

San Pablo Avenue: Coding an Urban Ecotone



San Pablo Avenue: Coding an Urban Ecotone



Andrea Gaffney

Masters Thesis 2009
Landscape Architecture and
City & Regional Planning
University of California at Berkeley

Andrea Gaffney

San Pablo Avenue: Coding an Urban Ecotone

by

Andrea Elaine Gaffney

B.Arch (Cornell University) 1999

A thesis submitted in partial satisfaction of the requirements for the concurrent degrees of

Master of City Planning

and

Master of Landscape Architecture

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Louise Mozingo

Elizabeth Macdonald

Teresa Caldeira

Spring 2009

San Pablo Avenue: Coding an Urban Ecotone

© 2009

by Andrea Elaine Gaffney

Contents

Introduction 1

- Project Summary 6
- Why design a code for a 25-mile avenue? 10
- Significance 12

Methods 15

- Discourse Construction 16
- Design: Corridor | Strip | Site 16
- Definitions 19

Literature Review 21

- Introduction to Literature Review 22
- Literature Review Method 22
- Urban Arterials 23
- San Pablo Avenue as Exemplar for Planning Efforts on Urban Arterials 25
- The Deakin Articles 28
- Research Methods on San Pablo Avenue 29
- Corridors and Strips 29
- Reconsiderations of the Strip 32
- Multi-jurisdictional Geographies 41
- Fiscalization of Land Use and Parcellization 44
- Sustainability 46
- Landscape Urbanism 58
- Urban Design: an orchestration of systems 60
- Negotiating Transformation: Codes as Design Tools 60
- San Pablo Avenue as an Urban Ecotone & The Ecotone as Code 64
- Linking the Pieces Together 67

Code Review 69

- Why FBC? 78
- Extracting FBC From the Transect 87
- A Different Approach to the Transect 90
- Transect Theory and the Smart Code as Applied to Urban Arterials 90
- Transect as Descriptive Theory 96
- Conclusion 99

Analysis 101

- Recent Planning Efforts 104
- 25-mile Corridor 107
- Barriers to Corridor-scale Planning 109
- Conditions of a 5-mile Urban Arterial Strip 121
- Special Use Districts 132

Code Design 134

Designing the Urban Ecotone Code	135
Regulating Plan and Development Types	136
Block Layout	145
Parcel Layout	145
Frontage	146
Sustainable Design	147
On-Site Energy Production	148
House the People	149
Feed the People	149
Building & Land Use: Existing and Future	149
Parking	151
Land Use	154
Riparian & Drainage Areas	155
Sun Slot	156
Vegetation & Stormwater	158
Open Space by Land Use	160
Development Types: SPA1 to SPA4	160

Code Test & Results 163

Site #1 (SPA3)	167
Site #2 (SPA3)	173
Site #3 (SPA2)	178
Site #4 (SPA1)	183
Site #6 (SPA1)	186
Site #7 (SPA3)	192
Site #11 (SPA3)	194
Site #12 (SPA3)	197
Site A (SPA4)	201
Code Test Conclusion	203

Code Design for the Public Realm 204

The Public Realm & One More Code Test	205
System, Zones & Components	208
A Code Test Interlude	209
Land Use and Investment	211
Applying the Urban Ecotone Code	212
Drop the Curb & Extend the Gutter	215
Why the Curb & Gutter?	216
Extend the Gutter	216
Extend the Curb & the Gutter on San Pablo Avenue	219
Existing Infrastructure Conditions	219
Transformed Infrastructure Conditions for SPA4	222
Conclusion	229

Conclusion 230

In the mean time...	232
---------------------	-----

Reference List 233

Acknowledgments

This mega thesis is too long, but I'm very grateful that I've learned a great deal about all of its myriad subject matter. The learning process was greatly improved upon by the support of Louise Mozingo, I look forward to more... The Landscape Architecture Foundation's support through the Olmsted Scholarship paid for my travels and books on which a great deal of this thesis is grounded. Thank you, I will always remember and act upon this honor. To my code testers, muchas gracias! If you ever design a code, I'll be happy to test it for you, even if it requires going to Norway.

Sarge, let's go for a walk!

Once there were parking lots, now it's just a peaceful oasis...
You got it! You got it!

I miss the honky-tonks, Dairy Queens and Seven-Elevens...
You got it! You got it!

And as things fell apart, nobody paid much attention...
You got it! You got it!

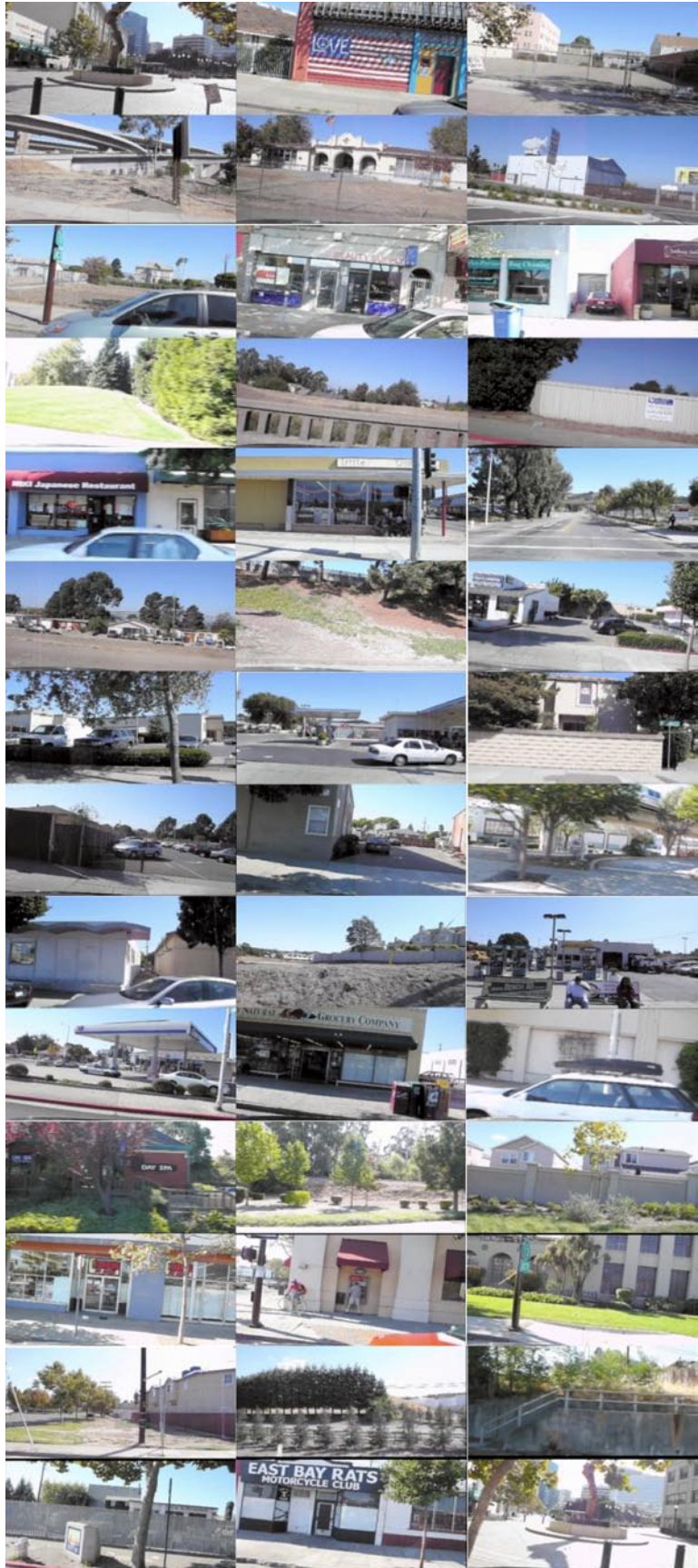
-Nothing but Flowers
David Byrne & the Talking Heads

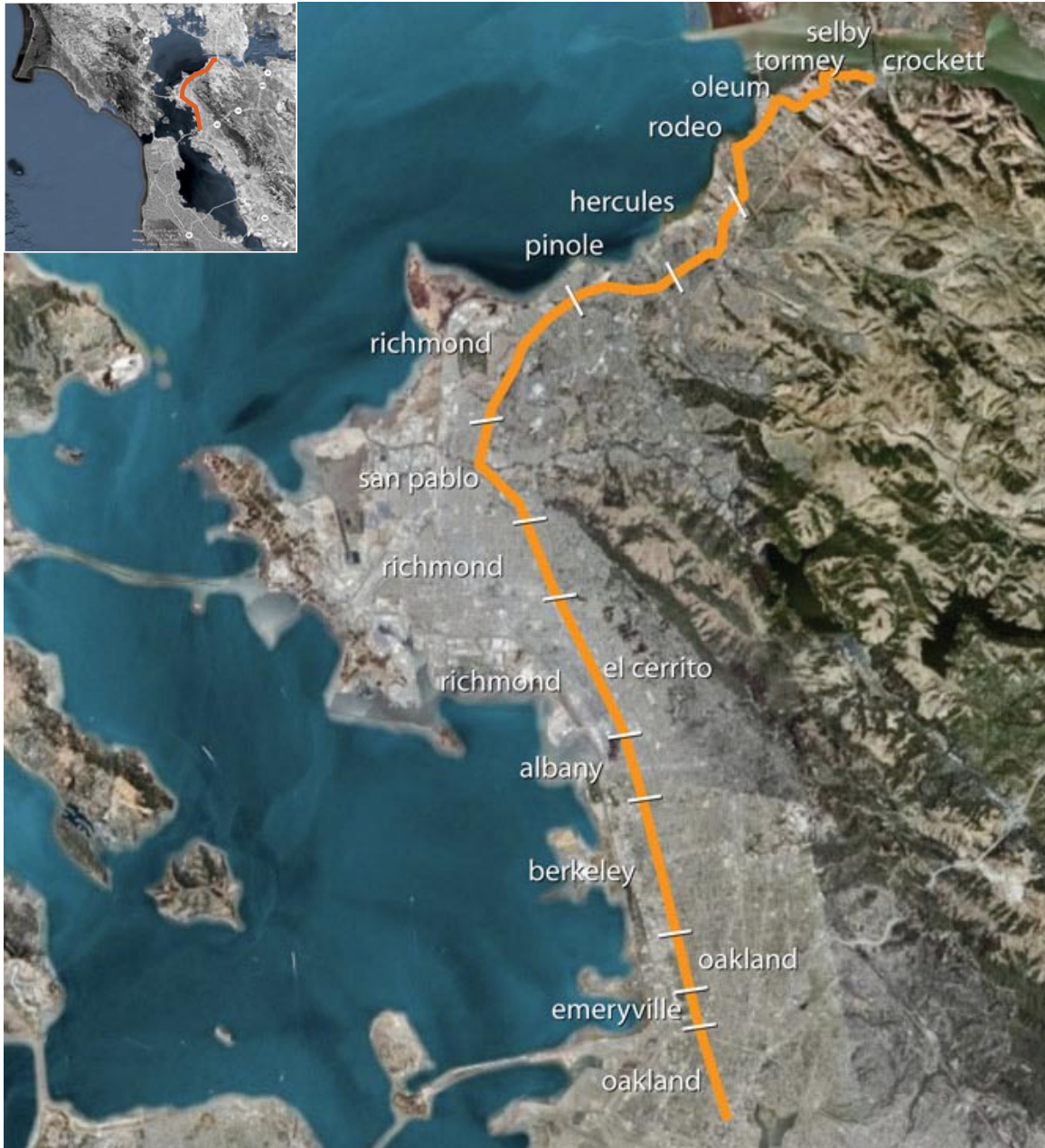


Take the Gas Out of the Car City...

Introduction

Stills from "Driving San Pablo Avenue," a split-frame video that simultaneously documents the east frontage while driving north and the west frontage while driving south.





San Pablo Avenue in the San Francisco Bay Area context.

Urban arterials, the oft-neglected spaces of cities where there is a convergence of a multitude of land uses and vast systems of infrastructure and mobility, can become significant sites of sustainable transformation. A hybrid form/performance-based code can negotiate these complex, multi-jurisdictional spaces towards an ecologically-, equitably- and economically-balanced future. A significant portion of the transformation can occur through a reconsideration of infrastructure that is located within the space of the corridor by taking single-use systems and retooling them for multi-functional benefits.

Cities have often been compared to complex webs of ecosystems (Hough, Van der Ryn). Within this web, urban arterials function as ecotones. A natural ecotone serves as both an edge and a transition zone between two distinct ecosystems, where a rich diversity of species and habitat can be found. The following definition of an ecotone aptly describes both the natural and urban system functions of an ecotone:

Definition: eco-tone (noun)

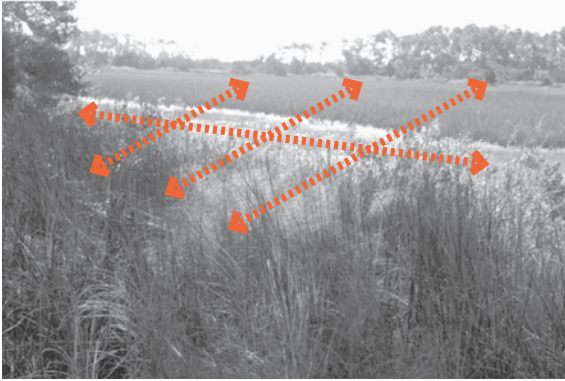
A transition area of vegetation between two different plant communities, such as forest and grassland. It has some of the characteristics of each bordering community and often contains species not found in the overlapping communities. An ecotone may exist along a broad belt or in a small pocket, such as a forest clearing, where two local communities blend together. The influence of the two bordering communities on each other is known as the edge effect. An ecotonal area often has a higher density of organisms of one species and a greater number of species than are found in either flanking community. Some organisms need a transitional area for activities such as courtship, nesting, or foraging for food (Encyclopedia Britannica).

Rewritten, all of the attributes of this definition can be translated into built environment conditions that characterize urban arterials like San Pablo Avenue, (author's contributions to definition in parentheses):

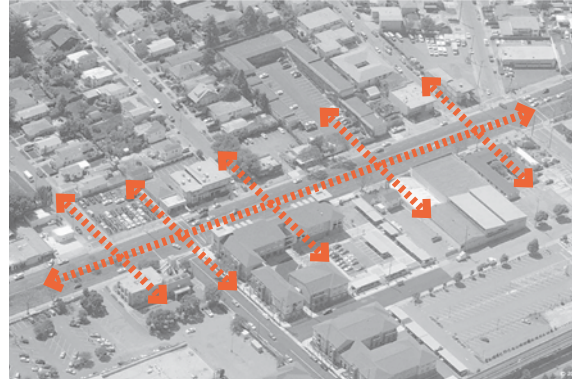
Definition: (urban) eco-tone (noun).

A transition area of vegetation (urban fabric) between different plant (socio-political and cultural) communities (adjacent to San Pablo Avenue), such as forest (the city of El Cerrito, for example) and grassland (the city of Richmond, for example). It has some of the characteristics of each bordering community (local-serving retail/commerce and residential) and often contains species (land uses) not found in the overlapping communities (regional-serving retail/commerce). An ecotone may exist along a broad belt or in a small pocket (varying sizes of strips), such as a forest clearing (a strip mall or transit node), where two local communities blend together. The influence of the two bordering communities on each other is known as the edge effect (multi-jurisdictional negotiated spaces). An ecotonal area often has a higher density of organisms of one species (a greater concentration of commercial land uses) and a greater number of species (greater diversity of land uses and density of people) than are found in either flanking community (of single family residences). Some organisms need a transitional area (public and private space along San Pablo Avenue) for activities such as courtship, nesting, or foraging for food (housing, socializing and consumption activities), (Encyclopedia Britannica and this author's contributions in parentheses).

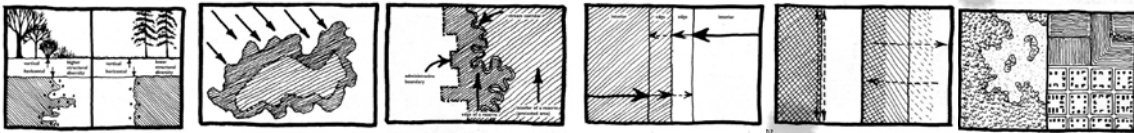
The hybrid code presented in this thesis aims to reinforce and improve upon the urban ecotone that is San Pablo Avenue. An urban ecotone is comprised of both public and private realms, therefore the Urban Ecotone Code in this thesis addresses both of these realms, utilizing the redesigned multi-functional infrastructure to connect the two conditions.



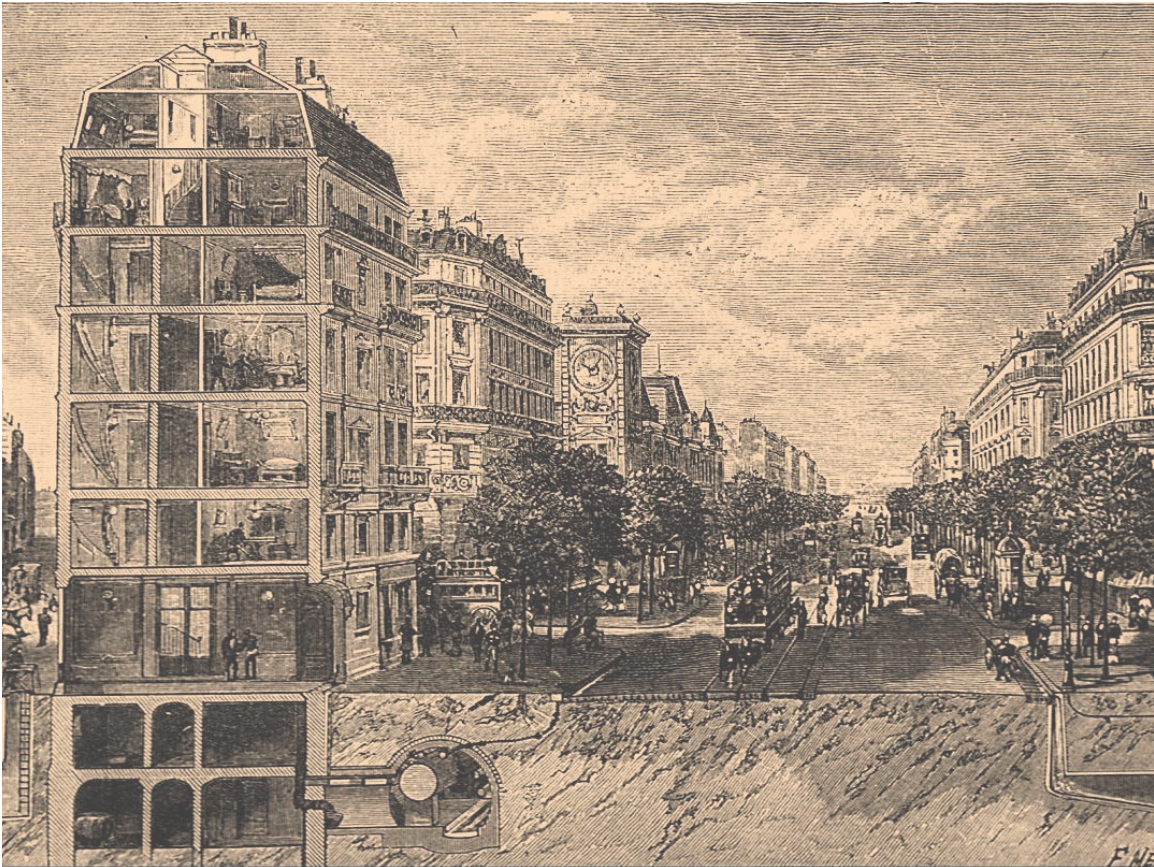
Natural ecotone: edge effect, diversity of species, movement patterns and patches.



Urban ecotone: edge effect, diversity of land uses and communities, movement patterns and patches of activity.



Types of ecotone edge conditions that apply to both natural and urban ecotones (Dramstad, Olson and Forman).



Cross-section of an urban ecotone from another era -- 19th Century Paris (Alphand via Spiro).

Project Summary

San Pablo Avenue is an historic right of way that connects nine cities, four unincorporated towns, spans two counties, is adjacent to almost every land use conceivable, and is equally diverse in its population. “San Pablo Avenue is a historic highway, an urban arterial, a local “main street,” a run-down strip, and a corridor that pulls discrete neighborhoods together in series,” (McAndrews, Florez, Deakin 2006, 92). This urban arterial, runs for 25 miles; from Oakland in the south it parallels the San Francisco Bay shoreline up to the city of San Pablo where it turns northeast to run along San Pablo Bay up to Crockett at the Carquinez Strait. For 15 miles of the southern portion, it is designated as state highway route 123, which means that the California Department of Transportation (Caltrans) controls that portion of the right-of-way (ROW). Automobile use accounts for 92% of all transit trips along San Pablo Avenue, (ABAG 2007, 85). The following description, taken from an article that discusses the nexus between transportation and land use development along San Pablo Avenue, notes that the corridor crosses “residential and industrial neighborhoods and brings to mind images from a palimpsest of transportation history: a Greyhound bus terminal, old rail spurs from the port, gas stations, 1950s drive-ins, and sometimes wide, grassy medians with street trees,” (McAndrews, Florez, Deakin 2006, 93).

Average daily traffic (ADT) along the corridor averages from about 15,000 vehicles up to 28,800 vehicles in some of the busiest intersections (ABAG 2007). “Thirty-seven bus routes are operated on at least part of San Pablo Avenue by four different transit agencies: AC Transit, WestCAT, Vallejo Transit, and Golden Gate Transit. Many of these routes also connect to BART and AMTRAK stations,” (Cherry, Deakin, Higgins, Huey 2006, 207). Posted speed limits vary between 30 and 45 miles per hour, typically with two lanes of travel in each direction. Lane widths are at least 12 feet wide, facilitating truck routes and higher driving speeds for smaller vehicles (Cherry, Deakin, Higgins, Huey 2006). The lack of pedestrian refuges, the elevated travel speeds, and the heavy traffic all contribute to a degraded pedestrian level-of-service (LOS), calculated in a 2006 *Transportation Research Record* article as LOS Grade C, considered acceptable but not contributing to a vibrant pedestrian realm, (Cherry, Deakin, Higgins, Huey 2006).

Movement and transport along the corridor have always been the primary function of an urban arterial such as San Pablo Avenue. In the 1948 publication *Design of Arterial Routes in Urban Areas*, the through-street urban arterial is defined in the following statement:

A street that facilitates through movement of traffic by regulation or control of pedestrian. It is an improved arterial street or highway, usually without control of access, on movements, of vehicular stopping and parking, and of cross and turning traffic to minimize interference to through traffic movement (Barnett 1948, 5 as quoted in Wilson 1998, 34).

The urban arterial right-of-way has not changed much since 1948, but the patterns of use and adjacent land use have begun to shift. The conditions of movement including infrastructures for transport of goods, water, waste and energy have been isolated from their context to such an extreme and detrimental degree that they have contributed to the degradation of the place. These systems of transport need to be rebalanced with conditions of stasis, such as neighborhood centers for the development of community and social interchange. In short, the definition of

the urban arterial needs to be rewritten. Also, the movement and presence of natural factors needs to be reconsidered in the corridor, as they are major contributors to creating a sense of place and building a healthy urban ecology.

An incremental, yet noticeable, redevelopment transformation has been occurring along San Pablo Avenue for approximately the past ten years, contributing to an increased density of housing, parcel consolidation, and a transformation in the types of uses along the corridor. A recent convergence of political and economic conditions along with local and regional planning efforts has accelerated this redevelopment activity, and yet it remains relatively incremental relative to the spatial construct of San Pablo Avenue as a destination and as a corridor, due to the multi-jurisdictional complexity of the area. These issues will be discussed in great detail in later chapters, where I will also analyze the different forms and opportunities of “infrastructure” along and across the right of way, taking into consideration a future in which we should be fully accountable for our environment, economy and society.

Starting with an analysis of the corridor to characterize relationships of use over time, I construct an argument that presents a reconsideration of this fragmented corridor into one of perceptual and physical connectivity for the East Bay, from Oakland to Crockett. This analysis will also identify different levels and types of use along the corridor. Some questions that arise are: How might the landscape of this corridor change? Was there ever an understanding of this Avenue as a continuous space? Is there an opportunity to revisit this concept? What type of urbanism does this propose? How can ecological, economic and equity issues be incorporated into a vision for the future of this corridor?

After looking at the 25-mile corridor scale, a 5-mile strip is identified for which the hybrid form/performance-based code encompassing sustainable principles is designed as an example for the larger corridor. This code is referred to as the Urban Ecotone Code. Recent redevelopment

efforts have been contentious for surrounding communities along the corridor due to issues of scale and types of land uses, such as commuter condos. A form-based code is a planning tool used for creating consensus about the transformation of built form among communities, their governments and future developers to facilitate an acceptable transformation for all involved. A performance-based code can address ecological system function within the urban fabric. My goal for developing a hybrid form/performance-based code along San Pablo Avenue is to create a framework in which not only forms are outlined, but also to delineate space and performance requirements that are both ecologically responsive and productive for both the right-of-way and the adjacent parcels—a comprehensive, contextual framework. This hybrid code reflects the post-industrial condition of our society where nuisance-segregating zoning codes are no longer necessary. The nuisances now being negotiated, climate change and environmental justice, come from the segregation of land use and the dependence on fossil fuel-based automobility. The issue of rebalancing the automobile landscape bias along San Pablo Avenue is mostly one of form, in which a form-based code can negotiate with agility. The issues of rebalancing the urban ecotone towards a sustainable future are most directly addressed through performance measures. Therefore, the layering of these two goals produces the hybrid form/performance based code that is the Urban Ecotone Code in this thesis.

Within the San Pablo Avenue, I have selected a 5-mile strip to further develop ideas. This area exhibits the typically high levels of jurisdictional complexity that occur along the corridor, where each side of the avenue can be located in a different city and the actual right of way is governed by Caltrans, the state highway agency. I believe this hybrid code, much like a model ordinance, has the ability and flexibility to span jurisdictional boundaries to create a spatial dialogue that could physically and perceptually unite the patches of San Pablo Avenue into a major corridor of the East Bay Region while reinforcing the unique places along it. Transformation is already occurring, so why not shape this transformation for public benefit? This thesis not only attempts to negotiate across jurisdictional boundaries, but also attempts

to navigate and subvert the conditions of neoliberal urbanism which create inequity through policies of privatization. This attempt is mostly evidenced through the performance standards and open space requirements of the code.

The design of the Urban Ecotone Code, which is discussed in the Code Design chapter, is divided into two parts: the private and public realms. The private realm, or development portion of the code was tested by a group of practicing designers on parcels within the 5-mile strip to identify issues for further refinement of the code. From there, the public realm and multi-functional infrastructure designs were developed in congruence with the private realm portion of the code. These design exercises culminate in a site-specific design for a portion of the strip's public realm, based on the comprehensive Urban Ecotone Code.

Why design a code for a 25-mile avenue?

San Pablo Avenue is where people in the East Bay go to get their cars repaired, buy Christmas trees, Halloween costumes and Indian wedding Saris; others gamble, buy their outdoor recreation equipment, find vintage plumbing accessories, or pick up jornaleros for work, (CP204c 2007-08). “Commuter condos” are sprinkled along the avenue indicating a transformation from low-intensity to a higher intensity, mixed land use. This building type provides higher density housing with ground floor retail, often vacant, where the housing is only accessible through the internal parking. This residential typology functions more like a compound rather than contributing to the “eyes on the street” a la Jane Jacobs ideal of the mixed use urban street. Most people drive to destinations on San Pablo Avenue or use it to commute short distances, although some census tracts including San Pablo Avenue report that 50% to 77% of the population are living without an automobile, (Cherry, Deakin, Higgins, Huey 2006). Residents will walk to places during the day if it is convenient or if parking is difficult. The avenue is a strip that has been by-passed by the highway and left to be developed in a piecemeal manner, subject to fiscalization of land use planning. California recently passed

the climate change bills AB32 and SB375, which allocates transit funding to areas where there are opportunities for transit-oriented development to mitigate greenhouse gas emissions through land use transformation; and as a result, San Pablo Avenue has been put back into the planning limelight. This represents a global and regional market-generated flip-flop from top-down neglect and bottom-up entrepreneurship to one of top-down focus, putting pressure on the bottom-up population that dominates the corridor. The regional consumption activities mentioned above are likely to withstand the transformation of San Pablo Avenue, but what about all of the people who live on or adjacent to the Avenue? It is likely that some of the consumption activities will be displaced and the perception of San Pablo Avenue as a strip will most definitely be transformed, most certainly effecting the neighboring population.

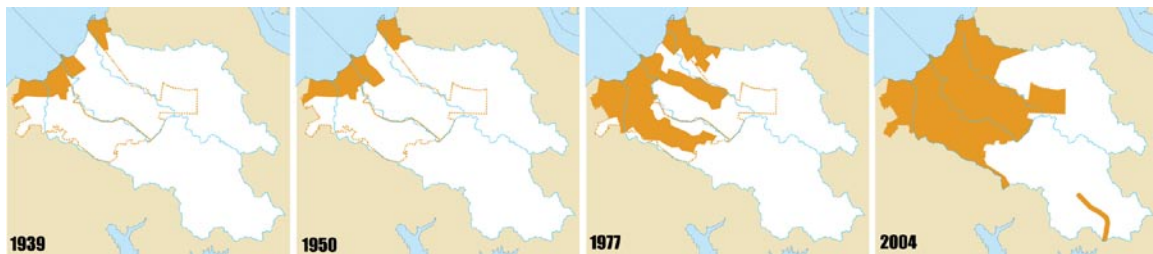
Corridor scale planning is essential to combat fiscalization of land use issues. The corridor scale planning is meant to assist the half-mile to five-mile, community level planning, which is how people live on and use the corridor. The call for corridor planning looks to the future when dramatic transformation in land use will occur as a result of the climate change bills. This type of planning is regional in nature, but is a discrete sub-regional area in which a jurisdictional accord could be achieved to improve the quality of life for all communities along the corridor.

At the heart of this thesis is the idea that the US is entering an era of localization in the age of globalization. This transition coincidentally marks the end of the love affair with fossil-fuel based auto-mobility. San Pablo Avenue's role in the region has long been subservient to regional transportation demands, so now that the region is once again paying attention to the corridor, there needs to be a negotiation for how and what will the transformation look like. Establishing a code framework for the corridor is a type of negotiation that can address and coordinate both the positive and negative issues associated with the impending transformation.

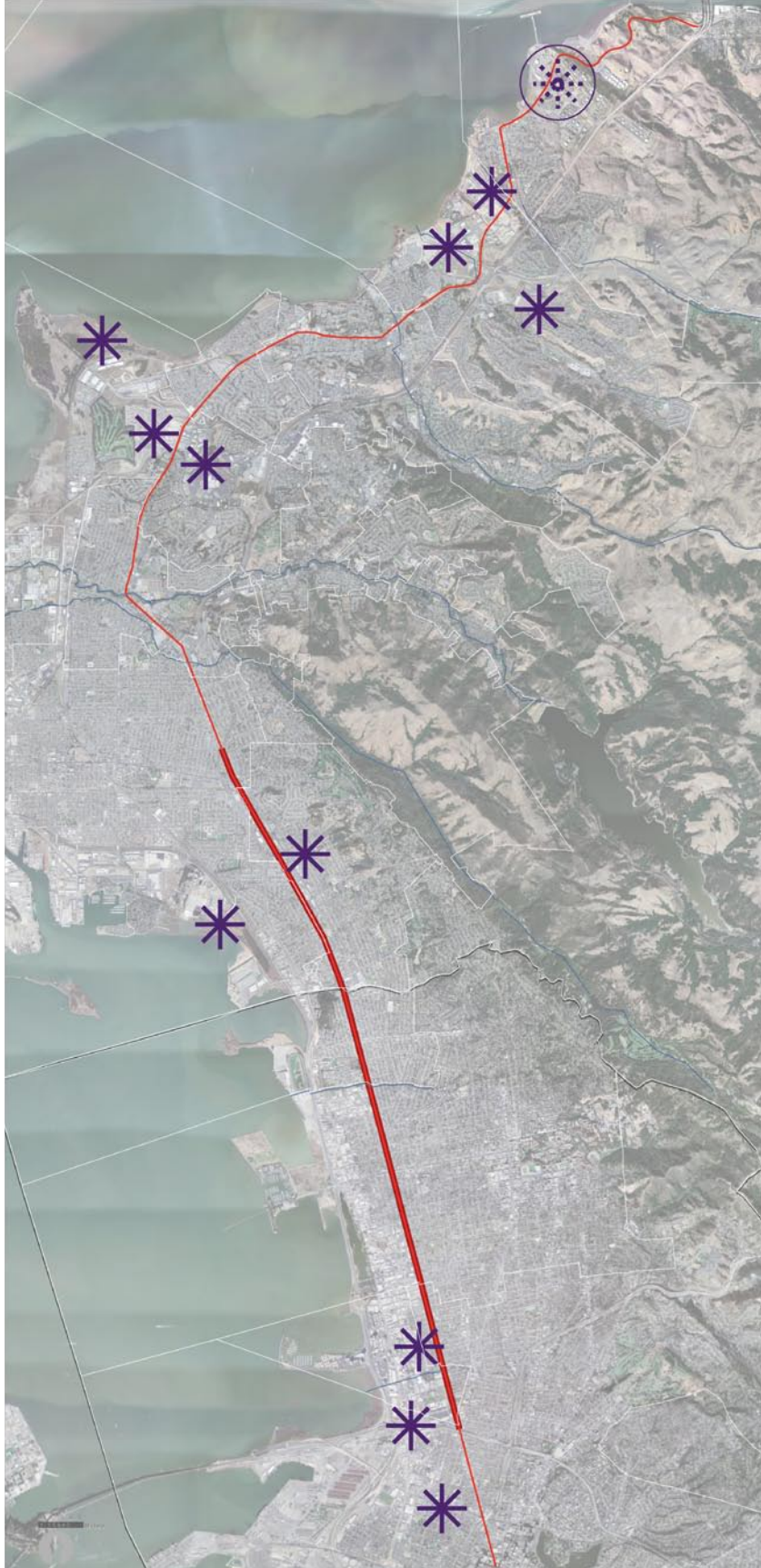
Significance

Specific to San Pablo Avenue and the Bay Area, there have been numerous studies of the corridor to which my research can fill in the gaps. These studies include: *Destination: San Pablo Avenue*, where in the year 2000 State Assemblywoman Loni Hancock formed a committee to coordinate planning efforts amongst all relevant agencies along San Pablo Avenue, UC Berkeley's Professor Elizabeth Deakin's articles on transportation and land use along San Pablo Avenue published between 2004 and 2006, and ABAG's 2005 and 2007 study of San Pablo Avenue as a Smart Growth Corridor in coordination with the Alameda County Congestion Management Agency. All of the above sources of information are invaluable for my research and in which I hope to contribute my findings and proposals.

Given the significant population growth in Western Contra Costa County since the 2000 census and the historical precedents in the area for conversion of industrial land uses into residential and other land uses within a mile of San Pablo Avenue, I argue that there should be a planning effort considering the entire corridor from Oakland to Crockett, that plans for a future where all large, heavy industrial parcels stand to be converted to other uses. This trend of land use conversion is only identified in this thesis to provoke others to delve more deeply into the issue and to construct an argument for the consideration of the entire San Pablo Avenue corridor.



Urbanization in the watersheds containing the towns of Pinole, Hercules and Rodeo in Western Contra Costa County on San Pablo Bay (USGS maps and aerial photos).



Locations where heavy industry land uses have been remediated and converted into residential and other land uses (1949 Land Use Survey, Department of Public Works compared against 2008 Land Use GIS, ABAG).

For most of its length, San Pablo Avenue acts as a relief valve for the interstate system, with most people limiting their trips along the Avenue to much less than five miles. But what about the electric car which only travels at 25mph? For this version of technology, San Pablo Avenue becomes the regional corridor because these cars cannot use the high-speed, limited access networks. This small piece of knowledge, while only limited by current technology, is significant because it implies a possible transformation in the role of the auto industry that is pervasive along San Pablo Avenue, which is the land use most frequently noted as the major contributor to the perception of San Pablo Avenue as a strip, and not a walkable street (McAndrews, Florez, Deakin 2006). The mix of uses along San Pablo Avenue is what makes the corridor a unique space in the Bay Area and I plan to build upon this mix of uses while designing for a more integrated whole.

My research will also contribute to general knowledge in the fields of planning, landscape architecture and urban design through my discourse on sustainable urban design for multi-jurisdictional geographies of urban arterials, and specifically for the state of California's planning for climate change under AB32 and SB375. Some readers might criticize this thesis for not having a specific level of design detail, but this thesis is an urban design framework proposal for which a larger population is required to fill in the details.