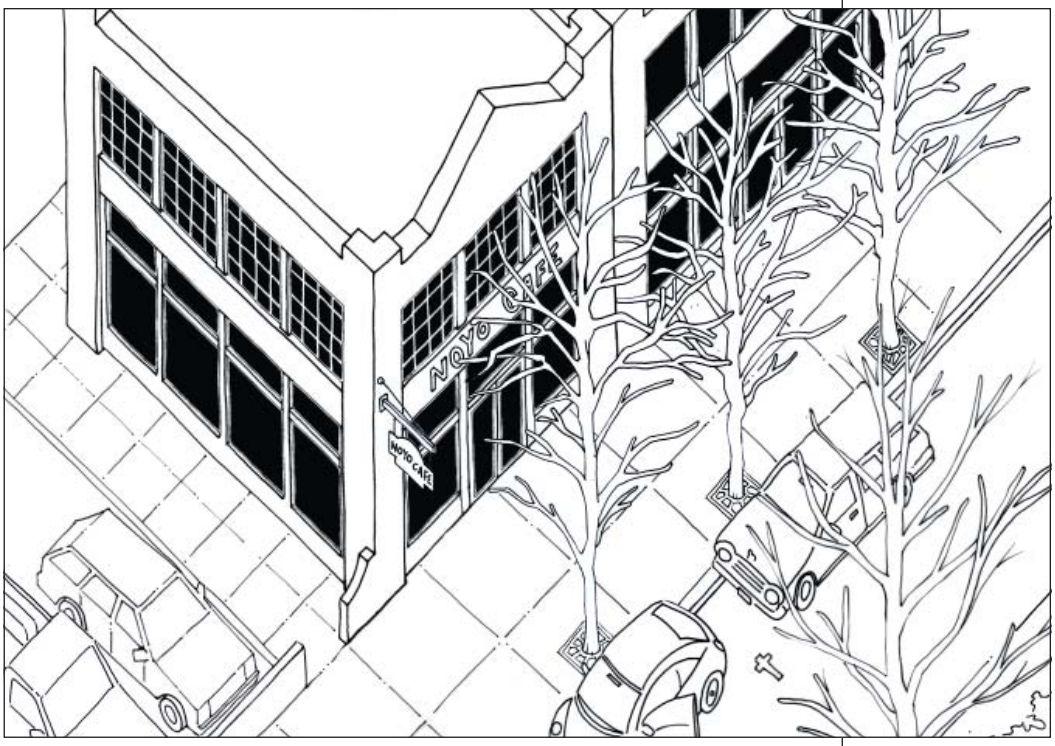
CITY OF FORT BRAGG

South Main Street Access and Beautification Plan

Final: April 25, 2011



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South Main Street Access and Beautification Plan
A Report to the City of Fort Bragg, CA
Final : April 25, 2011

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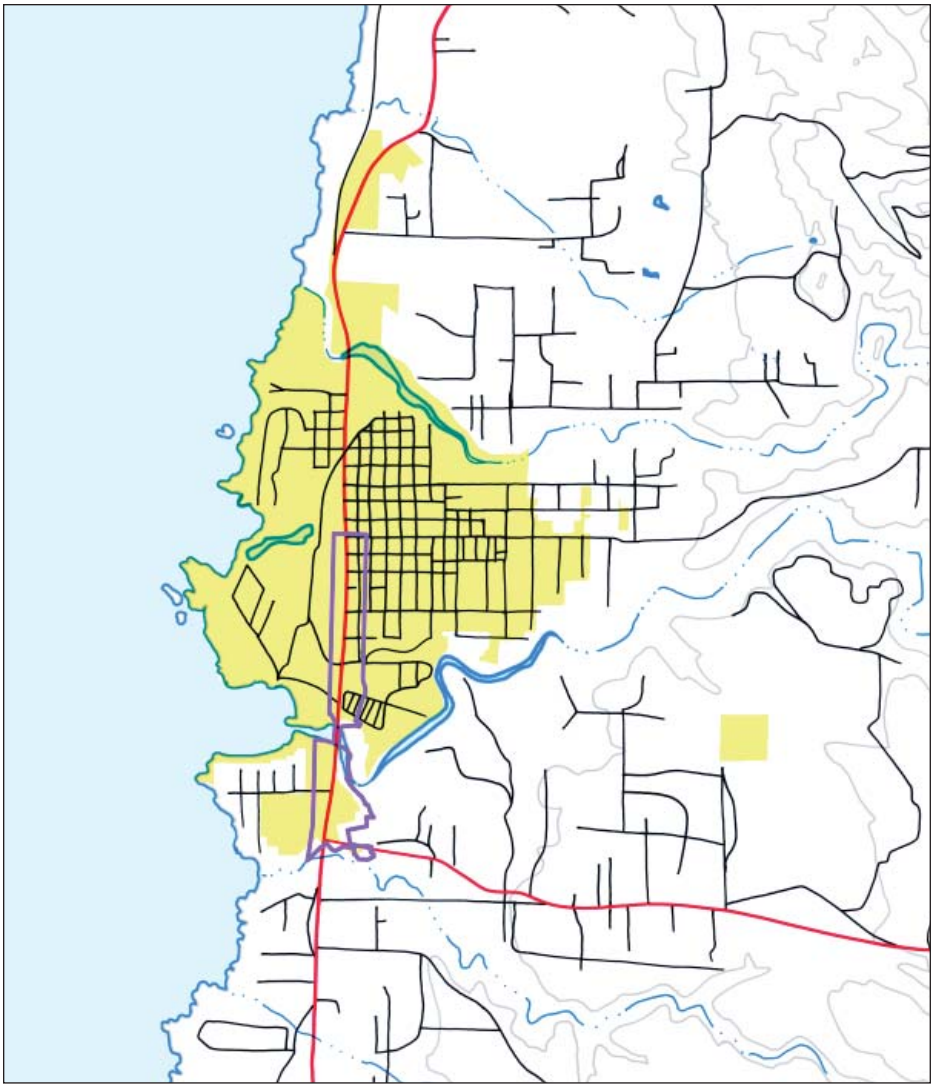
chapter 1 Introduction



This document is the outcome of a community-based planning process for the South Main Street Corridor in Fort Bragg, a city of approximately 7,030 residents along the Pacific Coast in Mendocino County. The project area includes an approximately 1.8 mile stretch of South Main Street – U.S. Highway 1 – between Oak Street and downtown Fort Bragg to the north and the Hare Creek Bridge to the south, as well as adjacent properties, landmarks, and destinations.

The primary purpose of this plan is twofold:

- First, it seeks to improve safety, mobility, and access between central Fort Bragg and its southern business, recreational, and residential areas. Made possible in part through a California Department of Transportation Environmental Justice: Context-sensitive Design Planning Grant received by the City, it grants a particular focus on pedestrian and bicycle access for residents and visitors with limited choices, including local low income and Latino citizens.

- Secondly, it seeks to improve the aesthetic qualities of the South Main corridor through design recommendations that positively impact the overall urban design of the project area — including the Highway 1/20 interchange which is a major gateway to the City of Fort Bragg — and to promote a high-quality environment for residents and visitors alike. This portion of the project was made possible by a Sustainable Communities grant.

Acknowledgements

This document was prepared through close coordination with local residents, City Staff, and a multi-disciplinary professional consultant team. Opticos Design, Inc., a Berkeley-based urban design and architecture firm, provided community planning and urban design expertise and prepared the plan document. W-Trans, Inc. located in Santa Rosa, focused on circulation and traffic. The Local Government Commission (LGC), a Sacramento-based nonprofit organization that works with local governments and communities to build healthy, livable places, assisted with community outreach and facilitation.

Plan Organization

This plan is composed of 9 chapters. Chapter 1 introduces the project, outlines the process, and presents the existing conditions. Chapter 2 describes a series of Guiding Design Principles that emerged during the planning process. Chapter 3 describes a series of Frameworks that describe overarching Goals for the corridor. While Chapter 4 describes specific design alternatives that focus on the corridor, Chapter 5 describes recommendations and Design Guidelines for private property fronting the roadway. Chapter 6 outlines next steps and provides recommendations for funding and implementation. Chapter 7 is an appendix containing records from the community process, including, outreach materials, participant lists, interactively created conceptual maps from the public workshops, results of the Community Image Survey and traffic study data and analyses from W-Trans' work. Chapter 8, an addendum, constitutes an additional design concept for the South Main Street Corridor summarizing the initial design alternatives the City Council and staff directed the consultant team to explore. Finally, Chapter 9 describes the final direction received from City Council on March 7, 2011 for fine tuning the initial design alternatives to represent a final set of designs for the South Main Street Corridor.

Community Outreach Summary

Community outreach was organized into a series of workshops over a three-month period. Work began with an initial kickoff meeting with City Staff in January 2010. Members of the project team discussed the project area with staff, gathered relevant background documents, and conducted a walking tour in order to become more familiar with some of the corridor's key issues and challenges.

The project team returned to Fort Bragg on the 23rd and 24th of February to conduct a series of stakeholder meetings and an introductory public workshop. During the day the project team met with interested property owners as well as 5th graders at Redwood Elementary School to discuss positive and negative aspects of the project area and brainstorm on their vision for the corridor. In the evening, approximately 30 people gathered at the Harbor Lite Lodge to listen to an introductory background presentation by Stefan Pellegrini of Opticos that highlighted current conditions within

***Above, from top to bottom**: Consultant team on site tour during January visit; Community members provide feedback during focus group session; Community members at the introductory workshop write notes on base maps while discussing specific aspects of the project area.*

the project area, the project team's analysis completed to date, and potential solutions and case studies used in other communities and similar environments. The group discussed walking and safety challenges, issues and concerns with aesthetic quality and character, and considered ideas for improvements during an open and beneficial discussion. Participants then broke into small groups to work over aerial maps of the corridor to draw, write, and articulate their vision for the project area. The workshop concluded with each group presenting and explaining their maps to all participants.

In the weeks that followed, the project team reviewed the input from the workshop, information from staff, field observations, and existing planning resources before returning to Fort Bragg for a 4-day community workshop, held March 29th through April 1st, 2010. Activities began on Monday, March 29th, with a Latino stakeholders group meeting at the Safe Passage Family Resource Center. For the remainder of the workshop, City staff secured a studio space at the C.V. Starr Recreation Center. Throughout the week, the project team held "open studio" hours during which community members could drop in to provide input on design concepts and be informed of the progress of design recommendations. Informal pin-ups were conducted each evening, providing an opportunity for multiple feedback loops with residents and stakeholders. Over 40 people attended during the week's studio events. Thursday evening, April 1st, team members presented the results and conducted a Community Image Survey in a closing public meeting at the C.V. Starr Center, attended by about 30 people.

***Top Left**: Scene from the opening workshop; **(Top to Bottom):** Scenes from the second workshop.*

After the workshop, the Fort Bragg Community Development Department arranged for the consultant team to engage the Fort Bragg City Council to discuss some of the potentially controversial design elements that were discussed during the workshops.

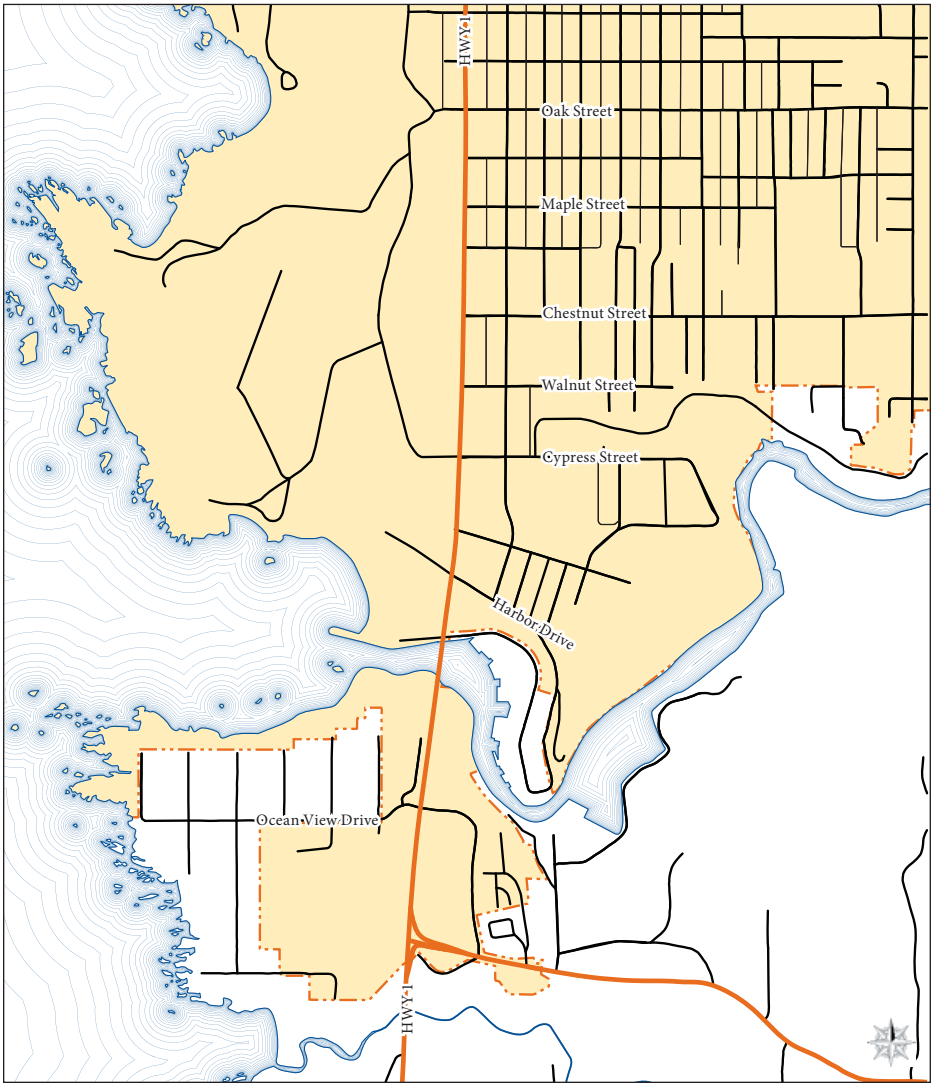
***Left**: The project area in context.*

Stefan Pellegrini from Opticos Design returned to Fort Bragg on May 10th, 2010 for a brief presentation. After discussion, Council requested that the report include multiple options developed during the workshop, and provided some additional specific guidance on detailed proposals.

In the months following the workshop, the project team worked to refine the design concepts, complete drawings, and prepare recommendations for the corridor. The resulting plan is presented herein.

Project Area Description

The project study area consists of the South Main Street (State Route 1) corridor in southern Fort Bragg between Oak Street at the northern limit and the Hare Creek



***Left**: South Fort Bragg circulation patterns.*

Bridge at the City's southern limit. It includes a mix of commercial, institutional, and residential development and includes the City's two primary grocery stores (Safeway at 660 South Main between Walnut Street and Cypress Street and the Harvest Market within the Boatyard Shopping Center at 171 Boatyard Drive), related seafood and fishing industries at the Noyo Harbor, and various employment and tourist-oriented areas (including retail shops, large hotels, and restaurants). The College of the Redwoods maintains their Mendocino Coast campus facility and a 9-acre Frisbee golf course at nearby 1211 Del Mar Drive. A variety of predominantly low-income and senior housing facilities are also present, including two mobile home parks.

Existing Circulation Patterns

SR 1 (Main Street) and SR 20 (Fort Bragg – Willits Road) are the only major highways/interregional connectors within Fort Bragg. SR 1 is unique in that it is the only continuous north-south road that serves the Mendocino Coast; between the Pudding

Creek bridge to the north and the Hare Creek bridge to the south, it provides primary regional access to destinations up and down the coast and within Fort Bragg for residents, visitors, commerce, and industry.

The central core of Fort Bragg is laid out in a grid pattern that provides good connectivity. Main Street and Franklin Street function as primary north-south routes. Within the project area several east-west streets, including Oak Street, Madrone Street, Maple Street, Hazel Street, Chestnut Street, Walnut Street, Cypress Street, and South Street provide access to commercial, residential, and institutional destinations east of Main Street.

While connections across Main to the west are currently limited to Cypress Street, the redevelopment of the former Georgia Pacific Mill Site anticipates additional access points, including a new connection at Madrone Street, access to future sections of the Coastal Trail, and new uses and future development along South Main.

Existing Roadway Characteristics

For the most part, South Main Street consists of five travel lanes (four travel lanes with a continuous two-way left turn lane), however its cross section is not consistent across the project area.

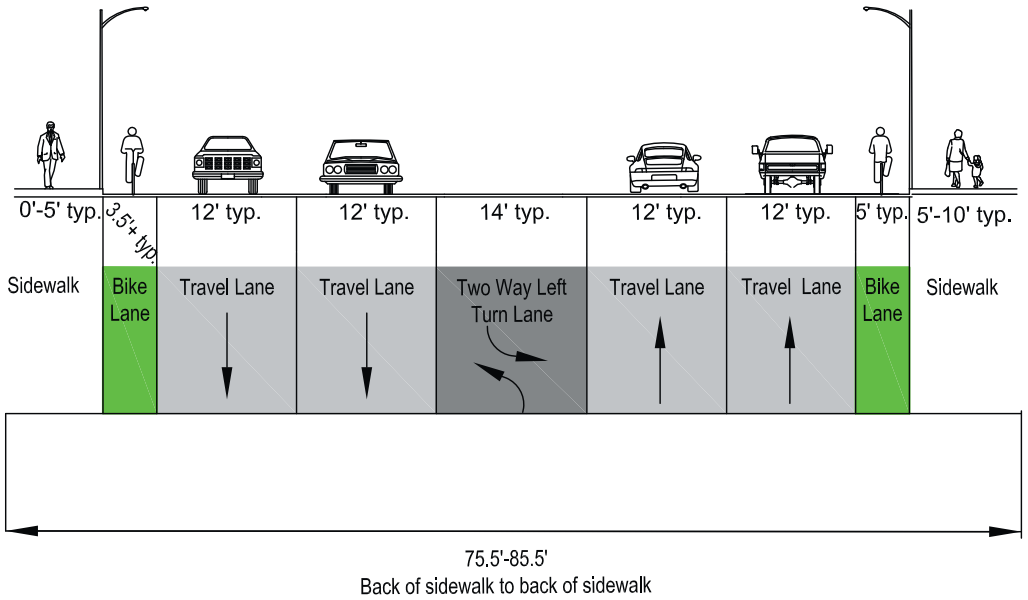
- At the northern end between Oak Street and Walnut Street, the roadway measures approximately 63 feet in width, with two travel lines in each direction, no on-street parking, a two-way left turn lane, and bicycle lanes approximately four feet wide. While wide sidewalks exist on the east side of the road, sidewalks on the west side are quite narrow.
- In the central section, between Walnut Street and Harbor Drive, the roadway widens to approximately 74 feet in width, with two travel lanes in each direction, on-street parking along the east side of the street, and no bicycle lanes. Here sidewalks are provided only on the east side of the roadway.
- At the center, the Noyo Bridge provides four travel lanes, a continuous center lane for emergency vehicles, and wide shoulders that provide both bicycle lanes and walking paths.
- South of the Noyo Bridge the roadway widens considerably, with two travel lanes in either direction, no on-street parking, no bicycle lanes, and no sidewalks present.

The roadway is currently a difficult environment for both pedestrians and bicyclists:

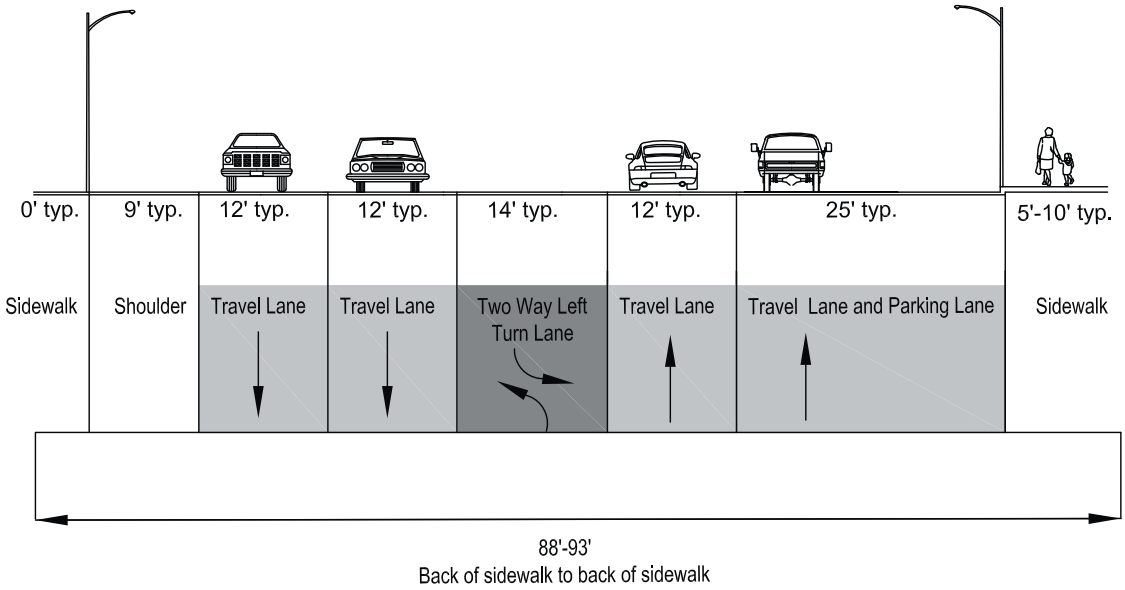
- Only five intersections provide safe crossing opportunities across the 1.8 mile stretch, with long lengths between each crossing.
- Sidewalks, where present, are narrow, frequently obstructed by sign posts, and interrupted by frequent driveway curb cuts. Elsewhere, they are absent or incomplete, particularly south of the Noyo Bridge.
- Connections to other important pedestrian destinations, such as the coast and the Noyo Harbor, are currently not well-signed.

Despite a lack of pedestrian facilities, residents and tourists can be found walking

***Above**: The project area as it intersects with the Fort Bragg street grid.*



***Above**: Typical existing cross section of South Main Street between Oak Street and Cypress Street (looking north) includes a narrow, Class II bicycle lane, wide travel lanes, and a central turning lane.*



***Above**: Typical existing cross section of South Main Street between Cypress Street and SR20 (looking north).*

along the roadway shoulder and even in the travel lanes, with well-worn, informal pedestrian pathways along some sections of the highway. While bicyclists in the southern portion of the project area utilize the shoulder for travel, the bicycle lanes narrow considerably closer to downtown, providing potential conflicts with parked cars and vehicles entering and exiting driveways.

While legal traffic speeds range from 45 mph to 35 mph, speeding and aggressive driving is common. While Caltrans collision data illustrates vehicle collisions well below the statewide averages, information obtained from SWITRS reports illustrate higher-than-average rates at South Main and Oak Street and SR20.

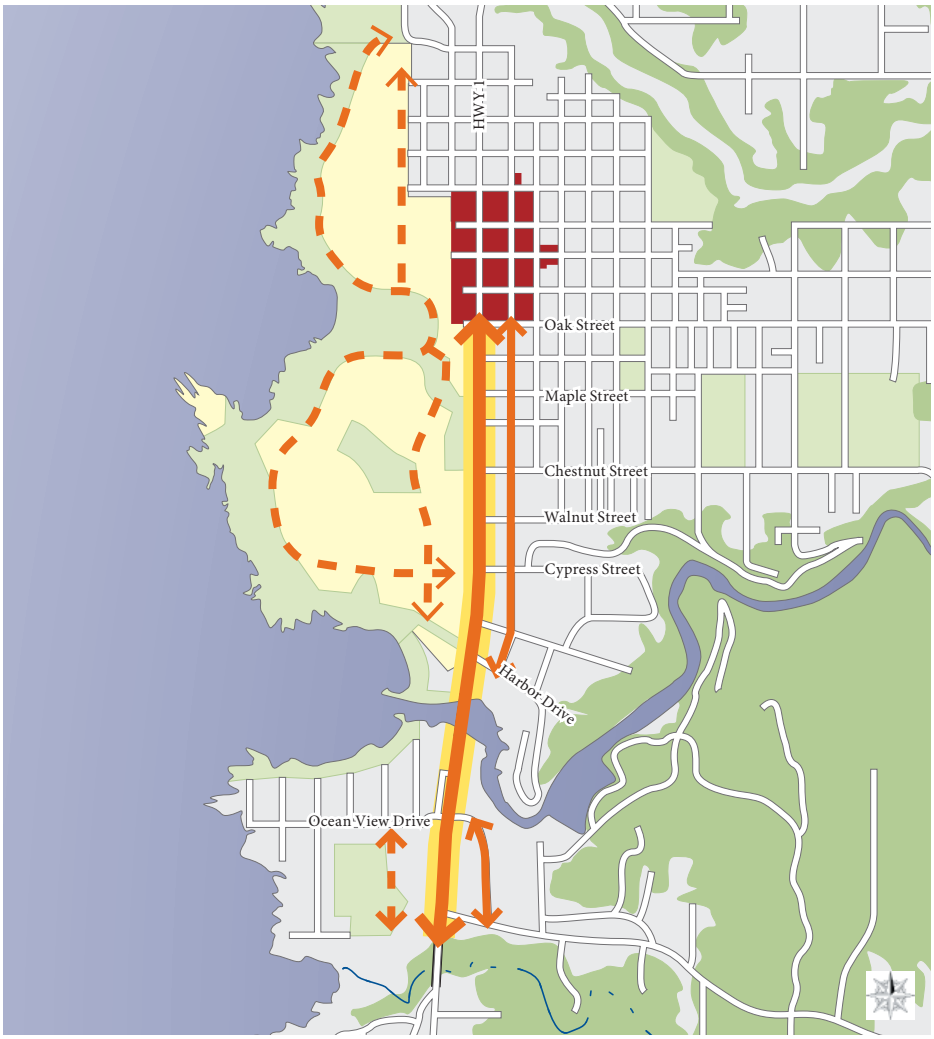
Existing Land Use and the Built Environment

Like many service-oriented environments, the South Main corridor does not possess a uniform urban design, with a great diversity of building styles and placements, inconsistent frontage and landscaping, and visually incongruous and often unattractive (and nonconforming) signage. Many buildings have outdated facades and are in need of aesthetic upgrades. The southern gateway to the City, does not present an attractive entrance for the community, and orientation and wayfinding are also difficult.

Significant development pressures do not exist in the area, and land utilization is relatively low. However, during the workshop several property owners in the vicinity of the corridor expressed their desires to potentially redevelop or intensify development on their properties over time, particularly south of the Noyo Bridge. As the Mill Site is improved, new development parcels on Main Street will also provide future development opportunities, and an opportunity to improve the urban design of the area.

Despite these challenges, the corridor presents a great opportunity for the City. As the Mill Site develops with new uses and amenities, it holds a lot of potential as an important vehicular route, an important connector for pedestrians and bicyclists, and a pedestrian-friendly destination for both locals and tourists.

Above (from top to bottom): *Unfriendly environment for the pedestrian; Limited crossing opportunities create a dangerous and inhospitable environment for pedestrians; Visual clutter makes wayfinding and orientation difficult.*

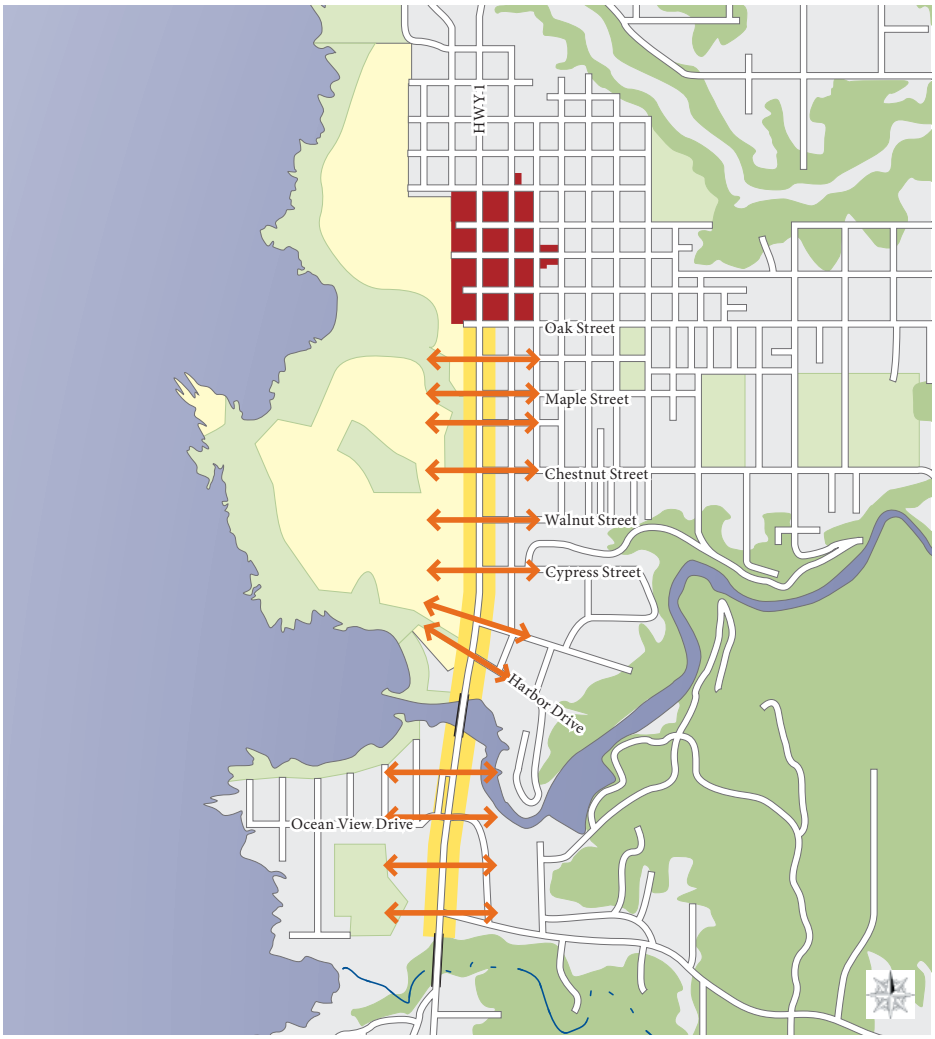


Above: *Existing and potential north-south connectivity within the project area.*

The design recommendations that follow are guided by a series of design principles that emerged during the community workshops.

Maintain & Strengthen North-South Connections for Pedestrians and Bicyclists

South Main is unique in that it provides the only continuous north-south road through the Mendocino Coast and The City of Fort Bragg. For local residents (particularly those who may not have other options) these north-south connections are important to safely reach local services, jobs, and the downtown core. It also serves as an important route for long-distance touring cyclists who pass through the area and must navigate a difficult, and at times dangerous route.

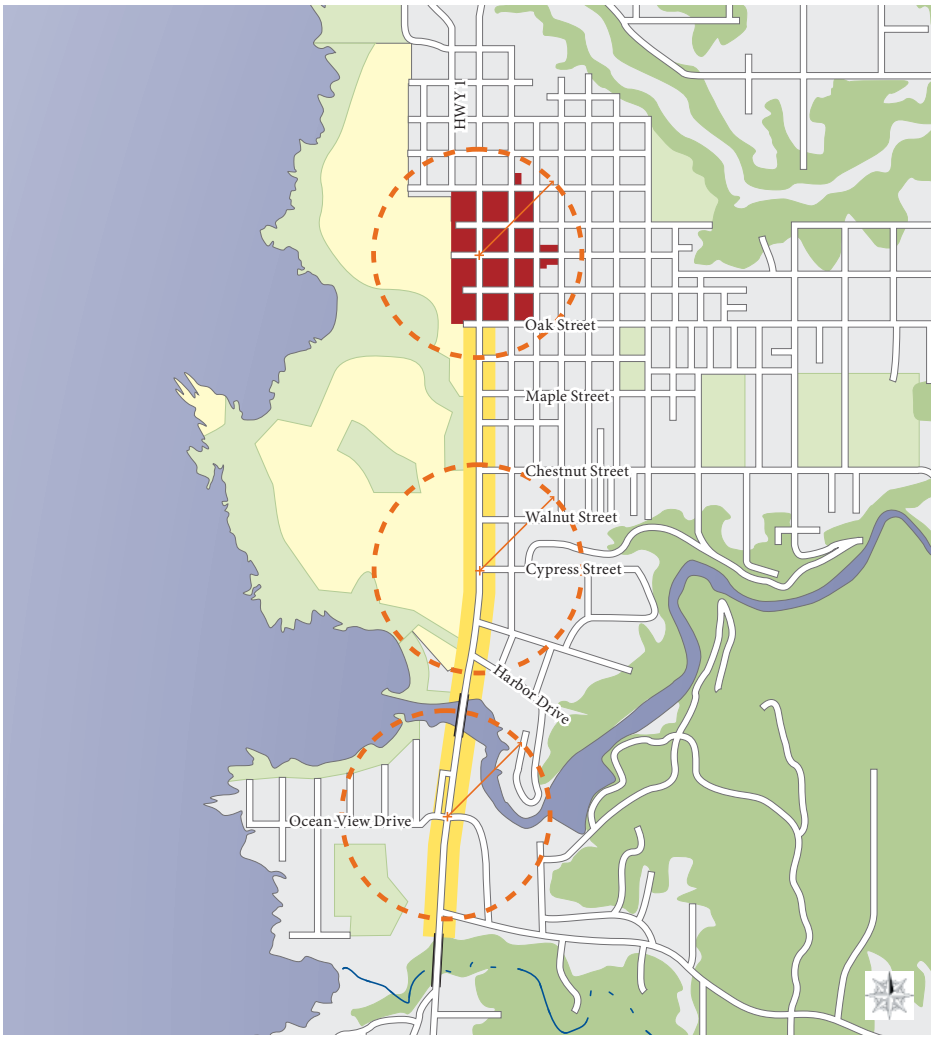


Above: *East-west pedestrian connection opportunities*

Maintain, Improve, and Increase East-West Connections for Pedestrians and Bicyclists

The east-west streets that pass through the project area connect South Main to important destinations within South Fort Bragg, including schools, parks, civic and institutional facilities, residential neighborhoods, and commercial services. As the Mill Site develops, it will be very important to establish a network of safe pedestrian routes across South Main that connect amenities on the east and west sides of the roadway. In some locations, such as Walnut or Cypress Streets, these connections may be possible through the extension of the Fort Bragg street grid. In other locations, such as South Street, pedestrian-only connections may be encouraged.

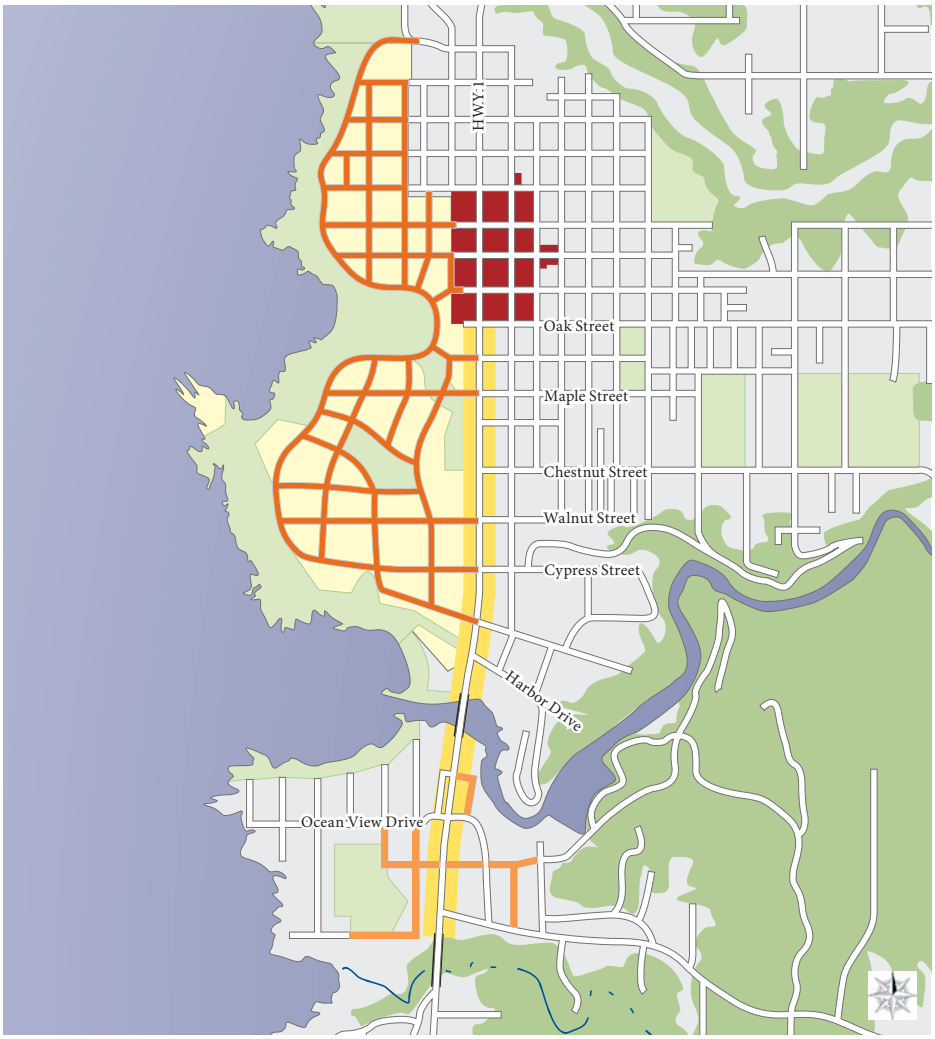
In the short term, such connections will provide access to recreational amenities such as new sections of the Coastal Trail.

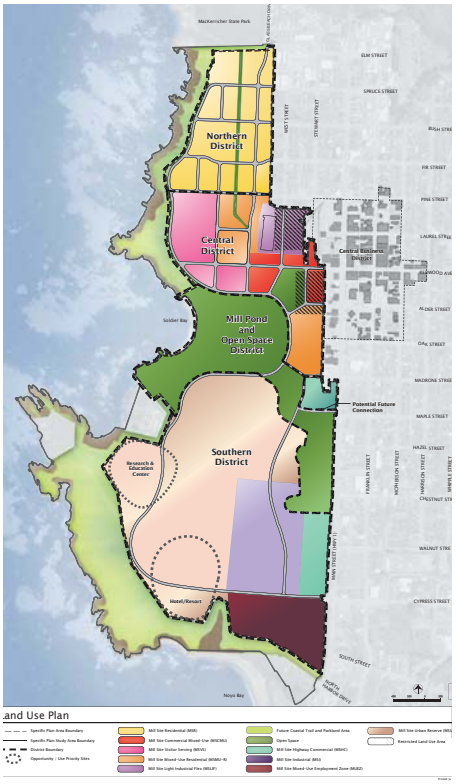


Above: *Areas of "Local Walkability" at Redwood Street (Downtown Fort Bragg), Cypress Street, and Ocean View Drive.*

Foster and Encourage Areas of Local Walkability

The project area is approximately 1.8 miles long in the north-south direction. As a corridor, it is difficult to imagine a continuous pedestrian environment or to expect pedestrian activity along the entire length of the corridor. However, within ¼ mile of particular destinations, areas of "local walkability" should be established. These areas can encourage both safe pedestrian travel to and from adjacent residential neighborhoods, and allow locals and visitors to "park once," safely reaching a series of destinations by foot before returning to their vehicles.





Above image: *Illustrative extension of street grid west of South Main.* ***Above right****: Proposed Land Use and Circulation Plan from the Mill Site Specific Plan.*

Extend Fort Bragg's Street Grid to Maximize Walkability and Connectivity

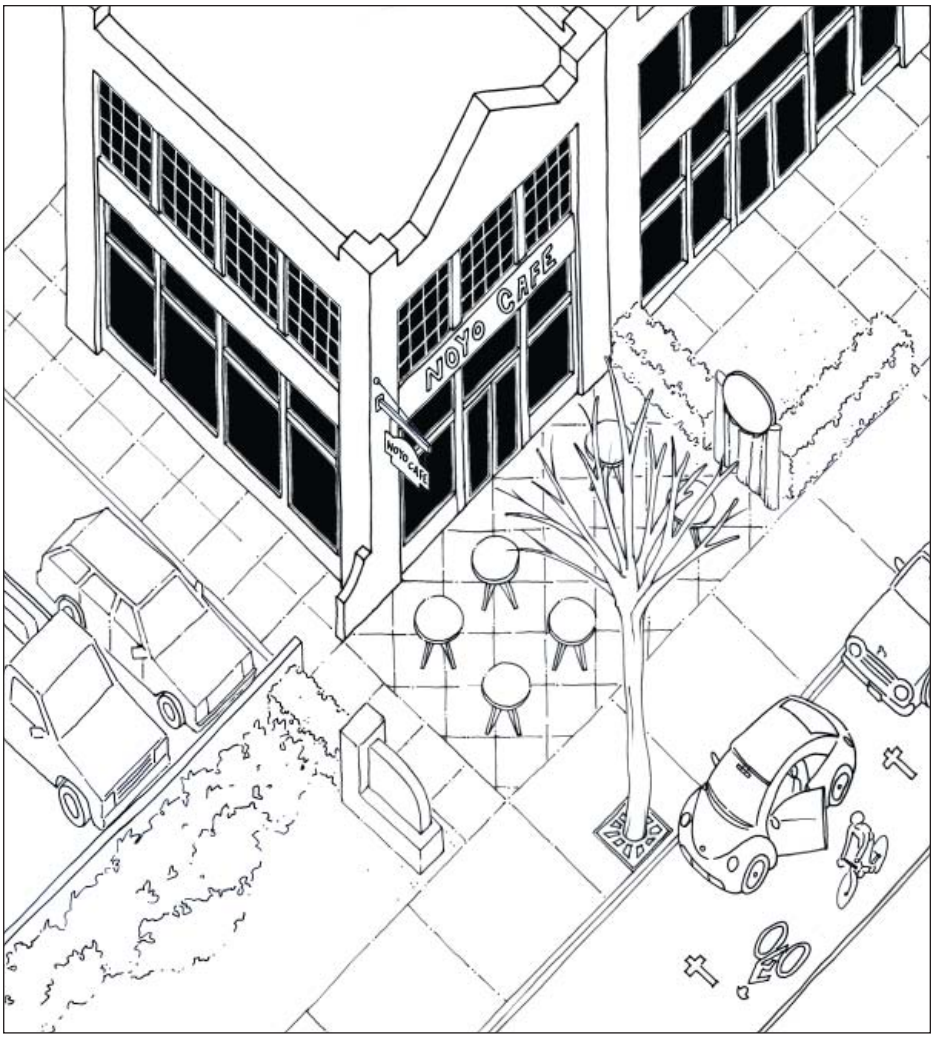
As the project area and its surroundings mature over time, it will be important to maximize walkability and connectivity to ensure a continued good environment for pedestrians and bicyclists. In the short term, connectivity should be addressed in areas with current development pressures. In the southern portion of the project area, for example, property owners on both sides of South Main have expressed desires to develop and/or entitle projects. In the long term, buildout of the Mill Site will be regulated in such a way that fosters good connectivity.

Above: *Gateways into Fort Bragg*

Foster Excellent Design at the Gateway Locations to the City

South Main provides an important entry route into the City and hence a "first impression" of the community for many visitors. Improvements to public and private-realm elements within the project area should be coordinated to present a high-quality, well-designed environment, including:

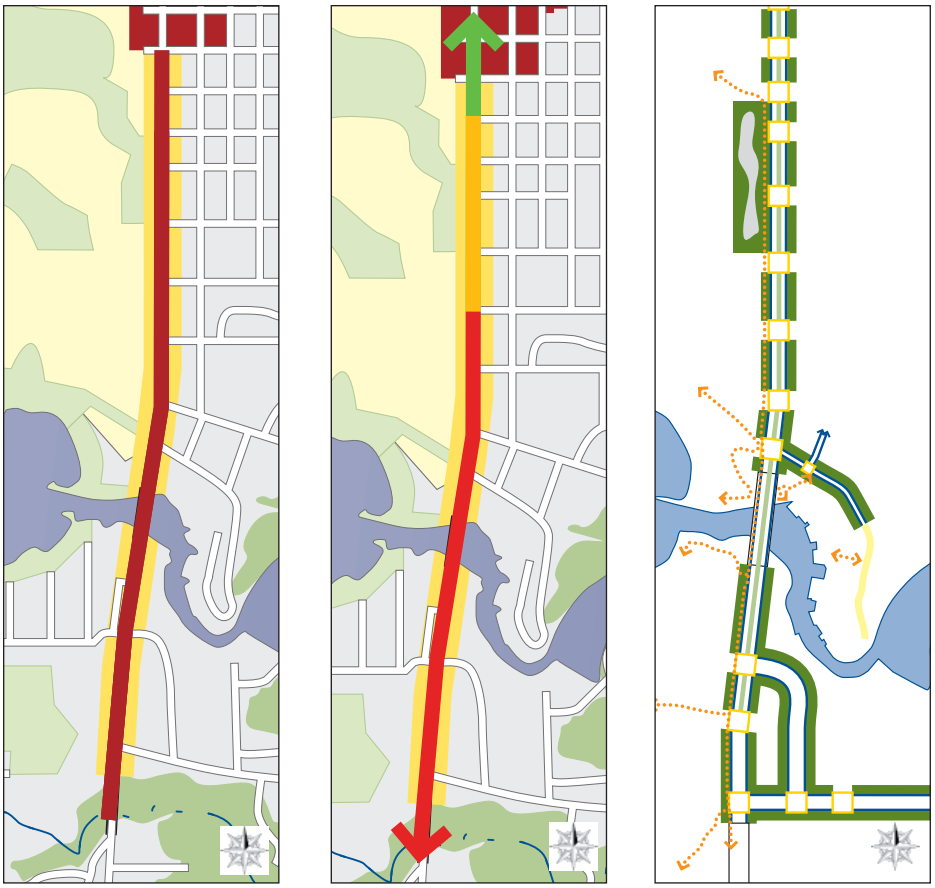
- Well-designed public space at the SR1/SR20 and Cypress/South Main intersections
- A well-designed Main Street corridor that includes a tree-lined, central median, landscaped planting strips, and drought tolerant, native plantings
- Signage does not negatively impact or distract from views to the ocean
- Building designs that model sustainability, energy efficiency, and green building



Above: *Illustration of appropriate frontage along South Main.*

Promote Pedestrian-Friendly, Walkable Frontage

Creating a good, walkable community goes beyond establishing a street network with continuous pedestrian amenities such as sidewalks and safe crossings. The nature and character of buildings, and the way they are oriented to the street, is also important. Currently, most of the buildings along South Main do not promote a comfortable walking environment. In the short term, much can be done to provide a better environment, including consistent landscaping, pedestrian-scaled signage, and improvements to building facades. In the long term, building placement, form, and orientation should be regulated to encourage a better pedestrian environment.



Introduction

This chapter presents and discusses a series of design frameworks for the corridor. These frameworks organize the concepts and initiatives that emerged from public input during the design workshops, and set the overall vision for the corridor. Detailed designs are discussed in Chapters 4 and 5.

The frameworks focus on the design speed of the corridor, pedestrian realm improvements, improvements to the bicycle network, the potential for a "road diet" or reduction in the number of travel lanes, and intersection improvements.

These frameworks are interrelated and should not be considered independently when thinking about changes to the corridor. For example, increased opportunities for pedestrian crossings through intersection improvements may only be possible if design speeds can be reduced. At the same time, design speeds may only be reduced, as a result of real time reduction in driving speeds, which will only result from specific design changes (such as coordinated intersection improvements) that ensure safe movement patterns.

chapter 3

Corridor Design Frameworks

Design Speed Reduction

In keeping with the goals of the CalTrans grant, many of the initiatives focus on creating a safer pedestrian and bicycle network and increasing access along the corridor. One key element to creating a safer environment in town is to reduce vehicular speeds. During the community activities many participants discussed issues with speeding traffic along the corridor.

Pedestrian fatalities in accidents between vehicles and pedestrians dramatically increase as speeds increase. For example, an accident involving a pedestrian and a vehicle at 20 mph has a 5 percent chance of being fatal for the pedestrian. As the vehicular speed increases the rate dramatically increases: At 30 mph chance of a fatality rises to 45 percent; at 40 mph it increases to 85 percent. Caltrans data within the project area currently indicates 10 collisions involving pedestrians and bicyclists over the past 10 years.

As Fort Bragg grows and the Mill Site is developed, these statistics become all the more relevant. The development of the Class I Trail along the Mill Site coastal bluffs, the future development of the Mill Site, and potential redevelopment along the South Main Street corridor will lead to increased pedestrian and bicycle traffic along the corridor and across it.

Reducing speeds along the corridor is not as simple as changing the "Speed Limit" signs along Highway 1 — it would instead be accomplished through a series of design changes that would allow for traffic to move safely through the area in coordination with pedestrians and bicyclists. Reducing the width of travel lanes along the corridor is an integral step in reducing speeds that should be considered.

***Above (from top to bottom)**: South of Cypress Street undefined traffic lanes encourage speeding and unsafe passing; No definition at shoulder also encourages speeding; Traffic moves through South Fort Bragg.*

Lane Width Reductions

Reduction of lane width is a commonly used tool for traffic calming. Information published by the Federal Highway Administration in *Mitigation Strategies for Design Exceptions*, July 2007, shows that a reduction in lane width from 12 feet to 11 feet on a two-lane highway results in an average decrease in free-flow speed by ranging between 0.4 to 4.7 miles per hour, depending on the width of the shoulder. In addition, this publication cites research that has found little difference in average collision rates for streets that have 11-foot travel lanes as compared to streets with 12-foot travel lanes. In *Traffic Calming – State of the Practice*, published by the Institute of Transportation Engineers in association with the FHWA, narrowed road widths are identified as a traffic calming method to reduce the free-flow speed of traffic.

The American Association of State Highway and Transportation Officials (AASHTO), in the publication *A Policy on Geometric Design of Highways and Streets*, 2004, identifies that lane widths generally range from nine to twelve feet with twelve feet being the prevailing standard width nationwide. AASHTO further states that lane widths of eleven feet are acceptable in urban areas where pedestrian, right-of-way or existing development constrains twelve-foot lanes. While the Caltrans Highway Design Manual indicates that travel lane widths shall be 12 feet wide, the Caltrans publication *Main Streets: Flexibility in Design and Operations*, 2005, indicates that there are some instances when Caltrans will approve design exceptions for lane widths narrower than the standard 12 feet.

For highways that serve as main streets, particularly those that operate at lower speeds, lane widths narrower than the standard 12 feet may be appropriate. Reduced lane widths in combination with other traffic calming measures may encourage slower speeds, which is desirable for a main street. Where existing right of way is limited, reducing lane widths can provide adequate shoulder width for bike lanes and sidewalks.

A key consideration for narrowed lane widths on corridors that experience frequent truck or recreational vehicle traffic is the usage of adjacent roadway spaces. On these corridors, it is desirable for some type of "buffer" to exist between the 11-foot wide lanes and opposing traffic and on-street parking. This can be accomplished by striping a one-foot offset from adjacent vertical curbs, providing a center two-way left-turn lane, or providing an on-street bicycle lane. While large vehicles by law are limited to 8.5 feet in width and would not be expected to actively travel in these buffer areas, the separation helps to accommodate large vehicle turning movements and oversize loads.

The use of 11-foot wide travel lanes on South Main Street in Fort Bragg would be expected to have little impact on large vehicles, other than a potential decrease in speeds as drivers adjust to the roadway conditions. The 11-foot wide lanes would still accommodate truck maneuverability, even for oversize loads, as they would be flanked by a center turn lane and on-street bicycle lane or shoulder.

During the workshop, the following strategy for reducing speeds was discussed.

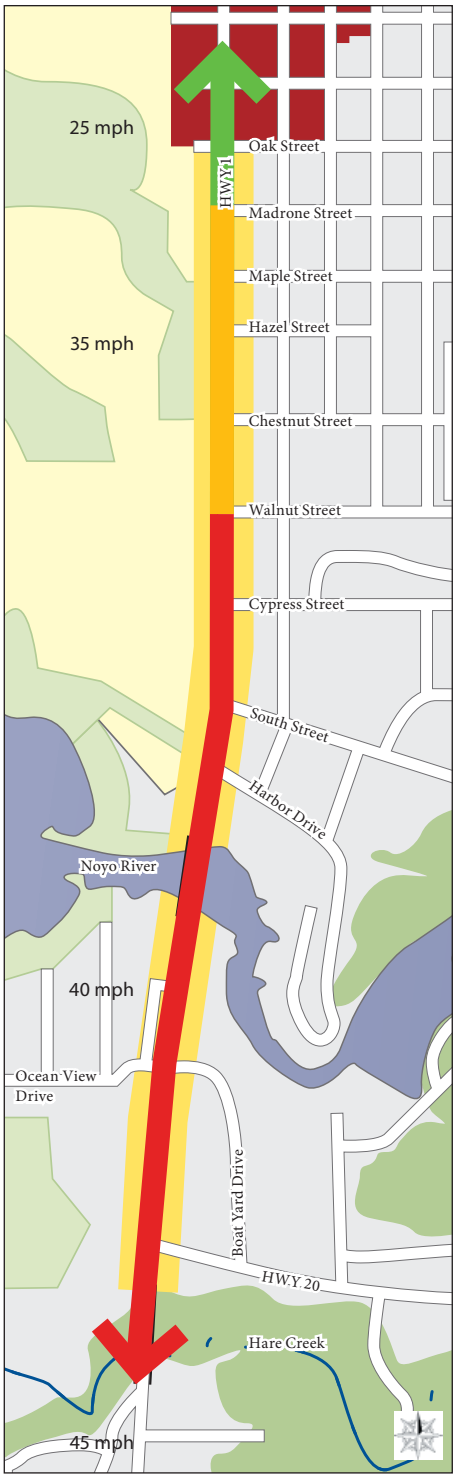
Simpson Lane to Ocean View Drive: 35 mph

The southernmost portion of the project area between Highway 20 and Ocean View Drive currently provides a hostile environment for pedestrians and bicyclists with few pedestrian amenities or opportunities for safe crossings.

However, the introduction of the Simpson Lane roundabout to the south of Fort Bragg will likely change driver behavior entering and exiting the City from the south. Modern roundabouts control intersections by reducing the number of potential vehicular conflict points, lowering speeds, and providing efficient traffic flow. The new Simpson Lane intersection can serve as a "gateway" that informs entering drivers that the character of the highway is changing from a rural context to an "in-town" one, providing an opportunity to lower driver speeds across the Hare Creek Bridge. A similar speed configuration could be maintained through to Ocean View Drive.

The City should work with Caltrans to explore a reduction in design speed between Simpson Lane and Ocean View Drive to 35 mph. This will slow traffic down and increase pedestrian safety within the County, while allowing for a gradual increase in pedestrian-friendly development south of the Noyo Bridge.

An "Engineering and Traffic Survey" could be conducted after the roundabout's construction to confirm that prevailing speeds have changed and that a change in the speed limit is warranted.



Above: *Existing speed limits along the corridor.*

Ocean View Drive to Maple Street:
30 mph

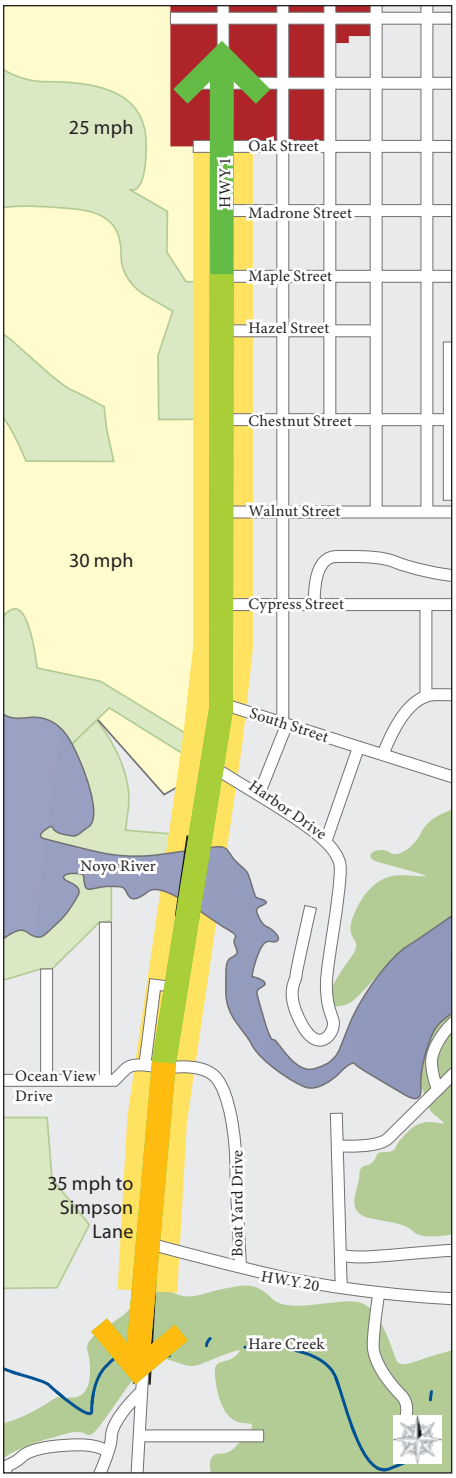
Pedestrian and bicycle traffic will invariably increase as new uses are developed on the Mill Site and as existing properties redevelop between Ocean View Drive and Maple Street. The City should work with Caltrans to explore a reduction in design speed between Ocean View Drive and Maple street to 30 mph.

Maple Street Through Downtown:
25 mph

North of Maple Street the roadway context becomes much more urban in character, with more frequent intersections and existing buildings built up to the right-of-way line. The existing 25 mph zone within downtown Fort Bragg should be extended southward to Maple Street.

Relationship with Other Design Frameworks and Initiatives

The reduction in vehicular speed in combination with improved intersections, controlling turns into driveway cuts and the clear delineation of the vehicular, bicycle and pedestrian realms can increase safety while maintaining good level of service in the corridor.



Above: *Proposed speed limits along the corridor.*

Pedestrian Realm Improvements

Existing Pedestrian Realm

Pedestrian amenities vary along the length of the corridor. Before entering Fort Bragg from the south, Highway 1 has a rural character, with a three-lane section and no sidewalks or crosswalks. North of the Hare Creek Bridge, South Main Street widens at the intersection of Highway 20 to provide room for turning and merging lanes; sidewalks, however, are limited to only one property frontage (McDonalds) between Highway 20 and Ocean View Drive. While sufficient pedestrian amenities exist along the Noyo Bridge, north of the bridge only the eastern edge has narrow sidewalks, while the western edge only has sidewalks north of Maple Street.

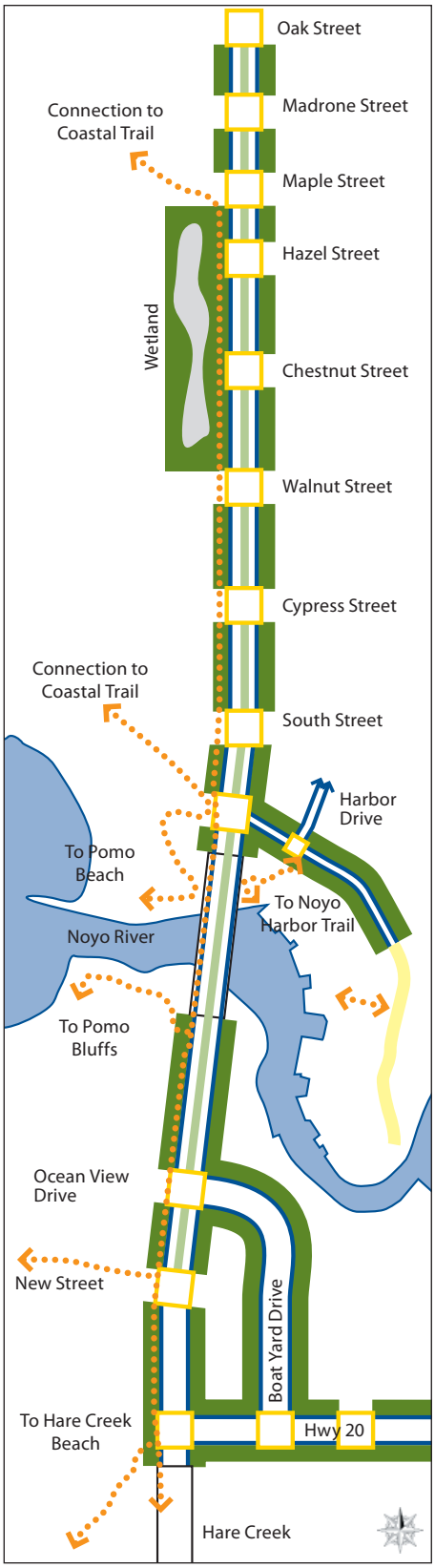
Highway 20 lacks sidewalks or crosswalks. The intersection of Highway 20 and Main Street is particularly difficult for pedestrians, with long distances to cross and no sidewalks.

Roadway Improvements

The recommended palette of physical pedestrian improvements to South Main Street and Highway 20 includes curb extensions, crosswalk improvements. These elements can be combined and added to over time to create an improved environment for pedestrians and bicyclists. They can also provide the corridor with an aesthetically pleasing, unified set of public realm elements. These include:

- Continuous sidewalks with a minimum 5 feet clear width along the corridor. For general commercial areas, 8 feet clear width provides a more inviting sidewalk scale; in retail or commercial areas, 10-15 feet clear should be considered. In areas where parked cars cannot provide a protective buffer for pedestrians, planting strips can be utilized to provide a more pleasing pedestrian environment.
- Clearly marked on-street parking spaces that provide a buffer between the sidewalk and the vehicular travel lanes.
- High visibility crosswalks with stop bars that are more legible for motorists and provide more visibility for pedestrians. At intersections where signalized intersection controls are not appropriate, pedestrian-controlled signals such as the RRFLED (Rectangular Rapid Flash LED) system can be utilized.
- "Bulb-outs," or curb extensions, that reduce the speed of traffic pedestrian crossing distances.
- Consideration of mid-block crosswalks at intersections that have — or are anticipated to have — high volumes of pedestrians.
- Median Islands with pedestrian refuges that increase pedestrian safety for crossing pedestrians.

Making these physical improvements to the South Main Street corridor will create an environment in which pedestrians can safely travel along and cross South Main Street (for illustrations of these types of improvements please see pages 3-6 and 3-7).



Right: *Framework of pedestrian improvements and connections to area trails.*

Summary Table of Improvements

Intersection	Enhanced Pedestrian Crossings	New Pedestrian Crossings	Wayfinding Signage	Intersection Controls	Implementation Priority
Hwy 1 at					
Oak Street	x			x	Moderate
Madrone Street		x			High
Maple Street		x			Low
Hazel Street		x			Low
Chestnut Street	x				Moderate
Walnut Street		x			Low
Cypress Street	x			x	High
South Street		x			Moderate
Harbor Drive		x	x	x	High
South of Noyo Bridge		x	x		Moderate
Ocean View Drive	x			x	Moderate
New Street		x		x	Low
Hwy 20	x		x	x	Moderate
Hwy 20 at					
Boatyard Drive	x	x	x	x	Moderate

Curb Extensions

Curb extensions, also known as bulb-outs or neck-downs, extend the sidewalk and curb line into the parking lane which reduces effective street widths and improves safety conditions for pedestrians. Curb extensions can significantly improve pedestrian crossings by: reducing vehicle turning speeds and calming traffic by visually and physically narrowing the roadway; reducing the distance of pedestrian crossings and thus pedestrian's exposure to traffic while they cross the street; and improving sight lines between drivers and pedestrians waiting to cross the street. Curb extensions prevent motorists from parking to close to a crosswalk which can visually screen pedestrians from traffic, and they prevent motorists from parking in a manor that can block a curb ramp or crosswalk. They also improve the public realm by providing adequate space for accessible ramps and crossing infrastructure, as well as landscaping and streetscape features.

Curb extensions should not extend into travel lanes or bicycle lanes. Typically, curb extensions extend 6 feet from the curb (the approximate width of a parked car). The turning needs of larger vehicles and street sweepers should be considered in the design of curb extensions. Curb extensions can also be used at midblock locations to benefit pedestrians.

Above: *Curb extensions, Cloverdale, CA*

Above: *RRFLED Pedestrian Crossing*

Median Islands (Pedestrian Crossing Islands)

Median islands generally serve four functions:

- Channelization – to control and direct traffic movement
- Division – to divide opposing or same direction traffic streams
- Pedestrian Refuge – to increase the safety and comfort of pedestrians crossing at intersections and midblock locations by giving them the opportunity to cross one direction at a time.
- Traffic Calming – to provide urban design and landscaping treatments which help to slow traffic

The safety benefits of curbed medians and roadway channelization have been documented in a number of research studies which have demonstrated reduced collision rates on facilities where they are present. Federal research has also shown that raised crossing islands play a role in reducing pedestrian crash rates at multi-lane sites (*Safety Effects of Marked vs. Unmarked Crosswalks*, FHWA, 2002). Pedestrian crossing islands provide a waiting area for those who cannot safely finish crossing a roadway, either because they began crossing late or travel slowly, such as elderly pedestrians with canes or walkers. According to the AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities (2004), "Depending upon the signal timing, crossing islands should be considered where the crossing distance exceeds 60', but can be used at intersections with shorter crossing distances where a need has been recognized."

While a center crossing island can serve as a waiting area for slower pedestrians or for those that begin the crossing too late, the signal should be designed to enable pedestrians to cross the entire width of the roadway in a single phase. Crossing islands should be a minimum of 6' wide to accommodate the typical width of a bicycle as well as persons in wheelchairs or those using mobility devices. Detectable warning surfaces (truncated domes) should be provided on both approaches. Crossing islands should be aligned directly with marked crosswalks and provide an accessible route of travel (per current accessibility guidelines). Where possible, crossing islands at intersections should include a raised approach nose to reduce the encroachment of turning vehicles into the pedestrian waiting area.

Continuous Raised Medians

The center turn lane could also be utilized for a continuous raised median. A raised median would provide the opportunity to provide composed landscaping, stormwater management, and pedestrian refuges at crosswalks. It would also control and restrict left turning movements in and out of properties along the corridor. While these restrictions help to improve traffic flow and minimize vehicular conflicts, they would also limit the "free access" that many of the South Main properties enjoy today.

Above (from top to bottom): *Median islands can be designed to encourage pedestrians to face oncoming traffic for added safety; Central medians can assist with stormwater retention and infiltration; Continuous raised medians can add beauty and character to the corridor.*

Bicycle Network

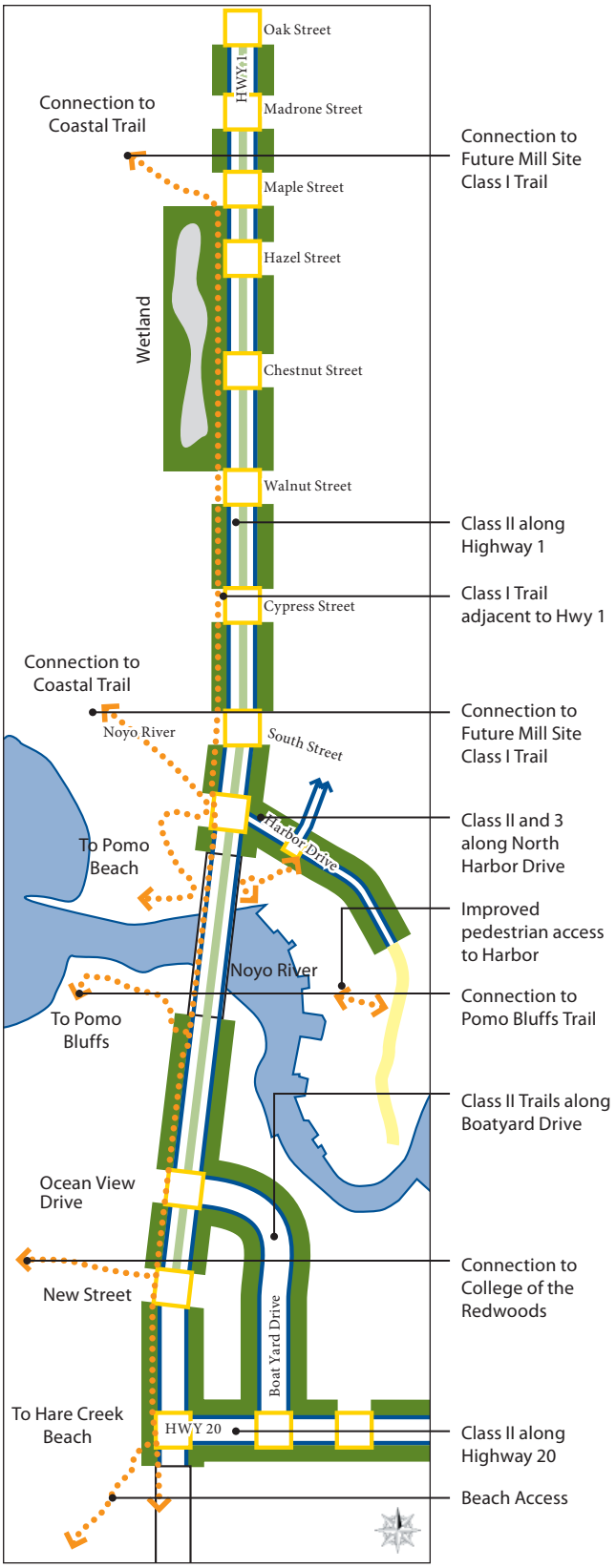
During the workshop the design team looked at ways that the bicycle network described in the 2009 Bicycle Master Plan could be expanded in the context of improvements to the South Main Corridor. Highway 1 is an important through route for touring cyclists that are traveling up and down the Pacific Coast. The proposed section of the Coastal Trail on the Mill Site provides a great opportunity to think about the corridor as part of a larger recreational and scenic amenity, as bicycle access both through and across the corridor will invariably increase.

The design team looked at the potential to complete the existing Class II bicycle facility that runs along the corridor. Currently bicycle lanes exist only north of Cypress Street; as the lanes near downtown they become quite narrow. Although a parallel Class II facility runs along Franklin, many workshop participants discussed their desires for improved facilities along the highway that could connect to additional amenities in the area. Such a network could connect to Class III facilities along North Harbor Drive leading into the Harbor, provide access to the Boatyard Shopping Center via a Class II path along Boatyard Drive, and provide access to the Holiday Inn and adjacent services along Highway 20 via a Class II facility.

The proposals in Chapters 4 look at ways that a complete Class II facility could be implemented within the cross section of the highway.

Class II facilities, particularly in the context of the highway, are not for everyone, however, and many bicyclists are not as comfortable riding with traffic, even within a designated lane or along the shoulder. There is the opportunity to create a Class I trail along South Main that would create a Class I loop with the coastal trail. This Class I trail could be completed within the existing CalTrans right-of-way or within the Mill Site property, depending on the selected approach to improving the roadway cross section. This trail would provide a safe route for bicyclists who are less comfortable riding in traffic and provide an easy route for tourists to travel around Fort Bragg.

The addition of this class I link along South Main Street would provide the opportunity for a Multi-Use Trail/Class I facility to run from the northern City boundary to the Hare Creek Bridge and the southern limit of the City.



Road Diet

During the design workshop the consultant team discussed the potential for reducing the number of vehicular traffic lanes along the South Main corridor, in order to provide increased space for pedestrians and bicyclists, as well as coordinated landscaping and signage. Practitioners generally refer to such a reduction as a "Road Diet."

Typically, road diets are associated with the conversion of streets from four lanes (two through lanes in each direction) to three lanes, (one through lane in each direction, and a center two-way left-turn lane). These conversions have been used by communities throughout the U.S. to address traffic safety, accessibility and bicycle facilities. Road diets in downtown corridors often result in an environment that is safer and friendlier to drivers, bicyclists, and pedestrians. The slowing of vehicular traffic generally results in a reduction in collisions and an increased comfort level for pedestrians and bicyclists. The use of a two-way left turn lane and turn lanes at intersections provides refuge for turning vehicles without obstructing the flow of following vehicles, increasing the comfort to the driver and decreasing potential collisions. The reduction in lanes also provides enough room to add bicycle lanes.

Despite the decrease in travel lanes, road diets have been seen to increase the average daily traffic of a roadway by making it operate more efficiently. At the same time, road diets may increase the availability of on-street parking, and make off-street parking easier to access.

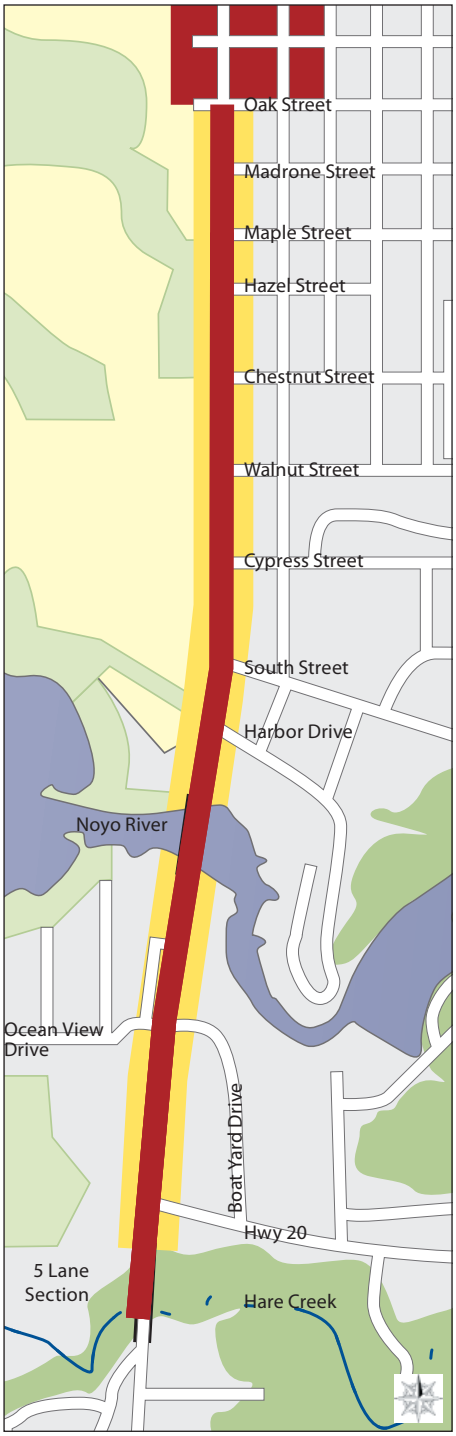
The combination of increased safety, efficiency and user comfort has also been seen to have a positive impact on businesses located along road diet corridors. Case studies have shown that downtown corridors that undergo a road diet generally experience an increase in sales and property values while experiencing a decrease in vacancy. This is often attributed to the fact that after the implementation of a road diet, it is easier for drivers and bicyclists to access a business; since pedestrians feel more comfortable, they are more likely to visit multiple businesses during one trip.

Reducing the number of lanes along South Main would likely have similar positive impacts, and would allow additional room for site-specific amenities discussed during the workshop, such as a Class I multi-use trail along the western side of the roadway within the existing right-of-way, Class II bicycle facilities that are consistent and generous, and wider sidewalks for pedestrians.

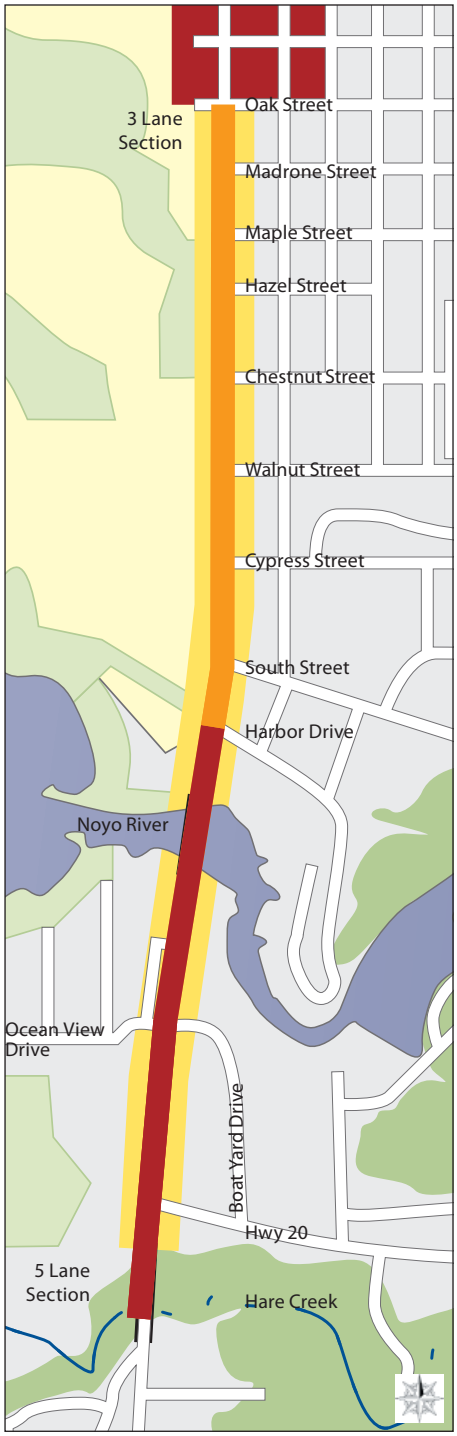
During the workshop the design team examined three principal alternatives for a Road Diet:

1. Maintaining the 5-lane section for the length of the corridor between Oak Street and Highway 20, while reducing lane widths to 11 feet.
2. Reducing the travel lanes between Oak Street and the Noyo Bridge to 3 lanes while maintaining the 5-lane section between the Noyo Bridge and Highway 20.
3. Reducing the travel lanes between Oak Street and Ocean View Drive to 3 lanes while maintaining the 5-lane section between Ocean View and Highway 20.

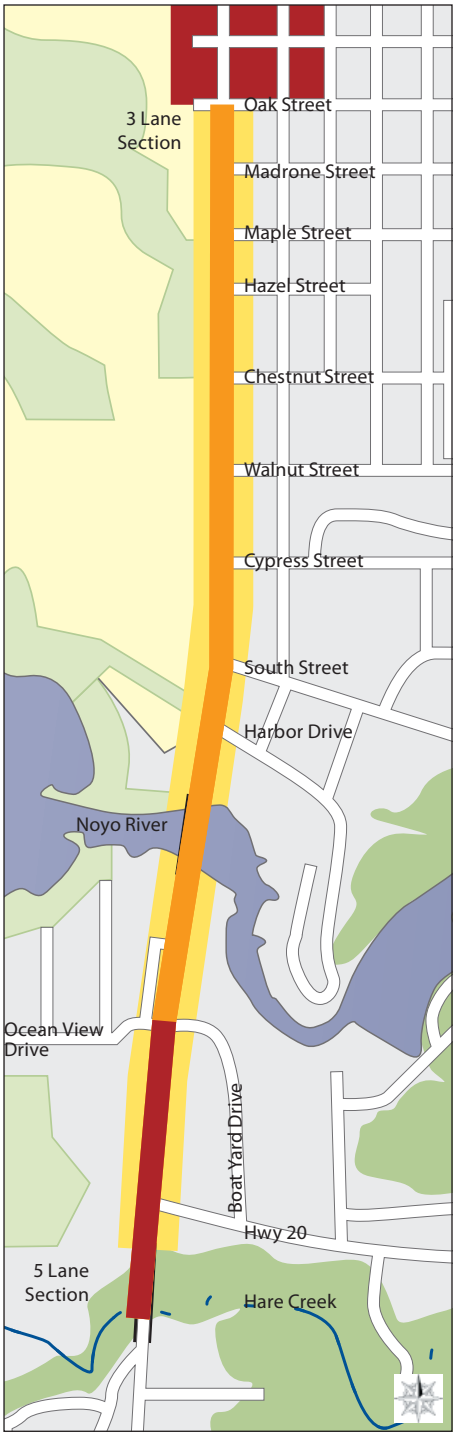
Above (from top to bottom): *La Jolla Boulevard in the Bird Rock neighborhood of San Diego was improved through a road diet with several roundabouts. Since then the area has seen private investment and increased pedestrian activity.*



Above: *Existing lane configurations, 5 lanes between Oak Street and the Hare Creek Bridge.*



Above: *Option I for a road diet to 3 lanes between Oak Street and the Noyo Bridge at North Harbor Drive.*



Above: *Option II for a road diet to 3 lanes between Oak Street and Ocean View Drive.*

Additional Considerations

A road diet for South Main presents an important policy decision for the City. While the five lane section can be upgraded to provide considerable pedestrian improvements, the road diet alone would accommodate the additional Class I multi-use bicycle trail along the west side of the roadway within the right of way. With a five-lane section, land along the Mill Site would need to be secured for this purpose.

Existing traffic counts along the corridor suggest that there is currently excess capacity and that a reduction in the number of lanes will still provide efficient traffic flow and maintain an acceptable peak hour level of service in keeping with the General Plan (e.g. Level of Service "C" or "D"). However, the future buildout of the Mill Site may increase the traffic load on the corridor to the point where a five-lane section would be required. In fact, preliminary analysis based on the May 2010 land use projections found peak hour levels of service dropping to "E" of "F" at several intersections at buildout.

The way in which the Mill Site is ultimately developed, however, will also impact the traffic load. For example, the general program for the Mill Site - particularly its southern portion - is conceptual at this time, and different buildout scenarios may affect the corridor differently. The ultimate street network is also difficult to predict. A grid pattern that provides multiple routes through the Mill Site could help to relieve some of the traffic that would otherwise depend upon South Main. At the time of writing, however, traffic analysis prepared for the Mill Site did not anticipate any internal connectivity that would allow for the potential internalization of some vehicular trips.

In the event that the City chooses to pursue improvements contingent upon the 3-lane alternative, additional traffic analysis would be necessary to study the potential for the Mill Site to internalize trips through the development of alternative routes. The City could work with Caltrans to complete a city-wide traffic model for this purpose.

Above (from top to bottom): *Typical 3-lane section with central turning lane; A road diet would free up space for additional pedestrian amenities, such as a continuous planting strip to buffer pedestrians from vehicular traffic.*

Intersection Controls

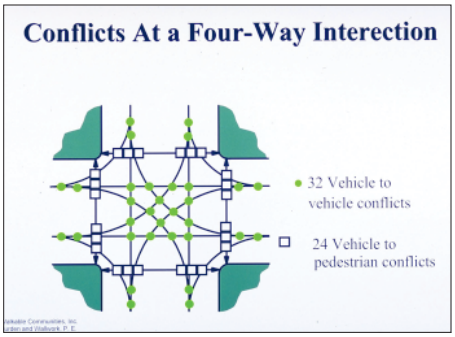
Changes to the physical character of the roadway will invariably have an impact on traffic flow along the corridor, in particular if a road diet is implemented. Preliminary analysis conducted by the design team during the workshop indicated that some enhancements to existing signalized intersections at Oak, Chestnut, Cypress, Boatyard, and Highway 20 may be necessary to ensure continued smooth traffic operations. Such enhancements may include changes to signal timing and lane configurations.

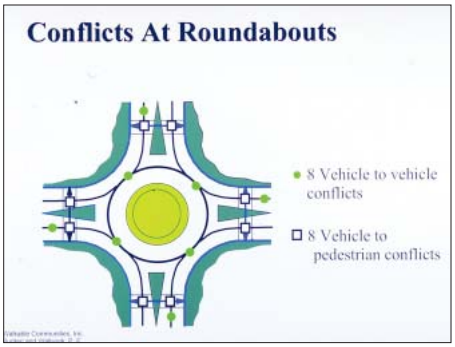
The design team also discussed roundabouts as an innovative solution to improve key intersections, improve overall traffic flow along the corridor, and help to reduce speeds to a level that facilitates easier crossing for pedestrians, particularly if a road diet is pursued.

Roundabouts are still new in the U.S. and many communities express concern when they are first proposed. However, once built, residents often embrace them and recognize that they are safer, quieter, more attractive and efficient than signalized intersections. While traffic engineers often recommend roundabouts because they are more efficient than a typical stop-controlled or signalized intersection, the lower speeds and more predictable vehicular movement also make them safer for pedestrians and bicyclists. The Simpson Lane roundabout south of the city will provide an interesting opportunity for residents to "test" a roundabout and consider its appropriateness along South Main.

Additional benefits of roundabouts that should be considered include:

- A typical 4-way intersection, may have as many as 32 vehicle-to-vehicle conflicts. A typical roundabout would reduce these conflicts to 8. Properly designed roundabouts are designed to bring vehicle speeds down to 15-20 mph, speeds at which motorists are much more likely to yield to pedestrians. The splitter island in a roundabout provides a refuge for pedestrians as they cross the street and simplifies the crossing by letting them focus on vehicles traveling in only one direction.
- Because roundabouts are more efficient at moving traffic it is often possible to use a one-lane roundabout as a viable alternative to a conventional intersection of four or more lanes. While the existing South Main cross section requires pedestrians to cross at least 100 feet, a one-lane roundabout could break the pedestrian crossing into as little as two, 12-14 foot legs.
- Roundabouts also work well for bicyclists. Most bicyclists at roundabouts simply take the travel lane since vehicles are circulating at a comfortable bicycle speed. Less confident bicyclists can be provided a ramp on the approach to the roundabout so they can exit and walk their bicycle across at the crosswalk.
- Roundabouts can be designed for long or wide vehicles (such as emergency vehicles, buses, and wide-load or extended bed trucks) with a mountable truck apron to allow space for wheels or equipment to pass over for turning movements.





Above (from top to bottom): *Urban single-lane roundabout, Bradenton Beach, Florida; Diagrams (courtesy Dan Burden) illustrate typical conflicts at conventional four-way intersections and at single-lane roundabouts.*

Aesthetic Improvements

Coordinated roadway improvements provide an opportunity to create a unified system of landscaping and signage along the corridor.

During the community workshop participants discussed their preference for indigenous plantings and drought tolerant landscaping that would provide added aesthetic beauty while communicating a strong community preference for ecological sensitivity. Adding medians and planting strips will provide an opportunity to plant street trees and complimentary landscaping along the corridor.

Signage and Wayfinding

Signage was also discussed as a design element in need of improvement. During the workshop participants discussed changes to the existing sign standards regulating private signs, including coordinated efforts to bring non-conforming signage up to standard, and the promotion of a more pedestrian scale and quality. Appropriate regulations can ensure that the standards of signage and landscaping are consistent across Fort Bragg and are done so within the community's traditional character.

Improvements to public signage were also discussed that would increase orientation and wayfinding in the area, and assist in connecting visitors traveling along South Main to adjacent destinations, such as the Noyo Harbor, the Pomo Bluffs, and downtown amenities. If possible, signs should be clustered together on the same monument to avoid visual clutter of multiple poles and signs along the street, and should be located in visible locations where pedestrian activity occurs.

Gateways

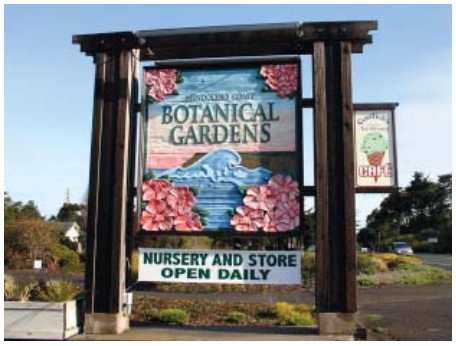
The study area also provides many opportunities to provide visual gateways at transition points along the corridor.

Entering the City from the south, the proposed Simpson Lane roundabout and the Hare Creek Bridge both provide the opportunity to signal to visitors and drivers that the rural scenic corridor of Highway 1 is transitioning to a different character.

The Simpson Lane roundabout can redefine the perceived boundaries of the City of Fort Bragg. The roundabout will allow traffic to flow more smoothly and slowly as it travels through the intersection. The center of the roundabout will be designed to provide landscaping and signage in a highly visible location.

The transition from a rural highway landscape framed by trees to the openness of South Main Street after the Hare Creek Bridge also provides a dramatic transition. The slopes on the west and northeast edges of the intersection of South Main and Highway 20 provide another opportunity for signage and coordinated landscaping.

Finally, the Noyo Bridge provides a grand opportunity with views of the Pacific Ocean and the Harbor. Signage at both ends of the bridge can better announce the Harbor, Pomo Bluffs trail, and Noyo Harbor Dog Beach, as well as future open spaces and trail uses on the Mill Site.



Above and above middle: *Some existing signage and landscaping is scaled to vehicles, rather than pedestrians.* ***Below middle and below:*** *Community members worked to identify desirable signage and landscaping imagery during the Community Image Survey.*

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Introduction

The ideas and concepts for the South Main corridor that were discussed during the workshop activities were brought to the Fort Bragg City Council on May 12th, 2010. At that time, council provided further discussion and direction regarding "baseline" and "augmented" alternatives for the corridor.

"Baseline" Alternative: Five Lane Cross Section

The "baseline" alternative includes the following components (see page 4-2 for illustrations):

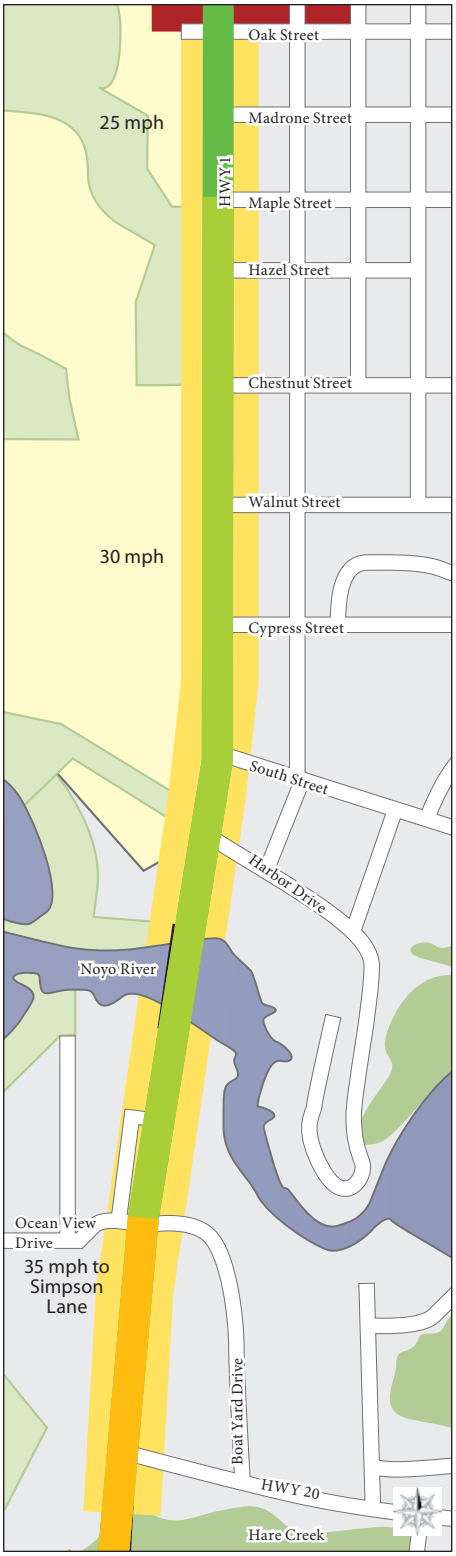
- An improved five-lane cross section with completed sidewalks and Class II bicycle lanes for the length of the roadway from Oak Street to the Hare Creek Bridge
- Enhanced pedestrian crossings, including curb extensions, high-visibility striping, stop bars, pedestrian signage, and median refuge islands at Oak, Chestnut, Cypress, Ocean View Drive, and Highway 20
- New pedestrian crossings, including curb extensions, high-visibility striping, stop bars, pedestrian signage, and median refuge islands at Madrone, Maple, Hazel, Walnut, South Street, North Harbor Drive, a new "mid-block" crossing south of the Noyo Bridge (near the American Repair Shop), and at a proposed new street between Ocean View/Boatyard Drive and Highway 20
- Improved Pedestrian and Bicycle Facilities on the Hare Creek Bridge
- Coordinated design changes, including enhancements to existing traffic lights and lane configurations at Oak, Chestnut, Cypress, Boatyard, and/or Highway 20 that would facilitate speeds along the corridor to be reduced as follows:
  - 35 mph from Hare Creek Bridge to Ocean View/Boatyard Drive
  - 30 mph from Ocean View/Boatyard Drive to Maple Street
  - 25 mph from Maple Street through downtown Fort Bragg
- Beautification efforts along the roadway, including the following:
  - Development of a center, tree-lined median
  - Development of planting strips along both sides of the roadway that provide a buffer for pedestrians from traffic
  - Improvements to the Fort Bragg Welcome Sign, including consideration of moving it to the intersection of South Main and Highway 20
  - Development of new gateways with coordinated signage and landscaping at the intersection of South Main with Highway 20 and Cypress Street
  - Improvements to private signage and landscaping along the corridor

Additional Design Considerations

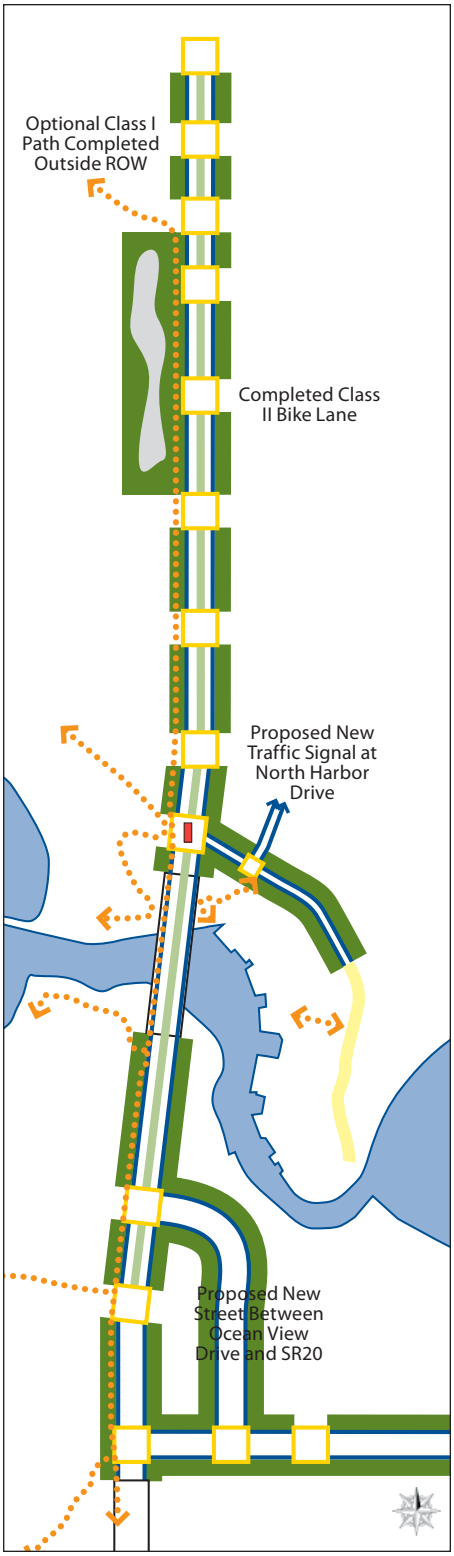
In addition to the above items Council considered the addition of a central raised median for the length of the corridor as an "augmented" design alternative.

Baseline Design Proposal

Above: *Maintain the 5 lane section for the entire stretch of the project area.*

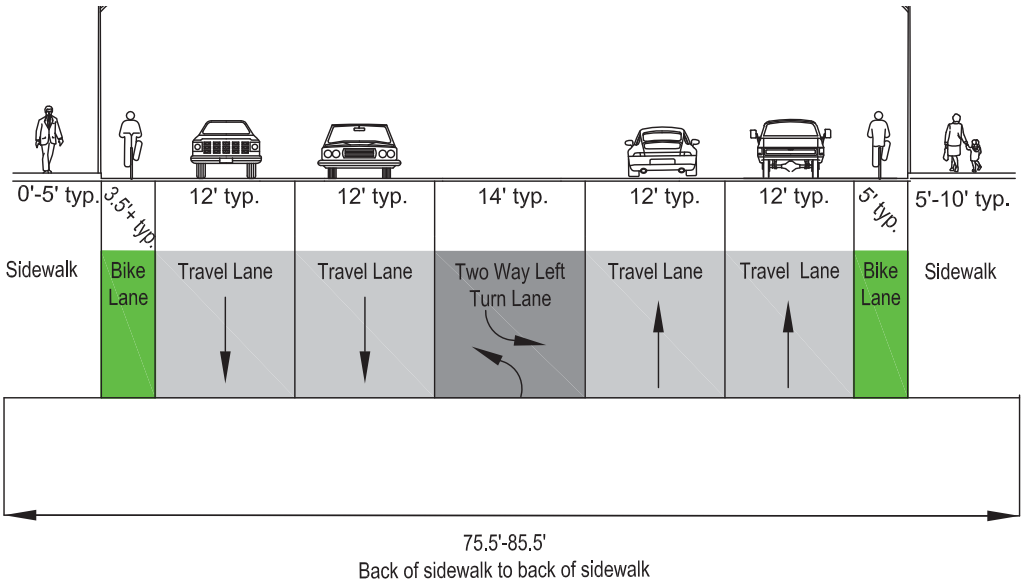


Above: *Reduce speeds to 35 mph between Simpson Lane and Ocean View Drive, 30 mph to Madrone Street, and 25 mph to Oak Street.*

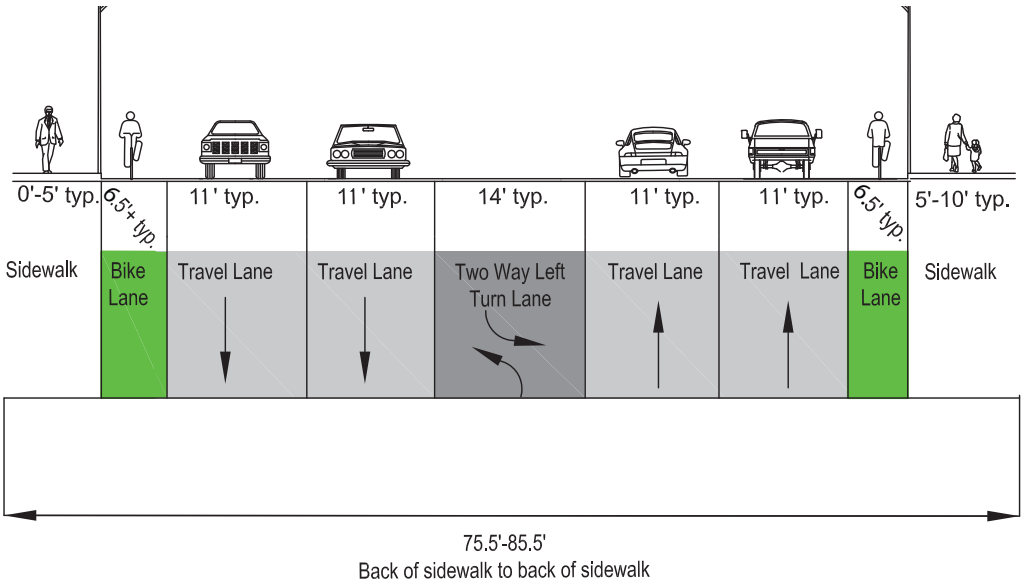


Above: *Complete sidewalks and Class II bike lanes, conventional intersection improvements.*

Oak Street to Maple Street

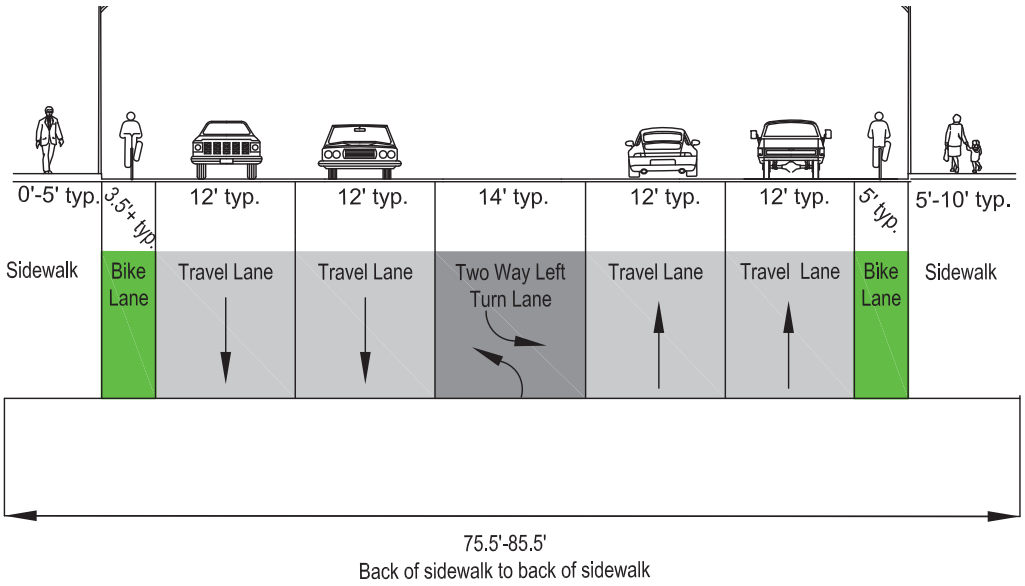


***Above**: Existing conditions along South Main between Oak Street and Maple Street (looking north).*

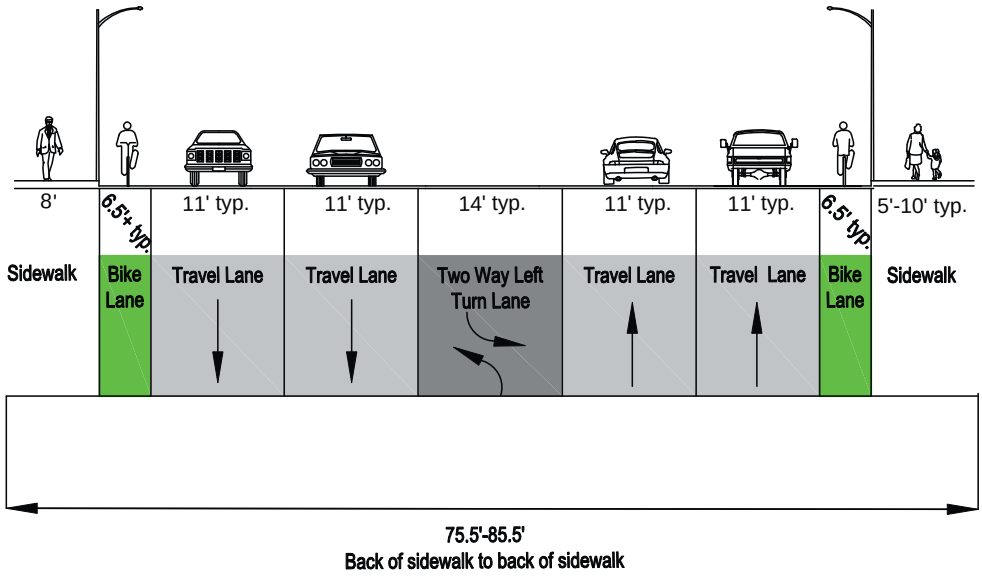


***Above**: Proposed cross section with narrowed travel lanes and widened bicycle lanes.*

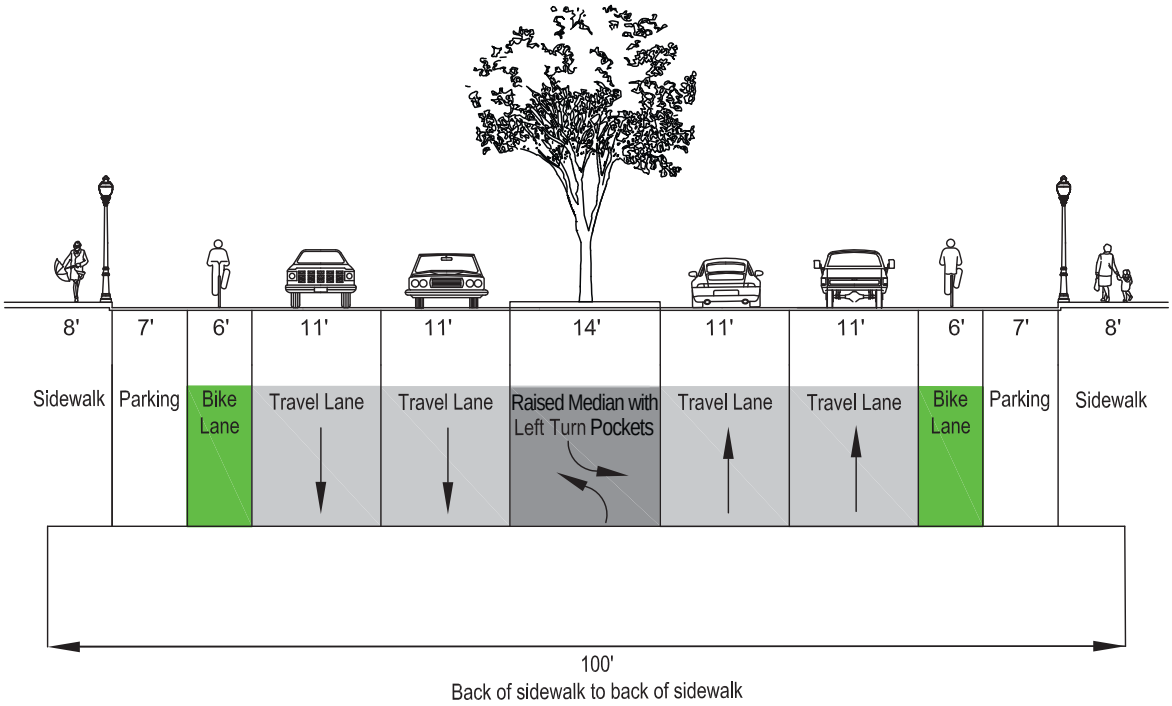
Maple Street to Cypress Street



***Above**: Existing conditions along South Main between Maple Street and Cypress Street (looking north).*



***Above:** Proposed cross section with narrowed travel lanes, widened bicycle lanes, and new 8' sidewalks on the west side of the roadway.*



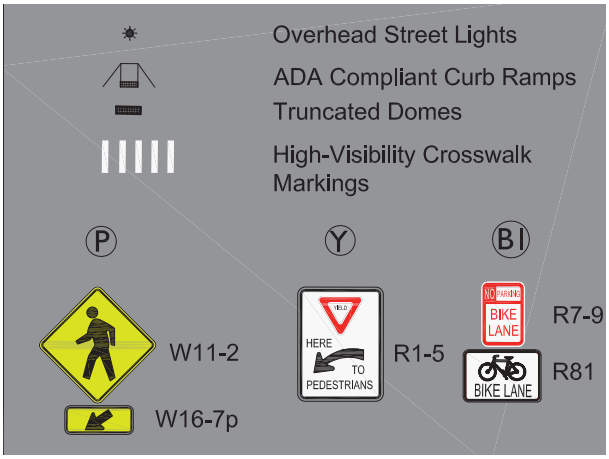
Above: *Alternative cross section with narrowed travel lanes, widened bicycle lanes, new 8' sidewalks on the west side of the roadway, and a central landscaped median with turn pockets at intersections.*

5-Lane Section: Bridgeport Way, University Place, Seattle, WA

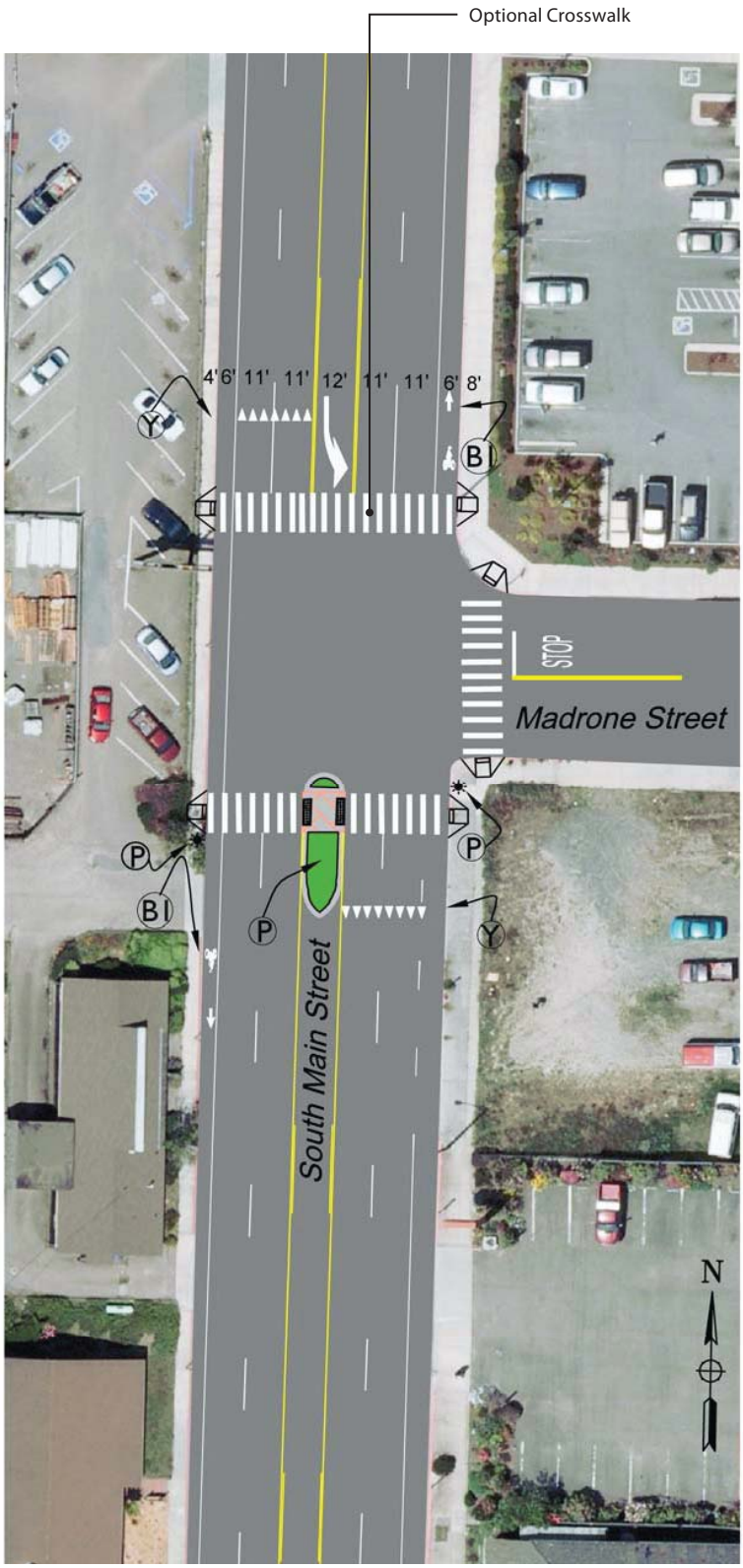
5-Lane Section: Curb Extension at Pedestrian Crossing

South Main at Madrone Street

Existing Conditions



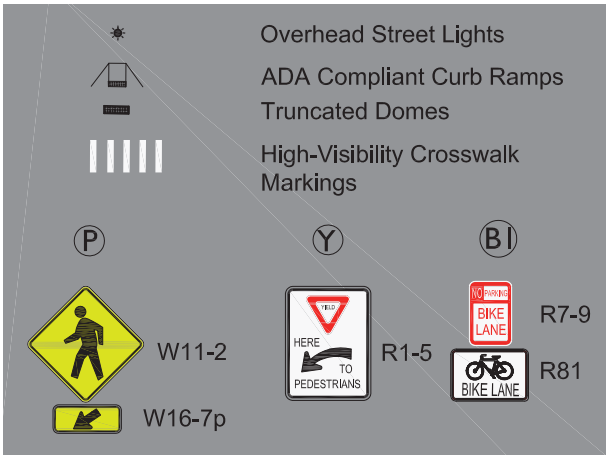
Signage, Lighting and Striping



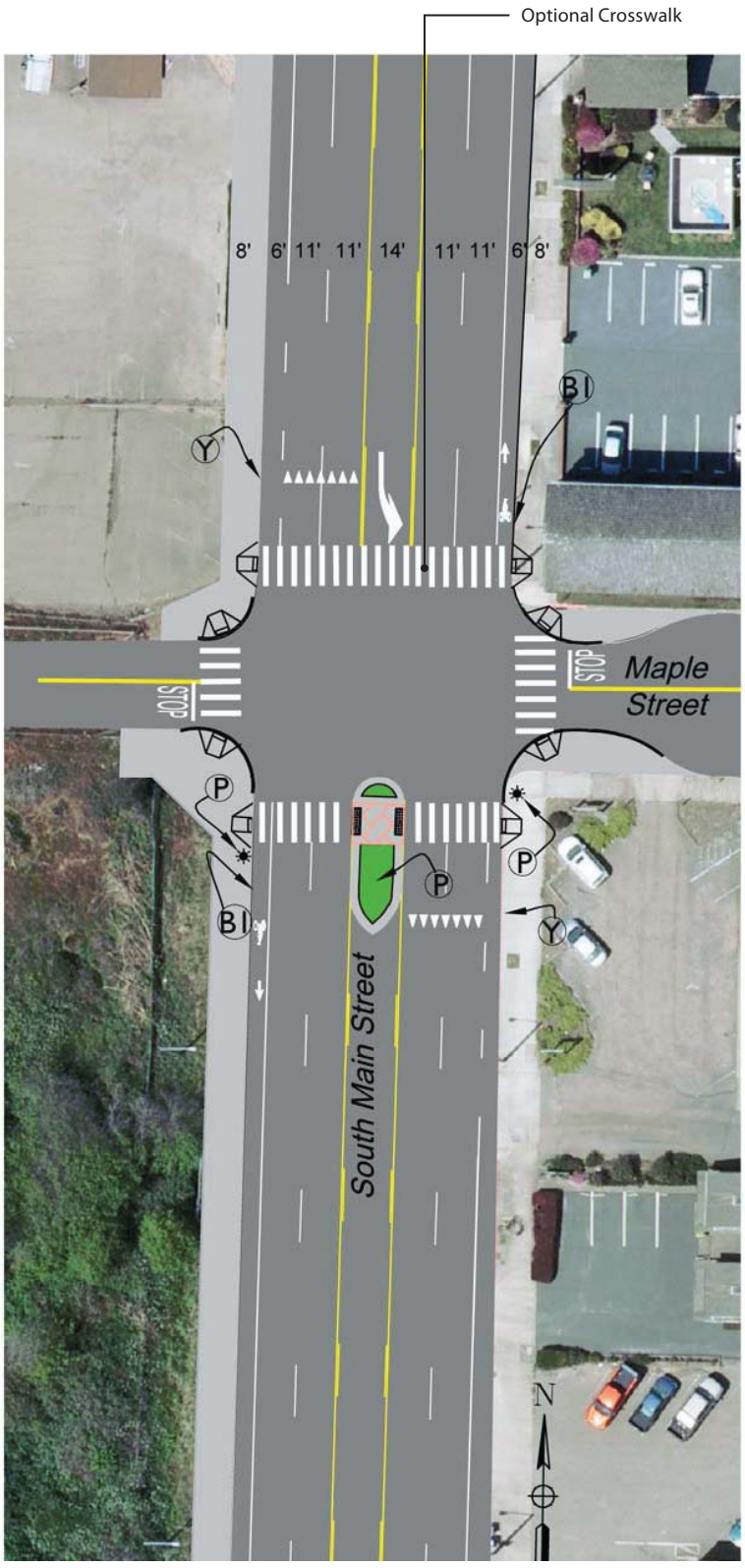
Proposed Intersection

South Main at Maple Street

Existing Conditions



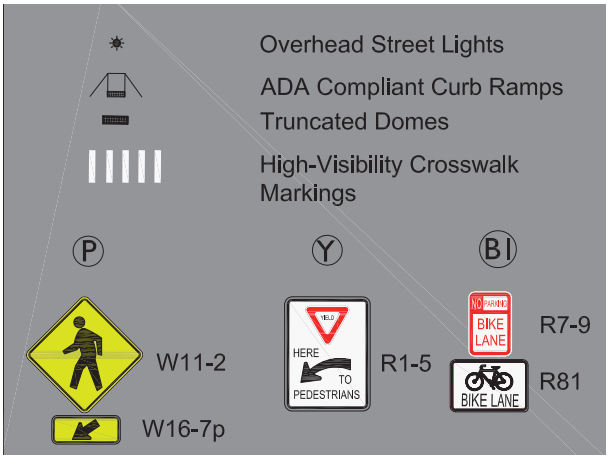
Signage, Lighting and Striping



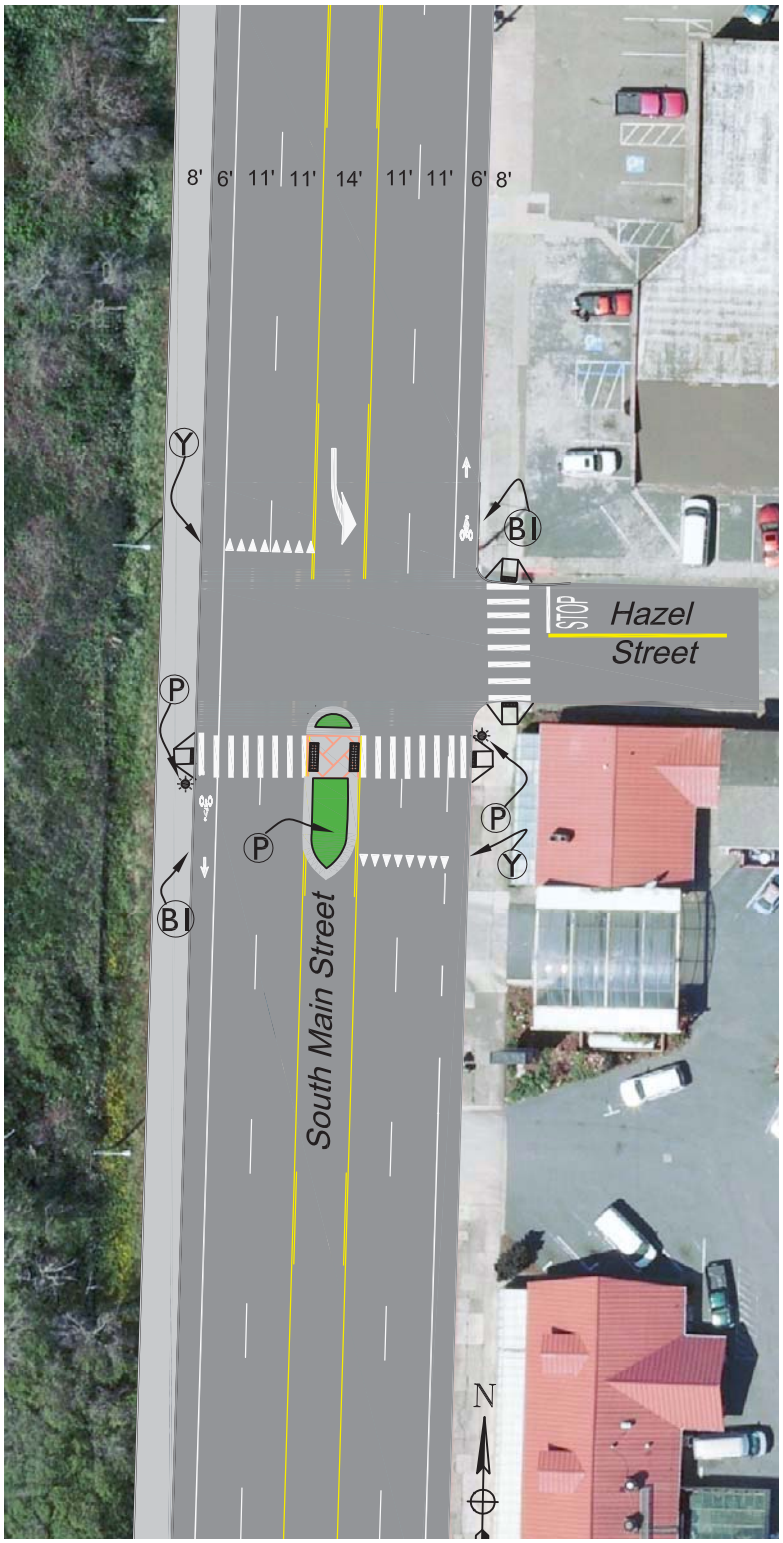
Proposed Intersection

South Main at Hazel Street

Existing Conditions



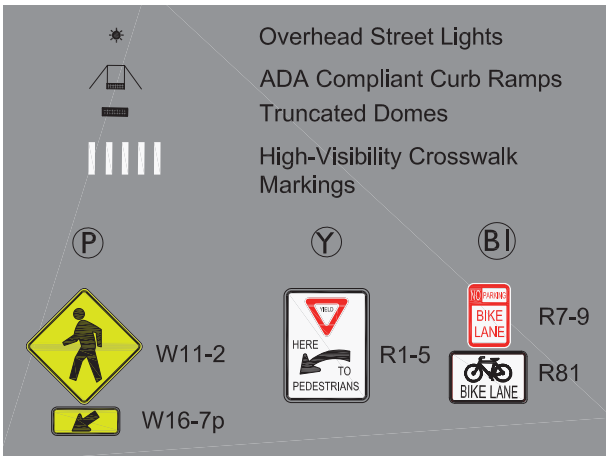
Signage, Lighting and Striping



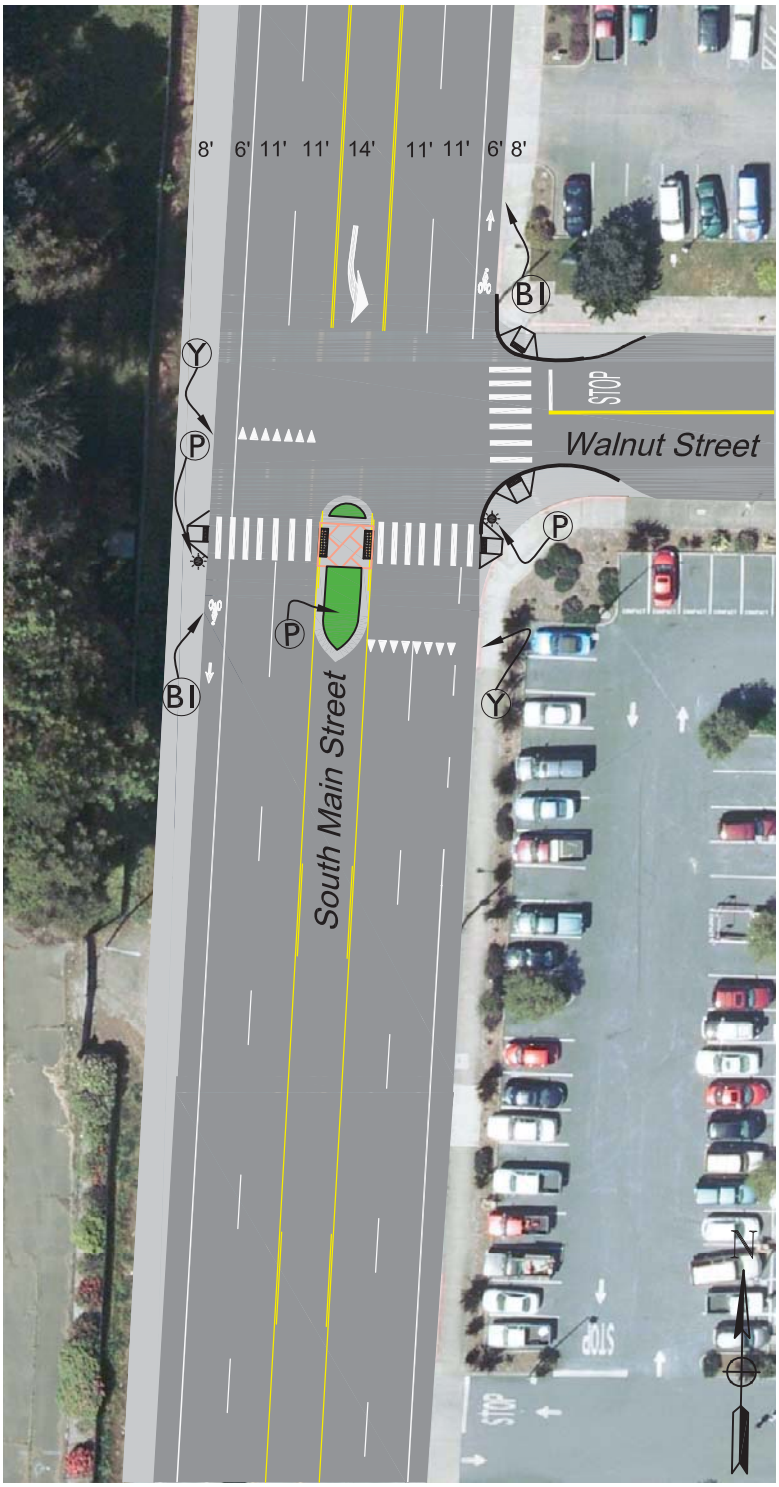
Proposed Intersection

South Main at Walnut Street

Existing Conditions

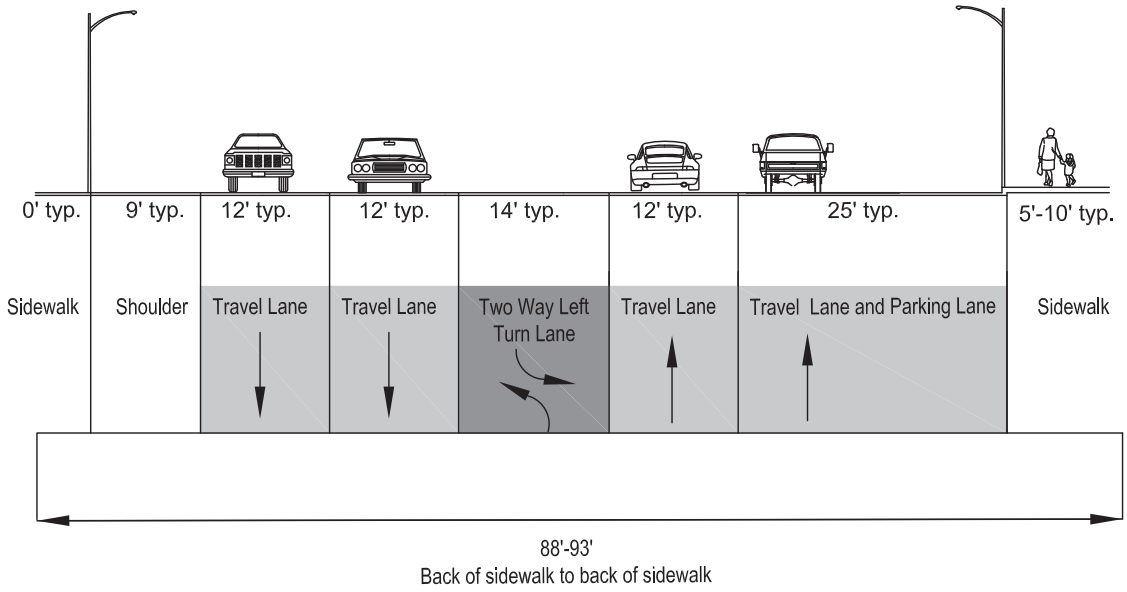


Signage, Lighting and Striping

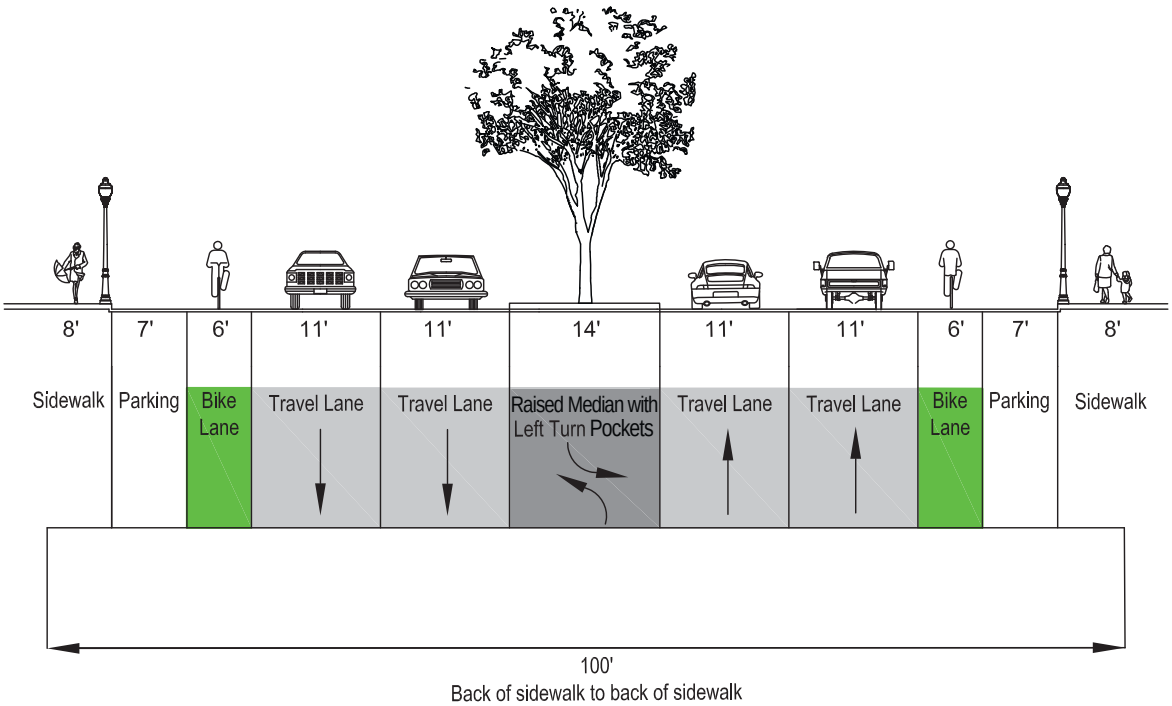


Proposed Intersection

Cypress Street to Highway 20

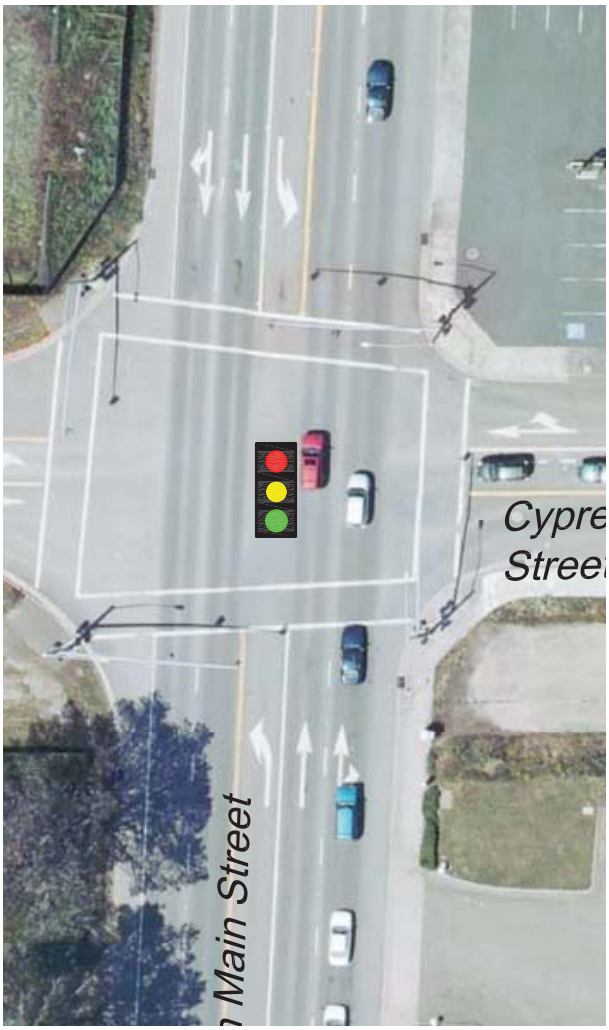


***Above**: Existing conditions along South Main between Cypress Street and Highway 20 (looking north).*

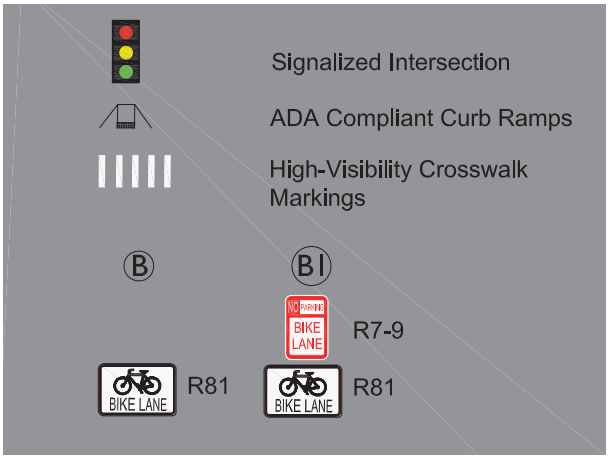


***Above:** Proposed cross section with narrowed travel lanes, bicycle lanes, and new 8' sidewalks on the west side of the roadway. The central turning lane can also accommodate a raised, landscaped median with turn pockets at intersections.*

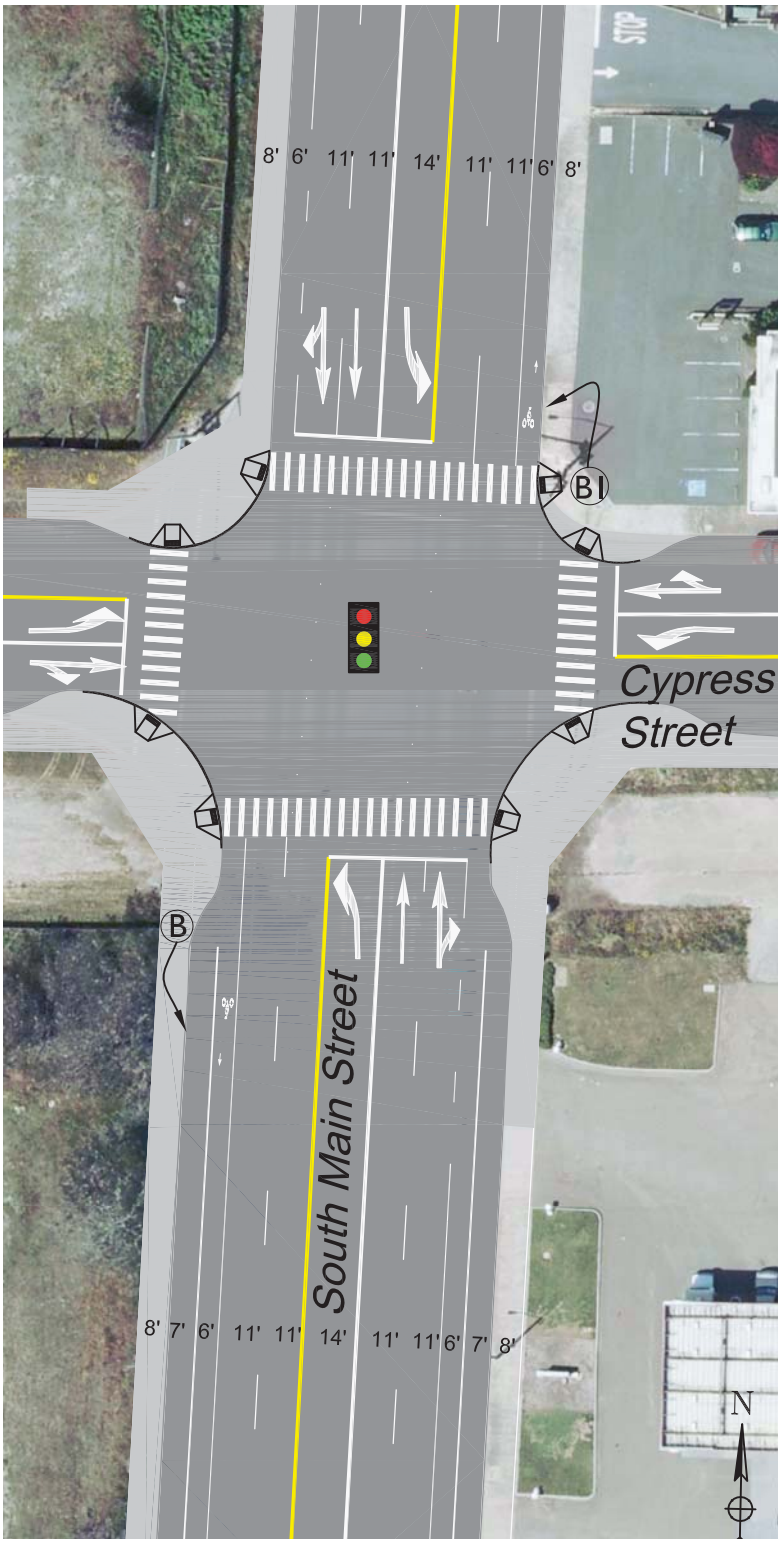
South Main at Cypress Street



Existing Conditions



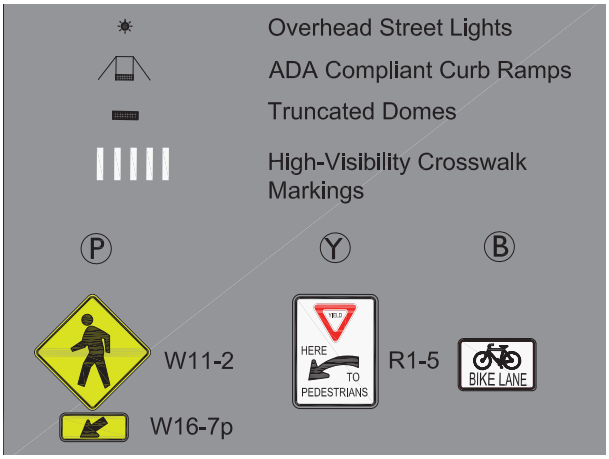
Signage, Lighting and Striping



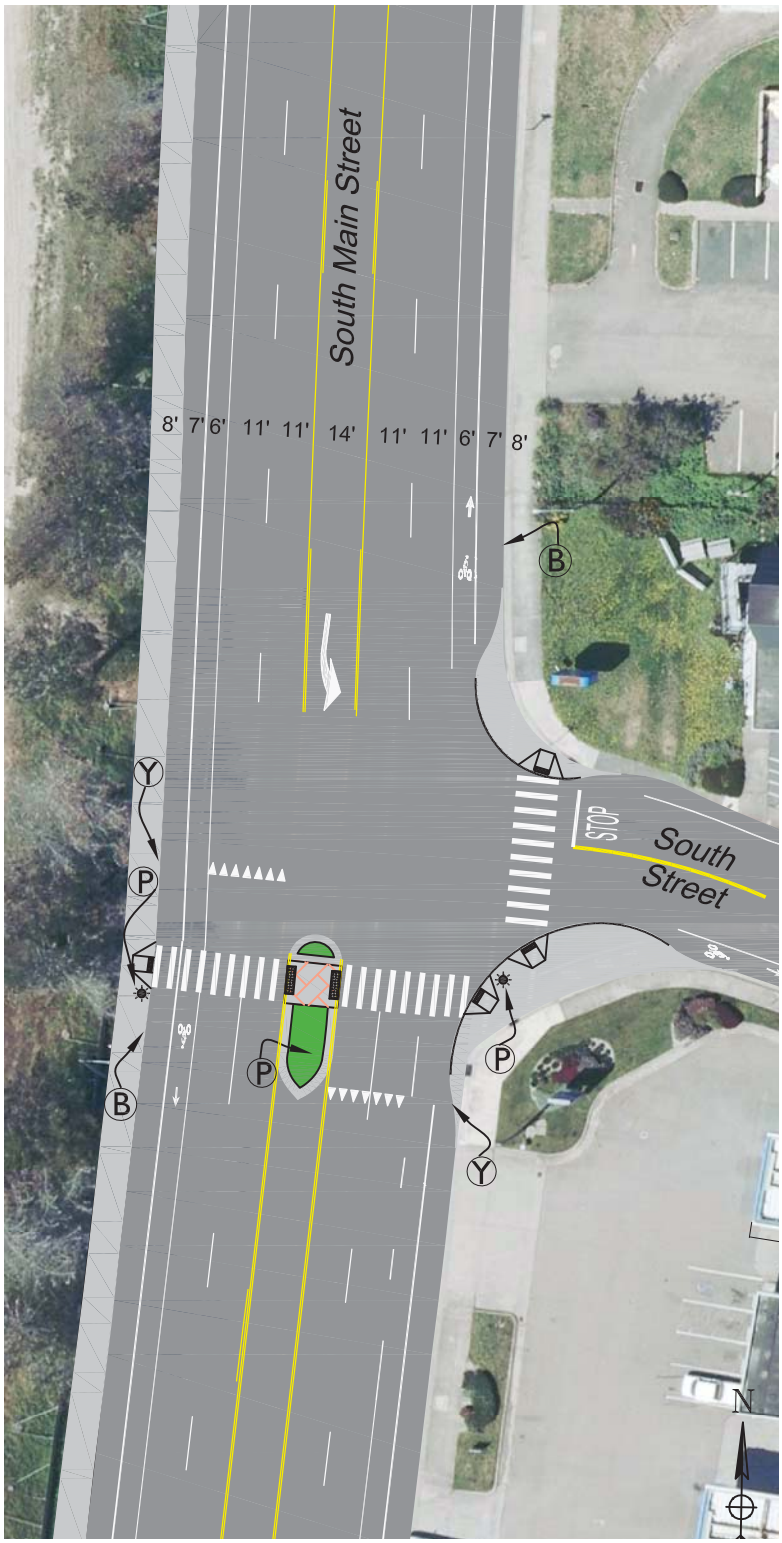
Proposed Intersection

South Main at South Street

Existing Conditions



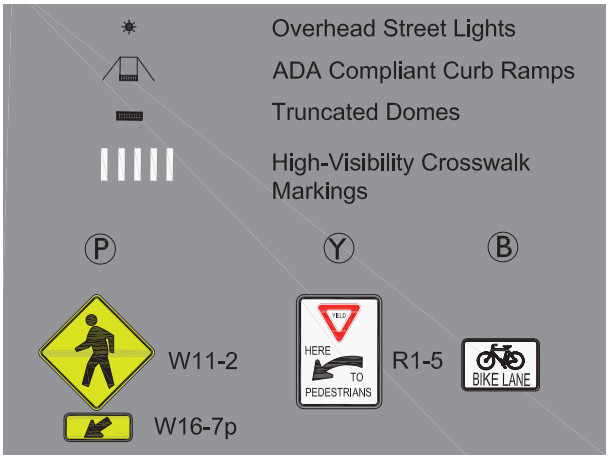
Signage, Lighting and Striping



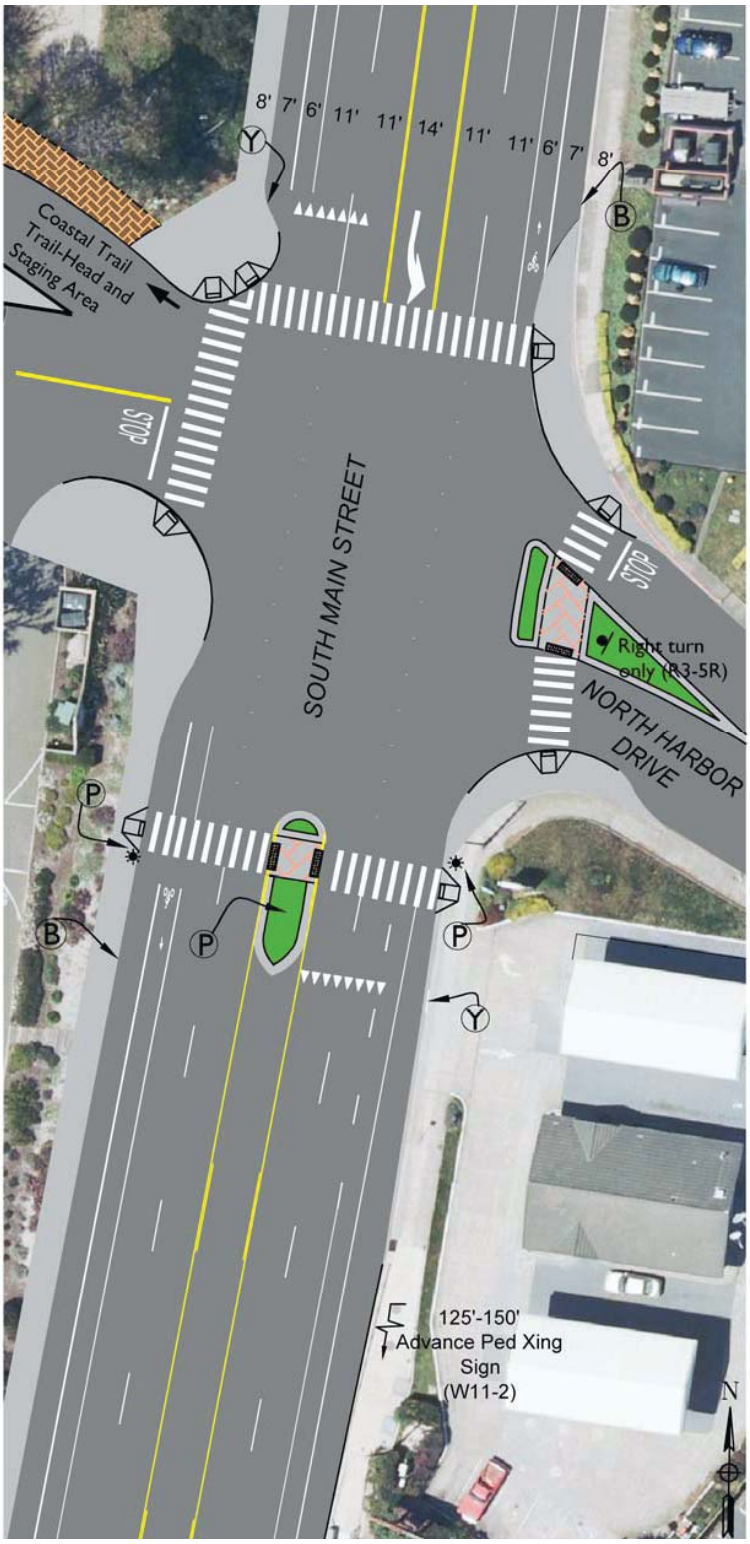
Proposed Intersection

South Main at North Harbor Drive

Existing Conditions



Signage, Lighting and Striping



Proposed Intersection

Harbor Access

During the workshop several residents expressed a desire to make the Noyo Harbor more visible and accessible to visitors and tourists. The Harbor provides a number of visitor amenities, including restaurants, outfitters, interesting historic fishery buildings and the Noyo Harbor beach park. From a regulatory and jurisdictional standpoint, however, the Harbor is in a difficult position. It is in the County rather than the City, within the Coastal Zone, and subject to a "Fishing Village" overlay, which hinders its revitalization and evolution.

North Harbor Drive currently provides primary automobile access into the Harbor. Access for pedestrians is limited as the roadway is narrow and its curvilinear configuration and steep grade make it challenging for bicyclists and pedestrians to negotiate. Despite these constraints, pedestrians and bicyclists regularly use North Harbor Drive to reach the Noyo Harbor and its many commercial and recreation destinations.

In addition, a pedestrian path runs just east of the Harbor Lite Lodge, beneath the Noyo Bridge, and winds along the bluff from North Harbor Drive down to the Harbor. This steep and narrow path is difficult to find, lacks handrails, and is unsuitable for bicyclists and/or those with mobility impairments. Lighting is also inadequate. Some residents expressed concerns with safety.

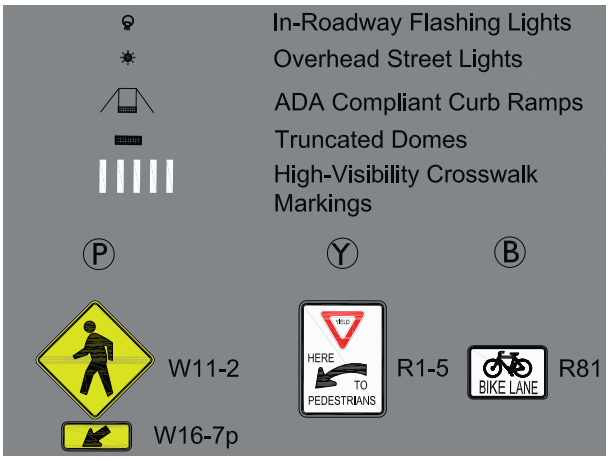
The Fort Bragg General Plan and Bicycle and Master Plan both call for long-term improvements to North Harbor Drive including widening to accommodate a sidewalk and a Class III bike route. To improve access along North Harbor Drive in the short term, shoulder edgelines be installed along with spot widening to carve out shoulder space along the edge of the road for pedestrians and bicyclists. Given North Harbor Drive's low traffic volumes and travel speeds, in locations where suitable sight distance exists, the center stripe could be removed to create additional shoulder space. The result would be a shared environment where edgelines or "suggestion lines" would create space for non-motorized modes. However, this space would still be available for use when large vehicles, trailers, and opposing traffic are present.

The City and the Harbor should work together to install coordinated signage directing visitors from South Main to the Harbor. This should be installed at or near the intersection of South Main and North Harbor Drive. More visible signage to the trail behind the Harbor Lite Lodge could also be installed along North Harbor in coordination with improvements to the roadway. The City could also consider partnering with the Harbor Lite Lodge to install and maintain lighting along the pedestrian path.

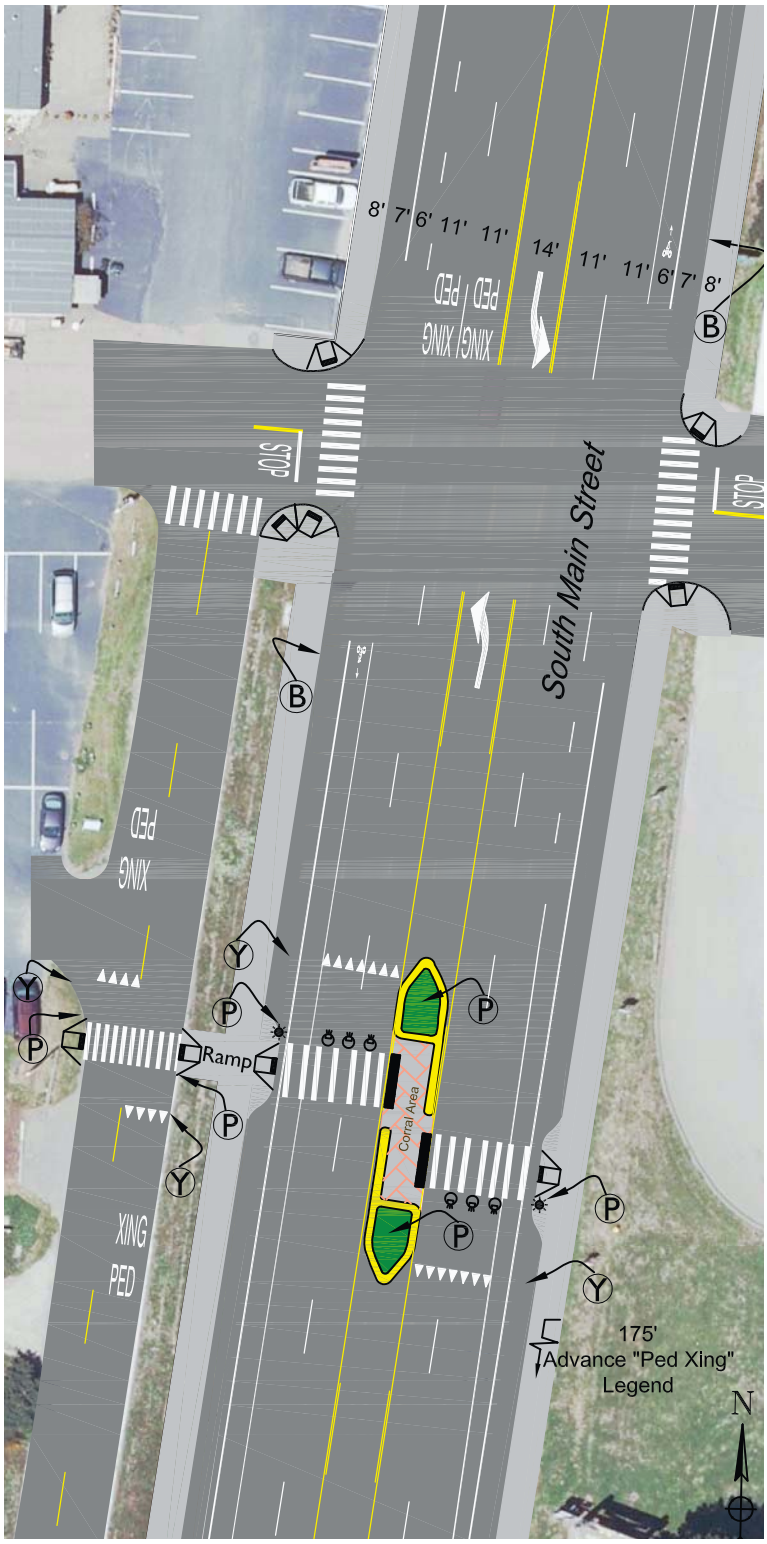
Above (from top to bottom): *Two views of the trail connecting North Harbor Drive to the Noyo Harbor; recent new investment in the Harbor.*

South Main South of Noyo Bridge

Existing Conditions

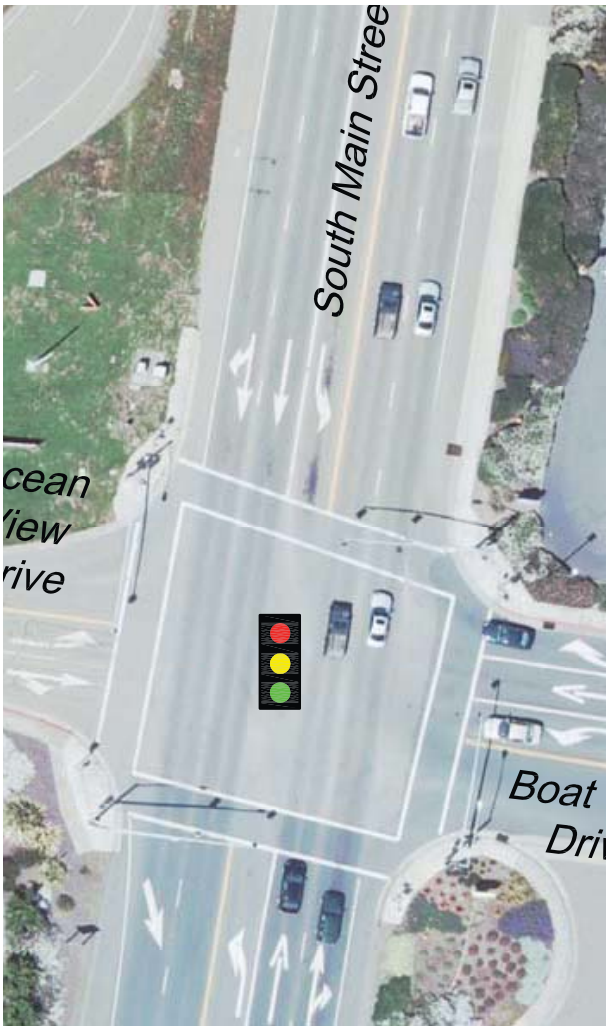


Signage, Lighting and Striping

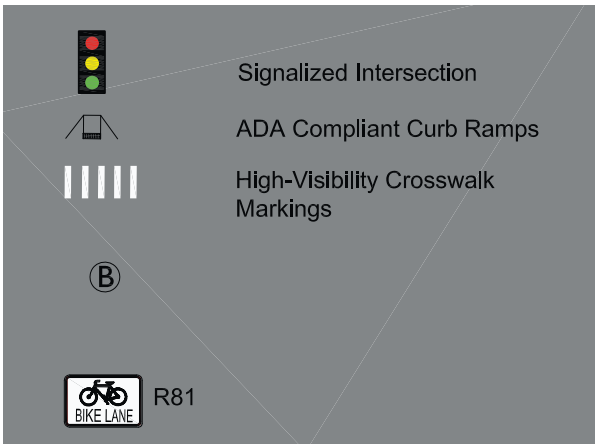


Proposed Intersection

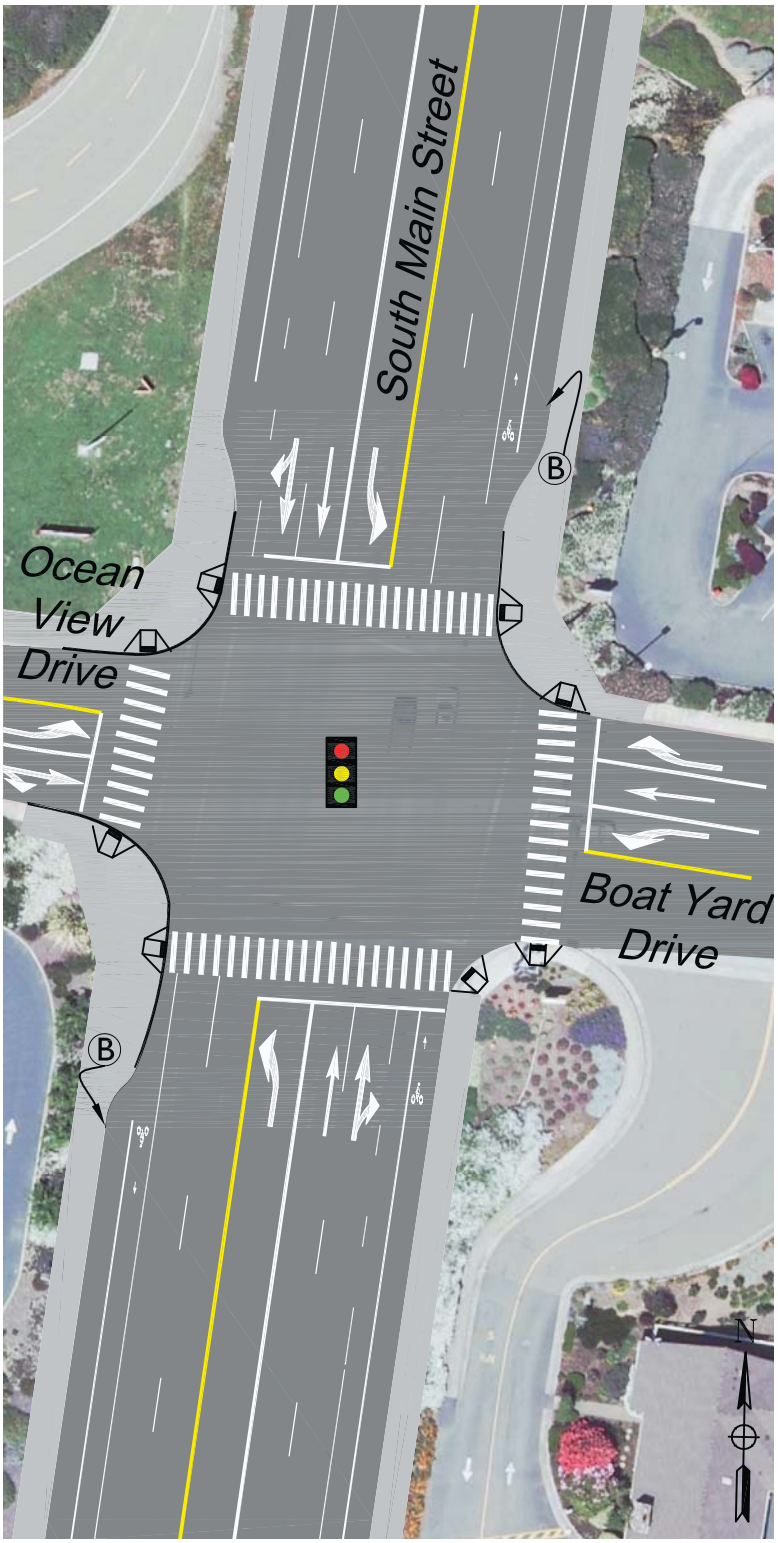
South Main at Ocean View/ Boat Yard Drive



Existing Conditions



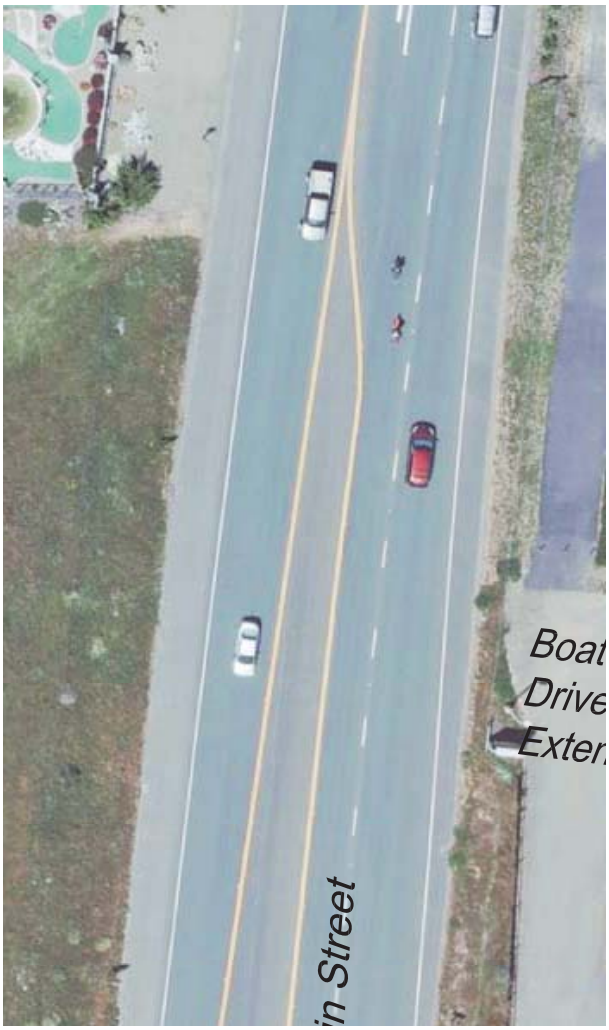
Signage, Lighting and Striping



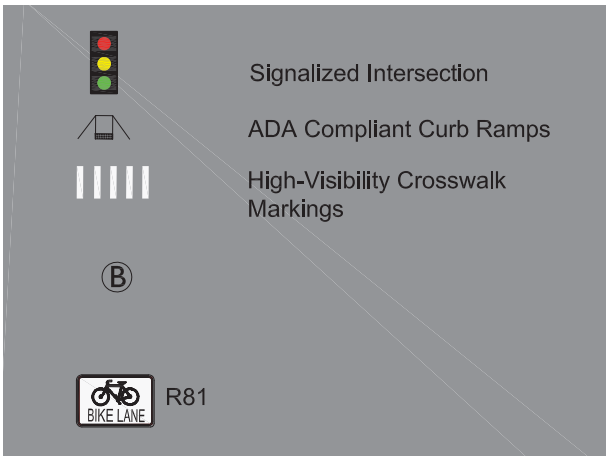
Proposed Intersection

South Main at New Street Extension

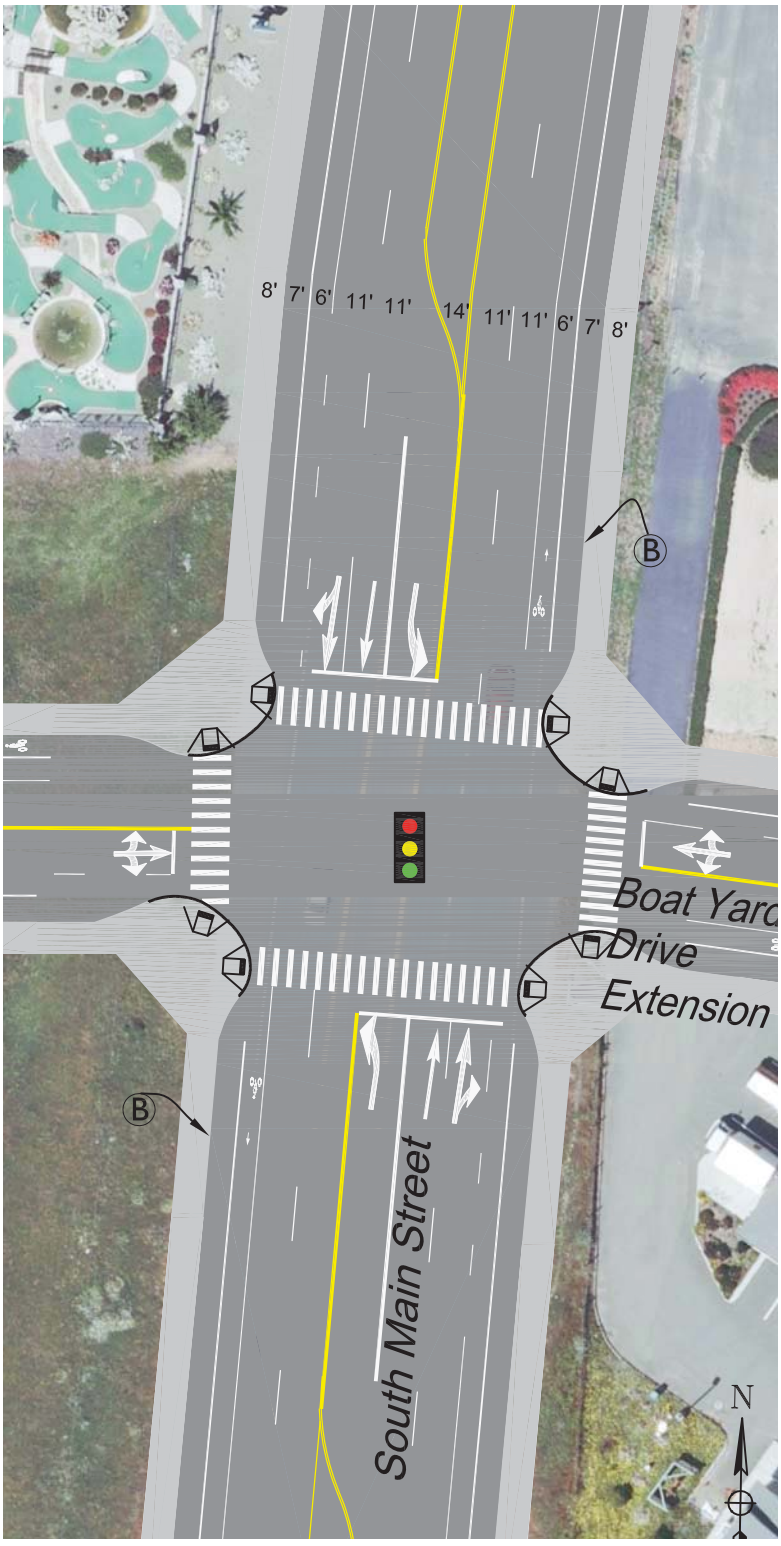
(Subject to Review and Approval by Caltrans and Property Owners)



Existing Conditions

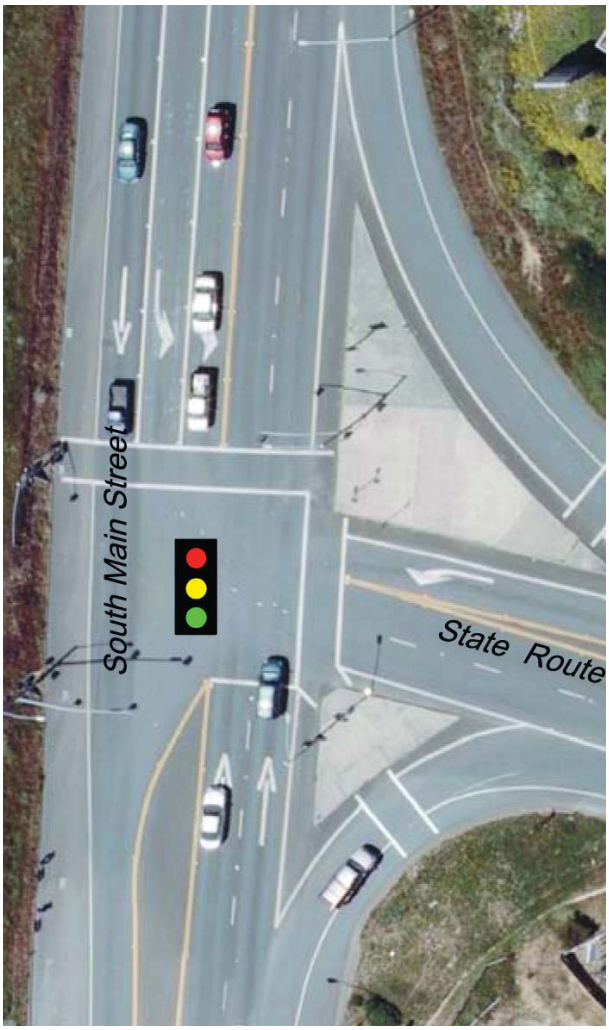


Signage, Lighting and Striping

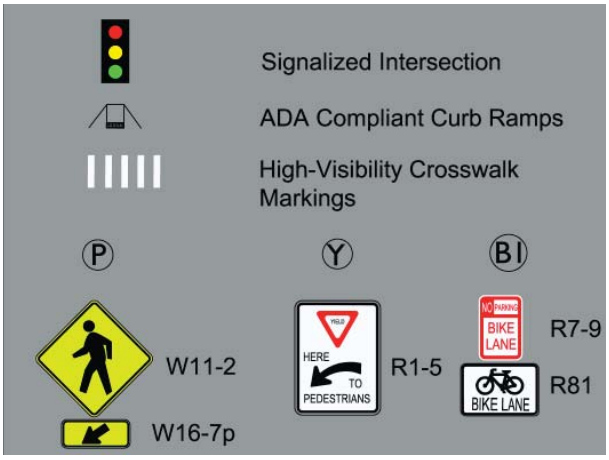


Proposed Intersection

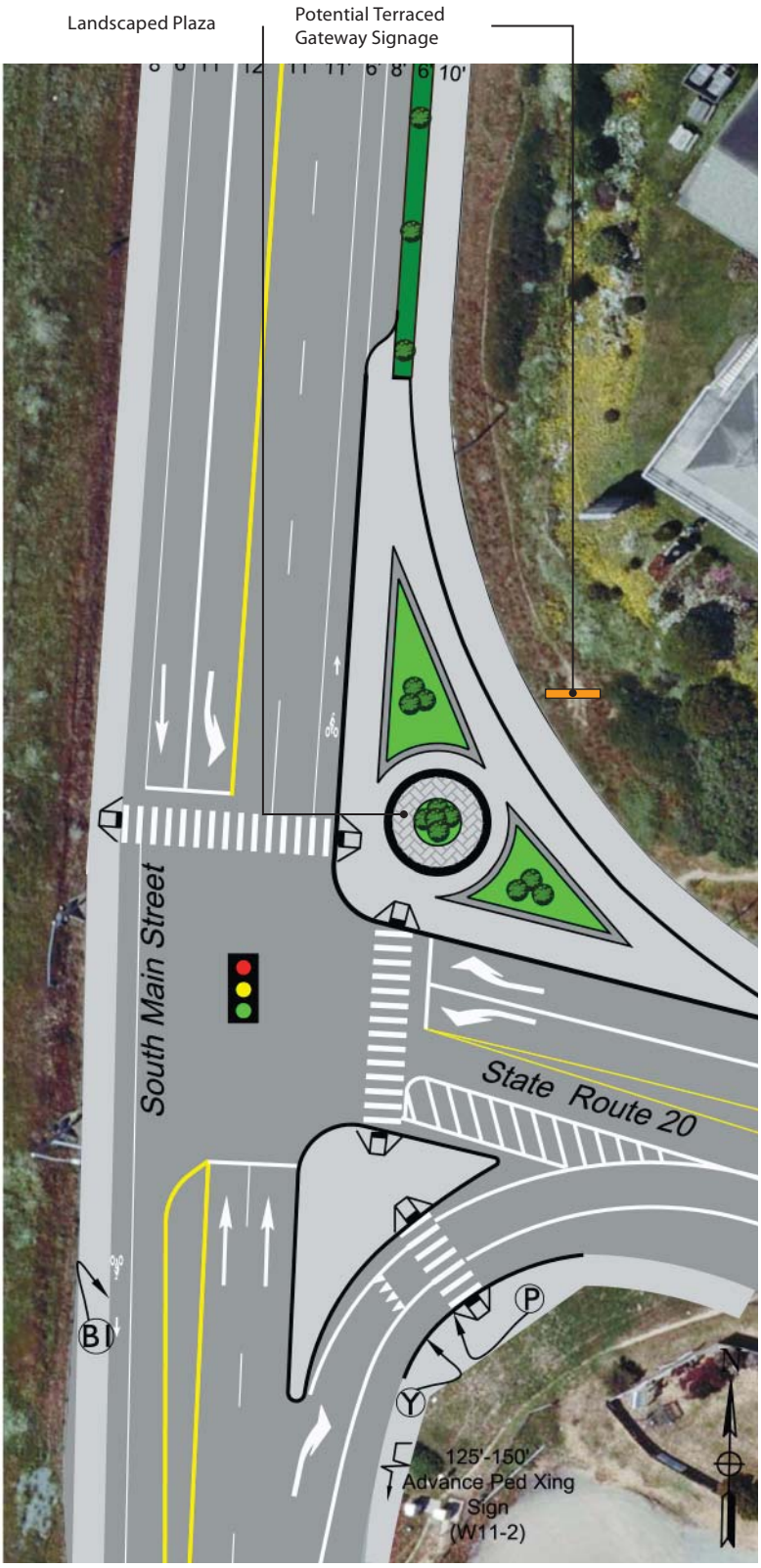
South Main at State Route 20



Existing Conditions



Signage, Lighting and Striping



Proposed Intersection

Gateway Concepts

Preferred Gateway Structure Precedent (Upper Lake, CA)

Preferred Signage Materials & Form (Downtown)

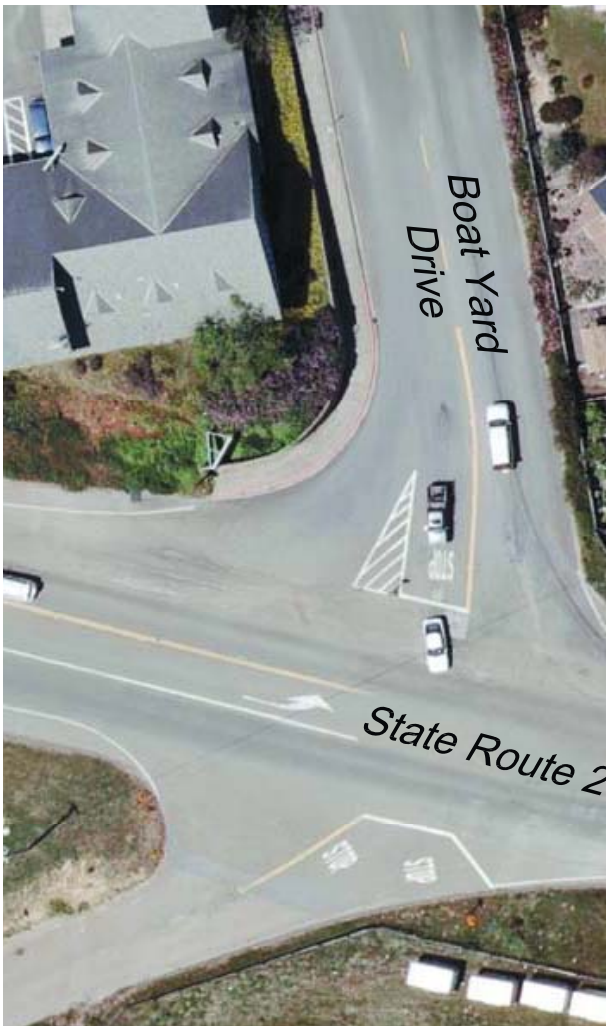
Preferred Signage Materials & Form (Downtown)

Preferred Gateway Signage & Landscaping (Solana Beach, CA)

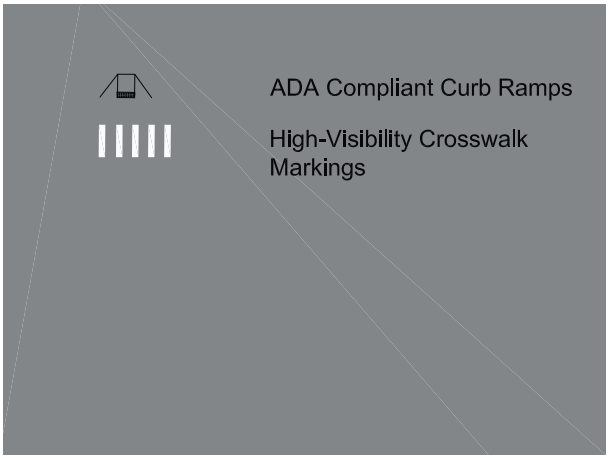
Preferred Gateway Landscaping (La Jolla, CA)

This page: *High-quality Gateways at Cypress and SR20 should be established. During the workshop appropriate materials and treatments for gateways were discussed. At Cypress Street, a gateway structure with a strong vertical element should be considered. The Upper Lake, CA precedent scored high during the community image survey, however the central span would be much more difficult to achieve across South Main. Gateway signage should incorporate high-quality, natural materials and hand-painted lettering. At SR20, a new gateway sign could be implemented together with a terraced landscape feature that takes advantage of the slope at the base of the Boatyard Shopping Center. Such a composition should incorporate native plantings and signage made from high-quality, natural materials.*

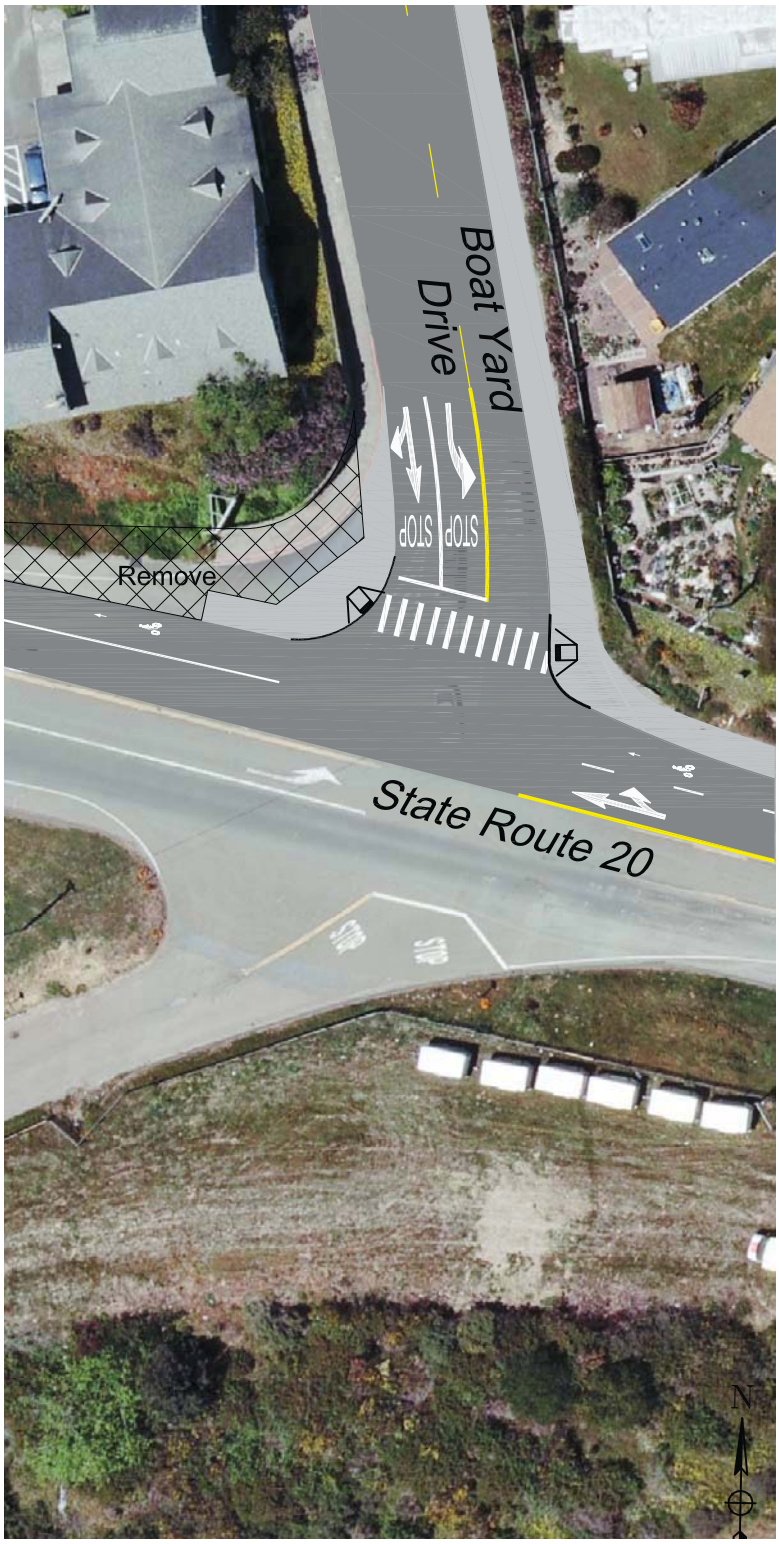
State Route 20 at Boat Yard Drive



Existing Conditions



Signage, Lighting and Striping



Proposed Intersection

Hare Creek Bridge

The Hare Creek Bridge is located on SR 1 at Fort Bragg's southern city limit. While the bridge is located within the County of Mendocino just outside of the project study area, it is an important link for bicyclists and pedestrians connecting between the City of Fort Bragg and destinations south of the City.

The bridge is a concrete arch structure that was constructed in 1947, and spans approximately 380 feet over Hare Creek. It has a paved width of approximately 25 feet with narrow 2-3 foot raised concrete sidewalks adjacent to the travel lanes; which are typical of structures from that era. The posted speed limit in the vicinity of the bridge is currently 45 mph. While variable width shoulders ranging from approximately 4 to 10 feet are provided on the approaches to the bridge, the sudden narrowing of the roadway forces all modes of traffic to merge together over the bridge. High travel speeds, narrow travel lanes, no shoulders, commercial trucks, rough surface conditions, and high curbs all combine to create considerable safety concerns for bicyclists. Bicycling across the Hare Creek Bridge is at best, difficult for seasoned riders, but it is a barrier for others. With narrow sidewalks adjacent to high speed traffic, conditions for pedestrians are also poor.

For optimum bicyclist safety and the reduction of conflicts, bridge shoulders should be widened enough for cyclists to ride safely outside of the traffic lane. All planned bridge replacement projects should incorporate a 4 to 10' shoulder area (sized to match the maximum roadway and approach width possible for that site within the life of the bridge.) Since widening the structure is likely infeasible, and no replacement is currently planned, the following measures should be considered to enhance safety for bicyclists and pedestrians:

- Warning signs such as "Narrow Bridge" (W5-2), "Share the Road" (W16-1), or a custom vehicular sign plaque such as "Watch for Bicycles."
- Additional safety measures could include reduced speed limits and supplemental radar speed feedback signs and/or bicycle or pedestrian activated flashing beacons.

Above: *Two views of the Hare Creek Bridge from the north.*

Alternative Design Concepts

Road Diet

Council also discussed the concept of completing a "road diet" for portions of the corridor, and determined that it should be included as an alternative for consideration. In addition to the previously listed pedestrian and bicycle improvements, this option would reduce the current number of lanes from 5 to 3, with one travel lane in either direction, and a central turning lane. The road diet could be implemented between Oak Street and Ocean View Drive, or could be extended one block south to a new intersection between Ocean View and Highway 20. It would free up enough space in the right-of-way to allow for a continuous planter strip to be implemented along the sidewalk edge (providing a buffer for pedestrians from the roadway) as well as the Class I multi-use path along the corridor's western edge.

With a road diet, Council expressed concern over a 3-lane section with a raised median that might hinder emergency access along the corridor. This alternative thus illustrates a 3-lane section with a central turning lane that can be utilized as an alternative route for emergency vehicles.

The road diet may also present problems with regards to Level of Service. As discussed in Chapter 3, preliminary analysis of the May 2010 land use projections for the Mill Site at build-out demonstrated a drop in Levels of Service to "E" or "F" at multiple points along the corridor, below the City's current standards as set by the 2008 General Plan Circulation Element. In the event that the City chose to pursue a road diet, additional traffic analysis would be necessary to study potential modifications to the surrounding street network that might affect Level of Service along the corridor.

Class I Path

A Class I path along the west side of the highway connecting to the future Coastal Trail and the Pomo Bluffs trails was strongly supported during the workshop activities as well as by Council. The design team explored an alignment that would extend from near Maple Street south to Highway 20.

With a road diet, a Class I path can be accommodated within the available right-of-way. In the event that a road diet is not pursued, the Class I path could still be accommodated on Mill Site property. South of Ocean View Drive, existing right-of-way maps suggest that the roadway widens from approximately 100' to 110'. Although unconfirmed at the time of writing, this would allow the Class I path to extend all the way to Highway 20 and connect with the Hare Creek beach trail.

Roundabouts

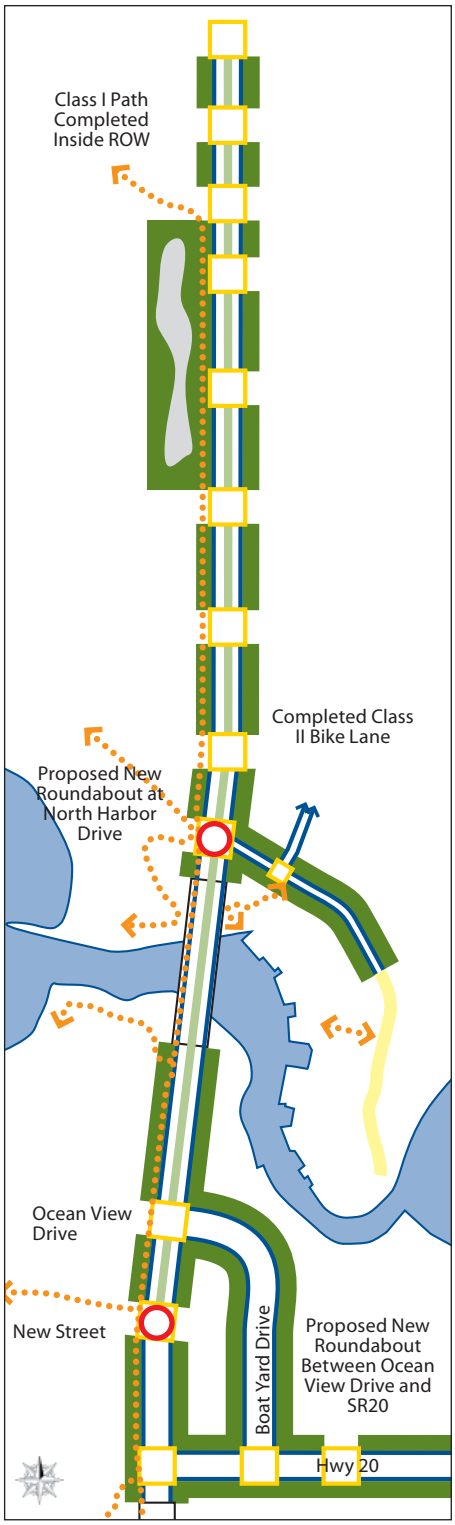
Roundabouts would work well with a 3-lane cross section at two or more points along the corridor to improve overall traffic flow and to maintain reduced vehicle speeds to levels that facilitate pedestrian crossings. Preliminary analysis indicated that a roundabout north of the Noyo Bridge (at North Harbor Drive) would help to relieve demand and maintain an acceptable level of service at the South Main - Cypress intersection. It would also facilitate safe turning movements between South Main, North Harbor Drive, and Noyo Point Road. Such a roundabout may need to be in a modified double lane configuration in order to accommodate turning movements.

A second roundabout south of the Noyo Bridge (either at Ocean View/Boatyard Drive or at a new east-west street between Ocean View/Boatyard Drive and Highway 20) could also be implemented at or near the point where the roadway would narrow from a 5-lane section to a 3-lane section. Such a roundabout could facilitate turning movements into future development both east and west of the corridor.

Alternative Design Concept

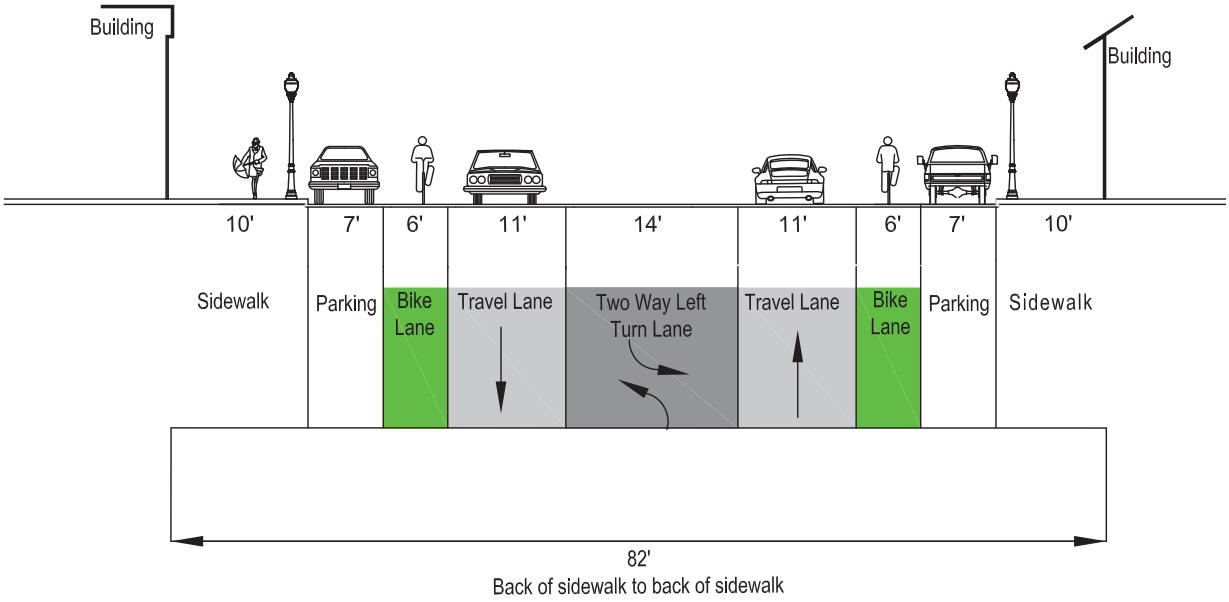
Above: *Road diet to 3 lanes between Oak Street and Ocean View Drive.*

Above: *Reduce speeds to 35 mph between Simpson Lane and Ocean View Drive, 30 mph to Madrone Street, and 25 mph to Oak Street.*



Above: *Complete sidewalks, Class II bike lanes, and Class I path on west side of roadway; Potential roundabouts at North Harbor Drive and south of Ocean View Drive.*

Oak Street to Maple Street

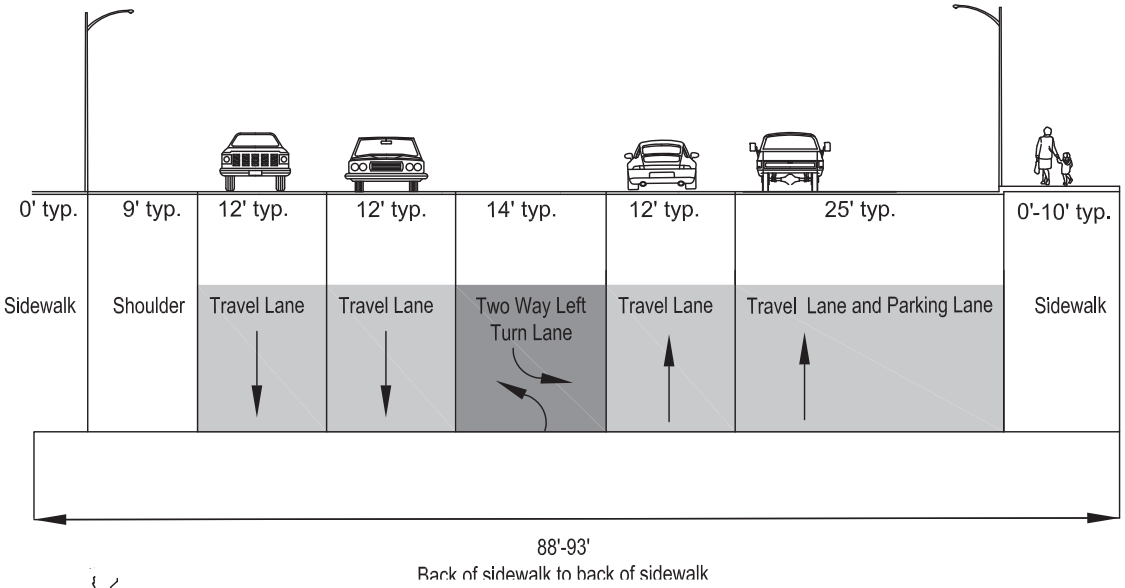


***Above**: Proposed road diet cross section between Oak Street and Maple Street (looking north), with one travel lane in either direction, a central two-way turn lane, widened bicycle lanes, sidewalks, and on-street parking.*

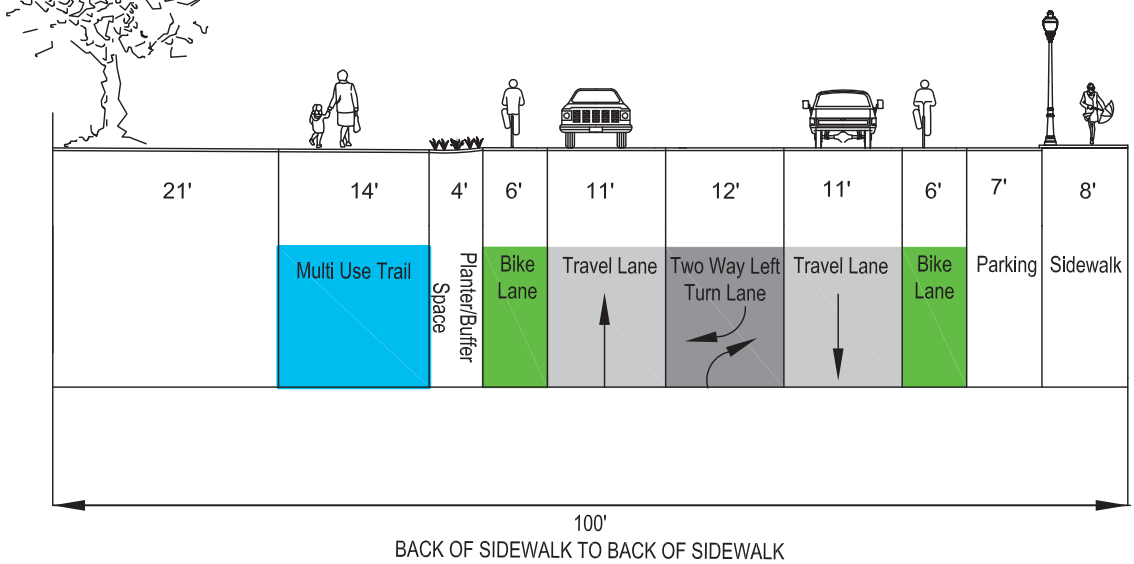
3-Lane Section: Charlotte, NC

3-Lane Section: Kirkland, WA

Maple Street to North Harbor Drive

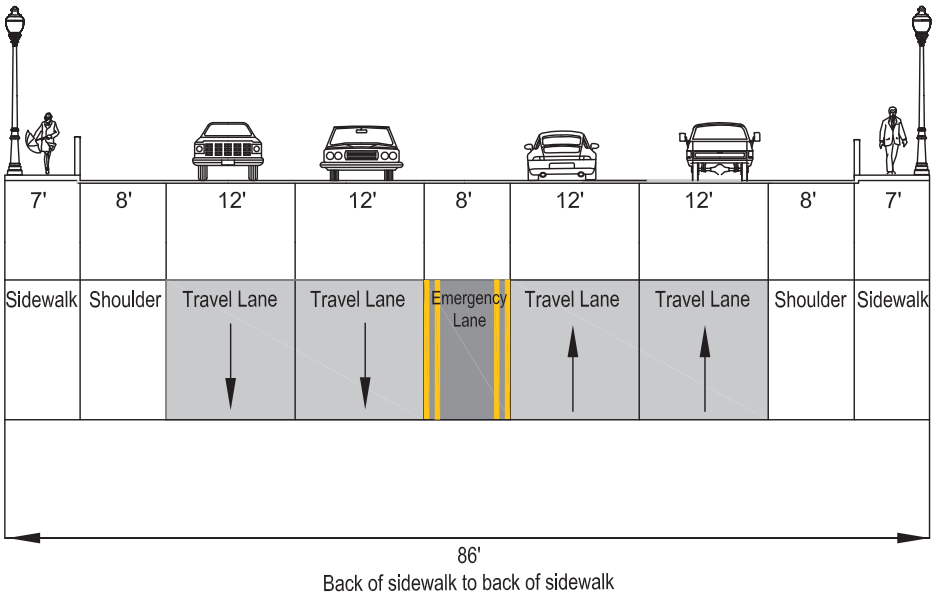


***Above**: Existing conditions along South Main between Maple Street and North Harbor Drive (looking north).*

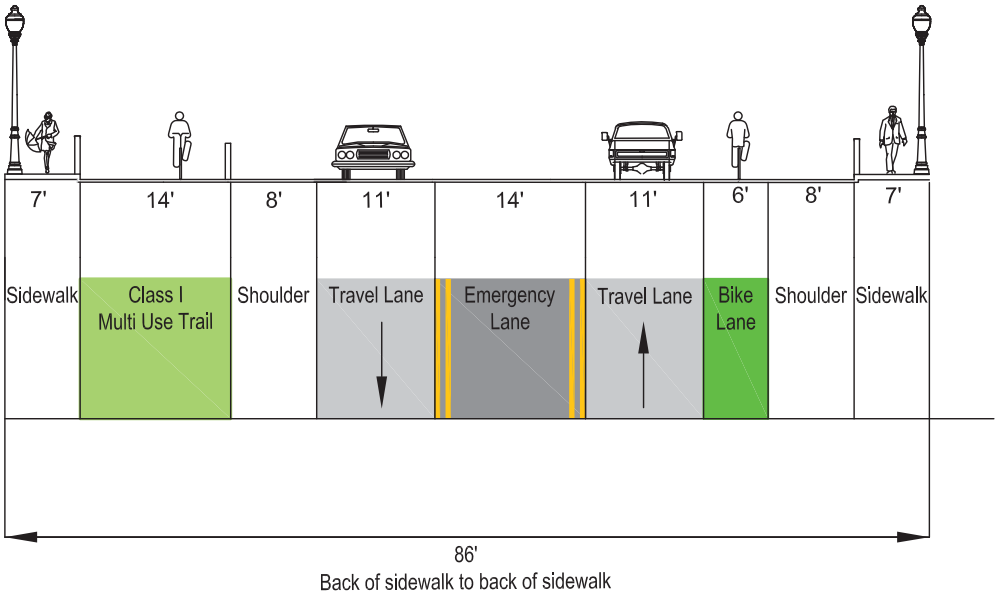


***Above:** Road diet alternative with one travel lane in either direction, a central two-way turn lane, widened bicycle lanes, on-street parking, sidewalks, and a Class I Path on west side of roadway.*

Noyo Bridge

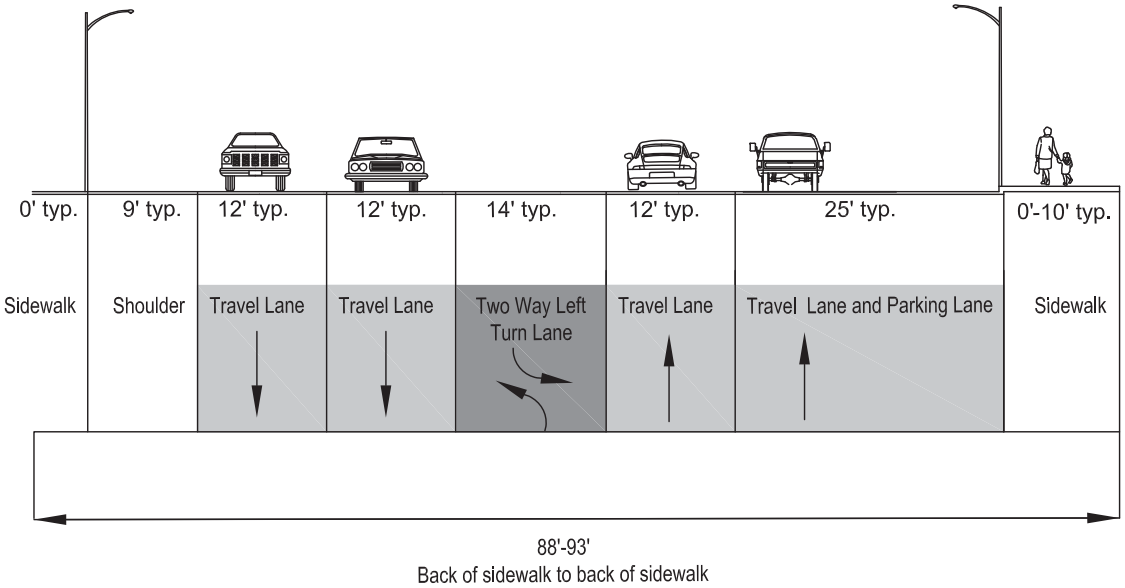


***Above**: Existing conditions on the Noyo Bridge (looking north).*

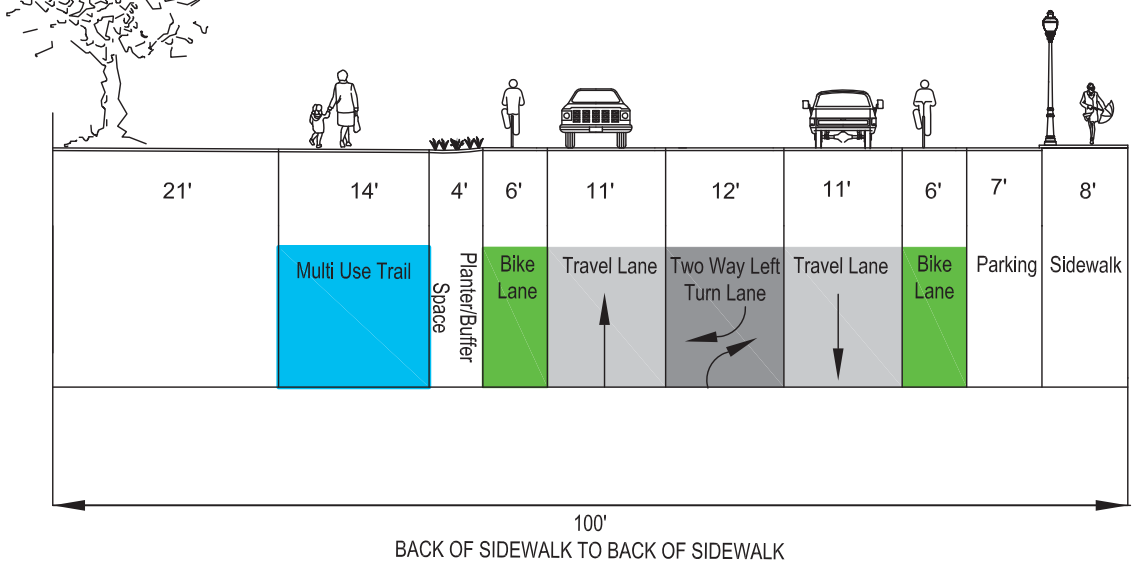


***Above:** With a road diet, the Noyo Bridge could integrate a Class I "Promenade" along the west side of the bridge that could become a significant amenity and attraction for tourists. A central lane would be retained for emergency vehicles.*

South of Noyo Bridge to Ocean View Drive

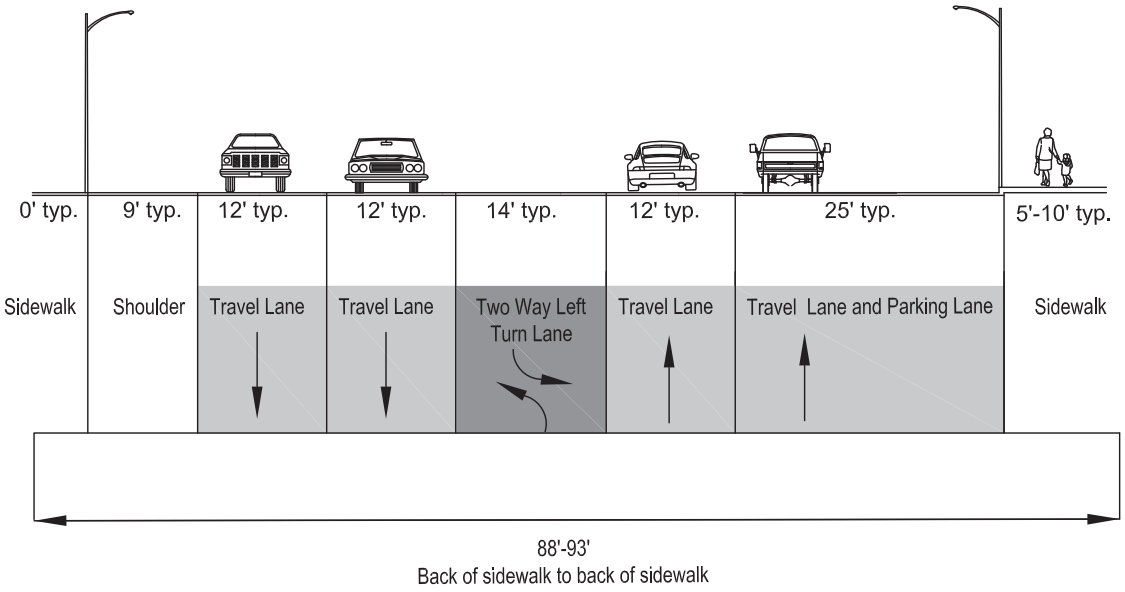


***Above**: Existing conditions along South Main south of the Noyo Bridge to Ocean View Drive (looking north).*

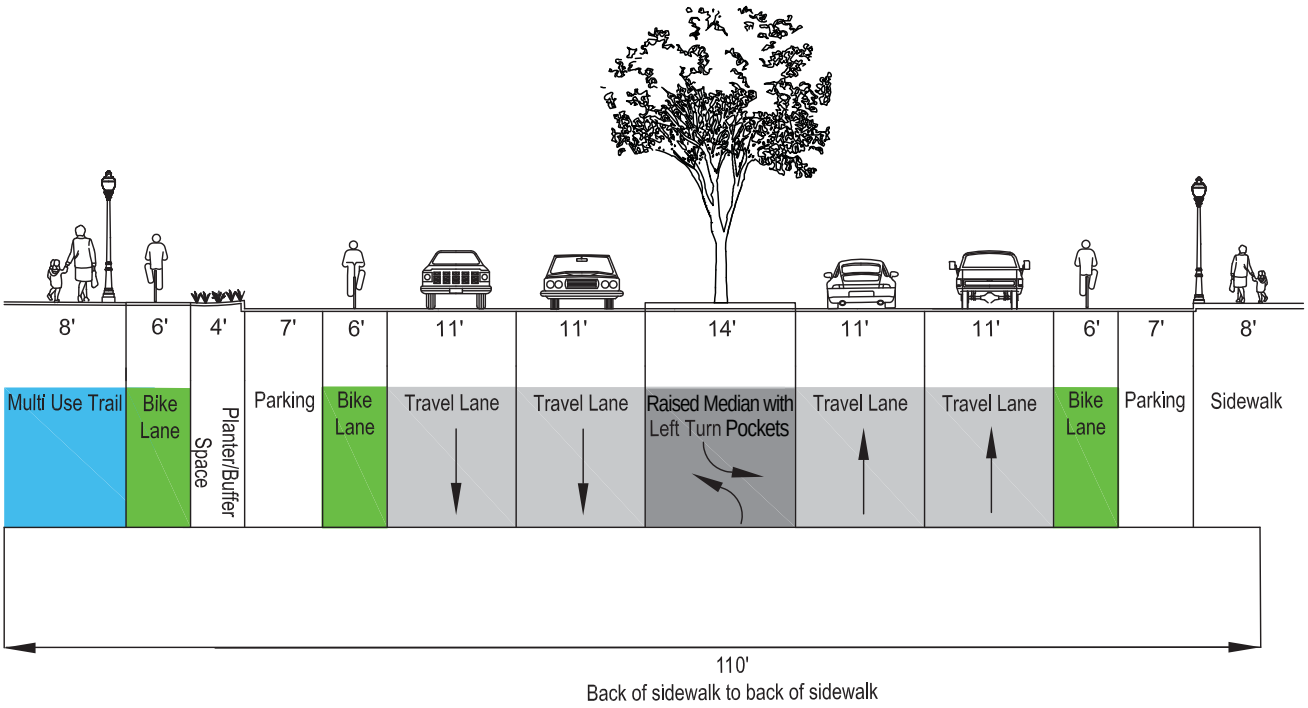


***Above:** Road diet alternative with one travel lane in either direction, a central two-way turn lane, widened bicycle lanes, on-street parking, sidewalks, and a Class I Path on west side of roadway.*

Ocean View Drive to Highway 20

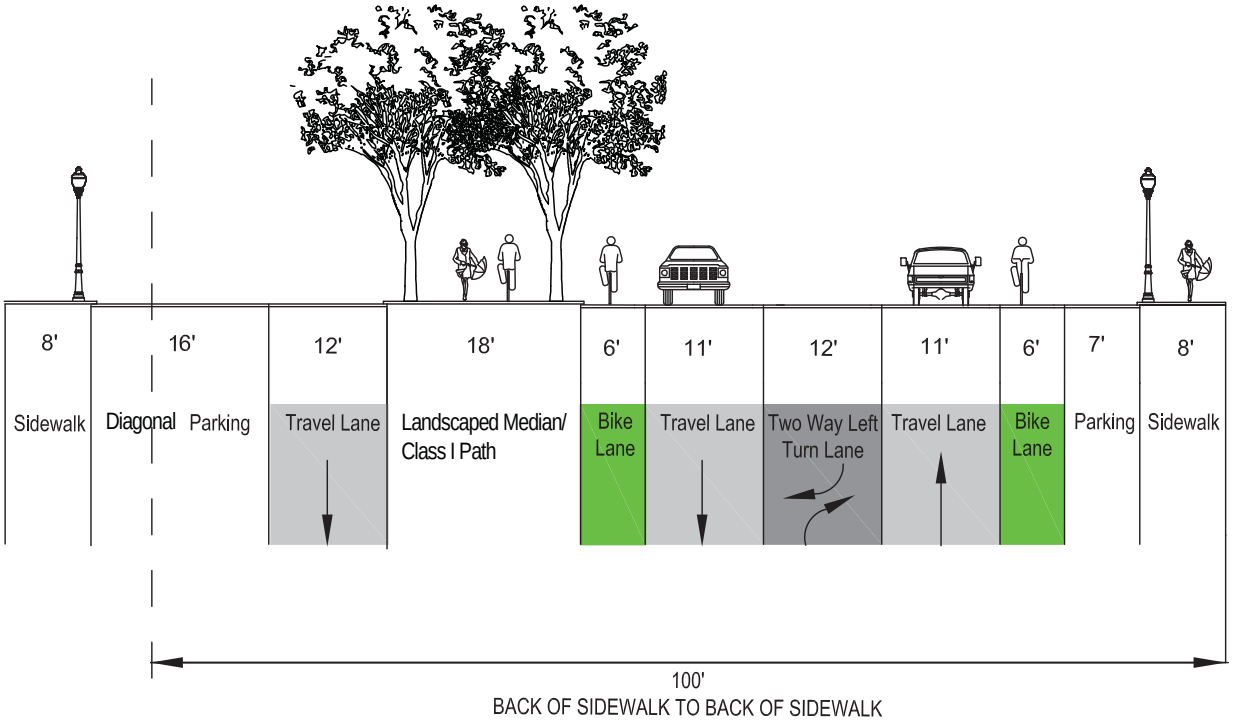


***Above**: Existing conditions along South Main between Ocean View Drive and Highway 20 (looking north).*



***Above:** The Class I path could be continued along this section, using an existing easement along the west side of the roadway.*

Frontage Road Concept



***Above**: Proposed section concept (looking north) illustrating a frontage road on the west side of the roadway.*

Frontage Road

During the workshop the design team also explored the possibility of implementing a frontage road condition along the west side of the corridor between Chestnut Street and North Harbor Drive. A frontage road could provide consolidated access management for future properties on the Mill Site and would invariably help to unify landscaping and frontage as new development occurs. It would also help to provide redundancy in the traffic network and could even assist with emergency response.

South of the Noyo Bridge a similar configuration could be implemented along the west side of the highway.

The Class I path could run along a landscaped median between the frontage road and the roadway, minimizing conflict between bicyclists and vehicles entering and exiting driveways. Preliminary studies illustrated a one-way frontage road with parallel parking spaces, and a new sidewalk edge to which new properties would develop.

Such a frontage road would require additional right-of-way to be secured on the Mill Site. This could be accomplished on a future, parcel-by-parcel basis, through a setback requirement that would stipulate standards and requirements for the frontage road.

Frontage Road in Cathedral City, CA

Frontage Road in Cathedral City, CA

Long Term Vision: North of Noyo Bridge

New Frontage Road along Western side of South Main

Central Landscaped Median with Turn Lanes at Intersections

Class I Multi-Use Trail in Frontage Road Median

High Visibility Crosswalks at all Intersections

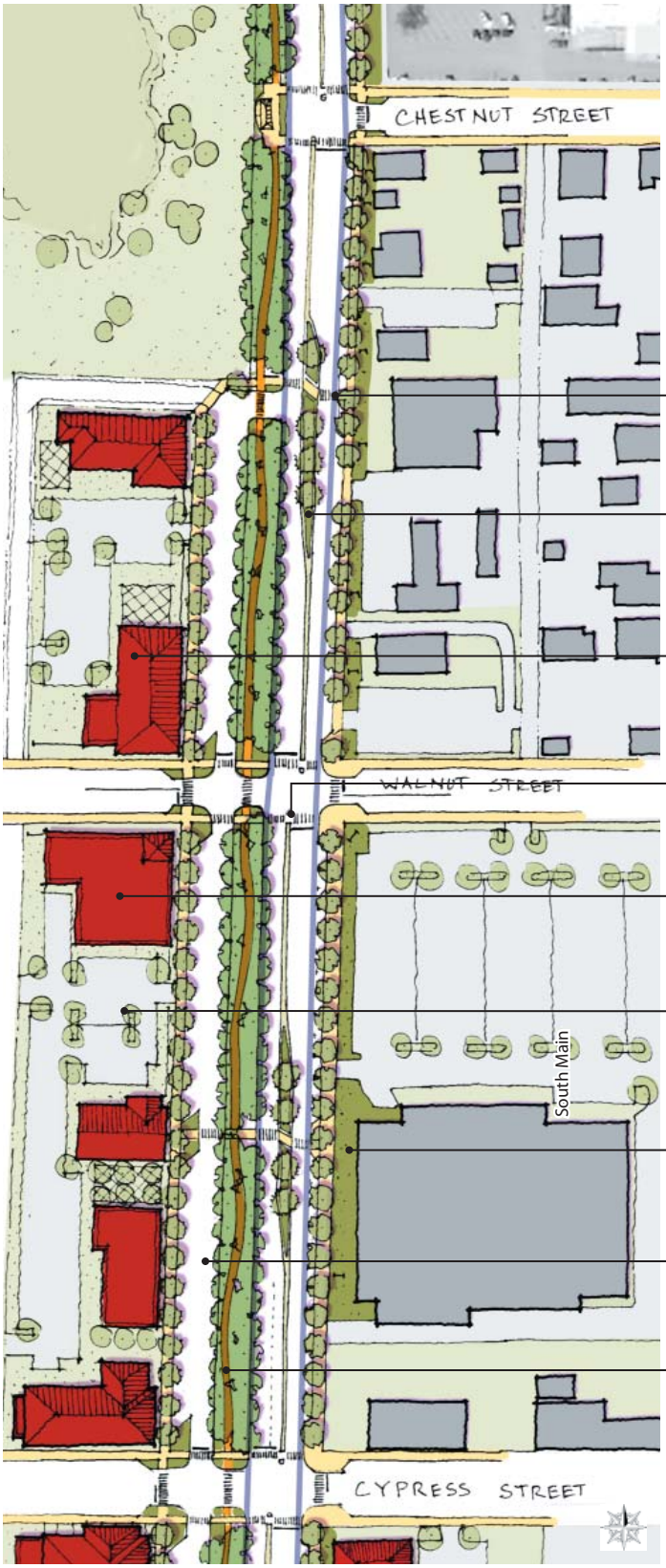
New Commercial/ Mixed-Use Infill

Future Development Blocks on Mill Site

Future Street Connections on Mill Site

Future Multi-Use Trail and Connection to Beach

Sidewalks Connecting to Noyo Harbor Trail



Class I Multi-Use Trail within Existing ROW

Central Landscaped Median with Turn Lanes at Intersections

New Commercial/ Mixed-Use Infill

High Visibility Crosswalks with Stop Bars at all Intersections

New Commercial/ Mixed-Use Infill

New Parking Lots Behind, or to the Sides of Buildings

Landscaping and Signage Setback "Yard" along South Main

New Frontage Road along Western side of South Main

Class I Multi-Use Trail in Frontage Road Median

Long Term Vision: South of Noyo Bridge

Multi-Use Promenade Along Noyo Bridge

Trail Connections to Harbor

New Potential Street Connections

Central Landscaped Median with Turn Lanes at Intersections

Potential New Frontage Road along Western side of South Main

High Visibility Crosswalks with Stop Bars at all Intersections

Class I Multi-Use Trail in Frontage Road Median

New East-West Street (Subject to Review and Approval by Caltrans and Property Owners)

Bicycle and Pedestrian Connections along Boat Yard Drive

New Gateway Signage at South Main and Highway 20

Pedestrian Connections to Holiday Inn

Hare Creek Bridge vImprovements

chapter 5 Design Guidelines & Recommendations

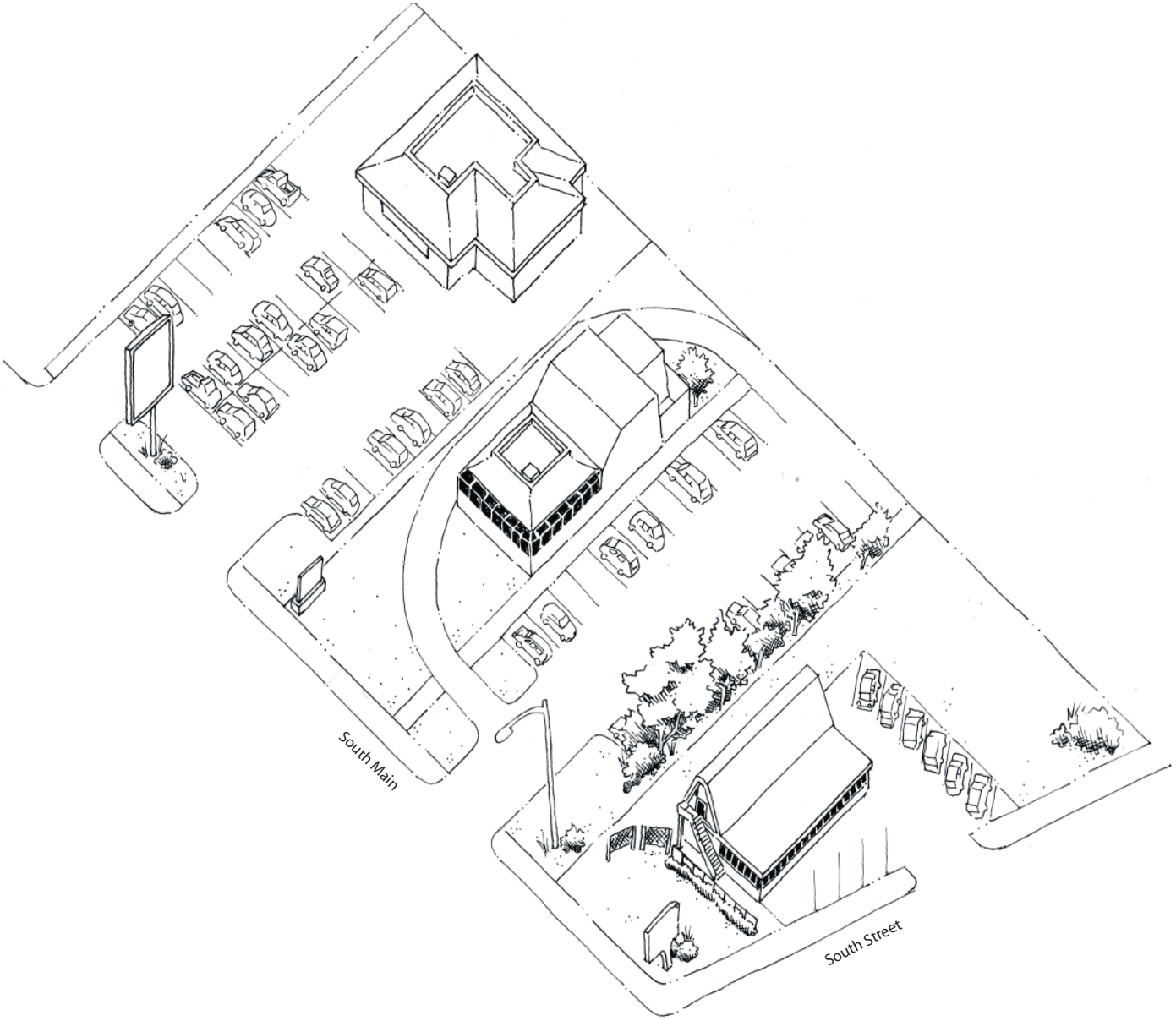
The properties along South Main within the project area play an important role in defining the overall character of the corridor. During the workshop activities the design team looked at many ways that the private components of the area could be improved and revitalized.

Pedestrian improvements to South Main, including new and wider sidewalks, new landscaping, lighting, and street trees, will invariably help to make the area more walkable. Most of the private development in the project area, however, is not necessarily conducive to pedestrian activity. Buildings are set back far from the street, often behind parking lots with little or no pedestrian amenities. Frequent curb cuts interrupt pedestrian flow. Signage, lighting, and other elements are scaled to be seen from a moving car rather than on foot. Many of the buildings in the area are also in need of renovation or revitalization, with outdated facades and architectural styles not necessarily in keeping with many residents' preferences.

The quality of design is also poor, with mismatched, non-conforming signage, and deteriorated or non-existent landscaping.

There is currently not much incentive to renovate or redevelop properties along the corridor. Existing zoning regulations for Highway Commercial and General Commercial have a relatively low FAR requirement and a high parking requirement. Most of the lots in the project area are thus "built out" unless zoning changes were considered. Under current regulations, new development will likely occur very slowly, as buildings become obsolete and turn over to new investment. When this does occur, new development will replicate the building forms of existing development unless changes to the zoning code are contemplated.

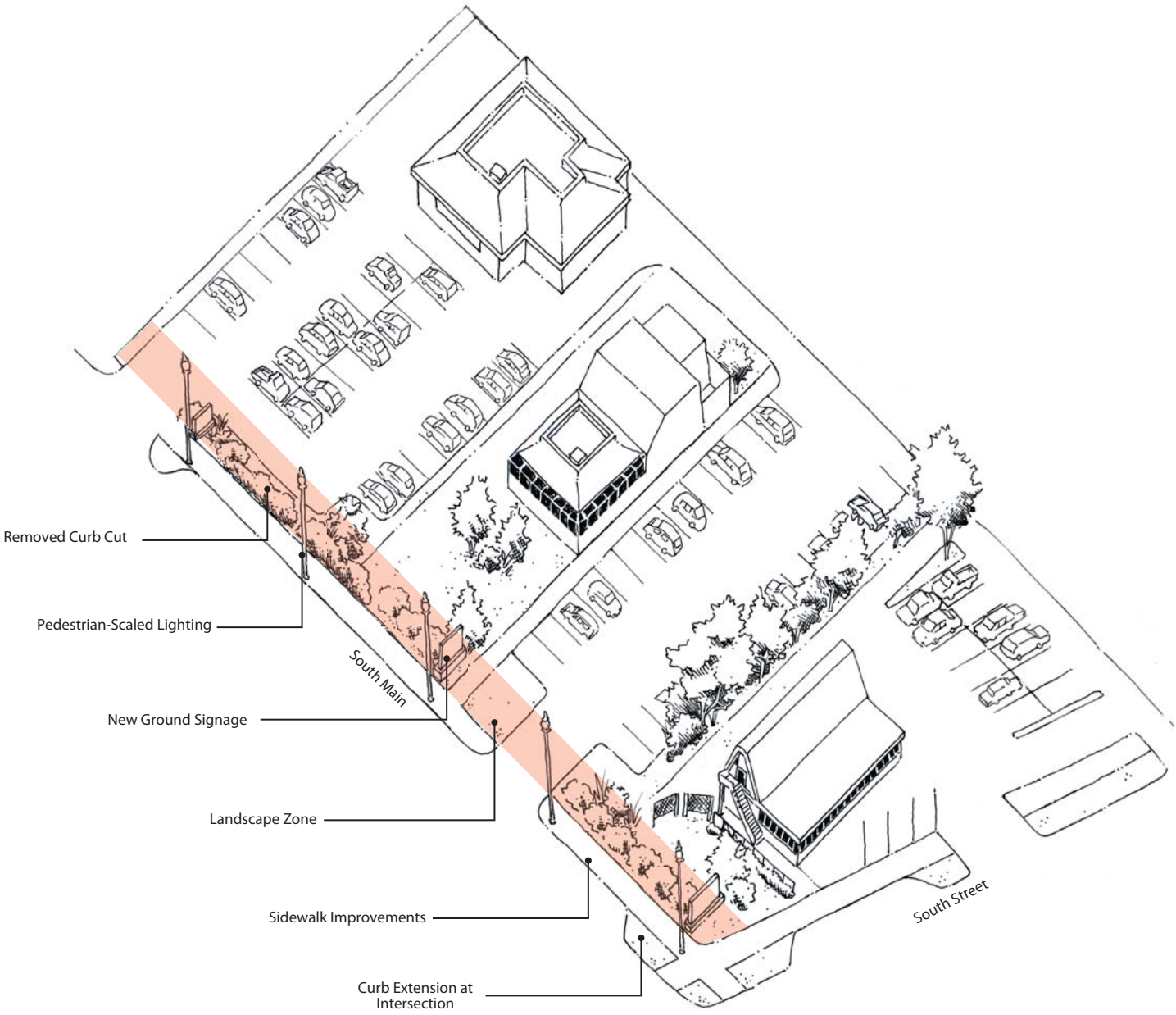
In light of these conditions the design team focused on ways that properties along the corridor could change over time through small-scale, incremental improvements, as well as potential changes to zoning and design regulations.



Existing Conditions

The design team focused on three properties at the northeast corner of South Main and South Street, including the Home Style Cafe, the New Best Buffet, and Round Table Pizza. The existing parcels have multiple driveways, inconsistent (and at times nonconforming) landscaping and signage, and varied setbacks.

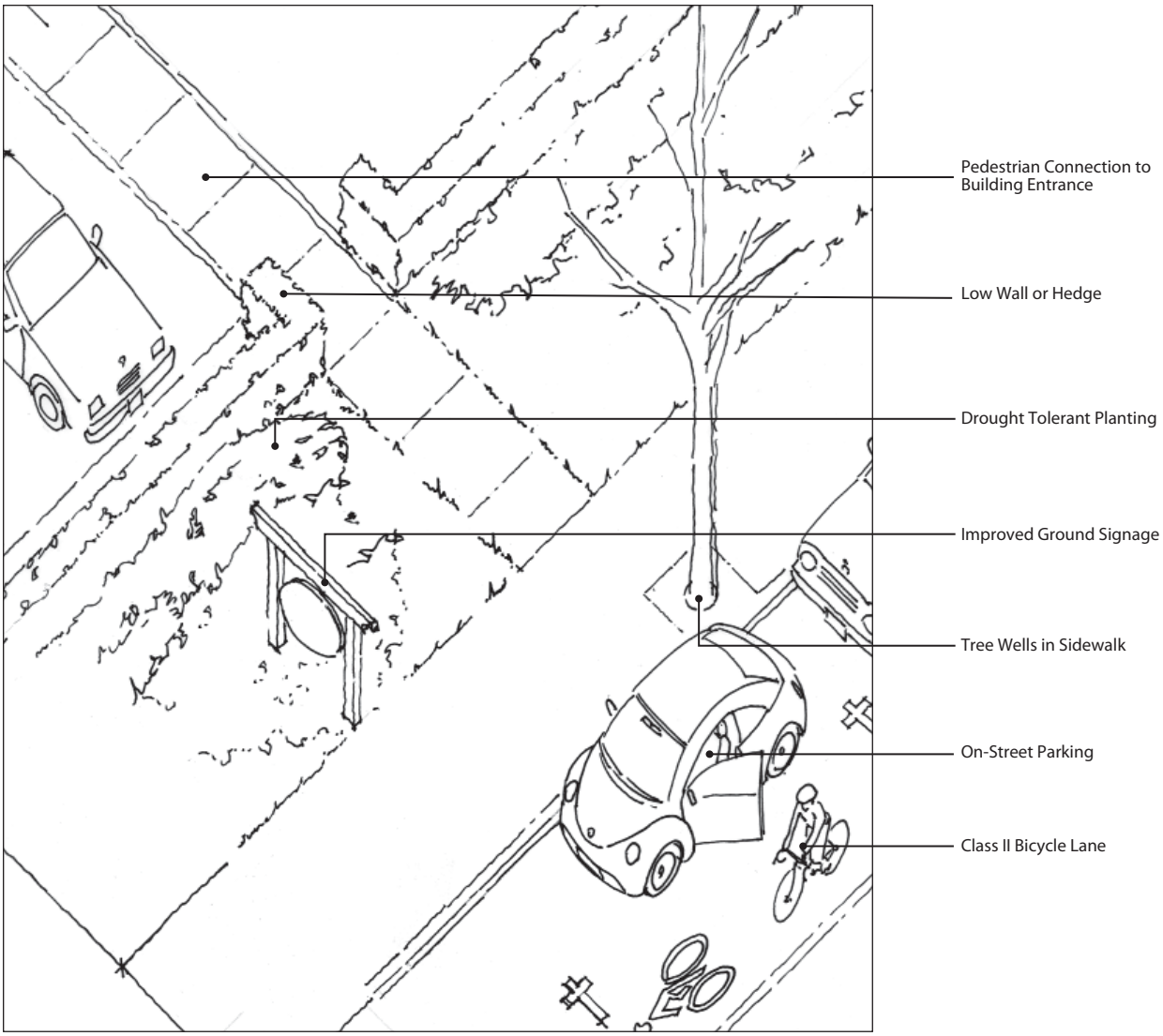
Short Term Improvements



Landscape and Signage Zone

In the short term, public realm improvements within the South Main right-of-way provide an opportunity to improve frontage. The above image illustrates improved sidewalks, curb extensions at the intersections, the introduction of pedestrian-scaled lighting, and a demarcated parking lane along South Main.

Private property owners could be encouraged to establish a “landscape and signage zone” within the front 15’-20’ of their properties where a concerted effort could be made to organize new landscape and signage, and consider additional permeable surfaces or the closing of extraneous driveways.



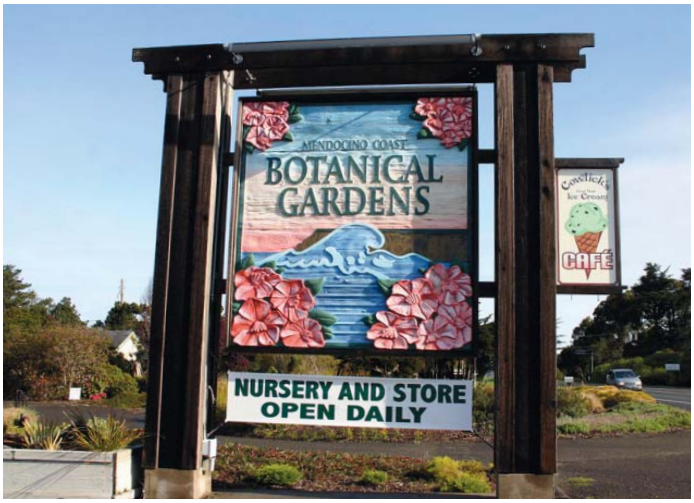
Landscape and Signage Zone

This illustration describes frontage improvements that are encouraged in the short term. A landscape edge is created by a hedge, which helps to screen pedestrian views of the parking lot and to create a sense of enclosure. Enforcement of existing signage standards would see larger-scale pylon signs replaced with more pedestrian-oriented ground signs at an appropriate pedestrian scale and designed in the character of Fort Bragg. Plant and landscaping standards promote the use of low-maintenance, indigenous plant species.

Public realm improvements are also visible, including a Class II bicycle path with a painted lane stripe, and the addition of an on-street parking lane.

Preferred Monument Signage

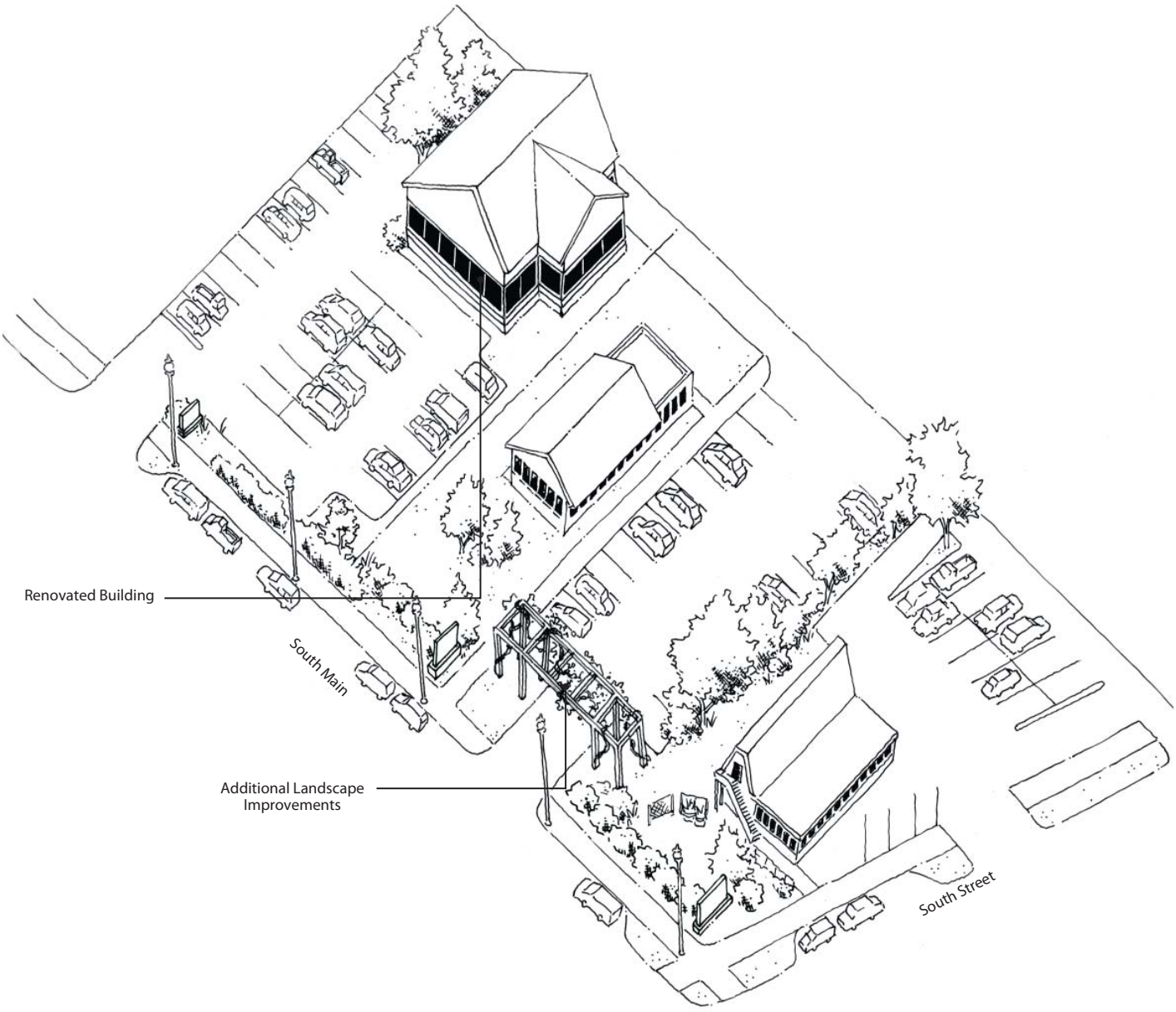
Sidewalk Improvements with Landscaping



Preferred Monument Signage

Indigenous, Drought-Tolerant Landscaping

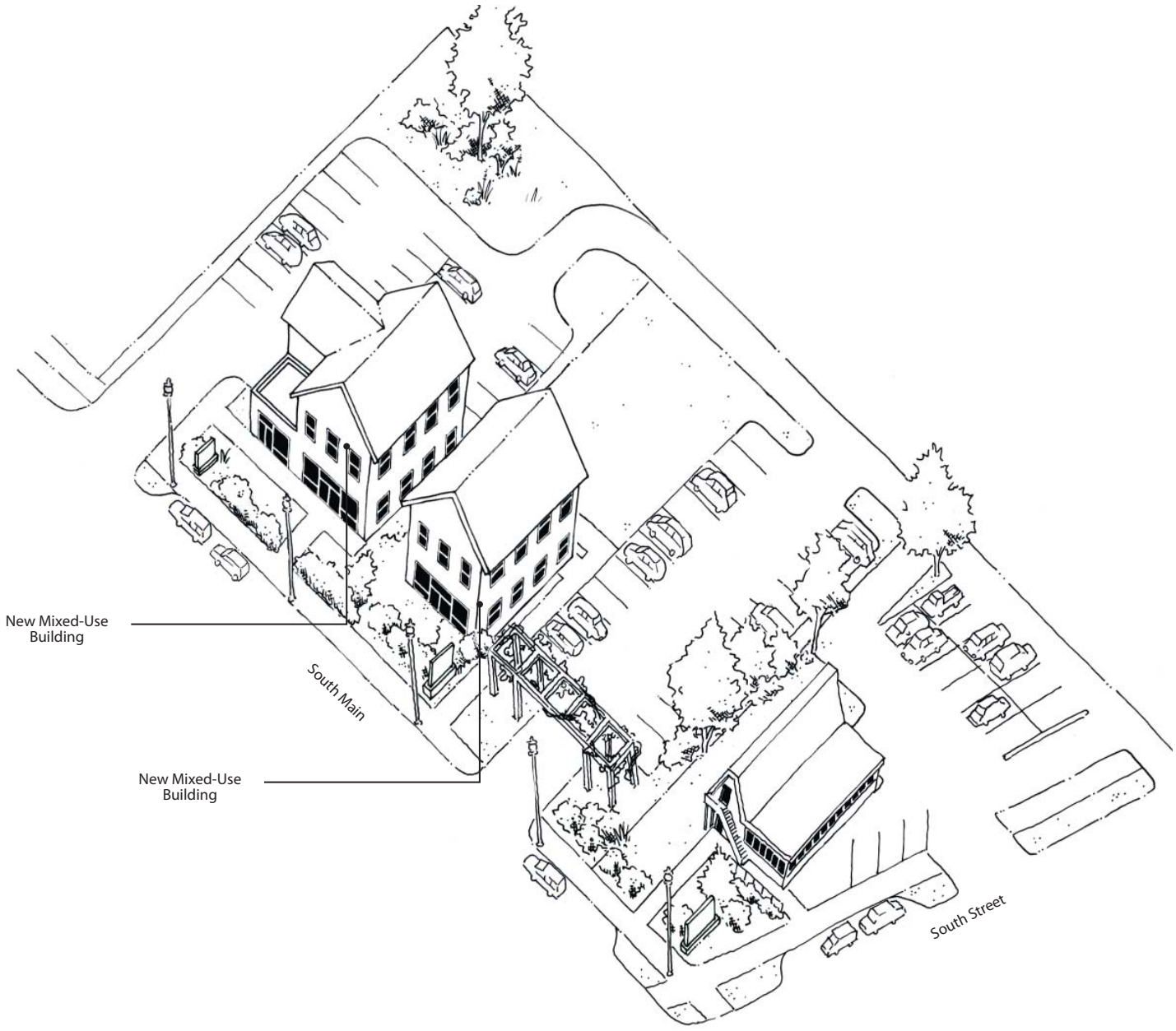
"Landscape Zone" Treatment



Facade Improvements

Private property owners could also be encouraged to engage in facade and exterior building renovations that bring their buildings more in line with acceptable community character. This illustration shows the addition of simple gabled or hipped roof forms in place of flat or mansard roofing, the orientation of windows and entrances to the street rather to parking lots, and the addition of ancillary landscape elements.

Long Term Improvements



New Buildings

As existing buildings become obsolete, property owners should be required to build their structures to a "build-to" line, rather than a flexible setback, in order to maintain a unified presence along South Main. This building placement will help development conform with the existing Design Guidelines, which encourage parking lots to be organized to the sides and to the rear of buildings.

The City should also consider modest increases in FAR, and a reduction in off-street parking requirements (or allowances to count on-street parking toward meeting off-street requirements) to allow modest intensification of properties to occur. Such incentives might encourage property owners to redevelop and improve more quickly.

Preferred Commercial Building (Downtown)

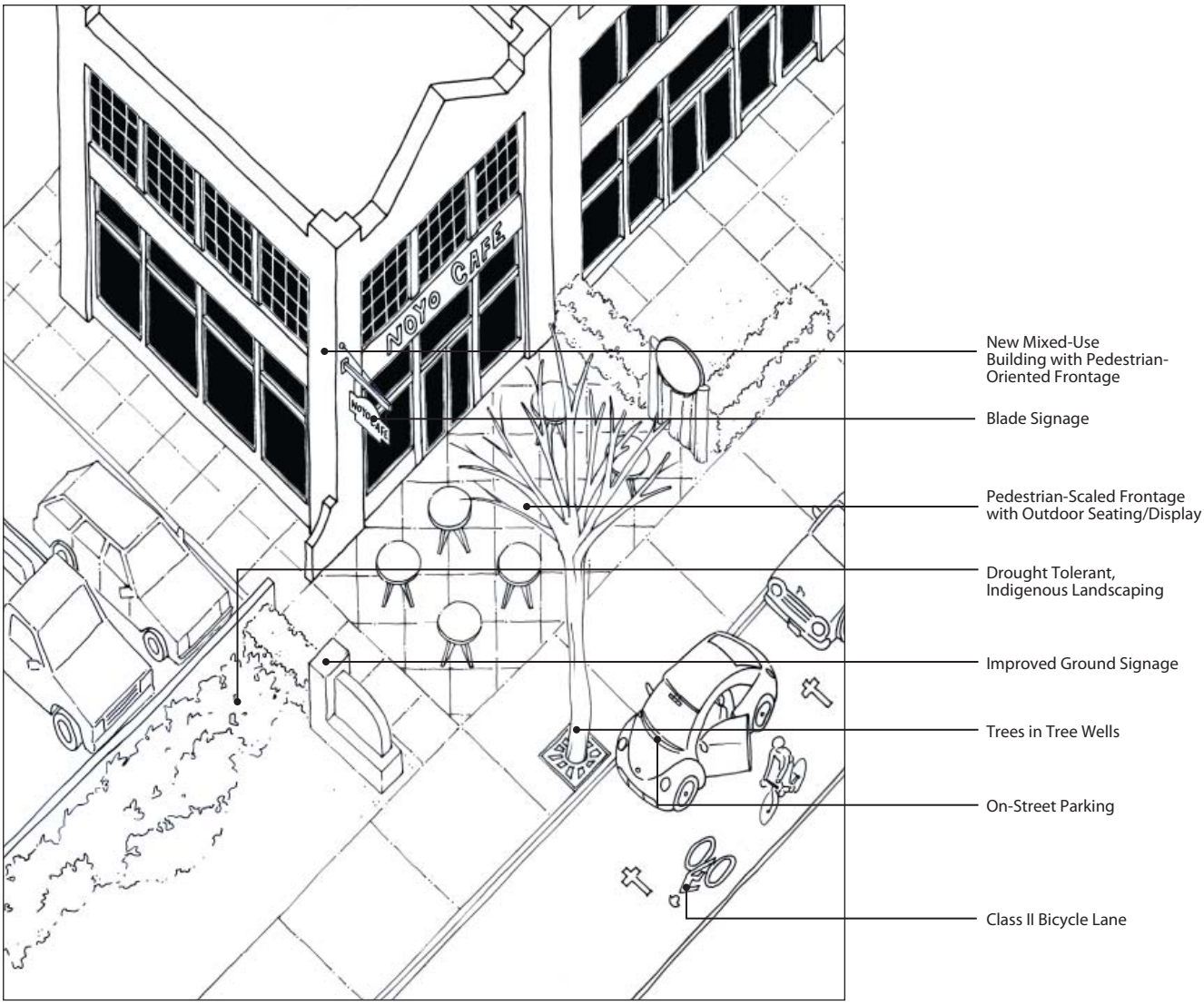
Preferred Mixed-Use Building (Noyo Harbor)

Preferred Mixed-Use Building (Downtown)

Preferred Commercial Building (Noyo Harbor)

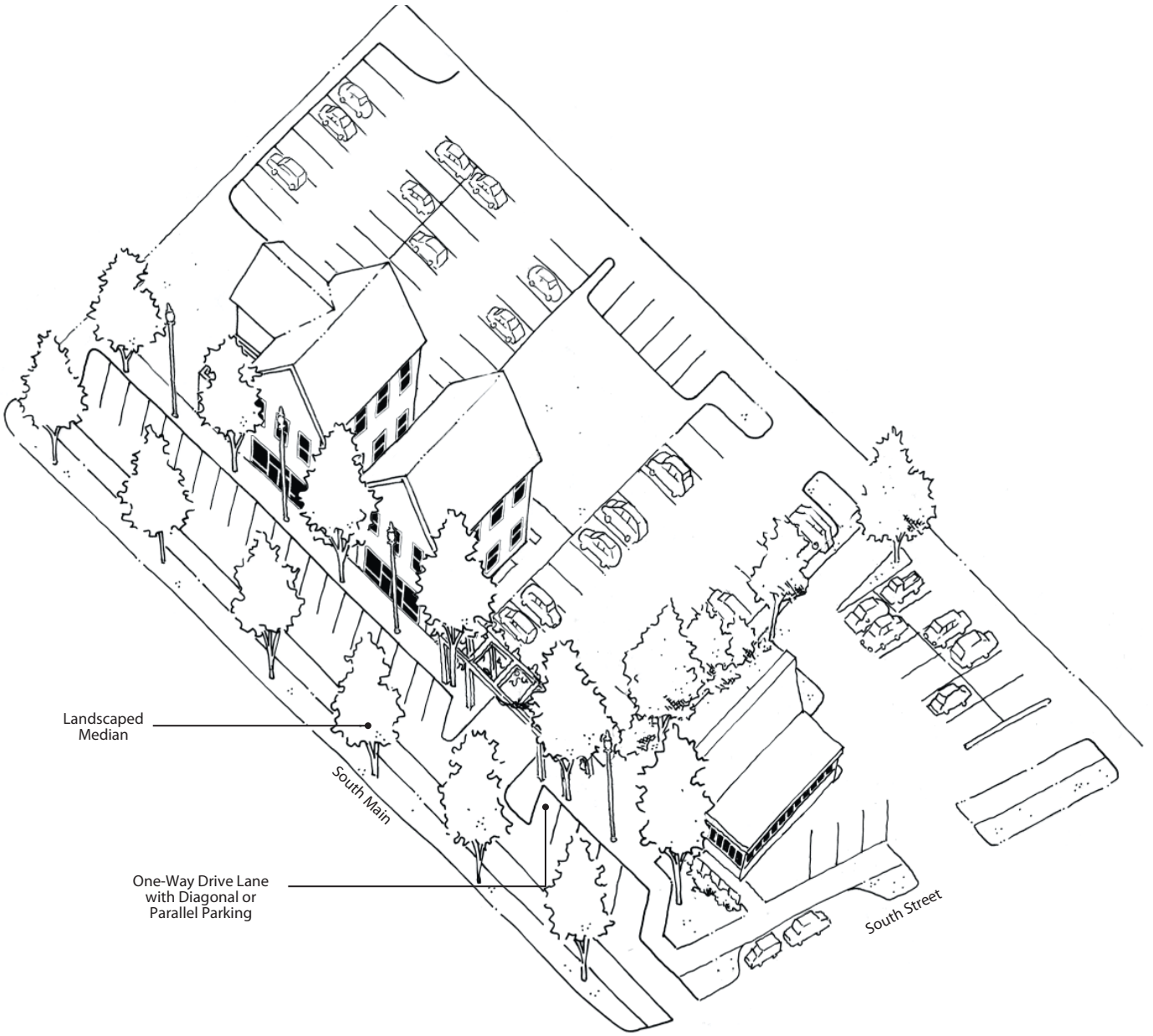
Preferred Commercial Building (South Main)

Preferred Pedestrian-Oriented Frontage



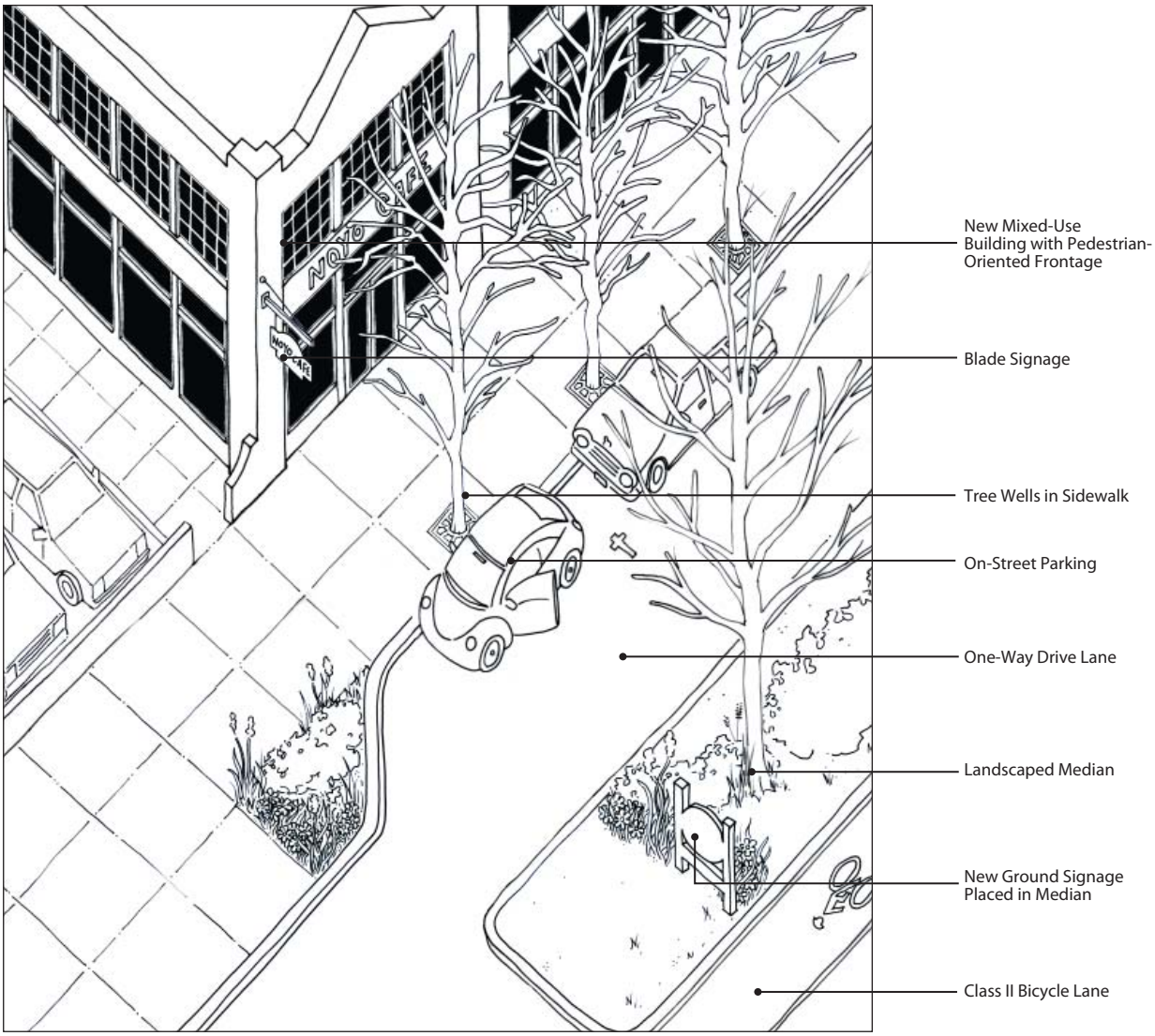
Landscape and Signage Zone

As the corridor is improved there may be opportunities for more pedestrian-friendly and attractive development. The landscape and signage zone can be transformed over time to accommodate greater numbers and frequency of pedestrians. This drawing illustrates the interface that a new building might have that is oriented toward South Main. Where the landscape zone at the building entrance is replaced by a hardscape terrace that can accommodate outdoor seating, display, and passage into and out of the
building.



Frontage Road

While the plan has discussed the potential for a frontage road along the western side of the corridor, a similar potential exists along its eastern side in blocks where current buildings are set back from the street. A frontage road could consolidate individual driveways behind a well-designed landscape median, and provide an environment for on-street parking oriented to shopfronts and businesses.



Frontage Road

In the event that a frontage road is implemented it can be utilized for landscaping as well as an address for signage for neighboring buildings as shown above.

Design and Zoning Recommendations

Signage Recommendations

Signage in the project area presented a big issue of concern during the workshop activities. Many of the existing signs were not perceived as presenting a good first impression to visitors and travelers along the corridor.

The design team looked at ways that new signage might be more integrated into a unified design for the corridor. Currently many of the signs are not in compliance with the City's existing sign ordinance.

Non-Conforming Signage

The concept of a "Sunset Ordinance" for non-conforming signage was discussed during the May 10th, 2010 Council hearing. Such an ordinance would develop a strategy of amortizing non-conforming signs over a period of time. The amortization period would be based on the value of a given sign, with more substantial and expensive signs granted a longer amortization. Similar strategies have been effective in other California Cities, including King City in Monterey County.

In the event that such an ordinance were adopted, the California Business and Professional Code Section 5491.1 states that the City would need to conduct an inventory of illegal or abandoned signs within 120 days of adoption of any such amendment to the Sign ordinance.

Council expressed concern over placing an undue burden on property owners to upgrade their signage, and recommended establishing a Working Group with the Community Development Committee to discuss this issue and bring forward recommendations to the full City Council.

New Signage

Current Coastal Zone regulations set sign size and height limit of 6' from "freestanding signs" (referred to as "monument signs" in the Design Guidelines). City Council is also considering regulations to the non-coastal zone portions of the City which would limit sign heights and size to the same limitations as the coastal zone.

Proposed Zoning Code Recommendations

The design team did not recognize significant issues with the City's existing regulatory framework for properties along the corridor. In the current form, the Zoning Ordinance and the Design Guidelines would generally encourage a more pedestrian-friendly environment in keeping with many of the goals in this plan. Minor refinements could be made to both the Design Guidelines and the Zoning Ordinance to ensure a more predictable built environment.

Building Setbacks

New buildings along the corridor should be built to match a common setback or "build-to line" as private development evolves. This could be set at 10 feet. New buildings would be most appropriate as either "Street Adjacent Buildings" or "Semi-Street Adjacent Buildings" as they are described on page 2-21 of the Design Guidelines. Results from the community image survey also found that respondents preferred parking placed behind buildings.

A maximum building setback along South Main could also be added to the Zoning code. This would create a setback zone in which building facades would be placed, eliminating the potential for a new building to be oriented to the rear of a property, away from the street. Currently the corridor has a 10 foot or 15 foot minimum setback, depending on the underlying zone. A maximum setback could be set at 20 feet. The resulting 10 foot zone would provide the area for new signage and landscaping while ensuring a close relationship with South Main Street.

A "build-to-line" would provide a more prescriptive alternative to having a minimum and maximum setback along the corridor, and create a uniform landscape zone for signage and landscaping. Such an approach could help to ensure realistic implementation of a possible future frontage road.

Either of these approaches would result in new buildings placed close to South Main Street with parking placed either to the side or rear of the building, appropriate for a well-designed, pedestrian-oriented environment.

Building Massing

Building length should be regulated to ensure reasonable pedestrian scale and articulation that retains the fine-grained nature of city fabric. Currently the Design Guidelines are somewhat vague, encouraging buildings to break up long facades through changes in roof massing and eave lines. This approach can result in awkward design outcomes.

The City could change its regulations for buildings over 100 feet in length to be broken down to read as a series of buildings, with no individual building reading as over 75 feet in length. Buildings would be required to have a defined rhythm of openings and bays.

Architectural Style

The Community Image Survey found a strong preference for buildings that followed the architectural traditions found in Fort Bragg. These include styles tied to the late 19th and early 20th centuries, common in the downtown, as well as those in the "Pylon Style" that reflect a more vernacular tradition of concrete pilings and weathered redwood siding, such as the Mendo Mill building and the Harbor Lite Lodge. Several workshop participants also expressed a desire for new buildings to reflect environmentally friendly and sustainable design that reflects a more modern tradition.

The City could consider a "pattern book" or more detailed, architectural approach to the Design Guidelines for the corridor. Pattern Books typically regulate building massing, facade composition, external details, and potentially colors and materials. Applicants might be encouraged to choose and follow an established architectural style, or an established appropriate architectural precedent, when making a new proposal. This choice can help to establish design review criteria when making a new proposal.

Property Redevelopment

Property owners could be incentivized to redevelop more quickly through reduced parking requirements or increased FAR. Such changes might encourage more rapid redevelopment of the properties, and would help facilitate a mix of uses, such as second-story office or residential uses over ground-floor commercial. The current Zoning Ordinance encourages mixed-use, however the existing FAR and parking requirements make it functionally impossible. The introduction of new uses (such as housing or office over retail) would invariably add population to the area and could help to promote a more pedestrian-friendly environment.

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Estimated Implementation Costs

Preliminary cost analysis for design and construction of the design alternatives is as follows:

1. "Baseline" Design Alternative: $5.73 million

2. Addition of a landscaped central median: $13.72 million

Cost analysis for the "Road Diet" alternative was not completed, given the conceptual nature of the project and the great number of undefined variables at this time.

Next Steps

1. Determine a Preferred Alternative for the Corridor
   - Conduct supplemental traffic analysis that analyzes potential modifications to the street network surrounding the corridor, including the potential for internal connectivity on the Mill Site that can absorb some of the daily trips projected by future Mill Site buildout.
   - Analyze the potential impact on emergency response times for both alternatives acknowledging that a central turning lane, a Frontage Road, and internal connectivity on the Mill Site may all provide network redundancy and increased emergency access.
2. Establish a Working Group involving City Staff and Caltrans to determine an acceptable strategy for detailed design elements.
3. Establish a Working Group to discuss and determine solutions for non-conforming signage within the project area.
4. Consider Certification as a Bicycle Friendly Community from the League of American Bicyclists.

Funding Resources

Given the current national and state economic turmoil, the status of many funding sources available to local governments is uncertain.

The American Recovery and Reinvestment Act of 2009 has provided numerous opportunities to support building healthier communities, but the specifics evolve quickly. See www.recovery.gov for the latest information on stimulus funding, as well as state level analysis ongoing through organizations such as the League of California Cities – (cacities.org).

Key federal funding sources for walking and bicycling are available. The Federal Highway Administration provides a matrix of funding opportunities at http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm#bp4. Support for accessing these funds can be found through regional transportation agencies.

A number of funding sources could help implement report recommendations. They offer alternatives for street design, community facilities, and other infrastructure. Each of these funding sources is subject to changes in state and federal law, budget levels, and target project priorities. A summary of the situation for each as it existed at the time of this writing is below.

Federal, State and Regional Transportation Funding Resources

Major federal, state and local transportation funding resources are outlined below. For more information on many of these programs, visit the Caltrans Division of Local Assistance website: www.dot.ca.gov/hq/LocalPrograms

Hazard Elimination Safety Program (HES)

The HES Program is a federal safety program but administered by the State. It provides funds for safety improvements on all public roads and highways. These funds serve to eliminate or reduce the number and severity of traffic accidents at locations selected for improvement. Some of the street design elements recommended may be eligible for funding if the site selected is considered a high hazard location. Caltrans solicits applications for projects. Any local agency may apply for these safety funds.

For more information, visit: http://www.dot.ca.gov/hq/LocalPrograms/hesp/hesp.htm
Or contact the Caltrans District 6 Local Assistance Office: www.dot.ca.gov/dist6/

State Transportation Improvement Program (STIP)

This program represents the lion's share of California's state and federal transportation dollars. The majority of the program's funds are earmarked for improvements determined by locally adopted priorities contained in Regional Transportation Improvement Pro¬grams (RTIP). RTIPS are submitted by regional transportation planning agencies from around the state.

STIP funds can be used for a wide variety of projects, including road rehabilitation, road capacity, intersections, bicycle and pedestrian facilities, public transit, passenger rail and other projects that enhance the region's transportation infrastructure.

Transportation Enhancement (TE) Activities

Federal Transportation Enhancement funds are for construction projects that are "over and above" normal types of transportation projects. These projects may include street trees and landscaping along roadways, pedestrian and bicycle access improvements, acquisition of scenic easements, preservation of abandoned railway corridors (including the conversion and use of the corridors for pedestrian or bicycle trails), and other scenic beautification.

For more information, visit: www.dot.ca.gov/hq/TransEnhAct/TransEnact.htm. Or contact TE Project Coordinator Jim Perrault at (559) 445-5417, James_Perrault@dot.ca.gov

Bicycle Transportation Account (BTA)

Administered by Caltrans, this state fund can be used for city and county projects that improve safety and convenience for bicycle commuters. Eligible projects include improving and maintaining existing bikeways, building new bikeways, constructing median crossings, installing bicycle/pedestrian signals, and planning. Annual BTA funding is in the range of $5 million a year. To be eligible for BTA funds, a city or county must prepare and adopt a Bicycle Transportation Plan. Adoption of a plan establishes eligibility for five consecutive funding cycles.

For more information, visit: www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm

Transportation Development Act (TDA)

TDA provides for two sources of funding: Local Transportation Funds (LTF) and State Transit Assistance (STA). The TDA funds a wide variety of transportation programs, including planning and program activities, pedestrian and bicycle facilities, community transit services, public transportation, and bus and rail projects.

For more information, visit: www.dot.ca.gov/hq/MassTrans/State-TDA.html

Office of Traffic Safety Grants

The Office of Traffic Safety (OTS) effectively and efficiently administers traffic safety grant funds to reduce traffic deaths, injuries and economic losses. OTS distributes funds statewide in the form of traffic safety grants that are awarded to political subdivisions of the state based upon certain criteria. OTS develops a yearly HSP that identifies the primary highway safety problems in the State and provides potential solutions. Identified in conjunction with the National Highway Traffic Safety Administration, OTS has several priority areas for grant funding, including Police Traffic Services, Emergency Medical Services, Roadway Safety, and Pedestrian and Bicycle Safety. Political subdivisions of the state are eligible to apply for and receive OTS grant funding. In addition to state govern¬mental agencies, state colleges, and state universities, subdivisions of the state include local city and county government agencies, school districts, fire departments, and public emergency services providers. Non-profit, community-based organizations (CBOs) are eligible to apply for funding through a political subdivision of the state. For example, a county department may submit a proposal that includes funding for CBO participation. The CBO funding would be included under contractual services in the proposal budget.

For more information, visit: www.ots.ca.gov/Grants/Apply/GME_2011.asp

Federal and State Economic Development Agencies and Programs

There are numerous state and federal programs that finance economic development. Some of these could provide potential funding resources for improvements in Fairmead.

U.S. Department of Housing and Urban Development (HUD)

HUD offers a host of programs to foster community and economic development. These include:

Community Challenge Planning Grants

In June of 2010 HUD authorized $40 million toward Community Challenge Planning Grants meant to "foster reform and reduce barriers to achieve affordable, economically vital, and sustainable communities." Grants are intended to fund amendments or updates to local master plans, zoning codes, and building codes to promote mixed-use development, affordable housing, the reuse of older buildings and structures for new purposes, and similar activities with the goal of promoting sustainability at the local or neighborhood level. Individual grants of up to $3 million require a minimum 20% match in cash and/or in-kind contributions. Community Challenge Planning Grants may be combined with TIGER II Planning Grants (see below). Interested applicants must submit a Pre-application by August 23, 2010.

Department of Transportation TIGER II Planning Grants

In June of 2010 HUD also authorized the Federal Department of Transportation to use up to $35 million toward the funding of Transportation Investment Generating Economic Recovery (TIGER) II Planning Grants. Grants are intended to fund the planning, preparation, or design of surface transportation projects. Individual grants of up to $3 million require a minimum 20% match. TIGER II Planning Grants may be combined with Community Challenge Planning Grants (see above). Interested applicants must submit a Pre-application by August 23, 2010.

For more information, visit: http://portal.hud.gov/portal/page/portal/HUD/program_offices/sustainable_housing_communities/HUD-DOT%20Community%20Challenge%20Grants

Community Development Block Grant Program (CDBG)

CDBG funding that would be potentially applicable to Fort Bragg is distributed through the State Housing and Community Development Department, which is discussed below. BEDI provides competitive grants to spur redevelopment of underutilized industrial and commercial sites. RHED provides grants that address the housing and economic development needs of rural communities, with funds available in two categories:

1. Capacity building and support for innovative housing and economic development activities. Awards up to $150,000 are given for hiring and training staff, purchasing software and other tools, obtaining technical assistance, and acquiring office space;
2. Support for innovative housing and economic development activities. Awards up to $400,000 can be used for preparation of plans and architectural drawings, land and building acquisition, demolition, infrastructure development, the purchase of materials, and construction costs.

For more information, visit: www.hud.gov

Infrastructure State Revolving Fund (ISRF) Program

Subdivisions of a local government, which includes cities and counties and joint power authorities, can apply for low-cost financing ranging from $250,000 to $10,000,000 with terms of up to 30 years through the ISRF program for a wide variety of infrastructure projects. Eligible project categories include city streets, county highways, state highways, drainage, water supply and flood control, educational facilities, environmental mitigation measures, parks and recreational facilities, port facilities, public transit, sewage collection and treatment, solid waste collection and disposal, water treatment and distribution, defense conversion, public safety facilities, and power and communications facilities.

For more information, visit: www.ibank.ca.gov/Programs/infrastructure.html Or contact program manger Diane Cummings at (916) 324-4805, dcummings@ibank.ca.gov

Land and Water Conservation Fund

Administered by CA State Parks, the Land and Water Conservation Fund is offered annually to cities, counties and districts. Funds can be used to acquire or develop outdoor recreation areas and facilities. Communities can use these funds to build trails, picnic areas, and preserve natural and cultural areas.

Recreational Trails Program (RTP)

The California Department of Parks and Recreation is the state agency that is responsible for administering the federal Recreational Trails Program, which provides funding for recreational trails and trails-related projects. The program provides funding for acquisition of easements and fee simple title to property for recreational trails, development of trailside and trailhead facilities, and construction of trails. Apportionments for California total approximately $4.7 million for the Federal Fiscal Year 2010.

Local Funding Resources

City Public Works Funds

The City can add striping, traffic calming, sidewalks, curbs and similar elements to other projects that already involve digging up or rebuilding street sections. For example, drainage and sewer improvements, utility under-grounding projects, and routine street resurfacing are all possibilities. The greater the extent of the reconstruction, the greater the opportunity for adding elements such as curb extensions and medians at a lower cost than if implemented as stand-alone projects.

Public and Private Cost Sharing

Some jurisdictions require developers and property owners to install or help pay for infrastructure improvements (streets, sidewalks, trails, landscaping, etc.) through individual development agreements. On a larger scale, the City could explore using development fees with a capital improvements program to help fund recommendations. To avoid legal challenge of the County's right to levy these fees, care must be taken to apply this strategy only where there is a clear link establishing that travel generated by the private project will use the facility to be funded with the fees.

Special Assessment Districts

A special assessment district could be explored for Fort Bragg as a financing tool for community improvements. One method would be the assembly of a neighborhood group into a district to generate funding for projects and programs. A local nonprofit or development agency would manage the district. A second would be a targeted assessment program organized and managed by the City upon voter approval by project area residents.

A neighborhood-focused district would use self-imposed taxes to generate funds for physical improvements or other amenities. The assessed tax is paid to the local government and returned to the district's management entity to finance service and programs, such as safety patrols, graffiti removal, signage, beautification and neighborhood cleanup projects.

Volunteer Initiatives and Private Donations

In addition to funding sources, programs can be created for volunteer initiatives such as "Adopt-a" programs where individuals or groups engage in beautification projects such as tree plantings. A program can also fund some projects, such as public art, by enlist¬ing private donors to sponsor downtown enhancement activities. These programs can be administered by the City or by other community organizations.

chapter 7

SOUTH MAIN STREET ACCESS AND BEAUTIFICATION PLAN

Appendix

Media Release

SUBJECT: Ft. Bragg Workshops: Making South Ft. Bragg More People and Bicycle Friendly

FROM: City of Ft. Bragg Community Development Department

DATE: January 26, 2010

CONTACT: Chris Carterette, Planner, Community Development Department, (707) 961-2827; ccarterette@fortbragg.com

The Ft. Bragg Community Development Department invites families, community members, business- and property-owners to share their vision for a more people and bicycle-friendly South Ft. Bragg. The first of two workshops will be held February 23, 2010, from 4:00 – 7:30 pm at Redwood Elementary School at 324 South Lincoln Street, Ft. Bragg.

Community input will help shape the future look, feel, and usability of Highway 101 in South Ft. Bragg from Oak Street to Highway 20. All are encouraged to share ideas about pedestrian and bicycle access, vehicle speeds, design of buildings, signage, landscaping, and other safety and design issues. Information will be used to create design guidelines and a pedestrian and bicycle plan for the area.

A walking tour of the project area will be conducted from 4:00-5:00 p.m. during which time participants will evaluate the area for safety, issues, and opportunities. City staff, planners, architects, and traffic engineers will be present to learn from the public and share ideas. The tour departs from Redwood Elementary School. Please bring appropriate footwear and clothing. Following the walking tour, a community presentation and interactive workshop will be convened from 5:00 – 7:30 p.m. at the school cafeteria. Free dinner and childcare will be provided!

The second community workshop will be conducted March 30 – April 1 in Ft. Bragg and will build on community input gathered at this workshop.

This project is sponsored by the Ft. Bragg Community Development Department, in partnership with Opticos Design, Inc; W-Trans; and the non-profit Local Government Commission. Funding is provided by a Caltrans Environmental Justice Planning Grant.

Opening Workshop Flyer

Help beautify Fort Bragg's South Main Street corridor and make it more people and bicycle friendly.

COMMUNITY WORKSHOP

The Pedestrian and Bike Access Plan is funded by a Caltrans Environmental Justice Planning Grant. The Main Street Design Guidelines are funded by a grant from the Sustainable Communities Grant and Loan Program.

For more information:

Chris Carterette
Fort Bragg Community Development Department
ccarterette@fortbragg.com
961-2827

Website: http://city.fortbragg.com/cdd/Main.html

Please join us for the first of two workshops!

Tuesday, February 23

Walking Tour
4:00 - 5:00 p.m.

Design Workshop
5:00 - 7:30 p.m.

Harbor Lite Lodge
120 North Harbor Drive

Help determine the future look and feel of the South Main Street corridor (Oak Street to Highway 20). Share your ideas about pedestrian and bicycle access, vehicle speeds, design of buildings, signage, landscaping, etc. Information will be used to create design guidelines and a pedestrian and bicycle plan.

Bring your family.

Free Food and Childcare!

Opening Workshop Flyer

Ayude a embellecer la parte sur de la Calle Principal de Fort Bragg y crear un lugar amistosa para peatones y ciclistas.

TALLER DE LA COMUNIDAD

El Plan de Acceso para Peatones y Ciclistas se esta financiando con una subvención para Justicia Ambiental de Caltrans. Las Directrices para la Calle Principal (Main Street) estan siendo financiadas a través del Programa de Subvenciones y Préstamos para Comunidades Sustentables.

Para más información:
Chris Carterette
Departamento de Desarrollo Comunitario de la Ciudad de Fort Bragg
961-2827
ccarterette@fortbragg.com

Internet: http://city.fortbragg.com/cdd/Main.html

¡Por favor participe en el primero de dos talleres!

Martes, 23 de febrero

Caminata de Investigación
4:00 - 5:00 de la noche

Taller de la Comunidad
5:00 - 7:30 de la noche

Harbor Lite Lodge
120 Calle North Harbor

Ayude a planear el futuro de la parte sur de la Calle Principal de Fort Bragg (de la Calle Oak a la Carretera 20). Comparta sus ideas sobre acceso peatonal y de bicicletas, velocidad de los vehículos, diseño de edificios, vegetación, etc. La información que proporcione la comunidad será utilizada para crear un plan para la circulación de peatones y ciclistas.

Traiga a su familia.

¡Comida gratis y guardería para niños!

Opening Workshop Notes

Meeting with Harriet Rhoades, Resident, Noyo River Indian Community
February 23, 2010, 1:30 pm

Main concern is the entrance to the Indian Community.

Speed is a concern.

Isn't fond of the coastal trail parking lot backing up to the Indian Community.

There are six residents in the Indian Community.

Safe exit and entry are needed.

Likes the lighting on the Noyo bridge – the safety and ambiance.

Grandson has done a lot of cleaning up after homeless people – trash from encampments.

Common destinations from the Noyo River Indian Community: Post Office, Safeway. Hardly ever go South unless people come into town.

A lot of people walk on the side of Main Street with the sidewalk. It would be nice to have the sidewalks continue on the West side.

Wouldn't be opposed to cultural recognition for the Indian Community. Would need to check with the others. They are all descendents of people that lived on the beach.

Would be nice to have the cultural center next to the Indian Community instead of on Sycamore Street.

Franklin Street is used as an alternate north/south route to Highway 1.

Lighting would be helpful for security.

Vision for the future: sidewalks in places that don't have them now, trees along the border, sidewalks in/through the west side of Hwy 1 through the green space, making it safer.

Hwy 20 intersection seems to be working well for vehicles (i.e. no wait time), but for pedestrians, it seems dangerous and like there is a lot of wait time.

Notes from Fort Bragg Opening Workshop
February 23, 2010, 5:00pm

What do you see as positive amenities in the South Main corridor?:

- The bridge – one of the best built – separation for pedestrians, great view, comfortable feeling, decent room for bikelane
- Great Views
- Plenty of room to work with
- Nice trees on the Mill Site
- Proximity to planning effort on GP site & integration of efforts
- Distance is manageable for walking if one chooses.
- Good amenities at Boatyard Shopping Center, although hard to access on foot.
- Landscaping at Surf Motel is very pretty
- The Coastal Trail
- Access to Pomo Bluffs
- Beach at Hare Creek has been purchased by Mendocino Land Trust
- Pedestrian-scale lighting is a specific plus on the bridge
- Frisbee golf course adjacent to college. Better bike/ped access needed.
- Architectural style that exhibits the coastal character and supports tourisms
- Change in single-owner locked-away property (Mill Site) to multi-owner accessible property.
- Only off-leash dog park in Fort Bragg is located under the bridge.

Things that could be improved:

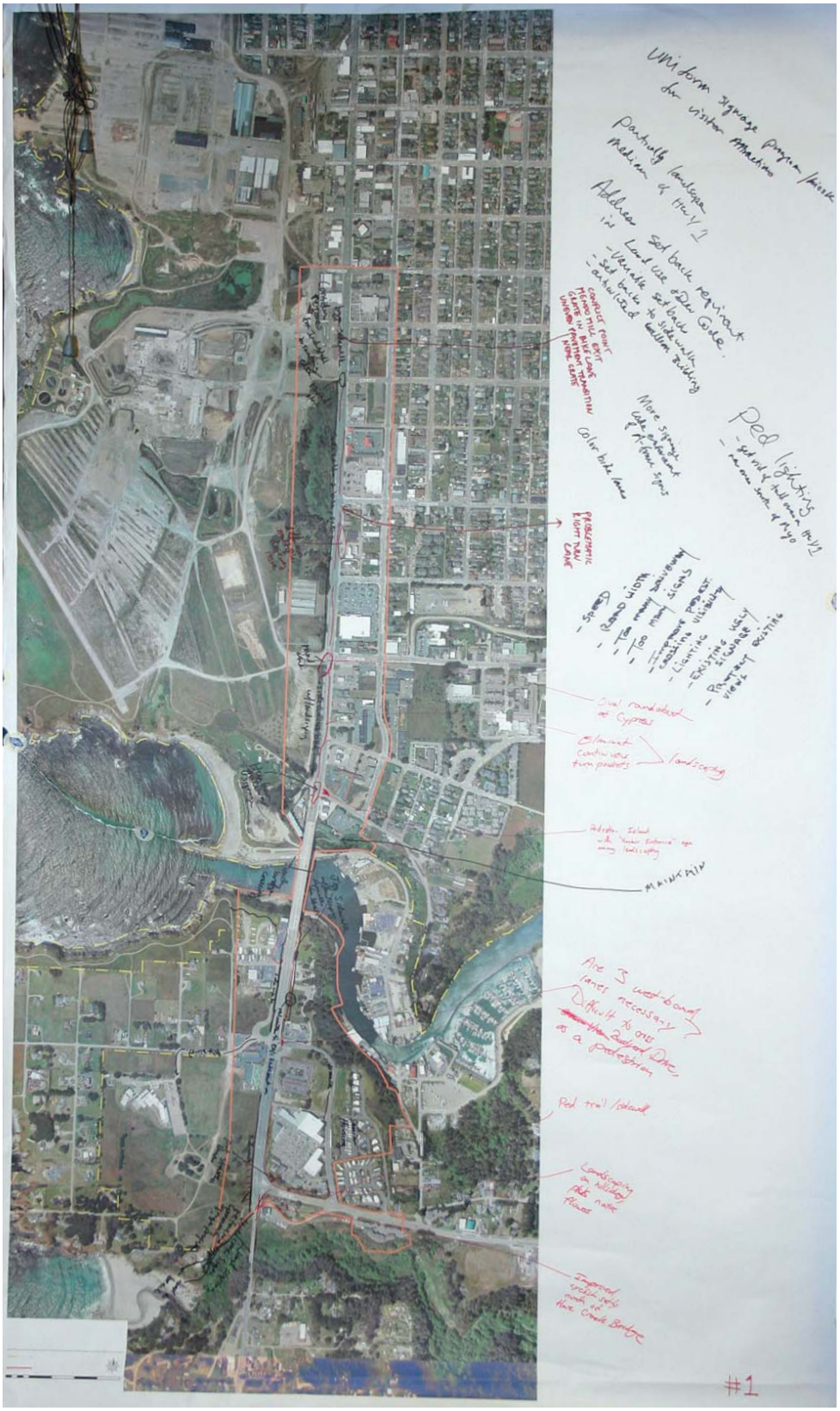
- High transient population & they hide in landscaping.
- It would be good to develop pedestrian undercrossing at Noyo Bridge – property owners would be amenable.
- Ped access to Boatyard Shopping Center is dangerous and difficult
- Speeds too fast
- Road width is excessive
- Too many signs
- Too many driveways and points of access (ingress & egress). Poor access management
- Existing crosswalks at Alder Street…but navigation is difficult
- Distance between any safe crossing is excessive. In particular between Noyo and Cypress Streets
- Pedestrian-scaled signage is lacking

- Lack of on-street Highway parking contributes to excessive speed and lack of safety.
- Corner turning radius creates unsafe speeds at South and Harbor.
- Lack of sidewalks and ped access to Boatyard Center
- Conflict in the cues we are sending to drivers. Posted speeds are low, yet roads are designed for faster speeds.
- No sense of arrival, despite the beautiful bridge. Need for gateway. Possible location: North Harbor Drive.
- Ned safe ped access to harbor. Ped xing signs are needed.

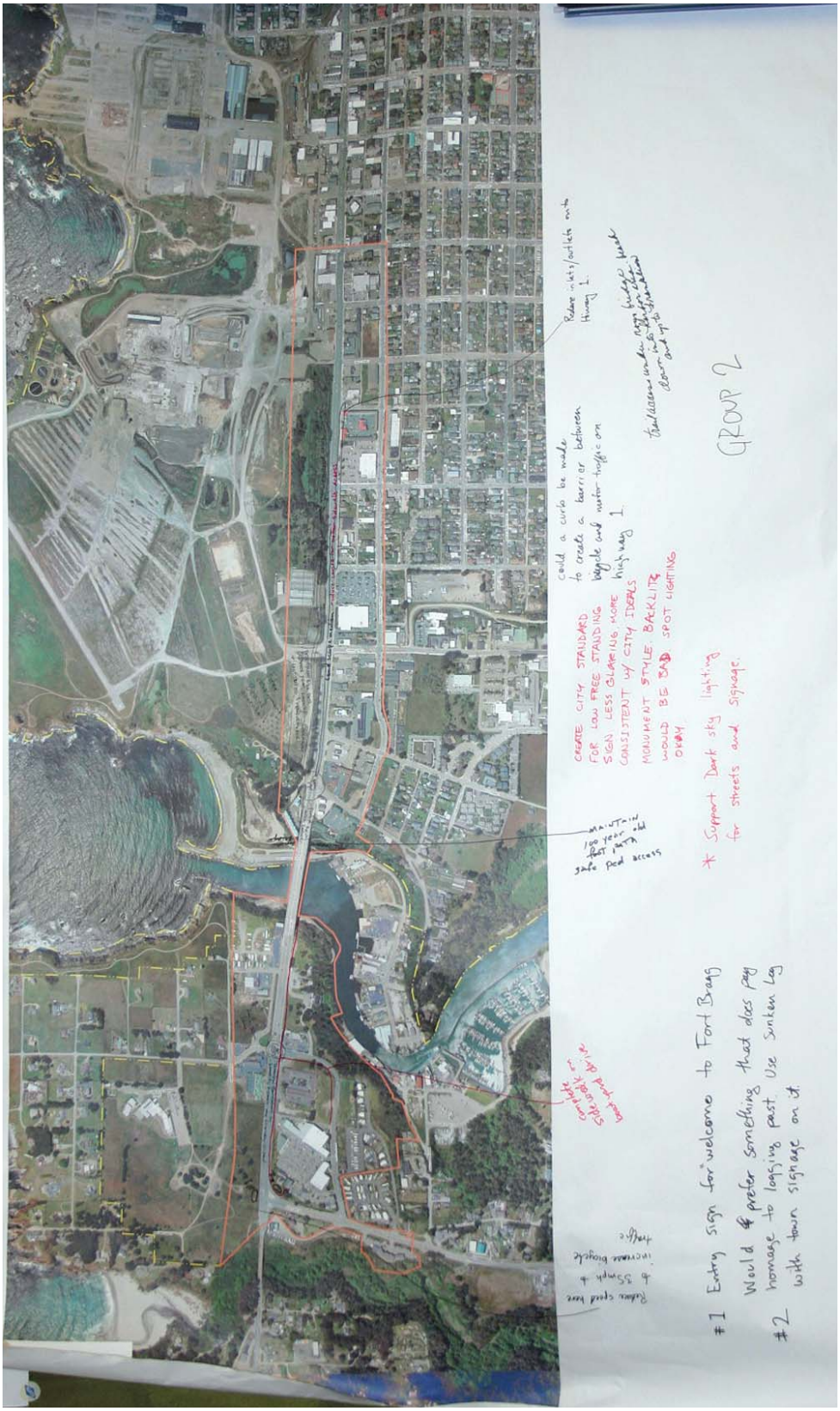
What are your thoughts about buildings along the Highway:

- Buildings in the middle of a sea of parking are not comfortable, and not conducive to creating a streetscape.
- Signs are in need of some continuity and less chaotic.
- Some landscaping is uninteresting and does not contribute.
- Oversized parking lots – too many spaces.
- Signage display could use better materials and be displayed in a more aesthetic way.
- Lack of street trees.

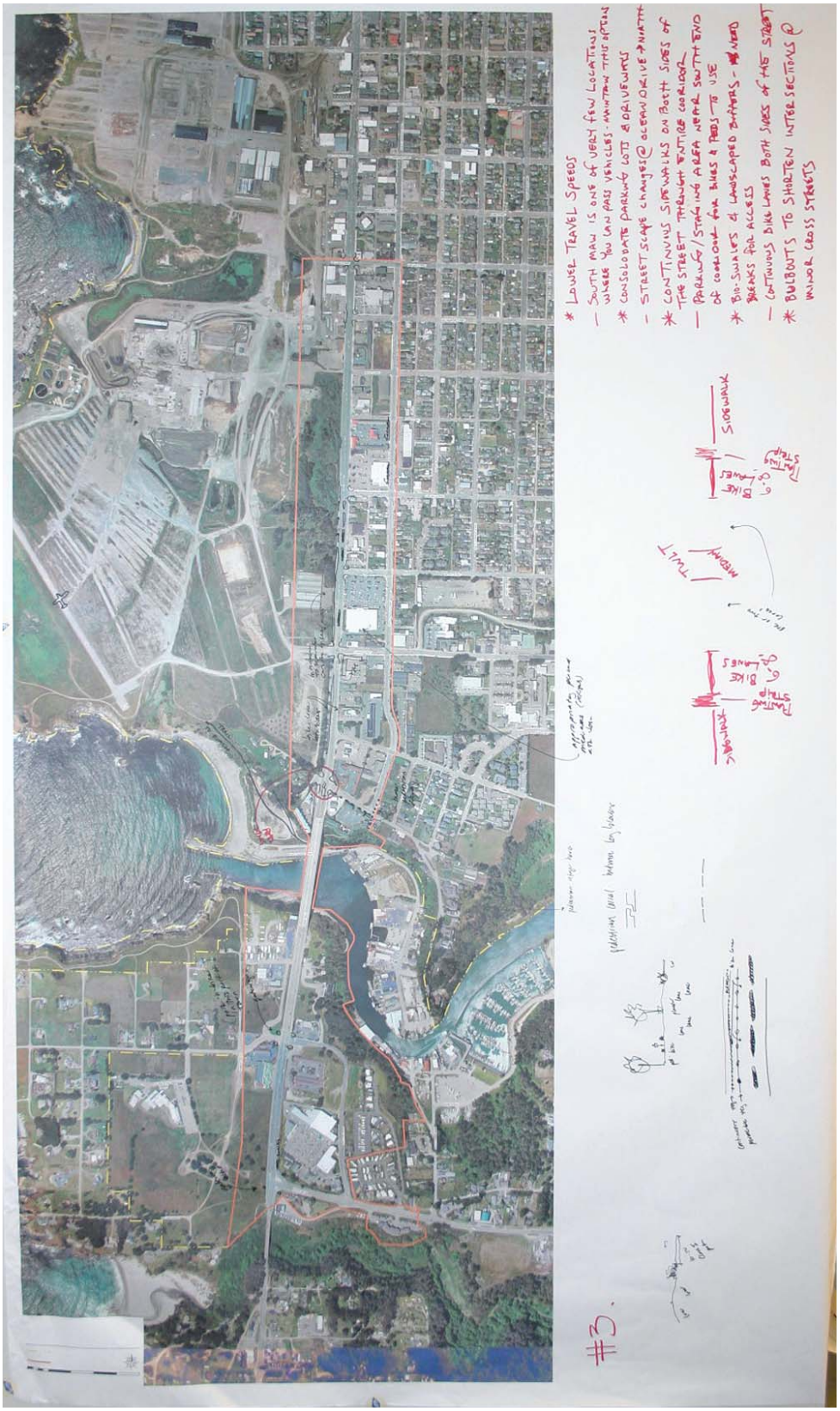
Table Maps



Group 1


GROUP 2
#1 Entry sign for welcome to Fort Bragg
Would like prefer something that does pay homage to logging past. Use Sunken Log with town signage on it.
#2
* Support Dark sky lighting for streets and signage.
CREATE CITY STANDARD FOR LOW FREE STANDING SIGN LESS GLARE/NO HOME CONSISTENT W/ CITY IDEALS
MONUMENT STYLE. BACKLIT WOULD BE BAD SPOT LIGHTING OKAY
Could a curb be made to create a barrier between Bicycle and motor traffic on High way 1
Reduce curb cuts/outlets onto Highway 1
maintain 100 year old path safe pedestrian access

Group 2


* LOWER TRAVEL SPEEDS
- SOUTH MAIN IS ONE OF VERY FEW LOCATIONS WHERE YOU CAN PASS VEHICLES. MAINTAIN THIS OPTION
* CONSOLIDATE PARKING LOTS & DRIVEWAYS
- STREET SCAPE CHANGES @ ACCESS/DRIVEWAYS
* CONTINUOUS SIDEWALKS ON BOTH SIDES OF THE STREET THROUGHOUT ENTIRE CORRIDOR
- PARKING / STAGING AREA NEAR SOUTH END OF CORRIDOR FOR BIKES & PEDS — TO USE
* BIO-SWALES & LANDSCAPED BUFFERS - WHERE POSSIBLE FOR ACCESS
- CONTINUOUS BIKE LANES BOTH SIDES OF THE STREET
* BULBOUTS TO SHORTEN INTER SECTIONS @ MINOR CROSS STREETS
#3.

Group 3

Second Workshop Outreach Strategy

(parentheses) indicate responsible party

Chamber of Commerce (LGC)

Arrange a meeting with Chamber staff on March 30 or 31 to get input on the project area. Utilize the Chamber's e-newsletter to invite chamber members to attend this meeting.

Families, Teachers & Students (LGC)

Send home flyers with students. Include a brief description of the project and workshops that teachers can read to students when they hand out flyers. The Middle School will post it in the school bulletin. Will require approval of flyer from District Office (in process).

- Redwood Elem. & Pre-School — 465 students, bundled in groups of 20
- Fort Bragg Middle School — 430 students
- Fort Bragg High School — 550 students
- Dana Gray Elementary — 430 students, bundled in groups of 20
- Noyo High School — 50 students

Workshop Participants (City of Fort Bragg)

Email to people that attended the first workshop, with a copy of the flyer, and ask them to help print and post.

Latino Community (LGC with assistance from the City)

Distribute flyers through Clinics. Post at taquerias. Distribute at the mobile home park on the west side of South Main Street. Distribute through the Catholic Church. Send home with students – according to local sources, this is the very best way to reach Latino families. Visit Latino employment centers and drop off flyers for distribution to staff. Continue to work with Safe Passage.

Direct Mailing to Stakeholders (City of Fort Bragg)

Conduct a mailing to business and property owners in the project area, and the multi-family housing projects.

Contact Supervisor Kendall Smith (LGC)

Ask her to attend and help bring awareness to the project.

Media Outreach (LGC provides PSA and the City circulates to contact list)

Develop a PSA to be submitted to the City's media contact list. Contact the Fort Bragg Advocate about writing a newspaper article. Submit to KZYX and KOZT radio stations. Contact local TV stations about doing a news story. Include a box advertisement in the March 25th Fort Bragg Advocate.

Special Invitations to stakeholders (LGC)

Call and email Chief of Police, Fire Marshall, Chamber of Commerce, etc. to invite them to stop by the open studio.

Second Workshop Flyer

YOUR IDEAS ARE NEEDED

The City of Fort Bragg wants to hear from you about how to:

* Make South Main Street Safer for People, Bicycles, and Cars
* Beautify the South Main Street Corridor
* Slow Traffic
* Locate New Buildings

Free Food, Prizes & Childcare

12 Family Passes to the C.V. Starr Community Center and Aquatic Center will be given away as door prizes! *(must be present to win)*

On February 23, 2010, the City of Fort Bragg held the first public workshop to get input on improving the South Main Street Corridor. Now join us on:

Tuesday, March 30 and Wednesday, March 31

Open Studio: drop by and share ideas about the designs in progress

- 5:30 - 7:30 pm

Thursday, April 1

Closing Workshop & Presentation of Design

- 5:30 - 7:30 pm
- Bring your family!

Where:
C.V. Starr Community Center
300 South Lincoln Street, Fort Bragg

For more information: http://city.fortbragg.com/ cdd/Main.html

For more information and to RSVP contact: Chris Carterette 961-2827, ccarterette@fortbragg.com

The Pedestrian and Bike Access Plan is funded by a Caltrans Environmental Justice Planning Grant. The Main Street Design Guidelines are funded by a grant from the Sustainable Communities Grant and Loan Program.

Workshop Participants

Mark Mannon
Lisa Mannon
Caryn Bender
Tim Bosma
Linda Dillion
Dusty Dillion
Rick Riley
Amy Wynn
Mike Thomas
Doug Hammerstrom
Dan Gjerde
Cecilia Hernandez
Nancy Serna
Jennifer Kennedy
Marie Jones
Judy Hawn
Erika Island
Jason Island
Richard Keaton
Irene Malone
Harriet Rhoades
Becky Ellis
Jesse Robertson
John Gebers
Rex Jackman
Henrietta Bensossen
Marie Jones
Bill Patton
Greg Patton
Tara Larson
Judy Hawn
Stan Miklese
Dave Gable
David Yedmans
P. David Desautels
Steve Otsi
Hush Connoly
Anne Semans
Tim Burma
Kendell Smith
Mike DelCampo
Merlyn Larson
Michael Oliphant
Geisce Ly
Nobuko Hiramin
Jason Hurst
Nancy Milano
Meg Courtney
Jennifer Bosma
Meg Courtney
Tim Bosma
Judy Haun
Jerry Beaty
Beely Ellis
Georgia Lucas

Community Image Survey

Tell me, I forget;
Show me, I remember;
Involve me, I understand

The Community Image Survey
A Tool for Public Participation in Planning

Background on the Visual Preference Survey™

Anton Nelessen and Associates developed the Visual Preference Survey™ (VPS™) as a technique to help communities get input from their citizens about what they liked and disliked about their city. Their responses could then be used in future planning efforts as a vision for what the public wanted their community to be like. The VPS™ has been successful as both an educational tool and as a citizen participation process.

In its traditional use, as administered by A. Nelessen and Associates, the VPS™ consists of a set of 180-240 images, all of which are taken from the public realm, in the same season, and under similar weather conditions. About 80% of the 180-240 slides should be taken from within the specific community, while 20% can be images from other communities. The goal is to get at least 1% of the total population of the community to participate in the VPS™.

Some cities that have used this technique include Portland, Oregon; Vancouver, British Columbia; Santa Fe, New Mexico; Truckee, California and Carson City, Nevada.

About the Community Image Survey

The Local Government Commission contracted with A. Nelessen and Associates to produce a shortened version of the Visual Preference Survey™ to be used as an educational tool in Southern California (this demonstration of the VPS™ was called "Vision Southern California"). A. Nelessen and Associates also prepared a guidebook to accompany the "Vision Southern California" slides, which is available on loan from the Local Government Commission.

The Local Government Commission has successfully used this shortened survey in other parts of California and the Western United States as a discussion tool for local elected officials, planners, and community members. Our version of the survey, called a "Community Image Survey" (CIS), consists of 40–60 images from a community or region. People of all ages and backgrounds are encouraged to participate in this fairly simple process, which can be used to both educate and stimulate discussion at the local level.

Local Government Commission staff has received training from Anton Nelessen on how to produce and administer these surveys. We are available on call to both produce "Community Image Surveys" for interested communities and to loan out and advise on the use of versions of the survey that we have already produced.

A Sample Survey

Please rate images from +5 to -5, with 0 being neutral

1. _____	11. _____
2. _____	12. _____
3. _____	13. _____
4. _____	14. _____
5. _____	15. _____
6. _____	16. _____
7. _____	17. _____
8. _____	18. _____
9. _____	19. _____
10. _____	20. _____

How to Produce a Community Image Survey: Basic Steps

1. Assemble an advisory committee/working group of interested individuals
2. Have a meeting: make a presentation (what is the CIS? How is it used? Etc.)
3. Select the geographic scope for your CIS and outline the issues to be addressed
4. Collect any relevant existing slides and organize them by issue
5. Create initial pairs, pairing a "good" example of a topic with a" bad" example
6. Identify holes: issues or half of a pair that are missing
7. Research where to go to take the slides to fill the holes (ask advisory committee/ working group to help identify where to go)
8. Take slides (all from the public realm, taken at same time of day and time of year)
9. Assemble pairs (using all available slides)
10. Select the best 20 pairs
11. Revisit the issues list to make sure all issues are addressed by slide pairs
12. Revise selection of 20 pairs as needed
13. Put the slides in an appropriate order
14. Preview the survey: administer it to the advisory committee/working group
15. Revise the survey as needed (replace any slides that have an average score near 0)

Sample Topics to be Addressed in a Community Image Survey

General Issues & Sample Topics for a Land Use CIS

- single family residences: design and orientation (garages and front porches)
- multi-family housing: design and orientation
- residential streets: wide vs. narrow, tree-lined
- sidewalks: along street or protected by green planting strip
- downtowns: pedestrian-oriented downtown shopping vs. big box retail/malls
- office buildings: big building isolated by parking vs. above retail
- mixed use
- transit
- open space
- parking: huge empty lots vs. street parking or good parking structure
- neighborhood open space: parks & bike paths
- commercial streets: downtown vs. strip commercial
- space making vs. space taking design
- street edges & residential design: walls & gated communities
- preserving historic buildings

How to Administer the Community Image Survey

Introductory Remarks

Vision planning is a first step toward creating a community vision. It is a technique that empowers people to become part of the planning process. It is often a catalyst for discussion.

Every one of you has a different vision. When we use words like "mixed-use," or "pedestrian-oriented," you have an idea in your mind as to what that looks like. The Community Image Survey helps you visualize those choices.

The underlying premise of vision planning is that we cannot create credible plans unless we can first see and understand the vision. To do that, we have developed a technique to stimulate discussion, called the Community Image Survey.

Based on a process first developed by Anton Nelessen and Associates of Princeton, New Jersey, called the Visual Preference Survey™, a Community Image Survey is a process by which a community can participate in evaluating its existing environment and in developing a common vision for the future.

Everyone can participate in this process. Everyone's opinion matters.

Instructions for Survey Participants

Tell participants that they will be looking at 40–60 images, each of which they will be asked to rate. Each slide should be given a value between –5 and +5, with 0 being neutral. Participants should ask themselves three questions:

- Do I like the image? (then decide whether the slide is a positive or a negative)
- By what value do I like it? (then assign a number value — is it a plus 3, or a plus 5, or merely a plus 1, etc.)
- Is it appropriate for the area? (then adjust the number value accordingly)

Images that are acceptable and appropriate should be assigned a positive value. Images that are neutral or ambivalent should be assigned a zero. Images that are unacceptable and inappropriate should be assigned a negative value.

Let people know that the slides will be shown quickly. Reassure participants that there is no right or wrong answer — their initial, "gut" response is best.

Evaluating the Results

After participants have taken the survey, collect the survey forms. Depending on how much time is available, you can determine the median scores for all the slides, or for a sampling of them. The medians or averages can be obtained fairly quickly by entering the responses into a computer spreadsheet program, or by having one person read off the scores for a particular slide, and having a second person enter those scores into a hand-held calculator, and then dividing the total by the number of surveys to obtain an average score for each image.

If you only have time to present back a few of the slides, the Local Government Commission recommends pre-selecting certain pairs. The easiest to use are those pairs that generally elicit the highest positive or negative results. If you don't have time to add the scores for all of the surveys, be sure to select those to be averaged at random. We recommend that at least 50% of the surveys be included in the initial analysis.

The images that receive the highest negative or highest positive ratings show where there is the most consensus in the group. These are the slides that tend to generate the most discussion and interest. (Those images with lower scores, closer to zero, represent images that did not generate a strong response or which received a mixture of ratings. Those are generally not as useful in a large group discussion.)

The simplest technique for presenting the results is to show the slides again as pairs (either all of the slides or just the slides you've pre-selected), tell participants the average score the slide received, and ask the participants why they rated that particular slide the way they did ("Why did you like or dislike this image?").

We recommend recording people's responses on large sheets of paper or on flip charts (it is best to have two easels — one for the positive characteristics and one for the negative). After analyzing a few of the slides in this manner, you will most likely see that the positive characteristics listed will tend to reappear in all of the positive images, and likewise for the negative ones. In addition, solutions to the negatively rated slides can often be found in the positively rated slides.

Remarks for Presenting the Results

The results of the Community Image Survey include public participation and education, and the beginning of a process for developing a common vision of what participants would like their community to look like. After administering the CIS, you can analyze and better understand both the problems and the potentials that exist within the community.

Pull out the details that are acceptable or unacceptable to the participants.

Those images that are rated the most positive are the most appropriate or best liked. These should be included in a comprehensive/general plan. Encourage participants to look at their zoning with those images in mind — does the current zoning allow this?

Those images that are rated the most negative are the most inappropriate or least liked. Often these represent the participants' greatest fear. Encourage participants to look at their general plans, codes and zoning with those images in mind — if existing zoning allows the things that people dislike to occur, local government planners might want to revise their regulations.

Pulling out the positive and negative characteristics allows you to create plans, and write and illustrate codes that better reflect the community's preferences.

If you have questions, or need assistance developing a Community Image Survey, please contact Paul Zykofsky, AICP, Director, Center for Livable Communities, Local Government Commission, 1303 J Street, Suite 250, Sacramento, CA 95814, phone: (916) 448-1198 x317, fax: (916) 448-8246, e-mail: pzykofsky@lgc.org

Community Image Survey - Results

The Fort Bragg Community Image Survey (CIS) was presented on April 1, 2010 during the closing workshop for making the South Main Street Corridor more friendly to people and bicyclists.

The CIS consists of 40 slides from Fort Bragg and other communities. Taken as a whole, the slides present contrasting images of design issues — streetscape, landscaping, building frontage, architectural themes, gateways, and signage. The survey was used during the closing design workshop to involve residents of the community in the planning process and to gauge what they would like to see along the South Main Street Corridor.

A copy of the Community Image Survey is included with this report along with instructions for how to administer it. City staff, elected officials and volunteers may want to use the CIS to obtain input from a larger cross-section of residents. The CIS is a tool that facilitates the public's involvement in the planning process and is relatively easy to use. It can be administered at a wide variety of meetings of civic associations including chambers of commerce, the Rotary Club, PTAs, and in local schools.

Participants who took the survey were asked to rate each image on a scale of –5 to +5 based on the following criteria:

1. Do I like or dislike the image?

2. How much do I like or dislike it?

3. Is it appropriate for Fort Bragg?

An average score for each of the 40 images was calculated. Scores ranged from a low of – 3.6 to a high of +4.3. (A printout of all 40 images listing average scores is attached.)

Following the discussion of the survey results, participants were shown the average scores for all 40 images in the Survey. Each pair of images was discussed in more detail and workshop participants were asked to identify what they liked or disliked about each image. While the major focus of the Community Image Survey was to engage residents in a participatory exercise, the numerical averages are useful in determining which elements of the built environment are viewed as positive and which are considered negative. These views can then help to shape planning policies and decisions, such as development of the South Main Street Design Guidelines.

Following is a list of elements participants during the Saturday workshop identified as reasons for liking an image:

- Use of wood and nautical pilings in signs and buildings
- Artistic and locally-crafted signs
- Trees
- High quality design
- Colorful Landscaping
- Well-maintained
- Parking to the rear of buildings
- Good lighting
- Small town / rural feel
- Using landscaping as a buffer between pedestrian and vehicular realm
- Materials and looks that reflect Fort Bragg's history
- Nautical / coastal themes
- Grand gateways

In addition, participants identified the following elements as reasons for disliking an image:

- Messy, clutter
- Garbage out front
- Signs that look like they could be in "Anywhere, USA"
- No landscaping
- Back-lit signs
- Parking without landscaping
- Big open parking lots
- Lighting out of scale (too big)
- Vehicles parked in front
- Disrepair
- Barbed wire and bad fencing
- Overgrown landscaping
- No buffer between pedestrian and vehicular realm
- Sidewalk too small

By reviewing this list of likes and dislikes we can identify more clearly some of the steps that residents of Fort Bragg believe can be taken to improve and create a more livable South Main Street Corridor.

Gateways

Participants expressed strong preference for a grand gateway that has a historic, rural or local feel to it. The large arched gateway (#21) scored much higher than an older wooden gateway sign (#1) with slide-in service organization advertisements. Smaller monument-style entrances carved from wood (#7 and #27) scored similarly, with the latter of the two scoring slightly higher, due to the colorful coastal landscaping. A landscaped roundabout gateway (#38) scored higher than a large gateway sign placed in a landscaped median (#18).

Materials & Facades

Generally, participants preferred historic buildings with wooden exteriors. A corrugated metal building with a nautical theme and attractive signage (#2) scored higher than a board-and-baton building without signage (#22). One participant said of the corrugated metal building, "its very nice in its appropriate location: the harbor". A multi-story historic storefront with recently upgraded façade (#5) scored higher than another multi-story historic building without the same color and architectural articulation (#25). A single-story historic building with recessed doorway and recent façade improvement (#39) scored higher than a single-story wooden building (#19).

Building / Street Frontage

Properties with landscaped buffers between buildings, parking lots and the street were preferred by participants. Buildings with articulated features, such as recessed doorways, storefronts, and variation of colors or materials were also preferred. A parking lot with a landscaped buffer and pedestrian access (#3) scored higher than a large open parking lot with no landscaping or separation from the roadway (#23). A block-long commercial building with articulated doorways and colorful façade (#28) scored higher than another block-long building of one color and no articulation (#8). The latter had a landscaping strip, but was poorly maintained; the former had no landscaping. It can be surmised that in a commercial area, Fort Bragg residents prefer well-maintained, visually-engaging storefronts, even without landscaping, over mono¬chromatic, non-articulated buildings and poorly maintained landscaping.

Signs

Fort Bragg residents prefer wooden signs that play off the historic logging or maritime themes. A wooden monument sign with a stone base (#24) scored much higher than a back-lit monument sign made of metal and plastic (#4). A well-maintained gas station sign (with landscaping and sidewalk) (#6) scored dramatically higher than a series of mini-mart signs in a poorly maintained lot (#26). On average, signs advertising multiple businesses did not receive positive scores. However, such a sign featuring wooden pilings on either side (#9) scored higher than a much taller wooden sign (#29). Participants noted that while they don't like back-lit signs (#9), they really dislike signs in a state of disrepair that are large in scale and have overhead fluorescent lighting (#29). A very large, colorful carved wooden sign for a local attraction scored one of the highest scores in the CIS (#11). This image was paired with a sign of similar size made from stucco and advertising multiple businesses (#31) that residents disliked comparatively. A pair of wooden signs reminiscent of Fort Bragg's history were shown. The image of a cross-section of redwood log with lettering on it (#15)

scored lower than the carved wooden sign with colorful painting done by a favorite local sign-maker (#35).

Parking

The relationship of parking to the street was explored in a series of paired images. Overall, participants liked parking lots at the rear of buildings that are well-landscaped. One image showing a new building built to the sidewalk, with parking in the rear scored a +3.7, while a similar-sized parking lot built up to the sidewalk (#33) scored a -2.8. The parking lots with landscaping, permeable paving and a bike rack (#16) scored much higher than a parking lots without significant landscaping, and without pedestrian/bicycle facilities (#36).

Landscaping

Landscaping is widely perceived as beautiful, and when placed appropriately, can increase safety in the pedestrian environment by acting as a buffer between the pedestrian and vehicular realms. Participants preferred the well-maintained raised landscape planter that separates the two realms (#30) to the poorly maintained landscape planter on the backside of the sidewalk (#10). Poorly maintained landscaping (#32) overgrowing the sidewalk scored negatively, while well-maintained diverse landscaping used as a buffer between the sidewalk and parking lot (#12) scored positively. The highest scoring image in the CIS was a landscaped curb extension in a downtown with on-street parking (#14). The image this was paired with was similar in that it had a curb extension with on-street parking, but was primarily hard-scaped with little landscaping (#34). Interestingly, the latter image still scored a 4.2 – the second highest average score in the CIS. Participants said it was because the image was so inviting to pedestrians. A relatively new landscape installation of ice plant planted into a lawn (#17) scored much lower than a newly planted xeriscape of other colorful succulents planted into mulch (#37). A landscape strip separating the sidewalk from a 4-lane roadway (#20) scored higher than the sidewalk not separated by landscaping from a similar roadway (#40).

Community Image Survey Results Prepared by the Local Government Commission

Preliminary Traffic Analysis

Collision History

The collision histories for each of the study intersections and the study segment were reviewed to determine any trends or patterns that may indicate a safety concern. Collision records for the study segment were obtained from the Traffic Accident Surveillance and Analysis System (TASAS), a State developed system used by Caltrans. Caltrans provided a five-year collision analysis, excluding pedestrians and bicyclists for the approximate 1.7-mile segment. A total of 71 collisions were reported for a calculated collision rate 1.15 collisions per million vehicle miles (c/mvm) for the segment, which is well below the state wide average collision rate for similar facilities of 4.45c/mvm.

For comparison, collision records for 1999 through 2008 were obtained from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports for the study intersections. As presented in Table 3, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in Caltrans' *2007 Accident Data on California State Highways*.

Table 3
Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (1999-2008)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. S Main St/Oak St	33	**0.51**	0.43
2. S Main St/Chestnut St	10	0.13	0.28
3. S Main St/Cypress St	25	0.29	0.43
4. S Main St/North Harbor Dr	5	0.05	0.22
5. S Main St/Ocean View Dr	4	0.05	0.43
6. S Main St/SR 20	33	**0.40**	0.28

Notes: c/mve = collisions per million vehicles entering
Bold indicates rate is above the statewide average

As shown in Table 3, the study intersections of South Main Street/Oak Street and South Main Street/SR 20 have collision rates that are higher than the statewide average. While this does not in and itself indicate a specific safety concern, further review is warranted. Of the 33 collisions reported at Main Street/SR 20, 18 were rear-ends and of those, 14 had unsafe speed indicated as the primary collision factor. This condition could be attributed to the change in speed limit and adjacent land uses found in proximity of the intersection. The remaining study intersections have rates that are below the statewide average, which typically indicate there is no apparent pattern that would be consistent with a safety concern.

Pedestrian-Bicycle Collisions

A review of records for collisions along the study corridor involving pedestrians and bicyclists was performed for the most recent ten-year period available using TASAS collision data provided by Caltrans. Ten collisions were reported during the analysis period. The primary collision factor for four of the collisions was "Other Violations." Two collisions were reported at the intersection of South Main Street/Chestnut Street. South Main Street/Maple Street had three collisions within close proximity of the intersection.

Figure 1displays the locations of the collisions recorded during the five-year period assessed for vehicular related collisions and ten years for pedestrian and bicycle related collisions.

Intersection Operating Conditions

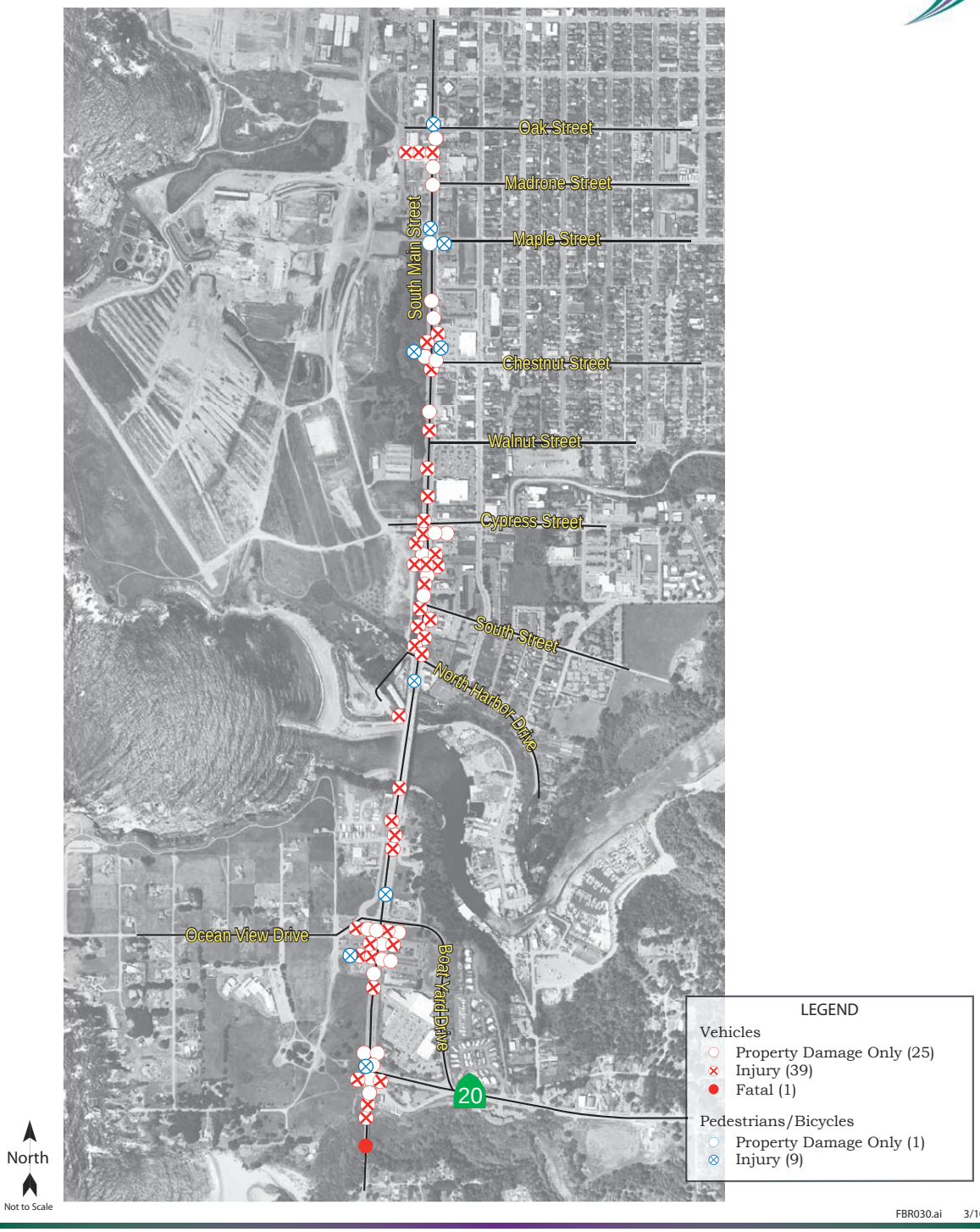
Current operating conditions at intersections along South Main Street in the study area were evaluated based on existing traffic volumes during the p.m. peak period. The following intersections, which are also shown in Figure 2, were evaluated:

1. Oak Street
2. Chestnut Street
3. Cypress Street
4. North Harbor Drive
5. Ocean View Drive
6. State Route 20

Existing turning movement counts for the intersections at Oak Street, Chestnut, Cypress Street, and North Harbor Drive were obtained from the *Mill Site Specific Plan Baseline Conditions Report*; these counts were collected in August 2008. Turning movements for the remaining intersections at Ocean View Drive and SR 20 were obtained in August 2008 for the Hare Creek Study.

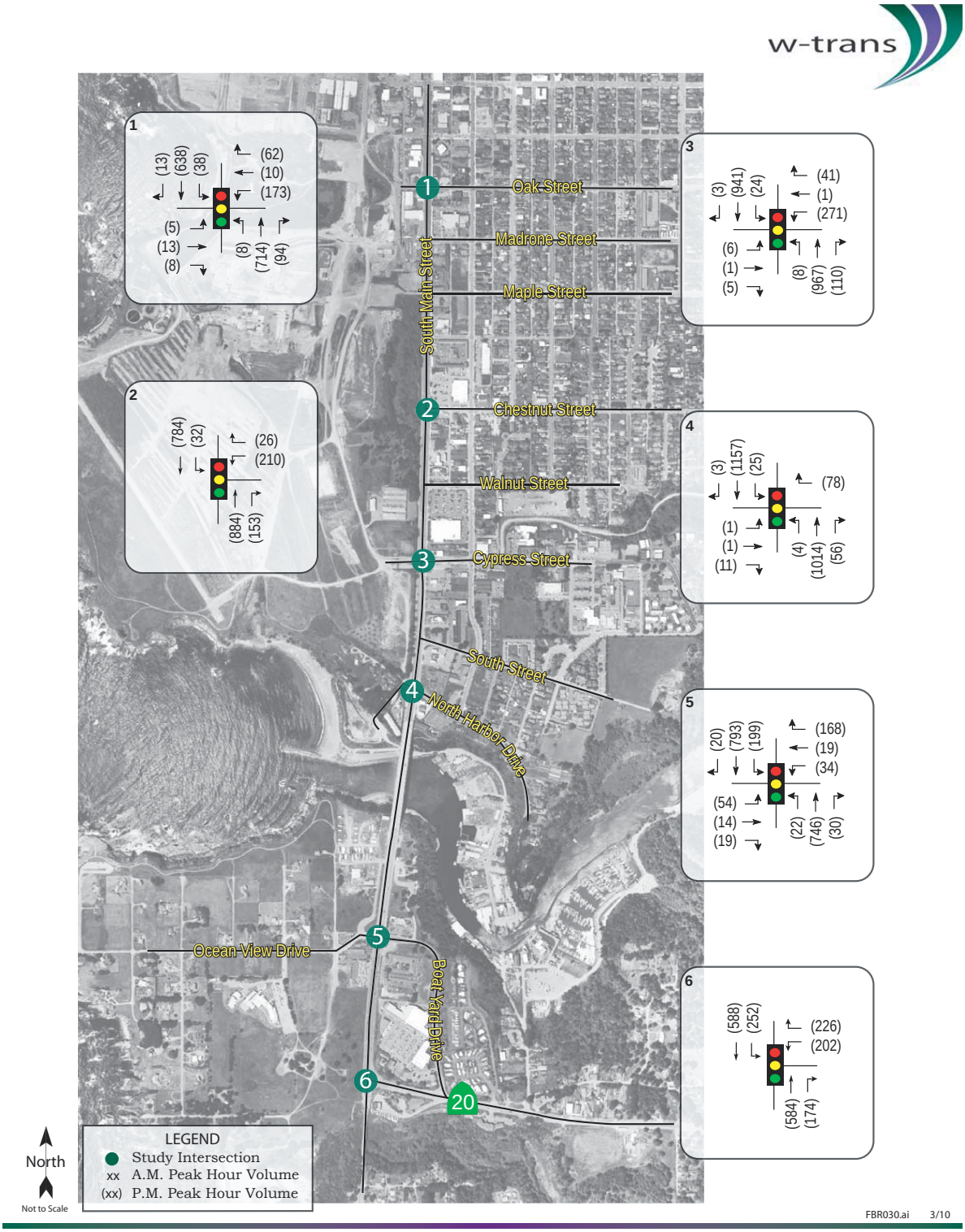
All of the study intersections are signalized except for Main Street/North Harbor Drive. This intersection is two-way stop-controlled, or "unsignalized," with uncontrolled movements on South Main Street and stop signs on the side streets.

Currently, all of intersections are operating at LOS B during the p.m. peak period. A summary of the level of service calculations is contained in Table 4 and copies of the calculations are provided in Appendix A.



South Fort Bragg Bicycle and Pedestrian Access Study
City of Fort Bragg

Figure 1
Collisions



South Fort Bragg Bicycle and Pedestrian Access Study — Figure 2

City of Fort Bragg — Study Area and Existing Traffic Volumes

Table 4
Summary of Existing PM Peak Hour Intersection Level of Service Calculations

Study Intersection	Existing Lanes		Road Diet	
Approach	**Delay**	**LOS**	**Delay**	**LOS**
1. S Main St/Oak St	15.3	B	26.1	C
2. S Main St/Chestnut St	10.4	B	14.5	B
3. S Main St/Cypress St	16.5	B	43.5	D
4. S Main St/North Harbor Dr				
Eastbound Approach	*15.2*	*C*	*27.2*	*D*
Westbound Approach	*13.6*	*B*	*22.8*	*C*
5. S Main St/Ocean View Dr	16.3	B	17.0	B
6. S Main St/SR 20	18.2	B	22.1	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service
Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Corridor Alternatives

Based on analysis of the base traffic conditions, input received from the public and stakeholders, and discussions with City staff, a "Road Diet" alternative was considered along South Main Street. "Road Diets" are generally the conversion of streets from four lanes (two through lanes in each direction) to three lanes (one through lane in each direction and a center two-way left-turn lane). Currently the configuration of South Main Street includes five lanes throughout the study corridor, and at various locations over 100 feet of right of way. The "Road Diet" concept has been employed by communities throughout the Country to address traffic safety, improve accessibility, and provide new bicycle facilities. Road diets in a downtown corridor often result in an environment that is safer and friendlier to drivers, bicyclists and pedestrians. The slowing of vehicular traffic generally results in a reduction of collisions and increase of comfort level for pedestrians and bicyclists.

With existing PM peak hour traffic volumes, implementation of a road diet configuration is projected to result in acceptable LOS D or better operation at the the study intersections, as summarized in Table 4.

Road Diet Analysis

Several "Road Diet" scenarios were tested and analyzed using the Synchro software package, including consideration of potential impacts on intersection LOS and vehicle queuing. The Synchro network only included the two-lane reduction from Oak Street to north of Ocean View Drive, with the addition of programmed improvements at Oak Street. It should be noted that the no major modifications were made to the surrounding street network. The intersection assumed to be modified was South Main Street/SR 20, where the double southbound left-turn lane was reduced and the free westbound right was eliminated and

reconfigured to operate with the existing traffic signal. Timing sheets received from Caltrans were entered to reflect base timing conditions for signalized intersections within the study corridor. Once base timing parameters were entered in Synchro, signal timing was re-optimized based on Road Diet conditions. Additionally two Buildout scenarios including the PM peak hour and the PM off-peak hour were analyzed, based on preliminary land use projections from the Mill Site redevelopment provided by Hexagon in May 2010. The results of these scenarios are summarized in Table 5 and included in Appendix A.

Table 5
Summary of Buildout Conditions Peak Hour Level of Service Calculations

S Main St Intersection *Approach*	PM Peak Hour		PM Off Peak Hour	
	Delay	**LOS**	**Delay**	**LOS**
1. Oak St	**	**F**	42.3	D
2. Madrone St	0.6	A	0.4	A
Westbound Approach	34.1	D	22.0	C
3. Maple St	0.3	A	0.2	A
Westbound Approach	***43.4***	***E***	*23.3*	*C*
4. Hazel St	0.2	A	0.1	A
Westbound Approach	***39.9***	***E***	*19.7*	*C*
5. E Chestnut St	**	**F**	53.0	D
6. Walnut St	11.3	B	1.6	A
Westbound Approach	**	**F**	**40.8**	**E**
7. Cypress St	**	**F**	**116.5**	**F**
8. South St	12.0	B	2.3	A
Westbound Approach	**	**F**	**64.2**	**F**
9. N Harbor Dr	1.4	A	0.8	A
Westbound Approach	**67.7**	**F**	*31.4*	*D*
Eastbound Approach	**36.0**	**E**	21.9	C
10. Ocean View Dr	12.4	B	11.9	A
11. SR 20	22.4	C	21.6	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service
** Delay is greater than 120 seconds; **Bold** = deficient operation
Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Intersection Level of Service Calculations

HCM Signalized Intersection Capacity Analysis
1: Oak Street & Main Street (Rt 1)

8/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	13	8	173	10	62	8	714	94	38	639	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	16	12	12	12	12	12	11	12	12	12	12
Total Lost time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.97		1.00	0.98		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1846			1601		1630	1630		1630	1711	
Flt Permitted		0.94			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1745			1282		1630	1630		1630	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	13	8	173	10	62	8	714	94	38	639	13
RTOR Reduction (vph)	0	6	0	0	16	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	20	0	0	229	0	8	803	0	38	651	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		17.4			17.4		0.7	43.3		2.2	44.8	
Effective Green, g (s)		17.4			17.4		0.7	43.3		2.2	44.8	
Actuated g/C Ratio		0.23			0.23		0.01	0.56		0.03	0.58	
Clearance Time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		393			289		15	913		46	992	
v/s Ratio Prot							0.00	c0.49		c0.02	0.38	
v/s Ratio Perm		0.01			c0.18							
v/c Ratio		0.05			0.79		0.53	0.88		0.83	0.66	
Uniform Delay, d1		23.5			28.2		38.1	14.7		37.4	11.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			13.7		31.9	11.8		69.9	3.4	
Delay (s)		23.5			42.0		70.0	26.5		107.3	14.4	
Level of Service		C			D		E	C		F	B	
Approach Delay (s)		23.5			42.0			27.0			19.5	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	14.4
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Madrone Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	24	866	39	19	822
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	24	866	39	19	822
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						468
pX, platoon unblocked	0.74					
vC, conflicting volume	1746	886			905	
vC1, stage 1 conf vol	886					
vC2, stage 2 conf vol	860					
vCu, unblocked vol	1832	886			905	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			97	
cM capacity (veh/h)	274	344			752	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	34	905	19	822
Volume Left	10	0	19	0
Volume Right	24	39	0	0
cSH	320	1700	752	1700
Volume to Capacity	0.11	0.53	0.03	0.48
Queue Length 95th (ft)	9	0	2	0
Control Delay (s)	17.6	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	17.6	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Maple Street & Main Street (Rt 1)

8/3/2010

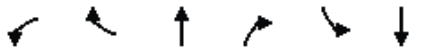
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	3	919	19	10	799
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	3	919	19	10	799
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			1064			938
pX, platoon unblocked	0.71	0.59			0.59	
vC, conflicting volume	1748	928			938	
vC1, stage 1 conf vol	928					
vC2, stage 2 conf vol	819					
vCu, unblocked vol	1083	532			548	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			98	
cM capacity (veh/h)	297	323			603	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	12	938	10	799
Volume Left	9	0	10	0
Volume Right	3	19	0	0
cSH	303	1700	603	1700
Volume to Capacity	0.04	0.55	0.02	0.47
Queue Length 95th (ft)	3	0	1	0
Control Delay (s)	17.4	0.0	11.1	0.0
Lane LOS	C		B	
Approach Delay (s)	17.4	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Hazel Street & Main Street (Rt 1)

8/3/2010



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	4	914	6	12	814
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	4	914	6	12	814
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			642			
pX, platoon unblocked	0.61	0.61			0.61	
vC, conflicting volume	1755	917			920	
vC1, stage 1 conf vol	917					
vC2, stage 2 conf vol	838					
vCu, unblocked vol	1921	537			542	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			98	
cM capacity (veh/h)	263	329			622	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	920	12	814
Volume Left	0	0	12	0
Volume Right	4	6	0	0
cSH	329	1700	622	1700
Volume to Capacity	0.01	0.54	0.02	0.48
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	16.1	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	16.1	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: E Chestnut Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	210	26	864	153	32	784
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	12	12	11
Total Lost time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	1658	1458	1630	1658
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	1658	1458	1630	1658
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	210	26	864	153	32	784
RTOR Reduction (vph)	0	22	0	26	0	0
Lane Group Flow (vph)	210	4	864	127	32	784
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Perm		pm+ov	Prot	
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	19.2	19.2	80.1	99.3	5.1	90.4
Effective Green, g (s)	19.2	19.2	80.1	99.3	5.1	90.4
Actuated g/C Ratio	0.16	0.16	0.67	0.83	0.04	0.75
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	261	233	1107	1270	69	1249
v/s Ratio Prot	c0.13		c0.52	0.02	0.02	c0.47
v/s Ratio Perm		0.00		0.07		
v/c Ratio	0.80	0.02	0.78	0.10	0.46	0.63
Uniform Delay, d1	48.6	42.5	13.8	1.9	56.1	6.9
Progression Factor	1.00	1.00	0.24	0.14	1.00	1.00
Incremental Delay, d2	16.3	0.0	3.6	0.0	4.9	2.4
Delay (s)	64.9	42.5	6.9	0.3	61.0	9.3
Level of Service	E	D	A	A	E	A
Approach Delay (s)	62.4		5.9			11.3
Approach LOS	E		A			B

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Walnut Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	63	956	22	43	962
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	29	63	956	22	43	962
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			675			674
pX, platoon unblocked	0.58	0.46			0.46	
vC, conflicting volume	2015	967			978	
vC1, stage 1 conf vol	967					
vC2, stage 2 conf vol	1048					
vCu, unblocked vol	1497	352			376	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	80			92	
cM capacity (veh/h)	219	321			549	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	92	978	43	962
Volume Left	29	0	43	0
Volume Right	63	22	0	0
cSH	280	1700	549	1700
Volume to Capacity	0.33	0.58	0.08	0.57
Queue Length 95th (ft)	35	0	6	0
Control Delay (s)	24.0	0.0	12.1	0.0
Lane LOS	C		B	
Approach Delay (s)	24.0	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Cypress Street & Main Street (Rt 1)

8/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1	5	271	1	41	8	967	110	24	941	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	11	12	11	11	12
Total Lost time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.88		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1501		1630	1464		1630	1658	1458	1576	1658	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1501		1630	1464		1630	1658	1458	1576	1658	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	1	5	271	1	41	8	967	110	24	941	3
RTOR Reduction (vph)	0	5	0	0	36	0	0	0	12	0	0	0
Lane Group Flow (vph)	6	1	0	271	6	0	8	967	98	24	944	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.8	1.6		15.0	15.8		1.6	78.6	93.6	5.2	82.2	
Effective Green, g (s)	0.8	1.6		15.0	15.8		1.6	78.6	93.6	5.2	82.2	
Actuated g/C Ratio	0.01	0.01		0.12	0.13		0.01	0.65	0.78	0.04	0.69	
Clearance Time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	11	20		204	193		22	1086	1137	68	1136	
v/s Ratio Prot	0.00	0.00		c0.17	c0.00		0.00	c0.58	0.01	c0.02	c0.57	
v/s Ratio Perm									0.06			
v/c Ratio	0.55	0.05		1.33	0.03		0.36	0.89	0.09	0.35	0.83	
Uniform Delay, d1	59.4	58.5		52.5	45.4		58.7	17.1	3.1	55.8	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.20	0.56	0.36	0.96	0.84	
Incremental Delay, d2	45.6	1.1		177.5	0.1		9.7	10.8	0.0	2.5	5.7	
Delay (s)	105.0	59.6		230.0	45.5		80.2	20.4	1.2	55.9	17.3	
Level of Service	F	E		F	D		F	C	A	E	B	
Approach Delay (s)		82.3			205.3			18.9			18.3	
Approach LOS		F			F			B			B	

Intersection Summary			
HCM Average Control Delay	43.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
8: South Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	54	1036	40	48	1183
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	47	54	1036	40	48	1183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						732
pX, platoon unblocked	0.54					
vC, conflicting volume	2335	1056			1076	
vC1, stage 1 conf vol	1056					
vC2, stage 2 conf vol	1279					
vCu, unblocked vol	3043	1056			1076	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	80			93	
cM capacity (veh/h)	138	274			648	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	101	1076	48	1183
Volume Left	47	0	48	0
Volume Right	54	40	0	0
cSH	188	1700	648	1700
Volume to Capacity	0.54	0.63	0.07	0.70
Queue Length 95th (ft)	70	0	6	0
Control Delay (s)	44.6	0.0	11.0	0.0
Lane LOS	E		B	
Approach Delay (s)	44.6	0.0	0.4	
Approach LOS	E			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: N. Harbor Drive & Main Street (Rt 1)

8/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	11	0	0	78	4	1014	56	25	1157	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	11	0	0	78	4	1014	56	25	1157	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1171	
pX, platoon unblocked	0.56	0.56	0.56	0.56	0.56		0.56					
vC, conflicting volume	2308	2286	1158	2268	2260	1042	1160			1070		
vC1, stage 1 conf vol	1208	1208		1050	1050							
vC2, stage 2 conf vol	1100	1078		1218	1210							
vCu, unblocked vol	2948	2908	889	2876	2861	1042	891			1070		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	94	100	100	72	99			96		
cM capacity (veh/h)	105	139	191	120	141	279	425			651		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	78	4	1070	25	1160
Volume Left	1	0	4	0	25	0
Volume Right	11	78	0	56	0	3
cSH	175	279	425	1700	651	1700
Volume to Capacity	0.07	0.28	0.01	0.63	0.04	0.68
Queue Length 95th (ft)	6	28	1	0	3	0
Control Delay (s)	27.2	22.8	13.6	0.0	10.7	0.0
Lane LOS	D	C	B		B	
Approach Delay (s)	27.2	22.8	0.1		0.2	
Approach LOS	D	C				

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: Ocean View Drive & Main Street (Rt 1)

8/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	14	19	34	19	168	22	746	30	199	793	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	12	12	14	14	12
Total Lost time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1568		1630	1716	1458	1630	3241		1739	3464	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1278	1568		1262	1716	1458	1630	3241		1739	3464	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	14	19	34	19	168	22	746	30	199	793	20
RTOR Reduction (vph)	0	18	0	0	0	85	0	1	0	0	1	0
Lane Group Flow (vph)	54	15	0	34	19	83	22	775	0	199	812	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		pm+ov	Prot			Prot		
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	9.3	9.3		9.3	9.3	28.3	3.5	76.1		19.0	91.6	
Effective Green, g (s)	9.3	9.3		9.3	9.3	28.3	3.5	76.1		19.0	91.6	
Actuated g/C Ratio	0.08	0.08		0.08	0.08	0.24	0.03	0.63		0.16	0.76	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	99	122		98	133	407	48	2055		275	2644	
v/s Ratio Prot		0.01			0.01	0.03	0.01	c0.24		c0.11	0.23	
v/s Ratio Perm	c0.04			0.03		0.02						
v/c Ratio	0.55	0.13		0.35	0.14	0.20	0.46	0.38		0.72	0.31	
Uniform Delay, d1	53.3	51.6		52.5	51.6	36.8	57.3	10.6		48.0	4.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	0.71		0.98	1.14	
Incremental Delay, d2	6.0	0.5		2.1	0.5	0.2	6.5	0.5		5.0	0.2	
Delay (s)	59.3	52.0		54.6	52.1	37.1	55.7	8.0		52.0	5.2	
Level of Service	E	D		D	D	D	E	A		D	A	
Approach Delay (s)		56.6			41.1			9.4			14.4	
Approach LOS		E			D			A			B	

Intersection Summary				
HCM Average Control Delay	17.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
11: State Route 20 & Main Street (Rt 1) 8/3/2010

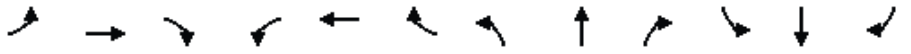
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	202	226	584	174	252	588
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.2	5.2	5.2	4.0	5.2	5.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	3260	1458	1630	3260
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	3260	1458	1630	3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	226	584	174	252	588
RTOR Reduction (vph)	0	63	0	0	0	0
Lane Group Flow (vph)	202	163	584	174	252	588
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		pm+ov		Free	Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8		Free		
Actuated Green, G (s)	20.1	43.9	60.5	120.0	23.8	89.5
Effective Green, g (s)	20.1	43.9	60.5	120.0	23.8	89.5
Actuated g/C Ratio	0.17	0.37	0.50	1.00	0.20	0.75
Clearance Time (s)	5.2	5.2	5.2		5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	273	597	1644	1458	323	2431
v/s Ratio Prot	c0.12	0.05	c0.18		c0.15	0.18
v/s Ratio Perm		0.06		0.12		
v/c Ratio	0.74	0.27	0.36	0.12	0.78	0.24
Uniform Delay, d1	47.5	26.8	18.0	0.0	45.6	4.7
Progression Factor	1.00	1.00	1.00	1.00	0.99	0.64
Incremental Delay, d2	10.1	0.2	0.6	0.2	11.3	0.2
Delay (s)	57.5	27.0	18.6	0.2	56.3	3.2
Level of Service	E	C	B	A	E	A
Approach Delay (s)	41.4		14.3			19.1
Approach LOS	D		B			B

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Oak Street & Main Street (Rt 1)

8/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	141	73	202	86	62	71	966	156	38	825	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	16	12	12	12	12	12	11	12	12	12	12
Total Lost time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1854			1628		1630	1624		1630	1697	
Flt Permitted		0.81			0.56		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1515			938		1630	1624		1630	1697	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	153	79	220	93	67	77	1050	170	41	897	72
RTOR Reduction (vph)	0	10	0	0	6	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	314	0	0	374	0	77	1215	0	41	967	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		36.8			36.8		6.0	65.6		3.2	62.8	
Effective Green, g (s)		36.8			36.8		6.0	65.6		3.2	62.8	
Actuated g/C Ratio		0.31			0.31		0.05	0.55		0.03	0.52	
Clearance Time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		465			288		82	888		43	888	
v/s Ratio Prot							c0.05	c0.75		0.03	0.57	
v/s Ratio Perm		0.21			c0.40							
v/c Ratio		0.68			1.30		0.94	1.37		0.95	1.09	
Uniform Delay, d1		36.4			41.6		56.8	27.2		58.3	28.6	
Progression Factor		1.00			1.00		1.42	0.15		1.00	1.00	
Incremental Delay, d2		3.9			157.2		16.8	166.4		118.5	57.2	
Delay (s)		40.3			198.8		97.3	170.4		176.8	85.8	
Level of Service		D			F		F	F		F	F	
Approach Delay (s)		40.3			198.8			166.1			89.5	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	131.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Madrone Street & Main Street (Rt 1) 8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	24	1246	39	19	1102
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	26	1354	42	21	1198
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						468
pX, platoon unblocked	0.49					
vC, conflicting volume	2615	1376			1397	
vC1, stage 1 conf vol	1376					
vC2, stage 2 conf vol	1239					
vCu, unblocked vol	3785	1376			1397	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	85			96	
cM capacity (veh/h)	129	178			489	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	37	1397	21	1198
Volume Left	11	0	21	0
Volume Right	26	42	0	0
cSH	160	1700	489	1700
Volume to Capacity	0.23	0.82	0.04	0.70
Queue Length 95th (ft)	21	0	3	0
Control Delay (s)	34.1	0.0	12.7	0.0
Lane LOS	D		B	
Approach Delay (s)	34.1	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Maple Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	3	1297	19	10	1079
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	3	1410	21	11	1173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			1064			938
pX, platoon unblocked	0.73	0.48			0.48	
vC, conflicting volume	2615	1420			1430	
vC1, stage 1 conf vol	1420					
vC2, stage 2 conf vol	1195					
vCu, unblocked vol	1491	1333			1354	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	96			96	
cM capacity (veh/h)	114	90			243	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	1430	11	1173
Volume Left	10	0	11	0
Volume Right	3	21	0	0
cSH	107	1700	243	1700
Volume to Capacity	0.12	0.84	0.04	0.69
Queue Length 95th (ft)	10	0	4	0
Control Delay (s)	43.4	0.0	20.5	0.0
Lane LOS	E		C	
Approach Delay (s)	43.4	0.0	0.2	
Approach LOS	E			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Hazel Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	4	1214	6	12	1094
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	1320	7	13	1189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			642			
pX, platoon unblocked	0.47	0.47			0.47	
vC, conflicting volume	2538	1323			1326	
vC1, stage 1 conf vol	1323					
vC2, stage 2 conf vol	1215					
vCu, unblocked vol	3719	1121			1128	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			95	
cM capacity (veh/h)	120	117			290	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	1326	13	1189
Volume Left	0	0	13	0
Volume Right	4	7	0	0
cSH	117	1700	290	1700
Volume to Capacity	0.04	0.78	0.05	0.70
Queue Length 95th (ft)	3	0	4	0
Control Delay (s)	36.9	0.0	18.0	0.0
Lane LOS	E		C	
Approach Delay (s)	36.9	0.0	0.2	
Approach LOS	E			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: E Chestnut Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	210	26	1214	153	312	1094
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	12	12	11
Total Lost time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	1658	1458	1630	1658
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	1658	1458	1630	1658
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	28	1320	166	339	1189
RTOR Reduction (vph)	0	23	0	12	0	0
Lane Group Flow (vph)	228	5	1320	154	339	1189
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Perm		pm+ov	Prot	
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	20.0	20.0	65.8	85.8	18.6	89.6
Effective Green, g (s)	20.0	20.0	65.8	85.8	18.6	89.6
Actuated g/C Ratio	0.17	0.17	0.55	0.71	0.16	0.75
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	243	909	1106	253	1238
v/s Ratio Prot	c0.14		c0.80	0.02	c0.21	0.72
v/s Ratio Perm		0.00		0.08		
v/c Ratio	0.84	0.02	1.45	0.14	1.34	0.96
Uniform Delay, d1	48.4	41.8	27.1	5.4	50.7	13.6
Progression Factor	1.00	1.00	0.40	0.05	1.09	0.77
Incremental Delay, d2	19.7	0.0	204.0	0.0	167.2	11.8
Delay (s)	68.1	41.8	214.8	0.3	222.6	22.3
Level of Service	E	D	F	A	F	C
Approach Delay (s)	65.2		190.9			66.7
Approach LOS	E		F			E

Intersection Summary			
HCM Average Control Delay	123.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Walnut Street & Main Street (Rt 1) 8/3/2010

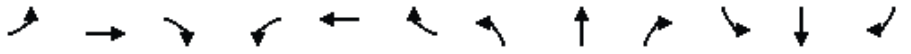
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	63	1328	22	43	1242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	68	1443	24	47	1350
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			675			674
pX, platoon unblocked	0.53	0.52			0.52	
vC, conflicting volume	2899	1455			1467	
vC1, stage 1 conf vol	1455					
vC2, stage 2 conf vol	1443					
vCu, unblocked vol	2106	1414			1437	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	42	22			81	
cM capacity (veh/h)	55	88			246	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	100	1467	47	1350
Volume Left	32	0	47	0
Volume Right	68	24	0	0
cSH	74	1700	246	1700
Volume to Capacity	1.36	0.86	0.19	0.79
Queue Length 95th (ft)	200	0	17	0
Control Delay (s)	325.1	0.0	23.1	0.0
Lane LOS	F		C	
Approach Delay (s)	325.1	0.0	0.8	
Approach LOS	F			

Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Cypress Street & Main Street (Rt 1)

8/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	96	224	271	53	87	110	1142	110	66	1106	76
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	11	12	11	11	12
Total Lost time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.91		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1535		1630	1556		1630	1658	1458	1576	1642	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1535		1630	1556		1630	1658	1458	1576	1642	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	104	243	295	58	95	120	1241	120	72	1202	83
RTOR Reduction (vph)	0	70	0	0	49	0	0	0	19	0	2	0
Lane Group Flow (vph)	177	277	0	295	104	0	120	1241	101	72	1283	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.0	21.8		12.0	21.8		8.8	59.6	71.6	7.0	57.8	
Effective Green, g (s)	12.0	21.8		12.0	21.8		8.8	59.6	71.6	7.0	57.8	
Actuated g/C Ratio	0.10	0.18		0.10	0.18		0.07	0.50	0.60	0.06	0.48	
Clearance Time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	163	279		163	283		120	823	870	92	791	
v/s Ratio Prot	0.11	c0.18		c0.18	0.07		c0.07	0.75	0.01	0.05	c0.78	
v/s Ratio Perm									0.06			
v/c Ratio	1.09	0.99		1.81	0.37		1.00	1.51	0.12	0.78	1.62	
Uniform Delay, d1	54.0	49.0		54.0	43.1		55.6	30.2	10.5	55.7	31.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.91	1.03	
Incremental Delay, d2	95.3	51.3		387.6	0.8		82.2	234.9	0.1	15.8	282.2	
Delay (s)	149.3	100.3		441.6	43.9		137.8	265.1	10.5	66.4	314.1	
Level of Service	F	F		F	D		F	F	B	E	F	
Approach Delay (s)		116.9			305.8			234.1			301.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	250.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	127.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
8: South Street & Main Street (Rt 1) 8/3/2010

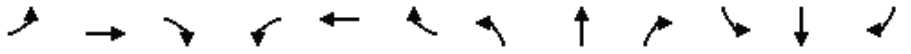
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	54	1312	40	48	1568
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	59	1426	43	52	1704
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						732
pX, platoon unblocked	0.54					
vC, conflicting volume	3257	1448			1470	
vC1, stage 1 conf vol	1448					
vC2, stage 2 conf vol	1809					
vCu, unblocked vol	4767	1448			1470	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	64			89	
cM capacity (veh/h)	47	161			459	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	110	1470	52	1704
Volume Left	51	0	52	0
Volume Right	59	43	0	0
cSH	76	1700	459	1700
Volume to Capacity	1.45	0.86	0.11	1.00
Queue Length 95th (ft)	223	0	10	0
Control Delay (s)	358.3	0.0	13.8	0.0
Lane LOS	F		B	
Approach Delay (s)	358.3	0.0	0.4	
Approach LOS	F			

Intersection Summary			
Average Delay	12.0		
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: N. Harbor Drive & Main Street (Rt 1)

8/3/2010



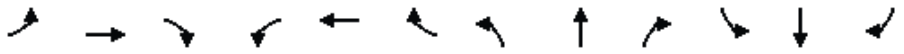
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	11	0	0	78	4	1290	56	25	1542	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	11	0	0	78	4	1290	56	25	1542	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1171	
pX, platoon unblocked	0.55	0.55	0.55	0.55	0.55		0.55					
vC, conflicting volume	2970	2948	1544	2930	2921	1318	1545			1346		
vC1, stage 1 conf vol	1594	1594		1326	1326							
vC2, stage 2 conf vol	1376	1354		1604	1595							
vCu, unblocked vol	4180	4140	1579	4107	4092	1318	1582			1346		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	85	100	100	59	98			95		
cM capacity (veh/h)	46	69	74	45	68	192	228			512		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	78	4	1346	25	1545
Volume Left	1	0	4	0	25	0
Volume Right	11	78	0	56	0	3
cSH	70	192	228	1700	512	1700
Volume to Capacity	0.19	0.41	0.02	0.79	0.05	0.91
Queue Length 95th (ft)	16	45	1	0	4	0
Control Delay (s)	67.7	36.0	21.1	0.0	12.4	0.0
Lane LOS	F	E	C		B	
Approach Delay (s)	67.7	36.0	0.1		0.2	
Approach LOS	F	E				

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	98.3%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: Ocean View Drive & Main Street (Rt 1)

8/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	14	19	34	19	168	22	1022	30	199	1178	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	12	12	14	14	12
Total Lost time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1568		1630	1716	1458	1630	3246		1739	3468	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1278	1568		1262	1716	1458	1630	3246		1739	3468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	14	19	34	19	168	22	1022	30	199	1178	20
RTOR Reduction (vph)	0	17	0	0	0	33	0	2	0	0	1	0
Lane Group Flow (vph)	54	16	0	34	19	135	22	1050	0	199	1197	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		pm+ov	Prot			Prot		
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	8.6	8.6		8.6	8.6	25.2	3.4	59.2		16.6	72.4	
Effective Green, g (s)	8.6	8.6		8.6	8.6	25.2	3.4	59.2		16.6	72.4	
Actuated g/C Ratio	0.09	0.09		0.09	0.09	0.25	0.03	0.59		0.17	0.72	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	135		109	148	443	55	1922		289	2511	
v/s Ratio Prot		0.01			0.01	0.05	0.01	c0.32		c0.11	0.35	
v/s Ratio Perm	c0.04			0.03		0.04						
v/c Ratio	0.49	0.12		0.31	0.13	0.30	0.40	0.55		0.69	0.48	
Uniform Delay, d1	43.6	42.2		42.9	42.2	30.3	47.3	12.3		39.3	5.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.20	0.30		1.00	1.00	
Incremental Delay, d2	3.4	0.4		1.6	0.4	0.4	4.0	1.0		6.7	0.7	
Delay (s)	47.0	42.6		44.6	42.6	30.7	60.8	4.7		45.9	6.5	
Level of Service	D	D		D	D	C	E	A		D	A	
Approach Delay (s)		45.3			33.9			5.8			12.1	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: State Route 20 & Main Street (Rt 1)

8/3/2010

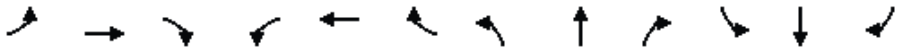
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	202	289	797	174	368	858
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.2	5.2	5.2	4.0	5.2	5.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	3260	1458	1630	3260
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	3260	1458	1630	3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	289	797	174	368	858
RTOR Reduction (vph)	0	21	0	0	0	0
Lane Group Flow (vph)	202	268	797	174	368	858
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		pm+ov		Free	Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8		Free		
Actuated Green, G (s)	17.1	43.9	40.5	100.0	26.8	72.5
Effective Green, g (s)	17.1	43.9	40.5	100.0	26.8	72.5
Actuated g/C Ratio	0.17	0.44	0.40	1.00	0.27	0.72
Clearance Time (s)	5.2	5.2	5.2		5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	279	716	1320	1458	437	2364
v/s Ratio Prot	c0.12	0.10	c0.24		c0.23	0.26
v/s Ratio Perm		0.08		0.12		
v/c Ratio	0.72	0.37	0.60	0.12	0.84	0.36
Uniform Delay, d1	39.2	18.8	23.4	0.0	34.6	5.1
Progression Factor	1.00	1.00	1.00	1.00	0.94	1.73
Incremental Delay, d2	9.0	0.3	2.1	0.2	12.7	0.4
Delay (s)	48.2	19.2	25.5	0.2	45.3	9.3
Level of Service	D	B	C	A	D	A
Approach Delay (s)	31.1		20.9			20.1
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Oak Street & Main Street (Rt 1)

8/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	141	73	202	86	62	71	966	156	38	825	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	16	12	12	12	12	12	11	12	12	12	12
Total Lost time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1854			1628		1630	1624		1630	1697	
Flt Permitted		0.82			0.59		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1548			996		1630	1624		1630	1697	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Adj. Flow (vph)	74	123	63	176	75	54	62	840	136	33	717	57
RTOR Reduction (vph)	0	9	0	0	6	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	251	0	0	299	0	62	971	0	33	772	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		33.8			33.8		5.6	69.4		2.4	66.2	
Effective Green, g (s)		33.8			33.8		5.6	69.4		2.4	66.2	
Actuated g/C Ratio		0.28			0.28		0.05	0.58		0.02	0.55	
Clearance Time (s)		5.2			5.2		4.0	5.2		4.0	5.2	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		436			281		76	939		33	936	
v/s Ratio Prot							c0.04	c0.60		0.02	0.45	
v/s Ratio Perm		0.16			c0.30							
v/c Ratio		0.57			1.06		0.82	1.03		1.00	0.82	
Uniform Delay, d1		36.9			43.1		56.7	25.3		58.8	22.1	
Progression Factor		1.00			1.00		1.37	0.09		1.00	1.00	
Incremental Delay, d2		1.8			71.1		6.1	19.6		156.7	8.2	
Delay (s)		38.8			114.2		83.8	21.9		215.5	30.3	
Level of Service		D			F		F	C		F	C	
Approach Delay (s)		38.8			114.2			25.6			37.9	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM Average Control Delay	42.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Madrone Street & Main Street (Rt 1) 8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	24	1246	39	19	1102
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	21	1083	34	17	958
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						468
pX, platoon unblocked	0.62					
vC, conflicting volume	2092	1100			1117	
vC1, stage 1 conf vol	1100					
vC2, stage 2 conf vol	991					
vCu, unblocked vol	2448	1100			1117	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			97	
cM capacity (veh/h)	209	258			625	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	30	1117	17	958
Volume Left	9	0	17	0
Volume Right	21	34	0	0
cSH	241	1700	625	1700
Volume to Capacity	0.12	0.66	0.03	0.56
Queue Length 95th (ft)	10	0	2	0
Control Delay (s)	22.0	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	22.0	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Maple Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	3	1297	19	10	1079
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	3	1128	17	9	938
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			1064			938
pX, platoon unblocked	0.66	0.48			0.48	
vC, conflicting volume	2092	1136			1144	
vC1, stage 1 conf vol	1136					
vC2, stage 2 conf vol	956					
vCu, unblocked vol	1145	738			755	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			98	
cM capacity (veh/h)	210	200			408	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	10	1144	9	938
Volume Left	8	0	9	0
Volume Right	3	17	0	0
cSH	208	1700	408	1700
Volume to Capacity	0.05	0.67	0.02	0.55
Queue Length 95th (ft)	4	0	2	0
Control Delay (s)	23.3	0.0	14.0	0.0
Lane LOS	C		B	
Approach Delay (s)	23.3	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Hazel Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	4	1214	6	12	1094
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	1056	5	10	951
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			642			
pX, platoon unblocked	0.47	0.47			0.47	
vC, conflicting volume	2030	1058			1061	
vC1, stage 1 conf vol	1058					
vC2, stage 2 conf vol	972					
vCu, unblocked vol	2634	556			561	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			98	
cM capacity (veh/h)	202	248			472	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	3	1061	10	951
Volume Left	0	0	10	0
Volume Right	3	5	0	0
cSH	248	1700	472	1700
Volume to Capacity	0.01	0.62	0.02	0.56
Queue Length 95th (ft)	1	0	2	0
Control Delay (s)	19.7	0.0	12.8	0.0
Lane LOS	C		B	
Approach Delay (s)	19.7	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: E Chestnut Street & Main Street (Rt 1)

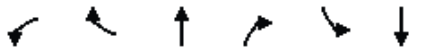
8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	210	26	1214	153	312	1094
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	12	12	11
Total Lost time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	1658	1458	1630	1658
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	1658	1458	1630	1658
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	80%	80%	80%	80%	80%	80%
Adj. Flow (vph)	183	23	1056	133	271	951
RTOR Reduction (vph)	0	20	0	25	0	0
Lane Group Flow (vph)	183	3	1056	108	271	951
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Perm		pm+ov	Prot	
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	17.9	17.9	65.8	83.7	20.7	91.7
Effective Green, g (s)	17.9	17.9	65.8	83.7	20.7	91.7
Actuated g/C Ratio	0.15	0.15	0.55	0.70	0.17	0.76
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	217	909	1080	281	1267
v/s Ratio Prot	c0.11		c0.64	0.01	c0.17	0.57
v/s Ratio Perm		0.00		0.06		
v/c Ratio	0.75	0.02	1.16	0.10	0.96	0.75
Uniform Delay, d1	48.9	43.5	27.1	5.9	49.3	7.8
Progression Factor	1.00	1.00	0.47	0.02	1.02	0.77
Incremental Delay, d2	12.4	0.0	76.0	0.0	37.8	3.2
Delay (s)	61.3	43.6	88.7	0.1	88.1	9.3
Level of Service	E	D	F	A	F	A
Approach Delay (s)	59.3		78.8			26.7
Approach LOS	E		E			C

Intersection Summary			
HCM Average Control Delay	53.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Walnut Street & Main Street (Rt 1) 8/3/2010



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	63	1328	22	43	1242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	55	1155	19	37	1080
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			675			674
pX, platoon unblocked	0.67	0.49			0.49	
vC, conflicting volume	2319	1164			1174	
vC1, stage 1 conf vol	1164					
vC2, stage 2 conf vol	1155					
vCu, unblocked vol	1527	812			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	70			90	
cM capacity (veh/h)	165	185			391	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	80	1174	37	1080
Volume Left	25	0	37	0
Volume Right	55	19	0	0
cSH	178	1700	391	1700
Volume to Capacity	0.45	0.69	0.10	0.64
Queue Length 95th (ft)	52	0	8	0
Control Delay (s)	40.8	0.0	15.2	0.0
Lane LOS	E		C	
Approach Delay (s)	40.8	0.0	0.5	
Approach LOS	E			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Cypress Street & Main Street (Rt 1)

8/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	96	224	271	53	87	110	1142	110	66	1106	76
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	11	12	11	11	12
Total Lost time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.91		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1535		1630	1555		1630	1658	1458	1576	1643	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1535		1630	1555		1630	1658	1458	1576	1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Adj. Flow (vph)	142	83	195	236	46	76	96	993	96	57	962	66
RTOR Reduction (vph)	0	73	0	0	52	0	0	0	18	0	2	0
Lane Group Flow (vph)	142	205	0	236	70	0	96	993	78	57	1026	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.9	17.8		12.0	17.9		9.7	63.5	75.5	7.1	60.9	
Effective Green, g (s)	11.9	17.8		12.0	17.9		9.7	63.5	75.5	7.1	60.9	
Actuated g/C Ratio	0.10	0.15		0.10	0.15		0.08	0.53	0.63	0.06	0.51	
Clearance Time (s)	4.0	5.2		4.0	5.2		5.2	5.2	4.0	5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	162	228		163	232		132	877	917	93	834	
v/s Ratio Prot	0.09	c0.13		c0.14	0.05		c0.06	c0.60	0.01	0.04	c0.62	
v/s Ratio Perm									0.05			
v/c Ratio	0.88	0.90		1.45	0.30		0.73	1.13	0.09	0.61	1.23	
Uniform Delay, d1	53.3	50.2		54.0	45.5		53.9	28.2	8.7	55.1	29.6	
Progression Factor	1.00	1.00		1.00	1.00		1.05	0.74	0.63	0.95	0.89	
Incremental Delay, d2	37.4	33.2		232.5	0.7		17.6	73.4	0.0	8.0	111.0	
Delay (s)	90.7	83.4		286.5	46.2		74.1	94.2	5.6	60.3	137.3	
Level of Service	F	F		F	D		E	F	A	E	F	
Approach Delay (s)		85.9			204.6			85.4			133.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	116.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: South Street & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	54	1312	40	48	1568
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	47	1141	35	42	1363
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						732
pX, platoon unblocked	0.51					
vC, conflicting volume	2605	1158			1176	
vC1, stage 1 conf vol	1158					
vC2, stage 2 conf vol	1447					
vCu, unblocked vol	3659	1158			1176	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	58	80			93	
cM capacity (veh/h)	97	239			594	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	88	1176	42	1363
Volume Left	41	0	42	0
Volume Right	47	35	0	0
cSH	143	1700	594	1700
Volume to Capacity	0.62	0.69	0.07	0.80
Queue Length 95th (ft)	82	0	6	0
Control Delay (s)	64.2	0.0	11.5	0.0
Lane LOS	F		B	
Approach Delay (s)	64.2	0.0	0.3	
Approach LOS	F			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: N. Harbor Drive & Main Street (Rt 1)

8/3/2010

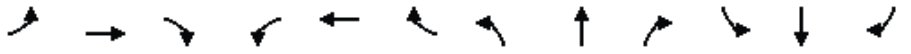
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	11	0	0	78	4	1290	56	25	1542	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	9	0	0	62	3	1032	45	20	1234	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1171	
pX, platoon unblocked	0.52	0.52	0.52	0.52	0.52		0.52					
vC, conflicting volume	2376	2358	1235	2344	2337	1054	1236			1077		
vC1, stage 1 conf vol	1275	1275		1061	1061							
vC2, stage 2 conf vol	1101	1083		1283	1276							
vCu, unblocked vol	3168	3135	995	3107	3094	1054	997			1077		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	94	100	100	77	99			97		
cM capacity (veh/h)	100	124	156	105	125	274	364			648		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	10	62	3	1077	20	1236
Volume Left	1	0	3	0	20	0
Volume Right	9	62	0	45	0	2
cSH	147	274	364	1700	648	1700
Volume to Capacity	0.07	0.23	0.01	0.63	0.03	0.73
Queue Length 95th (ft)	6	21	1	0	2	0
Control Delay (s)	31.4	21.9	15.0	0.0	10.7	0.0
Lane LOS	D	C	B		B	
Approach Delay (s)	31.4	21.9	0.0		0.2	
Approach LOS	D	C				

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: Ocean View Drive & Main Street (Rt 1)

8/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	14	19	34	19	168	22	1022	30	199	1178	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	12	12	14	14	12
Total Lost time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1567		1630	1716	1458	1630	3246		1739	3468	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1283	1567		1270	1716	1458	1630	3246		1739	3468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Adj. Flow (vph)	43	11	15	27	15	134	18	818	24	159	942	16
RTOR Reduction (vph)	0	14	0	0	0	84	0	1	0	0	0	0
Lane Group Flow (vph)	43	12	0	27	15	50	18	841	0	159	958	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		pm+ov	Prot			Prot		
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	8.4	8.4		8.4	8.4	24.6	3.4	79.8		16.2	92.6	
Effective Green, g (s)	8.4	8.4		8.4	8.4	24.6	3.4	79.8		16.2	92.6	
Actuated g/C Ratio	0.07	0.07		0.07	0.07	0.21	0.03	0.66		0.13	0.77	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.2	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	110		89	120	362	46	2159		235	2676	
v/s Ratio Prot		0.01			0.01	0.02	0.01	c0.26		c0.09	0.28	
v/s Ratio Perm	c0.03			0.02		0.02						
v/c Ratio	0.48	0.11		0.30	0.12	0.14	0.39	0.39		0.68	0.36	
Uniform Delay, d1	53.7	52.3		53.0	52.4	39.0	57.3	9.1		49.4	4.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.24	0.25		0.95	0.92	
Incremental Delay, d2	4.0	0.4		1.9	0.5	0.2	5.1	0.5		0.7	0.0	
Delay (s)	57.6	52.7		54.9	52.8	39.2	76.3	2.8		47.6	4.0	
Level of Service	E	D		D	D	D	E	A		D	A	
Approach Delay (s)		55.8			42.8			4.3			10.2	
Approach LOS		E			D			A			B	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: State Route 20 & Main Street (Rt 1)

8/3/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	202	289	797	174	368	858
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.2	5.2	5.2	4.0	5.2	5.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1630	1458	3260	1458	1630	3260
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1630	1458	3260	1458	1630	3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	80%	80%	80%	80%	80%	80%
Adj. Flow (vph)	162	231	638	139	294	686
RTOR Reduction (vph)	0	50	0	0	0	0
Lane Group Flow (vph)	162	181	638	139	294	686
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		pm+ov		Free	Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8		Free		
Actuated Green, G (s)	17.2	44.5	59.9	120.0	27.3	92.4
Effective Green, g (s)	17.2	44.5	59.9	120.0	27.3	92.4
Actuated g/C Ratio	0.14	0.37	0.50	1.00	0.23	0.77
Clearance Time (s)	5.2	5.2	5.2		5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	604	1627	1458	371	2510
v/s Ratio Prot	c0.10	0.07	c0.20		c0.18	0.21
v/s Ratio Perm		0.06		0.10		
v/c Ratio	0.69	0.30	0.39	0.10	0.79	0.27
Uniform Delay, d1	48.9	26.7	18.7	0.0	43.7	4.0
Progression Factor	1.00	1.00	1.00	1.00	0.85	1.57
Incremental Delay, d2	8.5	0.3	0.7	0.1	10.6	0.3
Delay (s)	57.4	27.0	19.4	0.1	47.7	6.6
Level of Service	E	C	B	A	D	A
Approach Delay (s)	39.5		16.0			18.9
Approach LOS	D		B			B

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queuing and Blocking Report
Road Diet E PM 8/3/2010

Intersection: 1: Oak Street & Main Street (Rt 1)

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	34	168	14	374	67	264
Average Queue (ft)	23	121	3	250	37	151
95th Queue (ft)	44	189	17	443	83	272
Link Distance (ft)	248	237		414		436
Upstream Blk Time (%)		0		1		
Queuing Penalty (veh)		0		6		
Storage Bay Dist (ft)			80		80	
Storage Blk Time (%)				20	2	15
Queuing Penalty (veh)				2	12	6

Intersection: 2: Madrone Street & Main Street (Rt 1)

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	46	52	34
Average Queue (ft)	25	11	13
95th Queue (ft)	56	61	40
Link Distance (ft)	279	413	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			25
Storage Blk Time (%)			6
Queuing Penalty (veh)			51

Intersection: 3: Maple Street & Main Street (Rt 1)

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	15	21
Average Queue (ft)	5	6
95th Queue (ft)	23	27
Link Distance (ft)	378	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		25
Storage Blk Time (%)		3
Queuing Penalty (veh)		21

Queuing and Blocking Report
Road Diet E PM 8/3/2010

Intersection: 4: Hazel Street & Main Street (Rt 1)

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	5	10
Average Queue (ft)	1	5
95th Queue (ft)	10	24
Link Distance (ft)	348	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		25
Storage Blk Time (%)		1
Queuing Penalty (veh)		11

Intersection: 5: E Chestnut Street & Main Street (Rt 1)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	160	181	230	75	71	317
Average Queue (ft)	136	71	144	24	35	213
95th Queue (ft)	195	225	298	97	90	384
Link Distance (ft)		725	618			575
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			120	100	
Storage Blk Time (%)	32		8			12
Queuing Penalty (veh)	8		12			4

Intersection: 6: Walnut Street & Main Street (Rt 1)

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	123	41	34
Average Queue (ft)	69	21	12
95th Queue (ft)	136	51	88
Link Distance (ft)	507		618
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Queuing and Blocking Report
Road Diet E PM

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Intersection: 7: Cypress Street & Main Street (Rt 1)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	TR
Maximum Queue (ft)	10	27	160	381	20	342	53	69	415
Average Queue (ft)	5	6	157	291	7	188	11	29	258
95th Queue (ft)	22	32	171	514	26	386	69	74	520
Link Distance (ft)		346		436		678			607
Upstream Blk Time (%)				11					0
Queuing Penalty (veh)				0					4
Storage Bay Dist (ft)	100		100		100		130	100	
Storage Blk Time (%)			73			12		1	13
Queuing Penalty (veh)			31			14		5	3

Intersection: 8: South Street & Main Street (Rt 1)

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	221	4	35
Average Queue (ft)	130	1	20
95th Queue (ft)	265	7	46
Link Distance (ft)	496	351	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			24
Storage Blk Time (%)			8
Queuing Penalty (veh)			96

Intersection: 9: N. Harbor Drive & Main Street (Rt 1)

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	R	L	TR	L
Maximum Queue (ft)	27	54	14	3	22
Average Queue (ft)	10	34	3	1	10
95th Queue (ft)	30	63	15	6	27
Link Distance (ft)	335	524		1875	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			25		25
Storage Blk Time (%)			1	0	2
Queuing Penalty (veh)			7	0	18

Queuing and Blocking Report
Road Diet E PM

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Intersection: 10: Ocean View Drive & Main Street (Rt 1)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	B29
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR	T
Maximum Queue (ft)	79	28	55	42	110	41	128	141	213	195	102	3
Average Queue (ft)	42	12	24	19	59	18	94	111	137	132	52	1
95th Queue (ft)	86	34	64	55	114	48	142	162	246	216	131	6
Link Distance (ft)		371		572			1197	1197	234	234	234	1875
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									2	0		
Storage Bay Dist (ft)	100		200		200	400						
Storage Blk Time (%)	2											
Queuing Penalty (veh)	1											

Intersection: 11: State Route 20 & Main Street (Rt 1)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	T	L	T
Maximum Queue (ft)	208	71	120	132	242	122
Average Queue (ft)	130	50	90	89	166	77
95th Queue (ft)	232	79	148	150	268	152
Link Distance (ft)		677	193	193		1197
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200				310	
Storage Blk Time (%)	3					
Queuing Penalty (veh)	7					

Zone Summary

Zone wide Queuing Penalty: 321

Queuing and Blocking Report
Mill Site Buildout Conditions PM 8/3/2010

Intersection: 1: Oak Street & Main Street (Rt 1)

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	255	252	95	356	73	451
Average Queue (ft)	223	237	57	181	41	451
95th Queue (ft)	301	291	115	383	94	455
Link Distance (ft)	248	237		414		436
Upstream Blk Time (%)	14	49		0		32
Queuing Penalty (veh)	0	0		1		0
Storage Bay Dist (ft)			80		80	
Storage Blk Time (%)			7	27	3	42
Queuing Penalty (veh)			75	19	30	16

Intersection: 2: Madrone Street & Main Street (Rt 1)

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	46	10	34	57
Average Queue (ft)	28	2	15	11
95th Queue (ft)	60	15	41	81
Link Distance (ft)	279	413		414
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			25	
Storage Blk Time (%)			10	1
Queuing Penalty (veh)			113	0

Intersection: 3: Maple Street & Main Street (Rt 1)

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	55	24	302
Average Queue (ft)	33	7	99
95th Queue (ft)	75	36	352
Link Distance (ft)	378		413
Upstream Blk Time (%)			1
Queuing Penalty (veh)			14
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		1	7
Queuing Penalty (veh)		13	1

Queuing and Blocking Report
Mill Site Buildout Conditions PM 8/3/2010

Intersection: 4: Hazel Street & Main Street (Rt 1)

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	19	15	374
Average Queue (ft)	7	4	228
95th Queue (ft)	26	21	485
Link Distance (ft)	348		364
Upstream Blk Time (%)			7
Queuing Penalty (veh)			72
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		2	19
Queuing Penalty (veh)		18	2

Intersection: 5: E Chestnut Street & Main Street (Rt 1)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	152	196	465	88	159	587
Average Queue (ft)	123	77	339	18	156	549
95th Queue (ft)	184	257	560	105	172	654
Link Distance (ft)		725	618			575
Upstream Blk Time (%)			1			18
Queuing Penalty (veh)			8			191
Storage Bay Dist (ft)	100			120	100	
Storage Blk Time (%)	28		32	0	54	11
Queuing Penalty (veh)	7		48	0	586	34

Intersection: 6: Walnut Street & Main Street (Rt 1)

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	236	59	29	506
Average Queue (ft)	145	18	16	291
95th Queue (ft)	292	133	42	653
Link Distance (ft)	507	607		618
Upstream Blk Time (%)				4
Queuing Penalty (veh)				49
Storage Bay Dist (ft)			100	
Storage Blk Time (%)				24
Queuing Penalty (veh)				10

Queuing and Blocking Report
Mill Site Buildout Conditions PM

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Intersection: 7: Cypress Street & Main Street (Rt 1)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	TR
Maximum Queue (ft)	154	366	160	434	130	689	161	109	618
Average Queue (ft)	136	330	156	355	81	671	42	45	602
95th Queue (ft)	193	438	169	546	145	748	164	119	656
Link Distance (ft)		346		436		678			607
Upstream Blk Time (%)		31		31		24			27
Queuing Penalty (veh)		0		0		333			346
Storage Bay Dist (ft)	100		100		100		130	100	
Storage Blk Time (%)	32	66	82	0	6	42		3	48
Queuing Penalty (veh)	103	107	115	0	70	92		30	32

Intersection: 8: South Street & Main Street (Rt 1)

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	293	380	45	18
Average Queue (ft)	182	293	21	4
95th Queue (ft)	360	499	52	25
Link Distance (ft)	496	351		678
Upstream Blk Time (%)	1	18		
Queuing Penalty (veh)	0	250		
Storage Bay Dist (ft)			24	
Storage Blk Time (%)			21	
Queuing Penalty (veh)			331	

Intersection: 9: N. Harbor Drive & Main Street (Rt 1)

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	R	L	TR	L
Maximum Queue (ft)	13	148	27	1275	26
Average Queue (ft)	5	79	5	552	13
95th Queue (ft)	16	176	39	1473	35
Link Distance (ft)	335	524		1875	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			25		25
Storage Blk Time (%)			0	21	4
Queuing Penalty (veh)			1	1	67

Queuing and Blocking Report
Mill Site Buildout Conditions PM 8/3/2010

Intersection: 10: Ocean View Drive & Main Street (Rt 1)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	82	46	54	29	130	38	262	291	140	200	123
Average Queue (ft)	48	23	33	16	81	20	153	192	88	125	56
95th Queue (ft)	97	51	67	38	137	48	304	337	154	228	145
Link Distance (ft)		371		572			1197	1197	234	234	234
Upstream Blk Time (%)										0	0
Queuing Penalty (veh)										2	0
Storage Bay Dist (ft)	100		200		200	400					
Storage Blk Time (%)	2						0				
Queuing Penalty (veh)	1						0				

Intersection: 11: State Route 20 & Main Street (Rt 1)

Movement	WB	WB	NB	NB	B30	SB	SB
Directions Served	L	R	T	T	T	L	T
Maximum Queue (ft)	178	138	221	220	64	203	208
Average Queue (ft)	121	82	148	151	13	124	125
95th Queue (ft)	206	148	242	240	78	222	252
Link Distance (ft)		677	193	193	674		1197
Upstream Blk Time (%)			2	2			
Queuing Penalty (veh)			0	0			
Storage Bay Dist (ft)	200					310	
Storage Blk Time (%)	1	0					0
Queuing Penalty (veh)	3	0					1

Zone Summary

Zone wide Queuing Penalty: 3192

Queuing and Blocking Report
Mill Site Buildout Conditions Off Peak 8/3/2010

Intersection: 1: Oak Street & Main Street (Rt 1)

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	209	244	101	225	72	407
Average Queue (ft)	151	208	60	146	43	298
95th Queue (ft)	261	310	128	257	85	485
Link Distance (ft)	248	237		414		436
Upstream Blk Time (%)	7	32				5
Queuing Penalty (veh)	0	0				0
Storage Bay Dist (ft)			80		80	
Storage Blk Time (%)			8	21	6	31
Queuing Penalty (veh)			70	12	44	9

Intersection: 2: Madrone Street & Main Street (Rt 1)

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	29	26
Average Queue (ft)	16	8
95th Queue (ft)	42	30
Link Distance (ft)	279	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		25
Storage Blk Time (%)		4
Queuing Penalty (veh)		36

Intersection: 3: Maple Street & Main Street (Rt 1)

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	20	4	16
Average Queue (ft)	8	1	5
95th Queue (ft)	29	7	24
Link Distance (ft)	378	364	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			25
Storage Blk Time (%)			1
Queuing Penalty (veh)			12

Queuing and Blocking Report
Mill Site Buildout Conditions Off Peak 8/3/2010

Intersection: 4: Hazel Street & Main Street (Rt 1)

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	20	10	148
Average Queue (ft)	6	2	34
95th Queue (ft)	25	14	157
Link Distance (ft)	348		364
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		1	3
Queuing Penalty (veh)		7	0

Intersection: 5: E Chestnut Street & Main Street (Rt 1)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	152	66	418	53	159	552
Average Queue (ft)	109	27	282	18	146	356
95th Queue (ft)	165	112	578	92	185	633
Link Distance (ft)		725	618			575
Upstream Blk Time (%)			2			3
Queuing Penalty (veh)			25			25
Storage Bay Dist (ft)	100			120	100	
Storage Blk Time (%)	18		29		43	12
Queuing Penalty (veh)	4		35		373	30

Intersection: 6: Walnut Street & Main Street (Rt 1)

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	176	139	60	564
Average Queue (ft)	97	46	26	306
95th Queue (ft)	229	245	75	743
Link Distance (ft)	507	607		618
Upstream Blk Time (%)				5
Queuing Penalty (veh)				56
Storage Bay Dist (ft)			100	
Storage Blk Time (%)				21
Queuing Penalty (veh)				7

Queuing and Blocking Report
Mill Site Buildout Conditions Off Peak 8/3/2010

Intersection: 7: Cypress Street & Main Street (Rt 1)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	TR
Maximum Queue (ft)	156	341	160	403	138	688	80	79	620
Average Queue (ft)	125	284	152	305	80	569	24	38	542
95th Queue (ft)	180	414	187	528	146	853	100	102	744
Link Distance (ft)		346		436		678			607
Upstream Blk Time (%)		10		20		18			22
Queuing Penalty (veh)		0		0		192			225
Storage Bay Dist (ft)	100		100		100		130	100	
Storage Blk Time (%)	31	49	73	2	4	39		1	45
Queuing Penalty (veh)	80	64	82	5	43	68		12	24

Intersection: 8: South Street & Main Street (Rt 1)

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	199	377	45	49
Average Queue (ft)	114	211	26	14
95th Queue (ft)	297	492	55	92
Link Distance (ft)	496	351		678
Upstream Blk Time (%)	0	9		
Queuing Penalty (veh)	0	100		
Storage Bay Dist (ft)			24	
Storage Blk Time (%)			19	0
Queuing Penalty (veh)			242	0

Intersection: 9: N. Harbor Drive & Main Street (Rt 1)

Movement	EB	WB	NB	SB
Directions Served	LTR	R	TR	L
Maximum Queue (ft)	10	97	478	26
Average Queue (ft)	4	49	203	9
95th Queue (ft)	15	118	726	33
Link Distance (ft)	335	524	1875	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				25
Storage Blk Time (%)			10	2
Queuing Penalty (veh)			0	30

Queuing and Blocking Report
Mill Site Buildout Conditions Off Peak

8/3/2010

Intersection: 10: Ocean View Drive & Main Street (Rt 1)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	60	35	49	19	88	37	102	139	163	170	134
Average Queue (ft)	32	16	21	5	56	15	53	75	88	107	55
95th Queue (ft)	72	43	57	23	99	42	130	166	177	196	153
Link Distance (ft)		371		572			1197	1197	234	234	234
Upstream Blk Time (%)										0	
Queuing Penalty (veh)										0	
Storage Bay Dist (ft)	100		200		200	400					
Storage Blk Time (%)	1										
Queuing Penalty (veh)	0										

Intersection: 11: State Route 20 & Main Street (Rt 1)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	T	L	T
Maximum Queue (ft)	157	84	151	158	186	149
Average Queue (ft)	112	57	103	105	138	74
95th Queue (ft)	179	90	173	195	212	164
Link Distance (ft)		677	193	193		1197
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)	200				310	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Zone Summary

Zone wide Queuing Penalty: 1914

Introduction

After the completion of the report summarizing the design alternatives explored at the design workshop, City Council and staff directed the consultant team to explore an additional design concept for the South Main Street Corridor. The following design concept resulted from the above mentioned direction, and was further refined as described in Chapter 9 during a final workshop on March 7, 2011.

Alternative: Five Lane Cross Section with Multi-Use Trail

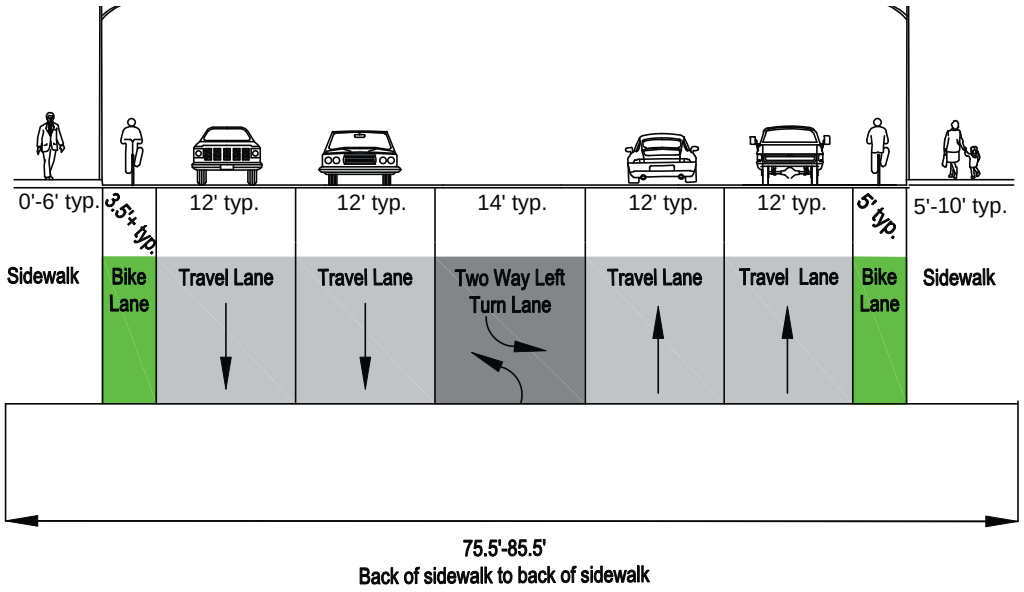
The alternative plan builds on the "baseline" plan found on page 4-1. The alternative plan includes many of the recommendations from the "baseline" but substitutes the on-street parking on the west side of the roadway with a multi-use trail that is separated from the roadway by a planter strip.

The multi-use trail augments the on-street Class II bicycle lanes along the length of South Main Street from Maple Street to North Harbor Drive. Pedestrians are the intended primary users of the multi-use trail, however the multi-use trail provides a safe environment for bicyclists who may not feel comfortable riding on the street, such as young or inexperienced riders.

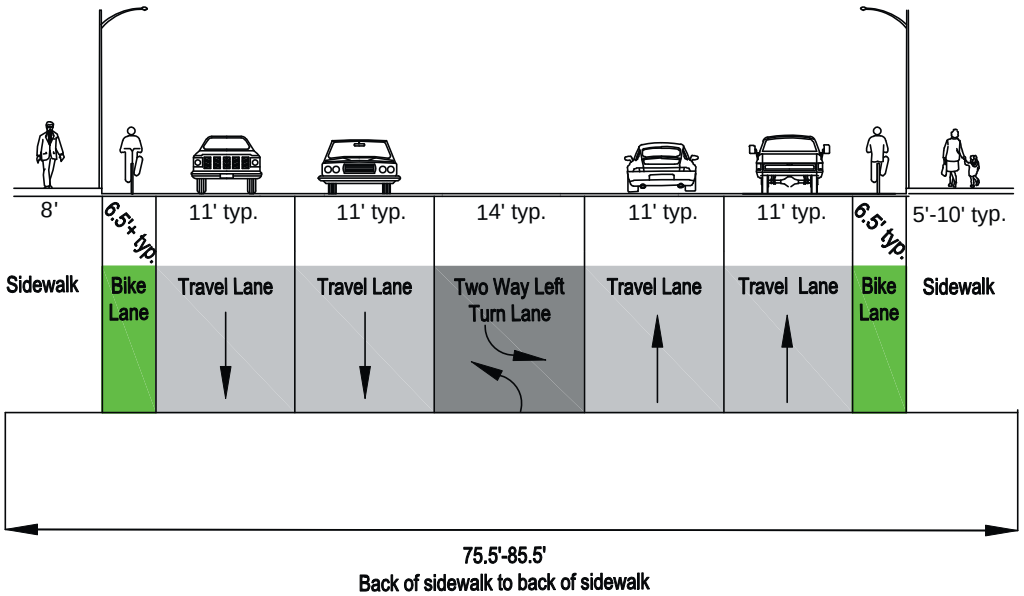
The multi-use trail is intended to connect to the planned Coastal Trail at North Harbor Drive and at Maple Street. The multi-use trail will provide a loop around the southern Mill site. In order to complete this loop, further study will be needed to extend the multi-use trail westward through the wetlands on the Mill site at Maple Street.

The alternative plan also calls for the addition of planter strips on the western edge of South Main Street from Maple Street to Highway 20. The planter strip is intended to allow for a buffer between the multi-use trail or sidewalk and the vehicular lanes. Within this planter strip, trees and stormwater management features such as bio-swales can be incorporated where there is sufficient right-of-way.

Oak Street to Maple Street

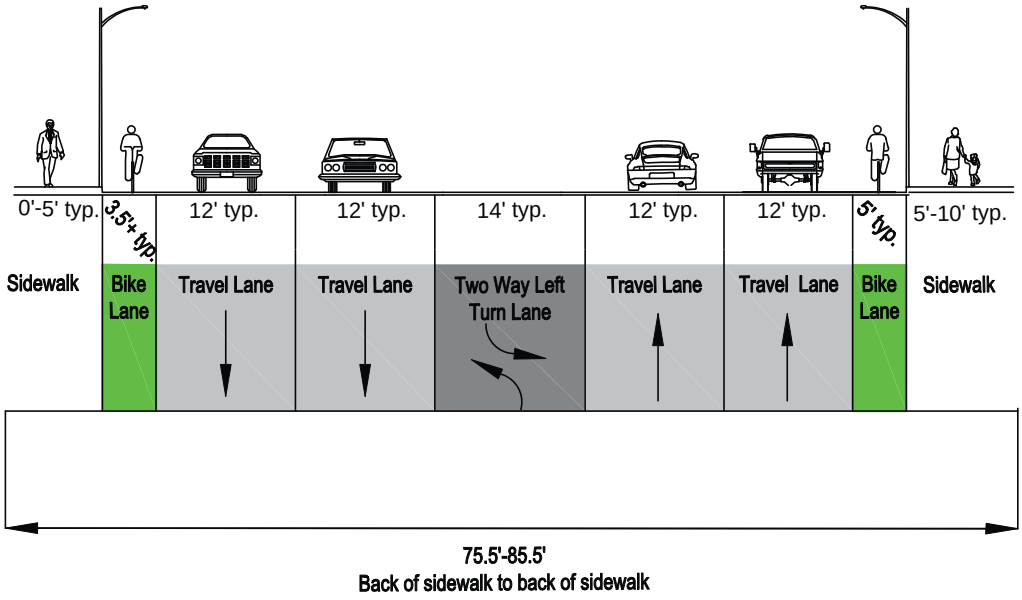


***Above**: Existing conditions along South Main between Oak Street and Maple Street (looking north).*

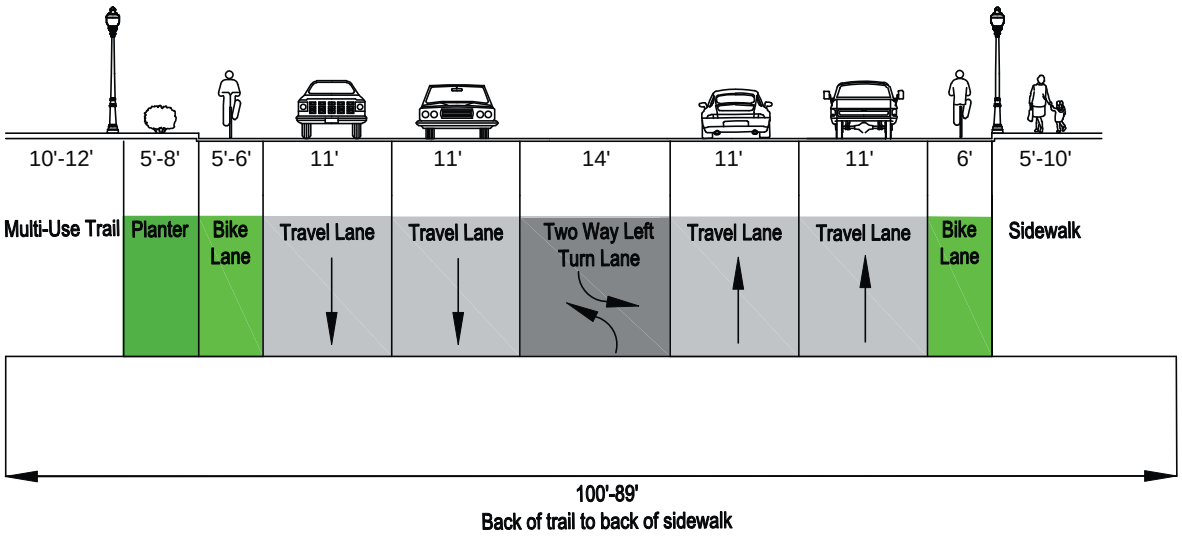


***Above**: Proposed cross section with narrowed travel lanes, widened bicycle lanes and a new 8' sidewalk on the west side of the roadway.*

Maple Street to Cypress Street



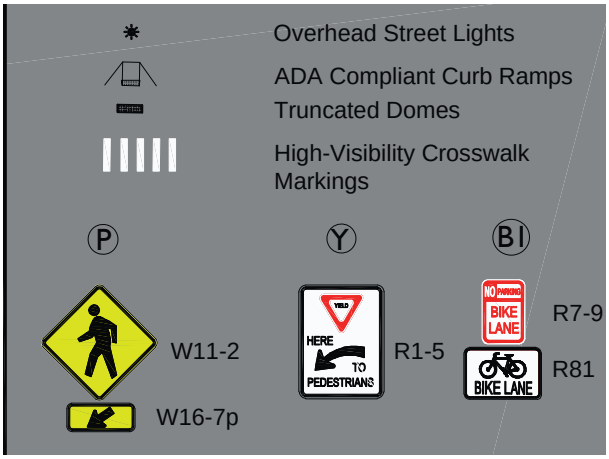
***Above**: Existing conditions along South Main between Maple Street and Cypress Street (looking north).*



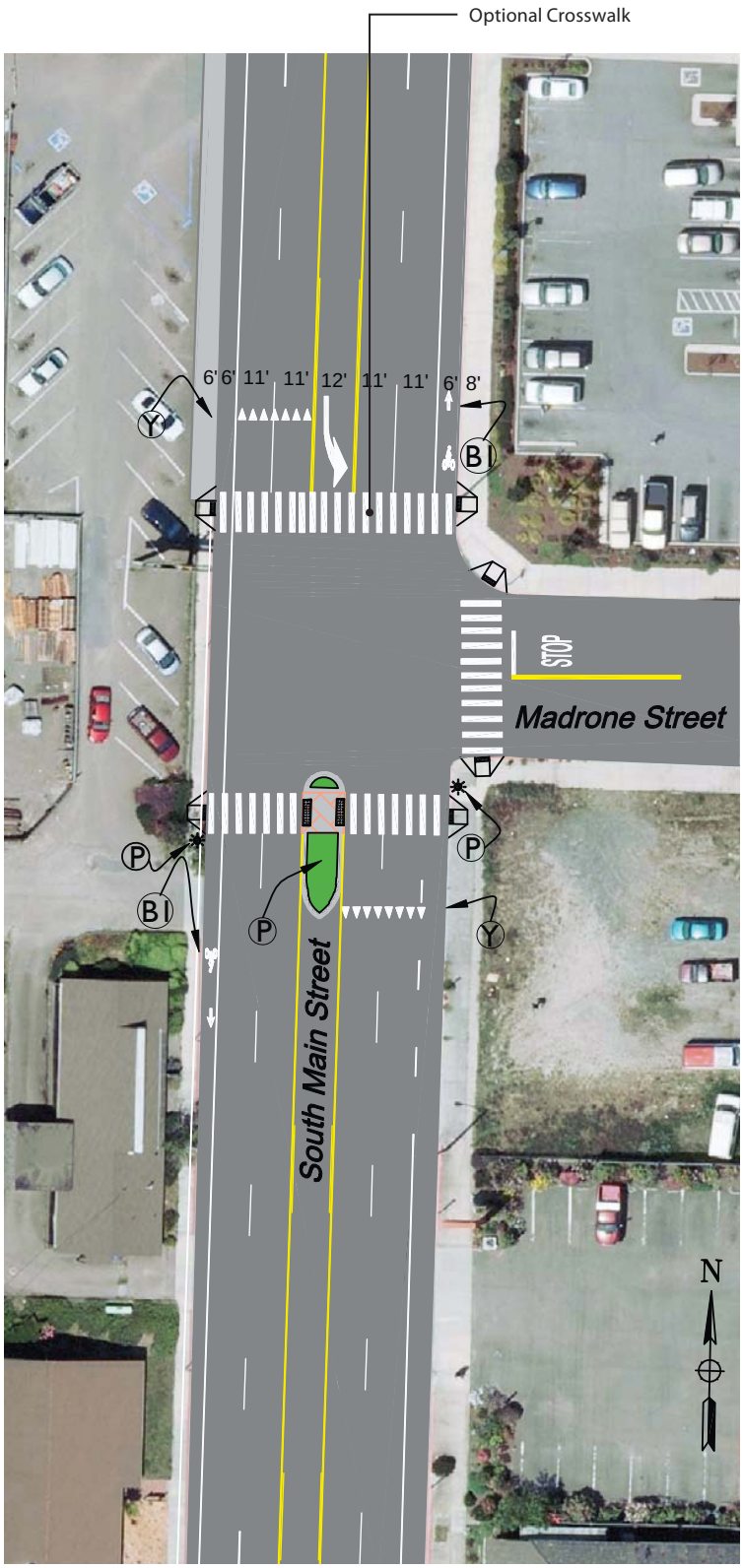
***Above:** Proposed cross section with narrowed travel lanes, widened bicycle lanes, and a new 10-12' multi-use trail and 5'-8' planter strip on the west side of the roadway.*

South Main at Madrone Street

Existing Conditions



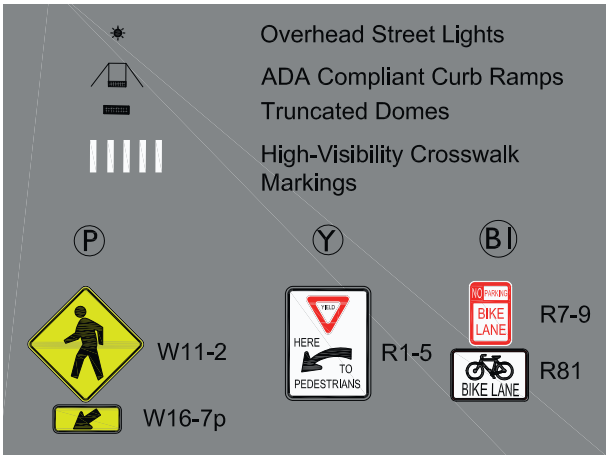
Signage, Lighting and Striping



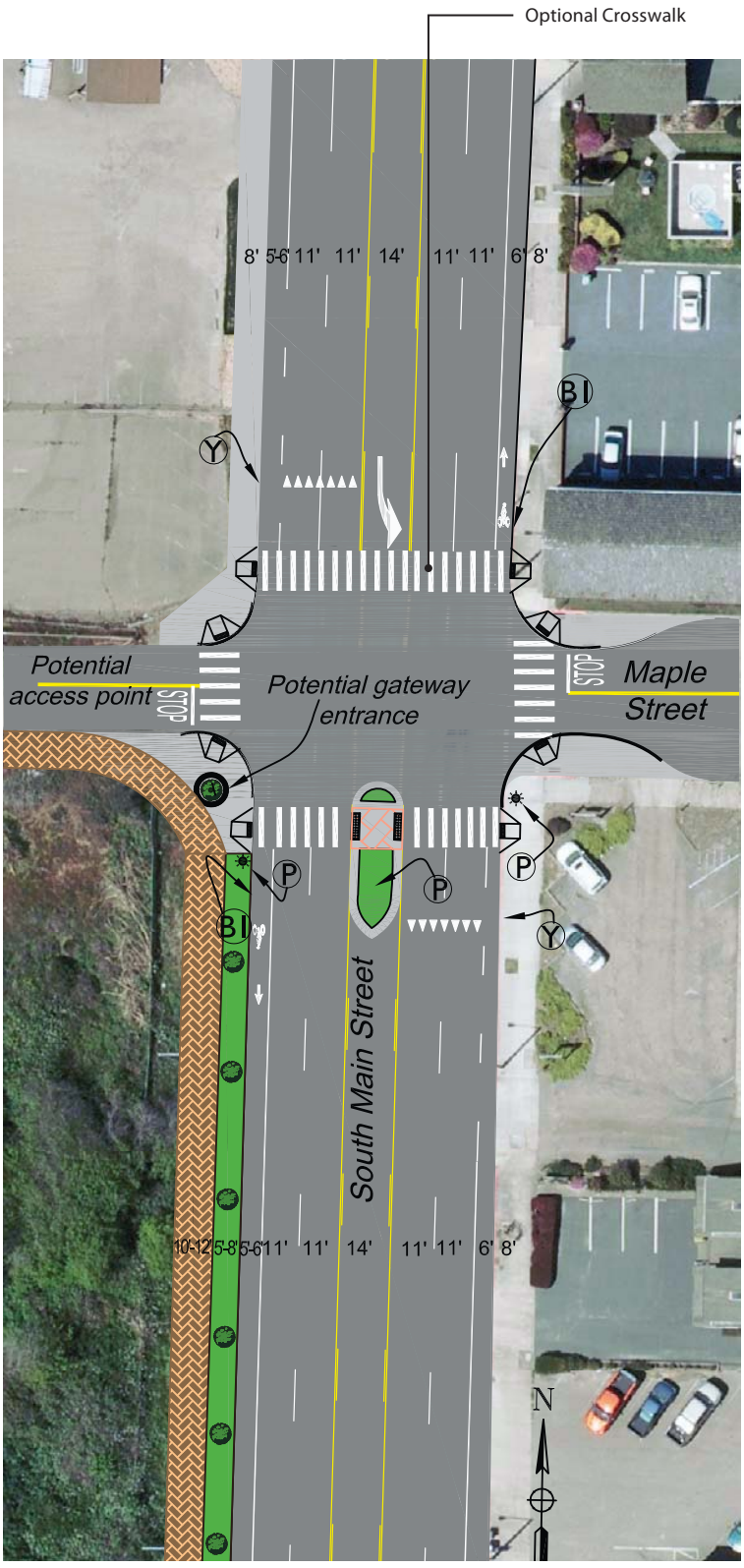
Proposed Intersection

South Main at Maple Street

Existing Conditions



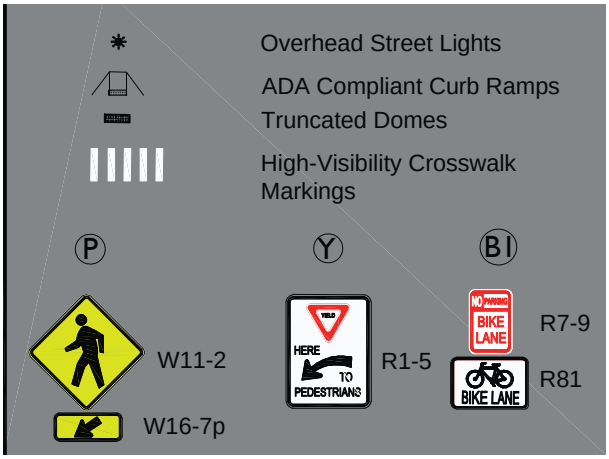
Signage, Lighting and Striping



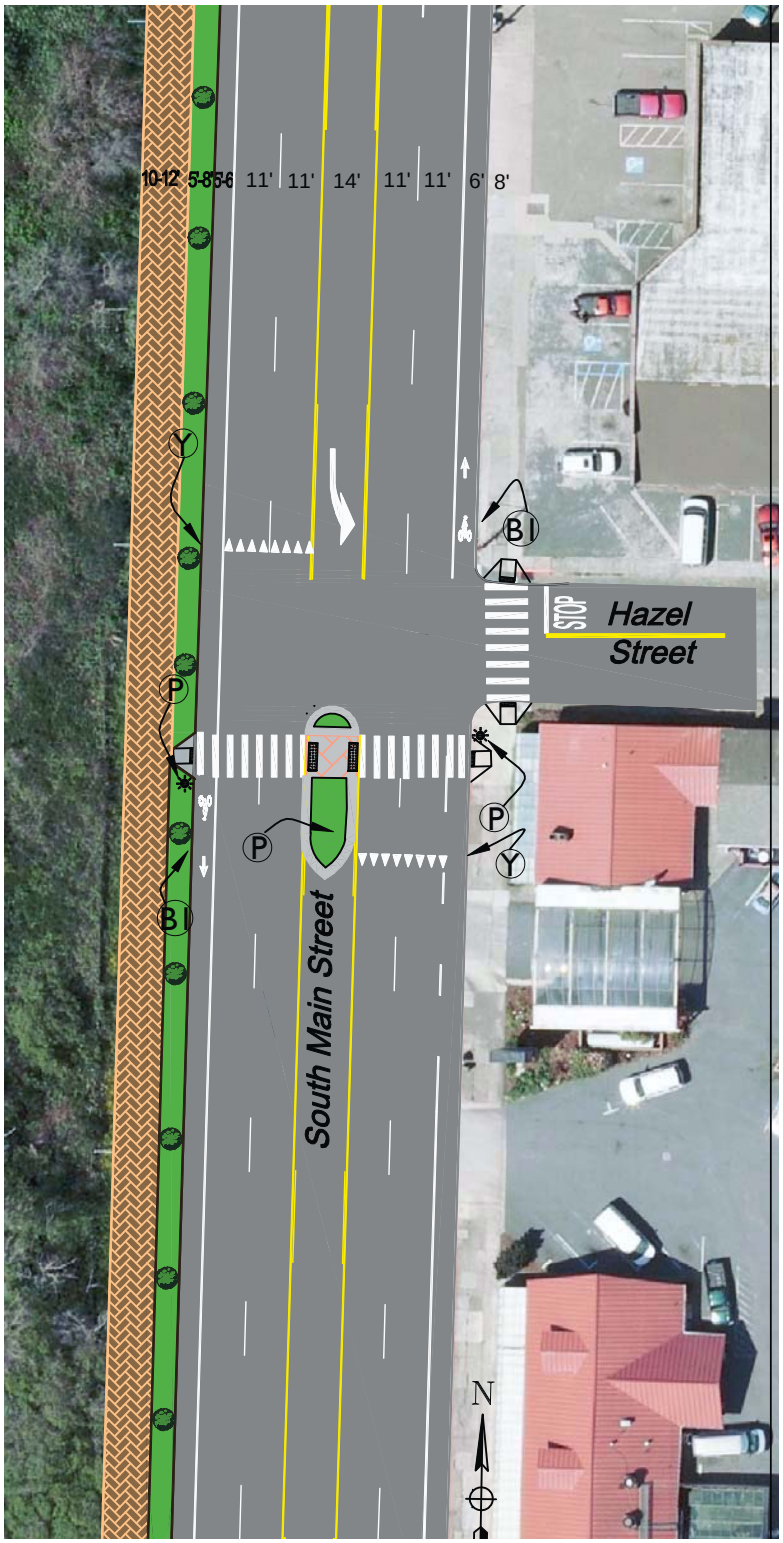
Proposed Intersection

South Main at Hazel Street

Existing Conditions



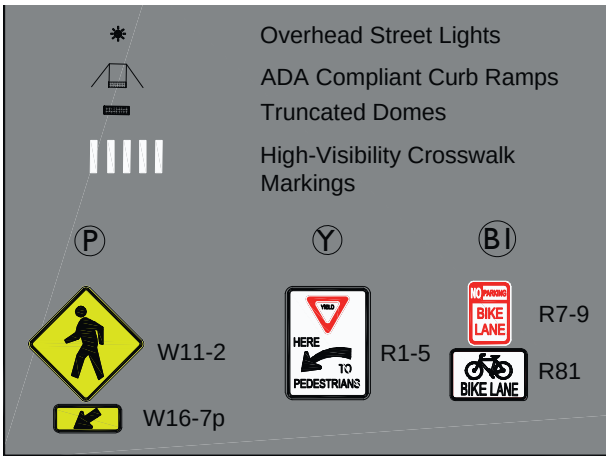
Signage, Lighting and Striping



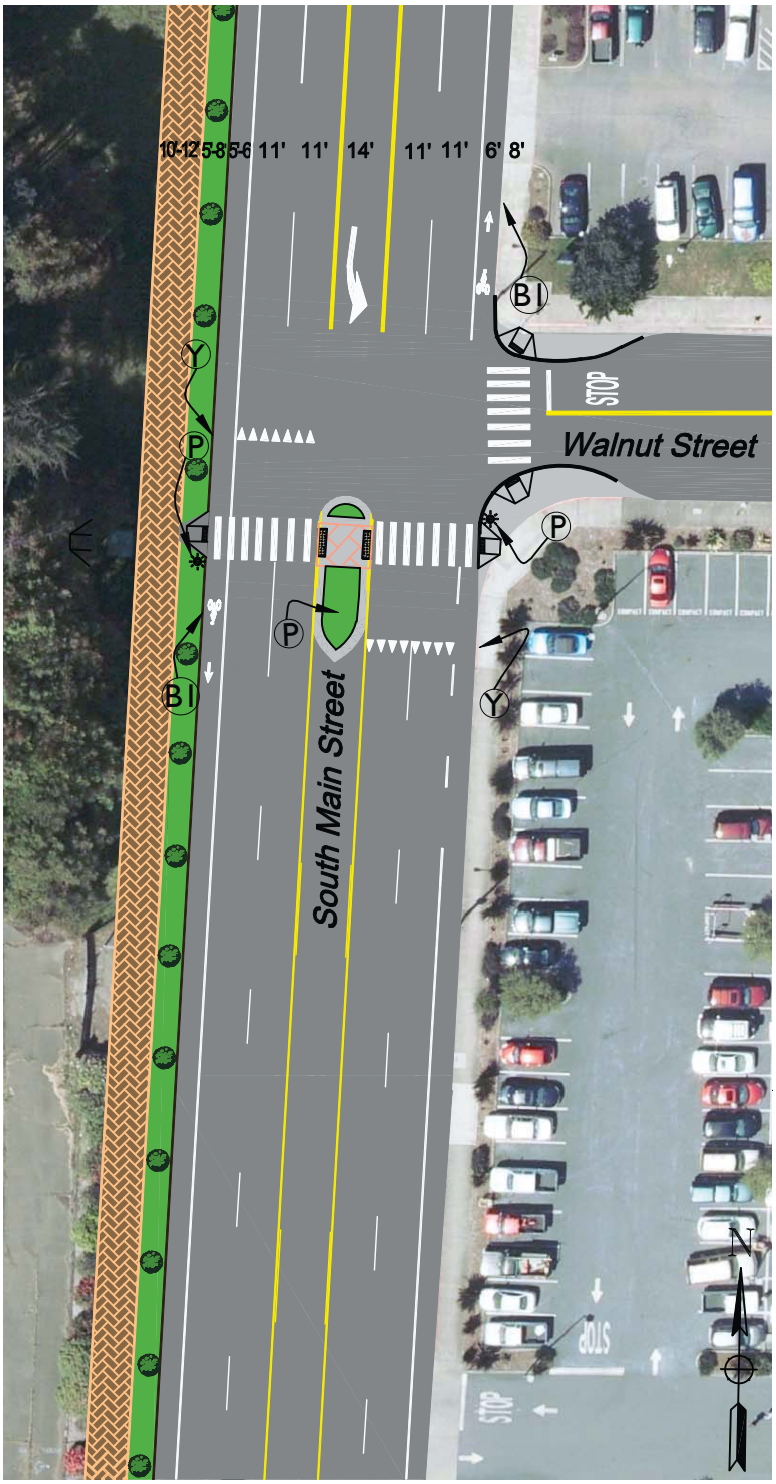
Proposed Intersection

South Main at Walnut Street

Existing Conditions

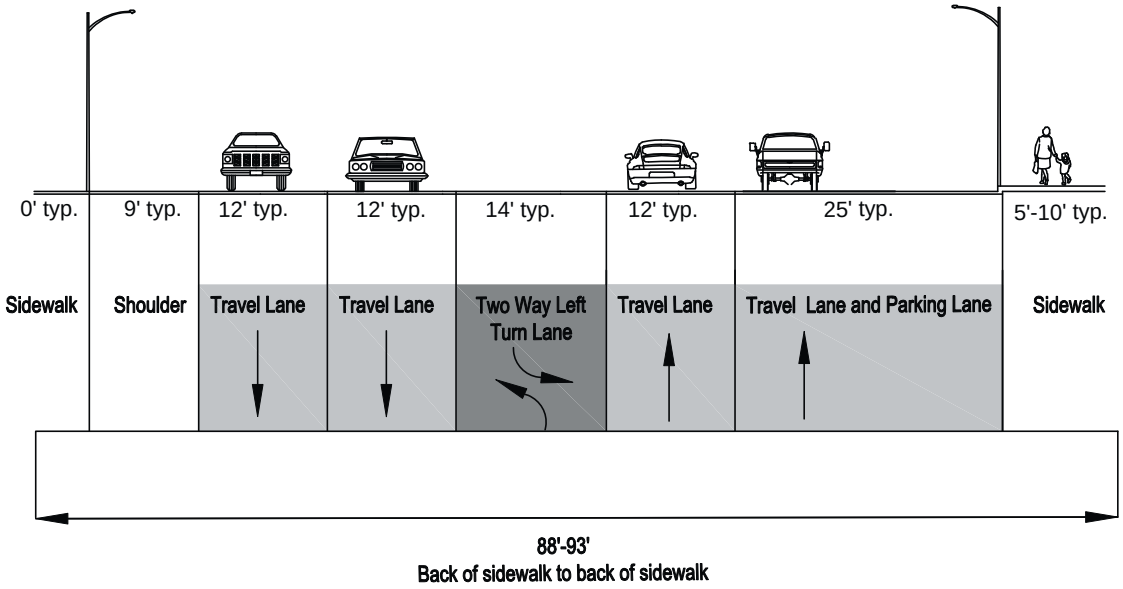


Signage, Lighting and Striping

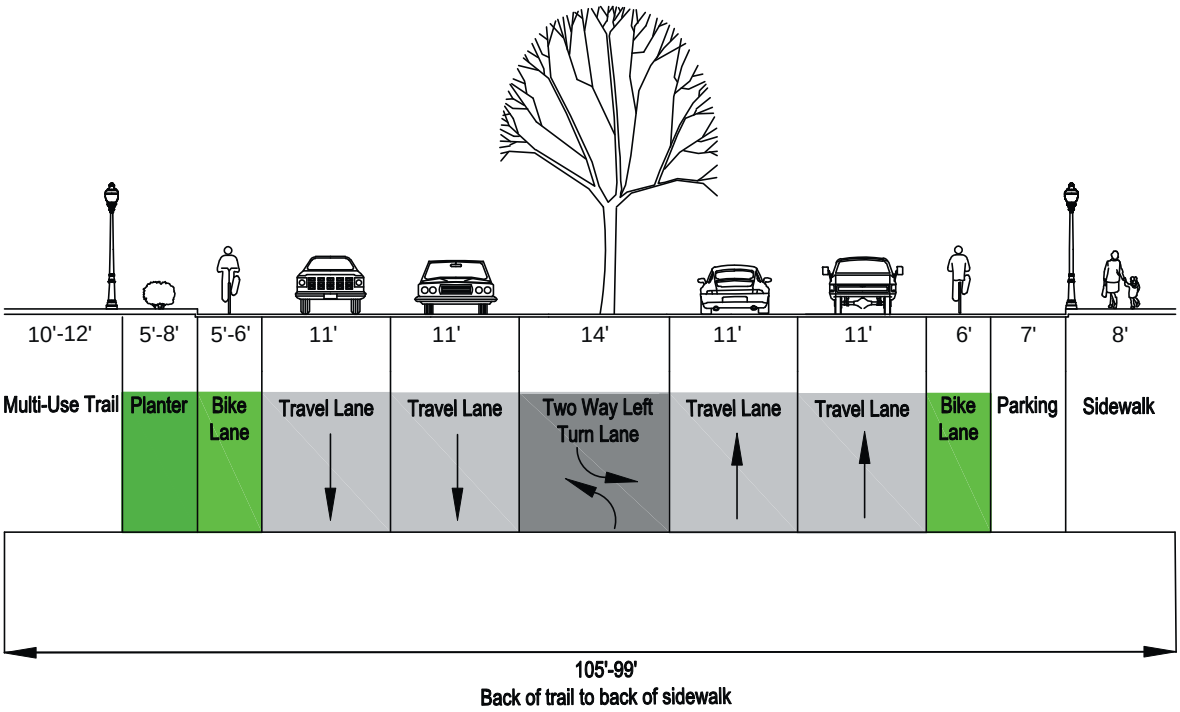


Proposed Intersection

Cypress Street to Highway 20

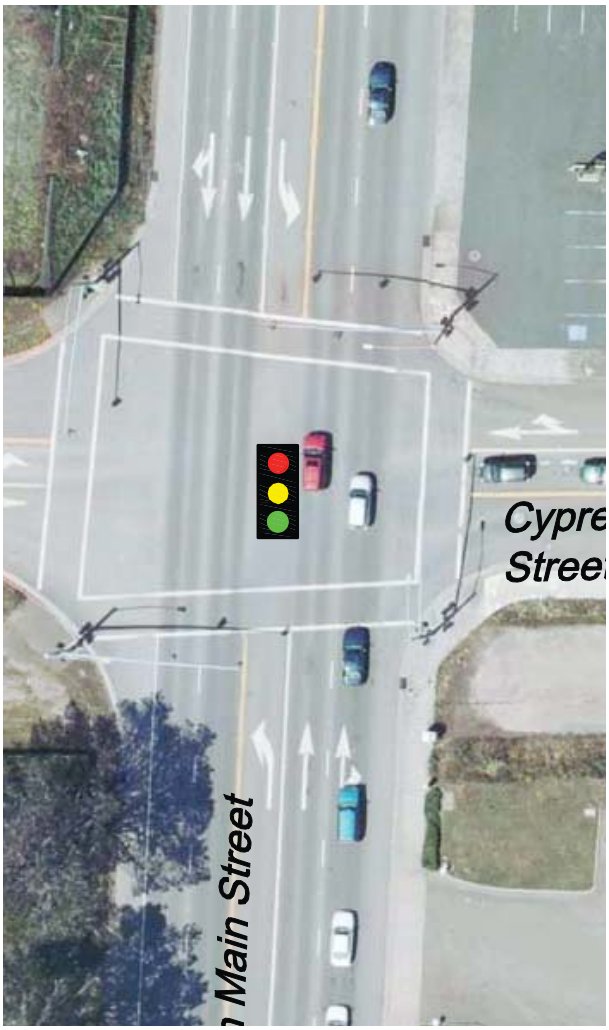


***Above**: Existing conditions along South Main between Cypress Street and Highway 20 (looking north).*

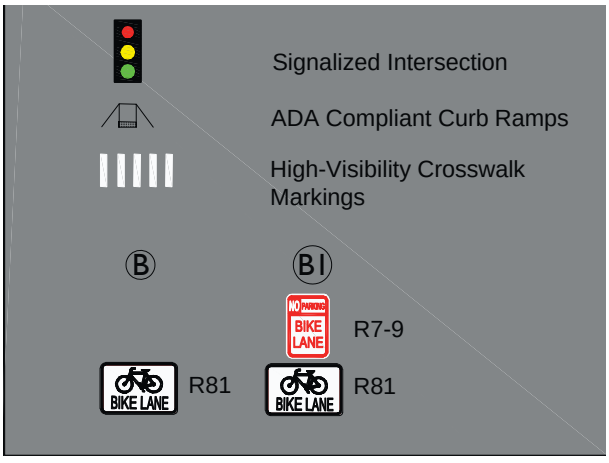


***Above:** Proposed cross section with narrowed travel lanes, bicycle lanes, and a new 10'-12' multi-use trail and 5'-8' planter strip on the west side of the roadway. The central turning lane can also accommodate a raised, landscaped median with turn pockets at intersections.*

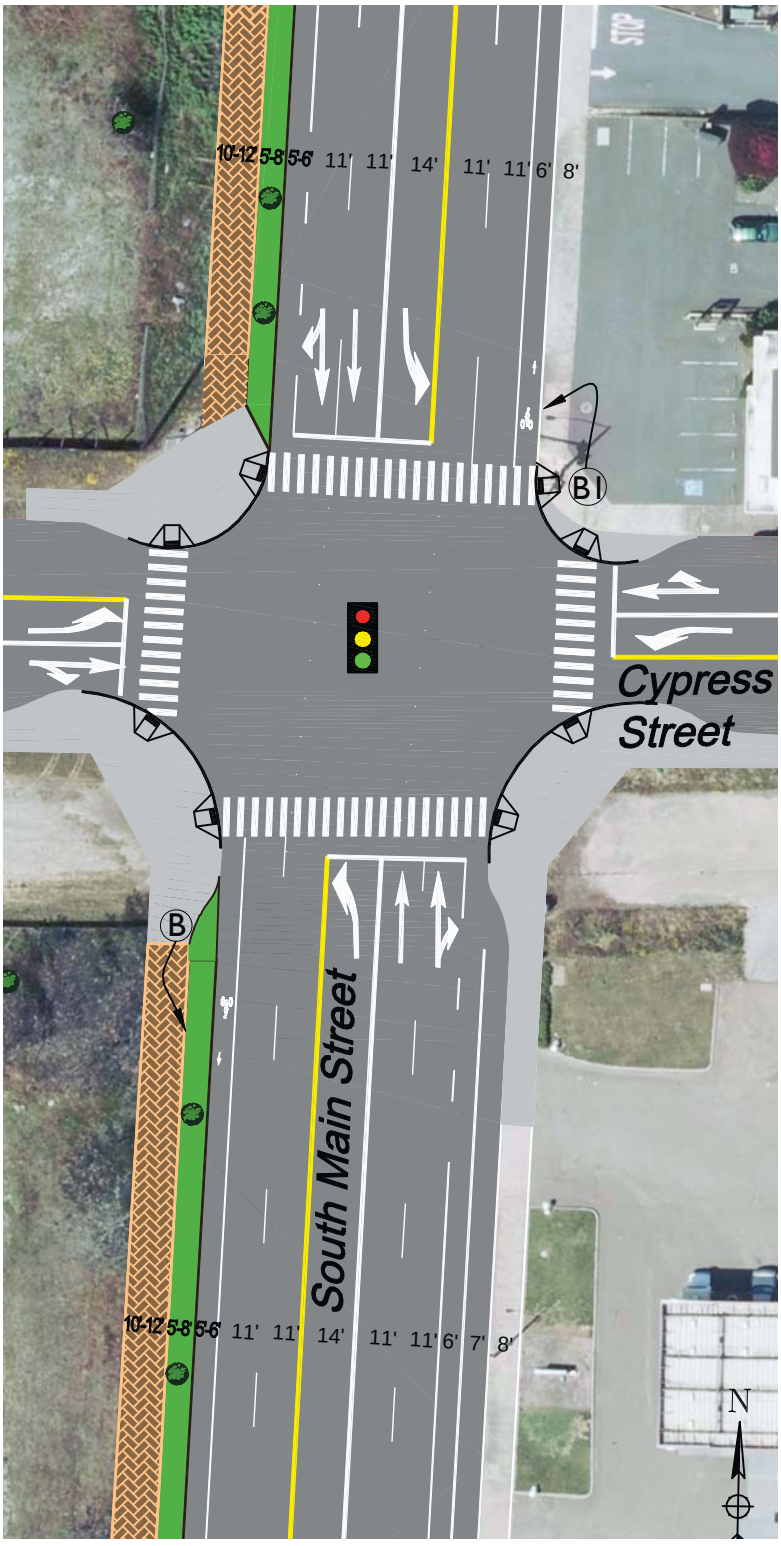
South Main at Cypress Street



Existing Conditions



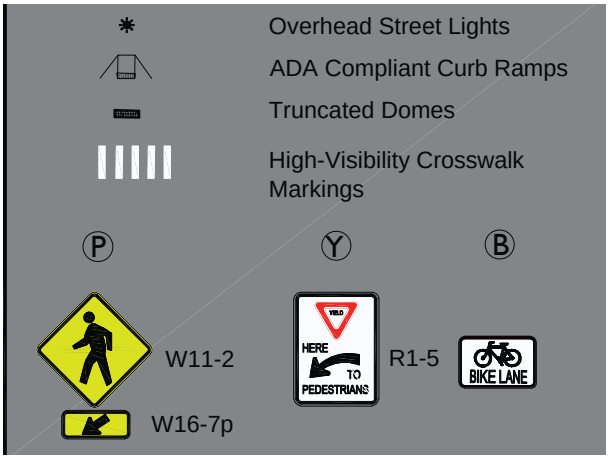
Signage, Lighting and Striping



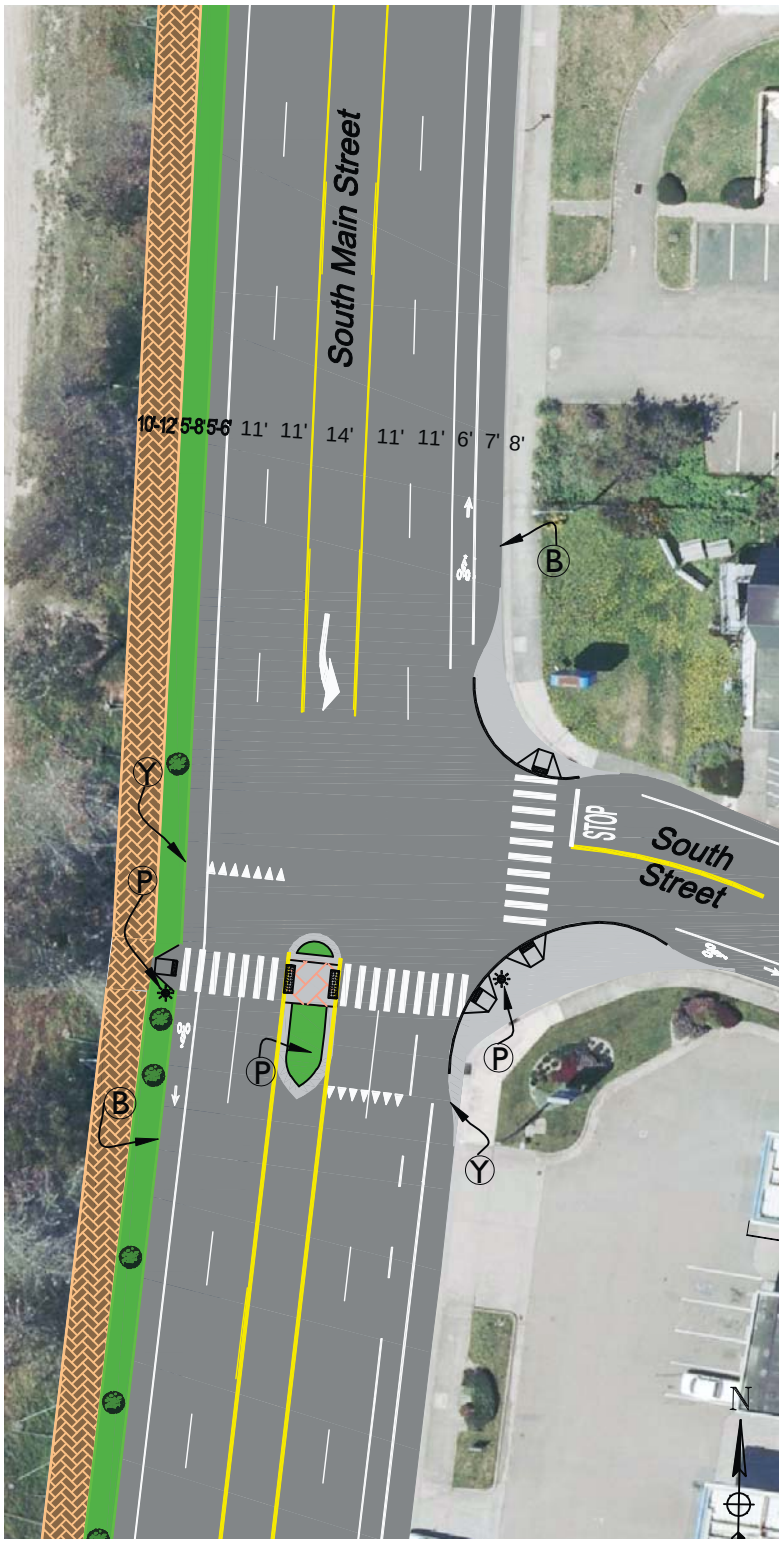
Proposed Intersection

South Main at South Street

Existing Conditions



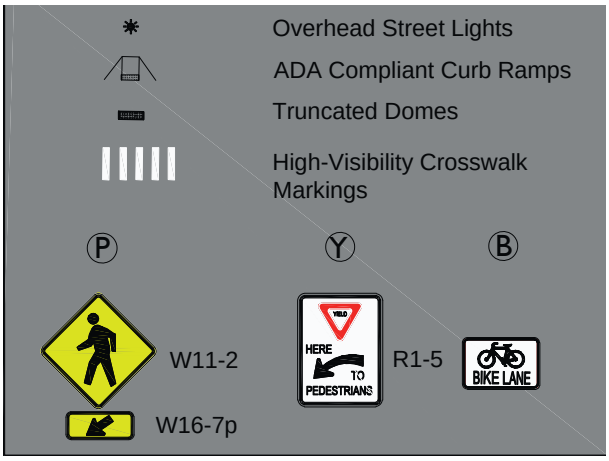
Signage, Lighting and Striping



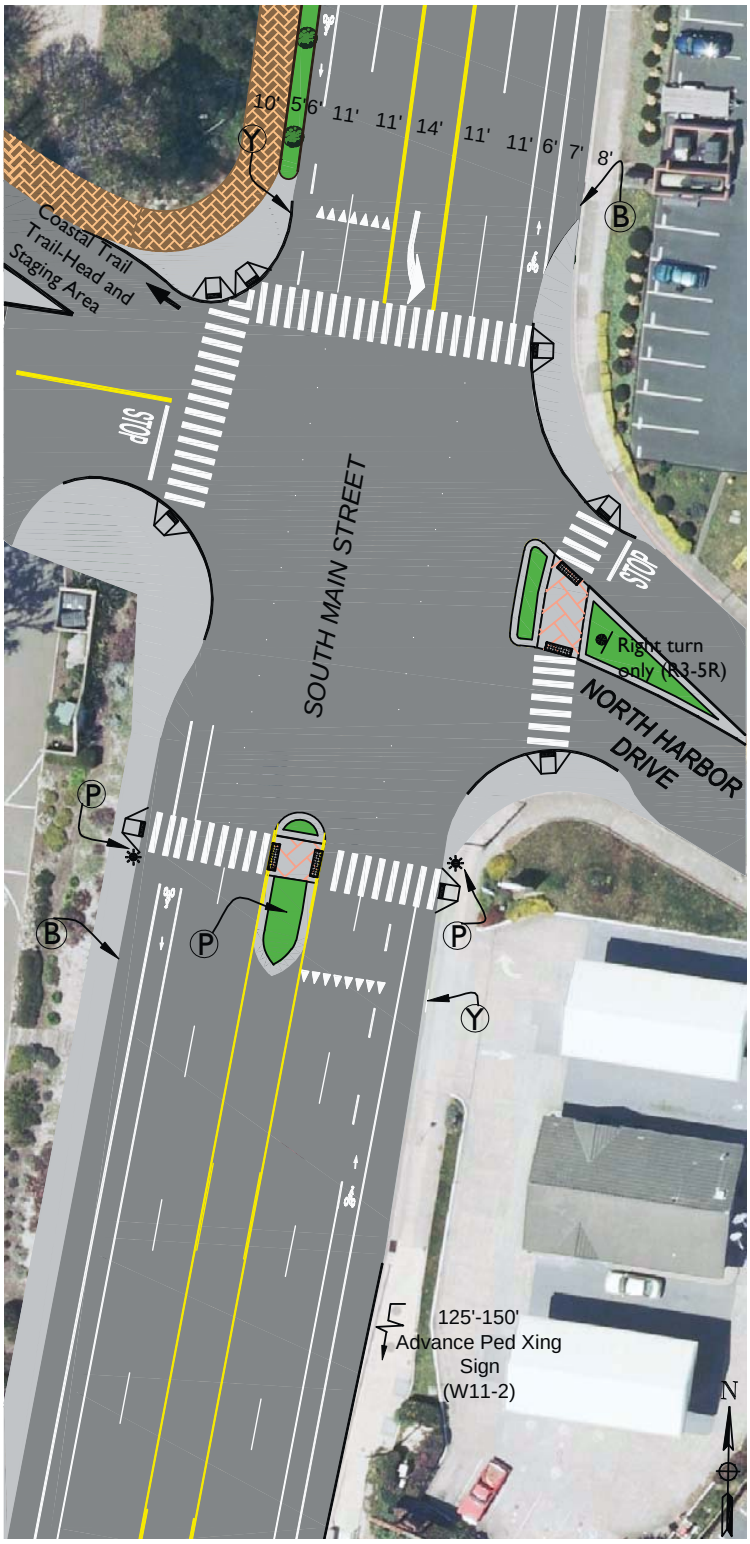
Proposed Intersection

South Main at North Harbor Drive

Existing Conditions



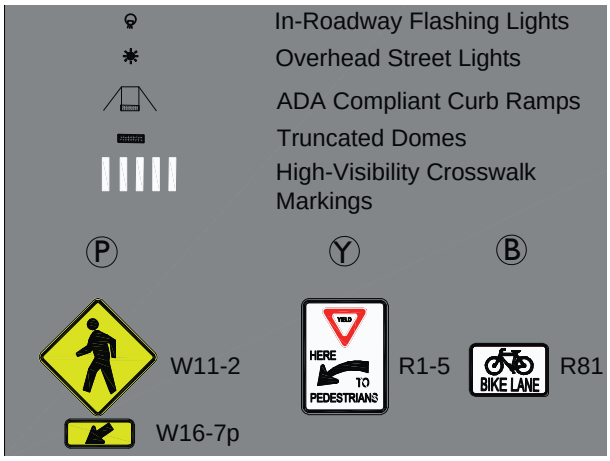
Signage, Lighting and Striping



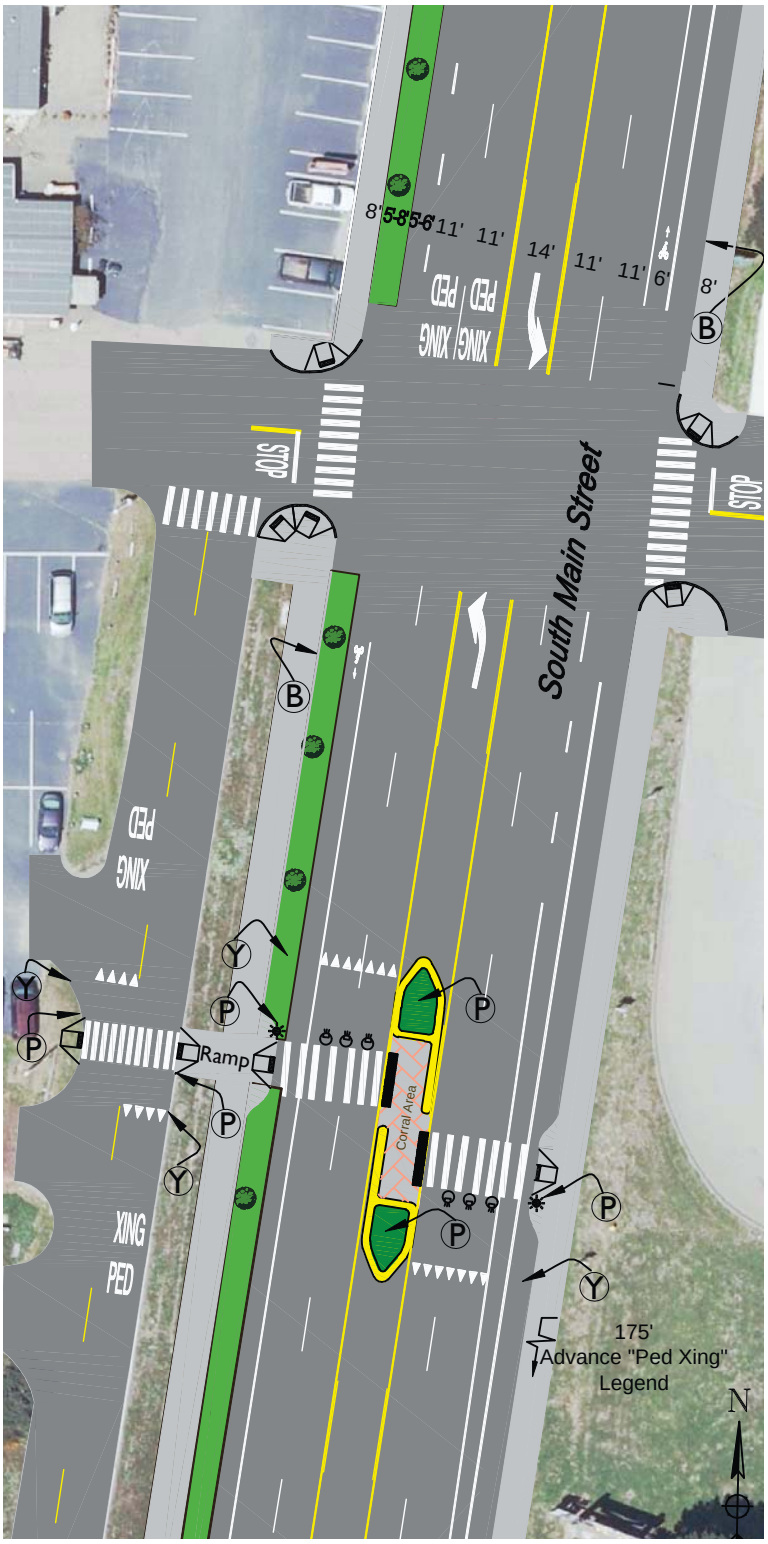
Proposed Intersection

South Main South of Noyo Bridge

Existing Conditions



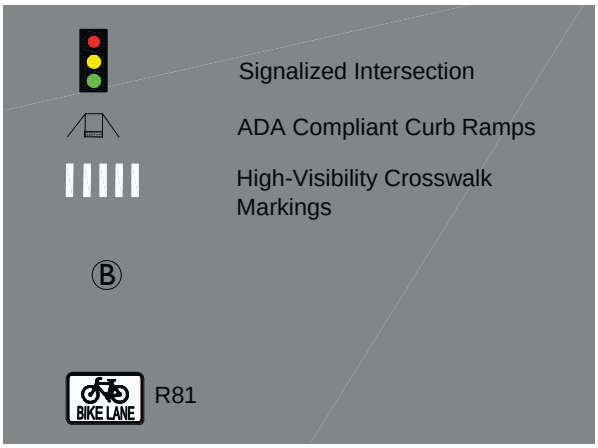
Signage, Lighting and Striping



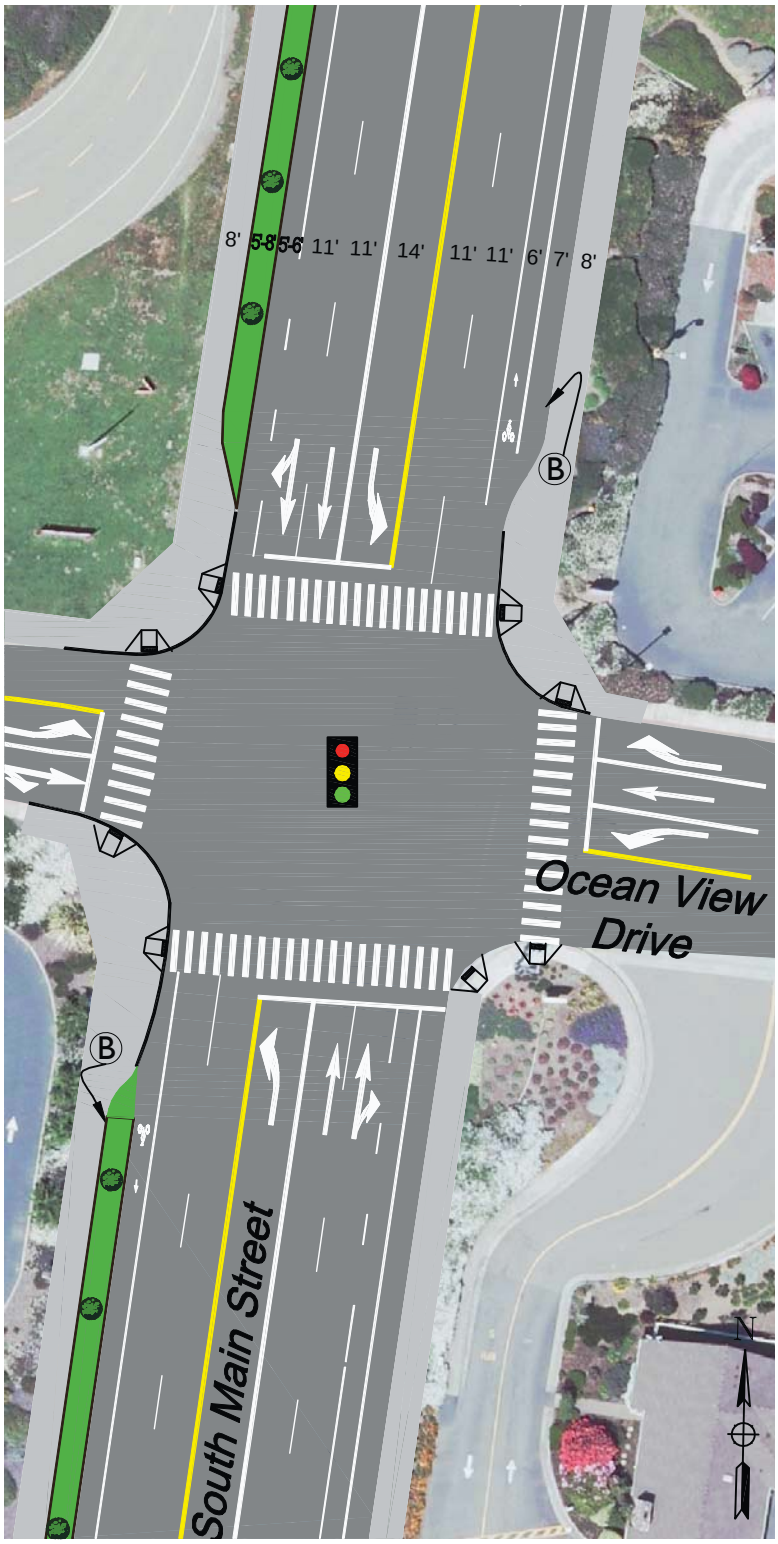
Proposed Intersection

South Main at Ocean View/ Boat Yard Drive

Existing Conditions



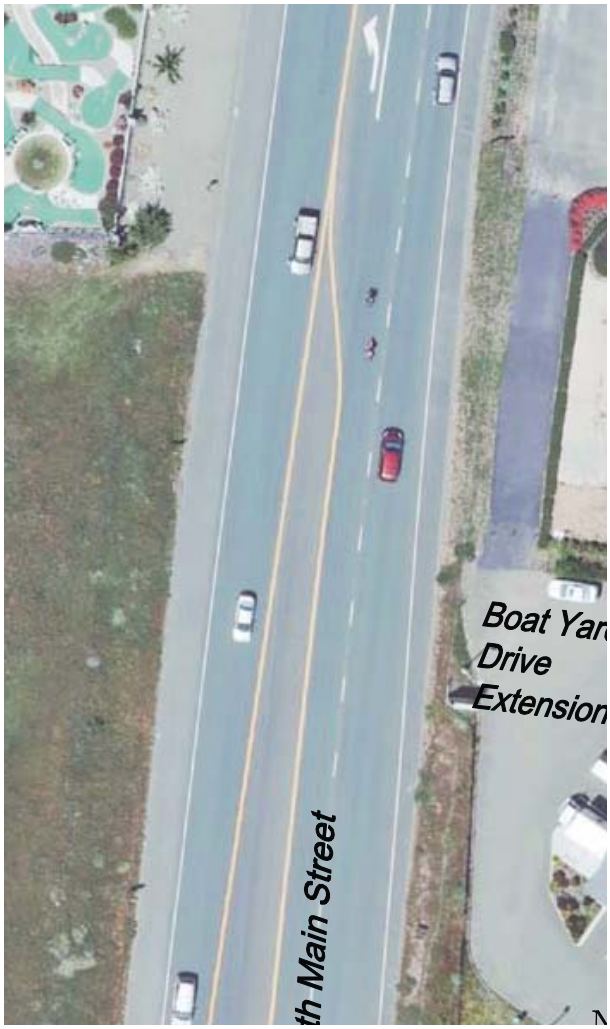
Signage, Lighting and Striping



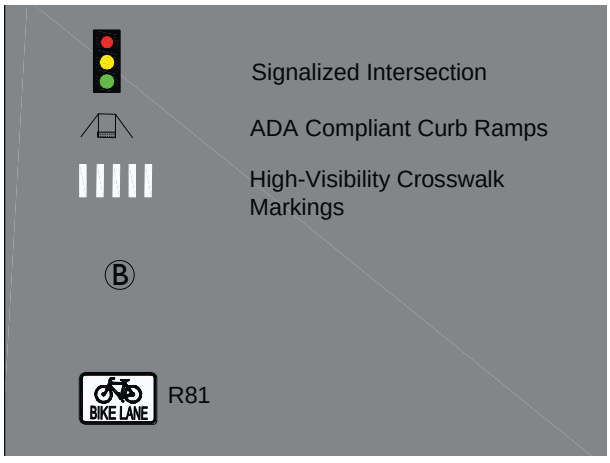
Proposed Intersection

South Main at New Street Extension

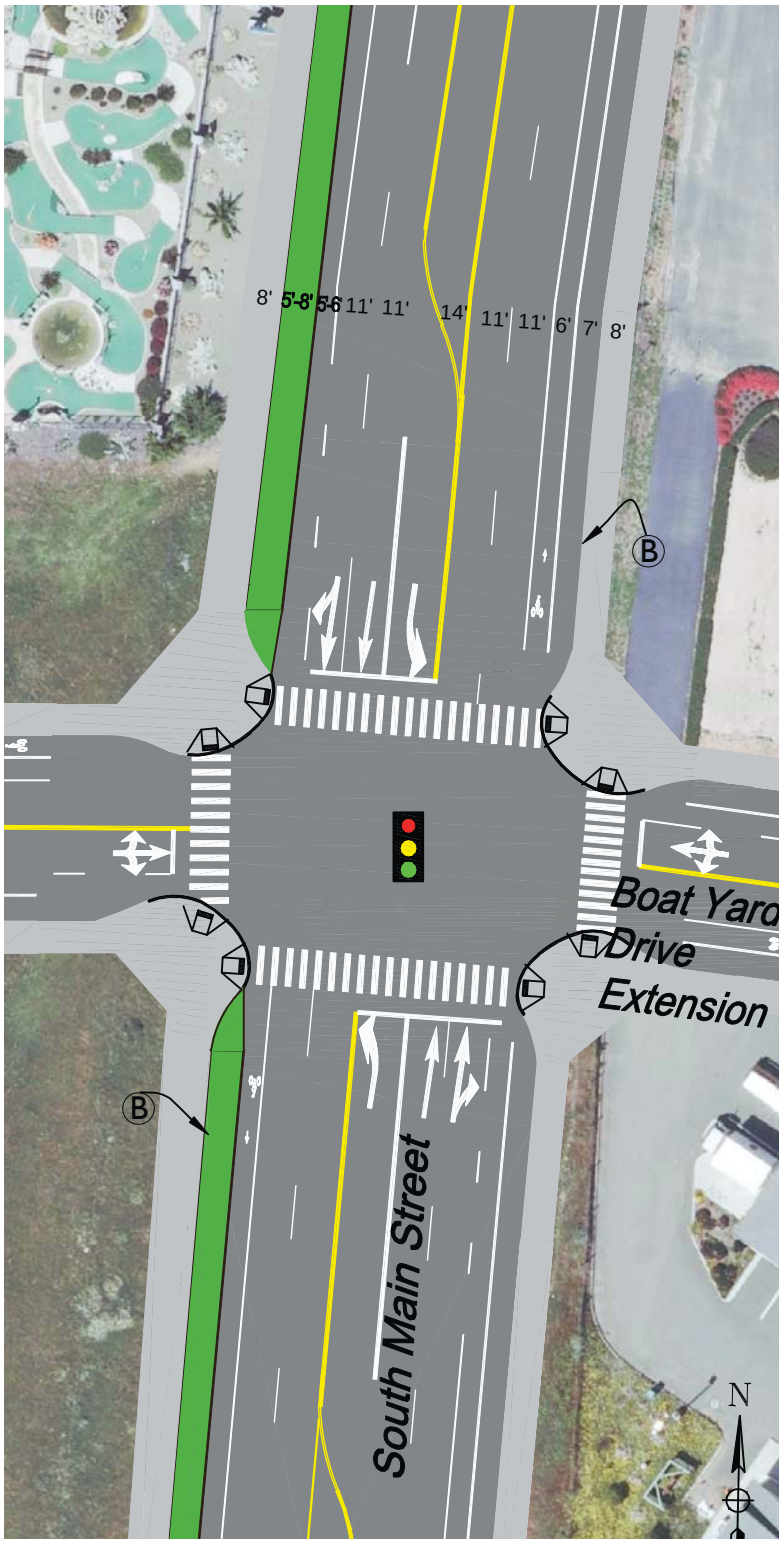
(Subject to Review and Approval by Caltrans and Property Owners)



Existing Conditions



Signage, Lighting and Striping



Proposed Intersection

chapter 9 Final Plan Altenative Concepts

Introduction

On March 7, 2011 the City held a public City Council Workshop to discuss, refine and finalize the plans for South Main Street and also to integrate those plans with the "Highway One Safety Improvement Plan" also known as the "Main Street Merge." Following are the results of that workshop as they pertain to the South Main Street Access and Beautification Plan.

Final Plan Alternative

Basic Tenets of the Final Plan Alternative:

- Retain 5 lanes on Main Street from Highway 20 to Oak Street
- Narrow travel lanes from 12 to 11 feet
- Install wider sidewalks where feasible
- Install Curb Extensions and make sure they are engineering to allow navigability by buses
- Install high Visibility Crosswalks Pedestrian Islands, Class II Bike Lanes
- Improve Signage & Lighting

Specific Elements of the Final Plan Alternative:

- Develop a 10-12 foot Pedestrian Promenade on the west side of Main Street
  - In implementing this plan, pay special attention to driveways and streets and the interface between bikes and cars, and how automobile oriented business would be accessed in this section.
- Wherever feasible, eliminate parking on the east side of the highway between Highway 20 and Oak Street in favor of improved landscaping, and pedestrian and bicycle facilities.
- Wherever feasible, develop a 5-8 foot landscaped buffer on east side of corridor.
- Include the following landscape elements and concepts in projects implementing this Plan:
  - The medians should be landscaped with drought tolerant grasses/groundcover that can be driven over in emergencies;
  - Landscaping adjacent to sidewalks should be drought tolerant small shrubs, decorative trees, rhododendrons;
  - Emphasis of plant selection should be on low shade, low growing, and low maintenance;
  - Landscaping on the west side of Main Street should be as natural or "forest-like" as possible to mimic the feel of the forested areas;
  - Gateway areas of Main Street (Highway 20, Cypress Street, Redwood Ave) should receive special/notable landscaping treatments;
  - Main Street should not be a "tree-lined boulevard." Landscaping on the east side of Main Street should be kept in the plan but it is a lower priority for implementation than the other items due to cost.
- Retain the Boatyard Drive Extension roadway concept.
  - While the extension is not a high priority for the City given the barriers to its implementation and estimated level of effort and expense required, it should stay in the Plan for possible future implementation.
- Retain the Highway 20/Main Street "free-merge" intersection in its current form, and:
  - Prioritize actions to improve pedestrian and bicycle safety.
  - Pursue the design and installation of a Fort Bragg welcome sign.
- Medians should have low growing, drought tolerant landscaping (grasses) with mountable curbs/aprons (traversable medians) as to allow emergency vehicles to drive over. The raised medians with landscaping should be located as extensively as possible throughout the project given: 1) public safety and emergency vehicle access requirements and 2) the need to accommodate turn pocket movements into driveways along Main Street.
- Median for turn lanes should be designed to the Caltrans minimum width of 12 feet

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