APPENDIX A:

COMMUNITY VISIONING WORKSHOPS SUMMARY

Napa County Transportation and Planning Agency

HIGHWAY 29 GATEWAY CORRIDOR IMPROVEMENT PLAN

Visioning Workshops Summary

DYETT & BHATIA
Urban and Regional Planners

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Project Purpose and Process

Project Purpose and General Objectives

The "Highway 29 Gateway Corridor Improvement Plan" is a planning project, led by the Napa County Transportation and Planning Agency (NCTPA), to develop a community-driven vision and improvement strategy for the southern portion of California State Route 29 (Highway 29). The portion of Highway 29 considered constitutes an important "gateway" to the Napa Valley as an experience and also as a Corridor through which considerable regional traffic must pass.

The project area extends thirteen miles from Napa's Trancas park and ride lot bus node to the north and Vallejo's ferry terminal to the south. Jurisdictions through which the Corridor passes include: the City of American Canyon the City of Napa, the City of Vallejo, and unincorporated Napa County. Napa County, Solano County and Caltrans have an interest in the project as an important part of county- and region-wide transportation networks. Caltrans owns and controls the Highway 29 right-of-way, and has made this project possible with a $300,000 grant to implement its community-based planning program.

The project brings together diverse interests and will address the needs and desires of residents, commuters, business owners, visitors and stakeholders, to improve mobility, safety, and community character along the Corridor. The project will also consider the role played by all transportation modes including ferry, auto, truck, bus, rail, air, bicycle and pedestrian.

General Objectives

Specific objectives will be developed as part of the project, which will also identify appropriate strategies and implementation measures. General objectives have been identified and include:

Transportation Performance. The Improvement Plan will help minimize traffic congestion through the Corridor, while enhancing pedestrian, bicycle and transit routes. Through traffic and local access needs will be addressed.

Advanced Technologies and Programs. Project goals will be advanced by the best available technologies and by "transportation demand management" (TDM) and other programs that can Corridor use in beneficial ways.

Physical and Design Improvements. The Improvement Plan will include recommendations for physical improvements to enhance transportation improvements, but also to enhance the character of each community and support desirable adjacent development patterns.

Implementation Tools. The Plan will include strategies for implementing programs and improvements, such as financing tools and timing improvements to correspond with the timing of adjacent development.

Alignment with each community's aspirations. NCTPA recognizes that the "right" design improvements or transportation programs will mean different things to different communities, and will likely vary depending on whether the highway is passing through urban commercial areas, industrial areas, or rural farmland. Stakeholders and interest groups from all of these communities will have the opportunity to share their vision for how the Corridor should be improved, which helps to ensure that the ultimate improvements that the Plan identifies will be effective and context-sensitive.

NCTPA is the lead agency for this planning effort, and is being assisted by a consultant team led by Dyett & Bhatia, and with the following areas of expertise:

- Dyett & Bhatia: Project Coordination, Urban Design, and Community Outreach
- Fehr & Peers: Transportation Performance
- Bottomley Design & Planning: Urban Design and Landscape Architecture
- Economic & Planning Systems: Infrastructure Financing and Implementation
- BKF Engineering: Engineering Due Diligence and Cost Estimating

Community Visioning Workshops

Introduction

VISIONING WORKSHOPS

This report describes the results of two community "visioning workshops" held in November 2012 to solicit input on the Highway 29 Gateway Corridor Improvement Plan. The workshops were designed to engage a diverse set of community members representing a range of interests. The workshops provided opportunities for discussion and direct input relating to the development of a "Vision Plan" for the Highway 29 Napa Gateway Corridor Improvement Plan.

Over fifty community members participated between the two workshops. The first workshop was held in American Canyon on November 13, 2012; twenty-nine community members attended and most were American Canyon residents. The second workshop was held in the city of Napa on November 27, 2012; twenty-two community members attended with participants split between Napa and American Canyon as their place of residence.

WORKSHOP PURPOSE

The purpose of these workshops was to give interested members of the public an opportunity to share their ideas, concerns, and preferences for future improvements to the Highway 29 Corridor and propose specific recommendations for roadway types and other circulation/mobility features in specific locations along the Corridor. The workshops also provided NCTPA staff and consultants an opportunity to explain the purpose of the project, the process, and desired outcomes.

Workshop results will inform development of recommended programs and policies for the Corridor. Results will be considered by the Community Advisory Committee (CAC) as it gives project guidance, and by the Corridor Steering Committee (CSC), the policy-making body for the project.

WORKSHOP OUTLINE

The visioning workshops followed an outline that provided a framework for understanding the project and options, and opportunities for direct input. The workshop agenda is provided in Appendix A.

- *Presentation*: Staff/consultants presented information about the project, planning process, and character-based options for highway improvements along the Corridor. The PowerPoint presentation that was given appears as is provided in Appendix B.
- *Initial Thoughts and Concerns*: Participants were seated at tables of four to eight persons, each accompanied by a member of the consultant team or NCTPA staff member who acted as a neutral facilitator. To provide all participants with the opportunity to state their ideas, small-group facilitators asked each person at their table to briefly

share his or her primary issues and concern regarding the Corridor. Facilitators summarized all comments on large notepaper tablets at the tables. Appendix C documents all comments recorded at the tables during this initial exercise.

- *Small Group Mapping Exercise*: This hands-on exercise provided an understanding of community members' preferences in a location-specific way, by visually representing potential improvements to the Corridor. To do this, each small group applied "game pieces" representing possible roadway types to a base map that showed expected future land uses along the Corridor, as represented by the General Plans for each jurisdiction. (Roadway types are described in "Highway Types and Relative Performance.") Game pieces also represented transportation features, such as trails, pedestrian crossings, and transit nodes.
- *Report Out*: Volunteers from each group reported back the central concepts of their maps to the group at-large. These discussions are summarized in the findings section below. Game pieces and their descriptions are found in Appendix D, along with photographs of each table's "vision" for the Corridor.

Workshop Presentation

Visioning

Mapping Exercise

Mapping Exercise

Reporting Out

Workshop Findings

COMMON THEMES

Tension between Local and Regional through Traffic

- Solutions to better serve one user group may negatively affect the other. Local access serves businesses but slows speeds and commute times. Faster vehicle speeds are less safe for pedestrians.
- Visibility and highway frontage help make local businesses viable. Some solutions that prioritize moving regional traffic quickly are not good for businesses (grade separated highway, overpasses, limited turning movements/driveways, etc.). At the same time, traffic congestion restricts business by limiting the times at which people are willing to get on the road to shop.
- Come up with solutions that understand tradeoffs and balance the needs of these two often competing travel interests. A boulevard design with local access/frontage roads might be a solution, but could be potentially confusing

Traffic Congestion

- Recognize traffic congestion as among principal problems and traffic alleviation as a high priority.
- Consider express lanes, synchronized traffic lights, roundabouts, and overpasses at certain intersections.
- Avoid overbuilding. Consider cost of widening highway. Recognize that the congestion problems only account during 3-4 hour peak daily.
- Consider role of alternative north-south routes to relieve congestion. Parallel routes could serve as local connections or as a commuter bypass.
- Parallel roadways and other improvements must be technically and politically feasible.

Beautification and Community Identity

- Add value by beautifying the Corridor. Enhancements benefit locals and regional visitors.
- Create a sense of arrival. Use signature “gateway” into American Canyon and Napa Valley for a unique identity.
- Better relate highway to the community that it abuts. Character and design should match context. Address segments differently reinforce use and identity.

Bicycles and Pedestrians

- Local access should not rely on cars, such as to local businesses and destinations. Walking and bicycling should be real options and family-friendly.

- Safe pedestrian crossings are needed at critical intersections and/or destinations.
- Provide continuous bike lanes or bike paths along all sections of the Corridor, as well as well-placed pedestrian/bicycle overcrossings.
- Heavy traffic impacts surrounding neighborhoods as commuters cut through on shortcuts. Short cuts affect around American Canyon High School.
- Widening Highway 29 could make crossing difficult and less safe for pedestrians.
- High vehicle speeds on highway are unsafe for pedestrians and bicyclists. Include separated bike/pedestrian paths regardless of highway configuration.
- All new facilities should be ADA compliant.

Transit

- Transit is underutilized. Residents and commuters need transit alternatives that are realistic. Greater density of development is needed to make it viable.
- Solutions should move away from being car-centered (especially single-occupancy vehicles) and support transit more strongly. Work with employers to encourage transit use.

ROADWAY PREFERENCES (MAPPING EXERCISE)

This section presents the results of the mapping exercise, in which participants collaborated to create a vision for the Corridor by assigning roadway types and other mobility-related features (represented on stickers or "game pieces") to points along and around the highway. To provide context for deciding roadway preferences and the location of other transportation features, a base map was provided that showed future land uses allowed by each jurisdiction's General Plan. Choices for roadway types are characterized in "Highway Types and Relative Performance."

Following the workshop, the vision maps from each table were processed by tabulating the frequency with which each game piece was placed at locations along the Corridor. While participants had an opportunity to make recommendations along the entire length of the Corridor–from the Vallejo ferry terminal to the city of Napa–participants at both workshops concentrated on the section of highway through American Canyon.

When tabulated, workshop vision plans suggest several characteristically separate segments, as is indicated graphically by the figures "Roadway Type Preferences," "Pedestrian Crossings and Transit Node Preferences," and "Suggested Trails." Based on the greatest number of roadway type game pieces for locations along the Corridor, unique segments include:

- South of Highway 37 (Sonoma Boulevard Specific Plan Area);
- Highway 37 to just south of American Canyon Road;
- Just south of American Canyon Road to Napa Junction Road;
- Napa Junction Road to just south of Highway 12;

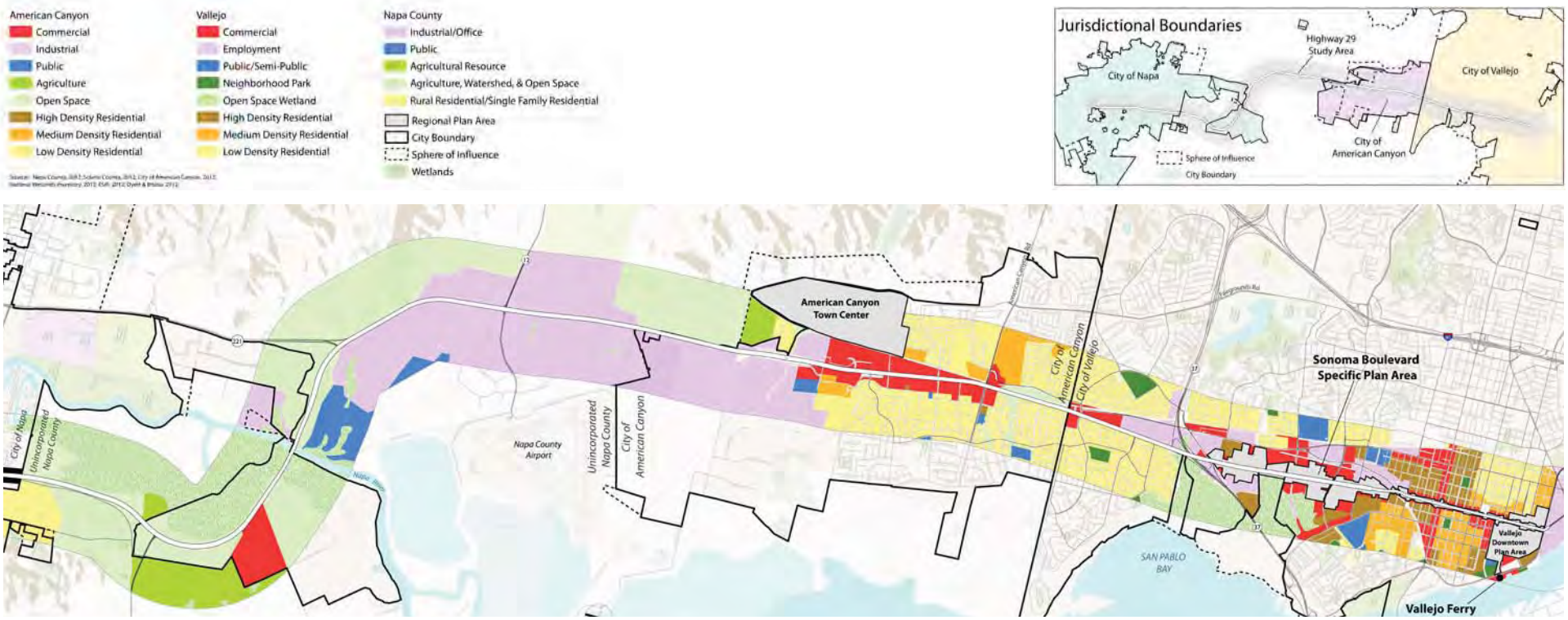
- Just south of Highway 12 to urbanized City of Napa; and
- Freeway in urbanized City of Napa.

These segments generally correspond with abutting land uses that exist and will be allowed under each jurisdiction's General Plan.

General Plan Designations (Workshop Base Map)

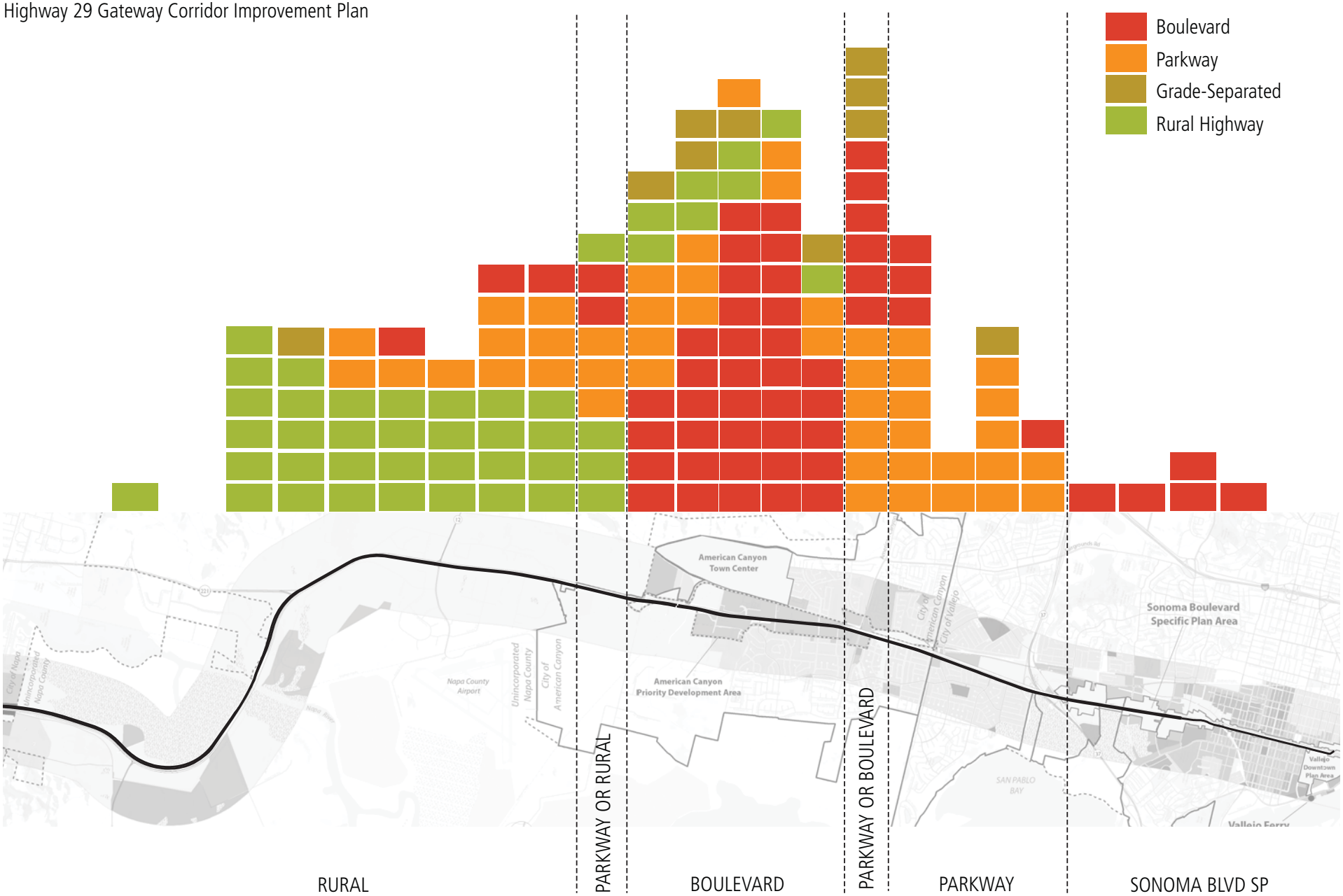
Visioning Workshops, November 2012

Highway 29 Gateway Corridor Improvement Plan



Note: To enlarge image, freeway segment in City of Napa is not shown.

Roadway Type Preferences
Visioning Workshops, November 2012
Highway 29 Gateway Corridor Improvement Plan



Note: To enlarge image, freeway segment in City of Napa is not shown.

Pedestrian Crossings and Transit Node Preferences

Visioning Workshops, November 2012

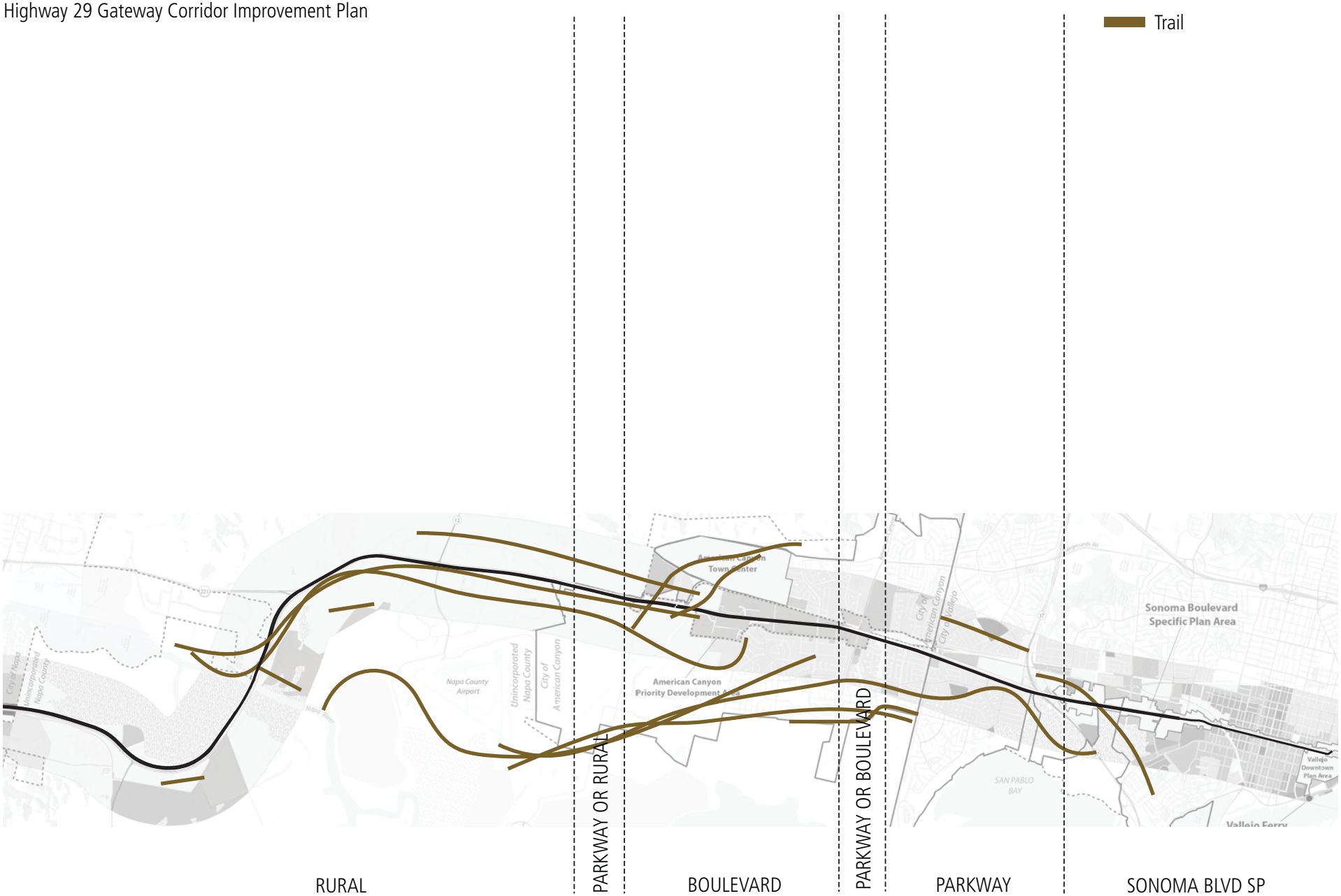
Highway 29 Gateway Corridor Improvement Plan

Note: To enlarge image, freeway segment in City of Napa is not shown.

Trail Routes Suggested

Visioning Workshops, November 2012

Highway 29 Gateway Corridor Improvement Plan



Note: To enlarge image, freeway segment in City of Napa is not shown.

South of Highway 37 (Sonoma Boulevard Specific Plan Area)

Preferred Roadway Type – Sonoma Boulevard Specific Plan Area: Few groups provided recommendations for this area, which is being planned by the City of Vallejo in a Specific Plan process that is separate from this project. Some participants designated this segment as Boulevard.

Additional Circulation Features: One group indicated that this segment should have an "express lane." One group demarcated the Ferry Terminal as a Transit Node, and also noted that the area around the Highway 29/37 interchange was an important trail connection location.

Highway 37 to Just South of American Canyon Road

Preferred Roadway Type–Parkway: Almost all tables that proposed that the Parkway type be used north of Highway 37 in Vallejo and in American Canyon where residential uses and open space will remain adjacent to the Corridor. When reporting out, groups emphasized the importance of landscaping and beautification in creating a scenic entryway and beautified "gateway" to the American Canyon and the Napa Valley.

Additional Circulation Features: Three groups proposed transit nodes at the intersection of Highway 29 and Highway 37, with one specifically noting that it should be a Park and Ride. One proposed a section of trail extending from the vacant property north of the Food 4 Less in Vallejo to the creek south of American Canyon Road, where there is a nearly continuous stretch of undeveloped land adjacent to the highway; while another proposed the trail on the west side of the highway (about a half mile to the west). Another group proposed an at-grade pedestrian crossing of the highway near the border of Napa and Solano counties.

Just South of American Canyon Road to Napa Junction Road

Preferred Roadway Type– Boulevard: Commercial land uses exist and will be allowed along this segment of the Corridor, and some mixed-use development has occurred. Most groups designated this segment as a Boulevard to provide local access and pedestrian-oriented environments along outside lanes, while moving regional/commuter traffic along inside lanes. Grade-separation was proposed by several tables at the American Canyon Road intersection.

Two tables proposed a bypass alternative to this segment, in the form of a rural highway along the east side of the American Canyon Town Center property. One group specifically showed the bypass connecting Highway 37 to Highway 12.

Additional Circulation Features: Two locations for transit nodes were suggested: at American Canyon Road and at the Town Center/Napa Junction. East-west connectivity in this segment was important to most groups. Two groups suggested at-grade pedestrian crossings at American Canyon Road, Donaldson Way, and Napa Junction Road, and several more groups desired pedestrian/bike bridges at these same intersections and at American Canyon High School. One group saw potential for a trail, paralleling the Corridor to the west and near San Pablo Bay.

Napa Junction Road to Just South of Highway 12

Preferred Roadway Type–Parkway: Industrial and other employment-related uses are present and will be allowed in this segment, under the General Plans for both American Canyon and Napa County. Most tables assigned the Parkway highway type to this segment. A few tables thought that the Rural Highway type would be most appropriate, essentially maintaining the current character. Some groups proposed improving the road to Parkway standards on the west side where more businesses are abutting, and having the east side remain Rural Highway to match the existing agricultural setting.

Additional Circulation Features: At-grade pedestrian crossings were proposed at Highway 12 and at Green Island Road. Another group showed a pedestrian/bike bridge at Green Island Road. Two groups labeled a Transit Node at the Airport. Several tables saw trails continuing north through the Corridor on the west side of the highway in this section.

Just South of Highway 12 to Urbanized City of Napa

Preferred Roadway Type – Rural Highway: For the area north of the Napa County Airport but south of urbanized City of Napa, most groups designated the Corridor as Rural Highway—essentially maintaining its current characteristics. Grade-separation was suggested by one group at Highway 221.

Additional Circulation Features: Two groups designated trails in this segment, extending both along the highway itself as well as north along the Napa River. One of these same groups noted an intersection near the 1st Street interchange in the City of Napa, which is particularly challenging for pedestrians and bicyclists.

Freeway in Urbanized City of Napa

This segment of the Corridor is a freeway and was not considered by during the workshops. This segment can only be enhanced as a Parkway, which is consistent with landscaping that has already occurred. Local access is only allowed at interchanges, which makes the Boulevard type infeasible. Urban development makes Rural Highway type infeasible. Grade-separation has already occurred at interchanges and overcrossings. The design phase of this project will consider ways to enhance this segment as a Parkway. "Gateway" features will also be considered.

Elements of a Draft Vision Plan

Community members who participated in the Visioning Workshop reached a significant level of agreement, as noted above and highlighted below.

The Citizens Advisory Committee is expected to offer additional guidance for components to be included within a long-term "Vision Plan" for the addressing the highway's design and community character. These notes are far from being finished conclusions, and are only provided as a starting point for CAC discussion.

ELEMENTS THROUGHOUT CORRIDOR

- Provide parallel routes for pedestrians and bicyclists, which may or may not be within the highway right-of-way, as is appropriate.
- Examine whether parallel local routes can provide alternative routes to residents, without attracting though-traffic in residential neighborhoods.
- Serve surrounding uses of sufficient intensity with well-located bus stops.

SOUTH OF HIGHWAY 37

- Defer to Sonoma Boulevard Specific Plan Area for highway improvements and community character.
- Examine methods to speed bus transit service to and from the Vallejo ferry terminal, including along routes in addition to Highway 29.
- Strengthen the ferry terminal as a regional transit hub.

HIGHWAY 37 TO JUST SOUTH OF AMERICAN CANYON ROAD

- Develop a Parkway with landscaping and bicycle/pedestrian paths along the right-of-way but buffered from traffic.
- Design a "gateway" to American Canyon and the Napa Valley.
- Examine demand for pedestrian crossings (none identified during workshops), as well as their location and type.
- Accommodate a park and ride transit node near the convergence of Highways 29 and 37.

JUST SOUTH OF AMERICAN CANYON ROAD TO NAPA JUNCTION ROAD

- Develop options for a Boulevard to allow local access and create pedestrian-oriented environments along the highway.
- Consider the appropriate balance between users making regional trips versus users making local trips–and local connectivity.
- Recommend specific locations for pedestrian/bicycle crossings at-grade and bridges, such as at: American Canyon Road, Donaldson Way, Napa Junction Road and the High School.
- Create scenic trails with views of San Pablo Bay.
- Examine feasibility of grade-separating major intersections, such as at American Canyon Road or Napa Junction Road.

NAPA JUNCTION ROAD TO JUST SOUTH OF HIGHWAY 12

- Create a Parkway with landscaping and other features that gives this employment area a distinct identity.

- Strive to maintain the rural character of this segment, especially to the east.
- Provide a pedestrian at-grade crossing or bridge at Highway 12 and at Green Island Road.
- Locate bus stops to serve employers. Consider establishing a transit park and ride facility near Napa County Airport.
- Provide bicycle/pedestrian trails along the Corridor, with good connections to employers.
- Create scenic trails with views of San Pablo Bay, if possible.

JUST SOUTH OF HIGHWAY 12 TO URBANIZED CITY OF NAPA

- Maintain a similar look and feel to current conditions. Recognize rural character as important to the identity of the Napa Valley, and tourism in the area.
- Provide a separated trail system paralleling Corridor. Address how the trail crosses the Napa River.
- Address functionality of intersection of Highway 29 with Highway 12/121.

FREEWAY IN URBANIZED CITY OF NAPA

- Enhance this segment as a Parkway, such as with additional landscaping and special features.
- Address functionality of First Street/Highway 29 interchange.

Attachments

These attachments appear on the following pages.

- Attachment 1: Workshop Agenda
- Attachment 2: Workshop Presentation
- Attachment 3: Table Notes
- Attachment 4: Mapping Exercise Materials and Results

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Attachment 1: Workshop Agenda

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Napa County Transportation & Planning Agency

A G E N D A

Napa Highway 29 Gateway Corridor Improvement Plan

November 13 & 27, 2012

1. **Welcome** *(2 minutes)*

2. **Workshop Purpose and Outline** *(3 minutes)*

3. **Project Background Information** *(presentation, 15 minutes)*
   - Project Purpose and Participating Jurisdictions
   - Process and Timeline
   - Existing Conditions
   - Existing General Plan Land Use Designations
   - Integrating Transportation Improvements and Community Character

4. **Small Group Exercises** *(60 minutes)*
   - Activity One: Individual Visions *(15 minutes)*
   - Activity Two: Sharing and Group Vision; Issues *(25 minutes)*
   - Report out *(20 minutes)*

5. **Themes and Next Steps** *(general discussion, 10 minutes)*

6. **Adjournment**

For more information on this project or to communicate with the project team, please go to: *https://sites.google.com/site/sr29corridorstudy/home/about-the-project*

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Attachment 2: Workshop Presentation

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WELCOME!

Napa County Transportation and Planning Agency

Highway 29 Gateway Corridor Improvement Plan

Visioning Workshops

November 13 & 27, 2012

Planning Area & Participating Jurisdictions

- *Napa County Transportation & Planning Agency*
- *Caltrans (Community Planning Grant Program)*
- *Cities of Napa, American Canyon, Vallejo*
- *Counties of Napa & Solano*

AGENDA

Project Background

- *Planning Area & Participating Jurisdictions*
- *Project Purpose*
- *Process & Timeline*
- *Existing Conditions*
- *Planning Principles*

Small Group Exercise

- *Individual Ideas & Concerns*
- *Group Discussion on Place & Highway Types*

Consider Common Themes

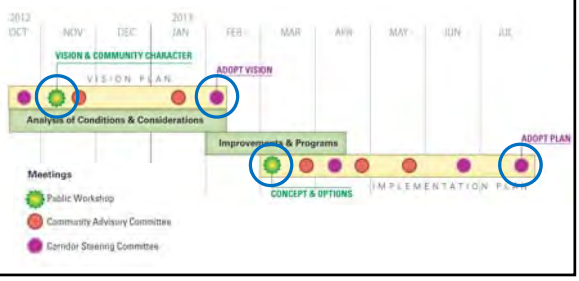
Project Purpose (Highway 29 Corridor)

- ***Transportation performance** (all modes)*
- ***Technologies and programs***
- ***Physical improvements***
- ***Implementation tools***
- ***Align with each community's aspirations***

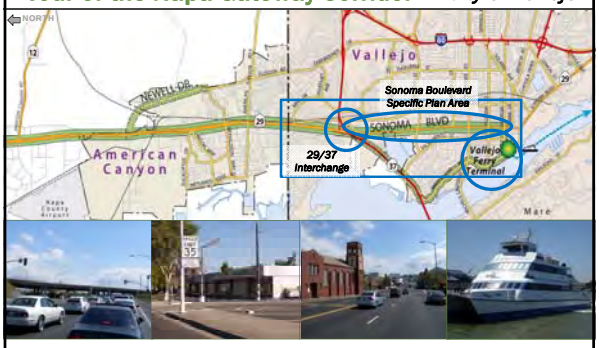
Project Background Information

Process & Timeline

- ***Corridor Steering Committee** (Jurisdiction Decision Makers)*
- ***Citizens Advisory Committee** (for Guidance)*
- ***Community Workshops** (for Direct Input)*

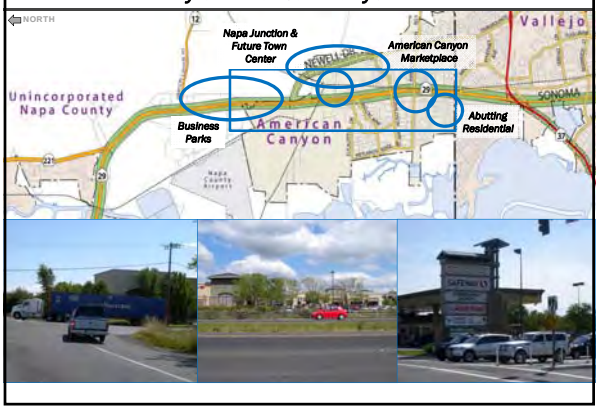


Tour of the Napa Gateway Corridor — City of Vallejo

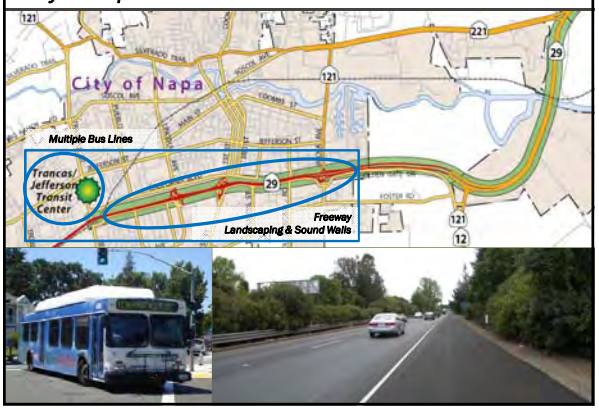


Unincorporated Napa County

City of American Canyon

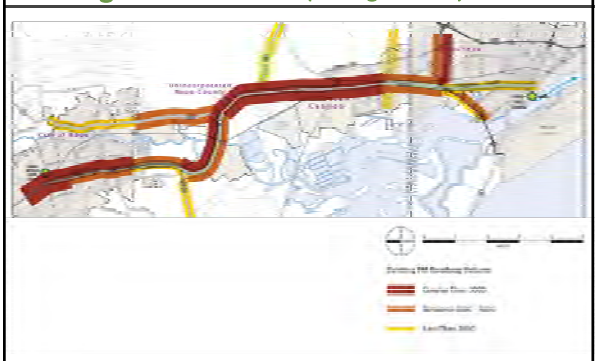


City of Napa

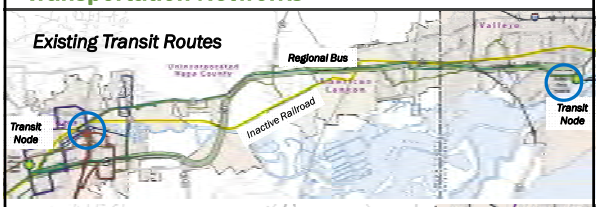


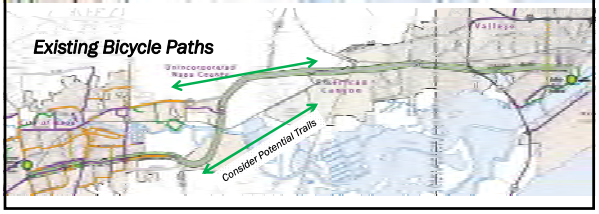
City of American Canyon

Existing Traffic Volumes (Existing PM Peak)



Transportation Networks



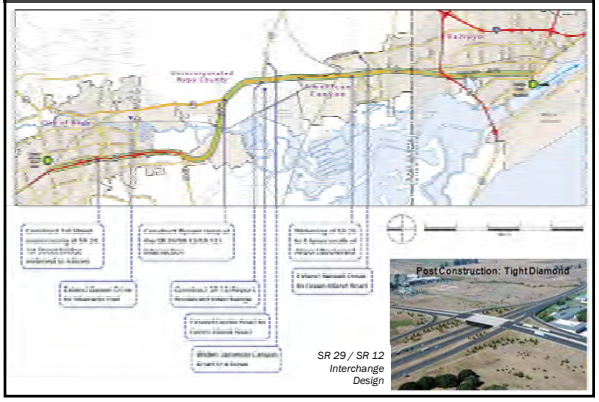


Connecting Roadway Types to Place Types

Rural Highway

NCTPA: SR29 Gateway Corridor Improvement Plan

Planned Highway Improvements



Parkway

NCTPA: SR29 Gateway Corridor Improvement Plan

Integrating Transportation & Community Character

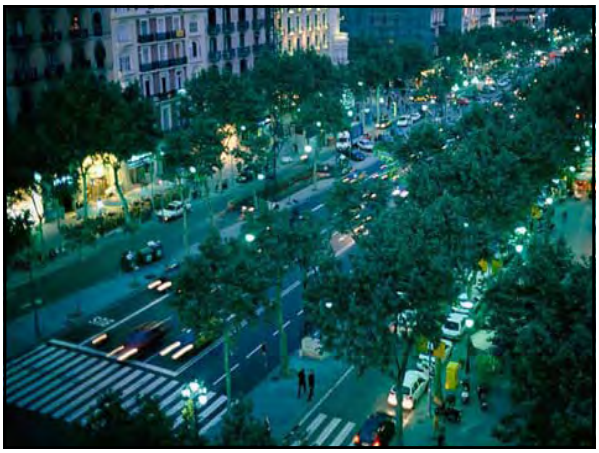
NCTPA: SR29 Gateway Corridor Improvement Plan

Emphasis on Vehicle Movement

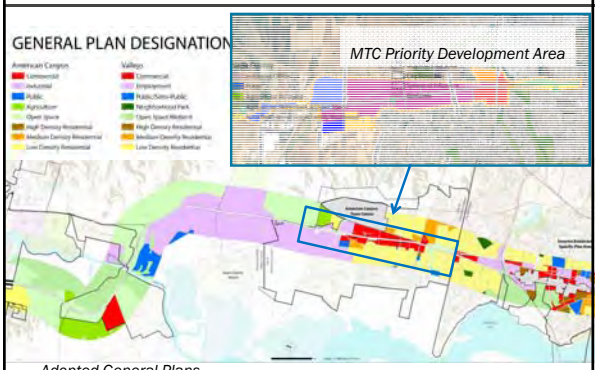
Multiple Modes & Community Character

Boulevard

NCTPA: SR29 Gateway Corridor Improvement Plan



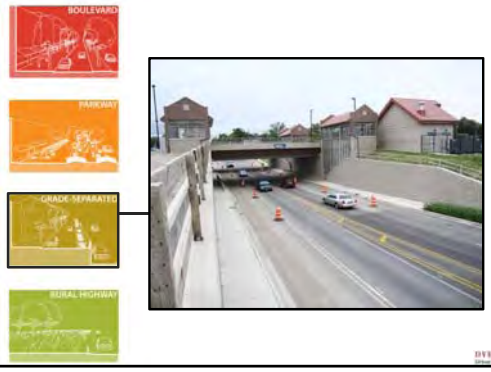
Planned Land Uses



Adopted General Plans

NCTPA: SR29 Gateway Corridor Improvement Plan

Grade-Separated Highway

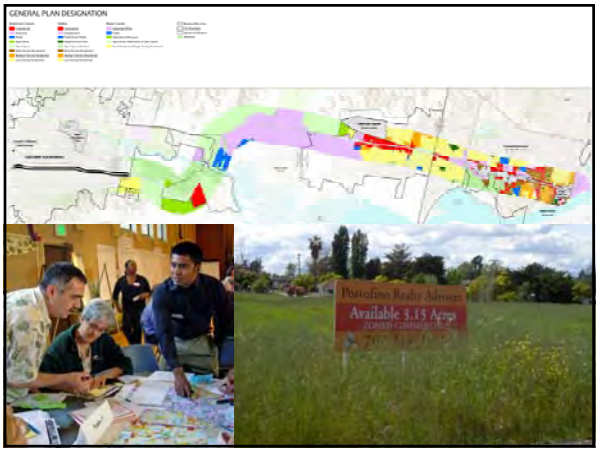


Vision for the Corridor Small Group Exercise

1) Record your general concerns.

2) Consider which transportation improvements, and where.

Visioning Exercise



Consultant Team Members & Roles

- ***Dyett & Bhatia:*** *Project Coordination, Land Use, Urban Design, and Community Outreach*
- ***Fehr & Peers:*** *Transportation Performance*
- ***Bottomley Design & Planning:*** *Multi-Modal Roadway Design, Urban Design, and Landscape Architecture*
- ***Economic & Planning Systems****: Infrastructure Financing, Governance, and Market Economics*
- ***BKF Engineering****: Civil Engineering Due Diligence and Infrastructure Cost Estimating*

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Attachment 3: Table Notes

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Visioning Workshop Notes

NOVEMBER 13, 2012

Table 1

- Grade separation, whole way?
- Commute M-F/Wine country Saturday-Sunday 9 AM- 5 PM
- Signage to Jameson Canyon/60 (?)
- Look like a small town destination
- A boulevard to separate through/local would be nice. With bikes!
- More ability to get across
- Like roundabouts, separate safe bike routes
- Separate bikes and walk from road
- Parkway next to growing stuff
- Bay trail
- Car bridge should go above people

Table 2

- Beautify the corridor. It's ugly!
- Traffic is a problem for whole county
  - Fix Safety
  - High school
- Beautification friendly to business owners
- Families and school kids should be able to walk to shops. Pedestrian friendly
- Expedite the through traffic, fewer stops, less pollution. Frustrated people won't visit businesses
- Traffic is a nightmare!
- Improve access across corridor
- Boulevard idea makes getting off road to shop easier
  - Would help people get a sense of American Canyon

- East/west traffic could go under
- Safer feeling/crossing for bicycles
- Access to businesses that don't have frontage
- "Explosion of green" coming into American Canyon from Vallejo
- Some disagreement: two ideas through heart of American Canyon
  - Boulevard (more business friendly)
  - Grade separated (would move traffic better)
- Remember ADA compliance on all crosswalks
- Beautify highway
- Alleviate traffic
- Safe for pedestrians
- Friendly for business
- Fewer stops

Table 3

- Grade separation between American Canyon Road and Napa Junction
  - Need to accept regional commute role
- Bypass routes may have political challenges
- Concerns about widening and consequences for pedestrians

Table 4

- Synchronized lights (* just received grant)
- High Speed Lane
- Improve traffic flow
- Volumes too high
- Highway clogged quickly
- Infrastructure –bikes and pedestrian
- Parallel options along roads for residents only, no bypasses
- Bad congestion at peak hours
- Pedestrian amenities
- Multi-modal
- Themes
  - Multimodal traffic flow

  - Regional vs. local
  - Bike vs. pedestrian

Table 5

- Bike lanes important in rural highway areas
- Attractive, really nice
- Context-sensitive character
- Boulevard from 37 to town center
  - Moving traffic
  - Access to businesses, visible
- Cross traffic and through traffic must work
- Recognize parallel routes
- Balance between regional corridor and main street feel/character
- Stop people taking small side streets (especially residential)
- Newell extended to Jameson Canyon
- Parkway where there are no businesses
- Grand view/entrance to the future boulevard
- Increase to three lanes each direction
- Don't compromise local traffic for commute traffic

Table 6

Concerns:

- Pedestrian crossing east and west American Canyon Road and Eucalyptus Drive
- No alternative north/south route
  - Safety concerns with crossing 29
  - Local alternate route
- Grade separated highway bad for local business
- Safety pedestrian bicycle crossing Highway 29
- Make it convenient for people to get to businesses but still keep traffic moving along main thorough way
- Speed limit on Highway 29 is too fast
- Highway 29 is also Broadway. Confusing

"Vision for future"

- Boulevard for 29 corridor through heart of American canyon
- Pedestrian bike bridge
- Alternative north/south roads "back roads"
- Character of corridor would match character of community roads
- Gateway marker
- Downtown
- Bypass road from north AC off Highway 29 behind high school should connect to Highway 37

NOVEMBER 27, 2012

Table 1

- Good local circulation not just through
- Access to frontage businesses
- Beautiful! Need to straighten out relationship to community
- Need to address different characters to create identity
- How to link different segments
- Continue parallel routes concept, keep them nice, not through traffic on local streets
- Make SR 29 nice
- PnR should be one at 37/29 too
- RR bridge –maximize its use for other functions
- Traffic engineering/congestion is key issue

Table 2

Concerns

- Benefits entire county (20) not just American Canyon
  - Bypass through American Canyon
- Cost/alternatives/timing of improvements
  - Incremental (phasing)
  - Overall
  - Options to changing 29
- Safety, easy access, business and family friendly
- Consensus- move forward with a solution

- How the corridor represents the community
- Local traffic vs. through traffic

Vision

- For American Canyon to be an asset that is good for everybody –community and regionally
- Serve community and through traffic

Table 3

Concerns

- Business accessibility from SR 29 visibility
- Restricted flow of traffic/congestion
- Thorough ways congested not just SR 29 side streets
- Restricts business development
- Limited business hours due to traffic

Vision

- Multi-modal overpass at H.S.
- Widen SR 29 to six lanes
  - Boulevard –four middle/ two outside
- Flyover at 12 &29
- Eliminate light at Hwy 29 café
- Rural Highway north of city
- Roundabout without signs at Soscol

Table 4

- Volume vs. design capacity
- Transit is underutilized
- Moving people, not cars
- Congestion mitigation
- Beautification
- Multimodal/bike facilities
- Congestion/consider constraints
- Beautification
- Better bike facilities

- Alternative modes
- Be careful of quick fix
  - Adding capacity
- Paradigm shift away from SUV
- Transit/pedestrian oriented land use
- Work with employees, tourist industry to shift modes
- If capacity is added hov/hot flex-time

Table 5

- What about an overpass for regional traffic?
- Frontage road access can be confusing
- Country road makes sense for some areas; a boulevard could be more appropriate in town
- Dedicated lands for local vs. through
- Want local traffic to not have to rely on cars. Foot, bike access
- For regional, we should accommodate transit better. Faster! Especially buses
- Incorporate SW into design
- Biking on the main roadway feels dangerous preserver small town crosses in American Canyon
- Community development on 29 is like blood –don't want to cut businesses off from road
- Multimodal access needs to work well in dense area
- Don't overbuild! Traffic probably doesn't exist for 21 hours a day!
- Don't want regional traffic cutting through neighborhoods unsafe
- Addressing local mobility will solve a lot of problems
- Important to have a class I bike path from ferry to Calistoga
  - Provide alternatives to driving
- Richmond has a good solution for grade separated that also serves other modes
- Create a destination, sense of place, add value
- Commit oaks as the signature statement plant for entrance to Napa Valley

"Minority opinion"

- Transition the majority of the regional traffic to bus
- Move away from car-centered solutions
- Low costs

Attachment 4: Mapping Exercise Materials and Results

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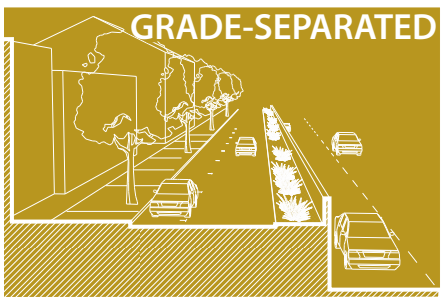
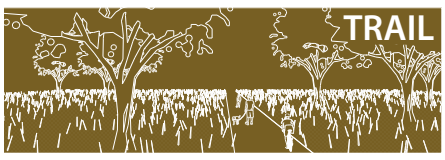
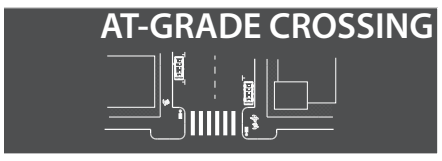
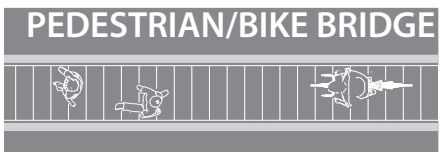
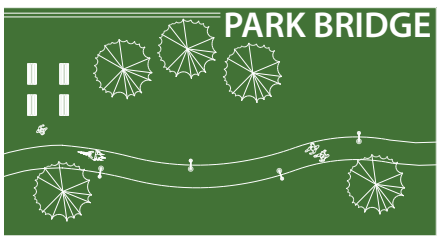
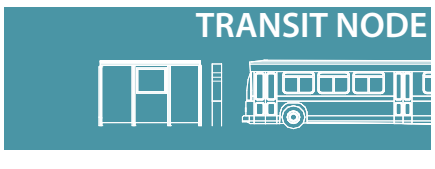
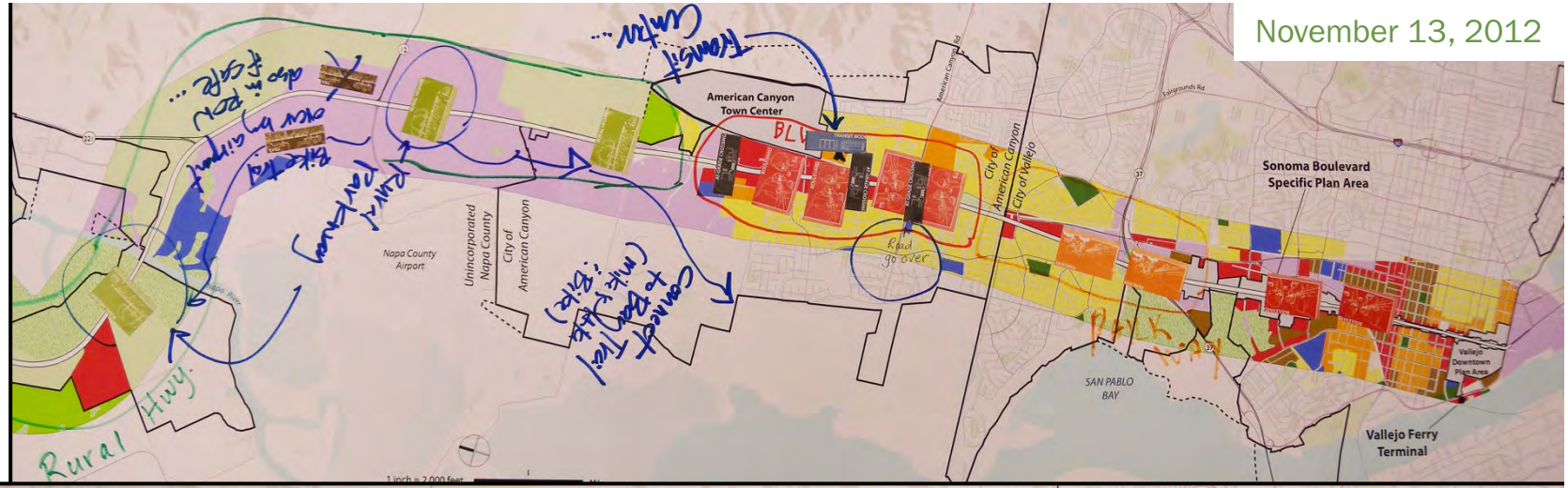
KEY TO ROADWAY TYPES AND COMMUNITY CHARACTER

TYPE	CHARACTER	PEDESTRIAN ENVIRONMENT	ADJACENT DEVELOPMENT	COST	ILLUSTRATION
Roadway Types					
Boulevard	Local access lanes with street-facing buildings	• Inner thru-traffic lanes • Outer local access lanes with on-street parking • Active sidewalk • Bicycles accommodated • Parking behind buildings	Any use except open space Where retail is allowed, shops could face roadway	$$	
Parkway	Landscaping with sound wall or open space adjacent	• Landscape buffers separate roadway from land uses • Path separated from roadway by landscaping • Bicycles accommodated • Building entrances typically face away from roadway	Any use	$	
Grade-Separated	Below-grade with or without local access lanes	• Pedestrian/bicycle paths vertically separated from roadway • Bicycles accommodated • No visual connection from thru-traffic to adjacent uses • Access via access lane or other roads	Any use except street-facing retail	$$$	
Rural Highway	No landscaping with open space adjacent	• No pedestrian path • Bicycles not accommodated	Open space only	No cost	
Pedestrian, Bicycle, and Transit Facilities					
Trail	Natural in character	• Pedestrian and bike only	Any use, but especially with open space	$	
Crossings	At-grade crossing	• Bulb-outs, advance stop bars, signals with countdown times	Any use	$	
	Pedestrian/bike bridge	• Narrow	Any use	$$	
	Park bridge	• Wide with park	Urban uses only	$$$$	
Transit Node	Serves VINE bus lines and potential future BRT lane	• Curb extensions/bulb-outs • Transit shelters	Urban uses only	$	

November 13, 2012

TABLE 1



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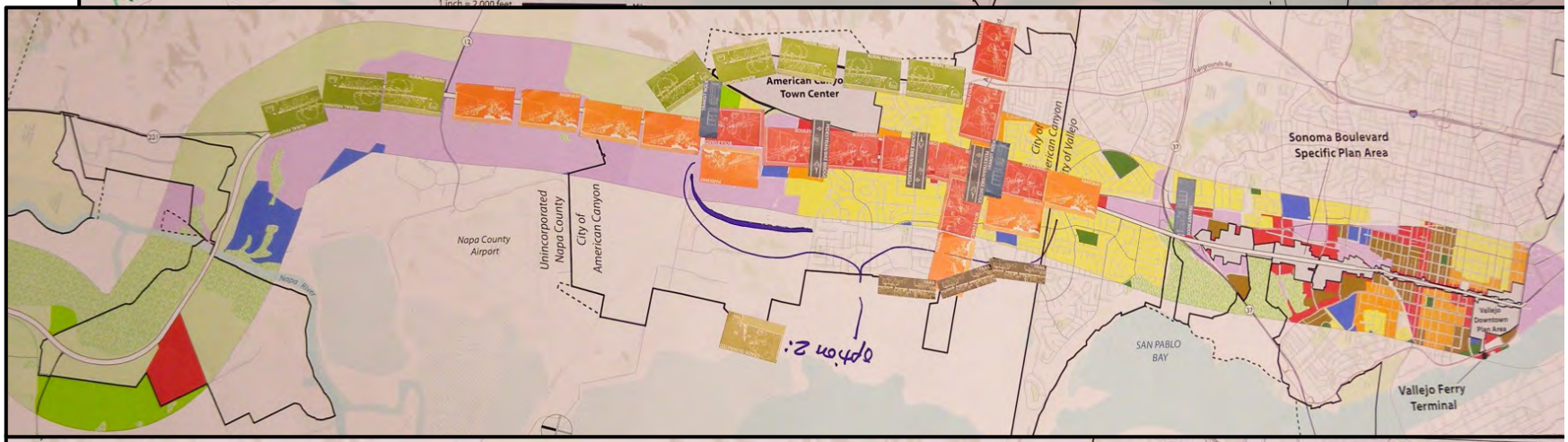

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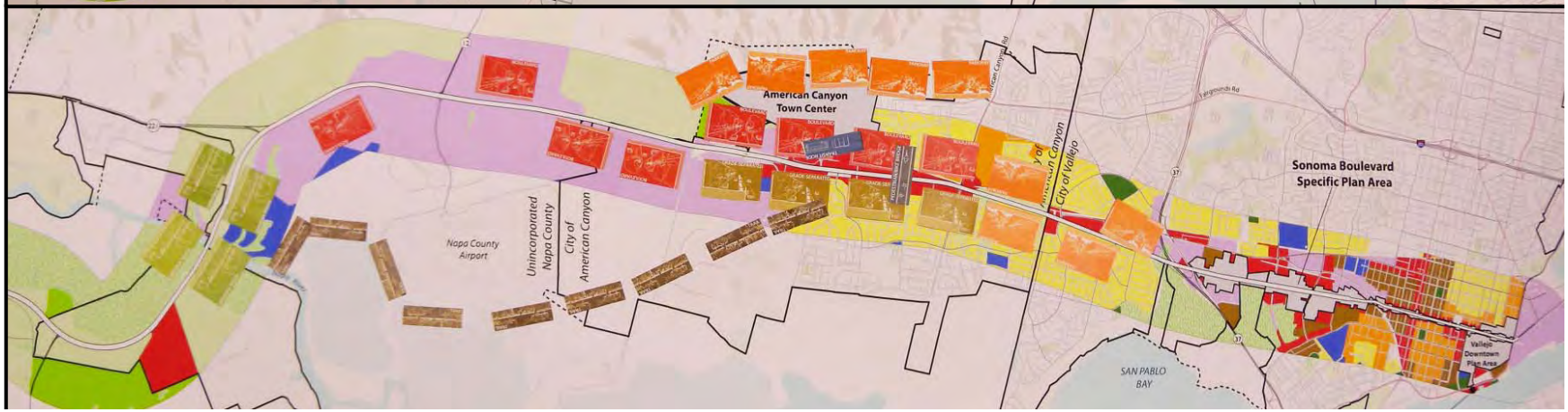
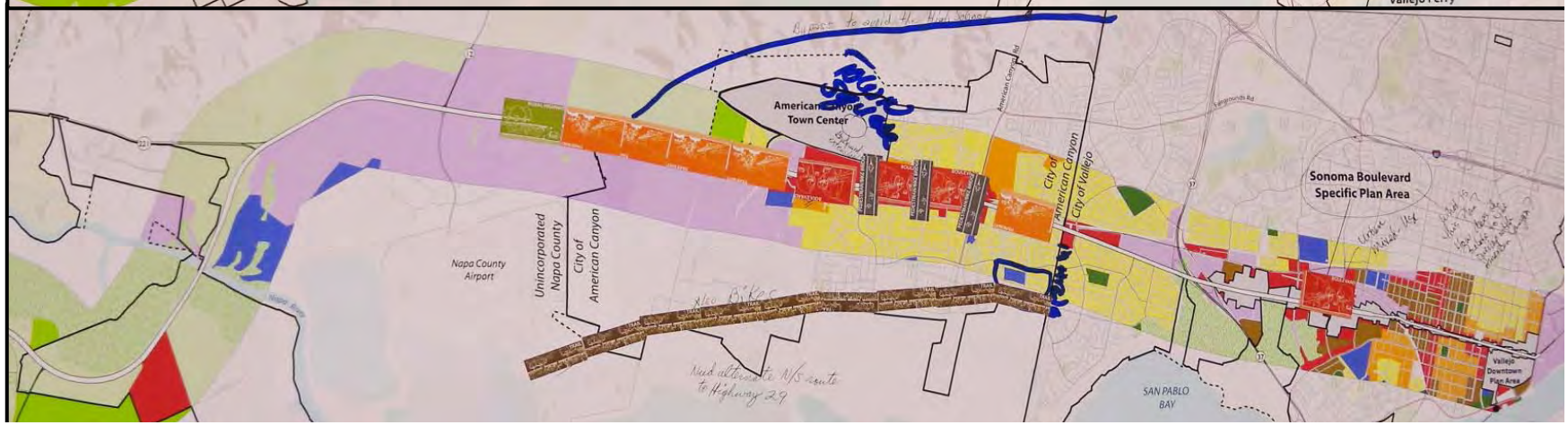


November 13, 2012

TABLE 4

TABLE 5

TABLE 6



November 27, 2012

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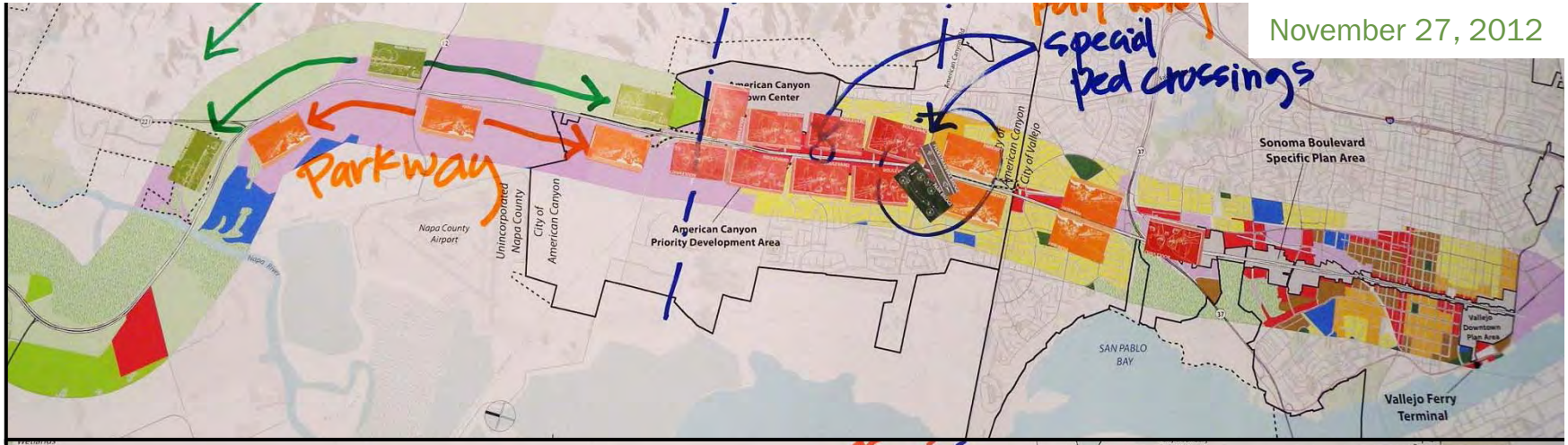

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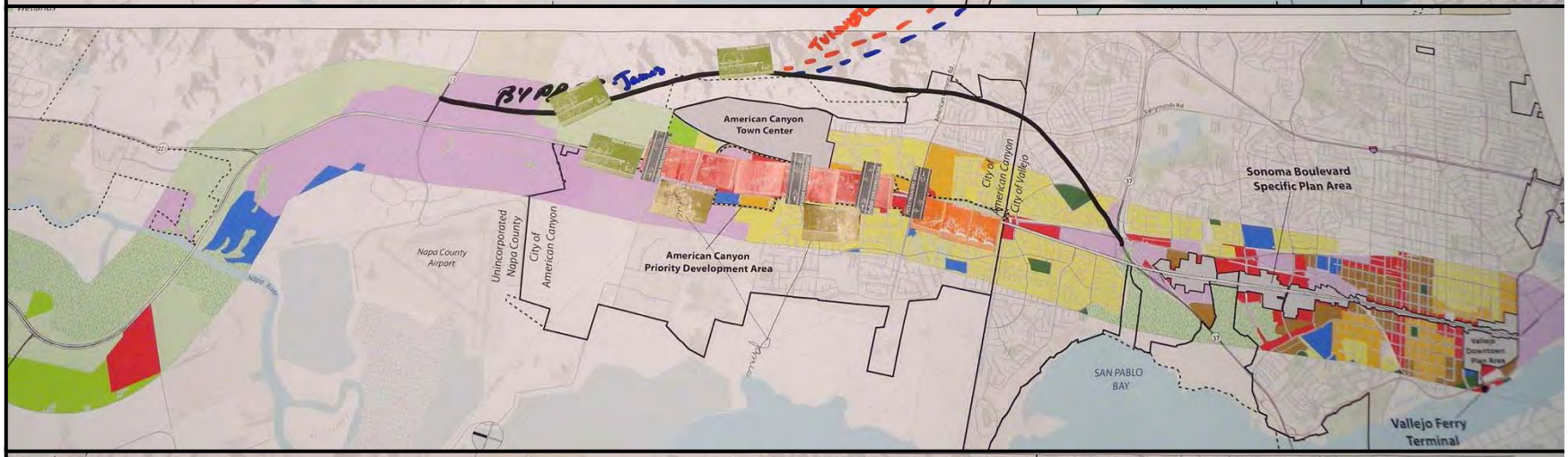

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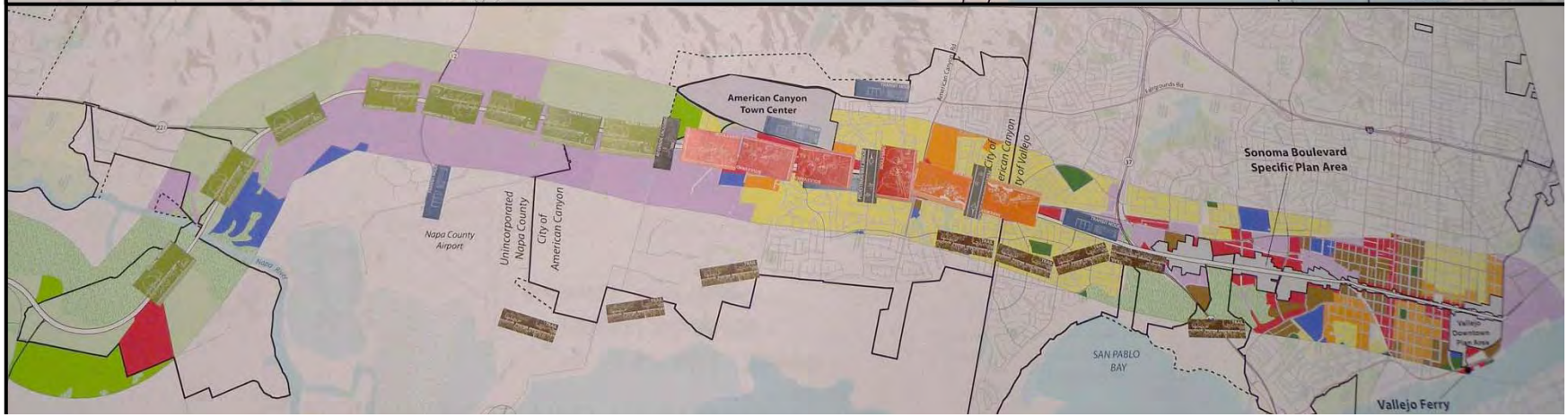

November 27, 2012

TABLE 4

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APPENDIX B:

N-STDM MODEL UPDATE METHODOLOGY

FEHR PEERS

MEMORANDUM

Date: May 10, 2013

To: Eliot Hurwitz, NCTPA

From: Steve Crosley & Dennis Lee, Fehr & Peers

Subject: Travel Demand Model Assumptions for the SR 29 Corridor Gateway Study

SF12-0651

This memorandum discusses the travel demand model that was used for the SR 29 Gateway Corridor Improvement Study and the updates applied to the model inputs to produce more accurate results. A four-step travel demand model begins with both existing and forecasted land use data and roadway networks. The accuracy of these inputs is important, as is matching the model's geographic scope with the study area. This memorandum discusses the updates to the land use and circulation network in the Napa-Solano Travel Demand Model (N-STDM) for review by the Staff Working Group.

NAPA-SOLANO TRAVEL DEMAND MODEL

SR 29 draws vehicular traffic from all across the region; therefore a multi-county model which tracks trips from the region and accounts for land use changes both in and outside of Napa County is best suited for this study. As outlined in the project scope, the Napa-Solano Travel Demand Model (N-STDM) is an appropriate tool to perform traffic forecasting for the SR 29 corridor.

Model Assumptions

To ensure the most recent land use and network inputs in the study area are represented in the N-STDM, Fehr & Peers reviewed relevant data sources: the *American Canyon General Plan* Circulation Element Update (2012), MTC's *Transportation 2035 Plan for the San Francisco Bay Area* (2009), the *Napa County General Plan* (2009), and ABAG's *2011 SCS Preferred Land Use Scenario*.

The following sections detail how Fehr & Peers incorporated the assumptions from those studies for use in the SR 29 Corridor Gateway Study.

Land Use Development

There have been a series of updates to the land use inputs for the N-STDM since its initial development by DKS Associates and Dowling Associates and its validation of the base year model to 2000. In 2008, DKS refreshed the base year land use data with input by City staff from various jurisdictions in Napa and Solano Counties, including the City of Napa, Napa County, and the City of Vallejo. In 2010, the model was updated by Fehr & Peers for the Solano Transportation Authority, where the base year was validated to 2010 conditions and special trip generators were established in Solano County. The land use data from remaining jurisdictions and unincorporated areas in Napa and Solano Counties were based on the MTC regional travel model. Land use data from other Bay Area counties were based on ABAG's *Projections 2005*. The N-STDM covers the nine Bay Area counties, the Sacramento Region, San Joaquin County, and Lake County.

American Canyon

With the recent 2012 update to the *American Canyon General Plan* Circulation Element, Fehr & Peers has updated the N-STDM land use data with the more recently developed and localized land use data in the American Canyon travel demand model. This update was performed on a TAZ-by-TAZ basis by scaling the N-STDM control totals to match the total household and total employment land use categories in the American Canyon model. The remaining household and employment subcategories were also scaled accordingly and kept at the same ratios as found in the original N-STDM model. Only TAZ's within the City of American Canyon were updated for this portion of the land use update. The base year land use summaries for the City of American Canyon from both models are presented in **Table 1**.

TABLE 1: Summary of Base Year Land Use Inputs for American Canyon					
Land Use Source	**Households**	**Retail Emp.**	**Service Emp.**	**Other Emp.**	**Total Employment**
N-STDM	4,036	687	590	2,126	5,555
American Canyon Travel Demand Model	5,163	400	446	3,138	3,984
Source: Napa Solano Travel Demand Model, as summarized by Fehr & Peers, January 2013; *City of American Canyon Circulation Element Update,* Appendix C: Background Report & Travel Demand Model Documentation, 2012					

The 2030 land use forecasts for the N-STDM were developed using growth ratios from ABAG household and employment forecasts contained in *Projections 2005*, and adjustments were made interactively with local city staff. Land use forecasts were developed for the American Canyon Travel Demand Model for the horizon year 2035 and were informed by the City's General Plan, 2035 ABAG projections from 2009, and current development projects.

Fehr & Peers updated the forecasted land use with the forecasts developed for the American Canyon Travel Demand Model. The methodology was identical to the base year lane use update. The future year land use summaries for the City of American Canyon from both models are presented in **Table 2**.

TABLE 2: Summary of Future Year Land Use Inputs for American Canyon					
Land Use Source	**Households**	**Retail Emp.**	**Service Emp.**	**Other Emp.**	**Total Employment**
N-STDM	4,848	1,162	762	5301	7,225
American Canyon Travel Demand Model	9,109	1,399	1,558	5,711	8,668
Source: Napa Solano Travel Demand Model, as summarized by Fehr & Peers, January 2013; *City of American Canyon Circulation Element Update,* Appendix C: Background Report & Travel Demand Model Documentation, 2012					

Remaining Jurisdictions in Napa and Solano Counties

The land use inputs of the remaining jurisdictions in Napa and Solano County, including the nearby Cities of Napa and Vallejo, were updated to match the forecasts of ABAG's *Sustainable Communities Strategy Preferred Land Use Scenario* (SCS). These are the latest projections released

by ABAG in draft format in March, 2012. The N-STDM land use inputs were updated TAZ-by-TAZ by scaling the total household and total employment land use categories to the ABAG control totals. The remaining household and employment subcategories were scaled accordingly and kept at the same ratios found in the original N-STDM model. This process was done for all jurisdictions in Napa and Solano Counties, with the exception of the City of American Canyon.

Updating the future land use scenario used a similar methodology; however, TAZ's which did not experience growth between existing and future N-STDM land uses were not scaled. This method maintains the finer grained land use details of the N-STDM compared to the larger ABAG TAZ's while still matching the ABAG control totals. Household and employment totals for Napa and Vallejo are summarized in **Table 3** and **Table 4**, respectively.

TABLE 3: Summary of Existing and Future Land Use Inputs for City of Napa

Scenario Year	Land Use Source	Households	Employment
Existing	N-STDM	31,758	29,881
	ABAG *SCS*	29,186	30,444
Future	N-STDM	35,444	33,176
	ABAG *SCS*	33,068	39,418

Source: Napa Solano Travel Demand Model, as summarized by Fehr & Peers, January 2013; ABAG *SCS Preferred Land Use Scenario*

TABLE 4: Summary of Existing and Future Land Use Inputs for City of Vallejo

Scenario Year	Land Use Source	Households	Employment
Existing	N-STDM	44,576	35,037
	ABAG *SCS*	41,422	31,509
Future	N-STDM	55,324	54.350
	ABAG *SCS*	45,979	43,083

Source: Napa Solano Travel Demand Model, as summarized by Fehr & Peers, January 2013; ABAG *SCS Preferred Land Use Scenario*

Other Jurisdictions

The land use data for all other jurisdictions in the N-STDM is assumed to remain the same as the latest model update. The above updates to the jurisdictions with the most direct influence on SR 29 will provide for an accurate measurement of future conditions on SR 29.

Network Improvements

To ensure planned road improvements are reflected properly in the N-STDM network, Fehr & Peers reviewed relevant jurisdictional plans, including MTC's *Transportation 2035 Plan for the San Francisco Bay Area* (2009), the *Napa County General Plan* Circulation Element (2009), *City of Napa General Plan* (2011); the *American Canyon General Plan* Circulation Element Update (2012), the City of Vallejo's *Sonoma Boulevard Corridor Design Plan* (2012), and Caltrans's *Corridor Plan State Route 29,* (2011). The following planned network improvements on and around the SR 29 study area will be reflected in the N-STDM future network:

- Construct SR 12 / Airport Boulevard Interchange at SR 29 (Napa County GP, MTC)
- Complete Devlin Road between Soscol Ferry Road and Green Island Road (Napa County GP)
- Widen SR 12 from 2 lanes to 4 lanes from I-80 in Solano County to SR 29 in Napa County (Napa County GP)
- Construct SR 29 / SR 12 / SR 221 Flyover Ramp (MTC)
- Widen 1st Street overcrossing from 2 to 4 lanes in the City of Napa (MTC)
- Extend Gasser Drive north to connect with Silverado Trail/Soscol Avenue (City of Napa GP)
- Extend Solano Avenue from Lincoln Street to 1st Street (City of Napa GP)
- Extend Newell Drive from American Canyon Road to Green Island Road (AC GP)
- Widen Green Island Road from 2 to 4-lane arterial (AC GP)
- Construct Commerce Boulevard from its southern terminus to Eucalyptus Drive (AC GP)
- Complete Devlin Road between Green Island Road and South Kelly Road (AC GP)
- Extend South Napa Junction Road from SR 29 to Newell Drive (AC GP)

One major network improvement was intentionally omitted: the widening of SR 29 from 4 to 6-lane arterial within American Canyon (AC GP). This is so that alternative configurations of the SR 29 Corridor Improvement Study may be tested against a 4-lane baseline configuration of SR 29.

Weekend Travel Demand Scenario

The N-STDM forecasts AM and PM peak period travel demand but does not have capabilities to forecast weekend travel. To develop a weekend scenario, Fehr & Peers will collect Caltrans PeMS hourly volume data on SR 29 for both weekdays and weekends. A factor will be developed between peak hour volumes for the weekday PM time period and the peak hour volume for the weekend. This factor will be applied to the PM peak results from the model to approximate existing and future weekend travel conditions.

This concludes the summary of the travel demand model assumptions for the SR 29 Gateway Corridor Study. If you have any questions, please contact Steve Crosley.

APPENDIX C:

INTERSECTION MODELING RESULTS

Existing Conditions

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	691	205	291	1135	1526	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	2.6	4.1	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	3433	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	3433	3539	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	720	214	303	1182	1590	322
RTOR Reduction (vph)	0	0	0	0	0	72
Lane Group Flow (vph)	720	214	303	1182	1590	250
Turn Type		Free	Prot			pt+ov
Protected Phases	7		5	2	6	6 7
Permitted Phases		Free				
Actuated Green, G (s)	24.1	85.3	13.0	48.5	30.3	61.3
Effective Green, g (s)	25.5	85.3	14.1	50.9	32.7	63.7
Actuated g/C Ratio	0.30	1.00	0.17	0.60	0.38	0.75
Clearance Time (s)	5.8		5.2	6.9	6.9	
Vehicle Extension (s)	3.0		3.0	2.0	2.0	
Lane Grp Cap (vph)	1026	1583	567	2112	1357	1182
v/s Ratio Prot	c0.21		0.09	c0.33	c0.45	0.16
v/s Ratio Perm		0.14				
v/c Ratio	0.70	0.14	0.53	0.56	1.17	0.21
Uniform Delay, d1	26.5	0.0	32.6	10.4	26.3	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.2	1.0	0.2	85.5	0.0
Delay (s)	28.7	0.2	33.6	10.6	111.8	3.3
Level of Service	C	A	C	B	F	A
Approach Delay (s)	22.2			15.3	93.5	
Approach LOS	C			B	F	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	13.4
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	1343	213	21	1407	2	16	18	7	769	46	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0	3.5	6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770	1863	1583	3433	1863	1583
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)	47	1460	232	23	1529	2	17	20	8	836	50	3
RTOR Reduction (vph)	0	0	160	0	0	0	0	0	6	0	0	2
Lane Group Flow (vph)	47	1460	72	23	1531	0	17	20	2	836	50	1
Turn Type	Split		Perm	Split			Prot		custom	Prot		custom
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8						7			8
Actuated Green, G (s)	30.0	30.0	30.0	25.0	25.0		2.6	11.8	25.0	20.0	29.7	30.0
Effective Green, g (s)	29.5	32.0	32.0	24.0	27.0		2.1	11.3	24.5	20.0	29.7	30.0
Actuated g/C Ratio	0.28	0.31	0.31	0.23	0.26		0.02	0.11	0.24	0.19	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5	3.5	6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8	2.0	4.0	4.0
Lane Grp Cap (vph)	503	1091	488	409	921		36	203	374	661	533	458
v/s Ratio Prot	0.03	c0.41		0.01	c0.43		0.01	0.01		c0.24	c0.03	
v/s Ratio Perm			0.05						0.00			0.00
v/c Ratio	0.09	1.34	0.15	0.06	1.66		0.47	0.10	0.01	1.26	0.09	0.00
Uniform Delay, d1	27.3	35.9	26.0	31.1	38.4		50.3	41.7	30.3	41.9	27.2	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	158.5	0.2	0.0	302.9		3.5	0.3	0.0	131.0	0.1	0.0
Delay (s)	27.4	194.4	26.2	31.1	341.3		53.8	42.0	30.3	172.9	27.3	26.3
Level of Service	C	F	C	C	F		D	D	C	F	C	C
Approach Delay (s)		167.4			336.7			44.4			164.2	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	227.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	7.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	25	25	58	115	293	188	1902	21	1012	1144	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5	4.0	5.1	4.0	4.0	4.1	4.0	4.0
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3327	1583	1770	1863	1583	1770	5085	1583	3433	3539	1583
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3327	1583	1770	1863	1583	1770	5085	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	36	26	26	61	121	308	198	2002	22	1065	1204	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	5	0	0	0
Lane Group Flow (vph)	20	42	26	61	121	308	198	2002	17	1065	1204	106
Turn Type	Split		Free	Split		Free	Prot		Perm	Prot		Free
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases			Free			Free			6			Free
Actuated Green, G (s)	6.3	6.3	153.0	15.2	15.2	153.0	21.8	60.2	60.2	51.2	89.1	153.0
Effective Green, g (s)	5.8	5.8	153.0	14.7	14.7	153.0	21.3	62.2	62.2	51.2	91.1	153.0
Actuated g/C Ratio	0.04	0.04	1.00	0.10	0.10	1.00	0.14	0.41	0.41	0.33	0.60	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	6.0	6.0	4.1	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	61	126	1583	170	179	1583	246	2067	644	1149	2107	1583
v/s Ratio Prot	0.01	0.01		0.03	c0.06		0.11	c0.39		c0.31	0.34	
v/s Ratio Perm			0.02			c0.19			0.01			0.07
v/c Ratio	0.33	0.33	0.02	0.36	0.68	0.19	0.80	0.97	0.03	0.93	0.57	0.07
Uniform Delay, d1	71.7	71.7	0.0	64.7	66.8	0.0	63.8	44.4	27.2	49.1	19.0	0.0
Progression 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
Incremental Delay, d2	3.1	1.6	0.0	1.3	9.7	0.3	16.3	13.1	0.0	12.4	0.5	0.1
Delay (s)	74.8	73.3	0.0	66.0	76.5	0.3	80.1	57.6	27.3	61.5	19.4	0.1
Level of Service	E	E	A	E	E	A	F	E	C	E	B	A
Approach Delay (s)		52.0			27.3			59.3			37.4	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	46.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	153.0	Sum of lost time (s)	13.6
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	7	24	51	5	5	61	2091	288	30	1243	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.93		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1649		1770	1723		1770	3475		1770	3531	
Flt Permitted	0.75	1.00		0.73	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1399	1649		1369	1723		1770	3475		1770	3531	
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)	16	8	26	55	5	5	66	2273	313	33	1351	20
RTOR Reduction (vph)	0	24	0	0	5	0	0	4	0	0	0	0
Lane Group Flow (vph)	16	10	0	55	5	0	66	2582	0	33	1371	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	8.7	8.7		8.7	8.7		7.7	73.6		4.8	70.7	
Effective Green, g (s)	8.7	8.7		8.7	8.7		7.7	73.6		4.8	70.7	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.08	0.73		0.05	0.70	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	121	143		118	149		135	2542		84	2482	
v/s Ratio Prot		0.01			0.00		c0.04	c0.74		0.02	0.39	
v/s Ratio Perm	0.01			c0.04								
v/c Ratio	0.13	0.07		0.47	0.04		0.49	1.02		0.39	0.55	
Uniform Delay, d1	42.5	42.2		43.7	42.1		44.6	13.5		46.5	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		2.9	0.1		2.8	21.9		3.0	0.3	
Delay (s)	43.0	42.5		46.6	42.2		47.3	35.4		49.5	7.5	
Level of Service	D	D		D	D		D	D		D	A	
Approach Delay (s)		42.6			46.0			35.7			8.5	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	174	52	105	27	21	122	83	2109	26	53	896	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1676		1770	1625		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1676		1770	1625		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	181	54	109	28	22	127	86	2197	27	55	933	54
RTOR Reduction (vph)	0	69	0	0	117	0	0	0	6	0	0	24
Lane Group Flow (vph)	181	94	0	28	32	0	86	2197	21	55	933	30
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	18.5	23.3		5.2	10.0		11.6	76.4	76.4	8.2	72.6	72.6
Effective Green, g (s)	18.5	23.3		5.2	10.0		11.6	76.4	76.4	8.2	72.6	72.6
Actuated g/C Ratio	0.14	0.18		0.04	0.08		0.09	0.59	0.59	0.06	0.56	0.56
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	300		71	125		158	2080	930	112	1976	884
v/s Ratio Prot	c0.10	c0.06		0.02	0.02		c0.05	c0.62		0.03	0.26	
v/s Ratio Perm									0.01			0.02
v/c Ratio	0.72	0.31		0.39	0.25		0.54	1.06	0.02	0.49	0.47	0.03
Uniform Delay, d1	53.3	46.4		60.9	56.5		56.7	26.8	11.2	58.9	17.2	12.9
Progression Factor	1.00	1.00		1.00	1.00		0.97	1.12	0.80	1.00	1.00	1.00
Incremental Delay, d2	9.4	0.6		3.6	1.1		2.2	32.7	0.0	3.4	0.8	0.1
Delay (s)	62.7	47.0		64.4	57.6		57.3	62.8	9.0	62.2	18.0	13.0
Level of Service	E	D		E	E		E	E	A	E	B	B
Approach Delay (s)		55.2			58.7			62.0			20.1	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM Average Control Delay	49.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	117	97	29	61	60	219	18	1765	38	87	1121	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.97		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1643		1770	3528		1770	5060	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1643		1770	3528		1770	5060	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	121	100	30	63	62	226	19	1820	39	90	1156	40
RTOR Reduction (vph)	0	9	0	0	119	0	0	1	0	0	2	0
Lane Group Flow (vph)	121	121	0	63	169	0	19	1858	0	90	1194	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.1	19.0		8.4	15.3		3.3	76.2		11.4	84.3	
Effective Green, g (s)	12.1	19.0		8.4	15.3		3.3	76.2		11.4	84.3	
Actuated g/C Ratio	0.09	0.15		0.06	0.12		0.03	0.59		0.09	0.65	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	165	263		114	193		45	2068		155	3281	
v/s Ratio Prot	c0.07	0.07		0.04	c0.10		0.01	c0.53		c0.05	0.24	
v/s Ratio Perm												
v/c Ratio	0.73	0.46		0.55	0.88		0.42	0.90		0.58	0.36	
Uniform Delay, d1	57.4	50.8		59.0	56.4		62.4	23.5		57.0	10.5	
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.90		1.06	0.72	
Incremental Delay, d2	15.5	1.3		5.7	32.7		3.6	4.0		5.2	0.3	
Delay (s)	72.8	52.1		64.7	89.1		58.0	25.3		65.6	7.9	
Level of Service	E	D		E	F		E	C		E	A	
Approach Delay (s)		62.1			84.7			25.6			11.9	
Approach LOS		E			F			C			B	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	304	89	84	293	640	90	1086	26	251	921	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3273		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3273		1770	3539	1583	1770	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	132	323	95	89	312	681	96	1155	28	267	980	87
RTOR Reduction (vph)	0	21	0	0	0	196	0	0	12	0	0	44
Lane Group Flow (vph)	119	410	0	89	312	485	96	1155	16	267	980	43
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	20.7	20.7		16.2	16.2	32.2	11.4	60.1	60.1	16.0	65.2	65.2
Effective Green, g (s)	20.2	20.2		15.7	15.7	31.2	10.9	62.1	59.6	15.5	67.2	64.7
Actuated g/C Ratio	0.16	0.16		0.12	0.12	0.24	0.08	0.48	0.46	0.12	0.52	0.50
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	250	509		214	427	380	148	1691	726	409	1829	788
v/s Ratio Prot	0.07	c0.13		0.05	0.09	c0.15	0.05	c0.33		0.08	0.28	
v/s Ratio Perm						0.15			0.01			0.03
v/c Ratio	0.48	0.81		0.42	0.73	1.28	0.65	0.68	0.02	0.65	0.54	0.05
Uniform Delay, d1	50.1	53.0		52.9	55.1	49.4	57.7	26.3	19.3	54.7	21.0	16.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.63	0.68
Incremental Delay, d2	0.5	8.5		1.0	6.0	143.2	7.1	2.3	0.1	2.7	1.1	0.1
Delay (s)	50.6	61.5		53.9	61.1	192.6	64.8	28.6	19.3	60.2	14.2	11.5
Level of Service	D	E		D	E	F	E	C	B	E	B	B
Approach Delay (s)		59.2			143.3			31.1			23.3	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM Average Control Delay	60.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	170	200	29	293	32	559	349	50	51	317	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3487		3433	3473		1770	3457	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3487		3433	3473		1770	3457	
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)	120	185	217	32	318	35	608	379	54	55	345	63
RTOR Reduction (vph)	0	0	157	0	5	0	0	6	0	0	8	0
Lane Group Flow (vph)	120	185	60	32	348	0	608	427	0	55	400	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.3	27.3	27.3	4.7	18.7		24.9	41.1		7.5	23.0	
Effective Green, g (s)	13.3	27.3	27.3	4.7	18.7		24.9	41.1		7.5	23.0	
Actuated g/C Ratio	0.13	0.28	0.28	0.05	0.19		0.25	0.42		0.08	0.23	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)	238	977	437	84	659		864	1443		134	804	
v/s Ratio Prot	c0.07	0.05		0.02	c0.10		c0.18	0.12		0.03	c0.12	
v/s Ratio Perm			0.04									
v/c Ratio	0.50	0.19	0.14	0.38	0.53		0.70	0.30		0.41	0.50	
Uniform Delay, d1	39.7	27.3	26.9	45.7	36.1		33.6	19.3		43.6	32.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.1	0.1	2.9	0.8		2.6	0.3		2.0	1.4	
Delay (s)	41.4	27.4	27.1	48.6	36.9		36.3	19.6		45.6	34.3	
Level of Service	D	C	C	D	D		D	B		D	C	
Approach Delay (s)		30.5			37.9			29.3			35.6	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	201	0	636	0	435	42	0	987	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0	4.0		4.0	4.0
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				3433		2787		3539	1583		3539	1583
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				3433		2787		3539	1583		3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	231	0	731	0	500	48	0	1134	160
RTOR Reduction (vph)	0	0	0	0	0	210	0	0	34	0	0	0
Lane Group Flow (vph)	0	0	0	231	0	521	0	500	14	0	1134	160
Turn Type				Prot		custom			Perm			Free
Protected Phases				3		3 9		2			6 9	
Permitted Phases									2			Free
Actuated Green, G (s)				9.2		30.9		15.1	15.1		36.3	55.0
Effective Green, g (s)				9.2		30.9		16.6	16.6		35.8	55.0
Actuated g/C Ratio				0.17		0.56		0.30	0.30		0.65	1.00
Clearance Time (s)				4.0				5.5	5.5			
Vehicle Extension (s)				2.0				4.0	4.0			
Lane Grp Cap (vph)				574		1566		1068	478		2304	1583
v/s Ratio Prot				c0.07		0.19		0.14			c0.32	
v/s Ratio Perm									0.01			0.10
v/c Ratio				0.40		0.33		0.47	0.03		0.49	0.10
Uniform Delay, d1				20.4		6.5		15.6	13.5		4.9	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.2		0.0		0.4	0.0		0.2	0.1
Delay (s)				20.6		6.5		16.1	13.6		5.2	0.1
Level of Service				C		A		B	B		A	A
Approach Delay (s)		0.0			9.9			15.8			4.5	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	631	260	591	1235	1410	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	2.6	4.1	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	3433	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	3433	3539	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	657	271	616	1286	1469	384
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	657	271	616	1286	1469	363
Turn Type		Free	Prot			pt+ov
Protected Phases	7		5	2	6	6 7
Permitted Phases		Free				
Actuated Green, G (s)	24.4	95.4	22.7	58.3	30.4	61.7
Effective Green, g (s)	25.8	95.4	23.8	60.7	32.8	64.1
Actuated g/C Ratio	0.27	1.00	0.25	0.64	0.34	0.67
Clearance Time (s)	5.8		5.2	6.9	6.9	
Vehicle Extension (s)	3.0		3.0	2.0	2.0	
Lane Grp Cap (vph)	928	1583	856	2252	1217	1064
v/s Ratio Prot	c0.19		c0.18	0.36	c0.42	0.23
v/s Ratio Perm		0.17				
v/c Ratio	0.71	0.17	0.72	0.57	1.21	0.34
Uniform Delay, d1	31.4	0.0	32.7	9.9	31.3	6.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.2	2.9	0.2	101.1	0.1
Delay (s)	33.9	0.2	35.7	10.1	132.4	6.7
Level of Service	C	A	D	B	F	A
Approach Delay (s)	24.1			18.4	106.4	
Approach LOS	C			B	F	

Intersection Summary			
HCM Average Control Delay	54.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	1689	41	12	1589	2	202	67	138	1126	17	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0	3.5	6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770	1863	1583	3433	1863	1583
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)	58	1836	45	13	1727	2	220	73	150	1224	18	38
RTOR Reduction (vph)	0	0	30	0	0	0	0	0	117	0	0	26
Lane Group Flow (vph)	58	1836	15	13	1729	0	220	73	33	1224	18	12
Turn Type	Split		Perm	Split			Prot		custom	Prot		custom
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8						7			8
Actuated Green, G (s)	36.0	36.0	36.0	25.0	25.0		30.1	14.9	25.0	20.0	5.3	36.0
Effective Green, g (s)	35.5	38.0	38.0	24.0	27.0		29.6	14.4	24.5	20.0	5.3	36.0
Actuated g/C Ratio	0.31	0.34	0.34	0.21	0.24		0.26	0.13	0.22	0.18	0.05	0.32
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5	3.5	6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8	2.0	4.0	4.0
Lane Grp Cap (vph)	557	1191	533	376	846		464	238	344	608	87	505
v/s Ratio Prot	0.03	c0.52		0.01	c0.49		c0.12	c0.04		c0.36	0.01	
v/s Ratio Perm			0.01						0.02			0.01
v/c Ratio	0.10	1.54	0.03	0.03	2.04		0.47	0.31	0.09	2.01	0.21	0.02
Uniform Delay, d1	27.4	37.5	25.1	35.3	43.0		35.1	44.7	35.3	46.5	51.8	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	247.9	0.0	0.0	473.8		0.3	1.0	0.0	461.7	1.6	0.0
Delay (s)	27.5	285.4	25.1	35.3	516.8		35.4	45.7	35.4	508.2	53.4	26.4
Level of Service	C	F	C	D	F		D	D	D	F	D	C
Approach Delay (s)		271.6			513.2			37.1			487.5	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	381.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.49		
Actuated Cycle Length (s)	112.9	Sum of lost time (s)	7.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	147	77	54	25	54	43	1395	25	1233	1680	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5	4.0	5.1	4.0	4.0	4.1	4.0	4.0
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3343	1583	1770	1863	1583	1770	5085	1583	3433	3539	1583
Flt Permitted	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3343	1583	1770	1863	1583	1770	5085	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	155	81	57	26	57	45	1468	26	1298	1768	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	7	0	0	0
Lane Group Flow (vph)	104	216	81	57	26	57	45	1468	19	1298	1768	5
Turn Type	Split		Free	Split		Free	Prot		Perm	Prot		Free
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases			Free			Free			6			Free
Actuated Green, G (s)	15.8	15.8	157.3	8.9	8.9	157.3	7.2	51.2	51.2	61.3	104.8	157.3
Effective Green, g (s)	15.3	15.3	157.3	8.4	8.4	157.3	6.7	53.2	53.2	61.3	106.8	157.3
Actuated g/C Ratio	0.10	0.10	1.00	0.05	0.05	1.00	0.04	0.34	0.34	0.39	0.68	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	6.0	6.0	4.1	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	157	325	1583	95	99	1583	75	1720	535	1338	2403	1583
v/s Ratio Prot	0.06	c0.06		c0.03	0.01		0.03	c0.29		c0.38	0.50	
v/s Ratio Perm			0.05			0.04			0.01			0.00
v/c Ratio	0.66	0.66	0.05	0.60	0.26	0.04	0.60	0.85	0.03	0.97	0.74	0.00
Uniform Delay, d1	68.5	68.5	0.0	72.8	71.5	0.0	74.0	48.4	34.9	47.1	16.2	0.0
Progression 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
Incremental Delay, d2	10.0	5.1	0.1	9.8	1.4	0.0	8.3	4.5	0.0	17.8	1.3	0.0
Delay (s)	78.6	73.6	0.1	82.6	72.9	0.0	82.3	52.9	34.9	64.9	17.5	0.0
Level of Service	E	E	A	F	E	A	F	D	C	E	B	A
Approach Delay (s)		60.0			47.2			53.5			37.5	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	157.3	Sum of lost time (s)	19.1
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: South Kelly Road & SR 29

5/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	20	20	108	1	1	15	1428	100	24	2058	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1723		1770	1723		1770	3504		1770	3538	
Flt Permitted	0.76	1.00		0.73	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1409	1723		1357	1723		1770	3504		1770	3538	
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)	38	22	22	117	1	1	16	1552	109	26	2237	4
RTOR Reduction (vph)	0	19	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	38	25	0	117	1	0	16	1659	0	26	2241	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	14.5	14.5		14.5	14.5		2.8	71.9		4.7	73.8	
Effective Green, g (s)	14.5	14.5		14.5	14.5		2.8	71.9		4.7	73.8	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.03	0.69		0.04	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	195	239		188	239		47	2409		80	2496	
v/s Ratio Prot		0.01			0.00		0.01	0.47		c0.01	c0.63	
v/s Ratio Perm	0.03			c0.09								
v/c Ratio	0.19	0.10		0.62	0.00		0.34	0.69		0.33	0.90	
Uniform Delay, d1	39.9	39.4		42.5	38.8		50.0	9.7		48.4	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		6.3	0.0		4.3	0.8		2.4	4.7	
Delay (s)	40.4	39.6		48.7	38.8		54.3	10.5		50.8	17.1	
Level of Service	D	D		D	D		D	B		D	B	
Approach Delay (s)		39.9			48.6			11.0			17.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	7.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	20	21	59	25	52	48	1234	23	142	1838	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1720		1770	1674		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1720		1770	1674		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	31	21	22	61	26	54	50	1285	24	148	1915	267
RTOR Reduction (vph)	0	21	0	0	49	0	0	0	8	0	0	59
Lane Group Flow (vph)	31	22	0	61	31	0	50	1285	16	148	1915	208
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	5.4	8.1		8.6	11.3		7.9	80.3	80.3	16.1	88.1	88.1
Effective Green, g (s)	5.4	8.1		8.6	11.3		7.9	80.3	80.3	16.1	88.1	88.1
Actuated g/C Ratio	0.04	0.06		0.07	0.09		0.06	0.62	0.62	0.12	0.68	0.68
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	74	107		117	146		108	2186	978	219	2398	1073
v/s Ratio Prot	0.02	0.01		c0.03	c0.02		0.03	0.36		c0.08	c0.54	
v/s Ratio Perm									0.01			0.13
v/c Ratio	0.42	0.21		0.52	0.21		0.46	0.59	0.02	0.68	0.80	0.19
Uniform Delay, d1	60.8	57.9		58.7	55.2		59.0	14.9	9.6	54.5	14.7	7.8
Progression Factor	1.00	1.00		1.00	1.00		1.24	0.62	0.40	1.00	1.00	1.00
Incremental Delay, d2	3.8	1.0		4.1	0.7		2.2	0.8	0.0	8.0	2.9	0.4
Delay (s)	64.6	58.9		62.9	55.9		75.6	10.1	3.9	62.4	17.6	8.2
Level of Service	E	E		E	E		E	B	A	E	B	A
Approach Delay (s)		61.3			58.9			12.4			19.4	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	47	42	72	48	106	54	1528	83	211	1922	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.93		1.00	0.90		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1731		1770	1670		1770	3512		1770	5068	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1731		1770	1670		1770	3512		1770	5068	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	59	48	43	74	49	109	56	1575	86	218	1981	46
RTOR Reduction (vph)	0	30	0	0	72	0	0	2	0	0	1	0
Lane Group Flow (vph)	59	61	0	74	86	0	56	1659	0	218	2026	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	8.5	11.1		8.8	11.4		8.3	81.1		14.0	86.8	
Effective Green, g (s)	8.5	11.1		8.8	11.4		8.3	81.1		14.0	86.8	
Actuated g/C Ratio	0.07	0.09		0.07	0.09		0.06	0.62		0.11	0.67	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	116	148		120	146		113	2191		191	3384	
v/s Ratio Prot	0.03	0.04		c0.04	c0.05		0.03	c0.47		c0.12	0.40	
v/s Ratio Perm												
v/c Ratio	0.51	0.41		0.62	0.59		0.50	0.76		1.14	0.60	
Uniform Delay, d1	58.7	56.4		59.0	57.0		58.8	17.4		58.0	12.0	
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.86		1.29	0.35	
Incremental Delay, d2	3.5	1.9		9.1	5.9		2.4	1.7		99.3	0.6	
Delay (s)	62.2	58.2		68.0	63.0		59.6	16.8		174.3	4.7	
Level of Service	E	E		E	E		E	B		F	A	
Approach Delay (s)		59.8			64.6			18.2			21.2	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	153	292	90	101	238	480	178	1028	77	624	1265	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3269		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3269		1770	3539	1583	1770	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	163	311	96	107	253	511	189	1094	82	664	1346	173
RTOR Reduction (vph)	0	22	0	0	0	172	0	0	37	0	0	90
Lane Group Flow (vph)	147	401	0	107	253	339	189	1094	45	664	1346	83
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	20.4	20.4		14.1	14.1	43.8	16.5	48.8	48.8	29.7	62.5	62.5
Effective Green, g (s)	19.9	19.9		13.6	13.6	42.8	16.0	50.8	48.3	29.2	64.5	62.0
Actuated g/C Ratio	0.15	0.15		0.10	0.10	0.33	0.12	0.39	0.37	0.22	0.50	0.48
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	246	500		185	370	521	218	1383	588	771	1756	755
v/s Ratio Prot	0.09	c0.12		0.06	c0.07	0.15	0.11	0.31		c0.19	c0.38	
v/s Ratio Perm						0.07			0.03			0.05
v/c Ratio	0.60	0.80		0.58	0.68	0.65	0.87	0.79	0.08	0.86	0.77	0.11
Uniform Delay, d1	51.3	53.1		55.5	56.1	37.2	56.0	34.9	26.4	48.5	26.6	18.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.38	0.80	1.51
Incremental Delay, d2	2.6	8.5		3.6	4.7	2.2	27.6	4.7	0.3	8.1	2.8	0.2
Delay (s)	53.9	61.7		59.0	60.9	39.5	83.5	39.6	26.7	74.8	24.2	28.6
Level of Service	D	E		E	E	D	F	D	C	E	C	C
Approach Delay (s)		59.7			48.1			44.9			39.9	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	304	568	54	282	46	480	225	50	37	135	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3465		3433	3443		1770	3509	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3465		3433	3443		1770	3509	
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)	38	330	617	59	307	50	522	245	54	40	147	9
RTOR Reduction (vph)	0	0	482	0	7	0	0	11	0	0	2	0
Lane Group Flow (vph)	38	330	135	59	350	0	522	288	0	40	154	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	4.5	16.5	16.5	6.9	18.9		18.1	29.1		4.6	14.9	
Effective Green, g (s)	4.5	16.5	16.5	6.9	18.9		18.1	29.1		4.6	14.9	
Actuated g/C Ratio	0.06	0.22	0.22	0.09	0.25		0.24	0.39		0.06	0.20	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)	106	774	346	162	869		824	1329		108	693	
v/s Ratio Prot	0.02	0.09		c0.03	c0.10		c0.15	c0.08		0.02	0.04	
v/s Ratio Perm			0.09									
v/c Ratio	0.36	0.43	0.39	0.36	0.40		0.63	0.22		0.37	0.22	
Uniform Delay, d1	34.1	25.4	25.2	32.2	23.5		25.7	15.5		34.0	25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.4	0.7	1.4	0.3		1.6	0.2		2.1	0.5	
Delay (s)	36.1	25.8	25.9	33.6	23.8		27.3	15.7		36.1	25.8	
Level of Service	D	C	C	C	C		C	B		D	C	
Approach Delay (s)		26.2			25.2			23.1			27.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	231	0	705	0	972	23	0	1348	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0	4.0		4.0	4.0
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				3433		2787		3539	1583		3539	1583
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				3433		2787		3539	1583		3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	266	0	810	0	1117	26	0	1549	159
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	15	0	0	0
Lane Group Flow (vph)	0	0	0	266	0	757	0	1117	11	0	1549	159
Turn Type				Prot		custom			Perm			Free
Protected Phases				3		3 9		2			6 9	
Permitted Phases									2			Free
Actuated Green, G (s)				21.7		45.3		37.5	37.5		60.6	91.8
Effective Green, g (s)				21.7		45.3		39.0	39.0		60.1	91.8
Actuated g/C Ratio				0.24		0.49		0.42	0.42		0.65	1.00
Clearance Time (s)				4.0				5.5	5.5			
Vehicle Extension (s)				2.0				4.0	4.0			
Lane Grp Cap (vph)				812		1375		1503	673		2317	1583
v/s Ratio Prot				0.08		c0.27		c0.32			c0.44	
v/s Ratio Perm									0.01			0.10
v/c Ratio				0.33		0.55		0.74	0.02		0.67	0.10
Uniform Delay, d1				29.0		16.2		22.2	15.3		9.7	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.1		0.3		2.2	0.0		0.8	0.1
Delay (s)				29.1		16.4		24.4	15.3		10.5	0.1
Level of Service				C		B		C	B		B	A
Approach Delay (s)		0.0			19.6			24.1			9.6	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Future No Project (4-lane Highway)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	700	860	630	1650	2790	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	2.6	4.1	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	3433	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	3433	3539	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	729	896	656	1719	2906	323
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	729	896	656	1719	2906	323
Turn Type		Free	Prot			pt+ov
Protected Phases	7		5	2	6	6 7
Permitted Phases		Free				
Actuated Green, G (s)	34.5	148.3	18.8	101.1	77.1	118.5
Effective Green, g (s)	35.9	148.3	19.9	103.5	79.5	120.9
Actuated g/C Ratio	0.24	1.00	0.13	0.70	0.54	0.82
Clearance Time (s)	5.8		5.2	6.9	6.9	
Vehicle Extension (s)	3.0		3.0	2.0	2.0	
Lane Grp Cap (vph)	831	1583	461	2470	1897	1291
v/s Ratio Prot	c0.21		c0.19	0.49	c0.82	0.20
v/s Ratio Perm		0.57				
v/c Ratio	0.88	0.57	1.42	0.70	1.53	0.25
Uniform Delay, d1	54.1	0.0	64.2	13.2	34.4	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	1.5	202.7	0.7	242.1	0.0
Delay (s)	64.4	1.5	266.9	13.9	276.5	3.2
Level of Service	E	A	F	B	F	A
Approach Delay (s)	29.7			83.7	249.1	
Approach LOS	C			F	F	

Intersection Summary			
HCM Average Control Delay	145.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	148.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	125.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2950	470	40	2580	0	30	40	10	0	140	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0		6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1863	1583		1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770	1863	1583		1863	1583
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)	98	3207	511	43	2804	0	33	43	11	0	152	11
RTOR Reduction (vph)	0	0	285	0	0	0	0	0	7	0	0	6
Lane Group Flow (vph)	98	3207	226	43	2804	0	33	43	4	0	152	5
Turn Type	Split		Perm	Split			Prot		custom			custom
Protected Phases	8	8		7	7		5	2			6	
Permitted Phases			8						7			8
Actuated Green, G (s)	64.0	64.0	64.0	53.5	53.5		3.2	18.2	53.5		12.0	64.0
Effective Green, g (s)	63.5	66.0	66.0	52.5	55.5		2.7	17.7	53.0		12.0	64.0
Actuated g/C Ratio	0.43	0.44	0.44	0.35	0.37		0.02	0.12	0.36		0.08	0.43
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5		6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8		4.0	4.0
Lane Grp Cap (vph)	753	1566	700	623	1316		32	221	562		150	679
v/s Ratio Prot	0.06	c0.91		0.02	c0.79		c0.02	0.02			c0.08	
v/s Ratio Perm			0.14						0.00			0.00
v/c Ratio	0.13	2.05	0.32	0.07	2.13		1.03	0.19	0.01		1.01	0.01
Uniform Delay, d1	26.1	41.6	27.1	32.1	46.8		73.2	59.3	31.1		68.6	24.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	473.8	0.4	0.0	511.4		168.8	0.6	0.0		77.0	0.0
Delay (s)	26.2	515.4	27.4	32.1	558.2		242.0	59.9	31.1		145.6	24.4
Level of Service	C	F	C	C	F		F	E	C		F	C
Approach Delay (s)		437.5			550.3			125.3			137.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	472.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.95		
Actuated Cycle Length (s)	149.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	30	140	10	10	70	2440	340	70	2730	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.93		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1653		1770	1723		1770	3474		1770	3532	
Flt Permitted	0.74	1.00		0.73	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1384	1653		1357	1723		1770	3474		1770	3532	
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)	22	11	33	152	11	11	76	2652	370	76	2967	43
RTOR Reduction (vph)	0	28	0	0	9	0	0	6	0	0	1	0
Lane Group Flow (vph)	22	16	0	152	13	0	76	3016	0	76	3009	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	20.0	20.0		20.0	20.0		6.5	93.2		5.5	92.2	
Effective Green, g (s)	20.0	20.0		20.0	20.0		6.5	93.2		5.5	92.2	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.05	0.70		0.04	0.70	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	209	250		205	261		87	2449		74	2463	
v/s Ratio Prot		0.01			0.01		c0.04	c0.87		0.04	0.85	
v/s Ratio Perm	0.02			c0.11								
v/c Ratio	0.11	0.06		0.74	0.05		0.87	1.23		1.03	1.22	
Uniform Delay, d1	48.4	48.1		53.6	48.0		62.4	19.5		63.3	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		13.5	0.1		56.7	108.0		112.3	103.7	
Delay (s)	48.6	48.2		67.1	48.0		119.1	127.5		175.6	123.7	
Level of Service	D	D		E	D		F	F		F	F	
Approach Delay (s)		48.3			64.7			127.3			125.0	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM Average Control Delay	123.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	132.2	Sum of lost time (s)	7.5
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	10	100	20	10	650	140	1990	160	20	2290	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.93			0.86		1.00	0.99		1.00	0.99	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3210			3028		1770	3500		1770	3500	
Flt Permitted		0.59			0.94		0.95	1.00		0.04	1.00	
Satd. Flow (perm)		1938			2845		1770	3500		78	3500	
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)	109	11	109	22	11	707	152	2163	174	22	2489	196
RTOR Reduction (vph)	0	84	0	0	16	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	145	0	0	724	0	152	2333	0	22	2681	0
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		32.0			32.0		10.0	110.0		96.0	96.0	
Effective Green, g (s)		32.0			32.0		10.0	110.0		96.0	96.0	
Actuated g/C Ratio		0.21			0.21		0.07	0.73		0.64	0.64	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		413			607		118	2567		50	2240	
v/s Ratio Prot							c0.09	0.67			c0.77	
v/s Ratio Perm		0.07			c0.25					0.28		
v/c Ratio		0.35			1.97dr		1.29	0.91		0.44	1.20	
Uniform Delay, d1		50.2			59.0		70.0	16.0		13.5	27.0	
Progression Factor		1.00			1.00		1.09	1.54		1.00	1.00	
Incremental Delay, d2		0.5			102.5		135.5	0.6		25.7	93.2	
Delay (s)		50.7			161.5		211.9	25.3		39.2	120.2	
Level of Service		D			F		F	C		D	F	
Approach Delay (s)		50.7			161.5			36.7			119.6	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM Average Control Delay	88.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	118.5%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	60	160	150	30	200	120	2190	30	220	2330	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1620		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1620		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	240	62	167	156	31	208	125	2281	31	229	2427	83
RTOR Reduction (vph)	0	74	0	0	136	0	0	0	8	0	0	22
Lane Group Flow (vph)	240	155	0	156	103	0	125	2281	23	229	2427	61
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	23.6	28.6		9.5	14.5		7.5	81.5	81.5	13.5	87.1	87.1
Effective Green, g (s)	23.6	28.6		9.5	14.5		7.5	81.5	81.5	13.5	87.1	87.1
Actuated g/C Ratio	0.16	0.19		0.06	0.10		0.05	0.54	0.54	0.09	0.58	0.58
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	278	316		112	157		89	1923	860	159	2055	919
v/s Ratio Prot	c0.14	0.09		c0.09	c0.06		0.07	0.64		c0.13	c0.69	
v/s Ratio Perm									0.01			0.04
v/c Ratio	0.86	0.49		1.39	0.65		1.40	1.19	0.03	1.44	1.18	0.07
Uniform Delay, d1	61.6	54.2		70.2	65.3		71.2	34.2	15.9	68.2	31.5	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.19	0.49	0.30
Incremental Delay, d2	23.1	1.2		222.1	9.4		236.2	89.4	0.1	201.4	82.0	0.0
Delay (s)	84.7	55.4		292.4	74.7		307.4	123.6	15.9	282.7	97.3	4.1
Level of Service	F	E		F	E		F	F	B	F	F	A
Approach Delay (s)		70.4			160.7			131.7			109.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	119.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	114.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	100	30	70	70	220	20	1780	40	90	2170	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.97		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1651		1770	3528		1770	5062	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1651		1770	3528		1770	5062	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	175	103	31	72	72	227	21	1835	41	93	2237	72
RTOR Reduction (vph)	0	10	0	0	75	0	0	1	0	0	3	0
Lane Group Flow (vph)	175	124	0	72	224	0	21	1875	0	93	2306	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	14.4	29.3		5.0	19.9		1.6	64.7		6.0	69.1	
Effective Green, g (s)	14.4	29.3		5.0	19.9		1.6	64.7		6.0	69.1	
Actuated g/C Ratio	0.12	0.24		0.04	0.17		0.01	0.54		0.05	0.58	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	439		74	274		24	1902		89	2915	
v/s Ratio Prot	c0.10	0.07		c0.04	c0.14		0.01	c0.53		c0.05	0.46	
v/s Ratio Perm												
v/c Ratio	0.83	0.28		0.97	0.82		0.88	0.99		1.04	0.79	
Uniform Delay, d1	51.6	36.8		57.4	48.3		59.1	27.2		57.0	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.3	0.4		94.8	17.0		127.4	17.5		108.2	2.3	
Delay (s)	73.8	37.2		152.2	65.2		186.5	44.7		165.2	22.1	
Level of Service	E	D		F	E		F	D		F	C	
Approach Delay (s)		57.9			82.1			46.3			27.7	
Approach LOS		E			F			D			C	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	410	90	130	340	650	100	1200	30	560	1620	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3296		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3296		1770	3539	1583	1770	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	149	436	96	138	362	691	106	1277	32	596	1723	128
RTOR Reduction (vph)	0	11	0	0	0	123	0	0	13	0	0	61
Lane Group Flow (vph)	134	536	0	138	362	568	106	1277	19	596	1723	67
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	28.2	28.2		16.1	16.1	48.1	10.4	56.7	56.7	32.0	78.8	78.8
Effective Green, g (s)	27.7	27.7		15.6	15.6	47.1	9.9	58.7	56.2	31.5	80.8	78.3
Actuated g/C Ratio	0.18	0.18		0.10	0.10	0.31	0.07	0.39	0.37	0.21	0.54	0.52
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	297	609		184	368	497	117	1385	593	721	1906	826
v/s Ratio Prot	0.08	c0.16		0.08	0.10	c0.24	0.06	0.36		0.17	c0.49	
v/s Ratio Perm						0.12			0.01			0.04
v/c Ratio	0.45	0.88		0.75	0.98	1.14	0.91	0.92	0.03	0.83	0.90	0.08
Uniform Delay, d1	54.4	59.5		65.3	67.1	51.5	69.6	43.5	29.7	56.6	31.1	17.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	13.3		15.0	42.3	85.6	53.6	11.6	0.1	7.4	7.6	0.2
Delay (s)	54.8	72.8		80.3	109.3	137.0	123.2	55.0	29.8	64.0	38.7	18.1
Level of Service	D	E		F	F	F	F	E	C	E	D	B
Approach Delay (s)		69.3			122.0			59.6			43.8	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM Average Control Delay	67.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	180	210	90	300	60	710	950	150	60	840	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3451		3433	3467		1770	3504	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3451		3433	3467		1770	3504	
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)	130	196	228	98	326	65	772	1033	163	65	913	65
RTOR Reduction (vph)	0	0	190	0	20	0	0	12	0	0	5	0
Lane Group Flow (vph)	130	196	38	98	371	0	772	1184	0	65	973	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.0	14.1	14.1	5.0	14.1		14.0	41.9		4.7	31.9	
Effective Green, g (s)	5.0	14.1	14.1	5.0	14.1		14.0	41.9		4.7	31.9	
Actuated g/C Ratio	0.06	0.17	0.17	0.06	0.17		0.17	0.50		0.06	0.38	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)	105	594	266	105	579		572	1729		99	1331	
v/s Ratio Prot	c0.07	0.06		0.06	c0.11		c0.22	c0.34		0.04	0.28	
v/s Ratio Perm			0.02									
v/c Ratio	1.24	0.33	0.14	0.93	0.64		1.35	0.69		0.66	0.73	
Uniform Delay, d1	39.5	30.8	29.8	39.3	32.6		35.0	16.0		38.9	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	165.0	0.3	0.3	66.4	2.4		168.7	1.7		14.6	2.9	
Delay (s)	204.5	31.1	30.1	105.7	35.0		203.7	17.8		53.5	25.3	
Level of Service	F	C	C	F	D		F	B		D	C	
Approach Delay (s)		71.4			49.2			90.7			27.0	
Approach LOS		E			D			F			C	

Intersection Summary			
HCM Average Control Delay	66.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	230	0	640	0	1030	190	0	990	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0	4.0		4.0	
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	
Frt				1.00		0.85		1.00	0.85		1.00	
Flt Protected				0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)				3433		2787		3539	1583		3539	
Flt Permitted				0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)				3433		2787		3539	1583		3539	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	264	0	736	0	1184	218	0	1138	0
RTOR Reduction (vph)	0	0	0	0	0	109	0	0	97	0	0	0
Lane Group Flow (vph)	0	0	0	264	0	627	0	1184	121	0	1138	0
Turn Type				Prot		custom			Perm			Free
Protected Phases				3		3 9		2			6 9	
Permitted Phases									2			Free
Actuated Green, G (s)				7.1		15.2		26.6	26.6		34.2	
Effective Green, g (s)				7.1		15.2		28.1	28.1		33.7	
Actuated g/C Ratio				0.14		0.30		0.55	0.55		0.66	
Clearance Time (s)				4.0				5.5	5.5			
Vehicle Extension (s)				2.0				4.0	4.0			
Lane Grp Cap (vph)				480		834		1958	876		2348	
v/s Ratio Prot				0.08		c0.23		c0.33			0.32	
v/s Ratio Perm									0.08			
v/c Ratio				0.55		0.75		0.60	0.14		0.48	
Uniform Delay, d1				20.4		16.1		7.6	5.5		4.2	
Progression Factor				1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2				0.8		3.4		0.6	0.1		0.2	
Delay (s)				21.1		19.5		8.2	5.6		4.5	
Level of Service				C		B		A	A		A	
Approach Delay (s)		0.0			20.0			7.8			4.5	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	640	710	970	2440	2200	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	2.6	4.1	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	3433	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	3433	3539	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	667	740	1010	2542	2292	385
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	667	740	1010	2542	2292	384
Turn Type		Free	Prot			pt+ov
Protected Phases	7		5	2	6	6 7
Permitted Phases		Free				
Actuated Green, G (s)	26.2	150.0	32.8	111.1	73.1	106.2
Effective Green, g (s)	27.6	150.0	33.9	113.5	75.5	108.6
Actuated g/C Ratio	0.18	1.00	0.23	0.76	0.50	0.72
Clearance Time (s)	5.8		5.2	6.9	6.9	
Vehicle Extension (s)	3.0		3.0	2.0	2.0	
Lane Grp Cap (vph)	632	1583	776	2678	1781	1146
v/s Ratio Prot	c0.19		c0.29	0.72	c0.65	0.24
v/s Ratio Perm		0.47				
v/c Ratio	1.06	0.47	1.30	0.95	1.29	0.34
Uniform Delay, d1	61.2	0.0	58.1	15.8	37.2	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	51.3	1.0	145.1	8.2	133.5	0.1
Delay (s)	112.5	1.0	203.1	24.0	170.7	7.6
Level of Service	F	A	F	C	F	A
Approach Delay (s)	53.9			74.9	147.3	
Approach LOS	D			E	F	

Intersection Summary			
HCM Average Control Delay	96.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2870	70	20	2400	0	310	100	210	0	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0		6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1863	1583		1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770	1863	1583		1863	1583
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)	98	3120	76	22	2609	0	337	109	228	0	54	109
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	149	0	0	65
Lane Group Flow (vph)	98	3120	32	22	2609	0	337	109	79	0	54	44
Turn Type	Split		Perm	Split			Prot		custom			custom
Protected Phases	8	8		7	7		5	2			6	
Permitted Phases			8						7			8
Actuated Green, G (s)	60.1	60.1	60.1	48.6	48.6		14.0	25.3	48.6		8.3	60.1
Effective Green, g (s)	59.6	62.1	62.1	47.6	50.6		13.5	24.8	48.1		8.3	60.1
Actuated g/C Ratio	0.40	0.42	0.42	0.32	0.34		0.09	0.17	0.33		0.06	0.41
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5		6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8		4.0	4.0
Lane Grp Cap (vph)	715	1490	666	571	1214		162	313	516		105	645
v/s Ratio Prot	0.06	c0.88		0.01	c0.74		c0.19	0.06			c0.03	
v/s Ratio Perm			0.02						0.05			0.03
v/c Ratio	0.14	2.09	0.05	0.04	2.15		2.08	0.35	0.15		0.51	0.07
Uniform Delay, d1	27.7	42.7	25.2	34.3	48.5		67.0	54.2	35.3		67.6	26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	494.6	0.0	0.0	519.9		506.6	0.9	0.1		5.6	0.1
Delay (s)	27.8	537.3	25.3	34.3	568.3		573.6	55.1	35.3		73.2	26.7
Level of Service	C	F	C	C	F		F	E	D		E	C
Approach Delay (s)		510.3			563.8			307.7			42.1	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	499.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.99		
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	13.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	70	70	150	10	10	20	2100	150	40	3140	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1723		1770	1723		1770	3504		1770	3538	
Flt Permitted	0.74	1.00		0.50	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1384	1723		931	1723		1770	3504		1770	3538	
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)	130	76	76	163	11	11	22	2283	163	43	3413	11
RTOR Reduction (vph)	0	26	0	0	9	0	0	3	0	0	0	0
Lane Group Flow (vph)	130	126	0	163	13	0	22	2443	0	43	3424	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	26.7	26.7		26.7	26.7		3.5	96.3		4.0	96.8	
Effective Green, g (s)	26.7	26.7		26.7	26.7		3.5	96.3		4.0	96.8	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.02	0.69		0.03	0.69	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	263	327		177	327		44	2402		50	2438	
v/s Ratio Prot		0.07			0.01		0.01	0.70		c0.02	c0.97	
v/s Ratio Perm	0.09			c0.18								
v/c Ratio	0.49	0.39		0.92	0.04		0.50	1.02		0.86	1.40	
Uniform Delay, d1	50.9	49.7		55.9	46.4		67.6	22.1		68.0	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.8		45.4	0.1		8.7	22.8		76.1	184.5	
Delay (s)	52.3	50.5		101.2	46.5		76.3	44.9		144.1	206.4	
Level of Service	D	D		F	D		E	D		F	F	
Approach Delay (s)		51.3			94.7			45.2			205.6	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM Average Control Delay	133.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.5	Sum of lost time (s)	7.5
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	10	340	30	10	210	80	1630	110	30	2930	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.91			0.87		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3150			3076		1770	3506		1770	3522	
Flt Permitted		0.66			0.62		0.95	1.00		0.08	1.00	
Satd. Flow (perm)		2128			1923		1770	3506		151	3522	
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)	207	11	370	33	11	228	87	1772	120	33	3185	109
RTOR Reduction (vph)	0	41	0	0	39	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	547	0	0	233	0	87	1889	0	33	3293	0
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		28.0			28.0		5.0	114.0		105.0	105.0	
Effective Green, g (s)		28.0			28.0		5.0	114.0		105.0	105.0	
Actuated g/C Ratio		0.19			0.19		0.03	0.76		0.70	0.70	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		397			359		59	2665		106	2465	
v/s Ratio Prot							c0.05	0.54			c0.93	
v/s Ratio Perm		c0.26			0.12					0.22		
v/c Ratio		1.38			0.65		1.47	0.71		0.31	1.34	
Uniform Delay, d1		61.0			56.5		72.5	9.4		8.6	22.5	
Progression Factor		1.00			1.00		0.90	2.25		1.00	1.00	
Incremental Delay, d2		184.7			4.0		273.5	1.3		7.5	153.9	
Delay (s)		245.7			60.5		338.4	22.3		16.1	176.4	
Level of Service		F			E		F	C		B	F	
Approach Delay (s)		245.7			60.5			36.2			174.8	
Approach LOS		F			E			D			F	

Intersection Summary			
HCM Average Control Delay	132.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	118.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	30	50	60	40	60	80	1570	30	240	3190	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1688		1770	1696		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1688		1770	1696		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	31	52	62	42	62	83	1635	31	250	3323	323
RTOR Reduction (vph)	0	46	0	0	43	0	0	0	9	0	0	48
Lane Group Flow (vph)	62	37	0	62	61	0	83	1635	22	250	3323	275
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	8.6	16.4		4.5	12.3		5.5	99.7	99.7	12.5	106.3	106.3
Effective Green, g (s)	8.6	16.4		4.5	12.3		5.5	99.7	99.7	12.5	106.3	106.3
Actuated g/C Ratio	0.06	0.11		0.03	0.08		0.04	0.66	0.66	0.08	0.71	0.71
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	101	185		53	139		65	2352	1052	148	2508	1122
v/s Ratio Prot	c0.04	0.02		c0.04	c0.04		0.05	0.46		c0.14	c0.94	
v/s Ratio Perm									0.01			0.17
v/c Ratio	0.61	0.20		1.17	0.44		1.28	0.70	0.02	1.69	1.32	0.24
Uniform Delay, d1	69.1	60.8		72.8	65.6		72.2	15.7	8.6	68.8	21.9	7.7
Progression Factor	1.00	1.00		1.00	1.00		0.86	1.57	2.66	1.17	0.42	0.09
Incremental Delay, d2	10.6	0.5		177.3	2.2		170.8	0.9	0.0	312.8	146.5	0.0
Delay (s)	79.7	61.3		250.0	67.8		233.2	25.5	22.8	393.4	155.6	0.8
Level of Service	E	E		F	E		F	C	C	F	F	A
Approach Delay (s)		69.2			135.8			35.3			158.1	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM Average Control Delay	119.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	60	50	80	80	110	60	1680	90	220	2640	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1735		1770	1701		1770	3512		1770	5057	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1735		1770	1701		1770	3512		1770	5057	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	62	62	52	82	82	113	62	1732	93	227	2722	103
RTOR Reduction (vph)	0	22	0	0	35	0	0	2	0	0	2	0
Lane Group Flow (vph)	62	92	0	82	160	0	62	1823	0	227	2823	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	8.3	21.7		7.0	20.4		6.0	87.3		19.0	100.3	
Effective Green, g (s)	8.3	21.7		7.0	20.4		6.0	87.3		19.0	100.3	
Actuated g/C Ratio	0.06	0.14		0.05	0.14		0.04	0.58		0.13	0.67	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	251		83	231		71	2044		224	3381	
v/s Ratio Prot	0.04	0.05		c0.05	c0.09		0.04	c0.52		c0.13	0.56	
v/s Ratio Perm												
v/c Ratio	0.63	0.37		0.99	0.69		0.87	0.89		1.01	0.83	
Uniform Delay, d1	69.4	57.9		71.5	61.8		71.6	27.2		65.5	18.6	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.96		0.76	1.24	
Incremental Delay, d2	12.6	0.9		93.9	8.6		39.1	3.2		21.4	0.2	
Delay (s)	81.9	58.8		165.4	70.4		99.0	29.3		71.1	23.3	
Level of Service	F	E		F	E		F	C		E	C	
Approach Delay (s)		67.0			98.5			31.6			26.8	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM Average Control Delay	33.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	420	180	110	280	490	180	1140	110	770	1770	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3238		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3238		1770	3539	1583	1770	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	202	447	191	117	298	521	191	1213	117	819	1883	223
RTOR Reduction (vph)	0	27	0	0	0	91	0	0	51	0	0	106
Lane Group Flow (vph)	182	631	0	117	298	430	191	1213	66	819	1883	117
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	31.6	31.6		12.9	12.9	47.9	16.1	53.5	53.5	35.0	72.9	72.9
Effective Green, g (s)	31.1	31.1		12.4	12.4	46.9	15.6	55.5	53.0	34.5	74.9	72.4
Actuated g/C Ratio	0.21	0.21		0.08	0.08	0.31	0.10	0.37	0.35	0.23	0.50	0.48
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	334	671		146	293	495	184	1309	559	790	1767	764
v/s Ratio Prot	0.11	c0.19		0.07	c0.08	0.20	0.11	0.34		c0.24	c0.53	
v/s Ratio Perm						0.07			0.04			0.07
v/c Ratio	0.54	0.94		0.80	1.02	0.87	1.04	0.93	0.12	1.04	1.07	0.15
Uniform Delay, d1	53.1	58.5		67.6	68.8	48.6	67.2	45.3	32.7	57.8	37.5	21.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.18	0.73	0.67
Incremental Delay, d2	1.0	21.1		25.5	57.0	14.4	76.7	12.6	0.4	34.2	37.0	0.2
Delay (s)	54.1	79.7		93.1	125.8	63.0	143.9	57.9	33.2	102.4	64.4	14.7
Level of Service	D	E		F	F	E	F	E	C	F	E	B
Approach Delay (s)		74.1			86.8			66.8			71.3	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	72.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	460	870	70	290	50	490	790	140	90	890	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3462		3433	3459		1770	3533	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3462		3433	3459		1770	3533	
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)	120	500	946	76	315	54	533	859	152	98	967	11
RTOR Reduction (vph)	0	0	185	0	11	0	0	12	0	0	1	0
Lane Group Flow (vph)	120	500	761	76	358	0	533	999	0	98	977	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.2	50.0	50.0	5.0	41.8		18.0	43.7		8.0	33.0	
Effective Green, g (s)	13.2	50.0	50.0	5.0	41.8		18.0	43.7		8.0	33.0	
Actuated g/C Ratio	0.11	0.40	0.40	0.04	0.33		0.14	0.35		0.06	0.26	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.3		4.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)	187	1416	633	71	1158		494	1209		113	933	
v/s Ratio Prot	0.07	0.14		c0.04	0.10		c0.16	0.29		0.06	c0.28	
v/s Ratio Perm			c0.48									
v/c Ratio	0.64	0.35	1.20	1.07	0.31		1.08	0.83		0.87	1.05	
Uniform Delay, d1	53.6	26.2	37.5	60.0	30.9		53.5	37.2		58.0	46.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	0.2	105.7	127.5	0.2		63.4	5.6		45.7	42.7	
Delay (s)	61.0	26.4	143.2	187.5	31.0		116.9	42.8		103.7	88.7	
Level of Service	E	C	F	F	C		F	D		F	F	
Approach Delay (s)		99.6			57.8			68.4			90.0	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM Average Control Delay	82.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	350	0	710	0	1560	40	0	1590	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0	4.0		4.0	
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	
Frt				1.00		0.85		1.00	0.85		1.00	
Flt Protected				0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)				3433		2787		3539	1583		3539	
Flt Permitted				0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)				3433		2787		3539	1583		3539	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	402	0	816	0	1793	46	0	1828	0
RTOR Reduction (vph)	0	0	0	0	0	19	0	0	20	0	0	0
Lane Group Flow (vph)	0	0	0	402	0	797	0	1793	26	0	1828	0
Turn Type				Prot		custom			Perm			Free
Protected Phases				3		3 9		2			6 9	
Permitted Phases									2			Free
Actuated Green, G (s)				12.0		20.0		35.8	35.8		43.3	
Effective Green, g (s)				12.0		20.0		37.3	37.3		42.8	
Actuated g/C Ratio				0.19		0.31		0.58	0.58		0.66	
Clearance Time (s)				4.0				5.5	5.5			
Vehicle Extension (s)				2.0				4.0	4.0			
Lane Grp Cap (vph)				636		860		2037	911		2337	
v/s Ratio Prot				0.12		c0.29		c0.51			0.52	
v/s Ratio Perm									0.02			
v/c Ratio				0.63		0.93		0.88	0.03		0.78	
Uniform Delay, d1				24.4		21.7		11.8	5.9		7.7	
Progression Factor				1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2				1.5		15.4		4.9	0.0		1.9	
Delay (s)				25.9		37.1		16.8	6.0		9.6	
Level of Service				C		D		B	A		A	
Approach Delay (s)		0.0			33.4			16.5			9.6	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	64.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Future (6-Lane Modified Boulevard)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	30	140	10	10	70	2440	340	70	2730	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.89		1.00	0.93		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1653		1770	1723		1770	4992		1770	5074	
Flt Permitted	0.74	1.00		0.73	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1384	1653		1357	1723		1770	4992		1770	5074	
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)	22	11	33	152	11	11	76	2652	370	76	2967	43
RTOR Reduction (vph)	0	28	0	0	9	0	0	10	0	0	1	0
Lane Group Flow (vph)	22	16	0	152	13	0	76	3012	0	76	3009	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	18.7	18.7		18.7	18.7		7.3	81.5		7.3	81.5	
Effective Green, g (s)	18.7	18.7		18.7	18.7		7.3	81.5		7.3	81.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.06	0.67		0.06	0.67	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	255		210	266		107	3362		107	3418	
v/s Ratio Prot		0.01			0.01		c0.04	c0.60		0.04	0.59	
v/s Ratio Perm	0.02			c0.11								
v/c Ratio	0.10	0.06		0.72	0.05		0.71	0.90		0.71	0.88	
Uniform Delay, d1	43.9	43.7		48.7	43.6		55.8	16.3		55.8	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		11.7	0.1		19.8	3.5		19.8	3.0	
Delay (s)	44.2	43.8		60.4	43.6		75.6	19.8		75.6	18.8	
Level of Service	D	D		E	D		E	B		E	B	
Approach Delay (s)		43.9			58.2			21.2			20.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	60	160	150	30	200	120	2190	30	220	2330	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.89		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1620		1770	5085	1583	1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1620		1770	5085	1583	1770	5085	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	240	62	167	156	31	208	125	2281	31	229	2427	83
RTOR Reduction (vph)	0	76	0	0	176	0	0	0	12	0	0	31
Lane Group Flow (vph)	240	153	0	156	63	0	125	2281	19	229	2427	52
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	25.1	25.1		11.5	11.5		9.5	79.0	79.0	17.5	86.6	86.6
Effective Green, g (s)	25.1	25.1		11.5	11.5		9.5	79.0	79.0	17.5	86.6	86.6
Actuated g/C Ratio	0.17	0.17		0.08	0.08		0.06	0.53	0.53	0.12	0.58	0.58
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	278		136	124		112	2678	834	207	2936	914
v/s Ratio Prot	c0.14	c0.09		c0.09	0.04		0.07	c0.45		c0.13	0.48	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.81	0.55		1.15	0.51		1.12	0.85	0.02	1.11	0.83	0.06
Uniform Delay, d1	60.2	57.3		69.2	66.5		70.2	30.5	17.0	66.2	25.6	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.4	2.4		122.1	3.2		119.7	3.7	0.1	93.9	2.8	0.1
Delay (s)	75.5	59.6		191.4	69.7		189.9	34.1	17.1	160.2	28.5	14.0
Level of Service	E	E		F	E		F	C	B	F	C	B
Approach Delay (s)		67.8			117.8			41.9			39.0	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	47.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	100	30	70	70	220	20	1780	40	90	2170	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.97		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1651		1770	5069		1770	5062	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1651		1770	5069		1770	5062	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	175	103	31	72	72	227	21	1835	41	93	2237	72
RTOR Reduction (vph)	0	12	0	0	95	0	0	2	0	0	3	0
Lane Group Flow (vph)	175	122	0	72	204	0	21	1874	0	93	2306	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.4	25.5		4.0	17.1		1.6	49.5		6.0	53.9	
Effective Green, g (s)	12.4	25.5		4.0	17.1		1.6	49.5		6.0	53.9	
Actuated g/C Ratio	0.12	0.26		0.04	0.17		0.02	0.50		0.06	0.54	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	458		71	282		28	2509		106	2728	
v/s Ratio Prot	c0.10	0.07		c0.04	c0.12		0.01	0.37		c0.05	c0.46	
v/s Ratio Perm												
v/c Ratio	0.80	0.27		1.01	0.72		0.75	0.75		0.88	0.85	
Uniform Delay, d1	42.6	29.8		48.0	39.2		49.0	20.2		46.6	19.5	
Progression Factor	1.00	1.00		1.00	1.00		0.97	1.18		1.00	1.00	
Incremental Delay, d2	18.1	0.3		110.8	8.8		52.8	1.4		50.3	3.4	
Delay (s)	60.7	30.1		158.8	48.0		100.4	25.2		97.0	23.0	
Level of Service	E	C		F	D		F	C		F	C	
Approach Delay (s)		47.4			69.5			26.1			25.8	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	410	90	130	340	650	100	1200	30	560	1620	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3296		1770	3539	1583	1770	5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3296		1770	3539	1583	1770	5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	149	436	96	138	362	691	106	1277	32	596	1723	128
RTOR Reduction (vph)	0	20	0	0	0	267	0	0	21	0	0	71
Lane Group Flow (vph)	134	527	0	138	362	424	106	1277	11	596	1723	57
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	20.7	20.7		10.8	10.8	27.8	7.1	34.5	34.5	17.0	44.9	44.9
Effective Green, g (s)	20.2	20.2		10.3	10.3	26.8	6.6	36.5	34.0	16.5	46.9	44.4
Actuated g/C Ratio	0.20	0.20		0.10	0.10	0.27	0.07	0.36	0.34	0.16	0.47	0.44
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	325	666		182	365	424	117	1856	538	566	2385	703
v/s Ratio Prot	0.08	c0.16		0.08	0.10	c0.16	0.06	0.25		c0.17	c0.34	
v/s Ratio Perm						0.10			0.01			0.04
v/c Ratio	0.41	0.79		0.76	0.99	1.00	0.91	0.69	0.02	1.05	0.72	0.08
Uniform Delay, d1	34.7	37.9		43.6	44.8	36.6	46.4	26.9	21.9	41.8	21.3	16.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.38	0.81	2.18
Incremental Delay, d2	0.3	6.0		15.7	44.7	43.2	53.6	2.1	0.1	44.3	1.2	0.1
Delay (s)	35.0	43.9		59.4	89.5	79.8	100.0	29.0	22.0	102.0	18.5	35.2
Level of Service	D	D		E	F	E	F	C	C	F	B	D
Approach Delay (s)		42.1			80.4			34.2			39.7	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	70	70	150	10	10	20	2100	150	40	3140	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1723		1770	1723		1770	5034		1770	5083	
Flt Permitted	0.74	1.00		0.50	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1384	1723		940	1723		1770	5034		1770	5083	
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)	130	76	76	163	11	11	22	2283	163	43	3413	11
RTOR Reduction (vph)	0	26	0	0	9	0	0	4	0	0	0	0
Lane Group Flow (vph)	130	126	0	163	13	0	22	2442	0	43	3424	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	26.1	26.1		26.1	26.1		3.4	89.8		6.8	93.2	
Effective Green, g (s)	26.1	26.1		26.1	26.1		3.4	89.8		6.8	93.2	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.02	0.66		0.05	0.68	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	6.0		3.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	265	330		180	330		44	3319		88	3478	
v/s Ratio Prot		0.07			0.01		0.01	0.48		c0.02	c0.67	
v/s Ratio Perm	0.09			c0.17								
v/c Ratio	0.49	0.38		0.91	0.04		0.50	0.74		0.49	0.98	
Uniform Delay, d1	49.1	48.0		53.8	44.8		65.6	15.3		63.0	20.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.7		41.0	0.0		8.7	0.9		4.2	11.8	
Delay (s)	50.5	48.8		94.8	44.9		74.2	16.2		67.2	32.6	
Level of Service	D	D		F	D		E	B		E	C	
Approach Delay (s)		49.6			88.9			16.7			33.0	
Approach LOS		D			F			B			C	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	30	50	60	40	60	80	1570	30	240	3190	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.91		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1688		1770	1696		1770	5085	1583	1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1688		1770	1696		1770	5085	1583	1770	5085	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	31	52	62	42	62	83	1635	31	250	3323	323
RTOR Reduction (vph)	0	46	0	0	43	0	0	0	13	0	0	70
Lane Group Flow (vph)	62	37	0	62	61	0	83	1635	18	250	3323	253
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	8.6	16.4		4.5	12.3		6.5	88.0	88.0	24.2	105.3	105.3
Effective Green, g (s)	8.6	16.4		4.5	12.3		6.5	88.0	88.0	24.2	105.3	105.3
Actuated g/C Ratio	0.06	0.11		0.03	0.08		0.04	0.59	0.59	0.16	0.70	0.70
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	6.4	6.4	3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	101	185		53	139		77	2983	929	286	3570	1111
v/s Ratio Prot	c0.04	0.02		c0.04	c0.04		c0.05	0.32		c0.14	c0.65	
v/s Ratio Perm									0.01			0.16
v/c Ratio	0.61	0.20		1.17	0.44		1.08	0.55	0.02	0.87	0.93	0.23
Uniform Delay, d1	69.1	60.8		72.8	65.6		71.8	18.9	13.0	61.4	19.2	7.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	0.5		177.3	2.2		125.5	0.7	0.0	24.2	5.7	0.5
Delay (s)	79.7	61.3		250.0	67.8		197.2	19.6	13.0	85.7	24.9	8.4
Level of Service	E	E		F	E		F	B	B	F	C	A
Approach Delay (s)		69.2			135.8			27.9			27.5	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	60	50	80	80	110	60	1680	90	220	2640	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1735		1770	1701		1770	5046		1770	5057	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1735		1770	1701		1770	5046		1770	5057	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	62	62	52	82	82	113	62	1732	93	227	2722	103
RTOR Reduction (vph)	0	26	0	0	43	0	0	4	0	0	2	0
Lane Group Flow (vph)	62	88	0	82	152	0	62	1821	0	227	2823	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	7.6	19.5		6.0	17.9		5.0	70.0		19.5	84.5	
Effective Green, g (s)	7.6	19.5		6.0	17.9		5.0	70.0		19.5	84.5	
Actuated g/C Ratio	0.06	0.15		0.05	0.14		0.04	0.54		0.15	0.65	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	103	260		82	234		68	2717		266	3287	
v/s Ratio Prot	0.04	0.05		c0.05	c0.09		0.04	0.36		c0.13	c0.56	
v/s Ratio Perm												
v/c Ratio	0.60	0.34		1.00	0.65		0.91	0.67		0.85	0.86	
Uniform Delay, d1	59.7	49.5		62.0	53.1		62.3	21.7		53.9	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.5	0.8		99.4	6.1		78.6	1.3		22.4	3.2	
Delay (s)	69.3	50.2		161.4	59.2		140.9	23.0		76.2	21.2	
Level of Service	E	D		F	E		F	C		E	C	
Approach Delay (s)		56.9			89.4			26.9			25.3	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	420	180	110	280	490	180	1140	110	770	1770	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3238		1770	3539	1583	1770	5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3238		1770	3539	1583	1770	5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	202	447	191	117	298	521	191	1213	117	819	1883	223
RTOR Reduction (vph)	0	40	0	0	0	179	0	0	85	0	0	133
Lane Group Flow (vph)	182	618	0	117	298	342	191	1213	32	819	1883	90
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	25.7	25.7		10.3	10.3	36.3	12.8	31.0	31.0	26.0	44.7	44.7
Effective Green, g (s)	25.2	25.2		9.8	9.8	35.3	12.3	33.0	30.5	25.5	46.7	44.2
Actuated g/C Ratio	0.23	0.23		0.09	0.09	0.32	0.11	0.30	0.28	0.23	0.42	0.40
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	369	742		158	315	508	198	1526	439	796	2159	636
v/s Ratio Prot	0.11	c0.19		0.07	c0.08	0.16	0.11	0.24		c0.24	c0.37	
v/s Ratio Perm						0.06			0.02			0.06
v/c Ratio	0.49	0.83		0.74	0.95	0.67	0.96	0.79	0.07	1.03	0.87	0.14
Uniform Delay, d1	36.9	40.4		48.9	49.8	32.4	48.6	35.4	29.3	42.2	28.9	20.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	7.6		16.1	36.3	2.8	53.1	4.4	0.3	39.5	5.2	0.5
Delay (s)	37.2	48.0		65.0	86.1	35.1	101.7	39.8	29.7	81.8	34.1	21.3
Level of Service	D	D		E	F	D	F	D	C	F	C	C
Approach Delay (s)		45.7			55.1			46.8			46.5	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	47.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Future (4-Lane Boulevard with Local Access Lanes)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	60	160	150	30	200	0	2055	0	220	2120	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5			6.4		3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95		1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.87			1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1620			3539		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1620			3539		1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	240	62	167	156	31	208	0	2141	0	229	2208	302
RTOR Reduction (vph)	0	0	0	0	107	0	0	0	0	0	0	119
Lane Group Flow (vph)	240	229	0	156	132	0	0	2141	0	229	2208	183
Turn Type	Prot			Prot						Prot		Perm
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases												2
Actuated Green, G (s)	22.1	70.5		5.5	53.9			39.6		7.5	50.2	50.2
Effective Green, g (s)	22.1	70.5		5.5	53.9			39.6		7.5	50.2	50.2
Actuated g/C Ratio	0.16	0.50		0.04	0.38			0.28		0.05	0.36	0.36
Clearance Time (s)	3.5	3.5		3.5	3.5			6.4		3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	279	835		70	624			1001		95	1269	568
v/s Ratio Prot	c0.14	c0.14		c0.09	0.08			c0.60		c0.13	0.62	
v/s Ratio Perm												0.12
v/c Ratio	0.86	0.27		2.23	0.21			2.14		2.41	1.74	0.32
Uniform Delay, d1	57.4	20.0		67.2	28.8			50.2		66.2	44.9	32.6
Progression Factor	1.76	0.06		0.95	3.67			1.00		1.00	1.00	1.00
Incremental Delay, d2	17.3	0.1		593.5	0.2			515.8		665.6	336.3	1.5
Delay (s)	118.3	1.2		657.5	105.8			566.0		731.9	381.2	34.1
Level of Service	F	A		F	F			F		F	F	C
Approach Delay (s)		61.1			323.7			566.0			372.2	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	415.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	111.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	100	15	70	70	220	0	1620	0	0	1980	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.98		1.00	0.89			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1827		1770	1651			3539			3539	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	1770	1827		1770	1651			3539			3539	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	175	103	15	72	72	227	0	1670	0	0	2041	0
RTOR Reduction (vph)	0	4	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	175	114	0	72	265	0	0	1670	0	0	2041	0
Turn Type	Prot			Prot								
Protected Phases	3	8		7	4			6			2	
Permitted Phases												
Actuated Green, G (s)	14.7	32.3		6.0	23.6			79.7			79.7	
Effective Green, g (s)	14.7	32.3		6.0	23.6			79.7			79.7	
Actuated g/C Ratio	0.11	0.25		0.05	0.18			0.61			0.61	
Clearance Time (s)	3.0	3.0		3.0	3.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	200	454		82	300			2170			2170	
v/s Ratio Prot	c0.10	0.06		0.04	c0.16			0.47			c0.58	
v/s Ratio Perm												
v/c Ratio	0.88	0.25		0.88	0.88			0.77			0.94	
Uniform Delay, d1	56.7	39.2		61.6	51.9			18.4			23.0	
Progression Factor	1.64	0.57		1.70	0.13			1.00			1.00	
Incremental Delay, d2	28.8	0.3		45.6	18.3			2.7			9.6	
Delay (s)	121.9	22.7		150.4	25.3			21.1			32.6	
Level of Service	F	C		F	C			C			C	
Approach Delay (s)		81.9			49.5			21.1			32.6	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	410	90	130	340	650	100	1200	30	560	1520	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	4.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3296		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3296		1770	3539	1583	1770	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	149	436	96	138	362	691	106	1277	32	596	1617	128
RTOR Reduction (vph)	0	11	0	0	0	122	0	0	13	0	0	65
Lane Group Flow (vph)	134	536	0	138	362	569	106	1277	19	596	1617	63
Turn Type	Split			Split		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7	5	1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	33.0	33.0		15.7	15.7	49.7	10.4	50.3	50.3	34.0	74.4	74.4
Effective Green, g (s)	32.5	32.5		15.2	15.2	48.7	9.9	52.3	49.8	33.5	76.4	73.9
Actuated g/C Ratio	0.22	0.22		0.10	0.10	0.32	0.07	0.35	0.33	0.22	0.51	0.49
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	349	714		179	359	514	117	1234	526	767	1803	780
v/s Ratio Prot	0.08	c0.16		0.08	0.10	c0.25	0.06	c0.36		0.17	0.46	
v/s Ratio Perm						0.11			0.01			0.04
v/c Ratio	0.38	0.75		0.77	1.01	1.11	0.91	1.03	0.04	0.78	0.90	0.08
Uniform Delay, d1	50.2	55.0		65.7	67.4	50.6	69.6	48.9	33.9	54.7	33.2	20.1
Progression Factor	0.68	0.71		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	3.6		17.7	49.6	72.1	53.6	35.1	0.1	4.5	7.5	0.2
Delay (s)	34.3	42.6		83.4	117.0	122.8	123.2	83.9	34.0	59.3	40.7	20.3
Level of Service	C	D		F	F	F	F	F	C	E	D	C
Approach Delay (s)		41.0			116.5			85.7			44.3	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	69.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	95	0	0	340	20	20	160	40	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0		6.0				
Lane Util. Factor		1.00			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		0.98				
Flt Protected		1.00			1.00	1.00		1.00				
Satd. Flow (prot)		1858			1863	1583		1809				
Flt Permitted		0.98			1.00	1.00		1.00				
Satd. Flow (perm)		1831			1863	1583		1809				
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)	5	103	0	0	370	22	22	174	43	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	17	0	6	0	0	0	0
Lane Group Flow (vph)	0	108	0	0	370	5	0	233	0	0	0	0
Turn Type	Perm					Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		23.6			32.3	32.3		79.7				
Effective Green, g (s)		23.6			32.3	32.3		79.7				
Actuated g/C Ratio		0.18			0.25	0.25		0.61				
Clearance Time (s)		3.0			3.0	3.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		332			463	393		1109				
v/s Ratio Prot					c0.20							
v/s Ratio Perm		0.06				0.00		0.13				
v/c Ratio		0.33			0.80	0.01		0.21				
Uniform Delay, d1		46.3			45.8	36.8		11.2				
Progression Factor		0.15			1.00	1.00		1.00				
Incremental Delay, d2		0.6			9.3	0.0		0.4				
Delay (s)		7.3			55.1	36.9		11.6				
Level of Service		A			E	D		B				
Approach Delay (s)		7.3			54.1			11.6			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM Average Control Delay	33.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	280	0	0	115	265	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5			3.5	6.8	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1863			1863	1758	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1863			1863	1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	0	0	125	288	33
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	304	0	0	125	318	0
Turn Type						
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	53.9			70.5	50.2	
Effective Green, g (s)	53.9			70.5	50.2	
Actuated g/C Ratio	0.38			0.50	0.36	
Clearance Time (s)	3.5			3.5	6.8	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	717			938	630	
v/s Ratio Prot	c0.16			c0.07	c0.18	
v/s Ratio Perm						
v/c Ratio	0.42			0.13	0.50	
Uniform Delay, d1	31.6			18.5	35.2	
Progression Factor	2.09			1.00	1.00	
Incremental Delay, d2	0.0			0.1	2.9	
Delay (s)	66.1			18.6	38.0	
Level of Service	E			B	D	
Approach Delay (s)	66.1			18.6	38.0	
Approach LOS	E			B	D	

Intersection Summary			
HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	434	16	210	80	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5			3.5		
Lane Util. Factor	1.00			1.00		
Frt	1.00			1.00		
Flt Protected	1.00			0.97		
Satd. Flow (prot)	1854			1798		
Flt Permitted	1.00			0.19		
Satd. Flow (perm)	1854			348		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	472	17	228	87	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	488	0	0	315	0	0
Turn Type			Perm			
Protected Phases	4			8		
Permitted Phases			8			
Actuated Green, G (s)	53.9			70.5		
Effective Green, g (s)	53.9			70.5		
Actuated g/C Ratio	0.38			0.50		
Clearance Time (s)	3.5			3.5		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	714			175		
v/s Ratio Prot	0.26					
v/s Ratio Perm				c0.91		
v/c Ratio	0.68			1.80		
Uniform Delay, d1	35.9			34.8		
Progression Factor	1.00			1.44		
Incremental Delay, d2	2.7			380.1		
Delay (s)	38.7			430.3		
Level of Service	D			F		
Approach Delay (s)	38.7			430.3	0.0	
Approach LOS	D			F	A	

Intersection Summary			
HCM Average Control Delay	192.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	69.5
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	180	15	5	65	0	0	0	0	90	190	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						6.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		0.99			1.00						0.97	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1844			1857						1790	
Flt Permitted		1.00			0.98						0.99	
Satd. Flow (perm)		1844			1834						1790	
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)	0	196	16	5	71	0	0	0	0	98	207	76
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	210	0	0	76	0	0	0	0	0	374	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		23.6			32.3						79.7	
Effective Green, g (s)		23.6			32.3						79.7	
Actuated g/C Ratio		0.18			0.25						0.61	
Clearance Time (s)		3.0			3.0						6.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		335			456						1097	
v/s Ratio Prot		c0.11										
v/s Ratio Perm					c0.04						0.21	
v/c Ratio		0.63			0.17						0.34	
Uniform Delay, d1		49.1			38.3						12.3	
Progression Factor		1.00			0.25						1.00	
Incremental Delay, d2		3.6			0.1						0.8	
Delay (s)		52.7			9.5						13.2	
Level of Service		D			A						B	
Approach Delay (s)		52.7			9.5			0.0			13.2	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	370	560	0	270	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	3.5		6.0	
Lane Util. Factor		0.95	0.95		1.00	
Frt		1.00	1.00		0.98	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		3539	3539		1754	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		3539	3539		1754	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	402	609	0	293	43
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	0	402	609	0	333	0
Turn Type						
Protected Phases		4	8		6	
Permitted Phases						
Actuated Green, G (s)		51.7	33.0		50.3	
Effective Green, g (s)		51.7	33.0		50.3	
Actuated g/C Ratio		0.34	0.22		0.34	
Clearance Time (s)		4.0	3.5		6.0	
Vehicle Extension (s)		3.0	2.0		4.0	
Lane Grp Cap (vph)		1220	779		588	
v/s Ratio Prot		c0.11	c0.17		c0.19	
v/s Ratio Perm						
v/c Ratio		0.33	0.78		0.57	
Uniform Delay, d1		36.3	55.1		40.9	
Progression Factor		1.00	0.86		1.00	
Incremental Delay, d2		0.7	2.8		3.9	
Delay (s)		37.1	50.5		44.8	
Level of Service		D	D		D	
Approach Delay (s)		37.1	50.5		44.8	
Approach LOS		D	D		D	

Intersection Summary			
HCM Average Control Delay	45.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	51.5
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	300	50	60	245	60	0	1400	0	240	2750	740
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5			6.4		3.5	6.8	6.8
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.97			1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1823		1770	1808			3539		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1823		1770	1808			3539		1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	312	52	62	255	62	0	1458	0	250	2865	771
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	0	0	0	220
Lane Group Flow (vph)	62	360	0	62	312	0	0	1458	0	250	2865	551
Turn Type	Prot			Prot						Prot		Perm
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases												2
Actuated Green, G (s)	9.1	79.2		5.5	75.6			38.9		9.5	51.5	51.5
Effective Green, g (s)	9.1	79.2		5.5	75.6			38.9		9.5	51.5	51.5
Actuated g/C Ratio	0.06	0.53		0.04	0.50			0.26		0.06	0.34	0.34
Clearance Time (s)	3.5	3.5		3.5	3.5			6.4		3.5	6.8	6.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	107	963		65	911			918		112	1215	543
v/s Ratio Prot	c0.04	c0.20		c0.04	0.17			0.41		0.14	c0.81	
v/s Ratio Perm												0.35
v/c Ratio	0.58	0.37		0.95	0.34			1.59		2.23	2.36	1.01
Uniform Delay, d1	68.6	20.8		72.1	22.3			55.6		70.2	49.2	49.2
Progression Factor	1.63	0.05		1.08	1.64			1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.2		92.1	0.2			269.9		582.2	613.7	42.4
Delay (s)	118.5	1.3		170.2	36.8			325.4		652.4	662.9	91.6
Level of Service	F	A		F	D			F		F	F	F
Approach Delay (s)		18.4			58.6			325.4			548.9	
Approach LOS		B			E			F			F	

Intersection Summary			
HCM Average Control Delay	428.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	395	45	80	140	90	0	1500	0	0	2150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.98		1.00	0.94			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1834		1770	1753			3539			3539	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	1770	1834		1770	1753			3539			3539	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	62	407	46	82	144	93	0	1546	0	0	2216	0
RTOR Reduction (vph)	0	3	0	0	17	0	0	0	0	0	0	0
Lane Group Flow (vph)	62	450	0	82	220	0	0	1546	0	0	2216	0
Turn Type	Prot			Prot								
Protected Phases	3	8		7	4			6			2	
Permitted Phases												
Actuated Green, G (s)	8.7	34.1		6.0	31.4			77.9			77.9	
Effective Green, g (s)	8.7	34.1		6.0	31.4			77.9			77.9	
Actuated g/C Ratio	0.07	0.26		0.05	0.24			0.60			0.60	
Clearance Time (s)	3.0	3.0		3.0	3.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	118	481		82	423			2121			2121	
v/s Ratio Prot	0.04	c0.25		c0.05	0.13			0.44			c0.63	
v/s Ratio Perm												
v/c Ratio	0.53	0.94		1.00	0.52			0.73			1.04	
Uniform Delay, d1	58.7	46.9		62.0	42.8			18.5			26.0	
Progression Factor	1.41	0.71		1.63	0.33			1.00			1.00	
Incremental Delay, d2	2.7	18.8		92.7	1.0			2.2			32.5	
Delay (s)	85.6	52.2		193.9	14.9			20.8			58.5	
Level of Service	F	D		F	B			C			E	
Approach Delay (s)		56.2			60.9			20.8			58.5	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	420	180	110	280	490	180	1140	110	770	1480	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5	4.0	4.0	6.5	6.5	4.0	6.5
Lane Util. Factor	0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3238		1770	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1610	3238		1770	3539	1583	1770	3539	1583	275	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	202	447	191	117	298	521	191	1213	117	819	1574	223
RTOR Reduction (vph)	0	27	0	0	0	238	0	0	52	0	0	129
Lane Group Flow (vph)	182	631	0	117	298	283	191	1213	65	819	1574	94
Turn Type	Split			Split		custom	Prot		Perm	Perm		Perm
Protected Phases	8	8		7	7	5	1	6			2	
Permitted Phases						7			6	2		2
Actuated Green, G (s)	55.5	55.5		11.5	11.5	23.5	13.5	54.0	54.0	53.0	53.0	53.0
Effective Green, g (s)	55.0	55.0		11.0	11.0	22.5	13.0	56.0	53.5	52.5	55.0	52.5
Actuated g/C Ratio	0.37	0.37		0.07	0.07	0.15	0.09	0.37	0.36	0.35	0.37	0.35
Clearance Time (s)	3.5	3.5		3.5	3.5	4.0	3.5	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.0	2.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	590	1187		130	260	237	153	1321	565	96	1298	554
v/s Ratio Prot	0.11	c0.20		0.07	0.08	c0.09	c0.11	0.34			0.44	
v/s Ratio Perm						0.09			0.04	c2.97		0.06
v/c Ratio	0.31	0.53		0.90	1.15	1.19	1.25	0.92	0.11	8.53	1.21	0.17
Uniform Delay, d1	33.9	37.4		69.0	69.5	63.8	68.5	44.8	32.4	48.8	47.5	33.7
Progression Factor	0.78	0.81		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		49.7	101.1	121.1	154.5	11.6	0.4	3410.2	103.0	0.7
Delay (s)	26.5	30.5		118.7	170.6	184.8	223.0	56.4	32.8	3458.9	150.5	34.3
Level of Service	C	C		F	F	F	F	E	C	F	F	C
Approach Delay (s)		29.6			172.0			75.5			1176.4	
Approach LOS		C			F			E			F	

Intersection Summary			
HCM Average Control Delay	571.3	HCM Level of Service	F
HCM Volume to Capacity ratio	3.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	395	0	0	250	20	60	170	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0		6.0				
Lane Util. Factor		1.00			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		0.96				
Flt Protected		1.00			1.00	1.00		0.99				
Satd. Flow (prot)		1863			1863	1583		1775				
Flt Permitted		1.00			1.00	1.00		0.99				
Satd. Flow (perm)		1863			1863	1583		1775				
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)	0	429	0	0	272	22	65	185	98	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	16	0	11	0	0	0	0
Lane Group Flow (vph)	0	429	0	0	272	6	0	337	0	0	0	0
Turn Type						Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases						8	2					
Actuated Green, G (s)		31.4			34.1	34.1		77.9				
Effective Green, g (s)		31.4			34.1	34.1		77.9				
Actuated g/C Ratio		0.24			0.26	0.26		0.60				
Clearance Time (s)		3.0			3.0	3.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		450			489	415		1064				
v/s Ratio Prot		c0.23			c0.15							
v/s Ratio Perm						0.00		0.19				
v/c Ratio		0.95			0.56	0.01		0.32				
Uniform Delay, d1		48.6			41.4	35.5		12.9				
Progression Factor		0.14			1.00	1.00		1.00				
Incremental Delay, d2		17.6			1.4	0.0		0.8				
Delay (s)		24.6			42.8	35.5		13.7				
Level of Service		C			D	D		B				
Approach Delay (s)		24.6			42.2			13.7			0.0	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	500	0	0	165	205	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5			3.5	6.8	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1863			1863	1732	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1863			1863	1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	0	0	179	223	82
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	543	0	0	179	296	0
Turn Type						
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	75.6			79.2	51.5	
Effective Green, g (s)	75.6			79.2	51.5	
Actuated g/C Ratio	0.50			0.53	0.34	
Clearance Time (s)	3.5			3.5	6.8	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	939			984	595	
v/s Ratio Prot	c0.29			c0.10	c0.17	
v/s Ratio Perm						
v/c Ratio	0.58			0.18	0.50	
Uniform Delay, d1	26.0			18.5	39.0	
Progression Factor	1.40			1.00	1.00	
Incremental Delay, d2	0.1			0.1	3.0	
Delay (s)	36.6			18.6	41.9	
Level of Service	D			B	D	
Approach Delay (s)	36.6			18.6	41.9	
Approach LOS	D			B	D	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	434	16	430	555	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5			3.5		
Lane Util. Factor	1.00			1.00		
Frt	1.00			1.00		
Flt Protected	1.00			0.98		
Satd. Flow (prot)	1854			1823		
Flt Permitted	1.00			0.42		
Satd. Flow (perm)	1854			776		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	472	17	467	603	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	488	0	0	1070	0	0
Turn Type			Perm			
Protected Phases	4			8		
Permitted Phases			8			
Actuated Green, G (s)	75.6			79.2		
Effective Green, g (s)	75.6			79.2		
Actuated g/C Ratio	0.50			0.53		
Clearance Time (s)	3.5			3.5		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	934			410		
v/s Ratio Prot	0.26					
v/s Ratio Perm				c1.38		
v/c Ratio	0.52			2.61		
Uniform Delay, d1	25.0			35.4		
Progression Factor	1.00			1.37		
Incremental Delay, d2	0.5			728.4		
Delay (s)	25.6			776.8		
Level of Service	C			F		
Approach Delay (s)	25.6			776.8	0.0	
Approach LOS	C			F	A	

Intersection Summary			
HCM Average Control Delay	541.2	HCM Level of Service	F
HCM Volume to Capacity ratio	2.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	70.8
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	280	15	10	130	0	0	0	0	220	480	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						6.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		0.99			1.00						0.98	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1850			1856						1806	
Flt Permitted		1.00			0.89						0.99	
Satd. Flow (perm)		1850			1657						1806	
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)	0	304	16	11	141	0	0	0	0	239	522	109
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	318	0	0	152	0	0	0	0	0	866	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		31.4			34.1						77.9	
Effective Green, g (s)		31.4			34.1						77.9	
Actuated g/C Ratio		0.24			0.26						0.60	
Clearance Time (s)		3.0			3.0						6.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		447			435						1082	
v/s Ratio Prot		c0.17										
v/s Ratio Perm					c0.09						0.48	
v/c Ratio		0.71			0.35						0.80	
Uniform Delay, d1		45.2			38.9						20.1	
Progression Factor		1.00			0.15						1.00	
Incremental Delay, d2		5.3			0.4						6.2	
Delay (s)		50.5			6.1						26.3	
Level of Service		D			A						C	
Approach Delay (s)		50.5			6.1			0.0			26.3	
Approach LOS		D			A			A			C	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	530	580	0	260	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	3.5		6.0	
Lane Util. Factor		0.95	0.95		1.00	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		3539	3539		1758	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		3539	3539		1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	576	630	0	283	33
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	0	576	630	0	313	0
Turn Type						
Protected Phases		4	8		6	
Permitted Phases						
Actuated Green, G (s)		70.0	55.5		54.0	
Effective Green, g (s)		70.0	55.5		54.0	
Actuated g/C Ratio		0.47	0.37		0.36	
Clearance Time (s)		4.0	3.5		6.0	
Vehicle Extension (s)		3.0	2.0		4.0	
Lane Grp Cap (vph)		1652	1309		633	
v/s Ratio Prot		c0.16	c0.18		c0.18	
v/s Ratio Perm						
v/c Ratio		0.35	0.48		0.50	
Uniform Delay, d1		25.5	36.2		37.4	
Progression Factor		1.00	1.30		1.00	
Incremental Delay, d2		0.6	0.0		2.8	
Delay (s)		26.1	47.3		40.1	
Level of Service		C	D		D	
Approach Delay (s)		26.1	47.3		40.1	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Future SR-29/Jameson Canyon Road: Diamond Interchange

HCM Signalized Intersection Capacity Analysis
301: Airport Blvd. & SR-29 SB Ramps

1/22/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	120	50	290	810	0	0	0	0	2330	0	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.94		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	1583	1770	3539					4990		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	1770	3539					4990		1583
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)	0	130	54	315	880	0	0	0	0	2533	0	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	130	54	315	880	0	0	0	0	2533	0	225
Turn Type			Free	Prot						Prot		custom
Protected Phases		4		3	8					1		
Permitted Phases			Free									6
Actuated Green, G (s)		9.1	83.2	16.0	29.1					46.1		46.1
Effective Green, g (s)		9.1	83.2	16.0	29.1					46.1		46.1
Actuated g/C Ratio		0.11	1.00	0.19	0.35					0.55		0.55
Clearance Time (s)		4.0		4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		556	1583	340	1238					2765		877
v/s Ratio Prot		0.03		c0.18	c0.25					c0.51		
v/s Ratio Perm			0.03									0.14
v/c Ratio		0.23	0.03	0.93	0.71					0.92		0.26
Uniform Delay, d1		33.9	0.0	33.0	23.4					16.8		9.6
Progression Factor		1.00	1.00	1.00	1.00					1.00		1.00
Incremental Delay, d2		0.2	0.0	30.3	2.0					5.3		0.2
Delay (s)		34.1	0.0	63.4	25.4					22.1		9.8
Level of Service		C	A	E	C					C		A
Approach Delay (s)		24.1			35.4			0.0			21.0	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	2380	0	0	870	1480	230	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	0.91			0.95	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1770	5085			3539	1583	1770	1583				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1770	5085			3539	1583	1770	1583				
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)	76	2587	0	0	946	1609	250	0	33	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	76	2587	0	0	946	1609	250	31	0	0	0	0
Turn Type	Prot					Free	Prot					
Protected Phases	7	4			8		5	2				
Permitted Phases						Free						
Actuated Green, G (s)	3.5	37.8			30.3	58.4	12.6	12.6				
Effective Green, g (s)	3.5	37.8			30.3	58.4	12.6	12.6				
Actuated g/C Ratio	0.06	0.65			0.52	1.00	0.22	0.22				
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	106	3291			1836	1583	382	342				
v/s Ratio Prot	0.04	0.51			0.27		0.14	0.02				
v/s Ratio Perm						c1.02						
v/c Ratio	0.72	0.79			0.52	1.02	0.65	0.09				
Uniform Delay, d1	27.0	7.4			9.2	29.2	20.9	18.3				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	20.5	1.3			0.2	26.8	4.0	0.1				
Delay (s)	47.5	8.7			9.5	56.0	24.9	18.4				
Level of Service	D	A			A	E	C	B				
Approach Delay (s)		9.8			38.8			24.2			0.0	
Approach LOS		A			D			C			A	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	0.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
301: Airport Blvd. & SR-29 SB Ramps

1/22/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	740	190	620	370	0	0	0	0	2490	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.94		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	1583	1770	3539					4990		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	1770	3539					4990		1583
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)	0	804	207	674	402	0	0	0	0	2707	0	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	804	207	674	402	0	0	0	0	2707	0	8
Turn Type			Free	Prot						Prot		custom
Protected Phases		4		3	8					1		
Permitted Phases			Free									6
Actuated Green, G (s)		16.9	89.9	25.0	45.9					36.0		36.0
Effective Green, g (s)		16.9	89.9	25.0	45.9					36.0		36.0
Actuated g/C Ratio		0.19	1.00	0.28	0.51					0.40		0.40
Clearance Time (s)		4.0		4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		956	1583	492	1807					1998		634
v/s Ratio Prot		c0.16		c0.38	0.11					c0.54		
v/s Ratio Perm			0.13									0.01
v/c Ratio		0.84	0.13	1.37	0.22					1.35		0.01
Uniform Delay, d1		35.2	0.0	32.5	12.1					27.0		16.2
Progression Factor		1.00	1.00	1.00	1.00					1.00		1.00
Incremental Delay, d2		6.8	0.2	179.1	0.1					163.1		0.0
Delay (s)		42.0	0.2	211.5	12.2					190.0		16.2
Level of Service		D	A	F	B					F		B
Approach Delay (s)		33.4			137.0			0.0			189.3	
Approach LOS		C			F			A			F	

Intersection Summary			
HCM Average Control Delay	144.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	2850	0	0	910	620	80	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	0.91			0.95	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1770	5085			3539	1583	1770	1583				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1770	5085			3539	1583	1770	1583				
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)	413	3098	0	0	989	674	87	0	54	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	413	3098	0	0	989	674	87	53	0	0	0	0
Turn Type	Prot					Free	Prot					
Protected Phases	7	4			8		5	2				
Permitted Phases						Free						
Actuated Green, G (s)	16.1	41.4			21.3	56.2	6.8	6.8				
Effective Green, g (s)	16.1	41.4			21.3	56.2	6.8	6.8				
Actuated g/C Ratio	0.29	0.74			0.38	1.00	0.12	0.12				
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	507	3746			1341	1583	214	192				
v/s Ratio Prot	0.23	c0.61			0.28		0.05	0.03				
v/s Ratio Perm						c0.43						
v/c Ratio	0.81	0.83			0.74	0.43	0.41	0.28				
Uniform Delay, d1	18.7	5.0			15.0	0.0	22.8	22.5				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	9.7	1.6			2.2	0.8	1.3	0.8				
Delay (s)	28.4	6.6			17.2	0.8	24.1	23.3				
Level of Service	C	A			B	A	C	C				
Approach Delay (s)		9.2			10.6			23.8			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	4.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Future SR-29/Jameson Canyon Road: Single Point Urban Interchange (SPUI)

HCM Signalized Intersection Capacity Analysis
301: Airport Blvd. & SR-29

1/22/2014

Movement	EBL	EBT	EBR2	WBL	WBT	WBR2	SEL	SER2	NWL	NWR2
Lane Configurations										
Volume (vph)	70	50	50	290	580	1480	2330	230	230	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.94	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	4990	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	4990	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	54	54	315	630	1609	2533	250	250	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	76	54	54	315	630	1609	2533	250	250	33
Turn Type	Prot		Free	Prot		Free	Prot	Free	Prot	Free
Protected Phases	7	4		3	8		1		5	
Permitted Phases			Free			Free		Free		Free
Actuated Green, G (s)	5.4	10.4	94.9	17.1	22.1	94.9	49.4	94.9	49.4	94.9
Effective Green, g (s)	5.4	10.4	94.9	17.1	22.1	94.9	49.4	94.9	49.4	94.9
Actuated g/C Ratio	0.06	0.11	1.00	0.18	0.23	1.00	0.52	1.00	0.52	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0		3.0	
Lane Grp Cap (vph)	101	557	1583	319	824	1583	2598	1583	921	1583
v/s Ratio Prot	0.04	0.01		0.18	0.18		0.51		0.14	
v/s Ratio Perm			0.03			c1.02		0.16		0.02
v/c Ratio	0.75	0.10	0.03	0.99	0.76	1.02	0.97	0.16	0.27	0.02
Uniform Delay, d1	44.1	38.0	0.0	38.8	34.0	47.5	22.1	0.0	12.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.7	0.1	0.0	46.5	4.3	26.8	12.3	0.2	0.2	0.0
Delay (s)	70.8	38.1	0.0	85.3	38.2	74.2	34.4	0.2	12.9	0.0
Level of Service	E	D	A	F	D	E	C	A	B	A
Approach Delay (s)		40.4			66.7					
Approach LOS		D			E					

Intersection Summary			
HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	94.9	Sum of lost time (s)	0.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
301: Airport Blvd. & SR-29

1/22/2014

Movement	EBL	EBT	EBR2	WBL	WBT	WBR2	SEL	SER2	NWL	NWR2
Lane Configurations										
Volume (vph)	380	360	190	620	290	620	2490	10	80	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.94	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	4990	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	4990	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	413	391	207	674	315	674	2707	11	87	54
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	413	391	207	674	315	674	2707	11	87	54
Turn Type	Prot		Free	Prot		Free	Prot	Free	Prot	Free
Protected Phases	7	4		3	8		1		5	
Permitted Phases			Free			Free		Free		Free
Actuated Green, G (s)	37.9	15.2	149.2	47.0	24.3	149.2	69.0	149.2	69.0	149.2
Effective Green, g (s)	37.9	15.2	149.2	47.0	24.3	149.2	69.0	149.2	69.0	149.2
Actuated g/C Ratio	0.25	0.10	1.00	0.32	0.16	1.00	0.46	1.00	0.46	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0		3.0	
Lane Grp Cap (vph)	450	518	1583	558	576	1583	2308	1583	819	1583
v/s Ratio Prot	0.23	c0.08		c0.38	0.09		c0.54		0.05	
v/s Ratio Perm			0.13			0.43		0.01		0.03
v/c Ratio	0.92	0.75	0.13	1.21	0.55	0.43	1.17	0.01	0.11	0.03
Uniform Delay, d1	54.1	65.2	0.0	51.1	57.4	0.0	40.1	0.0	22.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.4	6.2	0.2	109.6	1.1	0.8	82.8	0.0	0.1	0.0
Delay (s)	77.5	71.4	0.2	160.7	58.5	0.8	122.9	0.0	22.7	0.0
Level of Service	E	E	A	F	E	A	F	A	C	A
Approach Delay (s)		59.3			76.5					
Approach LOS		E			E					

Intersection Summary			
HCM Average Control Delay	94.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	149.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Future SR-29/SR-221 Flyover

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2950	470	40	2580	0	30	40	10	0	140	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0		6.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085		1770	1863	1583		1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085		1770	1863	1583		1863	1583
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)	98	3207	511	43	2804	0	33	43	11	0	152	11
RTOR Reduction (vph)	0	0	288	0	0	0	0	0	7	0	0	6
Lane Group Flow (vph)	98	3207	223	43	2804	0	33	43	4	0	152	5
Turn Type	Split		Perm	Split			Prot		custom			custom
Protected Phases	8	8		7	7		5	2			6	
Permitted Phases			8						7			8
Actuated Green, G (s)	63.0	63.0	63.0	53.5	53.5		3.2	19.2	53.5		13.0	63.0
Effective Green, g (s)	62.5	65.0	65.0	52.5	55.5		2.7	18.7	53.0		13.0	63.0
Actuated g/C Ratio	0.42	0.44	0.44	0.35	0.37		0.02	0.13	0.36		0.09	0.42
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5		6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8		4.0	4.0
Lane Grp Cap (vph)	741	2215	690	623	1892		32	233	562		162	668
v/s Ratio Prot	0.06	c0.63		0.02	c0.55		c0.02	0.02			c0.08	
v/s Ratio Perm			0.14						0.00			0.00
v/c Ratio	0.13	1.45	0.32	0.07	1.48		1.03	0.18	0.01		0.94	0.01
Uniform Delay, d1	26.7	42.1	27.6	32.1	46.8		73.2	58.4	31.1		67.7	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	204.1	0.4	0.0	219.8		168.8	0.5	0.0		52.6	0.0
Delay (s)	26.8	246.2	28.0	32.1	266.6		242.0	58.9	31.1		120.3	25.0
Level of Service	C	F	C	C	F		F	E	C		F	C
Approach Delay (s)		211.4			263.1			124.9			113.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	229.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	149.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2870	70	20	2400	0	310	100	210	0	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	2.0	4.5	1.5		3.5	6.5	4.0		6.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085		1770	1863	1583		1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085		1770	1863	1583		1863	1583
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)	98	3120	76	22	2609	0	337	109	228	0	54	109
RTOR Reduction (vph)	0	0	43	0	0	0	0	0	146	0	0	63
Lane Group Flow (vph)	98	3120	33	22	2609	0	337	109	82	0	54	46
Turn Type	Split		Perm	Split			Prot		custom			custom
Protected Phases	8	8		7	7		5	2			6	
Permitted Phases			8						7			8
Actuated Green, G (s)	63.0	63.0	63.0	53.5	53.5		5.9	17.9	53.5		9.0	63.0
Effective Green, g (s)	62.5	65.0	65.0	52.5	55.5		5.4	17.4	53.0		9.0	63.0
Actuated g/C Ratio	0.42	0.44	0.44	0.35	0.38		0.04	0.12	0.36		0.06	0.43
Clearance Time (s)	4.0	4.0	4.0	3.5	3.5		3.0	6.0	3.5		6.0	4.0
Vehicle Extension (s)	4.0	4.0	4.0	1.8	1.8		2.0	4.0	1.8		4.0	4.0
Lane Grp Cap (vph)	748	2235	696	628	1908		65	219	567		113	674
v/s Ratio Prot	0.06	c0.61		0.01	c0.51		c0.19	c0.06			0.03	
v/s Ratio Perm			0.02						0.05			0.03
v/c Ratio	0.13	1.40	0.05	0.04	1.37		5.18	0.50	0.14		0.48	0.07
Uniform Delay, d1	26.1	41.5	23.7	31.2	46.2		71.2	61.2	32.1		67.2	25.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	181.0	0.0	0.0	168.8		1916.8	2.4	0.0		4.3	0.1
Delay (s)	26.2	222.4	23.8	31.2	215.0		1988.0	63.6	32.1		71.5	25.2
Level of Service	C	F	C	C	F		F	E	C		E	C
Approach Delay (s)		212.0			213.4			1015.2			40.5	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	288.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	147.9	Sum of lost time (s)	7.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D:

COST ESTIMATION METHODOLOGY AND DETAIL

Highway 29 Corridor Improvements Cost Estimate

The purpose of this report is to document the estimated costs associated with proposed improvements along the Highway 29 corridor from Vallejo to Napa as outlined in the SR29 Gateway Corridor Improvement Plan Study. The improvements and costs identified below represent an "order of magnitude" study to help establish a general understanding of the potential infrastructure and associated costs required to facilitate development.

1. Methodology

In order to document existing improvements and right-of-way available along the study corridor, BKF first reviewed and compiled available Caltrans record maps and report documents in and around the Study Corridor. BKF compared record documents with aerial photography as possible to align the records with current improvements. Recommendations for future investigation are provided to verify existing conditions as well as for additional studies necessary to evaluate the impact of specific proposed improvements along the Study Corridor.

In assigning estimated costs for proposed improvements, BKF assumes that the existing utility and roadway infrastructure will be retained and utilized to support future development to the extent possible. Where existing infrastructure is in conflict with the proposed improvements, is in disrepair, or does not meet the demands of the redevelopment, it is anticipated that it will be replaced and/or upgraded with new infrastructure that to meet project demands.

The Study Corridor for the purposes of this report has been broken down into seven segments along the Study length, corresponding to changes in land use or development along the route. This report references improvements to the Study segments as follows:

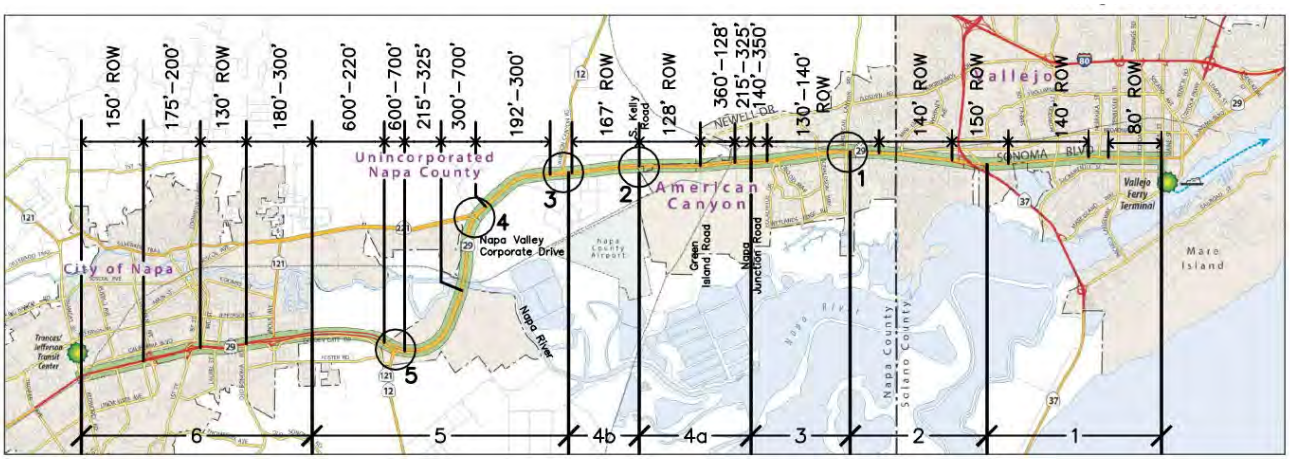
- (1) South of Highway 37 (Sonoma Boulevard Specific Plan Area)
- (2) Highway 37 to American Canyon Road
- (3) American Canyon Road to Napa Junction Road
- (4a) Napa Junction Road to South Kelly Road
- (4b) South Kelly Road to Highway 12/Jameson Canyon
- (5) Highway 12/Jameson Canyon to Urbanized City of Napa
- (6) Freeway in Urbanized City of Napa

In addition to these Study segments, recommendations have been made for improving several major intersections along the Corridor. These intersections are:

- (1) SR 29 at American Canyon
- (2) SR 29 at South Kelly Road
- (3) SR 29 at Airport Boulevard/Jameson Canyon
- (4) SR 29 at SR 12/SR 221 (Soscol Flyover)
- (5) SR 29 at SR 12/SR 121 (Carneros)

The general locations of the Study Corridor Segments and Intersections listed above can be seen in Figure 1 below.

Figure 1. Existing Roadway Segments, Intersections and Right-of-Way



STUDY CORRIDOR SEGMENTS

1. South of Highway 37
2. Highway 37 to American Canyon Road
3. American Canyon Road to Napa Junction Road
4a. Napa Junction Road to South Kelly Road
4b. South Kelly Road to Highway 12/Jameson Canyon
5. Highway 12/Jameson Canyon to Urbanized City of Napa
6. Freeway in Urbanized City of Napa

MAJOR INTERSECTION IMPROVEMENTS

1. SR29/American Canyon
2. SR29/South Kelly Road
3. SR29/Airport Blvd./Jameson Canyon
4. SR29/12/221 (Soscol Flyover)
5. SR29/12/121 (Carneros)

0 1 2 3 4 5 MILES

Study Area
Freeway
Arterial
Major Road
Local Road
County Border
City Border

NOTES

- ROW = Right-of-Way
- If a range of ROW limits is shown, the range in general is shown as it varies from south to north along the Study Corridor. For more information, please refer to the report text.

2. Roadway Improvements

Various modifications to roadway segments are proposed along the Study Corridor in order to improve traffic conditions for all modes of travel; vehicles, bicycles and pedestrians. This cost analysis primarily utilizes street cross-sections for the proposed roadway improvements as the basis for the estimate. Costs per linear foot of street infrastructure are estimated using recent cost information. The analysis provides order of magnitude cost summaries and includes soft costs for Design, Inspection, Staking, Construction Administration and Project Management.

In order to assign estimated costs per linear foot for each roadway segment at a planning level, BKF made the following assumptions for existing conditions and construction requirements:

- The proposed roadway sections were compared to the typical existing conditions for each segment and estimates prepared assuming that structural sections and pavement in existing travel lanes will be retained and re-used to the extent possible. Existing roadway shoulder pavement sections are assumed to not meet design specifications for traffic lanes. As such, pavement sections within the road shoulder are assumed to be removed and replaced.
- It is assumed that the proposed roadway improvements will not necessitate upgrades to existing sewer, water or joint trench facilities within or adjacent to the Study Area. Where there is the potential need to underground overhead lines in order to accommodate the proposed improvements, costs associated with this work are assumed to be covered by PG&E's Rule 20A legislation.
- The analysis does not take into consideration costs associated with land acquisition to establish additional public right-of-way for the new roadway improvements. BKF notes in its study however, locations where additional right-of-way may be required, along with an approximate square footage of the anticipated acquisition area.
- Applicability of stormwater treatment requirements varies based on the total amount of pavement disturbed or added, whether or not additional travel lanes are added, and depending on the drainage patterns of any existing pavement to remain in conjunction with new improvements. This analysis assumes that stormwater runoff from all impervious surfaces (existing and new) will require treatment and that adequate treatment area is available within the landscaped areas proposed in each new section.
- Conditions, locations and sizes of existing storm drain infrastructure vary along the entire Study Corridor and have not been thoroughly investigated for this level of planning. A significant amount of the existing roadway facilities along the corridor has no curb and gutter and directs storm water to the adjacent open areas. The introduction of curb and gutter will require further investigation of existing storm drain facilities and watershed drainage patterns where sufficient facilities are not currently in place. For the purposes of this study, BKF has assumed that, on average, two new 36" reinforced concrete pipe (RCP) storm drain mains will be installed along the entire corridor length to address storm water conveyance.

SEGMENT 1: SOUTH OF HIGHWAY 37

Improvements to this stretch of highway will be determined by the Sonoma Boulevard Specific Plan, which is currently underway. As such, BKF has not provided cost estimation for this segment of the Corridor Study in this report.

SEGMENT 2: HIGHWAY 37 TO AMERICAN CANYON ROAD

The Corridor Improvement Study considers two options for improvements within Segment 2, which are a "Parkway" concept and a combined "Parkway/Boulevard" concept. Both options include landscaped buffers between vehicles and wide shared paths for bikes and pedestrians. Both options will require some amount of right-of-way in addition to what is currently provided. The "Parkway" will require 3 to 13 feet along the segment for a total of approximately 51,600 square feet of additional right-of-way. The "Parkway/Boulevard" will require 10 to 20 feet along the segment length for a total of approximately 102,000 square feet.

In addition to the assumptions listed above, it is assumed that in either option traffic signal improvements will be minimal and limited to program modifications as necessary. For the Boulevard concept, new signal posts will be required at the local lanes for signalized intersections. No undergrounding of overhead utilities is anticipated for this segment.

There are three existing culverts crossing the highway along this segment. It is assumed that the culverts can remain in place with potential extension improvements as necessary to accommodate the roadway widening. General earthwork is included in the roadway subgrade preparation costs and contingency of the estimate. The improvements may require construction of 1,600 linear feet (LF) of retaining wall along the west side of the highway, north of Meadows Drive if re-grading the existing slope cannot mitigate the grade differentials.

SEGMENT 3: AMERICAN CANYON ROAD TO NAPA JUNCTION ROAD

Segment 3 from American Canyon Road to Napa Junction Road also has two options for improvements. The options include a "Boulevard" concept and a "Modified Boulevard" concept. The "Modified Boulevard" is similar to the "Parkway" concept in Segment 2 but with three lanes in each direction. The "Boulevard" concept has one-way local frontage streets in each direction and requires a 176 feet wide right-of-way. The "Modified Boulevard" concept requires 151 feet. The existing right-of-way is 135 feet for the majority of this 5,700 lineal foot segment. Implementing these options would require acquisition of approximately 233,700 square feet and 91,200 square feet, respectively, for the two options.

In addition to the assumptions listed above, it is assumed that in either option traffic signal improvements will be minimal and limited to program modifications as necessary. For the Boulevard concept, new signal posts will be required at the local lanes for signalized intersections. Both options may require undergrounding or relocation of existing overhead lines for approximately 5,600 feet on one side of the roadway.

There is one existing culvert crossing within Segment 3. It is assumed that the culvert can remain in place with potential extension improvements as necessary to accommodate the roadway im-

provements for the "Modified Boulevard" option. The wider "Boulevard" option may require undergrounding approximately 1,200 linear feet of existing stormwater detention swales on the east side of the highway, fronting the Napa Junction shopping center. General earthwork is included in the subgrade preparation costs and estimate contingency. It is not anticipated that retaining walls will be required along this segment in order to implement either option.

SEGMENT 4A: NAPA JUNCTION ROAD TO SOUTH KELLY ROAD

A 6-lane "Parkway" concept, similar to the "Modified Boulevard" concept in Segment 3, is proposed for Segment 4a, from Napa Junction Road to South Kelly Road. This option will require 142 feet of total right-of-way width. There appears to be sufficient right-of-way for the initial 4,600 feet north of Napa Junction Road to just north of Green Island Road. North of Green Island Road, 3,000 feet of roadway currently has only 128 feet of existing right-of-way width. The proposed roadway section will require approximately 42,000 square feet of additional right-of-way for this segment.

Implementing the proposed roadway improvements for the southern portion of this segment may be constrained by the Southern Pacific Railroad highway overpass. Each direction of the overpass is approximately 40 feet wide and could potentially accommodate the three lanes of traffic with reduced shoulders. Significant modifications to the existing roadway overpass or construction of a separate pedestrian/bicycle overpass would be necessary in order to link the shared bike and pedestrian improvements proposed to the north and south of the railroad. Both the north and south approaches to the overpass would require a minimum 20' widening to accommodate the new shared paths. It is not clear at this time whether re-grading of the existing highway embankment slopes will be sufficient to accommodate the extra width or if retaining structures would also be required. General earthwork is included in the subgrade preparation costs and estimate contingency. For the southern portion of this segment, additional costs are included in anticipation of the additional grading for the railroad crossing.

Undergrounding of existing overhead lines may be required for approximately 3,500 feet on each side of the roadway at the northern end of this segment. Partial funding of these improvements may be available from PG&E's Rule 20A. No signal improvements are anticipated within this study segment.

The bike and pedestrian facilities will leave the Highway 29 right-of-way at South Kelly Road and proceed west to Devlin Road. Devlin Road will be the future alignment of the Vine Trail through this region. Acquisition of approximately 15,000 square feet of additional right-of-way along South Kelly Road is anticipated to accommodate the 12-foot Class I trail connector. Estimated costs for this trail connection project are included with this project's analysis.

SEGMENT 4B: SOUTH KELLY ROAD TO HWY 12/JAMESON CANYON

A 6-lane "Rural Highway" concept is proposed for Segment 4b from South Kelly Road to Highway 12/Jameson Canyon Road. This option does not include shared use paths or curbs on the outer edges of the roadway. A right-of-way of up to 168 feet wide will be required to accommodate the proposed improvements. Flexibility in the width of the median and shoulder swales within this section eliminates the need for additional right-of-way along this segment of the highway.

This segment of the highway has three known drainage culvert crossings under the roadway. It is assumed that no major modification will be required for these, other than possible extension of the existing lines. General earthwork is included in the subgrade preparation costs and estimate contingency. It is not anticipated that retaining walls will be required along this segment.

Undergrounding of existing overhead lines on one side of the highway may be required along the entire 4,000 linear feet of this segment. Partial funding of these efforts may be available from PG&E's Rule 20A. No signal improvements are anticipated within this study segment.

SEGMENT 5: HWY 12/JAMESON CANYON TO URBANIZED CITY OF NAPA

The existing roadway improvements consist of two lanes in each direction along this segment of the Study Corridor and are anticipated to be sufficient to accommodate vehicle demand. Although no pedestrian improvements currently exist, the planned Vine Trail provides parallel connectivity. The Improvement Plan has not recommended improvements beyond landscaping and signage along the length of this section, with improvements proposed only at intersections as described below.

Proposed roadway improvements for Segment 5 are limited to landscape and irrigation improvements within the existing median, consisting of street trees planted every 50 feet and ground cover planting. Costs assume that sufficient water sources are available within the existing median and that new services to accommodate irrigation demands will not be required.

Approximately 3.3 miles of the 5.1 mile long Segment 5 has median averaging 38 feet wide. Landscaping improvements are limited to only segments of the highway with existing median. No other street improvements are included along this segment.

SEGMENT 6: FREEWAY IN URBANIZED CITY OF NAPA

The Corridor Improvement Study does not identify any improvements for cost estimation within this segment of the Study.

3. Intersection Improvements

Five intersections are identified for improvements along the Study Corridor. Although basic analysis has been performed to identify general improvements, additional, more detailed traffic studies, along with geotechnical and structural analysis are necessary to fully scope the design. As such, our costing of each interchange reflects only a gross "order of magnitude" cost based on an assumed complexity for each intersection in relation to one another. Two of the proposed intersection improvements, (3) Airport Boulevard/Jameson Canyon and (4) Soscol Flyover, have already been studied by Caltrans. The cost estimates prepared by Caltrans are included in this estimate. A second structural option, consisting of a "double-teardrop intersection, for (3) Airport Boulevard/Jameson Canyon is proposed by this study with an associated order of magnitude cost based on similar projects.

The improvements proposed at American Canyon and South Kelly Road consist primarily of signal modifications and roadway striping along with some pavement adjustments to improve bicy-

cle and pedestrian access. Stormwater quality improvements associated with these intersections is assumed to be mitigated by improvements within the adjoining segments. Implementation of the Boulevard option at American Canyon Road along segments 2 and 3 would necessitate additional signal improvements at this intersection. Costs associated with these signal improvements are included under the traffic signal modification work for segment 2.

The proposed intersection modifications at Highway 12 and 121, also known as Carneros, include at-grade lane and signal modifications. Since there are no roadway improvements proposed to the north or south of this intersection, stormwater quality mitigation for the new pavement will need to be handled by the intersection project directly. It is assumed that overall existing drainage patterns will not be impacted by the proposed improvements.

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BKF
ENGINEERS / SURVEYORS / PLANNERS

Highway 29 Gateway Corridor

INFRASTRUCTURE COST ANALYSIS

February 21, 2014

ITEM	DESCRIPTION	UNITS	UNIT COST	UNIT COST	QUANTITY	Parkway Options COSTS	Boulevard Options COSTS
A	**INTERCHANGE IMPROVEMENTS**						
1	SR 29 / American Canyon	LS		$150,000	1	$150,000	$150,000
2	SR 29 / South Kelly Road	LS		$218,000	1	$218,000	$218,000
3	SR 29 / Airport Blvd./Jameson Canyon	LS		$73,100,000	1	$73,100,000	$73,100,000
4	SR 29 / 12/221 (Soscol Flyover)	LS		$48,400,000	1	$48,400,000	$48,400,000
5	SR 29 / 12/121 (Carneros)	LS		$472,000	1	$472,000	$472,000
	INTERCHANGE SUBTOTAL					**$122,340,000**	**$122,340,000**
B	**ROADWAY SEGMENT IMPROVEMENTS**		**Parkway**	**Boulevard**			
1	Seg. 2 - Option 1: Hwy 37 to American Canyon Road *(143' ROW)*	LF	$2,800		8,275	$23,170,000	
1b	Seg. 2 - Option 2: Hwy 37 to American Canyon Road *(150' ROW)*	LF		$3,500	8,275		$28,962,500
	Seg. 2 - Opt. 2: Traffic Signal Modification	EA		$150,000	4		$600,000
2	Seg. 3 - Option 1: American Canyon Road to Napa Junction Road *(176' ROW)*	LF		$4,500	6,900		$31,050,000
	Seg. 3 - Opt. 1: Traffic Signal Addition	EA		$150,000	2		$300,000
	Seg. 3 - Opt. 1: Traffic Signal Modification	EA		$300,000	1		$300,000
	Seg. 3 - Opt. 1: 1,200 LF Undergrounding of 25' wide Drainage Detention Swale	EA		$5,000,000	1		$5,000,000
2b	Seg. 3 - Option 2: American Canyon Road to Napa Junction Road *(151' ROW)*	LF	$3,700		6,900	$25,530,000	
3	Seg. 4a: Napa Junction Road to South Kelly Road -Overpass *(151' ROW)*	LF	$3,500		2,940	$10,290,000	$10,290,000
	Seg. 4a: Southern Pacific RR Pedestrian Bridge Overpass Structure	EA	$10,000,000		1	$10,000,000	$10,000,000
3	Seg. 4a: Napa Junction Road to South Kelly Road -At-Grade *(151' ROW)*	LF	$3,400		5,190	$17,646,000	$17,646,000
4	Seg. 4b: South Kelly Road to Hwy 12/Jameson Canyon *(142' ROW)*	LF	$3,300		3,960	$13,068,000	$13,068,000
5	Seg. 5: Hwy 12/Jameson Canyon to City of Napa Limits *(168' ROW)*	LF	$450		17,540	$7,893,000	$7,893,000
	ROADWAY IMPROVEMENTS SUBTOTAL					**$107,597,000**	**$125,109,500**
C	**TRAIL IMPROVEMENTS**						
1	Seg. 4a: Trail Connection to Devlin Road	LF		$700	1,000	$700,000	$700,000
	TRAIL IMPROVEMENTS SUBTOTAL					**$700,000**	**$700,000**
					TOTAL CONSTRUCTION COST	**$230,637,000**	**$248,149,500**
				Design, Soft Costs, Mapping	(18%)	$41,514,700	$44,666,900
				Inspection, Staking, C/A	(15%)	$34,595,600	$37,222,400
				Project Management	(8%)	$18,451,000	$19,852,000
					GRAND TOTAL	**$325,198,000**	**$349,891,000**
Alternate	Improvement Options						
3a	SR 29 / Airport Blvd./Jameson Canyon - Teardrop Alternate	LS		$20,000,000	1	$20,000,000	$20,000,000

Notes:

1 Items A3 and A4 are Caltrans estimates and do include ROW acquisition costs.
2 Costs associated with ROW acquisition are not included in these estimates unless otherwise noted.
3 Alternate Item 3a would be in lieu of item A3 for the Airport Blvd/Jameson Canyon intersection. Estimated costs are an order of magnitude estimate based on a similar project. ROW acquisition is not included.
4 Estimates do not include construction phasing, construction permitting, or traffic control implementation.

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE		COMMENTS
				QUANTITY (per lin ft)	COST	
	Master List of Items and Prices					
1	6" Sanitary Sewer and Stubs for future laterals	LF	$ 180.00			
2	12" Sanitary Sewer	LF	$ 220.00			
3	Sanitary Sewer Manhole	EA	$ 6,500.00			
4	12" Sanitary Sewer Extension (650 LF)	LF	$ 300.00			Includes manholes; cut into existing CC roadway
5	8" Water Line (with valves)	LF	$ 220.00			Assumes new 8" main parallel to ex 20" distribution main
6	12" Water Line (w/valves)	LF	$ 250.00			
7	Fire Hydrant Assembly	EA	$ 6,500.00			
8	12" RCP Storm Drain Pipe - Class III	LF	$ 130.00			
9	24" RCP Storm Drain Pipe - Class III	LF	$ 185.00			
10	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00			
11	Storm Drain Manhole	EA	$ 6,500.00			
12	Storm Drain Catch Basin	EA	$ 3,700.00			BMP Overflow Drain
13	Storm Water BMP's (Biofiltration)	SF	$ 100.00			Assumes retaining walls around treatment area
14	Storm Water BMP's (Tree Well Filters)	EA	$ 9,000.00			
15	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 125.00			
16	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00			Installed outside of CC roadway
17	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 200.00			Includes removal of existing overhead lines
18	Street Lights and Pull Box Assemblies	EA	$ 6,000.00			
19	Pedestrain lighting bollard	EA	$ 500.00			
20	Landscape and Irrigation	SF	$ 8.00			
21	Street Trees	EA	$ 1,000.00			
22	Existing Pavement Removal	SF	$ 2.50			
23	Existing Misc Concrete Removal	LF	$ 2.50			
24	Earthwork - Cut to Fill	CY	$ 7.00			
25	Subgrade Preparation	SF	$ 0.75			
26	Sidewalk (including rock)	SF	$ 9.00			
27	Curb & Gutter/Vertical Curb	LF	$ 50.00			
28	K-Rail Type Median (2' wide)	LF	$ 20.00			
29	Median Permeable Hardscape	SF	$ 12.00			
30	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00			
31	Aggregate Base (AB) - 20"	TONS	$ 60.00			
32	Striping	LF	$ 2.50			
33	Signage	EA	$ 350.00			

Project Index

B1	SEGMENT 2 (OPT. 1)	$ 2,800
B1b	SEGMENT 2 (OPT. 2)	$ 3,500
B2	SEGMENT 3 (OPT. 1)	$ 4,500
B2b	SEGMENT 3 (OPT. 2)	$ 3,700
B3	SEGMENT 4a (OVERPASS SEGMENT)	$ 3,500
B3	SEGMENT 4a (AT GRADE)	$ 3,400
B1	SEGMENT 4a (Trail Connection to Devlin)	$ 700
B4	SEGMENT 4b	$ 3,300
B5	SEGMENT 5 SUMMARY	$ 450

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 2 (OPT. 1)					
	POTENTIAL EXTRA LUMP SUM ITEMS		**ROW**	**143**		11' travel lanes, 15' shared paths on each side
	• Modification of existing culverts (3 locations)		**Pavement**	**48**	**(ex to stay)**	
	• New retaining wall on west side north of Meadows (~1,600 LF; 1-3')		**Pavement**	**6**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**22**	**(removed)**	
			Landscape	**9**		
			Sidewalk	**30**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**6**	**(new)**	
			Curb/Gutter	**3**	**(removed)**	
			L/S Median	**15**		
B1	***SEGMENT 2 (OPT. 1)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	1/25	$ 240	1 street light, each side of street, every 50'
4	Landscape and Irrigation	SF	$ 8.00	24	$ 192	
5	Street Trees	EA	$ 1,000.00	3/50	$ 60	Assumes trees in median and each side, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	30	$ 270	
7	Curb & Gutter	LF	$ 50.00	6	$ 300	
8	Subgrade Preparation	SF	$ 0.75	42	$ 32	
9	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	2/9	$ 39	
10	Aggregate Base (AB) - 20"	TONS	$ 60.00	5/8	$ 38	
11	2" Asphalt Pavement Overlay	TONS	$ 170.00	3/8	$ 63	Assumes no additional roadway structural mitigation required
12	Striping	LF	$ 2.50	7	$ 18	
13	Signage	EA	$ 350.00	1/30	$ 12	
14	Storm Water BMP's (Biofiltration)	SF	$ 100.00	3 3/5	$ 360	Assumes treatment in median
15	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
16	Existing Misc Concrete Removal	LF	$ 2.50	3	$ 8	
17	Existing Pavement Removal	LF	$ 2.50	22	$ 55	
			SUBTOTAL		**$ 2,234**	
			Contingency -- 25%		**$ 559**	
	SEGMENT 2 (OPT. 1)		***TOTAL***		2,800	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~51,600 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
6 No distinction of roadway sections at intermediate intersections
7 Assumes existing intermediate traffic signals (3 locations) will remain in place with some reprogramming as necessary only

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 2 (OPT. 2)					
	POTENTIAL EXTRA LUMP SUM ITEMS		**ROW**	**150**		
	• Modification of existing culverts (3 locations)		**Pavement**	**28**	**(ex to stay)**	
	• New retaining wall on west side north of Meadows (~1,600 LF; 1-3')		**Pavement**	**38**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**38**	**(removed)**	
			Landscape	**20.5**		
			Sidewalk	**30**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**6**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**0**		
B1b	***SEGMENT 2 (OPT. 2)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	1/25	$ 240	1 street light, each side of street, every 50'
4	Landscape and Irrigation	SF	$ 8.00	20 1/2	$ 164	
5	Street Trees	EA	$ 1,000.00	3/50	$ 60	Assumes trees in median and each side, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	30	$ 270	
7	Curb & Gutter	LF	$ 50.00	6	$ 300	
8	Subgrade Preparation	SF	$ 0.75	74	$ 56	
9	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	1 4/9	$ 245	
10	Aggregate Base (AB) - 20"	TONS	$ 60.00	4	$ 238	
11	2" Asphalt Pavement Overlay	TONS	$ 170.00	1/3	$ 56	Assumes no additional roadway structural mitigation required
12	K-Rail Type Median (2' wide)	LF	$ 20.00	1	$ 20	
13	Striping	LF	$ 2.50	7	$ 18	
14	Signage	EA	$ 350.00	1/30	$ 12	
15	Storm Water BMP's (Biofiltration)	SF	$ 100.00	4	$ 408	Assumes treatment in median
16	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
17	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
18	Existing Pavement Removal	LF	$ 2.50	38	$ 95	
			SUBTOTAL		**$ 2,729**	
			Contingency -- 25%		**$ 682**	
	SEGMENT 2 (OPT. 2)		***TOTAL***		3,500	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~102,000 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
6 No distinction of roadway sections at intermediate intersections
7 Assumes existing intermediate traffic signals (4 locations) will remain in place with some reprogramming as necessary only; new signal heads added for boulevard concept local lanes. Costs added on Segment Summary sheet as individual projects.

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 3 (OPT. 1)					
	POTENTIAL EXTRA LUMP SUM ITEMS		**ROW**	**176**		
	• Modification of existing culverts (1 location)		**Pavement**	**44**	**(ex to stay)**	
			Pavement	**44**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**25**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**36**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**12**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**37**		
B2	***SEGMENT 3 (OPT. 1)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	Undergrounding of overhead lines for 5,600 LF on one side.
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	1/25	$ 240	1 street light, each side of street, every 50'
4	Pedestrain lighting bollard	EA	$ 500.00	2/25	$ 40	1 bollard, each side of street, every 25'
5	Landscape and Irrigation	SF	$ 8.00	37	$ 296	
6	Street Trees	EA	$ 1,000.00	1/10	$ 100	Assumes trees in 3 medians and each side, every 50'
7	Sidewalk (including rock)	SF	$ 9.00	36	$ 324	
8	Curb & Gutter	LF	$ 50.00	12	$ 600	
9	Subgrade Preparation	SF	$ 0.75	92	$ 69	
10	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	1 2/3	$ 284	
11	Aggregate Base (AB) - 20"	TONS	$ 60.00	4 3/5	$ 275	
12	2" Asphalt Pavement Overlay	TONS	$ 170.00	3/4	$ 125	Assumes no additional roadway structural mitigation required
13	Striping	LF	$ 2.50	7	$ 18	
14	Signage	EA	$ 350.00	1/30	$ 12	
15	Storm Water BMP's (Biofiltration)	SF	$ 100.00	5 4/9	$ 544	Assumes treatment in median
16	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
17	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
18	Existing Pavement Removal	LF	$ 2.50	25	$ 63	
			SUBTOTAL		**$ 3,538**	
			Contingency -- 25%		**$ 884**	
	SEGMENT 3 (OPT. 1)		***TOTAL***		4,500	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~233,700 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
5 No distinction of roadway sections at intermediate intersections
6 Existing intermediate traffic signals (Donaldson & Eucalyptus) will remain in place with some reprogramming as necessary only; new signal heads added for boulevard concept local lanes. Costs added on Segment Summary sheet as individual projects.

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 3 (OPT. 2)					
	POTENTIAL EXTRA LUMP SUM ITEMS		**ROW**	**151**		3 12' lanes each direction, 8' outer shoulders, 4' left-side shoulders, 13' shared paths on each side, landscaping on each side and median
	• Modification of existing culverts (1 location)		**Pavement**	**48**	**(ex to stay)**	
	• Undergrounding of existing detention areas at Napa Junction		**Pavement**	**42**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**27**	**(removed)**	
			Landscape	**13**		
			Sidewalk	**26**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**6**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**14**		
B2b	***SEGMENT 3 (OPT. 2)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	Undergrounding of overhead lines for 5,600 LF on one side.
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	1/25	$ 240	1 street light, each side of street, every 50'
4	Pedestrain lighting bollard	EA	$ 500.00	2/25	$ 40	1 bollard, each side of street, every 25'
5	Landscape and Irrigation	SF	$ 8.00	27	$ 216	
6	Street Trees	EA	$ 1,000.00	3/50	$ 60	Assumes trees in median and each side, every 50'
7	Sidewalk (including rock)	SF	$ 9.00	26	$ 234	
8	Curb & Gutter	LF	$ 50.00	6	$ 300	
9	Subgrade Preparation	SF	$ 0.75	74	$ 56	
10	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	1 3/5	$ 271	
11	Aggregate Base (AB) - 20"	TONS	$ 60.00	4 3/8	$ 263	
12	2" Asphalt Pavement Overlay	TONS	$ 170.00	3/4	$ 125	Assumes no additional roadway structural mitigation required
13	Striping	LF	$ 2.50	7	$ 18	
14	Signage	EA	$ 350.00	1/30	$ 12	
15	Storm Water BMP's (Biofiltration)	SF	$ 100.00	4 7/8	$ 488	Assumes treatment in median
16	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
17	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
18	Existing Pavement Removal	LF	$ 2.50	27	$ 68	
19	Traffic Signal Addition	LF	$ 43.48	1	$ 43	1 new signal to be installed (Poco Way)
			SUBTOTAL		**$ 2,938**	
			Contingency -- 25%		**$ 734**	
	SEGMENT 3 (OPT. 2)		***TOTAL***		3,700	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~91,200 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
5 No distinction of roadway sections at intermediate intersections
6 Assumes existing intermediate traffic signals (3 locations) will remain in place with some reprogramming as necessary only

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS

SEGMENT 4a SUMMARY

Segment	$/LF	LF	Subtotal	
SEGMENT 4a (OVERPASS SEGMENT)	3,500.00	2,940	10,290,000.00	
SEGMENT 4a (AT GRADE)	3,400.00	5,190	17,646,000.00	
	3,400.00	8,130	27,936,000.00	27,642,000.00

SEGMENT 4a (OVERPASS SEGMENT)

POTENTIAL EXTRA LUMP SUM ITEMS						
			ROW	142		
• Modification of existing culverts (none known)			Pavement	48	(ex to stay)	
• General Earthwork?			Pavement	62	(new)	Assumes constant cross-section for entire length of road
			Pavement	32	(removed)	
			Landscape	11		
			Sidewalk	0	(new)	
			Sidewalk	0	(removed)	
			Curb/Gutter	6	(new)	
			Curb/Gutter	0	(removed)	
			L/S Median	13		
B3	***SEGMENT 4a (OVERPASS SEGMENT)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	24	$ 192	
5	Street Trees	EA	$ 1,000.00	3/50	$ 60	Assumes trees in median and each side, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	0	$ -	
7	Curb & Gutter	LF	$ 50.00	6	$ 300	
8	Earthwork - Cut to Fill	CY	$ 7.00	8	$ 56	Assumes 20' additional width, each side, filled for entire length
9	Subgrade Preparation	SF	$ 0.75	68	$ 51	
10	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	2 1/3	$ 400	
11	Aggregate Base (AB) - 20"	TONS	$ 60.00	6 1/2	$ 388	
12	2" Asphalt Pavement Overlay	TONS	$ 170.00	1	$ 155	Assumes no additional roadway structural mitigation required
13	Striping	LF	$ 2.50	7	$ 18	
14	Signage	EA	$ 350.00	1/30	$ 12	
15	Storm Water BMP's (Biofiltration)	SF	$ 100.00	4 2/3	$ 464	Assumes treatment in median
16	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
17	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
18	Existing Pavement Removal	LF	$ 2.50	32	$ 80	
			SUBTOTAL		**$ 2,723**	
			Contingency -- 25%		**$ 681**	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
7 No distinction of roadway sections at intermediate intersections

SEGMENT 4a (OVERPASS SEGMENT) ***TOTAL*** 3,500

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 4a (AT GRADE)					
			ROW	**142**		3 12' lanes each direction, 8' outer shoulders, 4' left-side shoulders, 10' shared AC paths on each side, landscaping on each side and median
			Pavement	**48**	**(ex to stay)**	
			Pavement	**62**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**32**	**(removed)**	
			Landscape	**11**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**6**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**13**		
B3	***SEGMENT 4a (AT GRADE)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	Undergrounding of overhead lines for 3,500 LF on both sides.
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	24	$ 192	
5	Street Trees	EA	$ 1,000.00	3/50	$ 60	Assumes trees in median and each side, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	0	$ -	
7	Curb & Gutter	LF	$ 50.00	6	$ 300	
8	Subgrade Preparation	SF	$ 0.75	68	$ 51	
9	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	2 1/3	$ 400	
10	Aggregate Base (AB) - 20"	TONS	$ 60.00	6 1/2	$ 388	
11	2" Asphalt Pavement Overlay	TONS	$ 170.00	1	$ 155	Assumes no additional roadway structural mitigation required
12	Striping	LF	$ 2.50	7	$ 18	
13	Signage	EA	$ 350.00	1/30	$ 12	
14	Storm Water BMP's (Biofiltration)	SF	$ 100.00	4 2/3	$ 464	Assumes treatment in median
15	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
16	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
17	Existing Pavement Removal	LF	$ 2.50	32	$ 80	
			SUBTOTAL		**$ 2,667**	
			Contingency -- 25%		**$ 667**	
	SEGMENT 4a (AT GRADE)		***TOTAL***		3,400	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~42,000 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 No new lighting
5 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
6 No distinction of roadway sections at intermediate intersections

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 4a (Trail Connection to Devlin)					
			ROW	**15**		1 12' shared bike/ped path
			Pavement	**0**	**(ex to stay)**	
			Pavement	**12**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**3**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**0**		
B1	***SEGMENT 4a (Trail Connection to Devlin)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	Undergrounding of overhead lines for 3,500 LF on both sides.
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	3	$ 24	
5	Street Trees	EA	$ 1,000.00	1/25	$ 40	Assumes trees on each side, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	0	$ -	
7	Curb & Gutter	LF	$ 50.00	0	$ -	
8	Subgrade Preparation	SF	$ 0.75	12	$ 9	
9	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	1/2	$ 77	
10	Aggregate Base (AB) - 20"	TONS	$ 60.00	1 1/4	$ 75	
11	Striping	LF	$ 2.50	3	$ 8	
12	Signage	EA	$ 350.00	1/30	$ 12	
13	Storm Water BMP's (Biofiltration)	SF	$ 100.00	1/2	$ 48	Assumes treatment in median
14	24" RCP Storm Drain Pipe - Class III	LF	$ 185.00	1	$ 185	
15	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
16	Existing Pavement Removal	LF	$ 2.50	0	$ -	
			SUBTOTAL		**$ 527**	
			Contingency -- 25%		**$ 132**	
	SEGMENT 4a (Trail Connection to Devlin)		***TOTAL***		700	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs (Requires ~15,000 SF)
3 Assumes no sewer, water or joint trench upgrades or modifications
4 No new lighting
5 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
6 No distinction of roadway sections at intermediate intersections

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 4b					
	POTENTIAL EXTRA LUMP SUM ITEMS		**ROW**	**168**		3 12' lanes each direction, 8' shoulders, landscaping on each side and median
	• Modification of existing culverts (3 known)		**Pavement**	**48**	**(ex to stay)**	
	• General Earthwork?		**Pavement**	**54**	**(new)**	Assumes constant cross-section for entire length of road
			Pavement	**8**	**(removed)**	
			Landscape	**48**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**3**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**15**		
B4	***SEGMENT 4b***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	1/75	$ 49	BMP Overflow Drain
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	63	$ 504	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Sidewalk (including rock)	SF	$ 9.00	0	$ -	
7	Curb & Gutter	LF	$ 50.00	3	$ 150	
8	Subgrade Preparation	SF	$ 0.75	57	$ 43	
9	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	2	$ 348	
10	Aggregate Base (AB) - 20"	TONS	$ 60.00	5 5/8	$ 338	
11	2" Asphalt Pavement Overlay	TONS	$ 170.00	1	$ 186	Assumes no additional roadway structural mitigation required
12	Striping	LF	$ 2.50	7	$ 18	
13	Signage	EA	$ 350.00	1/30	$ 12	
14	Storm Water BMP's (Biofiltration)	SF	$ 100.00	4 1/5	$ 420	Assumes treatment in median
15	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	2	$ 500	
16	Existing Misc Concrete Removal	LF	$ 2.50	0	$ -	
17	Existing Pavement Removal	LF	$ 2.50	8	$ 20	
			SUBTOTAL		**$ 2,607**	
			Contingency -- 25%		**$ 652**	
	SEGMENT 4b		***TOTAL***		3,300	

NOTES

1 Assumes treatment for all pavement within landscaped areas (median and/or shoulders)
2 Does not include ROW acquisition costs
3 Assumes no sewer, water or joint trench upgrades or modifications
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing roadway is structurally sound for new traffic index. Ex paving is sawcut as necessary to widen or shift lanes for new section requirements. At minimum, the existing shoulder is assumed to be required to be removed.
7 No distinction of roadway sections at intermediate intersections

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS

SEGMENT 5 SUMMARY

Segment	$/LF	LF	Subtotal	
SEGMENT 5 (Part a)	300.00	3,400	1,020,000.00	
SEGMENT 5 (Part b)	300.00	900	270,000.00	
SEGMENT 5 (Part c)	500.00	1,750	875,000.00	
SEGMENT 5 (Part d)	400.00	540	216,000.00	
SEGMENT 5 (Part e)	500.00	4,700	2,350,000.00	
SEGMENT 5 (Part f)	500.00	6,250	3,125,000.00	
	450.00	17,540	7,856,000.00	7,893,000.00

SEGMENT 5 (Part a)

			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**25**		
B5	***SEGMENT 5 (Part a)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	25	$ 200	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 220**	
			Contingency -- 25%		**$ 55**	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

SEGMENT 5 (Part a)	***TOTAL***	300

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 5 (Part b)					
			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**20**		
B5	***SEGMENT 5 (Part b)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	20	$ 160	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 180**	
			Contingency -- 25%		**$ 45**	
	SEGMENT 5 (Part b)		***TOTAL***		300	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 5 (Part c)					
			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**45**		
B5	***SEGMENT 5 (Part c)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	45	$ 360	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 380**	
			Contingency -- 25%		**$ 95**	
	SEGMENT 5 (Part c)		***TOTAL***		500	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 5 (Part d)					
			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**30**		
B5	***SEGMENT 5 (Part d)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	30	$ 240	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 260**	
			Contingency -- 25%		**$ 65**	
	SEGMENT 5 (Part d)		***TOTAL***		400	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 5 (Part e)					
			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**40**		
B5	***SEGMENT 5 (Part e)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	40	$ 320	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 340**	
			Contingency -- 25%		**$ 85**	
	SEGMENT 5 (Part e)		***TOTAL***		500	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

HIGHWAY 29 ROADWAY INFRASTRUCTURE
ORDER OF MAGNITUDE COSTS

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
	SEGMENT 5 (Part f)					
			ROW	**0**		Landscaping and trees only
			Pavement	**0**	**(ex to stay)**	
			Pavement	**0**	**(new)**	
			Pavement	**0**	**(removed)**	
			Landscape	**0**		
			Sidewalk	**0**	**(new)**	
			Sidewalk	**0**	**(removed)**	
			Curb/Gutter	**0**	**(new)**	
			Curb/Gutter	**0**	**(removed)**	
			L/S Median	**45**		
B5	***SEGMENT 5 (Part f)***					
1	Storm Drain Catch Basin	EA	$ 3,700.00	0	$ -	
2	Joint Trench - Gas, Tel., CATV, Electric	LF	$ 150.00	0	$ -	
3	Street Lights and Pull Box Assemblies	EA	$ 6,000.00	0	$ -	
4	Landscape and Irrigation	SF	$ 8.00	45	$ 360	
5	Street Trees	EA	$ 1,000.00	1/50	$ 20	Assumes trees in median only, every 50'
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	0	$ -	
7	36" RCP Storm Drain Pipe - Class III	LF	$ 250.00	0	$ -	
			SUBTOTAL		**$ 380**	
			Contingency -- 25%		**$ 95**	
	SEGMENT 5 (Part f)		***TOTAL***		500	

NOTES

1 Assumes no stormwater treatment required
2 Assumes no ROW acquisition required
3 Assumes, if irrigation is required, that water is available nearby
4 Assumes existing overhead utilities are left in place (no undergrounding)
5 No new lighting
6 Assumes existing stormwater facilities or drainage patterns do not require modification
7 Assumes no major earthwork is required for planting

Master List of Items and Prices

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ENGINEER'S ESTIMATE QUANTITY (per lin ft)	ENGINEER'S ESTIMATE COST	COMMENTS
1	Existing Pavement Removal	SF	$ 2.50			
2	Existing Misc Concrete Removal	LF	$ 2.50			
3	Earthwork - Cut to Fill	CY	$ 7.00			
4	Subgrade Preparation	SF	$ 0.75			
5	Sidewalk (including rock)	SF	$ 9.00			
6	Curb & Gutter/Vertical Curb	LF	$ 50.00			
7	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00			
8	Aggregate Base (AB) - 20"	TONS	$ 60.00			
9	Striping	LF	$ 2.50			
10	Curb Ramp	EA	$ 3,000.00			
11	Relocate Streetlight	EA	$ 2,000.00			
12	Remove Guard Rail	LF	$ 5.00			
13	Storm Water BMP's (Biofiltration)	SF	$ 100.00			
14						
15						

SR29/American Canyon Intersection

			29 Width	**80**	**(final width)**	
			A.C. Width	**82**	**(ex to stay)**	Avg. at ped crossing
			Curb Radius	**50**		
			S/W Width	**10**		width at curb returns
A1	***SR29/American Canyon Intersection***					
1	Sidewalk (including rock)	SF	$ 9.00	3,142	$ 28,274	
2	Curb & Gutter/Vertical Curb	LF	$ 50.00	314	$ 15,708	
3	Striping	LF	$ 2.50	648	$ 1,620	
4	Curb Ramp	EA	$ 3,000.00	8	$ 24,000	
5	2" Asphalt Pavement Overlay	TONS	$ 170.00	97	$ 16,422	
6	Storm Water BMP's (Biofiltration)	SF	$ 100.00	138	$ 13,823	
7	Pedestrian/Bike Movement Signal Modifcations	LS	$ 20,000.00	1	$ 20,000	
			SUBTOTAL		**$ 119,847**	
			Contingency -- 25%		**$ 29,962**	

NOTES

1 Assumes Storm Water BMP is located within new street segment
2 Additional Traffic Signal Modifcation costs for this interection are included with Segment 2 Roadway Improvement costs
3

SR29/American Canyon Intersection	***TOTAL***	149,900

SR29/South Kelly Road Intersection

			29 Pavement	**148**	**(ex width)**	Avg. at ped crossing for both segments
			29 Pavement	**103**	**(final width)**	Avg. at ped crossing for both segments
			S.K. Pavement	**120**	**(ex to stay)**	
			Curb Radius	**50**		
			S/W Width	**10**		width at curb returns
A2	***SR29/South Kelly Road Intersection***					
1	Existing Pavement Removal	SF	$ 2.50	2,250	$ 5,625	
2	Sidewalk (including rock)	SF	$ 9.00	3,142	$ 28,274	
3	Curb & Gutter/Vertical Curb	LF	$ 50.00	314	$ 15,708	
4	Striping	LF	$ 2.50	892	$ 2,230	Includes new crosswalk striping
5	Curb Ramp	EA	$ 3,000.00	8	$ 24,000	
6	2" Asphalt Pavement Overlay	TONS	$ 170.00	201	$ 34,153	
7	Traffic Signal Modification	LS	$ 50,000.00	1	$ 50,000	
8	Storm Water BMP's (Biofiltration)	SF	$ 100.00	138	$ 13,823	
			SUBTOTAL		**$ 173,813**	
			Contingency -- 25%		**$ 43,453**	

NOTES
1 Assumes Storm Water BMP is located within new street segment
2 Assumes existing traffic signals will remain with minor adjustments and some reprogramming as necessary
3

SR29/South Kelly Road Intersection	***TOTAL***	217,300

SR29/12/121

			Lane Width	**12**		12' wide turn/merge lanes
			Lane Length	**450**		Length of new turn/merge lane
			# New Lanes	**2**		
A5	***SR29/12/121***					
1	Earthwork - Cut to Fill	CY	$ 7.00	23,850	$ 166,950	Includes two new turn lanes (WB right lane & NB slip lane)
2	Subgrade Preparation	SF	$ 0.75	10,800	$ 8,100	Includes two new turn lanes (WB right lane & NB slip lane)
3	Asphalt Concrete (AC) - 6.5"	TONS	$ 170.00	410	$ 69,615	Includes two new turn lanes (WB right lane & NB slip lane)
4	Aggregate Base (AB) - 20"	TONS	$ 60.00	1,125	$ 67,500	Includes two new turn lanes (WB right lane & NB slip lane)
5	Striping	LF	$ 2.50	1,350	$ 3,375	Two lane stripes WB and one lane stripe NB
6	Traffic Signal Modifications	LS	$ 15,000.00	1	$ 15,000	Relocate and adjust timing of existing equipment
7	Relocate Streetlight	EA	$ 2,000.00	1	$ 2,000	
8	Remove Guard Rail	LF	$ 5.00	300	$ 1,500	
9	Storm Water BMP's (Biofiltration)	SF	$ 100.00	432	$ 43,200	Locate new swale within existing landscaping
			SUBTOTAL		**$ 377,240**	
			Contingency -- 25%		**$ 94,310**	

NOTES
1 Assumes existing drainage remains uninterupted
2 Assumes existing traffic signals will remain with one pole relocation and some reprogramming as necessary
3 Assumes no wet utility upgrades or modifications
4 Assumes Storm Water BMP can infiltrate into ground and no subdrain is required

SR29/12/121	***TOTAL***	471,600

APPENDIX E:

PUBLIC COMMENTS ON DRAFT PLAN

Comments received on the DRAFT SR29 Gateway Corridor Improvement Plan (February 2014)

Comments from Public Workshop, American Canyon, Feb 10, 2014

Segments 2-3

1. Boulevard concept does not allow for easy access to merchants
2. Boulevard concept seems to assume our residents only traverse within the distance between American Canyon Rd and Napa Junction and aren't that interested in heading north to Napa etc.

Bike/Ped

1. Be clear about the bike facilities
2. Cross reference with countywide bike plan and other network connections

Segment 4

1. Extension of Flosden to Green Island would relieve the pressure on SR29
2. Another corridor on Wetlands Edge to airport would also relieve pressure
3. These 2 changes would minimize additional changes needed to SR29
4. TIME LIGHTS – lights ARE timed will from airport to American Canyon Rd, (given existing speed limit)
5. Timing is BAD between American canyon Rd and Napa Junction Rd (30 minutes am and pm)
6. Bike Access along the vine trail vs SR29 . . .what is the preferred route? Also, where can bike access cross the tracks?

Intersections

1. Soscol Ferry Rd businesses will suffer – make sure to consider truck access northbound from Devlin and southbound to Devlin
2. Bypass the city of American Canyon entirely (like Napa) via and underpass and/or grade separated intersections
3. Improve the Devlin/Soscol Ferry Rd intersection to address safety issues, which are already bad.
4. Separate SR12 and SR29 between Airport Rd and SR221 on its own alignment to segregate SR12 through traffic
5. At the Airport Rd/Jameson Canyon intersection add a flyover for the SB29 left turn on to EB SR12 (Jameson)
6. The Soscol flyover will obscure view of the Grape Crusher as people approach from the south and we will lose this element of a gateway entrance into Napa Valley.

Comments from Public Workshop, City of Napa, Feb 12, 2014

Bike/Ped

1. Make it clear that designation of Class II bike lanes is possible/desirable between N. American Canyon and Soscol Ave.
2. Accommodate bicycles on the Butler Bridge

Intersections

1. Concern about flyovers: southbound travelers are going to be moving fast – accidents are possible as cars try to merge left to turn left on Jameson Canyon road, especially if the Jameson interchange does not happen.
2. Consider designing in a way that capitalizes on Devlin continuing through to Airp9ort – Trucks may go through from 221 to Devlin. Maybe that should be encouraged
3. Jameson interchange should be reconsidered as soon as Soscol and Devlin are improved and Jameson Canyons improvements are open/complete
4. Look at flyover option at Carneros also

Segments 2/3

1. Mark the shoulder as Class II bike lane, giving consideration to transitions
2. Opportunities for people to move in and out of the local access lanes is very important
3. Perhaps a compromise for the Boulevard would be to have LIMITED left turns, while eliminating many of them – good example is RT 111 in Palm Desert CA

Transit

1. The studies used to discount the effectiveness of BRT are out of date (2003) – project should examine successful BRT projects in Aspen CO and in Eugene OR.

APPENDIX F:

MICROSIMULATION MODELING RESULTS

FEHR PEERS

MEMORANDUM

Date: June 13, 2014

To: Kate Miller and Eliot Hurwitz, NCTPA

From: Dave Stanek and Steve Crosley, Fehr & Peers

Subject: ***SR 29 in American Canyon***

SF 12-0651.01

Fehr & Peers has prepared a traffic microsimulation analysis of two options for the State Route 29 (SR 29) corridor in American Canyon:

- **Option 1 – Modified Boulevard**. This option includes three lanes in each direction on SR 29.
- **Option 2 – Boulevard**. This option includes two lanes in each direction on SR 29 (mainline) and one local access lane in each direction.

The purpose of this memorandum is to list the assumptions used to build the microsimulation models and to present the analysis results.

MODEL INPUTS

Forecasts

Traffic

SR 29 draws vehicular traffic from all across the region; therefore a multi-county model which tracks trips from the region and accounts for land use changes both in and outside of Napa County was best suited for the SR 29 Corridor Gateway Study. The Napa-Solano Travel Demand Model (N-STDM) was determined to be the appropriate tool to perform traffic forecasting for the SR 29 corridor. The memorandum Travel Demand Model Assumptions for the SR 29 Corridor Gateway Study (Fehr & Peers, May 2013) discussed the updates to the land use and circulation network in the N-STDM that was used to develop intersection turning movement forecasts.

The peak hour factor was assumed to be 0.95 based on congested conditions that would occur on the corridor.

Both options use the same total demand volume. The intersection turning movement volumes for the Modified Boulevard option are provided in the attachment. Direct movements that are prohibited in the Boulevard option – for example, the northbound left turn to Crawford Way – are diverted to U-turn movements at adjacent intersections. As a result, the intersection turning movement volumes vary slightly between the options.

FEHR PEERS

Transit

In general, future public transit improvements discussed in county planning documents are at the policy level rather than identifying specific route additions, changes, or improvements. For the American Canyon Circulation Element Update, the Plan discusses building a multi-modal transit center on SR 29 within the designated Community Center or Town Center. In addition, it recommends providing transit linkages between the Community Center or Town Center and regionally-related transit such as BART, commuter railway and the Vallejo ferry.

Today, the corridor is served by VINE Transit and American Canyon Transit. VINE Route 11 provides local service between Napa and Vallejo Ferry Terminal via American Canyon and unincorporated Napa County. The route operates with 30 to 40 minute headways during peak weekday hours and one hour headways off-peak and on Saturday (the route does not run on Sunday). VINE Route 29 is an express route that offers service between Calistoga and the El Cerrito Del Norte BART Station via Napa, American Canyon, and Vallejo. The route operates with four AM outbound and four PM inbound trips each weekday to/from BART. The two routes that operate in American Canyon are deviated fixed route services. We have not assumed any changes to transit in the corridor under future conditions.

Pedestrian/Bicycle

The N-STDM does not include pedestrian or bicycle volume estimates. Our base case is the following: Pedestrian crossings are assumed to have 10 pedestrians per hour, 5 in each direction. The bicycle volume is assumed to be 10 bicyclists per hour, 5 in each direction.

Trucks

The Caltrans truck volume book lists the daily truck counts on SR 29 as 8 percent at SR 37 and 7 percent at SR 12 based on daily volumes. Given the higher non-truck volumes during peak hours, the truck percentage for SR 29 is assumed to be 6 percent for the analysis. The truck percentage for the local streets is 3 percent, which is the default recommended value in the *Highway Capacity Manual* (Transportation Research Board, 2010).

Design Options

The typical cross sections used to develop the option corridor layouts are shown in Figures 1 and 2. All improvements under the project options are assumed to occur north of American Canyon Road and south of the railroad overhead north of Napa Junction Road. Both options assume that a separate project would widen SR 29 to three lanes in each direction north of Napa Junction Road. Figures 3 through 5 show the side-by-side corridor layouts of the existing and the two proposed options.

Due to right-of-way considerations, the actual project layout may differ. When building the corridor model, the following convention was used. For the Modified Boulevard Option, the right edge of the southbound lanes (edge of traveled way) was assumed to be the same as under existing conditions. For the Boulevard Option, the left edge of the southbound lanes (edge of traveled way) was matched to the left edge of the southbound lanes in the Modified Boulevard Option.

For the Boulevard Option, the SR 29 mainline is assumed to only travel through at signalized intersections except at American Canyon Road: all turning movements are made from the frontage road. At signals,

the frontage road would have a 250-foot left-turn pocket. Access from the mainline to the frontage road via a 100-foot long slip ramp would occur 200 feet downstream of a signalized intersection. The conflicting frontage road traffic would have a stop sign at the junction with the slip ramp, and the slip ramp would be uncontrolled. Access from the frontage road to the mainline would occur at signalized intersections.

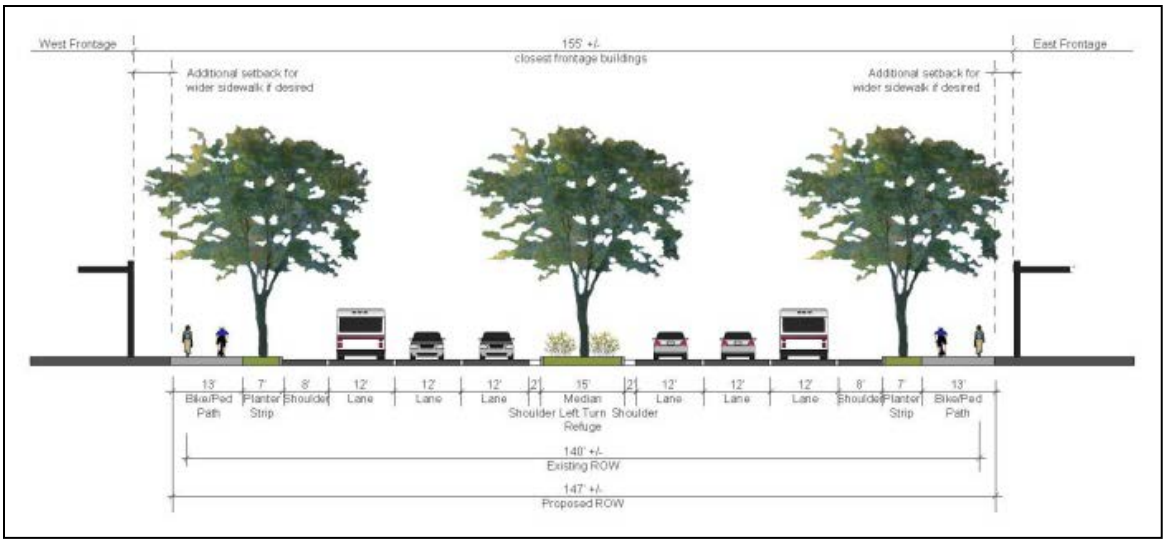

Figure 1. Modified Boulevard Option

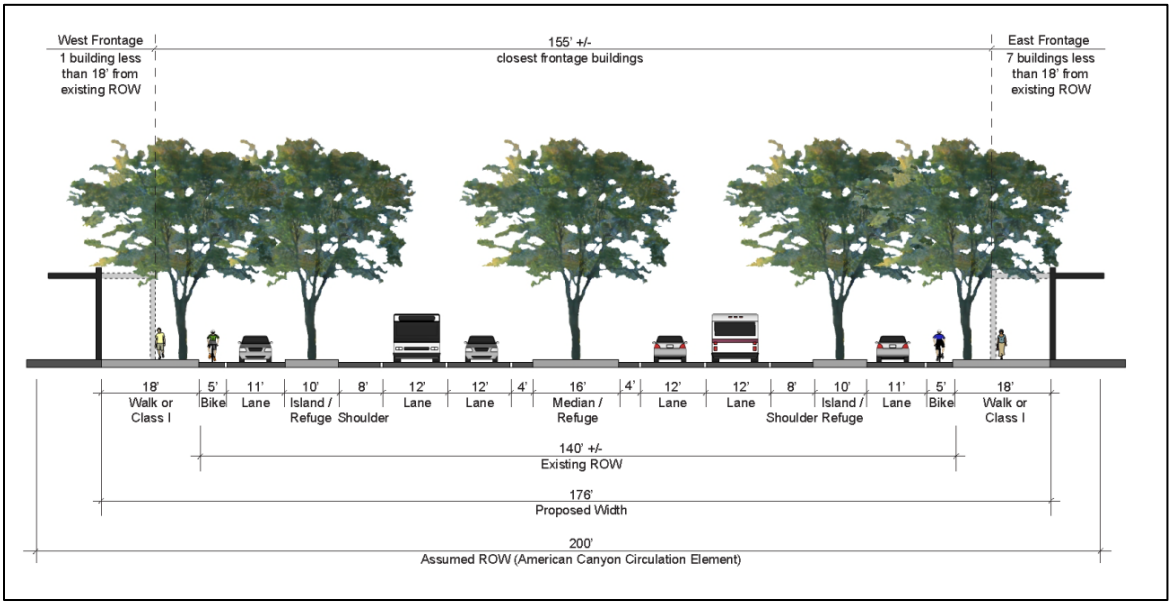

Figure 2. Boulevard Option

FEHR PEERS

Travel Speed

In the study area, the current posted speed on SR 29 is 55 mph. Both proposed options would reduce the posted speed to 45 mph. For the Boulevard Option, the frontage road would have a posted speed of 25 mph.

Turn Pocket Lengths

The existing turn pocket lengths include deceleration lane length based on the existing design speed of 55 mph. Both options would have a lower design speed and design features characteristic of urban areas. As a result, the SR 29 pocket lengths (on the SR 29 mainline for the Boulevard Option) will be revised using the following approach. The pocket length is the sum of the storage and deceleration lengths. The storage length for the turn pocket will be calculated as 1 foot per vehicle in the PM peak hour. Table 205.2B in the Highway Design Manual is used to determine deceleration length. Assuming partial deceleration is permitted on the through lanes, the design speed for the deceleration distance can be reduced by 10 to 20 mph. The table shows 235 feet for a design speed of 30 mph and 315 feet for a design speed of 40 mph. For this planning exercise, the deceleration lane length will be set to 250 feet.

Driveways

For the Modified Boulevard Option, the existing driveways would be squared-up so that the right turn in and out movements would be performed at lower speed. This will improve safety for pedestrians and bicyclists that cross the driveways. The existing northbound right-turn pockets at the Doubletree Driveway, Antonina Avenue, and Napa Junction Driveway will be retained. At the City Hall and Canyon Plaza Driveways, a 250-foot right turn pocket would be provided. The existing acceleration lanes would be removed at all driveways.

For the Boulevard Option, all driveways will be right-in/right-out with access to and from the frontage road only. Access to the SR 29 mainline will occur only at signalized intersections or via slip ramps from the mainline to the frontage road.

Signal Timing

For the analysis, the signalized intersections are optimized and coordinated based on the cumulative year travel volume, the posted speed of 45 mph, and the lane configuration. Pedestrian clearance time was calculated using a walking speed of 3.5 feet per second and applied to each design option layout. In the Boulevard option, the frontage roads are served by exclusive signal phases (as described further in the next section). These additional phases cause the selected cycle length to be longer at 200 seconds, compared to 180 seconds for the Modified Boulevard option.

Intersections

<u>American Canyon Road</u>

For both options, an eastbound bike lane east of SR 29 is assumed to be added. And, a pedestrian crosswalk would be added for the north and east legs. The southbound left turn pocket would be shortened to 650 feet.

For both options, the eastbound and westbound approaches will have separate left turn phases. The current split phase operation is planned to be converted to separate left turn phases later in 2014. For the Boulevard Option, an additional exclusive phase would be added for the southbound approach from the frontage road.

For the Boulevard Option, the existing southbound left and right turn pockets would be retained. Due to the adjacent frontage road, the southbound right turn movement from the mainline would be prohibited on red. The northbound frontage road would begin from a slip ramp that starts 100 feet north of the intersection.

Crawford Way

This intersection is assumed to remain unsignalized with side-street stop control. For the Modified Boulevard Option, the southbound u-turn and the eastbound left turn would be prohibited. The pocket length for the northbound left-turn lane would be 350 feet. For the Boulevard Option, the southbound U-turn, the eastbound left turn, and the northbound left turn movements would be prohibited.

Donaldson Way

The existing signal control would remain under both options with no changes to the side-street approaches. The northbound left-turn pocket length would be 350 feet and the southbound left turn pocket length would be 500 feet. A crosswalk would be added to the north leg. The westbound right-turn lane planned for construction in 2014 is included in both options.

For the Modified Boulevard Option, the current signal phasing would be retained. For the Boulevard Option, the signal would have four phases: (1) northbound and southbound through on the mainline, (2) northbound frontage road, (3) southbound frontage road, and (4) eastbound and westbound. The frontage road approaches would not be able to go concurrently due to overlapping left-turn movements. With this phasing, the westbound and eastbound left turns would be converted from protected to permissive movements.

Poco Way / S Napa Junction Road

A signal would be added at this location under both options. Crosswalks would be added to all four legs. A 200-foot left-turn pocket is assumed to be added on both side-street approaches. On the SR 29 approaches, 250-foot right turn and 350-foot left-turn pockets are assumed.

For the Modified Boulevard Option, the signal phasing would be similar to the existing phasing at Donaldson Way. For the Boulevard Option, the signal would have four phases: (1) northbound and southbound through on the mainline, (2) northbound frontage road, (3) southbound frontage road, and (4) eastbound and westbound. The frontage road approaches would not be able to go concurrently due to overlapping left-turn movements. With this phasing, the westbound and eastbound left turns would be permissive.

Rio Del Mar

Under both options, the signal would be removed at this location. For the Modified Boulevard Option, the existing turning movements would be retained with no changes to the turn pocket lengths.

FEHR PEERS

Eucalyptus Drive

Under both options, the fourth (west) leg would be constructed. The west leg would have one receiving lane, two left-turn pocket lanes (200 feet of storage), and a shared through/right-turn lane. Pedestrian crosswalks would be provided on all legs.

For the Modified Boulevard Option, the signal phasing will either be eight phase (separate left-turn phases on all approaches) or split phase for the eastbound and westbound approaches depending on the forecast volumes. For the Boulevard Option, the signal would have five phases: (1) northbound and southbound through on the mainline, (2) northbound frontage road, (3) southbound frontage road, (4) eastbound, and (5) westbound. The frontage road approaches would not be able to go concurrently due to overlapping left-turn movements. Permissive left turns would not be feasible for the eastbound and westbound approaches since double left-turn lanes are provided.

Napa Junction Road

Under both options, the existing signal and lane configuration for the side street would be retained. SR 29 would transition back to the existing roadway north of this intersection and before the railroad overhead. Both options include the planned widening of the eastbound and westbound approaches to have dual left turn lanes.

For the Modified Boulevard Option, the signal phasing will either be eight phase (separate left-turn phases on all approaches) or split phase for the eastbound and westbound approaches depending on the forecast volumes. For the Boulevard Option, the signal phasing would be similar except that an additional exclusive phase would be needed to serve the approach from the northbound frontage road.

ANALYSIS METHODOLOGY

The design options were analyzed using the Vissim (version 6) traffic microsimulation software. The analysis uses models of vehicle performance and driver behavior to model the interaction of agents (cars, bicycles, pedestrians, etc.), roadways, and traffic control. The software outputs various performance measures including throughput (volume served), delay, speed, and travel time. The software uses random seed values to generate vehicle entry time and vehicle characteristics. The results are an average of ten runs with different random seeds. Using the intersection delay results, the intersection LOS was assigned using the criteria shown in Table 1.

FEHR & PEERS

TABLE 1: INTERSECTION LOS THRESHOLDS

LOS	Average Delay (sec/veh)		Description
	Stop Control and Roundabout	Signal Control	
A	≤ 10	< 10	Very low delay occurs due to little or no conflicting traffic.
B	> 10 to 15	> 10 to 20	Low delay occurs although conflicting traffic becomes noticeable.
C	> 15 to 25	> 20 to 35	Average delays result from increased conflicting traffic.
D	> 25 to 35	> 35 to 55	Longer delays occur due to a reduction in available gaps. At signals, individual cycle failures are noticeable.
E	> 35 to 50	> 55 to 80	High delays and extensive queues occur. This value indicates volume-to-capacity ratios. This is considered to be the limit of acceptable delay.
F	> 50	> 80	Delays are unacceptable to most drivers due to over-saturation.

Note: sec/veh = seconds per vehicle
Source: *Highway Capacity Manual*, Transportation Research Board, 2010

PERFORMANCE MEASURES

Table 2 summarizes the network performance of the two design options.

TABLE 2: NETWORK PERFORMANCE

Performance Measure		Modified Boulevard	Boulevard
Percent Demand Volume Served		99%	76%
Total Delay[1]	All Traffic	386 hours	896 hours
	Non-motorized	8 hours	10 hours
Average Speed for Motorized Traffic		22.8 mph	10.9 mph
Number of Stops for Motorized Traffic		19,711 stops	42,220 stops
Travel Time/Speed[2]	Northbound	5.8 minutes / 26.0 mph	7.3 minutes / 20.8 mph
	Southbound	6.3 minutes / 24.2 mph	11.2 minutes / 13.5 mph

Notes: 1. Delay to vehicles queued outside of the network (for example, north of South Kelly Road) are not measured.
2. Travel time and speed are measured for vehicles traveling from Kimberly Drive to Green Island Road.
Source: Fehr & Peers, 2014

The Modified Boulevard option has three through lanes in each direction at the study intersections. With the higher capacity, this option is able to serve nearly all of the cumulative year PM peak hour traffic demand during the peak hour. The Boulevard option, which has two through lanes, would only serve about three-fourths of the peak hour demand volume during the peak hour. As a result, the total delay measured in the analysis area for the Boulevard option is more than double the delay for the Modified Boulevard option. The network-wide average speed and number of stops show similar results: the Boulevard option has less than half the average speed and more than twice the number of stops as the Modified Boulevard option. Travel time between Kimberly Drive (south of American Canyon Road) and Green Island Road (north of Napa Junction Road) is 1.5 minutes faster in the northbound direction and nearly five minutes faster in the southbound direction for the Modified Boulevard option.

Table 3 shows the intersection level of service (LOS) and average delay for the signalized intersections. The detailed operations analysis results from the Vissim models are provided in an attachment.

TABLE 3: INTERSECTION OPERATIONS

Intersection	Modified Boulevard		Boulevard	
	LOS	Delay	LOS	Delay
1. Napa Junction Road	E	66	F	201
2. Eucalyptus Drive	E	58	F	95
3. Poco Way/S Napa Junction Road	C	29	D	39
4. Donaldson Way	C	28	D	45
5. American Canyon Road	E	61	F	181

Note: Average delay is reported in seconds per vehicle.
Source: Fehr & Peers, 2014

The study intersections would operate at one LOS grade better under the Modified Boulevard compared to the Boulevard option. The fewer through lanes and higher signal cycle length in the Boulevard option provide lower corridor capacity. The lower capacity causes the higher average delays.

In the Boulevard option, the southbound queue at Napa Junction Road extends outside the model network boundary at South Kelley Road, which is about 5,000 feet north. For the Modified Boulevard option, the average maximum queue length for the southbound approach is 3,275 feet, which is less than the distance to Green Island Road (3,700 feet).

SUMMARY

The transportation analysis of cumulative year PM peak hour conditions shows that the Modified Boulevard option out-performs the Boulevard option with regard to motorized vehicle operations. The Modified Boulevard option has a higher throughput, lower total delay, and lower travel times on SR 29.

Although the Boulevard option would have higher non-motorized delay due to the longer cycle lengths, the level of pedestrian and bicycling comfort would likely be higher. The Boulevard option's cross section has multiple medians so that pedestrians crossing SR 29 would have less exposure to vehicle traffic. The north-south pedestrian phases at Eucalyptus Drive, Poco Way/South Napa Junction Road, and Donaldson Way would not have conflicting traffic since the phases are concurrent with the SR 29 mainline (for the Modified Boulevard option, northbound and southbound right-turning vehicles must yield to pedestrians and bicycles). Also, the frontage roads provide a barrier to the higher speed traffic on mainline lanes, which would improve comfort for pedestrians and bicyclists traveling along SR 29.

Vehicle performance for the Boulevard option could be improved with additional project features. For example, providing three through lanes for the mainline would provide additional capacity. Alternately, grade separation of the mainline lanes at the local street intersections would also increase through capacity for SR 29. These additional features may require additional right-of-way and would have higher construction cost (particularly for the grade separations).

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Figure 3

SR 29 Improvement Options

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Figure 4

SR 29 Improvement Options

EXISTING CONDITIONS

MODIFIED BOULEVARD

BOULEVARD

N

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Figure 5

SR 29 Improvement Options

VISSIM Post-Processor **SR 29 American Canyon**
Average Values from 10 Runs **Modified Boulevard (6 Lanes)**
Network Statistics **Cumulative PM Peak Hour**

Performance Measure	Vehicle Types	Average	Std. Dev.	Minimum	Maximum
Average Delay (seconds)	All	135.4	6.53	125.2	146.6
Total Delay (hours)	All	386	21	354	421
Average Stopped Delay (seconds)	All	80.7	2.14	75.1	82.3
Total Stopped Delay (hours)	All	230	7	212	237
Total Distance Traveled (miles)	All	17,251	183	16,823	17,488
Average Speed (mph)	All	22.0	0.56	21.1	23.0
Average Number of Stops	All	2.0	0.11	1.8	2.1
Total Number of Stops	All	20,046	1,178	18,523	21,802
Total Travel Time (hours)	All	783.6	22.5	752.4	820.4
Vehicles Active	All	780	48	713	852
Vehicles Arrived	All	9,488	64	9,346	9,592
Average Delay (seconds)	Motorized	139.9	6.72	129.5	151.2
Total Delay (hours)	Motorized	378	21	347	411
Average Stopped Delay (seconds)	Motorized	82.2	2.14	76.5	83.7
Total Stopped Delay (hours)	Motorized	222	7	205	227
Total Distance Traveled (miles)	Motorized	17,188	182	16,763	17,426
Average Speed (mph)	Motorized	22.8	0.59	21.9	23.8
Average Number of Stops	Motorized	2.0	0.11	1.9	2.2
Total Number of Stops	Motorized	19,711	1,177	18,188	21,464
Total Travel Time (hours)	Motorized	753.3	22.1	723.8	791.0
Vehicles Active	Motorized	751	47	682	821
Vehicles Arrived	Motorized	8,966	62	8,821	9,066
Average Delay (seconds)	Non-motorized	55.3	4.67	49.6	65.0
Total Delay (hours)	Non-motorized	8	1	7	10
Average Stopped Delay (seconds)	Non-motorized	54.2	4.69	48.5	64.1
Total Stopped Delay (hours)	Non-motorized	8	1	7	10
Total Distance Traveled (miles)	Non-motorized	63	3	59	69
Average Speed (mph)	Non-motorized	2.1	0.06	2.0	2.2
Average Number of Stops	Non-motorized	0.6	0.03	0.6	0.7
Total Number of Stops	Non-motorized	335	13	308	357
Total Travel Time (hours)	Non-motorized	30.2	1.7	28.6	32.8
Vehicles Active	Non-motorized	29	3	23	33
Vehicles Arrived	Non-motorized	523	8	509	537

VISSIM Post-Processor
Average Values from 10 Runs
Peak Hour Travel Time

SR 29 American Canyon
Modified Boulevard (6 Lanes)
Cumulative PM Peak Hour

Mode	Description	Distance (ft)	Volume (vehicles)		Travel Time (minutes)		Speed (mph)
			Average	Std. Dev.	Average	Std. Dev.	Average
Motorized	Northbound SR 29	13,343	674	16	5.84	0.36	26.0
	Southbound SR 29	13,343	1293	21	6.26	0.65	24.2

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Volume and Delay by Movement | **Cumulative PM Peak Hour**

Intersection 1 **SR 29/Napa Junction Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	**Movement**	**Volume (vph)**	**Average**	**Percent**	**Average**	**Std. Dev.**	**LOS**
NB	U Turn	10	10	104.0%	78.1	43.6	E
	Second Left						
	Left Turn	70	66	94.7%	123.7	21.0	F
	Through	1,630	1,612	98.9%	19.9	4.8	B
	Right Turn	30	30	99.7%	9.1	5.1	A
	Second Right						
	Subtotal	1,740	1,719	98.8%	24.3	5.8	C
SB	U Turn						
	Second Left						
	Left Turn	240	240	99.8%	144.2	29.4	F
	Through	3,280	3,252	99.1%	84.1	35.6	F
	Right Turn	310	304	98.0%	63.0	35.4	E
	Second Right						
	Subtotal	3,830	3,795	99.1%	86.4	34.8	F
EB	U Turn						
	Second Left						
	Left Turn	70	69	98.3%	82.4	10.2	F
	Through	30	28	91.7%	60.2	31.6	E
	Right Turn	50	53	105.8%	49.3	7.4	D
	Second Right						
	Subtotal	150	149	99.5%	65.3	7.9	E
WB	U Turn						
	Second Left						
	Left Turn	60	59	98.2%	86.6	17.5	F
	Through	40	43	107.5%	54.5	16.4	D
	Right Turn	60	63	104.3%	30.6	9.1	C
	Second Right						
	Subtotal	160	165	102.8%	57.5	12.3	E
Total		5,880	5,828	99.1%	66.2	21.7	E

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Volume and Delay by Movement | **Cumulative PM Peak Hour**

Intersection 2 **SR 29/Eucalyptus Dr** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	**Movement**	**Volume (vph)**	**Average**	**Percent**	**Average**	**Std. Dev.**	**LOS**
NB	U Turn						
	Second Left						
	Left Turn	75	65	86.5%	81.8	12.7	F
	Through	1,495	1,477	98.8%	37.2	3.8	D
	Right Turn	315	309	98.0%	20.3	4.4	C
	Second Right						
	Subtotal	1,885	1,850	98.2%	36.0	3.3	D
SB	U Turn	20	22	110.5%	90.3	24.1	F
	Second Left						
	Left Turn	155	154	99.6%	96.3	9.8	F
	Through	2,965	2,942	99.2%	46.7	4.8	D
	Right Turn	250	249	99.5%	24.3	5.4	C
	Second Right						
	Subtotal	3,390	3,367	99.3%	48.0	4.4	D
EB	U Turn						
	Second Left						
	Left Turn	175	173	99.0%	80.3	10.6	F
	Through	100	107	106.7%	68.3	12.0	E
	Right Turn	40	29	72.5%	55.6	9.6	E
	Second Right						
	Subtotal	315	309	98.1%	73.5	9.6	E
WB	U Turn						
	Second Left						
	Left Turn	335	324	96.8%	234.8	54.8	F
	Through	100	95	94.9%	124.3	49.8	F
	Right Turn	85	82	96.4%	111.1	49.9	F
	Second Right						
	Subtotal	520	501	96.4%	192.4	51.5	F
	Total	6,110	6,028	98.6%	57.6	2.9	E

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Volume and Delay by Movement | **Cumulative PM Peak Hour**

Intersection 3 **SR 29/Poco Way-S Napa Junction Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	**Movement**	**Volume (vph)**	**Average**	**Percent**	**Average**	**Std. Dev.**	**LOS**
NB	U Turn	10	9	88.0%	113.1	28.7	F
	Second Left						
	Left Turn	50	49	97.0%	100.5	14.6	F
	Through	1,815	1,796	98.9%	40.4	11.0	D
	Right Turn	15	14	90.7%	24.5	13.1	C
	Second Right						
	Subtotal	1,890	1,867	98.8%	42.2	10.6	D
SB	U Turn						
	Second Left						
	Left Turn	140	133	94.8%	106.6	7.8	F
	Through	2,955	2,904	98.3%	15.3	4.9	B
	Right Turn	150	150	99.8%	10.7	3.3	B
	Second Right						
	Subtotal	3,245	3,186	98.2%	18.9	4.6	B
EB	U Turn						
	Second Left						
	Left Turn	60	59	97.5%	80.1	7.4	F
	Through	15	16	104.0%	57.6	26.9	E
	Right Turn	20	20	100.5%	16.1	12.5	B
	Second Right						
	Subtotal	95	94	99.2%	62.4	5.8	E
WB	U Turn						
	Second Left						
	Left Turn	15	17	113.3%	87.6	31.6	F
	Through	15	15	100.0%	63.0	33.0	E
	Right Turn	40	28	69.5%	20.1	15.3	C
	Second Right						
	Subtotal	70	60	85.4%	51.3	22.8	D
Total		5,300	5,207	98.2%	28.5	6.2	C

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Volume and Delay by Movement | **Cumulative PM Peak Hour**

Intersection 4 **SR 29/Donaldson Way** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	**Movement**	**Volume (vph)**	**Average**	**Percent**	**Average**	**Std. Dev.**	**LOS**
NB	U Turn	5	6	118.0%	75.7	52.9	E
	Second Left						
	Left Turn	55	54	98.4%	74.1	13.5	E
	Through	1,720	1,699	98.8%	24.8	3.6	C
	Right Turn	120	122	101.6%	7.5	2.2	A
	Second Right						
	Subtotal	1,900	1,881	99.0%	25.4	3.4	C
SB	U Turn	10	10	96.0%	122.6	55.3	F
	Second Left						
	Left Turn	210	217	103.1%	120.6	17.8	F
	Through	2,670	2,615	97.9%	16.0	2.6	B
	Right Turn	100	96	95.7%	14.2	5.0	B
	Second Right						
	Subtotal	2,990	2,937	98.2%	24.2	3.6	C
EB	U Turn						
	Second Left						
	Left Turn	60	58	96.8%	95.6	20.7	F
	Through	70	68	97.6%	58.4	14.4	E
	Right Turn	50	50	100.8%	44.8	9.5	D
	Second Right						
	Subtotal	180	177	98.2%	67.4	9.3	E
WB	U Turn						
	Second Left						
	Left Turn	80	80	99.9%	96.3	19.9	F
	Through	80	81	101.4%	59.3	13.8	E
	Right Turn	110	107	97.1%	14.7	5.0	B
	Second Right						
	Subtotal	270	268	99.2%	52.8	8.2	D
Total		5,340	5,262	98.5%	27.8	2.6	C

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Volume and Delay by Movement | **Cumulative PM Peak Hour**

Intersection 5 **SR 29/American Canyon Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	**Movement**	**Volume (vph)**	**Average**	**Percent**	**Average**	**Std. Dev.**	**LOS**
NB	U Turn	10	16	162.0%	110.5	46.8	F
	Second Left						
	Left Turn	180	184	102.3%	97.2	14.4	F
	Through	1,140	1,118	98.1%	58.1	3.1	E
	Right Turn	100	98	98.1%	21.0	3.6	C
	Second Right						
	Subtotal	1,430	1,416	99.0%	61.0	3.9	E
SB	U Turn						
	Second Left						
	Left Turn	905	887	98.0%	93.5	5.8	F
	Through	1,680	1,631	97.1%	41.4	8.5	D
	Right Turn	210	214	101.7%	11.6	2.9	B
	Second Right						
	Subtotal	2,795	2,732	97.7%	56.3	4.3	E
EB	U Turn						
	Second Left						
	Left Turn	150	154	102.9%	89.0	7.3	F
	Through	450	442	98.2%	61.7	4.0	E
	Right Turn	200	196	98.1%	61.2	12.8	E
	Second Right						
	Subtotal	800	793	99.1%	67.1	4.4	E
WB	U Turn						
	Second Left						
	Left Turn	110	111	101.3%	87.3	8.7	F
	Through	360	357	99.3%	58.6	7.6	E
	Right Turn	655	655	99.9%	68.1	18.6	E
	Second Right						
	Subtotal	1,125	1,123	99.9%	67.4	11.7	E
Total		6,150	6,064	98.6%	61.0	4.0	E

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Queue Length | **Cumulative PM Peak Hour**

Intersection 1 **SR 29/Napa Junction Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	350	53	11	39	75	200	41	130	267	NO
	Second Left										
	Left Turn	350	53	11	39	75	200	41	130	267	NO
	Through	1,660	55	9	44	68	639	135	438	803	NO
	Right Turn	300	0	0	0	1	32	13	21	51	NO
	Second Right										
SB	U Turn										
	Second Left										
	Left Turn	500	171	65	106	323	1,435	1,065	372	2,799	MAX
	Through	3,700	1,059	371	717	1,760	3,274	496	2,723	4,410	NO
	Right Turn	500	6	1	5	9	160	59	96	297	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	150	25	4	20	33	113	20	92	151	NO
	Through	440	21	5	17	31	172	32	134	232	NO
	Right Turn	440	23	5	18	32	172	32	134	233	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	150	23	3	19	26	89	15	65	112	NO
	Through	425	24	5	18	35	190	38	128	240	NO
	Right Turn	425	25	5	18	35	189	38	128	240	NO
	Second Right										

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Queue Length | **Cumulative PM Peak Hour**

Intersection 2 **SR 29/Eucalyptus Dr** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn										
	Second Left										
	Left Turn	350	30	5	24	39	188	45	147	296	NO
	Through	1,800	95	16	63	119	740	253	511	1,309	NO
	Right Turn	575	14	3	9	20	235	60	131	354	NO
	Second Right										
SB	U Turn	450	86	9	73	96	346	46	296	434	NO
	Second Left										
	Left Turn	450	86	9	73	96	346	46	296	434	NO
	Through	1,660	321	24	287	357	1,416	13	1,403	1,442	NO
	Right Turn	500	7	2	5	9	159	50	110	250	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	760	53	5	48	63	214	62	140	342	NO
	Through	760	57	10	38	71	335	115	203	536	NO
	Right Turn	760	54	10	36	69	334	115	203	536	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	175	375	81	276	515	607	19	591	643	AVG
	Through	400	133	31	82	193	583	29	512	610	MAX
	Right Turn	400	134	29	81	192	583	29	512	610	MAX
	Second Right										

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Modified Boulevard (6 Lanes)
Cumulative PM Peak Hour

Intersection 3 **SR 29/Poco Way-S Napa Junction Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	350	27	6	19	35	147	31	85	189	NO
	Second Left										
	Left Turn	350	27	6	19	35	147	31	85	189	NO
	Through	2,650	172	24	136	218	938	142	730	1,185	NO
	Right Turn	250	0	0	0	0	24	6	20	40	NO
	Second Right										
SB	U Turn										
	Second Left										
	Left Turn	400	83	7	75	97	303	45	241	364	NO
	Through	1,800	71	20	43	115	1,180	288	743	1,518	NO
	Right Turn	400	0	0	0	1	51	16	20	78	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	200	29	8	22	47	149	30	117	220	NO
	Through	720	7	2	4	10	88	23	46	134	NO
	Right Turn	720	9	2	6	12	92	23	50	137	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	230	8	2	4	10	61	16	42	96	NO
	Through	800	8	3	3	15	90	15	73	116	NO
	Right Turn	800	8	3	2	15	89	15	72	115	NO
	Second Right										

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Modified Boulevard (6 Lanes)
Cumulative PM Peak Hour

Intersection 4 **SR 29/Donaldson Way** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	350	27	5	18	36	156	34	112	233	NO
	Second Left										
	Left Turn	350	27	5	18	36	156	34	112	233	NO
	Through	2,510	87	4	80	96	447	42	379	511	NO
	Right Turn	350	2	1	1	3	73	14	53	99	NO
	Second Right										
SB	U Turn	500	161	24	124	199	552	184	395	1,025	MAX
	Second Left										
	Left Turn	500	161	24	124	199	552	184	395	1,025	MAX
	Through	2,650	48	19	24	89	1,022	321	536	1,462	NO
	Right Turn	350	0	0	0	1	42	15	21	65	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	225	32	5	26	39	168	37	112	245	NO
	Through	1,040	39	5	33	50	235	36	166	293	NO
	Right Turn	1,040	39	5	33	49	234	36	165	292	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	300	44	14	21	71	194	79	85	359	NO
	Through	580	27	5	18	34	171	60	105	272	NO
	Right Turn	125	6	1	4	8	85	17	46	108	NO
	Second Right										

VISSIM Post-Processor | **SR 29 American Canyon**
Average Results from 10 Runs | **Modified Boulevard (6 Lanes)**
Queue Length | **Cumulative PM Peak Hour**

Intersection 5 **SR 29/American Canyon Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	117	26	79	159	442	116	290	656	MAX
	Second Left										
	Left Turn	250	117	26	79	159	442	116	290	656	MAX
	Through	3,050	151	13	134	170	612	126	484	912	NO
	Right Turn	275	8	2	5	12	117	23	75	161	NO
	Second Right										
SB	U Turn										
	Second Left										
	Left Turn	650	289	18	269	326	1,017	354	646	1,408	MAX
	Through	1,320	203	27	158	245	1,019	316	567	1,405	NO
	Right Turn	500	7	2	5	11	137	31	102	211	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	450	130	16	105	147	476	72	380	629	MAX
	Through	850	139	10	123	150	477	71	386	630	NO
	Right Turn	850	138	10	122	148	476	71	385	628	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	450	60	7	50	69	265	33	188	308	NO
	Through	830	67	6	57	76	251	32	200	314	NO
	Right Turn	600	78	92	27	327	618	200	427	1,072	MAX
	Second Right										

VISSIM Post-Processor **SR 29 American Canyon**
Average Values from 10 Runs **Boulevard (4 Lanes)**
Network Statistics **Cumulative PM Peak Hour**

Performance Measure	Vehicle Types	Average	Std. Dev.	Minimum	Maximum
Average Delay (seconds)	All	366.6	12.68	349.5	388.4
Total Delay (hours)	All	905	29	872	952
Average Stopped Delay (seconds)	All	144.3	6.50	138.1	156.5
Total Stopped Delay (hours)	All	357	17	333	384
Total Distance Traveled (miles)	All	13,006	117	12,806	13,193
Average Speed (mph)	All	10.7	0.29	10.3	11.0
Average Number of Stops	All	4.8	0.24	4.4	5.2
Total Number of Stops	All	42,534	2,085	39,105	46,317
Total Travel Time (hours)	All	1,219.1	28.7	1,187.1	1,265.5
Vehicles Active	All	1,238	59	1,120	1,347
Vehicles Arrived	All	7,655	63	7,563	7,749
Average Delay (seconds)	Motorized	386.5	13.89	367.3	410.9
Total Delay (hours)	Motorized	896	29	862	942
Average Stopped Delay (seconds)	Motorized	149.7	7.14	142.7	163.0
Total Stopped Delay (hours)	Motorized	347	17	324	374
Total Distance Traveled (miles)	Motorized	12,942	117	12,746	13,129
Average Speed (mph)	Motorized	10.9	0.31	10.5	11.3
Average Number of Stops	Motorized	5.1	0.26	4.6	5.5
Total Number of Stops	Motorized	42,220	2,089	38,792	46,012
Total Travel Time (hours)	Motorized	1,187.2	28.7	1,155.4	1,232.7
Vehicles Active	Motorized	1,207	55	1,096	1,306
Vehicles Arrived	Motorized	7,136	66	7,022	7,252
Average Delay (seconds)	Non-motorized	64.9	3.36	59.4	68.2
Total Delay (hours)	Non-motorized	10	1	9	11
Average Stopped Delay (seconds)	Non-motorized	63.9	3.36	58.4	67.3
Total Stopped Delay (hours)	Non-motorized	10	1	9	11
Total Distance Traveled (miles)	Non-motorized	64	2	60	67
Average Speed (mph)	Non-motorized	2.0	0.03	2.0	2.1
Average Number of Stops	Non-motorized	0.6	0.02	0.5	0.6
Total Number of Stops	Non-motorized	314	12	296	333
Total Travel Time (hours)	Non-motorized	31.9	1.2	30.3	33.9
Vehicles Active	Non-motorized	32	7	19	41
Vehicles Arrived	Non-motorized	519	15	496	544

VISSIM Post-Processor
Average Values from 10 Runs
Peak Hour Travel Time

SR 29 American Canyon
Boulevard (4 Lanes)
Cumulative PM Peak Hour

Mode	Description	Distance (ft)	Volume (vehicles)		Travel Time (minutes)		Speed (mph)
			Average	Std. Dev.	Average	Std. Dev.	Average
Motorized	Northbound SR 29	13,344	659	14	7.30	0.82	20.8
	Southbound SR 29	13,347	815	29	11.24	0.79	13.5

VISSIM Post-Processor **SR 29 American Canyon**
Average Results from 10 Runs **Boulevard (4 Lanes)**
Volume and Delay by Movement **Cumulative PM Peak Hour**

Intersection 1 **SR 29/Napa Junction Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	U Turn	10	11	105.0%	111.1	38.8	F
	Second Left	70	62	88.0%	93.3	12.1	F
	Left Turn						
	Through	1,610	1,527	94.9%	15.2	3.3	B
	Right Turn	20	22	108.0%	102.3	19.3	F
	Second Right	30	29	97.0%	50.6	30.8	D
	Subtotal	1,740	1,650	94.8%	21.8	3.7	C
SB	U Turn						
	Second Left						
	Left Turn	240	153	63.8%	385.9	20.7	F
	Through	3,282	2,043	62.2%	344.0	19.1	F
	Right Turn	310	192	61.9%	280.0	15.4	F
	Second Right						
	Subtotal	3,832	2,388	62.3%	342.0	18.2	F
EB	U Turn						
	Second Left						
	Left Turn	70	68	97.6%	94.1	10.9	F
	Through	30	28	94.7%	72.3	18.4	E
	Right Turn	50	52	104.0%	33.5	14.7	C
	Second Right						
	Subtotal	150	149	99.1%	70.5	6.8	E
WB	U Turn						
	Second Left						
	Left Turn	60	0	0.0%	0.0	0.0	A
	Through	40	1	1.8%	0.0	0.0	A
	Right Turn	60	1	1.3%	0.0	0.0	A
	Second Right						
	Subtotal	160	2	0.9%	0.0	0.0	A
Total		5,882	4,188	71.2%	201.3	9.3	F

VISSIM Post-Processor **SR 29 American Canyon**
Average Results from 10 Runs **Boulevard (4 Lanes)**
Volume and Delay by Movement **Cumulative PM Peak Hour**

Intersection 2 **SR 29/Eucalyptus Dr** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	U Turn	25	24	94.0%	149.9	48.7	F
	Second Left	65	64	98.0%	147.0	59.7	F
	Left Turn	1	0	0.0%	0.0	0.0	A
	Through	1,498	1,430	95.4%	48.0	6.7	D
	Right Turn	1	0	10.0%	0.0	0.0	A
	Second Right	316	300	94.8%	14.7	4.2	B
	Subtotal	1,906	1,817	95.3%	48.3	9.1	D
SB	U Turn	20	14	69.0%	112.7	46.1	F
	Second Left	155	98	63.3%	115.0	22.3	F
	Left Turn	4	4	90.0%	46.7	58.5	D
	Through	2,963	1,830	61.8%	80.2	8.2	F
	Right Turn	1	0	30.0%	1.9	5.9	A
	Second Right	250	152	60.6%	8.5	2.6	A
	Subtotal	3,393	2,098	61.8%	77.4	7.7	E
EB	U Turn						
	Second Left						
	Left Turn	175	174	99.3%	95.9	9.0	F
	Through	100	105	104.7%	70.5	11.6	E
	Right Turn	27	27	98.5%	75.0	25.4	E
	Second Right	3	3	83.3%	25.8	35.9	C
	Subtotal	305	308	100.8%	85.0	6.8	F
WB	U Turn						
	Second Left						
	Left Turn	336	215	64.0%	465.7	12.0	F
	Through	100	66	66.2%	268.6	43.9	F
	Right Turn	79	54	68.7%	263.3	47.6	F
	Second Right	5	3	56.0%	122.3	112.2	F
	Subtotal	520	338	65.1%	385.5	21.2	F
Total		6,124	4,560	74.5%	95.4	5.5	F

VISSIM Post-Processor **SR 29 American Canyon**
Average Results from 10 Runs **Boulevard (4 Lanes)**
Volume and Delay by Movement **Cumulative PM Peak Hour**

Intersection 3 **SR 29/Poco Way-S Napa Junction Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	U Turn	10	8	82.0%	102.1	43.7	F
	Second Left	50	48	95.2%	64.6	9.8	E
	Left Turn	4	3	85.0%	76.8	76.2	E
	Through	1,809	1,718	94.9%	49.9	6.0	D
	Right Turn	1	1	90.0%	0.6	1.8	A
	Second Right	15	12	80.7%	4.1	3.7	A
	Subtotal	1,889	1,790	94.7%	50.2	5.7	D
SB	U Turn	1	0	0.0%	0.0	0.0	A
	Second Left	130	84	64.5%	90.8	11.0	F
	Left Turn	8	9	110.0%	76.5	46.1	E
	Through	2,935	1,834	62.5%	20.8	5.3	C
	Right Turn	1	1	60.0%	2.6	4.6	A
	Second Right	150	97	64.9%	7.9	1.2	A
	Subtotal	3,225	2,025	62.8%	24.0	5.1	C
EB	U Turn						
	Second Left						
	Left Turn	60	59	98.3%	111.2	47.5	F
	Through	15	15	100.0%	58.1	26.7	E
	Right Turn	18	17	96.7%	73.6	30.4	E
	Second Right	2	2	95.0%	9.5	18.4	A
	Subtotal	95	93	98.2%	92.2	26.5	F
WB	U Turn						
	Second Left						
	Left Turn	15	17	110.7%	103.6	30.2	F
	Through	15	15	98.0%	60.6	30.4	E
	Right Turn	24	23	96.3%	76.6	22.0	E
	Second Right	6	6	96.7%	24.0	31.8	C
	Subtotal	60	60	100.3%	72.6	12.0	E
Total		5,269	3,968	75.3%	38.5	4.8	D

VISSIM Post-Processor **SR 29 American Canyon**
Average Results from 10 Runs **Boulevard (4 Lanes)**
Volume and Delay by Movement **Cumulative PM Peak Hour**

Intersection 4 **SR 29/Donaldson Way** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	U Turn	50	47	93.4%	145.1	50.7	F
	Second Left	55	50	91.1%	157.7	67.2	F
	Left Turn	8	8	98.8%	133.2	92.1	F
	Through	1,710	1,623	94.9%	36.4	10.1	D
	Right Turn	1	0	40.0%	1.1	3.4	A
	Second Right	120	117	97.2%	18.8	21.5	B
	Subtotal	1,944	1,845	94.9%	42.2	13.1	D
SB	U Turn	10	6	60.0%	74.4	62.4	E
	Second Left	210	141	67.0%	97.5	22.2	F
	Left Turn	3	3	110.0%	51.3	67.3	D
	Through	2,669	1,672	62.6%	35.7	9.7	D
	Right Turn	1	0	20.0%	1.3	4.3	A
	Second Right	100	63	63.3%	16.2	13.7	B
	Subtotal	2,993	1,886	63.0%	40.4	8.0	D
EB	U Turn						
	Second Left						
	Left Turn	60	61	101.2%	117.4	48.3	F
	Through	70	69	98.0%	71.0	12.8	E
	Right Turn	48	51	105.2%	79.2	16.1	E
	Second Right	2	2	75.0%	22.6	47.1	C
	Subtotal	180	181	100.7%	87.1	13.4	F
WB	U Turn						
	Second Left						
	Left Turn	80	77	96.0%	121.8	29.4	F
	Through	80	78	97.5%	63.8	10.1	E
	Right Turn	105	102	97.2%	69.8	15.2	E
	Second Right	5	4	86.0%	10.4	13.6	B
	Subtotal	270	261	96.7%	82.3	12.3	F
Total		5,387	4,173	77.5%	45.3	8.1	D

VISSIM Post-Processor **SR 29 American Canyon**
Average Results from 10 Runs **Boulevard (4 Lanes)**
Volume and Delay by Movement **Cumulative PM Peak Hour**

Intersection 5 **SR 29/Frontage Rd/American Canyon Rd** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	U Turn	15	15	101.3%	212.4	52.9	F
	Second Left						
	Left Turn	180	176	97.5%	232.9	42.2	F
	Through	1,135	1,095	96.4%	143.1	43.7	F
	Right Turn	100	96	95.6%	103.9	49.3	F
	Second Right						
	Subtotal	1,430	1,381	96.6%	153.5	43.2	F
SB	U Turn						
	Second Left						
	Left Turn	855	556	65.0%	41.7	3.0	D
	Through	1,635	1,045	63.9%	20.6	4.5	C
	Right Turn	210	138	65.8%	19.4	9.9	B
	Second Right						
	Subtotal	2,700	1,738	64.4%	27.0	3.9	C
SE	U Turn	34	35	103.8%	99.4	16.1	F
	Second Left						
	Left Turn	16	15	94.4%	90.7	33.0	F
	Through	42	38	91.4%	92.8	15.6	F
	Right Turn	1	1	70.0%	10.7	34.0	B
	Second Right						
	Subtotal	93	90	96.2%	95.3	9.1	F
EB	U Turn						
	Second Left						
	Left Turn	185	146	79.1%	213.5	89.5	F
	Through	465	442	95.1%	95.4	36.7	F
	Right Turn						
	Second Right						
	Subtotal	650	588	90.5%	125.7	47.4	F
WB	U Turn						
	Second Left						
	Left Turn	110	103	93.7%	233.7	24.9	F
	Through	360	337	93.6%	175.7	24.9	F
	Right Turn	620	563	90.9%	283.3	24.9	F
	Second Right						
	Subtotal	1,090	1,004	92.1%	243.4	21.4	F
Total		5,963	4,801	80.5%	180.7	26.6	F

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Boulevard (4 Lanes)
Cumulative PM Peak Hour

Intersection 1 **SR 29/Napa Junction Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	40	9	30	61	204	34	161	256	NO
	Second Left										
	Left Turn										
	Through	1,660	69	10	52	92	579	296	290	1,147	NO
	Right Turn	715	18	3	13	23	123	21	90	160	NO
	Second Right	715	18	3	13	23	123	21	89	160	NO
SB	U Turn										
	Second Left										
	Left Turn	500	99	6	88	109	346	41	307	407	NO
	Through	3,700	4,837	55	4,728	4,892	5,073	0	5,073	5,074	AVG
	Right Turn	475	4,837	55	4,729	4,893	5,073	0	5,073	5,074	AVG
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	150	28	4	22	33	116	22	92	171	NO
	Through	440	19	5	9	25	169	48	106	237	NO
	Right Turn	440	20	5	10	26	169	48	106	236	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	150	469	15	439	478	495	11	476	507	AVG
	Through	425	0	1	0	3	14	29	0	69	NO
	Right Turn	425	1	1	0	3	14	29	0	70	NO
	Second Right										

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Boulevard (4 Lanes)
Cumulative PM Peak Hour

Intersection 2 **SR 29/Eucalyptus Dr** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	74	21	45	108	294	125	179	551	MAX
	Second Left	250	74	21	45	108	294	125	179	551	MAX
	Left Turn	250	74	21	45	108	294	125	179	551	MAX
	Through	1,800	246	34	198	303	1,117	147	920	1,464	NO
	Right Turn										
	Second Right										
SB	U Turn	250	82	15	60	114	325	61	246	404	MAX
	Second Left	250	82	15	60	114	325	61	246	404	MAX
	Left Turn	250	82	15	60	114	325	61	246	404	MAX
	Through	1,660	689	27	634	738	1,437	10	1,421	1,459	NO
	Right Turn	1,220	3	1	1	5	132	50	65	212	NO
	Second Right	1,220	3	1	1	5	132	50	66	213	NO
EB	U Turn										
	Second Left										
	Left Turn	175	64	15	50	100	304	128	162	551	MAX
	Through	760	57	7	43	72	349	100	209	550	NO
	Right Turn	760	57	7	43	72	349	100	209	550	NO
	Second Right	760	57	7	43	72	349	100	208	549	NO
WB	U Turn										
	Second Left										
	Left Turn	400	551	4	546	559	622	16	601	652	AVG
	Through	400	238	121	63	433	608	15	594	637	MAX
	Right Turn	400	238	121	63	433	608	15	594	637	MAX
	Second Right	400	238	121	63	434	609	15	595	638	MAX

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon Boulevard (4 Lanes)
Cumulative PM Peak Hour

Intersection 3 **SR 29/Poco Way-S Napa Junction Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	26	5	17	33	155	26	121	211	NO
	Second Left	250	26	5	17	33	155	26	121	211	NO
	Left Turn	250	26	5	17	33	155	26	121	211	NO
	Through	2,650	311	28	273	356	1,100	413	813	2,151	NO
	Right Turn	920	0	0	0	0	34	16	21	66	NO
	Second Right	920	0	0	0	0	33	16	20	66	NO
SB	U Turn	250	48	7	37	58	244	49	170	326	NO
	Second Left	250	48	7	37	58	244	49	170	326	NO
	Left Turn	250	48	7	37	58	244	49	170	326	NO
	Through	1,800	109	21	88	156	1,019	511	356	1,502	NO
	Right Turn	885	1	1	1	3	82	25	50	126	NO
	Second Right	885	2	1	1	3	82	25	50	126	NO
EB	U Turn										
	Second Left										
	Left Turn	200	38	18	25	87	169	46	121	279	NO
	Through	720	14	5	6	24	106	36	69	197	NO
	Right Turn	720	14	5	6	24	106	36	69	197	NO
	Second Right	720	14	5	6	24	107	36	69	198	NO
WB	U Turn										
	Second Left										
	Left Turn	230	9	3	6	14	70	18	44	97	NO
	Through	800	17	2	13	21	114	15	92	144	NO
	Right Turn	800	17	2	13	21	114	15	92	144	NO
	Second Right	800	17	2	13	21	115	15	93	144	NO

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Boulevard (4 Lanes)
Cumulative PM Peak Hour

Intersection 4 **SR 29/Donaldson Way** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	96	36	58	166	325	123	213	589	MAX
	Second Left	250	96	36	58	166	325	123	213	589	MAX
	Left Turn	250	96	36	58	166	325	123	213	589	MAX
	Through	2,510	172	42	141	285	741	292	545	1,550	NO
	Right Turn	870	2	1	1	4	78	30	51	146	NO
	Second Right	870	2	1	1	4	79	30	51	147	NO
SB	U Turn	250	90	15	69	114	402	62	304	478	MAX
	Second Left	250	90	15	69	114	402	62	304	478	MAX
	Left Turn	250	90	15	69	114	402	62	304	478	MAX
	Through	2,650	216	80	139	378	1,333	458	628	1,874	NO
	Right Turn	1,410	1	0	0	1	62	19	43	110	NO
	Second Right	1,410	1	0	1	1	62	19	43	110	NO
EB	U Turn										
	Second Left										
	Left Turn	225	41	8	30	53	187	45	146	290	NO
	Through	1,040	51	7	37	62	252	42	206	322	NO
	Right Turn	1,040	51	7	37	62	252	42	206	322	NO
	Second Right	1,040	48	7	35	57	252	42	206	322	NO
WB	U Turn										
	Second Left										
	Left Turn	300	65	38	30	156	223	128	106	556	NO
	Through	580	29	4	25	36	162	46	112	244	NO
	Right Turn	125	42	6	29	49	208	33	155	256	MAX
	Second Right	125	42	6	29	50	208	33	155	256	MAX

VISSIM Post-Processor
Average Results from 10 Runs
Queue Length

SR 29 American Canyon
Boulevard (4 Lanes)
Cumulative PM Peak Hour

Intersection 5 **SR 29/Frontage Rd/American Canyon Rd** **Signal**

Direction	Movement	Storage (ft)	Average Queue (ft)				Maximum Queue (ft)				Exceeds Storage?
			Average	Std. Dev.	Minimum	Maximum	Average	Std. Dev.	Minimum	Maximum	
NB	U Turn	250	449	239	160	893	1,647	471	909	2,354	AVG
	Second Left										
	Left Turn	250	449	239	160	893	1,647	471	909	2,354	AVG
	Through	3,050	682	246	284	1,048	1,703	461	966	2,353	NO
	Right Turn	275	9	3	5	13	128	37	68	196	NO
	Second Right										
SB	U Turn										
	Second Left										
	Left Turn	650	68	6	60	77	351	41	296	409	NO
	Through	2,550	48	5	39	56	379	132	194	640	NO
	Right Turn	550	12	4	7	20	106	39	66	193	NO
	Second Right										
SE	U Turn	325	29	6	18	37	136	31	89	172	NO
	Second Left										
	Left Turn	325	29	6	18	37	136	31	89	172	NO
	Through	1,310	22	6	15	32	109	21	75	138	NO
	Right Turn	1,310	18	6	10	28	109	21	75	138	NO
	Second Right										
EB	U Turn										
	Second Left										
	Left Turn	450	205	78	131	391	600	84	496	730	MAX
	Through	850	225	70	161	392	602	84	497	731	NO
	Right Turn	850	225	70	161	393	603	84	498	732	NO
	Second Right										
WB	U Turn										
	Second Left										
	Left Turn	450	205	78	131	391	600	84	496	730	MAX
	Through	830	225	70	161	392	602	84	497	731	NO
	Right Turn	600	225	70	161	393	603	84	498	732	MAX
	Second Right										

APPENDIX G:

SONOMA BOULEVARD CORRIDOR DESIGN PLAN

city of vallejo

sonoma boulevard

CORRIDOR DESIGN PLAN

FINAL
FEBRUARY 2013

city of vallejo

sonoma boulevard

CORRIDOR DESIGN PLAN

FINAL
FEBRUARY 2013

Funded by the Caltrans' Community-Based
Transportation Planning Grant Program

Prepared by

MIG

In Association with
BAE Urban Economics
Fehr & Peers

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1 introduction

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CHAPTER 1

introduction

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1.1 Plan Approach, Purpose and Objectives

1.2 Regional and City Context

1.3 Planning Area

1.4 Planning Context

1.5 Community-Based Planning Process

1.6 Document Overview

Acknowledged as the "spine" of the Vallejo community, Sonoma Boulevard is a **vitally important street that shapes and impacts the economic vitality, social fabric, physical connections, and perceptions** of the entire City. The Sonoma Boulevard Corridor Design Plan is the culmination of efforts by a wide range of community stakeholders to leverage the area's assets and opportunities and cultivate a shared vision for this critical roadway through Vallejo. Ultimately, this plan is an **action-oriented framework** to guide land use patterns and street improvements to create real change along the corridor.

This chapter is organized as follows:

1.1 Plan Approach, Purpose and Objectives – A "snapshot" of the plan approach, including an overview of the four key "Focus Areas" for Sonoma Boulevard.

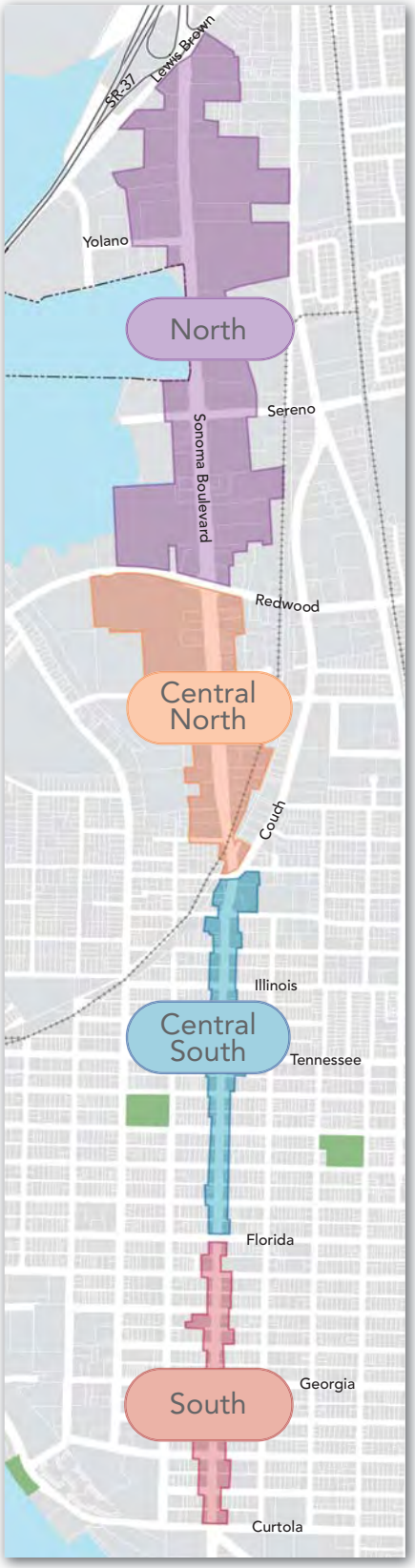
1.2 Regional and City Context – An overview of the corridor's position in the regional and City context and potential as both a destination and connector.

1.3 Planning Area – An outline of the planning area boundaries and immediate context.

1.4 Planning Context – A description of the existing plans and initiatives that impact the planning area.

1.5 Community-Based Planning Process – An overview of the planning process, including community outreach and engagement forums and tools.

1.6 Document Overview – An outline of the remaining chapters in the Corridor Design Plan.



1.1 PLAN APPROACH, PURPOSE AND OBJECTIVES

A multi-faceted roadway that goes through the heart of Vallejo, Sonoma Boulevard is a vital resource to the community. It is also strategically positioned within the Bay Area as a link between San Francisco to the south and Napa Valley to the north (*see Figure 1.1: Regional Context*). Though the corridor is currently underperforming, there is potential to capitalize on Sonoma Boulevard's location and assets to create an attractive destination for visitors, businesses, and local residents alike. The Corridor Design Plan builds on this opportunity by providing a planning framework to **catalyze the economic growth** of the corridor and surrounding areas; create an improved and **environmentally sustainable streetscape** area; and implement a cohesive approach to **enhance the character and development** of the corridor. Under this framework the community has envisioned that Sonoma Boulevard will promote **economic vitality, pedestrian and bicycle safety, and social and environmental health** for the area and entire City.

The Sonoma Boulevard planning area (*see Figure 1.2: City Context and Figure 1.3: Planning Area*) has many positive attributes, from an appealing natural environment to a range of commercial services and residential development. There is a distinct historic fabric as the roadway passes through Downtown and several traditional neighborhoods. The Vallejo Transit Center and Kaiser Permanente Medical Center are nearby assets.

Despite these attributes, Sonoma Boulevard has several challenges and constraints, including poor pedestrian connections, vacant and underutilized spaces, and a lack of clearly defined destination nodes. Weak market demand and perception issues also impact the corridor.

Given these assets and challenges, the plan approach revolves around creating incremental **"quick win" implementation measures** that can respond to market opportunities as they arise and are supported by the greater community. To add greater depth and specificity to this approach, the plan breaks down the roadway into **four distinct "Focus Areas."** Each area has a set of distinctive land uses, streetscape elements, neighborhood character, and overall function within the City and regional context. The Focus Areas are illustrated at left, highlighted on the following page, and covered in detail in Chapter 4: Land Use Activation and Mobility Strategy.

FOCUS AREA OVERVIEW

North Focus Area

The North Focus Area is the northern gateway to the Sonoma Boulevard planning area. This portion of the corridor contains large parcels and quick highway access, resulting in opportunities to attract regional destination commercial businesses and improve the economic vitality of the corridor. In addition, the nearby White Slough has potential to become a local and regional draw for outdoor recreation and the promotion of sustainability, health, and wellness.

Central North Focus Area

The Central North Focus Area currently contains several light industrial businesses and a variety of commercial uses. In a constrained economy this area can serve as an incubator for new businesses, as well as a hub for vocational training to increase the skill sets of the local workforce.

Central South Focus Area

The Central South Focus Area has a finer grain than the northern portions of the corridor. This more pedestrian-oriented grid has potential to provide more neighborhood retail and services geared toward local residents. In addition, the diversity and family orientation of the surrounding communities can inspire a playful, colorful, and vibrant streetscape environment for the enjoyment of users of all ages.

South Focus Area

The South Focus Area is well positioned to support the planning and development efforts underway in the Downtown and nearby waterfront, and to funnel visitors into the heart of the City. The fine grain and historic fabric in this portion can accommodate creative streetscape design elements as well as start-up businesses to increase the vibrancy and streetlife of the community.

1.2 REGIONAL AND CITY CONTEXT

The City of Vallejo is located northeast of San Francisco along San Pablo Bay *(see Figure 1.1: Regional Context)*. Neighboring cities include Benicia and American Canyon. As a gateway into the Napa and Sonoma valley regions, several key state freeways and highways run through the City including Interstate 80, State Route 37, and Sonoma Boulevard (State Route 29). Vallejo is also regionally connected through the Baylink Ferry, Napa County VINE, and Amtrak rail service. Vallejo Transit provides local and regional bus service with connections to the Vallejo Ferry Terminal and the El Cerrito Del Norte, Pleasant Hill, and Walnut Creek BART stations.

Sonoma Boulevard is located toward the western side of the City of Vallejo and serves as a major north/south connector *(see Figure 1.2: City Context)*. Natural features adjacent to the planning area include the Napa River and the White Slough, a marshy, low-lying area that fills with tidal water from San Pablo Bay. Major nearby influences include maritime activities along the waterfront, civic uses in the Downtown, as well as the St. Vincent's Historic District and Architectural Heritage District (*see Figure 1.2: City Context)*. Train tracks cross through the boulevard close to its middle portion near Couch Street.

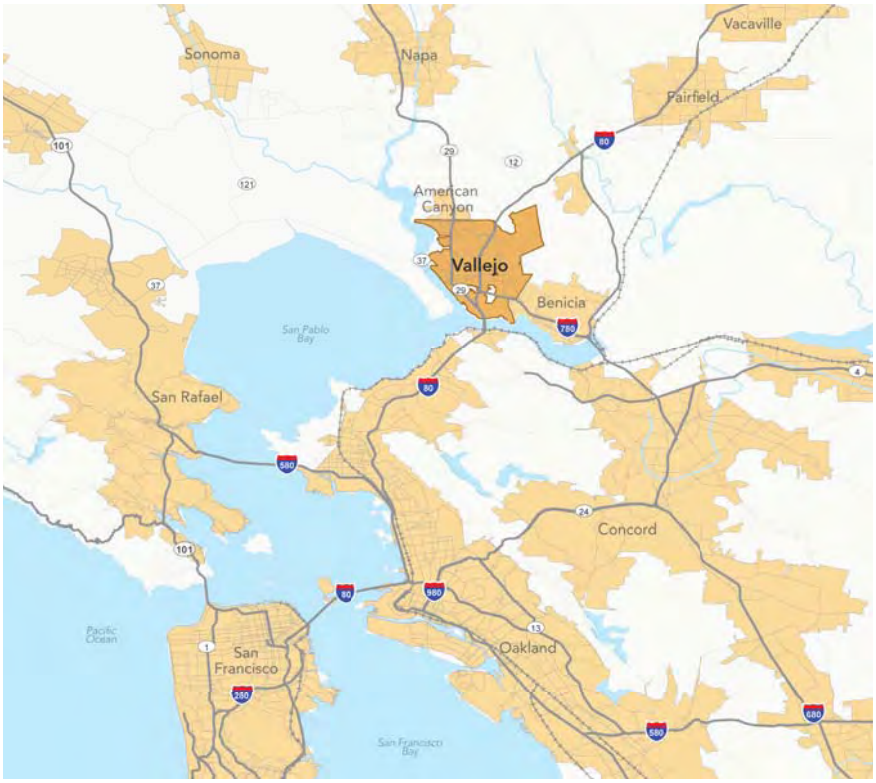


Figure 1.1: Regional Context

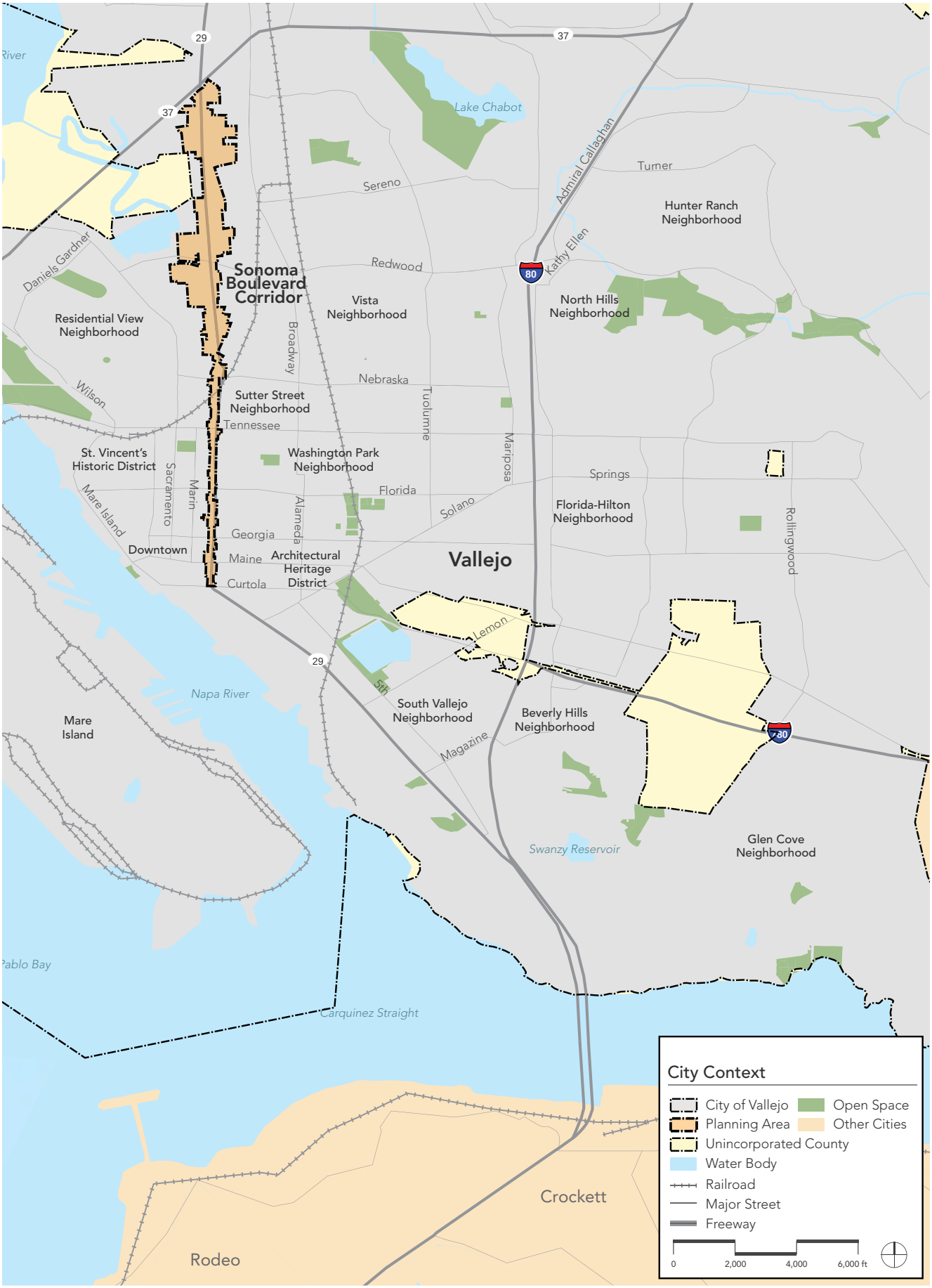


Figure 1.2: City Context

1.3 PLANNING AREA

Sonoma Boulevard is State Route 29, a State Department of Transportation (Caltrans) roadway. The Sonoma Boulevard Corridor Design Plan planning area spans 5.5 miles between Curtola Parkway in the south and State Route 37 in the north (*see Figure 1.3: Planning Area*). The area runs with a north-south orientation along the roadway and is typically one parcel deep on both east and west sides of the street. The planning area is narrow south of Couch Street due to shallow parcel depths, and wider north of Couch Street where parcels are generally deeper.

1.4 PLANNING CONTEXT

Building upon the planning framework established by the City of Vallejo's General Plan, the Corridor Design Plan addresses issues specific to the planning area geography, economic conditions, and social environment. In addition, the goals outlined in the City of Vallejo's Climate Action Plan of 2012 guide the multimodal transportation and sustainable streetscape design strategies of the plan. This document also incorporates initiatives from plans that address areas adjacent to Sonoma Boulevard, including the White Slough Specific Area Plan of 1996 and the Downtown Vallejo Specific Plan of 2005.

Caltrans is in the process of updating the Transportation Concept Report for the State Route 29 corridor, which encompasses Sonoma Boulevard from State Route 37 to Curtola Parkway. Coordinated planning between the City of Vallejo and Caltrans is recommended as both projects are further developed.

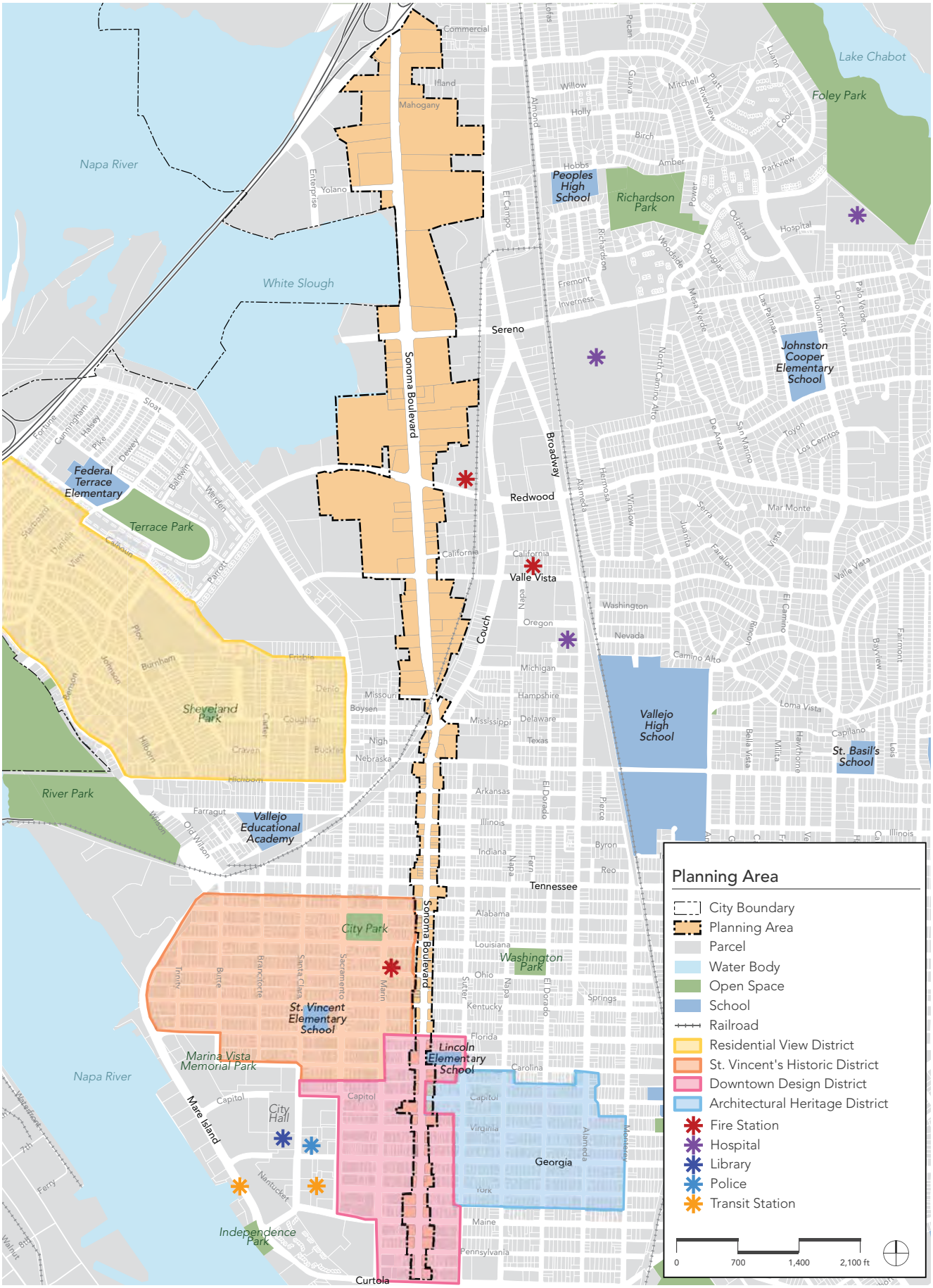


Figure 1.3: Planning Area

1.5 COMMUNITY-BASED PLANNING PROCESS

In 2011, the City of Vallejo was awarded a Community Based Transportation Grant by Caltrans. The purpose of the grant was to promote the integration of transportation and land use planning with community values to create "livable" communities. As a result, the City of Vallejo initiated a three-phase participatory planning process for the Sonoma Boulevard corridor.

Phase one began with an existing conditions analysis during which the consultant team (led by Berkeley-based urban planners and designers MIG, Inc. with support by economic development consultants BAE and transportation consultants Fehr & Peers) conducted a thorough background analysis. The analysis drew from existing data supplemented with additional field observations and research. The summary of that analysis is in Chapter 2: Existing Conditions.

The consultant team worked closely with the City to tailor an outreach strategy that would provide multiple avenues to foster valuable input. The outreach process included one-on-one stakeholder interviews; community workshops; regular meetings with a community advisory committee comprised of key property and business owners and neighborhood leaders; and a meeting with local high school students. An interactive website was designed to keep residents updated throughout the planning process and to gather additional feedback. From this outreach process a comprehensive community vision was developed for the corridor, which serves as the guiding force behind the development of the plan.

Following the establishment of the existing conditions analysis and community vision, phase two included the development of alternative improvement scenarios based on community input. Through further outreach and committee participation these scenarios were then refined into a preferred land use and mobility strategy for the corridor and supplemented by corridor-wide and Focus Area-specific implementation strategies.

Finally, phase three entails the compilation of the analysis, input, and concept alternatives to formulate the Sonoma Boulevard Corridor Design Plan document. This phase also includes review and refinement of the plan by City staff, the Planning Commission, City Council, community advisory committee, and the public.

Community Workshop Visioning Wallgraphic

Community Workshop

High School Student Workshop

Project Website

Community Workshop

Community Advisory Committee

Community Workshop

1.6 DOCUMENT OVERVIEW

The following represents the organization of the Sonoma Boulevard Corridor Design Plan and includes a short summary of each chapter:

CHAPTER 1: INTRODUCTION

This Introduction chapter provides the background and road map for the document by defining the project area and describing the purpose and intent of the Corridor Design Plan.

CHAPTER 2: EXISTING CONDITIONS

The Existing Conditions chapter includes a summary of the Existing Conditions Analysis Report, which provides a baseline analysis of the existing land uses, community character, circulation and parking, and economics and market conditions.

CHAPTER 3: VISION FRAMEWORK

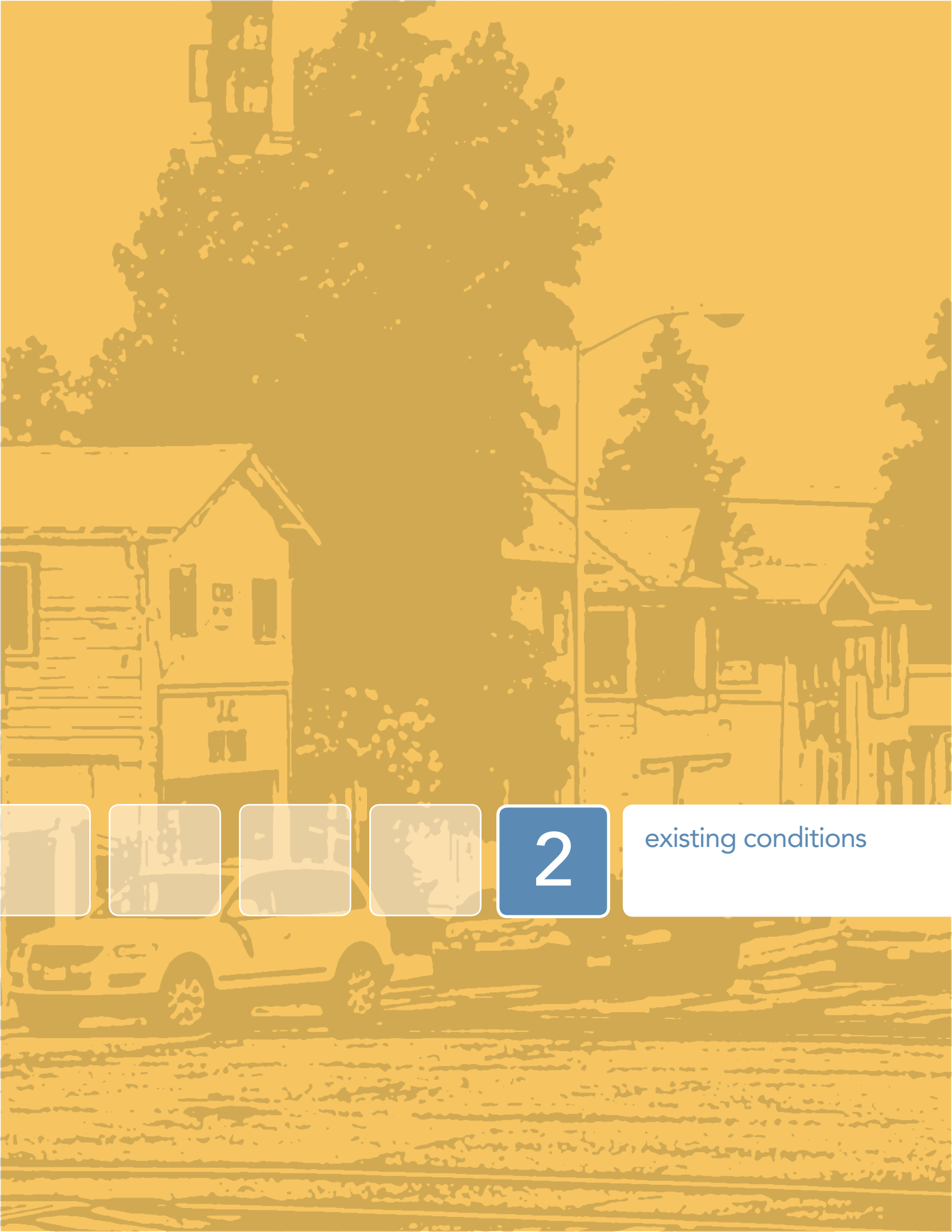
The Vision Framework chapter describes the desired future for Sonoma Boulevard through a Vision Statement and supporting elements that were developed through the community participation process.

CHAPTER 4: LAND USE ACTIVATION AND MOBILITY STRATEGY

The Land Use Activation and Mobility Strategy chapter outlines the general location of land uses, streetscape design concepts, and proposed circulation patterns for all modes of transportation along Sonoma Boulevard.

CHAPTER 5: IMPLEMENTATION

The Implementation chapter provides the actions necessary to carry out the plan components and achieve the community's vision. It includes an outline of specific action steps, costs, funding sources, and phasing, as well as the responsible parties associated with each implementation step.



2 existing conditions

J.C.
MINI MART

CHAPTER 2

existing conditions

IN THIS CHAPTER...

2.1 Economics and Market Conditions

2.2 Land Use

2.3 Circulation, Transportation and Parking

2.4 Community Design

Sonoma Boulevard has many positive attributes, including a historic Downtown fabric; appealing natural environment; existing commercial base; and a motivated constituency of businesses, property owners and residents. However, there are many challenges impacting Sonoma Boulevard. From an economic perspective, there has been limited new investment in recent years, market demand is weak across a range of sectors, and the current constrained conditions show few signs of abating in the near term. From a physical and social perspective, the corridor has many vacant and underutilized spaces, a degraded commercial and pedestrian environment, and issues with perceptions and realities related to safety.

This chapter provides an overview of the existing conditions analysis of the Sonoma Boulevard planning area. This analysis serves as the foundation for **recommendations that will support public safety, ensure high-quality design, leverage social connections,** and **promote economic development opportunities**.

This chapter is organized as follows:

2.1 Economics and Market Conditions – An overview of the current economic conditions and opportunities driving the plan.

2.2 Land Use – A description of the range of existing land uses and zoning designations within the planning area.

2.3 Circulation, Transportation and Parking – An outline of the area's existing automobile, transit, bicycle and pedestrian facilities.

2.4 Community Design – A description of the physical character of the corridor.

2.1 ECONOMICS AND MARKET CONDITIONS

The Sonoma Boulevard corridor is an area in transition. It was formerly the commercial core of Vallejo, but over time competing retail nodes elsewhere in the City, as well as in nearby cities, have become more dynamic settings for retail and other uses. The result is that new retailers now typically go to other locations and existing retail and commercial spaces are difficult to lease, resulting in a large number of vacant and underutilized sites. A number of existing retail centers and buildings have experienced disinvestment, and are in need of renovation to provide a contemporary and competitive retail setting. These properties and sites now present a long-term opportunity to pursue a greater diversity of uses along the corridor, including residential and office development as well as revitalized retail spaces.

The Sonoma Boulevard area is diverse in the character of its existing buildings and the potential for various types of development. The character ranges from the historic and pedestrian-friendly streets in the Downtown area to a suburban environment with wide streets, many traffic lanes, and buildings set far back from the street in the northern portion of the corridor. Thus, while the entire corridor exists in the same local market area, analysis of its future development potential should consider the differences in its character along its length.

Raley's shopping center is one of many successful businesses operating on Sonoma Boulevard.

RECENT DEMOGRAPHIC AND ECONOMIC TRENDS

The local market area for the Sonoma Boulevard corridor (defined as the area from which potential shoppers are drawn and the economic base that supports new development) is the entire portion of Vallejo that is west of Interstate 80 and includes Mare Island. This local market area contains 60% of Vallejo's population. The demographics of this area hold both similarities and differences to the rest of the City.

Between 2000 and 2010, the population of the local market area decreased by approximately 3,600, reducing local support for retail and creating less demand for existing housing. Vallejo as a whole lost approximately 800 residents, meaning that the decline in population west of Interstate 80 was only partially offset by population growth on the east side of the City. Compared to the rest of the City, the local market area has fewer family households (65% vs. 72%), lower homeownership rates (52% vs. 60%), a lower median annual household income ($50,200 vs. $61,300), and a higher poverty rate (17% vs. 13%). Households that make less than $25,000 per year comprise 25% of local market area households. For other measures, the local market area is similar to the entire City, including median age, share of population under 18 years or over 65 years, and average household size.

Automobile dealerships create a regional commercial draw at the north end of the corridor.

Kaiser Permanente is a major destination and jobs center located in close proximity to the planning area.

The local market area lost more than 1,700 jobs between 2007 and 2010. Approximately 83% of residents who work commute to jobs outside the City.

Data on local market area resident expenditures suggests that much spending occurs outside the Sonoma Boulevard corridor, with most of this retail "leakage" likely going to retail clusters at Northgate in Vallejo and centers in American Canyon, located north of Vallejo along SR-29. The Northgate area, located along Interstate 80 east of Sonoma Boulevard, has in many respects supplanted Sonoma Boulevard as the City's first destination of choice for both shoppers and new retailers. Recent market studies for other projects in Vallejo have reinforced a lack of near-term potential for large-format retail, or market support for additional food stores.

Despite these shortcomings, the Sonoma Boulevard corridor has a number of existing market strengths, including: the historic character of Downtown Vallejo; Filipino ethnic retail cluster around the Seafood City supermarket; Kaiser hospital medical cluster; successful Raley's shopping center; and new automobile dealers at the north end of Sonoma Boulevard. dd's Fashions is an example of a national value-oriented

Competing retail centers in nearby cities make it difficult to lease many vacant commercial spaces.

clothing retailer that was attracted to a space in an existing Sonoma Boulevard shopping center.

REAL ESTATE MARKET CONDITIONS

The retail real estate market along Sonoma Boulevard is characterized by long-term vacancies and low rents, particularly in smaller centers which are up to 30% vacant. However, larger centers have a less than 10% vacancy rate, and the modern Raley's center has an asking rent of up to $2 per square foot per month, triple-net (tenant pays all expenses). The majority of retail construction in the area was built between the 1950s and 1980s and much of it is now in need of rehabilitation or replacement. Rehabilitation of these older retail centers can be challenging in terms of both market support and coordination between owners for centers with multiple ownership. Struggling retail centers in other parts of the Bay Area (for example, Foothill Square in East Oakland), have redeveloped in part by diversifying uses to include service and medical space. A similar strategy could be utilized to revive retail centers along Sonoma Boulevard. Real estate brokers cite the following factors that deter national retailers from considering Sonoma Boulevard locations: a lack of suitable spaces; negative perceptions of Vallejo; and preference for nearby areas with higher household incomes that can also attract shoppers from Sonoma Boulevard corridor residents.

Though the corridor has little new residential development, the local market area has been heavily impacted by residential foreclosure activity. At current sales levels, properties in the local market area that are in default or foreclosure may represent up to a three-year supply, and half of current market activity is investors purchasing foreclosed properties. Between March and July 2011, the median home sale price in Vallejo was $139,000 and it was even lower in the local market area, with the median sale price for a single-family home at $114,000, while the median sale price for condominiums was only $50,500.

Residential rental properties in Vallejo are available for moderate rents. The average rent for a one-bedroom apartment in Vallejo dropped from $1,071 per month in 2008 to $970 per month in 2011. However, demand supports an average 93% occupancy rate.

The prices for both rental and for-sale residential are well below those

required to support new residential development. The current low price of for-sale units relative to rental rates means that purchasing a home in the local market area can be less expensive than renting for those who can obtain mortgages. Monthly mortgage payments for a median-priced home in the local market area are low enough to make homeownership affordable to approximately 70 to 75% of local market area residents, provided that potential homebuyers are able to afford a down payment and obtain a mortgage. However, difficulties in obtaining financing based on underwriting restrictions limit the number of individuals who can benefit from these low prices.

POTENTIAL FOR FUTURE MARKET SUPPORT

A long-term challenge for new development along Sonoma Boulevard and elsewhere in Vallejo and nearby cities is that there is considerably more land available for development than there is market demand. This means that future development is likely to be dispersed throughout the area based on the availability of sites and their relative attractiveness to developers and retailers..

A key factor for supporting redevelopment of existing properties and new development along the corridor will be for the local market area to successfully attract a share of the projected future growth in Vallejo's population and Solano County jobs. The local market area must either maintain or grow its current share within the broader market in order to attract new development to Sonoma Boulevard, since developers and retailers tend to avoid areas with declining populations and lower potential spending.

Based on the Association of Bay Area Governments (ABAG) population projections from 2010 to 2035, if the local market area can maintain its current share of Vallejo's population, it could gain more than 9,100 residents and nearly 3,400 new households (and potentially that number of new residential units – see *Figure 2.1: Potential Population and Household Growth, 2010-2035*). In addition, if the local market area can maintain its current share of Solano County jobs it could gain 11,600 new jobs, which could potentially support nearly three million square feet of new development (see *Figure 2.2: Potential Employment Growth, 2010-2035*). New jobs in the market area are likely to be concentrated in industries that have recently expanded in Solano County, such as the health care industry. As economic conditions improve, the local market

area is also likely to support jobs in industries which have historically accounted for a large portion of jobs in Solano County and the local market area, such as construction, retail, and accommodation/food service.

Figures 2.1 and 2.2 represent the potential for the entire local market area, including Mare Island. The majority of new residential development is likely to be located on Mare Island, Downtown and along Sonoma Boulevard. Mare Island is also expected to absorb a large portion of future industrial and office development. New retail space is more likely to be concentrated Downtown and along the northern end of Sonoma Boulevard. While this indicates that the Sonoma Boulevard corridor would likely capture only a portion of the potential development in the local market area, there is still potential support for a significant amount of new development along the corridor over the long term.

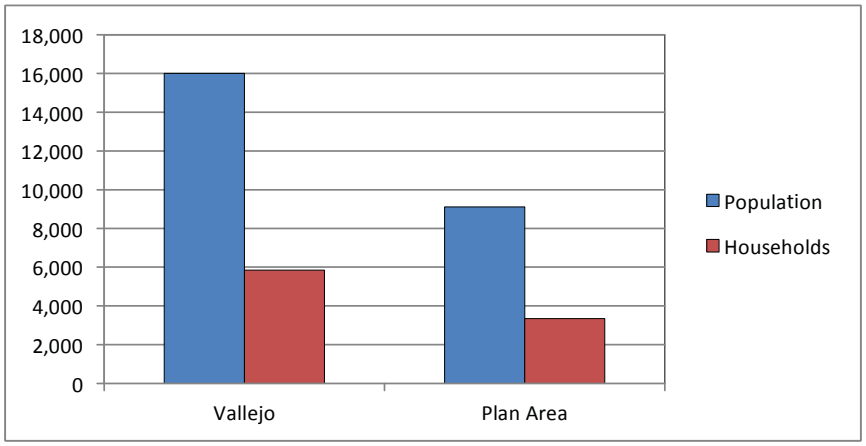


Figure 2.1: Potential Population and Household Growth, 2010-2035

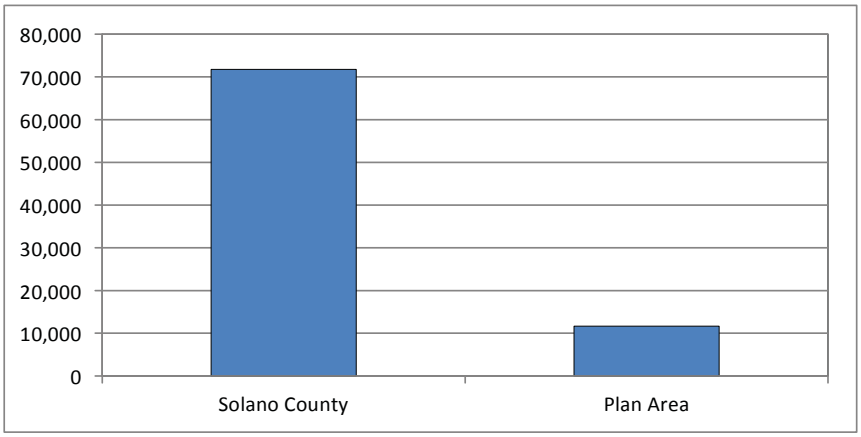


Figure 2.2: Potential Employment Growth, 2010-2035

2.2 LAND USE

The middle and southern portions of the corridor contain many mixed-use buildings.

Fast food and casual dining restaurants are prevalent.

Car-oriented services are present along the corridor, even near Downtown.

Taco trucks are found in a few locations along the corridor.

Land uses and development patterns vary along Sonoma Boulevard, particularly between its northern and southern portions. In general, parcels fronting the street are mostly commercial. There is also a range of other land uses including housing, mixed-use buildings, community facilities and services, and temporary uses.

The northern portions of the corridor are largely shaped by large-footprint automobile-oriented commercial uses. Strip malls with parking fronting the street are intermixed with auto-related businesses, large and small retailers such as casual dining restaurants, and hardware and drug stores. The middle sections of the corridor serve as a transitional area and have a range of land uses including residential, car-oriented services, small markets, liquor stores, and fast food restaurants. Although there are no public parks, plazas or open spaces along Sonoma Boulevard, City Park and Washington Park are in close proximity. Closer to Downtown, uses include car-oriented services as well as office, retail, residential, community services, and institutional and religious facilities. Most of these uses are smaller in size and scale, reflecting the character of the Downtown environment.

EXISTING ZONING

Zoning within the planning area is primarily designated linear commercial, pedestrian shopping and services, or medium density residential *(see Figure 2.3: Zoning)*. Zoning currently deviates from General Plan land use designations. Future specific planning efforts will address appropriate zoning based on the approach identified in this plan. Special Zoning Districts that regulate land use and streetscape design in parts of the corridor include: Downtown Vallejo Specific Plan, Architectural Heritage, Arts and Entertainment, the White Slough Plan, Waterfront Plan, and the Planned Development Master Plan process.

COMMUNITY AMENITIES

Sonoma Boulevard has several community amenities along its length, including civic uses, churches and a public elementary school. There are also other civic and cultural buildings, a transit station, a ferry terminal, and the Kaiser Permanente Medical Center—a major regional destination—proximal to the corridor. However, Sonoma Boulevard is currently perceived by local residents as a barrier creating a disconnection between east and west sides. Stronger connections between the surrounding residential neighborhoods, Downtown, and community amenities and destinations are needed to enhance the neighborhoods, create identity, and strengthen the sense of community.

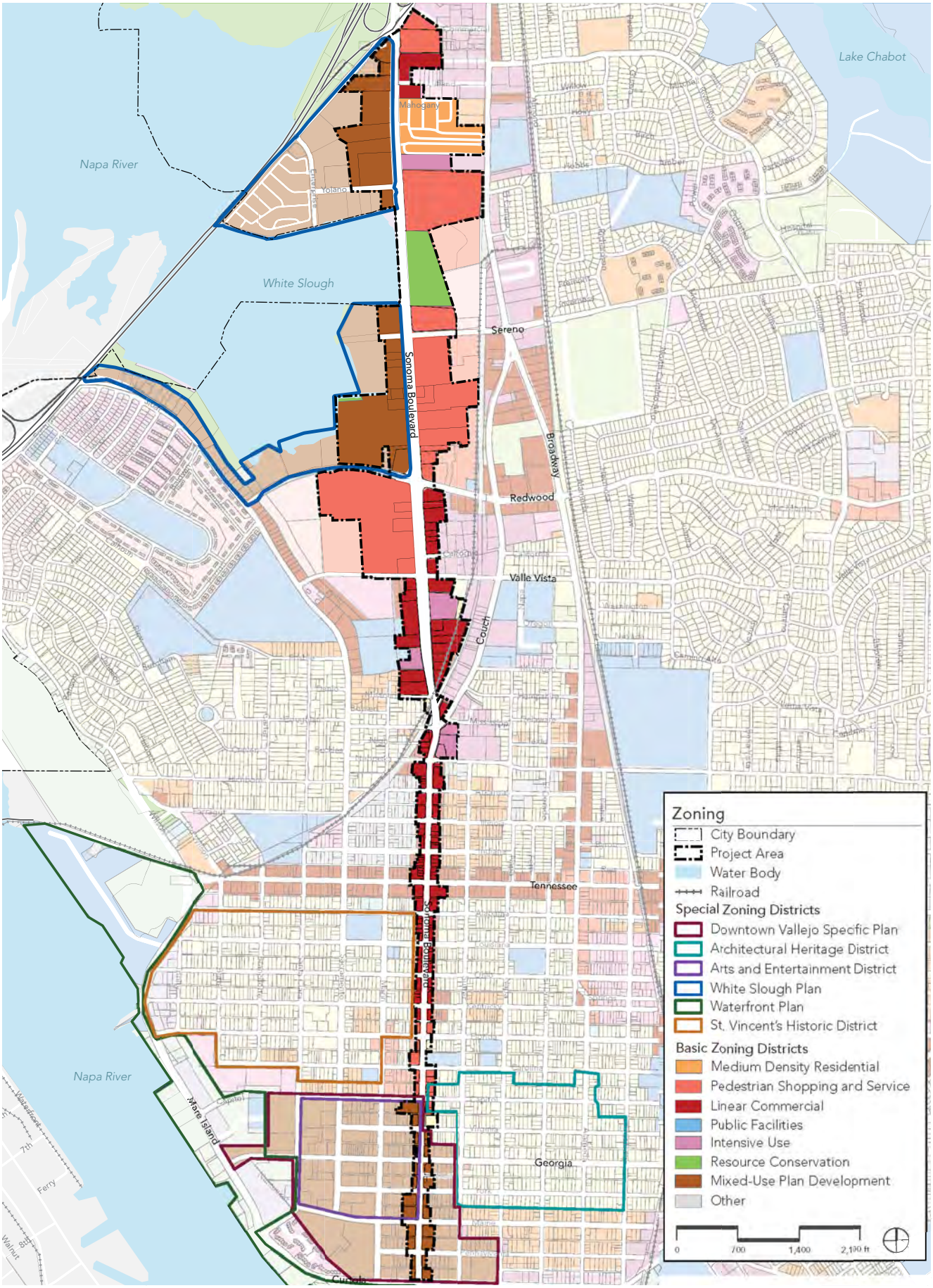


Figure 2.3: Zoning

2.3 CIRCULATION, TRANSPORTATION AND PARKING

Circulation, transportation and parking are all important factors impacting the function and health of the corridor.

Despite its location, Sonoma Boulevard is an underutilized roadway. It is in need of improvements to enhance safety and circulation of all modes of transportation. Sidewalks are not continuous along portions of the corridor and pedestrian and bicycle amenities are minimal, creating an incomplete and unwelcoming streetscape environment.

STREET NETWORK

Regional Network

State Route 29 (SR-29) is a major north-south highway that connects Napa County to the north, and Lake County to the north of Napa County and Interstate 80 (I-80) in Vallejo to the south *(see Figure 2.4: Freeway system around City of Vallejo)*. It runs along the western side of the City of Vallejo, providing two travel lanes in each direction. Sonoma Boulevard is a divided roadway north of Couch Street with a posted speed limit of 40 mph. It is undivided south of Couch Street, with a posted speed limit of 35 mph between Couch Street and Illinois Street and 30 mph south of Illinois Street. The annual average daily traffic (Caltrans, 2010) increases going north along Sonoma Boulevard, from 12,300 vehicles at Maine Street to 16,000 at Tennessee Street and 27,000 at the State Route 37 (SR-37) junction. Sonoma Boulevard is part of the state truck network and is designated as a Terminal Access (TA) route, which permit large STAA-designated trucks[1].

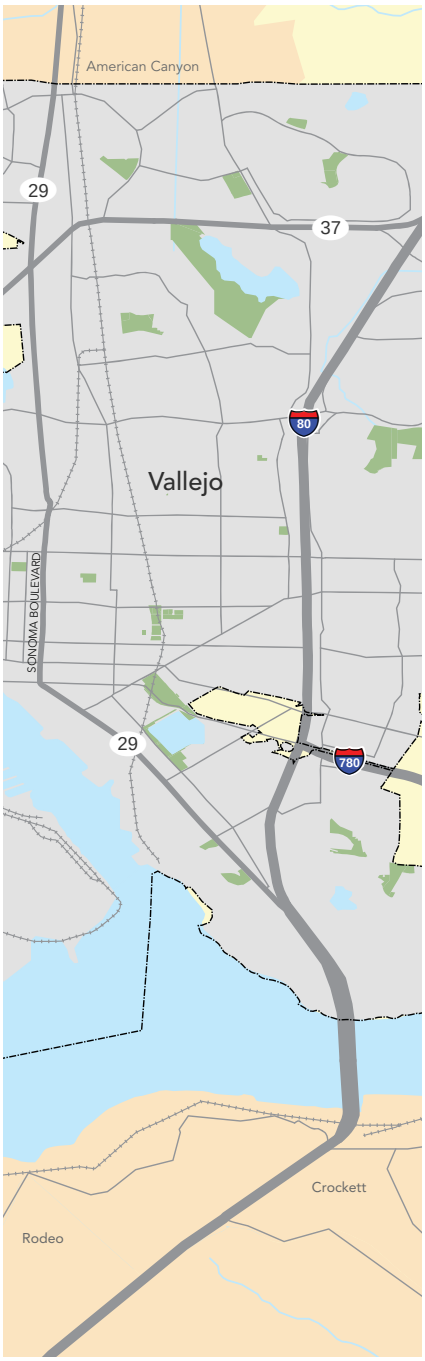


Figure 2.4: Freeway system around City of Vallejo

Sonoma Boulevard between Sereno Drive and Yolano Drive

[1] *Surface Transportation Assistance Act (STAA) of 1982 legalized operation of large STAA-designated trucks with a 48-foot semitrailer, an unlimited overall length, and an unlimited kingpin-to-rear-axle (KPRA) distance on the National Network.*

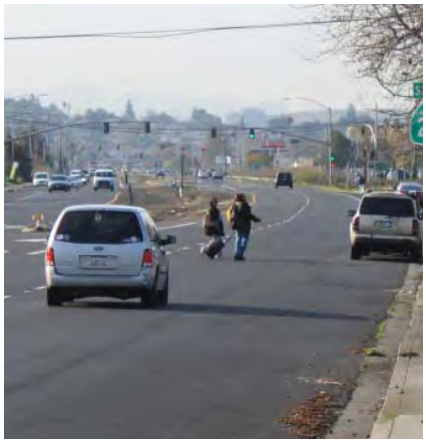
SR-37 is an east-west highway that connects Highway 101 in Novato to the west and I-80 in Vallejo to the east. In the vicinity of the project, SR-37 is a restricted-access freeway—a freeway that provides an unhindered flow of traffic with no traffic signals, intersections or property access—that provides two travel lanes in each direction. The posted speed limit is 65 mph. Access to Sonoma Boulevard is provided via the SR-37/SR-29 interchange in northern Vallejo. The annual average daily traffic (Caltrans, 2010) is 30,500 vehicles west of the SR-37/SR-29 interchange and 65,000 east of the interchange.

Local Street System

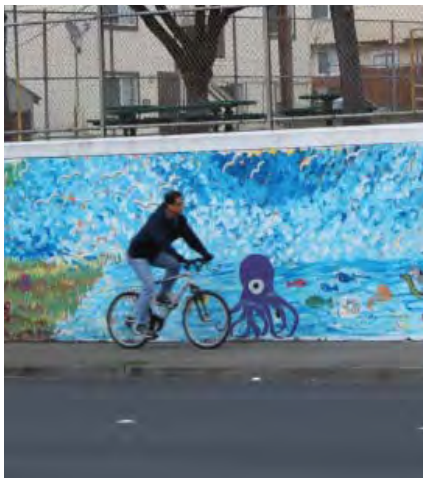
Several major local roads connect into Sonoma Boulevard (*See Figure 2.6 Planning Area Aerial)*. Sereno Drive is a four-lane east-west collector street with low- to moderate-capacity that extends between White Slough to the west and Fairgrounds Drive to the east. In the vicinity of the project corridor, the posted speed limit is 25 mph. Redwood Street is a four-lane, east-west arterial road that extends between Sacramento Street to the west and I-80 to the east. In the vicinity of the project corridor, the posted speed limit is 30 mph. Tennessee Street is a four-lane, east-west arterial road that extends between Mare Island Way to the west and Columbus Parkway to the east. In the vicinity of the project corridor, the posted speed limit is 30 mph. Georgia Street is an east-west collector street that extends between Mare Island Way to the west and Ascot Parkway east of I-80. In the project area, it is two lane to the west of Sonoma Boulevard and four lane to the east. The posted speed limit is 25 mph. Curtola Parkway is a four-lane east-west arterial road that extends

Sonoma Boulevard at Redwood Street

Disconnected sidewalks create dangerous areas for pedestrians.



Infrequent crosswalks in the northern portion of the corridor encourage jaywalking.



Without bike lanes along the corridor many cyclists are forced onto the sidewalk.

between Mare Island Way to the west and Interstate 80 to the east. In the vicinity of the corridor, the posted speed limit is 35 mph to the west and 40 mph to the east of Sonoma Boulevard.

TRAFFIC OPERATIONS

Traffic operations were evaluated at six major intersections along the project corridor (SR-37 westbound ramps, SR-37 eastbound ramps, Redwood Street, Tennessee Street, Georgia Street, and Curtola Parkway). The analysis was based on AM and PM peak hour traffic counts collected between 7-9AM and 4-6PM in August 2011. The results of the analysis include a descriptive term known as level of service (LOS). LOS is a measure of traffic operating conditions, which varies from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). All intersections are currently operating at LOS C or better during both AM and PM peak hours *(see Appendix B: Fehr & Peers Report)*.

EXISTING PEDESTRIAN AND BICYCLE NETWORK

Pedestrian Facilities

Sidewalks are generally provided on both sides of the corridor, except on Sonoma Boulevard north of the SR-37 eastbound ramp and between Sereno Drive and Ifland Way, where sidewalks are intermittent *(see Figure 2.5: Existing Pedestrian Facilities)*. When present, sidewalks range from eight feet wide in the northern portions of the corridor to 10 feet wide

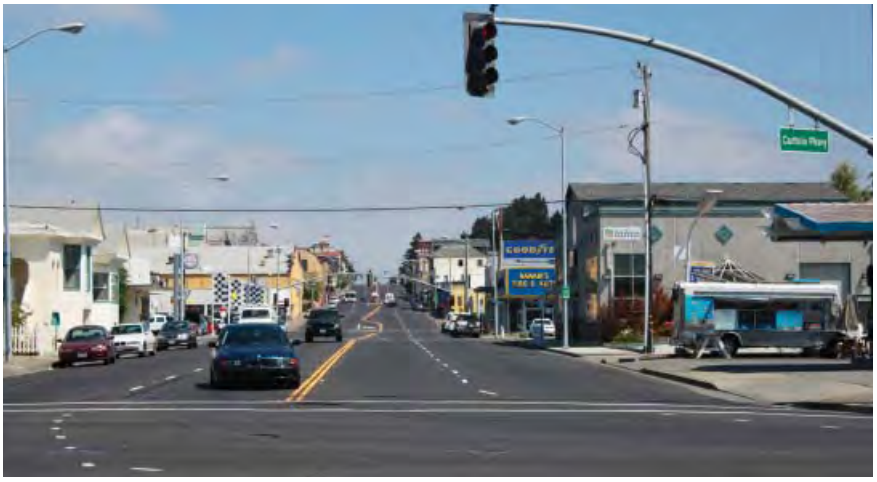
Sonoma Boulevard at Tennessee Street

in the south. However, there are some bottle-necks along the sidewalk caused by utility boxes. All six of the major intersections analyzed provide crosswalks on at least one approach crossing Sonoma Boulevard and the side street. The exception is at the SR-37 westbound ramp, where only one crosswalk approach is provided on Sonoma Boulevard across the ramp. Pedestrian signals are provided for crosswalks at all study intersections.

Bicycle Facilities

Class I bike lanes are physically protected paths, Class II bike lanes are buffered lanes, and Class III bike routes are designated routes where cyclists share lanes with motorists. Currently there are no bicycle lanes along Sonoma Boulevard. As a result cyclists, typically ride on the sidewalks as fast-moving traffic makes it unsafe to share the road with vehicles. Marin Street, which parallels Sonoma Boulevard to the west, provides dedicated Class II bike lanes extending from Alabama Street to Capitol Street. Tennessee Street provides a Class III bike route between Mare Island Way to the west and I-80 to the east.

Other roadways with Class III bike routes intersecting the corridor include Louisiana Street, Nebraska Street, and Lewis Brown Drive. Connections throughout the area need improvement, especially those leading to schools, parks, and community amenities.



Sonoma Boulevard at Curtola Parkway

Figure 2.5: Existing Pedestrian Facilities

EXISTING TRANSIT SERVICE OVERVIEW

Surface transit service providers in the vicinity of the planning area include Vallejo Transit, Napa County VINE, and Amtrak. Vallejo Transit provides local and regional bus service with connections to the Vallejo Ferry Terminal and the El Cerrito Del Norte, Pleasant Hill, and Walnut Creek BART stations. The Napa County VINE provides bus service to various destinations in Napa County. Additionally, Amtrak provides limited bus service to Martinez, Napa, and McKinleyville. The Baylink Ferry provides high-speed ferry service to and from San Francisco.

Vallejo Transit

Six Vallejo Transit bus routes operate along the project corridor on weekdays, and two routes operate on weekends. The six bus routes cover most of the Sonoma Boulevard corridor, with gaps between Curtola Parkway and York Street and between Florida Street and Tennessee Street. Service is most concentrated between Valle Vista Avenue and Sereno Drive, with all six bus routes running through this area. Bus stops along Sonoma Boulevard are located near Ifland Way, Yolano Drive, Redwood Street, Couch Street, Nebraska Street, Tennessee Street, Florida Street, and Georgia Street (*See Appendix B: Fehr and Peers Report*). The Sereno Transit Center is a major transit point between Vallejo Transit bus routes and is located just to the east of the project corridor on Sereno Drive between Sonoma Boulevard and Broadway. The Vallejo Transit Center, located at Sacramento Street and York Street, is the

The Vallejo Transit Center is a key hub for transit service near the planning area.

major transit point in the southern part of the City. It serves numerous bus lines and bridges Old Town with the ferry terminal and waterfront.

Vine

Napa County VINE bus route 10 operates daily service along the project corridor. The VINE has one stop on the project corridor located on Sonoma Boulevard just north of Couch Street.

Baylink Ferry

The Baylink Ferry operates daily service for Vallejo and the North Bay Region to and from San Francisco. The Vallejo Ferry Terminal is located near the Sonoma Boulevard corridor, five blocks west on Georgia Street where it terminates at Mare Island Way. The terminal is accessible via public transit by the numerous bus lines that terminate at the Vallejo Transit Center located at Sacramento Street and York Street. The recently completed parking structure, which provides parking for both the ferry terminal and the Vallejo Transit Center, supplies 750 parking spaces under Phase I; with the completion of Phase II of the project, a total of 1,200 parking spaces will be provided.

The Vallejo Ferry Terminal provides daily services to other port cities within the San Francisco and San Pablo bays.

PARKING

On-street parking along Sonoma Boulevard is provided via parallel parking. Parking is generally provided on Sonoma Boulevard south of Valle Vista Avenue. Parking is generally prohibited between Valle Vista Avenue and the SR-37 interchange. There are two segments along the northern portion of the project corridor that allow parking, both of which are on the west side: just north of Redwood Street and just south of the SR-37 eastbound ramps.

2.4 COMMUNITY DESIGN

Sonoma Boulevard has diverse block and street patterns, pleasant views, and a range of parcel sizes and building types *(see Figure 2.6: Planning Area Aerial)*. This results in different sections of the corridor having their own distinct character and feel. As a whole, however, the physical design of the corridor's public right-of-way is not entirely consistent and Sonoma Boulevard has a few sections characterized by poor streetscape conditions, detracting from an overall sense of vibrancy and identity for the corridor.

Figure 2.6: Planning Area Aerial

BUILDING AND PEDESTRIAN EDGES

Though there are areas along Sonoma Boulevard with a strong street wall and unique historic façades, particularly close to Downtown, there are sections where the corridor and its connecting cross streets are less friendly to pedestrians because of conditions such as blank walls and wide setbacks with surface parking. In the northern portion of the corridor, proximal to SR-37, occasional abandoned parking lots and vacant parcels create an incomplete pedestrian edge. The Downtown area has better pedestrian edges with more entries and windows along the sidewalk; however, some vacancies and buildings in need of maintenance can distract from these positive architectural features.

BLOCK AND STREET PATTERNS

City blocks north of Redwood Street are "mega-blocks" with irregular shapes, typical in car-centric environments. Block size is roughly 800-1,000 feet by 1,200-4,000 feet. This block and street pattern offers poor pedestrian connectivity and safety. Blocks between Couch Street and Redwood Street are medium to large (roughly 800-1,000 feet by 1,000-1,400 feet), irregular in shape, and have inadequate pedestrian connections between intersections. City blocks south of Couch Street are 300 by 420 feet, a block size that is nicely scaled for pedestrian circulation. Blocks in the southern portion of the corridor also have alleys running east-west through the center of the block.

ARCHITECTURAL CHARACTER

The architectural character of buildings covers a wide range of styles. The diversity offers some visual interest but fails to create a clear identity for the corridor. Landmark buildings, particularly close to the Downtown area, have a Spanish-Mediterranean style that is characterized by pastel

colors, stucco finish, terracotta tile roofs, and vertical elements at the corners of buildings. Newer developments along the northern portion of the corridor are mostly big-box style with minimal ornamentation, creating a fabric that lacks attractiveness for locals and visitors.

LANDSCAPING

Landscaping and street trees are minimal or nonexistent south of Couch Street. North of Couch Street there is more vegetation on private parcels along the corridor, but there is none in the public right-of-way. The central median north of Couch Street has vegetation, but it is not well maintained and contributes to the poor image of the corridor.

VIEWS

The corridor has significant changes in elevation throughout the planning area. This creates attractive view corridors from the higher points along Sonoma Boulevard, particularly around Florida Street, as well as close to the White Slough where there are views into the marshy areas and hills in the background.

A lack of landscaping in the public right-of-way and blank walls create an unwelcoming sidewalk environment.

Vacant lots create an unfriendly environment for pedestrians.

Sonoma Boulevard has many segments with attractive views.

Historic architectural styles are evident near Downtown.

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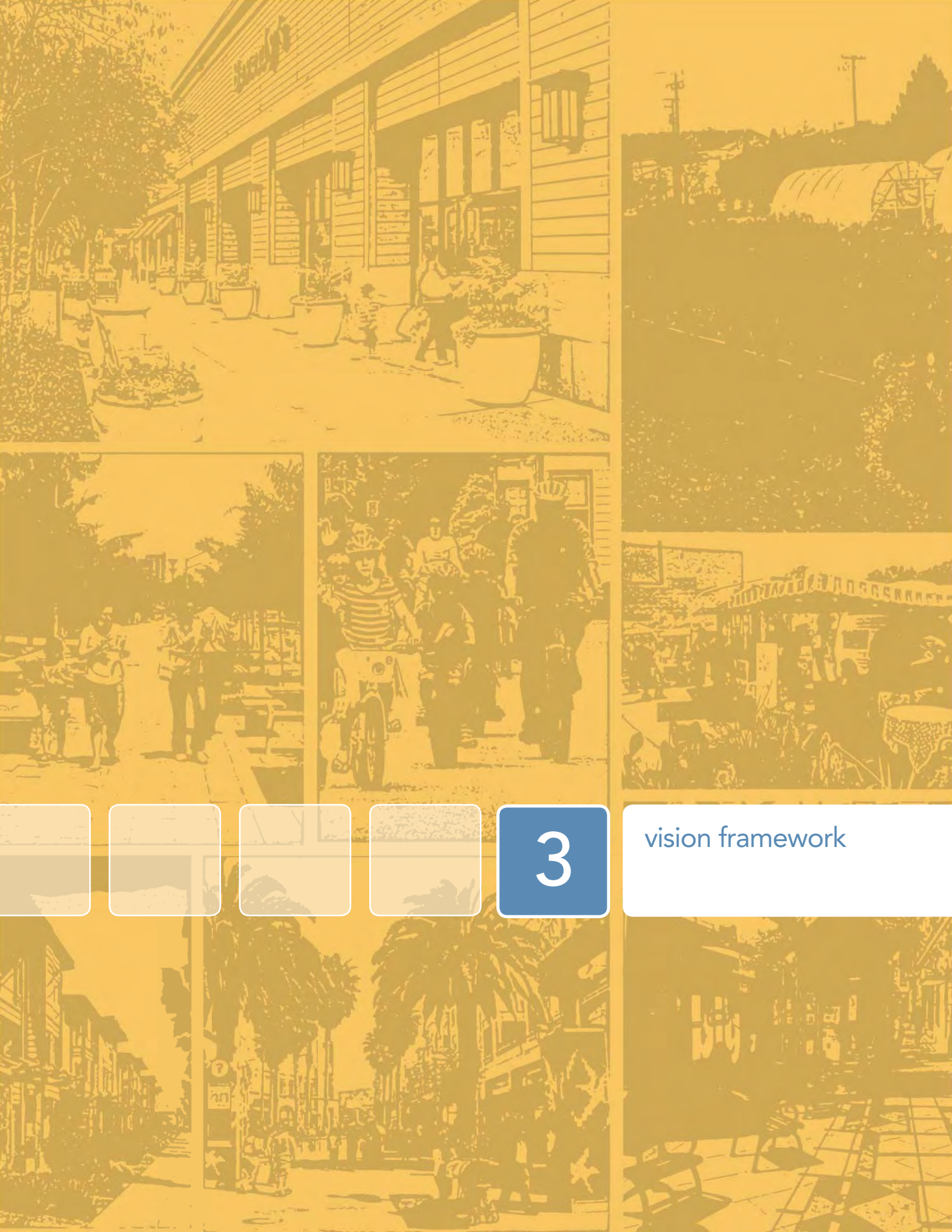


3 vision framework

Beverly's

CHAPTER 3

vision framework

IN THIS CHAPTER...

3.1 Vision Statement

3.2 Transformative Strategies

3.3 Focus Areas

3.4 Corridor Goals

3.5 Vision Framework

The Vision Framework for the Sonoma Boulevard corridor builds upon the existing conditions analysis and synthesizes community input to create an overarching guide for strengthening and enhancing the corridor. The Framework includes a set of tools, outlined below, that address **the future economic, physical, and social vitality of the corridor and greater City.**

This chapter is organized as follows:

3.1 **Vision Statement** – Narrative and imagery that reflect and articulate the community's long-term desired future for Sonoma Boulevard as the "spine of the City of Vallejo."

3.2 **Transformative Strategies** – Descriptions of the strategies designed to support the community's vision, and to help define the planning area's long-term direction.

3.3 **Focus Areas** – A description and location of each of the four Focus Areas into which Sonoma Boulevard is divided for this planning effort.

3.4 **Corridor Goals** – A matrix outlining the economic development, land use, transportation, and design goals for each of the four Focus Areas.

3.5 **Vision Framework** – A one page layout that includes all of the elements that comprise the Vision Framework and set the plan direction.

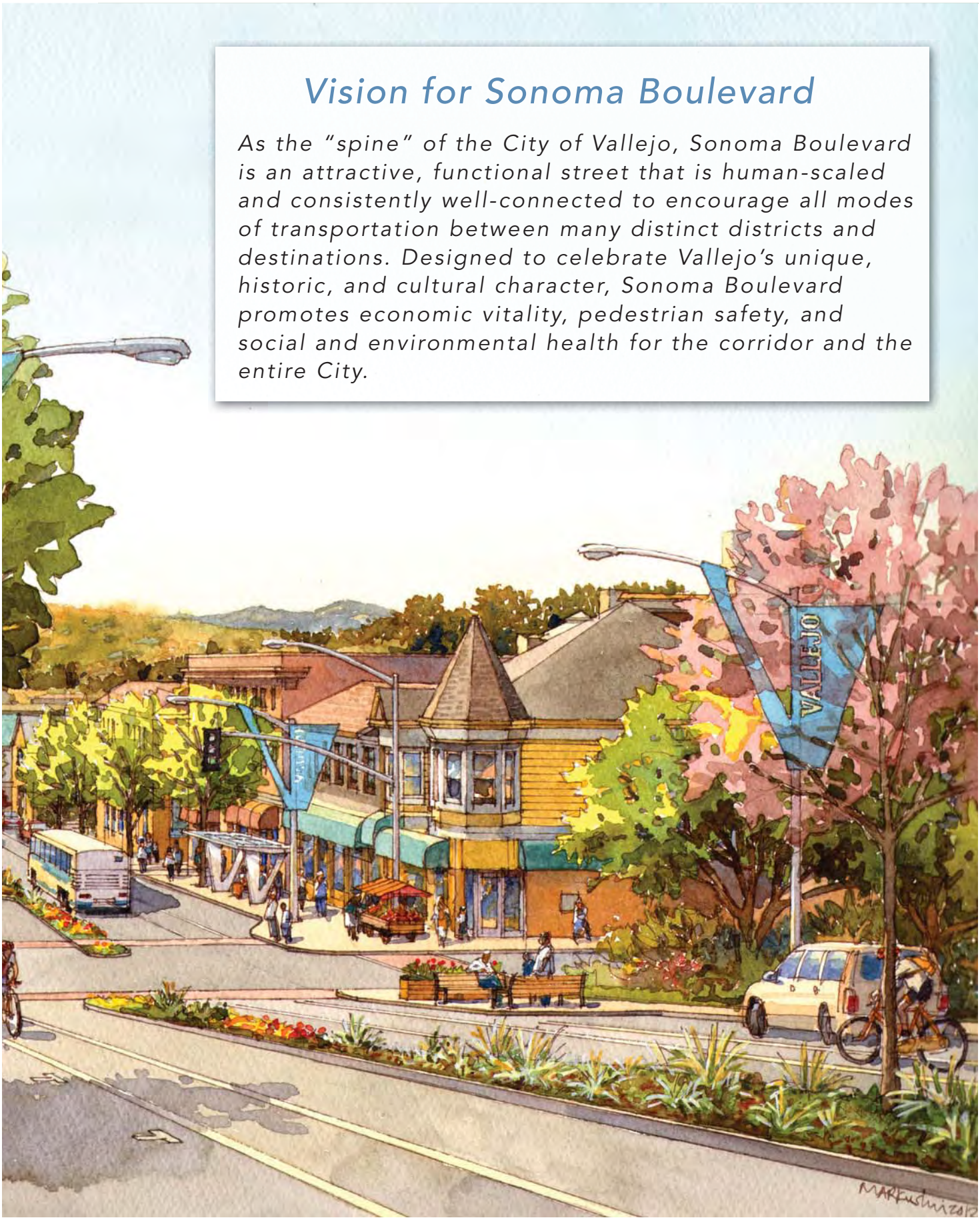
3.1 VISION STATEMENT

The following Vision Statement was crafted based on community input gathered during a broad range of outreach events and activities. This included community workshops, Community Advisory Committee meetings, stakeholder interviews, focus groups, and online feedback from the community at large.

The Vision Statement encompasses the most important values and characteristics that the community wants to see come to fruition in the corridor. It illustrates how the community wants Sonoma Boulevard to look, feel, and function in the coming years.

Vision for Sonoma Boulevard

As the "spine" of the City of Vallejo, Sonoma Boulevard is an attractive, functional street that is human-scaled and consistently well-connected to encourage all modes of transportation between many distinct districts and destinations. Designed to celebrate Vallejo's unique, historic, and cultural character, Sonoma Boulevard promotes economic vitality, pedestrian safety, and social and environmental health for the corridor and the entire City.



3.2 TRANSFORMATIVE STRATEGIES

Building on the Vision Statement, following are the plan's proposed Transformative Strategies. Transformative Strategies are the overall drivers for creating implementable actions and real change along Sonoma Boulevard. The Strategies apply corridor-wide and help tie together the Focus Area-specific goals and actions.

JOB OPPORTUNITIES, THRIVING BUSINESSES AND A RANGE OF LAND USES

Encourage a variety of business opportunities from small start-ups to regional retail stores and commercial businesses. Modify zoning regulations to allow for flexible land uses including interim and mixed-use development.

DESTINATION NODES AND DISTINCT DISTRICTS

Create destination nodes to attract visitors and residents and encourage them to patronize local businesses. Build on the unique character and cultural diversity of existing districts to create distinct identity and branding strategies.

FUNCTIONAL, ATTRACTIVE AND WELL-MAINTAINED STREETSCAPE

Include landscaping to welcome pedestrian traffic and improve the attractiveness of commercial spaces. Provide appropriate amenities, street furniture, and lighting to create an inviting and safe streetscape environment.

RANGE OF TRANSPORTATION MODES

Encourage walking, biking, and transit through improved sidewalks, bike lanes, and transit amenities. Create mixed-use districts, each with a broad range of land uses to improve walkability and attract residents from nearby neighborhoods.

ACCESSIBLE, WALKABLE, BIKEABLE, SAFE AND CONNECTED STREETSCAPE

Provide a streetscape environment that encourages use by people of all abilities. Improve crossings at all intersections to ensure safety for pedestrians and cyclists. Ensure that sidewalks and bike lanes are consistently connected along the corridor.

FLEXIBLE, ADAPTABLE AND VIBRANT NETWORK OF SPACES

Improve underutilized and vacant lots and buildings with flexible interim uses that promote street life, vibrancy, and economic activity. Create a network of lively spaces so that people are compelled to stop when traveling down the street.

SUSTAINABLE AND ENVIRONMENTALLY-FRIENDLY DESIGN

Incorporate green infrastructure systems that improve stormwater drainage and use alternative energy sources. Encourage sustainable building design.

3.3 FOCUS AREAS

As a result of the existing conditions analysis and community input, the planning area was subdivided into four Focus Areas. The Focus Areas generally differ from each other in terms of the land uses and building types that line the corridor; street widths, configurations and rights-of-way that create clear transitions, especially between the two northern and two southern Focus Areas; and potential economic development opportunities and strategies.

NORTH FOCUS AREA

The North Focus Area extends from Lewis Brown Drive in the north to Redwood Street in the south. This Focus Area is characterized by large parcels and buildings and a "wide open" character. The roadway has a car-oriented scale with intersections far from each other, few and inconsistent pedestrian amenities, and fast vehicular speeds. Land uses are typically commercial with some residential. The White Slough is a key natural feature of this area.

CENTRAL NORTH FOCUS AREA

The Central North Focus Area extends from Redwood Street in the north to Couch Street in the south. Building footprints range from medium (50' by 150') to large (250' by 500'). Buildings also vary in placement, as some structures are set far back while others line the street. There are a range of commercial uses along this segment.

CENTRAL SOUTH FOCUS AREA

The Central South Focus Area extends from Couch Street in the north to Florida Street in the south. This Focus Area is within the historic core of the City and therefore has smaller blocks with regular intersections and a good pedestrian scale. Parcels and buildings are much smaller than in the north. Uses are varied, including mixed-use, commercial, and residential.

SOUTH FOCUS AREA

The South Focus Area extends from Florida Street in the north to Curtola Parkway in the south. This Focus Area is located within the historic core of the City and it encompasses part of the Downtown. The street is well defined by the building edges, creating a fairly comfortable and attractive pedestrian environment. Land uses in the area are generally commercial and mixed-use with some residential.

3.4 CORRIDOR GOALS

Building on the corridor-wide Vision Statement and Transformative Strategies, the Corridor Goals outline the economic development, land use, transportation, and design goals for the Focus Areas. Together these elements provide the foundation for the recommendations described in Chapter 4: Land Use Activation and Mobility Strategy, as well as the implementation steps and priorities outlined in Chapter 5: Implementation.

The Corridor Goals are outlined in broad terms below and specifically applied to each Focus Area at the end of this chapter.

ECONOMIC DEVELOPMENT

Build upon the existing assets, characteristics, and uniqueness of each Focus Area to attract interim as well as long-term job-generating businesses that work together to build up the area identity and economic vitality. Target development efforts at key nodes and intersections.

LAND USES

Promote land uses that strengthen existing patterns, allow flexibility to attract new uses and interim uses, provide neighborhood- and visitor-oriented services, and support the overall identity of each Focus Area.

TRANSPORTATION

Create a streetscape environment that welcomes all users, providing a safe and comfortable environment with the necessary amenities. Slow down traffic speeds to increase safety and promote a sense of place and a "destination" corridor.

DESIGN ELEMENTS

Design a streetscape environment that has a clear entry and sense of place. Draw inspiration from the rich local history through the use of public art such as murals and sculptures. Create public spaces that are inclusive of the whole community and help bolster the area's economy.

3.5 VISION FRAMEWORK

The Vision Framework combines the range of components to guide growth along Sonoma Boulevard for the coming years and decades. While other opportunities, ideas, and strategies for improving the area may arise in the future, the Vision Framework will continue to endure and reflect the community's desires, concerns, and commitments. This Framework should be used to assess the value of each step along the way and to measure success in planning.

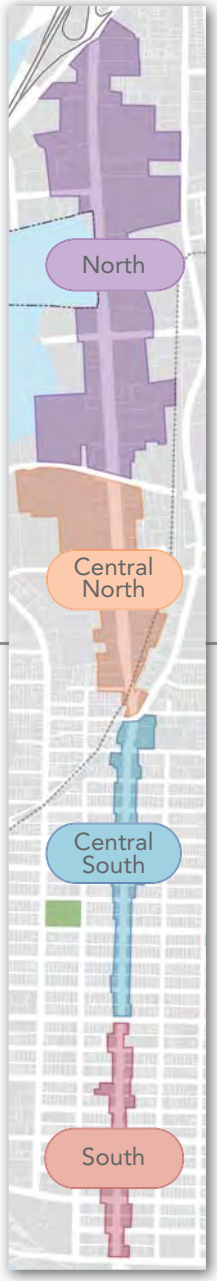
Vision for Sonoma Boulevard

As the "spine" of the City of Vallejo, Sonoma Boulevard is an attractive, functional street that is human-scaled and consistently well-connected to encourage all modes of transportation between many distinct districts and destinations. Designed to celebrate Vallejo's unique, historic, and cultural character, Sonoma Boulevard promotes economic vitality, pedestrian safety, and social and environmental health for the corridor and the entire City.

Transformative Strategies

- Job opportunities, thriving businesses and a range of land uses
- Destination nodes and distinct districts
- Functional, attractive and well-maintained streetscape
- Range of transportation modes
- Accessible, walkable, bikeable, safe and connected streetscape
- Flexible, adaptable and vibrant network of spaces
- Sustainable and environmentally-friendly design

Focus Areas



Corridor Goals

	Economic Development	Land Uses	Transportation	Design Elements
North	Leverage the district's assets and strengths to attract job-generating businesses.	Create a diverse district that strengthens the existing retail base and also supports residential, office, and open space uses. Allow interim uses while market demand for more permanent uses increases.	Ensure easy access and mobility while promoting safety, providing amenities to all users, and improving connectivity across the corridor.	Create a distinctive and well-maintained streetscape environment that features a gateway into Vallejo, highlights the White Slough as a natural asset, and has strong pedestrian and bicycle amenities.
Central North	Support existing and encourage new interim uses as well as long-term job-generating businesses.	Create zoning and regulations that allow flexibility to attract desirable new uses as well as interim uses.	Ensure easy access, mobility, and connectivity while promoting safety and appropriate amenities for a range of users.	Create a safe and well-maintained streetscape that features culturally-inspired design elements, and has strong pedestrian and bicycle amenities.
Central South	Promote the creation of a neighborhood commercial node between Tennessee and Indiana streets.	Promote the creation of a district with a mixed-use/residential character and incentivize interim uses on vacant or underutilized parcels.	Slow down traffic speeds and create a streetscape environment that is safe, comfortable, and attractive to a range of users.	Create a comfortable, safe, and attractive streetscape that features culturally-inspired design elements, and balances the needs of different users.
South	Develop a district with a unique identity that fosters local and start-up businesses, arts and cultural facilities, and street commerce.	Ensure land use patterns that support the district's mixed-use, pedestrian-friendly, and historic character.	Slow down traffic speeds and create a well-connected streetscape environment that promotes street life, pedestrian and bicycle movement, and retail vitality.	Create an inviting, attractive, and safe streetscape environment that features a gateway into Downtown, highlights the rich local history of Vallejo, and promotes the unique artistic and local character of the area.

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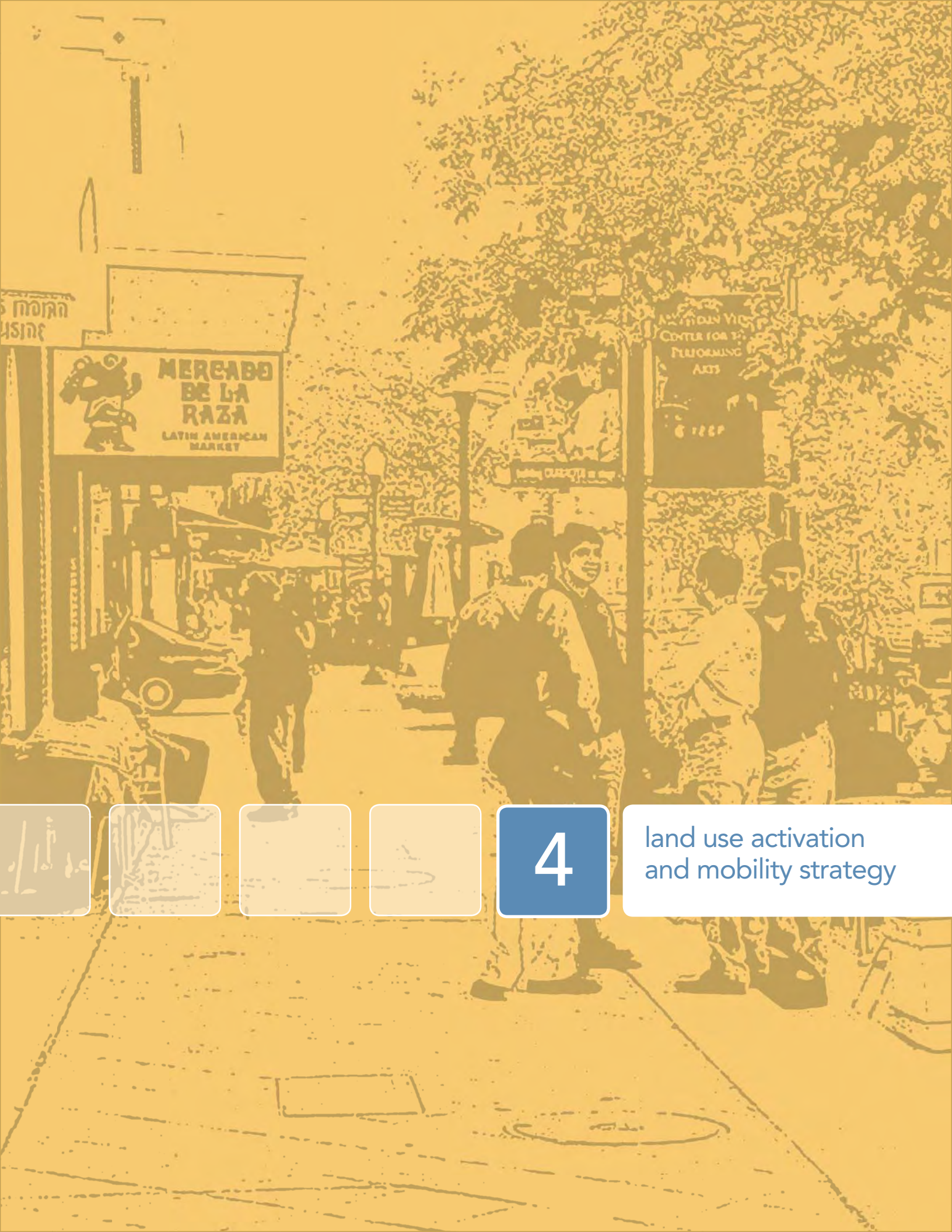


4

land use activation and mobility strategy

MERCADO
DE LA
RAZA
LATIN AMERICAN
MARKET
CENTER FOR
PERFORMING
ARTS

CHAPTER 4

land use activation and mobility strategy

IN THIS CHAPTER...

4.1 Overall Corridor Strategy

4.2 Overall Corridor Design Guidelines

4.3 North Focus Area Strategy

4.4 Central North Focus Area Strategy

4.5 Central South Focus Area Strategy

4.6 South Focus Area Strategy

The Land Use Activation and Mobility Strategy for Sonoma Boulevard outlines the **proposed economic development and physical improvements for the corridor to achieve the desired "livable" environment envisioned by the community**. The objective of this strategy is to provide the City, community, and stakeholders with **clear targets for future development**. The strategy includes key elements to be implemented throughout the corridor, offering cohesion and continuity from the South Gateway to the North Gateway; while also promoting the creation of nodes that build upon each Focus Area's unique assets to create distinctive destinations along the boulevard.

This chapter is organized as follows:

4.1 Overall Corridor Strategy – An overview of the plan strategy to activate the local economy and improve mobility along the corridor.

4.2 Overall Corridor Design Guidelines – An overview of the design guidelines for the public and private realm.

4.3 North Focus Area Strategy – A description of the specific strategies for the district.

4.4 Central North Focus Area Strategy – A description of the specific strategies for the district.

4.5 Central South Focus Area Strategy – A description of the specific strategies for the district.

4.6 South Focus Area Strategy – A description of the specific strategies for the district.

4.1 OVERALL CORRIDOR STRATEGY

Given its role as a key entry point into Vallejo and the main spine of the City, Sonoma Boulevard should have a unified identity that carries through its entirety. That cohesive identity can be achieved by having a unified public realm that provides a safe, well-defined, and comfortable environment for users. A sense of place can also be cultivated through the land uses and specific design of the private properties lining the roadway (*see Figure 4.1: Overall Corridor Land Use Activation and Mobility Strategy*).

Figure 4.1: Overall Corridor Land Use Activation and Mobility Strategy

PUBLIC REALM

In the future, Sonoma Boulevard should have a **clear sense of arrival** as residents and visitors cross through the gateways located at the north and south ends. A better balance between automobiles, bicyclists, and pedestrians should be established through a **redesigned streetscape**. The existing public realm should be overlaid by new bicycle- and pedestrian-friendly amenities, including bike lanes, widened sidewalks, gathering opportunities, adequate lighting, and clearly striped and more frequent crosswalks.

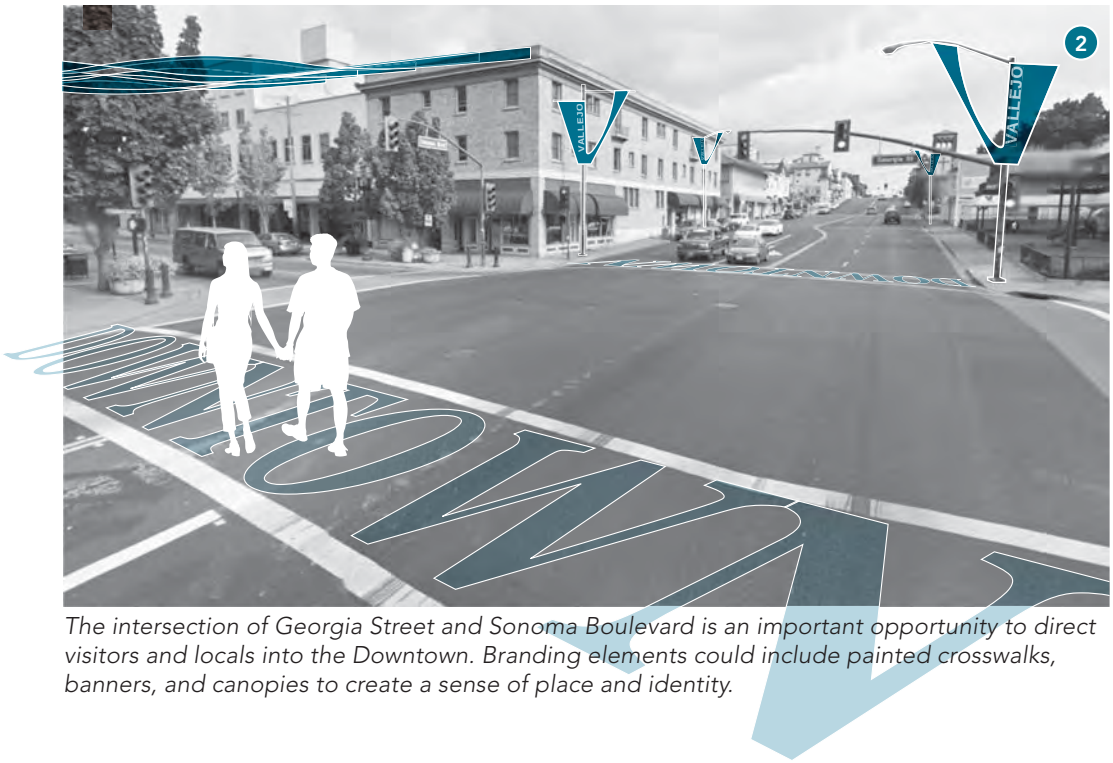
Well-maintained, widened sidewalks, with intermittent gathering and seating opportunities and adequate lighting, should characterize the pedestrian experience and encourage community interaction. New facilities along the length of the corridor, including furniture, customized bus stops, and signage should help to establish a **distinctive and cohesive character**. Continuous rows of trees along the sidewalks and within the medians should provide an identifiable sense of place while being sensitive to climate and location.

The public realm improvements described in this document respond to the needs and desires expressed by the community, and to current regulations and design trends. Recommendations may need to include changes to posted speed limits to reflect proposed street calming measures. This plan does not attempt to exclude other solutions that might be desirable or necessary in the future as community needs, trends or regulations change. Instead it allows for **flexibility and a range of solutions** to address the design and planning of the public realm. It is important to note that many of these improvements are costly and will take time to coordinate and fund. Chapter 5: Implementation outlines action steps that focus on high-impact, short-term improvements at key locations (nodes) spread along the corridor, with the goal of gradually filling in the gaps with longer-term improvements.

Boosting the Image and Brand of Sonoma Boulevard

Within the public realm there are several opportunities to **communicate the image and identity** for the City of Vallejo and Sonoma Boulevard. Potential streetscape branding elements can range from low cost items such as crosswalk painting, banners, and temporary art installations to large scale permanent public art. The elements illustrated below and on the following page are prototypical; specific design, materials and colors should be further developed as part of a comprehensive branding and marketing initiative.

The southern gateway to the corridor at Curtola should clearly communicate a sense of arrival. The primary branding element in this location could include a central identifiable public art piece or signage within a new roundabout.



The intersection of Georgia Street and Sonoma Boulevard is an important opportunity to direct visitors and locals into the Downtown. Branding elements could include painted crosswalks, banners, and canopies to create a sense of place and identity.

The northern gateway to the corridor should create a clearly defined and welcoming entry that is legible in this wide right-of-way. Branding elements could include an identifiable public art piece or signage in the median, banners, and iconic lighting integrating sustainable technology.

Bus shelters should have a vibrant and welcoming design that boldly integrates corridor branding to encourage alternate modes of transportation.

PRIVATE REALM

A combination of economic recovery and improved perceptions of the Sonoma Boulevard corridor will be essential to strengthening its market potential. A key aspect of this plan's strategy is to focus on **lower-cost actions that can be implemented in the near term**. These can include "pop-up" or temporary retail in vacant storefronts with minimal up-front investment; other interim uses for underutilized properties; and activity generators such food trucks, festivals, and other special events that can expand the corridor's visibility and attract potential interest from retailers and others.

Longer-term development along the corridor will require placemaking enhancements, such as the streetscape improvements previously described, to change perception of the area and create an environment that attracts investment from developers, tenants, shoppers, and residents. While **most new retail is likely to be local-serving**, there is **potential for more region-serving retail** at the northern end of Sonoma Boulevard, near State Route 37. As the market rebounds, **rental workforce and affordable housing developments** can function as catalyst projects by increasing market-rate developer confidence in the area and spurring further development.

Development product types should be varied based on the physical characteristics and existing uses within the four Focus Areas, which in turn will help cultivate and reinforce each area's distinct identity. North of Couch Street, sites tend to be relatively large and hold potential for the redevelopment of existing shopping centers as well as new, larger mixed-use developments. Seafood City, a supermarket located in Vallejo Plaza with Asian and Filipino-influenced products, can be an anchor for expanded ethnic retailing. Flexible office/industrial space has potential in areas without Sonoma Boulevard frontage.

Sites are generally smaller south of Couch Street and in the Downtown area. Therefore, opportunity sites tend to consist of vacant storefronts and some small vacant lots, with development more likely to be targeted to local-serving retail and service uses. In the near term, Downtown spaces are well suited for interim uses such as "pop-up" shops and other small entrepreneurs that can fill empty storefronts and create interest.

Improving Sonoma Boulevard Over Time

The photo simulations below and on the following page illustrate existing and future conditions along Sonoma Boulevard, as envisioned through **a combination of public and private realm improvements that will occur over time.** Specific development and design strategies for the overall corridor and for each Focus Area are outlined on the following pages.

Sonoma Boulevard at Illinois Street (Today)

*Proposed **initial public realm improvements** to enhance the pedestrian and bicycle environment include striped crosswalks, bike lanes, parking buffers and median.*

Note: Photo simulations are for visualization purposes only, and are not intended to show specific details and dimensions of proposed improvements and new development.

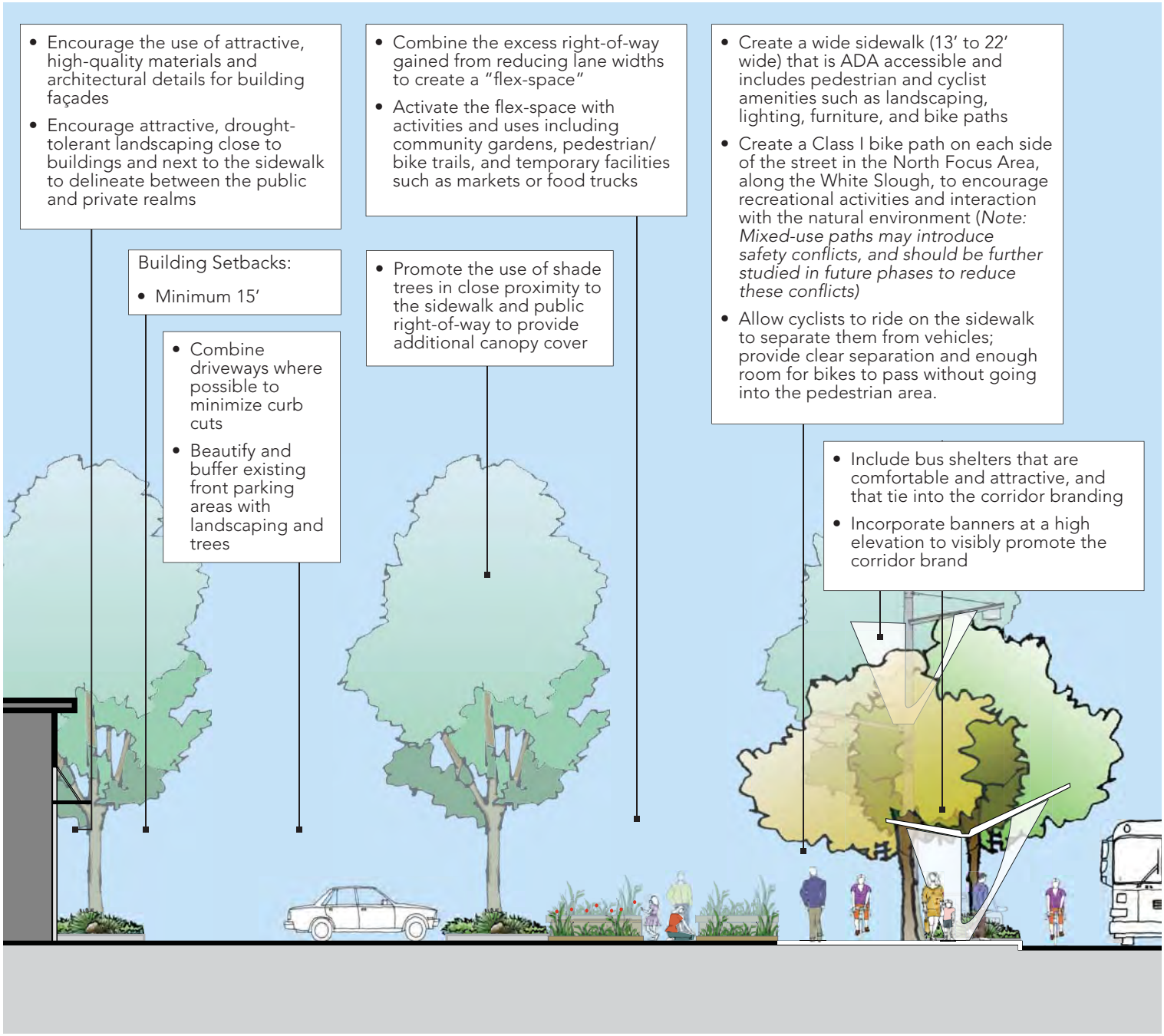
*Proposed near-term **private realm improvements** to activate the corridor include seasonal uses such as a pumpkin patch, food trucks, façade improvements to existing commercial buildings, and initial new private development.*

*Proposed **long-term public and private realm improvements** to create a vibrant mixed-use and multimodal corridor include landscaped medians and bulbouts, additional new private development, and branded signage and wayfinding.*

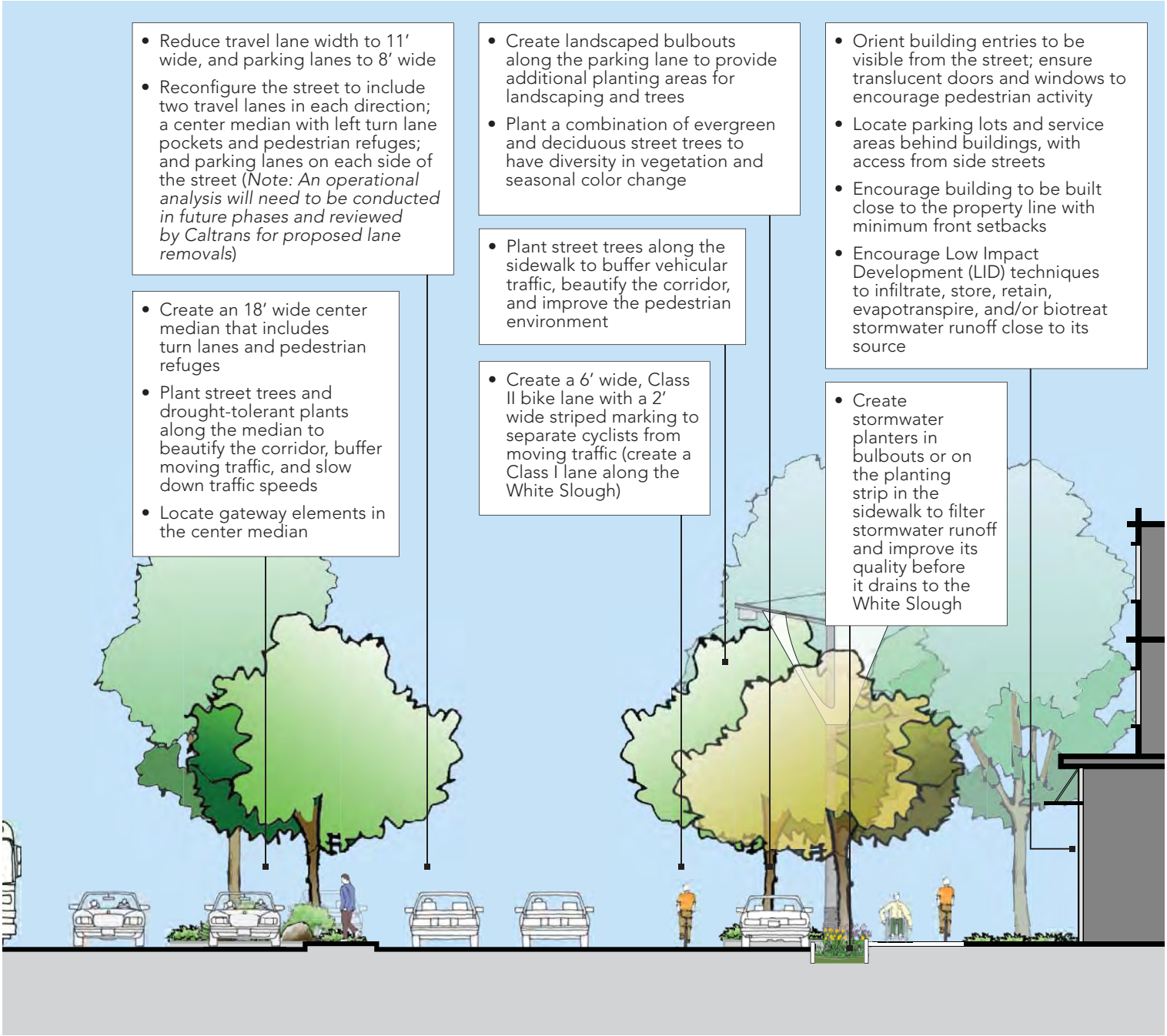
4.2 OVERALL CORRIDOR DESIGN GUIDELINES

The creation of a great corridor will entail the application of strong design principles for the street, sidewalks, and uses and buildings that frame the roadway. General design guidelines for the North and Central North Focus Areas, as well as the Central South and South Focus Areas, are below and on the following pages.

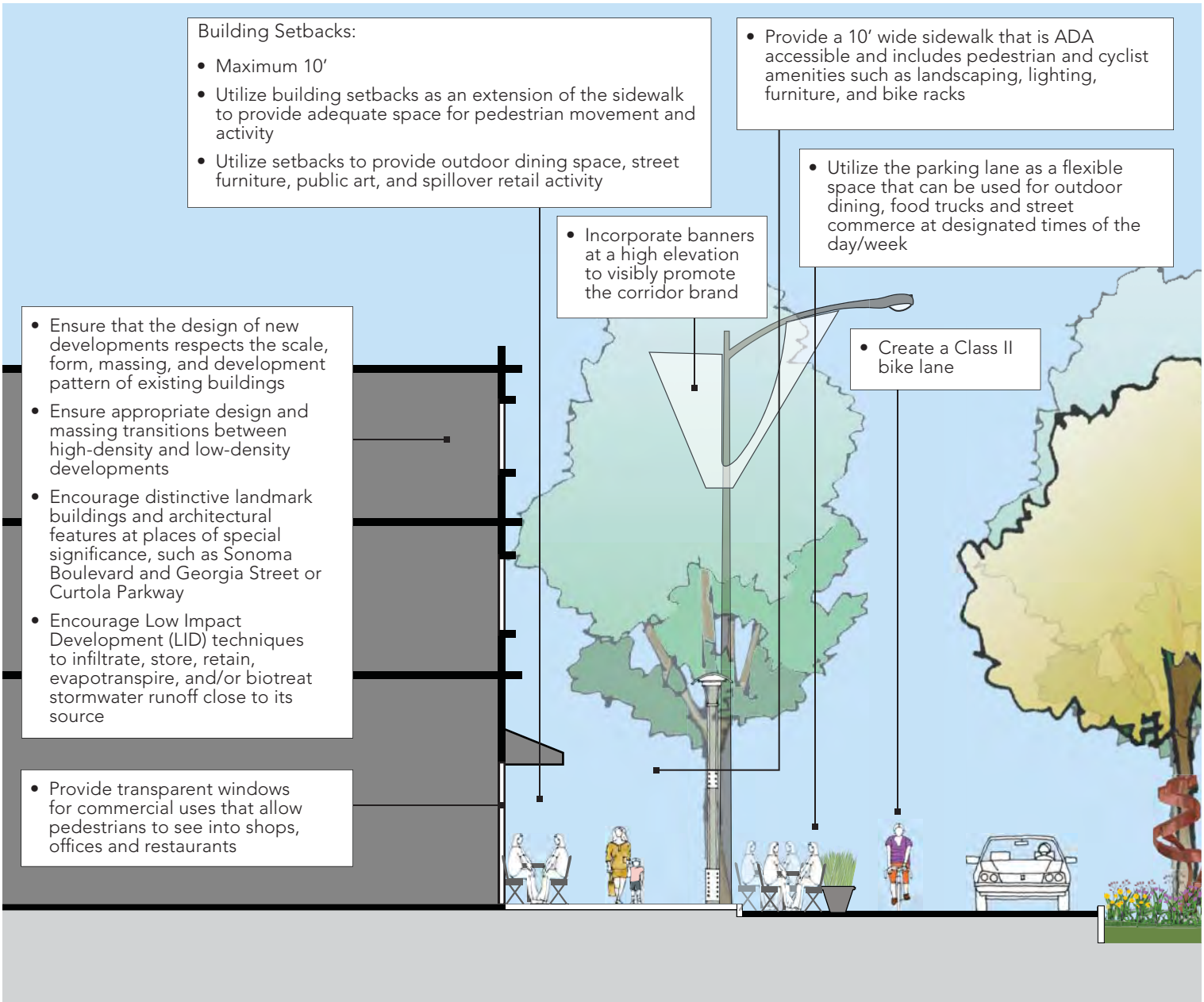
NORTH AND CENTRAL NORTH FOCUS AREAS DESIGN ELEMENTS AND GUIDELINES

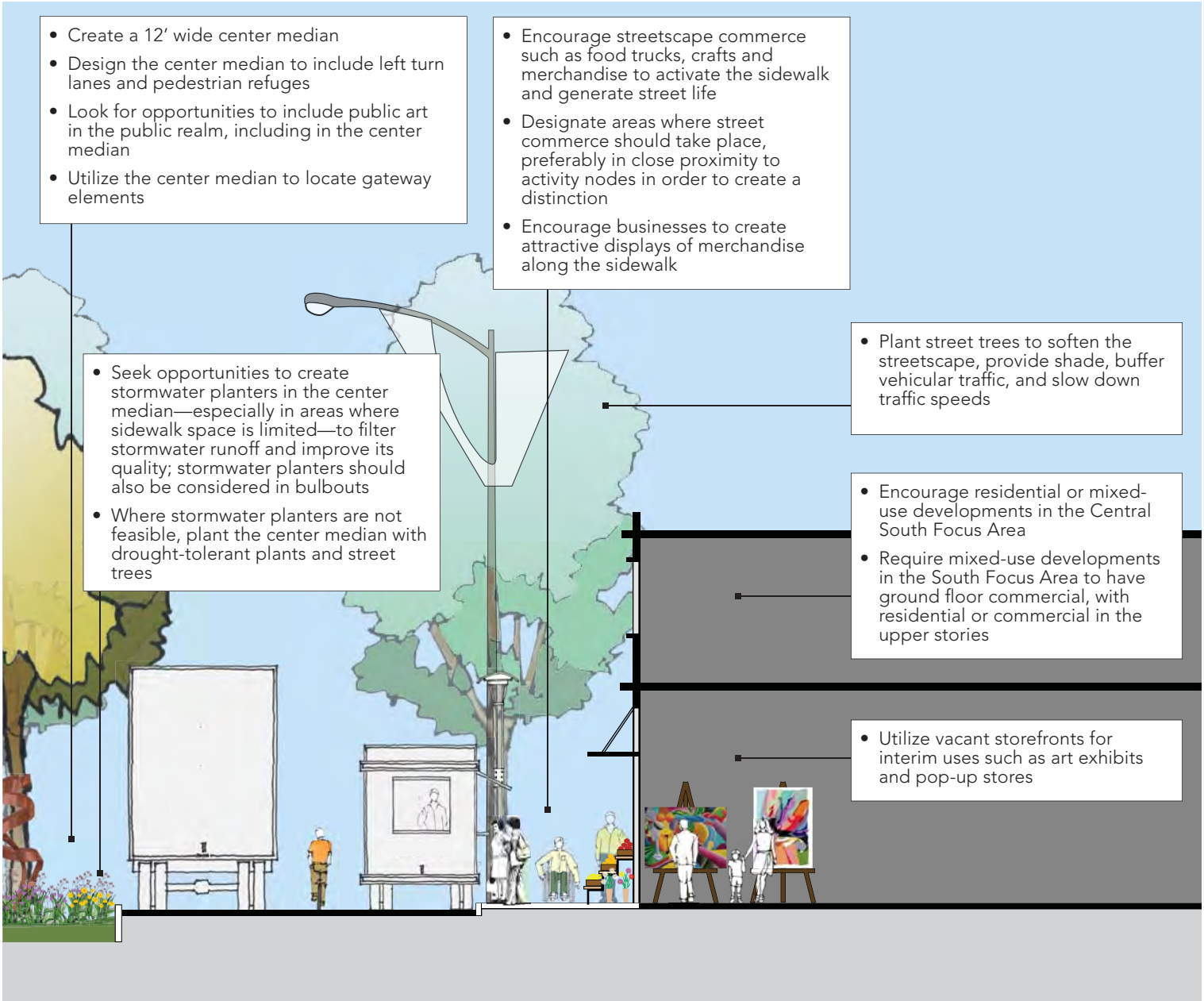


Note: The streetscape design strategies proposed align with applicable Caltrans policies, procedures, guidelines and standards for State facilities including: Sidewalk facility design criteria – Caltrans HDM Section 105.2; Travel lane width – Caltrans HDM Section 301.1; Curb extension design criteria and clearance from traveled way – Caltrans HDM Section 303.4; Bike path (Class I) design criteria – Caltrans HDM Section 1003.1; Bike lane (Class II) design criteria – Caltrans HDM Section 301.2.



CENTRAL SOUTH AND SOUTH FOCUS AREAS DESIGN ELEMENTS AND GUIDELINES




• Create a 12′ wide center median
• Design the center median to include left turn lanes and pedestrian refuges
• Look for opportunities to include public art in the public realm, including in the center median
• Utilize the center median to locate gateway elements
• Encourage streetscape commerce such as food trucks, crafts and merchandise to activate the sidewalk and generate street life
• Designate areas where street commerce should take place, preferably in close proximity to activity nodes in order to create a distinction
• Encourage businesses to create attractive displays of merchandise along the sidewalk
• Seek opportunities to create stormwater planters in the center median—especially in areas where sidewalk space is limited—to filter stormwater runoff and improve its quality; stormwater planters should also be considered in bulbouts
• Where stormwater planters are not feasible, plant the center median with drought-tolerant plants and street trees
• Plant street trees to soften the streetscape, provide shade, buffer vehicular traffic, and slow down traffic speeds
• Encourage residential or mixed-use developments in the Central South Focus Area
• Require mixed-use developments in the South Focus Area to have ground floor commercial, with residential or commercial in the upper stories
• Utilize vacant storefronts for interim uses such as art exhibits and pop-up stores

4.3 NORTH FOCUS AREA STRATEGY

The North Focus Area has many existing assets, such as its strategic location close to regionally-connecting highways; the natural environment of the White Slough; areas of medium-density housing; and existing businesses such as car dealerships and large footprint retail. A main challenge is the wide, auto-oriented nature of the roadway, its fast-moving vehicles, and lack of pedestrian facilities and connections.

This plan proposes a multimodal street that balances the needs of automobiles, truck traffic, cyclists, and pedestrians; takes advantage of the White Slough as a natural resource; creates safe and inviting linkages through and across the boulevard; and promotes and supports a successful business environment.

Figure 4.2: North Focus Area Land Use Activation and Mobility Strategy presents the elements that constitute the strategy for this Focus Area. On the following pages, a detailed explanation of each element of this strategy is provided. Images and/or diagrams are also used to clarify the different concepts.

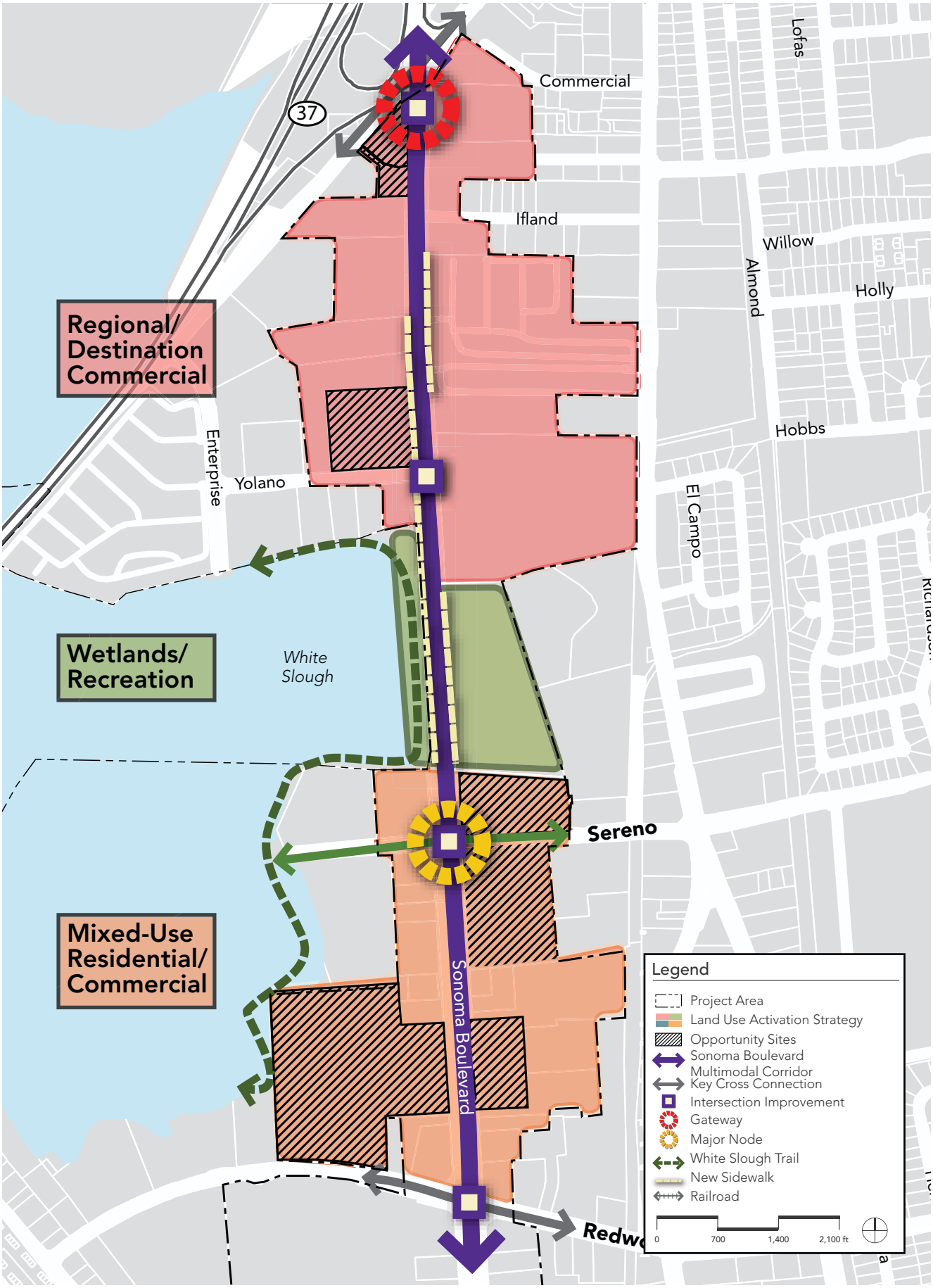
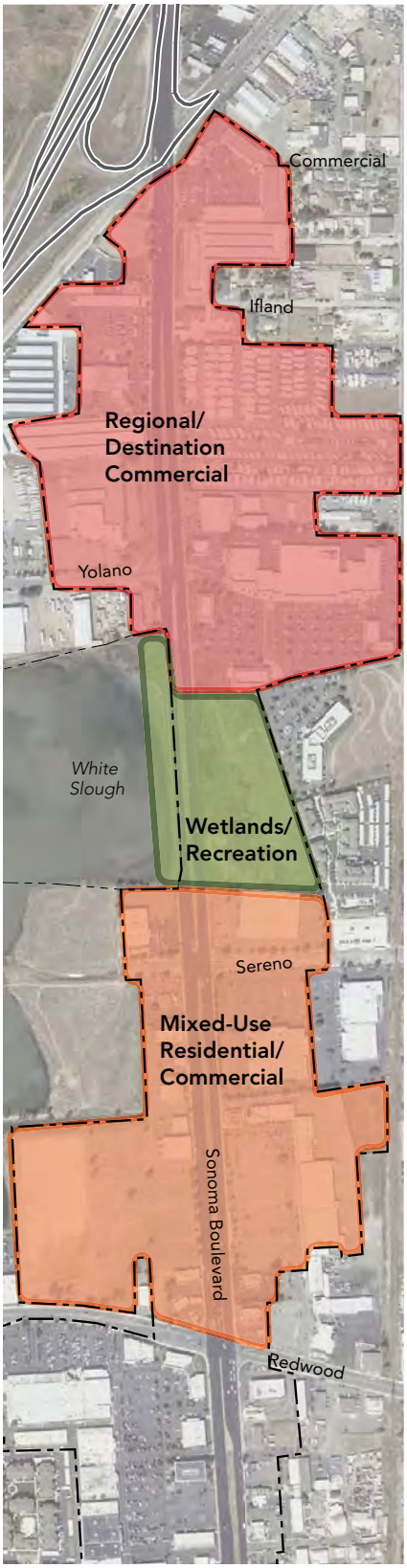


Figure 4.2: North Focus Area Land Use Activation and Mobility Strategy



LAND USE STRATEGY

The land use strategy breaks down the Focus Area into three distinct sectors that support commercial businesses and promote livability.

Regional Destination Commercial

The north portion of the Focus Area will attract large footprint businesses like car dealerships and regional stores. Businesses should be encouraged to create attractive shopping environments that are also environmentally friendly.

Wetland/Recreation

The White Slough natural environment will be improved with adequate movement of tidal waters and a restored wetland landscape. The slough will become an enjoyable destination with pedestrian and bicycle paths, and will offer both active and passive recreational opportunities in addition to a pristine wildlife habitat.

Mixed-Use Residential/Commercial

The south portion of the Focus Area will promote mixed-use residential and commercial uses. This includes housing opportunities for seniors and workers at employment centers like Kaiser, as well as forming a retail, shopping, and restaurant destination for local residents.

OPPORTUNITY SITES

The North Focus Area contains several large parcels that are either completely vacant or have commercial uses with under-utilized parking lots. Until market demand improves, these opportunity sites can be activated with a range of interim or transitional uses that can be transformed in the future into more permanent developments.

Potential interim uses for this area include: urban agriculture, viticulture, a farmer's market, a flea/antique market, seasonal businesses (such as Christmas trees or a pumpkin patch), a nursery, a fun park, and other uses that do not require permanent facilities or infrastructure and can be easily disassembled.

GATEWAY

There is great opportunity to establish a strong northern gateway to the corridor. This gateway element could include art features, signage, light, landscaping, and trees or other vegetation. The gateway element should welcome residents and visitors, announcing entry into the City through an attractive, inspired, and meaningful composition. A roundabout designed to Caltrans standards could potentially be integrated to enhance the gateway design and to improve traffic flow and safety for all users.

MULTIMODAL STREETSCAPE

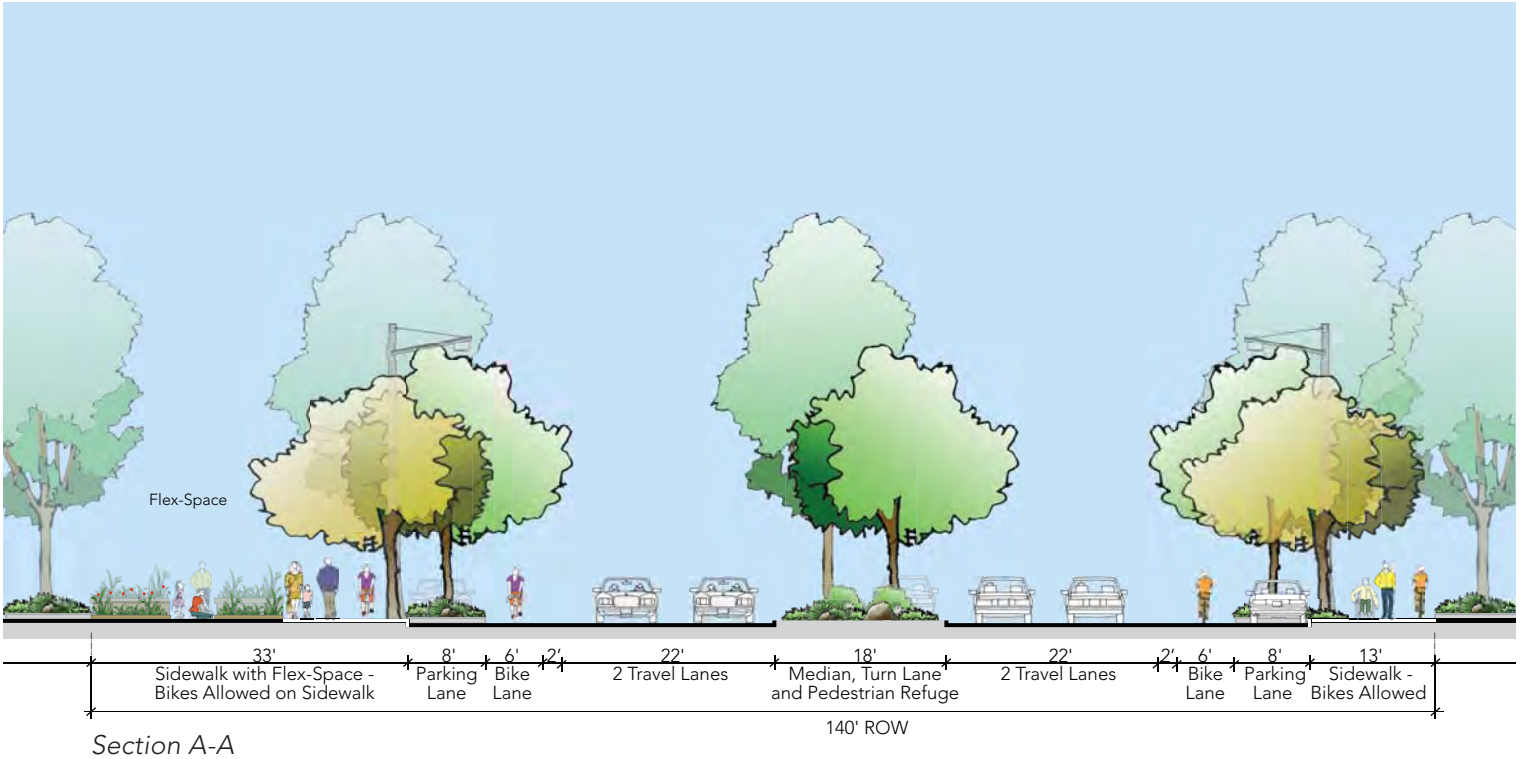
By redistributing the right-of-way and narrowing travel lanes in this Focus Area, Sonoma Boulevard can achieve a true multimodal character. The overall right-of-way will continue to be 140'; however, the distribution of space dedicated to each transportation mode will become more balanced.

In this stretch, the corridor has two slightly different configurations. North and south of the White Slough (*see section A-A on the key map to the left and on the following page*) there will be two travel lanes in each direction; parking lanes on both sides of the street; and Class II bike lanes adjacent to automobile travel lanes; as well as comfortable sidewalks with street trees, landscaping, and stormwater planters on both sides of the corridor. Sidewalks north and south of the White Slough will be wide enough to allow bikers to ride on the sidewalk an acceptable practice by the City of Vallejo. The space gained from doing a road diet—reducing the width of travel lanes—will be used to create "flex-space" on one side of the street.

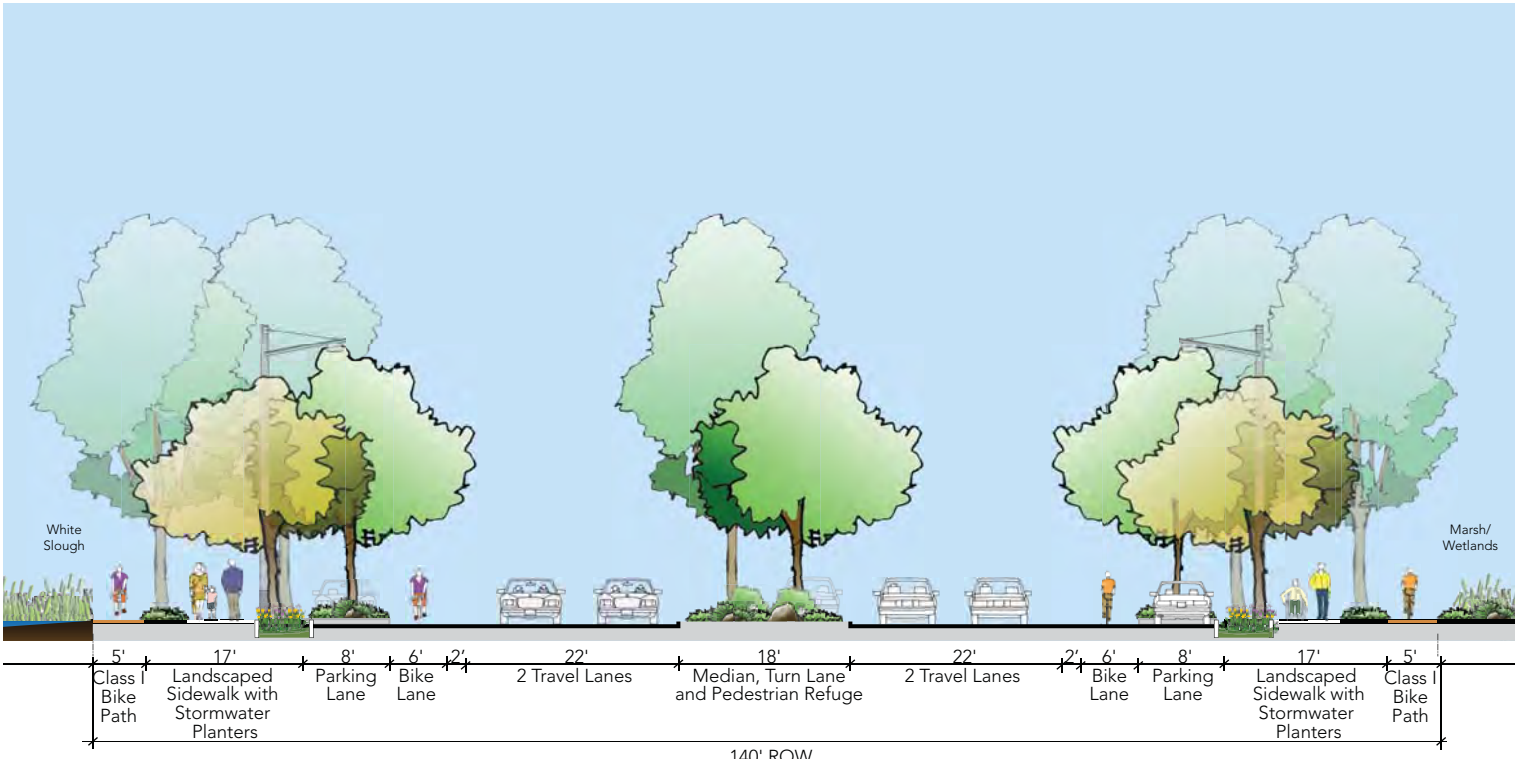
One of the most important features of the North Focus Area is the White Slough. The streetscape will reinforce the prominence of this natural asset by including a dedicated Class I bike path (separated from automobile traffic) adjacent to the slough that will invite users to explore and experience this natural feature (*see section B-B on the key map to the left and on the following page*).

Parking will be included all along the corridor to help support area businesses, create an additional buffer for pedestrians, and slow automobile speeds.

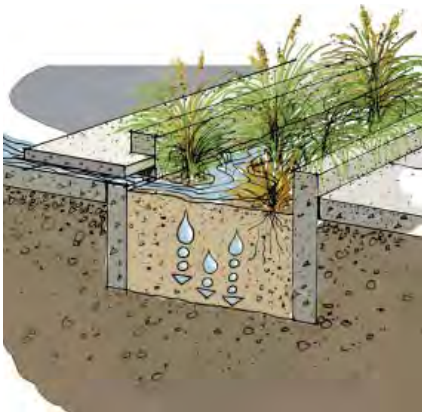
((See Appendix B: Fehr & Peers Report for traffic analysis of the proposed project)



Section A-A



Section B-B



Above are examples of stormwater planters placed along the right-of-way to capture, filter and infiltrate stormwater runoff from the road and adjacent developments.

The illustration in the following page shows the future configuration of the right-of-way after doing a road diet. Space gained with this new configuration will be used to include additional amenities that will benefit pedestrians, bikers, and the surrounding environment.

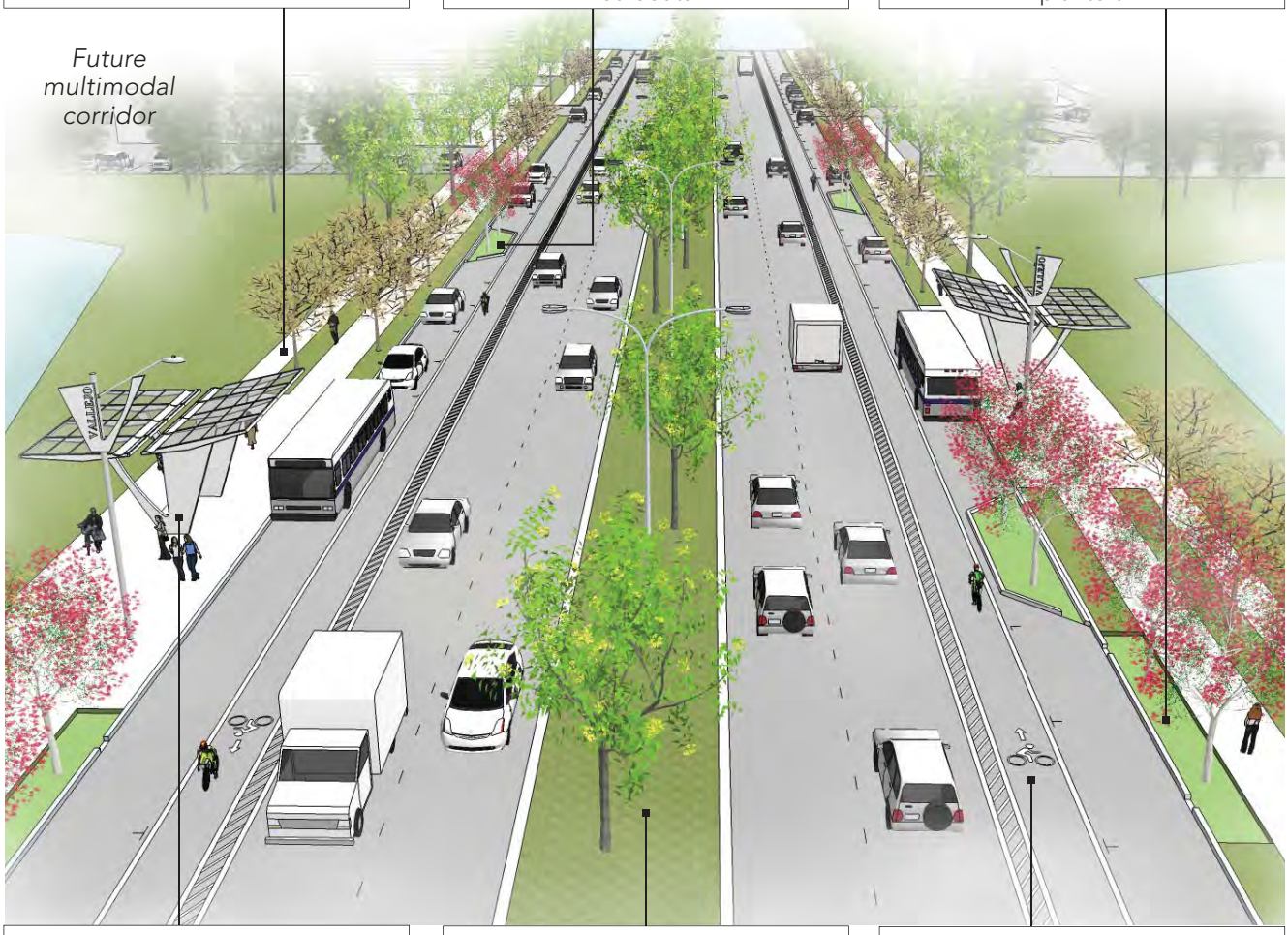
Stormwater planters will be a key new feature of the streetscape that will improve the quality of stormwater runoff before it drains to adjacent natural water bodies, and will embellish the streetscape by providing attractive, lush native plantings. These planters can be designed to allow infiltration which can reduce the costs of drainage infrastructure as the City explores the transition from piped to natural percolation. Stormwater planters can be installed on sidewalks, medians, bulbouts, parks and plazas, and traffic circles.

Specific location, design and specifications for stormwater planters will need to be established as this plan progresses and is refined with additional planning efforts. Key agencies and departments will need to be contacted to coordinate work and prevent conflicts between new streetscape features and existing utilities.

Class I bike lane

Stormwater and/or landscaped bulbouts

Stormwater and/or landscaped planters



Bus shelters

Planted median

Class II bike lane

CROSS CONNECTIONS AND INTERSECTION IMPROVEMENTS

Sonoma Boulevard in the North Focus Area has widely spaced intersections, lending to the difficult pedestrian environment. These wider sections could benefit from more amenities to improve pedestrian safety such as countdown lights, clearly delineated crosswalks, and pedestrian refuges. In addition to these improvements, signalized mid-block crosswalks and left-turn lane pockets should be considered and analyzed in future phases especially as more development occurs.

MIXED-USE RETAIL NODE

A mixed-use retail node should be created at the intersection of Sonoma Boulevard and Sereno Drive. This node should attract a mix of commercial uses geared to residents and visitors; residential uses that support nearby facilities such as Kaiser; and, potentially, some amenities such as food services, coffee shops, or a library branch so that this node becomes a mixed-use destination. If a critical mass of medical-related facilities begins to locate near the node, it could start to emerge as a "health and wellness" center.

WHITE SLOUGH TRAIL

A new multi-use trail should be created around the White Slough. As the natural wetland environment is restored, the slough will become a desirable natural resource for exploration and recreation. A trail that loops around the water body will allow pedestrians and cyclists to enjoy close interaction with the wetlands environment and wildlife. The area can also begin to attract visitors from around the region and support economic development in the Focus Area.

SIDEWALK CONNECTIONS

New sidewalks should be created along stretches of the corridor in the North Focus Area where they are currently missing. Filling in these missing links will improve pedestrian safety and offer opportunities to include stormwater planters and tree plantings. Both measures will help to improve the quality of stormwater drainage into the White Slough.

4.4 CENTRAL NORTH FOCUS AREA STRATEGY

The Central North Focus Area is a transitional area with many existing assets including Seafood City, a successful retail destination, and a range of commercial business types and sizes. A main challenge is the wide, auto-oriented nature of the roadway, its fast-moving vehicles, and unwelcoming pedestrian realm.

This plan proposes a multimodal street that balances the needs of automobiles, truck traffic, cyclists, and pedestrians; promotes activities and green spaces along the public right-of-way; and creates an attractive environment for cottage industries and innovative businesses.

Figure 4.3: Central North Focus Area Land Use Activation and Mobility Strategy presents the elements that constitute the strategy for this Focus Area. On the following pages, a detailed explanation of each element of this strategy is provided. Images and/or diagrams are also used to clarify the different concepts.

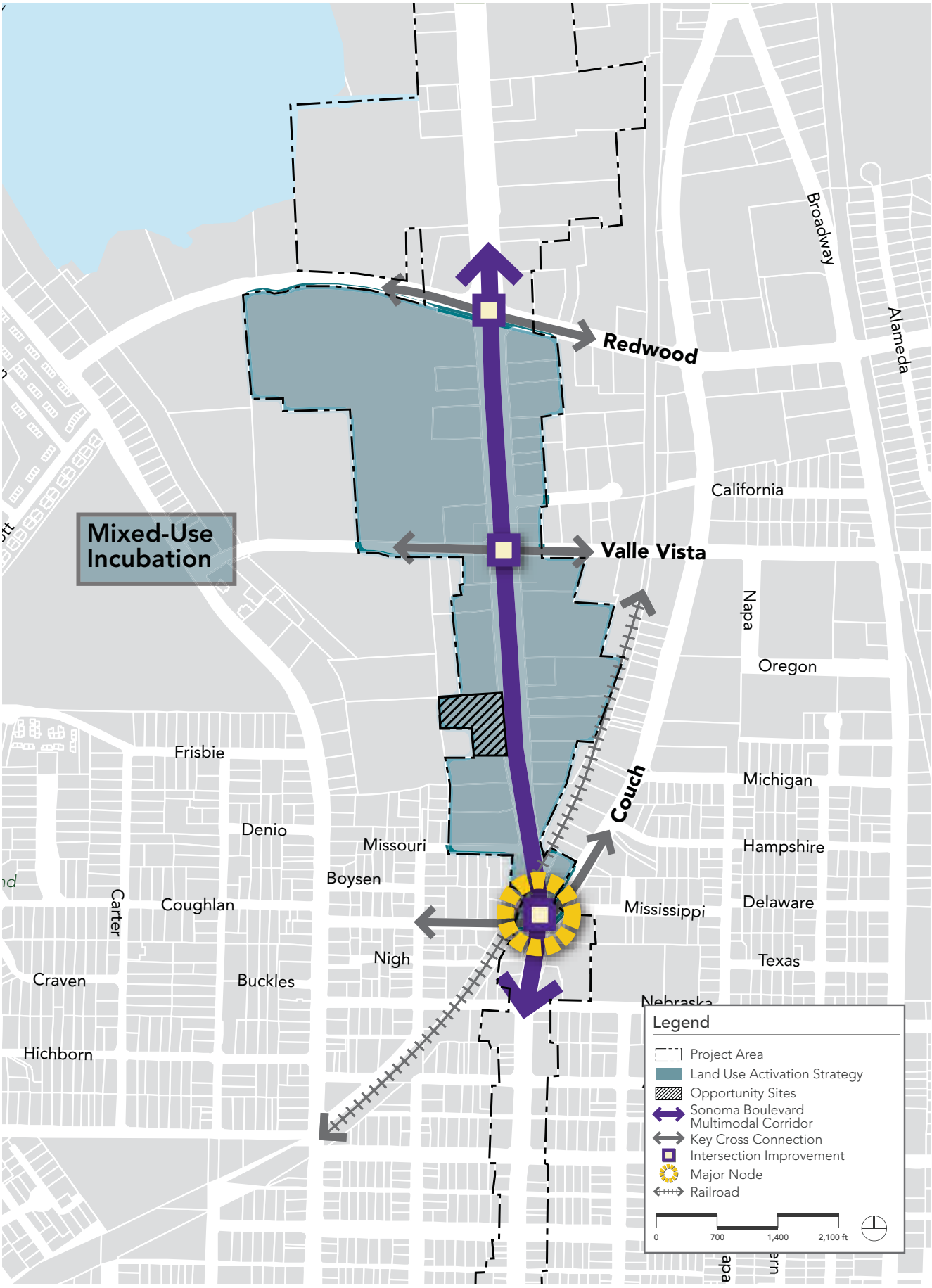
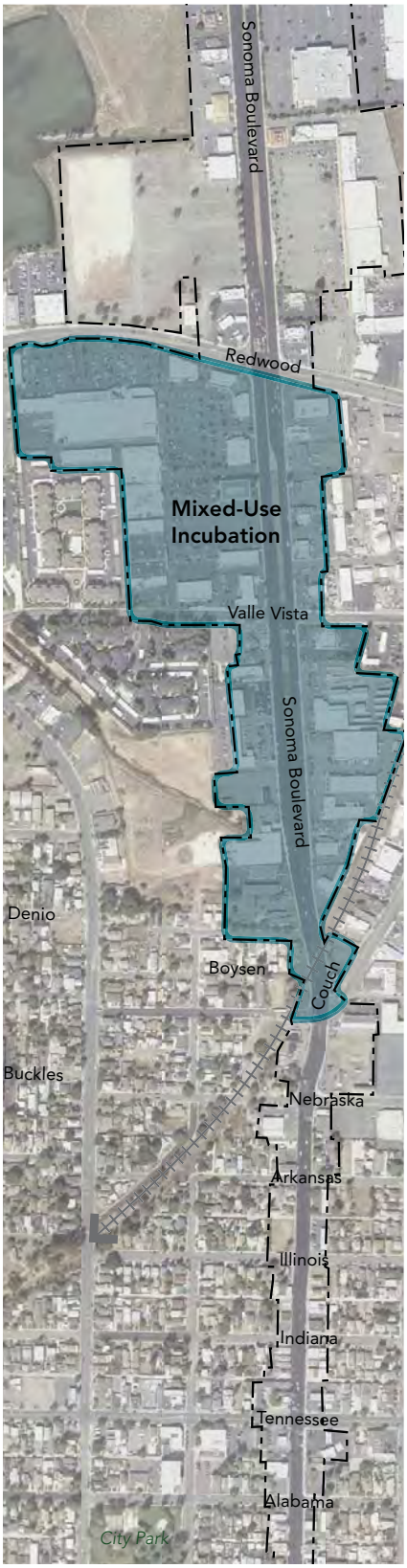


Figure 4.3: Central North Focus Area Land Use Activation and Mobility Strategy



LAND USE STRATEGY

The land use strategy focuses on an environment that provides local services while fostering businesses and entrepreneurs.

Mixed-Use Incubation

The goal of the land use strategy for this Focus Area is to support the establishment of a range of small- to medium-size trade businesses, cottage industries, and innovative entrepreneurs and artisans. A trade school that provides practical and hands-on training would be a great addition, creating a skilled labor pool that could then be employed in the City or region. Allowing zoning flexibility and creating targeted incentives will be important to achieving these objectives.

OPPORTUNITY SITE

One opportunity site is identified in the Central North Focus Area. It is located on the west side of Sonoma Boulevard, in the stretch between Couch Street and Valle Vista Avenue. Other sites in this Focus Area, including some large parking lots—such as the one at Vallejo Plaza—could also benefit from increased activity and programming. Increased activity along the corridor would create a cycle in which even more people would begin to visit the corridor and stop along the way, rather than swiftly crossing through the City.

Potential interim uses for this site include: urban agriculture (potentially supplying to the Filipino community that frequently shops at Seafood City), viticulture, a farmer's market, a flea/antique market, seasonal businesses, a nursery, a food truck "court," and other uses that do not require permanent facilities or infrastructure and can be easily disassembled.

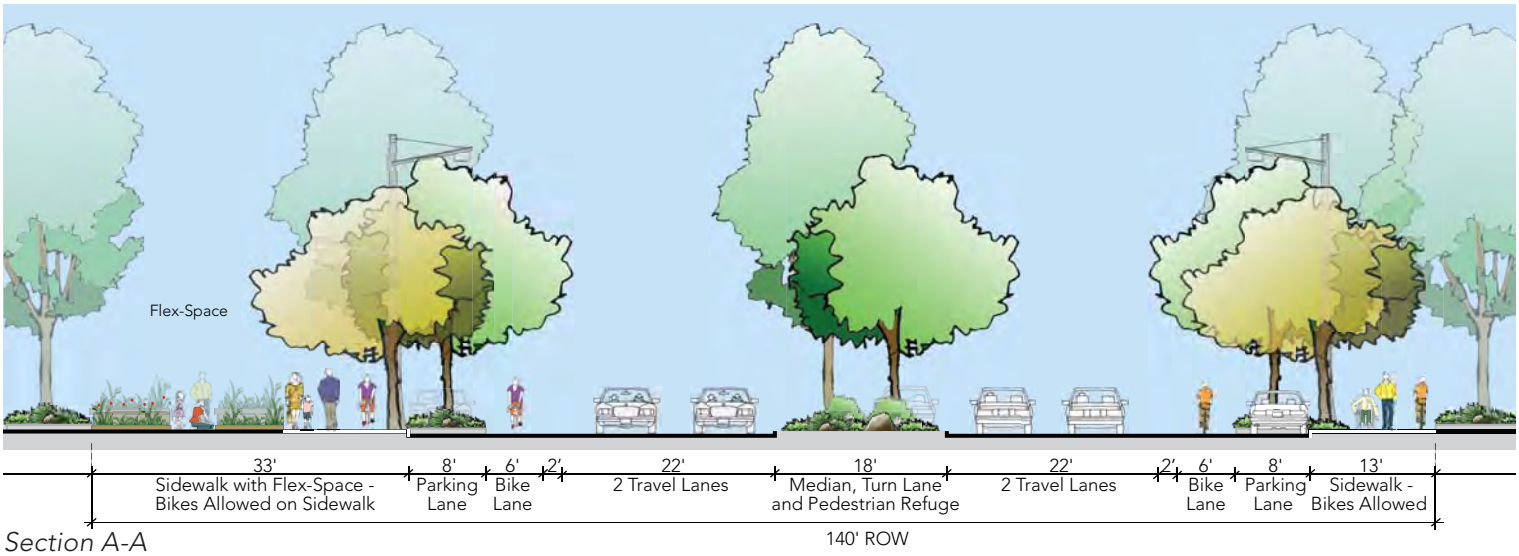
MULTIMODAL STREETSCAPE

Similar to the North Focus Area, this section of the corridor will continue to have a right-of-way of 140', though the width of the roadway reduces toward the Focus Area's south end. A more attractive and functional multimodal street will be created through a range of improvements including a reduction of travel lane width. *(see following page).*

A reduction of the dual left-turn lanes at the north and south approaches of Sonoma Boulevard and Redwood Street is also recommended to allow for increased median and sidewalk width. Existing and projected AM/PM peak hour traffic volumes do not warrant dual left-turn lanes at the north and south approaches at Sonoma Boulevard and Redwood Street. However, further analysis is recommended in future phases of project development.

In order to increase comfort for multiple users, a shared pedestrian and cyclist sidewalk with planting and street trees should be provided in this area. "Flex-spaces," created through a road diet, should be programmed along the sidewalk with engaging uses such as community gardens and food truck dining areas. Branding elements should also be incorporated and visible from both the sidewalk and road to communicate the corridor identity. Left turn lane pockets should also be provided at strategic locations along the reconfigured median.

(See Appendix B: Fehr & Peers Report for traffic analysis of the proposed project)

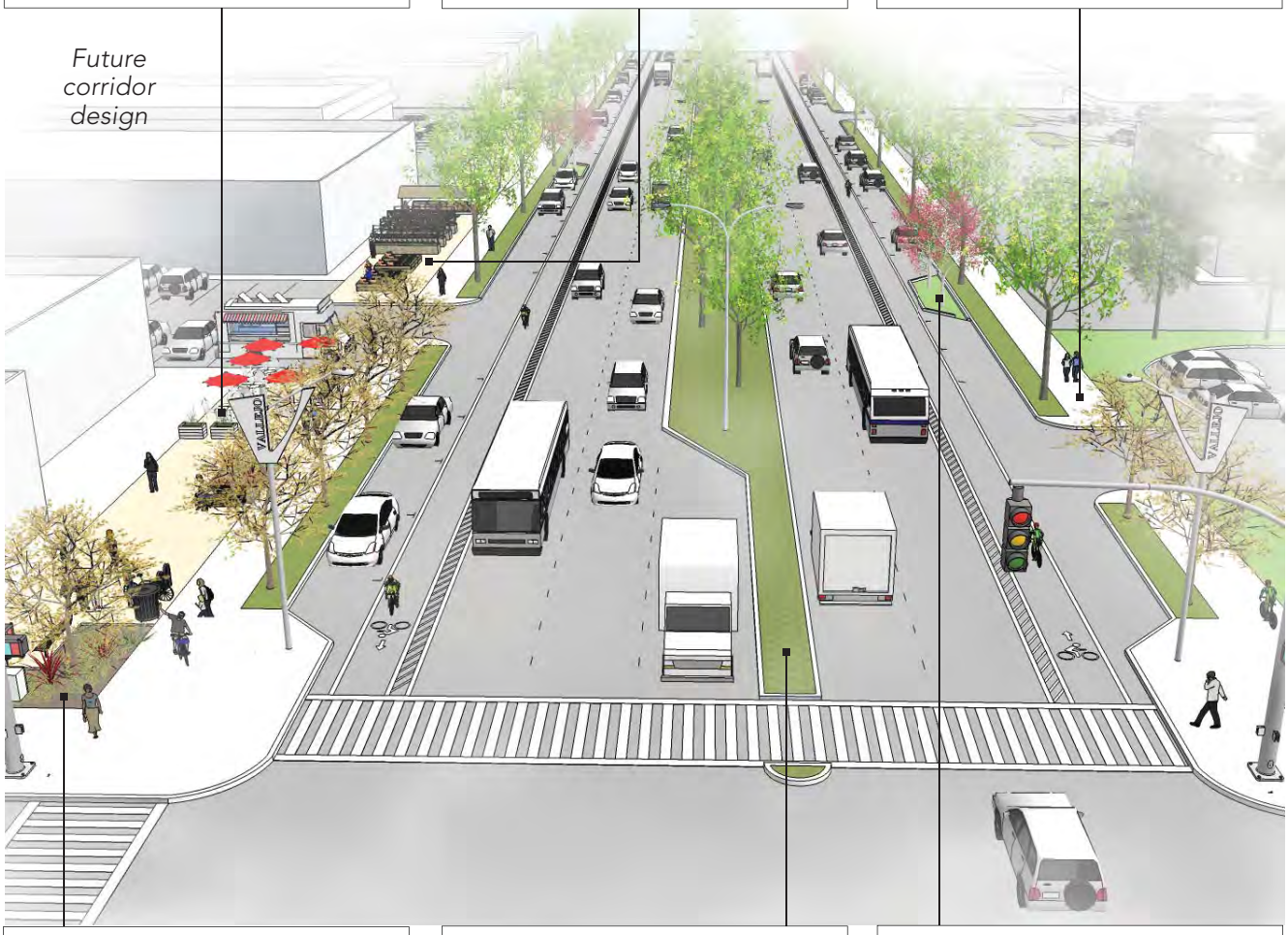


Section A-A

Flex-space next to sidewalk

Community garden next to sidewalk

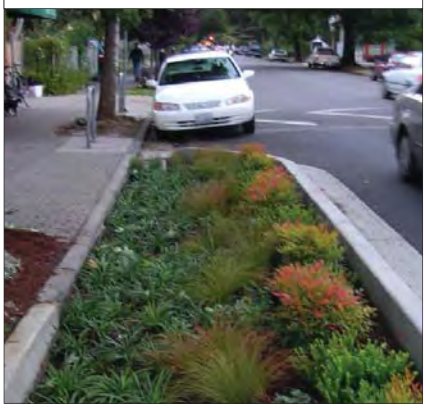
Shared pedestrian/cyclist sidewalk



Drought-tolerant plantings

Planted median with turn lane

Landscaped bulbouts



CROSS CONNECTIONS AND INTERSECTION IMPROVEMENTS

The Central North Focus Area has a few major intersections that are wide and difficult for pedestrians to safely navigate. These intersections are spaced far apart and lack a number of features that would improve pedestrian safety, such as countdown lights, clearly delineated crosswalks, and pedestrian refuges. Pedestrians in this area also encounter the train track crossing, which is wide and inhospitable. As the corridor develops, efforts should be focused on creating pedestrian mid-block crosswalks, left turn lane pockets, and a more inviting and safe railroad crossing.

TRANSIT-ORIENTED DEVELOPMENT NODE

A "transit-oriented development node" is identified at the south end of the Central North Focus Area. Due to its proximity to the railroad tracks, this area has the potential to eventually become a stop or station along a future passenger/commuter train. If this long-range vision comes to fruition, the area could benefit from this railroad connectivity to the region, with the potential to create a small-scale transit village.

4.5 CENTRAL SOUTH FOCUS AREA STRATEGY

The Central South Focus Area has several assets as a true mixed-use district with small footprint commercial and residential buildings, and businesses that cater to City-wide and neighborhood users. However, the current right-of-way configuration does not support the type of uses and businesses existing along this stretch of Sonoma Boulevard.

This plan proposes improvements that would foster a pedestrian and bicycle environment, where residents would be encouraged to walk and bike to local services and businesses; create inviting areas in the public realm for neighbors to interact and congregate, promoting a true sense of neighborhood; and concentrate neighborhood-serving retail at a key node.

Figure 4.4: Central South Focus Area Land Use Activation and Mobility Strategy presents the elements that constitute the strategy for this Focus Area. On the following pages, a detailed explanation of each element of this strategy is provided. Images and/or diagrams are also used to clarify the different concepts.

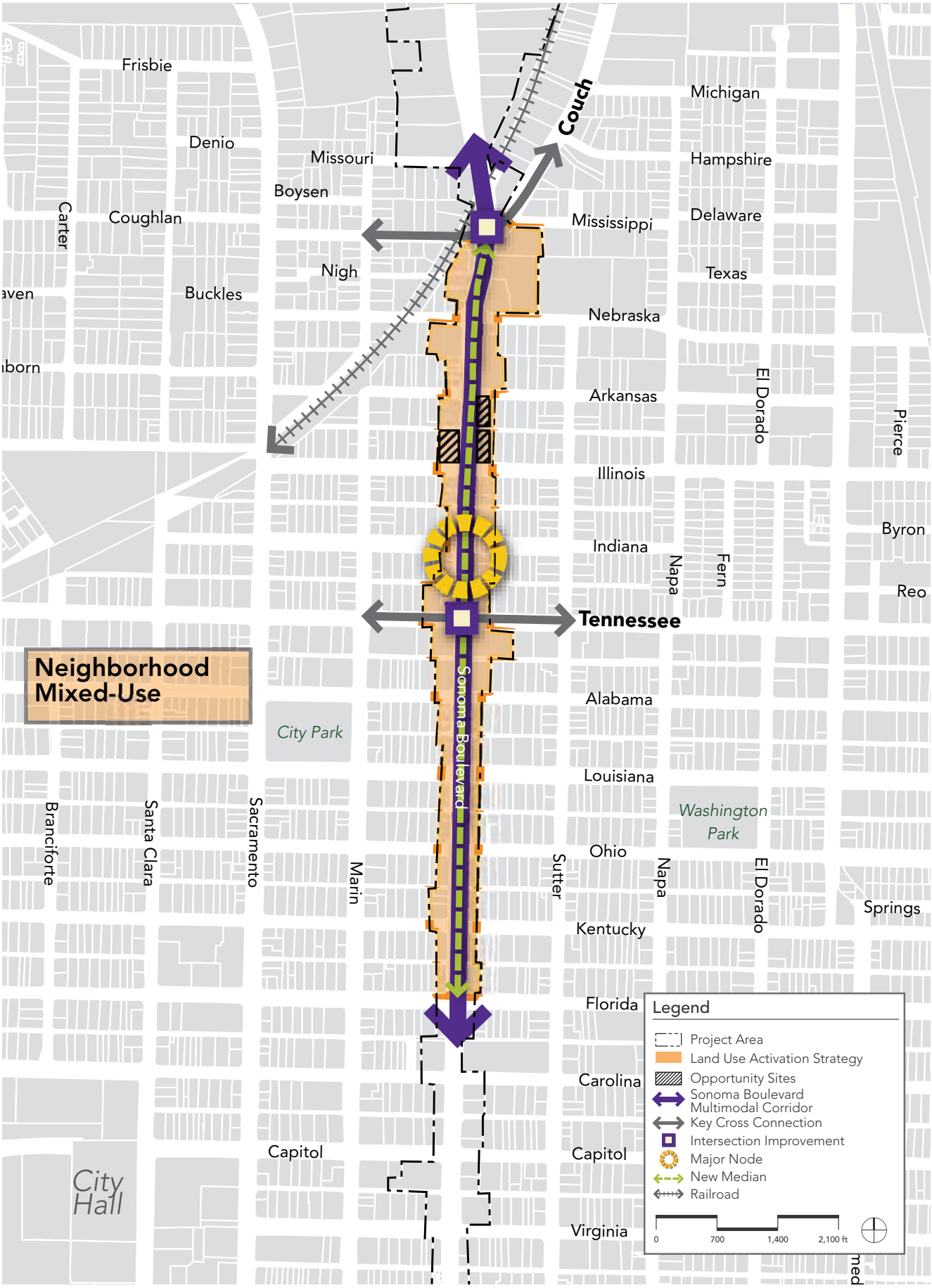
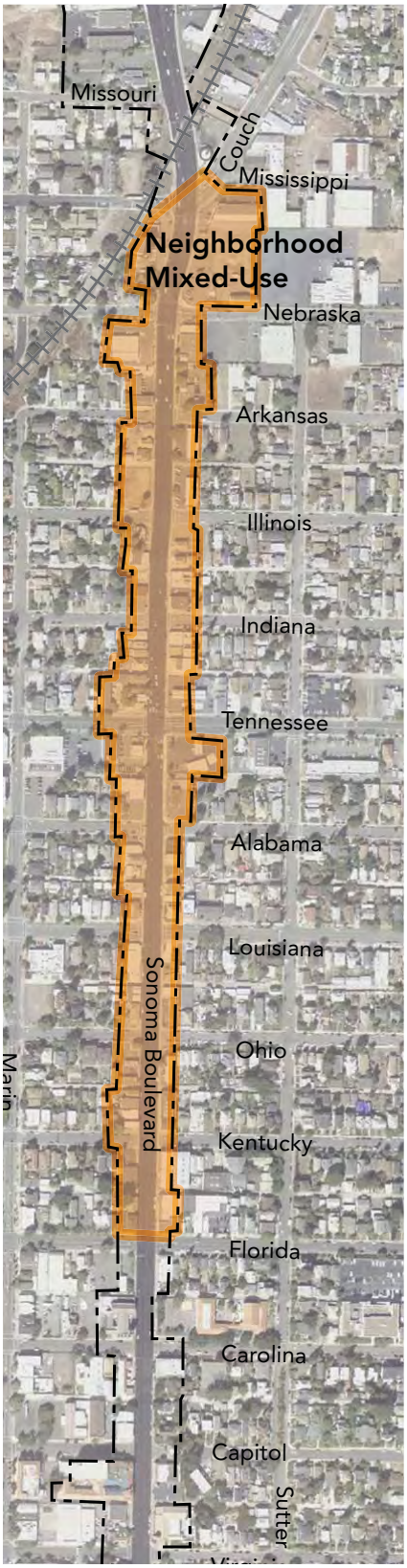


Figure 4.4: Central South Focus Area Land Use Activation and Mobility Strategy



LAND USE STRATEGY

The land use strategy focuses on fostering a mix of businesses and residences along Sonoma Boulevard and implementing improvements that will create an inviting and neighborly environment.

Neighborhood Mixed-Use

Local businesses, family-owned stores, small offices, and non-profits will be encouraged to locate in this area. An attractive, inviting and safe pedestrian environment should be created to incentivize pedestrian movement through and across the corridor. Neighboring residents will be further enticed to shop in the district, supporting the local economy. The neighborhood will benefit from the developing sense of place and a flourishing mixed-use node.

LANE
BIKE
Crafts

MINY PONY
PRODUCE
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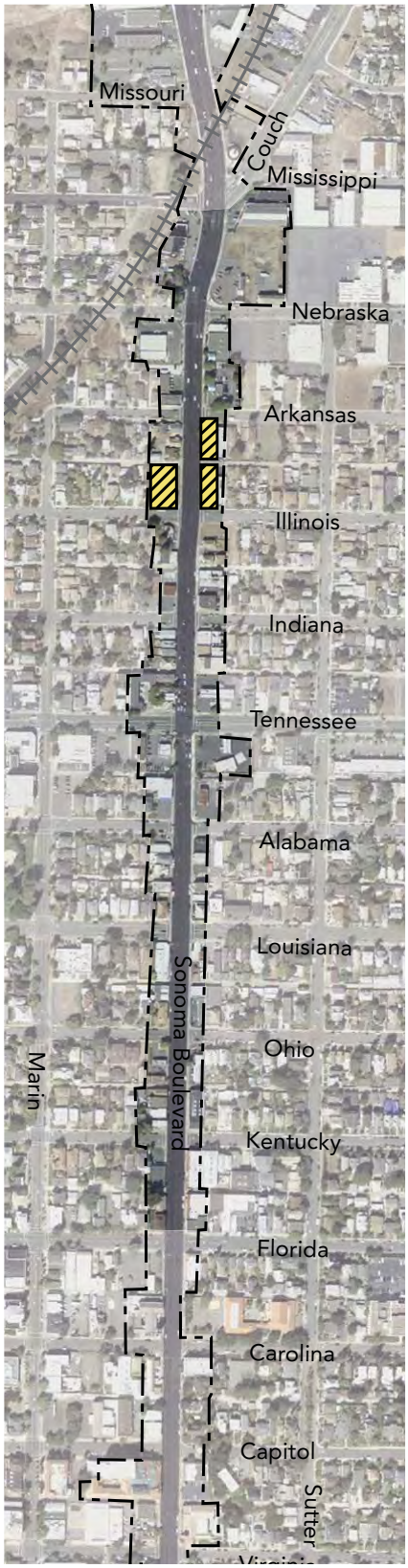


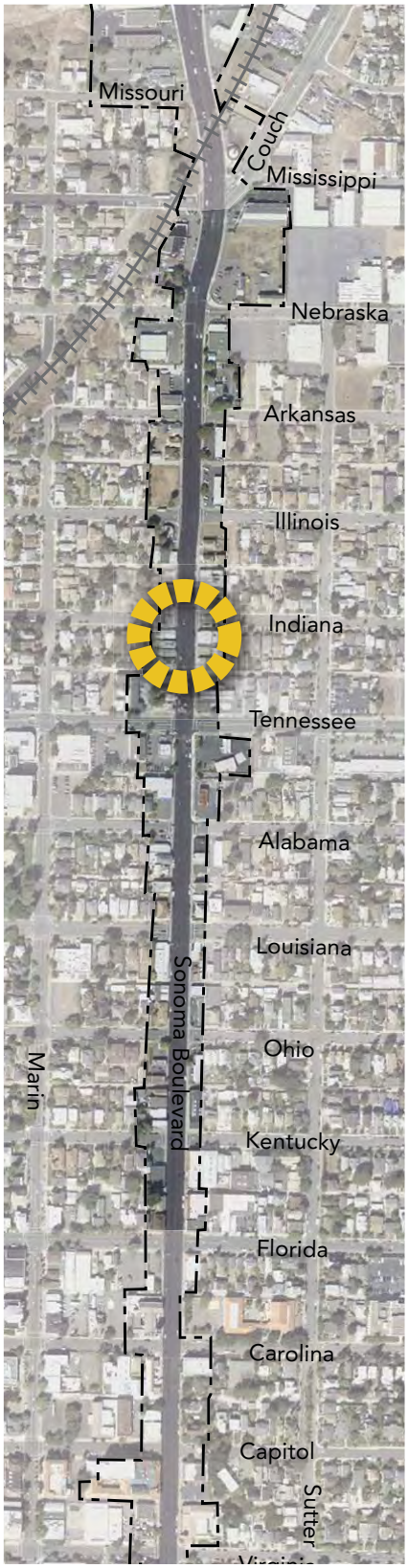
OPPORTUNITY SITES

The Central South Focus Area has two smaller opportunity sites. One is a vacant lot on the northwest corner of Sonoma Boulevard and Illinois Street, the other is an underutilized parking lot on the east side of Sonoma Boulevard, between Illinois Street and Arkansas Street.

These two sites could be activated with interim uses that promote a neighborhood sense of place and promote activities that bring the community together, such as a community garden, temporary park, farmer's market, and/or other smaller commercial efforts.

NEIGHBORHOOD MIXED-USE NODE

Creation of a neighborhood mixed-use node is recommended at the intersection of Sonoma Boulevard and Indiana Street. Special incentives and programs should be focused in this node to promote the types of neighborhood-oriented services and retail desired for this area such as markets, book stores, restaurants, coffee shops, salons and barber shops, and small hardware stores and drug stores. Initial efforts should be concentrated on making changes to the streetscape and to store frontages and façades within the node to create a sense of momentum and critical mass of activity in the Focus Area.

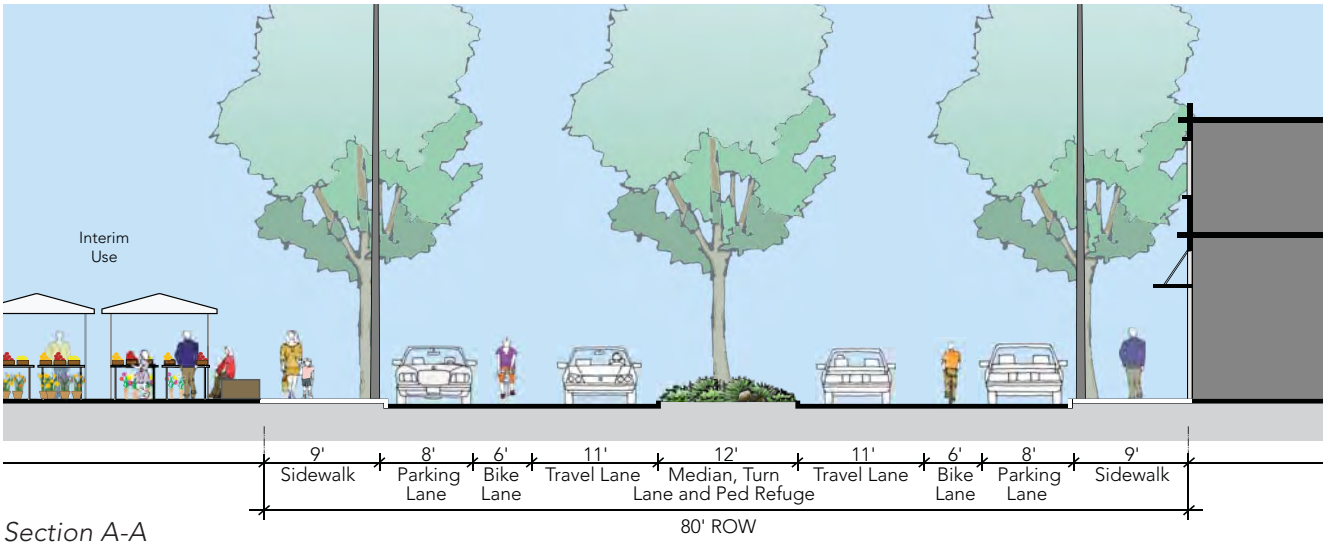


MULTIMODAL STREETSCAPE

With a right-of-way reduced from 140' to 80', Sonoma Boulevard's character is dramatically different in this Focus Area. Near- and long-term changes for this section will entail modifying the corridor's current configuration from two travel lanes in each direction to one travel lane in each direction with a turn lane/center median; installing Class II bike lanes; and incorporating landscape improvements to support a walkable neighborhood character *(see following page)*.

Amenities for pedestrians, bikers and transit users should be integrated into the public right-of-way such as streetscape furniture, bus shelters, lighting and landscaping. In addition, a consistent and thematically branded wayfinding and signage program should be developed to reflect the overall corridor branding and the character of the surrounding neighborhoods. Left turn lane pockets should also be provided at strategic locations along the reconfigured median.

(See Appendix B: Fehr & Peers Report for traffic analysis of the proposed project)

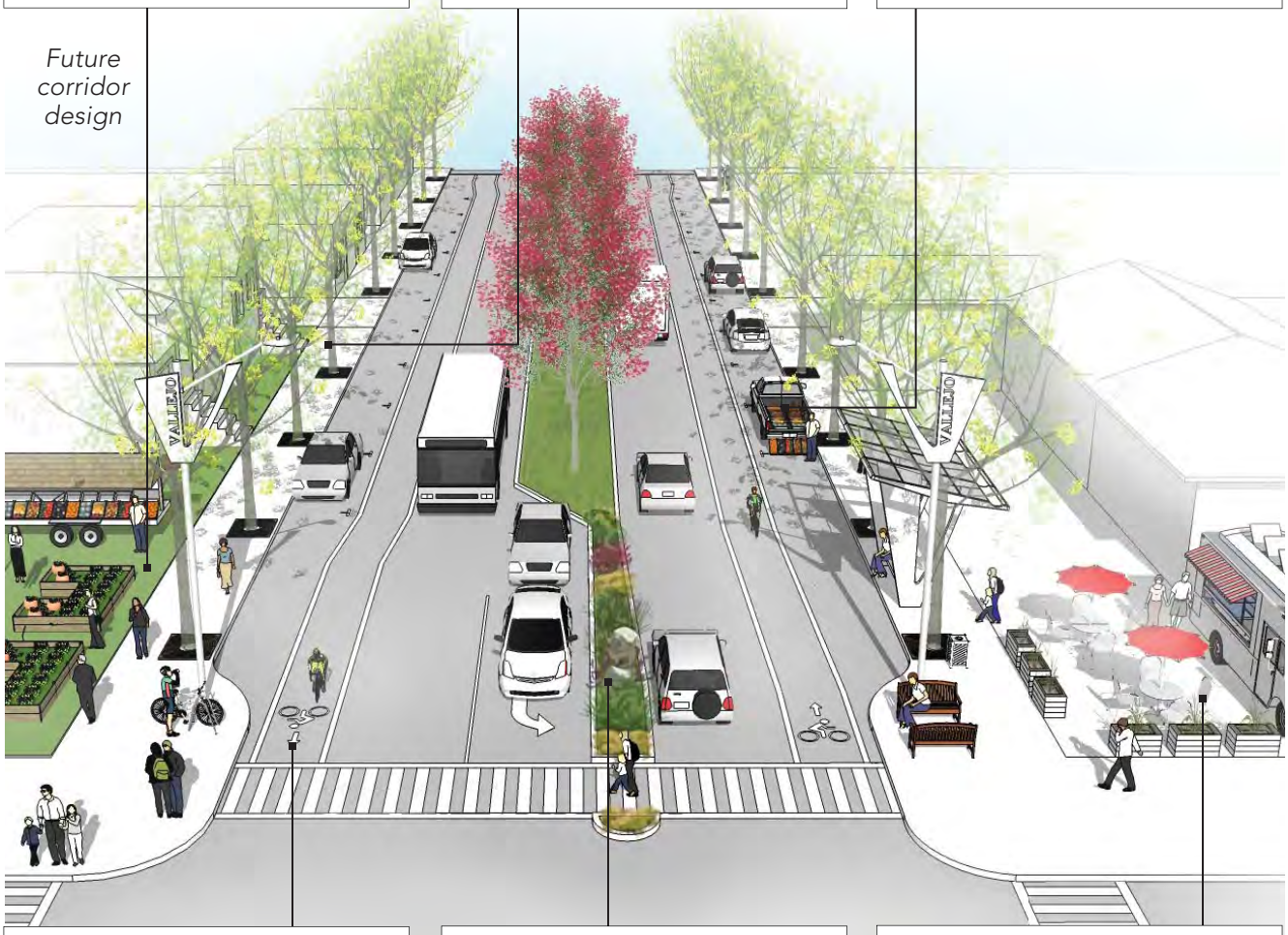


Section A-A

Community garden

Comfortable sidewalk

Street commerce



Class II bike lane

Planted median with turn lane

Interim uses

CROSS CONNECTIONS AND INTERSECTION IMPROVEMENTS

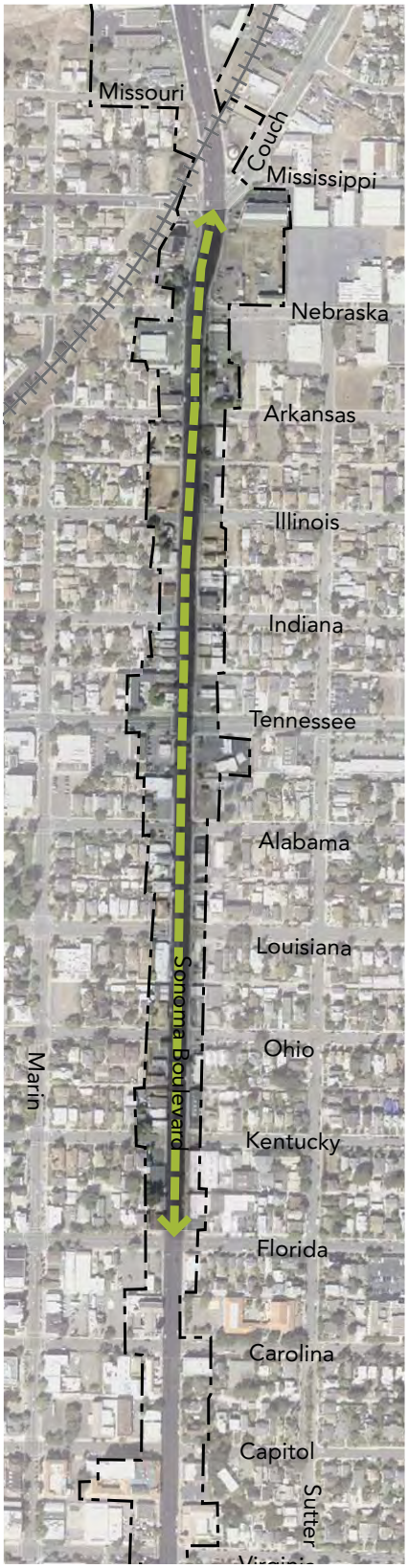
The Central South Focus Area contains many intersections and crosswalks, since this area of the City is within the historic core and has a pedestrian-scale grid of blocks and streets. Two major streets crossing the boulevard are Couch Street and Tennessee Street. Intersections should be improved throughout the whole area but particular focus should be given to these major cross connectors. All four sides of the intersection should be clearly striped and defined to call the attention of vehicles as pedestrians circulate and cross the streets.

All intersections along the corridor should be ADA compliant and in key locations should provide additional amenities such as seating, bike racks, and trash receptacles.

NEW MEDIAN

A new central median will be a prominent element of an eventual new street configuration. The median will serve many functions as it will allow for additional street trees and landscaping; include new left turn pockets at intersections; and provide pedestrian refuges.

In the short term, interim treatments of the median such as road striping stamped asphalt will be explored. This type of treatment is cost effective and will help users get accustomed to the new street configuration while more permanent solutions are designed and funded.



4.6 SOUTH FOCUS AREA STRATEGY

As part of the Downtown, the South Focus Area has many assets including a historic building stock, mixed-use buildings, and a pedestrian-scaled streetscape environment. However, the area is challenged by a prevalence of vacant buildings and lack of street activity.

This plan proposes public realm improvements to create a vibrant and lively pedestrian environment, with activities spilling over onto the sidewalks and even the street; mixed-used developments with ground-floor commercial uses and residential/office uses in the upper stories; interim uses and/or art exhibits in vacant spaces; and pop-up, mom-and-pop, and local businesses.

Figure 4.5: South Focus Area Land Use Activation and Mobility Strategy presents the elements that constitute the strategy for this Focus Area. On the following pages, a detailed explanation of each element of this strategy is provided. Images and/or diagrams are also used to clarify the different concepts.

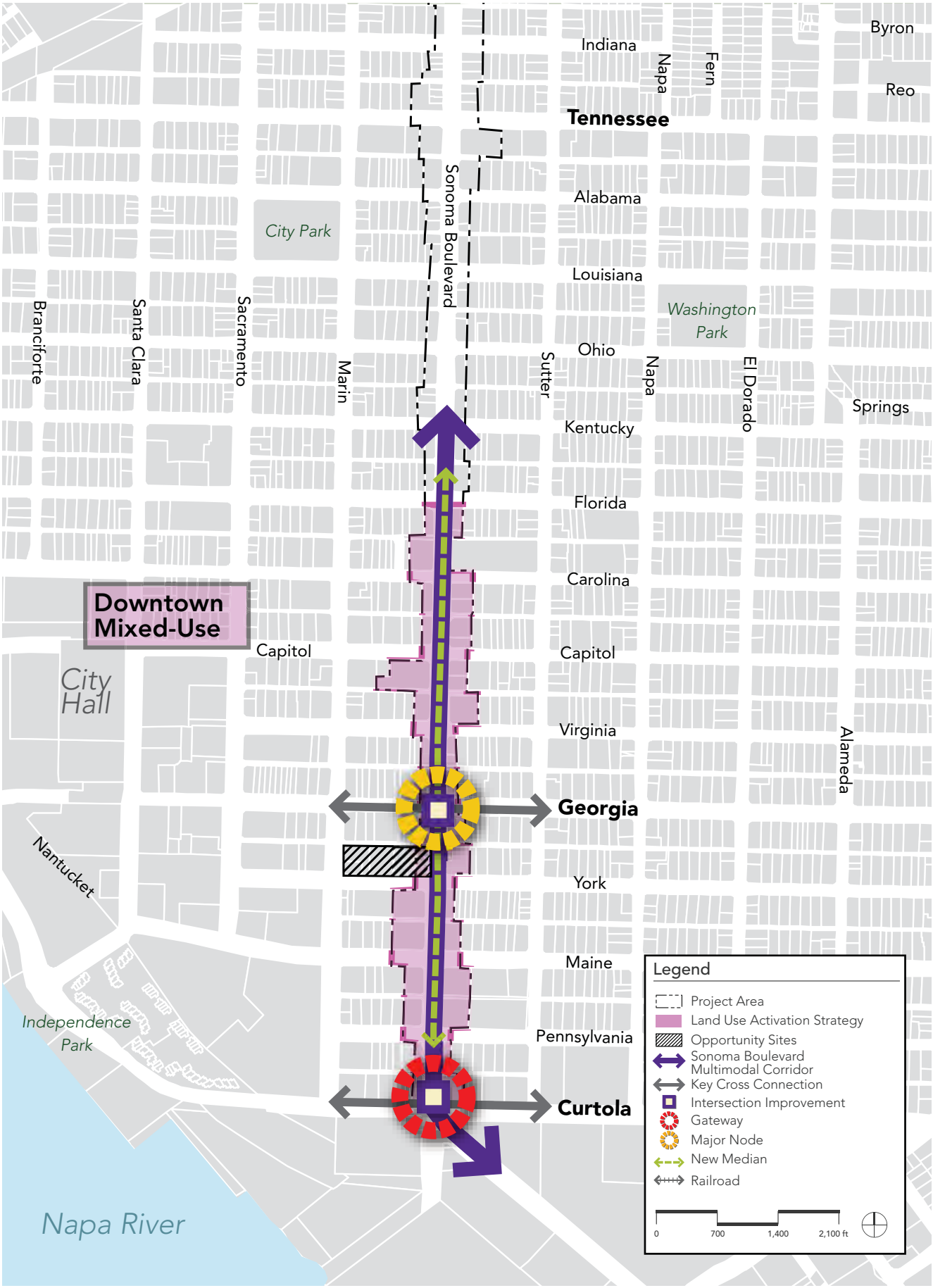
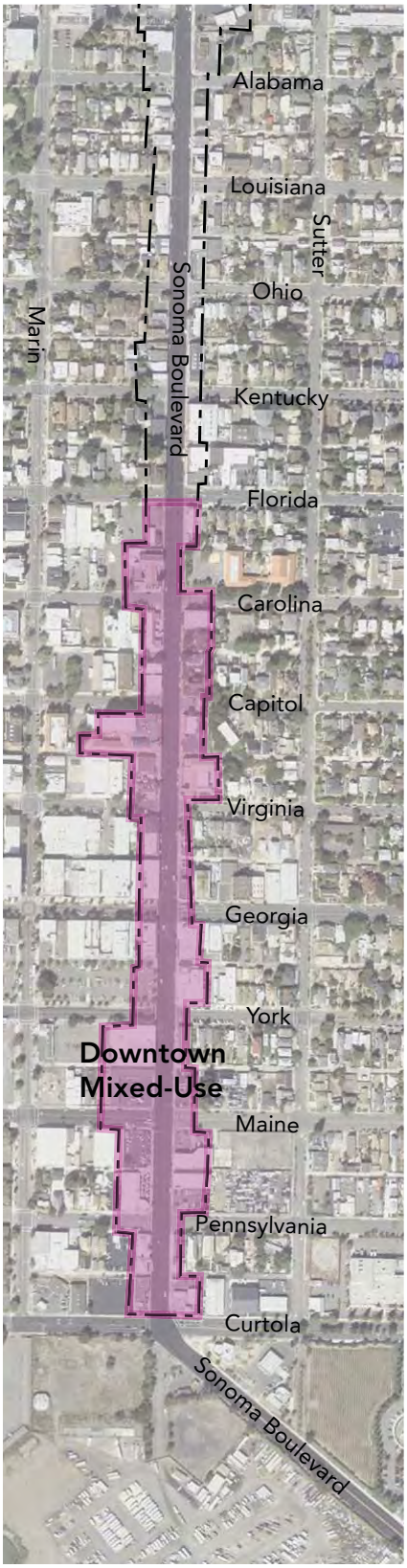


Figure 4.5: South Focus Area Land Use Activation and Mobility Strategy



LAND USE STRATEGY

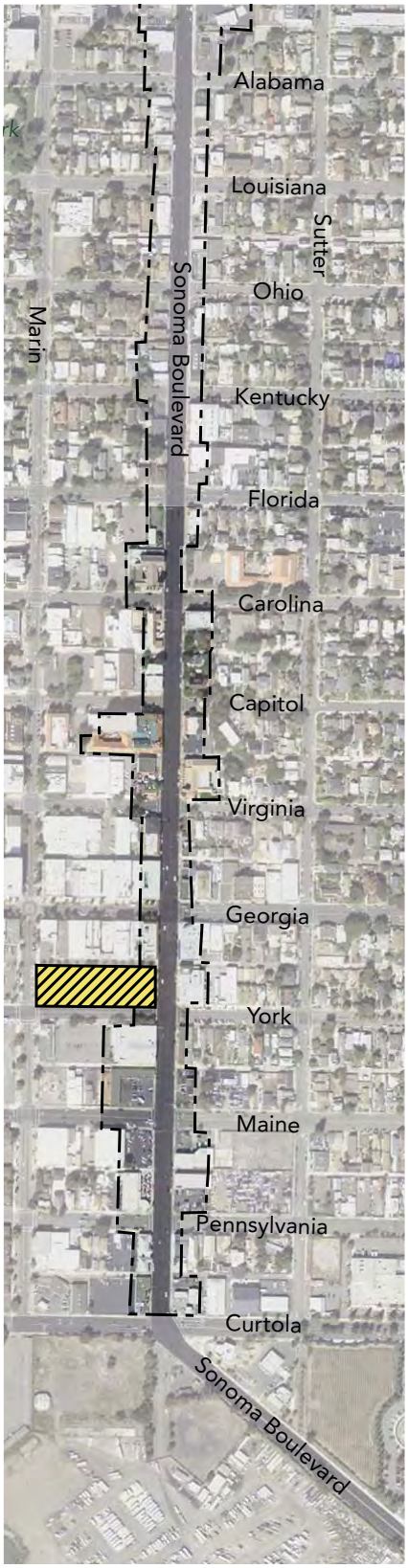
The land use strategy for this area is shaped by the Downtown Vallejo Specific Plan, which outlines a robust mixed-use environment with commercial ground floors and upper story office and/or residential uses.

Downtown Mixed-Use

As the social and civic heart of the City, the Downtown area will encourage a range of small-scale retail stores and businesses that will boost street activity and contribute to a vibrant public domain. Live-work spaces, restaurants, cafes, a grocery store, boutique stores, art and cultural facilities, and street vendors are all desirable uses and activities for this Focus Area.

OPPORTUNITY SITE

The South Focus Area has one prominent opportunity site. Located northwest of Sonoma Boulevard and York Street, the site is currently an underutilized parking lot. Due to its location along the corridor and proximity to key amenities, it has great potential for significant infill development. In the near-term, this site could be activated with temporary uses that promote street life and activities in the Downtown. These can include street commerce, a food truck "court," a temporary plaza, a beer garden, street-fair celebrations, a food and farmer's market, an antiques market and more.

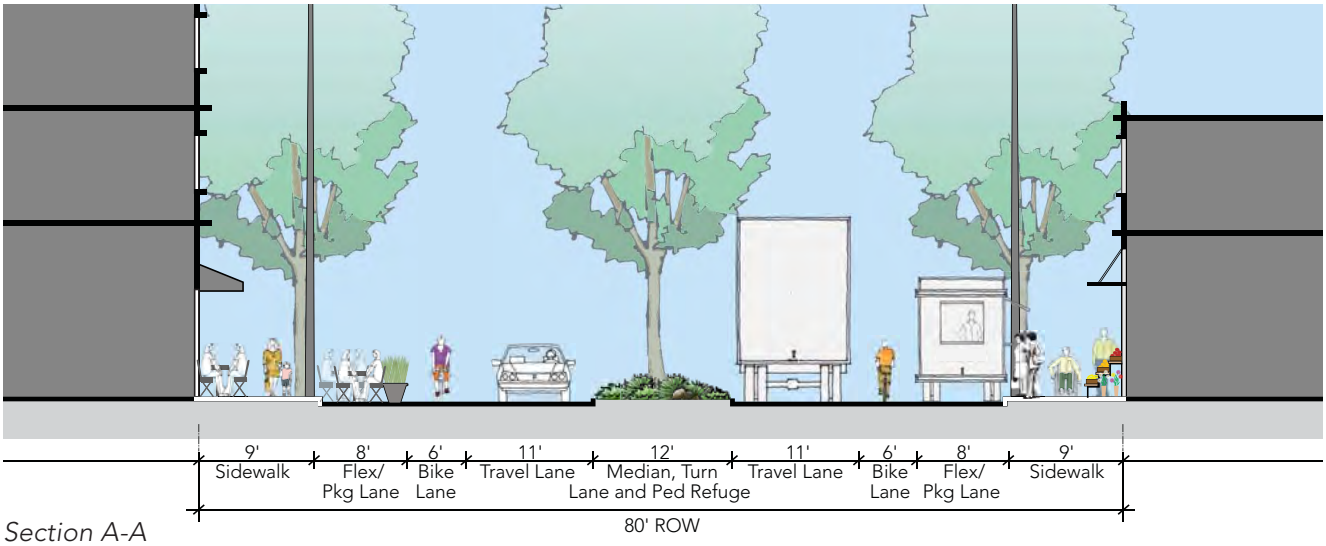


MULTIMODAL STREETSCAPE

Similar to the Central South Focus Area, Sonoma Boulevard in the South Focus Area has an 80' right-of-way. Eventually, the corridor's current configuration should be changed, going from two travel lanes in each direction down to one travel lane in each direction with a turn lane/ center median. The roadway improvements—combined with the building edges that frame the street—will help slow down traffic, support local businesses, and create an identifiable image and gateway into Downtown (*see following page*).

Amenities for pedestrians, bikers and transit users should be incorporated in the public right-of-way such as streetscape furniture, bus shelters, lighting and landscaping. In addition, a consistent and thematically branded wayfinding and signage program should be developed to maximize visual recognition of the Downtown, as well as key landmarks and destinations proximal to Sonoma Boulevard.

(See Appendix B: Fehr & Peers Report for traffic analysis of the proposed project)

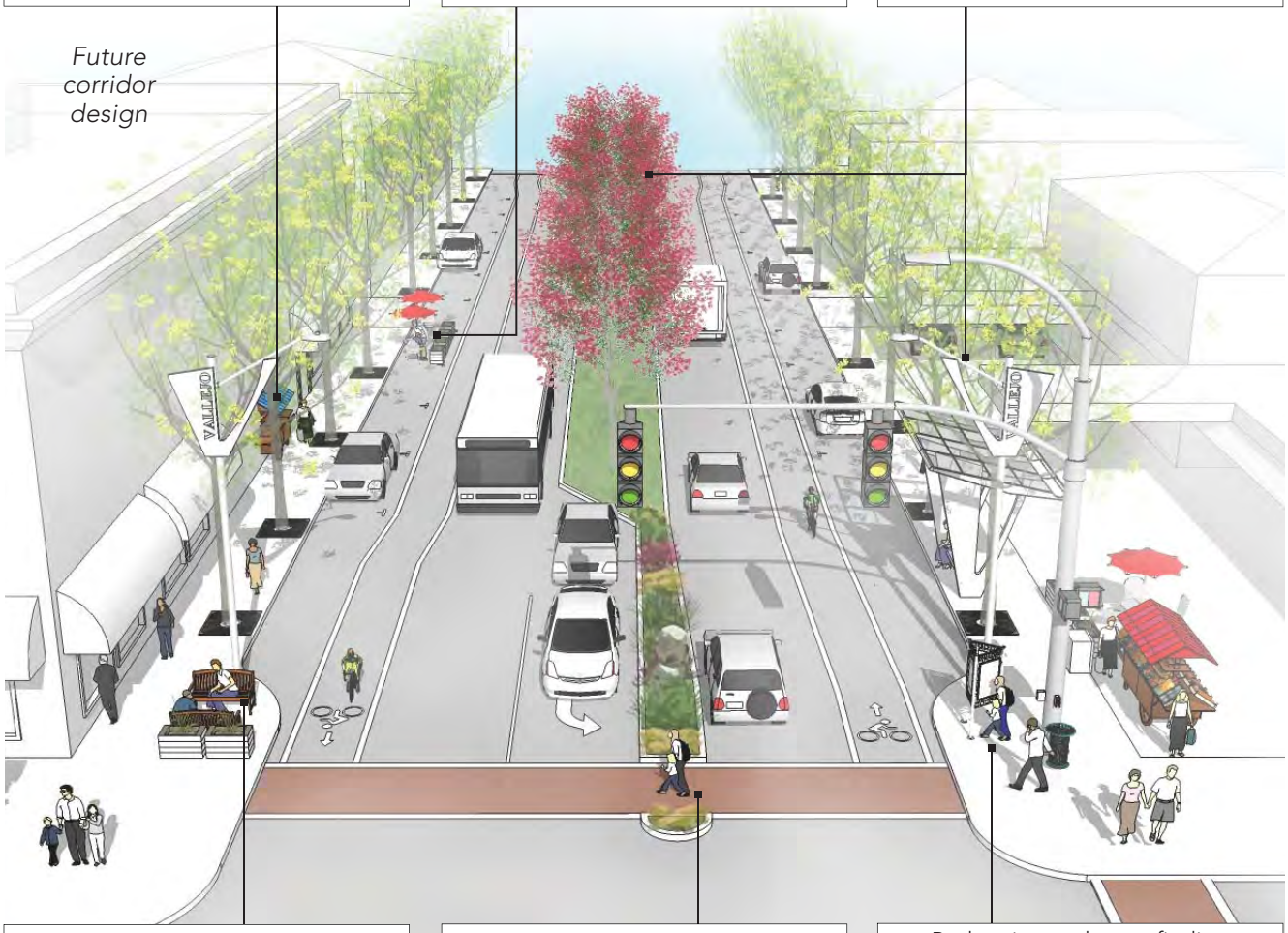


Section A-A

Retail spill over

Flex parking lane

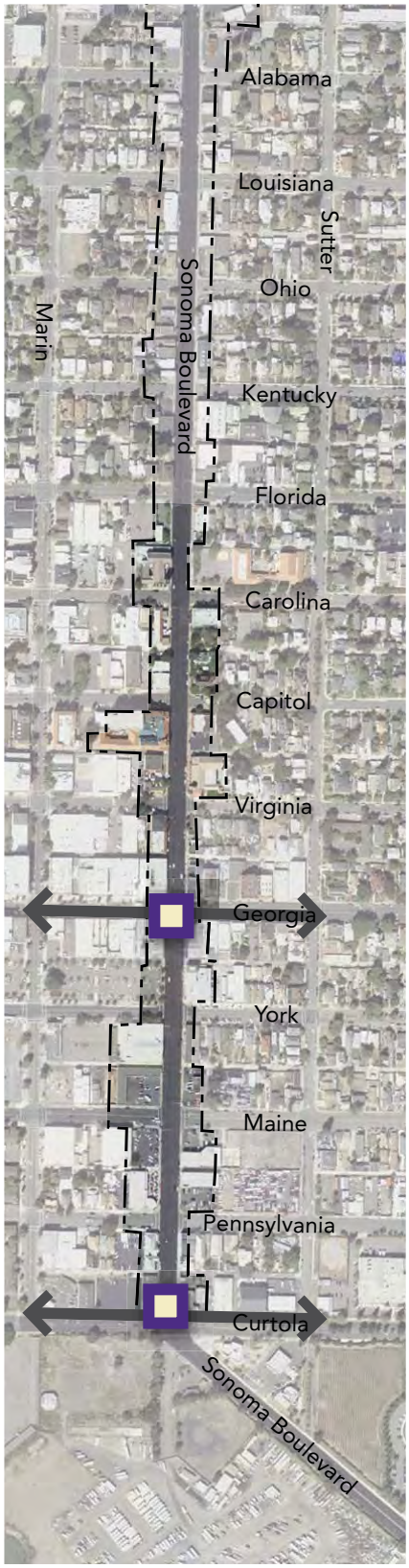
Street trees



Street furniture

Intersection with pedestrian refuge

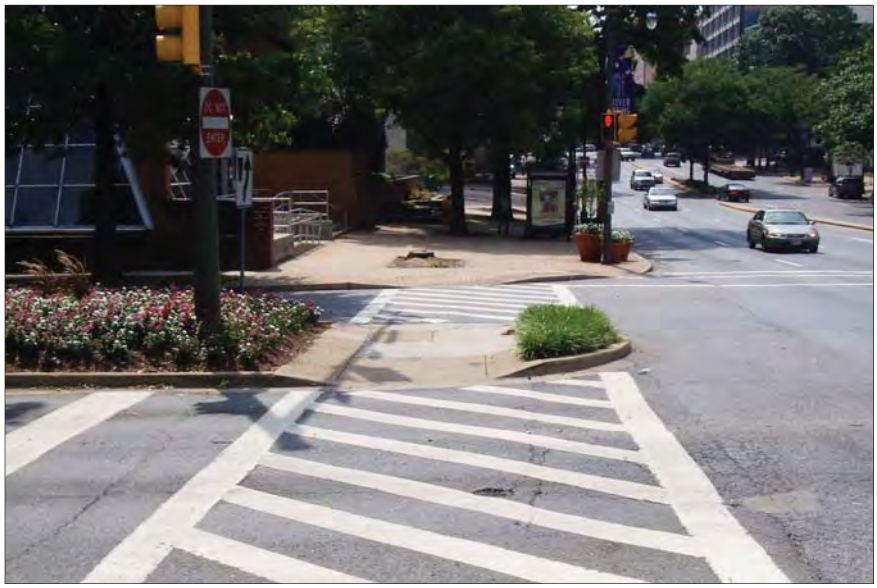
Pedestrian-scale way finding and signage



CROSS CONNECTIONS AND INTERSECTION IMPROVEMENTS

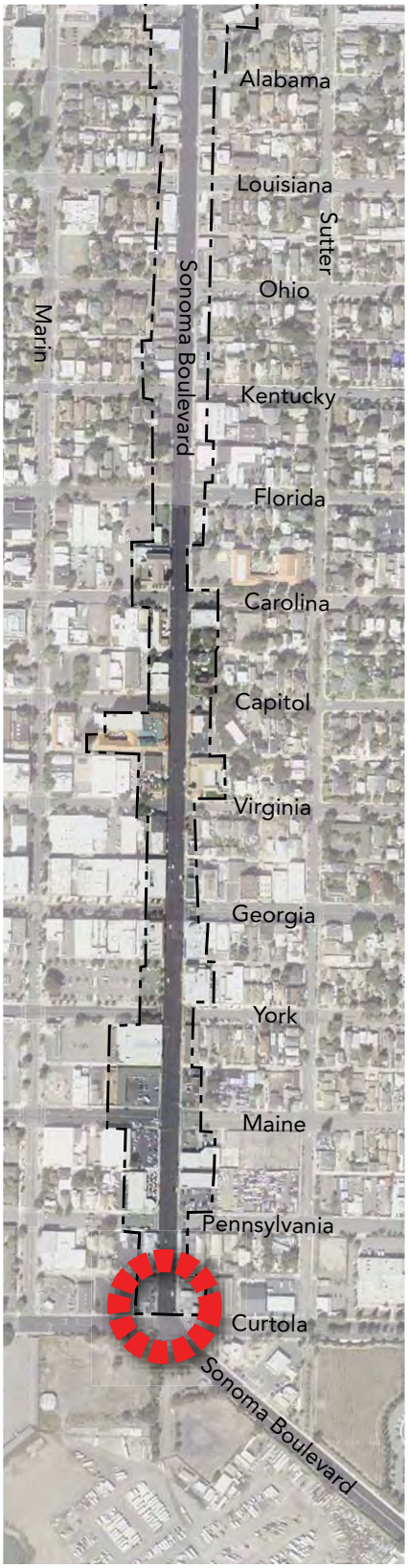
The South Focus Area has many intersections and crosswalks. Two major streets crossing the boulevard in this area are Georgia Street and Curtola Parkway. Improvements to intersections should focus on these major cross connecting streets that represent the gateway into the Sonoma Boulevard corridor (Curtola Parkway) and the gateway into Downtown (Georgia Street).

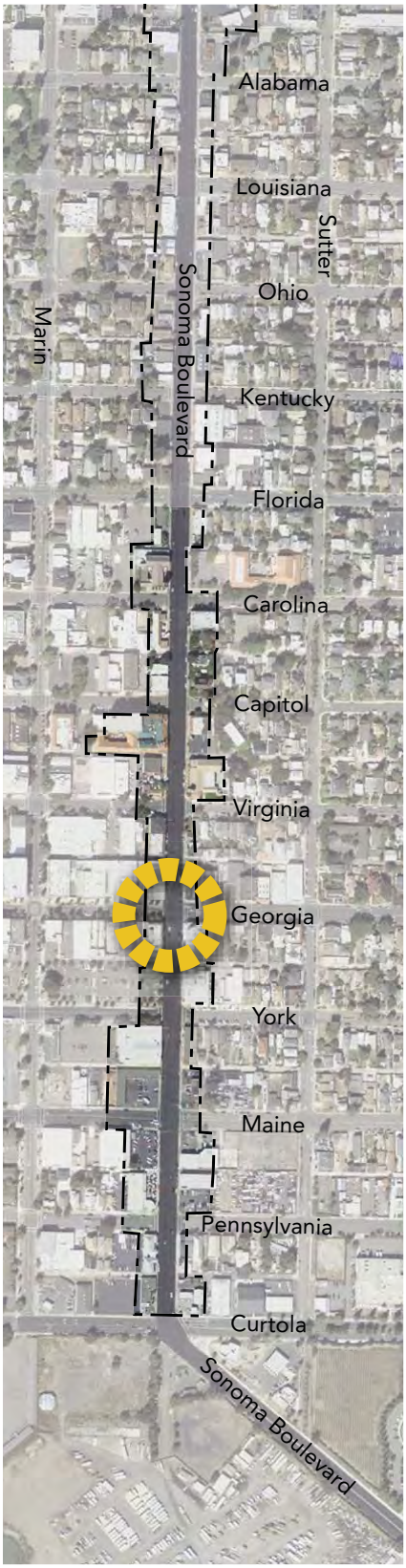
All intersections along the corridor should be ADA compliant and in key locations should provide additional amenities such as seating, bike racks, and trash receptacles.



GATEWAY

The intersection at Curtola Parkway is a critical entry into the Sonoma Boulevard corridor and Downtown. A dramatic gateway could be created here using a combination of art features, signage, light, landscaping, and trees. The gateway element should welcome residents and visitors, announcing the entry into the City and Downtown core with an attractive, inspired, and meaningful composition. A roundabout designed to Caltrans standards could potentially be integrated to enhance the gateway design and to improve traffic flow and safety for all users.





DOWNTOWN MIXED-USE NODE

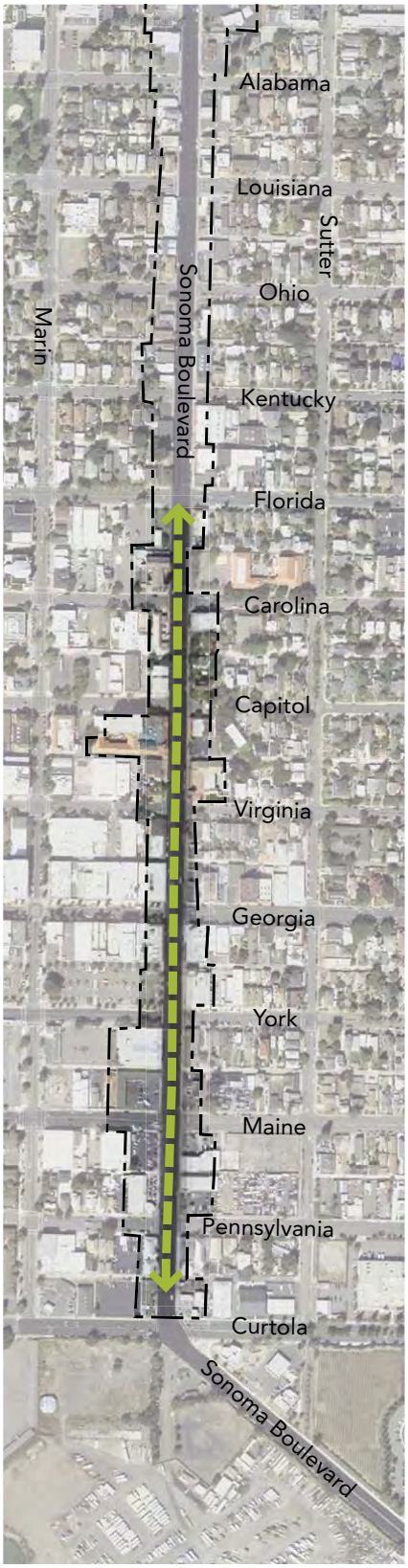
Building on the Downtown Specific Plan initiatives, the Downtown mixed-use node will be centered at the intersection of Sonoma Boulevard and Georgia Street. Special incentives and programs, such as façade improvement programs, should be focused in this node to promote the growth of pop-up and local businesses and small- to medium-scale retail enterprises, with the goal of promoting positive change that can organically spread to other portions of the corridor. This node should leverage the area's strong historic identity and sense of place. Historic buildings will be highlighted.

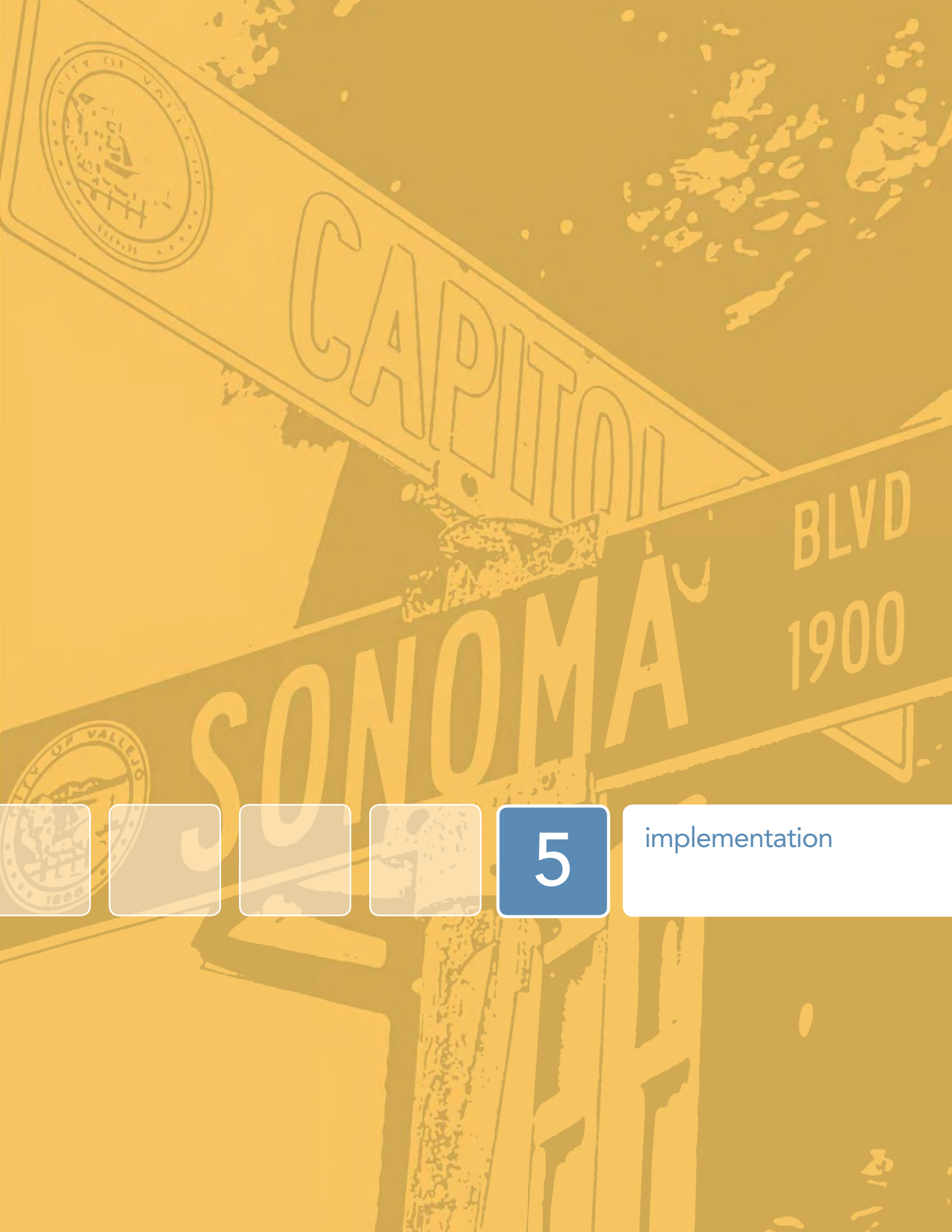
Within this node, nighttime activities and uses should be encouraged to create round-the-clock vibrancy. Innovative lighting, projections, and art should be encouraged to add vitality to Downtown Vallejo at night.

NEW MEDIAN

A new central median will be a prominent element of an eventual new street configuration. The median will serve many functions as it will allow for additional street trees and landscaping; include left turn pockets at intersections; and provide pedestrian refuges.

In the short term, interim treatments of the median such as road striping and stamped asphalt will be explored. This type of treatment is cost effective and will help users get accustomed to the new street configuration while more permanent solutions are designed and funded.





5 implementation

CITY OF VALLEJO
1868
CAPITOL
SONOMA
BLVD
1900
OF VALLEJO
1868

CHAPTER 5

implementation

IN THIS CHAPTER...

5.1 Implementation Approach

5.2 Priority Actions

5.3 Implementation Matrix

The implementation component of the Corridor Design Plan outlines the **"how-to" steps for creating change along Sonoma Boulevard in the short and long terms**. This framework creates a solid foundation from which to support existing businesses, attract new businesses and development, leverage community assets, allocate limited resources, and foster collaboration through strong partnerships. While the plan remains visionary in its ambition, the action steps in this chapter put forth a realistic and practical approach to generate transformation in the corridor.

This chapter is organized as follows:

5.1 Implementation Approach – The overall approach to implementing the plan vision over the short, medium and long terms.

5.2 Priority Actions – An outline of the actions most central to achieving the plan vision.

5.3 Implementation Matrix – A table outlining the specific implementation actions by category and their related timeframes, primary responsibilities and partners, approximate costs, and potential funding sources. Actions are organized into overall corridor actions and those specific to each of the Focus Areas.

5.1 IMPLEMENTATION APPROACH

The Sonoma Boulevard corridor and its Focus Areas — North, Central North, Central South, and South — represent a diverse set of existing conditions and potential future opportunities. Implementation of the Corridor Design Plan needs to be **tailored to each of these Focus Areas** in order to maximize the potential for new types of development, support existing businesses, and bolster nearby neighborhood and community-building efforts. Implementation strategies must be responsive to both the currently weak market conditions and the range of factors that threaten to limit investment and activity over the medium and long terms. In addition, the maintainability of proposed facilities will require further evaluation by Caltrans in future phases.

NEAR-TERM OPPORTUNITIES

The continued lack of development activity and slow recovery of real estate markets point toward focusing on **creative and interim uses of existing vacant storefronts and properties** in the near term. This could include "pop-up" (temporary) stores, urban agriculture, a Mercado (indoor multi-vendor market), food trucks, additional farmers' markets, and special events. These uses have the potential to create activity, attract a broader range of residents and business owners, and potentially stimulate interest in longer-term tenancies. They can help foster the creation and growth of new retail businesses, which would result in the greatest near-term impact on the corridor.

It is important to first **focus on a limited set of activities** that can be successfully done in the locations with the greatest potential. This initial success can then set the stage for expansion to other Focus Areas. For example, the two southern Focus Areas, including Downtown, provide a greater concentration of vacant storefronts and a more pedestrian-friendly environment that is better suited to pop-up stores and events that engage the local arts community, such as a monthly Art Walk and art in vacant storefronts. Sites in the two northern Focus Areas offer larger spaces and sites for uses such as various types of urban agriculture and a Mercado.

MEDIUM- AND LONG-TERM DEVELOPMENT POTENTIAL

The market analysis section in Chapter 2: Existing Conditions notes that in the longer term, population and employment growth will generate **support for new development if the corridor can attract its**

proportionate share. Different types of development are likely to occur in the different Focus Areas.

The North and Central North Focus Areas have the greatest potential for a range of new retail and redevelopment of existing centers, with stronger interest from larger retailers as alternate sites in Northgate and American Canyon become less available. These Focus Areas can also support "horizontal" mixed-use development where multifamily residential and flex/light industrial uses are located behind retail and commercial uses facing the street. This type of mixed-use will become feasible sooner than more expensive "vertical" mixed-use development that stacks uses on top of each other.

Enhancement of the White Slough to improve its ecological health and to address odor issues can create a compelling setting for new housing near the waterfront west of Sonoma Boulevard. This enhanced open space can improve the perception of the North Focus Area as suitable for a wider range of uses, including residential.

Modestly-scaled infill projects are better suited to the smaller sites of the Central South and South Focus areas. These types of projects can accommodate more local-service retail and commercial uses and small-scale multifamily, complementing revitalization of the core Downtown area.

IMPLEMENTATION CHALLENGES

There are a broad range of challenges that will need to be addressed for the Corridor Design Plan to maximize its potential to stimulate new development. Key challenges include:

- **Existing zoning restrictions** – Food trucks and street vending, as well as facilitating a broad range of interim uses, must be encouraged through a supportive zoning ordinance.
- **Lack of focused attention** – There are currently no City staff or local organizations specifically dedicated to addressing the challenges of the corridor and providing continuity in identifying and implementing solutions.
- **Suburban parking requirements** – Mixed-use development can be encouraged by lowering parking requirements based on mixed-use efficiencies, and requiring shared parking between properties.

- **Complex ownership patterns** – Older centers are often parcelized or have cross-easement between properties, making redevelopment or new development problematic.
- **Lack of feasibility** – Current market conditions and low rents and sale prices can make development infeasible.
- **Perception issues and area competition** – The current poor condition of many properties and Vallejo's reputation challenges, combined with newer retail centers and destinations within an easy drive, make it difficult to interest developers and retailers in new projects.

Some of these broader issues will require time to resolve, particularly the weak market conditions. Others will require specific and concerted action by the City and other parties to create support for new investment and development.

IMPLEMENTATION STRATEGY

Recognizing the limited resources available to the City, a near-term implementation strategy should focus on low-cost efforts that can produce Priority Actions or "Quick Wins," demonstrating the potential for the corridor to create activity while also stimulating interest from new businesses. Actions of the **near-term strategy** would include:

- **Revise the zoning code** to ensure maximum flexibility for various interim uses, including pop-up stores, urban agriculture, food trucks and others, as well as restaurant and entertainment uses. The City should also review and revise procedures to expedite and simplify processing of approvals for these uses.
- **Create a City staff position (or reassign a current position) dedicated to plan implementation, Economic Development Division, and marketing** for all of the available sites and spaces in the corridor Focus Areas. The position should be staffed at 30 hours per week for at least one year. This position would pursue interim uses, conduct outreach to corridor businesses to identify opportunities for assistance and potential new businesses to attract, and coordinate partnership activities.
- **Enter into partnerships and/or contractual arrangements** with organizations and individuals that have successfully established urban agriculture, pop-up stores and food truck venues to establish these uses in appropriate locations along the corridor,

and work with interested individuals to create new, viable businesses.

- **Work with the Chamber of Commerce and other organizations** to encourage volunteer programs that engage property owners, businesses and residents to improve conditions, such as "adopt-a-block" for clean-up and maintenance.
- **Create one or more special events**, based on the availability of funding, that draw residents from throughout Vallejo to enjoy activities in the corridor.

The **medium- and long-term strategy actions** build on these early successes and would include:

- **Create a distinct brand and identity** for Sonoma Boulevard that is consistent with the larger branding and marketing initiative that is commencing to increase awareness and positive perceptions of Vallejo. This will support developer and retailer recruitment initiatives.
- **Establish a Community Benefits District** (using the State authority to create Business Improvement Districts or another type of Special District) to provide funds to sustain long-term enhanced maintenance of sidewalks, streetscape and public areas along the corridor, particularly after improvements are made. Because this involves voting for extra fees, it will likely take some time to generate property owner and business support, building upon successes from the near-term strategy.
- **Establish a façade renovation program,** as funding sources are identified, to enable business owners and property owners to modernize the exterior of their buildings, based on a set of design guidelines to ensure high-quality improvements. This program was previously funded by the City's Redevelopment Agency, prior to State legislation eliminating redevelopment agencies.
- **Phase in road, sidewalk, streetscape, and other public space improvements** as funding sources become available. It is essential that improvements are established and phased in nodes where development will happen soonest. Spreading limited improvement funds throughout the corridor will greatly lessen their impact and the potential for public investment to stimulate private investment in new projects.

- **Create public-private partnerships for high-quality new catalyst and anchor developments**. These partnerships can involve the City working with centers that have multiple owners; assembling sites for new development; engaging Kaiser and others to expand existing medical uses; and working with developers and others to create incentive programs to attract new businesses.
- **Make revisions to the zoning code** to provide more flexibility for horizontal and vertical mixed-use development, including reducing parking requirements based on the efficiencies from mixing uses, requiring shared parking between properties, and allowing credit for street parking spaces.

PUBLIC ACTIONS AND FUNDING

Funding for public actions is a key challenge for plan implementation, one that can be thought of in short-term versus medium- and long-term opportunities.

A focus on Priority Actions and what can be done in the next year means that most of the funding, including for a part-time City staff position dedicated to the corridor, will need to come from the City's General Fund or other funds. Much of this work, excluding special events, could potentially be accomplished for about $150,000 or less. Special events present opportunities to obtain sponsorship support from private sector businesses and organizations in Vallejo, particularly if they can use those events to support their outreach and marketing efforts.

Funding for medium- and long-term actions will require layering multiple sources of funding. As discussion continues in the California State Legislature on funding sources to replace the loss of redevelopment, some of those solutions may present opportunities to obtain funding for corridor improvements and projects. For example, if existing authority for Infrastructure Finance Districts, a type of tax-increment finance, is revised to make its use more practical this could become a significant source of funding for corridor improvements.

The City can pursue a range of existing grant and other funding sources for improvements that promote alternative transportation and pedestrian environments, enhanced air quality and environmental benefits, safe corridors, and other items. This includes Caltrans programs, such as its Transportation, Community, and System Preservation Program (TCSP); Bicycle Transportation Account; Safe Routes to School; and others.

Metropolitan Transportation Commission (MTC) programs such as the Transportation for Livable Communities (tied to the Downtown Priority Development Area); Transportation Improvement Program; and proposed OneBayArea program present opportunities. The pending MAP-21 federal transportation funding legislation (successor for SAFETEA-LU), once approved, is likely to lead to additional potential funding sources.

Because of the City's existing funding challenges, there may be limited potential to fund improvements through the City's Capital Improvement Program. Potential allocation of future year CDBG funds can be considered. Public-private partnerships for development projects can also access a range of additional funding sources, such as New Markets Tax Credits.

NEXT STEPS

Plan implementation, as described in this section and in the detailed action steps on the following pages, will require near-term strategies that can create Quick Wins and build momentum, complemented by other actions to set the stage for successful improvements and development in the medium and long terms. Moving forward, a financing plan for full plan implementation will need to be prepared based on refined cost estimates, and design work will need to commence for key public improvements.

5.2 PRIORITY ACTIONS

Priority Actions are those actions outlined in the implementation plan that will be easier to get implemented due to **minimal or no cost, feasible near-term changes to planning or permitting processes, and overall community support**. These actions are vital to the implementation process because they will allow immediate change to become tangible. In turn, this will help generate City, agency and community support to tackle more involved, lengthy or expensive implementation actions. The Priority Actions, highlighted below and detailed further in 5.3 Implementation Matrix, are either pertinent to the entire corridor, or are specific and relevant to individual Focus Areas. They are not in order of priority.

PA-1: ESTABLISH AN IMPLEMENTATION TEAM AND STAFF POSITION

An Implementation Team must be established to spearhead efforts outlined in the implementation plan. This team should be formed by Community Advisory Committee members as well as other stakeholders invested in the corridor's development. The City staff person assigned to the project should work closely with the Implementation Team to coordinate meetings and tasks.

PA-2: ENCOURAGE STREET VENDORS AT ACTIVITY NODES

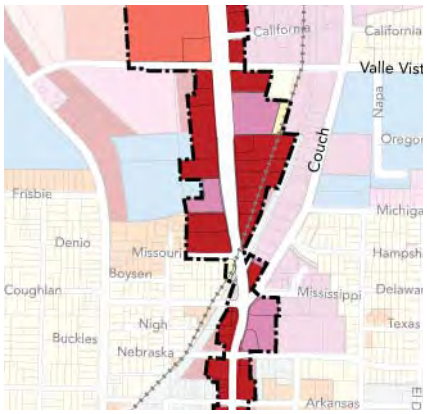
In order to create visible impact and quick transformation, improvement efforts should be concentrated on the four nodes identified in Chapter 4: Land Use Activation and Mobility Strategy. Attracting food vendors and street commerce could quickly generate shopping and gathering destinations and begin to activate otherwise vacant or underutilized parcels and buildings.

PA-3: PLANT STREET TREES

Planting street trees has the potential to significantly transform the physical environment of Sonoma Boulevard. Trees would provide a range of benefits and create an attractive setting. Street trees can be costly to install; therefore, efforts should be targeted at locations where installation might be less expensive, such as the existing median. They should also be planted at the nodes, where they can create a sense of place and private development opportunities are highest.

PA-4: IMPROVE CROSSWALKS

Crosswalks should be prominent, promoting a more pedestrian-friendly environment where vehicles have additional cues that help reduce travel speeds. A simple approach like paint can begin to transform intersections, creating a safer environment for pedestrians.



PA-5: MAKE KEY ZONING ORDINANCE REVISIONS

Some of the action items identified within the implementation plan require revisions to the zoning ordinance to allow more flexibility of uses. City staff, working with the Implementation Team, should work to revise the zoning ordinance, make recommendations, and implement changes.

PA-6: ACTIVATE THE PUBLIC REALM

Downtown is the natural location to promote outdoor activities, spaces and endeavors that can activate the public realm to make it more inviting and lively. These can range from organized festivals and public activities on the street and sidewalks, to existing stores bringing their uses to the sidewalk, to new businesses and vendors setting up shop along the street.

PA-7: ALLOW INTERIM USES

Interim uses are a way to activate parcels and buildings that would otherwise sit vacant. A range of uses is suggested in Chapter 4: Land Use Activation and Mobility Strategy, depending on the size and location of available underutilized space.

PA-8: ESTABLISH BIKE LANES

A well-connected and safe bike lane along the Sonoma Boulevard corridor is a community priority. This improvement will help connect neighborhoods and amenities, such as the Ferry Terminal and transit hub, to destinations inside and outside the City.

5.3 IMPLEMENTATION MATRIX

The Implementation Matrix on the following pages includes the anticipated public- and private-led actions necessary to begin to shape the vision for Sonoma Boulevard. The matrix includes the anticipated **timeframe for making the improvements, lead parties and partners responsible for implementation, general cost, and potential sources of funding.** Under management of City staff and the Implementation Team, the matrix should be used as a flexible and evolving guide to direct the timing of major improvements as opportunities arise, some of which are tied to market demand and triggered by private investment and/or availability of public financing and funding. The improvements described in this implementation plan will be funded by various means detailed in the matrix below. The matrix is broken down by Overall Corridor, followed by each of the Focus Areas. It is also important to note that Caltrans owns the right-of-way which includes the streets and sidewalks and therfore must approve any improvements to these areas.

KEY

Timeframe	Cost
Short = 1 year	$ = < $50,000
Medium = 2-3 years	$$ = $50,000 - $250,000
Long = over 3 years	$$$ = $250,000 - $500,000
	$$$$ = $500,000 - $1 million
"Priority Actions"	$$$$$ = > $1 million

OVERALL CORRIDOR

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Economic Development Division				
ED 1: Develop a street food vending ordinance to allow designated areas for street commerce	Short	**Planning Division** Economic Vitality Commission Planning Commission	no cost	n/a
ED 2: Facilitate discussions with property and business owners to attain their support for this plan and vision a. Interview business owners to identify their future plans; promote potential assistance with support services b. Use business owners to identify prospective new tenants for vacant spaces and help arrange contacts with those prospects c. Create a Community Benefits District to improve the physical environment for pedestrians along the corridor d. Create a program to attract and retain new businesses focusing at key commercial nodes along the corridor	Short	**Economic Development Division** **Implementation Team** Property and Business Owners Chamber of Commerce Vallejo Business Alliance Local Real Estate Brokers Community Benefits District	no cost - $	City

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
ED 3: Create a cluster of street food vendors in close proximity to nodes identified in Chapter 4: Land Use Activation and Mobility Strategy	Short	**Planning Division** Street Food Vendors	$	City
ED 4: Promote the utilization of vacant and underutilized parcels with interim uses/ businesses that can generate employment and revenue a. Amend the zoning ordinance to include an overlay zone for interim uses b. Identify an organization that can take on program management responsibilities for overseeing a start-up/pop-up program, define requirements for renters, etc. c. Enter into agreements with owners of vacant spaces to allow interim/short-term uses d. Create a marketing initiative to market spaces available for start-up/pop-up use e. Create festivals/special events to increase foot traffic and awareness of start-up/ pop-up shops	Short to Medium	**Economic Development** **Implementation Team** Property and Business Owners Chamber of Commerce Vallejo Business Alliance Local Real Estate Brokers	$	City Community Benefits District
ED 5: Incentivize start-up businesses to locate along Sonoma Boulevard and provide business incubation opportunities a. Coordinate with property owners to create a Mercado/indoor market with multiple stalls to provide start-up/ incubator locations. Recruit a Mercado operator b. Provide funding assistance for site improvements and/or building rehabilitation	Medium to Long	**Economic Development**	a. no cost b. $$$$	CDBG / Sec. 108 Infrastructure State Revolving Loan Fund New Markets Tax Credit
Land Use				
LU 1: Identify one vacant or underutilized parcel in the North/Central North Focus Areas and one in the South/Central South Focus Areas to start an interim use program to stimulate Economic Development Division and improve streetscape perception and activity a. Identify vacant/underutilized parcels in close proximity to or within nodes. Some potential locations include old Mervyn's site in the North/Central North Focus Areas, and the north-west corner of Sonoma Boulevard and Curtola Parkway in the South/Central South Focus Areas b. Consider creation of a series of special events on these sites to increase activity	Short to Medium	**Economic Development** Chamber of Commerce	a. no cost b. $ - $$	City Community Benefits District
LU 2: Revise the zoning ordinance to ensure that it allows desirable land uses identified in this plan, and provides flexibility for new uses	Medium	**Planning Division** Planning Commission	no cost	n/a

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
LU 3: Allow and promote agricultural and viticultural industries and uses to locate along the corridor a. Contact urban agriculture organizations to seek a viable model and advice b. Identify a local organization or neighborhood group that can take management responsibilities for overseeing agricultural production c. Identify vacant parcels and property owners that would enter a lease or share agreement for their land	Short to Medium	**Planning Division** Vallejo Co-op	a. no cost b. no cost c. $	City
Transportation				
T 1: Restripe the street to include bike lanes along Sonoma Boulevard a. Start in the North/Central North Focus Areas where right-of-way is wide and bike lane can be easily implemented b. Continue restriping the South/Central South Focus Areas to create a continuous bike lane along the corridor c. In the North/Central North Focus Areas, allow bikers to also ride on sidewalks	Short to Medium	**Public Works** Caltrans MTC	a. $$ b. $$ c. no cost	Proposed MAP-21 federal transportation legislation (successor to SAFETEA-LU, new funding sources to MTC) MTC Transportation for Livable Communities (Downtown Priority Development Area) MTC OneBayArea (Proposed, potential successor to CMAQ) MTC Transportation Improvement Program City Capital Improvement Program Infrastructure Finance District Safe Routes to School Caltrans Bicycle Transportation Account Caltrans Transportation, Community, and System Preservation (TCSP) Program CDBG Infrastructure Financing
T 2: Construct pedestrian enhancements (i.e. countdown signals, audible/ tactile pedestrian push buttons, ramp improvements) at signalized crossings in the following locations: • Sereno Drive • Redwood Drive • Valle Vista Avenue • Nebraska Street • Tennessee Street • Florida Street • Georgia Street • Curtola Parkway	Medium to Long	**Public Works** Caltrans	$$	[See Overall Corridor T1 Funding]

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
T 3: Improve crosswalk visibility at key intersections with paint or special material like pavers in the following locations: • Lewis Brown Drive • Yolano Drive • Sereno Drive • Redwood Drive • Valle Vista Avenue • Mississippi Street/Couch Street • Nebraska Street • Indiana Street • Tennessee Street • Florida Street • Georgia Street • Curtola Parkway	Short to Medium	**Public Works** Caltrans	$ - $$	[See Overall Corridor T1 Funding]
T 4: Provide bulbouts to shorten crosswalk distance and to provide more space to accommodate pedestrian amenities like furniture, trees and planting areas in the following locations: • Yolano Drive • Sereno Drive • Redwood Drive • Valle Vista Avenue • Mississippi Street/Couch Street • Nebraska Street • Indiana Street • Tennessee Street • Florida Street • Georgia Street	Medium to Long	**Public Works** Caltrans	$	[See Overall Corridor T1 Funding]
T 5: Improve existing transit stops by providing transit shelters that protect users from elements and offer seating a. Prioritize locations within or in close proximity to nodes	Medium to Long	**Public Works** SolTrans	$$	[See Overall Corridor T1 Funding]
T 6: Link proposed bike lanes along Sonoma Boulevard to bike network in surrounding areas and the region. Create a bike network that connects the Ferry Terminal to bike trails that go to Napa Valley	Short to Long	Vine Trail Napa Bicyclists and other Bike Groups/Coalitions	Cost varies depending on the extent of necessary construction	[See Overall Corridor T1 Funding]
T 7: Construct a streetcar line along or near Sonoma Boulevard	Long	**Public Works** **Planning Division** Caltrans	$$$$$	Federal Transit Administration Small Starts Program City Infrastructure Finance District Assessment District for local match
Design Elements				
DE 1: Improve landscaping along center median in the North and Central North Focus Areas by including drought-tolerant plantings and trees	Short	**Public Works** Caltrans	$$$$	City Capital Improvement Program Infrastructure Finance District CDBG Infrastructure Financing

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
DE 2: Plant street trees along the entirety of the corridor along sidewalks a. Prioritize gateway locations b. Concentrate efforts along node locations to create an immediate and visible impact	Short to Long	**Public Works** Vallejo Co-op	$$$$ a. $ b. $$	[See Overall Corridor DE 1 Funding]
DE 3: Include landscaping and plant materials along sidewalks a. Prioritize node locations	Short to Medium	**Public Works**	$$$$ a. $$	[See Overall Corridor DE 1 Funding]
DE 4: Include way finding signage highlighting key amenities, destinations and historic points of interest a. Create an identifiable signage style that is consistent for the entire corridor, but that has an appropriate scale visible at the different speeds of traffic and width of the right-of-way along the corridor	Short to Medium	**Public Works** Architecture Commission	$$	City Capital Improvement Program
DE 5: Include street furniture and pedestrian amenities along the corridor at key intersections, bus stops and gathering nodes a. Prioritize node locations and bus shelters	Short to Medium	**Public Works**	$$ a. $	[See Overall Corridor DE 1 Funding]
DE 6: Seek opportunities to incorporate art and artistic expression along the corridor, particularly site-specific art that is inspired by the history, culture or natural local environment a. Prioritize gateways and node locations	Short to Long	Architecture Commission	$$$	City Capital Improvement Program NEA ArtPlace Grant Program
DE 7: Improve street lighting along the corridor by providing additional pedestrian lights a. Prioritize node locations	Medium to Long	**Public Works**	$$$$ a. $$	[See Overall Corridor DE 1 Funding]
DE 8: Design stormwater planters and locate them on the planting strip along sidewalks in places where right-of-way is wide enough to comfortably accommodate this infrastructure a. Prioritize locations in close proximity to the White Slough b. Build additional stormwater planters along the rest of the corridor	Medium to Long	**Public Works**	a. $ b. $$$$	City Capital Improvement Program Infrastructure Finance District CDBG Infrastructure Financing EPA Urban Green Infrastructure Grants
DE 9: Design cohesive branding elements to place at important gateways and nodes along the corridor to communicate the overall Sonoma Boulevard and City of Vallejo branding and marketing initiative	Short to Long	**Planning Division** **Public Works** Property and Business Owners Community Groups Chamber of Commerce Architecture Commission	$$ - $$$$	City Capital Improvement Program

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Partnerships and Programs				
PP 1: Create a Specific Plan for the corridor that incorporates the community vision and design intent described in this plan and that integrates it with the existing Downtown, Waterfront, and Mare Island plans, providing the necessary regulatory framework to improve land use and transportation linkages a. Coordinate infrastructure information and create base mapping to indicate design constraints	Short	**Planning Division** Vallejo Sanitation and Flood Control District	$$$-$$$$ a. $	Proposition 84 Sustainable Communities Planning Grant
PP 2: Form an Implementation Team to advance actions described in this Implementation Matrix	Short	**Economic Development Division** **Planning Division** CAC members Community/City Organizations Property and Business Owners	$	City
PP 3: Ensure the maintenance program for the corridor executed in 2012 continues to remain active to keep it clean and attractive at all times a. Keep median and sidewalks clean, well maintained, and clear of weeds and trash b. Coordinate maintenance of all signalized intersections as well as landscaping and irrigation along median and sidewalk areas with Caltrans c. Consider creating a Maintenance Agreement between Caltrans and the City of Vallejo	Short	**Public Works** **Caltrans**	Cost will vary depending on area to be maintained and type of improvements	Community Benefits District
PP 4: Form partnerships with business and property owners, and community volunteers to encourage them to engage in the upkeep and maintenance of landscaping and cleanliness of the street a. Create an "adopt-a-block" program to encourage a sense of ownership and pride	Short	**Planning Division** **Public Works** **Caltrans** Property and Business Owners Community Groups	$	City

NORTH FOCUS AREA

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Economic Development Division				
ED 1: Attract large format retailers (i.e. auto dealerships, destination retail, etc.) a. Prioritize area identified as Regional/ Destination Commercial (from SR 37 up to White Slough) b. Create outreach materials of potential sites to deliver to potential users	Short to Medium	**Economic Development Division** **Planning Division**	a. no cost b. $	City
ED 2: Market the area as a medical village, which may include medical clinics, nursing schools, work force housing for nearby hospitals, and retirement and senior housing	Short to Medium	**Economic Development Division** **Planning Division**	$	City
Land Use				
LU 1: Create a mixed-use retail node at the intersection of Sonoma Boulevard and Sereno Drive a. Reach out to and coordinate with property owners and tenants b. Provide funding assistance for site improvements and/or other project costs	Short to Long	**Planning Division** **Economic Development Division** Property and Business Owners Developers Retail Brokers	a. no cost b. $$$$$	City CDBG / Sec. 108 Infrastructure State Revolving Loan Fund New Markets Tax Credit
LU 2: Repurpose underutilized parking lots for interim uses and/or seek opportunities to create new retail or mixed-use development a. Interview business owner from CVS property/parking lot to identify partnering opportunities	Short to Long	**Planning Division** Property and Business Owners	no cost	
Transportation				
T 1: Build sidewalks where they are currently missing on both east and west sides of the corridor	Short to Medium	**Public Works** Caltrans	$$	[See Overall Corridor T1 Funding]
T 2: Study feasibility to create a new mid-block crosswalk between Lewis Brown Drive and Yolano Drive. New crosswalk should be signalized and have a pedestrian refuge. Prioritize a location close to the bus stop	Medium	**Public Works** Caltrans	$$	[See Overall Corridor T1 Funding]
T 3: Study feasibility to create two breaks in the median to allow for left turns a. Locate one in coordination with the mid-block crossing suggested in the previous action item b. Locate a break in the median with left turn lane between Redwood Street and Sereno Drive	Medium to Long	**Public Works** Caltrans	$	[See Overall Corridor T1 Funding]
T 4: Create a Class I bike lane along the White Slough	Medium to Long	**Public Works** Caltrans	$$	[See Overall Corridor T1 Funding]

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
T 5: Create a shared pedestrian and bicycle sidewalk/path in the remaining stretches of the North Focus Area	Medium to Long	**Public Works** Caltrans	$$$	[See Overall Corridor T1 Funding]
Design Elements				
DE 1: Build a gateway into Vallejo from SR 37 that incorporates landscape, art and signage a. Create a "donate-a-tree" program to encourage individuals and organizations to fund gateway tree installation	Short to Medium	**Public Works** Property and Business Owners Community Groups Chamber of Commerce Architecture Commission	$$ a. no cost	City Capital Improvement Program
DE 2: Add trees to the existing median a. Create a "donate-a-tree" program to encourage individuals and organizations to fund street tree installation	Short	**Public Works** Caltrans Property and Business Owners Community Groups	$$ a. no cost	[See Overall Corridor DE 1 Funding]
DE 3: Improve landscaping and plantings in areas surrounding the White Slough	Short	**Public Works** Caltrans	$$	City Capital Improvement Program Infrastructure Finance District CDBG Infrastructure Financing EPA Urban Green Infrastructure Grants
DE 4: Design stormwater planters and locate them on the planting strip along sidewalks a. Prioritize locations in close proximity to the White Slough	Medium to Long	**Public Works** Caltrans	$ a. no cost	City Capital Improvement Program Infrastructure Finance District CDBG Infrastructure Financing EPA Urban Green Infrastructure Grants
DE 5: Underground utilities	Long		$$	CPUC Rule 20 Assessment District

CENTRAL NORTH FOCUS AREA

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Economic Development Division				
ED 1: Provide business incubation and vocational training opportunities targeted to local residents	Short to Medium	**Economic Development** Business Owners Vallejo Community College	no cost	n/a
Land Use				
LU 1: Repurpose underutilized parking lots for interim uses and/or seek opportunities to create new building footprints, especially along sidewalks	Short to Long	**Economic Development Division** **Planning Division** Property and Business Owners	no cost	n/a
Transportation				
T 1: Create two new mid-block crosswalks, one between Redwood Street and Valle Vista Avenue and the other between Valle Vista Avenue and Couch Street. New crosswalks should be signalized and have a pedestrian refuge. Prioritize a location close to bus stop or other pedestrian amenities	Medium	**Public Works** Caltrans	$$$	[See Overall Corridor T1 Funding]
Design Elements				
DE 1: Add trees to the existing median a. Create a "donate-a-tree" program to encourage individuals and organizations to fund street tree installation	Short	**Public Works** Caltrans	$$ a. no cost	[See Overall Corridor DE 1 Funding]
DE 2: Design stormwater planters and locate them on the planting strip along sidewalks	Medium to Long	**Public Works**	$$	City Capital Improvement Program Infrastructure Finance District CDBG Infrastructure Financing EPA Urban Green Infrastructure Grants
DE 3: Underground utilities	Long	**Public Works**	$$	CPUC Rule 20 Assessment District

CENTRAL SOUTH FOCUS AREA

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Economic Development Division				
ED 1: Incentivize start-up businesses to locate in proximity to the proposed neighborhood mixed-use node (Sonoma Boulevard between Indiana Street and Tennessee Street), creating a cluster of businesses that act as a catalyst for development	Short to Medium	**Economic Development** **Planning Division** Property and Business Owners	TBD – depends on specifics of incentive program	TBD
ED 2: Develop a façade improvement program for small businesses a. Focus resources on the node	Medium to Long	**Economic Development Division** **Planning Division** Property and Business Owners Community Benefits District	$$$$$	Establish Revolving Loan Fund
Land Use				
LU 1: Work with property owners from vacant/ underutilized parcels to establish interim uses a. Identify an organization that can take on program management responsibilities for overseeing a temporary rental program, define requirements for renters, etc. b. Enter into agreements with owners of vacant/underutilized sites to allow interim/ short-term uses c. Create a marketing initiative to market spaces available for interim use	Short to Medium	**Economic Development** Property and Business Owners Community Benefits District	no cost - $$	City
Transportation				
T 1: Reconfigure street design to have two travel lanes, a center median/turn lane, bike lanes and parking on both sides of the street a. Consider road striping or stamped asphalt as an interim treatment for medians and bulbouts	Short to Long	**Planning Division** **Public Works** Caltrans	$$$$ a. $$-$$$	[See Overall Corridor T1 Funding] Caltrans Highway Safety Improvement Progam Grant
T 2: Seek opportunities to reutilize train tracks and provide a commuter train that links Vallejo with Napa Valley	Long	**Economic Development Division**	$$$$$	Federal Transit Administration New Starts Program MTC Regional Transportation Improvement Program `Local Match TBD
Design Elements				
DE 1: Provide pedestrian amenities and bicycle parking in proximity to the proposed node	Short to Medium	**Public Works**	$$	[See Overall Corridor DE 1 Funding]

SOUTH FOCUS AREA

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Economic Development Division				
ED 1: Designate an area for street commerce and food vendors a. Prioritize locations in close proximity to proposed node	Short	**Planning Department**	no cost	n/a
ED 2: Incentivize clusters of start-up and pop-up businesses in vacant commercial spaces a. Use business owners to identify prospective new tenants for vacant spaces and help arrange contacts with those prospects	Short	**Economic Development Division** Property and Business Owners	$$	City
ED 3: Incentivize start-up businesses to locate in proximity to the proposed node, creating a cluster of businesses that act as a catalyst for development	Short to Long	**Economic Development Division**	TBD – depends on specifics of improvement program	TBD
ED 4: Develop a façade improvement program for small businesses a. Focus resources on the node area	Short to Medium	**Economic Development Division** Property and Business Owners Community Benefits District	$$$$$	Establish Revolving Loan Fund
ED 5: Encourage outdoor dining and business spillover into the sidewalk. Allow business owners to utilize "flex" parking stalls to accommodate spillover activities	Short to Medium	**Planning Division** Property and Business Owners Community Benefits District	no cost	n/a
ED 6: Increase amount of allowable liquor licenses to improve Downtown restaurant and nightlife culture	Short to Medium	**Planning Division** Downtown Business Owners	no cost	n/a
Land Use				
LU 1: Work with property owners from vacant/ underutilized parcels to establish interim uses a. Consider creation of a series of special events on these sites to increase activity	Short	**Economic Development Division** Property and Business Owners Community Benefits District	$ - $$	City

Specific Action by Category	Timeframe	Primary Responsibility / Partners	Cost	Funding
Transportation				
T 1: Reconfigure street design to have two travel lanes, a center median/turn lane, bike lanes and parking on both sides of the street a. Consider road striping or stamped asphalt as an interim treatment for medians and bulbouts	Short to Long	**Public Works** Caltrans	$$$$ a. $$-$$$	[See Overall Corridor T1 Funding] Caltrans Highway Safety Improvement Progam Grant
T 2: Install special paving at the intersection of Georgia Street and Sonoma Boulevard	Short to Medium	**Public Works**	$$	[See Overall Corridor T1 Funding]
T 3: Study feasibility to create a traffic circle or roundabout at the intersection of Sonoma Boulevard and Curtola Parkway	Medium to Long	**Public Works** Caltrans	$-$$	[See Overall Corridor T1 Funding]
Design Elements				
DE 1: Designate areas where street food vendors can sell their products and set movable furniture on the street to encourage outdoor dining	Short	**Planning Department** Business Owners	no cost	n/a
DE 2: Build a gateway into Downtown that incorporates landscape, art and signage a. Create a "donate-a-tree" program to encourage individuals and organizations to fund street tree installation b. Study potential location for gateway within the roundabout proposed for the intersection of Sonoma Boulevard and Curtola Parkway	Short to Medium	**Public Works** Property and Business Owners Community Groups Chamber of Commerce Architecture Commission	$$	City Capital Improvement Program
DE 3: Provide bicycle parking in proximity to the proposed Downtown Gateway Node	Short to Medium	**Public Works**	$	Caltrans Bicycle Transportation Account
DE 4: Provide historic markers that highlight important places and events as well as landmark buildings and structures	Short to Medium	**Public Works** Architecture Commission Heritage Team	$	City Capital Improvement Program California Cultural and Historical Endowment Grants California Council for the Promotion of History Grants

appendix A
existing conditions analysis report

sonoma
boulevard
corridor design plan

Draft Existing Conditions Analysis

December 2011

Introduction

- This report provides an overview of the existing conditions present within the Sonoma Boulevard Corridor Design Plan Planning Area in the City of Vallejo, California

- This information will be used during the planning process as a foundation for shaping alternatives and strategies for strengthening and enhancing the corridor

- The report has three main sections:
  - Land Use and Streetscape Design;
  - Economics and Market Conditions; and
  - Circulation, Transportation and Parking.

Overall Summary

- Land Use and Streetscape Design

  - There is a range of land uses as well as zoning districts along Sonoma Blvd but parcels fronting the corridor are largely commercial

  - The corridor has a great range of block and street patterns, parcel size and building footprints as one travels along the length of the Planning Area

  - Overall, the corridor is missing pedestrian and bicycle amenities, and landscaping and street trees

Overall Summary

- Economics and Market Conditions

  - As economic conditions improve, there might be potential for new residential, commercial and flex-space developments although current market is very limited.

  - Retailers and developers looking in the local market area may consider Sonoma Boulevard sites and locations elsewhere in Vallejo and American Canyon. There are more available sites than market demand in the local area.

  - Economic recovery, changes in perceptions of the corridor and supporting public improvements will be key to realizing market potential.

Overall Summary

- Circulation, Transportation and Parking

  - Sonoma Blvd has underutilized roadway space that could be utilized to improve overall streetscape environment, circulation of all modes of transportation and safety

  - Sidewalks are not continuous and pedestrian and bicycle amenities are minimal

  - Sonoma Blvd is well served by public transit and proximity to bus and ferry terminals

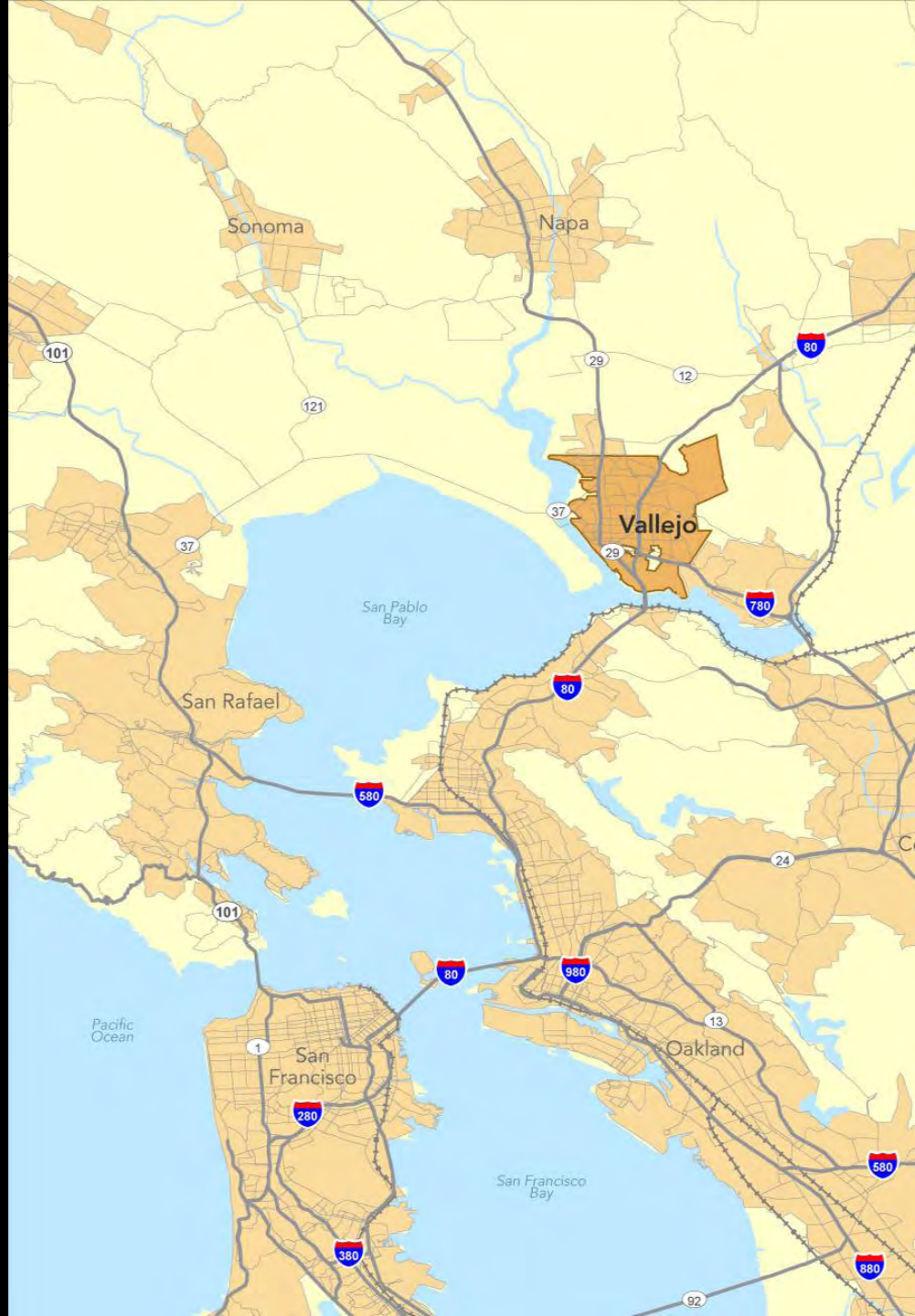
Land Use and Streetscape Design

Land Use and Streetscape Design

- This section contains information on the following:
  - Regional Context
  - Citywide Context
  - Planning Area
  - Zoning
  - Historical Context
  - Community Amenities
  - Celebrations and Festivals
  - Views
  - Streetscape Design
  - Architecture
  - Parking
  - Planning Subareas: South, Central-South, Central-North and North

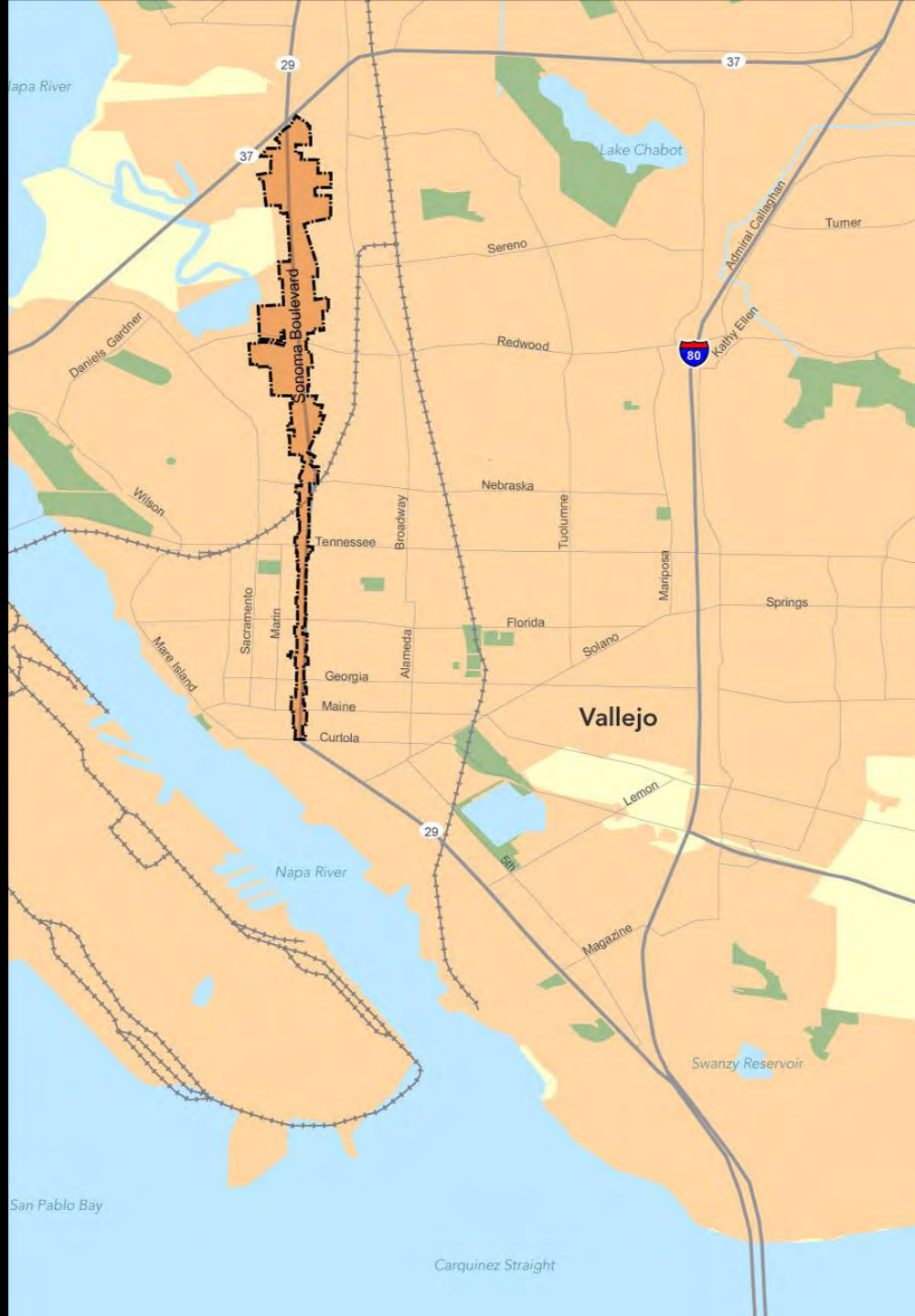
Regional Context

- The City of Vallejo is located northeast of San Francisco along the San Pablo Bay
- Neighboring cities include Benicia and American Canyon
- Vallejo is a gateway into the Napa and Sonoma valleys
- Key state freeways and highways run through the City



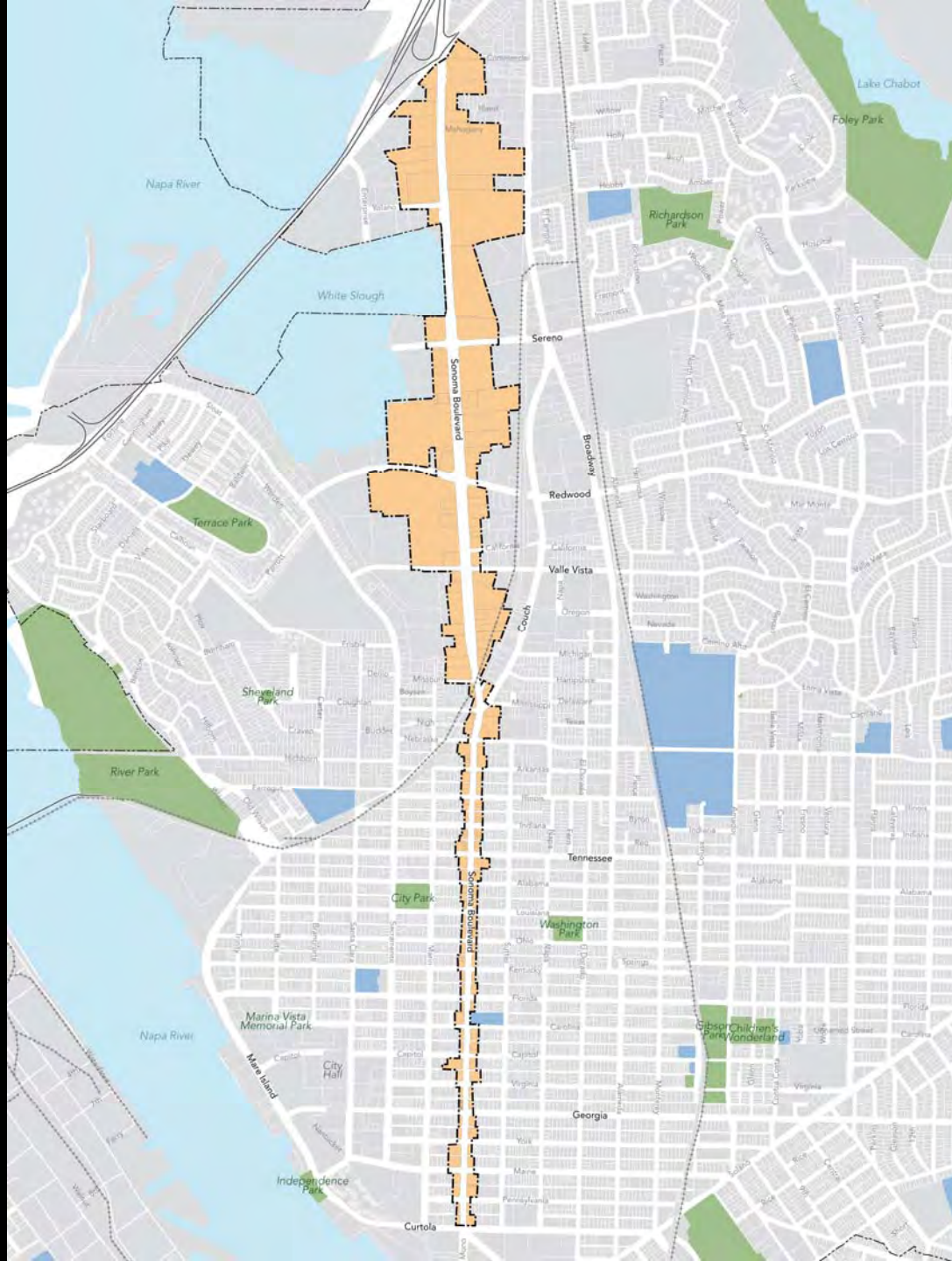
Citywide Context

- The Planning Area is located towards the western side of the City of Vallejo
- The Planning Area runs with a north-south orientation along Sonoma Blvd
- Natural features adjacent to Sonoma Blvd include the White Slough a marshy, low area that fills with tidal water from the San Pablo Bay and Napa River
- Train tracks cross through the Planning Area close to its middle portion



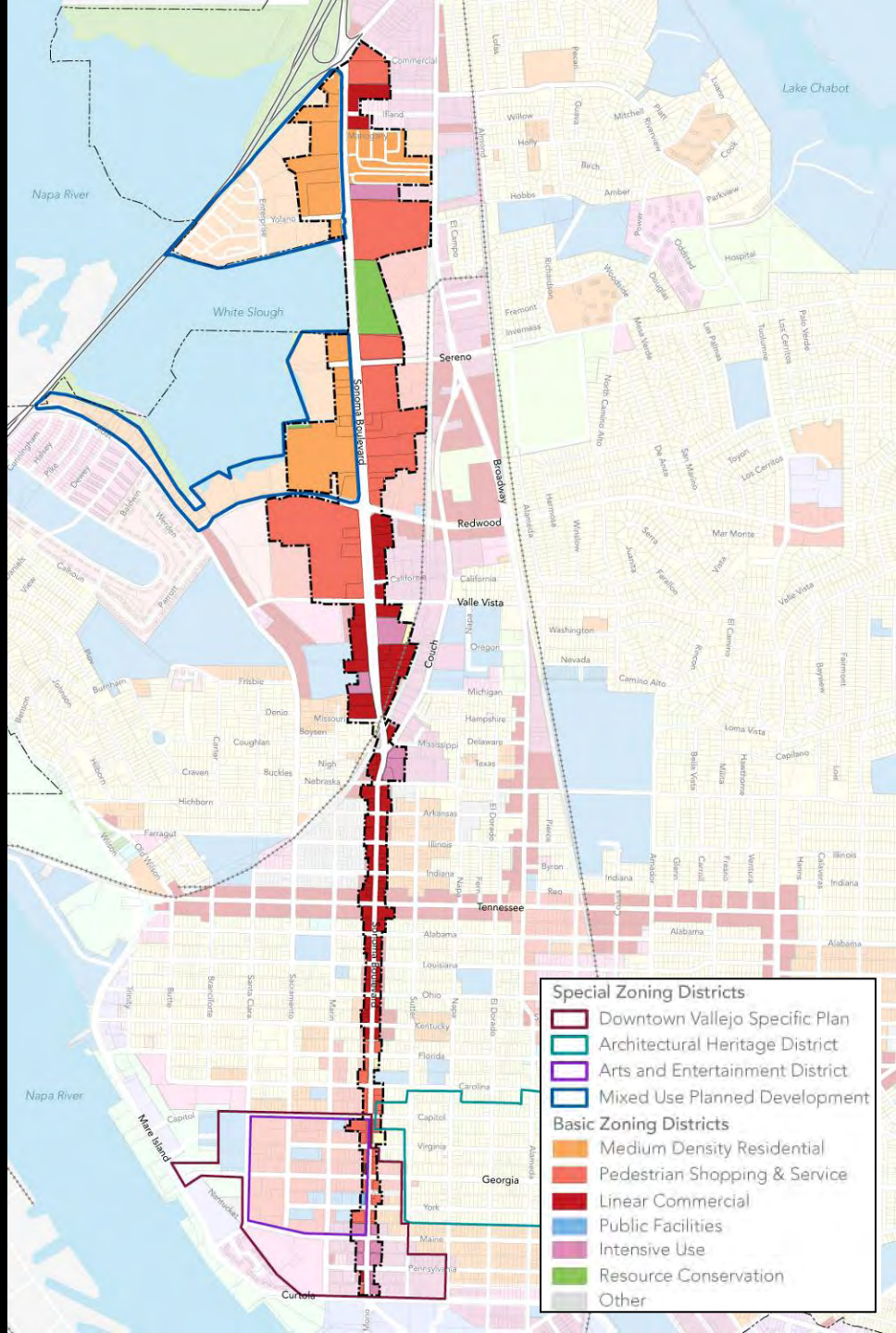
Planning Area

- The Planning Area is defined by Curtola Pkwy in the south and Hwy 37 in the north and is typically one parcel deep on both east and west sides of Sonoma Blvd
- The Planning Area is much narrower south of Couch St due to shallow parcel depth, and much wider north of Couch St where parcels are generally much deeper



Zoning

- The City of Vallejo Zoning Code establishes Special Zoning Districts and Basic Zoning Districts
- Special Zoning Districts regulate land use and streetscape design within the parcels included



Zoning

- Special Zoning Districts that are relevant to the Planning Area are:

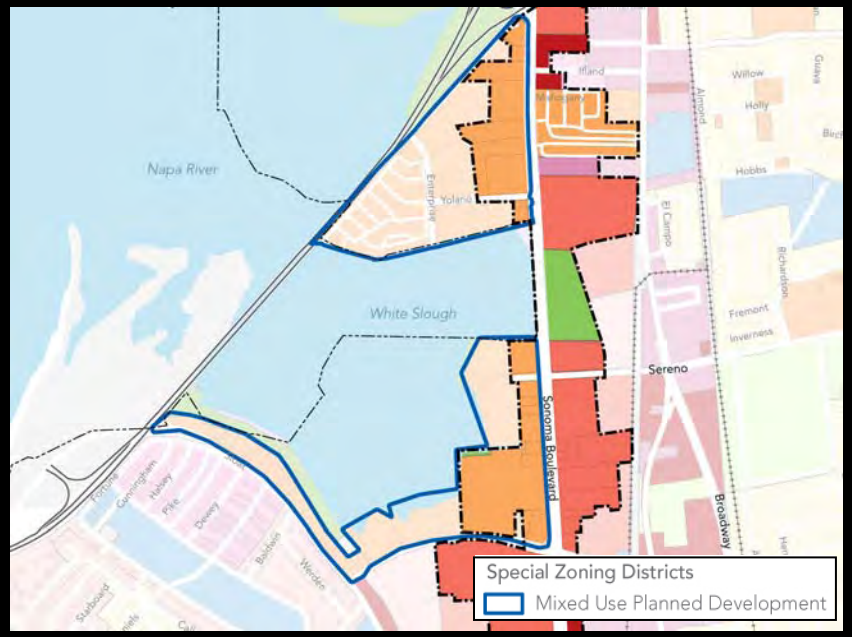
  - Downtown Vallejo Specific Plan

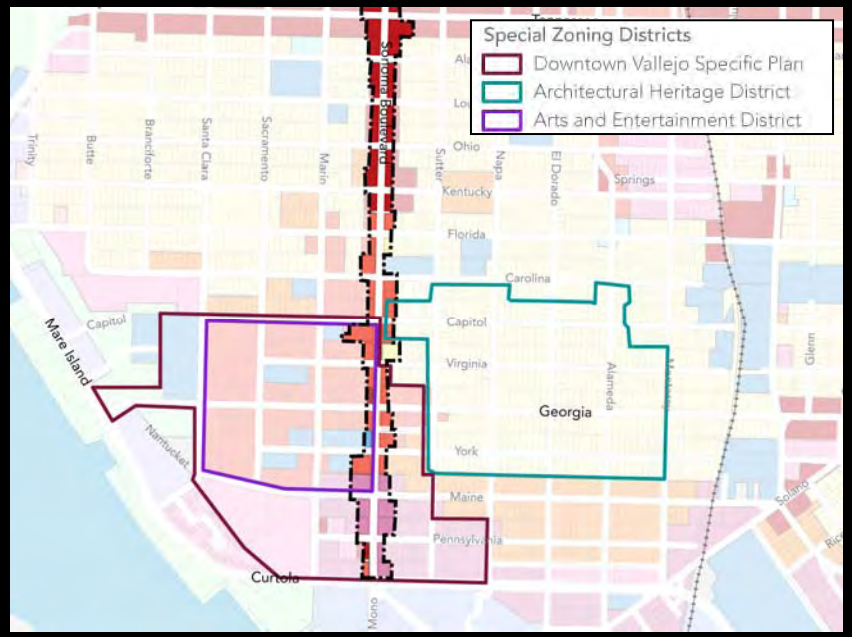
  - Architectural Heritage

  - Arts and Entertainment

  - Mixed Use Planned Development

- Specific Plans regulate land use, zoning and streetscape design for parts of the corridor





Historical Context

- 1926-27 map of the City of Vallejo prior to the creation of Route 29-Sonoma Boulevard
- Historic street grid is shown with a traditional rectilinear grid of approximately 300’ by 400’ blocks

1926-1927

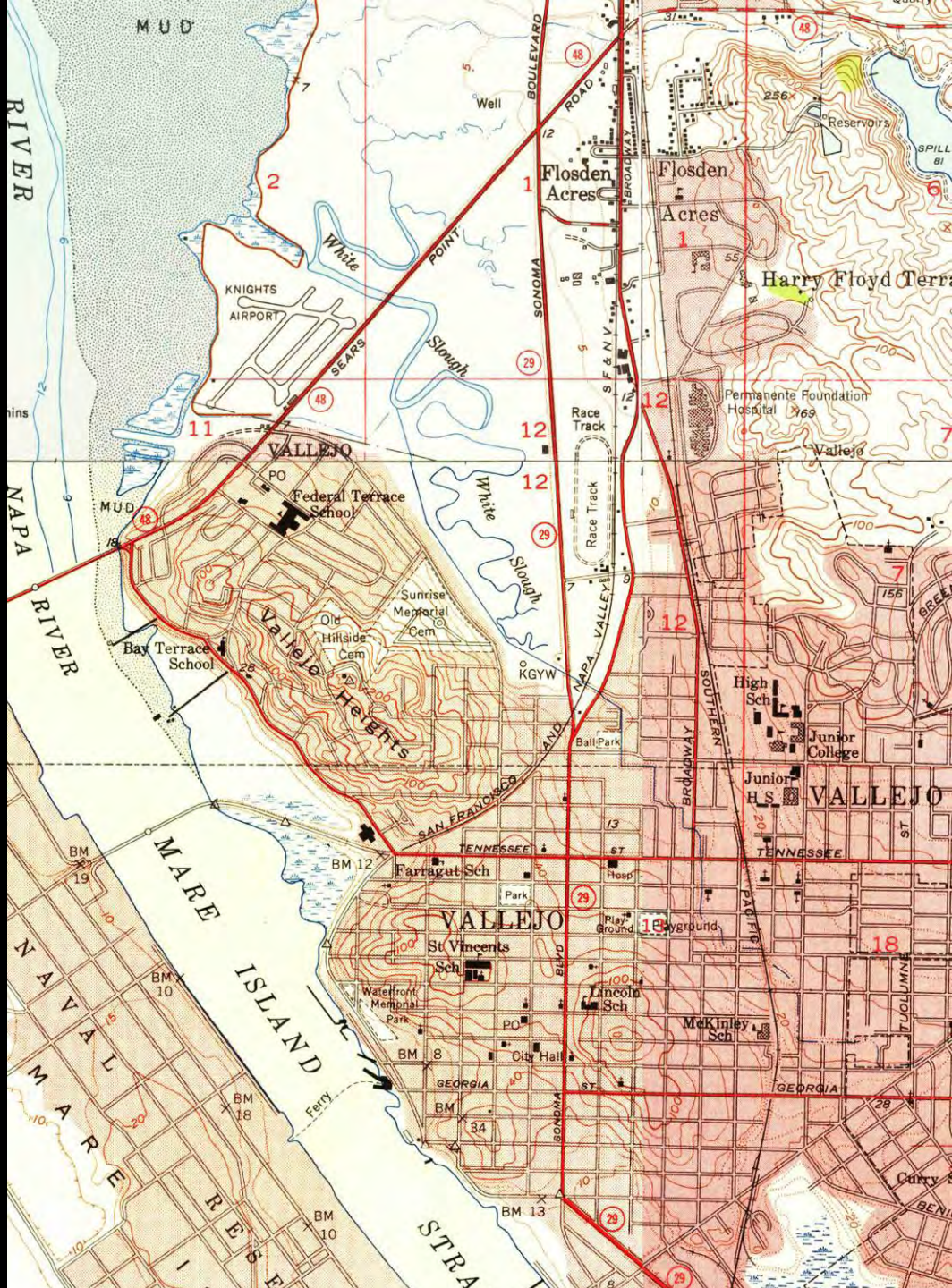
Historical Context

- Historic Route 29 was signed as part of the initial state signage of routes in 1934

1943-1947

Historical Context

- In 1963, Route 29 was defined as “from Route 80 near the Carquinez Bridge to Route 20 near Upper Lake.” In 1965, Chapter 1371 reworded the origin of the route to be "near Vallejo" instead of the Carquinez Bridge
- Sonoma Boulevard facilitated access and development of parcels north of Couch Street

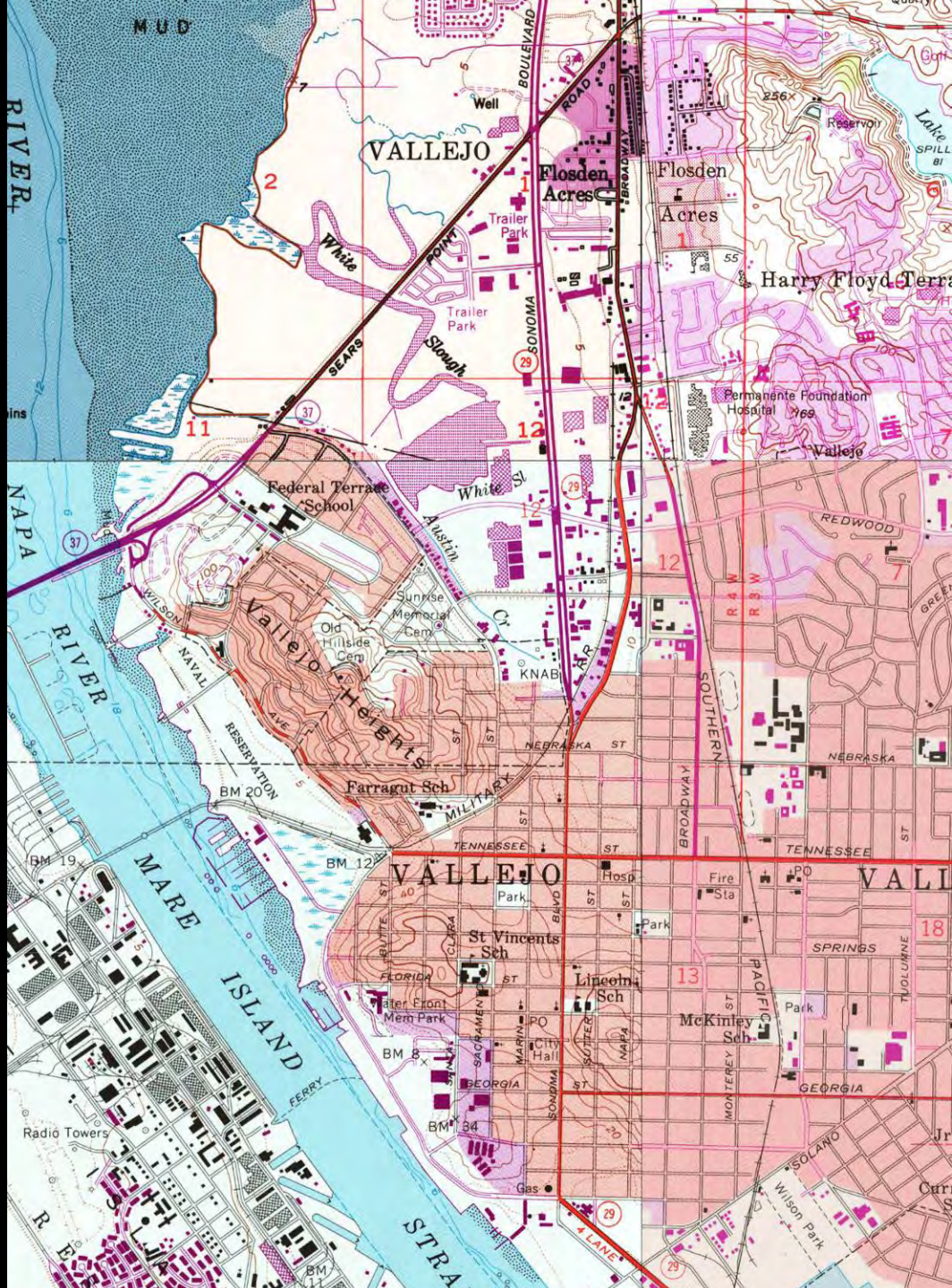


1956-1957

Historical Context

- Sonoma Boulevard north of Couch Street becomes a two-way divided corridor with a center median
- Parcels along Sonoma Boulevard north of Couch Street did not have the dimension of historical City blocks
- Parcels north of Couch Street were much larger and irregular in shape allowing for larger building footprints

1981-1988



Historical Context

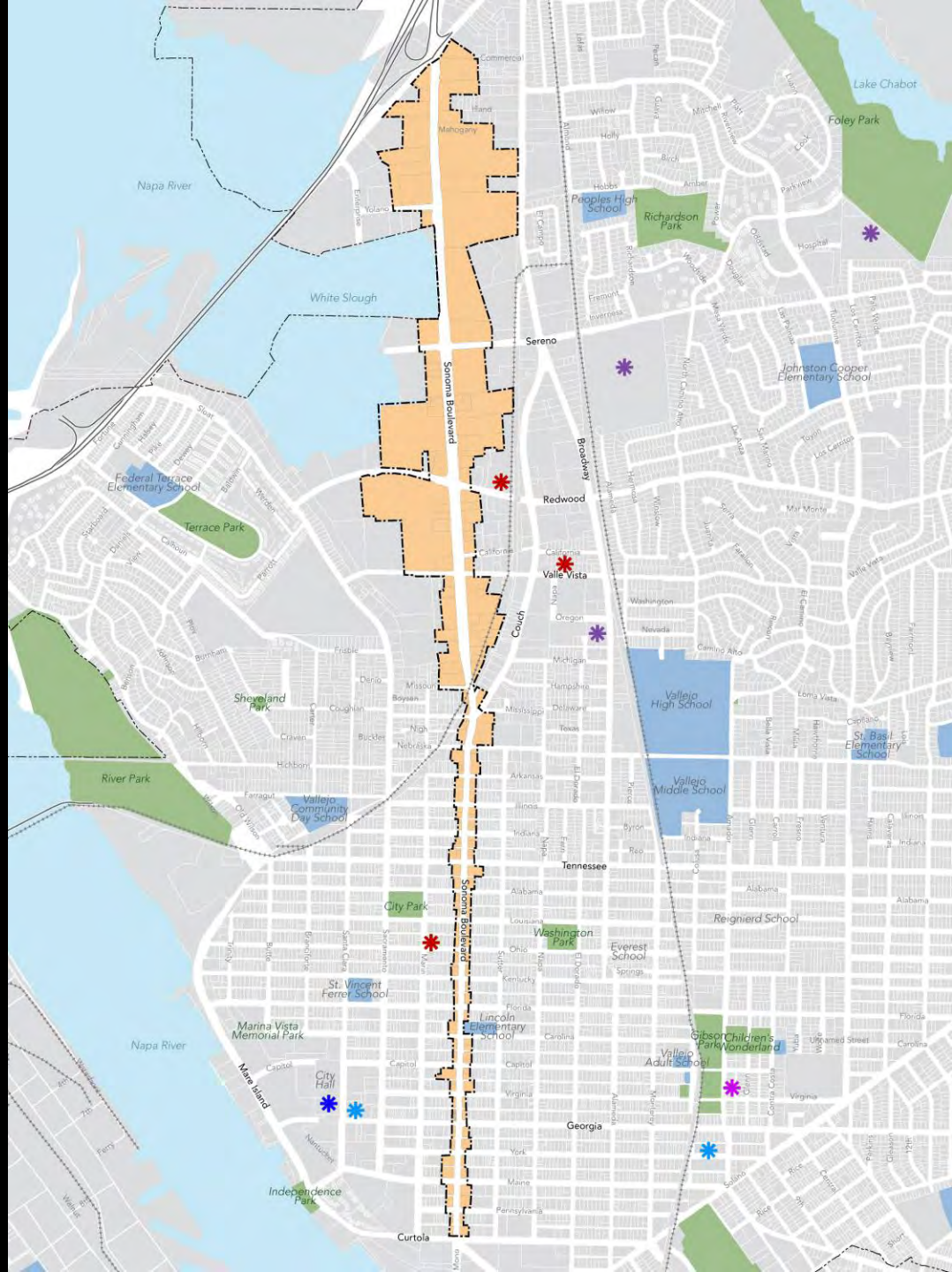
- Vallejo had a thriving economy and city life early in the 20th century
- Beautiful architecture and a traditional pedestrian-friendly city grid are remnants from this era

Historical Context

- Historic areas like the Architectural Heritage and St. Vincent's Historic districts have traditional Victorian and Craftsman houses

Community Amenities

- Sonoma Blvd has community amenities along its length or in close proximity
- Currently Sonoma Blvd is perceived as a barrier creating a disconnection between east and west sides
- Connections from neighborhoods to Downtown, community amenities and destinations should be enhanced



Community Amenities

- Churches and a public elementary school are located along Sonoma Blvd
- Kaiser Permanente is a major regional destination located in close proximity to the Planning Area

Community Amenities

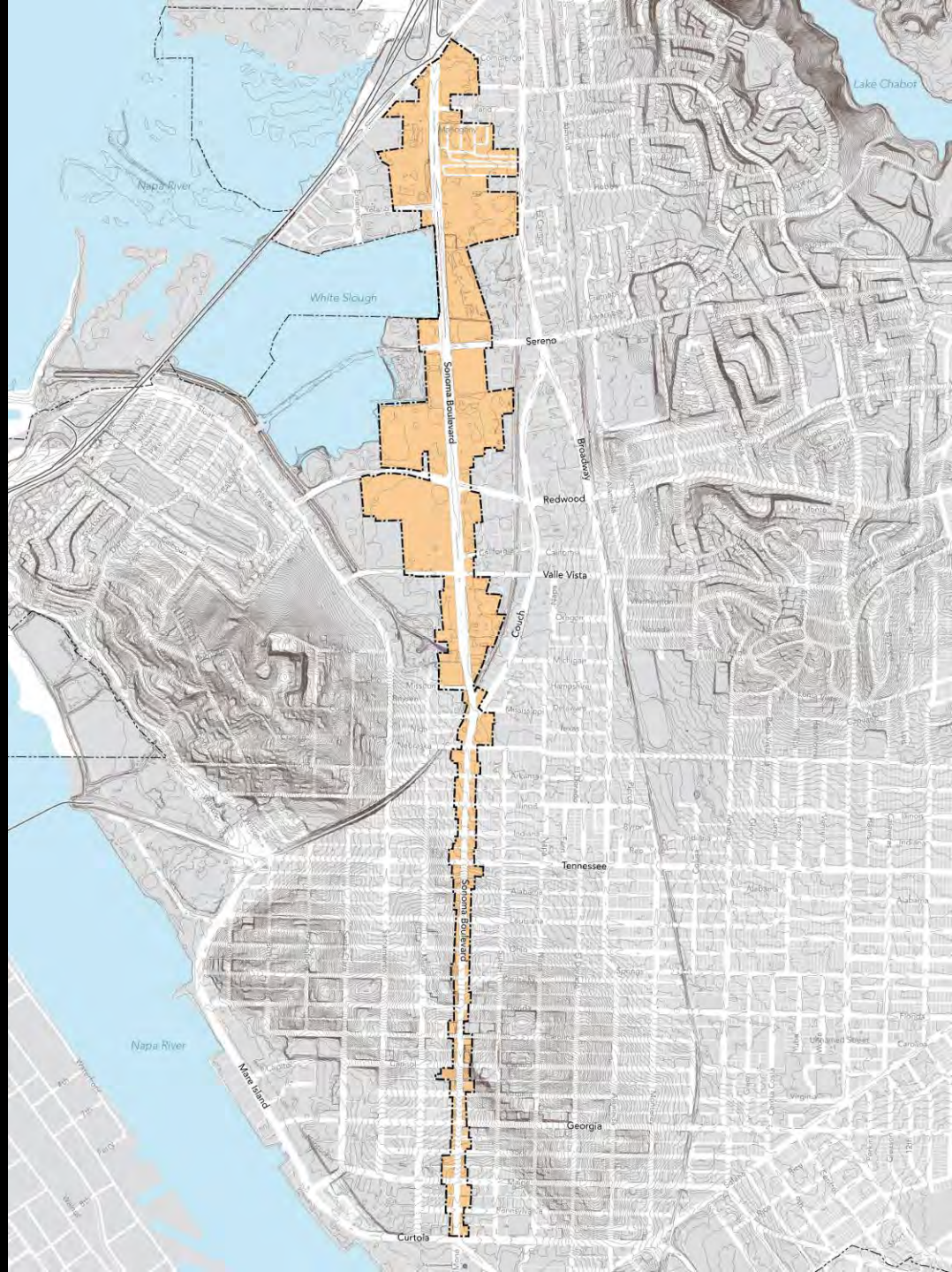
- Community amenities such as civic and cultural buildings, transit station, ferry terminal, and a concentration of retail are located in close proximity to the Planning Area

Celebrations and Festivals

- Sonoma Boulevard is used as the stage for a number of lively celebrations and festivals that bring the different cultural groups together

Views

- The corridor has some significant changes in elevation throughout the Planning Area
- The design of the street and future developments should consider views generated through topography changes as well as view corridors into natural resources



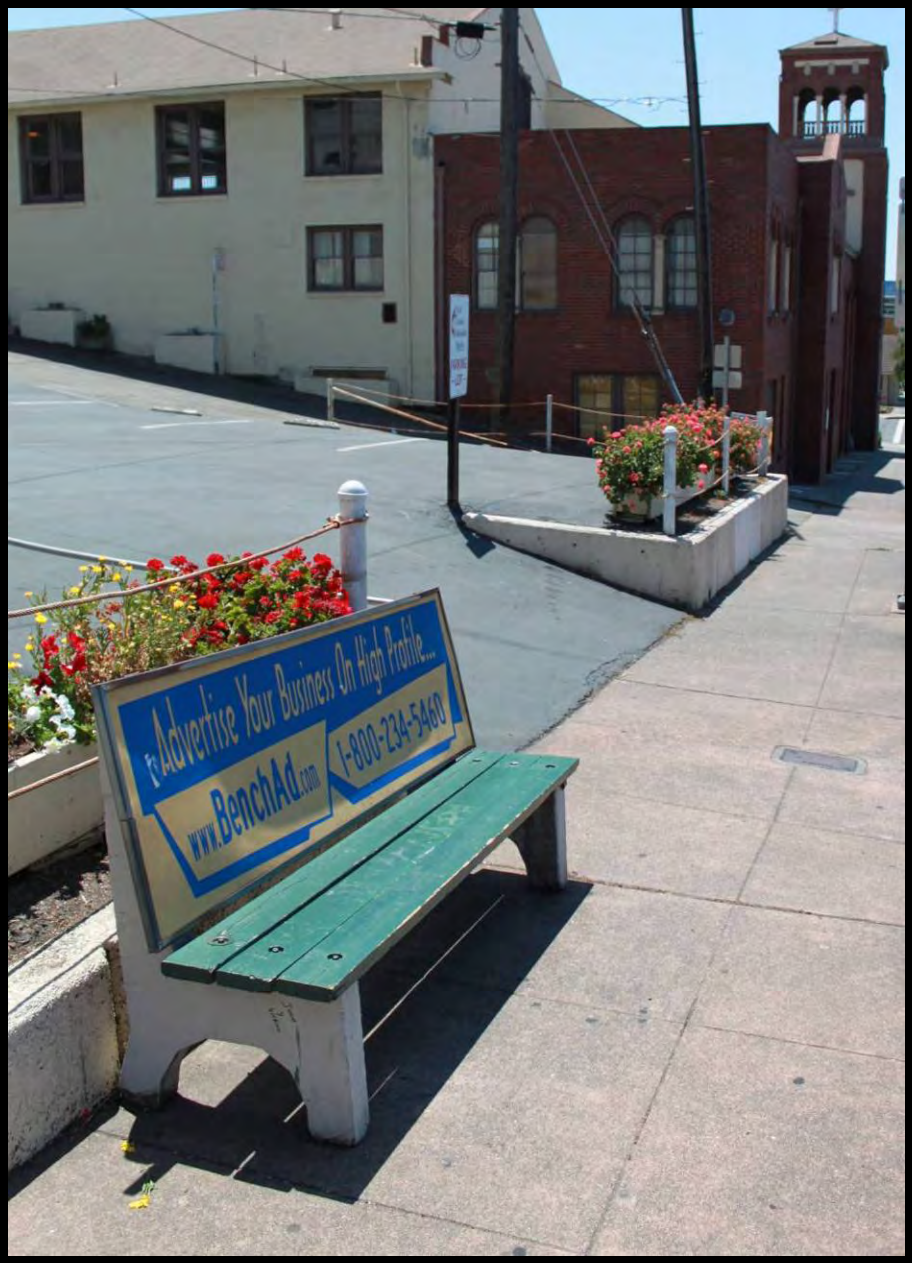
Views

- There are attractive view corridors from the higher points along the corridor (around Florida St)
- Close to the White Slough there are views into the marshy areas and mountains in the background

Streetscape Design

Furniture

- Furniture and pedestrian amenities are minimal
- Transit stops would benefit by having more furniture and a unified design style through the corridor



Streetscape Design

Bicycle Amenities

- Currently there are no bicycle lanes along Sonoma Blvd
- Bikers typically ride on the sidewalks since fast moving traffic makes it unsafe to share the road with vehicles
- Bicycle connections throughout the area are minimal and could be improved, especially those leading to schools, parks and community amenities

Streetscape Design

Signage

- Signage is mostly focused on vehicular traffic and has a large scale
- There are some mid-20th century signs that are also scaled for vehicular traffic but have an interesting quality and design

Streetscape Design

Landscaping

- Landscaping and street trees are minimal or nonexistent south of Couch St
- North of Couch St there is more vegetation on private parcels along the corridor but it is nonexistent on the public ROW
- There is a complete lack of street trees along the boulevard
- The central median north of Couch St has vegetation but it is poorly maintained and contributes to the poor image of the corridor

Architecture

- The architectural characters of buildings along Sonoma Boulevard cover a wide range of styles
- The range and mix of styles fails to create a clear identity for the corridor

Architecture

- Landmark buildings along the corridor, particularly close to the Downtown area, have a Spanish-Mediterranean style that is characterized by pastel colors, stucco finish, terracotta tile roof and vertical elements at the corner of buildings

Architecture

- Newer developments along the northern portion of the corridor are for the most part big-box style with minimal ornamentation

Blank Walls

- The majority of the building edges along Sonoma Blvd and its connecting cross streets are unfriendly
- The Downtown area has better pedestrian edges with more entries and windows along the sidewalk; however, vacancies and neglected buildings detract from positive architectural features

Parking

- The corridor has a wide range of parking arrangements along its length
- North of Valle Vista Ave the corridor has large surface parking lots fronting the corridor
- Parking along the boulevard is prohibited between Valle Vista Ave and SR-37 Interchange

Parking

- Between Valle Vista Ave and Couch St the corridor has medium-sized parking lots associated with older shopping centers
- South of Couch St, the corridor is characterized by small surface parking lots or no parking lots
- Between Valle Vista Ave and Curtola Pkwy parking allowed along the street

Planning Subareas

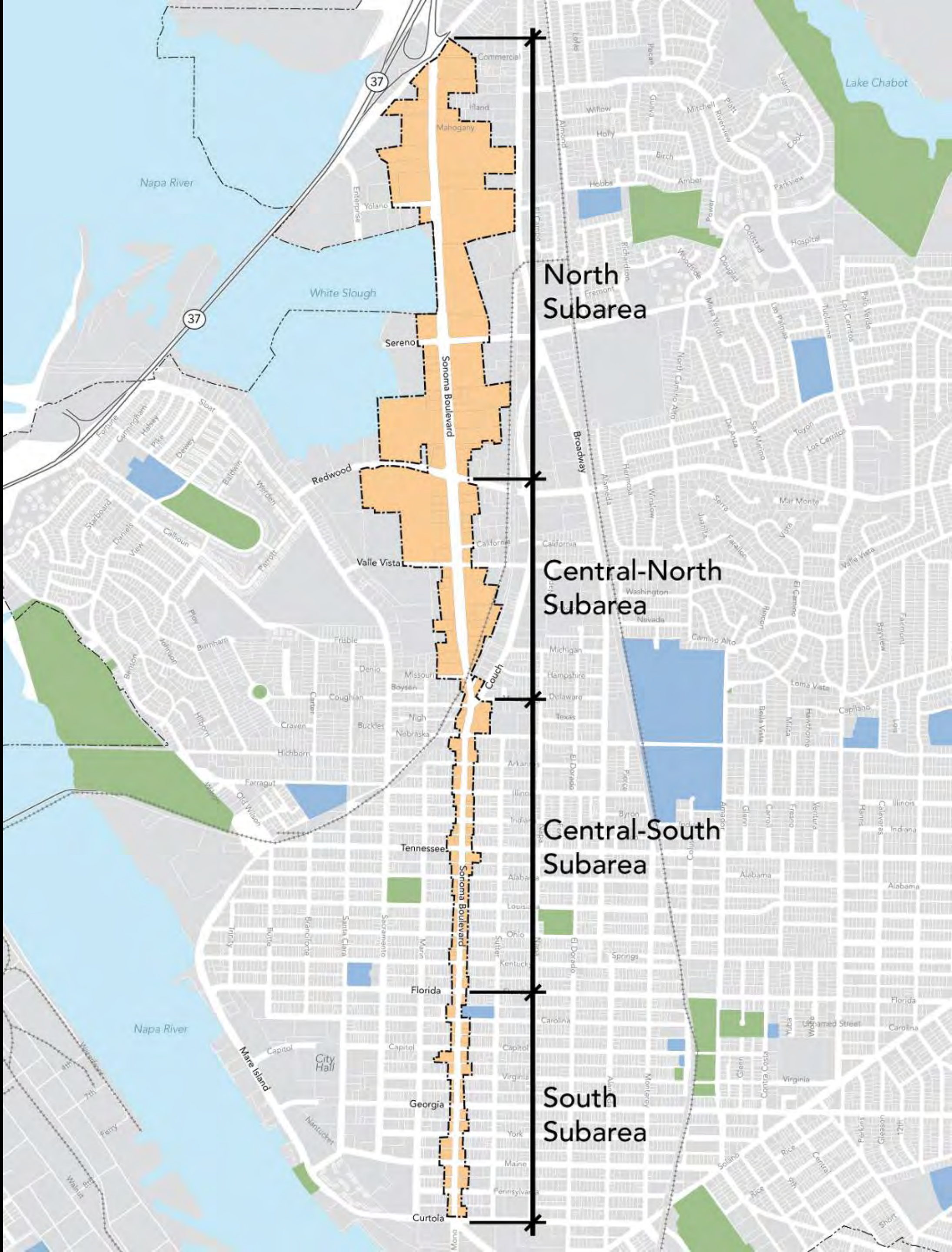
- The Planning Area has been subdivided into four subareas that have distinctive land uses, streetscape characteristics and overall function in relation to the City and regional context
- The four Planning Subareas are:

  - South Subarea

  - Central-South Subarea

  - Central-North Subarea

  - North Subarea



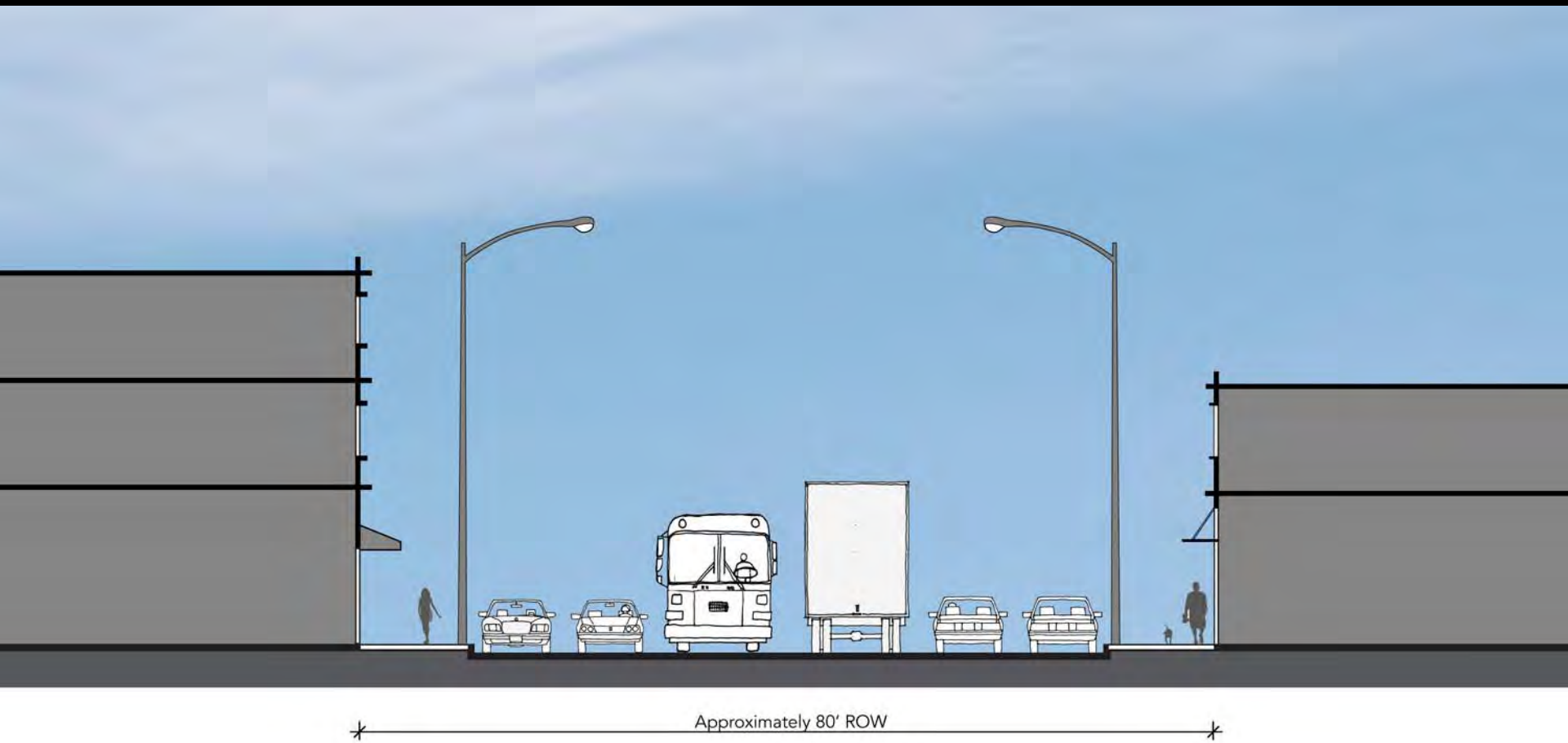
South Subarea

- The South Subarea is defined by Curtola Pkwy in the south and Florida St to the north and, similarly to all other subareas in the corridor, is one parcel deep on both east and west sides of Sonoma Blvd
- Downtown Vallejo is centered around Georgia St and includes parts of Sonoma Blvd that overlap with this South Subarea of the corridor

Curtola Pk
GOODYE
NAWABI'S
TIRE & AUT
FOUR SEASONS
SUNROOMS

Typical Street Section in South Subarea

Sonoma Blvd @ Georgia St

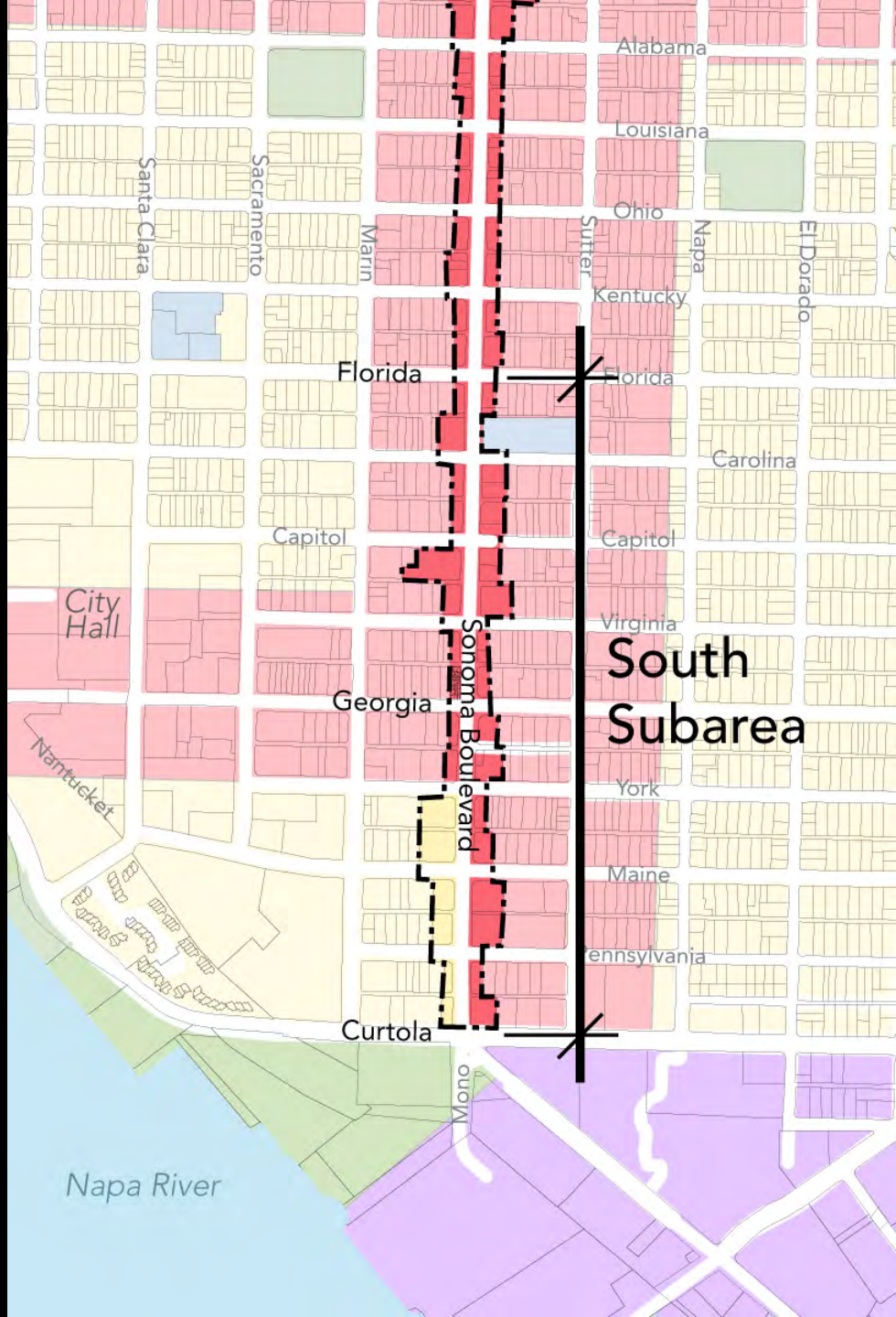


Sidewalk

- Sidewalks are 10’ wide and well connected
- There are some bottle-necks along the sidewalk when utilities are located along the street
- Crosswalks are clearly marked and they are located at every intersection

Land Use

- Land uses along the South Subarea include:
  - commercial/office
  - commercial/retail
  - residential
  - mixed-use (commercial/residential)
  - car-oriented services
  - community services like restaurants and small retail
  - institutional and religious
  - temporary uses like ‘taco trucks’



Land Uses found along the South Subarea of the corridor

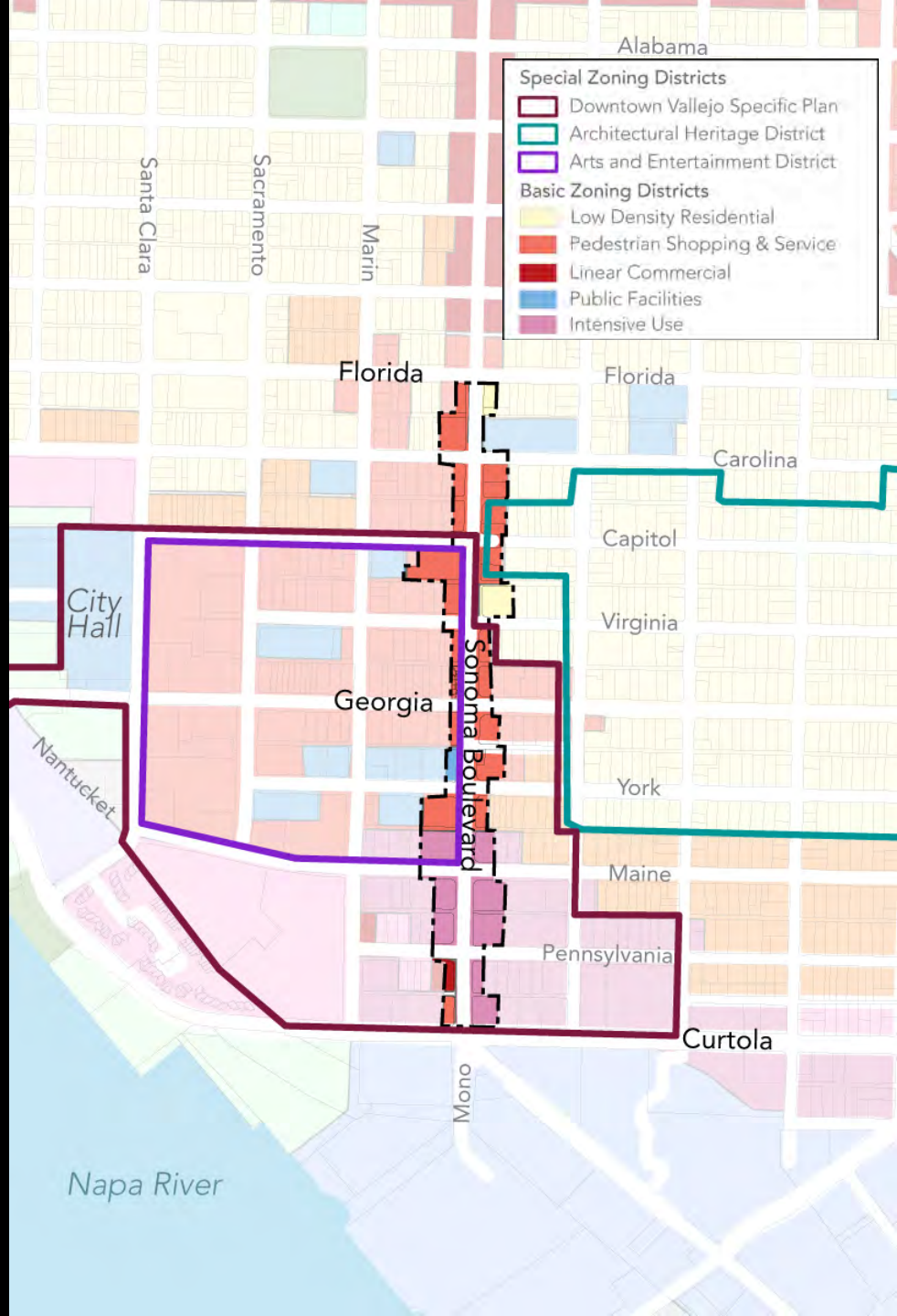
Other Land Uses

- Although not located within the Planning Area, urban agriculture (vineyards) are present in close proximity to Sonoma Blvd close to the south boundary of the Planning Area

Vineyards located southeast of the Planning Area

Zoning

- Three Special Zoning Districts are present in this subarea:
  - Downtown Vallejo Specific Plan
  - Architectural Heritage District
  - Arts and Entertainment District
- Five zoning designations are present in this subarea:
  - Low Density Residential
  - Pedestrian Shopping & Service
  - Linear Commercial
  - Public Facilities
  - Intensive Use
- See Vallejo's Zoning Code for list of permitted uses and development standards



Vacant Commercial

- Vacant and underutilized parcels and buildings are located throughout the corridor
- The South Subarea has smaller size vacant offices and buildings

Street and Block Grid

- City blocks in this subarea are approximately 300’ by 420’
- Downtown blocks close to waterfront were redeveloped during the 1970’s and some blocks were consolidated
- This subarea of the corridor has a block size that is nicely scaled for pedestrian circulation
- Although the street grid and block size are favorable for pedestrian circulation, other factors like fast moving traffic and poor buffers between traffic and pedestrians inhibit pedestrian and bicycle circulation

Alleys

- City blocks in this subarea have alleys running in a east-west orientation through the center of the block
- Utilities are located along central alleys
- As a result of utilities being located along alleys, Sonoma Boulevard has no electricity poles or cables overhead

Building Footprints

- Building footprints in parcels along the South Subarea are small (25’ by 50’) to medium (50’ to 130’) in size
- Buildings in this subarea usually either have no setback or they might have surface parking in front of building setting back buildings from the street anywhere from 40-100’

Some of the building types found along the South Subarea of the corridor

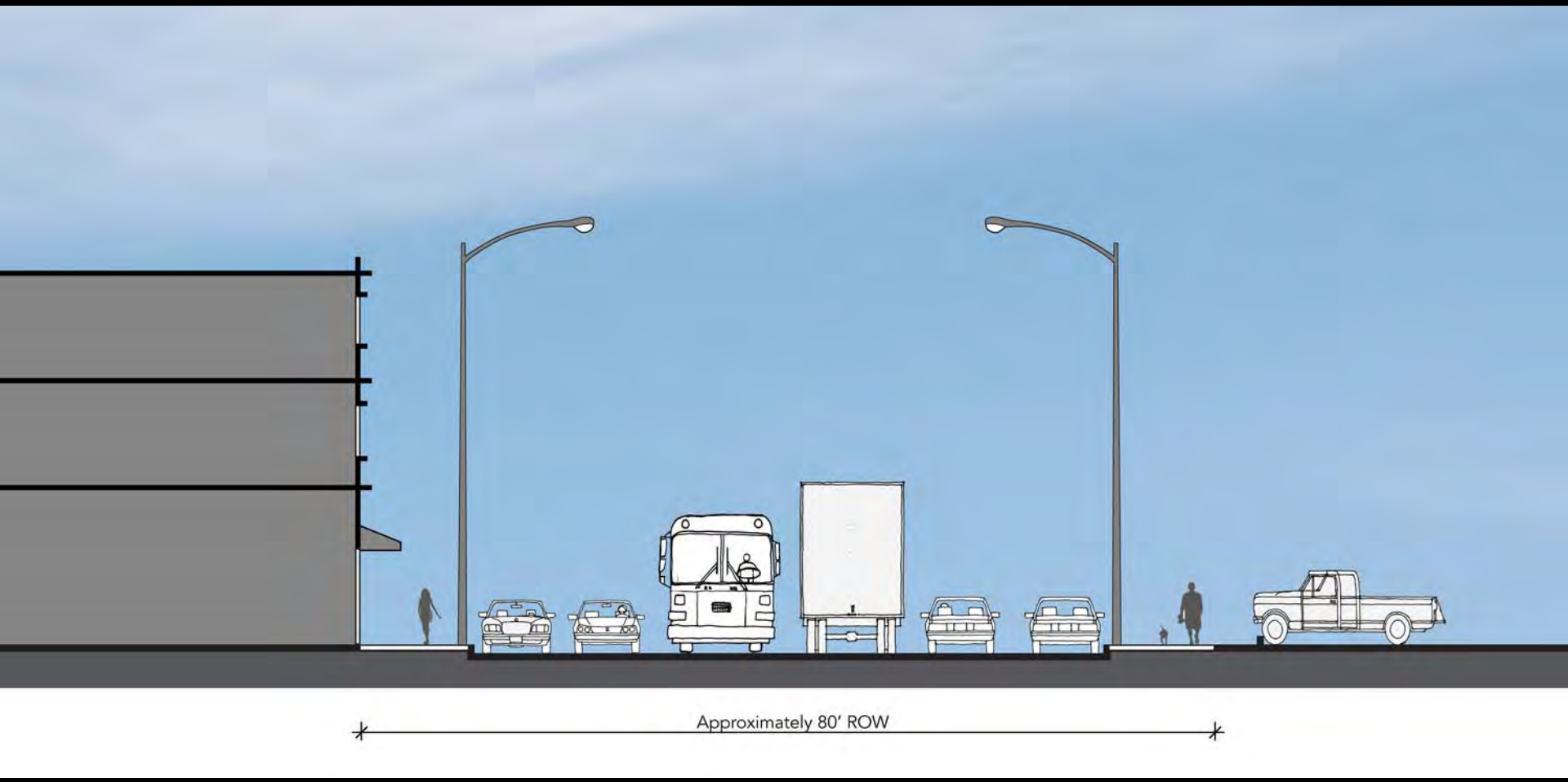
Central-South Subarea

- The Central-South Subarea is defined by Florida St in the south and Couch St to the north
- Tennessee St is a major connecting street linking the City and Mare Island to the I-80 Freeway

Tennessee St
J.C.
MINI MART

Typical Street Section in Central-South Subarea

Sonoma Blvd @ Tennessee St

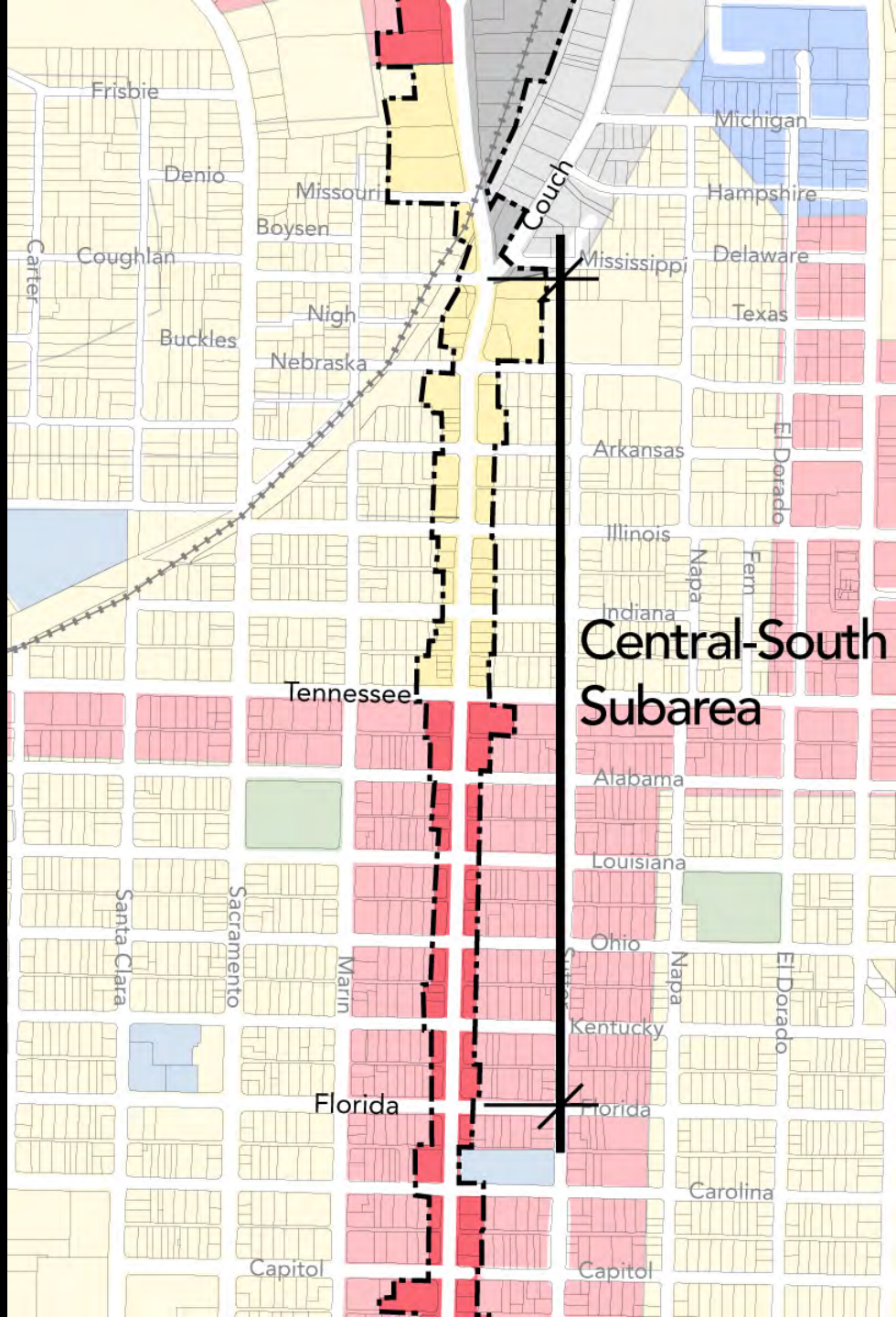


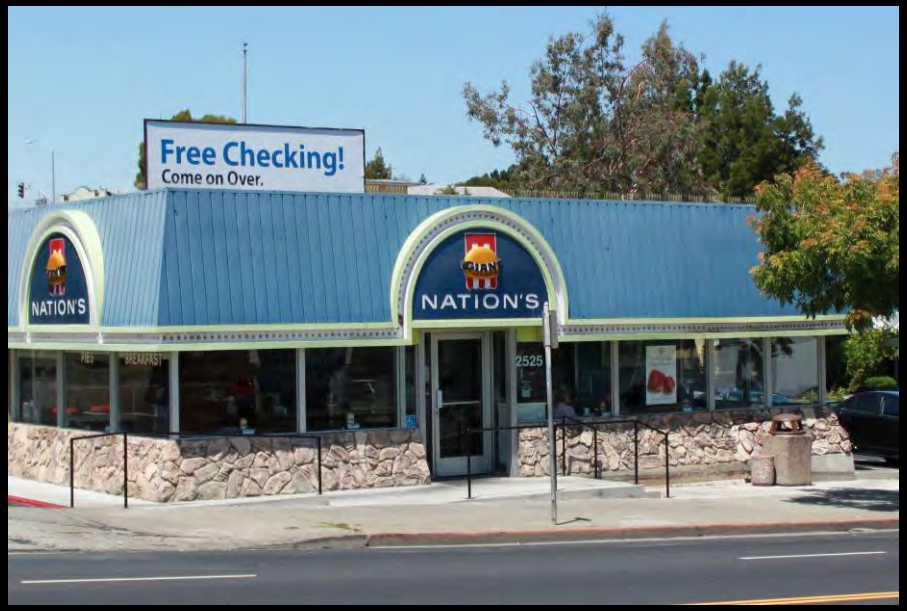
Sidewalk

- Sidewalks in this subarea are 10’ wide and continuous
- There are some bottle-necks along the sidewalk when utilities are located along the street
- Crosswalks are clearly marked and they are located at every intersection; however, the fast moving traffic and the lack of buffering between travel lanes and sidewalk create an inhospitable pedestrian environment

Land Use

- Land uses along the Central-South Subarea include:
  - commercial/retail
  - residential
  - mixed-use
  - car-oriented services
  - community services like small markets, liquor stores and fast food restaurants





Land Uses found along the Central-South Subarea of the corridor

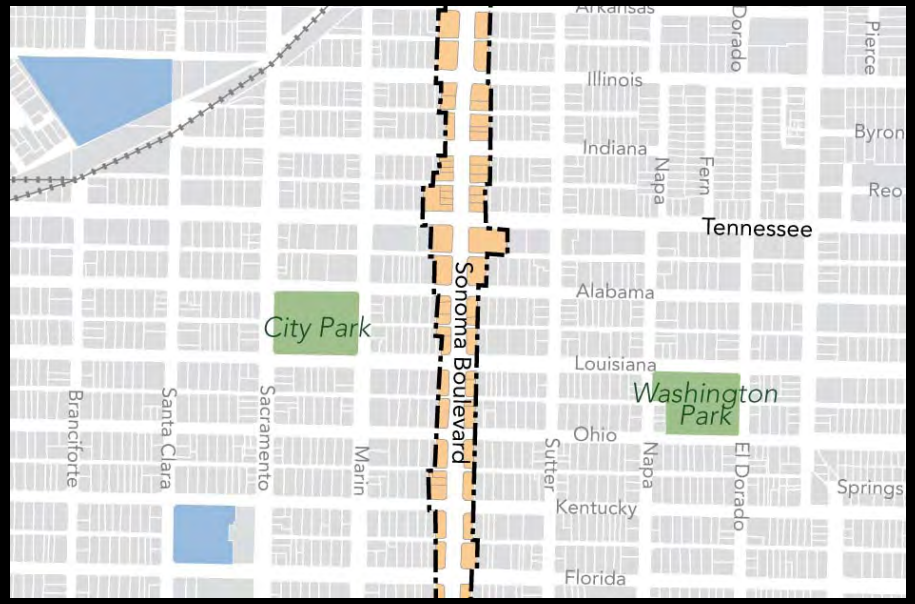
Zoning

- Three zoning designations are present in this subarea:
  - Pedestrian Shopping & Service
  - Pedestrian Shopping & Service
  - Linear Commercial
  - Intensive Use
- See Vallejo's Zoning Code for list of permitted uses and development standards

Open Space

- Although there are no public parks, plazas or open spaces along Sonoma Blvd, the Central-South Subarea has attractive open spaces in close proximity to the Planning Area
- Park facilities in close proximity to the Planning Area include City Park and Washington Park

City Park is just one block from the Planning Area



Central-South Subarea has two parks in close proximity to Sonoma Blvd

Street and Block Grid

- This subarea has blocks that are approximately 300’ by 420’
- Street and block grid is more regular here than in the Downtown area, where some blocks were consolidated
- Although the area has good “bones” for connectivity, other factors discourage pedestrian and bicycle circulation

Alleys

- City blocks in this subarea have alleys running in a east-west orientation through the center of the block
- Utilities are located along central alleys
- As a result of utilities being located along alleys, Sonoma Boulevard has no electricity poles or cables overhead
- Some alleys are clean and maintained while others have trash and broken pavement

Building Footprints

- Building footprints in parcels along the Central-South Subarea are for the most part small (25’ by 50’) with a few medium ones (50’ to 130’)
- Buildings in this subarea usually have no setback or they are shallow (up to 40’)
- A few buildings including gas station have larger setbacks (40-60’)

Some of the building types found along the Central-South Subarea of the corridor

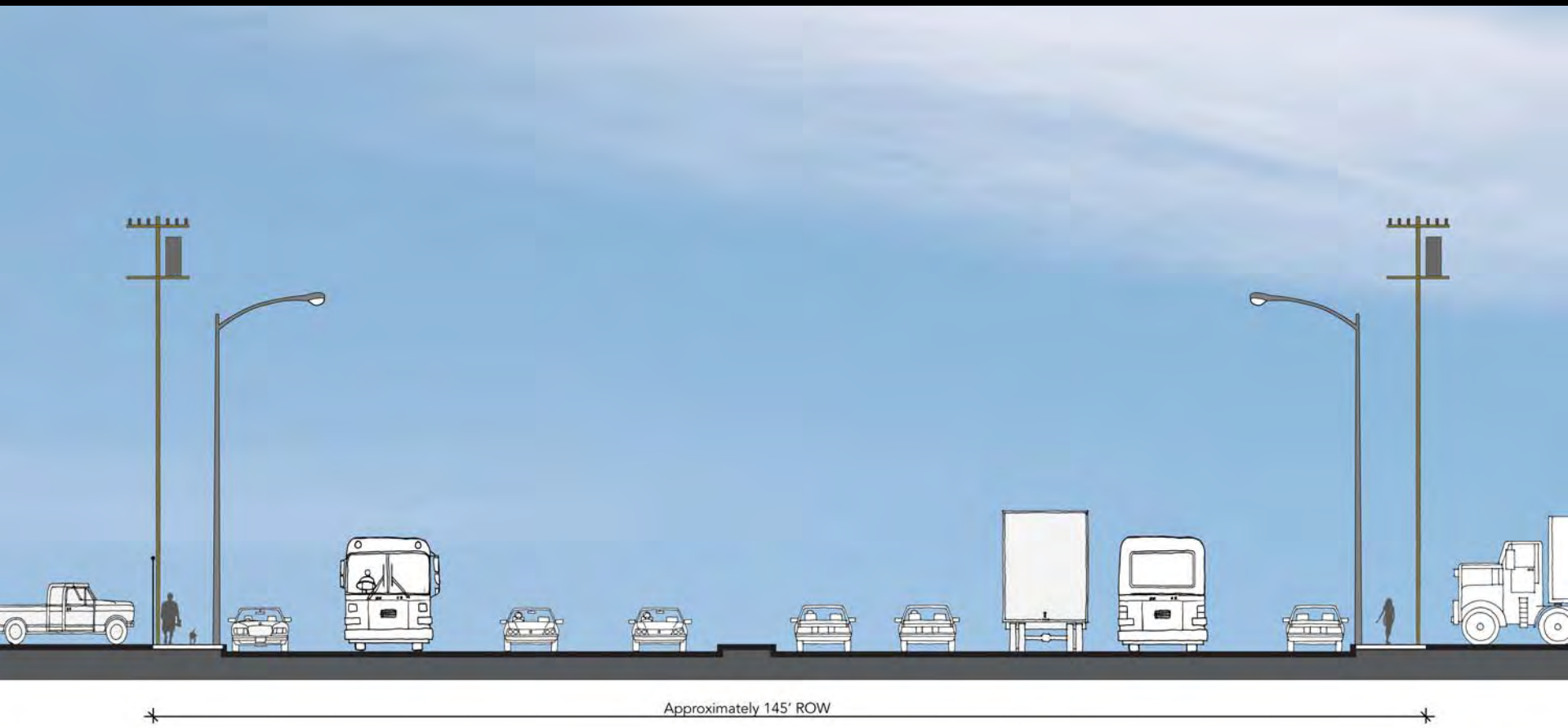
Central-North Subarea

- The Central-North Subarea is defined by Couch St to the south and Redwood St to the north and
- This area can be characterized as a transitional area between the subareas located south of Couch St and the one to the north
- Within this subarea the Boulevard's ROW becomes wider, parcels become deeper, and block size increases

76
ConocoPhillips
376
386
395
Cash Price
Snack Shop
Redwood St

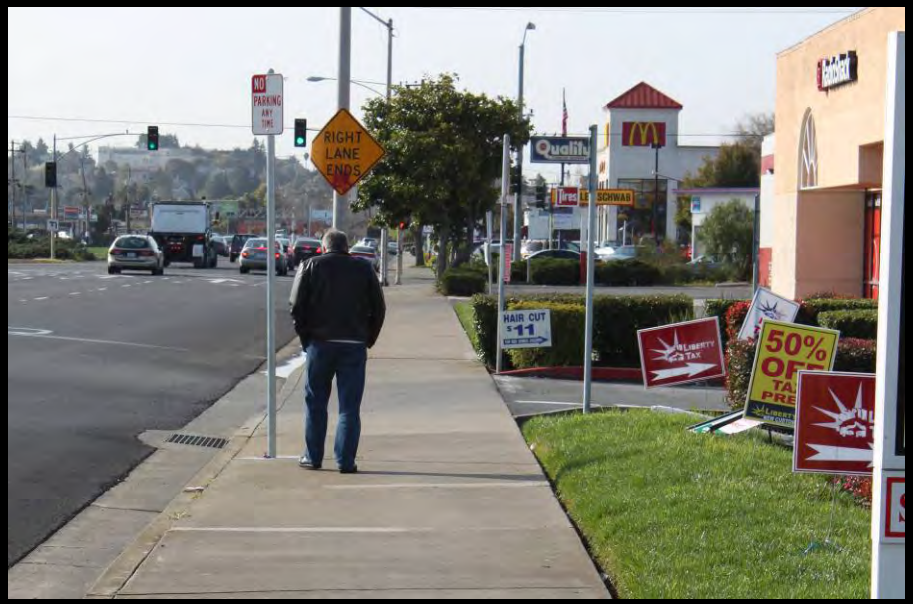
Typical Street Section in Central-North Subarea

Sonoma Blvd @ Redwood St



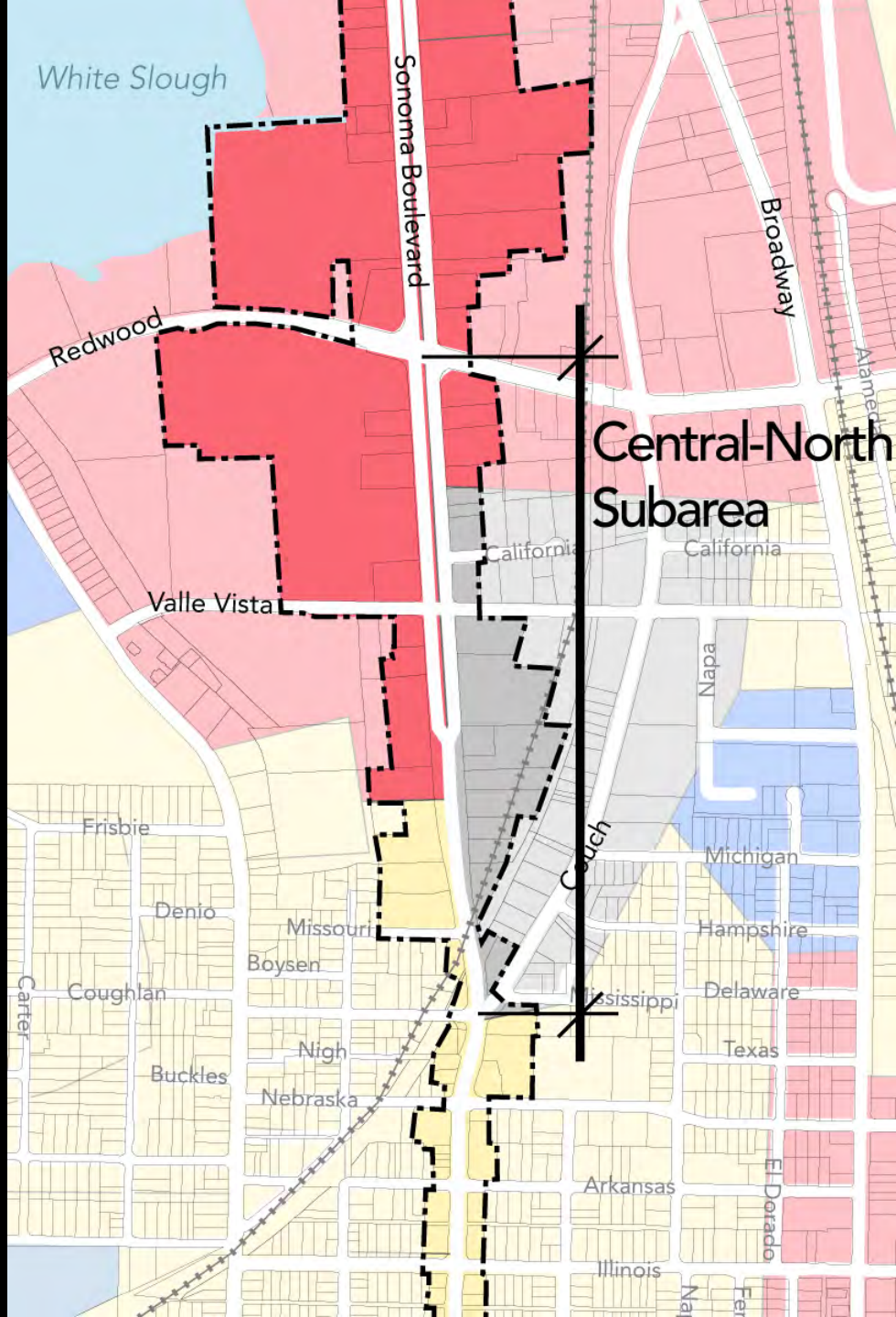
Sidewalk

- Sidewalks are 8’ wide
- Sidewalks are continuous throughout this subarea
- There is a clear disproportion between the ROW dedicated to vehicles and what is dedicated to pedestrians and cyclists
- Sidewalks are in close proximity to fast moving traffic and there is no buffering to increase safety and comfort



Land Use

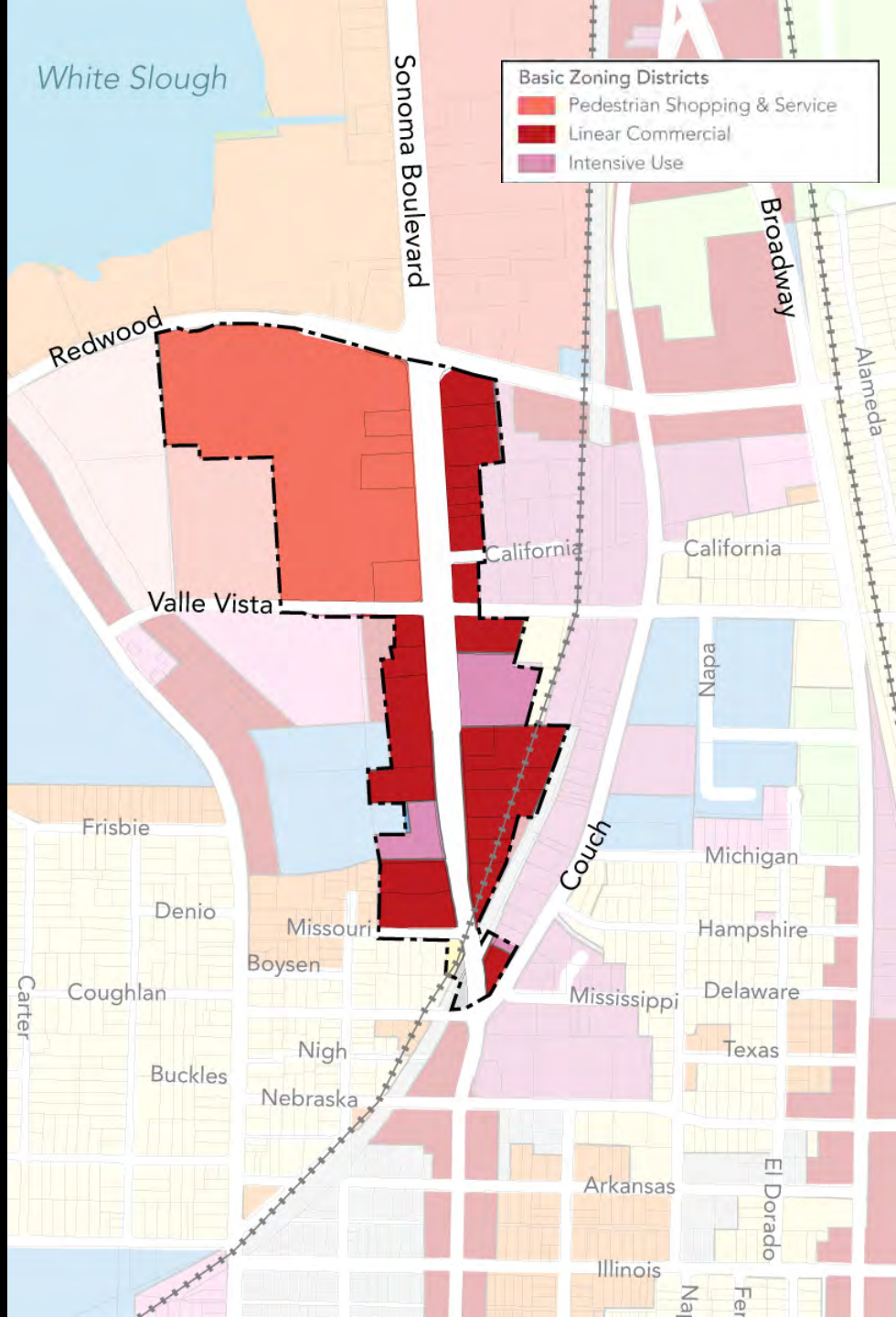
- Land uses along the Central-North Subarea include:
  - industrial
  - services like restaurants, fast food restaurants and retail geared toward local and regional customers
  - car-oriented services and retail
  - religious
  - temporary uses such as taco trucks



Land Uses found along the Central-North Subarea of the corridor

Zoning

- Three zoning designations are present in this subarea:
  - Pedestrian Shopping & Service
  - Pedestrian Shopping & Service
  - Linear Commercial
  - Intensive Use
- See Vallejo's Zoning Code for list of permitted uses and development standards

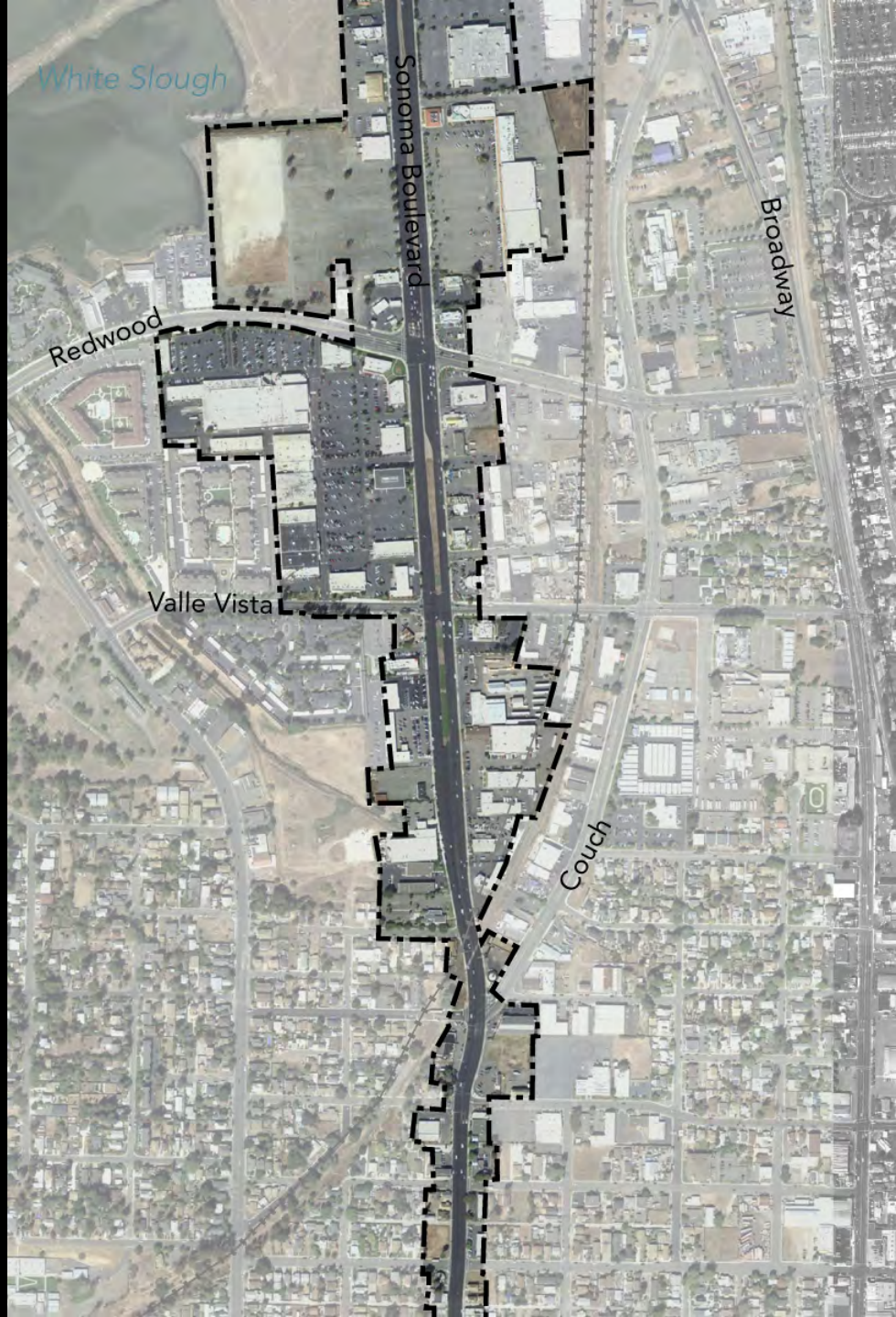


Street and Block Grid

- City blocks between Couch St and Redwood St are irregular in shape
- Blocks to the east and south of this subarea are bisected by train tracks
- Blocks in this subarea are medium in size when compared to the ones from adjacent subareas to the north and south
- Block size is roughly 800-1000’ by 1000-1400’

Building Footprints

- Building footprints in parcels in the Central-North Subarea range from medium (50’ by 150’) to large (250’ by 500’)
- Building footprints are for the most part medium size
- Buildings in this subarea have medium (150’) to large (400’) setbacks that are generally use for surface parking



Some of the building types found along the Central-North Subarea of the corridor

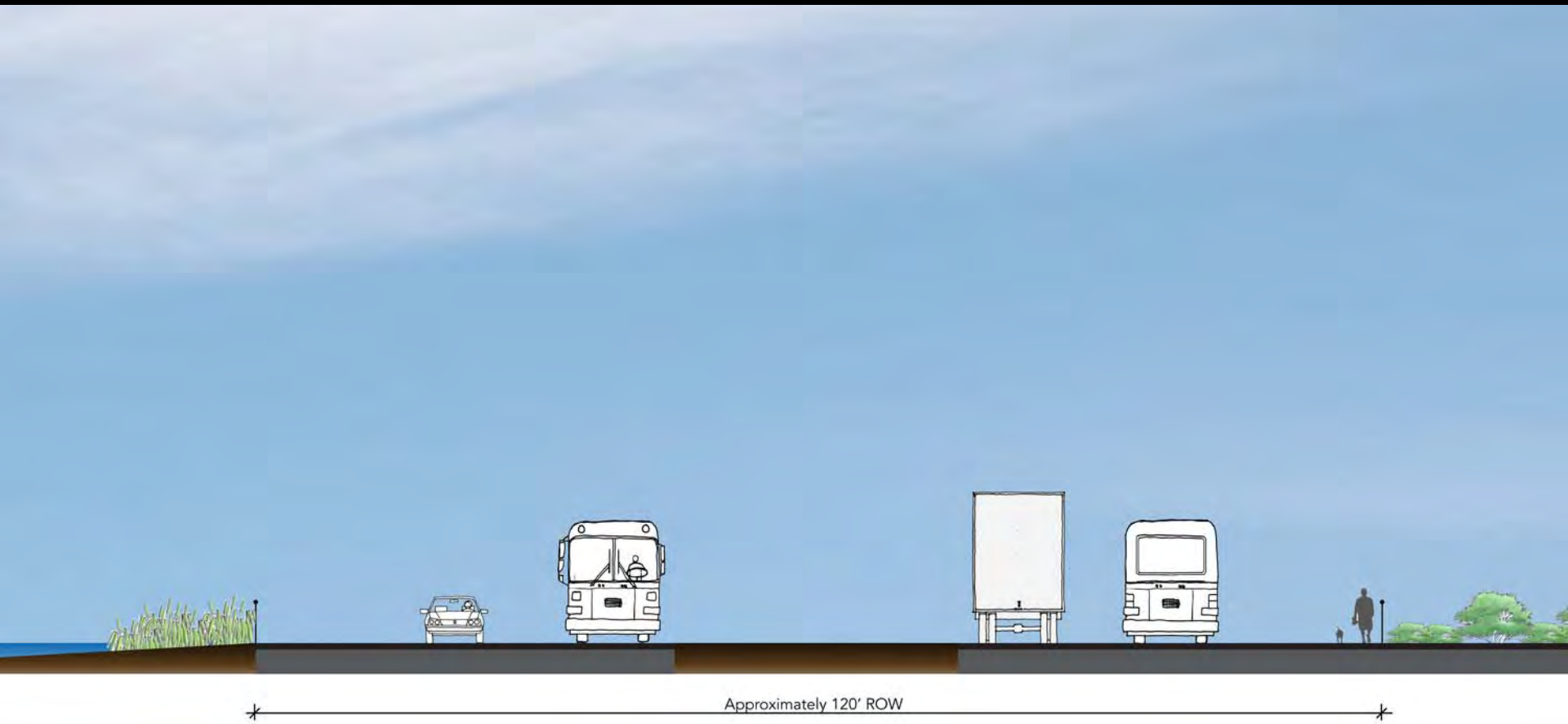
North Subarea

- The North Subarea is defined by Redwood St to the south and I-37 Highway to the north
- The proximity to I-37 Highway has had a big influence in shaping the physical qualities of the corridor's public and private realms
- This subarea has a car-centric scale and character

We made this billboard
boring so you'd keep
your eyes on the road.
76

Typical Street Section in North Subarea

Sonoma Blvd @ Yolano Dr

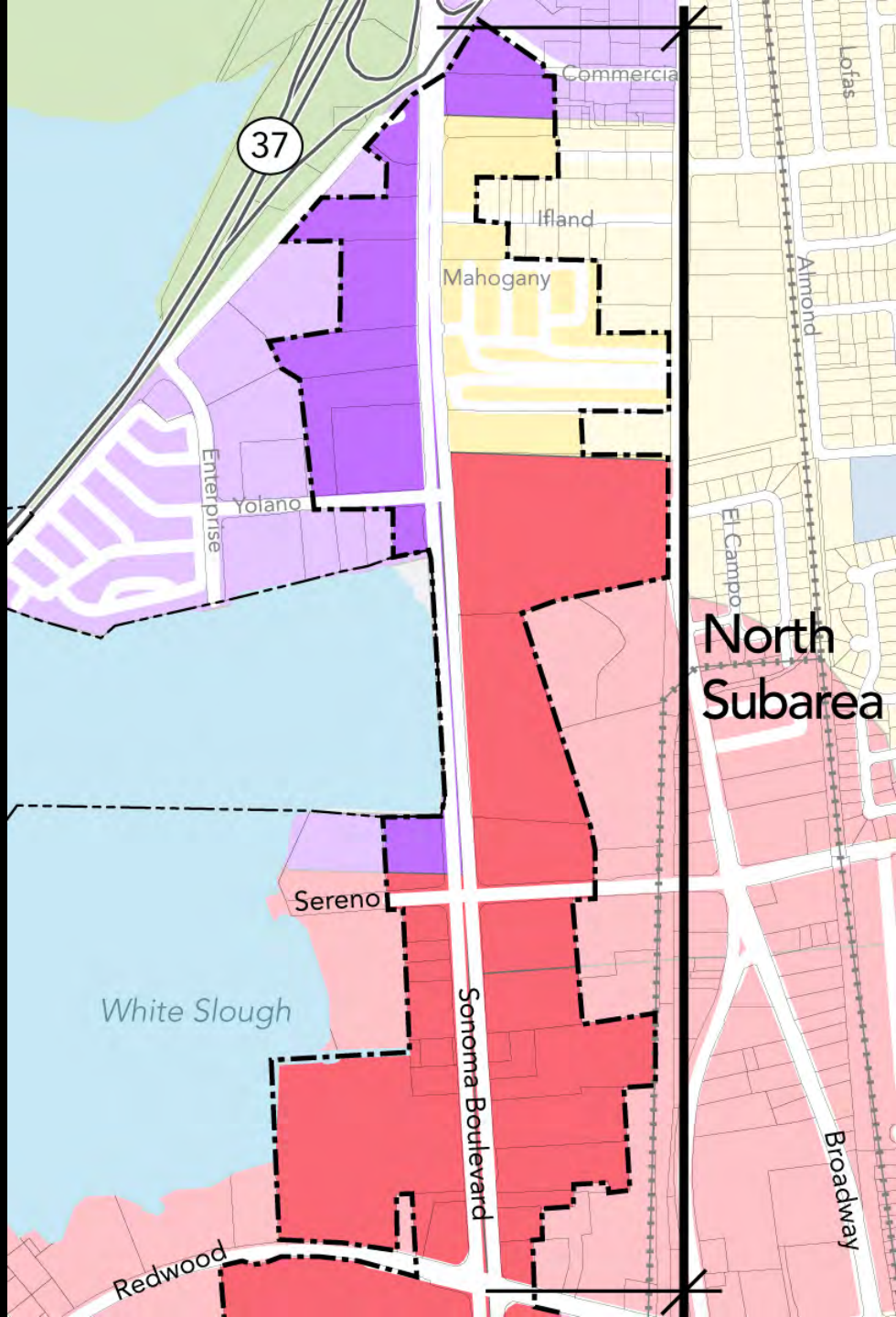


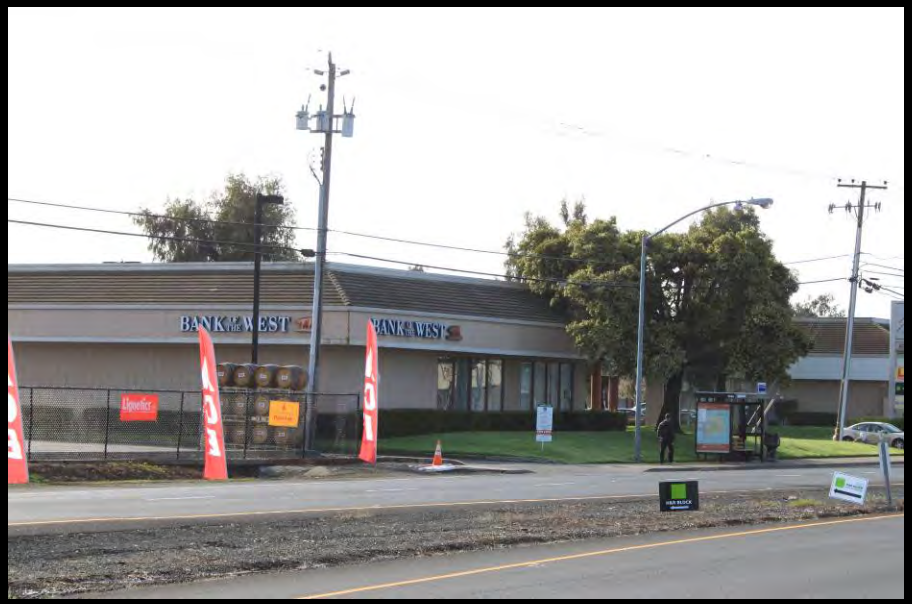
Sidewalk

- Sidewalks – when present – are 8’ wide
- Sidewalks are not continuous throughout this subarea
- Crosswalks are too far apart forcing pedestrians to jay-walk

Land Use

- Land uses along the North Subarea are largely shaped by automobile-oriented commercial uses
- Surface parking and large-format retail is predominant in this subarea
- Strip malls with parking fronting the street are intermixed with auto-related businesses, and large and small retailers

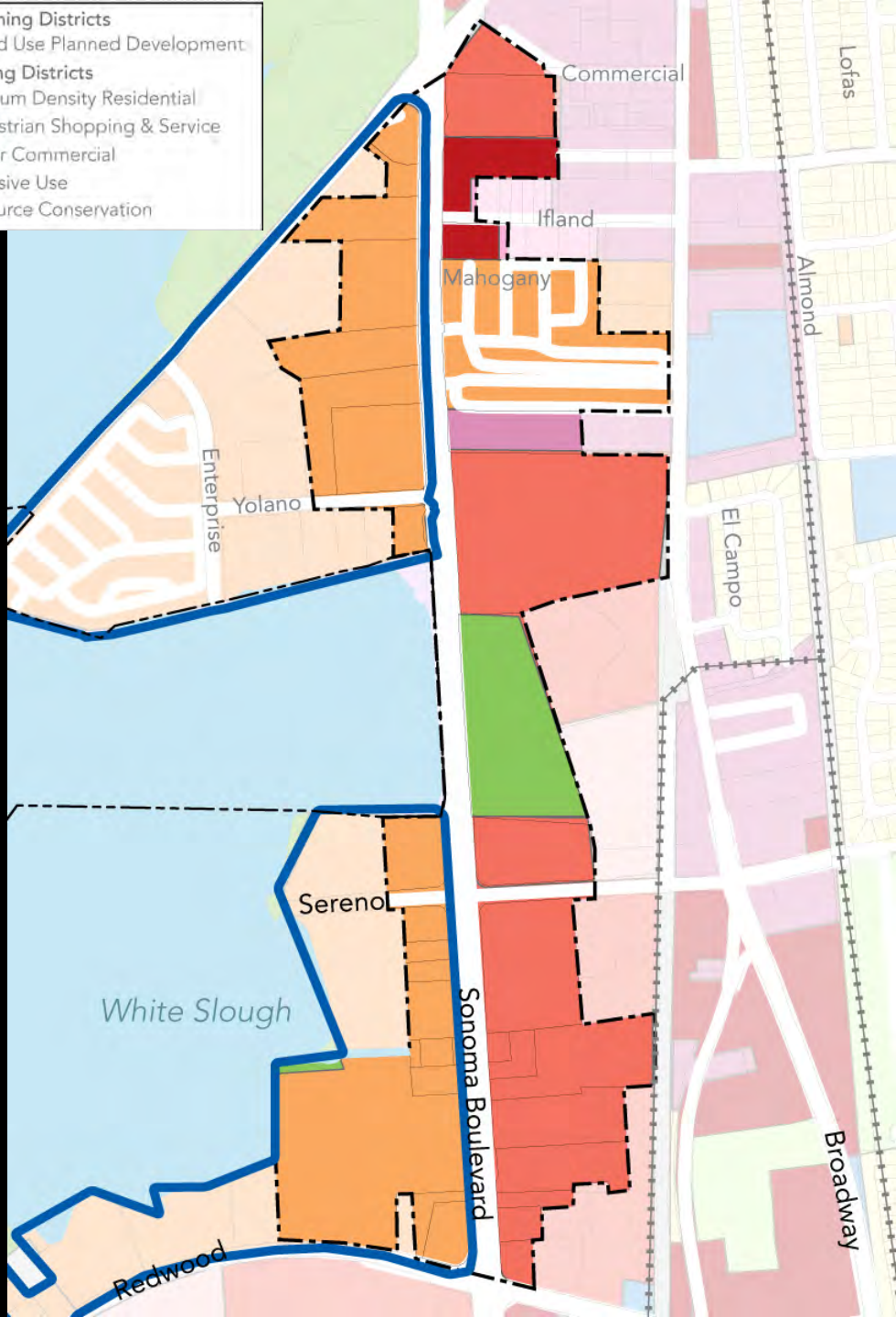




Land Uses found along the North Subarea of the corridor

Zoning

- One Special Zoning Districts is present in this subarea:
  - Mixed Use Planned Development (White Slough Area Plan)
- Five zoning designations are present in this subarea:
  - Medium Density Residential
  - Pedestrian Shopping & Service
  - Linear Commercial
  - Intensive Use
  - Resource Conservation
- See Vallejo's Zoning Code for list of permitted uses and development standards

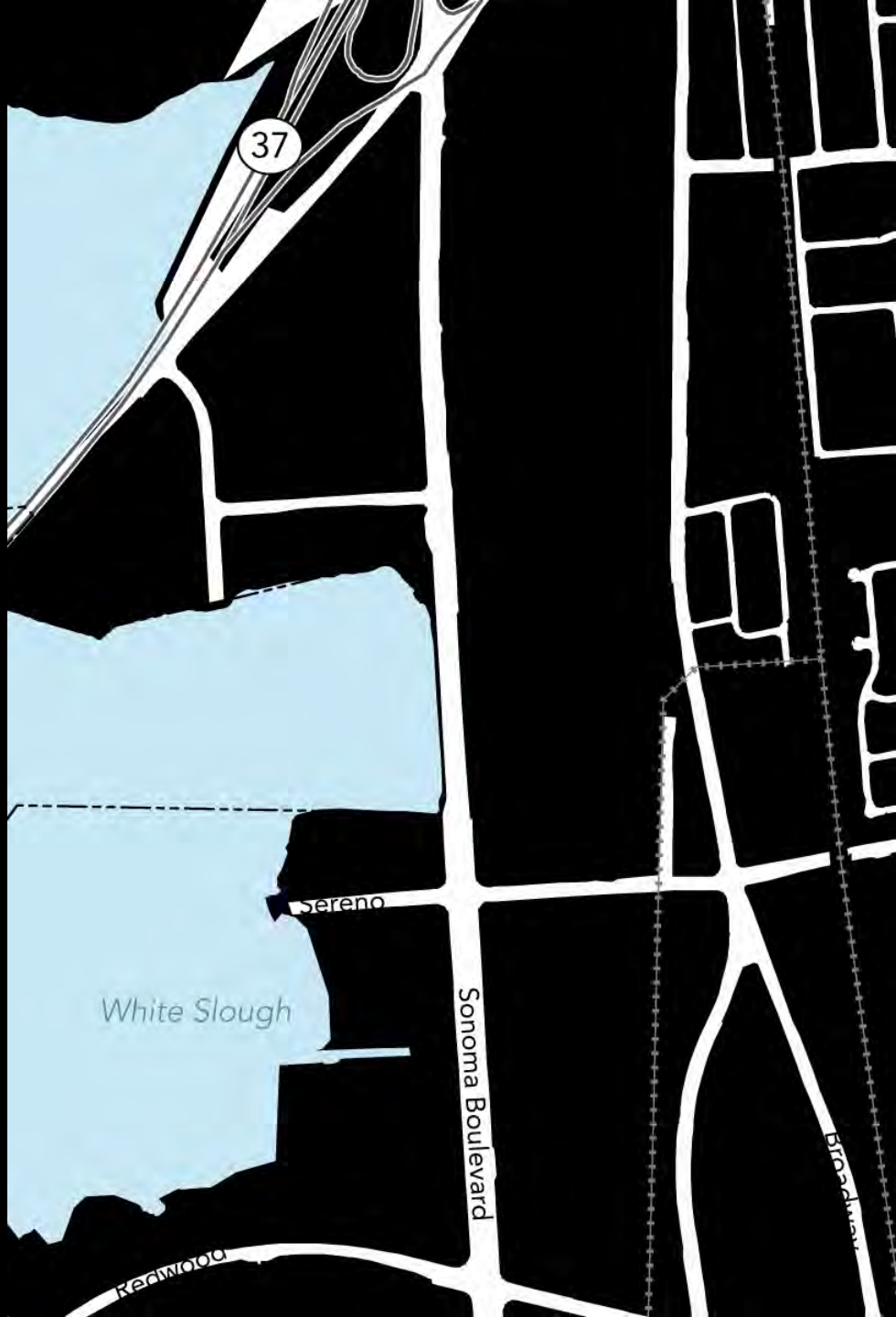


Vacant and Underutilized Parcels

- Abandoned parking lots and vacant parcels characterize the pedestrian edge in the North Subarea
- Larger vacant lots are due to the closure of K-Mart (Redwood St), Mervyn's Department Store (Sereno Dr), and the Cadillac dealership (Yolano Dr)
- Some edges are lined with chain link fences, boarded up and vacant buildings, and vandalized structures
- The poor quality of the edge in Sonoma Boulevard's north end contributes to the perception that this area is unwelcoming and unsafe

Street and Block Grid

- City blocks north of Redwood St are mega-blocks with irregular shapes
- This block and street pattern offers poor pedestrian connectivity and safety
- This block and street pattern is typical in car-centric environments
- Block size is roughly 800-1000’ by 1200-4000’



Building Footprints

- Building footprints in parcels in the Central-North Subarea range from small mobile homes to large (250’ by 700’)
- There is a large presence of big-box retail buildings
- Buildings in this subarea have large (400’) setbacks that are use for surface parking

Some of the building types found along the North Subarea of the corridor

Economics and Market Conditions

Prepared by BAE Urban Economics

Economics and Market Conditions

- This section contains information on the following:
  - Summary of findings
  - Approach and Methodology for the Market Overview
  - Demographic Analysis
  - Real Estate Market Analysis
  - Potential Future Market Support Findings
  - Development Product Type Recommendations
  - Appendices – Data Tables

Summary of Findings - Demographics

- The Local Area – the portion of Vallejo west of I-80, including Mare Island – contains 60% of Vallejo's population, and differs in various ways by comparison to the City:
  - Its population decreased approximately 3,600 between 2000-2010.
  - There are more single person households (27% vs. 24%) and fewer family households (65% vs. 72%).
  - Homeownership rates are lower (52% vs. 60%).
  - Annual median household income is lower ($50,222 vs. $61,300) with higher rates of poverty (17% vs. 13%). Households earning less than $25,000 per year comprise 25% of the Local Area.
  - Educational attainment measured by AA degree or higher is lower (28% vs. 35%).
- But in other respects the Local Area is similar to the City
  - Similar median age (36.1 years vs. 37.9 years); population under age 18 (24% vs. 23%); and seniors over 65 (12%).
  - Households on average are similarly sized (2.78 persons vs. 2.82 persons).

Summary of Findings - Demographics

- Data on Local Area resident expenditures suggests much of it occurs elsewhere, but most of this “leakage” likely goes to retail clusters at Northgate and in American Canyon.
  - Northgate has replaced Sonoma Boulevard as the City’s newest shopping destination and likely absorbs a significant portion of retail demand from Local Area residents.
  - Recent market studies for Solano 360 and the proposed Winco store reinforce a lack of near-term potential for large-format retail, or market support for additional food stores.
  - The dd’s Fashions store on Sonoma Blvd. is representative of the potential for discount and value retail in the Local Area.
  - Seafood City on Sonoma Blvd. is an example of a successful ethnic retailer who has created a destination.

Summary of Findings - Demographics

- The Local Area lost more than 1,700 jobs (8.1%) between 2007-2010.
- Vallejo has a low jobs to housing ratio, below 0.7, with 83% of working residents commuting to jobs outside the City.
- Complete demographics and economics tables are contained in the Appendix.

Summary of Findings – Real Estate Markets

- The Local Area for-sale residential market is active, but half of the activity is investors buying foreclosed properties.
  - Between March-July 2011, the median sale price of single family homes bought by individuals was $114,250 and for condos $50,500.
  - Properties in default/foreclosure in the 94589 and 94590 zip codes may represent a 3+ year supply at current sales levels.
  - Near-term potential for new for-sale development will be limited until foreclosures are resolved and the economy improves.
- Rental residential in the Local Area has 90%+ occupancies, mostly 1- and 2-bedroom units, but rents from $900 - $1,300 per month will not support new construction.

Summary of Findings – Real Estate Markets

- Local Area retail market conditions vary; larger centers are 90%+ occupied, but smaller centers are up to 30% vacant.
  - Most rents are too low to support new construction, only the Raley's Center can ask rents up to $2.00 per sq. ft. / mo. NNN.
  - Brokers report perception issues are keeping national retailers away from Sonoma Blvd. locations.

Summary of Findings – Real Estate Markets

- The Local Area market for office space is small, with smaller spaces at low rents under $1.17 per sq. ft. per mo.
  - These rents do not support new construction.
  - There may be potential for build-to-suit office space for users, who can pay the rent needed to justify construction.
- The Vallejo area hotel market is lagging national recovery, with low occupancy at 49% and rates below break-even.
- Flex space that can accommodate industrial, service, and office tenants may have potential as economic conditions improve, although there is no current market for it.
  - This product type is doing well in American Canyon, Benicia.
  - It can be a good use for the portions of redevelopment sites without Sonoma Blvd. frontage.
  - SBA financing can help attract business owners who want to own rather than lease their space.

Summary of Findings – Potential Market Support

- The key for the Local Area will be to capture a share of future regional growth comparable to its current share of population and employment.
- Based on ABAG projections through 2035, this could result in support for 1,600 – 2,300 new residential units.
- Potential support for all types of commercial uses (retail, office, flex, etc.) could be 1.0 – 1.7 million+ square feet.
- Sonoma Boulevard competes with other locations in Vallejo and American Canyon for retail. Land available for development exceeds market demand, affecting how much of the potential support can be captured in new projects.
- Economic recovery, changes in perceptions of Sonoma Blvd., and supporting public improvements will be key to realizing this market potential.

Summary of Findings – Development Types

- Multifamily residential, potentially rental to start, then townhouses and condos, will have the most potential.
  - High quality affordable/workforce housing is not tied to market conditions, can reduce risk for subsequent market-rate developers.

Summary of Findings – Development Types

- The potential for commercial development needs to reflect the variation along Sonoma Blvd. in the Study Area.
  - The “retail core” along its northern end could support redevelopment of existing centers, one or more new centers.
  - The Downtown segment at its southern end, with smaller sites, could house local-serving commercial, service uses that complement revitalization of the core Downtown area.
- Mixed-use development has potential. In the near- and medium-term it may need to be “horizontal” mixed-use on a site, rather than “vertical” mixed-use within one structure.
- A placemaking strategy with open space, education, civic / institutional uses can provide higher quality settings and enhance development potential.

Approach and Methodology

- Demographic analysis uses Census 2010 and Census 2005 – 2009 American Community Survey (ACS) data.
  - Census 2010 data is from the “short form” questionnaire – limited to basic population count, plus household age, sex, race, and housing tenure only.
  - ACS replaces the Census “long form” questionnaire for detailed household demographic, economic, social, housing, and financial characteristics.
    - However, because ACS is calculated over a period of time, rather than a single point in time like the Census, direct comparisons cannot be made between these two sources.
    - ACS data for small areas measures 5-year intervals, with annual updates. Since it has just come out, it will be awhile before comparisons for an area can be made across time periods.

Approach and Methodology, *cont'd*

- Real estate market analysis looks at current prices and development patterns for the Study Area, Primary Market Area, and the City.
  - The Primary Market Area, or Market Area, is the source of most (2/3 or more) potential renters and purchasers for new development.
  - Comparisons between geographies shows current lease rates and sale prices, and the extent to which they can increase and remain competitive.

Approach and Methodology, *cont'd*

- Potential future market support is based on the Study Area's current share of City-wide population and its potential to capture a larger share.
  - Based on ABAG projections for household and employment growth through 2035. This is not market based, however it is the only available projection.
  - Evaluation of the extent to which the study area's share of future City growth can increase, based on area characteristics, available land supply, etc.
- Provide recommendations for development product types, based on demographic, real estate market, and potential future growth.
  - Provides basis for evaluation of land uses, identification and phasing of corridor improvements, and implementation and funding strategy.

American Canyon
80
37
Six Flags & Solano County Fairgrounds
Northgate Shopping Center
Sonoma Blvd
37
Downtown Vallejo
29
780
0 0.5 1 2 Miles
Zip Codes 94589 & 94590
City of Vallejo
Local Area Census Tracts

Geographic Areas Analyzed

- **Local Area** census tracts were identified that serve as the primary market area for local-serving uses on Sonoma Blvd.
  - This comprises the portion of the City of Vallejo west of I-80, and includes Mare Island.
- The local area census tracts were compared to the **City of Vallejo** as a whole, which serves as a secondary market for local serving uses on Sonoma Blvd.
- These two areas were compared to **Solano County** as a whole, to provide a benchmark.
- Certain data, available only on zip code basis, was compiled for the 94589 and 94590 zip codes.
  - This comprises the areas west of I-80 and south of the Vallejo city limit at American Canyon, and excludes Mare Island
  - Applies to data for employment, and retail sales potential.

Population Trends *(Census 2000 – 2010)*

- Both the Local Area and the City of Vallejo lost population between 2000 and 2010.
  - Approximately 3,600 persons in the Local Area (-0.5%).
  - Approximately 800 persons for the City (-0.1%) -- so Vallejo outside the Local Area actually *gained* approximately 2,800 persons.
- By comparison, Solano County grew by approximately 18,800 persons (0.5%).
- All areas grew more slowly than the State (10%).
- Vallejo contained approximately 30% of Solano County's 1990 population. Capturing a proportional share of 2000-2010 growth would have added more than 5,500 persons to the City.

Household Composition *(Census 2000 – 2010)*

- Households in the Local Area differ from those in the City and County.
  - More single person households at 27% (24% City, 22% County).
  - Fewer families at 65% (69% in City, 72% in County).
  - Fewer homeowners at 52% (60% in City, 72% in County).
- All three areas saw a decrease in household size between 2000-2010, consistent with national trends.
  - The City gained nearly 1,000 households overall due to shrinking household size, even as overall population declined.
  - Average household size in the Local Area (2.78) is comparable to the City (2.82) and County (2.83).

Age Distribution *(Census 2000 - 2010)*

- All three areas have comparable age distributions. Median age in the Local Area is 36.1 years, City is 37.9 years, and County is 36.9 years
- Population under 18 is 24% in the Local Area, 23% in the City, and 25% in the County.
- Seniors 65 or older is 12% in the Local Area and City, 11% in the County.

Educational Attainment *(ACS 2005-2009)*

- The Local Area has slightly lower levels of educational attainment than the City or County.
  - 28% of the Local Area population has an AA degree or higher, versus 35% in the City and County.
  - 79% of the Local Area population has a High School degree, versus 84% in the City and 86% in the County.
- This can be a consideration for retailers who look at education level in addition to household income.
- It also can affect local residents access to new jobs.

Household Income Distribution *(ACS 2005-2009)*

- Median household income in 2009 in the Local Area was approximately 4/5 of the City, and 3/4 of the County.
  - Local Area annual median household income is approximately $50,200 versus $61,300 in City and $67,900 in the County.
  - California state-wide is $58,900.
- The Local Area has a higher rate of poverty at 17%, versus 13% in the City and 10% in the County (14% for State).
  - Households earning less than $25,000 / year comprise 25% of Local Area households, versus 20% in the City and 16% in the County.
- Conversely, the Local Area has a lower share of higher income households earning $100,000+ per year.
  - 17% in the Local Area, versus 25% in the City, and 29% in the County.

Household Expenditures

(Claritas Projections from Census 2000)

- A comparison of consumer expenditures versus sales in the Local Area was prepared by Claritas, a private data provider.
  - This may not match confidential taxable retail sales reports to the State, but can identify categories for further evaluation.
- Several categories show higher sales than expenditures, with the Local Area attracting business from elsewhere:
  - Motor vehicle parts and dealers
  - Electronics and appliance stores
  - Food and beverage stores (food retailers)
- Other categories show sales less than expenditure, which means Local Area residents are spending more elsewhere:
  - Building materials – approximately $50 million
  - Clothing and clothing accessories – approximately $25 million
  - General Merchandise – approximately $90 million
  - Food service (bars and restaurants) – approximately $21 million

Household Expenditures

(Claritas Projections from Census 2000), cont'd

- While these figures suggest potential for additional retail in the Local Area, retail in adjacent areas absorbs much of it.
  - Target, Home Depot, various dining choices in the Northgate area.
  - Walmart in American Canyon.
- Sonoma Boulevard has continued to attract a limited number of new retailers in recent years, indicating some market support.
  - This includes Monument Car Parts on Yolano Drive and dd's Discounts on Redwood Street.
- A detailed leakage analysis using sales tax data would need to be prepared to estimate supportable retail square footage.

Housing Stock *(ACS 2005-2009)*

- Local Area has a higher proportion of multifamily housing at 32% than City (27%) or County (22%).
  - 19% of Local Area housing stock is multifamily developments with 9 units or less.
- Higher proportion of mobile homes in the Local Area at 5.3%, compared to City (3.5%) and County (3.2%).
  - Large mobile home developments adjacent to or near Sonoma Blvd.
- Local Area housing stock is older, with 54% of units 50 years or older, compared to City (38%) and County (21%).
  - Conversely, only 26% of housing in Local Area is 30 years or newer, compared to City (37%) and County (48%).

Employment Status

- The only Local Area unemployment data is from 2005 – 2009 ACS, which misses impact of the recession.
- Most recent data from CA Employment Development Dept. (EDD) as of May 2011 shows 13.8% unemployment in City.
  - County unemployment rate was 11.3%.
  - State unemployment rate was 11.4%.
  - Above data is not seasonally adjusted.

Job Change, 2007 - 2010

- EDD data by zip code was used to compare jobs by sector pre-financial crisis (3rd Qtr. 2007) vs. 3rd Qtr. 2010.
- Largest sectors in 2010 were: Health Care (37%); Retail (11%); Local Government (10%); Construction (7%); Accommodation & Food Service (7%).
- During this period, the Local Area lost more than 1,700 jobs overall (8.1%).
  - Largest declines in smaller sectors, Information and Finance/Insurance (51%); Administration (31%); Other Services (29%)
  - Larger sectors also saw declines: Local Government (23%); Retail (19%); Accommodation & Food Service (7%)
  - Larger growing sectors: Construction (32%); Health Care (3.4%)
- County has same set of largest sectors for jobs, but much larger manufacturing sector (7.4%). Its overall decline in employment was smaller at 5.2%

Occupation & Industry of Workers *(ACS 2005-2009)*

- The occupations of Local Area residents and their of employment are generally similar to City and County, with some variations:
  - Slightly fewer in management, professional, and related occupations at 26% (City is 32%, County is 33%)
  - Slightly more in production, transport, and material moving at 13% (approximately 11% in both City and County)
  - Slightly more in service at 22% (City is 19%, County is 18%)
- Employment by industry is generally similar between the geographies, with slightly more jobs in the Local Area in Manufacturing and Entertainment/Recreation/Accommodation & Food Service
  - Slightly fewer jobs Finance/Insurance/Real Estate
  - Number of jobs in Education, Health, and Social Services is similar to the County but fewer than in the City

Commute Patterns

(Census Center for Economic Studies, 2009)

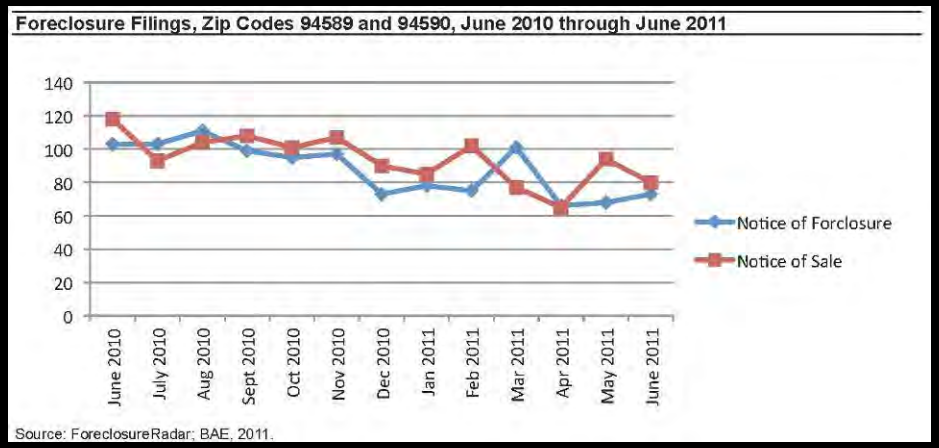
- There are many more employed residents in Vallejo (44,500) than jobs (27,100), with a jobs : housing ratio less than 0.7.
- Most Vallejo residents commute to other locations (83%).
- For the jobs in Vallejo, only 28% are held by City residents.
- Cross-commuting patterns can contribute to higher traffic volumes and congestion.

For-Sale Residential Trends

- Sales of existing single-family units in the Local Area are active, but split between sales to individuals and investors.
  - Between March and July 2011, 78 sales of single family homes to individual buyers, at a median price of $114,250.
  - For the same period, 67 sales of single family homes to investment entities, at a median price of $125,000.
  - Of the sales to individuals, 25 were 1- or 2-bedroom units selling for less than $100,000.
- Sales of existing multi-family units (condos) in the Local Area shows a similar pattern.
  - 36 sales to individuals with a median price of $50,500 and 43 sales to investment entities, at a median price of $48,500.
- There are no pending or proposed new for-sale residential development in the Local Area; new units would need to sell for considerably more for development to be feasible.
- Ownership is cheaper than renting at these prices, assuming buyers can obtain financing and are willing to purchase.

For-Sale Residential Trends

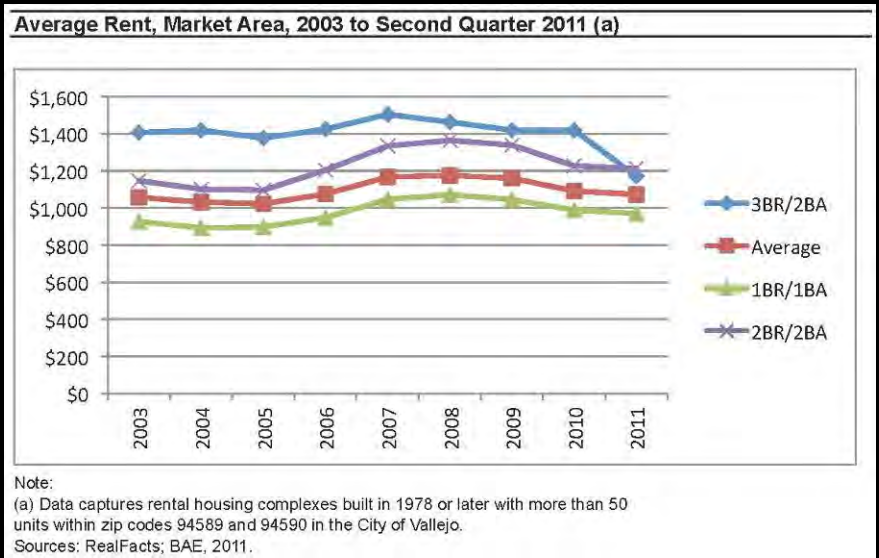
- As in many markets, foreclosure activity is having an impact on the market for for-sale residential. Foreclosure trends are down, but still at a high level as shown below:



- For zip codes 94589 and 94590, in June there were 867 units in default, pre-sale, or bank-owned. This level has been fairly consistent over the past year.
  - Based on recent sale volume, it represents a 3+ year supply of units.
- This suggests that foreclosure activity will continue to depress values, inhibit new market-rate for-sale residential development in the near-term.

Rental Residential Trends

- Rental rates have experienced much less fluctuation both before and after the financial crisis than for-sale prices:



- A survey of 6 larger multifamily development in the Local Area shows occupancy rates in the low- to mid-90% range.
- Rental rates largely fall within $900 - $1,200/mo for 1-bedroom units, and $1,050 - $1,300 for 2-bedroom units.
  - These larger units have a modest supply of 3-bedroom units.

Rental Residential Trends

- Multifamily rental units are one of the few product types with active new development in the current market.
- Most of this activity has been in primary markets, such as SF and San Jose, but it is spreading to secondary markets.
- However, current Local Area rental rates are not high enough to support new market-rate development.
  - Vacancy rates are slightly higher than markets seeing new multifamily rental development.
  - The smaller proportion of higher income households might potentially support one or more new developments.
  - However, developers are likely to look for favorable trends in job growth or other demand drivers before building new units.

Rental Residential Trends, *cont'd*

- The White Slough Specific Plan, which covers a portion of the Local Area north of Redwood Street, identifies multiple areas that are zoned to allow multifamily housing and would therefore be suitable for market-rate and affordable housing development.
- Development of affordable senior and family housing is not tied to market conditions and can facilitate market-based development as economic conditions improve.

Office Market Conditions

- The existing office market consists of a limited inventory, largely of smaller spaces in older buildings.
  - Available spaces typically 1,000 to 5,000 square feet, with most monthly rents between $0.77 - $1.17 per sq. ft., modified gross.
  - Most spaces in buildings constructed between 1940 and 1980.
- Rents for office space do not support the cost of new construction.
  - Brokers indicate that properties with asking rents at $1.50 per sq. ft. / mo. are above market, needs to be lowered to get tenants.
  - Property owners often offer free rent on top of low asking rents.
- Brokers reported limited potential for the development of speculative space in the current market, but some potential for build to suit development for users.
  - The Waterfront Project developer is pursuing a strategy of seeking office users for build to suit space.

Retail Market Conditions

- Retail market conditions vary between smaller stand-alone and strip centers vs. larger centers with anchors.
  - Larger centers are 90%+ occupied, achieve monthly triple-net rents of $0.75 - $1.25 per sq. ft. for older center; $1.50 – $2.00 per sq. ft. for new centers.
  - Smaller centers and stand-alone building have higher vacancy rates, up to 30% or higher, with rents $1.10 - $1.25 per sq. ft.
  - Rental rates of $2.00 per sq. ft. or higher are needed to make new construction feasible.
- Brokers report Sonoma Blvd. has difficulty attracting and retaining retail tenants.
  - National retailers elsewhere in Vallejo are difficult to attract to Sonoma Blvd., leaving smaller, less credit worthy tenants.
  - There is an excess supply of retail space in the study area and many units remain vacant for months or years.

Retail Market Conditions, *cont'd*

- Retail spaces are in need of rehabilitation or replacement.
  - Most retail space was constructed between the 1950s and 1980s and has not been substantially upgraded.
  - The appearance of existing retail space is cited by brokers as a deterrent to potential new retail and office tenants.
  - Yolano Plaza, a mixed-use project at Yolano Dr. and Sonoma Blvd., has been entitled for a gas station and mini mart (Phase 1) as well as an additional 43,000 square feet of retail and 8,000 square feet of office. Construction plans for Phase 1 are currently under City review.

Retail Market Conditions, *cont'd*

- Local and broad economic concerns are cited by brokers as a impediment to attracting business to Sonoma Blvd.
  - The recession and associated lack of discretionary income are thought to contribute to the lack of retail activity in the area.
  - The perception that it is difficult to obtain permits is also cited as an impediment to retail growth.
- Strengths in the northern end of Sonoma Blvd. include ethnic retailing (Seafood City), new discount retailers matching area demographics (dd's Fashions), and the Raley's Center.

Industrial Flex Space Market Conditions

- The market for light industrial flex space in Vallejo that can accommodate smaller firms, and also be used for service/commercial uses or office space is minimal.
  - A small amount of industrial flex space is available on Mare Island for $6 per square foot per year, NNN.
- Nearby, cities of Benicia and American Canyon have stronger industrial flex markets.
  - At about $5 to $7 per square foot per year NNN, rents in the Benicia Industrial Park are comparable to those on Mare Island.
  - While Benicia has higher vacancies, lower lease rates, and shorter lease terms due to the recession, brokers report a reasonably high level of interest in available properties.
  - In American Canyon, rental rates reach $10 per square foot per year and brokers report vacancy rates under 9%.
- Prior to the financial crises, there was a growing regional market in for-sale flex space buildings. This market has the potential to recover as the economy improves.

Hotel Market Conditions

- The Vallejo lodging market includes motels and limited service hotels targeted at visitors to Napa, Six Flags.
- Limited service and extended-stay hotels have the most potential for new development.
  - There are currently 3 such properties in American Canyon and 3 in Vallejo that participate in Smith Travel Research's survey program.
- Data on the performance of these hotels for 2010, shows an annual (combined) occupancy rate of 49%, with and Revenue Per Available Room (RevPAR) of $42.
  - Demand and rates are highly variable, peaking in Summer and Fall.
  - This is considerably below the previous peak occupancy rate of 52% and RevPAR of $50 achieved in 2007.
  - Properties are unlikely to achieve break-even operations at these figures. There is likely to be little demand for new lodging development until occupancy and room rates strengthen.

Urban Agriculture Opportunities

- Rapidly growing effort in the Bay Area and U.S. to reuse underutilized urban properties for agriculture.
  - Ranges from use of small private residential lots to publicly owned property for a range of fruit, vegetable crops.
  - Can be individual efforts or community organizations.
  - Includes smaller scale (1 acre or less) market farms, as well as farms targeting higher-end restaurants.
- Benefits range from addressing food security and income needs of individuals, to reuse and remediation of land.
- Could provide an opportunity for interim use of vacant Sonoma Blvd. corridor land.
  - Vallejo is within SF and Bay Area's local foodshed.
  - Councilmembers are currently considering an urban farm ordinance to facilitate this use for vacant lots and other sites.

Urban Agriculture Opportunities

- Several key considerations (and there are a variety of resources to help individuals and organizations).
  - Need to obtain consent from private property owners.
  - Supportive zoning and City policies – in progress.
  - Must address potential environmental contamination – there are resources and solutions from EPA and others.
  - Challenges for fruit, where more time and expense is needed to develop orchards.

Potential Market Capture

- Future growth in Vallejo, Solano County, and the Bay Area is a driver of development potential in the Study Area.
- ABAG 2009 projections for household and employment growth from 2010 – 2035 were used although it projected 9% higher population in Vallejo than actual 2010 figures.
  - This is the only available data for long-term growth, and while it is an allocation model it provides a beginning point.
  - While households and employment start lower than projections, it is reasonable to expect recovery to the projections by 2035.
- It is assumed that the Local Area captures a share of future growth based on its current share of Vallejo; and Vallejo captures its projected share of future growth in the County.

Potential Market Capture, *cont'd*

- A decrease of up to 1/3 was also calculated, to allow for continued lack of near-term development activity.
- This results in potential new residential development through 2035 of 1,600 – 2,300+ new residential units.
- New commercial development for all uses (office, retail, flex, etc.) could range from 1.0 – 1.7 million+ square feet.
- The surplus of land for development plus underdeveloped and obsolete sites in Vallejo and American Canyon means that certain types of development on those sites could reduce the level of development activity on Sonoma Blvd.
  - Redevelopment of the Fairgrounds and Mare Island's North Area may have implications for what works on Sonoma Blvd.
- The figures for market capture assume economic recovery by the medium-term, an improvement in perceptions of Vallejo, and public improvements to Sonoma Blvd.

Potential Development Product Types

- Multifamily residential, starting with rental projects, then townhouses, and condos.
  - High-quality affordable/workforce housing strategically located can increase market-rate developer confidence in development.
- Retail development will likely vary along Sonoma Blvd.
  - Smaller scale retail and service uses near Downtown.
  - The northern area could support redevelopment of existing centers and one or more new centers.

Potential Development Product Types

- Office development would be smaller scale, oriented towards service firms.
- For-sale flex industrial space could be built on larger sites behind Sonoma Blvd. frontage, with up to 100% office uses.
- Horizontal mixed-use development is an opportunity in the near- and medium-term.
  - Market conditions will need to strengthen considerably to support vertical mixed-use with smaller ground floor retail space.

Potential Development Sites

- The length and variation along Sonoma Blvd. in the Study Area suggests different scales and types of development
  - Downtown will be smaller scale residential and service uses complementing redevelopment of the core Downtown area.
  - North of Couch St. is the “retail core”, with larger sites, and more potential for larger mixed-use development.
  - The middle area between Downtown and the retail core will be shaped by development in those areas, and in the long-term may have less potential for commercial uses.

Potential Development Sites

- Placemaking strategies will be important to create settings that change perceptions and enhance development potential.
  - Southern Sonoma Blvd. is the gateway to the historic Downtown.
  - Northern Sonoma Blvd. needs to prioritize public improvements on near-term opportunity sites.
  - Educational, civic/institutional, and open space are important potential contributors to enhancing development potential.

Circulation, Transportation and Parking

Prepared by Fehr & Peers

Circulation, Transportation and Parking

- This section contains information on the following:
  - Street Network
  - Traffic Operations
  - Existing Pedestrian and Bicycle Network
  - Existing Transit Service
  - Parking
  - Opportunities and Constraints

Street Network

- Regional Network
  - State Route 29 (SR-29)
  - State Route 37 (SR-37)

- Local Street Network
  - Curtola Parkway
  - Georgia Street
  - Redwood Street
  - Sereno Drive
  - Tennessee Street

Regional Network

- SR-29
  - Major north-south highway connecting Lake County to north and I-80 in Vallejo to south
  - Sonoma Boulevard is designated as SR-29 through Vallejo
  - Generally two lanes in each direction within project corridor
  - Annual average daily traffic (AADT) of 12,300 vehicles at Maine St., 16,000 vehicles at Tennessee St., 21,100 vehicles at Sereno Dr., and 27,000 vehicles at SR-37 Interchange (Caltrans, 2010)

- SR-37
  - East-west highway connecting US-101 in Novato to the west and I-80 in Vallejo to the east
  - Two lanes in each direction
  - AADT of 30,500 vehicles west of SR-37/SR-29 interchange and 65,000 vehicles to the east (Caltrans, 2010)

Local Street Network

- Curtola Parkway
  - 4-lane, east-west arterial
  - Extends between Mare Island Way to the west and I-780 to the east
  - Posted speed limit is 35 mph west of Sonoma Boulevard and 40 mph to the east
- Georgia Street
  - East-west collector
  - Extends between Mare Island Way to the west and beyond I-80 to the east
  - 2-lane roadway west of Sonoma Boulevard and 4-lane roadway to the east
  - Posted speed limit is 25 mph

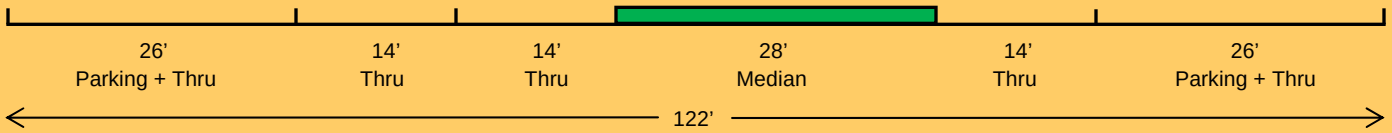
Local Street Network *– cont.*

- Redwood Street
  - 4-lane, east-west arterial
  - Extends between Sacramento Street to the west and I-80 to the east
  - Posted speed limit is 30 mph
- Sereno Drive
  - 4-lane, east-west collector
  - Extends between White Slough to the west and Fairgrounds Drive to the east
  - Posted speed limit is 25 mph
- Tennessee Street
  - 4-lane, east-west arterial
  - Extends between Mare Island Way to the west and Columbus Parkway to the east
  - Posted speed limit is 30 mph

Typical Cross-sections

Northern portion

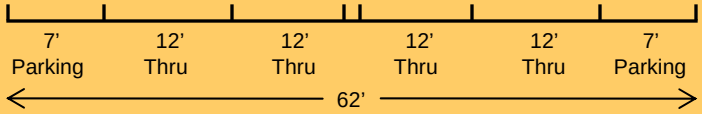
Typical road cross-section



Average Annual Daily Traffic = 21,100

Southern portion

Typical road cross-section



Average Annual Daily Traffic = 12,300

Speed Limits

Traffic Operations

- Methodology
  - Intersection operations are described using Level of Service (LOS)
  - LOS ranges from A (no congestion and delay) to F (excessive congestion and delays)
  - Signalized intersection operations are evaluated using methods provided in 2000 Highway Capacity Manual (HCM) and Synchro traffic analysis software
  - Rating is based on the weighted average control delay (associated with deceleration, stopping, moving up in the queue, and acceleration) of all movements measured in seconds per vehicle.

- Data Collection
  - Intersection turning movement counts collected in late August 2011
  - Counts captured morning (7-9 AM) and afternoon (4-6 PM) peak periods
  - Vehicles, pedestrians, and bicyclists were observed

Traffic Operations – *cont.*

Intersection Level of Service Definitions		
Level of Service	**Signalized Intersection Control Delay (sec/veh)**	**General Description**
A	0 – 10.0	Little to no congestion or delays
B	10.1 – 20.0	Limited congestion, short delays
C	20.1 – 35.0	Some congestion with average delays
D	35.1 – 55.0	Significant congestion and delays
E	55.1 – 80.0	Severe congestion and delays
F	> 80.0	Total breakdown with extreme delays

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Intersection Level of Service (LOS) Results

Intersection Level of Service Summary
Existing Conditions

	Intersection	Peak Hour	Delay	LOS
1	Sonoma Boulevard / SR-37 Westbound Ramps	AM	15.8	B
		PM	23.5	C
2	Sonoma Boulevard / SR-37 Eastbound Ramps	AM	21.0	C
		PM	30.2	C
3	Sonoma Boulevard / Redwood Street	AM	17.4	B
		PM	27.3	C
4	Sonoma Boulevard / Tennessee Street	AM	18.3	B
		PM	22.2	C
5	Sonoma Bouelvard / Georgia Street	AM	13.0	B
		PM	15.1	B
6	Sonoma Boulevard / Curtola Parkway	AM	16.9	B
		PM	19.0	B

Source: Fehr & Peers, 2011.

Existing Pedestrian and Bicycle Network

- Pedestrian facilities
  - Sidewalks
  - Crosswalks
  - Pedestrian signals at signalized intersections

- Bicycle facilities
  - Bike paths (Class I)
  - Bike lanes (Class II)
  - Bike routes (Class III)

Pedestrian Facilities

Pedestrian Facilities *– cont.*

- Gaps in sidewalk network near SR-37 Interchange and White Slough
- Typical sidewalk widths
  - 8 feet in north (non-fronting commercial)
  - 6 feet in south (fronting retail)
- Wide street in the northern portion results in long pedestrian crossings

Pedestrian Facilities *– cont.*

Sidewalk ends looking south on Sonoma Boulevard toward the SR-37 eastbound ramps/Lewis Brown Drive

No sidewalk looking north on Sonoma Boulevard toward the SR-37 westbound ramp

Bicycle Facilities

- Sonoma Boulevard currently lacks bicycle facilities
- Marin Street is a parallel north-south roadway with a Class II bike lane
- Tennessee Street is a Class III bike route between Mare Island Way to the west and I-80 to the east
- Other intersecting roadways with Class III bike routes include Louisiana St., Nebraska St., and Lewis Brown Dr.

Existing Transit Service

- Vallejo Transit
  - Local and regional bus service with connections to the Vallejo Ferry Terminal and the El Cerrito Del Norte, Pleasant Hill and Walnut Creek BART stations
  - 6 bus routes (5 local, 1 regional) along project corridor
  - Local bus fare is $1.75 for youth and adults, and $0.85 for seniors and disabled
  - Regional bus fare is $5 for youth and adults, and $2.50 for seniors and disabled
- Napa County VINE
  - Provides bus service to various destinations in Napa County
  - 1 bus route along project corridor
  - Adult fares range from $1.35-$2.90 (zone-based fare system); Youth fares range from $1.10-$2.00; Seniors/disabled fares range from $0.65-$1.25
- Amtrak
  - Provides limited bus service to Martinez, Napa, and McKinleyville
  - 1 bus route along project corridor

Existing Transit Service *– cont.*

- Baylink Ferry
  - High speed commuter ferry service to and from San Francisco
  - Adult fare is $13; Youth/seniors/disabled fare is $6.50

Transit Routes

Transit Route Summary

Line	Route	Nearest Stop	Weekday		Weekend	
			Hours	Headway	Hours	Headway
Local Routes						
Vallejo Transit 1	South Vallejo to Rancho Vallejo	Various stops on Sonoma Blvd between Valle Vista Ave and SR-37	4:50 a.m. to 8:28 p.m.	30 minutes	5:50 a.m. to 10:58 p.m.	30 minutes (60 minutes for last bus)
Vallejo Transit 2	Northeast Vallejo to Downtown	Various stops on Sonoma Blvd between Valle Vista Ave and SR-37	5:17 a.m. to 7:58 p.m.	60 minutes	6:30 a.m. to 10:40 p.m. (Saturday only)	60 minutes
Vallejo Transit 4	Tuolumne Street to Downtown	Sonoma Blvd north of Redwood St, and at Jeffry St	6:51 a.m. to 6:57 p.m.	60 minutes	9:30 a.m. to 4:57 p.m. (Saturday only)	60 minutes
Vallejo Transit 5	Redwood Parkway to Gateway Plaza to Springs Road	Sonoma Blvd north of Redwood St	5:30 a.m. to 8:38 p.m.	30 minutes	6:27 a.m. (6:57 a.m. Sun) to 6:15 p.m.	60 minutes
Vallejo Transit 7	Springs Road to Gateway Plaza to Redwood Parkway	Sonoma Blvd north of Redwood St, at Jeffry St, and at Lozier Al	5:20 a.m. to 8:12 p.m.	30 minutes	7:30 a.m. to 8:12 p.m. (Saturday only)	30 minutes

Sources: Vallejo Transit, Napa County Transportation and Planning Agency, Amtrak, and Baylink Ferry (July, 2011)

Transit Route Summary – *cont.*

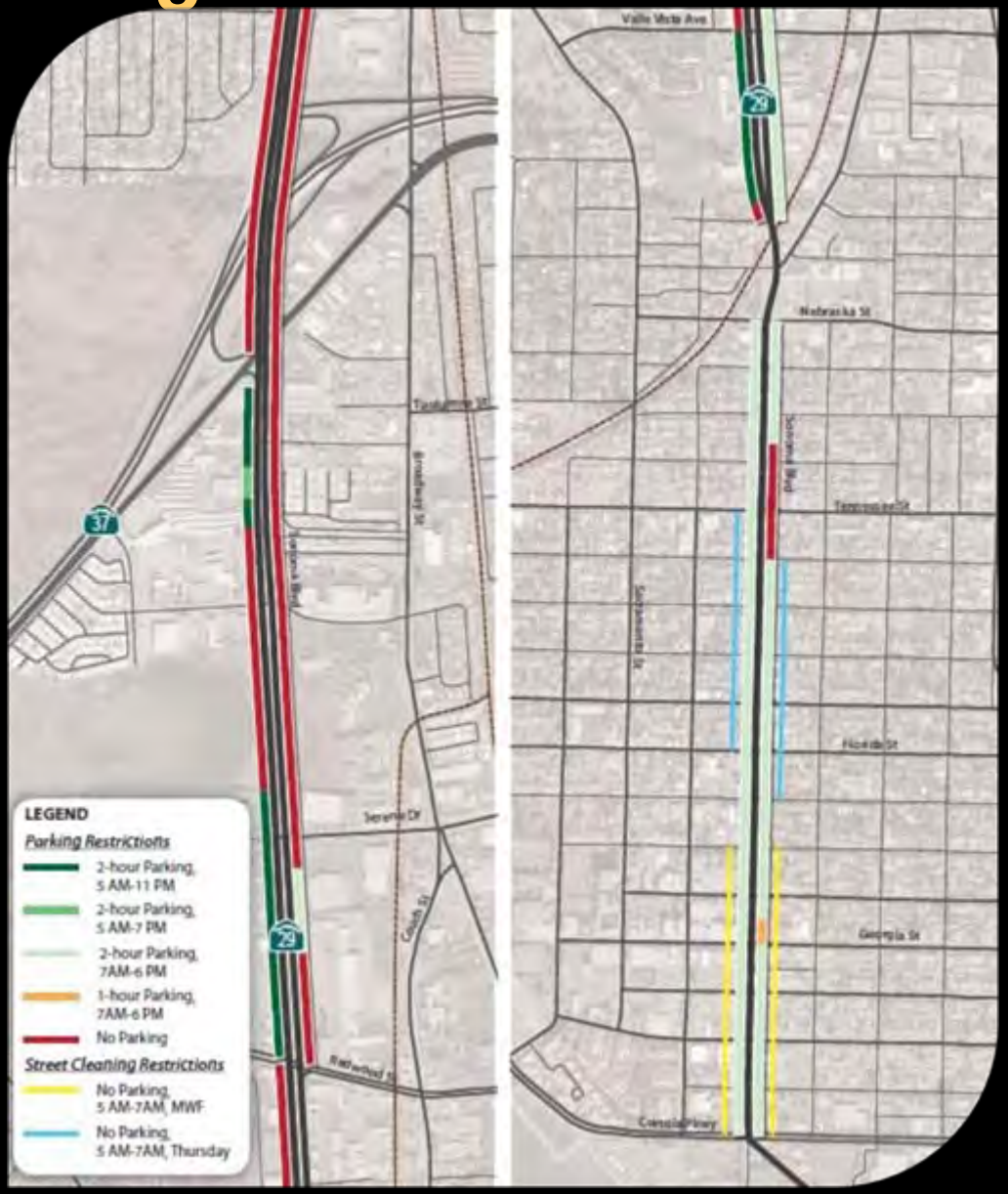
Line	Route	Nearest Stop	Weekday		Weekend	
			Hours	Headway	Hours	Headway
Regional Routes						
Vallejo Transit 85	Vallejo to Fairfield	Various stops on Sonoma Blvd between Tennessee St and Sereno Dr	5:35 a.m. to 11:28 p.m.	30 minutes (a.m. peak) 60 minutes (all other times)	6:35 a.m. to 10:28 p.m. (Saturday) 8:35 a.m. to 8:28 p.m. (Sunday)	120 minutes
Vine Route 10	Vallejo to Calistoga	Sonoma Blvd at Couch St	5:07 a.m. to 9:43 p.m.	60 minutes	7:20 a.m. to 9:26 p.m. (Saturday) 8:19 a.m. to 6:46 p.m.	90 minutes
Amtrak Thruway Bus Route 7 Napa Loop	Martinez to Napa	West side of Sonoma Blvd south of SR-37	10:50 a.m., 3:50 p.m., 7:10 p.m. (Northbound discharge only) 12:55 p.m., 4:45 p.m (Southbound)	n/a	10:50 a.m., 3:50 p.m., 7:10 p.m. (Northbound discharge only) 12:55 p.m., 4:45 p.m (Southbound)	n/a
Amtrak Thruway Bus Route 7 McKinleyville	Martinez to McKinleyville	West side of Sonoma Blvd south of SR-37	10:50 a.m. (Northbound) 7:50 a.m., 9:20 a.m. (Southbound)	n/a	10:50 a.m. (Northbound) 7:50 a.m., 9:20 a.m. (Southbound)	n/a
Baylink Ferry	Vallejo to San Francisco	Vallejo Ferry Terminal, Mare Island Way at Georgia St	5:30 a.m. to 7:15 p.m.	~60 minutes (peak), 90-150 minutes (off-peak)	8:30 a.m. to 9:00 p.m.	90 minutes

Sources: Vallejo Transit, Napa County Transportation and Planning Agency, Amtrak, and Baylink Ferry (July, 2011)

Parking

- On-street parking along Sonoma Boulevard is provided via parallel parking
- Parking is generally provided south of Valle Vista Avenue, and prohibited between Valle Vista Avenue and SR-37 Interchange
- On-street parking supply exceeds current demand along project corridor

Parking Restrictions and Street Cleaning Times



Truck Routes and Railroad

- Sonoma Blvd is part of the state Truck Network
  - Designated as a Terminal Access (STAA) route
- SPRR line is currently being used by T&O Railroad Company to serve Mare Island

Opportunities and Constraints

- Vehicle Circulation
- Pedestrian Facilities
- Bicycle Facilities
- Transit Service
- Parking

Vehicular Circulation

Underutilized roadway along northern section

- **South of SR37, the existing four-lane section is sufficient to serve 27,000 AADT**
- **Narrowing of center median would allow for enhancements to existing pedestrian, bicycle, and/or transit facilities**

Vehicular Circulation – *cont.*

Vehicular Circulation – *cont.*

Possible road diet for southern portion

- **12,300 – 16,000 AADT along southern portion can be served with a two-lane roadway**
- **Enhanced access and mobility for pedestrians, bicyclists and transit users**

Vehicular Circulation – *cont.*

Traffic Volumes and Road Diet Feasibility		
Average Daily Traffic Volume Range (vehicles/day)	**Road Diet Feasibility**	**Local Bay Area Examples**
Less than 12,000	High Potential (center turn lane/turn pockets beneficial, though not necessary for traffic capacity)	Castro Street, Mountain View (~ 9,000 vehicles/day)
12,000 – 18,000	High Potential (center turn lane/turn pockets likely needed; may require traffic microsimulation analysis to confirm signal timings and turn pocket lengths)	Valencia Street, San Franisco (~ 17,000 vehicles/day)
18,000 – 23,000	Moderate Potential (center turn lane/turn pockets needed; typically requires traffic simulation analysis to confirm feasibility)	Marin Avenue, Berkeley (~ 20,000 vehicles/day)
Greater than 23,000	Road diets are generally not considered unless spillover traffic can be accommodated on parallel streets	N/A

Vehicular Circulation – *cont.*

Improve wayfinding signs for popular nearby destinations

- **Ferry Terminal**
- **Old Town**
- **Transit Centers**
- **Hospitals**
- **Napa Valley**
- **Six Flags Discovery Kingdom**
- **Mare Island**

Pedestrian Facilities

Northern portion

- Sidewalk Gap Closure
- Pedestrian amenities at SR-37 interchange
- Bulb-outs to shorten pedestrian crossing distance

Pedestrian Facilities *– cont.*

Southern portion

- **Has continuous sidewalk**
- **Clear obstructions for ADA compliance**
- **Wider sidewalk for pedestrian comfort**

Pedestrian Facilities *– cont.*

Pedestrian Safety Enhancements

- Reduce crossing length (adjust road width, install pedestrian bulb-outs)
- Pedestrian push button upgrades
- Pedestrian countdown signals
- Audible pedestrian signals
- High visibility crosswalks/ in-pavement flashers at mid-block crossings
- Curb ramp upgrades to be ADA compliant

Pedestrian Facilities *– cont.*

Bicycle Facilities

Bicycle network can be enhanced:

- **Provide Class II bike lane on Sonoma Boulevard**
- **Additional bike facilities on intersecting east-west roadways, particularly in northern portion**
- **Install bike racks and lockers for area businesses**

Transit Service

Capitalize on close proximity to major transit centers

- **Continuous service along corridor**
- **TOD opportunities**

Transit Service *– cont.*

Relocate bus stops from street to inside shopping plaza (northern section)

- **Better serve customers, employees, and businesses**

Transit Service *– cont.*

Explore Bus Rapid Transit (BRT) or transit-only lanes

- **Improve transit performance**
- **Northern portion has under-utilized roadway which could be reallocated for transit use**

Parking

Explore alternative parking layouts

- **Angled parking in downtown area can increase parking supply**
- **Could be coupled with road diet to promote pedestrian and bicycle-friendly environment**

sonoma
boulevard
corridor design plan

Existing Conditions Analysis

December 2011

appendix B
fehr & peers report

2.3 CIRCULATION, TRANSPORTATION, AND PARKING

The existing conditions chapter presents the physical and operational characteristics of the transportation system within the project corridor. The project corridor is shown in Figure 1**.**

2.3.1 Street Network

Regional Network

State Route 29 (SR-29) is a major north-south highway that connects Napa County to the north, and Lake County to the north of Napa County and Interstate 80 (I-80) in Vallejo to the south. Through Vallejo, SR-29 is **Sonoma Boulevard**. It runs along the western side of the City, providing two travel lanes in each direction. Sonoma Boulevard is a divided roadway north of Couch Street with a posted speed limit of 40 mph. It is undivided south of Couch Street, with a posted speed limit of 35 mph between Couch Street and Illinois Street and 30 mph south of Illinois Street. The annual average daily traffic (AADT) increases going north along Sonoma Boulevard, from 12,300 vehicles at Maine Street to 16,000 vehicles at Tennessee Street and 27,000 vehicles at the SR-37 junction[1]. Sonoma Boulevard is part of the state truck network and is designated as a Terminal Access (TA) route, which permit large STAA-designated trucks[2]. The average annual daily truck traffic (AADTT) increases going north, from 460 vehicles at Maine Street to 520 vehicles at Tennessee Street and 710 vehicles at the SR-37 junction[1].

State Route 37 (SR-37) is an east-west highway that connects Highway 101 (US-101) in Novato to the west and Interstate 80 (I-80) in Vallejo to the east. In the vicinity of the project, SR-37 is a restricted access freeway that provides two travel lanes in each direction. The posted speed limit is 65 mph. Access to Sonoma Boulevard is provided via the SR-37/SR-29 interchange in northern Vallejo. The annual average daily traffic is 30,500 vehicles west of the SR-37/SR-29 interchange and 65,000 vehicles east of the interchange[1].

Local Street System

Curtola Parkway is a 4-lane east-west arterial road that extends between Mare Island Way to the west and Interstate 780 (I-780) to the east. In the vicinity of the project corridor, the posted speed limit is 35 mph to the west and 40 mph to the east of Sonoma Boulevard.

Georgia Street is an east-west collector street that extends between Mare Island Way to the west and Ascot Parkway east of I-80. In the project area, it is 2-lanes to the west of Sonoma Boulevard and 4-lanes to the east. The posted speed limit is 25 mph.

Redwood Street is a 4-lane, east-west arterial road that extends between Sacramento Street to the west and I-80 to the east. In the vicinity of the project corridor, the posted speed limit is 30 mph.

Sereno Drive is a 4-lane east-west collector street that extends between White Slough to the west and Fairgrounds Drive to the east. In the vicinity of the project corridor, the posted speed limit is 25 mph.

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[1] Caltrans, 2010, http://traffic-counts.dot.ca.gov/.

[2] Surface Transportation Assistance Act (STAA) of 1982 legalized operation of large STAA-designated trucks with a 48-foot semitrailer, an unlimited overall length, and an unlimited kingpin-to-rear-axle (KPRA) distance on the National Network.

Tennessee Street is a 4-lane, east-west arterial road that extends between Mare Island Way to the west and Columbus Parkway to the east. In the vicinity of the project corridor, the posted speed limit is 30 mph.

2.3.2 Traffic Operations

Traffic operations for the study area were analyzed using the Synchro (Version 7) software program. Synchro is based on procedures outlined in the Transportation Research Board's *2000 Highway Capacity Manual* (HCM). The results of the analysis include a descriptive term known as level of service (LOS). LOS is a measure of traffic operating conditions, which varies from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed design capacity resulting in long queues and delays). **Table 2-1** summarizes the relationship between the average control delay per vehicle and LOS for signalized intersections.

TABLE 2-1
INTERSECTION LEVEL OF SERVICE THRESHOLDS

Level of Service	Signalized Intersection Control Delay (sec/veh)[1]	General Description
A	0 – 10.0	Little to no congestion or delays.
B	10.1 – 20.0	Limited congestion. Short delays.
C	20.1 – 35.0	Some congestion with average delays.
D	35.1 – 55.0	Significant congestion and delays.
E	55.1 – 80.0	Severe congestion and delays.
F	> 80.0	Total breakdown with extreme delays.

Notes:
1. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay.

Source: *Highway Capacity Manual*, Chapter 16 (Signalized Intersections), Transportation Research Board, 2000.

Traffic operations was evaluated at six major intersections along the Project corridor including:

1. Sonoma Boulevard / SR-37 Westbound Ramps
2. Sonoma Boulevard / SR-37 Eastbound Ramps
3. Sonoma Boulevard / Redwood Street
4. Sonoma Boulevard / Tennessee Street
5. Sonoma Boulevard / Georgia Street
6. Sonoma Boulevard / Curtola Parkway

The analysis was performed for three scenarios including Existing (No Project), Existing With Project, and Future With Project conditions. The Project scenarios assume that the North/Central North corridors provide two travel lanes in each direction and that a road diet is implemented in the South/Central South corridors to provide one travel lane in each direction.

Existing Conditions

The existing conditions analysis was based on AM and PM peak hour traffic counts collected between 7-9 AM and 4-6 PM in August 2011. Existing peak hour traffic volumes and lane configurations are presented in Figure 2. **Table 2-2** presents the intersection level of service results for all six study intersections. As shown, all study intersections are currently operating at LOS C or better during both AM and PM peak hours.

TABLE 2-2
EXISTING CONDITIONS INTERSECTION PEAK HOUR LEVELS OF SERVICE

Location	Control	Peak Hour	Delay[2]	LOS[3]
1. Sonoma Boulevard / SR-37 Westbound Ramps	Signal	AM PM	16 24	B C
2. Sonoma Boulevard / SR-37 Eastbound Ramps	Signal	AM PM	21 30	C C
3. Sonoma Boulevard / Redwood Street	Signal	AM PM	17 27	B C
4. Sonoma Boulevard / Tennessee Street	Signal	AM PM	18 22	B C
5. Sonoma Boulevard / Georgia Street	Signal	AM PM	13 15	B B
6. Sonoma Boulevard / Curtola Parkway	Signal	AM PM	17 19	B B

Source: Fehr & Peers, May 2012.

Project Conditions

Future (Year 2030) traffic volumes were derived from the Solano Transportation Authority (STA) Travel Demand Model (TDM). The base year and future year model projections were used to calculate annual growth rates which were applied to the existing traffic counts.

Figures 3 and 4 presents the Existing With Project and Future With Project peak hour traffic volumes and lane configurations assuming the proposed geometric improvements are implemented at the study intersections.

Table 2-3 presents the level of service results under Existing With Project and Future With Project conditions. The Existing No Project results are also provided in the table. As shown, under all scenarios, all six study intersections are anticipated to operate at LOS D or better during the weekday AM and PM peak hours. More detailed analyses (i.e. corridor-wide microsimulation, multi-modal level of service) is recommended to assess the potential impacts of the proposed improvements on operations along the corridor.

Based on the traffic operations analysis, northbound and southbound right-turn pockets are not necessary at the study intersections along the project corridor. However, right-turn pockets would improve operations and should be considered where curb extensions are not provided.

Based on the projected growth derived from the STA model, the future year Annual Daily Traffic (ADT) is between 15,000 and 19,500 in the South and Central South corridors and between 26,000 and 33,000 in the North and Central North corridors. The proposed road diet along the South and Central South corridors can accommodate the anticipated future demand. Many cities have successfully implemented road diets on facilities that served up to 23,000 daily vehicles. For the North and Central North corridors, four lane divided arterial roadways have a two-way capacity of approximately 35,000 daily vehicles so the future demand can be accommodated.

TABLE 2-3
INTERSECTION PEAK HOUR LEVELS OF SERVICE COMPARISON

Location	Control	Peak Hour	Existing No Project		Existing With Project		Future (Year 2030) With Project	
			Delay	LOS	Delay	LOS	Delay	LOS
1. Sonoma Boulevard / SR-37 Westbound Ramps	Signal	AM PM	16 24	B C	16 24	B C	25 48	C D
2. Sonoma Boulevard / SR-37 Eastbound Ramps	Signal	AM PM	21 30	C C	21 30	C C	24 48	C D
3. Sonoma Boulevard / Redwood Street	Signal	AM PM	17 27	B C	19 28	B C	21 44	C D
4. Sonoma Boulevard / Tennessee Street	Signal	AM PM	18 22	B C	22 29	C C	27 38	C D
5. Sonoma Boulevard / Georgia Street	Signal	AM PM	13 15	B B	14 17	B B	14 19	B B
6. Sonoma Boulevard / Curtola Parkway	Signal	AM PM	17 19	B B	17 19	B B	19 23	B C

Source: Fehr & Peers, May 2012.

2.3.3 Existing Pedestrian and Bicycle Network

This section describes the existing pedestrian and bicycle facilities within the project corridor.

Pedestrian Facilities

Typical pedestrian facilities include sidewalks, crosswalks, and pedestrian signals at signalized intersections. The existing pedestrian facilities along the project corridor are illustrated on Figure Z3. Sidewalks are generally provided on both sides of the project corridor, except on Sonoma Boulevard north of the SR-37 Eastbound ramp and between Sereno Drive and Ifland Way where sidewalks are intermittent. All six of the major intersections analyzed provide crosswalks on at least one approach crossing Sonoma Boulevard and the side street. The exception is at the SR-37 Westbound ramp, where only one crosswalk approach is provided on Sonoma Boulevard across the ramp. Pedestrian signals are also provided for crosswalks at all study intersections.

Bicycle Facilities

Sonoma Boulevard currently lacks bicycle facilities. Marin Street, which parallels Sonoma Boulevard to the west, provides a Class II bike lane extending from Alabama Street to Capitol Street. Tennessee Street provides a Class III bike route between Mare Island Way to the west and I-80 to the east. Other roadways with Class III bike routes intersecting the Project corridor include Louisiana Street, Nebraska Street, and Lewis Brown Drive.

2.3.4 Existing Transit Service Overview

Surface transit service providers in the project vicinity include Vallejo Transit, Napa County VINE, and Amtrak. Vallejo Transit provides local and regional bus service with connections to the Vallejo Ferry Terminal and the El Cerrito Del Norte, Pleasant Hill and Walnut Creek BART stations. The Napa County VINE also provides bus service to various destinations in Napa County. Additionally, Amtrak provides limited bus service to Martinez, Napa, and McKinleyville. Figure Z4 presents the existing transit services provided along the project corridor. The Baylink Ferry provides high speed ferry service to and from San Francisco. Each service is described below.

Vallejo Transit

Six Vallejo Transit bus routes operate along the project corridor on weekdays, and two routes operate on weekends. The characteristics of the Vallejo Transit routes operating in the area are summarized in **Table 2-4**. The six bus routes cover most of the Sonoma Boulevard corridor with gaps between Curtola Parkway and York Street and between Florida Street and Tennessee Street. Service is most concentrated between Valle Vista Ave and Sereno Drive, with all six bus routes running through this area. The Sereno Transit Center is a major transit point between Vallejo Transit bus routes and is located just to the east of the project corridor on Sereno Drive, between Sonoma Boulevard and Broadway. The Vallejo Transit Center, located at Sacramento Street and York Street is the major transit point in the southern part of the City. Opened in June 2011, it serves numerous bus lines and

Exhibit 2-1: Vallejo Transit Center at Sacramento Street and Marin Street

bridges Old Town with the ferry terminal and waterfront.

Local fares as of June 2008 are $1.75 for youth and adults, and $0.85 for seniors or persons with disabilities. Express bus fares are $5.00 for youth and adults, and $2.50 for seniors or persons with disabilities. Monthly transit passes are also available for both types of service.

On July 1, 2011, Solano County Transit (SolTrans) officially took over the public transit program in Vallejo. As of August, 2011, transit service and fares in Vallejo have not changed since the transition.

Vine

Napa County VINE bus route 10 operates daily service along the project corridor. The characteristics of the VINE route are summarized in Table 2-3. The only VINE stop on the project corridor is located on Sonoma Boulevard just north of Couch Street. The fare is zone-based. The adult fares for traveling intrazone, one, and two zones are $1.35, $2.15, and $2.90, respectively. The youth fares for traveling intrazone, one, and two zones are $1.10, $1.60, and $2.00, respectively. The reduced fares for seniors and persons with disabilities traveling intrazone, one, and two zones are $0.65, $1.00, and $1.25, respectively.

Amtrak

The Amtrak Thruway Bus Route 7 operates daily service in the northern section of the project corridor. The characteristics of the Amtrak route are summarized in Table 2-3. The Amtrak Thruway Bus stop is located on the west side of Sonoma Boulevard south of the SR-37 interchange and services Amtrak rail passengers between the Martinez Amtrak station and Napa or McKinleyville. The route schedule is timed with the arrival and departure of San Joaquin Amtrak trains. Northbound buses only discharge passengers at the Vallejo stop.

Baylink Ferry

The Baylink Ferry operates daily service for Vallejo and the North Bay Region to and from San Francisco. The Vallejo ferry terminal is located near the Sonoma Boulevard study corridor, five blocks west on Georgia Street where it terminates at Mare Island Way. It is accessible via public transit by the numerous bus lines that terminate at the Vallejo Transit Center located at Sacramento Street and York Street. The recently completed parking structure, which provides parking for both the ferry terminal and the Vallejo Transit Center, supplies 750 parking spaces under Phase I; with the completion of Phase II of the project, a total of 1,200 parking spaces will be provided. The adult fare for one-way travel to San Francisco is $13.00. The fare is $6.50 for youths, seniors, and persons with disabilities. The characteristics of the Baylink Ferry are summarized in Table 2-3.

2.3.5 Parking

On-street parking along Sonoma Boulevard is provided via parallel parking. Parking is generally provided on Sonoma Boulevard south of Valle Vista Avenue. Parking is generally prohibited between Valle Vista Avenue and the SR-37 interchange. There are two segments along the northern portion of the project corridor that allow parking, both of which are on the west side: just north of Redwood Street and just south of the SR-37 eastbound ramps. Figure Z5 presents the locations of the various parking restrictions and street cleaning rules.

TABLE 2-4
TRANSIT SERVICE SUMMARY

Line	Route	Nearest Stop	Weekday		Weekend	
			Hours	Headway	Hours	Headway
Local Routes						
Vallejo Transit 1	South Vallejo to Rancho Vallejo	Various stops on Sonoma Blvd between Valle Vista Ave and SR-37	4:50 a.m. to 8:28 p.m.	30 minutes	5:50 a.m. to 10:58 p.m.	30 minutes (60 minutes for last bus)
Vallejo Transit 2	Northeast Vallejo to Downtown	Various stops on Sonoma Blvd between Valle Vista Ave and SR-37	5:17 a.m. to 7:58 p.m.	60 minutes	6:30 a.m. to 10:40 p.m. (Saturday only)	60 minutes
Vallejo Transit 4	Tuolumne Street to Downtown	Sonoma Blvd north of Redwood St, and at Jeffry St	6:51 a.m. to 6:57 p.m.	60 minutes	9:30 a.m. to 4:57 p.m. (Saturday only)	60 minutes
Vallejo Transit 5	Redwood Parkway to Gateway Plaza to Springs Road	Sonoma Blvd north of Redwood St	5:30 a.m. to 8:38 p.m.	30 minutes	6:27 a.m. (6:57 a.m. Sun) to 6:15 p.m.	60 minutes
Vallejo Transit 7	Springs Road to Gateway Plaza to Redwood Parkway	Sonoma Blvd north of Redwood St, at Jeffry St, and at Lozier Al	5:20 a.m. to 8:12 p.m.	30 minutes	7:30 a.m. to 8:12 p.m. (Saturday only)	30 minutes
Regional Routes						
Vallejo Transit 85	Vallejo to Fairfield	Various stops on Sonoma Blvd between Tennessee St and Sereno Dr	5:35 a.m. to 11:28 p.m.	30 minutes (a.m. peak) 60 minutes (all other times)	6:35 a.m. to 10:28 p.m. (Saturday) 8:35 a.m. to 8:28 p.m. (Sunday)	120 minutes
Vine Route 10	Vallejo to Calistoga	Sonoma Blvd at Couch St	5:07 a.m. to 9:43 p.m.	60 minutes	7:20 a.m. to 9:26 p.m. (Saturday) 8:19 a.m. to 6:46 p.m.	90 minutes
Amtrak Thruway Bus Route 7 Napa Loop	Martinez to Napa	West side of Sonoma Blvd south of SR-37	10:50 a.m., 3:50 p.m., 7:10 p.m. (Northbound discharge only) 12:55 p.m., 4:45 p.m (Southbound)	n/a	10:50 a.m., 3:50 p.m., 7:10 p.m. (Northbound discharge only) 12:55 p.m., 4:45 p.m (Southbound)	n/a
Amtrak Thruway Bus Route 7 McKinleyville	Martinez to McKinleyville	West side of Sonoma Blvd south of SR-37	10:50 a.m. (Northbound) 7:50 a.m., 9:20 a.m. (Southbound)	n/a	10:50 a.m. (Northbound) 7:50 a.m., 9:20 a.m. (Southbound)	n/a
Baylink Ferry	Vallejo to San Francisco	Vallejo Ferry Terminal, Mare Island Way at Georgia St	5:30 a.m. to 7:15 p.m.	~60 minutes (peak), 90-150 minutes (off-peak)	8:30 a.m. to 9:00 p.m.	90 minutes

Sources: Vallejo Transit, Napa County Transportation and Planning Agency, Amtrak, and Baylink Ferry (July, 2011)

0 0.125 0.25 0.5 0.75 1 Miles

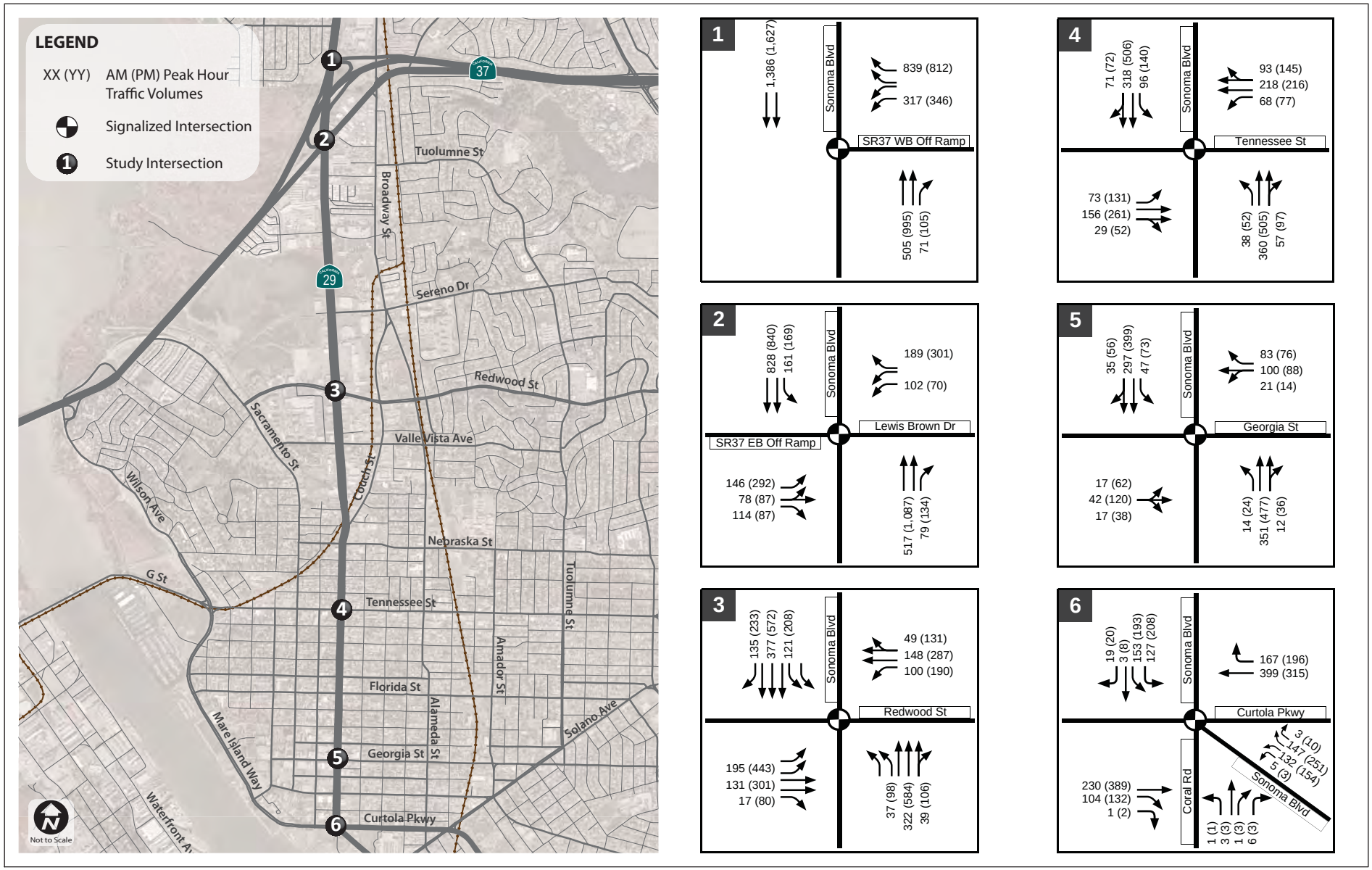
Sonoma Boulevard Corridor Design Plan

FEHR PEERS

WC11-2837_1_StudyArea

PROJECT STUDY AREA

FIGURE 1



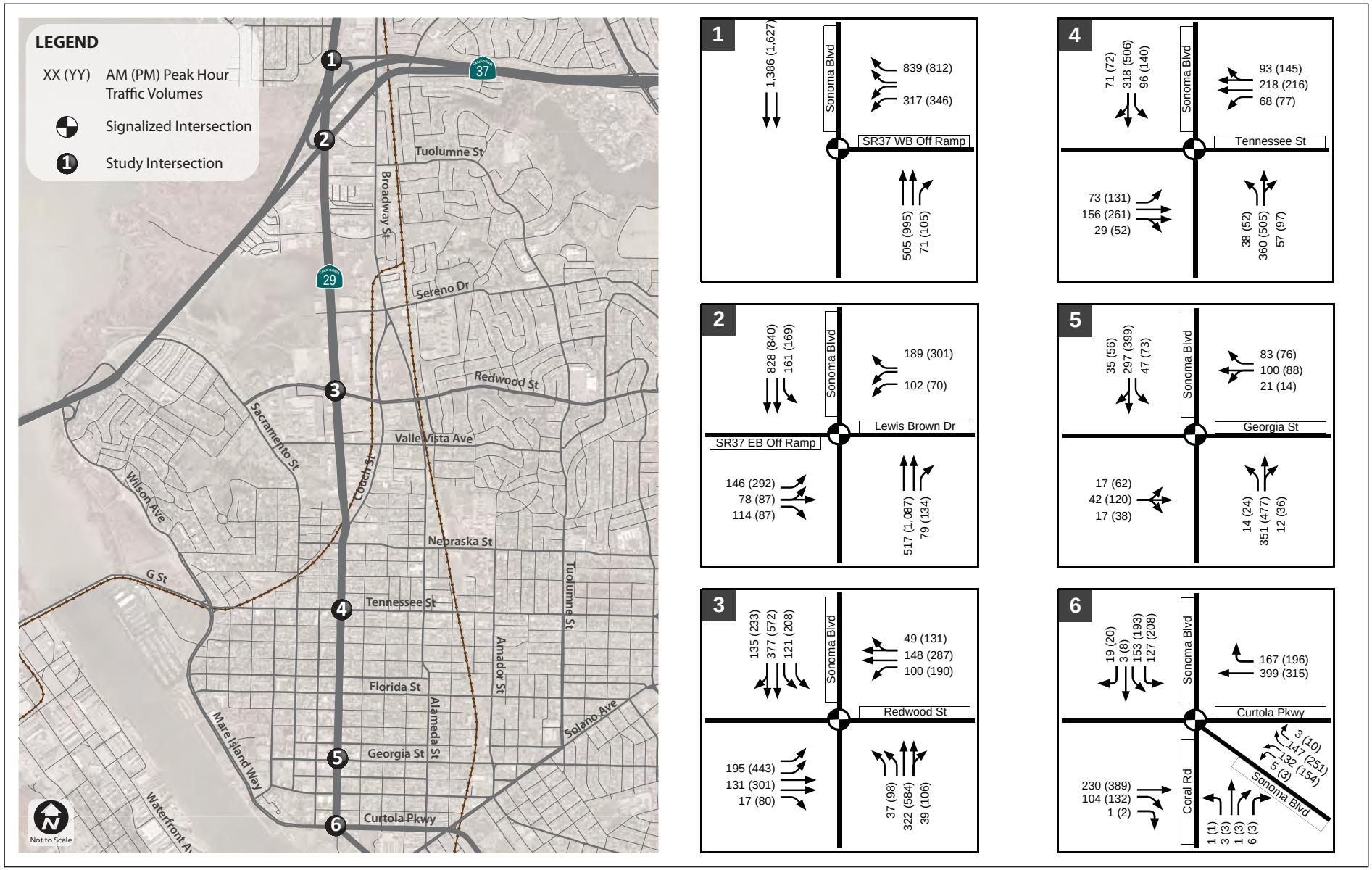
FEHR PEERS

WC11-2837_2_ExVol

EXISTING CONDITIONS

PEAK HOUR TURNING MOVEMENT VOLUMES, LANE CONFIGURATIONS AND TRAFFIC CONTROL

FIGURE 2

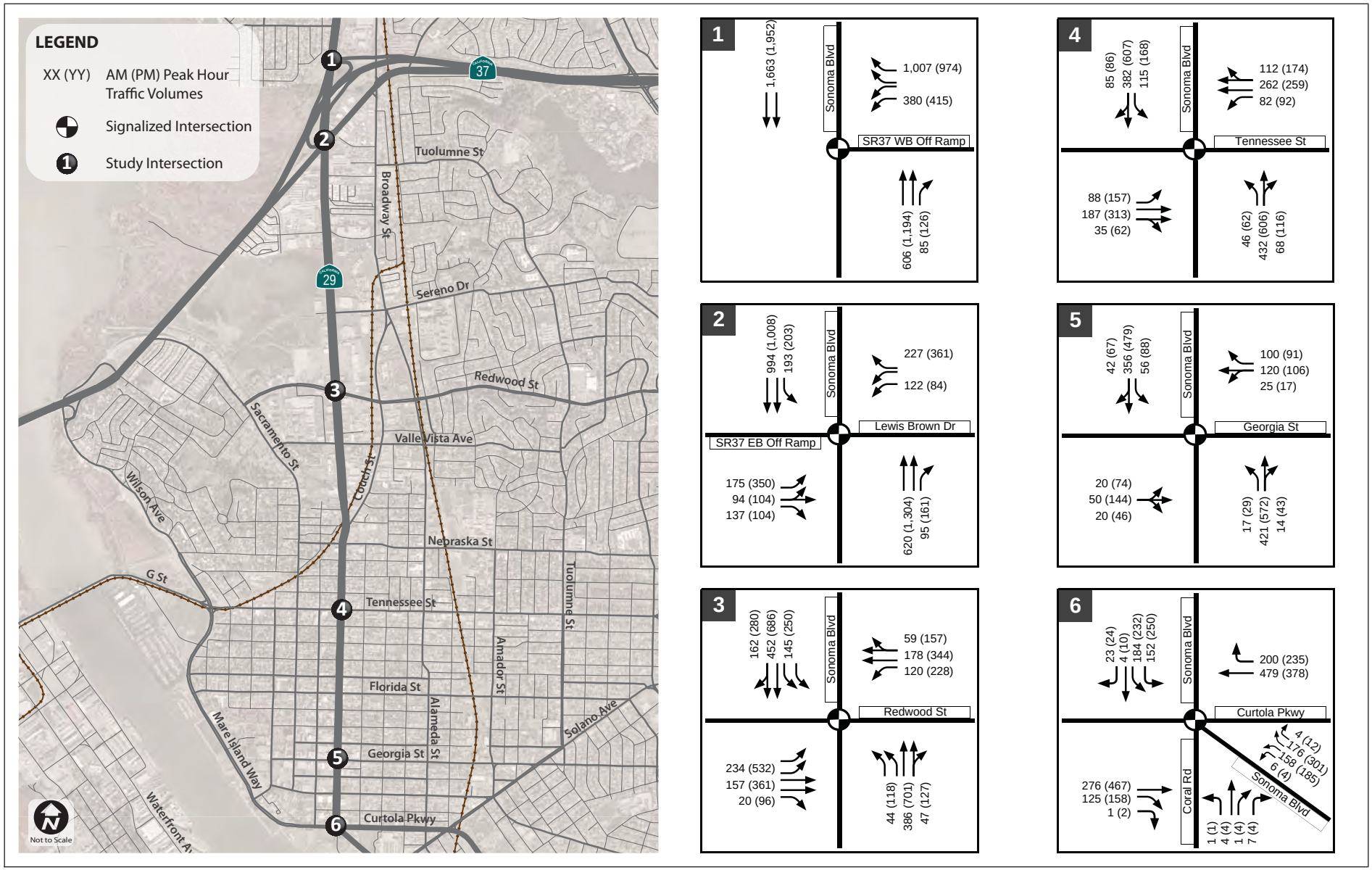


FEHR PEERS

WC11-2837_3_ExPPVol

EXISTING PLUS PROJECT CONDITIONS
PEAK HOUR TURNING MOVEMENT VOLUMES, LANE CONFIGURATIONS AND TRAFFIC CONTROL

FIGURE 3



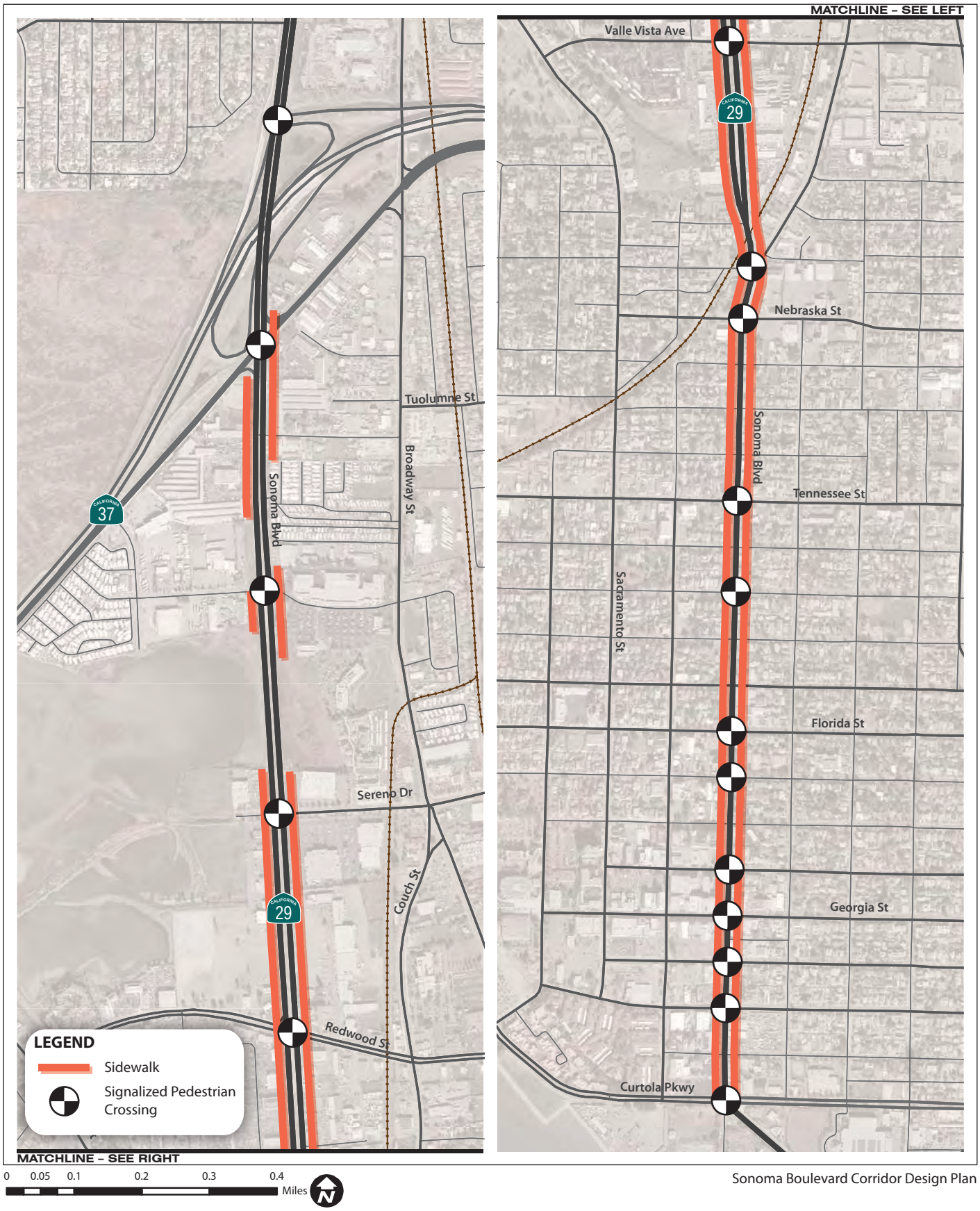
FEHR PEERS

WC11-2837_4_FutPPVol

FUTURE PLUS PROJECT CONDITIONS

PEAK HOUR TURNING MOVEMENT VOLUMES, LANE CONFIGURATIONS AND TRAFFIC CONTROL

FIGURE 4



0 0.05 0.1 0.2 0.3 0.4 Miles

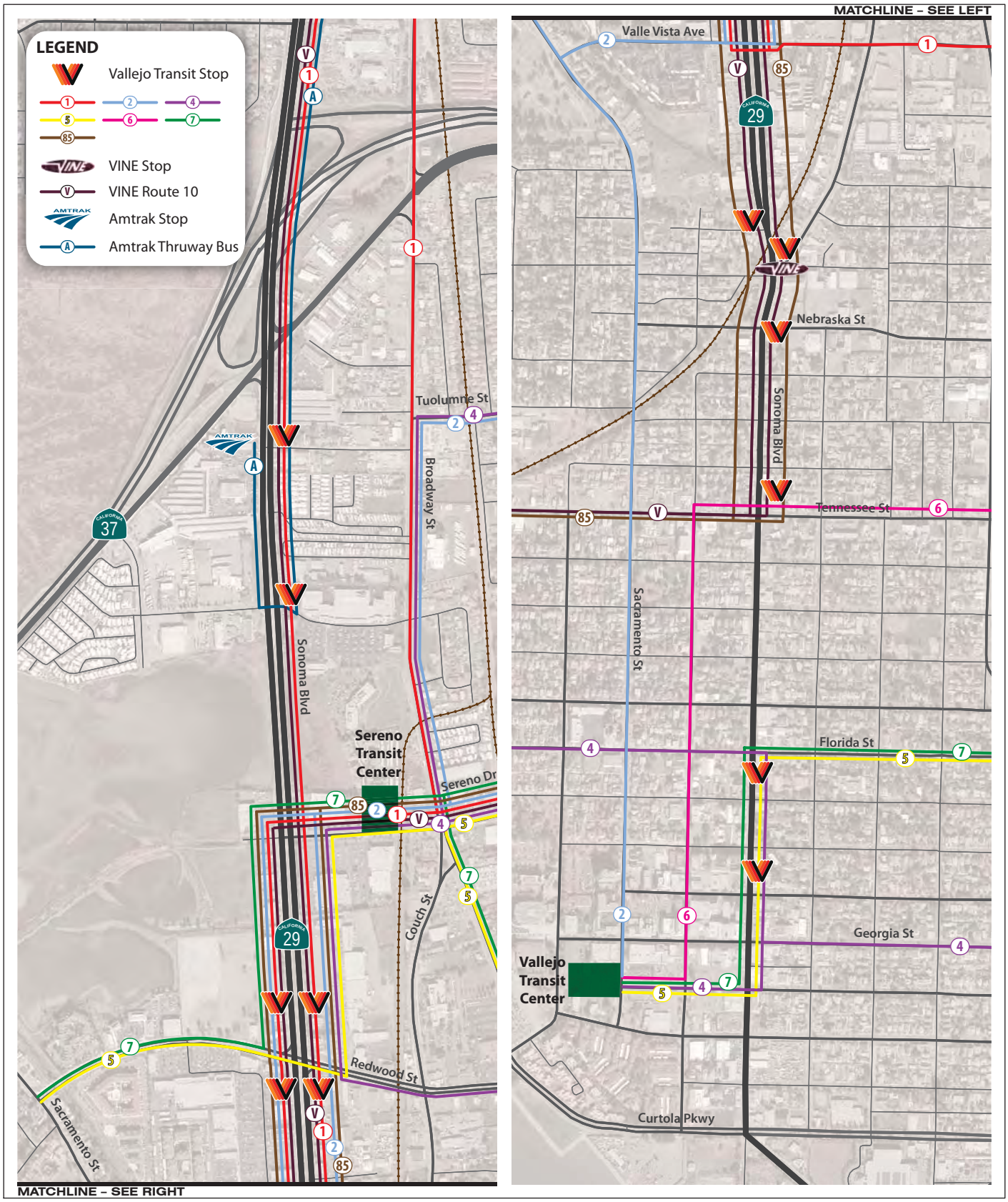
Sonoma Boulevard Corridor Design Plan

FEHR PEERS

WC11-2837_Z3_PedFac

EXISTING PEDESTRIAN FACILITIES

FIGURE Z3



0 0.05 0.1 0.2 0.3 0.4 Miles

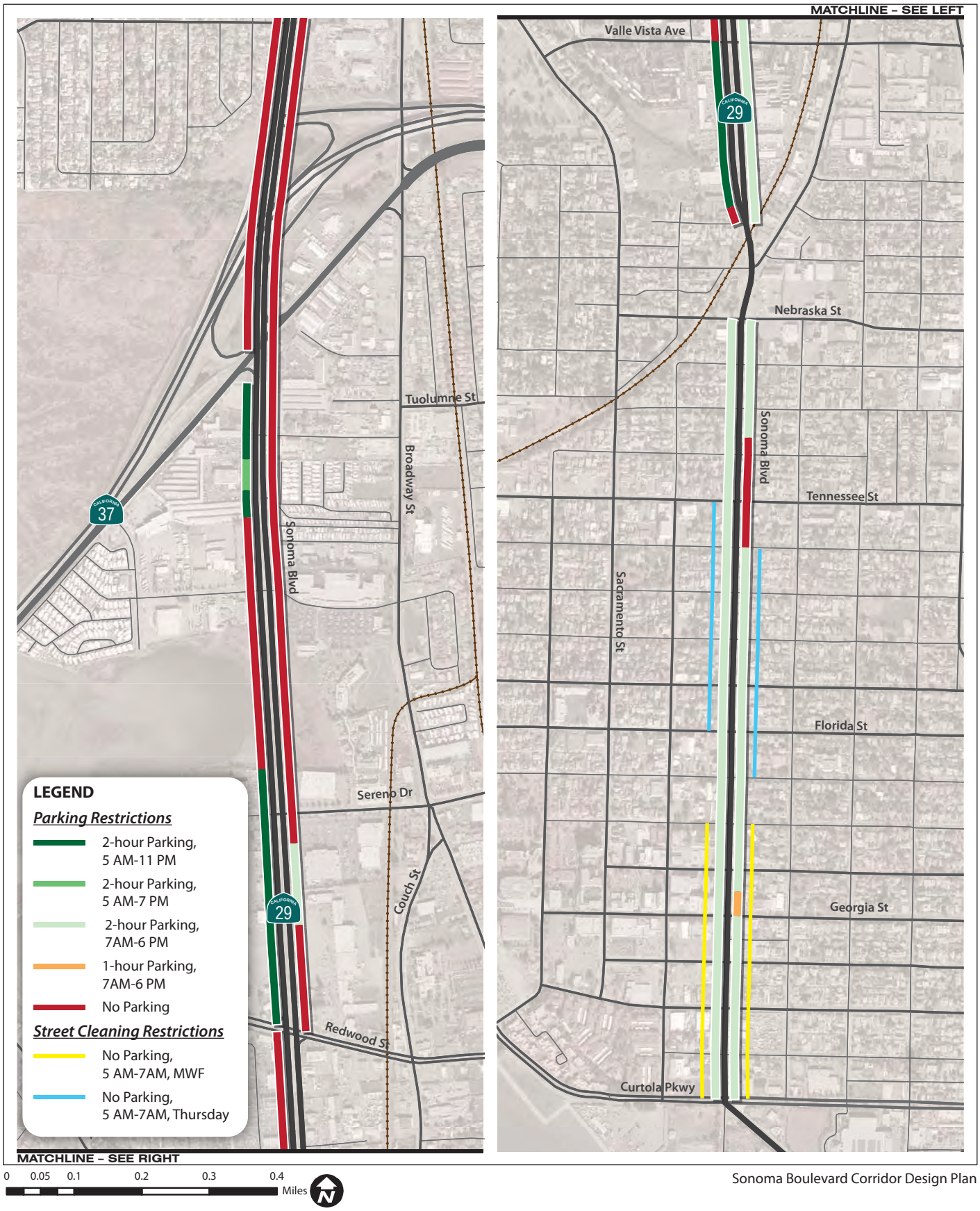
Sonoma Boulevard Corridor Design Plan

FEHR PEERS

WC11-2837_Z4_Transit

EXISTING TRANSIT ROUTES

FIGURE Z4



0 0.05 0.1 0.2 0.3 0.4 Miles

Sonoma Boulevard Corridor Design Plan

FEHR PEERS

WC11-2837_Z5_ExOnPark

EXISTING ON-STREET PARKING RESTRICTIONS

FIGURE Z5

appendix C
meetings summaries

Community Workshop #1 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. Acknowledged as the "spine" of the community, Sonoma Boulevard is a vitally important street that shapes and impacts the economic vitality, social fabric, physical connections, and perceptions of the entire City. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long stretch of Sonoma Boulevard between Curtola Parkway and Highway 37. Many types of commercial services, residential areas and transit connections are located within the project's Planning Area, providing a strong physical framework to build upon in future improvements.

The Corridor Design Plan is in the beginning stages of the planning process. This initial phase is focused on understanding the Planning Area's existing conditions as a baseline to create recommendations for future improvements. To help guide the process as the plan develops, a Community Advisory Committee (CAC) has been formed to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large.

II. Meeting Format

On Wednesday, October 19, 2011 the City held the project's first Community Workshop in the Joseph Room of the Vallejo Public Library in downtown Vallejo, from 6:30 to 8:30 p.m. The meeting was attended by more than 50 members of the public as well as Beth Thomas and Robert Bregoff from Caltrans District 4.

The session began with introductions and a review of the meeting purpose from Chris Beynon, Principal and Project Manager from the lead urban planning and design consultant MIG, Inc. Mr. Beynon then presented an overview of the project, including highlights of its background, purpose and process. The presentation continued with a discussion of trends in corridor design, using case examples from cities and places throughout the Bay Area and nationwide. It concluded with an overview of existing physical, economic, and transportation conditions along the corridor.

Following the presentation Mr. Beynon facilitated community members in a discussion of assets, challenges, opportunities and visions for Sonoma Boulevard. Comments made by the participants were recorded on a large wallgraphic by Maria Landoni and Laura Shipman, Project Associates from MIG.

III. Comments from Community Members

Following are highlights from the community discussion. Specific comments made by community members are included in the wallgraphic photo reduction at the end of this document.

Assets

Participants listed several positive qualities and characteristics of the corridor and surrounding areas.

Among the assets specific to the corridor, participants mentioned the corridor has a **wide right-of-way that is flexible** for reconfiguration. The corridor also has a **good flow of pedestrian traffic** as well as commuter traffic; however, commuters need to be incentivized to stop on Sonoma Boulevard possibly by capitalizing on its location and branding it as the "Gateway to Napa." **Temporary uses in open spaces** such as the farmer's market or food trucks have been successful. The corridor also has **an appealing natural environment** including views, climate, dramatic topography, and existing wildlife along the White Slough.

In addition to these corridor-specific assets, Sonoma Boulevard is surrounded by several **anchor districts and properties** that have potential to contribute to the vitality of the corridor including Downtown Vallejo, the Vallejo transit center, Kaiser Permanente and local community colleges. The **diversity of the community members** that live in proximity to the corridor also helps to create the **unique character** of the area. Additionally**, local youth** represent the primary end users of the long-term improvements to Sonoma Boulevard and are an invaluable asset in helping to envision and shape its future.

Challenges and Opportunities

Community members identified many issues for Sonoma Boulevard that need to be addressed. Some of these issues may be addressed quickly to provide near-term impacts on the corridor; others might require more time, budgeting, support from the community, and shifts in market demand.

The corridor currently acts as a **barrier** with wide streets, poor pedestrian crossings and a wide median that is difficult to maintain. This wide right-of-way could become a **connective "Green Street" with sustainable design** accommodating bike lanes, public transit, improved sidewalks and crosswalks, and reduced lane widths; however any improvements should **maintain flexibility** to adjust to the needs of the corridor over time. In addition,,coordination with the highway planning of Route 37 could potentially contribute to the improvement of the corridor by **redirecting heavy traffic,** particularly trucks to Route 37 and onto I-80.

Economic development is central to the improvement of the corridor, including supporting existing businesses and attracting new stores and services. There are currently several **vacant and underutilized spaces**. There are opportunities in the short-term to utilize these vacant spaces as transitional development sites, such as food truck hubs or temporary parks with family activities like miniature golf. In the long-term there is a need to **define nodes along the corridor as destinations** and increase tourism – particularly to the Downtown – through emphasis on each node's unique character using branding, signage and wayfinding. Kaiser Permanente has the potential to be better integrated and connected to the corridor as one of these destination nodes through the development of a "Medical Village" that would attract businesses and services related to the health industry.

Vision

Building from the identification of assets, issues and opportunities, an initial vision for the corridor began to emerge. The participants' overall vision is to **increase community pride and create an economically, environmentally and socially healthy community along Sonoma Boulevard**.

Community members envision the roadway becoming a corridor with **unique character that is both a destination and connector to the surrounding neighborhoods and the region**. Potential destinations along the corridor include a revitalized Downtown that preserves historic character as a "Gateway to Napa"; a Kaiser Permanente "Medical Village" connected to the White Slough as an environmental health and recreation area; and diverse ethnic neighborhoods as distinctive districts emphasizing the cultural diversity of the Vallejo community.

Sonoma Boulevard is also envisioned to be **transformed into a sustainable, safe and attractive "Green Street".** The boulevard should have improved local connections along the roadway; easy and safe passage across the street; and enhanced linkages to the City and greater region. This connectivity is envisioned through all modes of transportation including pedestrian links with improved sidewalks, intersections and crossings; increased opportunities for biking by creating bike lanes along the corridor and connections regionally (such as through connectors to the Bay Trail and converting rails to trails); and enhanced modes of public transportation, including express buses and future rail that would also connect to other regional transit systems such as BART and ferries.

These nodes and improvements along the corridor are also envisioned to help **build the local economy, improve local businesses, and generate jobs** that would attract visitors and local residents to invest in the community.

IV. Next Steps

The meeting closed with a brief summary of some of the key comments received during the meeting and with an overview of upcoming events and next steps.

The next Community meeting will be held on Jan 11, 2012 at the Joseph Room in the Vallejo Public Library, 505 Santa Clara St. in downtown Vallejo.

OCTOBER 19

COMMUNITY WORKSHOP #1

ASSETS

- TRANSIT CENTER
- TOPOGRAPHY
- PEDESTRIAN TRAFFIC
- WIDE STREET
- ANCOR DISTRICTS + PROPERTIES
- KAISER
- WHITE SLOUGH
- CLASS A BIKE PATH
- 2 COLLEGES
- FARMER'S MARKET
- PEOPLE THAT COMUTE THROUGH → STOP HERE!
- DIVERSITY!
- SCALE OF SECTIONS
- CHARACTER OF ≠ AREAS
- IMPROVE/EMPHASIZE NODES
- OPEN SPACES - USED FOR TEMPORARY USES!
- HIGH SCHOOLS & STUDENTS - INVOLVE YOUTH! - INVOLVE THEM IN PROCESS
- VIEWS!
- EXISTING WILDLIFE

VISION FOR SONOMA!

A CORRIDOR FOR THE WHOLE COMM

GREEN CORRIDOR

MEDICAL VILLAGE

WHITE SLOUGH AS DESTINATION REC.

BOULEVARD WITH OF DISTRICTS / SECTORS! — CULTURES & DIVERSITY

BIKING CONNECTED TO REGION

TOURISM! BIKE/HIKE NODES AS DESTINATIONS — WINE TRAIN?

TAP ON EDUCATION!

JOB GENERATION! FOOD, SMALL BUSINESS

ATTRACTIVE INVITING BLVD! — CLEAN, COMFORTABLE

SAFE BLVD FOR ALL USERS! — ENFORCEMENT!! LIGHTING

ALL MODES OF TRANSP. — LIGHT RAIL - SIGNS

DESTINATION!

CONNECT TO REGION AND BAY TRAIL! — ATTRACTIVE EXPERIENCE!

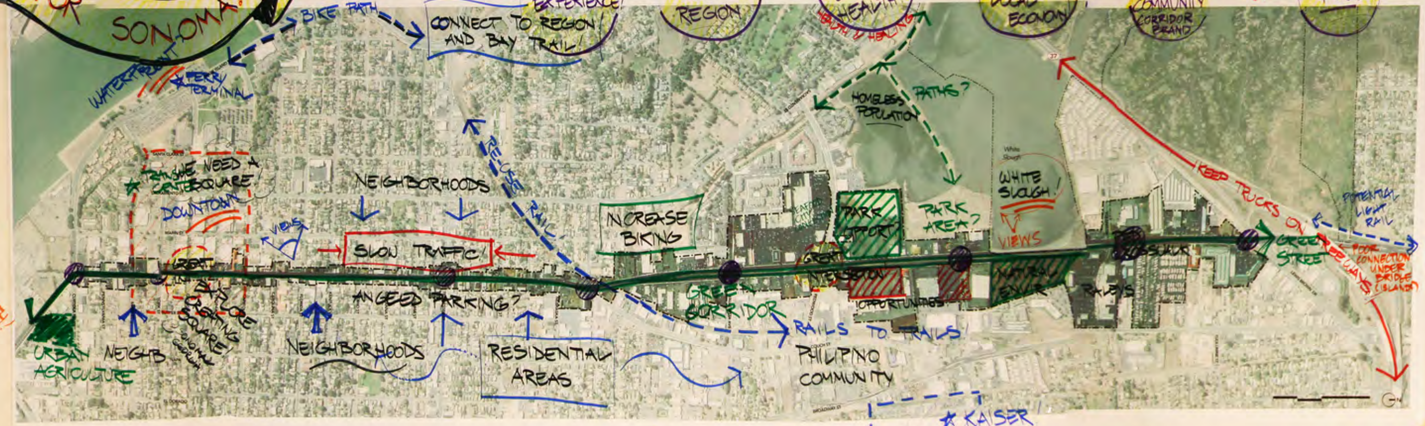
CONNECT WITH REGION

ENVIRO SOCIAL ECONOMIC HEALTH! — HEALTH & HEALING

SUPPORT LOCAL ECONOM

DIVERSE COMMUNITY CORRIDOR BRAND

COMMUNITY PRIDE



CHALLENGES & OPPORTUNITIES

- WIDE STREETS WIDE MEDIAN — REDUCE WIDTH — MAINTENANCE
- KAISER & HEALTH INDUSTRY — NEW GOV. VILLAGE!
- BIKE LANES!
- MAINTENANCE ISSUES!
- WETLANDS — HABITAT NORTH
- ECONOMIC DEVELOPMENT TO ASSETS
- FLEXIBILITY - OVER TIME — ROADS WAY NEED TO WIDEN + NARROW OVER TIME
- BIKE PATH TO NAPA - NAPA TO FUND CONNECTION
- ROUTE HEAVY TRAFFIC I-37 > I-80
- CONNECT COLLEGES W/ PATHS — WALKING NETWORK
- OVERCOME SONOMA BLVD AS BARRIER — CONNECTIONATO
- DIRECT
- FOOD TRUCKS — PORTLAND MODEL - CREATE GATHERING PLACE, NOT SPREAD OUT
- HIGHWAY 29 & 37
- PLANNING PARTNERSHIPS - EDUCATE ABOUT UPDATES & PROCESS
- INCORPORATE DOWNTOWN SQUARE - GEORGIA - STOP TO NAPA
- GREEN STREET
- TRANSITIONAL DEVELOPMENT IN VACANT SPACES
- SIGNAGE/ CHARACTER
- INCREASE LIGHTING!
- LABOR FROM LOCAL RESIDENTS
- SAFETY + TRAFFIC CALMING — PEDESTRIAN CROSSINGS — SIGNALS ON GEORGIA
- PARKING STRATEGIES - ANGLED PLE TO REDUCE SPEEDS
- LARGE TRUCKS HOW DO YOU MOVE TO 37?
- INCREASE TURISM
- CREATE NODES AS DESTINATIONS
- INCORPORATE YOUTH IN PLANNING — HIGH SCHOOL
- COMMUNITY SOUTH + NORTH
- LIGHT RAIL SYSTEM
- HABITAT PRESERVATION ENVIRONMENTAL + ECONOMIC + SOCIAL HEALTH
- BARRIER TO BIKE LANE

VISIT US!

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SONOMA BOULEVARD CORRIDOR DESIGN PLAN

Community Workshop #2 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. Acknowledged as the "spine" of the community, Sonoma Boulevard is a vitally important street that shapes and impacts the economic vitality, social fabric, physical connections, and perceptions of the entire City. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long stretch of Sonoma Boulevard between Curtola Parkway and Highway 37. Many types of commercial services, residential areas, and transit connections are located within the project's Planning Area, providing a strong physical framework to build upon in future improvements.

The Corridor Design Plan is in the second phase of the planning process: development of concepts and alternatives. This phase is focused on developing the framework of opportunities and design alternatives for future improvements to the Planning Area.

Community participation is integral part of developing the Sonoma Boulevard Design Plan. An initial visioning workshop was held with the community in the first phase of the planning process (visioning). A Community Advisory Committee (CAC) has also been involved to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large. This meeting summary provides an overview of the meeting input from Community Workshop #2, which explored various concepts and alternatives for the future of the corridor.

II. Meeting Format

On Wednesday, January 11, 2011 the City held the project's second Community Workshop in the Joseph Room of the Vallejo Public Library in Downtown Vallejo, from 6:30 to 8:30 p.m. The meeting was attended by more than 40 members of the public as well as Beth Thomas and Robert Bregoff from Caltrans District 4.

The session began with introductions and a review of the meeting purpose from Michelle Hightower, Planning Manager for the City of Vallejo, and Chris Beynon, Principal and Project Manager from the lead urban planning and design consultant MIG, Inc. Mr. Beynon then presented a brief overview of the project to the large group, including highlights of its background, purpose, and process. The presentation continued with a discussion of the emerging vision and transformative strategies that were shaped by City and community input. Mr. Beynon then highlighted the specific economic development, land use, transportation, and design goals for each of the four sub-areas of the corridor (North, Central North, Central South, South). Finally, the large-group session concluded with a presentation of the streetscape design alternatives for further discussion in the break-out group sessions.

Following the presentation Maria Landoni and Laura Shipman, Project Associates from MIG, facilitated community members in break-out group discussions of the economic development, land use, transportation, and design goals for the four sub-areas of the corridor as well as the streetscape design alternatives.

III. Comments from Community Members

Following are highlights from the break-out group discussions focused on each of the four planning sub-areas. Facilitators reiterated the economic, land use, transportation, and design goals for each sub-area, as well as for the design alternatives, Participants' recommended comments and feedback were then recorded by the facilitators on large maps and graphics.

North

Economic Development: Leverage district's assets and strengths to attract job-generating businesses.

Land Use: Create a diverse district that, while strengthening existing retail base, also supports residential, office and open space uses, and allows interim uses while market demand for more permanent uses increases.

- Participants envisioned improvements that would define Vallejo as **"A City for the year 2030"** with flexible uses that are **sustainable and adaptable to the future**.
- The potential opportunities for the White Slough to be a true neighborhood amenity and destination were emphasized. Improvements to the White Slough should include habitat restoration and alleviation of the smell as well as **infrastructure for visitors** including tours, visitor center, and education opportunities for youth. **Outdoor recreation-oriented retail** was recommended to take advantage of these improvements to the natural environment around the White Slough.
- Community members emphasized the importance of attracting **large businesses for the area's large parcels to increase potential tax revenue**.
- An idea developed during the first workshop – highlighting the potential for the North sub-area to be transformed into a "**Medical Village**" and the corridor to be a "**Gateway to Napa**" – were reemphasized. Participants recommended wineries and micro-breweries as places to attract outside visitors to stop en-route to Napa. Health-related research and support services – as well as housing for staff and temporary housing or hotels for visitors – were also suggested.

Transportation: Ensure easy access and mobility while guaranteeing safety, providing amenities to all users, and improving connectivity across the corridor.

Design: Create a distinctive and well-maintained streetscape environment that features a gateway into Vallejo, highlights the White Slough as a natural asset, and has essential pedestrian and bicycle amenities. [Design Alternative 1: widen sidewalks and add street trees and landscaping, maintain street parking, introduce bike lanes, and plant street trees in median. Design Alternative 2: reduce lane widths, eliminate median, create continuous turn lane, eliminate on-street parking, create a shared use path for pedestrians and bikes, provide a forty foot flex space for commercial, housing and open space opportunities.]

- Community members recommended **design that capitalizes on the natural environment** by integrating views of the Bay and White Slough through elements such as viewing platforms and walking paths. In order to not obstruct or distract from these views, big box retail should be discouraged on the east side of the corridor.
- Continuing on the theme of the gateway to Napa, **bike trails should be connected regionally from Vallejo to Napa** as a tourism opportunity.
- The preferred streetscape design alternative for Group 1 was Alternative 1 with a reduced median for purposes of maintenance, while Alternative 2 was not preferred because the

right-of-way was too dramatically reduced; for Group 2 the preferred alternative was a hybrid that integrated the landscaped median and bike lanes of Alternative 1 into the reduced right-of-way Alternative 2.

Central North

<u>Economic Development:</u> Support existing and encourage new interim as well as long-term job-generating businesses.

<u>Land Use</u>: Create zoning and regulations that allow flexibility to attract desirable new uses as well as interim uses.

- The Central North was envisioned by community members as an opportunity for trade schools and **skill development for teens and young adults.**
- Light industry was recommended as the predominant use, and the sea of parking surrounding several buildings in this sub-area of the corridor should be infilled with small businesses or uses such as vineyards and community gardens.
- An alternate vision was proposed to create **quality destination shopping and dining** similar to Solano mall to attract visitors.

<u>Transportation</u>: Ensure easy access, mobility, and connectivity while guaranteeing safety and appropriate amenities to all users.

<u>Design Elements</u>: Create a safe and well-maintained streetscape that features culturally inspired design elements, and has essential pedestrian and bicycle amenities. [Design Alternative 1: widen sidewalks and add street trees and landscaping, maintain street parking, introduce bike lanes, and plant street trees in median. Design Alternative 2: reduce lane widths, eliminate median, create continuous turn lane, eliminate on-street parking, create a shared use path for pedestrians and bikes, provide a forty foot flex space for commercial, housing and open space opportunities.]

- As a long-term vision, participants recommended the **reuse of the existing railroad track for mass transit** locally connecting Sonoma Boulevard to Broadway and also to connect to Napa and Mare Island. This passenger rail corridor could then integrate open spaces and a mix of uses.
- A **light rail or trolley** with rubber tires to ride along Sonoma Boulevard was suggested.
- Participants preferred a **hybrid design alternative** with a smaller median than in Alternative 1 as well as a shared use side path for pedestrians and bikes as illustrated in Alternative 2. Bike lanes pushed to one side of the road were proposed, as well as bus turnouts to reduce impeding traffic flows.

Central South

<u>Economic Development</u>: Promote the creation of a neighborhood commercial node at a key intersection.

<u>Land Use</u>: Promote the creation of a district with a residential character and incentivize interim uses on vacant or underutilized parcels.

- Participants affirmed the goal to have this sub-area **focused on local youth and families** with a neighborhood-serving commercial node and predominantly residential uses throughout. The node could be located at the intersection of Sonoma Boulevard, Couch Street, and the existing rail tracks to prepare for future passenger rail and create a **high density and mixed use transit-oriented development center**.
- **Resources and services for families** were emphasized such as a Boys & Girls Club or community center, along with zoning to encourage **responsible and community-oriented businesses** that would promote community safety.

<u>Transportation</u>: Slow down traffic speeds and create a streetscape environment that is safe, comfortable, and attractive to all users.

<u>Design Elements</u>: Create a comfortable, safe, and attractive streetscape that features culturally inspired design elements, and balances the needs and amenities of all users. [Design Alternative 1: maintain sidewalk width, add street trees, maintain parallel street parking, introduce bike lanes, create median with turn lane. Design Alternative 2: widen sidewalks, add street trees, provide street furniture and spaces for street commerce, maintain parallel street parking, introduce bike lanes. Design Alternative 3: maintain sidewalk width, add street trees, introduce diagonal back-in parking.]

- Participants agreed with the **creation of a more complete streetscape environment** by reducing lane widths, introducing bike lanes and bike parking, and improving pedestrian amenities such as accessibility and lighting. However, these improvements should be balanced with **attention to traffic flows**: only allowing left turns at key intersections and increasing signal locations.
- As a means to introduce a variety of quirky and creative spaces in this sub-area of the corridor, community members recommended using "**parklets" similar to those in San Francisco** as well as **transforming alleys into small-scale pedestrian retail streets**.
- Design elements should **reflect and celebrate the diversity of local ethnic communities**.
- The preferred streetscape design alternative was a hybrid of Alternative 1 and 2 including both a median and wider sidewalks.

South

<u>Economic Development</u>: Develop a district with a unique identity that fosters local, start-up businesses; arts and cultural facilities; and street commerce.

<u>Land Use</u>: Ensure land use patterns that support the district's mixed-use, pedestrian friendly, and historical character.

- Participants affirmed the economic development and land use goals for the Downtown area of the corridor and indicated the importance of having a **vibrant nightlife** and an overall balanced mix of uses.
- Business incubation was seen as key to the future of the area and, building on the existing fiber-optic cable infrastructure, an **emphasis should be placed on attracting small tech businesses**.
- Auto uses should be discouraged from locating in this sub-area of the corridor in the future.

<u>Transportation</u>: Slow down traffic speeds and create a well-connected streetscape environment that promotes street life, pedestrian and bicycle movement, and retail vitality.

<u>Design Elements</u>: Create an inviting, attractive, safe and unique streetscape environment that features a gateway into Downtown, highlights the rich local history of the City, and promotes the unique artistic and local character of the Downtown area. [Design Alternative 1: maintain sidewalk width, add street trees, maintain parallel street parking, introduce bike lanes, create median with turn lane. Design Alternative 2: widen sidewalks, add street trees, provide street furniture and spaces for street commerce, maintain parallel street parking, introduce bike lanes. Design Alternative 3: maintain sidewalk width, add street trees, introduce diagonal back-in parking.]

- Design of the corridor in this sub-area should **reflect the historic character of Downtown Vallejo** while also integrating innovative streetscape elements to define the corridor into the future**.**
- **A prominent gateway element and roundabout** were proposed at the intersection of Sonoma Boulevard and Curtola to make visitors aware of the corridor as a destination and not a pass-through.
- The preferred streetscape design alternative for this sub-area of the corridor was a hybrid of Alternatives 2 and 3 that utilized back-in diagonal parking on one side of the street and parallel parking on the other to allow for bike lanes on one side.

IV. Next Steps

The meeting closed with a brief summary of some of the key comments received during the break-out groups and with an overview of upcoming meetings and next steps. The planning team will synthesize the results of the workshop feedback and create a preferred alternative for by the City, Community Advisory Committee, and agency partners in late winter and early spring.

The next Community meeting will be held in June 2012 at the Joseph Room in the Vallejo Public Library, 505 Santa Clara Street in Downtown Vallejo.

Sonoma Boulevard Corridor Design Plan

Community Advisory Committee #1 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long roadway between Curtola Parkway and Highway 37. Many types of commercial services, residential areas and transit connections are located within the project's Planning Area, offering a good physical framework to build upon in future improvements.

The Corridor Design Plan is in the beginning stages of the planning process. This current phase is focused on understanding the Planning Area's existing conditions as a baseline to create recommendations for future improvements. The first of three Community Workshops will be held in October 2011. To help guide the process as the plan develops, a Community Advisory Committee (CAC) has been formed to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large.

II. Meeting Format

On Wednesday, August 17, 2011, the City held the first CAC meeting, at the Joseph Room of the Vallejo Public Library in downtown Vallejo, from 7:00 p.m. to 8:45 p.m. At the time of this meeting, the CAC was composed of 11 members. All CAC meetings are open to the public.

This first meeting was attended by the following CAC members:

- Mick Weninger, Vallejo Bike Coalition
- Roberto Cortez, Civil Engineer
- David Jones, Business Owner
- Bill Elliot, Commercial Property Realtor
- Dennis Klimisch, Vallejo Planning Commission

The meeting began with an introduction from Michelle Hightower, the Planning Manager for the City of Vallejo; as well as self-introductions by each of the CAC members, City staff and the consultant team. Following the introductions, Chris Beynon, Principal and Project Manager from the lead consultant MIG, Inc., presented an overview of the project. This includes highlights of the project background, purpose and process. The presentation continued with an overview of the charges and responsibilities of the CAC members and a review of existing conditions.

Following the presentation Mr. Beynon facilitated CAC members in a discussion of assets, challenges, opportunities and visions for the corridor. Comments made by the participants during this discussion were recorded on a large wallgraphic by Maria Landoni, Project Associate from MIG.

Following this recorded discussion, Mr. Beynon presented some of the latest trends on streetscape design to CAC members.

III. Comments from CAC Members

Following are some of the highlights from the advisory committee discussion. Specific comments made by CAC members are included in the wallgraphic photo reductions at the end of this document.

Assets

Participants listed several positive qualities and characteristics of the corridor and surrounding areas.

Among the assets specific to the corridor, participants mentioned a wide right-of-way that could be reconfigured to better serve all modes of transportation and improve pedestrian and bike amenities and safety. The corridor has a good supply of parking in the southern portion, allowing for easy access to retail and services. Sidewalks are sufficiently wide for pedestrian comfort through the downtown area, although they are not continuous all along the corridor. The corridor is well connected with the network of local streets and area freeways, providing easy access to local and regional destinations.

In addition to these corridor-specific assets, Sonoma Boulevard is surrounded by a number of amenities, including stores that serve both local and regional customer bases. Kaiser Permanente, USA Car Museum, and downtown Vallejo are destinations located along or in close proximity to the corridor. The corridor has outstanding natural assets, including vistas of the San Francisco Bay, gracious topography and the White Slough. The corridor is surrounded by residential neighborhoods offering a good client base for potential new businesses, services or even transit that might appear along the corridor.

Finally, the corridor was described by committee members as a gateway to the Napa Valley, offering possibilities to explore and develop this identity as a way to enhance physical characteristics and economic opportunities.

Challenges and Opportunities

Advisory committee members identified many issues for Sonoma Boulevard that need to be addressed. Some of these issues may be addressed quickly to provide near-term impacts on the corridor; others might require more time, budgeting, support from the community, and shifts in market demand.

The corridor currently lacks appropriate bike and pedestrian amenities. However, due to its wide right-of-way, travel lanes could be narrowed. There is even potential to reduce the overall number of travel lanes, allowing for more support of bicycle transit and continuous sidewalks for pedestrians. The wide right-of-way currently represents an obstacle dividing the City into two, and discouraging pedestrian and bike users. However, there is potential to enhance existing intersections with bulbouts and clearly delineated crosswalks, as well as adding new pedestrian crosswalks in areas where traffic lights and crosswalks are currently far apart.

Participants identified a great opportunity to capture drive-through traffic by developing a range of businesses and services. The downtown area could become an entertainment district, building upon existing historic buildings and the area's attractive character. Wineries from the region could settle along Sonoma Boulevard, acting as a first stop or gateway to other destinations in the Napa or Sonoma valleys. There is an opportunity to increase the volume of street vendors, creating a quick transformation of street life.

The White Slough currently presents challenges, with a large homeless population settled around its margins and issues with poor water circulation leading to bad odors. However, participants identified the potential to transform this area into a space rich with wildlife, as well as with pedestrian and bike trails and other amenities

Vision

Building from the identification of assets, issues and opportunities, an initial vision began to emerge for the corridor.

CAC members envision Sonoma Boulevard becoming a corridor that has a strong sense of identity, building upon historical buildings, street grids, natural features and cultural resources. The corridor is well connected to the rest of the City as well as the region. Areas of the boulevard can become destinations, transforming the street from an obstacle dividing the City to a place of community gathering that allows easy access and flow across and along its entire length. Everyone will be welcome to the corridor as it becomes a safe, inviting and active thoroughfare. The process for creating the vision and plan for the corridor is highly participatory, where the community at large becomes involved and supports the plan.

IV. Next Steps

The meeting closed with a brief summary of some of the key comments received during the meeting and with an overview of upcoming events and next steps.

CAC members were assigned homework. They were asked to spread the word about the project to increase participation in community meetings; and to visit the corridor to identify additional assets, challenges and opportunities.

The next CAC meeting will be held on Wednesday, November 2, 2011 at the Joseph Room in the Vallejo Public Library, 505 Santa Clara St. in downtown Vallejo.

SONOMA BOULEVARD CORRIDOR DESIGN PLAN

CAC #1

ASSETS

- DOOR OF NAPA VALLEY!
- AVAILABLE COMMERCIAL SPACE
- AUTO-ORIENTED STORES
- EVENT CENTER
  - USA CAR MUSEUM
- PARKING DOWNTOWN
- WHITE SLOUGH!
- WORK WITH OTHER EXISTIN PLANS
  - WHITE SLOUGH
  - DOWNTOWN
  - SOLANO 360
- WIDE R.O.W ON THE NORT PORTION OF CORRIDOR
- EASY ACCESS TO/FROM CORRIDOR
- RESIDENTIAL CLOSE TO CORRIDOR
- WIDE R.O.W & MEDIAN
  - → GO TO BETTER USE!
- KAISER
- SENIOR HOUSING
- HISTORIC DOWNTOWN

VISION FOR SONOMA BOULEVARD

- SONOMA BECOMES A COMMUNITY VISION
- EVERYONE GETS INVOLVED!
- WHITE SLOUGH AS A NATURAL ASSET!
- GATEWAY TO NAPA VALLEY!
- REGIONAL CONNECTIVITY! RAIL THAT COMBES TO NAPA WE TRAIN
- BEAUTIFY ENVIRONMENT FOR PEDESTR & OTHER MODES
- CONNECT LENGTH AND ACROSS CORRIDOR
- AUTHENTIC HISTORIC CHARACTER
- SAFE ENVIRONMENT FOR EVERYONE!
- DOWNTOWN VALLEJO ENTERTAINMENT DISTRICT!
- DOWTOWN DESTINATION!

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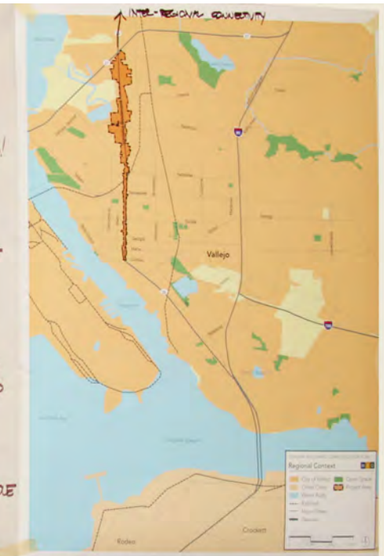
CHALLENGES & OPPORTUNITIES

- VALLEJO IS NOT BIKE FRIENDLY RIGHT NOW.. OPPORT TO BRING
- WINERIES TO DOWTOWN
- CAPTURE DRIVE-THROUGH TRAFFIC @ SONOMA & CURTOLA
- ENTERTAINMENT DISTRICT DOWN!
- THERE ARE NO BIKE AMENITIES RIGHT NOW
- BIKING BETTER SOUTH OF TENNESSEE THAN SOUTH (THROUGH DOWN)
- ENHANCE WHITE SLOUGH! → MAKE IT AN ASSET & AMENITY
- CITY OPPEN TO COORDINATE PLANS FOR SONOMA & OTHERS TO CREATE SYNERGY

BIKES ARE FORCED TO RIDE ALONG TRUCKS & HEAVY TRAFFIC

- NORTH NO SIDEWALKS! OR BIKE ACCESS
- WHITE SLOUGH CAN BE A CHALLENGE NEEDS ENHANCEMENT & MAINTENANCE
  - ALGAE BLOOM
- HOMELESS AROUND WHITE SLOUGH
- IMPROVE STREET TO PROMOTE BUSINESSES
- POOR CONNECTIVITY ACROSS BLVD.
- SAFETY CONCERNS
- CONNECT/TREAT WHOLE CORRIDOR
- PARKING ISSUES SOUTH OF TRACKS
- HAVE OTHER COUNTIES CONNECT WITH THIS PLAN
- OPPORT. FOR VENDORS DOWNTOWN



- GET EVERYONE INVOLVED
  - PEOPLE ALONG CORRIDOR

WHITE SLOUGH PLAN
SMELL FROM ALGAE BLOOM
WALMART SITE
HOMELESS
-VENDORS DOWNTOWN
-CRIME-
REFUGEES TO ATTRACT
ENTERTAINMENT CENTER
LACK OF CROSSINGS
MIX OF USES
NEGLECTED PROPERTIES
BAD ENVIRO FOR BUSINESSES
SLOW TRAFFIC
NEBRASKA
WIDE R.O.W.
NO PEDS/BIKE ACCESS
FUN ACCESS
CONNECT TO NAPA WINE TRAIN
HOMELESS

sonoma boulevard corridor design plan

Community Advisory Committee #2 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. Acknowledged as the "spine" of the community, Sonoma Boulevard is a vitally important street that shapes and impacts the economic vitality, social fabric, physical connections, and perceptions of the entire City. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long stretch of Sonoma Boulevard between Curtola Parkway and Highway 37. Many types of commercial services, residential areas and transit connections are located within the project's Planning Area, providing a strong physical framework to build upon in future improvements.

The Corridor Design Plan is in the early stages of its second phase: Development of Concepts and Alternatives. This phase is focused on developing a range of plan concepts and strategies that will be embodied in alternative development scenarios for the Sonoma Boulevard Corridor. To help guide the process as the plan develops, a Community Advisory Committee (CAC) has been formed to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large.

II. Meeting Format

On Wednesday, November 2, 2011, the City held the second CAC meeting at the Joseph Room of the Vallejo Public Library in Downtown Vallejo, from 6:30 to 8:30 p.m. At the time of this meeting, the CAC was composed of 13 members. All CAC sessions are open to the public.

This second meeting was attended by the following CAC members:

- Dennis Klimisch, Planning Commissioner/Business Owner
- Bill Elliot, Commercial Property Realtor
- Randall Sperring, O'Brien Kiernan Investment Co.
- Marian Swanson, Vallejo Heritage Team
- Dennis Brinson, Property Owner
- David Jones, Foster Lumber
- Steve Swanson (seating for Pearl Tranter)

The meeting began with an introduction from Chris Beynon, Principal and Project Manager from the lead urban planning and design consultant, MIG, Inc., as well as self-introductions by each of the CAC members, City staff and the rest of the consultant team. Following the introductions, Mr. Beynon presented an overview of the project, including highlights of its background, purpose and process. The presentation continued with a brief summary of the Existing Conditions Analysis, followed by an overview of the Community Workshop #1 results and a summary of participant input. The presentation ended with an overview of a draft "Community Vision and Opportunities Framework". Following the presentation, Mr. Beynon facilitated CAC members in a discussion of the draft Community Vision and Opportunities Framework and emerging ideas for the development of Land Uses and Transportation Alternatives. Comments made by the participants were recorded on a flip chart as well as directly on a large print of the framework matrix by Maria Landoni, Project Associate from MIG.

III. Comments from CAC Members

Following are highlights from the advisory committee discussion. Specific comments made by CAC members are included in the Community Vision and Opportunities Framework photo reduction at the end of this document.

Vision Statement

Committee members described additional qualities for Sonoma Boulevard that they would like to see included in the draft Vision Statement.

Participants mentioned that the statement should reflect how the corridor should have a **consistent and coherent design**, or corridor experience, all along the Planning Area, even if there are **different districts with unique qualities**. They also indicated that the design should highlight the **rich history of the corridor and the City of Vallejo**. As the spine of the community, the corridor should **draw people in, have an appropriate human scale, and be walkable**.

Transformative Strategies

Advisory committee members generally agreed with the proposed Transformative Strategies that are part of the Community Vision and Opportunities Framework; however, they raised some additional concepts, such as that the corridor should be **functional, walkable and highlight the rich cultural diversity of Vallejo**. Also, participants suggested adding that the strategies should promote a **range of land uses** along the corridor.

Opportunities Matrix

Building on the Vision Statement and Transformative Strategies input, participants discussed in detail four different sub-areas within the corridor (South, Central South, Central North and North). These four sub-areas were analyzed in terms of proposed land uses, potential design elements, transportation options, and economic development opportunities and challenges.

South

The South Subarea is defined by Curtola Parkway in the south and Florida Street to the north. Similar to all other subareas in the corridor it is one parcel deep on both east and west sides of Sonoma Blvd

Committee members envision this sub-area – encompassing the Downtown and linking to nearby historic neighborhoods – as a **walkable, mixed-use district**. The roadway should have a narrowed vehicular corridor that provides more space for **pedestrian circulation and activities** on the sidewalk, encourages **public transit and biking**, and includes different **parking opportunities** – such as angled parking – to calm traffic and support local retailers. The inclusion of well-designed **signage and historical references** will be crucial to remaking this sub-area into a attractive gateway into central Vallejo and the Sonoma Boulevard corridor.

Central South

The Central-South Subarea is defined by Florida St in the south and Couch St to the north.

Participants see this sub-area as a **lower-density, mixed-use district that supports small and local businesses** that serve the daily needs of local residents. **Additional street parking** achieved through the reduction of travel lanes should be explored and could potentially benefit these small businesses that currently lack appropriate parking supply. Committee members see the potential for **augmenting existing land uses**, such as exploring the integration of urban agriculture and interim land uses**. Improved maintenance** of both the public and private realms, such as through the implementation of a **façade improvement program**, could have a great impact in this sub-area. Finally, participants suggested that due to the large Latino population that lives in this sub-area, the area's **design elements and land use orientation could be inspired by the Latino culture**.

Central North

The Central-North Subarea is defined by Couch St to the south and Redwood St to the north.

The vision presented for this sub-area was to create a clean and safe streetscape environment; promote the growth of existing businesses and light industrial uses; and foster transitional and interim uses and urban agriculture on vacant parcels. Committee members agreed with the ideas presented, but they had a few additional suggestions, including the need to **improve and/or redesign the center median** along Sonoma Boulevard. The median – if it continues to be there in the future – should be **landscaped and beautified with native and drought-tolerant plants**. Large canopy trees would also greatly improve the look and feel of the corridor.

North

The North Subarea is defined by Redwood St to the south and I-37 Highway to the north.

Participants feel that the North end of the Planning Area has the **most immediate potential to bring economic development** to the City and therefore should be a priority area for improvement. This sub-area should become an **attractive and enticing gateway** into Vallejo and the businesses and activities along the corridor. Committee members suggested that **mid- and large-size businesses should continue to be attracted** to locate in the North sub-area. They also suggested that other land uses such as **residential developments, senior housing (especially around White Slough) and medical facilities** could play an important role in the future of Sonoma Boulevard. There is a critical need to **improve the public realm**, including sidewalks, crosswalks and intersections, landscaping and the overall look and feel of the streetscape environment. The **White Slough area should be improved** and highlighted as a valuable natural resource with the potential to attract and generate recreation and tourism.

IV. Next Steps

The meeting closed with a brief summary of the key comments received during the meeting and with an overview of upcoming events and next steps.

The next CAC meeting will be held from 6:30 to 8:30 pm on Wednesday, December 14, 2011 at the Joseph Room in the John F. Kennedy Library, 505 Santa Clara Street in Downtown Vallejo.

CORRIDOR EXPERIENCE
- SPINE OF THE COMMUNITY!
- SONOMA BLVD IS 'FACE' OF VALLEJO
- CONSISTENCY
  WELL CONNECTED
- FUNCTIONAL DESIGN/CORRIDOR

Sonoma Boulevard

An attractive, functional street that promotes economic vitality, social safety and well-being, and environmental health along the corridor and throughout the City of Vallejo.

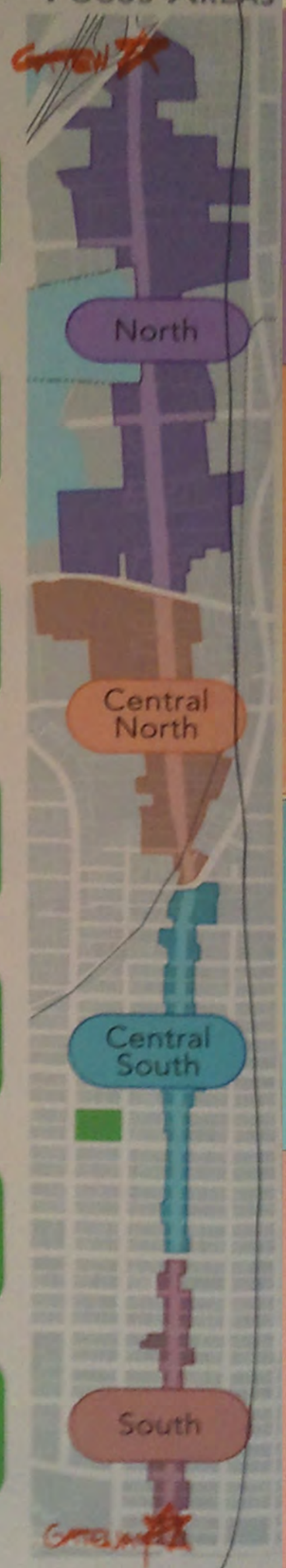
- HISTORY OF CORRIDOR
- ATTRACTIVE/CHARACTER
- DRAW PEOPLE IN/MAKE PEOPLE STOP
- SIGNAGE/IMAGE
- HUMAN SCALE
- GATEWAYS!
- WALKABLE!

Transformative Strategies

RANGE OF L.U.!

- job opportunities and thriving businesses
- destination nodes and distinct districts
  CULTURAL DIVERSITY!
- FUNCTIONAL attractive and well maintained streetscape
  HISTORIC
- range of transportation modes
- WALKABLE accessible, safe and connected streetscape
- flexible, adaptable and vibrant network of spaces
- sustainable and environmentally friendly design
  TREES!

Focus Areas



	Vision	Land Uses	Design Elements	Transportation	Economic Development
North	• Restore natural wetland habitat • Strengthen regional draw with key retailers and desirable land uses • Build upon nearby medical facilities • ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ o GATEWAY!	• Active and passive open space • Wildlife habitat preserve • Commercial and retail • Urban agriculture • Viticulture • RESIDENTIAL (HOMES NOT FRONTING SONOMA) o SENIOR HOUSING o 'HOSPITAL VILLAGE'	• Gateway element • Lush landscaping • Green infrastructure • Street trees • Pedestrian and bicycle trails • More crosswalks • Street lighting o MID-BLOCK CROSSINGS FOR VEHICLES & PEOPLE! o WHITE SLOUGH SHOULD LOOK NATURAL! o CATTAILS	• Balance user needs • Allow large traffic volumes but improve safety of all users • RAIL? • OUTSIDE BOX TRANSPORTATION	• Medical village • Urban agriculture • Open space and habitat preserve • Eco-tourism • Outdoor activities and businesses • NICE TAXES
Central North	• Create a clean and safe streetscape environment • Promote the growth of existing businesses and light industrial uses • Foster transitional and interim uses and urban agriculture on vacant parcels • ~~[illegible]~~	• Medium- to large-footprint businesses • Transitional and interim uses • Urban agriculture • Viticulture	• Street trees • Street lighting • Pedestrian and bicycle infrastructure at nodes and main intersections • More crosswalks o MEDIAN TREATMENT o LANDSCAPE ON MEDIAN (GREEN VALLEY RD) o NATIVE PLANTINGS	• Increase train service to Napa Valley or re-use tracks and ROW for other modes	• Transitional and interim uses on vacant parcels • Urban agriculture
Central South	• Create a linear mixed-use district that invites people to use all modes of transit • ~~Promote sustainable practices~~ o SMALL BUSINESS ENVIRONMENT	• Locally serving commercial • Small-footprint retail • Residential • Office o BASIC/DAILY SERVICES o URBAN AG	• Lush landscaping • Street trees • Street lighting • Pedestrian and bicycle amenities o FAÇADE IMPROVEMENT & SIGNAGE o SIDEWALK APPEAL o WELL MAINTAINED SIDEWALKS o LATINO CULTURE/LATINO HISTORY	• Strengthen pedestrian and bicycle connections • Improved transit amenities o BETTER PARKING/DIAGONAL o NOT TO BUSES.. o TRUCKS PARK ON STREET o LOADING ZONES & TIMES	• Improved maintenance of vacant buildings • Transitional and interim uses on vacant parcels
South	• Create an active, vibrant downtown with lively streets day and night • Promote pedestrian activity • Create design rooted in the rich local history of Vallejo • Provide for a central community space or plaza • ~~[illegible]~~ • HUMAN SCALE	• Transitional and interim • Mixed-use district • Locally serving retail • Small-footprint businesses • Specialty and unique businesses • Street vendors • Farmer's market and street fairs o LIVE-WORK o MIXED-USE (UPPER STORY RES)	• Highlight views • Emphasis on pedestrian amenities and crosswalks • Street trees • Street lighting • Street furniture and art • Infrastructure for street commerce • Preserve historic structures PARIO • SIGNAGE/WAYFINDING • WIDE SIDEWALKS • LIST OF BUSINESSES/POINTS OF INTEREST • GATEWAY • HISTORIC LANDMARKS	• Focus on pedestrians • Create bicycle lanes • Improve transit amenities • Connect to regional transit (ferry and bus lines/terminal) • Create bicycle connection from ferry and bus terminal to rest of city and region • Emphasize cars less • 2 TRAVEL LANES? o BUS TOURS TO SONOMA (TOCELY) TO 121 o DIAGONAL PARKING WOULD BENEFIT BUSINESSES • SLOW CAR & COMBINE W/BIKE LANES	• Street commerce • Utilization of vacant buildings • Improved maintenance of vacant buildings • Temporary displays on vacant buildings (art and crafts)

Community Advisory Committee #3 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long roadway between Curtola Parkway and Highway 37. Many types of commercial services, residential areas, and transit connections are located within the project's Planning Area, offering a good physical framework to build upon in future improvements.

The Corridor Design Plan is in the early stages of its Second Phase: Development of Concepts and Alternatives. This current phase is focused on developing a range of plan concepts and strategies that will be embodied in alternative development scenarios for the Sonoma Boulevard Corridor. The second of three Community Workshops will be held in January 2012. To help guide the process as the plan develops, a Community Advisory Committee (CAC) has been formed to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large.

II. Meeting Format

On Wednesday, December 14, 2011, the City held the third CAC meeting at the Joseph Room of the Vallejo Public Library in downtown Vallejo, from 6:30 p.m. to 8:30 p.m. At the time of this meeting, the CAC was composed of 13 members. All CAC meetings are open to the public.

This second meeting was attended by the following CAC members:

- Dennis Klimisch, Planning Commissioner/Business Owner
- Randall Sperring, O'Brien Kiernan Investment Co.
- Dennis Brinson, Property Owner
- Pearl Jones Tranter, Architectural Heritage and Landmarks Commission
- Jack Anthony, Jack Anthony Ind. Inc
- Mick Weniger, Vallejo Bicycle Coalition

The meeting began with an introduction from Chris Beynon, Principal and Project Manager from the lead consultant, MIG, Inc., as well as self-introductions by each of the CAC members, City staff, and the rest of the consultant team. Following the introductions, Mr. Beynon presented an overview of the project including highlights of the project background, purpose, and process. The presentation continued with a brief summary of the Existing Conditions Analysis focusing on Economics and Market Conditions. Following this background information, the presentation and discussion was focused on confirming the Community Vision and Opportunities Framework that had been originally introduced to CAC members during the previous meeting in early November and since had been refined based on CAC members' comments as well as input from City staff and the subconsultant team.

The presentation and facilitated discussion then moved into new material and the discussion of Emerging Ideas for the Development of Land Uses and Transportation Alternatives for the corridor. Land Use Alternatives and Concepts were presented by Maria Landoni, Project Associate from MIG, and the presentation and discussion concluded with a presentation from

Ellen Poling, Project Manager from Fehr and Peers, the Transportation and Parking subconsultant firm.

Comments made by the participants during the meeting were recorded on a large wallgraphic paper by Chris Beynon and Maria Landoni alternatively. A photo reduction of the wallgraphic is attached at the end of this summary.

III. Comments from CAC Members

Following are some of the highlights from the advisory committee discussion. Specific comments made by CAC members are included in the wallgraphic photo reduction at the end of this document.

Vision Statement

After reading the draft Vision Statement, participants described additional qualities for Sonoma Boulevard that they would like to see included in this statement and they also suggested some refinement in the wording and concepts describing the Vision.

Participants mentioned that the Vision Statement should describe qualities of the street such as: dynamic, walkable, comfortable, and having trees along the corridor. They also indicated that the design should highlight the multi-cultural character of the corridor and provide safety for all users including pedestrians and bikers.

Transformative Strategies and Opportunities Framework

Advisory committee members agreed with the refinements that were done to the Transformative Strategies and Opportunities Framework since the framework was introduced to them in CAC meeting #2 on November 2. No further comments or refinements were made during this meeting.

Emerging Ideas for the Development of Land Uses and Transportation Alternatives

Building on the preceding discussion, and being reminded of some of the economic constraints and opportunities that emerged during the Existing Conditions Analysis phase, participants were guided to focus the discussion for the rest of the evening on the emerging ideas and concepts for the development of Land Uses and Transportation Alternatives for each of the four different sub-areas within the corridor (North, Central North, Central South, and South).

North and Central North Sub-areas

While discussing land use alternatives and development types for the North sub-area, participants agreed with the concepts presented that build on existing assets and the character of the North Sub-area. Proposed land uses include large footprint retail and office space, medical support facilities, housing, and urban agriculture and viticulture. With adequate restoration and improvements, the White Slough has the potential to become a key natural asset of this sub-area. Land uses that tap into this natural asset include active and passive outdoor recreation and wildlife habitat. Another asset of the North sub-area is the Kaiser Permanente Hospital which presents opportunities to generate complementary land uses such as housing for employees and seniors who could benefit from the proximity to the hospital, and catering services, among other supporting uses. Urban agriculture and viticulture are seen as viable uses in the short term that would allow for the development of other more permanent uses in the long term, if so desired.

While discussing land uses for the Central North sub-area, participants supported ideas to bring interim uses that would inject life to the corridor in the short term. These transitional uses could include an antique market, urban agriculture and viticulture, a food market, and other seasonal/interim businesses. In addition, participants agreed that it might be necessary to take

a close look at the current zoning code and potentially introduce changes that would allow for more flexibility in terms of what type of businesses can settle in this sub-area of the corridor.

The transportation alternatives for the North and Central North sub-areas included three new different configurations (‘Pedestrian and Bike Priority,’ ‘Development Priority and Reduced Right of Way,’ and ‘Maximum Development Priority and Reduced Right of Way’) as well as the existing conditions. In all scenarios, the right of way is redistributed to safely accommodate all modes of transportation including pedestrians, bikers, and vehicles. The alternative that participants selected as most desirable was the one described as ‘Maximum Development Priority and Reduced Right of Way.’ This alternative proposes a corridor without center median or parking lanes, but that would preserve two-travel lanes in each direction and a continuous central turn lane. The excess or remaining land gained from the ‘road-diet’ would become ‘flex space’ that could be developed in different ways.

South and Central South Sub-areas

Based on the economic and market analysis, these sub-areas of the corridor were identified as having potential to develop over time a larger residential presence and character, focusing commercial uses at a key intersection or node. Participants had a mixed reaction to this concept. Currently these sub-areas have scattered commercial uses, and some participants thought it could be difficult to change that character. Other participants supported the idea and thought that a larger residential character with a concentrated commercial node would be desirable. It was also proposed that the commercial node located at a key intersection would be generally composed of locally-serving retail and basic services with potential to also have small office space for non-profit type businesses. Additional street parking achieved through the reduction of travel lanes should be explored and could potentially benefit these small businesses that currently lack appropriate parking supply. Participants see the potential for additional land uses, and would like to explore urban agriculture and interim land uses. Improved maintenance of both the publicand private realms, for example with the implementation of a façade improvement program, could have a great impact in these sub-areas. Finally, participants suggested that due to the large Latino population of these sub-areas, some of the design elements could be inspired by the Latino culture.

While discussing land uses for the South sub-area, participants agreed with the concept of creating a walkable, mixed-use district with a narrowed vehicular corridor that provides more space for pedestrian circulation and activities on the sidewalk. Most of this sub-area of the corridor falls within the boundary enclosed by the Downtown Vallejo Specific Plan; therefore, all proposed land uses should correspond with those proposed under the Specific Plan. Land uses for this sub-area include mixed-use (commercial ground floor with residential or office above); live-work and incubator spaces; small footprint and unique businesses; grocery store and other locally-serving retail; arts and cultural facilities, street fairs, street commerce and other uses that activate the street life.

The transportation alternatives for the South and Central South sub-areas included four new different configurations (‘Streetscape, Landscape and Bike,’ ‘Pedestrian and Bike Priority,’ ‘Caltrans Compliant,’ and ‘Parking Priority’) as well as the existing conditions. In all scenarios, the right of way is redistributed to safely accommodate all modes of transportation including pedestrians, bikers, and vehicles by proposing a ‘road-diet’ and going from two travel lanes in each direction to one travel lane in each direction. The excess space is utilized in different ways (wider sidewalks, more landscaping, wider bike lanes, additional parking space) depending on each of the four alternatives named above. For the South and Central South sub-areas there was not an alternative that participants unanimously selected as most desirable.

IV. Next Steps

The meeting closed with a brief summary of some of the key comments received during the meeting and with an overview of upcoming events and next steps.

Prior to the next meeting, CAC members were asked to take a careful look at the Land Uses and Transportation Alternatives for each sub-area and provide additional comments.

The next CAC meeting will be held from 6:30 p.m. to 8:30 pm on Wednesday, February 29, 2012 at the Joseph Room in the John F. Kennedy Library, 505 Santa Clara Street in Downtown Vallejo.

DECEMBER 14

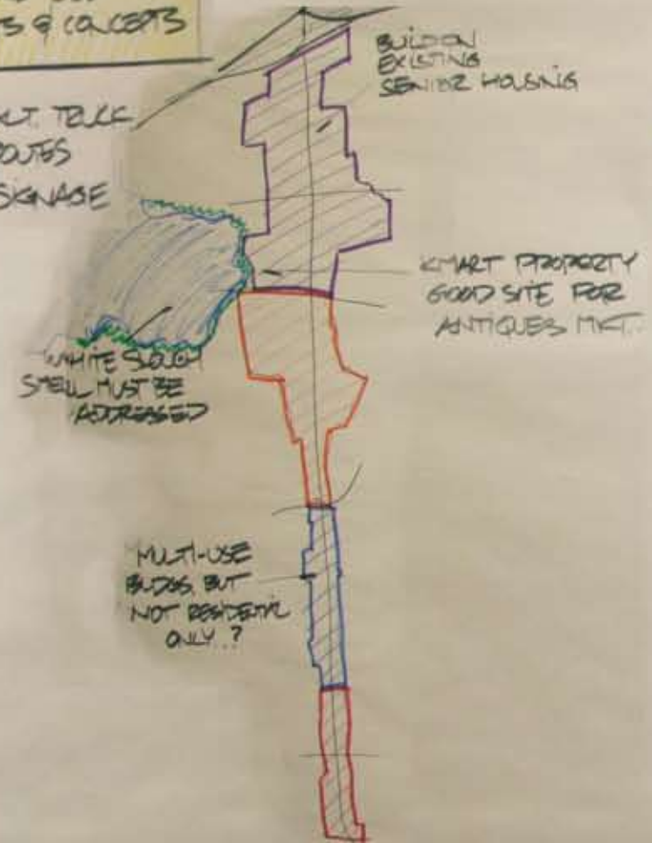
COMMUNITY ADVISORY COMMITTE #3

VISION FOR SONOMA BLVD

- DYNAMIC ATTRACTIVE BEAUTIFUL!
- TREE-LINED STREET
- PEDESTRIAN & BIKE SAFETY
- HUMAN-SCALE?
  - WALKABLE
  - ~~FUNCTIONAL ST~~
- FUNCTIONAL?
  - PEDESTRIAN FRIENDLY
- MULTI-CULTURAL!

LAND USE ALTS & CONCEPTS

- ALT TRUCK ROUTES
- SIGNAGE



TRANSPORTATION ALTERNATIVES

NORTH & CENTRAL NORTH

- CENTER LANE (TURN)
  - DESIGNED FOR SLOWER SPEEDS
- ALLOWS TURN @ ANY POINT
  - NEED TO LOOK IN DEPTH @ EXISTING DRIVEWAYS
- ALTERNATIVE #B IS IT FEASIBLE?
- ALTERNATIVE C
  - INTERESTING!
  - ALLOWS + TURN
  - INTRODUCE MEDIAN
- DOES NORTH NEED PARKING ON THE ST?
  - A FEW BUSINESSES USE ST PARKING
- ALT A & B
  - NEED + LEFT TURN POCKETS
  - NO PARKING
- WHAT DO WE USE FLEX SPACE?
  - DEVELOPMENT TO FUND STREET IMPROVEMENTS
  - GREEN BELT
  - AG BELT

SOUTH & CENTRAL SOUTH

- TURNS FOR TRUCKS
  - WHERE?
  - LOOK @ TRUCK ROUTES
- ALTERNATIVE BIKE ROUTES ON OTHER STREETS?
- INTERESTING IDEAS C & D

OTHER IDEAS

- RAIL ALONG SB?
  - CONNECTS TRAILS TO TRANSIT STATION -

Community Advisory Committee #4 Meeting Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and street design plan for the Sonoma Boulevard/Route 29 corridor. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realms along the 5.5 mile-long roadway between Curtola Parkway and Highway 37. Many types of commercial services, residential areas, and transit connections are located within the project's Planning Area, offering a good physical framework to build upon in future improvements.

The Corridor Design Plan is in the late stages of its Second Phase: Development of Concepts and Alternatives. This current phase is focused on developing a range of plan concepts and strategies that will be embodied in alternative development scenarios for the Sonoma Boulevard Corridor. The second of three Community Workshops was held in January 2012, where the community began to identify and give shape to a preferred alterative for the corridor. To help guide the process as the plan develops, a Community Advisory Committee (CAC) has been formed to provide feedback and to serve as a liaison among the City, consultant team, and community-at-large.

II. Meeting Format

On Wednesday, February 29, 2012, the City held the fourth CAC meeting at the Joseph Room of the Vallejo Public Library in downtown Vallejo, from 6:30 p.m. to 8:30 p.m. At the time of this meeting, the CAC was composed of 13 members. All CAC meetings are open to the public.

This second meeting was attended by the following CAC members:

- Dennis Klimisch, Planning Commissioner/Business Owner
- Randall Sperring, O'Brien Kiernan Investment Co.
- Dennis Brinson, Property Owner
- Pearl Jones Tranter, Architectural Heritage and Landmarks Commission
- Mick Weniger, Vallejo Bicycle Coalition
- Marian Swanson, Vallejo Heritage Team
- Bill Elliott, Elliott Real State

The meeting began with an introduction from Chris Beynon, Principal and Project Manager from the lead consultant, MIG, Inc., as well as self-introductions by each of the CAC members, City staff, and the rest of the consultant team. Following the introductions, Mr. Beynon presented an overview of the project process including highlights from two technical meetings held with City Staff and Caltrans. The presentation continued with a brief summary of key points discussed with the community during Community Workshop #2 which took place on January 11, 2012. Following, the presentation and discussion was focused on the Land Use Activation and Mobility Strategy for the corridor. The Land Use Activation and Mobility Strategy synthesize in a diagrammatic form all the major interventions for the corridor and provide a road map for the physical improvements that will transform Sonoma Blvd to achieve the type of environment described in the Vision Statement.

The presentation and facilitated discussion then moved into new material with the discussion of

the Implementation Matrix. The implementation actions will incorporate short-, medium- and long-term strategies for Economic Development, Land Use, Transportation and Design Elements categories. The actions are also divided by location having a number of actions that are applicable for the Overall Corridor and others that are relevant to each of the four subareas: North, Central North, Central South and South. The matrix also identifies Primary Responsibility and Partners involving roles and responsibilities of the public and private sectors. Among the list of actions, some of them were highlighted (with background color) as Quick Wins. Quick Wins are implementation actions that can be easier to implement, have a very short implementation timeframe and can create immediate and visible change in the corridor.

The Implementation Matrix was presented by Maria Landoni, Project Associate from MIG. Comments made by the participants regarding the Implementation Matric were recorded on a large printout of the matrix by Chris Beynon and Maria Landoni alternatively. A photo reduction of the Implementation Matrix is attached at the end of this summary.

III. Comments from CAC Members

Following are some of the highlights from the advisory committee discussion. Specific comments made by CAC members are included in the photo reduction of the Implementation Matrix at the end of this document.

Implementation Matrix

Community Advisory Committee had a general positive response to the implementation actions listed on the Implementation Matrix. Most actions were approved without modifications; however, a few actions were identified as needing further refinement. The photo reductions at the end of this summary highlight all the specific comments made by CAC members.

One key action item discussed was the creation of an Implementation Team to carry forth the actions listed in the matrix. This team would also be expected to become stewards for the Sonoma Boulevard Corridor Design Plan. The action item to create an Implementation Team was one of the “Quick Wins” highlighted in the matrix. A few CAC members manifested interest in becoming part of the Implementation Team and take leadership advancing the implementation actions.

IV. Next Steps

The meeting closed with a brief summary of some of the key comments received during the meeting and with an overview of upcoming events and next steps.

CAC members were asked to take a careful look at the Implementation Matrix and provide additional comments.

The next CAC meeting will be held from 6:30 p.m. to 8:30 pm on Wednesday, May 30, 2012 at the Joseph Room in the John F. Kennedy Library, 505 Santa Clara Street in Downtown Vallejo.

Implementation Matrix

Overall Corridor

Timeframe
Short: 1 year
Medium: 2-3 years
Long: over 3 years

Quick Wins

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Economic Development	ED 1: Develop a street food vending ordinance to allow designated areas for street commerce	Short	City	
	* ED 2: Create a cluster of street food vendors in close proximity to the proposed Nodes located at Sonoma Blvd and Sereno Dr (Mixed-Use Retail Node), Sonoma Blvd between Indiana St and Tennessee St (Neighborhood-Serving Retail Node) and Downtown Gateway Node (Sonoma Blvd and Georgia St)	Short	City	Street Food Vendors
	ED 3: Facilitate discussions with property and business owners to attain their support for this plan and vision a. Interview business owners to identify their future plans, potential assistance with support services. b. Use business owners to identify prospective new tenants for vacant spaces and help arrange contacts with those prospects. - BUSINESS ATTRACTION & RETENTION PROGRAM	Short	City Implementation Team → ECONOMIC DV. - BENEFIT DISTRICT	Property and Business Owners CHAMBER OF COMMERCE LOCAL BROKERS
	ED 4: Promote the utilization of vacant and underutilized parcels with interim uses/businesses that can generate employment and revenue a. Amend the zoning ordinance to include an overlay zone for interim uses. b. Identify an organization that can take on program management responsibilities for overseeing a start-up/pop-up program, define requirements for renters, etc. c. Enter into agreements with owners of vacant spaces to allow temporary/short-term uses. d. Create a marketing initiative to market spaces available for start-up/pop-up use. e. Create holiday-related festivals/special events to increase foot traffic and awareness of start-up/pop-up hops. (S)	Short to Medium	City Implementation Team	Property and Business Owners
	ED 5: Incentivize start-up businesses to locate along Sonoma Blvd and provide business incubation opportunities a. Work with a property owner to create a Mercado/indoor market with multiple stalls to provide start-up/incubator locations.	Medium to Long		
MOVE INTO GOAL	~~ED 6: Provide construction and permanent job opportunities for local residents~~	~~MEDIUM TO LONG~~		

Implementation Matrix

Overall Corridor

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Land Use	* LU 1: Identify one vacant or underutilized parcel in the North/Central North subareas and one in the South/Central South subareas to start an interim use program to stimulate economic development and improve streetscape perception and activity – PROXIMITY TO NODES!	Short	E.D. CITY NORTH (MERVINS) SOUTH (N-W CORNER OF CURTOLA)	
COMBINE	LU 2: Look for opportunities to occupy and activate the identified vacant and underutilized parcels in the North/Central North subareas and South/Central South subareas with interim uses a. Consider creation of a series of special events on these sites to increase activity	Short to Medium		
	LU 3: Allow and promote agricultural and viticulture industries and uses to ~~settle~~ LOCATE along the corridor a. Contact organizations that do urban agriculture to seek a viable model and advice b. Identify a local organization or neighborhood group that can take management responsibilities for overseeing an agricultural production c. Identify vacant parcels and property owners that would enter a lease or share agreement of their land	Short to Medium		VALLEJO COOP
	LU 4: Revise zoning ordinance to ensure that it allows desirable land uses identified in this plan, and provide flexibility for new uses.	Medium	CITY PLANNING	
Transportation (MOVE TO N-CN)	* T 1: Restripe street to include bike lanes all along Sonoma Blvd – START @ NORTH & CENTRAL NORM WIDE ROW.	Short		
	T 2: Construct pedestrian enhancements (i.e. countdown signals, audible/tactile pedestrian push buttons, ramp improvements) at signalized crossings in the following locations: • Sereno Dr • Redwood Dr • Valle Vista Ave • Nebraska St • Tennessee St • Florida St • Georgia St • Curtola Pkwy	Medium to Long		CALTRANS FUNDING?

Implementation Matrix

Overall Corridor

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Transportation QW!	T 3: Improve crosswalk visibility at key intersections with paint or special material like pavers in the following locations: • Lewis Brown Dr • Yolano Dr • Sereno Dr • Redwood Dr • Valle Vista Ave • Mississippi St/Couch St • Nebraska St • Indiana St • Tennessee St • Florida St • Georgia St • Curtola Pkwy	Short to Medium	CITY MAINT	
	T 4: Provide bulbouts to shorten crosswalk distance and to provide more space to accommodate pedestrian amenities like furniture, trees and planting areas in the following locations: • Yolano Dr • Sereno Dr • Redwood Dr • Valle Vista Ave • Mississippi St/Couch St • Nebraska St • Indiana St • Tennessee St • Florida St • Georgia St	Medium to Long		
	T 5: Improve existing transit stops by providing transit shelters that protect users from elements and offer seating a. Design transit shelters to match style and feel of structures present at the Vallejo Transit Center hub b. Prioritize locations at or close to the proposed Nodes at Sonoma Blvd and Sereno Dr (Mixed-Use Retail Node), Sonoma Blvd between Indiana St and Tennessee St (Neighborhood-Serving Retail Node) and Downtown Gateway Node (Sonoma Blvd and Georgia St)	Medium to Long		
	T 6: Link proposed bike lanes along Sonoma Blvd to bike network in surrounding areas and the region. Create a bike network that connects the ferry station to bike trails that go to Napa Valley	Short to Long		VINE TRAIL NAPA BIKE GROUPS
	T 7: Construct a streetcar line along Sonoma Blvd OR NEAR	Long		

Implementation Matrix

Overall Corridor

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Design Elements	DE 1: Improve landscaping along center median in the North and Central North subareas by including drought-tolerant plantings and trees – IRRIGATION? & SURROUNDING WHITE SLOUGH!	Short		CALTRANS
	DE 2: Plant street trees along the entirety of the corridor along sidewalks. Consider planting a double row of trees in the North/Central North subareas where ROW is wide enough to accommodate them WHERE? ① CVS THROUGH SLOUGH	Short to Long	② GATEWAY	
	DE 3: Include landscaping and plant materials along sidewalks a. Prioritize proposed Node locations (stated previously) so that pedestrian environment is enhanced, attractive and inviting	Short to Medium		
	DE 4: Include way-finding signage highlighting key amenities and destinations a. Create an identifiable signage style that is consistent for the entire corridor	Short to Medium	S – SOME BASED OR ROW – HISTORIC POINT OF INTEREST	
	DE 5: Include street furniture and pedestrian amenities along the corridor at key intersections, bus stops and gathering nodes a. Prioritize proposed Node locations (previously stated) and bus stops	Short to Medium		
NEEDS MORE THOUGHT / REFINEMENT	DE 6: Give each subarea a unique identity that differentiates it from the others. This identity could be provided through the use of colors, materials, art, and selection of streetscape elements a. The corridor should be perceived as a unit that has consistent elements tying together different subareas; however, based on historical or cultural influences each of the subareas could have subtle elements that differentiate them from one another – TYPES OF RETAIL MORE SPECIFIC TO EACH AREA	Short to Long		
	DE 7: Seek opportunities to incorporate art and artistic expression along the corridor, particularly site-specific art that is inspired by the history, culture or natural local environment a. Prioritize Gateways and Node locations (previously stated)	Short to Long		
	DE 8: Improve street lighting along the corridor by providing additional pedestrian lights a. Prioritize proposed Node locations (previously stated)	Medium to Long		

Implementation Matrix

Overall Corridor

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Partnerships and Programs	* **PP 1:** Form and Implementation Team to advance actions stated in this Implementation Matrix and achieve goals stated in the Plan	Short/Now!		
	PP 2: Create an appropriate maintenance program for the corridor to keep it clean and attractive at all times	Short		
	PP 3: Form partnerships with business and property owners to encourage them to engage in the upkeep and maintenance of landscaping and cleanliness of the street	Short		

Implementation Matrix

North Subarea

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Economic Development	ED 1: Attract large footprint businesses and destination retail such as auto dealerships a. Prioritize area identified as Regional/Destination Commercial (from HWY 37 up to White Slough) b. Create outreach materials of potential sites to deliver to potential users	Short to Medium	LARGE FOOTPRINT RETAILERS, (ETC)	
	ED 2: Market the area for medical villages which may include medical clinics, nursing schools, and work force housing for nearby hospitals RETIREMENT / SENIOR HOUSING	Short to Medium		
Land Use	LU 1: Create a Mixed-Use Retail Node at the intersection of Sonoma Blvd and Sereno Dr	Short to Long		
	* LU 2: Repurpose underutilized parking lots for interim uses and/or seek opportunities to create new retail and housing development, especially along sidewalks a. Interview business owner from CVS property/parking lot to identify partnering opportunities	Short to Long		
Transportation	T 1: Build sidewalks on currently missing sidewalk stretches on both east and west sides of the corridor	Short to Medium		
	T 2: Create a new mid-block crosswalk between Lewis Brown Dr and Yolano Dr. New crosswalk should be signalized and have a pedestrian refuge. Prioritize a location close to bus stop or other pedestrian amenities	Medium		
	T 3: Create a class I bike path in the stretch where Sonoma Blvd crosses the White Slough	Medium to Long		
	T 4: Create a shared pedestrian and bicycle path on the sidewalk in other stretches of North Subarea (not where the Blvd crosses the White Slough)	Medium to Long		
Design Elements	* DE 1: Build a gateway into Vallejo from Hwy-37 that incorporates landscape, art and signage	Short FINANCING		
	* DE 2: Add trees to the existing median and consider planting a double row to create a lush canopy	Short		
	DE 3: Give the North subarea a unique identity inspired by cultural or natural elements/assets relevant to it	Short to Long		
	DE 4: Design stormwater planters and locate them on the planting strip along sidewalks a. Prioritize locations in close proximity to the White Slough so that storm water is filtered/cleaned before it drains to the slough	Medium to Long		

UNDER. UTILITIES

Implementation Matrix

Central North Subarea

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Economic Development	**ED 1:** Provide business incubation and vocational training opportunities targeted at local residents ACTIONS / IMPLEMENTATION	Short/ MEDIUM		
Land Use	**LU 1:** Repurpose underutilized parking lots for interim uses and/or seek opportunities to create new building footprints, especially along sidewalks	Short to Long		
Transportation	**T 1:** Create two new mid-block crosswalk one between Redwood St and Valle Vista Ave and the other between Valle Vista Ave and Couch St. New crosswalk should be signalized and have a pedestrian refuge. Prioritize a location close to bus stop or other pedestrian amenities	Medium		
Design Elements	* **DE 1:** Add trees to the existing median and consider planting a double row to create a lush canopy	Short		
	DE 2: Give the Central North subarea a unique identity inspired by cultural/ethnic influences of the surrounding neighborhood	Short to Long		
	DE 3: Design stormwater planters and locate them on the planting strip along sidewalks	Medium to Long		

UNDERGROUND UTILITIES

Implementation Matrix

Central South Subarea

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Economic Development	**ED 1:** Incentivize start-up businesses to locate in proximity to the proposed Neighborhood-Serving Retail Node (Sonoma Blvd between Indiana St and Tennessee St) creating a cluster of businesses that act as catalyst for development	Short to Medium		
	ED 2: Develop a façade improvement program for small businesses (focus resources on neighborhood node area)	Medium to Long		
Land Use	**LU 1:** Work with property owners from vacant/underutilized parcels to establish temporary uses a. Identify an organization that can take on program management responsibilities for overseeing a temporary rental program, define requirements for renters, etc. b. Enter into agreements with owners of vacant/underutilized sites to allow temporary/short-term uses. c. Create a marketing initiative to market spaces available for temporary use.	Short to Medium		
Transportation	**T 1:** Reconfigure street design to have two travel lanes –one in each direction– with a center median/turn lane, bike lanes and parking on both sides of the street	Short to Long		
	T 2: Seek opportunities to reutilize train tracks and provide a commuter train that links Vallejo with Napa Valley	Long		
Design Elements	**DE 1:** Provide bicycle parking in proximity to the proposed Neighborhood-Serving Retail Node	Short to Medium		
	DE 2: Give the Central South subarea a unique identity inspired by cultural/ethnic influences	Short to Long		

Implementation Matrix

South Subarea

Category	Specific Action	Timeframe	Primary Responsibility	Partners
Economic Development	* ED 1: Designate areas for street commerce and food vendors	Short		
	ED 2: Incentivize clusters of start-up and pop-up businesses in vacant commercial spaces a. Use business owners to identify prospective new tenants for vacant spaces and help arrange contacts with those prospects.	Short		
	ED 3: Incentivize start-up businesses to locate in proximity to the proposed Downtown Gateway Node (intersection of Sonoma Blvd and Georgia Street) creating a cluster of businesses that act as catalyst for development	Short to Long		
	ED 4: Develop a façade improvement program for small businesses (focus resources on the Downtown Gateway Node area)	Short to Medium		
	* ED 5: Encourage outdoor dining and business spillover into the sidewalk. Allow business owners to utilize "flex" parking stalls to accommodate spillover activities	Short to Medium		
	ED 6: Increase amount of allowable liquor licenses to improve downtown restaurant and nightlife culture	Short to Medium		
Land Use	* LU 1: Work with property owners from vacant/underutilized parcels to establish temporary uses a. Consider creation of a series of special events on these sites to increase activity.	Short		
Transportation	T 1: Reconfigure street design to have two travel lanes –one in each direction– with a center	Short to Long		
	T 2: Install special paving at the intersection of Georgia Street and Sonoma	Short to Medium		
	T 3: [redacted] a traffic circle or roundabout at the intersection of Sonoma Blvd and Curtola Pkwy STUDY FEASIBILITY	Medium to Long		
Design Elements	* DE 1: Designate areas where street food vendors can set movable furniture on the street to encouraging outdoor dining	Short		
	DE 2: Build a gateway into Downtown that incorporates landscape, art and signage	Short		
	DE 3: Provide bicycle parking in proximity to the proposed Downtown Gateway Node	Short to Medium		
	DE 4: Provide historic markers that highlight important places and events as well as landmark buildings and structures	Short to Medium		
	DE 5: Give the South subarea a unique identity inspired by historical or cultural elements relevant to it that is an extension of the identity for the Downtown area. The palette of design elements should stay consistent with design guidelines provided under the Downtown Vallejo Specific Plan	Short to Long		

sonoma boulevard corridor design plan

Sonoma Boulevard Corridor Design Plan

Stakeholder Interviews Summary

I. Introduction

The City of Vallejo is conducting a planning process that will culminate in the creation of a land use and schematic street design plan for the Sonoma Boulevard/Route 29 corridor. The Corridor Design Plan is focused on crafting a vision and specific steps to guide development and improvements to the public and private realm along the 5.5 mile-long roadway between Curtola Parkway and Highway 37. Many types of commercial services, residential areas and transit connections are located in the project's Planning Area, offering a good physical framework with which to build upon in future improvements.

The Corridor Design Plan is in the beginning phase of its planning process. This current phase is focused on understanding the Planning Area's existing condition as a baseline to create recommendations for improvements in the future. To help guide the process as the plan develops, a number of stakeholder interviews were performed to increase outreach opportunities to key community members and groups. Their vision, ideas and feedback will be essential as the Corridor Design Plan takes shape in the coming months.

II. Format

On Tuesday, August 16; Wednesday, August 17; and Monday, August 29, 2011, phone interviews were conducted to stakeholders for the Sonoma Boulevard Corridor Design Plan. Chris Beynon, principal and project manager from the lead consultant team MIG, Inc. conducted five (5) interviews. The community members interviewed were Dennis Klimisch, Planning Commissioner and Property owner; Erin Hannigan, City Councilwoman; Dave Jones, Business owner; Marti Brown, City Councilwoman; and Terry Curtola, Former Mayor and former City Council member.

The conversations during these phone interviews were about the Expectations and Desired Outcomes, assets, challenges and opportunities, Process and People, and vision for the corridor. Comments made by the stakeholders during these calls were typed on a computer and the notes are following this section of the document. Some minor edits were done to clarify concepts. At the end of the document is a list of the questions stakeholders received prior to the phone interviews to prepare for them.

Notes from the phone interviews are listed in the order they took place.

III. Stakeholder Phone Interviews

Stakeholder Interview with Dennis Klimisch

Date: Tuesday, August 16, 2011
Role: Planning Commissioner and Property owner of auto collision repair business (corner of Couch and Valle Vista)

Expectations and Desired Outcomes

- Vallejo does not receive the political and economic support that it deserves
- Vallejo does not get its fair due in relation to other communities in the North Bay.
- The Corridor Design Plan should put pressure on Caltrans to enhance and maintain properly the corridor.
- There is a need for more open communication between Caltrans and the shopping centers (particularly in north).

Assets

- Traffic flows well along the Sonoma Blvd. The timing of lights is good in south portion of the corridor.

Challenges and Opportunities

- Caltrans needs to invest more in Vallejo with an appropriate maintenance schedule and performing necessary improvements.
- The corridor needs repairs and a maintenance schedule that is kept up.
- Portions of the corridor are neglected both in the private and public realm. From highway 37 south to Nebraska landscaping is neglected and properties are not maintained; this area is extremely blighted.
- Volunteer groups should be allowed to help improve and maintain corridor.
- Utilities need to go underground on east side.
- Caltrans is more limited as to what they can do in the Downtown area.
- Biking is a viable transportation mode that should be encouraged
- Promoting walking is more challenging; most people move across the corridor but there is not a lot of walking along Sonoma Boulevard.
- This project needs to focus on maintenance rater than beautification.
- Retailers are leaving the plan area moving to American Canyon instead of Vallejo (Mervyn's, Bill Lang Cadillac, K-Mart, Blockbuster Video, Meadows Video)
- The corridor needs a couple of sit down restaurants (like Black Bear diner)
- Vallejo is diverse culturally (African-American, Caucasian, Filipino, Hispanic and Indian); however, but it has worked against us – we can't all come to the same conclusion; there are different Chamber of Commerces for each group that don't coordinate
- The City has areas where different cultures concentrate: Broadway – Hispanic; Springs Road – Filipino; Fairgrounds Drive area – African-American.
- Parking lots need improvements as they are currently torn, pothole-ridden and not well lit.
- There is a need for more and better coordination between agencies (City, Caltrans) as well as business and property owners to maintain Sonoma Blvd.
- There should be a number where for people to call with comments or complaints.
- Find cost-effective ways to clean and maintain the corridor.

Process/People

- Extend outreach efforts to include the following community members/stakeholders:
  - Greg Campagno, owner of Nissan dealership
  - Tom Cannavesio, Solano Auto Body
  - Dave Jones, owner of Foster Lumber Company
  - Gary or Larry Glenn, Three Brothers Furniture
  - Pinky Santiago, West American Bank
  - Ken Ingersall, owner of Gracie's Barbeque
  - Four Seasons Construction

Vision

- Sonoma Boulevard becomes a better maintained street where agencies, businesses and property owners take responsibility and collaborate to improve the corridor.

Stakeholder Interview with Erin Hannigan

Date: Tuesday, August 16, 2011
Role: City Council Member, homeowner, works for State Farm Insurance

Expectations and Desired Outcomes

- Create a broad public outreach with many opportunities to voice concerns, ideas and vision.
- Provide an outreach program at different times of day, days of week, bring show on road to senior center, community center, etc.
- This plan needs easily and seamlessly connect/link to the rest of the City
- Support the best uses for properties.

Assets

- The corridor is owned by Caltrans, so they have to maintain the roadway.
- There are a range of community amenities along the corridor including beautiful churches and schools.
- There are a few new stores and retail in Sonoma Boulevard.

Challenges and Opportunities

- There are many challenges in the corridor.
- The corridor currently acts as an obstacle bisecting the City.
- Redevelopment plans should be carefully planed not to repeat mistakes done in the past (memories of 1960s urban renewal; demolished a Carnegie Library, Julia Morgan building).
- Sonoma Blvd should be study in sections to address the specific qualities of different stretches.
- Consider including linear, multi-story, residential developments.
- Along the corridor there are blighted properties, vacant places, smatterings of car dealerships (some now defunct).
- The railroad crossing is currently a challenge.
- Sonoma Blvd is not a very pedestrian-friendly street; pedestrian cross at mid-block due to the long block without appropriate crosswalks creating an unsafe environment for all users.
- Explore different strategies to make the corridor more pedestrian friendly.
- Some key amenities in proximity to the corridor are difficult to access since the corridor is hard to cross like the senior housing at Redwood St.
- The corridor needs to address the needs of poor families without transportation who walk to work, schools, churches and other amenities.
- Explore viability of commercial/retail developments like Walmart.
- Look into developing a hotel strip along the corridor.
- Coordinate with Solano 360 efforts.
- Make the most of our location: Sears Point, Wine Country, Six Flags, SF Ferry – Vallejo can capitalize on its location, be the hub to stay while visitors are going to these destinations; Vallejo could offer cheaper services, hotels and restaurants.
- Explore opportunities to develop Kids sports and amateur sports.
- Consider creating a truck stop in the north end of the planning area.

Process/People

- Extend outreach efforts to include the following community members/stakeholders:

* Terry Curtola, former Mayor; worked in Economic Development, worked with car dealers on Sonoma Blvd, secured money for improvements
* Ken Ingersall, Gracie's Barbeque
* Bus Transit System (Soltrans); routes, ridership
* Dave Jones, owner of Foster Lumber Company
* Jack Anthony, owns Seven Flags Car Wash
* Buck Kamphausen, owns USA World Classics Museum + other properties and Phil Elstrum

Vision

- Sonoma Blvd becomes a walkable corridor lined with grocery stores, restaurants and job centers.
- The vision for Sonoma Blvd addressed the different sections of the corridor and highlights their unique characteristics. The vision looks at the different segments of the corridor and builds upon their particular quality.
- The design along the corridor should respect and emphasize man-made as well as natural features and adapt the design to the specific qualities of a certain area.
- Strive to preserve historic assets.

Stakeholder Interview with Dave Jones

Date: Tuesday, August 16, 2011
Role: Business owner of Foster Lumber Company (3280 Sonoma Valle Vista)

Expectations and Desired Outcomes

- Create a continuous blvd all the way through town
- Dress up the corridor, draw people into town/downtown
- Make it easy to get around and to downtown
- Notch Vallejo up on Caltrans' priority list
- Need leadership and vision; get people on the same page, not in a cat fight
- Need a plan and a commitment that is better than competing cities'

Assets

- Road infrastructure works; traffic signals, traffic flow all work (especially in north)
- Location, direction to downtown, goes through town so it can be used as a regional attractor

Challenges and Opportunities

- Vacant land and commercial buildings
- Not very appealing
- White Slough has a putrid smell
- Development requirements are counterproductive to attracting development, e.g. Walmart had to turn its back onto the boulevard
- Nebraska street going south, commercial properties are blighted and need to go
- Caltrans doesn't maintain the corridor; overgrown, trash
- Vallejo is low priority for Caltrans
- Tennessee Street to top of hill is worst stretch
- Curtola at Sonoma on West side is an eyesore
- Loss of car dealerships, not consolidated now

Process/People

- Extend outreach efforts to include the following community members/stakeholders:
    - Greg Compagno, Nissan Dealership

Vision

- Redeveloped retail
- Access route to a vibrant downtown
- Commuter trains, hotel
- Casino on Mare Island

Stakeholder Interview with Marti Brown

Date: Wednesday, August 17, 2011
Role: City Council Member, City Planner in Sacramento

Expectations and Desired Outcomes

- The Corridor Design Plan should be bigger than just a streetscape plan; should be as comprehensive as we can make it.
- This plan should coordinate with other City wide planning efforts having a long range view of what makes sense for the city with a contextual view (Solano 360, waterfront, downtown planning, other districts and corridors, etc.)
- Create a long-term sustainable plan in a City wide larger context.
- Think creatively about breaking down the corridor.
- Consider how much commercial use is really viable along the corridor.
- Explore what makes good sense in terms of land use types, commercial nodes and hubs.
- Consider what is the value of having Sonoma Boulevard be a state highway. Does it make sense to have Caltrans abandon it? What is the process?

Assets

- White Slough is a natural asset located on the on northeast side of boulevard.
- The railroad tracks have potential to increase connectivity to and from Vallejo.

Challenges and Opportunities

- City is not satisfied with current caretaking of the boulevard.
- The White Slough plan is a pretty good plan, adopted by County, City and BCDC – great ideas in there, great recreational opportunity
- The corridor has a mish-mash of commercial uses and too many vacancies.
- Development should be modest around White Slough to preserve and enhance natural features.
- The roadway is very long and changes along its whole length presenting a challenge to plan and design.
- Connectivity to Downtown Vallejo should be stronger and the Downtown feel and character should be emphasized.
- More than one railroad track crosses the boulevard. Find out what rail lines are in use and what opportunities are there to repurpose the unused tracks for other uses. Is there an opportunity to convert rails to trails?
- City Council is drafting an urban farm ordinance (on vacant lots, also on private property land that community members could partner with) to promote community health, community gardens and urban agriculture.
- Explore potential for interim uses in vacant and underutilized parcels (if you don't have the resources, financing, infrastructure to build something permanent): mobile vending, farmers market, urban farming.

Process/People

- Extend outreach efforts to include the following community members/stakeholders:
  - Business and property owners adjacent to boulevard
  - Board of realtors, Vallejo economic development corporation, chamber of commerce
  - Lack of creative non-profit neighborhood/community-based groups
  - Vallejo Heights Neighborhood Association! (Katie N.)

* Heritage District representation (neighborhood just east of downtown); Marian Swanson
* People that live around City Park (one block in from Sonoma Boulevard and Tennessee intersection, southwest corner)

Vision

- Sonoma Boulevard becomes a vibrant, vital commercial corridor that provides for a variety of interests and uses, and complements other commercial areas and uses in the City – truly mixed-use, from small shopping centers that are pedestrian and bike friendly to recreation uses around White Slough.

Stakeholder Interview with Terry Curtola

Date: Monday, August 29, 2011
Role: Former Mayor and former City Council member; worked in the Economic Development Department for the City of Vallejo from 2001 to 2005 creating the industry association, as well as with private developers.

Expectations and Desired Outcomes

- Improve economic development.
- This should be a smaller project. Focus planning efforts on north portion of the corridor; shorten the length of the project area! Tennessee to Highway 37 should be the extent, or even Nebraska street northward.
- Don't have this plan sit on a shelf! Do not let this plan become a planning exercise.
- Don't let the plan get too visionary, or nothing will happen!
- Create a gateway to/from Napa.
- Improve aesthetics of corridor.
- Improve and upgrade infrastructure.
- Break into long-term (land use regulations, design guidelines) and short-term (median improvements, give businesses a chance to survive before they all become vacant) provide implementation steps.

Assets

- Retail and businesses north of Nebraska street are holding on (Seafood City, Foster Lumber, Campagno auto dealers, vacant land for development).
- These property and business owners are most likely to want to help beautify the neighborhood.

Challenges and Opportunities

- Currently the corridor is dilapidated, with a poor sense of arrival or gateway.
- City needs to beautify the stretch north of Nebraska.
- The street is full of weeds, fences are falling down.
- The White Slough stinks, particularly in September and October.
- City is more concerned with graffiti, not supporting business owners directly.
- This plan needs to reach out to the major property owners!

Process/People

- Extend outreach efforts to include the following community members/stakeholders:
  - David Jones, Foster Lumber
  - Greg Campagno, Nissan
  - Ron Barber, sold dealerships, kept property, now running businesses and property in the City
  - Bill Elliot, real estate broker
  - Owner of Seafood City
  - Tom Foley, property manager of Vallejo Plaza
  - Bill Mares, owns DeMares Jewelers in Vallejo Plaza center
  - Owner of Mervyn's vacant property

Vision

- The Vision from his previous report presentation (2004), except for ordinance for the big box store.

Stakeholder Interviews – Draft Questions

Desired Outcomes

- What is your vision for Sonoma Boulevard for the next three to five years? What about the longer term of 10-20 years?
- What role do you think this process can play in supporting initiatives and engagement throughout the Vallejo community?

Assets

- What are positive characteristics about Sonoma Boulevard that should be preserved and/or built upon in this planning process?
- Sonoma Boulevard is a long street. What are the different areas or segments of the corridor and how would you characterize them?

Challenges and Opportunities

- What are your ideas for making Sonoma Boulevard a safer, more attractive and vibrant place?
- What specific challenges/opportunities in the physical environment of the corridor need to be addressed (automobile speeds, pedestrian connections, development sites, etc.)?
- How can the corridor better connect Downtown, neighborhoods and commercial districts, acting as a central spine for the City?
- What recommendations do you propose for improving the business environment and overall economic health of Sonoma Boulevard?
- What uses or activities are missing along Sonoma Boulevard?

Outreach Strategies

- How can this planning process best reach out to other stakeholders?
- Are there certain people, associations or organizations that you recommend we should contact as part of this process?