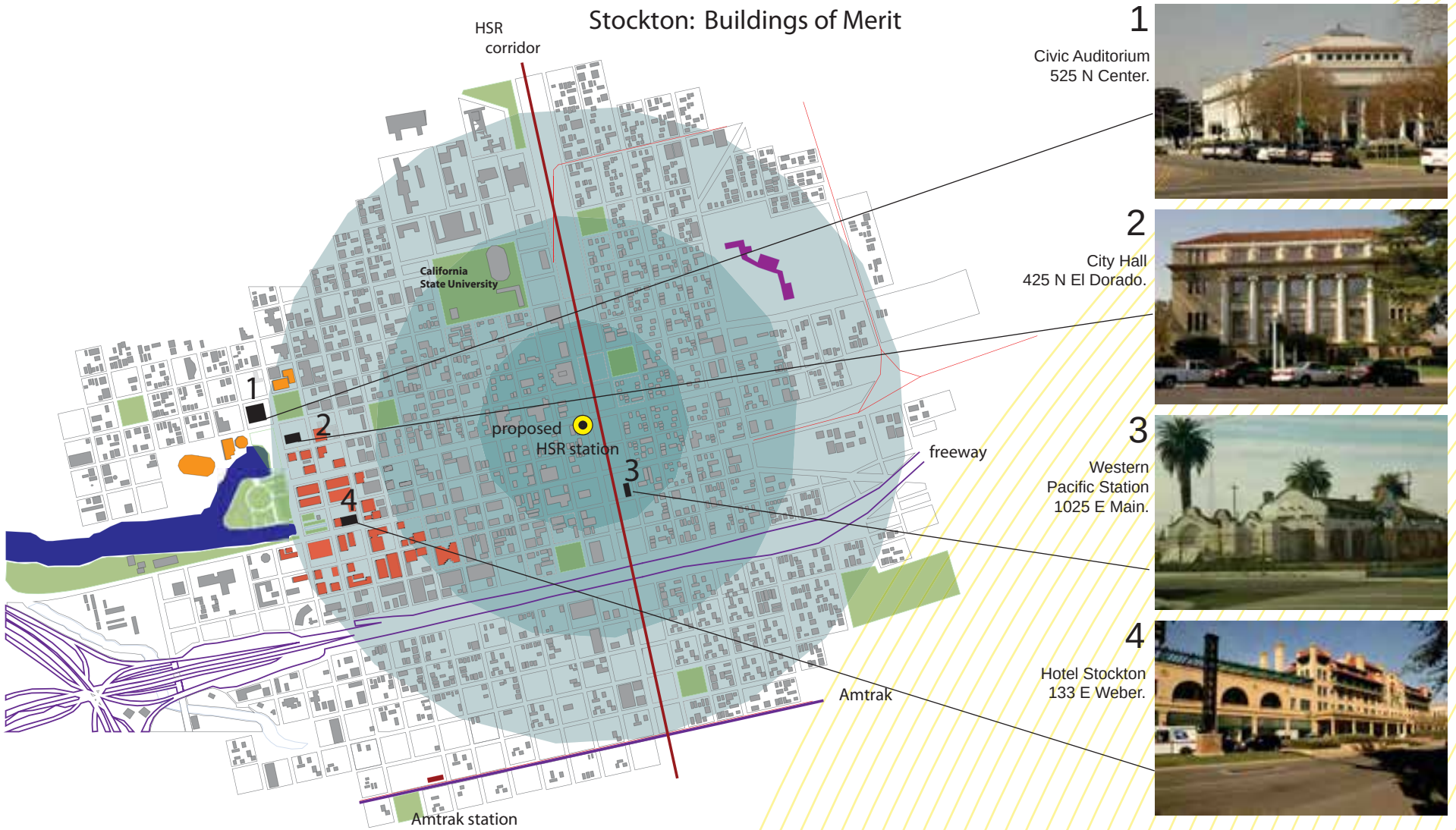
HSR corridor

overpasses and underpasses

Buildings of merit and historical significance

4.8. Hotel Stockton, opened in 1910, 133 E Weber Ave.

Stockton was founded in 1849, and has a rich array of beautiful buildings from the past. These images show such buildings of merit within the 15-minute walkshed.

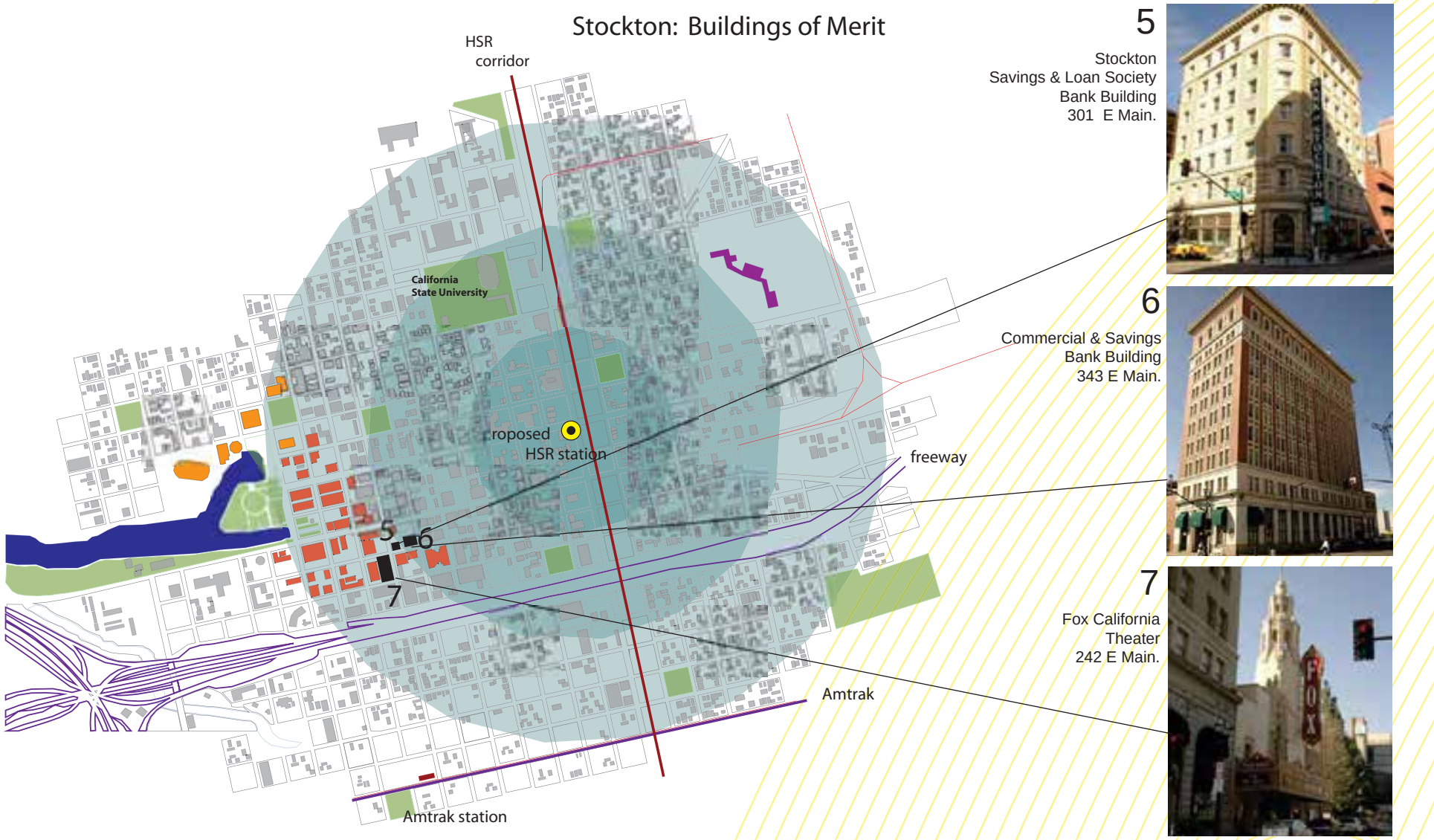


4.9 Map of the downtown area of Stockton showing the location of buildings of merit (1).

Buildings of merit and historical significance (Cont.)

4.10. Fox California Theater
242 E Main.

Within the present urban core, there are several truly exceptional buildings from the early 20th Century. Most of these buildings currently contain offices and housing, with some other uses such as theaters and retail. Stockton can build upon the historic character of the downtown by seeking opportunities to revive and preserve more of its “classic” buildings within the walkshed. Within this area some of the buildings are currently vacant, some derelict. A detailed evaluation of existing building conditions and adaptations for future uses is recommended.



4.11 Map of the downtown area of Stockton showing the location of buildings of merit (2).

Underutilized parcels

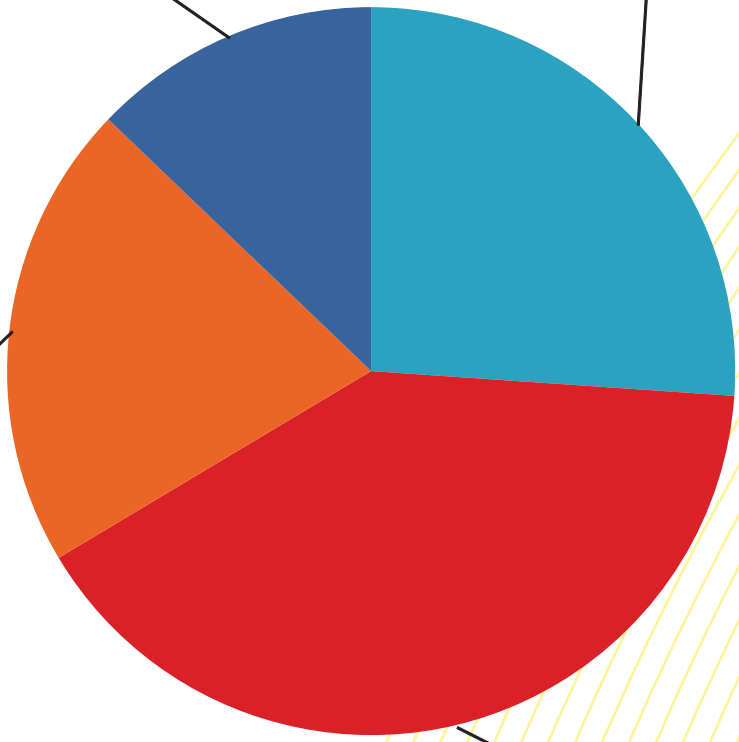
4.12. Example of an underutilized parcel in downtown Stockton, along Miner Avenue.

Within the one square mile area around the proposed HSR station, the land uses are as follows: 21% is covered by buildings, 40% by right of way (streets, alleys, etc.), 13% by parking lots (such as the one in the image above) and 26% is undeveloped. In terms of acreage, 165 acres of land are currently “unused” and 82 acres are surface parking lots. Based on these numbers, there are ample sites for infill development within this area.

Station Area Analysis - 1 Square Mile Around Station

Parking Lots 13%

Block Area minus Parking Lots minus Buildings 26%



Building Footprints 21%

Right of Way 40%

4.13. Land use statistics for a 1 square mile area around the proposed Stockton HSR station location.

Residential uses

4.14. Example of a house in the Magnolia historical district.

Much of the area around the proposed HSR station is in residential use. The historic Magnolia Victorian District located west of the proposed station has a density of 6.5 units an acre, whereas the neighborhoods located east of the railroad and south of Highway 4 tend to be in the range of 7-8 units per acre. Notably, the neighborhood north of the downtown has higher densities at about 26 units per acre due to the presence of multi-family apartment buildings.

Higher densities, including infill housing, offices, and retail, could boost the density levels and create a stronger downtown, while strengthening the market for HSR and other forms of public transport.

4.15 Map of downtown Stockton showing housing densities in specific locations.

Table 4.2. Current densities in areas around the proposed Stockton HSR station location.

4.2. STOCKTON: EXISTING TRANSIT

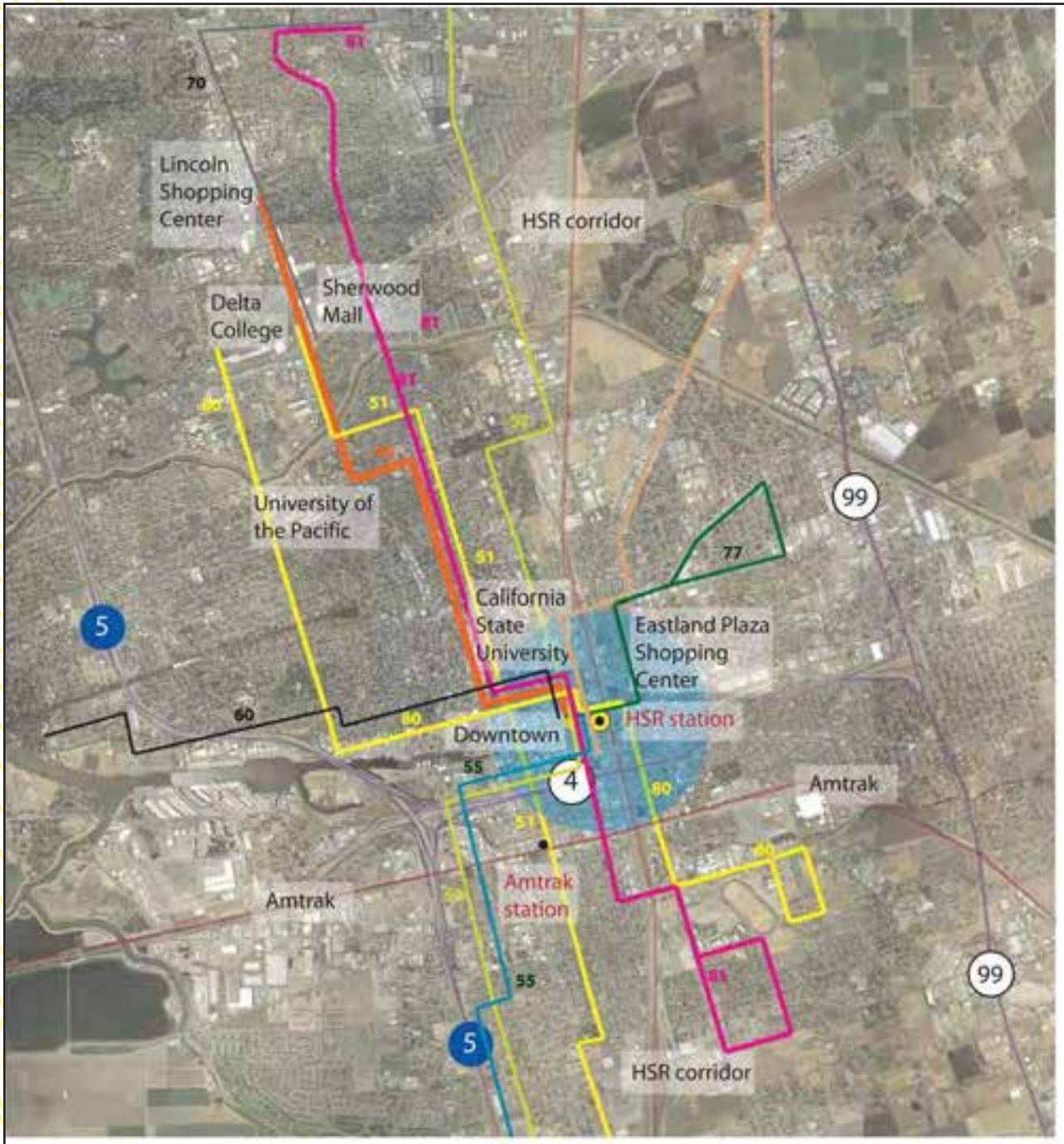
Overall housing density in Stockton is too low to support high-frequency bus service, with most areas being under 10 units per acre, considerably lower than the minimum of 15 - 30 units per acre that is commonly recommended as the minimum for effective transit. As a result, existing transit routes serve almost exclusively the transit dependent and do not constitute a viable alternative to the automobile, with frequencies generally around 40 minutes to over one hour.

The routes that generate the most ridership, and which can also operate at higher frequency, are those that connect major destinations, such as the university campuses (San Joaquin Delta College, University of the Pacific, California State University Stanislaus/Stockton), the train stations (Altamont Commuter Express and Amtrak), the Central Business District, the San Joaquin General Hospital (to the south of the city, not on the map), and the major shopping centers (Lincoln Center, Sherwood Mall, Eastland Plaza, etc.). Since these major destinations tend to be located on a north-south axis in Stockton, the best bus routes in terms of frequency and ridership (40, 51, 81) operate along this direction.

Route 40 (Metro Express), which has the second highest ridership of all Stockton bus routes, connects two major campuses (Delta College and University of the Pacific), the Central Business District, and two major shopping centers. Route 51, the third most travelled route, connects Delta College and the Cal State University to the Amtrak station and the San Joaquin General Hospital to the south.

It is important to note that most of these routes pass through the study area (the 15 minute walking radius around the proposed HSR station) and most of them stop at the downtown transit hub, providing a major transfer point. However, other important destinations within the study area, such as the HSR or the Amtrak station, are only served by a few routes, while most routes pass three or four blocks away.

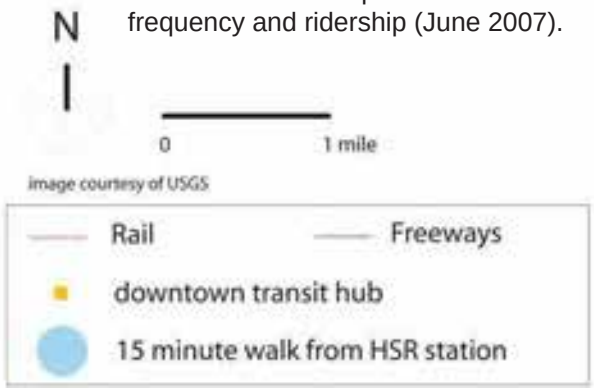
In looking more carefully at the variety of transit services within the study area, we begin to see how the bus routes and the trolley routes could better serve the future HSR station. Routes could be improved by providing exclusive lanes or queue jumpers on congested street segments, by providing front-door service to major trip generators, and by better integrating trolley, feeder buses, and rail service into a coordinated source network that is easy to understand and use.



4.16. Stockton bus routes and frequency.
Source: San Joaquin Rapid Transit district website: www.sanjoaquinrtd.com

San Joaquin RTD Bus Routes (north-south routes in bold)	Monthly Ridership (data for June 2007)
Metro Express route 40 **15 minutes peak** **30 minutes off peak**	**38,665 total** **1,636 average weekday**
route 51 **every 40 to 60 minutes**	**26,251 total** **986 average weekday**
route 52 **every 60 minutes**	**12,634 total** **1,636 average weekday**
route 55 every 60 to 70 minutes	7,351 total 298 average weekday
route 60 every 60 to 70 minutes	3,922 total 161 average weekday
route 70 every 60 minutes	1,153 total 54 average weekday
route 75 every 30 to 60 min	2,278 total 108 average weekday
route 77 every 30 to 40 min	20,263 total 835 average weekday
route 80 **every 30 to 40 min**	**24,392 total** **997 average weekday**
route 81 **every 25 to 40 min**	**42,164 total** **1,781 average weekday**

Table 4.3. San Joaquin RTD bus routes frequency and ridership (June 2007).



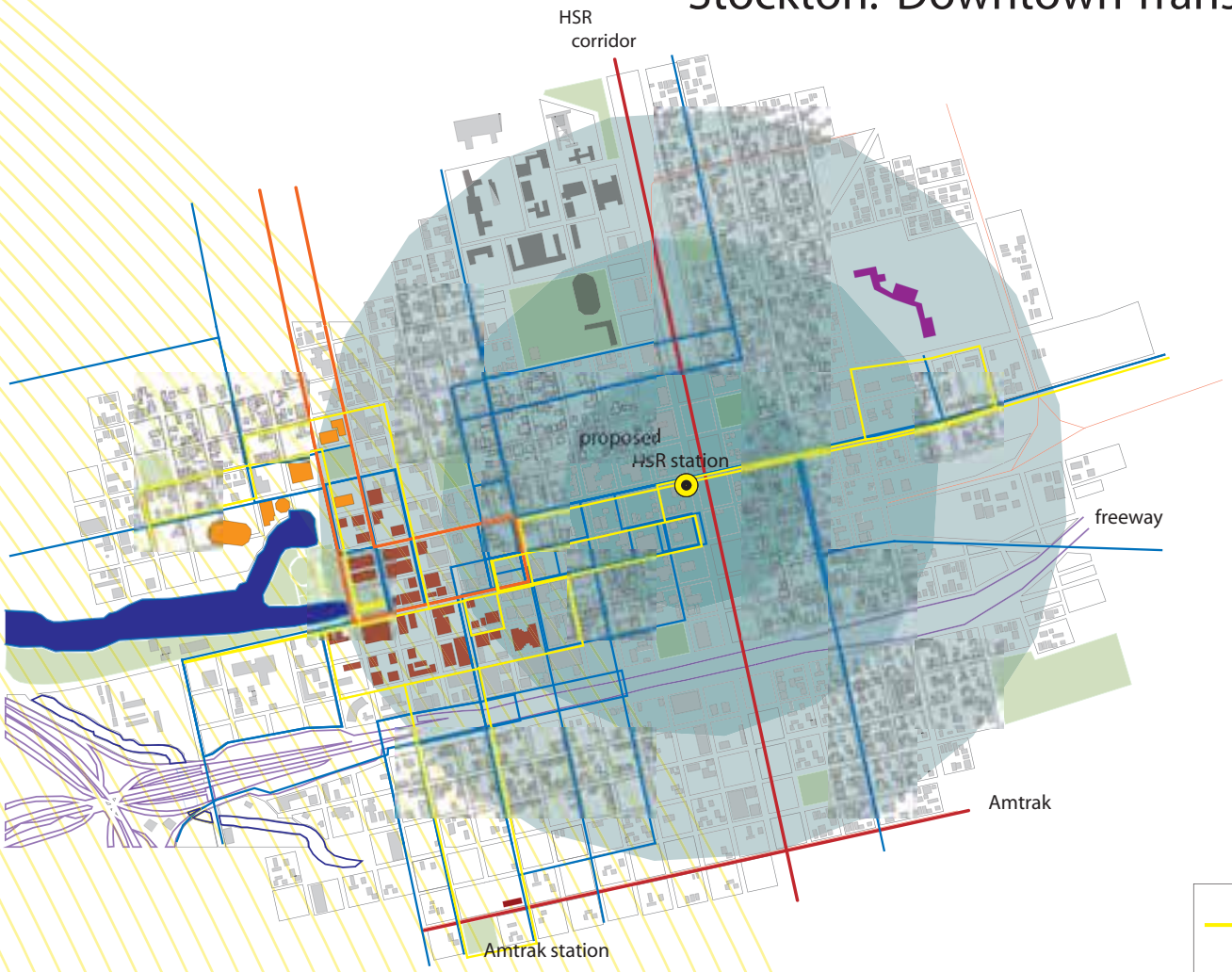
Downtown Transit Center on Weber Ave.

4.17. Map of the Metro Express Route.

Delta College/ Sherwood Mall:
There is currently no dedicated lane and the bus is often slowed down by traffic during peak hours on Pacific Ave. The street, however, is wide enough (110') to allow for a designated bus lane or queue jumpers, or use signal priority or preemption.

University of the Pacific:
There is less traffic in this section and while there is also no dedicated lane, this is less of a problem than at Delta College

Stockton: Downtown Transit

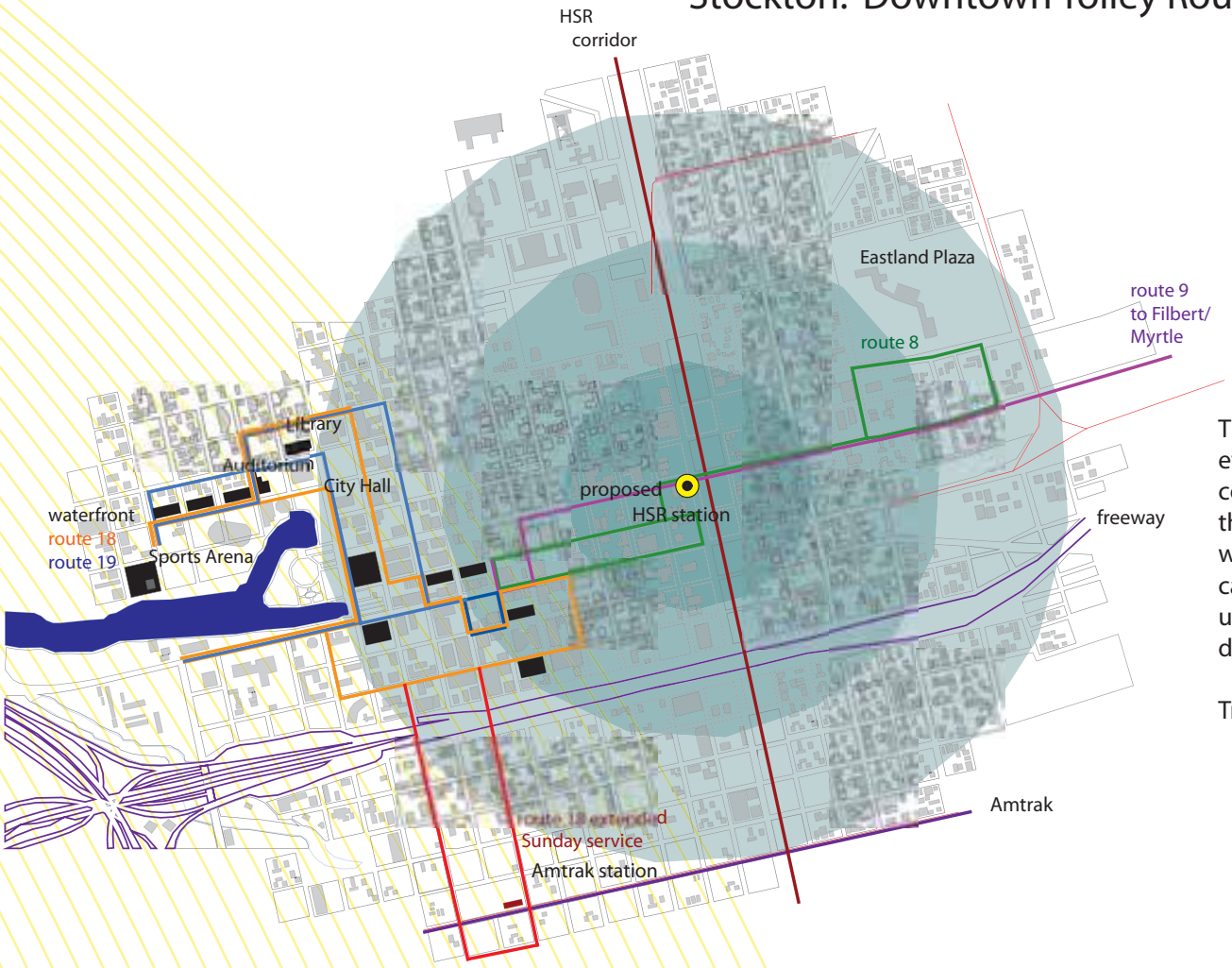


4.18. Stockton downtown transit routes, trolley, rail, bus routes, and Metro express.

4.19. Stockton Downtown Transit Hub.
This photo is taken at the corner of Channel and California St.

This photo shows Stockton's trolley system, which runs on 5 routes that loop around the downtown. Increased frequency and better operational design could produce stronger connections between the transit center, rail stations, and civic center/office/retail areas.

Stockton: Downtown Tolley Routes



The trolley routes are designed specifically for events in the downtown area and connect to parking lots (shown in black) in the downtown area. The city encourages those who wish to attend the events to leave their cars in one of the designated parking lots and use the trolley for transportation across the downtown area.

Trolley Fares: $0.25 one way

N

0' 500' 1000' 2000'

source: City of Stockton official website: www.stocktongov.com

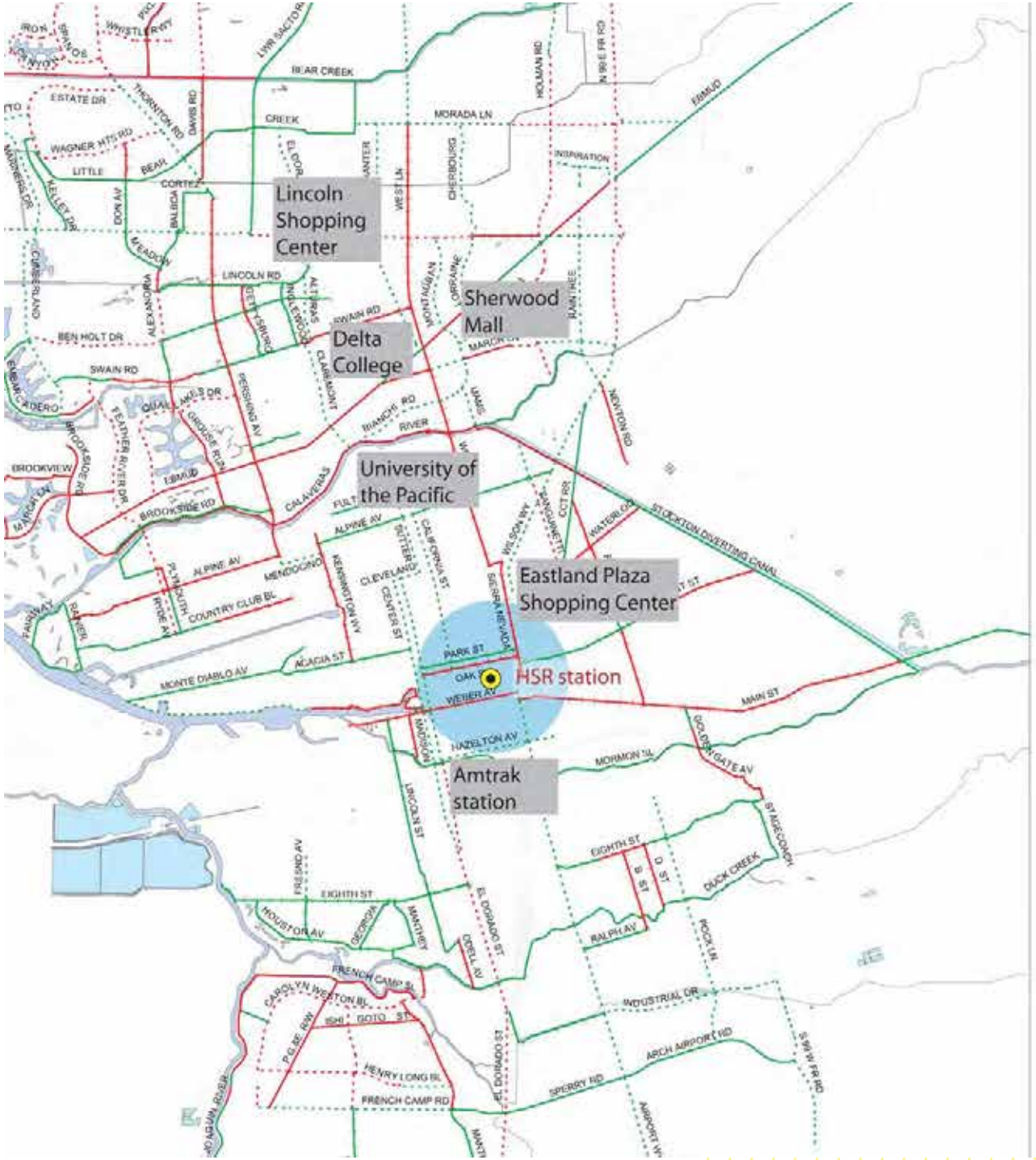
- route 8 (every 20 minutes)
- route 9 (every 20 minutes)
- route 18 (every 20 minutes)
- route 18 - Sunday (every 30 minutes)
- route 19 (every 15 minutes)

- HSR station location
- freeway and railways
- 5, 10, 15 minute walk from station
- designated parking locations

4.20. Map of the downtown trolley system.

Stockton: Bike routes in the regional context

Stockton has a growing network of bikeways, but only a few are Class I Paths and they do not always connect to major trip generators.



4.21. Regional map of bike lanes and paths.

Legend

- Class I - Bike Path
- Class II - Bike Lane (Marked & Signed)
- Class III - Bike Route (Signed)
- Future Class I
- Future Class II
- Future Class III

N

0 1 mile

source:http://www.stocktongov.com/parks/otherfacilities/documents/BikeTrailMap2.06.pdf

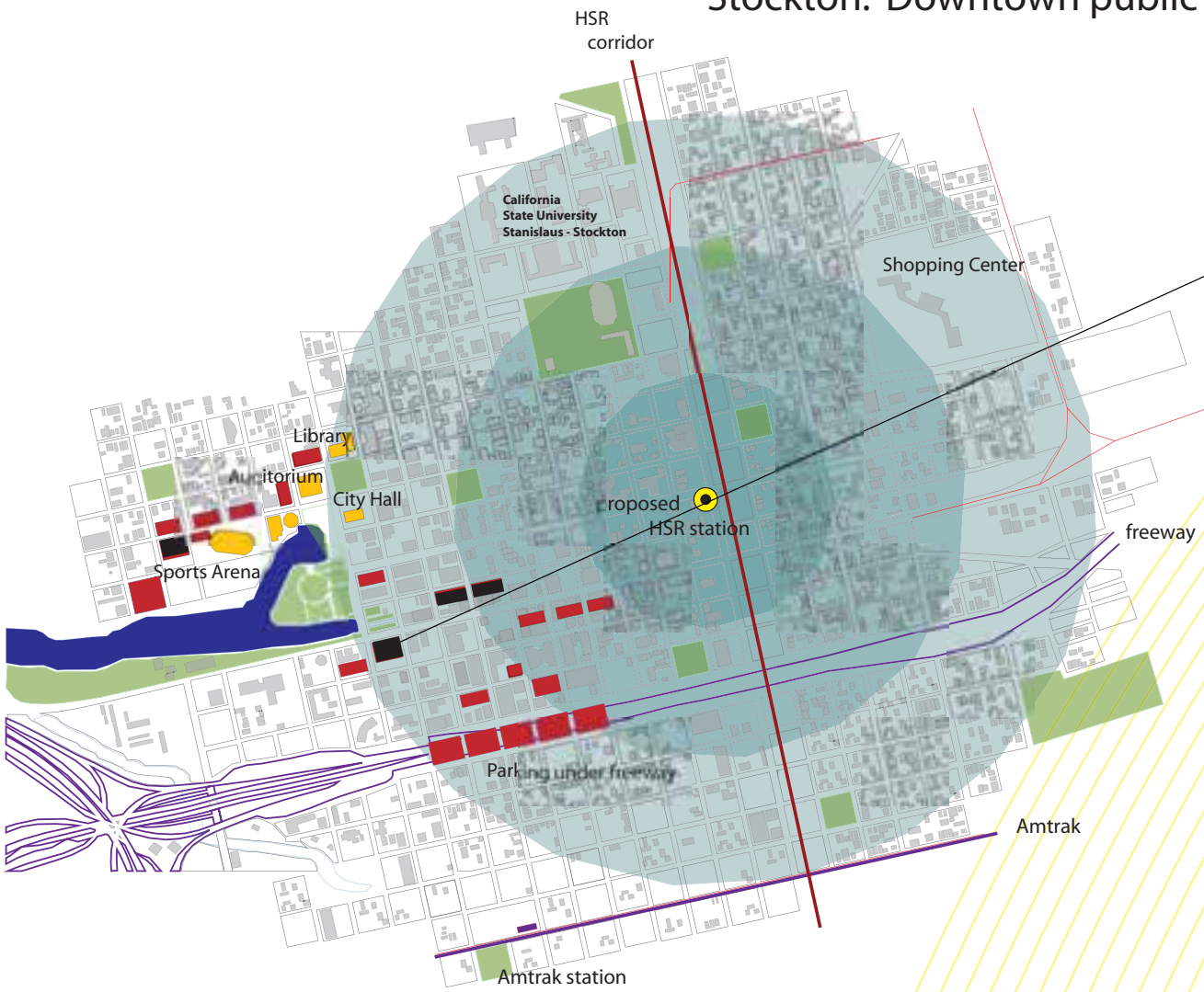
15 minute walk from HSR station

4.3. STOCKTON: PARKING ANALYSIS

4.22.Parking lot at the corner of Miner Ave. and California St.

The Stewart-Eberhardt Parking structure has a 700-vehicle capacity. Proposals for additional structures should be carefully considered after examining existing parking supply and demand. Stockton currently has a considerable supply of off-street parking spaces in public lots and garages. Field observations indicate that much of the parking remains vacant during the weekday. This means there is room for growth, utilizing the existing parking supply - even if some developments replace surface lots.

Stockton: Downtown public parking garages and lots



The Stewart-Eberhardt Parking Sructure
Opened March 2001
700 vehicle capacity

Parking Costs:

- On-Street Metered: $0.50 per hour
- Public Garage or Lot: $0.75-$1 per hour
- Event Parking: $5-$10

HSR station

freeway and railways

5, 10, 15 minute walk from station

Public parking garages*

Public parking lots*

*Source: City of Stockton Central Parking District

N

0' 500' 1000' 2000'

4.23. Map of downtown public parking locations.

4.24. On-street parking on Miner Ave.

The current parking supply appears ample, and could support higher levels of activity. This photo was taken on a weekday morning, showing the current low demand for street parking.

Stockton: Downtown On-Street Parking Supply

- Low demand for on-street parking during business hours
- Cost of on-street parking: $0.50 per hour

Angle parking on Miner Ave.
(near Sutter St.)

Parallel parking on Channel St.
(near California St.)

4.25. Illustrations of the low demand for parking.
These photos are taken during a weekday at locations indicated.

4.4. STOCKTON: URBAN DESIGN IDEAS

4.26. Schematic map showing the main urban design strategies.

The City of Stockton is currently focusing its urban design efforts in the Civic Center and along the waterfront.

High Speed Rail could create another anchor that would attract development around the station.

Our urban design concepts focus on the area between these development centers, using the connection between these two nodes as a way to revitalize the downtown area between them.

The following section discusses different urban design strategies for revitalizing downtown, ranging in scale from a city block, to a 1 square mile area around the future HSR station.

Stockton: Sites with potential for infill development around the HSR station

Some of the sites highlighted in this map have already been chosen by the City of Stockton for potential infill development. Our analysis has added a number of other sites (shown here in red) according to the method explained in chapter 3. The locations are underutilized parcels, either vacant lots or surface parking lots, and their size and position allows for infill development without demolishing existing structures.

N

0' 500' 1000' 2000'

- proposed infill housing (city of Stockton)
- proposed residential projects (city of Stockton)
- proposed parking locations (city of Stockton)
- other possible infill sites (UC Analysis)

- HSR station
- freeway and railways
- 5, 10, 15 minute walk from station
- main street

Source: City of Stockton official website, www.stocktongov.com

4.27. Map of infill potential sites in downtown Stockton.

This is an example of an older building, at the corner of Channel and California streets, that could contribute to the character and aesthetics of the downtown area, if it were renovated.

4.28. Example of possible design intervention on an existing block by renovating a historical building.

Above: existing building, California and Channel St.

Below: Design concept: revitalizing the building as part of a larger urban project.

This parking lot at the corner of California Street and Miner Avenue is one of several parking lots in the downtown area that could be used for infill development.

The image below shows how it could be transformed by adding mixed-use development with retail on the ground floor and office space or housing on the upper floors.

On the following pages, we offer a more comprehensive image of how this block, situated between Miner Ave., Channel St., California St., and Sutter St. could be developed. This would involve preserving or renovating the buildings of character and retrofitting the other exiting buildings by adding floors and redesigning some facades. It would not involve demolition of existing buildings, only infill development on parking lots, with newly created podium parking at ground level to address the need for additional parking spaces.

4.29. Example of another possible design intervention on the same block, by building on an underutilized parking lot.

Above: existing parking lot, corner of California St. and Miner Ave.

Below: Design concept: Infill development replaces the surface parking, with a podium providing additional parking spaces.

4.30. Overall view of an existing Stockton city block showing possible interventions:
renovation and/or retrofitting of existing buildings, infill development, redesigning of streets.

The buildings are commercial on the busy streets, with ground floor retail and offices on the top levels; in the rear and on quiet streets uses are residential. The green space provided on top of the podium is a shared amenity. However, some sections of the greens could also be designed to have private control using fences or hedges.

Number of Apartments Added (1,000 to 1,200 ft² each)	22
Total Units	22
Retail Space Added (ft²)	23,000
Office Space Added (ft²)	60,000
Parking Spaces Provided (120 podium + 36 on street)	156
Block Surface (Acres)	2.1

Table 4.4. Program for redesigning an existing block.

In this proposal, a relatively modest amount of parking is proposed; instead, on-street parking and other nearby lots and garages would be better utilized.

4.31. Plan of an existing Stockton block, showing possible design interventions.

4.5. DESIGN CONCEPTS FOR STOCKTON CITY BLOCKS

This section takes a different approach from the previous block design concept. Without focusing on any existing buildings and blocks, and using the most common block size in downtown Stockton (300'x300') as well as common street dimensions (75' to 110'), these concepts offer a comparative view of different ways to develop a block through a series of five block design concepts. They contain a mix of townhouses, apartments, ground floor retail, and office spaces. As they progress from block 1 to block 5, they change from lower density residential use (blocks 1 or 2), to higher density, mixed-use developments for very active urban arterials (blocks 4 or 5). We add density by either changing land use type or adding more of the same use along busy streets.

Street design played an important role in the design of the block and went hand in hand with the design of the buildings. We have designed the blocks with the idea that more intensive uses will line busy streets, whereas uses with lower intensity will be more suitable for side and/or quieter streets.

The aim is to show how three or four story buildings can have sufficiently high densities to support public transit and other services, and also provide a vibrant and pleasant urban environment. These concepts also show how trade-offs can be achieved between higher housing density (block 3) and a greater diversity of housing options (block 2), with both contributing to the overall quality of the urban environment.

An important aspect of these concepts was the provision of an adequate number of parking spaces for each type of block. We have worked with a standard of 1 parking space per housing unit and 1 space per every 500 sq. ft. of retail or office. Using these standards, making the best use of on-street parking, and adding additional spaces on internal alleys or in podium* parking, we were able to meet parking demand while proposing a higher overall housing density than what is common in downtown Stockton without using parking lots and providing more parks and playgrounds. Block 5 is the only concept where on site parking cannot meet the parking demand (204 spaces provided out of the 258 required, leaving a deficit of 54 parking spaces) due to the high density. However, all the other block concepts provide more parking that they need according to the standard we used (56 extra spaces for block 2, or 57 for block 3, for example). This means that the additional parking spaces for block 5 could be located on adjacent blocks.

** A podium parking design is when the building is raised up and the space beneath is dedicated to parking.*

4.32. Overview of five generic block design concepts.

Block 1. Townhouses.

Block 2. Townhouses and Apartments.

Block 3. Apartments.

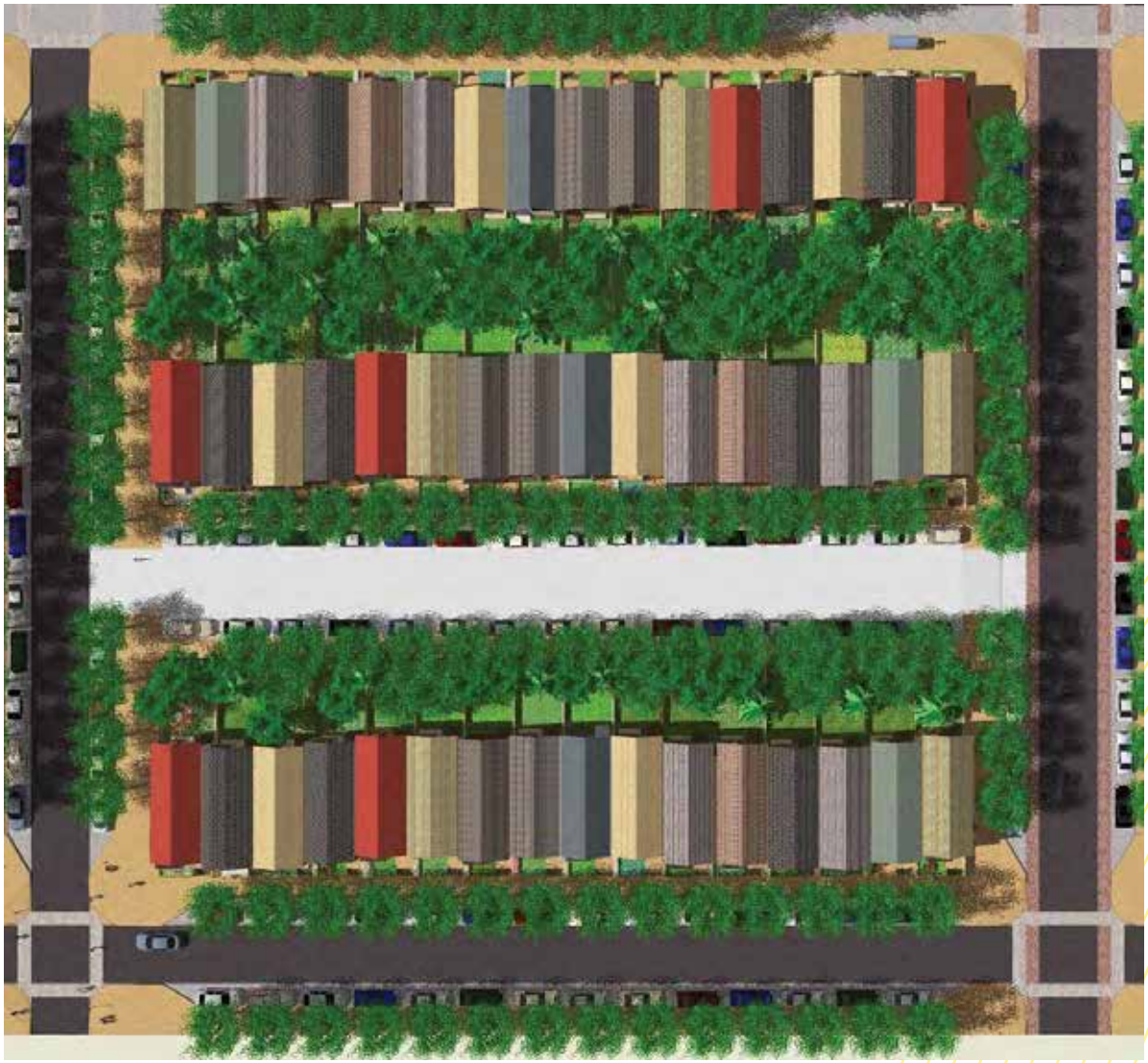
Block 4. Apartments, Townhouses, and Retail.

Block 5. Apartments, Offices, and Retail.

Block 1: Townhouses.

4.33. Townhouses. Overall view.

Townhouses could be developed with possible front and/or back yards, or with green spaces in the center of the block.



4.34. Townhouses. Plan.

Number of Townhouses (1200 sq. ft. each)	48
Number of Apartments (1000 - 1200 sq. ft. each)	0
Total Units	48
Total area of townhouses (sq. ft.)	57,600
Internal circulation (sq. ft.)	0
Retail (sq. ft.)	0
Office (sq. ft.)	0
Units/Acre	23
Parking Spaces Required (1 per housing unit, 1 per 500 sq. ft. of retail or office)	48
Parking Spaces Provided (30 on internal alley and 52 on street)	82
Block Surface (Acres)	2.1

Table 4.5. Block 1. Program.

4.35. Townhouses. Street view.

Block 2: Townhouses and Apartments.

4.36. Townhouses and Apartments. Overall view.

Along the busy streets, a row or a corner of a block can start to have higher densities – this is the way in which denser land uses are introduced. This block is a step up from the previous concept in that apartments with a mix of townhouses are proposed. More parking is provided as land uses get denser. In this concept, a common playing area is proposed within the block with grass crete, landscape elements, and other softer playing surfaces.

4.37. Townhouses and Apartments. Plan.

Number of Townhouses (1200 sq. ft. each)	16
Number of Apartments (1000 - 1200 sq. ft. each)	39
Total Units	55
Total area of townhouses (sq. ft.)	19,200
Total area of apartments (sq. ft.)	51,500
Internal circulation (percentage of total apartment area)	20%
Retail (sq. ft.)	0
Office (sq. ft.)	0
Units/Acre	26
Parking Spaces Required (1 per housing unit, 1 per 500 sq. ft. of retail or office)	55
Parking Spaces Provided (59 on internal alley and 52 on street)	111
Block Surface (Acres)	2.1

Table 4.6. Block 2. Program.

4.38. Townhouses and Apartments. Street view.

4.39. Example from Washington, DC.

Note architectural variation but consistent setbacks, landscaping, and heights.

Block 3: Apartments.

4.40. Apartments. Overall view.

From this block concept onwards parking is added through a partial podium and the open spaces between the building areas are maintained as green spaces above the podium.

4.41. Apartments. Plan.

Number of Townhouses (1200 sq. ft. each)	0
Number of Apartments (1000 - 1200 sq. ft. each)	96
Total Units	96
Total area of apartments (sq. ft.)	126,700
Internal circulation (percentage of total apartment area)	20%
Retail (sq. ft.)	0
Office (sq. ft.)	0
Units/Acre	46
Parking Spaces Required (1 per housing unit, 1 per 500 sq. ft. of retail or office)	96
Parking Spaces Provided (120 in podium and 55 on street)	175
Block Surface (Acres)	2.1

Table 4.7. Block 3. Program.

4.42. Apartments. Street view.

4.43. Example from Commonwealth Avenue, Boston, MA - townhouses, flats, and apartments.

Block 4: Retail, Apartments, and Townhouses.

4.44. Retail, Apartments, and Townhouses. Overall view.

In this concept ground floor retail is added, thus starting the creation of a busy streetscape that helps to revitalize the central city. Notice how this single block can accommodate very different land uses and densities. Compared to the previous concept, the overall housing density is lower. However, density and activity is maintained by adding retail and providing different housing types, from apartments to townhouses. Within this block, one could choose to live in a townhouse on a quiet street, with a private backyard, or in a duplex apartment with a rooftop terrace, or in an apartment on a very active street, right above retail. Podium parking occupies the ground floor in the center of the block, and on top of it there are private courtyards that open onto a playground for children right in the center.

4.45. Retail, Apartments, and Townhouses. Plan.

Number of Townhouses (1200 sq. ft. each)	11
Number of Apartments (1000 - 1200 sq. ft. each)	73
Total Units	84
Total area of townhouses (sq. ft.)	13,200
Total area of apartments (sq. ft.)	96,350
Internal circulation (percentage of total apartment area)	20%
Retail (sq. ft.)	17,000
Office (sq. ft.)	0
Jobs Provided (3 per 1000 sq. ft. of retail or office)	51
Units/Acre	40
Parking Spaces Required (1 per housing unit, 1 per 500 sq. ft. of retail or office)	118
Parking Spaces Provided (120 in podium and 55 on street)	175
Block Surface (Acres)	2.1

Table 4.8. Block 4. Program.

4.46. Retail, Apartments, and Townhouses. Street view.

Block 5: Retail, Offices, and Apartments.

4.47. Retail, Offices, and Apartments. Overall view.

This design shows a very intense urban block near a major arterial. It has ground floor retail which can be serviced through the podium parking behind it, offices along the busy streets, and apartments along the quieter cross street. The arterial has dual exclusive bus lanes.

4.48. Retail, Offices, and Apartments. Plan.

Number of Townhouses (1200 sq. ft. each)	0
Number of Apartments (1000 - 1200 sq. ft. each)	60
Total Units	60
Total area of apartments (sq. ft.)	79,000
Internal circulation (percentage of total apartment and office area)	20%
Retail (sq. ft.)	17,000
Office (sq. ft.)	81,600
Jobs Provided (3 per 1000 sq. ft. of retail or office)	296
Units/Acre	29
Parking Spaces Required (1 per housing unit, 1 per 500 sq. ft. of retail or office)	258
Parking Spaces Provided (120 in podium and 84 on street)	204
Block Surface (Acres)	2.1

Table 4.9. Block 5. Program.

4.49. Retail, Offices, and Apartments. Street view.

4.50. Retail, Offices, and Apartments. Special parking strategy.

This high-density mix of housing, retail, and office can support a Bus Rapid Transit corridor. But the high level of activity increases parking demand and calls for solutions to accommodate more vehicles than any of the previous block concepts. Some of the additional parking could be provided by redesigning quieter streets with perpendicular on-street parking as shown in this image. Supplemental parking locations could be found on adjacent blocks, since blocks 1 through 4 all have more parking spaces than needed. This would work in a multi-block configuration where all these block types are combined at the scale of a neighborhood.

4.6. MULTI-BLOCK DESIGN CONCEPTS FOR STOCKTON

4.51. Multi-block concepts. Aerial view.

No. of blocks	12
Total surface (acres, not counting streets)	25
No. of townhouses (1200 sq. ft. each)	171
No. of apartments (1000 – 1200 sq. ft. each)	636
Total units	807
Net housing density (units per acre)	32
Retail space (sq. ft.)	150,000
Office space (sq. ft.)	288,000
Jobs Provided (3 per 1000 sq. ft. of retail or office)	1314

Table 4.10.
Multi-block concepts.
Program.

Taking a further step from the single block concepts, this multi-block concept shows how all the different block types could be organized at the scale of a neighborhood. Major streets have higher density buildings, ground floor retail, and transit service. Between them there are quieter residential neighborhoods, with parks and playgrounds, within walking distance of retail, transit, and services located on major streets.

There is a hierarchy among larger streets as well. Some can be designed for through traffic, while also having, for instance, a bus rapid transit corridor, while others can be more oriented towards pedestrians, having wider, shaded sidewalks, arcades, and street cafes.

The aim is to show how a high quality urban environment, with varied levels of density and pleasant pedestrian spaces, can achieve levels of density sufficient to support a good quality transit system, as well as other services. All the images shown on the following pages would be part of a neighborhood with an overall net density of 32 units per acre, and over 1300 jobs in retail or office space.

4.52. Multi-block concepts. Major boulevard.

Curbside Bus Rapid Transit service is co-located with high density buildings, concentrating civic and commercial activity, where transit access is most convenient.

4.53. Multi-block concepts. Street intersection.

High densities along the Bus Rapid Transit corridor give way to quieter, lower-density residential neighborhoods on adjacent streets.

4.54. Seating spaces along a commercial street in Keene, NH.

4.55. Urban park on a quiet street. Aerial view.

Higher densities allow for the creation of parks and other open public spaces, while still maintaining an overall density that can support transit.

4.56. Urban park in Chicago, IL.

4.57. Urban park on a quiet street. Eye level view.

4.58. Multi-block concepts. Residential street.

4.59. Multi-block concepts. Commercial street.

This is a major street, yet more pedestrian-oriented than the major transit corridor shown earlier. It has shaded sidewalks, retail, and a landscaped median.

5. URBAN DESIGN CONCEPTS FOR MERCED

The City of Merced is located along Highway 99 in the eastern portion of Merced County, just over 100 miles to the southeast of San Francisco and some 300 miles north of Los Angeles. Merced is also located just west of the southern entry to Yosemite National Park and the city is sometimes referred to as the "Gateway to Yosemite." Incorporated in 1889, Merced has a 2008 population of just over 76,000 and is both the largest city and the county seat of Merced County. Merced is located in the midst of some of the nation's most productive farmland and the city's economy has traditionally been centered on agribusiness. Until its recent closing, nearby Castle Air Force Base was also a major driver of economic activity.

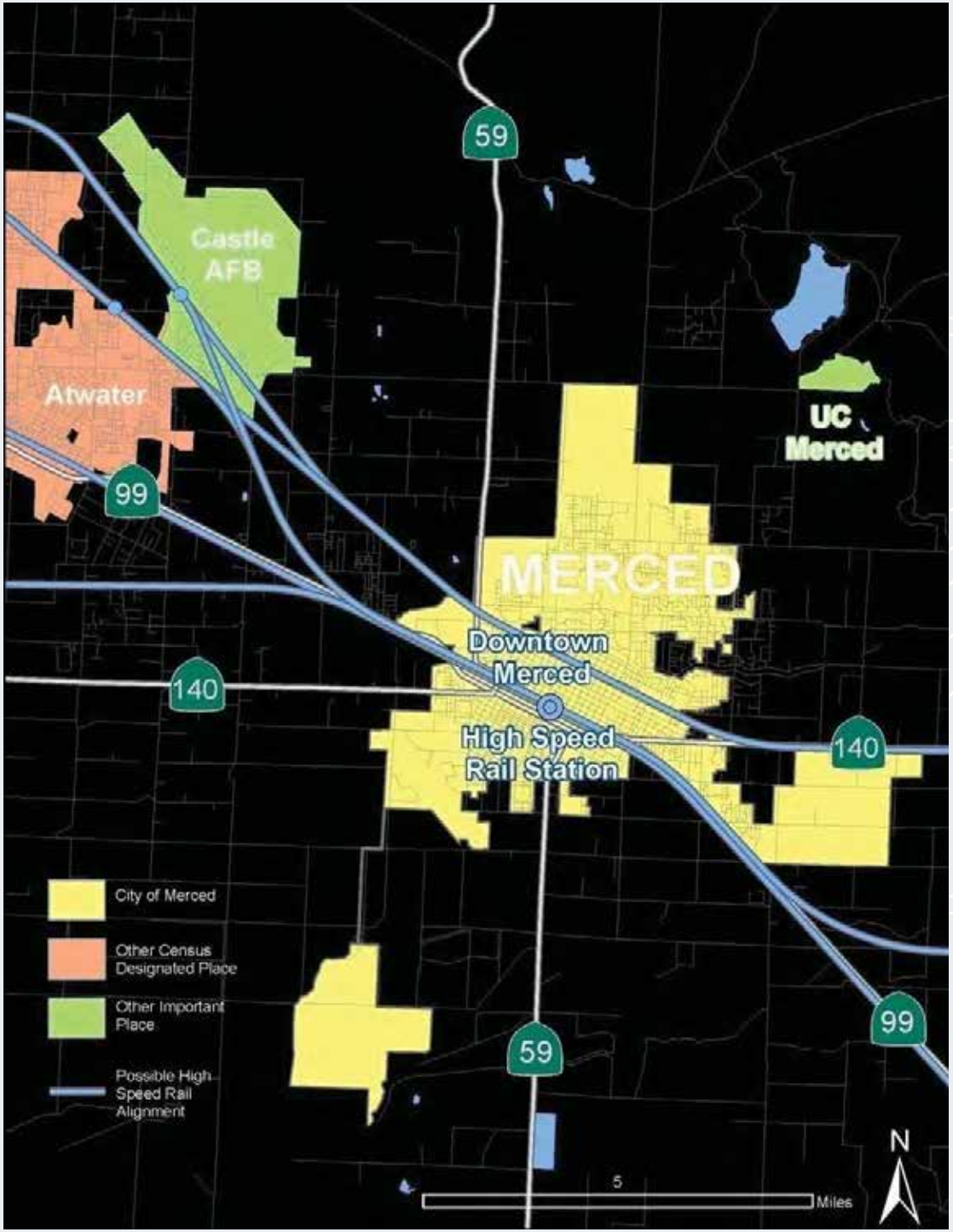
Merced and Merced County are experiencing rapid population growth which is expected to continue in the coming decades. Employment in Merced County is projected to grow at a rate slightly less than the projected population growth rate. A major growth pole for Merced is the new University of California campus, which opened in 2005 just outside the city limits. Although enrollment at the University is currently limited to some 2,000 students the University plans to expand rapidly and is projecting 30,000 students by 2030.

Merced, like much of the Central Valley, is predominantly auto-oriented. Transit service is minimal and generally oriented toward serving the needs of the transit dependent. However, its downtown is walkable and pleasant.

The first section in this chapter introduces Merced. A discussion of urban design ideas for the city follows, looking at street design and infill typologies in the 1 square mile area around the proposed station location. A detailed parking analysis for new uses proposed in the core is also presented.

5.1. INTRODUCTION TO MERCED

This map shows the location of Merced's proposed HSR station, the city limits, and the wider regional context with the Castle Air Force Base, City of Atwater and the UC Merced campus.



5.1. Merced's regional context.

Data Sources: California Department of Conservation, California Construction Industry Research Board.

Table 5.1. Merced population and commute statistics.

	Merced City 2000	Merced District 2000	Merced District 2030	% Change 2000-2030
Total Workers Residing in Merced	21,582	57,650	117,582	104%
Work within the city of Merced	13,940	44,123	93,897	113%
Work elsewhere in Merced county	5,015	1,409	3,160	124%
Work in San Joaquin or Stanislaus Counties (remainder of Northern San Joaquin Valley)	1,252	8,651	15,802	83%
Work in Sacramento Region	105	185	147	-21%
Work in Monterey Bay Area	15	41	93	127%
Work in Bay Area	285	928	1,928	108%

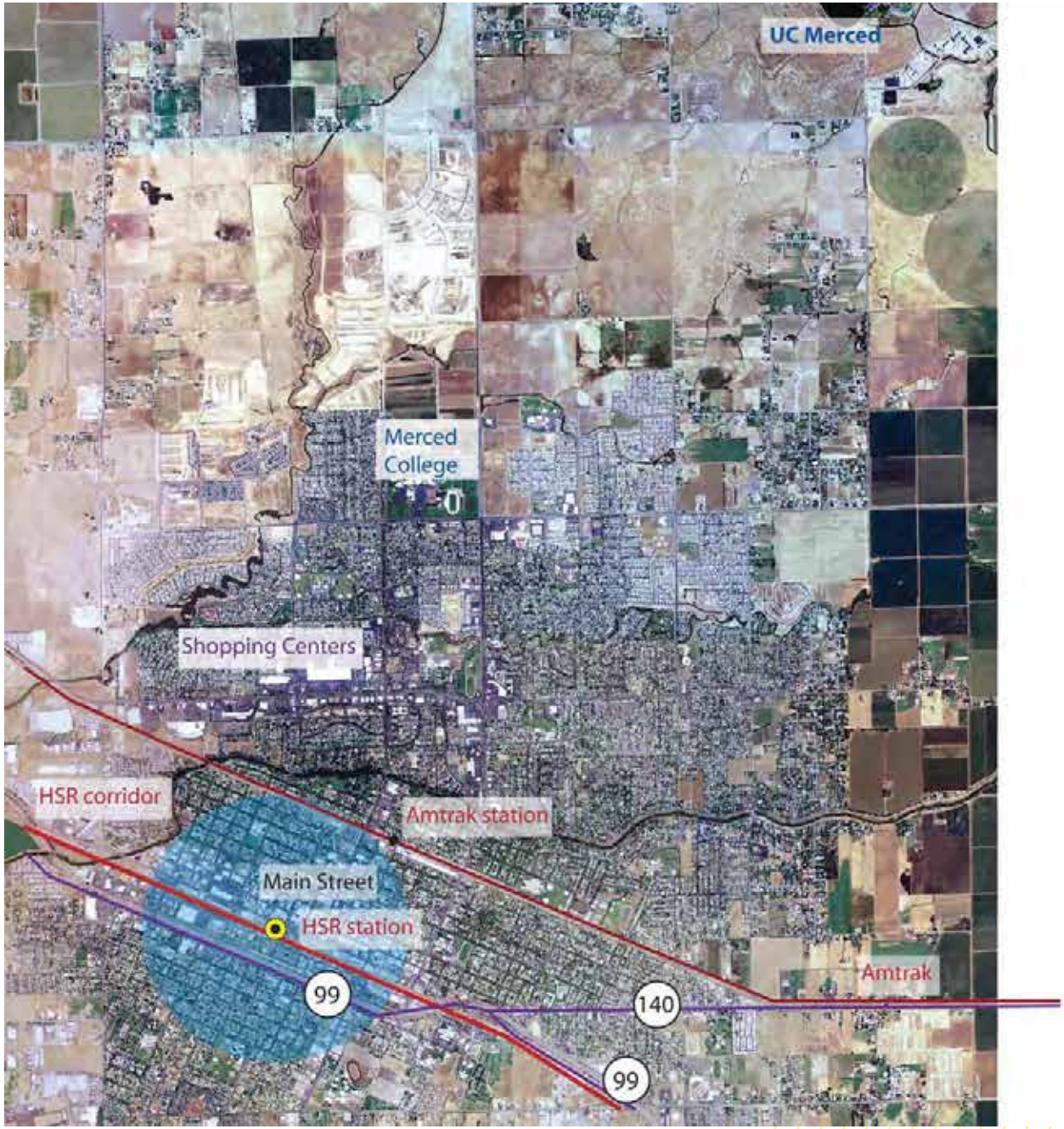
Population 2007	**76,879**
Employment 2008	**28,300**

Place data ftp://ftp.abag.ca.gov/pub/mtc/census2000/CTPP/flowdata/CTPP2000_California_PlaceFlow_AllVars.zip
District data ftp://ftp.abag.ca.gov/pub/mtc/planning/forecast/commuter2006/Commuter_Forecasts_2006.xls

We use MTC's defined districts for norther California as a basis for the "Merced District".
Refer http://www.mtc.ca.gov/maps_and_data/datamart/gis/corr1.htm

CENSUS, Annual Estimates of the Population for Incorporated Places in California
http://www.census.gov/popest/cities/tables/SUB-EST2007-04-06.xls

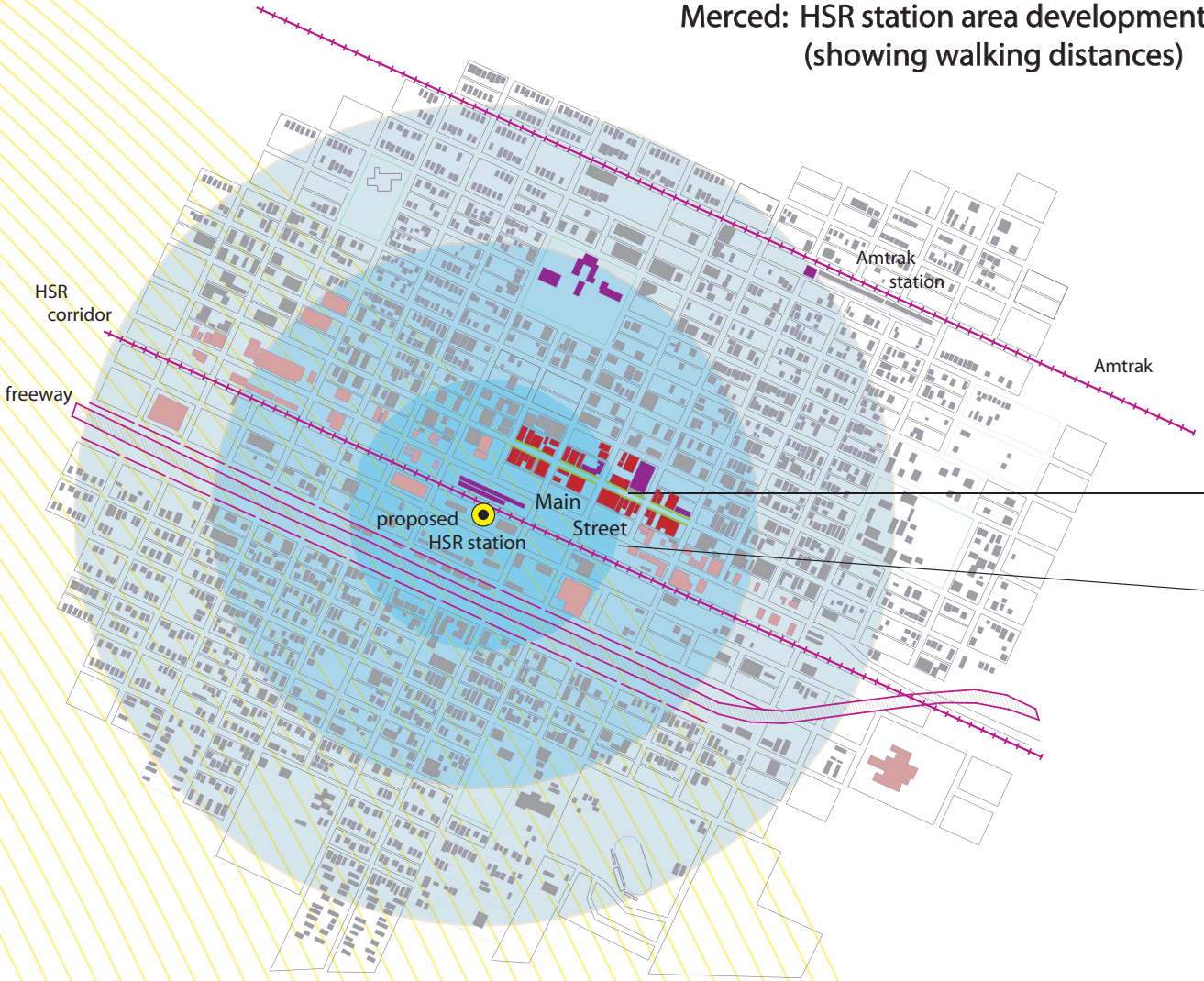
Merced
The HSR Station Area
Within Regional Context



The proposed HSR station in Merced is very well located in the downtown area, within walking distance of Main Street and the core of downtown. It is also within walking distance of the existing Amtrak station (north of downtown). The UC Merced campus, an important future trip generator, is located 7 miles north of downtown. The station also would have easy access to the freeway south of the station.

5.2. The Merced HSR station area within the regional context.

Merced: HSR station area development analysis. (showing walking distances)



Main Street

16th Street

N

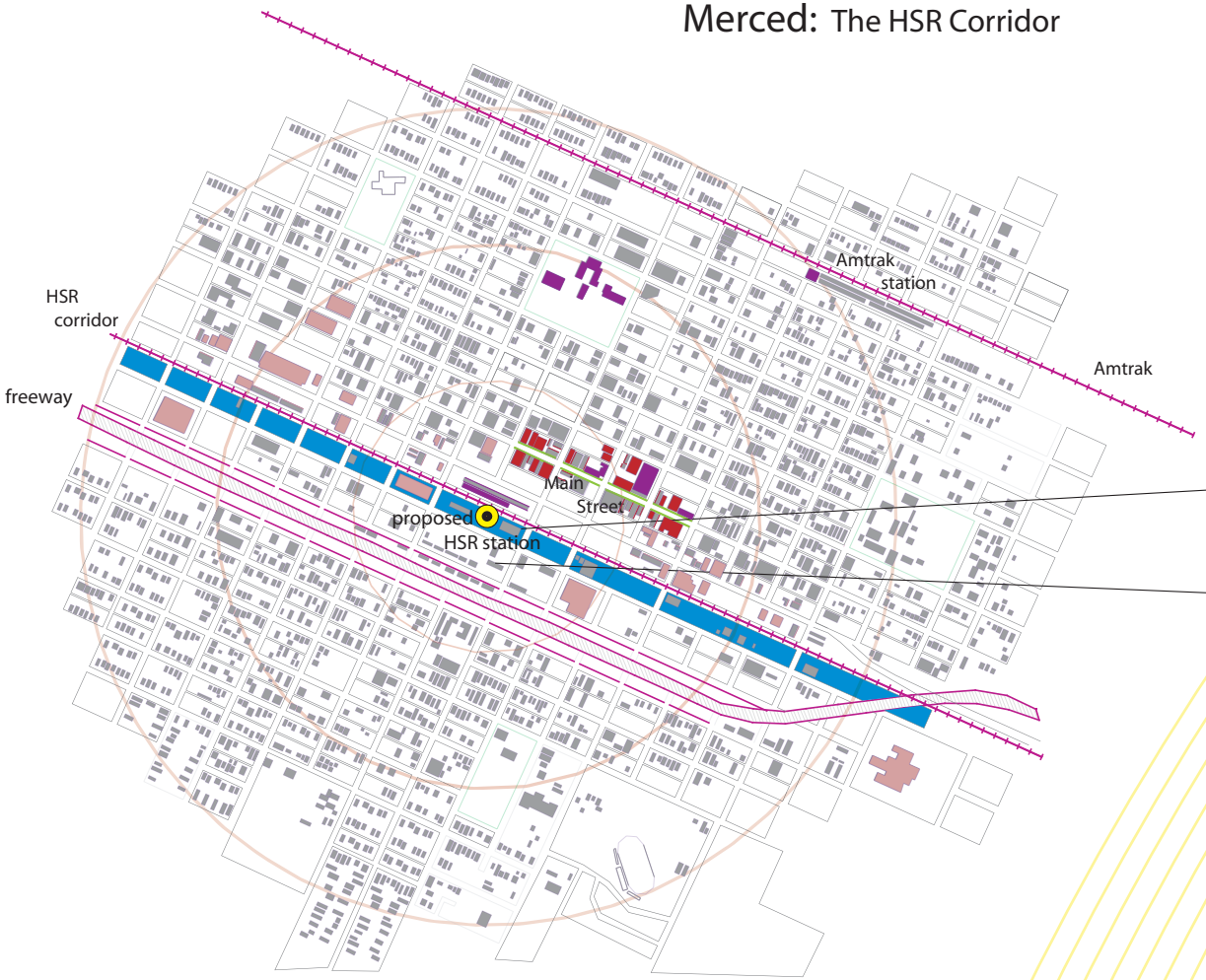
0′ 500′ 1000′ 2000′

- downtown retail
- public buildings
- retail/ office
- housing

- HSR station
- freeway and railways
- 5, 10, 15 minute walk from station
- main street

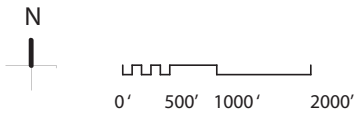
5.3. The HSR station area and the major destinations situated within a 15-minute walk.

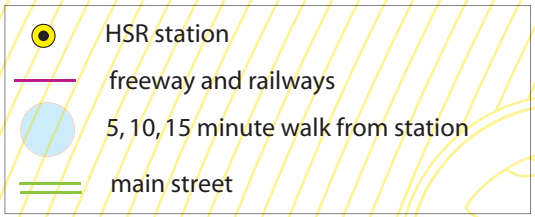
Merced: The HSR Corridor



Boys and Girls Club (within HSR corridor)

Senior housing (next to HSR corridor)

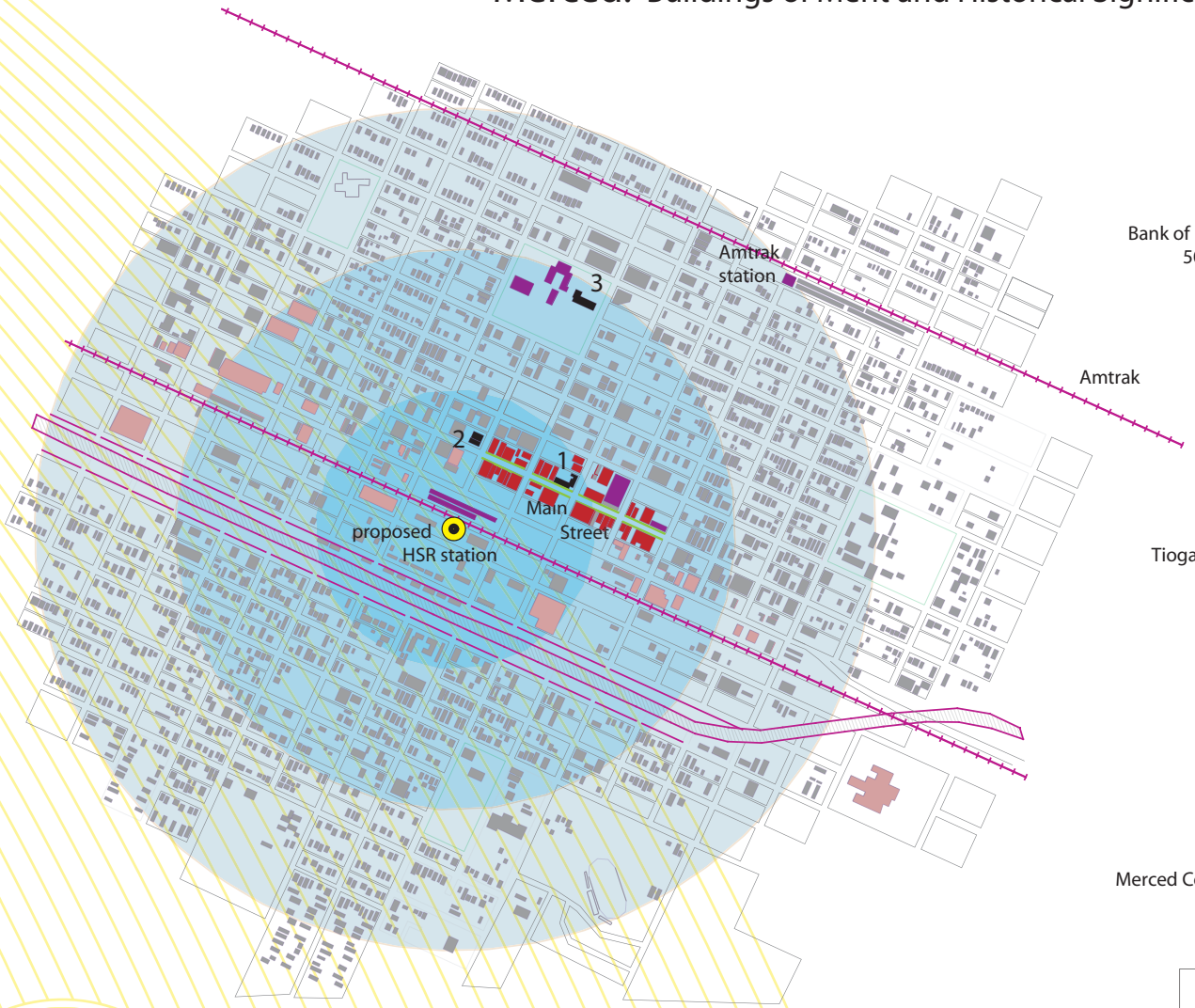




5.4. Map of the HSR corridor in downtown Merced.

The proposed alignment for the HSR goes through Merced between Main Street (the core of downtown) and the freeway. Some of the uses currently there (such as the Boys and Girls Club) may need to be relocated.

Merced: Buildings of Merit and Historical Significance



1
Bank of Italy Building
501 W Main St.

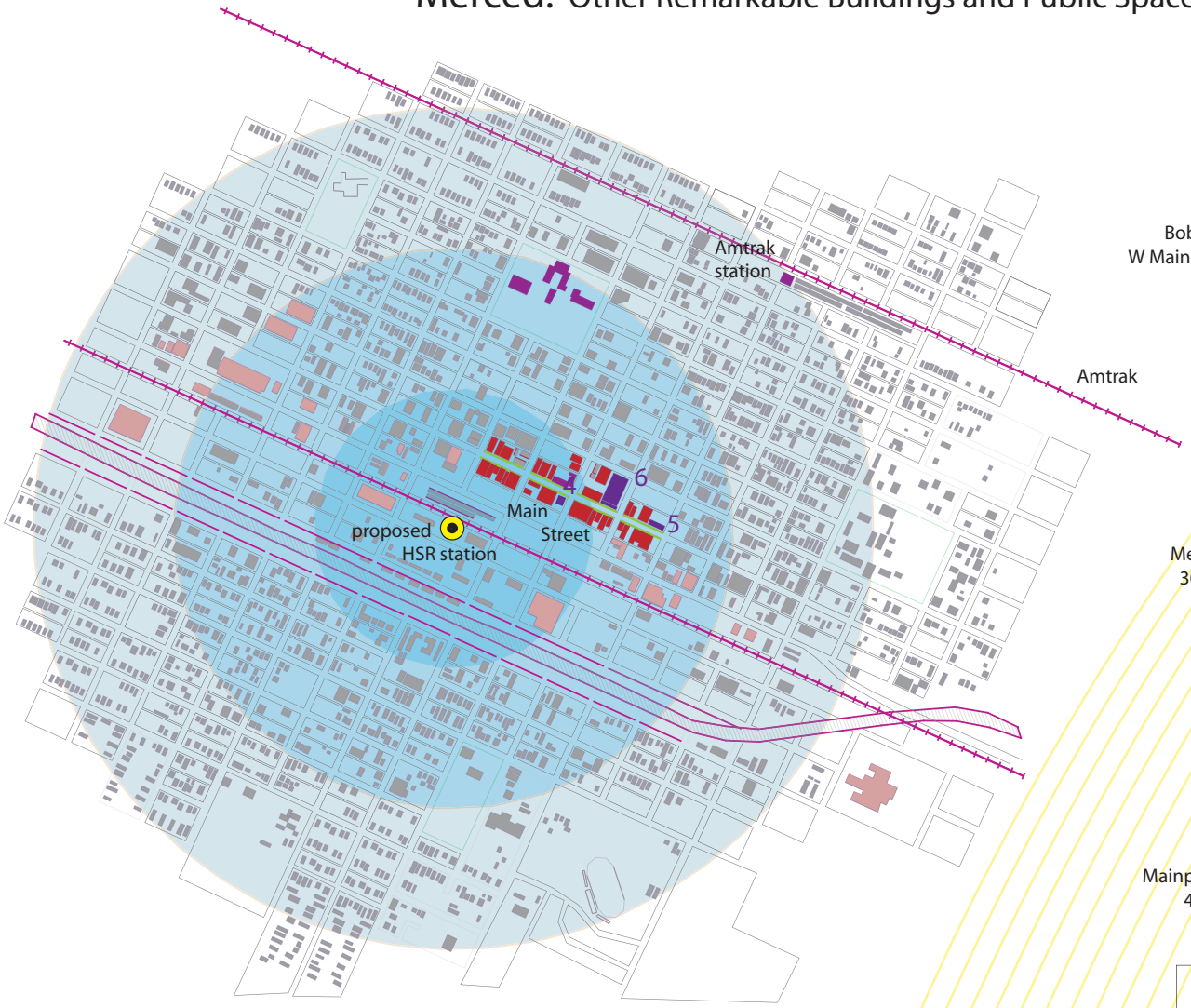
2
Tioga Apartments
1715 N St.

3
Merced County Library
2125 M St.

5.5. Buildings of merit in the study area (1).

These buildings are on the National Register of Historic Places and are located within a 15-minute walking distance from the proposed HSR station. They create points of focus and attraction for the station area, and offer design typologies.

Merced: Other Remarkable Buildings and Public Spaces



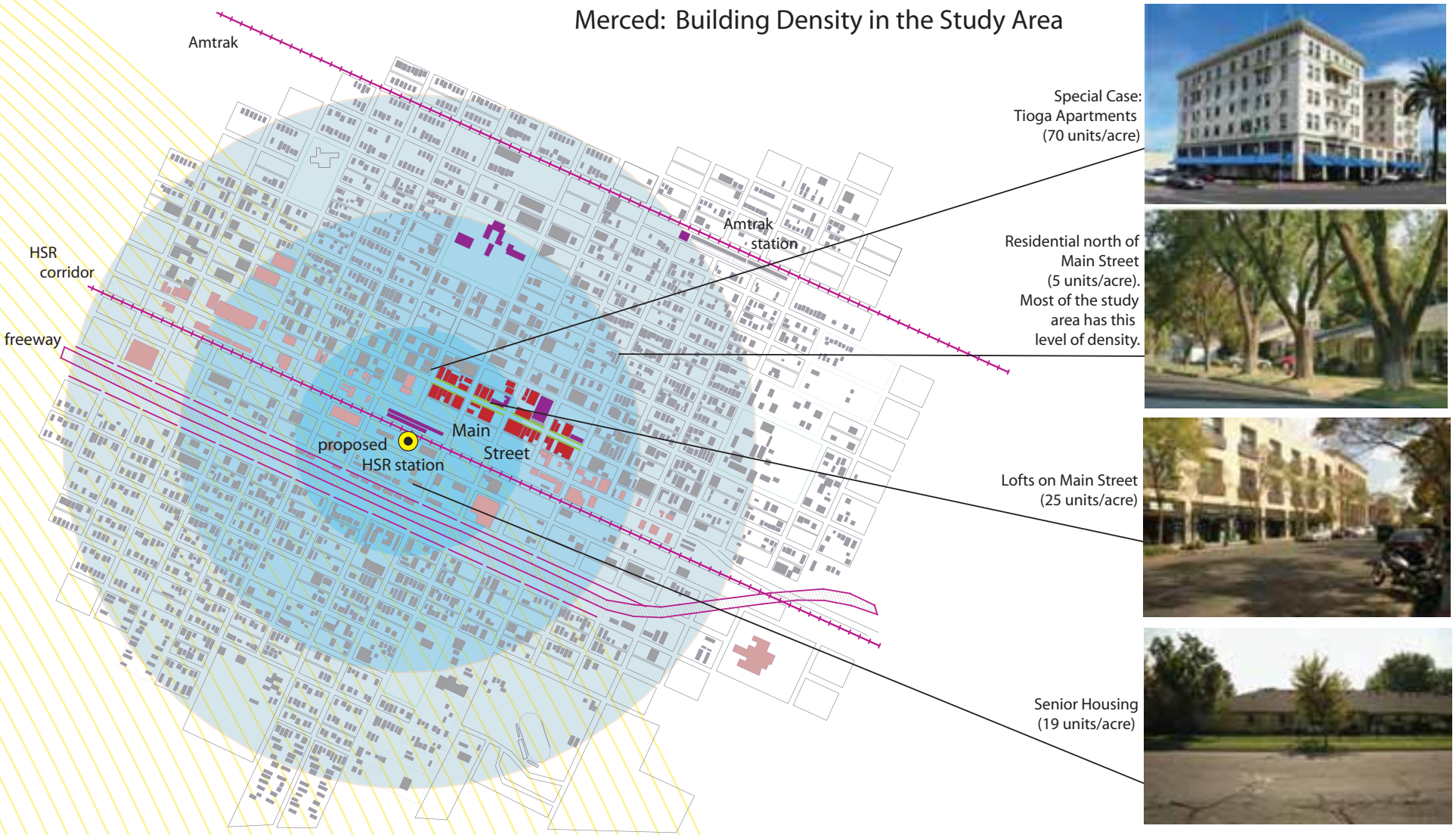
4
Bob Hart Square
W Main and Canal St.

5
Merced Theatre
301 W Main St.

6
Mainplace Cinemas
401 W Main St.

5.6. Buildings of merit in the study area (2).

While these buildings do not show up on the National Register of Historic Places, they are well designed, found in significant locations and potential destinations for development analysis.



5.7. Map of downtown Merced showing building densities in specific locations.

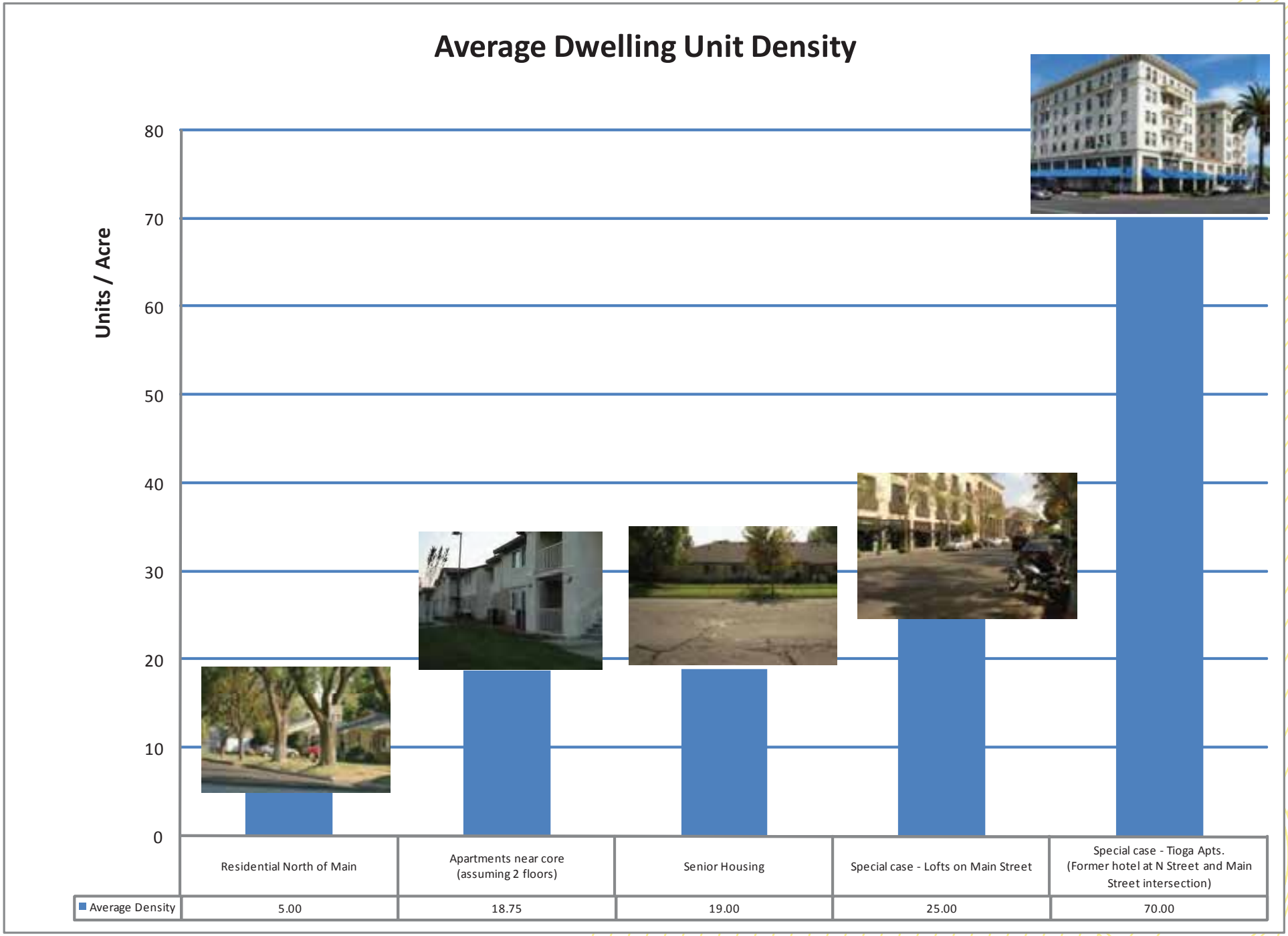
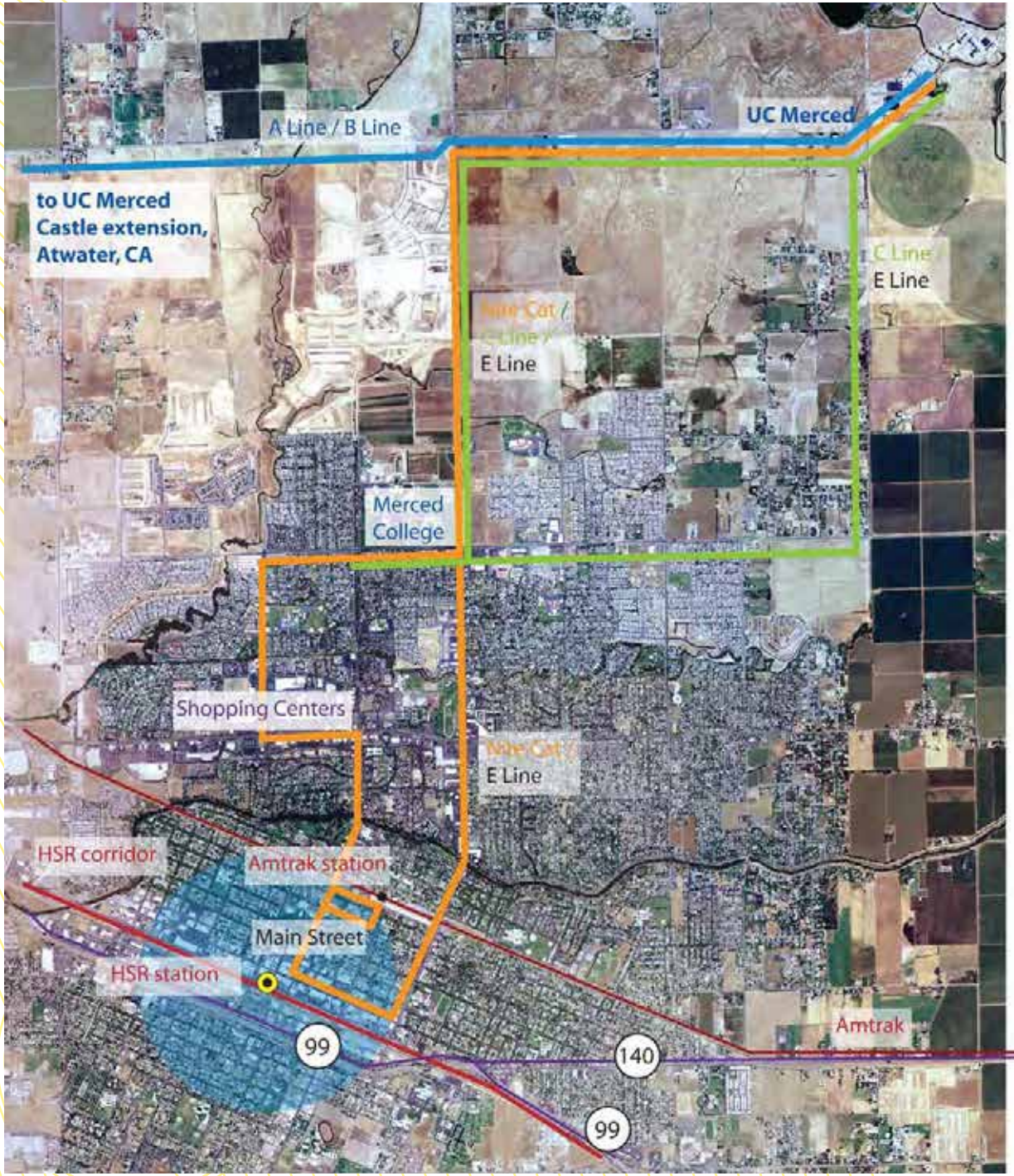


Table 5.2. Housing densities in the area surrounding the proposed Merced HSR station.



5.8. Map of UC Merced shuttle routes.

5.2. MERCED: EXISTING TRANSIT

UC Merced *CatTracks* Shuttles:

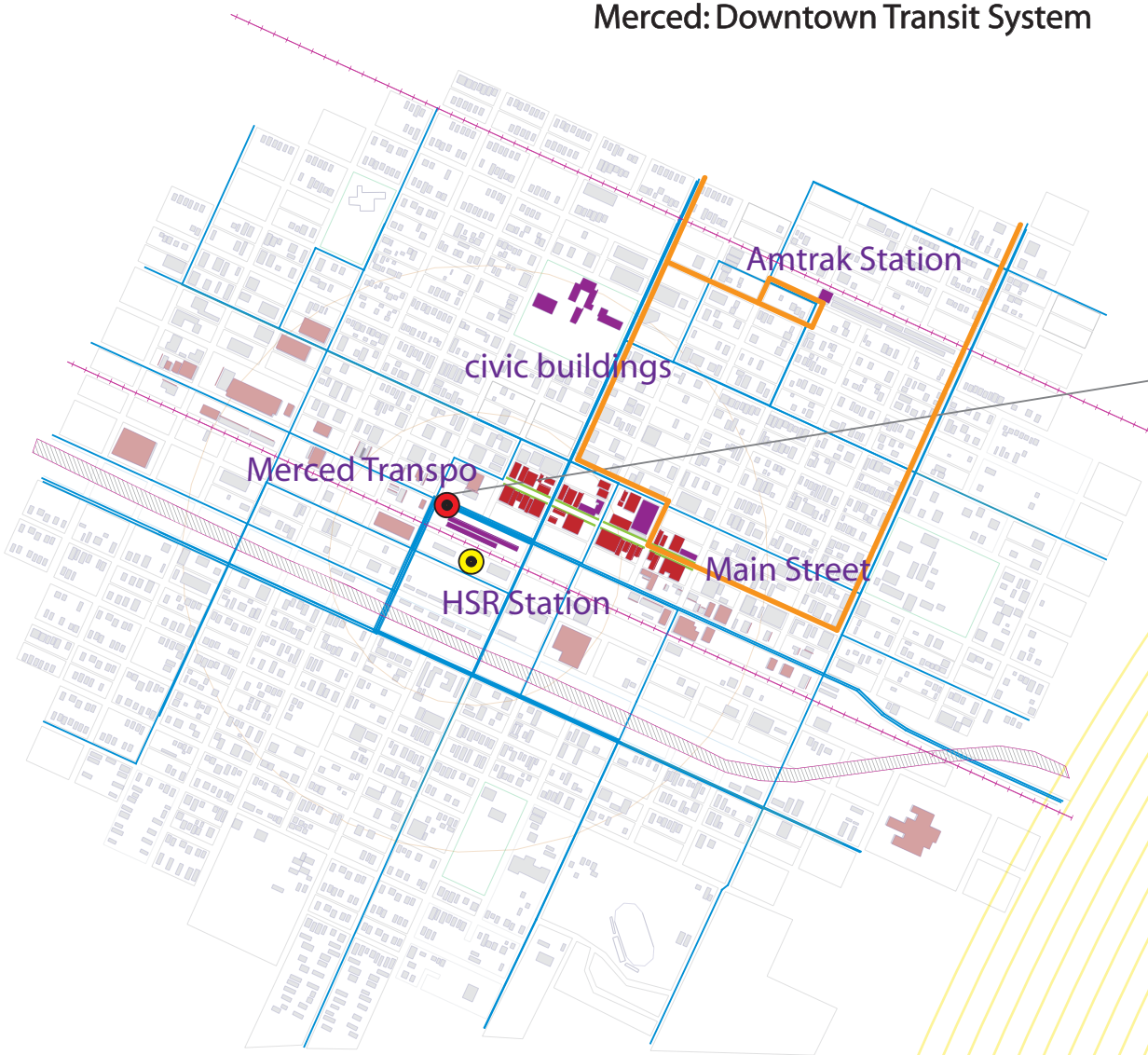
One of Merced's major trip generators is the University of California campus, located about seven miles north of downtown. Expected enrollment is 30,000 students by 2030 (more than ten times the current number). Located far from downtown, the campus can pose serious problems in terms of transport.

Most areas north of downtown have density levels that are too low to support good quality transit. A system of motor coaches has been put in place, connecting the campus to select locations within the city, offering a transportation alternative to students and faculty.

The City of Merced could increase the connectivity by developing a transportation corridor between Main Street, the HSR station, and the UC campus, creating higher densities along the way. The urban design concepts shown here for the HSR station area could be a first step in this process.

The way the University expands could pose challenges. A campus extension has recently opened at Castle Air Force base, which is far from downtown Merced and the main UC campus and requires an additional CatTracks shuttle route. If this development pattern continues, the campus will be spread out across various suburban locations and the potential for Bus Rapid Transit will be significantly lower than if the campus expanded around its present location or along the route to downtown Merced, creating a potential future transit corridor.

Merced: Downtown Transit System



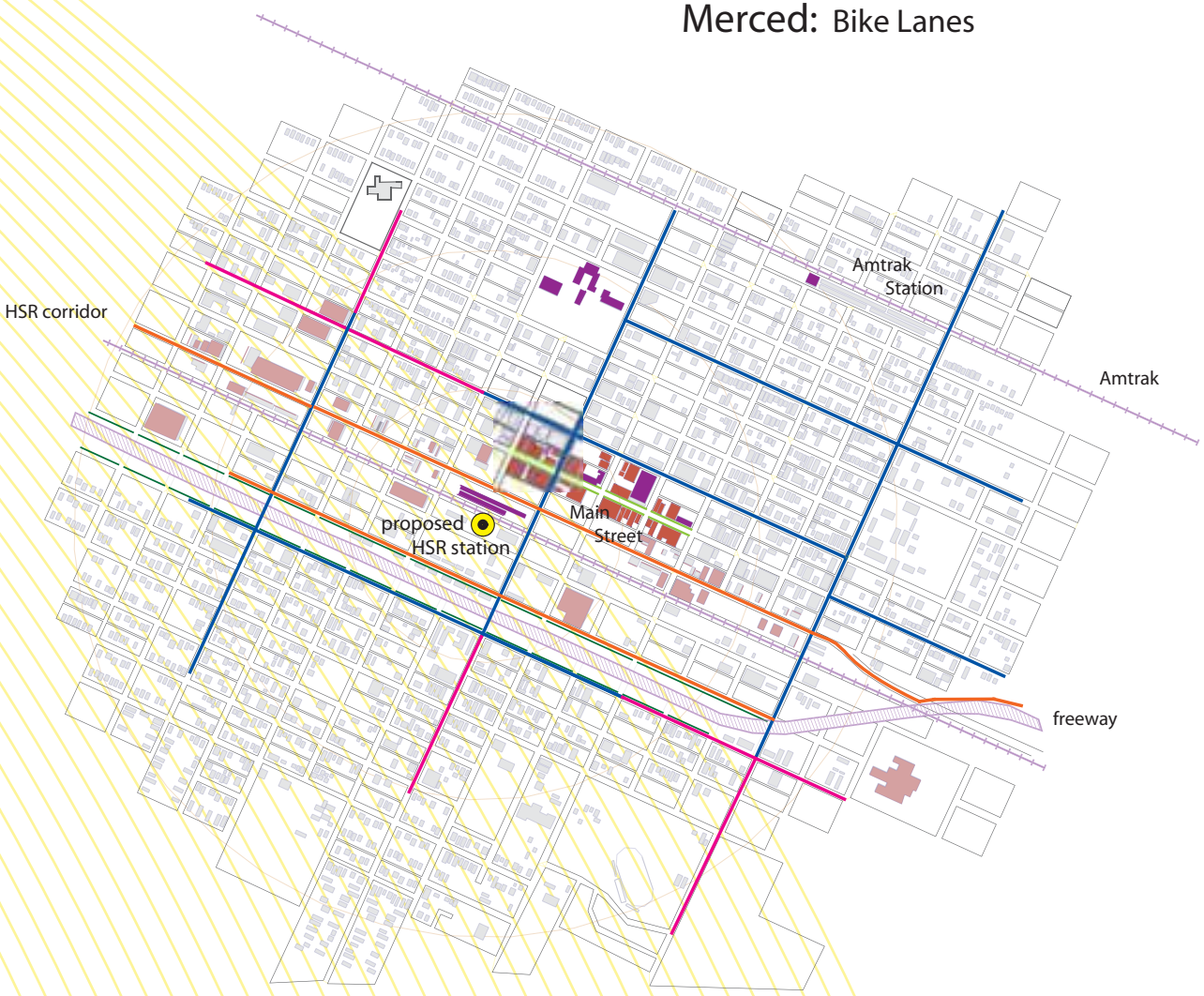
Merced Transpo, major bus terminal
W16th Street (the same block as the HSR station)

An important asset for transit-oriented development in Merced's downtown area is the location of the major bus terminal right next to the proposed HSR station. This offers the opportunity to create a multimodal transportation hub, offering better connectivity between different transit services. All the bus routes that pass through the downtown area (i.e., 1 and 2 ["City Shopper"], 3 ["M Street shuttle"], 4 ["G Street shuttle"], 5, 5x, 7, 9, 10, 10A, 11, 12, and 14) stop at Merced Transpo, and connect it with all the major destinations within Merced and Atwater. Very few routes do not stop at the terminal; the UC Merced shuttles do not stop at Merced Transpo although they pass less than two blocks from it.

sources: http://www.mercedthebus.com/routes.html
http://www.cattracks.org/systemmap.html

5.9. Map of Merced's downtown transit system.

Merced: Bike Lanes

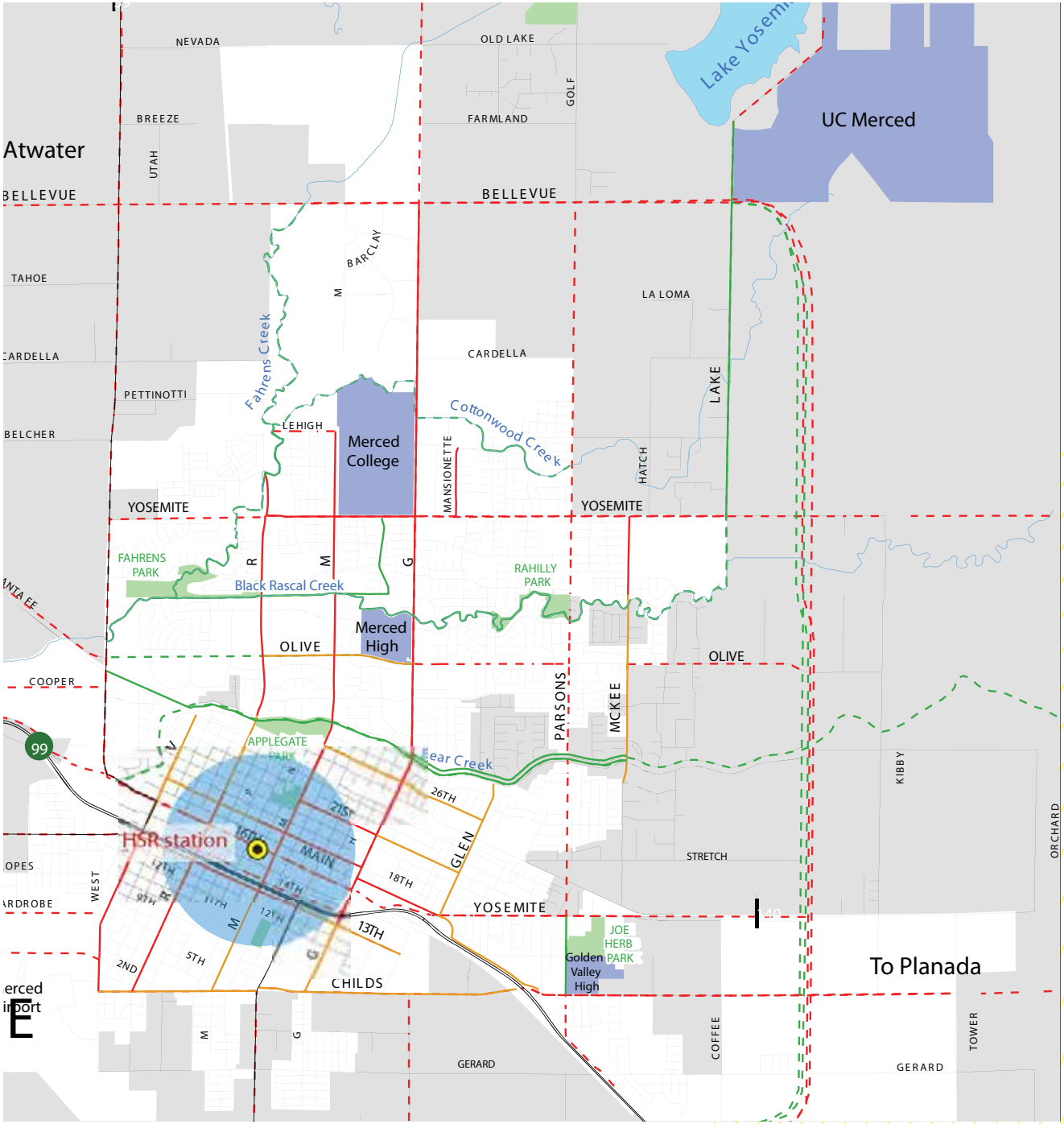


Source: www.cityofmerced.org

5.10. Map of bike lanes and routes in downtown Merced.

The existing bike path and lane network leaves room for improvement, both in terms of how the network connects with major destinations (HSR station, Amtrak station, etc.), as well as how to create a friendlier environment for biking by redesigning the streets.

Merced: Bike Routes In The Regional Context



Legend

- Existing Bike Path
- Existing Bike Lane
- Existing Bike Route
- Proposed Bike Path
- Proposed Bike Lane
- Highways
- Creek
- Lake
- Park
- School
- City Limits

Merced Data
Special Services, Inc.
369 W. 18th Street
Merced, CA 95340
(209) 723-3153
FAX (209) 723-0322

N

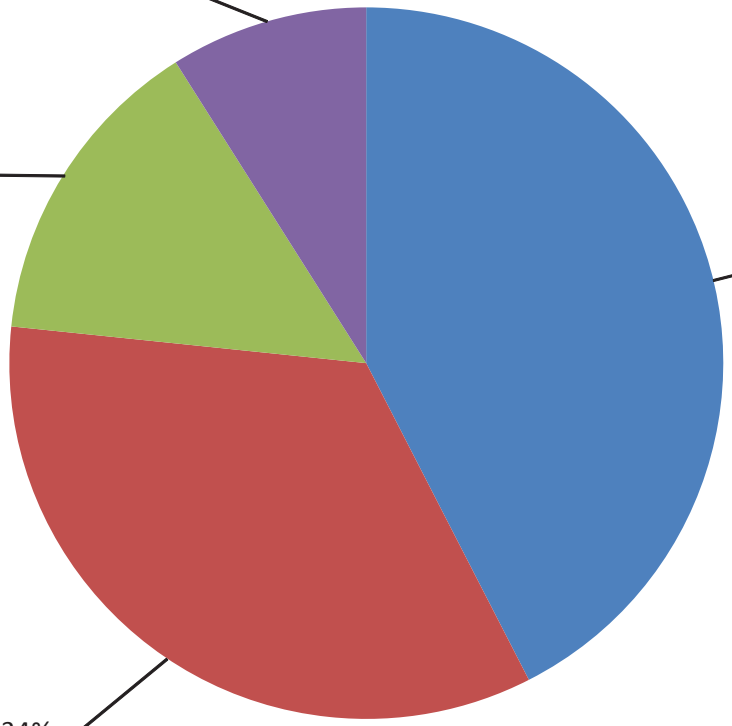
0 1 mile

source: http://www.mercedrides.com/BIKE/images/maps/merced/mercedbike.pdf

15-minute walk from HSR station

5.11. Map of bike lanes and routes in downtown Merced and its surroundings.

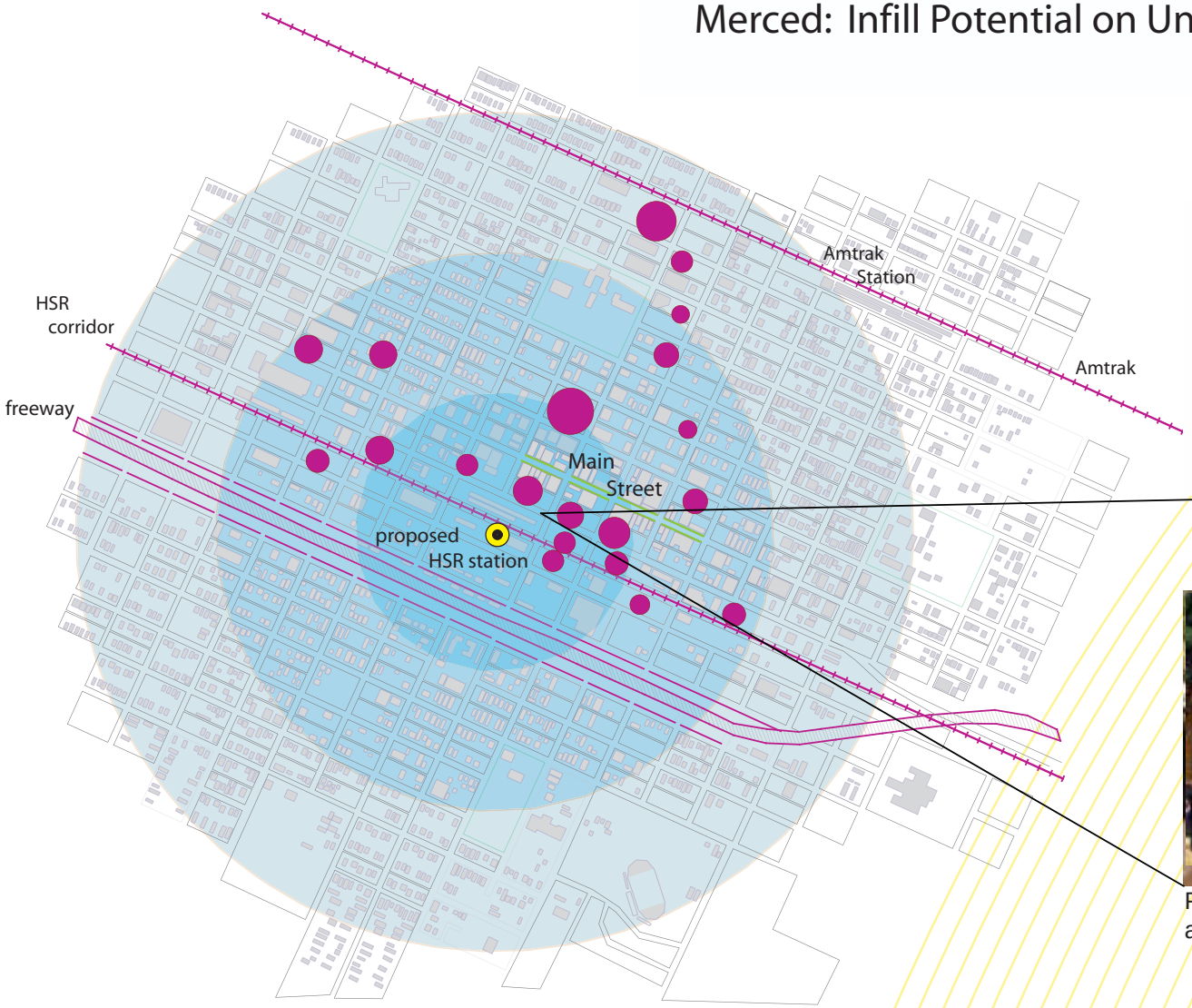
Merced: Station Area Analysis
1 Square Mile Around Station



More than half of the entire square mile around the proposed HSR station is underutilized (parking lots and other undeveloped spaces within city blocks). This is an important asset for development, since it provides ample opportunities for infill while preserving the existing buildings.

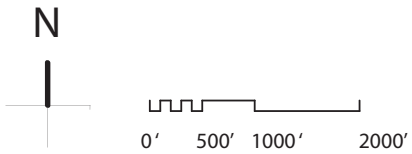
5.12. Land use analysis for a 1 square mile area around the HSR station.

Merced: Infill Potential on Underutilized Parcels

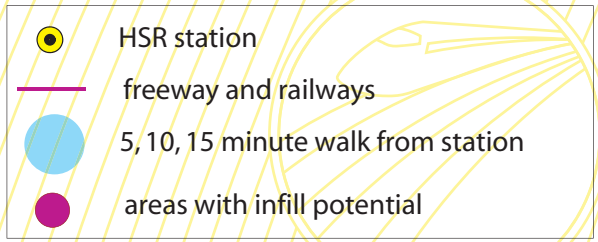


16th Street as it looks today.

Possible redesign of 16th Street, taking advantage of underutilized parcels.

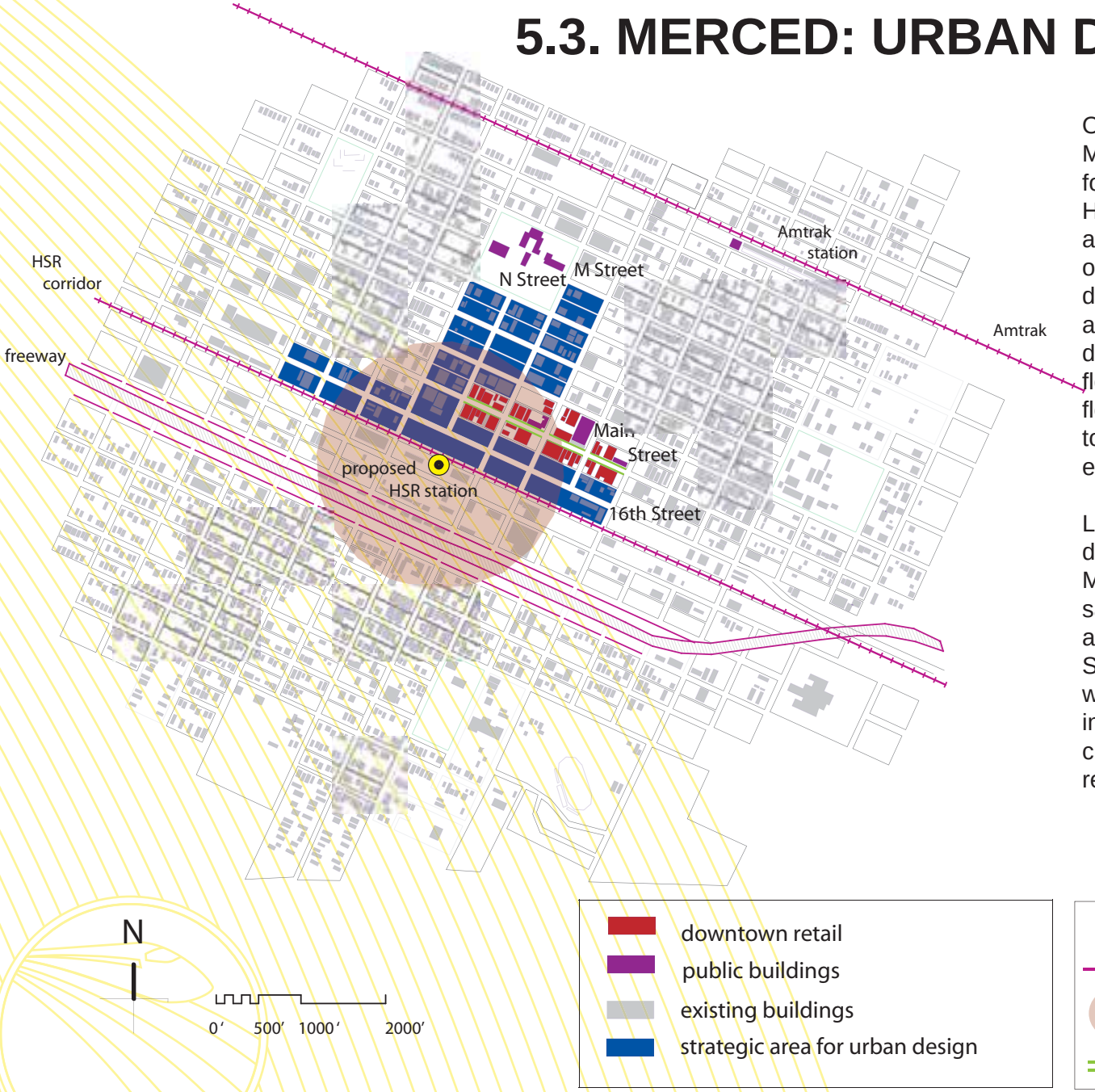


Possible infill sites in Merced, on parking lots or underutilized parcels, without demolishing existing buildings (as explained in chapter 3).



5.13. Map of downtown Merced showing major possible infill sites.

5.3. MERCED: URBAN DESIGN IDEAS



Our urban design concepts for downtown Merced focus on the existing opportunities for infill development around the future HSR station, without demolishing or altering any existing buildings. We have focused on the area around the station, proposing different building types from townhouses to apartments, office buildings, and mixed-use development, combining retail on the ground floor with office and housing on the upper floors. We have given special attention to improving the quality of the pedestrian environment.

Learning from positive examples of street design in downtown Merced, especially Main Street, we seek to replicate the same quality on other major streets in the area, such as 16th Street, N Street, and M Street, through larger, shaded sidewalks, with arcades, awnings, or trees, and new infill development, increasing density and creating a stronger market for downtown retail.

5.14. Schematic map of downtown Merced illustrating the main urban design ideas.

5.15. Design concepts: Perspective view of a new HSR plaza.

The Station Plaza

5.16. Design concepts: N Street, leading to the HSR station and plaza.

N Street could be redesigned to have wide sidewalks for outdoor retail, and perpendicular parking to create more on-street parking supply. The station plaza connects to this street and starts a series of pedestrian-oriented spaces.

5.17. Design concepts: Above: New hotel and conference center next to the HSR station. Below: Drop-off area south of the station.

New Hotel And Conference Center

A new major urban plaza at the Merced HSR station could become a major focus for urban revitalization. Next to the train station, there could be a new hotel and conference center, with a viewing gallery towards the high speed trains. Some of the parking provided for the hotel, in a podium behind it, could be shared with the station. 16th Street could become a second major commercial street in Merced.

A drop-off area could be located south of the station, within easy access to and from Hwy 99. Additional parking could be located there as well.

The Transit Hub North Of Station

The HSR station could be a multimodal transportation hub, directly linking the high speed trains to local and regional transit. The image above shows the connection between the HSR station platforms and the bus terminal, with new Bus Rapid Transit service linking the station to the UC Merced campus. A pedestrian overpass links the north and the south sides of the HSR station. The transit hub connects the HSR station to the Bus Rapid Transit corridor.

5.18. Design concepts. Above: Multimodal transportation hub at the HSR station in Merced. Below: Bike station in the transportation hub.

5.4. MERCED: DESIGNING STREETS

West 16th - The Commercial Street

5.19. West 16th Street. The major thoroughfare. Perspective view.
Redesigned with landscape median, 2 vehicle lanes in each direction, ground floor retail uses, offices, and housing on upper levels.

West 16th Street - Another Street Design Concept

5.20. West 16th Street. The major thoroughfare. Perspective showing a different design concept.

5.21. M Street. The Bus Rapid Transit corridor.

This image shows a design for a shaded pedestrian and bike friendly environment, making walking or biking in Merced a pleasant experience. Alternative building and street designs might use arcades or trees to provide shaded sidewalks. This image also shows curbside Bus Rapid Transit along the route, linking the HSR station to the UC Merced campus.

The Quiet Residential Street

5.22. The quiet residential street, featuring townhouses.

Pedestrian-friendly streets with one vehicle lane in each direction, parallel on-street parking, wide sidewalks, street-accessible housing with raised front yards. Parking is also provided in a podium behind the ground level street housing, upper levels also have housing.

5.23. The quiet residential street, featuring apartments.

5.24. Example of a residential street, Chicago, IL.

Mid Block Alley

Infill development offers the opportunity to redesign some of the mid-block alleys, present in almost every block in Merced. These alleys have the potential to become more attractive places.

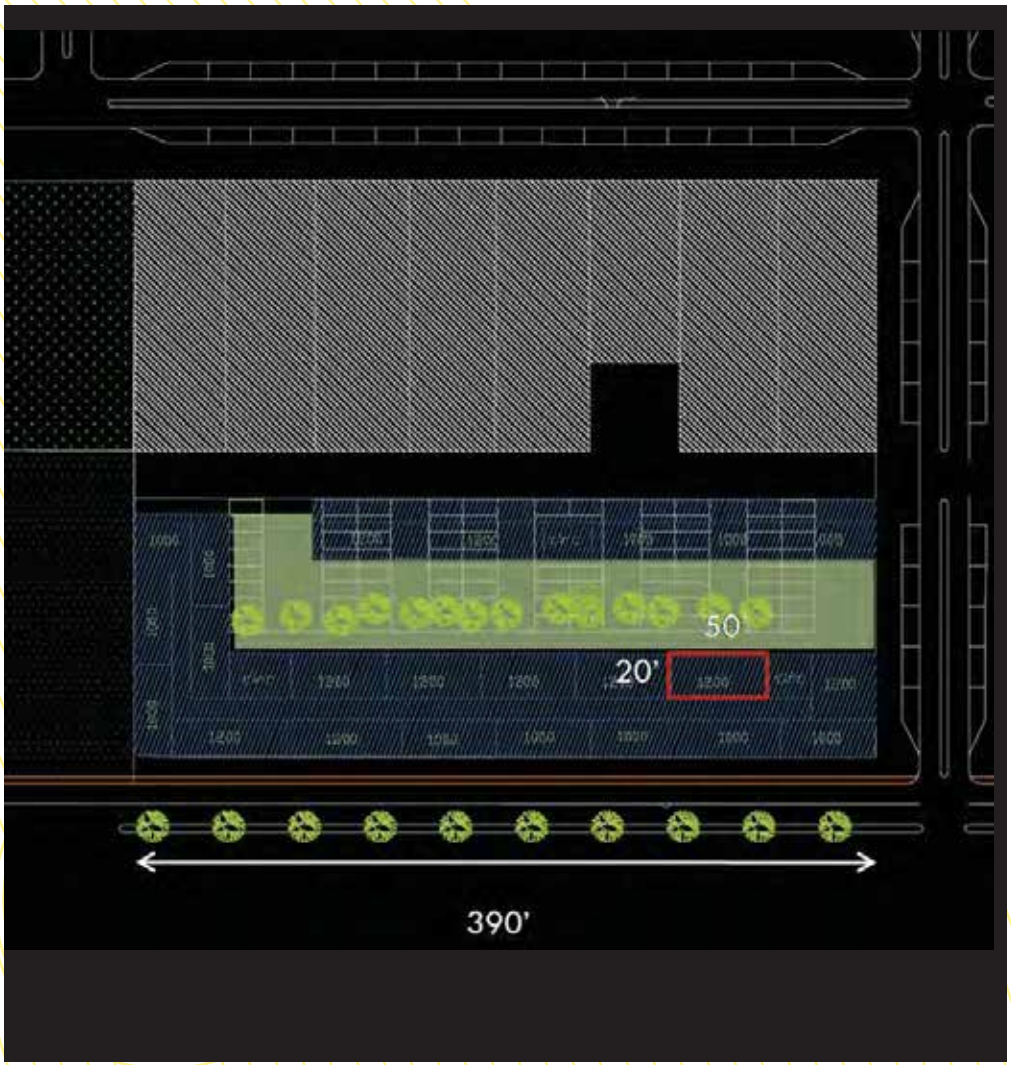
5.25. The mid-block alley.
Above: View of an existing alley on a block along W16th Street. Note the parking lot on the left side of the image, which provides opportunity for infill development.

Below: Design concept for a mid-block alley.

5.5. DESIGN CONCEPTS FOR MERCED CITY BLOCKS

Infill Typology A: Podium parking on ground, with retail uses on busy streets, and a mix of 3 levels of housing or offices above (based on location), internal courtyard above podium.

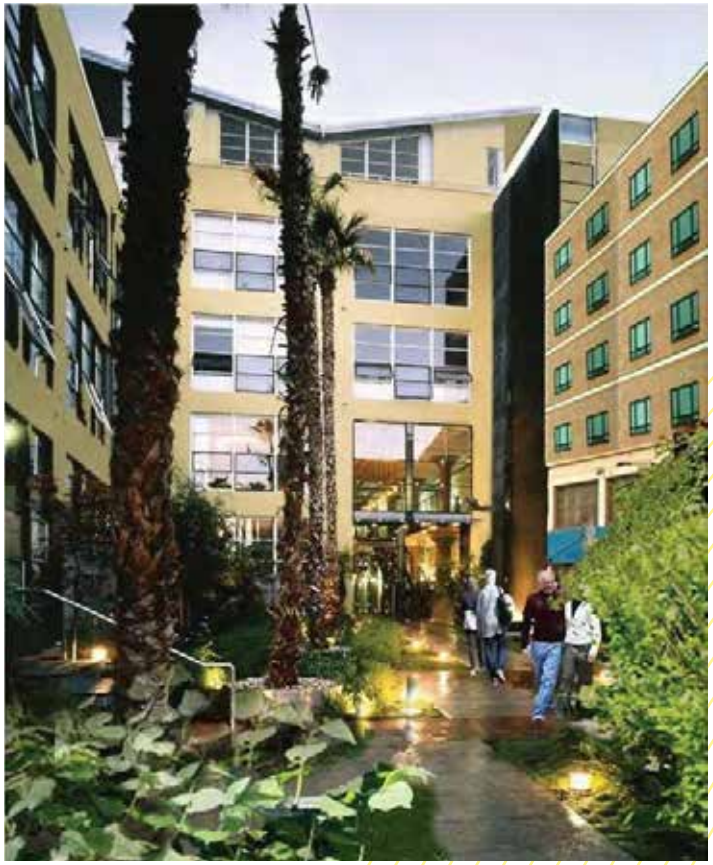
Ground floor retail would be located on the major streets, such as West 16th, N Street or M Street. Office buildings would be located in the more central locations, around the High Speed Rail station plaza, or along N Street, while housing would predominate throughout the rest of the infill areas.



5.26. Infill design concepts. Mixed-use development.
Left: plan of a block along W16th Street, showing infill development on a parking lot.
Upper right: Mixed-use infill development perspective.

No. of housing units	69
Apt. Size (1,000 – 1,200 ft²)	
Housing area including 20% circulation (ft²)	91,000
Retail area (ft²)	23,000
Parking spaces required (1 per housing unit, 1 per 500 ft² retail)	115
Parking spaces provided (88 in podium + 5 on street)	93
Block area (ft²)	54,800
Housing units/acre	55

Table 5.3.
Mixed-use development.
Program.



5.27. Infill design concepts. Courtyards above podium parking.

Internal Housing Courtyards
(Above podium parking)
Alternative A (left image)

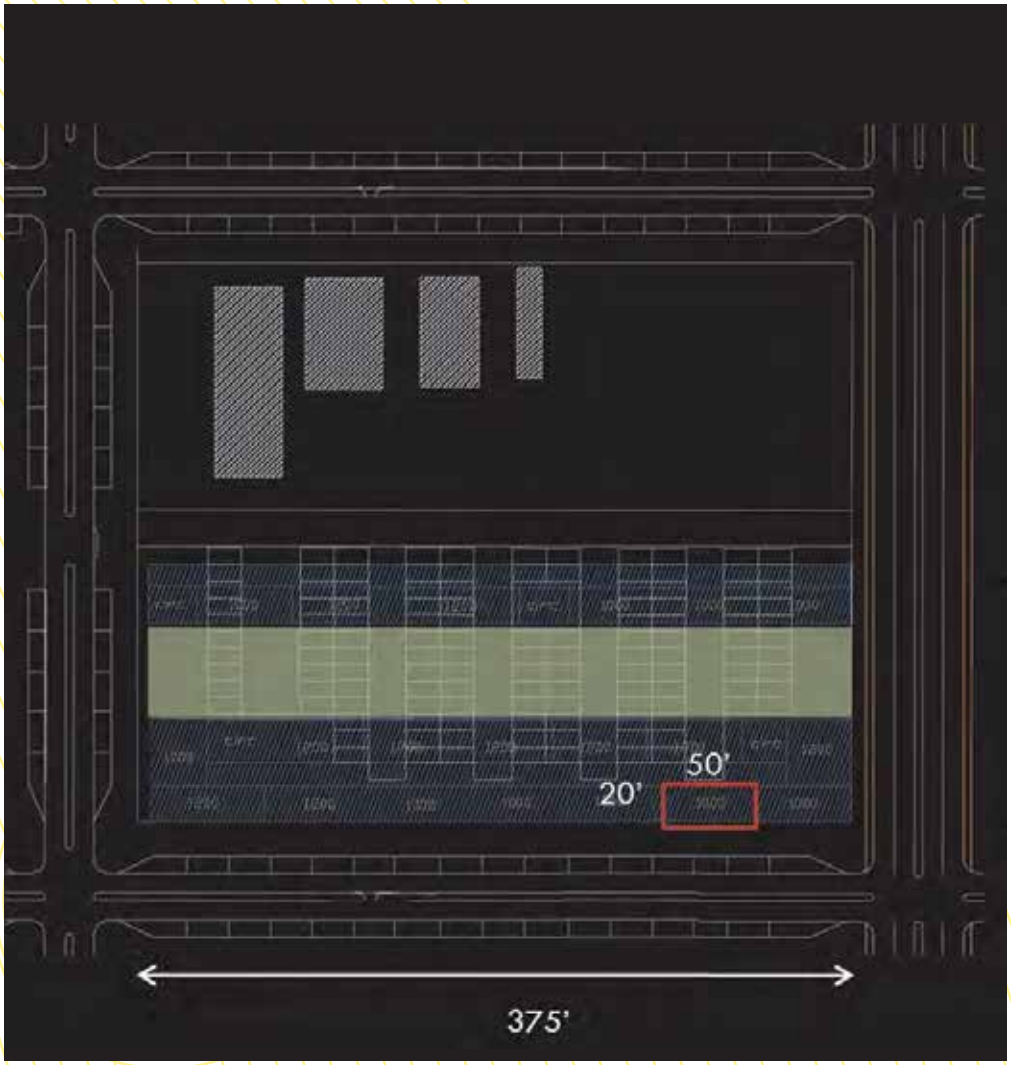
Example of how an internal courtyard might look. The first floor apartments could have direct access to it, while those from the upper floors would access the courtyard through the main staircase.

Internal office + housing courtyards
(Above podium parking)
Alternative B (right image)

Another possible courtyard configuration. In this concept, the first floor is occupied by offices, while the upper floors contain housing units, with everyone accessing the courtyard through the main staircase.

Infill Typology B: 6’ Podium with housing at street level (having front yards) and 3 levels of housing above.

This design would be suitable for quieter streets with less potential for ground floor retail; housing on all floors, with the first floor set 6’ above street level, on top of podium parking, creating a buffer space between the street and the housing.



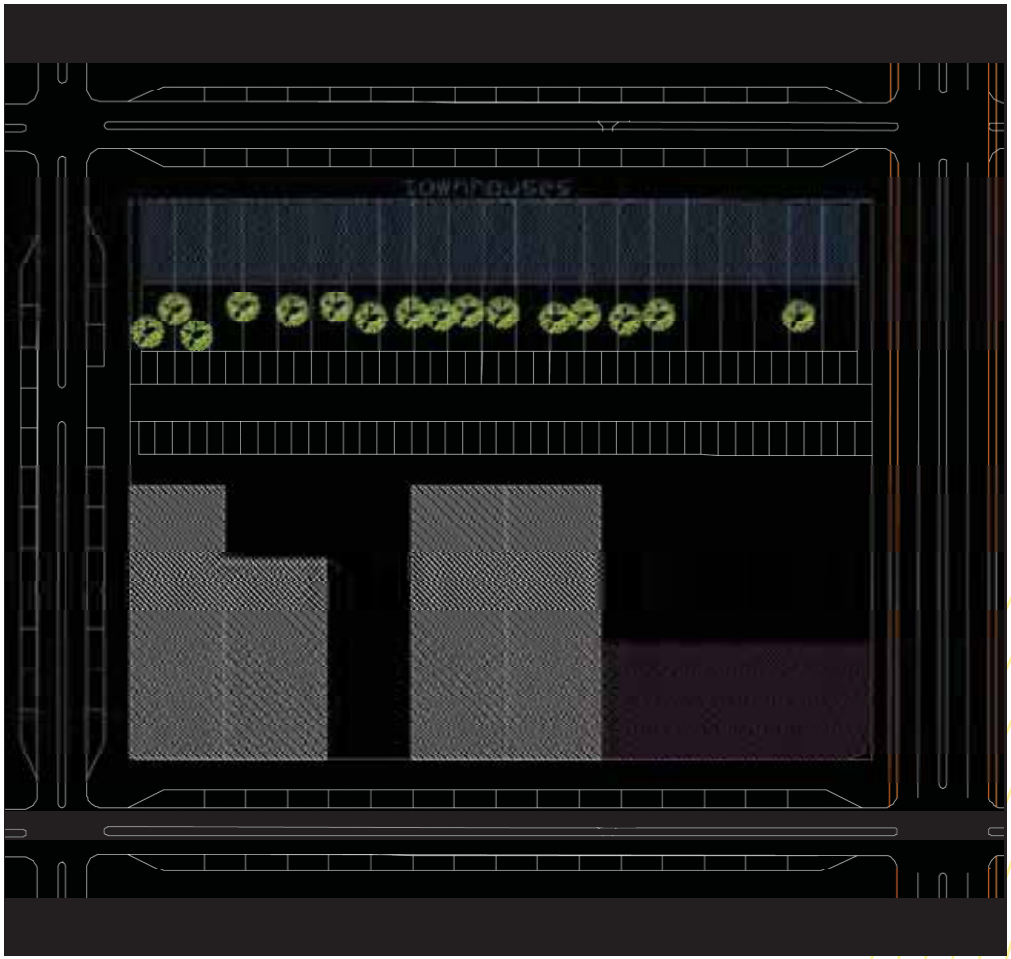
5.28. Infill design concepts. Apartments on a residential street.
Left: Plan of a block along 18th Street, showing infill development on a parking lot.
Upper right: Apartments on a residential street.

No. of housing units	60
Apt. Size (1,000 – 1,200 ft²)	
Housing area including 20% circulation (ft²)	79,000
Retail area (ft²)	0
Parking spaces required (1 per housing unit, 1 per 500 ft² retail)	60
Parking spaces provided (131 in podium + 21 on street)	152
Block area (ft²)	56,700
Housing units/acre	46

Table 5.4. Apartments. Program.

Infill Typology C: Townhouses (1200 sq. ft.) in empty lot behind existing retail.

This is another infill concept suitable for quieter residential streets located slightly farther away from the HSR station. The mix of busier and quieter streets would put the townhouses within walking distance of retail and public transit, while retaining a lower overall density and quieter environment.



No. of housing units in a 1.2 acre infill site	21
Housing area (ft^2)	25,200
Retail area (ft^2)	0
Parking spaces required (1 per housing unit)	21
Parking spaces provided (84 on internal alley + 19 on street)	103
Infill site area (ft^2)	52,700
Housing units/acre	18

Table 5.5.
Townhouses.
Program.

5.29. Infill design concepts.
Townhouses on a residential street.
Left: Plan of a block along 18th Street, showing infill development on a parking lot.
Upper right: Townhouses on a residential street.

5.6. MERCED: PARKING ANALYSIS

Business As Usual Approach

Parking requirements for the new HSR station. 2400 Riders per Weekday X 0.75 drive in rate = 1800 parking spaces on surface parking (14.4 acres)

5.30. Aerial view of the HSR station area showing the impact of a 'business as usual' parking approach.

125 parking spaces/acre

In contrast to the urban design concepts presented here, a "business as usual" approach in which three quarters of HSR riders drive and park would require about 15 acres of surface parking very close to the station location – shown here in one possible configuration. With more intense urban design, parking garages for HSR patrons could be developed; some could be shared with other uses.

Data Source for ridership:
Cambridge Systematics

Parking Analysis For The Proposed Design

Area of analysis 1 Square Mile (640 Acres) around the station location	New Infill (Sq. Ft.)	Of all new infill by %	Parking required: **Merced City Standards** (1.75 per dwelling unit, 1 per 250 Sq. Ft. of office and retail)	Parking required: **UCB Analysis** (1 per dwelling unit, 1 per 500 Sq. Ft. of office and retail)
New housing (1250 units)	1,930,000	75%	2,200	1,250
New retail	340,000	13%	1,350	6,80
New office	310,000	12%	1,240	6,20
Parking for HSR station (assuming TOD in place, with 2400 riders per weekday, and 35% transit/walk mode share to station)			1,550	1,550
Total parking required			**6,340**	**4,100**

Table 5.6. Parking analysis for the 1 square mile area around the proposed Merced HSR station.

With transit-oriented development (TOD), many regular users of the HSR are likely to live within walking distance of the station, if experience with TOD elsewhere in the US bears out. In addition, TOD will permit more cost-effective transit service to be provided, so some HSR patrons are likely to take a bus or BRT to the station. HSR patronage could also grow substantially due to the greater convenience to TOD dwellers, workers, and visitors.

Parking Requirements Without On-Street Parking

	Parking required: **Merced City Standards** (1.75 per dwelling unit, 1 per 250 Sq. Ft. of office and retail)	Parking required: **UCB Analysis** (1 per dwelling unit, 1 per 500 Sq. Ft. of office and retail)
Total parking required	6,340	4,100
Existing surface parking lost to infill development	2,000	2,000
Podium parking provided	2,262	2,262
Parking outcome (provided- required - lost)	-6,078	-3,838

Table 5.7. Parking requirements with and without on-street parking.

The urban design concept provides 2,626 parking spaces through podium parking. 2,000 existing surface parking spaces are lost to infill development. Without considering on-street parking, there is a parking deficit.

Parking Requirements With On-Street Parking

	Parking required: **Merced City Standards** (1.75 per dwelling unit, 1 per 250 Sq. Ft. of office and retail)	Parking required: **UCB Analysis** (1 per dwelling unit, 1 per 500 Sq. Ft. of office and retail)
Total parking required	6,340	4,100
Existing surface parking lost to infill development	2,000	2,000
Podium parking provided	2,262	2,262
On-street parking provided	3,000	3,000
Parking outcome (provided- required - lost)	-3,078	-838

Up to 3,000 parking spaces can be made available with efficient utilization of on-street parking. Other parking strategies, outlined in the next two pages, may need to be examined to meet future demand.

Potential Future Parking Strategy

Additional parking could be added in garage(s) within a short walk of the station. Parking should be priced to reflect its cost. The pedestrian access to the station could be clearly marked with signs, flags, special pavers, etc.

5.31. Possible site for future parking (on MLK Jr. Way and Canal St. between W14th and W15th).

Potential Future Parking Strategies (On MLK Jr. Way & Canal St.)

As more infill development occurs in the 1 square mile around the proposed HSR station location, there will be demand for more parking. The station will also require substantial parking. The additional parking can be phased in as demand for parking grows with new infill developments and increased HSR patronage.

Phase 1 - Surface parking concept with existing warehouse in place

4.95 Acres - 615 Parking spaces (at 125 spaces/acre)

Phase 2 – Surface parking with warehouse demolished

7.7 Acres - 960 Parking spaces (at 125 spaces/acre)

Phase 3 - Structured parking (with warehouse demolished)

With a multi-level structure built (assuming 315 sq. ft. / parking space, 20-foot setbacks to parking structure from all sides), each level can accommodate 835 parking spaces: a 2 level structure = 1670 spaces, 3 level structure = 2505 spaces, 4 level structure = 3340 spaces.

6. CONCLUSIONS AND RECOMMENDATIONS

High Speed Rail will dramatically increase the accessibility of the Central Valley to the rest of California, but the extent to which Central Valley cities realize additional local benefits from HSR is dependent upon their establishing a supportive framework of planning and development policies. Transit-supportive land use designations and zoning in station areas, downtown revitalization efforts, proactive parking policies, the construction of transit-oriented developments, and the creation of commerce incentive zones are all examples of measures that could be undertaken at the local level to help maximize the positive impacts of HSR. As this report has shown, the proposed station areas in Stockton and Merced have ample space for higher density development that would support HSR. Although the downtowns of Stockton and Merced have seen new projects and investment in recent years, both contain vacant lots and areas that suffer from underinvestment. In both cities there is sufficient land at the station and in the vicinity that is readily available for transit-oriented housing and commercial projects. Based on analyses of ridership forecasts and existing conditions in Stockton and Merced, several conclusions can be made that will help guide officials in maximizing the benefits of HSR to their communities.

(1) Maximize the development opportunity provided by High Speed Rail

The proposed High Speed Rail stations in downtown Stockton and Merced will be each city's access point to a world-class transportation system. It is imperative that surrounding land uses are planned in a way that takes full advantage of this unique opportunity. Clustering higher-density residential and commercial development within walking distance of the station will provide a number of benefits to both cities and to the HSR system. Local jurisdictions should consider the following recommendations when planning for HSR:

• Increase densities to put more population and employment within walking distance of the station. This will increase HSR ridership as well as local walking, biking, and transit use. An increased level of development also will support downtown businesses.

• Take advantage of the accessibility benefits provided by the HSR station to reduce the costs of development, allowing higher densities with lower parking requirements and lower traffic mitigation fees in anticipation of the higher walk, bike, transit, and HSR use that TOD will promote. Provide excellent walk and bike facilities and services to encourage use of these modes of travel to and within the HSR station area.

There are a number of mechanisms that local jurisdictions can use to ensure that land within the station area is dedicated to higher density residential and commercial uses. Such strategies could include the creation of station area zones with minimum density requirements, density bonuses, reduced traffic impact fees and parking requirements, land banking and assembly, and fast-tracking the project review process for higher density developments. Transfer of development rights from outlying areas to the station areas could simultaneously protect important agricultural, waterscape, and habitat lands from development, allow land owners a good economic return on development in alternative locations, and support sustainable development practices.

CONCLUSIONS AND RECOMMENDATIONS (Cont.)

(2) Plan and design for multimodal access to stations

Clustering residential and commercial development around stations will allow some HSR riders to walk to the station. Other passengers will arrive by private automobile, transit, and bicycle. HSR stations and their associated development must accommodate access by a variety of modes in a way that minimizes negative impacts to the surrounding area. Local jurisdictions should consider the following recommendations:

• Use parking management strategies to reduce the impact of station parking requirements on downtowns. Coordinating with the HSRA to develop compact parking structures or providing shuttle service to satellite lots are two potential solutions that minimize the amount of space in station areas dedicated to parking rather than active uses. Parking should be priced to reflect its cost (economic and environmental).

• Plan and design a variety of transit, pedestrian, and bicycle connections within and around stations and develop policies to encourage passengers to use alternative modes. Focus transit routes on the station and connect the station to major trip generators such as universities and job centers with fast, efficient services. Coordinate schedules with HSR to minimize wait times and transfer times. Downtown shuttles, local feeder buses, bus rapid transit connections to major destinations such as UC Merced and the University of the Pacific, and intercity express buses connecting to other San Joaquin Valley communities and transit destinations such as Yosemite should all be accommodated in station area plans and coordinated with HSR service. Focus transit service along specific corridors and strive to create a transit network that is easily understood by both city residents and visitors.

• Provide parking at HSR stations in structures located within an easy walk of the station and along auto access routes that do not disrupt the pedestrian quality of the downtowns. Minimizing the impact of station parking and traffic and creating high quality transit connections to HSR will be critical to increasing the share of riders accessing the station by transit and other alternative modes and will contribute to an active and vibrant station area.

(3) Promote high quality architecture and location-appropriate design

High quality architecture and urban design sensitive to local conditions and values are critical to ensuring that planned HSR stations and their associated development contribute to vibrant, livable downtowns in Stockton and Merced. The design concepts discussed in this report suggest strategies for creating pedestrian and transit-friendly environments and public spaces that build upon existing strengths and important precedents in the downtowns. As densities and infill development around HSR stations increase, local jurisdictions should:

• Identify and preserve historical sites and structures of merit including those that have important local value: maintain and revitalize these buildings and ensure that infill development is integrated around them.

• Use infill development first in efforts to revitalize the downtown: build on vacant lots and excess surface parking lots. Upgrade and reuse existing buildings, for example, converting warehouses to offices and residences or adding floors to one and two story buildings. Relocate incompatible uses but reuse their buildings whenever possible.

CONCLUSIONS AND RECOMMENDATIONS (Cont.)

• Design and build to create a lively pedestrian environment. Create high quality public spaces that can be used for both active and passive recreation. Develop mid-block alleys as pedestrian spaces. Widen sidewalks and add street trees and furniture. Line major streets with active uses such as cafes, restaurants, and retail uses.

Many of the design concepts shown for Stockton and Merced represent substantial increases in residential and commercial densities, but they do so by incorporating design elements that respect the character of the areas, varying density by street type, preserving existing buildings, and creating a more pedestrian-friendly and active downtown.

(4) Integrate High Speed Rail into the city planning process

Although California's High Speed Rail System will not be fully constructed and operational for some years, the process of planning for station area development and transit facilities in each city hosting a station should be initiated much sooner.

• Begin station area planning early to ensure that sites near the station are not dedicated to incompatible or inappropriate uses but are instead used for development that can capitalize on the accessibility benefits provided by HSR.

• Consider how the station area and downtown will be affected by development elsewhere in the community. Reduce the amount of low density, auto-dependent commercial and residential development on the urban fringe as a means of channeling growth towards downtown. Encourage higher density development along transit corridors and plan for bicycle, pedestrian and transit connections from new development to the HSR station. Recognize that development on the periphery is likely to draw activity away from the downtown and if built at low density, will be auto dependent.

• Use transfer of development rights and other strategies to reduce development of prime farm lands, wetlands, habitat, and floodplains while providing landowners with a share of the benefits of urban development by allowing development at higher densities in the station area.

By planning in advance for the station area and incorporating HSR into jurisdiction-wide plans, cities can make sure that they will maximize the benefits of having a station.

FLY CALIFORNIA

Transit Oriented Development for High Speed Rail (HSR) in the Central Valley, California: Design Concepts for Stockton and Merced.

Date: July 31, 2008
The Center for Global Metropolitan Studies
University of California Berkeley