



CITY OF LAGUNA HILLS TRAFFIC COMMISSION

REGULAR MEETING AGENDA

Wednesday, November 16, 2022 – 7:00 PM

Chris Bieber - Vice Chair

Michael Caputo - Commissioner

Manuel Hernandez - Commissioner

Mark Schaff - Commissioner

Location: City Council Chamber, 24035 El Toro Road, Laguna Hills, CA 92653

Any person wishing to address the Traffic Commission on any matter, whether or not it appears on this Agenda, is asked to complete a "Request to Speak" form available on the table at the back of the Chamber. The completed form is to be submitted to the Recording Secretary prior to an individual being heard by the Traffic Commission. Completion of the form is voluntary. All persons may attend the meeting regardless of whether this form is completed.

Members of the public wishing to address the Traffic Commission can do so during the Public Comments portion of the Agenda with a time limitation of three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes for Public Comments. If you are commenting on an Agenda item, your comments will be heard at the time that item is scheduled on the Agenda. If you are addressing the Commission on an item not listed on the Agenda, the Traffic Commission is prohibited by law from discussing or taking any action on that item.

CALL TO ORDER

Resolution No. 96-04-09-1 established rules of decorum for public meetings held by the City of Laguna Hills. Resolution No. 96-04-09-1 is available on the table at the back of the City Council Chamber.

PLEDGE OF ALLEGIANCE

ROLL CALL OF COMMISSION MEMBERS

1. PUBLIC COMMENTS

This is the time to address the Traffic Commission on any matter not listed on this Agenda that is within the subject matter jurisdiction of the Commission. Public Comments are limited to three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes.

2. MINUTES

2.1 Minutes

Recommendation: That the Traffic Commission approve the Minutes of July 20, 2022.

3. PRESENTATIONS

4. ADMINISTRATIVE REPORTS

4.1 Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

Recommendation: 1) That the Traffic Commission recommend any suggested modifications to the City staff report for presentation to City Council; 2) That the Traffic Commission receive and file the report made by Laguna Hills Police Services; 3) That the Traffic Commission recommend that the City Council direct City staff to update the Master Bicycle Plan and appropriate funding for this work; 4) That the Traffic Commission recommend the City Council direct Police Services to monitor and observe violations of State law and City codes related to motorized bicycles and devices and report back to the Commission in one year.

4.2 Traffic Signal Master Plan Update and Construction of New Traffic Signals

Recommendation: That the Traffic Commission recommend: 1) City staff and its Traffic Engineering Consultant update the Traffic Signal Master Plan; and 2) City staff return to the Traffic Commission with recommendations on traffic signals to construct using available CARITS funding for approval by City Council.

4.3 Speed Feedback Signs

Recommendation: That the Traffic Commission approve the installation of two speed feedback signs, one on Paseo de Valencia and one on La Paz Road.

4.4 Radar Trailer Schedule

Recommendation: That the Traffic Commission receive and file the report.

4.5 Do Not Block Intersection Signs

Recommendation: That the Traffic Commission recommend: 1) City staff present a Resolution to the City Council for adoption authorizing the establishment of "Do Not Block Intersection" locations and signage at the discretion of the City Engineer.

5. INFORMATIONAL ITEMS

5.1. Sheriff's Department Verbal Report**6. COMMISSIONER COMMENTS****7. ADJOURNMENT**

The next Regular Meeting of the Traffic Commission will be January 18, 2023, at 7:00 p.m. in the City Council Chamber, located at 24035 El Toro Road, Laguna Hills California.

CERTIFICATION

I, JOE AMES. P.E., T.E., Public Works Director/City Engineer of the City of Laguna Hills, do hereby certify that a copy of the foregoing Agenda was posted at Laguna Hills City Hall, Laguna Hills Community Center, and the Courtyard at La Paz Center by November 10, 2022, at 5:00 p.m.



Joe Ames, P.E., T.E, Public Works Director/City Engineer

November 10, 2022

Date

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, you should contact the office of the Public Works Director/City Engineer at (949) 707-2650. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to assure access.

Materials related to an item on this Agenda submitted to the Commission after distribution of the Agenda packet are available for public inspection in the Public Services Department at 24035 El Toro Road, Laguna Hills, California, during normal business hours.



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Minutes

RECOMMENDATION: That the Traffic Commission approve the Minutes of July 20, 2022.

ATTACHMENTS:

- Minutes July 20 2022

**CITY OF LAGUNA HILLS
TRAFFIC COMMISSION**

**REGULAR MEETING
MINUTES
Wednesday, July 20, 2022**

CALL TO ORDER

The meeting was called to order at 7:00 p.m. by Vice Chair Bieber.

PLEDGE OF ALLEGIANCE: Commissioner Hernandez

ROLL CALL OF COMMISSION MEMBERS

Attendee Name	Title	Status	Arrived
Chris Bieber	Vice Chair	Present	
Manuel Hernandez	Commissioner	Present	
Mark Schaff	Commissioner	Absent	
Michael Caputo	Commissioner	Present	

1 Election of Chair

Recommendation: That the Traffic Commission Elect a New Chair.

A motion to continue this item to the next Traffic Commission meeting was made by Vice Chair Bieber, seconded by Commissioner Hernandez.

RESULT:	CONTINUED [UNANIMOUS]
MOVER:	Chris Bieber, Vice Chair
SECONDER:	Manuel Hernandez, Commissioner
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner, Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

2 Election of Vice Chair

Recommendation: That the Traffic Commission Elect a New Vice Chair.

A motion to continue this item to the next Traffic Commission meeting was made by Vice Chair Bieber, seconded by Commissioner Hernandez.

Attachment: Minutes July 20 2022 (3016 : Minutes)

RESULT:	CONTINUED [UNANIMOUS]
MOVER:	Chris Bieber, Vice Chair
SECONDER:	Manuel Hernandez, Commissioner
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner, Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

1. PUBLIC COMMENTS

There were no public comments on non-agendized items.

2. MINUTES

2.1 Minutes

Recommendation: That the Traffic Commission Approve the Minutes of March 16, 2022.

RESULT:	APPROVED [2-0]
MOVER:	Manuel Hernandez, Commissioner
SECONDER:	Chris Bieber, Vice Chair
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner
ABSTAIN:	Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

3. PRESENTATIONS

There were no presentations.

4. ADMINISTRATIVE REPORTS

4.1 2022 Traffic Flow Map

Acting Public Services Director Amber Shah reviewed the information provided in the staff report and responded to Commissioner requests for additional information.

Recommendation: That the Traffic Commission Receive and File the Report.

RESULT:	RECEIVE AND FILE [UNANIMOUS]
MOVER:	Chris Bieber, Vice Chair
SECONDER:	Manuel Hernandez, Commissioner
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner, Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

4.2 Protected/Permissive Left Turn Phasing

Acting Public Services Director Amber Shah reviewed the information provided in the staff report and responded to Commissioner requests for additional information.

Recommendation: That the Traffic Commission Receive and File the Report.

RESULT:	RECEIVE AND FILE [UNANIMOUS]
MOVER:	Mike Caputo, Commissioner
SECONDER:	Manuel Hernandez, Commissioner
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner, Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

5. INFORMATIONAL ITEMS

5.1. Sheriff's Department Verbal Report

Police Services staff were unable to attend the meeting.

5.2 Radar Speed Trailer

Recommendation: That the Traffic Commission Receive and File the Report.

RESULT:	RECEIVE AND FILE [UNANIMOUS]
MOVER:	Manuel Hernandez, Commissioner
SECONDER:	Chris Bieber, Vice Chair
AYES:	Chris Bieber, Vice Chair, Manuel Hernandez, Commissioner, Mike Caputo, Commissioner
ABSENT:	Mark Schaff, Commissioner

6. COMMISSIONER COMMENTS

There were no Commissioner comments.

7. ADJOURNMENT

There being no further business before the Traffic Commission at this session, Vice Chair Bieber declared the meeting adjourned at 7:16 p.m.

Julie Comella, Administrative Assistant

ATTEST:

Chris Bieber, Vice Chair

Approved at meeting of November 16, 2022

Attachment: Minutes July 20 2022 (3016 : Minutes)



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

RECOMMENDATION: 1) That the Traffic Commission recommend any suggested modifications to the City staff report for presentation to City Council; 2) That the Traffic Commission receive and file the report made by Laguna Hills Police Services; 3) That the Traffic Commission recommend that the City Council direct City staff to update the Master Bicycle Plan and appropriate funding for this work; 4) That the Traffic Commission recommend the City Council direct Police Services to monitor and observe violations of State law and City codes related to motorized bicycles and devices and report back to the Commission in one year.

SUMMARY:

At the September 13, 2022, City Council meeting, the City Council directed the Traffic Commission and City staff to research safety concerns over bicycles, electric bicycles, and motorized mobility devices and provide a report to City Council. To this end, City staff has prepared the attached report and is making the recommendations listed above for next steps associated with the topic.

BACKGROUND:

The Public Works Director/City Engineer understood this topic was raised by Councilmember Sedgwick after learning about the City of Carlsbad's declared "state of emergency" related to recent electric bicyclist fatalities, and after Mayor Wheeler was contacted separately by a Laguna Hills resident requesting more dedicated bicycle routes through the City.

DISCUSSION:

In response to City Council's direction for the Traffic Commission and City staff to research concerns over bicycle, electric bicycle, and motorized mobility device safety, the Public Works Director/City Engineer is providing the following report outlining the following:

1. Types of electric bicycles (e-bikes) and motorized mobility devices, relative speeds, and why riding them on sidewalks, trails, and other areas can pose a risk to other users;
2. Existing City ordinances and State law regarding bicycles and motorized mobility devices;
3. A summary of Police Services observations regarding safety issues and enforcement (which will be supported by a separate verbal presentation by Police Services);
4. Existing bicycle routes and classes of bicycle routes; and
5. Proposed solutions including education, new ordinances, and new bicycle infrastructure, including ideas for future new dedicated Class 1 bikeways.

In addition, Police Services will make a presentation to the Commission at this meeting regarding their own observations and enforcement.

FISCAL IMPACT:

None.

ATTACHMENTS:

- Memorandum to the Traffic Commission Concerning Bicycle Safety

CITY OF LAGUNA HILLS



MEMORANDUM

DATE: November 16, 2022

TO: Traffic Commission

FROM: Joe Ames, P.E., T.E., Public Works Director/City Engineer

SUBJECT: Bicycle, Electric Bicycle, and Motorized Mobility Device Safety

In response to City Council's direction for the Traffic Commission and City staff to research concerns over bicycle, electric bicycle, and motorized mobility device safety, the Public Works Director/City Engineer is providing this memorandum reporting on the following:

1. Types of electric bicycles (e-bikes) and motorized mobility devices, relative speeds, and why riding them on sidewalks, trails, and other areas can pose a risk to other users;
2. Existing City ordinances and State law regarding bicycles and motorized mobility devices;
3. A summary of observations by Police Services regarding safety issues and enforcement;
4. Existing bicycle routes and classes of bicycle routes; and
5. Proposed solutions including education, new ordinances, and new bicycle infrastructure, including ideas for future new dedicated Class 1 bikeways.

In addition, Police Services will make a presentation to the Traffic Commission at the November 16, 2022 meeting regarding their own observations and enforcement. This memorandum, after receipt of comments from the Traffic Commission, will be modified for use in a future report to City Council.

Types of Bike Routes

While bicycle facility design standards are not covered directly in the California Highway Design Manual or the California Manual of Uniform Traffic Control Devices, there are bicycle facility classifications that have been agreed upon throughout the United States based upon the degree of separation from motor vehicle traffic. These classifications are defined in California Streets and Highways Code Section 890.4.

The Orange County Transportation Authority's *District 5 Bikeways Strategy* provides the following summaries and diagrams outlining the facility classifications:

Shared Roadways (No bikeway designation): Bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. In some instances, streets may be fully adequate and safe without bicycle specific signing and pavement markings.

Class III Bikeways (Bike Routes): Shared Roadways configured with pavement markings, signage and other treatments including directional signage, traffic diverters, chicanes, chokers and/or other traffic calming devices to reduce vehicle speeds or volumes. Such enhanced treatments often are associated with Bicycle Boulevards.



An example of a Class III Bikeway (Bike Route)

Class II Bikeways (Bike Lanes): These bikeways use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists.



An example of a Class II Bikeway (Bike Lanes)

Class IV Bikeways (Cycle Tracks): These bikeways are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.



Example of a Class IV Bikeway (Cycle Tracks)

Class 1 Bikeways (Bike Paths): These bikeways are facilities separated from roadways for use by bicyclists and pedestrians.



An example of a Class I Bikeway (Bike Path or Trail)

State Laws Defining These Devices

The State Vehicle Code separates and specifically defines electric bicycles, electric personal assistive mobility devices, electrically motorized skateboards/boards, motorized scooters, and shared mobility devices.

The definition of an electric bicycle is provided in Vehicle Code Section 312.5:

(a) An “electric bicycle” is a bicycle equipped with fully operable pedals and an electric motor of less than 750 watts.

(1) A “class 1 electric bicycle,” or “low-speed pedal-assisted electric bicycle,” is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.

(2) A “class 2 electric bicycle,” or “low-speed throttle-assisted electric bicycle,” is a bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.

(3) A “class 3 electric bicycle,” or “speed pedal-assisted electric bicycle,” is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour, and equipped with a speedometer.

(b) A person riding an electric bicycle, as defined in this section, is subject to Article 4 (commencing with Section 21200) of Chapter 1 of Division 11.

(c) On and after January 1, 2017, manufacturers and distributors of electric bicycles shall apply a label that is permanently affixed, in a prominent location, to each electric bicycle. The label shall contain the

classification number, top assisted speed, and motor wattage of the electric bicycle, and shall be printed in Arial font in at least 9-point type.

There are no age restrictions for persons riding class 1 or class 2 electric bicycles, but persons operating a class 3 electric bicycle must be 16 years or older and all persons under age 18 must wear a helmet while riding an electric bicycle.



Examples of electric bicycles.

Some can look like motorcycles – the pedals give them away.

Others carry more than one passenger.

Most class 2 and 3 electric bicycles have a “throttle” that will propel the bicycle without pedaling.

This table provides a good summary of the different classes of electric bicycles and the laws governing their use:

Key Differences Between Bicycles, E-Bike and Mopeds

CALIFORNIA	Vehicle		User				Bike Access			
	Pedal Operated	Max Assisted Speed	Minimum Age (yrs)	Driver's License	License Plate	Helmet	Class 1 Bike Path	Class 2 Bike Lane	Class 3 Bike Route	Class 4 Protected Lane
 BICYCLE	YES	N/A	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
 TYPE 1 EBIKE	YES	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
 TYPE 2 EBIKE	NO	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
 TYPE 3 EBIKE	YES	28	16	NO	NO	YES	NO	YES	YES	YES
 MOPED	NO	N/A	16	YES	YES	YES	NO	YES	YES	NO

Credit: San Diego County Bicycle Coalition

The definition of electric personal assistive mobility devices, more commonly known as a “hoverboard,” is provided for in Vehicle Code Section 313:

The term “electric personal assistive mobility device” or “EPAMD” means a self-balancing, nontandem two-wheeled device, that is not greater than 20 inches deep and 25 inches wide and can turn in place, designed to transport only one person, with an electric propulsion system averaging less than 750 watts (1 horsepower), the maximum speed of which, when powered solely by a propulsion system on a paved level surface, is no more than 12.5 miles per hour.



Example of an “electric personal assistive mobility device” or “EPAMD”

The definition of electric skateboards/boards is provided for in Vehicle Code Section 313.5:

An “electrically motorized board” is any wheeled device that has a floorboard designed to be stood upon when riding that is not greater than 60 inches deep and 18 inches wide, is designed to transport only one person, and has an electric propulsion system averaging less than 1,000 watts, the maximum speed of which, when powered solely by a propulsion system on a paved level surface, is no more than 20 miles per hour. The device may be designed to also be powered by human propulsion.



Examples of electric skateboards. They often come with remote controls.

The definition of motorized scooters is provided for in Vehicle Code Section 407.5:

(a) A “motorized scooter” is any two-wheeled device that has handlebars, has either a floorboard that is designed to be stood upon when riding

or a seat and footrests in place of the floorboard, and is powered by an electric motor. This device may also be designed to be powered by human propulsion. For purposes of this section, a motorcycle, as defined in Section 400, a motor-driven cycle, as defined in Section 405, or a motorized bicycle or moped, as defined in Section 406, is not a motorized scooter.

(b) A device meeting the definition in subdivision (a) that is powered by a source other than electrical power is also a motorized scooter.



Example of a motorized scooter.

Not to be confused with a motorized wheelchair, which is also sometimes called a motorized scooter.

Related to this discussion, the definition of “shared mobility devices” is defined by California Civil Code Section 2505 and is not a distinct class of vehicles in and of themselves. Rather, they are any of the above listed motorized vehicles that are made available to the general public for compensation through a digital application. Examples of shared mobility devices include Bird or Lime scooters and/or bikes. Being that these devices are not a distinct class of vehicles on their own, it does not appear that there are State laws regulating their use, and instead use is regulated based upon the specific type of device.

Furthermore, all of these devices are defined differently from motorcycles, “motor-drive cycles,” “motorized bicycles,” or “mopeds” in State law, generally, by having a seat or saddle and either by having a higher maximum speed or an internal combustion engine.

Thus, the subject of this report excludes motorcycles, “motor-drive cycles,” “motorized bicycles,” and “mopeds.”

State Laws Relating to the Operation of Bicycles, Electric Bicycles, Electric Personal Assistive Mobility Devices, Electric Skateboards and Motorized Scooters

Electric bicycle or (“E-bike”): Persons riding E-bikes must comply with the regulations of the vehicle code related to bicycles, specifically VC § 21200

through § 21213. This includes a provision requiring persons riding upon a highway to comply with all applicable sections of the vehicle code including but not limited to the following: DUI and rules of the road related to traveling at a speed safe for prevailing conditions, obeying traffic signals, sharing of the roadway, following stop signs, and yielding of the right of way. While there is no state law prohibiting the operation of a bicycle or E-bike on a sidewalk, local authorities are permitted to adopt ordinances regulating the use of bicycles including E-bikes on pedestrian facilities including banning them from sidewalks or other areas under VC § 21206.

Electric personal assistive mobility devices: Pursuant to VC § 21281.5 a person operating these devices cannot operate without “due regard” to current road and weather conditions, cannot operate at a speed that endangers the safety of persons or property, and must yield the right of way to all pedestrians.

Electric skateboards/boards: Operation of electrically motorized boards is governed under VC §§ 21290-21296. These rules include that a motorized board is not to be operated by persons under the age of 16, they cannot be operated upon a highway, bikeway, sidewalk or trail unless a bicycle helmet is properly worn, if operated at night they are equipped with proper lighting and reflectors, they can only be operated on a highway with a speed limit of less than 35 mph, they cannot be operated at a speed greater than 15 mph or at a speed that is unsafe for prevailing conditions, they cannot be operated while under the influence of any alcohol or drug.

Specifically related to electric skateboards, which again operate outside of the size and power restrictions of a motorized board mentioned above, cannot be operated on any sidewalk, roadway, or any other part of a highway or on any bikeway, equestrian trail, hiking or recreational trail pursuant to VC § 21968.

The State permits local authorities to adopt additional rules and regulations related to the operation of Motorized boards by ordinance or resolution pursuant to VC § 21967.

Motorized scooters: Persons riding motorized scooters are governed under VC § 21220 through § 21235. This includes a provision requiring persons riding upon a highway to comply with all applicable sections of the vehicle code including but not limited to the following: drivers' licenses, DUI and rules of the road related to traveling at a speed safe for prevailing conditions, obeying traffic signals, sharing of the roadway, following stop signs, and yielding of the right of way. Additionally, there are provisions of State law requiring motorized scooters to be equipped with relevant safety equipment, to operate with an exhaust system that is not excessively loud, and when traveling at a speed slower than the normal speed of traffic to operate as far to the right hand edge of the roadway as possible, to operate within a designated class II bike lane when available,

to not operate on sidewalks, or to attach the rider or the scooter onto any other vehicle on the roadway.

The State permits local authorities to adopt additional rules and regulations by ordinance related to registration or parking of motorized scooters pursuant to VC § 21225. As well as to prohibit use of a motorized scooter on bicycle path, trail or bikeway pursuant to VC § 21230.

City Ordinances (Laws) Relating to the Operation of Bicycles, Electric Bicycles, Electric Personal Assistive Mobility Devices, Electric Skateboards and Motorized Scooters

The City of Laguna Hills already bans electric bicycles, electric personal assistive mobility devices, electric skateboards and motorized scooters in City parks. Motorized wheelchairs or other similar conveyances for the disabled are not affected by the City's municipal code. An excerpt from the Municipal Code can be found below.

8-04.280 Motor vehicles or similar conveyances.

Except for motorized wheelchairs or other similar conveyances for the disabled, and motorized vehicles used for park maintenance, no person shall operate or drive any motor vehicle, motorcycle, ATV, motorized quadricycle, motorized tricycle, or motorized scooter in a designated park, nor shall any person clean, wash, polish, or make any repairs to any such vehicle, cycle, or scooter in a designated park without a valid facility permit issued by the Director, or in the case of a private park, a written authorization from the consenting owner. (Ord. 2015-4 § 1 (part): Ord. 2004-12 § 2: prior code § 8-05.075. Formerly 8-04.160)

"Motorcycle" means any motor vehicle, motorized bicycle, or motor-driven cycle as defined respectively in Sections 400, 405, and 406 of the California Vehicle Code.

"Motorized quadricycle" means a four-wheeled device, as defined in Section 407 of the California Vehicle Code.

"Motorized scooter" means any two-wheeled device that has handlebars, is designed to be stood or sat upon by the operator, and is powered by an electric motor that is capable of propelling the device with or without human propulsion, as defined in Section 407.5 of the California Vehicle Code.

"Motorized tricycle" means a three-wheeled device, as defined in Section 407 of the California Vehicle Code.

Observations by Police Services Regarding Use of Bicycles, Electric Bicycles, Electric Personal Assistive Mobility Devices, Electric Skateboards and Motorized Scooters

Generally, Police Services reports users of these devices do not constitute a nuisance within the City. The number of complaints received and the number of accidents reported have been few, and the statistical data from Police Services

supports this viewpoint. Additional data can be found in the OCTA District 5 Bikeways Strategy Report, attached.

One fatality involving a motor vehicle striking a bicyclist occurred in September 2022 on southbound Paseo de Valencia near Alisal Avenue; however, it appears the driver of the motor vehicle was at fault for this collision.

City staff believes the interest in the topic has been driven by recent news articles on the subject, especially in light of the Carlsbad “state of emergency” declaration resulting from the deaths of electric bicycle operators after being involved in collisions with motor vehicles. Social media posts, especially originating from residents in coastal cities, and anecdotal information regarding unreported bicycle collisions and “near misses” have contributed to the perception that bicyclists, and in particular, electric bicycle riders are not respecting the laws.

Existing Bicycle Routes

In April 2011, the City Council approved the last update to the City’s 2001 Bikeways, Trails & Open Space Master Plan (Master Plan). The City also adopted the Orange County Transportation Authority (OCTA) Commuter Bikeways Strategic Plan as the City’s “Bicycle Transportation Plan” in December 2009. The OCTA Commuter Bikeways Strategic Plan identified proposed improvements to the City’s bicycle transportation system (bike routes) in order to allow the City to meet eligibility requirements for State bicycle transportation funding. The 2011 Master Plan update included proposed improvements identified in the OCTA Commuter Bikeways Strategic Plan.

Subsequently, the Orange County Council of Governments (OCCOG) and OCTA commissioned the District 5 Bikeways Strategy Report. This report was completed in March 2015. This report focused on nine “bikeway corridors” in South Orange County and proposed improvements which could be made to finish the corridors.

The existing bicycle routes in the City are outlined in Table 1 of the 2011 Master Plan update shown below.

Table 1

Street	From	To	Class	Mileage
Alicia Pkwy (w/b)	Paseo de Valencia	Moulton Pkwy	I	0.76
Paseo de Valencia (sb)	Laguna Hills Dr	Alicia Pkwy	I	0.28
San Diego Fwy Path s/s	Alicia Pkwy.	North of Georgia Sue Dr.	I	0.33
J01 Bike trail (County of Orange)	I-5 fwy	w/o Moulton Pkwy	I	1.8
Laguna Hills Drive	Paseo de Valencia	Indian Hill lane	I	0.48
Oso Parkway (w/b)	Cabot Rd	Moulton Pkwy	I	1.71
Alicia Pkwy	Moulton Pkwy	Paseo de Valencia	II	0.76
Paseo de Valencia (nb)	Alicia Pkwy	El Toro Rd	II	1.50
Paseo de Valencia (sb)	El Toro Rd	Alicia Pkwy	II	1.50
Paseo de Valencia	Alicia Pkwy	La Paz Rd.	II	0.91
Alicia Pkwy	Paseo de Valencia	Hon Ave	II	0.83
Laguna Hills Dr (w/b)	Paseo de Valencia	Moulton Pkwy	II	0.70
Laguna Hills Dr (e/b)	Moulton Pkwy	Paseo de Valencia	II	0.70
Oso Pkwy (e/b)	Moulton Pkwy	Cabot Rd	II	1.71
Oso Pkwy (w/b)	Cabot Rd	Moulton Pkwy	II	1.71
Moulton Pkwy (n/b)	City bdry near Glenwood Dr.	La Paz Rd	II	1.72
Moulton Pkwy (s/b)	City bdry near Glenwood Dr.	City bdry near Nellie Gail Rd	II	2.18
Moulton Pkwy	Lake Forest Dr.	Ridge Route Dr.	II	0.56
Los Alisos Blvd (e/b)	Paseo de Valencia	San Diego Fwy (City bdry)	II	0.43
Los Alisos Blvd (w/b)	San Diego Fwy (City bdry)	Paseo de Valencia	II	0.43
Lake Forest Dr (e/b)	Del Lago Dr	Santa Vittoria	II	0.76
Lake Forest Dr (w/b)	Santa Vittoria Dr	Del Lago Dr.	II	0.76
La Paz Rd e/b	Cabot Rd	I-73	II	2.37
La Paz Rd w/b	I-73	Cabot Rd	II	2.37
Cabot Rd.	La Paz Rd.	s/o Oso Pkwy	III	1.18
			Total	28.0

Table 1 of the City's Bikeways, Trails & Open Space Master Plan, updated in 2011, identifying existing Class I, II, and III Bikeways

However, there are several gaps in the routes where bicyclists must share the road with motorists to traverse the City.

Insufficient connections exist between Mission Viejo and Laguna Hills, except via the Aliso Creek Bike Trail south of Los Alisos Boulevard. The Interstate 5 South County Improvement Project will provide a dedicated bike lane on La Paz Road within Laguna Hills and will provided a dedicated bike lane for the Los Alisos Boulevard bridge crossing over Interstate 5. However, the portion of La Paz Road within Mission Viejo immediately adjacent to Interstate 5 will not have a dedicated bike lane, and Oso Parkway and Alicia Parkway will still not have dedicated bike lanes to connect Laguna Hills with Mission Viejo.

Insufficient connections also exist between the central portion of Laguna Hills and north Laguna Hills. Some examples are below:

- There is insufficient right-of-way to provide a bicycle connection along Avenida de la Carlota from Ridge Route Drive to Los Alisos Boulevard.
- There are segments of Moulton Parkway with insufficient right-of-way in the City of Laguna Woods.
- There is no bike lane on El Toro Road.

Opportunities and constraints for creating Class II and III bikeways are discussed in the next section of this memorandum.

Proposed Solutions

Proposed solutions may take the form of increased education, additional laws and enforcement, and/or new infrastructure to support the use of bicycles.

Education

Regarding increased education, Capistrano Valley Unified School District in partnership with the cities of Dana Point and Laguna Niguel and the Orange County Sheriff's Department started a program requiring students attending certain schools to apply for a permit if they are planning on riding a bicycle, electric bicycle, scooter or skateboard to school. Attached is a printout from the Capistrano Valley Unified School District website outlining an example of the new permit process for Laguna Ranch Middle School. This program might be a model for schools in Laguna Hills.

Additionally, the City of Laguna Niguel has published a bicycles topic page on the City's website encouraging residents to voluntarily register their bicycles with Police Services (Orange County Sheriff's Department). The page also includes a "Electric Bicycle Feedback" form to allow citizens to report unsafe e-bike riding behavior, and a video published on YouTube by the Orange County Sheriff's Department on bike safety.

Laws and Enforcement

Generally, State law allows local authorities to adopt ordinances regulating the use of bicycles including electric bicycles on pedestrian facilities including banning them from sidewalks or other areas under VC § 21206.

Recently, the City of Carlsbad declared a "state of emergency" over electric bicycle collisions. In response, the City passed a new comprehensive ordinance. The Carlsbad ordinance regulates bicycles, electric bicycles, and electric personal assistive mobility devices in the following areas: 1) specific posted no riding zones, 2) some sidewalk riding prohibitions, 3) drainage facility riding prohibitions, 4) sports court riding prohibitions, 5) gymnasium prohibitions, 6) requirements to ride with due care and to reduce speeds, and 7) trail use limitations and prohibitions. The City Attorney advises the Carlsbad approach would be appropriate to follow, except for the penalties section, which would need to be changed to the standard misdemeanor and infraction penalties for Laguna Hills. In addition, the Carlsbad ordinance contemplates the establishment of an e-bike safety school which Laguna Hills could not conduct

due to staffing constraints. A copy of Chapter 10.56 of the Carlsbad Municipal Code is attached for reference.

Aliso Viejo also recently passed an ordinance concerning bicycles, electric bicycles, and electric personal assistive mobility devices. Generally, the Aliso Viejo ordinance prohibits these devices from being ridden on sidewalks within a commercial or business center or complex, sidewalks adjacent to any public school building when school is in session, sidewalks and parking lots adjacent to or within any community or recreation center when in use, sidewalks adjacent to a church during services, parking lots of any property owned or operated by the City, or any pedestrian overcrossing or other sidewalk where prohibited by posted signs. In addition, the Aliso Viejo ordinance allows the Public Works Director to prohibit these devices on additional portions of sidewalk, as designated by the Public Works Director, and supported by appropriate signage. A copy of the Aliso Viejo ordinance is attached for reference.

Both the Carlsbad and Aliso Viejo ordinances generally seek to ban bicycles, electric bicycles, and electric personal assistive mobility devices from sidewalks where potential conflicts with pedestrians exist thereby, in most cases, displacing these device users into lanes of vehicular traffic. As such, the Public Works Director/City Engineer recommends against enacting an ordinance which creates additional conflicts between bicyclists and motorists. Both ordinances also require enforcement by police.

New Infrastructure

There exist gaps in the roadway network to allow bicyclists and other mobilized device users to cross from area to area in the City. To this end, the Traffic Commission and City Council may consider authorizing funding to update the City's existing bicycle route master plan in order to prioritize work efforts and funding toward constructing new and improved bicycle routes.

An example of a gap in the bicycle route network exists on Paseo de Valencia between La Paz Road and Cabot Road connecting the Class II bike route on Paseo de Valencia north of La Paz Road with the Class III bike route on Cabot Road. At a future Traffic Commission meeting, the Public Works Director/City Engineer may propose to place Paseo de Valencia on a "road diet" south of La Paz Road to reduce the number of through lanes in each direction from two (2) lanes to one (1) lane. This section of road is lightly travelled, and the City Engineer has determined the existing roadway configuration is not needed to accommodate the existing average daily traffic counts on this section of roadway. Theoretically, this road diet would allow for space for the construction of a new median, dedicated bike lane in each direction, and parkway landscaping without the need to purchase any right-of-way. This road diet should also allow for space on the north side of the roadway to construct dedicated refuge lane in front of Valencia Elementary school that would be separated from through traffic, which

would address a verbal request made by Councilmember Pezold in October 2022 to investigate ways of providing a safer “drop off zone” on Paseo de Valencia in front of Valencia Elementary school. Currently, parents often park their vehicles on the shoulder of the roadway to drop off and pick up their children because the school’s existing parking lot does not have enough capacity for all the vehicles. This type of project should qualify for State funding under the Active Transportation Program because it would include bicycle and pedestrian mobility improvements. Potentially, Paseo de Valencia between La Paz Road and Alicia Parkway could also be placed on a road diet as part of this project to construct and continue the same improvements northerly to Alicia Parkway. Even if this project were approved by the Traffic Commission and the City Council, unfortunately, it would be a multi-year effort. This proposed project would first need to be approved by the Orange County Transportation Authority (OCTA) because Paseo de Valencia is part of the County’s Master Plan of Arterial Highways (MPAH). In order for the City to remain eligible for Measure M turnback funds, the City is required to certify annually that it has not reduced the number of travel lanes on any arterial highway. Therefore, an amendment to the MPAH would first need to be approved by OCTA prior to investigating any additional time and effort on this project.

The 2011 City’s Bikeways, Trails & Open Space Master Plan identifies Class II and Class III improvements to reduce the number of bicycle connectivity gaps in the City.

Table 2

Street/Path	From	To	Class	Mileage
Ridge Route Dr.	Mill Creek	Santa Vittoria	Class II	0.46
Ridge Route Dr	Mill Creek	Avenida de la Carlota	Class II	0.68
Aliso Hills Dr	Alicia Pkwy	La Paz Rd	Class II	0.9
Alicia Pkwy	Moulton Pkwy.	Ramona St.	Class II	0.22

Street/Path	From	To	Class	Mileage
*Moulton Pkwy	Ridge Route Dr.	Santa Maria Ave.	Class II	0.25
Moulton Pkwy (n/b)	Nellie Gail Rd	La Paz Rd	Class II	0.56
Paseo de Valencia	La Paz Rd.	Cabot Rd.	Class II	0.59
Avenida de la Carlota	Ridge Route Dr.	Los Alisos Blvd	Class III	1.44
Avenida de la Carlota	Ridge Route Dr.	Lake Forest Dr.	Class III	0.73
El Toro Rd (w/b)	City bdry near Ave Carlota	Paseo de Valencia	Class III	0.34
El Toro Rd (e/b)	Paseo de Valencia	City bdry near Ave Carlota	Class III	0.34
Santa Vittoria Dr	Santa Maria Ave	Lake Forest Dr	Class III	1.27
Lake Forest Dr (e/b)	Del Lago Dr.	City Bdry near I-5 fwy	Class III	0.37
Lake Forest Dr (w/b)	City Bdry near I-5 fwy	Del Lago Dr.	Class III	0.37
El Toro Road	Avenida de la Carlota	City Bdry near I-5 fwy	Class III	0.06
Alicia Pkwy	Hon Ave.	City Bdry near I-5 fwy	Class III	0.18
La Paz Rd.	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.08
Oso Pkwy	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.05
			Total	8.89

*Under Construction 2010/2011

Table 2 of the City's Bikeways, Trails & Open Space Master Plan, updated in 2011, identifying future Class II and Class III Bikeways.

Most of these locations will not be feasible under roadway widenings are implemented.

Final Thoughts

It looks decades for infrastructure to be built for the automobile. Now it appears we are the cusp of needing new infrastructure for e-bikes and bicycles.

The City Engineer is of the opinion that e-bikes are here to stay. For better or for worse, in particular, Southern California is at the forefront of e-bike movement. The area has the combination of hilly terrain, nearly year-round good weather, and residents who can afford e-bikes that has resulted in their popularity as a method of recreation and transportation. It seems appropriate that the community embrace it with better and new education, enforcement, and bicycle infrastructure.

Attachments:

1. OCTA District 5 Bikeways Strategy Report
2. Appendix to the 2001 City of Laguna Hills Bikeways, Trails and Open Space Master Plan
3. City of Laguna Hills Bikeways Report – 2009
4. 2011 Bikeways, Trails & Open Space Master Plan Update
5. Police Services Bike Safety Flyer
6. Carlsbad City Ordinance – Chapter 10.56
7. Aliso Viejo Staff Report & Ordinance
8. Capistrano Valley Unified School District E-Bike Program
9. City of Laguna Niguel website printout

Attachment 1



4.1.a

DISTRICT 5

BIKEWAYS STRATEGY REPORT

March 2015



KOA Corporation
KTU+A

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I. EXECUTIVE SUMMARY

This report summarizes the results of a collaborative effort to identify and prioritize potential regional bikeways throughout south Orange County (Supervisory District 5). Through extensive facilitation efforts, nine regional bikeway corridors were identified and ranked. The rankings serve as the basis for a subsequent feasibility study for the top three corridors. The remaining six corridors may be assessed at a later date, as agencies work toward obtaining funding for the completion of each corridor.

While the Orange County Council of Governments (OCCOG) and the Orange County Transportation Authority (OCTA) have commissioned this report, implementation of bikeway corridors will be led by the agency's that have jurisdiction. In some cases, roadways are managed by Caltrans, such as portions of Pacific Coast Highway (State Route 1) or at freeway interchanges. While OCCOG and OCTA will promote the implementation of corridors recommended in this report, final design, construction, and maintenance of the corridors will be coordinated and conducted by the respective jurisdictions. Additionally, the cities or the County may need to coordinate with various landowners such as utility companies, rail operators, and OCTA for right-of-way acquisition.

The District 5 Bikeways Strategy aims to enhance community interaction and expand travel choices for residents and bicyclists of all skill levels throughout south Orange County. The integrated planning effort establishes bikeways that cross jurisdictional boundaries and serve major destinations and employment centers. The coordinated efforts by OCTA and member agencies support improved road safety, reduced automobile trips, reduced fuel consumption and air emissions, and improved community health outcomes within District 5. The feasibility study will include an assessment of what is needed to complete or enhance the corridors, recommended designs, preliminary drawings, and cost estimates. These assessments and recommendations are intended to help advance local project implementation and provide the basis to apply for state and federal grants.

I.I Background

The District 5 Bikeways Strategy was developed as part of OCTA's regional bikeways planning process, which involves OCTA, local jurisdictions, and public stakeholders. This process began in 2011 with a pilot effort for Supervisory District 4 in northern Orange County, then for Supervisory Districts 1 & 2 in central and western Orange County in 2012. It is funded by a federal grant received by OCCOG, with a 20% local match provided by OCTA. There are two phases of the regional bikeways planning process. Phase 1 is this bikeways strategy, which identifies the regional "backbone" bikeway corridors that connect to major activity centers. The regional bikeway corridors are identified based on community and agency input and ranked based on criteria consistent with regional transportation goals and objectives (see Table ES.1 and Chapter 3). In Phase 2, the top-ranking corridors are studied in more detail with the development of a feasibility study, which provide planning-level design recommendations to the local jurisdictions.



DISTRICT 5 BIKEWAYS STRATEGY
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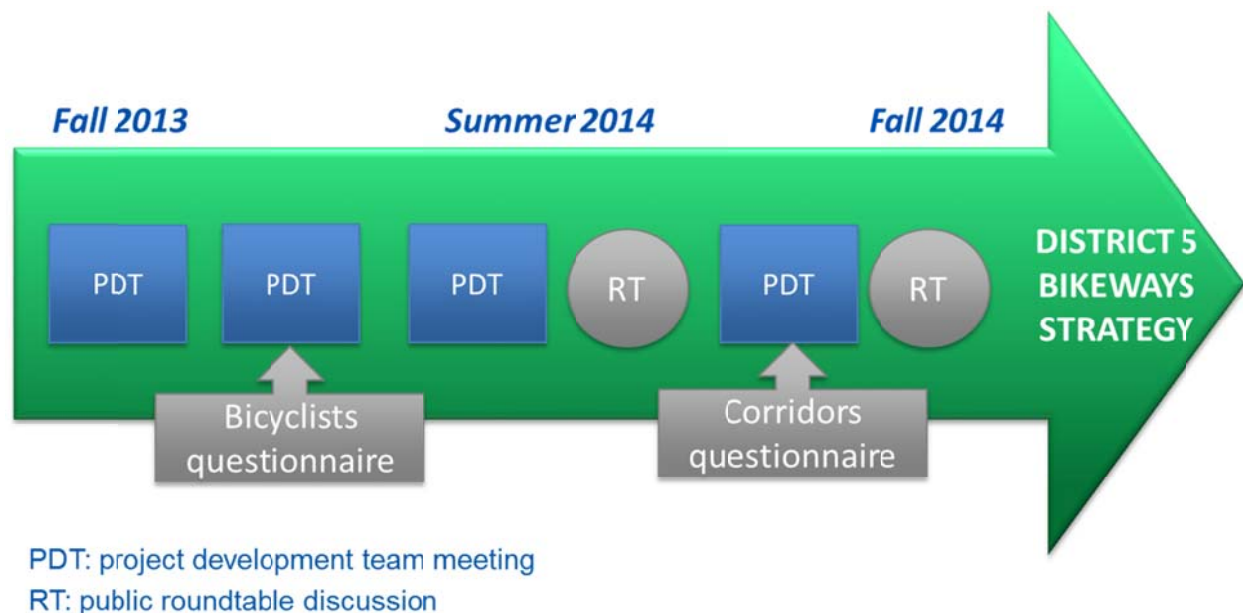
Regional bikeway planning supports the goals contained in existing countywide transportation plans, such as the Long Range Transportation Plan, OCTA Commuter Bikeways Strategic Plan (CBSP), and the Orange County Sustainable Communities Strategy. These goals are interrelated and include expanding travel choices, improving safety, and supporting the viability of bicycle transportation.

Building on these broad goals, a set of goals, objectives, and strategies were developed by the project team for District 5. These goals and objectives recognize the physical challenges facing District 5, which include high speed and high volume arterial roadways, large intersections, flood control channels, railroads, and freeways, and hilly terrains. There are four main goals established in accordance with the District 5 local context:

- Goal #1: Increase the use of bicycles as a viable alternative to the automobile
- Goal #2: Coordinate regional bikeways planning and construction among individual cities
- Goal #3: Build a bicycle transportation network by planning, designing, and maintaining transportation facilities that will meet the needs for all types of bicyclists
- Goal #4: Improve bicycling safety in the district

I.II Facilitation Efforts

Preparation of this report was a collaborative effort between OCTA, local agencies, bicycle advocates, and the general public. The process for facilitating discussions between the various stakeholders including the project development team and the bicycling community is detailed below:



The following summarizes the process for facilitating the regional bikeway discussion in preparing the Strategy:

- A project development team (PDT) was organized with planning and engineering representatives from each local jurisdiction (county and city) within Supervisorial District 5. These include the County of Orange and the cities of Aliso Viejo, Dana Point, Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, San Juan Capistrano, and Caltrans District 12. OCTA staff and the project consultant team participated on the PDT. The PDT met on multiple occasions to discuss project goals and objectives, opportunities and constraints, preliminary corridor alignments, and draft ranking criteria.
- Focus group meetings were conducted with smaller working groups of PDT representatives. During the focus group meetings, large-format boards were printed for brainstorming potential bikeways corridors. The boards presented information to help frame bikeways demand, needs, and opportunities. This included the identification of flood control channels and rail corridors, the transportation network, existing and proposed bikeways, major destinations, and other key features for consideration and collaborative brainstorming.
- Two community roundtable discussions were held to provide an opportunity for public input on the project. The first roundtable occurred in May 2014 during National Bike Month. A presentation on the draft regional bikeway corridors was made and public input was requested on corridor concepts, ranking evaluation criteria, and their top three desired corridors. Approximately 30 attendees included public stakeholders from the bicycle advocacy, health, safety, and social justice sectors, bicycle shop owners, as well as elected officials and community residents. Presentations describing the planning process and large-format boards displaying the proposed corridors were provided. The second roundtable occurred in September 2014 and was attended by approximately 50 people with boards showing the top three ranked regional bikeway corridors. A presentation described the nine corridors and key changes since the first roundtable with a focus on prioritizing the top three corridors. Attendees at the roundtable discussed the ranking analysis results and provided feedback on the recommended top three corridors. Promotion of the



roundtables was conducted by means of direct emails to over 1,000 stakeholders, advertisements on OCTA and city websites, OCTA's "On the Move" blog, and social media.

- A project webpage was created on OCTA's website (www.octa.net/Share-the-Ride/Bike/District-5-Bikeways-Roundtable). It included a project overview that was updated regularly with project materials, including meeting materials, meeting dates, and contact information.
- An online questionnaire was promoted online and distributed at the first public roundtable asking respondents to gauge attendees' level of bicycling comfort and gather input about their bicycling preferences and frequency. Almost 200 questionnaires were completed.
- A second questionnaire was distributed online and at the second roundtable to solicit feedback on the proposed corridors. It included a map of the proposed corridors. Participants were asked to rank the top three corridors. There were 150 questionnaires completed.

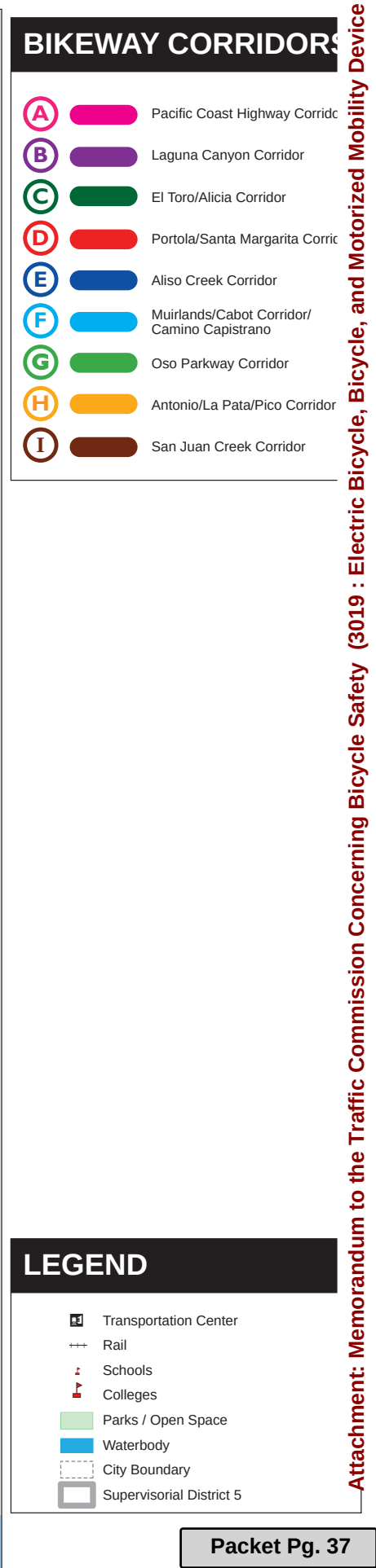
I.III Regional Corridors

As shown in Figure ES.I, a total of nine regional bikeway corridors are proposed to help improve the viability of bicycling and cross-jurisdictional bikeway connectivity throughout south Orange County. The proposed corridors provide connections to other regional bikeway corridors established in neighboring supervisorial districts and between major points of interest. These corridors are comprised of both existing bikeway facilities and new proposed segments. The exact corridor alignments may change upon more detailed analysis during the feasibility study phase. For example, corridors may be realigned to use parallel or adjacent streets that provide a more feasible route. The proposed corridors and corridor alignments evaluated in this Strategy are the following:

- **Corridor A – Pacific Coast Highway (PCH)** – This 20-mile north-south corridor runs south along PCH from the southern Newport Beach city boundary, along Del Prado to Golden Lantern Street, down to Dana Point Harbor Drive, along Park Lantern to Coast Highway, and finally along El Camino Real to the southern San Juan Capistrano city limit.
- **Corridor B – Laguna Canyon** – This 8.8-mile north-south corridor runs along Laguna Canyon Road from the Supervisorial District 5 boundary in Irvine at the I-405 Freeway and continues to PCH.
- **Corridor C – El Toro/Alicia/Laguna Canyon** – This 15.3-mile corridor extends along Alicia Parkway from Santa Margarita, onto Paseo de Valencia, to El Toro Road, then along Laguna Canyon Road (State Route 133) to Broadway Street, and ending at PCH in Laguna Beach.
- **Corridor D – Portola/Santa Margarita** – This 6.7-mile corridor extends along Portola Parkway from the Supervisorial District 5 boundary at the western city limit of Lake Forest, west of Paloma, and continues along Santa Margarita Parkway to Avenida Empresa, ending at Antonio Parkway.



- **Corridor E – Aliso Creek** – This 20.3-mile corridor runs along Santiago Canyon Road from the Supervisorial District 5 boundary in Modjeska Canyon at approximately Bolero Lookout Road, to El Toro Road at Ridgeline Road, continues along the Class I Aliso Creek bike path parallel to El Toro Road and ends at PCH.
- **Corridor F – Muirlands/Cabot/Camino Capistrano**– This 18-mile corridor runs along Muirlands Boulevard from the Supervisorial District 5 boundary east of Bake Parkway, then along the Aliso Creek Bike Path at Los Alisos Boulevard. It continues along the bike path parallel to Paseo de Valencia, then on Paseo de Valencia at Laguna Hills Drive, and onto Cabot Road and the Cabot-Forbes bike path at Rapid Falls Road. From there, it extends along Forbes Road to the Laguna Niguel Metrolink Station, crossing over to Camino Capistrano, continuing to La Zanja Street, then onto Avenida De La Vista. It picks up from there on the Trabuco Creek Trail, to the San Juan Creek Trail along Camino Capistrano to access San Juan Creek Road, then along a proposed bikeway currently in development that would connect to Avenida California, continue along Via California and Via Fortuna to Via Sacramento, then along Camino Capistrano to Palisades Drive and down to PCH.
- **Corridor G – Oso Parkway** – This 8.9-mile corridor runs along Pacific Park Drive from Woodfield and continues along Oso Parkway to its eastern end at Bend Road/Coto De Caza Drive.
- **Corridor H – Antonio/La Pata/Pico** – This 18-mile corridor runs along Antonio Parkway from Avenida De Las Flores and continues along La Pata Avenue, then onto Avenida Pico down to El Camino Real.
- **Corridor I – San Juan Creek** – This 8.6-mile corridor extends along San Juan Creek Trail from Antonio Parkway down to PCH.



Each corridor was evaluated using criteria consistent with District 5 goals and objectives and building from criteria specified in OCTA's 2009 CBSP and District 1, 2 and 4 Bikeways Collaboratives. The criteria consider a range of opportunities, constraints, and other factors affecting demand and feasibility. The evaluation criteria include the following categories:

- Trip Demand
- Level of Traffic Stress (LTS)
- Reported Collisions
- Public Support
- Physical Constraints
- Completes the Corridor
- Completes the Network
- Economic Efficiency

Table ES.1 summarizes the ranking evaluation, with raw and weighted scores shown. Raw scores for each category were calculated using a methodology described in Chapter 3.2. The weighted scores account for normalizing between 0 and 100 and the weighting of each criterion.

The regional corridors were ranked to help guide implementing agencies in prioritizing bikeway improvements. The evaluation process determined which corridors would provide the greatest relative potential benefit to bicyclists in terms of regional connectivity, access to key destinations, and improved safety, while also possessing significant public support and limited physical constraints that could hinder implementation. The following top ranked corridors will be further studied for feasibility in the second phase of the District 5 Bikeways Strategy:

- **Corridor A:** Pacific Coast Highway
- **Corridor C:** El Toro/Alicia/Laguna Canyon
- **Corridor F:** Muirlands/Cabot/Camino Capistrano

Each of the District 5 cities, the County of Orange, and Caltrans have jurisdiction over portions of at least one of these three corridors. While feasibility review is not immediately being provided for all of the other six corridors, cities may advance the study of any corridor where there is interest in continuing the efforts of the Strategy.

Table ES.2 summarizes criteria ranking results for the nine proposed corridors within District 5 and shows the distance of each corridor and range of cost.

Table ES.1: Corridor Scoring

Criteria		Score	Level of Traffic Stress		Reported Collisions		Economic Efficiency		Trip Demand		Public Input		Completes the Network		Physical Constraints		Completes the Corridor	
Best Possible Score		Tot.	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS
		100	4.0	20	3.0	20	6.4	15	343.6	15	96	10	1.7	5	3	10	0%	5
A	PCH Corridor	70	4	19	3	20	1	2	280	12	96	10	1	3	12	2	0	1
B	Laguna Canyon	54	4	20	1	9	0	1	209	9	62	6	1	2	29	1	0	5
C	El Toro/Alicia/Laguna Canyon	65	4	20	2	16	2	4	289	13	21	2	1	4	20	1	0	5
D	Portola/Santa Margarita	59	4	20	1	7	1	1	317	14	19	2	2	5	6	5	0	5
E	Aliso Creek	50	1	6	0	1	5	11	261	11	58	6	1	4	3	10	0	1
F	Muirlands/Cabot / Camino Capistrano	60	2	12	1	8	6	15	344	15	47	5	1	3	21	1	0	1
G	Oso Parkway	48	4	19	0	3	1	2	277	12	13	1	1	4	16	2	0	5
H	Antonio/La Pata/Pico	44	3	17	1	7	1	1	245	11	23	2	1	2	20	1	0	2
I	San Juan Creek	38	1	3	0	0	5	12	313	14	22	2	1	3	11	2	0	1

Note: RS = Raw Score; WS = Weighted Score

Table ES.2: Corridor Ranking

Corridor ID	Corridor Name	Rank	Weighted Score	Length (miles)	Cost Range (millions)
A	PCH	1	70	19.0	\$11.5 – \$14.1
C	El Toro/Alicia/Laguna Canyon	2	65	15.3	\$12.2 – \$15.0
F	Muirlands/Cabot/Camino Capistrano	3	60	17.9	\$7.4 – \$9.0
D	Portola/Santa Margarita	4	59	6.7	\$6.5 – \$8.0
B	Laguna Canyon	5	54	8.8	\$8.4 – \$10.3
E	Aliso Creek	6	50	20.3	\$8.2 – \$10.0
G	Oso Parkway	7	48	8.9	\$5.5 – \$6.8
H	Antonio/La Pata/Pico	8	44	18.0	\$11.1 – \$13.5
I	San Juan Creek	9	38	8.6	\$3.8 – \$4.6
TOTAL				123.5	\$74.6 – \$91.3

I.IV Near-Term Action Plan

In an effort to build momentum to complete the regional bikeway network, the District 5 Bikeways Strategy recommends potential near-term projects. These potential near-term projects along the proposed corridors can be implemented requiring minimal construction costs, low right-of-way acquisition, and minimal environmental review as funds become available. Examples of near-term projects may include restriping a street to implement a Class II bike lane or providing signage along a street to designate it as a Class III bike route.

Each jurisdiction will lead funding and implementation efforts for projects in their respective areas. OCTA can provide support to these jurisdictions through efforts such as providing grant notifications, grant application guidance, and design solutions. Coordination between jurisdictions is highly encouraged to implement linkages simultaneously.

I.V Funding Strategies

Funding assistance can be provided through federal, state, and local government agency programs aimed at improving bicycle infrastructure. It is important that communities are made aware of funding sources and that the proper procedures are followed in applying for the grants. Because only a portion of public transportation funding is allocated toward bicycle policy development and infrastructure, there is strong competition between jurisdictions to successfully secure funding.

Most federal funding requires that funds be matched by state and/or local municipalities. State funding often requires similar funding matches from local agencies. To facilitate the acquisition and coordination of funding, a full-time bicycle coordinator with extensive knowledge of funding sources is often appointed. Bicycle coordinators should also have a strong capability to develop a competitive proposal, specifying the project details and jurisdictional needs and opportunities for bicycle improvements.

A summary table by source type has been provided with details regarding eligibility, use, and requirements associated with funding sources, to support agency efforts in finding outside funding sources to implement improvements along the proposed corridors (Chapter 6).

I.VI Programs

Non-infrastructure bicycle programs, such as education, encouragement (public outreach), enforcement, and evaluation (four of the “Five Es” of bicycle planning - with the fifth being engineering), work together through policy development and engineering implementation to enhance the bicycle network for all users. Based on community input and coordination with agency staff, programmatic recommendations are provided in this Strategy to complement the infrastructure recommendations associated with the proposed corridors.



1.0 INTRODUCTION

This document summarizes the recommendations and near-term action plan for the implementation of regional bikeways throughout south Orange County. The objective of the District 5 Bikeways Strategy (“the Strategy”) is to coordinate planning and funding efforts between the various entities for implementing regionally-beneficial bikeways. The recommendations are the result of a collaborative effort between the local agencies and community stakeholders. The Strategy focuses on identifying potential regional bikeways that could best serve bicyclists of varying skill levels. A near-term action plan was established to outline potential next steps for completing the regional bikeway network.

1.1 Background

The District 5 Bikeways Strategy was developed as part of OCTA’s regional bikeways planning process: involving OCTA, local jurisdictions, and public stakeholders. The County of Orange, Caltrans, and the cities of Aliso Viejo, Dana Point, Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano were involved. This process began in 2011 with a pilot effort for Supervisorial District 4 in northern Orange County, then for Supervisorial Districts 1 & 2 in west central Orange County in 2012. It is funded by a federal grant received by the Orange County Council of Governments (OCCOG), with a 20% local match provided by the Orange County Transportation Authority (OCTA). Figure 1.1 illustrates the Supervisorial District 5 boundaries.

Regional bikeway planning efforts support the goals contained in existing countywide transportation plans, such as the Long Range Transportation Plan and the Orange County Sustainable Communities Strategy. These goals include expanding travel choices, improving safety, and supporting sustainability. They also build on the 2009 Commuter Bikeways Strategic Plan (CBSP) which outlines OCTA’s roles in bikeways planning, as follows:

- Suggesting regional priorities for optimal use by local jurisdictions;
- Assisting in coordinating plans between jurisdictions;
- Providing planning and design guidelines; and
- Participating in outreach efforts to encourage bicycle commuting.

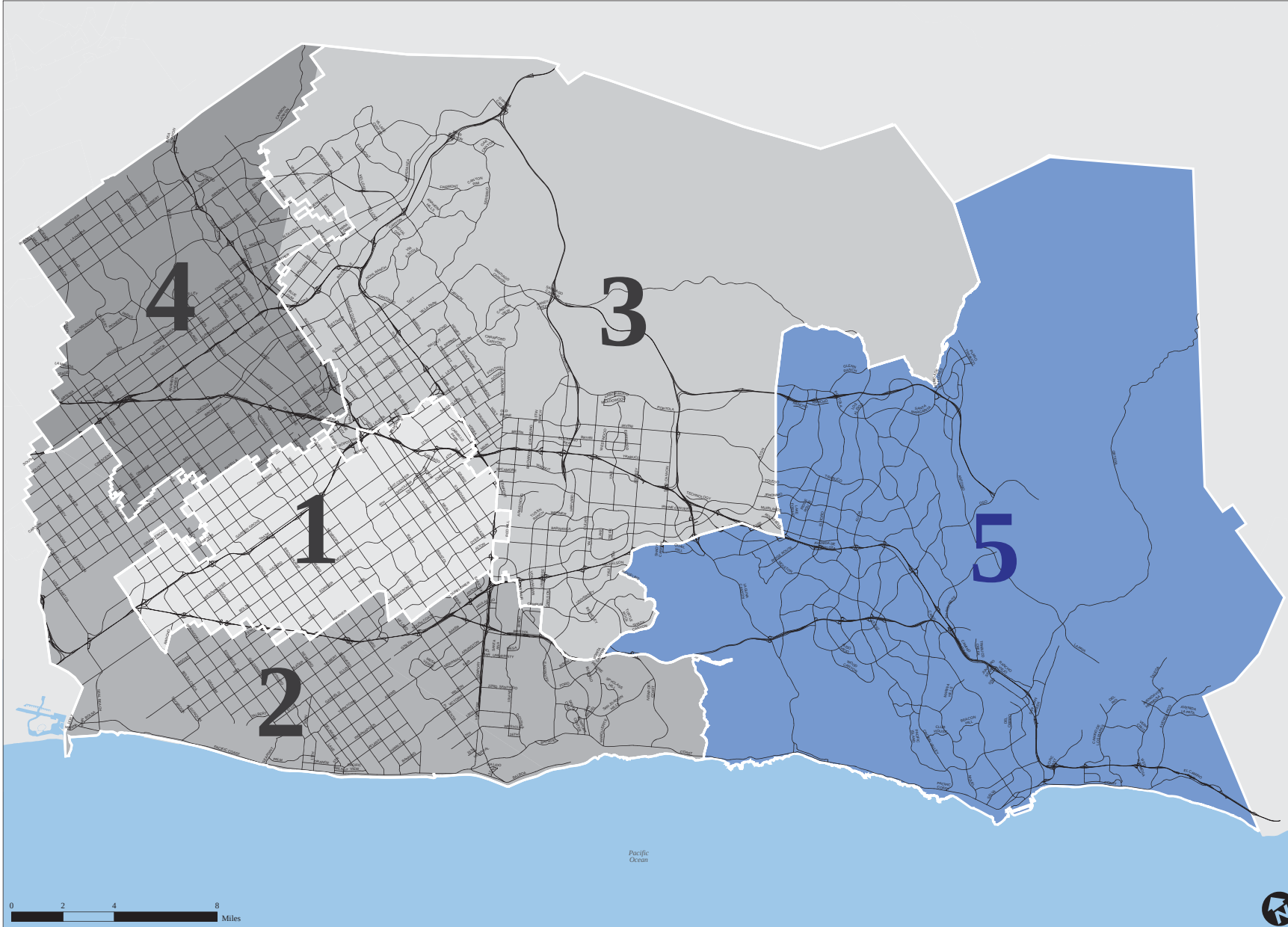
The CBSP outlines “regional priority locations”, including colleges and universities, transportation centers, and major employment areas. These regional priorities served as the basis for developing the potential District 5 regional bikeway corridors. While this planning process has been initiated and coordinated by OCTA, local jurisdictions will bring projects from concept to construction, through coordination with Caltrans and OCTA as needed.



DISTRICT 5 BIKEWAYS STRATEGY
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DISTRICT INFORMATION

DISTRICT 1

Fountain Valley (Portions of)
 Garden Grove
 Santa Ana
 Westminster

DISTRICT 2

Buena Park (Portions of)
 Costa Mesa
 Cypress
 Fountain Valley (Portions of)
 Huntington Beach
 La Palma
 Los Alamitos
 Newport Beach
 Seal Beach
 Stanton

DISTRICT 3

Anaheim (Portions of)
 Irvine (Portions of)
 Orange
 Tustin
 Villa Park
 Yorba Linda

DISTRICT 4

Anaheim (Portions of)
 Brea
 Buena Park (Portions of)
 Fullerton
 La Habra
 Placentia

DISTRICT 5

Aliso Viejo
 Dana Point
 Irvine (Portions of)
 Laguna Beach
 Laguna Hills
 Laguna Niguel
 Laguna Woods
 Lake Forest
 Mission Viejo
 Rancho Santa Margarita
 San Clemente
 San Juan Capistrano

I.2 Strategy Overview

The Strategy identifies nine regional corridors to serve as the backbone bikeway network for cities and unincorporated areas within south Orange County. These corridors and the rationale for their alignments are described in Chapter 3. The report includes an overview of current conditions, highlights of attractions along the corridor, and the identification of opportunities (e.g. existing flood channel maintenance roads and available road right-of-way) and constraints (e.g. significant inclines/ declines and complex intersections).

The report describes each of the eight criteria used to assess and rank the regional corridors. These criteria are based on goals and objectives developed with input from the local agencies and the community. The top three corridors have been selected for a follow-up feasibility study that will include planning-level design recommendations for key sections of each corridor. The feasibility study will provide the information and data required for local jurisdictions to prepare grant applications for the design and construction of sections of each corridor.

In an effort to facilitate project implementation, a high-level near-term action plan for all nine of the corridors is outlined in this report. The plan recommends implementing items that are relatively low-cost and with few major constraints such as slope, environmental concerns, or lack of right-of-way. Local governmental agencies are already working on many of the items identified in the plan.

The Strategy also consists of a detailed discussion of the various types of bike facilities that could be used along these corridors in southern Orange County. Facilities covered in this section range from bike lanes and shared-use markings or “sharrows” to separated paths, cycle tracks, complex intersection treatments, signage, and street markings. Sections of the corridors where these facilities may be appropriate are identified.

The Strategy outlines educational approaches for bicyclists and motorists. Classes for children and adults as well as public outreach are reviewed.

Finally, the Strategy outlines funding strategies and points to a variety of public, as well as private, sources of funds for bike infrastructure and educational projects.

I.3 Bikeways Classifications

Throughout this report, reference is made to four classes or categories of bikeways. Until recently, the California Department of Transportation (Caltrans) used three categories for bikeways. However, a fourth category, separated bikeways or cycle tracks, has recently been added to the classification. California Streets and Highways Code (SHC) Section 890.4 defines the four bikeway. These bikeway classifications are illustrated in Figure I.2 and summarized below:



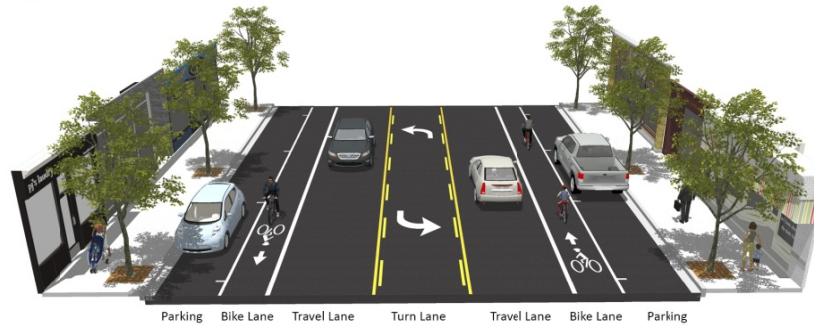
- Class I – Off-Street Paved Bike Paths: facilities on a separate right-of-way from roadways, usually shared by bicyclists and pedestrians.
- Class II – On-Road Striped and Signed Bicycle Lanes: on-street facilities that use painted stripes and stencils to delineate the right-of-way assigned to bicyclists and motorists, and to provide for more predictable movements by each.
- Class III – On-Road Shared-Lane Signed Bicycle Routes: signed on-street facilities that accommodate vehicles and bicycles in the same travel lane. Bicycles are permitted on most roadways; however, for safety purposes, signed bicycle routes are often found on streets with lower speeds and traffic volumes.
- Class IV Bikeways - Separated Bikeways (Cycle Tracks): exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.

A more detailed description is in Chapter 5 (Bicycle Facility Toolkit).

I.4 Jurisdictional Governance

While OCCOG and OCTA commissioned this report, the implementation of bikeway corridors will be led by the cities or the County of Orange, whomever has jurisdiction. In some cases, roadways are managed by Caltrans, such as portions of Pacific Coast Highway (State Route 1), or at freeway interchanges.

While OCCOG and OCTA promote the implementation of corridors recommended in this report, final design, construction, and maintenance of the corridor would ultimately need to be accepted by the respective jurisdictions as outlined above. Additionally, the cities or the County of Orange may need to coordinate with various landowners such as utility companies, rail operators, and OCTA for right-of-way acquisition.

Figure I.2: Caltrans Bikeway Classifications**Class I: Shared-Use Path/Trail****Class II: Bike Lane****Class III: Bike Route****Class IV: Cycle Track or Separated Lane**

2.0 EXISTING CONDITIONS

2.1 Context

The 2009 OCTA CBSP notes that much of south Orange County was developed as planned communities over the last 30 years. The roadway networks are generally wider and more circuitous than in Central County. The advantage to these roads is that many of them were designed with bike lanes along the shoulders. However, these roads typically have higher speed limits, more elevation change, and alignments through low-density communities with housing separated from work and shopping centers. This layout often results in longer trips, and the lower densities consequently result in fewer job opportunities near the residential communities. The higher speed limits and wider roads result in more challenges for bicyclists desiring to share and cross the roadways. Nonetheless, many opportunities still exist, such as providing improved access and facilities at transit stations.

According to the 2013 American Community Survey (U.S. Census Bureau), less than 1 percent of Orange County's population commutes by bicycle. The vast majority of commuters commute to work by driving alone. This shows how automobile-dependent Orange County currently is and why many of the streets and freeways are at, or close to, maximum capacity. The Orange County Projections, produced by the Center for Demographic Research (out of California State University, Fullerton), estimates Orange County's 2013 population of 3.114 million to grow by nearly 600,000, more than 19 percent, by 2035, which will only put more demand on transportation infrastructure. See 2014 Long Range Transportation Plan (www.octa.net/LRTP/).

2.2 Rationale

Implementing bikeway facilities can result in decreased levels of traffic congestion, fuel consumption, and air pollutions, and improved air quality and health. Biking is a viable transportation option for short trips. It solves first mile/last mile issues for transit riders. A bicycle commuter who rides four miles to work, five days a week, avoids 2,000 miles of driving and (in the U.S.) about 2,000 pounds of carbon dioxide emissions each year, which is approximately 5% of the average American's carbon footprint (www.data.worldbank.org).

Serious obesity and diabetes issues exist in the US. Orange County is not immune. The overall obesity rate in the County is over 33%, with most cities in southern Orange County having rates in the low to mid 20's (www.publichealthadvocacy.org). As the graphic on the following page shows, over 7% of people in Orange County suffer from diabetes, with an increasing number of them being children (from the Orange County Health Care Agency, 2014-2016 OC Health Improvement Plan). Encouraging bicycling and other physical activities may help reduce diabetes. According to the Centers for Disease Control and Prevention, children 6 to 17 years of age should get one hour of exercise per day and adults about 30 minutes per day. Bicycling can provide much of this beneficial exercise.



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However, to increase the number of people who bike on a regular basis, bicyclists need to feel safe on the roads and bikeways. According to pedbikeinfo.org, “Bicycle trips account for only 1% of trips in the United States. In 2012, there were 726 bicyclist fatalities and 49,000 bicyclist injuries. This data represents 2.2% of all traffic fatalities during the year. Sixty-nine percent of the bicyclist fatalities occurred in urban areas. In California, there were 124 bicyclist fatalities, representing 4.3% of the total 2,857 traffic fatalities in 2012”. (National Highway Traffic Safety Administration Traffic Safety Facts 2012 Data, published in April 2014). Bike safety has become an increasing concern over the years.

Priority Area #3: Obesity and Diabetes

Key Findings:

- Almost one in four Orange County adults is obese and only 56.7% of 5th graders have healthy body composition.
- Rates of diabetes increased from 6.6% to 7.7% between 2003 and 2009. 7.4% of adults report having diabetes in 2011-12 (methodology changes prevent comparison to previous years).
- Fewer adults are getting the recommended amount of exercise or fruit and vegetables.



Goal 1: Increase the proportion of Orange County residents who are in a healthy weight category.

Objective 1.1: By 2020, increase the proportion of children and adolescents who are in a healthy weight category and reduce disparities in subgroups with lower rates of healthy weight.

Highlighted Strategy: Work with school districts and educators to explore opportunities to align priorities for health and education.

Goal 2: Reverse the trend of increasing rates of diabetes among Orange County residents.

Objective 2.1: By 2020, stabilize the rates of diabetes among Orange County residents.

Highlighted Strategy: Work with health care providers to increase identification of and interventions for pre-diabetes and gestational diabetes.

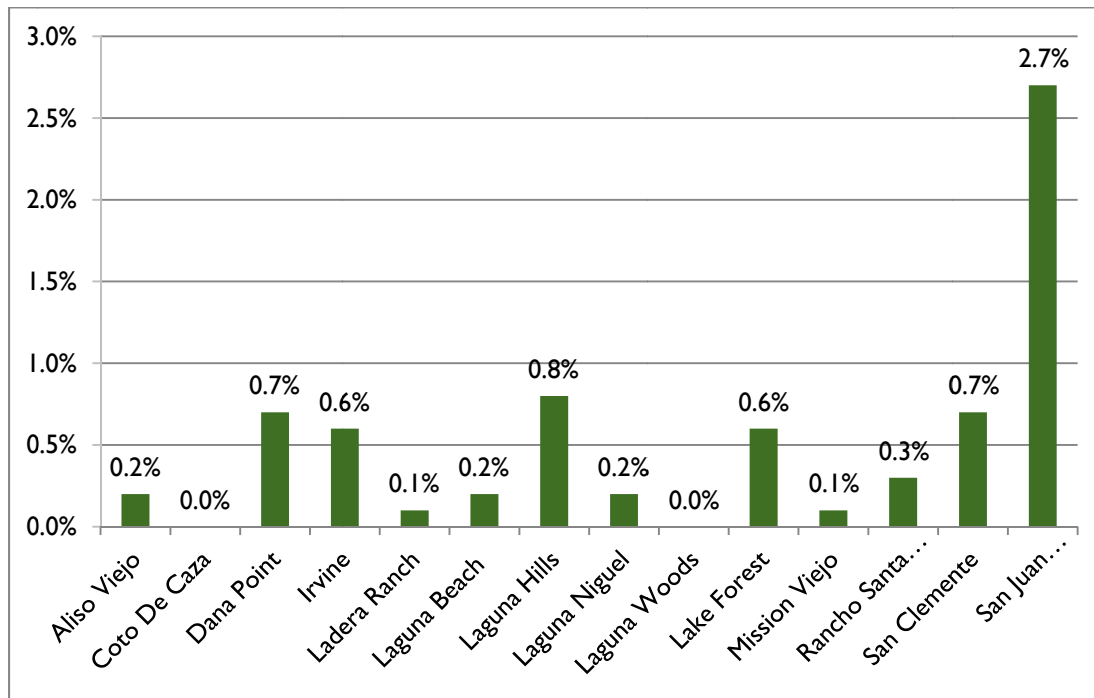
Orange County Health Care Agency,
2014-2016 OC Health Improvement Plan

The Strategy identifies corridors that touch all portions of south Orange County's 5th District. They are intended to be designed for and used by bicyclists of all skill levels and help improve health, environmental, social, safety, and economic conditions. The corridors will connect neighboring cities and districts; within those boundaries, connect major points of interest, including employment and retail centers. This effort will require coordination among associated entities to implement.

2.3 Activity Levels and Collision Analysis

2.3.1 Bicycle Commute Mode Share by City

Bicycle commute mode share by city is determined using American Community Survey (ACS) data from the US Census Bureau. Figure 2.1 illustrates that the bicycle mode share for all work trips ranges between 0% and 2.7% within the District 5 cities. The state and county average is 1.0%, while the national average is 0.6%.

Figure 2.1: Bicycle Commute Mode Share by City¹

1: US Census Bureau: 2009-2013 American Community Survey, 5-Year Estimates

Note: Only the tracts within Supervisorial District 5 of Irvine (mix of land uses)

2.3.2 Estimated Commuter and Utilitarian Bicyclists

In order to recognize the multiple benefits of these regional bikeway corridors, including improved health, less traffic congestion, and maintenance of ambient air quality levels, the number of bicyclists needs to be maximized. A better understanding of the number of existing bicycle trips is needed to achieve these goals of the Strategy. The U.S. Census' ACS provides useful data for understanding bicycling rates across different populations and geographies, as shown in Figure 2.1, but they only report the modes which residents use for commuting to and from work.

The following estimates include additional utilitarian trips, such as those trips made for daily activity by populations other than adults commuting to work. As shown in Table 2.1, there are about 25,000 daily trips by bicycle estimated in District 5. It is important to note that this is simply an order-of-magnitude estimate, based on available data and does not include recreational trips.

Table 2.1: Bicycle Trends in District 5

Variable	Value	Source
Existing Employed Population	290,934	2009-2013 ACS, B08101 5-Year Estimates
Existing Bike-to-Work Mode Share	0.8%	2009-2013 ACS, B08101 5-Year Estimates
Existing Number of Bike-to-Work Commuters	1,460	(Existing Employed Population) x (Existing Bike-to-Work Mode Share)
Existing Work-at-Home Mode Share	8.7%	2009-2013 ACS, B08101 5-Year Estimates
Existing Number of Work-at-Home Population	25,288	(Existing Employed Population) x (Existing Work-at-Home Mode Share)
Existing Number of Work-at-Home Bicyclists	1,264	Assumes 5% of population working at home makes at least one daily bicycle trip
Existing Transit-to-Work Mode Share	1.1%	2009-2013 ACS, B08101 5-Year Estimates
Existing Transit-to-Work Commuters	3,335	(Existing Employed Population) x (Existing Transit-to-Work Mode Share)
Existing Transit Bicycle Commuters	67	Assumes 2% of transit riders access transit by bicycle
Existing School Children, Ages 5-14 (Grades K-8)	41,405	2009-2013 ACS, B01001 5-Year Estimates
Existing School Children Bike Mode Share	2.0%	National Safe Routes to Schools surveys, 2010
Existing School Children Bike Commuters	828	(Existing School Children) x (Existing School Children Bicycling Mode Share)
Existing Number of College Students	35,137	2009-2013 ACS, B14001 5-Year Estimates
Existing College Bicycling Mode Share	25.0%	National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).
Existing College Bike Commuters	8,784	(Existing Number of College Students) x (Estimated College Bicycling Mode Share)
Existing Total Number of Bike Commuters	12,403	Total bike-to-work, school, college and utilitarian trips. Does not include recreation
Total Daily Bicycling Trips	24,807	Total bicycle commuters x 2 (for round trips)

2.3.3 Impact of E-Bike Technology

E-bikes are gaining popularity in the US with sales expected to double over the next 5 years. In hilly areas such as much of southern Orange County, e-bikes will make it easier for people to make short trips by bike versus car as well as use a bike for exercise and recreation.

A recent survey based study titled “Electric Bikes (E-Bikes) in the United States” by John MacArthur at Portland State University suggests that people who are likely to use e-bikes include those who (1) are older, (2) those commute over 5 miles, (3) live in hilly areas, (4) have physical limitations that makes bicycling difficult, (5) people who don't want to sweat or wear special clothes to commute, and (6) people who need to carry or haul items. http://ppms.otrec.us/media/project_files/E-bikes_in_North_America.pdf

“I live in a hilly town and would never commute to work on a standard bike –I wouldn't be able to make it up the hills. My electric assist bike makes commuting by bike possible.” –Survey Respondent

According to the survey the major reasons people bought e-bikes or converted a standard bike were (1) to replace some car trips, (2) health - to increase physical fitness, (3) live or work in a hilly area and (4) ride with less effort. The study also showed that the biggest uses for e-bikes were commuting to work/school and for local trips. The third largest use was for recreation.

The study shows that of the survey respondents 55% rode their standard bike weekly or daily prior to the e-bike purchase; this went to up to 93% after purchase.

The increased popularity of e-bikes will help drive the number of people who use bike facilities in Southern Orange County. As shown by the Portland State University Survey the e-bikes will likely be used largely for commuting and for short trips to local stores and restaurants. This will further increase the demand for bike facilities where all levels of bicyclists feel comfortable.

At the present time in the State of California anyone operating an electric bike is subject to all of the rules and regulations governing operation of a bicycle as outlined in California Vehicle Code Sections 21200-21212. In addition all users must be at least 16 years of age and wear a helmet (California Vehicle Code 24016). At the present time electric bikes cannot be operated on bicycle paths or trails, bikeways, equestrian trails, or hiking or recreational trails, unless it is within or adjacent to a roadway or unless the local authority or governing body of a public agency having jurisdiction over such paths or trails permits, by ordinance, such operation (California Vehicle Code section 21207.5). The laws governing the use of electric bikes are currently being reassessed. Therefore, review of the latest laws governing the use of electric bikes as outlined in the California Vehicle Code must be conducted.

2.3.4 Collision Analysis

Personal safety is a main concern for all new and existing bicyclists. A bikeway perceived as too dangerous or too close to heavy vehicular traffic will discourage the majority of cyclists from using that facility.

In Orange County, between June of 2013 and May of 2014, 17 bicyclists were struck and killed (California State Wide Integrated Traffic Records System). Part of this study is identifying potential improvements that will help prevent or minimize these collisions and resulting fatalities.

The Strategy has assessed the corridors for physical constraints, including freeways, channels, railroads, curb parking, slope, and roadway right-of-way to help identify the routes that would be most useful and enjoyable to the rider, while minimizing threats to their safety.

The analysis of bicyclist-involved crash data in District 5 from 2007-2011, obtained from the California Statewide Integrated Traffic Records System (SWITRS) shows there were 428 total crashes in the study area in the five-year period. Table 2.2 presents the total crashes in District 5 by violation category and party at fault. As shown in Figure 2.2, excluding "unknown causes", over two-thirds of the crashes were the result of four major causes listed below.

1. Right-of-way violation represents nearly one quarter of all crashes. A good example would be a car pulling out in front of a bicyclist.
2. Riding or driving on the wrong side of the road represents 18% of all crashes. Statewide, this is the number one cause of bicyclist-caused crashes and fatalities. This is an area where the education of bicyclists can make a major difference in their safety.
3. The third is improper turning, which accounts for 14% of all crashes. An example of this is when a motor vehicle driver or a bicyclist turns in front of the other.
4. The fourth is unsafe speed, accounting for 12% of all crashes.

Many people assume that running stop signs and stop lights is a cause of bike-related crashes. In District 5, this is the cause of less than 10% of all crashes. In this category motor vehicle drivers and bicyclists are almost equally at fault.

As shown in Figure 2.3, bicyclist-involved crashes per year ranged from 74 in 2007 to 100 in 2011, the most recent year for which complete data are available. As seen statewide, this upward trend in crashes coincides with an increase in the number of people riding bikes. Thus while the number of crashes is increasing, the overall rate of crashes may in fact be declining although at the present time those data are not available.

Table 2.2: Bicycle Collisions in District 5, 2007-2011

Violation Category	Bicycle	Vehicle	Pedestrian	Total	% Excluding unknown
Automobile ROW ¹	37	50		87	24%
Wrong Side of Road	33	32		65	18%
Unknown	34	21		58	
Improper Turning ²	30	23		53	14%
Unsafe Speed	34	10		44	12%
Traffic Signals and Signs	17	14		31	8%
Other Improper Driving	15	10		25	7%
Other Hazardous Violation	6	12		18	5%
Other Than Driver	11	1		12	3%
Under the Influence	5	6		11	3%
Unsafe Lane Change ³	4	3		7	2%
Unsafe Starting or Backing	2	2		4	1%
Improper Passing	3	1		4	1%
Pedestrian ROW	2			2	<1%
Lights	2			2	<1%
Pedestrian Violation			2	2	<1%
Following Too Closely	1			1	<1%
Impeding Traffic		1		1	<1%
Other Equipment	1			1	<1%
Total	240	186	2	428	

¹ <http://www.nolo.com/legal-encyclopedia/free-books/beat-ticket-book/chapter7-5.html>² <http://www.nolo.com/legal-encyclopedia/free-books/beat-ticket-book/chapter7-4.html>³ <http://www.nolo.com/legal-encyclopedia/free-books/beat-ticket-book/chapter7-8.html>

Figure 2.2: Causes of Bicyclist-Involved Crashes by Year

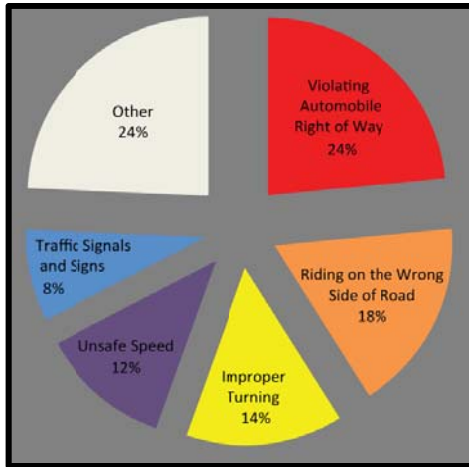
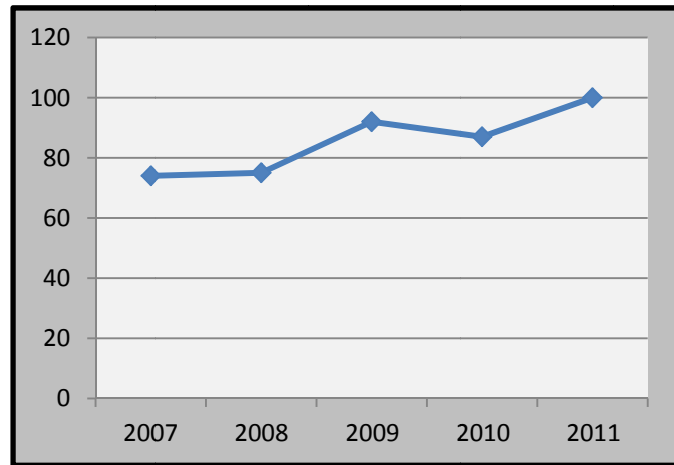


Figure 2.3: Bicyclist-Involved Crashes by Year



2.3.5 Recent Agency Efforts to Improve Bicycle Planning & Infrastructure

Within the 5th District, there are many planning and engineering efforts currently led by the cities to improve bicyclist safety, enhance infrastructure, and support increased bicycling within Orange County. The planning of bicycle infrastructure through general plan updates or bicycle master planning has occurred in San Clemente, Dana Point, Irvine, Laguna Beach, Rancho Santa Margarita, and the adjacent communities in Newport Beach. Many cities have applied for or obtained ATP Cycle I grant funds to implement new or improved bicycle facilities. Lower-cost bike facilities such as Class II bike lane striping have been implemented by many cities.

Major bike design and construction projects are currently in progress by cities such as San Clemente and Dana Point. For example, the City of San Clemente is currently in the design stages of improving the existing Class II bike lanes and constructing a Class I bike path along El Camino Real from Camino Capistrano to Avenida Estacion. In Dana Point, the city is in the planning stage to provide roadway and signal improvements, along with providing Class I and II facilities along Pacific Coast Highway, including Del Prado, from the northerly city limits to Camino Capistrano. The City of Laguna Beach has developed an assessment report for Laguna Canyon Road between El Toro Road to Canyon Acres Drive to improve mobility for all uses. The Rancho Mission Viejo development plan has adopted sustainable circulation to address bicycle and neighborhood electric vehicle components.

3.0 REGIONAL BIKEWAY CORRIDORS

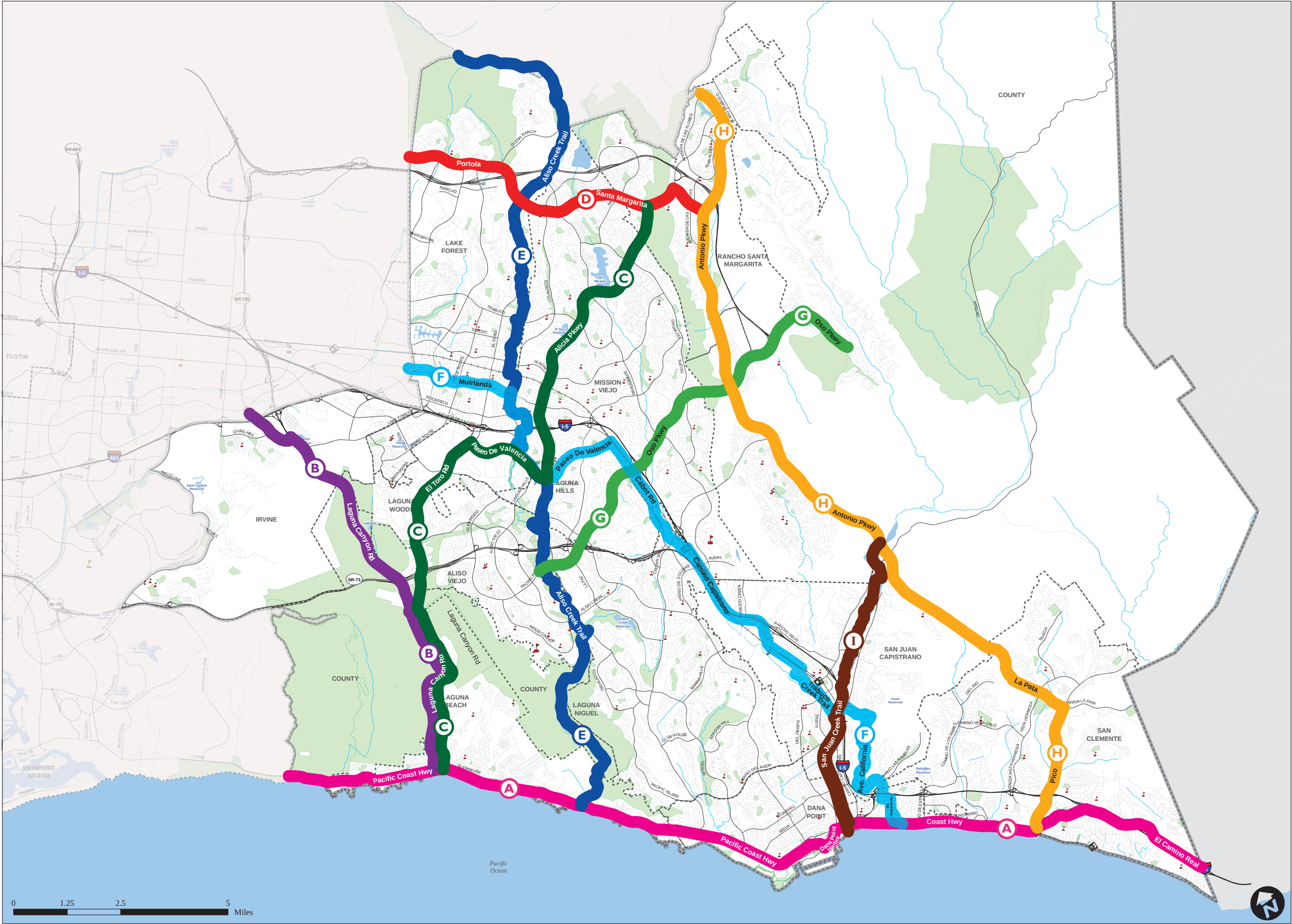
As shown in Figure 3.1, the following nine regional bikeway corridors are proposed for District 5. The corridors connect to one another and to bike facilities to the north in OCTA Supervisorial Districts 2 and 3, as well as to the south in San Diego County. They provide key connections to popular attractions such as beaches, parks, schools, shopping, employment, and transit centers.

3.1 Regional Corridors

Regional corridors were developed through a series of focus group meetings and PDT meetings. At PDT Meeting #2, the team agreed to split the region into three focused areas: central cities, coastal cities, and northern area cities. Each focus group identified its own preferred corridors. OCTA and the consultant then consolidated the corridors identified by the three groups. At PDT Meeting #3, the draft regional corridors were presented and modified based on the collaborative input. In addition, the public input through online surveys or local events were obtained and the results and comments were presented at the PDT meetings.

The following provides a detailed discussion of each regional corridor within District 5. The corridors are labeled in no particular order. The ranking analysis of the nine corridors, using specific criteria, is presented in Section 3.2 for prioritization.

Efforts have been made to identify conceptual alignments of each corridor; however, refinements are expected as feasibility studies are conducted to provide an improved analysis and review of the constraints and opportunities of each corridor. Therefore, flexibility in the alignment of each corridor should be expected to help achieve regional connectivity and continuous linkage.



BIKEWAY CORRIDORS

(A)	Pacific Coast Highway Corridor
(B)	Laguna Canyon Corridor
(C)	El Toro/Alicia Corridor
(D)	Portola/Santa Margarita Corridor
(E)	Aliso Creek Corridor
(F)	Muirlands/Cabot Corridor/ Camino Capistrano
(G)	Oso Parkway Corridor
(H)	Antonio/La Pata/Pico Corridor
(I)	San Juan Creek Corridor

LEGEND

	Transportation Center
	Rail
	Schools
	Colleges
	Parks / Open Space
	Waterbody
	City Boundary
	Supervisory District 5

3.1.1 Corridor A: Pacific Coast Highway

Overview

The Pacific Coast Highway Corridor runs along Pacific Coast Highway through a combination of on- and off-street bike facilities. The corridor is approximately 19 miles¹ long, with 14.1 miles of existing bike facilities and 6.9 miles of proposed bike facilities.

The corridor directly connects to OCTA District 2 and passes through the following jurisdictions: County of Orange, Laguna Beach, Dana Point, and San Clemente. It also includes or intersects the following Caltrans facilities: Coast Highway 1, State Route 133, and Interstate 5 Freeway. The corridor has direct links to other regional bikeway corridors including Laguna Canyon, Aliso Creek, Muirlands/Cabot/Camino Capistrano, San Juan Creek, and Antonio/La Pata/Pico. Figure 3.2 illustrates Corridor A.

Jurisdictions:	• County of Orange • Laguna Beach • Dana Point • San Clemente
Attractions:	• Beach cities • Museums, theaters, parks, shopping • Dana Cove • San Clemente Metrolink • Beach resorts
Cost:	\$11.5-\$14.1 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	1.6
	Proposed	0.8
Class II	Existing	4.6
	Proposed	5.7
Class III	Existing	7.9
	Proposed	0.4
Total Bikeway Miles		21.0
Corridor Length (miles)		19.0

Opportunities, Constraints, and Estimated Costs

The majority of the Pacific Coast Highway Corridor is located in coastal beach cities and attracts avid and social bicyclists of all levels of experience. With some notable exceptions, its relatively flat terrain makes the corridor easily accessible and ride-able. The corridor provides key regional connectivity, linking to five other regional bikeway corridors. At major junction points along the corridor, such as at the Interstate 5 Freeway, the bike facility is separated from automobile traffic.

A major challenge to completing the corridor involves installing Class II and III on-street bikeways, as the interaction between automobiles and bicyclists may deter

novice cyclists from using the facility. The high number of street intersections and segments having limited right-of-way or on-street parking pose increased risks to cyclists using the corridor.

Estimated construction costs for the Pacific Coast Highway corridor including new and updated Class II bike lanes, a new Class I bike path along PCH in the City of Dana Point, one bridge crossing, and eight major intersection crossings, range from \$11.5 to \$14.1 million. Adjacent streets can be used, such as Cliff Drive and Glenneyre Street, as alternative routes to using PCH.

Major Regional Destinations

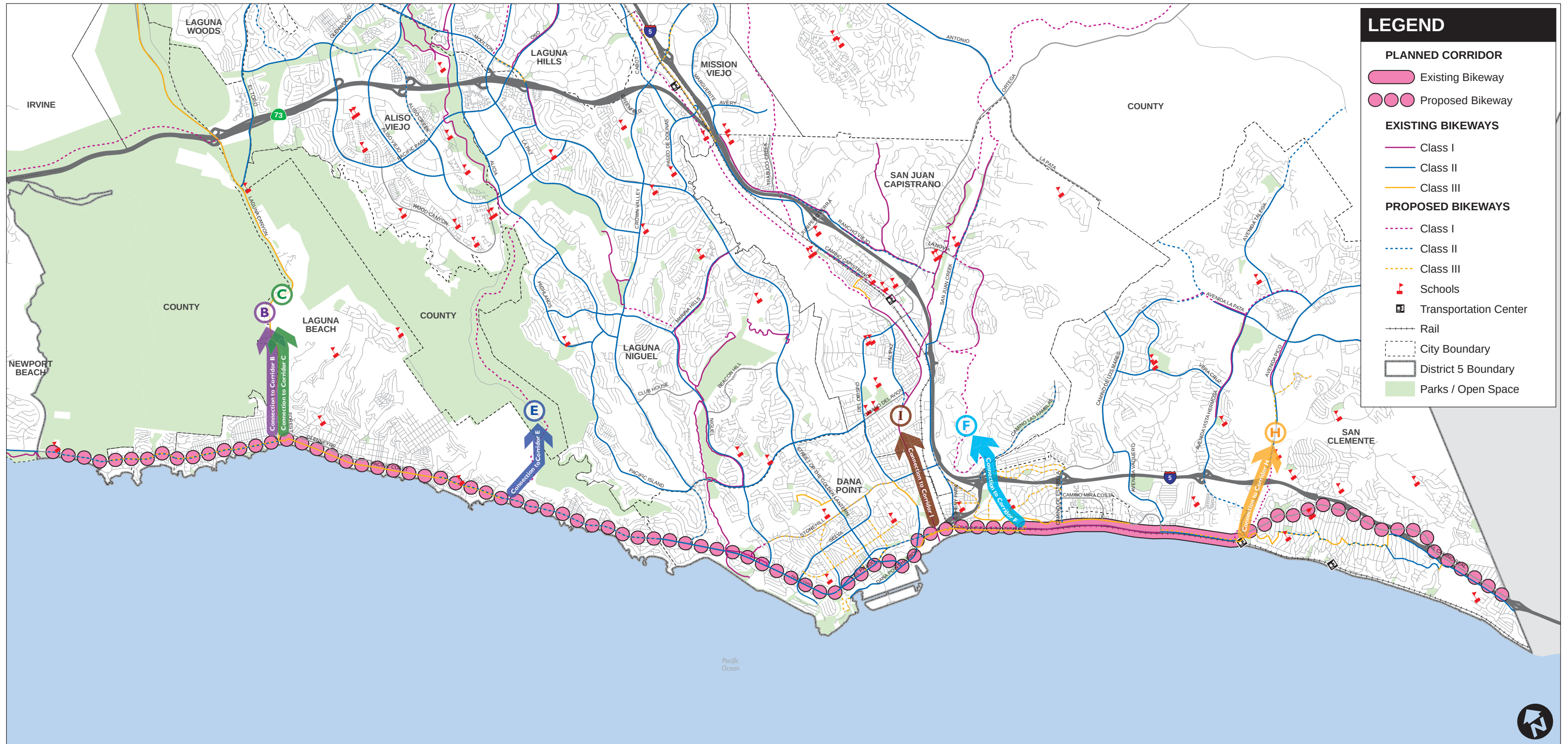
Aside from San Juan Creek, parks, and beaches along the corridor, the Pacific Coast Highway Corridor would also link to the Laguna Art Museum and South Coast Theatre, Dana Cove, San Clemente Metrolink Station, and beach resorts.

¹ Corridor length and total miles of bikeway facilities along a corridor often differ as segments of the corridor may have more than one type of facility, such as both a class I off road facility and class II bike lanes. Total corridor length is measured in center line miles.



CORRIDOR A: PACIFIC COAST HIGHWAY

OCTA District 5 Bikeways Collaborative



Corridor A Bikeway Corridor Details

1.6 miles of existing Class I
4.6 miles of existing Class II
7.9 miles of existing Class III



Schools within
1/4-mile Served



Parks within
1/4-mile Served



People within 1/4-mile
Served (approx.)



Of Total
Corridor Length



\$11.5-14.1 million

Estimated
Project Cost

3.1.2 Corridor B: Laguna Canyon

Overview

The Laguna Canyon Corridor runs north-south near the west boundary of District 5, with the majority of the corridor running along State Route 133 (Laguna Canyon Road). The corridor is approximately 8.8 miles long, comprised of mostly existing Class III bike facilities.

The corridor directly connects to OCTA District 3, and runs within the following jurisdictions: Irvine, County of Orange, and Laguna Beach. It also intersects the following Caltrans facilities: Interstate 405 Freeway, State Route 73, State Route 133, and Coast Highway 1. The corridor has direct links to other regional bikeway corridors including the El Toro/Alicia and Pacific Coast Highway corridors. Figure 3.3 illustrates Corridor B.

Jurisdictions:	• Irvine • County of Orange • Laguna Beach
Attractions:	• Bommer and Shady Canyons Park • Laguna Coast Wilderness Park • Laguna College of Art and Design • Downtown Laguna Beach
Cost:	\$8.4-\$10.3 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	0.0
	Proposed	0.0
Class II	Existing	1.0
	Proposed	6.8
Class III	Existing	7.8
	Proposed	0.0
Total Bikeway Miles		15.6
Corridor Length (miles)		8.8

Opportunities, Constraints, and Estimated Costs

The majority of the Laguna Canyon Corridor provides a scenic and largely uninterrupted riding experience for bicyclists wanting to travel long distances. The corridor has Class III bike facilities along its full length. To upgrade to a Class II bike facility would require major improvements such as roadway widening and construction of new sidewalks, curb, and gutter, and signing and striping. At major junction points, such as at State Route 73, there exists adequate right-of-way to provide bike lanes.

A challenge for the Laguna Canyon Corridor are short segments with grades greater than 5%, which are considered more difficult to bicycle or walk. Also, the majority of the corridor being located on State Route 133 and having a posted speed limit of 50 MPH may pose additional auto-related risks to bicyclists.

Most of the cost associated with the Laguna Canyon Corridor is associated with installing Class II bikeways on the segment between Hwy 73 and Canyon Acres Drive, which requires widening some segments of the roadway. Estimated construction costs for the Laguna Canyon corridor, including street widening, range from \$8.4 to \$10.3 million.

Major Regional Destinations

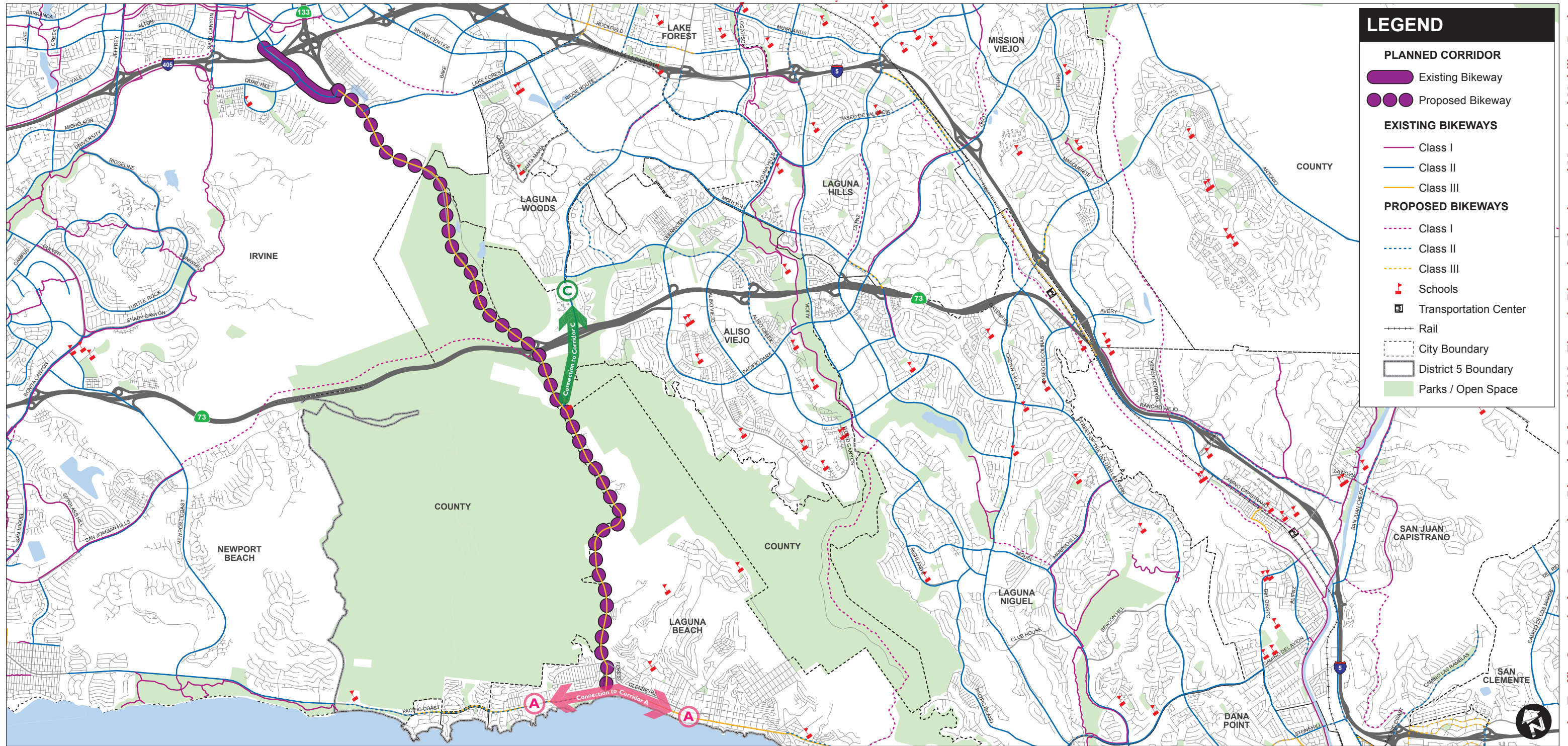
The Laguna Canyon Corridor would link to state parks including Bommer and Shady Canyons Park, Laguna Coast Wilderness Park, Crystal Cove State Park, and the Laguna College of Art and Design.





CORRIDOR B: LAGUNA CANYON

OCTA District 5 Bikeways Collaborative



**Corridor B
Bikeway Corridor Details**

1 mile of existing Class II
7.8 miles of existing Class III

				
1	6	7.5K	8.8 miles	\$8.4-10.3 million
Schools within 1/4-mile Served	Parks within 1/4-mile Served	People within 1/4-mile Served (approx.)	Of Total Corridor Length	Estimated Project Cost

3.1.3 Corridor C: El Toro/Alicia/Laguna Canyon

Overview

The El Toro/Alicia Corridor runs diagonally from near the north boundary of District 5 to Laguna Beach. The corridor is approximately 15.3 miles long, comprised of 0.5 miles of existing Class I, 10.5 miles of existing Class II bike facilities, and 4.3 miles of Class III. The corridor passes through the following jurisdictions: County of Orange, Mission Viejo, Laguna Hills, Laguna Woods, Aliso Viejo, and Laguna Beach. It also intersects the following Caltrans facilities: Interstate 5 and State Route 7, and part of the corridor is State Highway 133. The corridor has direct links to other regional bikeway corridors including the Portola/Santa Margarita, Aliso Creek, Muirlands/Cabot/Camino Capistrano, PCH, and Laguna Canyon. Figure 3.4 illustrates Corridor C.

Length of Bikeway Facilities (Miles)		
Class I	Existing	0.5
	Proposed	0.0
Class II	Existing	10.5
	Proposed	1.4
Class III	Existing	4.3
	Proposed	0.0
Total Bikeway Miles		15.8
Corridor Length (miles)		15.3

Jurisdictions:	• County of Orange • Aliso Viejo • Laguna Beach • Laguna Woods • Laguna Hills • Mission Viejo • Rancho Santa Margarita
Attractions:	• Shopping centers • Saddleback Memorial Medical Center • Laguna Hills High School • Lake Mission Viejo • State and local parks and beaches
Cost:	\$12.2-15.2 million

Opportunities, Constraints, and Estimated Costs

The majority of the El Toro/Alicia/Laguna Canyon Corridor is located among residential and commercial uses that could appeal to avid and casual bicyclists. The majority of the corridor is already in place, making the corridor an established route that will only increase its ridership once improvements are made. The corridor intersects or overlaps with five other regional corridors, expanding its network.

The corridor crosses several major intersections; a large number of collisions have been recorded along the route. Due to this, enhanced bikeway features are recommended. The corridor crosses five major intersections and Interstate 5, and will require special treatments at these locations. The segment along Laguna Canyon is narrow with relatively high speed traffic. Currently improvements are planned for the northbound I-5 and eastbound Alicia Parkway on/off-ramp including widening the sidewalk from approximately four feet to eight feet and adding ADA curb ramps from the bridge to the adjacent Target driveway.

Estimated construction costs for the El Toro/Alicia/Laguna Canyon corridor including freeway and major intersection crossing improvements, range from \$12.2 to \$15.2 million.

Major Regional Destinations

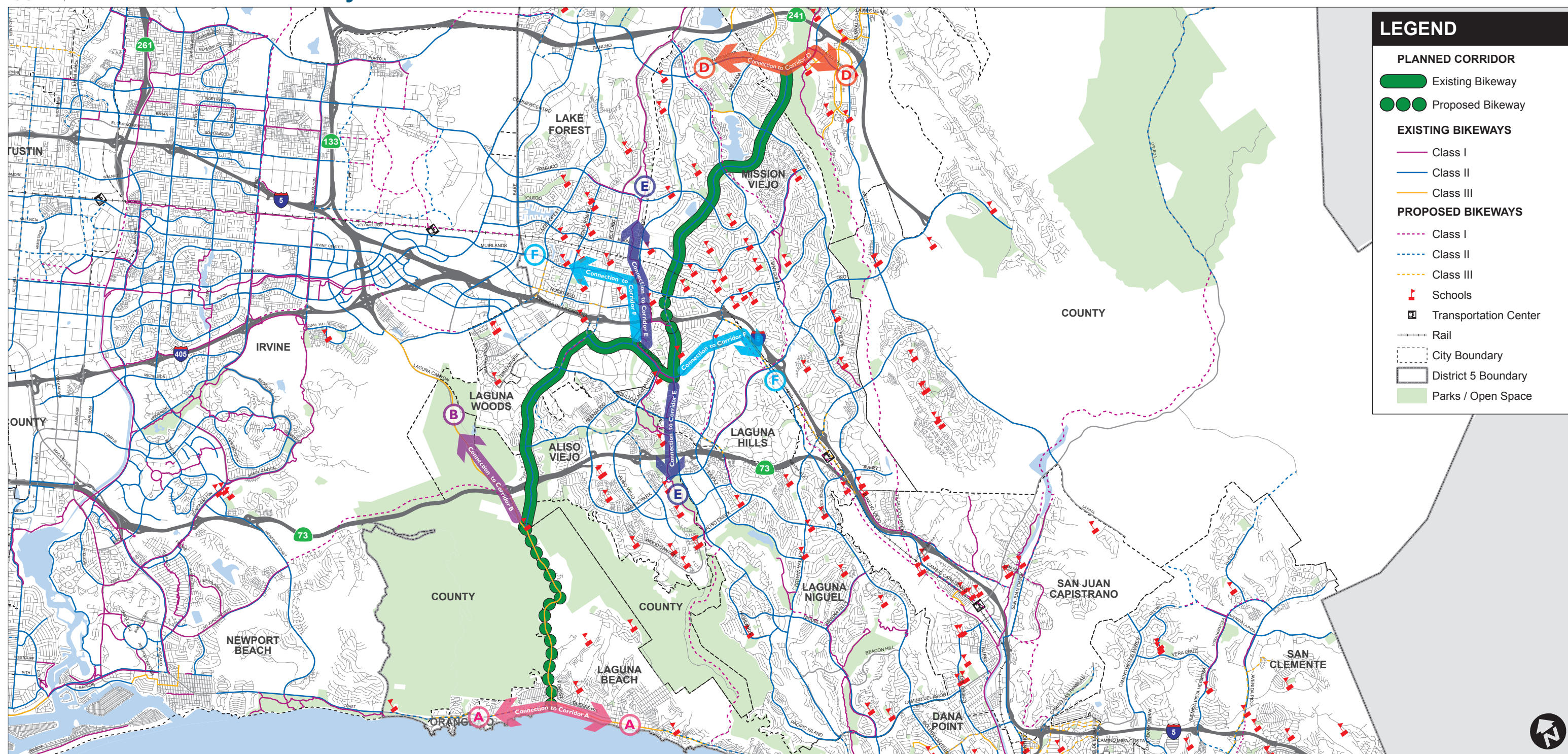
The El Toro/Alicia/Laguna Canyon Corridor would link to state and local parks including Aliso Wood Canyons Wilderness Park, Lake Mission Viejo, and the Saddleback Memorial Medical Center, downtown Laguna Beach, and the adjacent beach areas.





CORRIDOR C: EL TORO / ALICIA / LAGUNA CANYON

OCTA District 5 Bikeways Collaborative



Corridor C Bikeway Corridor Details

0.5 miles of existing Class I
10.5 miles of existing Class II
4.3 miles of existing Class III



6

Schools within
1/4-mile Served



24

Parks within
1/4-mile Served



50.4K

People within 1/4-mile
Served (approx.)



15.3 miles

Of Total
Corridor Length



\$12.2-15.2 million

Estimated
Project Cost

3.1.4 Corridor D: Portola/Santa Margarita

Overview

The Portola/Santa Margarita Corridor runs diagonal near the north boundary of District 5. The corridor is approximately 6.7 miles long, with 6.5 miles of existing Class II bike lanes and 0.6 miles of proposed Class I bike paths.

The corridor directly connects to Supervisorial District 3, Lake Forest, Mission Viejo, and Rancho Santa Margarita, and intersects State Route 241. The corridor has direct links to other regional bikeway corridors including the Aliso Creek, El Toro/Alicia/Laguna Canyon, and Antonio/La Pata/Pico corridors. Figure 3.5 illustrates Corridor D.

Jurisdictions:	• Lake Forest • Mission Viejo • Rancho Santa Margarita
Attractions:	• Shopping centers • Employment centers • Elementary and High Schools • State and local parks
Cost:	\$6.5-\$8.0 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	0.0
	Proposed	0.6
Class II	Existing	6.5
	Proposed	0.0
Class III	Existing	0.0
	Proposed	0.0
Total Bikeway Miles		7.1
Corridor Length (miles)		6.7

Opportunities, Constraints, and Estimated Costs

Corridor D covers major residential and commercial areas in the northern portions of District 5. This is an appealing aspect of this corridor and could attract commuter and recreational riders. Class II bike lanes already exist along a majority of the corridor with connections to eleven intersections with existing or proposed bikeway facilities, providing many links for local cyclists. The corridor intersects or overlaps with three other regional corridors, expanding its network.

A majority of the street segments have high speed limits and Class II bike lanes, thus many bicyclists may not feel comfortable or safe riding next to high speed traffic. The corridor also crosses the State Route 241 freeway with Class II bike lanes provided; this may deter some riders and require special improvements.

Estimated construction costs for the Portola/Santa Margarita corridor including major intersection crossing improvements, range from \$6.5 to \$8.0 million.

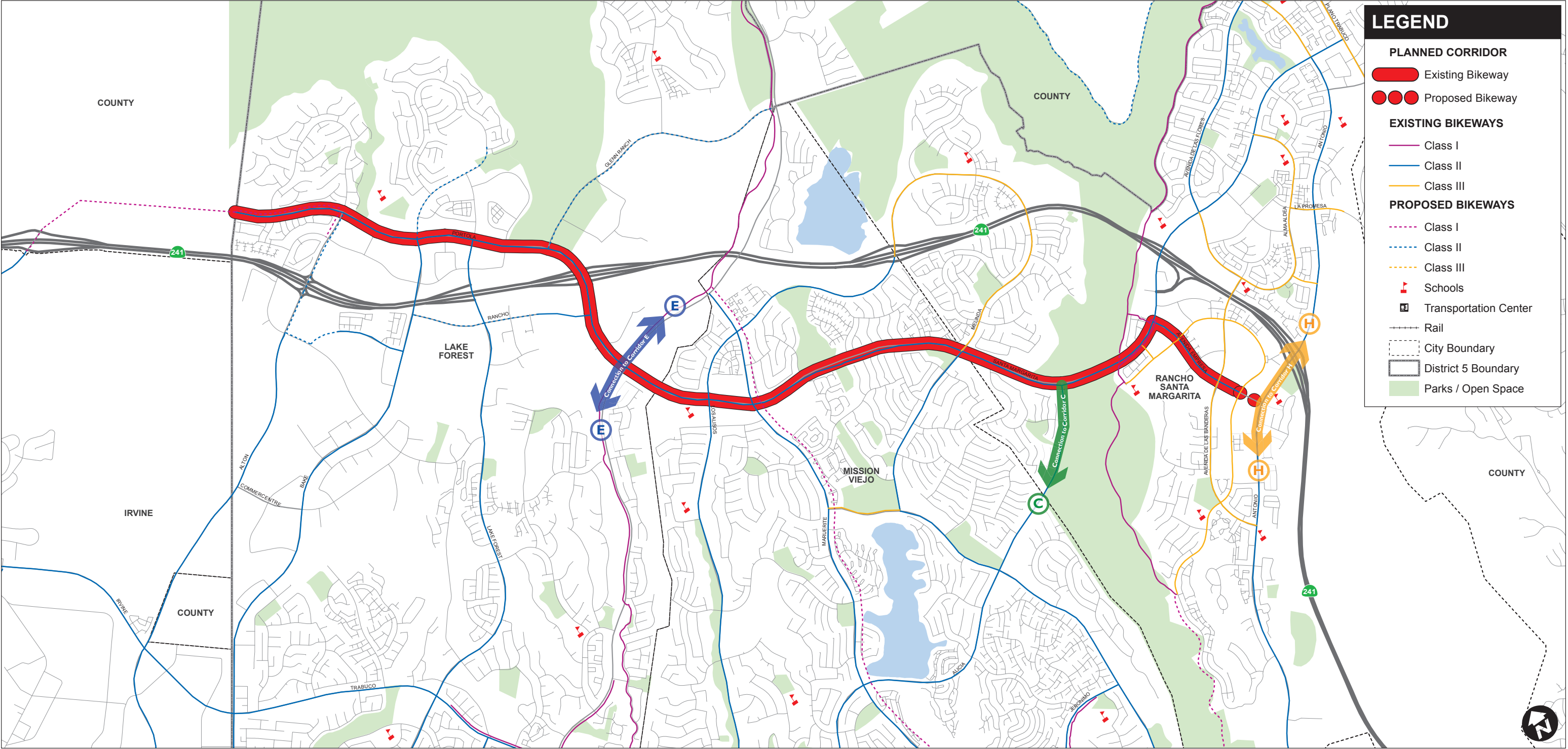
Major Regional Destinations

The Portola/Santa Margarita Corridor would link to state and local parks, Aliso Creek Trail, Serrano Creek Trail, Trabuco Hills High School, and Tijeras Creek Elementary School.



CORRIDOR D: PORTOLA / SANTA MARGARITA

OCTA District 5 Bikeways Collaborative



Corridor D
Bikeway Corridor Details

6.5 miles of existing Class II


4
Schools within 1/4-mile Served


7
Parks within 1/4-mile Served


26.7K
People within 1/4-mile Served (approx.)


6.7 miles
Of Total Corridor Length


\$6.5-8.0 million
Estimated Project Cost

3.1.5 Corridor E: Aliso Creek Corridor

Overview

The Aliso Creek Corridor runs north-south from the north boundary of District 5 to Pacific Coast Highway. The corridor is approximately 20.3 miles long, with 13.5 miles of existing Class I bike paths and 2.0 miles of existing Class II bike lanes.

The corridor directly connects to Supervisorial District 3 and runs within the following jurisdictions: County of Orange, Lake Forest, Mission Viejo, Laguna Woods, Laguna Hills, Aliso Viejo, Laguna Niguel, and Laguna Beach. It also intersects the following Caltrans facilities: State Route 133 and 241, Interstate 5, and State Route 1. The corridor has direct links to other regional bikeway corridors including the Portola/Santa Margarita, Muirlands/Cabot/Camino Capistrano, El Toro/Alicia, Oso Parkway, and Pacific Coast Highway corridors. Figure 3.6 illustrates Corridor E.

Jurisdictions:	• County of Orange • Lake Forest • Mission Viejo • Laguna Woods • Laguna Hills • Aliso Viejo • Laguna Niguel • Laguna Beach
Attractions:	• Shopping centers • Employment centers • Elementary and High Schools • State and local parks • Beach
Cost:	\$8.2-\$10.0million

Length of Bikeway Facilities (Miles)		
Class I	Existing	13.5
	Proposed	6.3
Class II	Existing	2.0
	Proposed	0.0
Class III	Existing	0.0
	Proposed	0.0
Total Bikeway Miles		21.8
Corridor Length (miles)		20.3

Opportunities, Constraints, and Estimated Costs

Corridor E covers major residential and commercial areas with access to schools and local and state parks. This corridor is largely comprised of existing Class I bike paths, which is an appealing aspect of the corridor and attracts numerous users every day. Class I bike paths exist along a majority of the corridor with connections to several intersections with existing or proposed bikeway facilities, providing additional links for local cyclists. The corridor intersects or overlaps with five other regional corridors, expanding its network and choice of routes. The corridor also crosses State Route 241 and 73 freeways, along with the Interstate 5 freeway, all providing Class I facilities traveling under the freeway.

As outlined in the Strategy, the corridor connects through Aliso and Wood Canyons Wilderness Park with a Class I connection to Aliso Beach County Park. However, at the present time the lower portion of Aliso Creek Canyon is privately owned by various landowners and hosts a nine-hole golf course and small hotel. Due to the narrowness of the canyon and property easement issue, a way to accommodate both the golf course and the bike corridor has not been resolved.

Estimated construction costs for the Aliso Creek corridor including grading/retaining walls and the construction of proposed Class I facilities, range from \$8.2 to \$10.0 million.

Major Regional Destinations

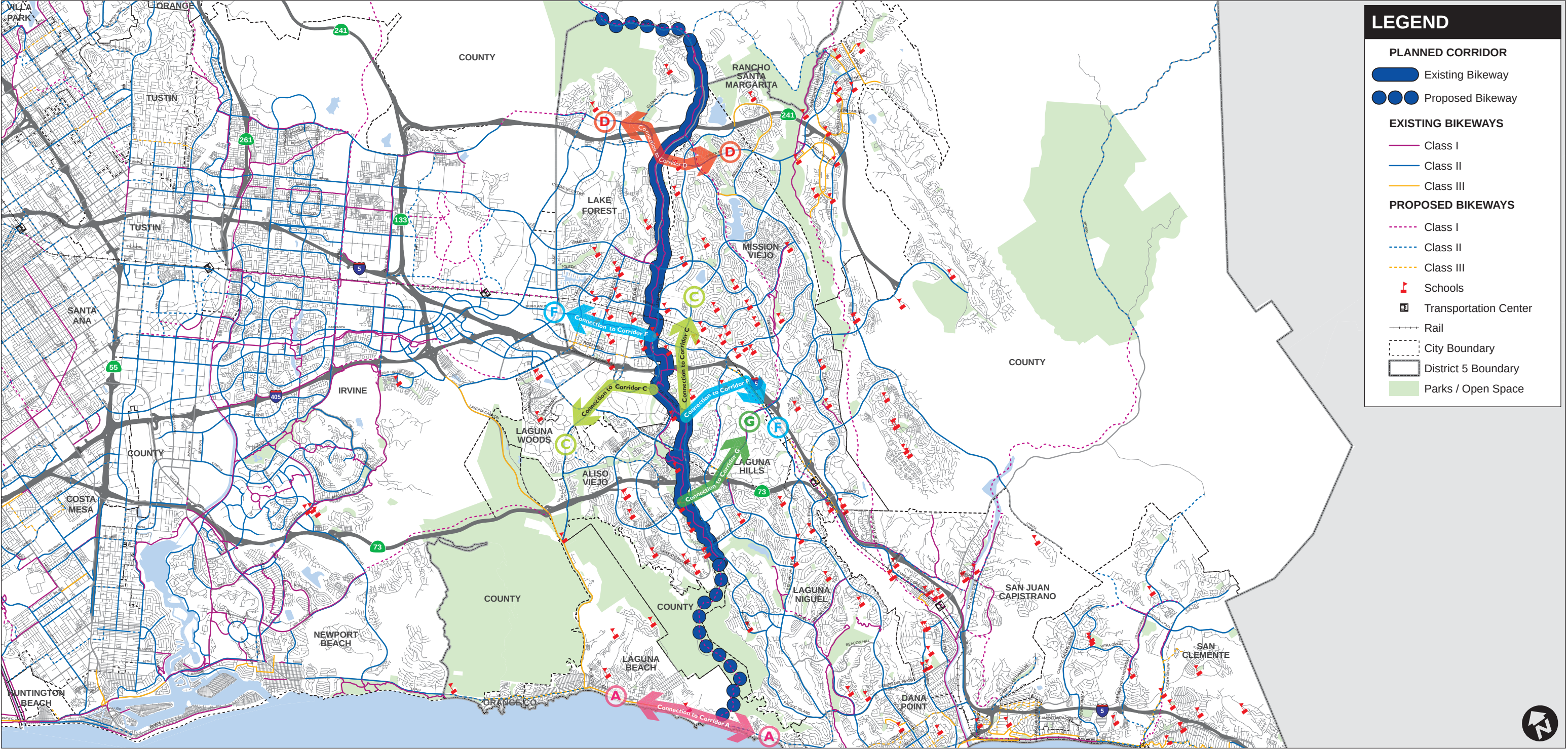
The Aliso Creek Corridor links to state and local parks, Laguna Hills Community Center and Sports Complex, Aliso Viejo Middle School, Aliso Niguel High School, and Wood Canyon Elementary School.





CORRIDOR E: ALISO CREEK

OCTA District 5 Bikeways Collaborative



Corridor E
Bikeway Corridor Details

13.5 miles of existing Class I

2 miles of existing Class II



12

Schools within 1/4-mile Served



35

Parks within 1/4-mile Served



57.2K

People within 1/4-mile Served (approx.)



20.2 miles

Of Total Corridor Length



\$8.2-10.0 million

Estimated Project Cost

3.1.6 Corridor F: Muirlands/Cabot/Camino Capistrano

Overview

The Muirlands/Cabot/Camino Capistrano Corridor runs diagonally north – south starting at the northern boundary of District 5 adjacent to Irvine and south to Pacific Coast Highway. The corridor is approximately 17.9 miles long, including 4.4 miles of existing Class I bike paths, 6.5 miles of existing Class II bike lanes, and 2.6 miles of proposed Class I bike paths. The corridor connects to Supervisorial District 3 on the north end, to Pacific Coast Highway on the south end, and crosses the I-5 Freeway at multiple locations. The corridor has direct links to other regional bikeway corridors including the Aliso Creek, El Toro/Alicia, Oso Parkway, San Juan Creek, and Pacific Coast Highway corridors. Figure 3.7 illustrates Corridor F.

Jurisdictions:	• Lake Forest • Mission Viejo • Laguna Woods • Laguna Hills • Laguna Niguel • San Juan Capistrano • Dana Point
Attractions:	• Shopping centers • Employment centers • Elementary and High Schools • State and local parks
Cost:	\$7.4-\$9.0 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	4.4
	Proposed	2.6
Class II	Existing	6.5
	Proposed	1.5
Class III	Existing	1.6
	Proposed	2.0
Total Bikeway Miles		18.6
Corridor Length (miles)		17.9

Opportunities, Constraints, and Estimated Costs

Corridor F covers a major portion of District 5 and provides connections to some of the densest residential and commercial areas in south Orange County. It parallels the Metrolink rail corridor with access to two Metrolink stations. A large portion of the corridor is already in place, providing Class I bike paths and Class II bike lanes along the majority of the corridor. It provides many connections to several intersections with existing or proposed bikeway facilities. The corridor intersects or overlaps with five other regional

corridors, expanding its network. The corridor crosses the Interstate 5 freeway at three locations along the entire corridor. There are many significant constraints for this corridor: (1) crossing the I-5 at La Paz Road, (2) using the LOSSAN railroad right-of-way along Camino Capistrano, south of the Mission Viejo Metrolink station, and (3) connection from San Juan Creek to the Coast Highway, and others.

At La Paz Road, Muirlands Boulevard (on the north side of I-5) and Cabot Road (on the south side of I-5) are separated by only a few hundred yards. However, the connection currently requires navigating the I-5 undercrossing of La Paz Road, which has very high traffic volumes. To avoid this difficult crossing an alternate route has been proposed that would go south on Los Alisos Boulevard, connect to the Aliso Creek Bikeway to cross under the I-5, with a connection to Paseo De Valencia, then back to Cabot Road. This more circuitous route adds about 1.5 miles and several hills to the corridor. During the feasibility phase other alternatives will be examined including (1) improvements to LaPaz at the freeway on/off ramps and (2) adding a Class I facility adjacent to the railroad right-of-way between Muirlands Boulevard and Cabot Road at La Paz Road. Right-of-way issues on Camino Capistrano will be reviewed during the feasibility study phase. Estimated construction costs for the Muirlands/Cabot/Camino Capistrano corridor, including major intersection crossing improvements, new Class I bike path facilities, and improvements to Class II bikeways, range from \$7.4 to \$9.0 million.

Major Regional Destinations

The Muirlands/Cabot/Camino Capistrano corridor would link state and local parks, Aliso Creek Trail, Los Alisos Intermediate School, Ralph A. Gates Elementary School, Laguna Hills Community Center and Sports Complex, Valencia Elementary School, Laguna Niguel/Mission Viejo Metrolink Station, San Juan Capistrano Metrolink Station, San Juan Hills Golf Club, and Palisades Elementary School.

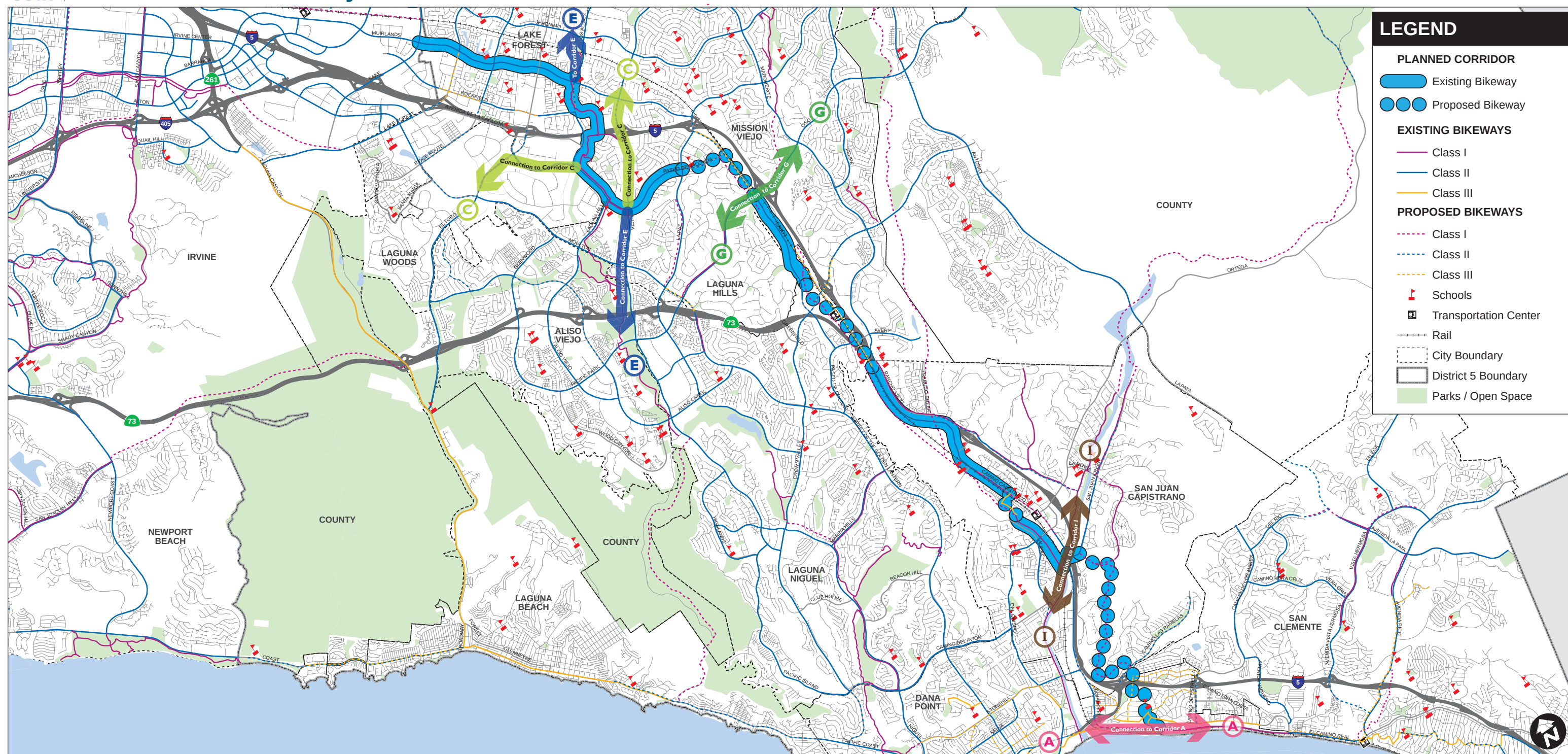


CORRIDOR F: MUIRLANDS / CABOT / CAMINO CAPISTRANO

OCTA District 5 Bikeways Collaborative

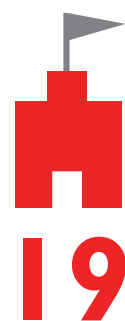
KOA CORPORATION
PLANNING & ENGINEERING

4.1.a



Corridor F Bikeway Corridor Details

4.4 miles of existing Class I
 6.5 miles of existing Class II
 1.6 miles of existing Class III



Schools within
1/4-mile Served



Parks within
1/4-mile Served



People within 1/4-mile
Served (approx.)



Of Total
Corridor Length



\$7.4-9.0 million

Estimated
Project Cost

Packet Pg. 67

3.1.7 Corridor G: Oso Parkway

Overview

The Oso Parkway Corridor runs east-west from east of Aliso Creek Road to South Bend Road/Coto De Caza Drive. The corridor is approximately 8.9 miles long, with 1.7 miles of existing Class I bike paths and 8.8 miles of existing Class II bike lanes. The corridor directly connects to Aliso Viejo, Laguna Niguel, Laguna Hills, Mission Viejo, Rancho Santa Margarita, County of Orange, and intersects State Route 73 and the Interstate 5 freeway. The corridor has direct links to other regional bikeway corridors including the Aliso Creek, Muirlands/Cabot, and Antonio/La Pata/Pico corridors. Figure 3.8 illustrates Corridor G.

Jurisdictions:	• Aliso Viejo • Laguna Niguel • Laguna Hills • Mission Viejo • Rancho Santa Margarita • County of Orange
Attractions:	• Shopping centers • Middle and High Schools • State and local parks
Cost:	\$5.5-\$6.8 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	1.7
	Proposed	0.0
Class II	Existing	8.8
	Proposed	0.0
Class III	Existing	0.0
	Proposed	0.0
Total Bikeway Miles		10.5
Corridor Length (miles)		8.9

Opportunities, Constraints, and Estimated Costs

Corridor G covers major residential areas in the central portion of District 5. The entire corridor is already in place providing Class II bike lanes along a majority of the corridor with connections to approximately seven intersections with existing or proposed bikeway facilities, providing many links for local cyclists. The corridor intersects or overlaps with three other regional corridors, expanding its network. Because the corridor has some segments with an average slope greater than 5%, some cyclists may not feel comfortable

or willing to ride along portions of this corridor. The corridor also crosses the State Route 73 and 241 freeways along with the Interstate 5 freeway with Class II bike lanes provided; this may deter some riders and special improvements are needed.

Estimated construction costs for the Oso Parkway corridor including upgrading Class II bike lanes to separated bikeway facilities, range from \$5.5 to \$6.8 million.

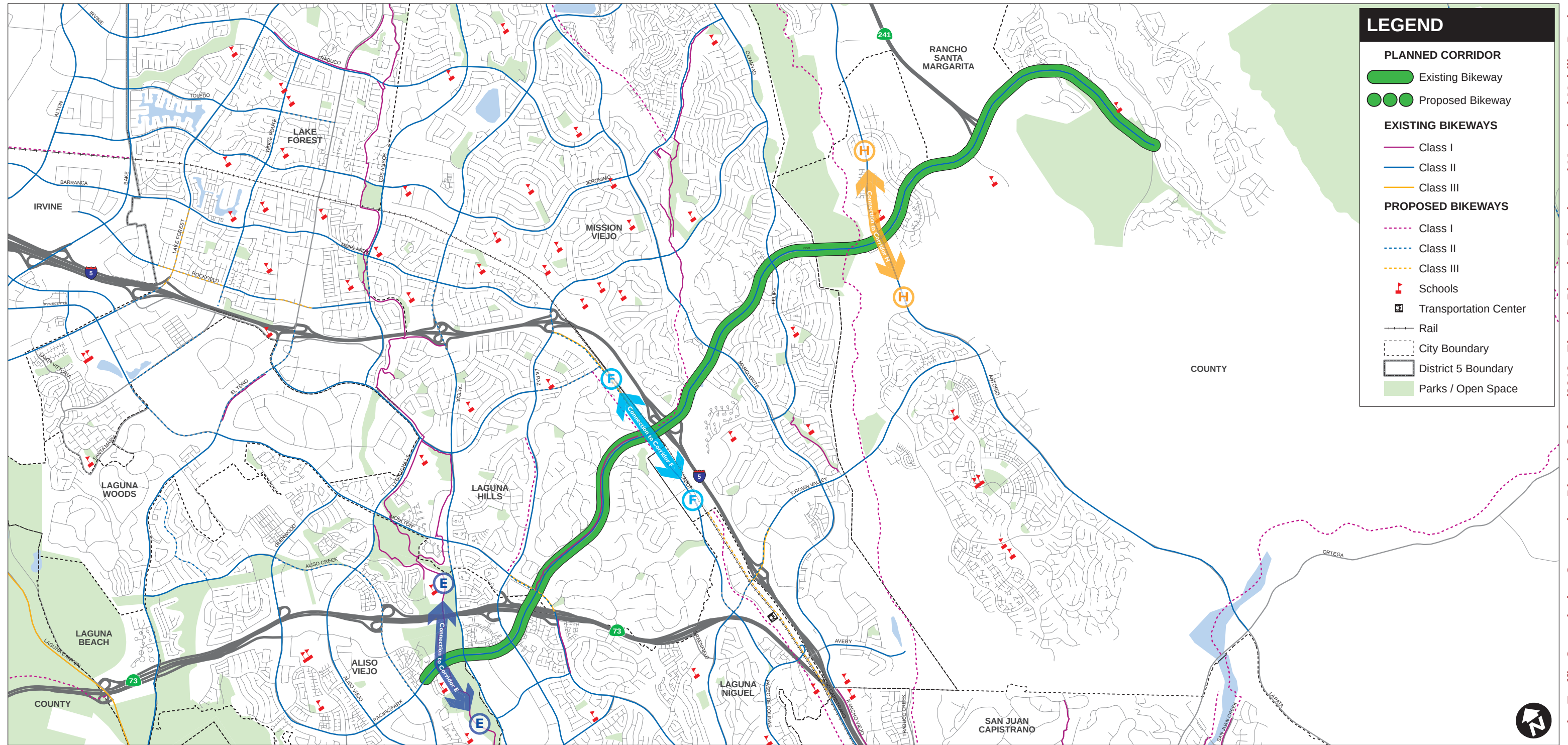
Major Regional Destinations

The Oso Parkway corridor connects state and local parks, Aliso Creek Trail, Mission Viejo Golf Course, Serrano Creek Trail, Las Flores Middle School, Tesoro High School, and Wagon Wheel Sports Park.



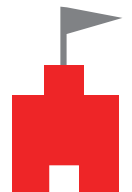
CORRIDOR G: OSO PARKWAY

OCTA District 5 Bikeways Collaborative



**Corridor G
Bikeway Corridor Details**

1.7 miles of existing Class I
8.8 miles of existing Class II

 5	 8	 22.4K	 8.9 miles	 \$5.5-6.8 million
Schools within 1/4-mile Served	Parks within 1/4-mile Served	People within 1/4-mile Served (approx.)	Of Total Corridor Length	Estimated Project Cost

3.1.8 Corridor H: Antonio/La Pata/Pico

Overview

The Antonio/La Pata/Pico Corridor runs diagonally from near the north boundary of District 5 to Pacific Coast Highway. The corridor is approximately 18 miles long, with 13 miles of existing Class II bike lanes and 1 mile of existing Class I bike paths. The corridor directly connects to Rancho Santa Margarita, County of Orange, San Juan Capistrano, and San Clemente, and intersects State Route 241. The corridor has direct links to other regional bikeway corridors including the Portola/Santa Margarita, Oso Parkway, San Juan Creek, and Pacific Coast Highway corridors. Figure 3.9 illustrates Corridor H.

Jurisdictions:	• Rancho Santa Margarita • County of Orange • San Juan Capistrano • San Clemente
Attractions:	• Shopping centers • Employment centers • Elementary, Middle and High Schools • State and local parks
Cost:	\$11.1-\$13.5 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	1.0
	Proposed	0.2
Class II	Existing	13.0
	Proposed	3.5
Class III	Existing	0.5
	Proposed	0.0
Total Bikeway Miles		18.2
Corridor Length (miles)		18.0

Opportunities, Constraints, and Estimated Costs

Corridor H covers major residential and commercial areas in the eastern portions of District 5. A major portion of the corridor is already in place providing Class II bike lanes with connections to approximately ten intersections with existing or proposed bikeway facilities, providing many links for local bicyclists. The corridor also intersects or overlaps with three other regional corridors, expanding its network. Avenida Pico has limited curb to curb width with high traffic demand. An opportunity to utilize the flood channel parallel to Avenida Pico to create a Class I bike lane has been explored.

The corridor is relatively flat with only two segments having an average slope of 5% or higher. A segment of the corridor is missing and needs infrastructure to complete the corridor. The corridor also crosses the State Route 241 freeway with Class II bike lanes provided. The other challenge for Corridor H is the high speed and high volume arterial roadway.

Estimated construction costs for the Antonio/La Pata/Pico corridor including major intersection crossing improvements, improving the existing Class II bike lanes, and the new Class I bike paths, range from \$11.1 to \$13.5 million.

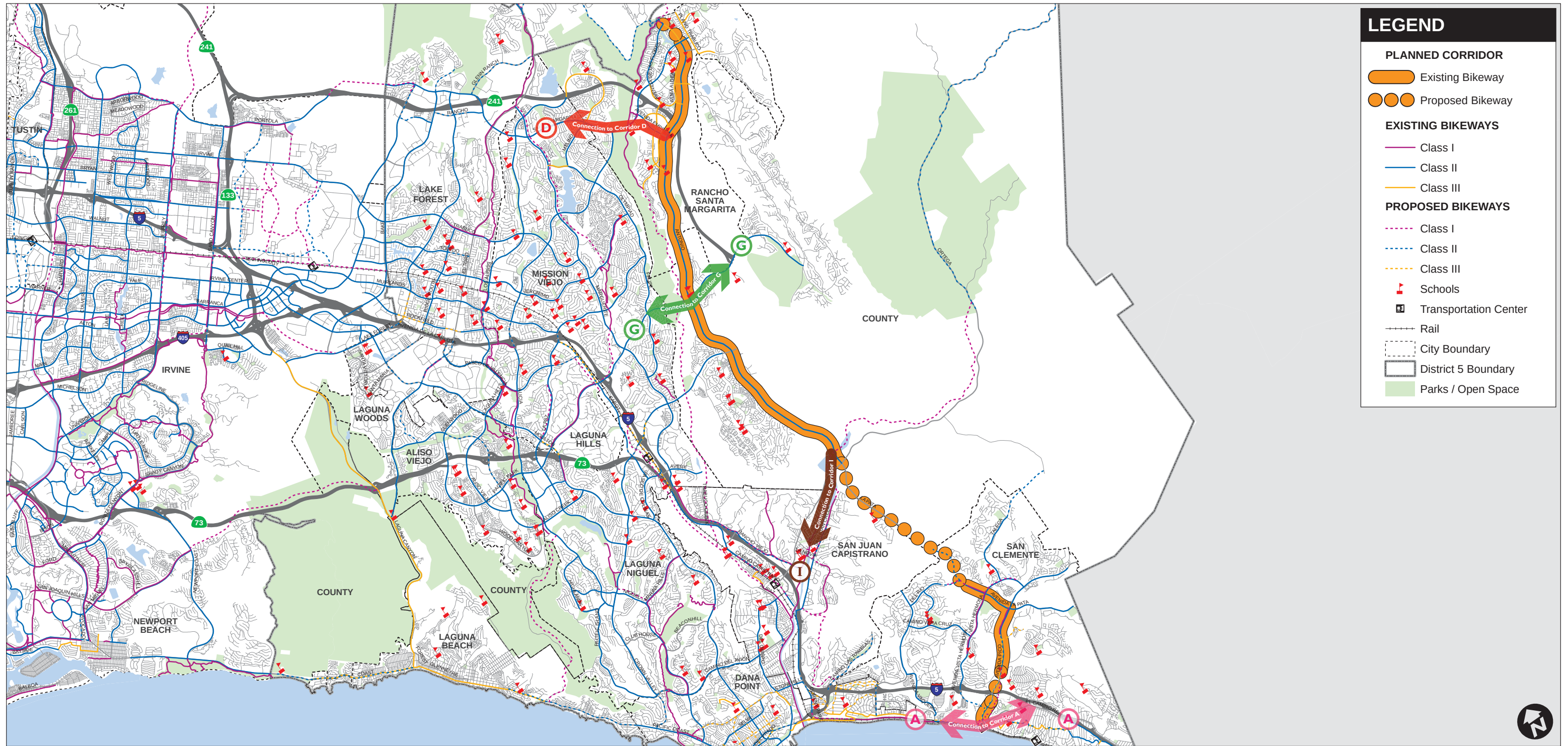
Major Regional Destinations

The Antonio/La Pata/Pico corridor provides connection to state and local parks, Trabuco Mesa Elementary School, Santa Margarita Catholic High School, Rancho Santa Margarita Intermediate School, Tijeras Creek Elementary School, Las Flores Middle School, Rancho Mission Viejo Horse Park, San Juan Hills High School, Vista Hermosa Sports Park, San Clemente High School, and the San Clemente Metrolink Station.



CORRIDOR H: ANTONIO / LA PATA / PICO

OCTA District 5 Bikeways Collaborative



Corridor H Bikeway Corridor Details

1 mile of existing Class I
13 miles of existing Class II
0.5 miles of existing Class III



Schools within
1/4-mile Served



Parks within
1/4-mile Served



40.8K

People within 1/4-mile
Served (approx.)



18 miles

Of Total
Corridor Length



\$11.1-13.5 million

Estimated
Project Cost

3.1.9 Corridor I: San Juan Creek

Overview

The San Juan Creek Corridor runs diagonally from Antonio Parkway just north of San Juan Capistrano to Doheny State beach in Dana Point. The corridor is approximately 8.6 miles long, comprised of 5.8 miles of existing Class I bike paths and 2.8 miles of proposed Class I bike paths. The corridor connects to the County of Orange, San Juan Capistrano, Dana Point, and intersects the Interstate 5 freeway. The corridor also has direct links to other regional bikeway corridors including the Antonio/La Pata/Pico, Muirlands/Cabot, and Pacific Coast Highway corridors. Figure 3.10 illustrates Corridor I.

Jurisdictions:	• Lake Forest • Mission Viejo • Rancho Santa Margarita
Attractions:	• Shopping centers • Employment centers • Elementary and High Schools • State and local parks
Cost:	\$3.8-\$4.6 million

Length of Bikeway Facilities (Miles)		
Class I	Existing	5.8
	Proposed	2.8
Class II	Existing	0.0
	Proposed	0.0
Class III	Existing	0.0
	Proposed	0.0
Total Bikeway Miles		8.6
Corridor Length (miles)		8.6

Opportunities, Constraints, and Estimated Costs

Corridor I provides connections to residential, commercial, and recreational areas in the southern portions of District 5. This corridor consists of Class I bike paths along the majority of the corridor, which is an appealing aspect of this corridor and attracts numerous users every day. The majority of the corridor is already in place, providing Class I bike lanes along a majority of the corridor with connections to four streets with existing or proposed bikeway facilities, providing access to local and regional bicyclists. The corridor intersects or overlaps with three other regional corridors, expanding its network. Because the corridor is completely off-street without intersection crossings or travel alongside vehicles, many bicyclists will feel more comfortable or safe riding along this corridor. The corridor also crosses under the Interstate 5 Freeway. There is an opportunity to pave the south/east bank of the trail and connect to the new development area of the City of San Juan Capistrano.

Estimated construction costs for the San Juan Creek corridor including major intersection crossing improvements, new Class I bike paths, and a new pedestrian/bicycle bridge where San Juan Creek and Trabuco Creek meet, providing access to the east side of the San Juan Creek, range from \$3.8 to \$4.6 million.

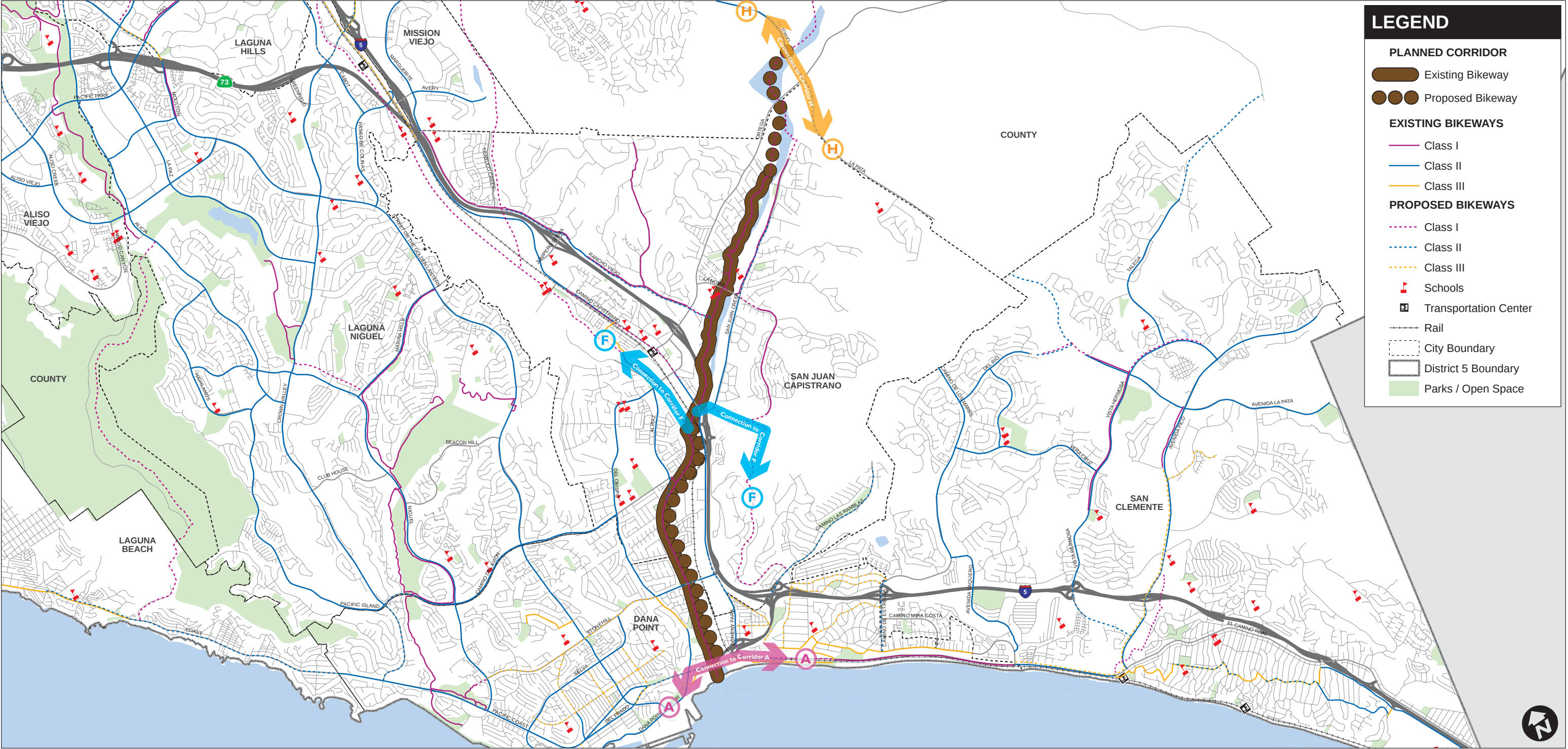
Major Regional Destinations

The San Juan Creek Corridor would provide connections and access to state and local parks, Saint Margaret's Episcopal School, City of San Juan Capistrano City Hall, and Doheny State Beach in Dana Point.



CORRIDOR I: SAN JUAN CREEK

OCTA District 5 Bikeways Collaborative



Corridor I
Bikeway Corridor Details

5.8 miles of existing Class I


9
Schools within 1/4-mile Served


5
Parks within 1/4-mile Served


18.2K
People within 1/4-mile Served (approx.)


8.6 miles
Of Total Corridor Length


\$3.8-4.6 million
Estimated Project Cost

3.2 Evaluation and Ranking

3.2.1 Criteria and Weighting

Each of the proposed regional bikeway corridors were evaluated based on criteria consistent with District 5 goals and objectives. Using the District 1 and 2 criteria as a baseline, the criteria were refined through discussions with PDT members, and through public feedback received during Roundtable #1. The criteria and weighting factors for District 5 have been altered based on the input from Roundtable #1 and the PDT meetings. The criteria below were used to account for a range of opportunities, constraints, and other factors that could influence the usage and implementation of each corridor.

The criteria were developed and presented to the PDT members during the PDT Meeting #3. The criteria were refined based on the feedback from the PDT members and then used to evaluate and rank the regional corridors. During the Roundtable #1 meeting, the regional corridor evaluation analysis results were presented to the PDT members and the public. The evaluation criteria was then refined and several weighting factors were adjusted based on the feedback from the PDT members and the public during the Roundtable #1 meeting. For example, through Roundtable #1, most stakeholders agreed that the safety factor (reported collisions) needed to have a higher weighting factor due to the high speed and high volume roadway characteristic of District 5.

Table 3.1: Criteria Weighting Factor Adjustments

Criteria	Initial Weight Factor	Adjusted Weight Factor
Level of Traffic Stress	1.0	1.0
Reported Collisions	0.5	1.0
Economic Efficiency	1.0	0.75
Trip Demand	1.0	0.75
Public Support	0.5	0.5
Physical Constraints	0.5	0.5
Completes the Network	0.5	0.25
Completes the Corridor	0.5	0.25

Refinements to the criteria and weighting factors included the refinement of the criteria description and analysis methodology. Weighting factors were adjusted to allocate a higher weight on some criteria more than others, based on the feedback from the PDT members and the public. The criteria weighting factors were adjusted as shown in Table 3.1.

The regional corridors were evaluated and ranked using these criteria to help guide the implementing cities in prioritizing bikeway improvements in order to complete and/or improve the corridor bikeway facilities. The evaluation process determined which corridors would provide the greatest relative potential benefit to bicyclists in terms of regional connectivity, access to key destinations, and improved safety, while also having significant public support and limited physical constraints that could impede implementation. The top ranked proposed corridors will be further studied for feasibility in the second phase of the District 5 Bikeways Collaborative. Cities may individually advance the study of a corridor where there is interest and desire to continue the efforts of the strategy.

Table 3.2 below summarizes the criteria and weighting utilized in the ranking analysis and in determining the top ranked corridors to be further studied for feasibility. Please refer to Appendix D for additional details regarding the criteria.

Table 3.2: Criteria Description and Weighting Summary

CRITERIA	DESCRIPTION	WEIGHT
Level of Traffic Stress	Addresses perceive safety related to existing bikeway type and posted speed limits. There are four levels of traffic stress. Corridors with higher level of traffic stress are scored higher and represent a higher priority for treatment.	1.0
Reported Collisions	Addresses safety through five years of reported crash data, normalized by crashes per mile. Unlike motor vehicle crash data, the lower volume of bike crashes and lack of robust, long term exposure data (i.e. number of bicyclists using each corridor) means that this dataset is not as statistically sound. However, it is still commonly reported and easily understood. Corridors with higher collisions per mile are scored higher.	1.0
Economic Efficiency	Measures the financial benefits associated with the corridor, normalized by the number of anticipated users (which is in turn a product of the facility type, population density along the corridor and length), and divided by planning level construction costs estimates.	0.75
Trip Demand	Based on the Bicycle Priority Index (BPI). The BPI, which was developed by OCTA and accounts for various factors that influence bicycle usage including population and employment density, land use, local schools and transit.	0.75
Public Support	Incorporates public priorities through a Public Demand Index. The public input was acquired through the Roundtable #1 and online surveys.	0.5
Physical Constraints	A tally of physical constraints such as right-of-way, on-street parking, freeway ramps, and other “chokepoints”. Fewer constraints result in a higher score as the corridor will be easier to implement.	0.5
Completes the Network	Regional corridors which connect to other regional and local bikeways to help complete the bikeways network. Measured by the number of intersections with other existing and proposed bikeways. Existing bikeway would be weighted more heavily. Proximity to the bikeway network is also included in the BPI.	0.25
Completes the Corridor	Proportion of the corridor that is already built to at least minimum Caltrans standards for the bikeway type that is being proposed. This helps to prioritize corridors which are already partially built. This factor is also part of the LTS Index.	0.25

3.2.2 Cost Estimate Assumptions

Planning level cost estimates were prepared for each corridor for use in the economic efficiency criterion. The costs utilized in the ranking analysis include high-level estimates based on cost averages of similar facilities. Estimates include costs for sign installations at intersections, major intersection improvements, grading and retaining walls, and other anticipated construction costs including bridges, but do not include environmental clearance, design, utility impacts, or maintenance costs. Refer to Appendix D for detailed cost estimate assumptions for each corridor.

The following are key assumptions utilized during the preparation of the cost estimates by facility type:

Class I (off-street bike path):	
Existing Facilities	Upgrade way-finding signs on existing routes, including additional bike lane signage
Proposed Facilities	- Construction of new Class I bike path with 10-foot-wide pavement and 2-foot-wide shoulders on each side, per Caltrans standards. While Caltrans allows 8-foot-wide Class I bike facilities, input from cities during the project indicated that the additional width allows for better accommodation of maintenance vehicles and provides enhanced space allocation for heavily utilized corridors. It also more readily accommodates both bicycle and pedestrian usage, which public input has suggested is an important factor. - Signage for bike path and way-finding - Street crossings were assumed to be at-grade either using nearby existing signalized intersections or a new crosswalk (enhanced crosswalks assumed in limited locations); no new traffic signals assumed. - Bridges over flood control channels were assumed, where appropriate

Class II (on-street bike lanes):	
Existing Facilities	- Upgrade way-finding along existing routes, including additional bike lane signage (particularly at intersections). - Upgrade Class II striping to include a buffer between vehicle travel lanes and the bike lane on existing facilities where feasible.
Proposed Facilities	- Stripe new Class II on-street bike lane with standard white stripe at locations where curbside travel lane is greater than 16 feet wide; buffer or colored lanes also assumed. - Widening of street by 4 feet to accommodate new Class II on-street bike lane with standard white stripe at locations where curbside travel lane is less than 16 feet wide; with cost represented on per linear foot basis assuming general costs for widening and right-of-way acquisition. - Signage for bike lane and for way-finding - Where on-street parking exists, initial cost assumes removal of on-street parking instead of street widening. The feasibility of removing parking will be more a component of the next phase of corridor analysis.

Class III (on-street bike routes):	
Existing Facilities	Upgrade way-finding along existing routes, including additional bike lane signage, sharrows, and signage for regional corridor.
Proposed Facilities	- Implementation of sharrows, bike route signage, and way-finding signage. - Enhanced bike boulevard treatments such as traffic circles, roundabouts, and bikeway channels were not included in cost estimates pending more detailed feasibility review.

Class IV (cycle tracks)	
Existing Facilities	N/A
Proposed Facilities	- Installation of raised islands serving as buffers between a curbside bike lane and vehicular travel lanes - Narrowing of vehicular lanes by restriping

Table 3.4 summarizes the results of the criteria ranking for the nine proposed corridors within District 5 with length and range of costs shown.

Table 3.3: Corridor Cost Estimates

Corridor ID	Corridor Name	Length (miles)	Cost Range (millions)
A	PCH	19.0	\$11.5 – \$14.1
B	Laguna Canyon	8.8	\$8.4 – \$10.3
C	El Toro/Alicia/Laguna Canyon	15.3	\$12.2 – \$15.0
D	Portola/Santa Margarita	6.7	\$6.5 – \$8.0
E	Aliso Creek	20.3	\$8.2 – \$10.0
F	Muirlands/Cabot/Camino Capistrano	17.9	\$7.4 – \$9.0
G	Oso Parkway	8.9	\$5.5 – \$6.8
H	Antonio/La Pata/Pico	18.0	\$11.1 – \$13.5
I	San Juan Creek	8.6	\$3.8 – \$4.6
TOTAL		123.5	\$74.6 – \$91.3

Note: The costs shown above are high-level estimates based on averages of similar facilities. Costs include costs for sign installations at intersections, major intersection improvements, grading and retaining walls, and other anticipated construction costs including bridges, but do not include environmental clearance, design, utility impacts, or maintenance costs.

3.2.3 Results of Criteria Ranking

Table 3.3 summarizes the detailed ranking evaluation, with raw and weighted scores shown. The weighted scores account for normalizing between 0 and 100, and weighting of each criterion.

Table 3.4: Corridor Scoring

Criteria		Rank	Score		Level of Traffic Stress		Reported Collisions		Economic Efficiency		Trip Demand		Public Input		Completes the Network		Physical Constraints		Completes the Corridor	
			Tot.	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	RS	WS	
Best Possible Score			100	4.0	20	3.0	20	6.4	15	343.6	15	96	10	1.7	5	3	10	0%	5	
A	PCH Corridor	1	70	3.8	19	2.9	20	0.9	2	280.1	12	96	10	0.8	3	12	2	0.0	1	
C	El Toro/Alicia/Laguna Canyon	2	65	3.9	20	2.4	16	1.5	4	288.8	13	21	2	1.0	4	20	1	0.0	5	
F	Muirlands/Cabot / Camino Capistrano	3	60	2.3	12	1.1	8	6.4	15	343.6	15	47	5	0.9	3	21	1	0.3	1	
D	Portola/Santa Margarita	4	59	3.9	20	1.1	7	0.6	1	317.1	14	19	2	1.7	5	6	5	0.0	5	
B	Laguna Canyon	5	54	4.0	20	1.4	9	0.3	1	209.2	9	62	6	0.6	2	29	1	0.0	5	
E	Aliso Creek	6	50	1.1	6	0.1	1	4.5	11	260.8	11	58	6	1.0	4	3	10	0.3	1	
G	Oso Parkway	7	48	3.7	19	0.4	3	1.0	2	277.3	12	13	1	1.0	4	16	2	0.0	5	
H	Antonio/La Pata/Pico	8	44	3.4	17	0.9	7	0.6	1	245.1	11	23	2	0.5	2	20	1	0.2	2	
I	San Juan Creek	9	38	0.7	3	0.0	0	5.2	12	312.6	14	22	2	0.9	3	11	2	0.3	1	

Note: RS = Raw Score; WS = Weighted Score

The corridor evaluation process determined that corridors A, C, and F would provide the greatest relative potential benefit to bicyclists in terms of regional connectivity, access to key destinations, and improved safety, while also possessing significant public support and limited physical constraints that could impede implementation.

The following section describes the performance of corridors for each criterion.

Criteria			Reported Collisions	
Best Possible Score			RS	WS
			3.0	20
Corridor	C	El Toro/Alicia	3.0	20
	A	PCH Corridor	2.9	19
	B	Laguna Canyon	1.4	9
	F	Muirlands/Cabot	1.1	7
	D	Portola/Santa Margarita	1.1	7
	H	Antonio/La Pata/Pico	0.9	6
	G	Oso Parkway	0.4	3
	E	Aliso Creek	0.1	1
	I	San Juan Creek	0.0	0

RS = Raw Score, WS = Weighted Score

Safety:

Corridor C received the highest score with regard to the safety criterion. This indicates that this corridor exhibited a relatively higher number of collisions per mile, and priority for treatment.

Criteria			Level of Traffic Stress	
Best Possible Score			RS	WS
			4.0	20
Corridor	B	Laguna Canyon	4.0	20
	C	El Toro/Alicia	3.9	20
	D	Portola/Santa Margarita	3.9	20
	A	PCH Corridor	3.8	19
	G	Oso Parkway	3.7	19
	H	Antonio/La Pata/Pico	3.4	17
	F	Muirlands/Cabot	2.3	12
	E	Aliso Creek	1.1	6
	I	San Juan Creek	0.7	3

RS = Raw Score, WS = Weighted Score

Level of Traffic Stress

Corridor B received the highest score with regard to Level of Traffic Stress. This indicates that the corridor had relatively higher posted speeds and lack of designated bicycle facilities.

Criteria		Trip Demand	
		RS	WS
Best Possible Score		343.6	15
Corridor	F Muirlands/Cabot	343.6	15
	D Portola/Santa Margarita	317.1	14
	I San Juan Creek	312.6	14
	C El Toro/Alicia	288.8	13
	A PCH Corridor	280.1	12
	G Oso Parkway	277.3	12
	E Aliso Creek	260.8	11
	H Antonio/La Pata/Pico	245.1	11
	B Laguna Canyon	209.2	9

RS = Raw Score, WS = Weighted Score

Trip Demand: Bicycle Priority Index (BPI)

Corridor F received the highest BPI score indicating the most potential demand for bicycle demand. Some of the most densely populated and major employment centers in south Orange County are in close proximity to Corridor F.

Criteria		Economic Efficiency	
		RS	WS
Best Possible Score		6.4	15
Corridor	F Muirlands/Cabot	6.4	15
	I San Juan Creek	5.2	12
	E Aliso Creek	4.5	11
	C El Toro/Alicia	1.5	4
	A PCH Corridor	1.1	3
	G Oso Parkway	1.0	2
	D Portola/Santa Margarita	0.6	1
	H Antonio/La Pata/Pico	0.6	1
	B Laguna Canyon	0.3	1

RS = Raw Score, WS = Weighted Score

Economic Efficiency

Corridor F received the highest score for economic efficiency and exhibited the most benefit for the cost to complete/enhance the corridor. The majority of Corridor F is already in place and would require relatively minimal work to complete, but serve the most potential demand.

Criteria		Public Input	
		RS	WS
Best Possible Score		96	10
Corridor	A PCH Corridor	96	10
	B Laguna Canyon	62	6
	E Aliso Creek	58	6
	F Muirlands/Cabot	47	5
	H Antonio/La Pata/Pico	23	2
	I San Juan Creek	22	2
	C El Toro/Alicia	21	2
	D Portola/Santa Margarita	19	2
	G Oso Parkway	13	1

RS = Raw Score, WS = Weighted Score

Public Support

Corridor A received the highest score for public support. Pacific Coast Highway is one of the most iconic bicycling routes in California and is recognized throughout Orange County as a popular and scenic bicycling destination.

Criteria			Physical Constraints	
Best Possible Score			RS	WS
			3	10
Corridor	E	Aliso Creek	3	10
	D	Portola/Santa Margarita	6	5
	I	San Juan Creek	11	2
	A	PCH Corridor	12	2
	G	Oso Parkway	16	2
	C	El Toro/Alicia	20	1
	H	Antonio/La Pata/Pico	20	1
	F	Muirlands/Cabot	21	1
	B	Laguna Canyon	29	1

RS = Raw Score, WS = Weighted Score

Constraints

Corridor E received the highest score for having the least amount of constraints. The Aliso Creek corridor is entirely off-street and has minimal at-grade crossings. It is also aligned along a natural water body with minimal slope.

Criteria			Completes the Corridor	
Best Possible Score			RS	WS
			0.0	5
Corridor	B	Laguna Canyon	0.0	5
	G	Oso Parkway	0.0	5
	D	Portola/Santa Margarita	0.0	5
	C	El Toro/Alicia	0.0	5
	H	Antonio/La Pata/Pico	0.2	2
	E	Aliso Creek	0.3	1
	I	San Juan Creek	0.3	1
	F	Muirlands/Cabot	0.3	1
	A	PCH Corridor	0.3	1

RS = Raw Score, WS = Weighted Score

Complete the Corridor

Corridor's B, G, D, and C received the highest score with regard to completing the corridor. This indicates that these corridors are relatively the most complete and already in place and would require only gap closures to complete.

Criteria			Completes the Network	
Best Possible Score			RS	WS
			1.7	5
Corridor	D	Portola/Santa Margarita	1.7	5
	C	El Toro/Alicia	1.0	4
	E	Aliso Creek	1.0	4
	G	Oso Parkway	1.0	4
	A	PCH Corridor	0.8	3
	F	Muirlands/Cabot	0.9	3
	I	San Juan Creek	0.9	3
	B	Laguna Canyon	0.6	2
	H	Antonio/La Pata/Pico	0.5	2

RS = Raw Score, WS = Weighted Score

Complete the Network

Corridor D received the highest score exhibiting the most connections to other bike facilities. This indicates that Corridor D serves as a key connection point in the overall bike network.

3.2.4 Top Ranked Corridors

As shown in Table 3.3 the three top ranked corridors are:

- **Corridor A:** Pacific Coast Highway;
- **Corridor C:** El Toro/Alicia/Laguna Canyon;
- **Corridor F:** Muirlands/Cabot/Camino Capistrano

Each of the District 5 cities, the County of Orange, and Caltrans have jurisdiction over portions of these three corridors.

The Pacific Coast Highway Corridor, which extends from the north side of Laguna Beach to San Clemente received the highest score. This score was driven by the level of traffic stress (19 out of a possible 20 points), reported collisions (20 out of 20 possible points), trip demand (12 out of 15) and strong public input (10 out of 10).

El Toro/Alicia/Laguna Canyon Corridor, which extends from the base of the Santa Ana Mountains in Mission Viejo to the beach in Laguna Beach, received the second highest score. This score was driven by the level of traffic stress (20 out of a possible 20 points), reported collisions (16 out of 20 possible points), and trip demand (13 out of 15).

Muirlands/Cabot/Camino Capistrano Corridor, which extends from just north of the I-5 in Lake Forest SE to San Juan Capistrano and the Dana Point/San Clemente Border, was the third highest ranking corridor. This score was driven by economic efficiency (15 out of a possible 15 points), trip demand (15 out of 15 possible points), trip demand (12 out of 15) and to a lesser extent level of traffic stress (12 out of 20 possible points).

These three corridors will be further studied for feasibility in the second phase of the District 5 Bikeways Collaborative. The feasibility analyses may determine that segments of certain corridors should be shifted to parallel roadways, depending upon circumstances and/or constraints. Therefore, the nine corridors identified in this report are only conceptual and their exact alignments may change in subsequent stages of planning and design. This design flexibility will ensure that the best possible routes are included in transportation plans and applications for construction funds.

4.0 ACTION PLAN

4.1 Potential Near-Term Efforts

This section identifies potential near-term projects that can be implemented by each of the cities within District 5 to begin implementation of the proposed corridors. Potential near-term projects are those that are expected to have a low construction cost and can be implemented in a relatively short period of time as funds become available. Implementation and funding of these projects would be the responsibility of each jurisdiction. OCTA would assist local jurisdictions in obtaining funding for these projects by providing letters of support, grant notifications and guidance, and design solutions. Coordination between jurisdictions is highly encouraged to implement bikeway connections simultaneously.

Each of the nine regional bikeway corridors has been reviewed at a conceptual level to identify “potential near-term” projects expected to require minimum capital investment, little or no right-of-way acquisition, and may require minimal environmental review. These types of projects may include restriping a street to implement a Class II bikeway, signing a street to designate it as a Class III bikeway, or signing and striping an existing paved off-street path or maintenance road of sufficient width to serve as a Class I off-street bikeway. For existing Class II bike lanes, if there is enough roadway width, enhancing the existing Class II bike lane to a buffered bike lane can be easily implemented.

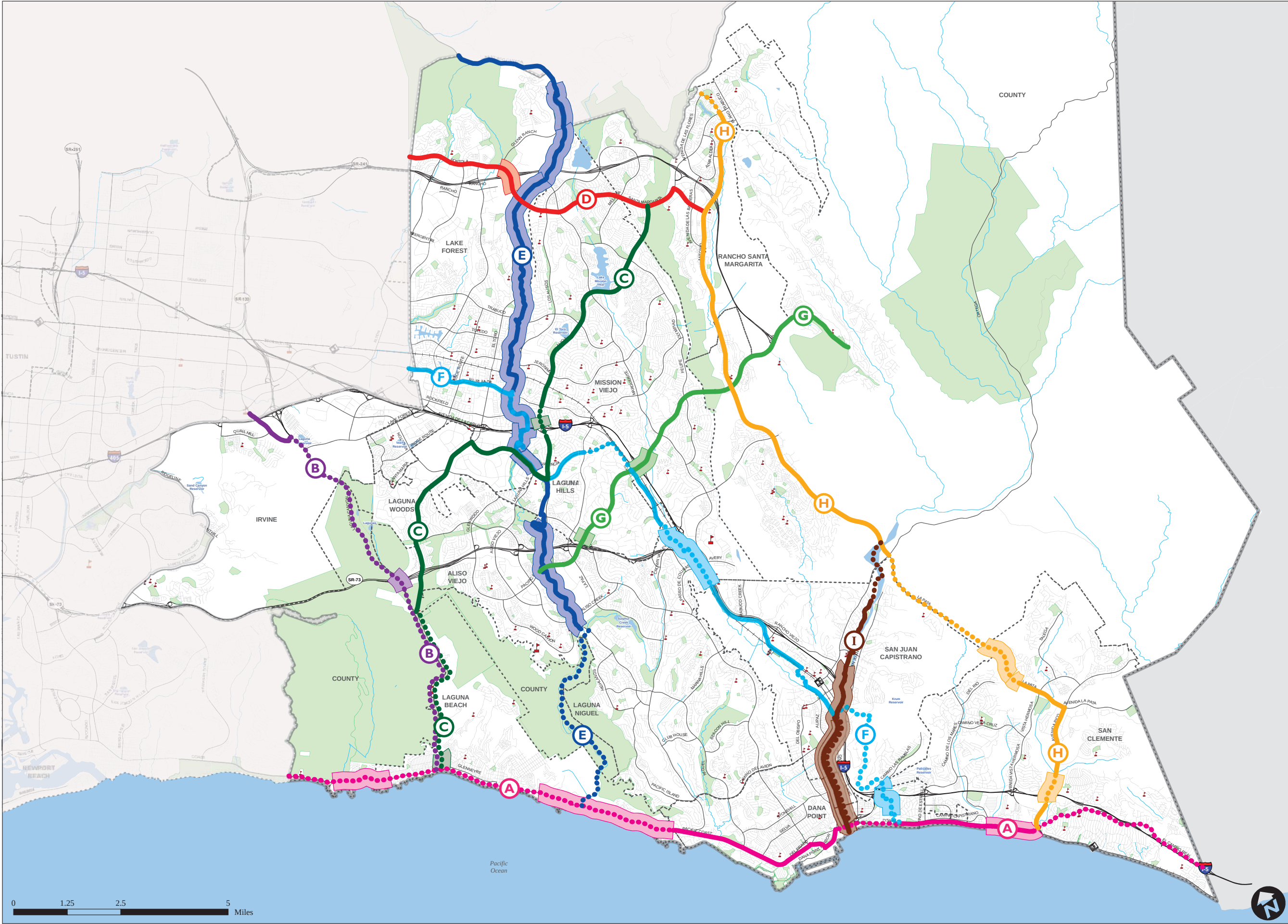
Table 4.1 summarizes the proposed near-term improvements along with estimated costs and jurisdictional responsibilities. Figure 4.1 shows the locations of the proposed near-term improvements.

Table 4.1: Proposed Near-Term Improvements

Corridor	Location	Owner/ Operator	Proposed Improvement	Length (feet)	Cost Estimate
A: Pacific Coast Highway	PCH (west city limit to Cliff Dr)	Laguna Beach/Caltrans	New Class II (on-street, striping)	5,970	\$65,670
	PCH (Nyes Place to Eastline Drive)	Laguna Beach/Caltrans	New Class II (on-street, striping)	14,230	\$156,530
	El Camino Real (Camino Capistrano to Avenida Estacion)	San Clemente	New Class IV	10,000	\$524,000
B: Laguna Canyon	Laguna Canyon Road at SR-73	County of Orange / Caltrans	Stripe bike lanes through freeway interchange	3,000	\$33,000

Corridor	Location	Owner/ Operator	Proposed Improvement	Length (feet)	Cost Estimate
C: El Toro / Alicia / Laguna Canyon	Broadway Street (Laguna Canyon Road to PCH)	Laguna Beach	Upgrade Existing Facility (signage and other)	1,510	\$453
D: Portola / Santa Margarita	SR-241 and Portola Parkway	County of Orange / Caltrans	Class II buffered bikeway striped through interchange	3,000	\$33,000
E: Aliso Creek	Aliso Creek Trail	County of Orange,	Upgrade existing Class I by adding way-finding signage	4,670	\$1,401
		Mission Viejo		5,930	\$1,779
		Lake Forest		30,050	\$9,015
		Laguna Woods		2,870	\$861
		Laguna Hills		3,410	\$1,023
		Aliso Viejo		14,550	\$4,365
F: Muirlands/ Cabot/Camino Capistrano	Camino Capistrano (Metrolink Station to south city limit)	Laguna Niguel	New Class III (on-street, signage)	3,710	\$9,275
	Via California (Camino Las Ramblas to Calle Beinenido)	San Clemente	New Class III (on-street, signage)	510	\$1,275
	Via California (Via Velez to Via Lopez)	Dana Point	New Class II (on-street, striping)	540	\$5,940
	Via Fortuna (Via California to Via Sacramento)	Dana Point	New Class III (on-street, signage)	840	\$2,100
	Via Sacramento (Via Fortuna to Camino Capistrano) & Via California (via Lopez to Via Fortuna)	Dana Point	New Class III (on-street, signage)	1,950	\$4,875
G: Oso Parkway	Oso Parkway at I-5 Freeway	OCTA and Caltrans	Add buffered class II striping through intersection (with green paint)	5,500	\$75,000
	Oso Parkway at Moulton Parkway	Aliso Viejo	Add Class II striping to the intersection	900	\$10,000
H: Antonio / La Pata / Pico	La Pata - west city limits to Del Rio	San Clemente	New Class II (on-street striping)	870	\$9,570
	La Pata - Del Rio to Calle Saluda	San Clemente	New Class I (off-street paving)	1,200	\$180,000
	Avenida Pico (Calle Frontera/Avenida Presidio to Calle De Industrias/Via Pico Plaza)	San Clemente	New Class II (on-street striping)	3,000	\$33,000

Corridor	Location	Owner/ Operator	Proposed Improvement	Length (feet)	Cost Estimate
I: San Juan Creek	Avenida Siega/Calle Arroyo to Calle Jardin	San Juan Capistrano	Upgrade Existing Facility (Signage and Other)	19,700	\$5,931
	Calle Jardin to Doheny State Beach	Dana Point	Upgrade Existing Facility (Signage and Other)	6,240	\$1,872
	East side of San Juan Creek (Trabuco Creek Trail to Stonehill Dr)	San Juan Capistrano	New Class I - off street paving	7,620	\$1,143,000
	East side of San Juan Creek (Stonehill Dr to PCH)	Dana Point	New Class I - off street paving	3,810	\$571,500



BIKEWAY CORRIDORS

Existing Facility	Proposed Facility	Near Term Project	
			A: Pacific Coast Highway
			B: Laguna Canyon
			C: El Toro/Alicia
			D: Portola/Santa Margarita
			E: Aliso Creek
			F: Muirlands/Cabot/Camino Capistrano
			G: Oso Parkway
			H: Antonio/La Pata/Pico
			I: San Juan Creek

LEGEND

-  Transportation Center
-  Rail
-  Schools
-  Colleges
-  Parks / Open Space
-  Waterbody
-  City Boundary
-  Supervisory District 5

4.2 Programmatic Recommendations

Of the five E's of bicycle planning, four are related to programs; encouragement, education, enforcement and evaluation. Programs should complement engineering improvements such as bike paths, lanes, and routes by providing the education and encouragement to ensure that the facilities get maximum utilization.

4.2.1 Encouragement

Safe Routes to School Program

The Safe Routes to School (SRTS) Program (www.saferoutesinfo.org) focuses on both education and infrastructure development with the goal of increasing the number of children who walk and bike to school on a regular basis.



The program offers promotional and educational materials to help communities develop effective safe routes to schools programs. The statewide Active Transportation Program (ATP) for funding bike and pedestrian programs includes a specific category for SRTS programs. These grants can be used for either infrastructure or educational programs that promote children walking and biking to school. One of the advantages of SRTS grants is that they require no local match. For more on funding opportunities, see Chapter 6.



Bike month is a nationwide event held in May of each year. The intent of the month long campaign is to increase awareness of bicycling, its benefits and impact, as well as encourage bicycling across all segments of the population. OCTA has an active campaign each May that includes not only a bike-to-work day, but a number of events held throughout the month. In addition, many of the cities in District 5 hold their own bike-related events.

For more information on National Bike Month, go to the League of American Bicyclists www.bikeleague.org/bikemonth. For a list of events in Orange County, see www.octa.net/Share-the-Ride/Bike/Bike-Month

Employer-Based Encouragement Programs

Many companies, OCTA, and participating cities work with or provide information to employees about commuting by bicycle. A useful resource is an article published in Inc Magazine in 2010 titled "[How to encourage your employees to bike to work](#)." It has a checklist showing what companies (and government agencies) can do to encourage their employees to bike to work.



Launch Party for New Bikeways

When a new bikeway is built, some residents will become aware of it and use it, while others may not realize that they have improved bikeway options available.

Conducting opening events where you invite local dignitaries, school groups, bike clubs, and local businesses to participate is a great way to help raise early awareness and use of new facilities.



Elected and school officials are often eager to be involved in these types of events, as they can be used to highlight programs they have encouraged and championed in the community.



Open Streets Events

Open streets events have many names: Sunday Parkways, Ciclovias, Summer Streets, and Sunday Streets. These events have become increasingly popular across the County. In Southern California, these events have been hosted from Los Angeles to Santa Ana, Garden Grove, and San Diego. Los Angeles's events routinely attract over 100,000 participants and have encouraged large numbers of people who do not regularly ride a bike to come out and enjoy car-free city streets.

One of the many benefits of these events is highlighting the businesses along the route and showing people how easy it is to dine and shop by bike. A recent study from UCLA, titled "[Economic impacts of CicLAvia: Study Finds Gain To Local Businesses](#)" discusses the significant economic impact of these events.

For a guide to conducting an open streets event, go to the Alliance for Biking and Walking website: www.bikewalkalliance.org/resources/reports/open-streets-guide.

Bicycle Friendly Community



The League of American Bicyclists recognizes communities that are good, friendly, safe places to ride your bike; cities that welcome and encourage bicyclists and bicycling. According to the league's website, "A BFC welcomes bicyclists by providing safe accommodations for bicycling and encouraging people to bike for

transportation and recreation. Making bicycling safe and convenient are keys to improving public health, reducing traffic congestion, improving air quality and improving quality of life."

Being recognized as a bike friendly community is becoming more and more important in attracting and retaining new residents as well as businesses. People of all ages ranging from school age, to newly working adults to aging baby boomers are looking for cities that offer an active lifestyle and provide an opportunity to choose to get out of their vehicle and use alternative forms of transportation including bicycling. Businesses are looking to locate and grow in cities that offer a lifestyle that will attract new employees and customers; one of their important criteria has become having a bike (and pedestrian) friendly culture.

In Orange County, the cities of Irvine and Huntington Beach, along with the County, have achieved recognition as Bike Friendly Communities. Nationwide, over 300 communities are recognized as being bike friendly.

For information on the advantages of being recognized as a bike friendly community and on obtaining bike friendly status see the League of American Bicyclists website www.bikeleague.org/bfa.

4.2.2 Education

Bicycle Resource Website

Educating both bicycles and motorists is an important aspect of being bike friendly. Bicyclists need to understand safe bicycling behavior and the basics of bicycle maintenance. They need to understand how to deal with traffic as well as pedestrians and other bicyclists. Motorists need to understand that bicyclists have the same rights that vehicle drivers have. Now motorists need to understand safety rules, such as the 3-foot law.

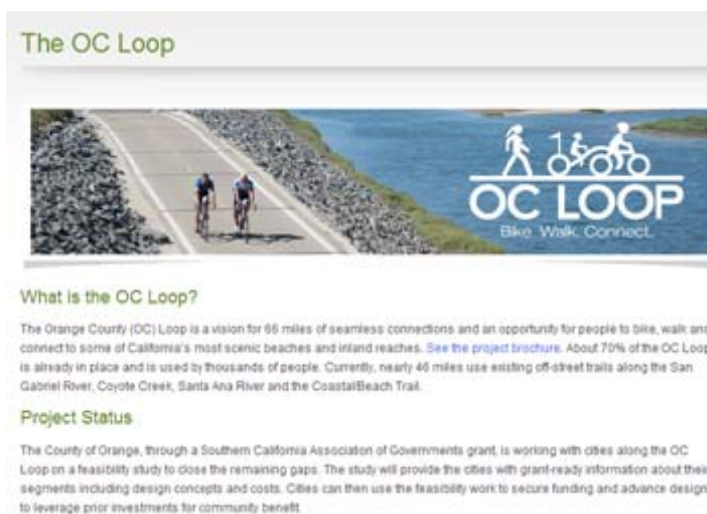
OCTA hosts several pages dedicated to bicycling and bicycle safety: <http://www.octa.net/Share-the-Ride/Bike/Riding-in-Orange-County/OC-Bikeways-Map/>

Bicycle resource websites may also include:

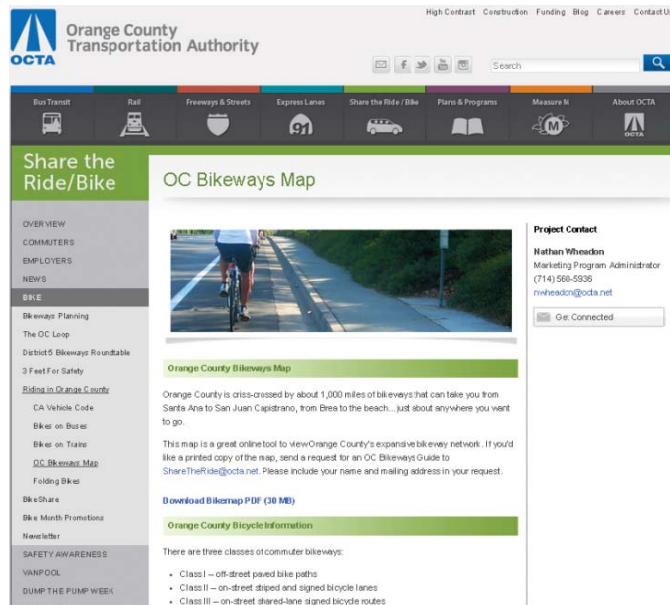
- Advertisements for all bikeways after implementation
- Bicycling tips including information on how to:
 - o Carry items using baskets and panniers
 - o Properly lock a bike
 - o Ride in the rain with help from fenders and rain gear
 - o Tips can also include information on the importance of bicycle lights and reflectors.
- Bikeway maintenance and repair phone numbers
- Bicycle events calendar
- Bicycle traffic skills classes information
- multilingual versions

Marketing Concurrent with New Facilities

Education about new facilities can help notify and educate both cyclists and motorists about newly installed facilities. OCTA has a history of effective marketing using local events to highlight new facilities. These include special events associated with opening segments of facilities, such as ribbon cutting ceremonies and bike rides where local private and governmental entities are invited to participate, along with local school and youth groups.



Social media and the web are also important tools for marketing new facilities. A recent example of a marketing campaign associated with the OC Loop, a 66-mile largely off-street bike and pedestrian facility that connects northern inland OC with the beach communities can be found at www.octa.net/OCLOOP



A marketing campaign that highlights bicyclists and pedestrian safety is an important part of creating public awareness.

OCTA has a strong history of creating community outreach programs, using social media, and creating public service messages including items such as banner ads, in particular those placed on OCTA busses.

OCTA's yearly Bike Month Campaign has been very effective at conveying a safety message for both motorists and bicyclists.

Funding sources for similar campaigns that can be conducted at the city level are discussed in Chapter 6.

Adult Bicycling Traffic Skills Classes

Most adult bicyclists have not received any formal training on safe bicycling practices, the rules of the road, and bicycle handling skills. If they received any bike education at all, it was most likely as a child. Now, many of the adults who are being encouraged to return to bicycling feel uncomfortable, in many cases, even riding in their neighborhood.

Adult classes offered by League of American Bicyclist certified instructors are available by contacting www.bikeleague.org. These courses combine some short lectures about riding skills and simple bike maintenance. More importantly they offer the bicyclist the opportunity to learn new skills or refresh old skills in a safe environment, accompanied by a certified instructor.

Route 004 : Silver Lake to Downtown



Meet Thursdays at 8:00am at Caffè Vita on Sunset near Hillhurst and the Vista Theater. This route uses bike lanes on Sunset Boulevard, Rampart Boulevard and 7th Street to take us from Los Feliz/Silverlake past beautiful MacArthur Park to Downtown Los Angeles, ending at 7th and Grand

where you can refuel at Bottega Louie if the ride leaves you with a sweet tooth. Majority of the route is on bike lanes, but we will share the road with automobiles for brief sections. We'll keep it low-stress and low-sweat; this is more of a trolley than high-speed rail. Even still, we'll make the trip in about 30 minutes!

A recent innovation in LA has been the creation of "bike trains" for adults. Just as a train, a bike train runs on a given schedule over a given route. Bike trains have been used for several years to aid children going to and from school. More recently, a similar concept has been implemented for adults in LA. There are currently eight routes in LA. For each of these routes a group will meet one or two days per week. Each ride has a conductor who guides the group along the route as well as provides any assistance that is necessary. For more information on Bike Trains for Adults see <http://labiketrains.com/>

Youth Bicycle Skills Classes

School-based bicycle education programs educate students about the rules of the road and safe bicycling skills. Safe routes to schools (SRTS) educational grants are available for these programs, which are typically offered for upper elementary and middle school age children. Funding strategies for these programs is discussed in Chapter 6.

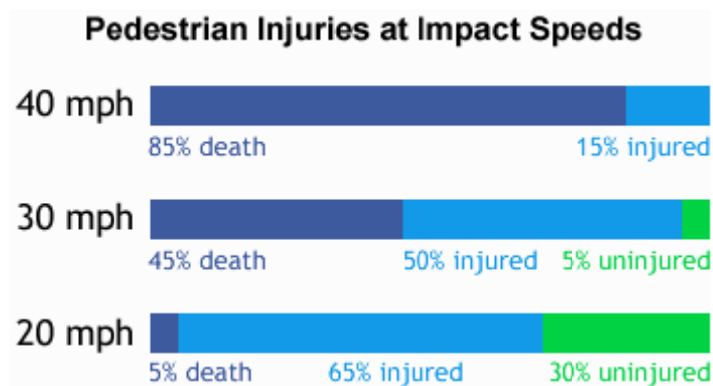
Bike trains and walking school buses, where parents or staff guide students to and from school over a set route at a set time, are being added in more and more schools across Southern California. In some cases these are formal programs that are sponsored by the school. In other cases the programs are organized and coordinated informally by parents who want the children to have the opportunity to walk and/or bike to school. These programs allow children with different skill levels to interact and provide an alternative to the class-room or school-yard based training.



4.2.3 Enforcement

Bicycle Patrol

Police bicycle patrols not only increase the mobility of officers in dense areas but also offer the opportunity for officers to interact with bicyclists in a non-confrontational, low key manor. Bicycle patrol officers know both the law as well as the challenges faced by bicyclists on a day-to-day basis. These officers can demonstrate and explain safe riding techniques as well as provide enforcement if appropriate.



Speed Feedback Signs and Rest in Red Signals
Vehicle speeds greatly affect the severity of the crash for the bicyclist or pedestrian. The adjacent figure, from the Safe Routes to School (SRTS) guide to slowing down traffic, shows that at a speed of 20 MPH, the percentage of pedestrians being killed in a crash is under 5% but at a speed of 40 mph, the percentage is 85%.

Speed feedback signs have been shown to be an effective means of making the driver more aware of their speed and encouraging them to reduce their speed.

A relatively new traffic engineering tool involves setting traffic lights for when vehicles approach a signal over the legal speed limit, the light turns red. Once the vehicle slows to below the limit, it will turn green, allowing the vehicle to proceed. The City of Long Beach has recently installed these with success at two locations. A video showing how this works can be seen at www.youtube.com/watch?v=x5zhziy7TIA

Targeted Enforcement

Targeted enforcement uses the focused efforts of police officers at known locations where compliance is low. According to the Federal Highway Traffic Administration (FHWA) these programs are most effective when crash, citation or other sources of information suggests that the site is unusually hazardous due to illegal driving practices.

According to the FHWA, "The advantage of targeted enforcement is that it can be implemented in a very short period of time and identified problems can be addressed almost immediately. The disadvantage is that the effectiveness is usually measured in terms of days and perhaps weeks, rather than months or years." For more information on targeted enforcement see:

safety.fhwa.dot.gov/intersection/resources/intsafestratbro/ugl.cfm

Adult Bicycle Education Diversion Program

A few cities in the State of California have adopted adult bicycle diversion programs. In these programs, when bicyclists are given a traffic ticket they are provided the opportunity to take a bike education program rather than paying the full price of the ticket. At the present time Huntington Beach has a program for teens; Marin County has an adult program. Due to potential conflicts with state regulations these programs have not been widely adopted across the state.

4.2.4 Evaluation

Evaluation programs measure and evaluate the impact of projects, policies and programs.

Surveys

Surveys are useful for eliciting infrastructural deficiency and attitudinal information. These may be intercept surveys conducted in the field during events or in locations such as bike shops. They may also be conducted online. For this report both online and face-to-face surveys were used to collect both behavioral information as well as indications of preferred routes and to determine corridor rankings.



Counts

Bike counts are an important part of any bike program. As the [National Bicycle and Pedestrian Documentation Project](#) says, "One of the greatest challenges facing the bicycle and pedestrian field is the lack of documentation on usage and demand. Without accurate and consistent demand figures, it is difficult to measure the impacts of investments in these modes."

Standard forms and instructions for bike counts can be downloaded from the National Bicycle and Pedestrian Documentation Project website

(www.bikepeddocumentation.org).

In addition to yearly counts, counts can be done on a before and after basis to show the impact of a specific project. Most projects that are funded by government grants routinely incorporate these counts into the project plans.

Recently, several cities have started to use automated counters that are useful in collecting long term counts, establishing daily, weekly, or monthly variations, and almost always requiring fewer person hours ([National Bicycle and Pedestrian Documentation project: Automatic count technologies](#)).

The photo on the previous page shows one form of counter that has recently been installed in on the Santa River Trail.

Several other cities including Portland, OR, Minneapolis, MN and Arlington, VA, are installing counters such as the one shown on the left. These counters not only keep track of the number of bicyclists, but visibly display the results on a real time basis. (Photo by Eco-Counter)



Automated counters are an important element in helping determine the effectiveness of bike programs. With their effectiveness and efficiency in data collection and their reasonable costs (\$2,000-\$3,000 or less per installation), they can be incorporated in most future projects.

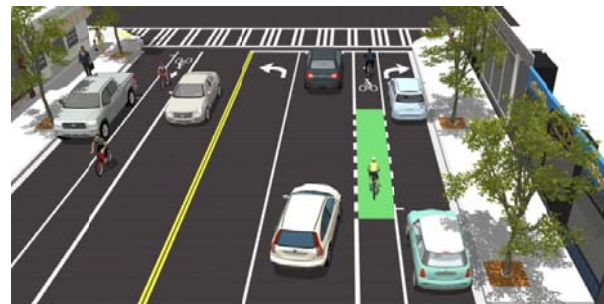
A recent project sponsored jointly by SCAG and the Los Angeles County MTA is designed to help compile, organize, make accessible and create a standard for bike count data in Southern California. As a result of the project, a clearinghouse for bike count data has been created and is being maintained by UCLA. The project includes information on best practices and forms for bike counts, a literature review, and a white paper on bike counts, travel demand modeling, and benefits estimation. For more information on the Bike Count Clearinghouse see www.bikecounts.luskin.ucla.edu.

5.0 BICYCLE FACILITY TOOLKIT

5.1 Introduction

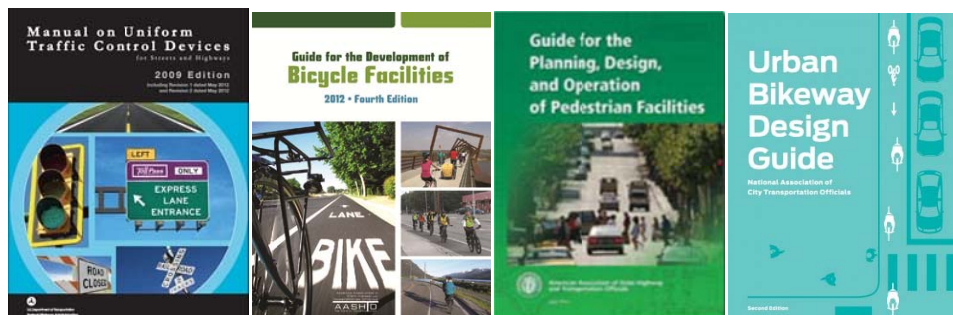
This chapter is intended to assist the Orange County Transportation Authority and local jurisdictions within the District 5 study area in the selection and design of bicycle facilities. District 5 is unique from the other Districts in Orange County in which corridors are on major arterials due to the topography of District 5. Many of these corridors have existing bike lanes; however an extensive shared-use path network also exists throughout District 5.

The following pages pull together best practices by facility type from public agencies and municipalities nationwide. Within the design section, treatments are covered within a single-sheet tabular format relaying important design information and discussion, example photos, schematics (if applicable), and existing summary guidance from current or upcoming draft standards. Existing standards are referenced throughout and should be the first source of information when seeking to implement any of the treatments featured here.



5.1.1 National Standards

Several agencies and organizations provide design standards for bike facilities in the US. The most commonly used manuals that outline these standards are listed below.



The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) defines the standards used by traffic engineers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The FHWA MUTCD forms the basis of the California MUTCD, which is the standard used by most cities in California.

To further clarify the MUTCD, the FHWA created a table of contemporary bicycle facilities that lists various bicycle related signs, markings, signals, and other treatments and identifies their official status (e.g., can be implemented, currently experimental). See Bicycle Facilities in the Manual on Uniform Traffic Control Devices.

There are some newer bikeway treatments that may not be explicitly covered by the MUTCD that are often subject to experiments, interpretations and official rulings by the FHWA. The MUTCD Official Rulings is a resource that allows website visitors to obtain information about these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.

American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic information, such as minimum sidewalk widths, bicycle lane dimensions, detailed striping requirements and recommended signage and pavement markings.

The National Association of City Transportation Officials' (NACTO) 2014 Urban Bikeway Design Guide is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US.

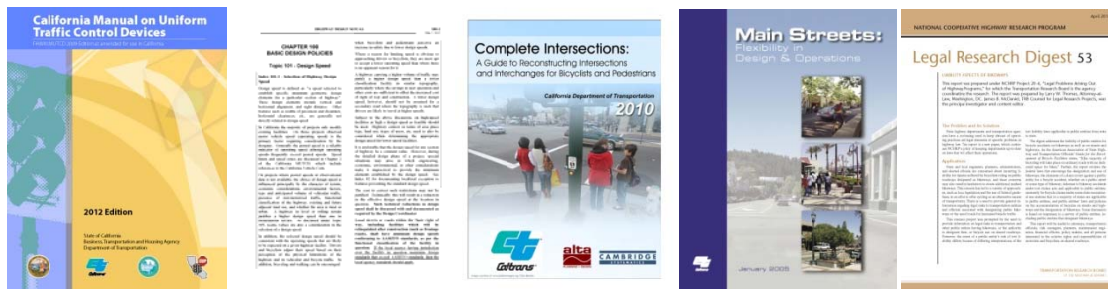
Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle and pedestrian facility project. The United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) and the 2010 ADA Standards for Accessible Design (2010 Standards) contain guidance and standards, respectively, for the construction of accessible facilities. This includes requirements for sidewalk curb ramps, slope requirements, and pedestrian railings along stairs.

Some of these treatments are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.

Below is a list of the websites associated with these standards and guides and their associated manuals.

1. FHWA. Bicycle Facilities and the Manual on Uniform Traffic Control Devices. 2011. http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm
2. MUTCD Official Rulings. FHWA. <http://mutcd.fhwa.dot.gov/orsearch.asp>
3. <http://nacto.org/cities-for-cycling/design-guide/>
4. <http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way>
5. www.ada.gov/2010ADAstandards_index.htm

5.1.2 State Standards and Guidelines



California Highway Design Manual (HDM) (2012)

This manual establishes uniform policies and procedures to carry out highway design functions for the California Department of Transportation. The 2012 edition incorporated Complete Streets focused revisions to address the Department Directive 64 R-1.

Under existing California law, all local agencies responsible for the development or operation of bikeways or roadways where bicycle travel is permitted must utilize Caltrans adopted design criteria and specifications as contained in the HDM and MUTCD. For bikeways that do not meet these standards, cities and counties can apply for a design exception from Caltrans. However, according to the Legislative Analyst's review during passage of Assembly Bill 1193 in 2014, "local governments complain that the process is cumbersome and time-consuming. In contrast, cities and counties may, but are not required to, utilize the HDM when designing local streets and roads." AB 1193 allows local governments to adopt alternative national criteria, such as AASHTO's or NACTO's.

Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (2010)

This California Department of Transportation reference guide presents information and concepts related to improving conditions for bicyclists and pedestrians at major intersections and interchanges. The guide can be used to inform minor signage and striping changes to intersections, as well as major changes and designs for new intersections.

Main Streets: Flexibility in Design & Operations (2013)

This Caltrans booklet is an informational guide that reflects many of the recent updates to the Caltrans manuals and policies that improve multimodal access, livability and sustainability within the transportation system. The document will help users locate information about standards and procedures described in the Caltrans Highway Design Manual (HDM), the California Manual on Uniform Traffic Control Devices (California MUTCD) and the Project Development Procedures Manual (PDPM) www.dot.ca.gov/hq/LandArch/mainstreet/main_street_3rd_edition.pdf

NCHRP Legal Digest 53: Liability Aspects of Bikeways (2010)

This digest is a useful resource for city staff considering innovative engineering solutions to localized issues. The document addresses the liability of public entities for bicycle collisions on bikeways as well as on streets and highways. The report will be useful to attorneys, transportation officials, planners, maintenance engineers and all persons interested in the relative rights and responsibilities of motorists and bicyclists on shared roadways.

New Legislation Allowing Safety Standards Other Than Caltrans' HDM: AB 1193

AB 1193, signed into law on September 22, 2014, allows local agencies to adopt, by resolution, safety standards for bikeways other than Caltrans' Highway Design Manual. According to the Legislative Analyst, AB 1193 "allows local governments to deviate from state criteria when designing bikeways, but does not give them complete control. Cities and counties that elect to use design criteria not contained within the HDM would have to ensure that the alternative criteria have been reviewed and approved by a qualified engineer, are adopted by resolution at a public meeting, and adhere to guidelines established by a national association of public agency transportation officials, such as the National Association of City Transportation Officials." The bill also expands the definition of bikeways to include cycle tracks or separated bikeways, also referred to as "Class IV bikeways," which promote active transportation and provide a right-of-way designated exclusively for bicycle travel adjacent to a roadway and which are protected from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

5.1.3 Bicycle Facility Standards Compliance

Some of these bicycle facilities covered by these guidelines are not directly referenced in the current versions of the California Highway Design Manual or the California MUTCD, although many of the elements of these treatments are found within these documents. An "X" marking in Table 5.1 below identifies the inclusion of a particular treatment within the national and state design guides. A "-" marking indicates a treatment may not be specifically mentioned, but is compliant assuming MUTCD compliant signs and markings are used.

In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.

Table 5.1: National and State Design Guides

	Caltrans	Caltrans	NACTO
	CA MUTCD (2014)	Highway Design Manual (2014)	Urban Bikeway Design Guide (2014)
Signed Shared Roadway	X		
Marked Shared Roadway	X		X
Bicycle Boulevard	-		X
Bicycle Lane	X	X	X
Buffered Bicycle Lane	X	-	X
Cycle Tracks		Same as Class I	X
Bike Box	Experimental		X
Bike Lanes to the left of Right Turn Only Lanes	X		X
Green-Colored Bike Lanes in Conflict Areas	FHWA Interim Approval (IA-14)		X
Combined Bike Lane/Turn Lane	Disallowed		X
Two-Stage Turn Queue Boxes	At T-intersections		X
Intersection Crossing Markings	X		X
Wayfinding Sign Types & Placement	X		X
Wayfinding Sign Placement	X		X
Bicycle Signal Heads	X		X
Active Warning Beacons	X		X
Pedestrian Hybrid Beacons	X		X

5.2 Bicycle Facility Selection

There are no ‘hard and fast’ rules for determining the most appropriate type of bicycle facility for a particular location – roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected bicycle user types are all critical elements of this decision. Studies find that the most significant factors influencing bicycle use are motor vehicle traffic volumes and speeds. Additionally, most bicyclists prefer facilities separated from motor vehicle traffic or located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for bicyclists who prefer to avoid motor vehicle traffic. Consistent use of treatments and application of bikeway facilities allow users to anticipate whether they would feel comfortable riding on a particular facility, and plan their trips accordingly. This section provides guidance on various factors that affect the type of facilities that should be provided.



5.2.1 Facility Classification

Description

Consistent with bicycle facility classifications throughout the nation, these Bicycle Facility Design Guidelines identify the following classes of facilities by degree of separation from motor vehicle traffic.

Shared Roadways (No bikeway designation) are bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. In some instances, streets may be fully adequate and safe without bicycle specific signing and pavement markings.

Class III Bikeways (Bike Routes) are Shared Roadways configured with pavement markings, signage and other treatments including directional signage, traffic diverters, chicanes, chokers and /or other traffic calming devices to reduce vehicle speeds or volumes. Such enhanced treatments often are associated with Bicycle Boulevards.



Class II Bikeways (Bike Lanes) use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists.



Class IV Bikeways (Cycle Tracks) are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.



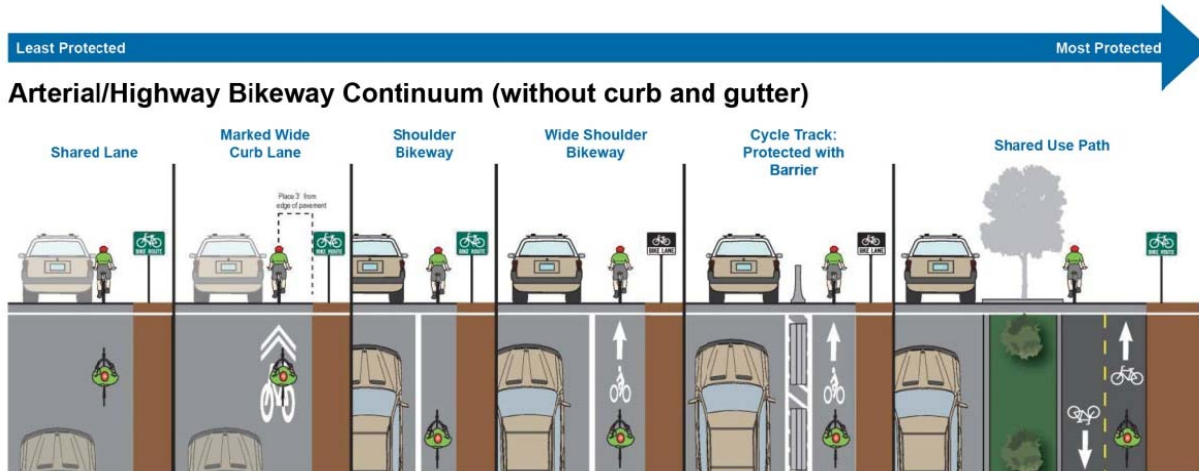
Class I Bikeways (Bike Paths) are facilities separated from roadways for use by bicyclists and pedestrians.



5.2.2 Facility Continua

The following continua illustrate the range of bicycle facilities applicable to various roadway environments, based on the roadway type and desired degree of separation. Engineering judgment, traffic studies, previous municipal planning efforts, community input and local context should be used to refine criteria when developing bicycle facility recommendations for a particular street. In some

corridors, it may be desirable to construct facilities to a higher level of treatment than those recommended in relevant planning documents in order to enhance user safety and comfort. In other cases, existing and/or future motor vehicle speeds and volumes may not justify the recommended level of separation, and a less intensive treatment may be acceptable.



Arterial/Highway Bikeway Continuum (with curb and gutter)



Collector Bikeway Continuum



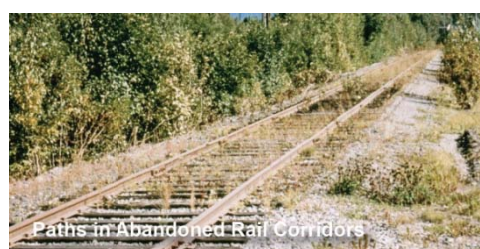
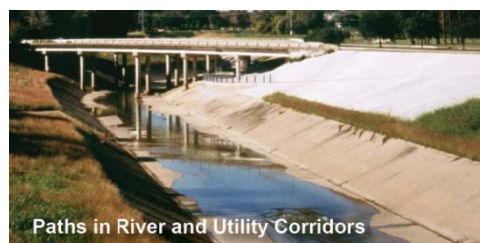
5.3 Shared-use Paths

A shared-use path allows for two-way, off-street use for pedestrians, skaters, wheelchair users, joggers and other non-motorized users, as well as for bicyclists. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Throughout the United States outside of California, the terms “shared-use path” and “Class I bike path” are used interchangeably. However, California law requires all bikeways, i.e., “all facilities that provide primarily for, and promote, bicycle travel”, to conform to the Caltrans Highway Design Manual, even bikeways that are not under Caltrans’ jurisdiction. For this reason, paths that fall short of the HDM’s requirements for Class I pavement widths, shoulders, vertical clearance, and separation from the edge of travel way of a parallel street are often labeled “shared-use paths”, removing the implication that the path is primarily for bicyclists.

Key features of shared-use paths include:

- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and bicyclists when heavy use is expected.



5.3.1 General Design Practices

Description

Shared-use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle paths should generally provide directional travel opportunities not provided by existing roadways.

Guidance

Width

- 9 feet is the minimum allowed by the HDM for a one-way Class I bicycle path consisting of a 5-foot paved width with 2-foot shoulders on each side.
- 12 feet is the minimum allowed by the HDM for a two-way Class I bicycle path consisting of two 4-foot lanes and 2-foot shoulders on each side. On structures, the clear width of a Class I path between railings shall be not less than 10 feet.

Lateral Clearance

- The minimum separation between the edge of pavement of a one-way or a two-way bicycle path and the edge of travel way of a parallel road or street shall be 5 feet plus the standard shoulder width. Prior to 2012, the Highway Design Manual allowed narrower separation if a physical barrier is included. Since 2012, however, a physical barrier would not result in a reduced separation.

Overhead Clearance

- The minimum vertical clearance allowed by the HDM to obstructions across the width of a bike path is 8 feet, and 7 feet over shoulder.

Striping

- When striping is required, use a 4-inch dashed yellow centerline stripe with 4-inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.



Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term.

Existing Locations

- Avenida Pico, San Clemente (see photo on previous page)
- Avenida Vista Hermosa in San Clemente
- Aliso Creek Bike Path in Laguna Hills

Potential Locations

- Trabuco Creek in Rancho Santa Margarita
- Service road in Aliso and Wood Canyons Wilderness Park, Orange County
- Avenida California in San Juan Capistrano

5.3.2 Paths in River and Utility Corridors

Description

Utility and waterway corridors often offer excellent shared-use path development and bikeway gap closure opportunities. Utility corridors typically include power line and sewer corridors, while waterway corridors include canals, drainage ditches, rivers, and beaches. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

Guidance

Shared-use paths in utility corridors should meet or exceed general design practices, and must conform to the Caltrans Highway Design Manual if designated as a Class I bike path.

Access Points

Any access point to the path should be well-defined with appropriate signage designating the pathway as a shared-use path or bicycle facility and prohibiting motor vehicles.

Path Closure

Public access to the path may be prohibited during the following events:

- Canal/flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions



5.3.3 Paths in Abandoned Rail Corridors

Description

Commonly referred to as Rails-to-Trails or Rail-Trails, these projects convert vacated rail corridors into off-street paths. Rail corridors offer several advantages, including relatively direct routes between major destinations and generally flat terrain.

Guidance

Shared-use paths in abandoned rail corridors should meet or exceed general design practices. If additional width allows, wider paths and landscaping are desirable.

In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.

Discussion

It is often impractical and costly to add material to existing railroad bed fill slopes. This results in trails that meet minimum path widths, but often lack preferred shoulder and lateral clearance widths.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
- California MUTCD. 2014.
- Flink, C. *Greenways*. 1993.

Materials and Maintenance

For paths that are susceptible to flooding or ponding, permeable pavement is an option to reduce water collection.

Existing Locations

- San Juan Creek Trail, San Juan Capistrano (see photo on previous page)

Potential Locations

- TBD

5.3.4 Paths in Active Rail Corridors

Description

Rails-with-Trails projects typically consist of paths adjacent to active railroads. It should be noted that some constraints could impact the feasibility of rail-with-trail projects. In some cases, space needs to be preserved for future planned freight, transit or commuter rail service. In other cases, limited right-of-way width, inadequate setbacks, concerns about safety and trespassing, and numerous mid-block crossings may affect a project's feasibility.



Guidance

If required, fencing should be a minimum of 5 feet in height with higher fencing than usual next to sensitive areas such as switching yards. Setbacks from the active rail line will vary depending on the speed and frequency of trains, and available right-of-way. Furthermore, the railroad operators have their own design criteria regarding separation from bikeways.

Metrolink's SCRRRA Rail-with-Trail Design Guidelines provide recommended minimum setbacks from the centerline of the nearest track. For example, the setback should be 40 feet where the main line railroad speed is between 90 mph and 79 mph. Where these setbacks cannot be met, "additional barriers, vertical separation or other methods shall be employed."





Discussion

Railroads typically require fencing with all rail-with-trail projects. Concerns with trespassing and security can vary with the amount of train traffic on the adjacent rail line and the setting of the bicycle path, i.e. whether the section of track is in an urban or rural setting.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
- California MUTCD. 2014.
- FHWA. *Rails-with-Trails: Lessons Learned*. 2002.
- Metrolink SCRRRA *Rails-with-Trails Design Guidelines*, 2010

Materials and Maintenance

For paths that are susceptible to flooding or ponding, permeable pavement is an option to reduce water collection.

Existing Locations

- San Clemente Beach Trail (see photo above)
- Aliso Creek Bike Path, Lake Forest

Potential Locations

- LOSSAN Corridor in Mission Viejo, Laguna Niguel, and Lake Forest

5.3.5 Local Neighborhood Accessways

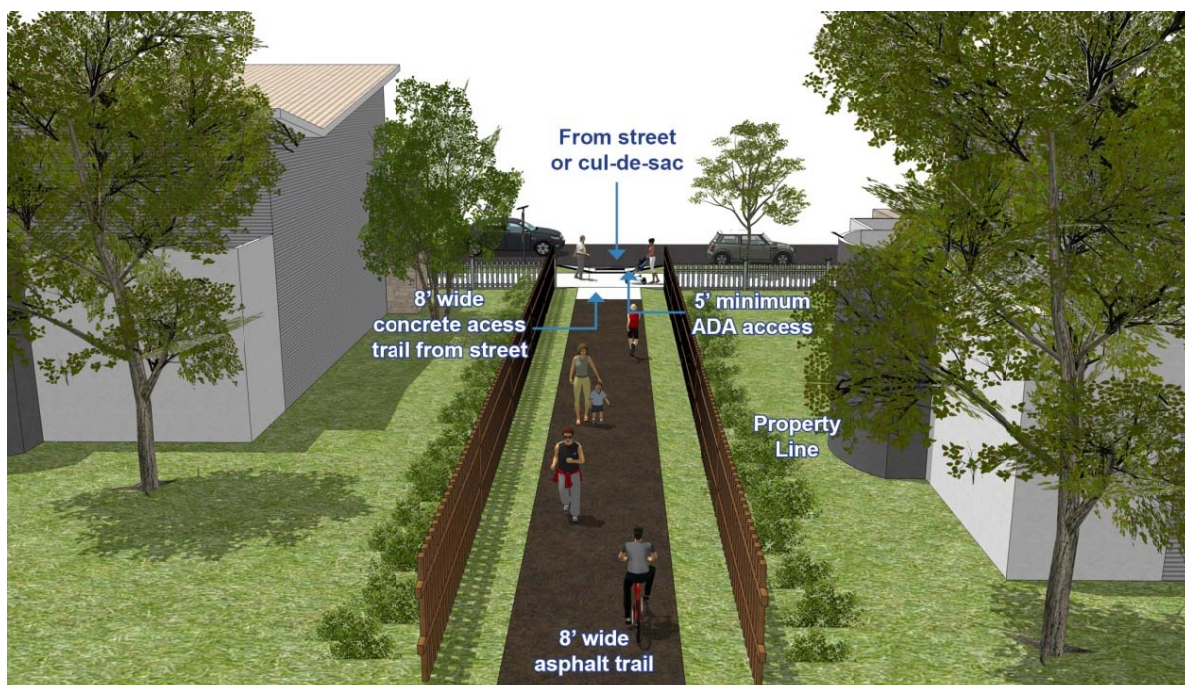
Description

Neighborhood accessways provide residential areas with direct bicycle and pedestrian access to parks, trails, green spaces, and other recreational areas. They most often serve as small trail connections to and from the larger trail network, typically having their own rights-of-way and easements.

Additionally, these smaller trails can be used to provide bicycle and pedestrian connections between dead-end streets, cul-de-sacs, and access to nearby destinations not provided by the street network.

Guidance

- Neighborhood access should remain open to the public
- Trail pavement shall be at least 8 feet wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use
- Trail widths should be designed to be less than 8 feet wide only when necessary to protect large mature native trees over 18 inches in caliper, wetlands or other ecologically sensitive areas.
- Access trails should slightly meander whenever possible





Discussion

Neighborhood access should be designed into new subdivisions at every opportunity and should be required by City/County subdivision regulations.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.

Materials and Maintenance

For paths that are susceptible to flooding or ponding, permeable pavement is an option to reduce water collection.

Existing Locations

- Horno Creek Road to Marbella Vista Road, San Juan Capistrano (see photo above)
- Aliso Creek Bike Path at Clarington Dr., Laguna Hills

Potential Locations

- Cul-de-sac connections
- Neighborhood easements

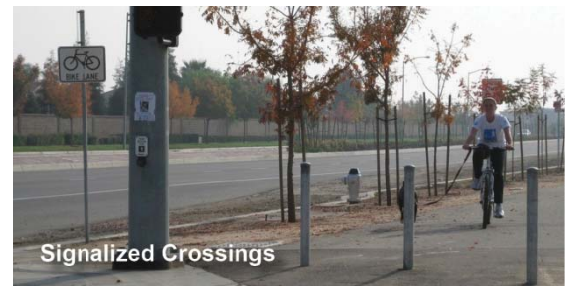
5.4 Path/Roadway Crossing

At-grade roadway crossings can create potential conflicts between path users and motorists; however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Path facilities that cater to bicyclists can require additional considerations due to the higher travel speed of bicyclists versus pedestrians.

5.4.1 Marked/Unsignalized Crossings

Description

A marked/unsignalized crossing typically consists of a marked crossing area, signage, and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.



When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

Guidance

Maximum traffic volumes

- < 9,000-12,000 Average Daily Traffic (ADT) volume
- Up to 15,000 ADT on two-lane roads, preferably with a median
- Up to 12,000 ADT on four-lane roads with median

Maximum travel speed: 35 MPH

Minimum line of sight

- 25 MPH zone: 155 feet
- 35 MPH zone: 250 feet
- 45 MPH zone: 360 feet



Discussion

Unsignalized crossings of multi-lane arterials over 15,000 ADT may be possible with features such as sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like rectangular rapid flash beacons.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012
- California MUTCD. 2014

Existing Location for Potential Improvement

- Shady Canyon Drive, Irvine (see photo above)
- Aliso Creek Bike Path at Los Alisos Blvd, Lake Forest
- Pacific Coast Highway Connector at Coast Hwy, Dana Point

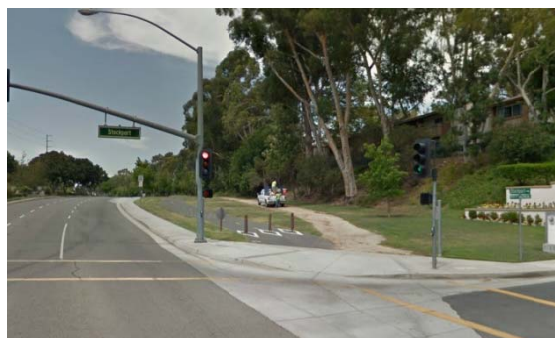
5.4.2 Signalized Crossings

Description

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

Guidance

Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.



Discussion

In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet. Engineering judgment and the context of the location should be taken into account when choosing the appropriate allowable setback.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012
- AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004

Materials and Maintenance

If a sidewalk is used for crossing access, it should meet ADA guidelines.

Existing Locations

- Laguna Hills Drive at Paseo de Valencia, Laguna Hills (see photo above)
- Aliso Creek Bike Path at Alicia Pkwy, Laguna Hills
- Trabuco Side Path at Trabuco Rd and El Toro Rd, Lake Forest

Potential Locations

- Avenida Empresa at Santa Margarita Pkwy, Rancho Santa Margarita
- Salt Creek Bike Path at Ritz Carlton Dr. and Pacific Coast Hwy, Dana Point

5.4.3 Overcrossings

Description

Bicycle/pedestrian overcrossings provide critical non-motorized system links by joining areas separated by barriers such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist. Grade-separated crossings may be needed where existing bicycle/pedestrian crossings do not exist, where ADT exceeds 25,000 vehicles, and where 85th percentile speeds exceed 45 miles per hour.

Guidance

- 10-foot minimum width between railings, 14 feet preferred. If overcrossing has any scenic vistas additional width should be provided to allow for stopping. A separate 5-foot pedestrian area may be provided for facilities with high bicycle and pedestrian use.
- 10-foot headroom on overcrossing
- Vertical clearance below will vary depending on feature being crossed:
 - ✓ Roadway: 17 feet
 - ✓ Freeway: 18.5 feet
 - ✓ Heavy Rail Line: 23 feet





Discussion

Overcrossings for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes of 8.33% (1:12) with 5-foot landings every 30 feet. Title 24 of the California Code of Regulations requires gradients up to 5% (1:20) to have 5-foot landings at 400-foot intervals.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
- AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004.

Materials and Maintenance

Potential issues with vandalism

Existing Locations

San Juan Creek Bicycle-Pedestrian Bridge, San Juan Capistrano (see photo on previous page)

Bicycle-Pedestrian Bridge over I-5, San Clemente (see photo above)

Pedestrian Overpass at Paseo De Cristobal and Esplanade, San Clemente

Possible Locations

San Juan Creek near Trabuco Creek confluence in San Juan Capistrano

5.5 Separated Bikeways

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping (Class II), or physical measures such as parking, bollards, raised islands, or curbs (Class IV Cycle Tracks). Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.

5.5.1 Bicycle Lane

Description

This facility provides an exclusive lane for one-way bicycle travel on a street or highway, installed along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served by them. On streets with on-street parking, bicycle lanes are located between the parking area and the traffic lanes and used in the same direction as motor vehicle traffic.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

Provide 5-foot minimum width for bicycle lanes located between parking and traffic lanes. Six feet is desired.

- Provide 4-foot minimum width if no gutter exists. With a normal 2-foot gutter, minimum bicycle lane width is five feet.
- 14.5-foot preferred from curb face to edge of bike lane. (12-foot minimum).
- 7-foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.
- When approaching an intersection with right turn only lanes, the bike lane should be transitioned to a through bike lane to the left of the right turn only lane.



Bicycle Lane



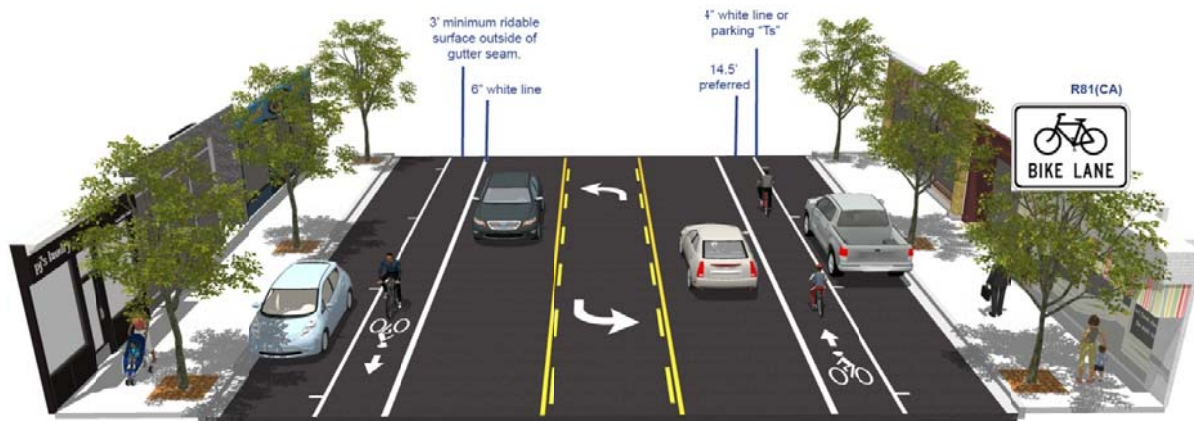
Bicycle Lanes and Diagonal Parking



Buffered Bicycle Lanes



Cycle Tracks



Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Consider Buffered Bicycle Lanes when further separation is desired.

Additional References and Guidelines

- AASHTO Guide for the Development of Bicycle Facilities, 2012
- California MUTCD, 2014
- NACTO Urban Bikeway Design Guide, 2012
- Caltrans California HDM, 2012



Materials and Maintenance

Paint can wear more quickly in high traffic areas.

Existing Locations

- Oso Pkwy, Aliso Viejo
- Niguel Rd, Laguna Niguel

Potential Locations

- Golden Lantern Street, Dana Point (see photo above)
- Crown Valley Pkwy, Dana Point

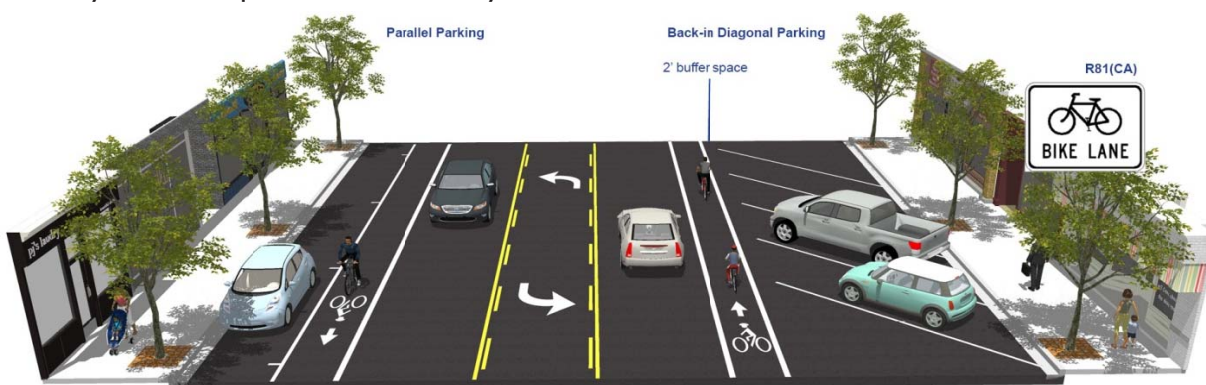
5.5.2 Bicycle Lanes and Diagonal Parking

Description

The back-in/head-out parking is considered safer than conventional head-in/back-out parking due to better visibility when leaving. This is particularly important on busy streets or where vehicle drivers may find their views blocked by large vehicles or tinted windows in adjacent vehicles. The presence of raised median islands helps prevent motorists from using a back-in stall for head-in parking.

Guidance

Based on existing dimensions from test sites and permanent facilities, provide 16 feet from curb edge to inner bicycle lane stripe and a five foot bicycle lane.



Discussion

Test the facility on streets with existing head-in angled parking and moderate to high bicycle traffic. Additional signs to direct vehicle driver in how the back-in angled parking works is recommended.

Additional References and Guidelines

- City of Los Angeles Bicycle Plan Update, City of Los Angeles

Existing Locations

- None

Potential Locations

- TBD

5.5.3 Buffered Bicycle Lane

Description

Buffered Bike Lanes as defined in the Urban Bikeway Design Guide are "conventional bike lanes paired with a buffered space separating the bike lane from the adjacent motor vehicle travel lane and/or parking lane." Buffered bike lanes are allowed as per California 2014 MUTCD guidelines for buffered preferential lanes (section 3D-01).

Conventional bike lanes typically provide a 5 to 6-foot wide space between the curb and travel lane. However, many bicyclists are uncomfortable riding this close to moving traffic particularly on higher speed and/or higher volume roadways. A recent study from Portland State titled "Evaluation of innovative bicycle facilities," shows that bicyclists feel a lower risk of being "doored" in a buffered bike lane and nearly nine in ten bicyclists prefer buffered lanes to standard lanes. Seven in ten bicyclists indicated they would go out of their way to ride on a buffered bike lane over a standard lane.

The NACTO Urban Bikeway Design guides list several advantages of buffered lanes including:

- Providing a "shy" distance between motor vehicles and bicyclists.
- Providing space for bicyclists to pass another bicyclist without encroaching into the adjacent motor vehicle travel lane.
- Encouraging bicyclists to ride outside of the door zone when buffer is between parked cars and the bike lane.
- Providing a greater space for bicycling without making the bike lane appear so wide that it might be mistake for a travel lane or a parking lane.
- Appealing to a wider cross-section of bicyclist users.
- And encouraging bicycling by contributing to the perception of safety among users of the bicycle network.

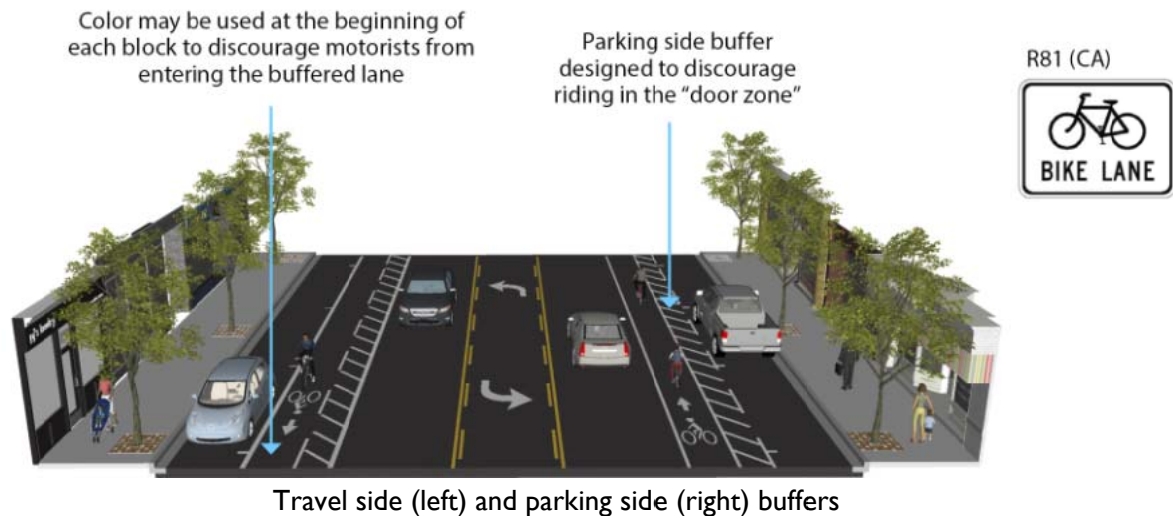
There are three types of buffers:

1. Parking side or curb buffer
2. Travel lane side buffer
3. Combined side or double buffer

Parking side or curb buffer:

Parking or curb side buffers provide space between the bicyclist and parked cars or the gutter pan. This (1) reduces the potential for a bicyclist to strike a car door being opened by a driver, (2) eliminates use of the gutter pan as part of the bike lane, and (3) moves the bicyclist out of the blind spots of motorists approaching on side streets or driveways.

The limitation to the parking side or curb side buffer is that they do not provide the "shy space" that makes bicyclists feel more comfortable, but they do reduce the risk of dooring and the use of the gutter pan as part of the bike lane.



Travel side buffer:

Travel side buffers provide space between the bicyclist and motor vehicles in the travel lane. High speed, high volume roadways make many bicyclists uncomfortable. Recent studies from the Portland State have shown that a simple buffer substantially increases the level of comfort for most bicyclists. The example below shows side travel side buffer on PCH in Dana Point.



Combined side or double sided buffer:

The combined side or double sided buffer offers advantage of guiding the bicyclists away from the door zone while providing a perceived safer distance between the bicyclist and motor vehicles.

Guidance

According to California MUTCD 2014 - Section 3D Buffered bike lanes are considered "allowable" treatments. Signage and dimensional guidelines are the same as for Class 2 bicycle lanes. Additional guidance is included in the NACTO Urban Bikeway Design Guide.

- Bike lane word and/or symbol shall be used (MUTCD Figure 9C-3).
- The buffer shall have interior diagonal cross hatching or chevron markings if it is 3 feet in with or wider.
- The buffer shall be marked with 2 white lines. The California MUTCD 2104 standards (Section 3D.01) are such that for a bicyclist to be allowed to cross a double white line it must be dashed (these are the same standards applied to buffered HOV Lanes). Thus it is recommended that that the inside line be dashed instead of solid.
- Buffers should be at least 24inches wide.

Discussion

- Add diagonal striping on the outer buffer adjacent to the traffic lanes.
- On-street parking remains adjacent to the curb.
- A travel lane may need to be eliminated or narrowed to accommodate buffers.

Additional References and Guidelines

- NACTO Urban Bikeway Design Guide, 2014
- Portland State University, Center for Transportation Studies (2011) Evaluation of innovative bicycle facilities.
- California MUTCD 2014 Edition

Materials and Maintenance

Paint can wear more quickly in high traffic areas.

Existing Locations

- Pacific Coast Highway, Dana Point

Potential Locations

- Pacific Coast Hwy, Laguna Beach (see photo on previous page)
- Antonio Parkway, Ladera Ranch & Rancho Santa Margarita

5.5.4 Cycle Track or Class IV Bike Facilities

Description

Cycle tracks, which were recently designated as Class IV facilities in California, are an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. These differ from buffered lanes in that the bicyclist is separated from the travel lanes by a physical barrier.

Class IV: Cycle Track

Cycle tracks have different forms but all share common elements they provide space that is intended to be exclusively or primarily used by bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. Raised cycle tracks may be at the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk to separate the cycle track from the pedestrian area.



Over the past five years more than 100 new separated bike facilities have been added in the US. This relatively new type of facility has been shown to be effective in increasing the number of bicyclists using the street, increasing safety for bicyclists, pedestrians and motorists and increasing access to local businesses (Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the US, National Institute for Transportation and Communities, 2014).

Separated bikeways can increase safety and promote proper riding by:

- Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path.
- Discouraging bicyclists from riding on the sidewalk.

Guidance

Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.

One-Way Cycle Tracks

- NACTO Guidelines recommend a 7-foot minimum to allow passing. 5-foot minimum width in constrained locations. Note: In accordance with AB 1193, signed in 2014, the local agency

must pass a resolution to adopt NACTO Guidelines in lieu of the Caltrans Highway Design Manual if the one-way cycle track width is less than 9 feet.

- One way cycle tracks can be either conventional flow (i.e., go the same direction as the adjacent traffic) or contra-flow (opposite direction of adjacent traffic flow, such as to the left side of traffic on a one-way street).



Two-Way Cycle Tracks

- Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
 - 12-foot recommended minimum for two-way facility. 8-foot minimum in constrained locations.
- Note: In accordance with AB 1193, signed in 2014, the local agency must pass a resolution to adopt NACTO Guidelines in lieu of the Caltrans Highway Design Manual if the two-way cycle track width is less than 12 feet.



Discussion

Special consideration should be given at transit stops to manage bicycle and pedestrian interactions. Driveways and minor street crossings are unique challenges to cycle track design. Parking should be prohibited within 30 feet of the intersection to improve visibility.

Additional References and Guidelines

- NACTO. Urban Bikeway Design Guide. 2014.
- Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the US, National Institute for Transportation and Communities, 2014

Materials and Maintenance

Depending upon the width, barrier-separated and raised cycle tracks may require smaller equipment for sweeping.

Existing Locations

- PCH in Dana Point just north of San Clemente

Potential Locations

- El Camino Real, San Clemente

5.6 Separated Bikeways at Intersections

Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way, and facilitating eye contact and awareness with other modes.

Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals. The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection, and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian, and motorist movements. The degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.



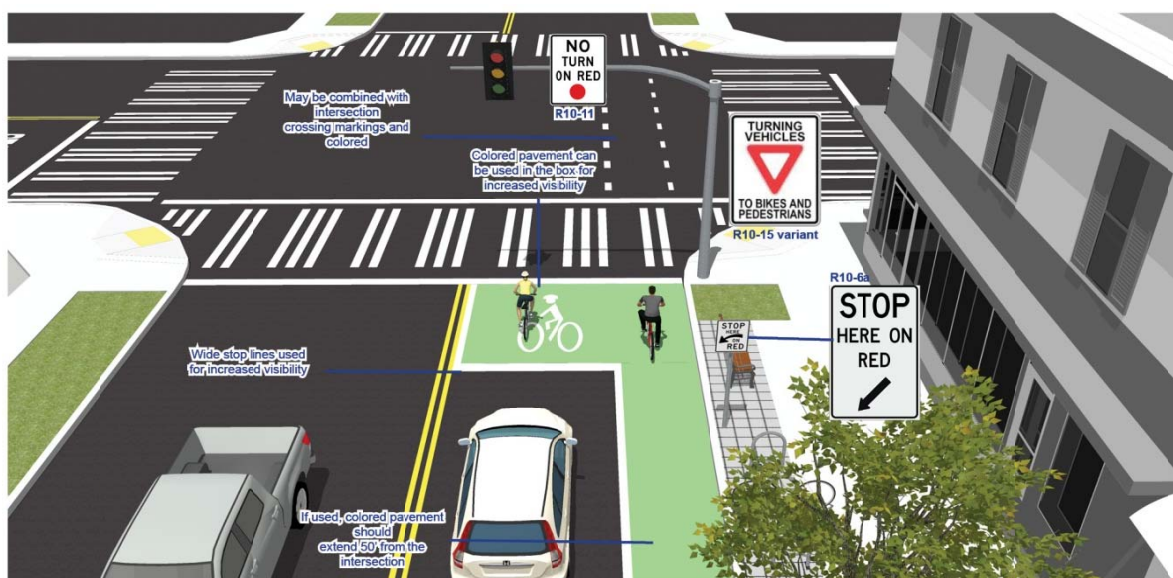
5.6.1 Bike Box

Description

A bike box is a designated area located at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible space to get in front of queuing motorized traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box.

Guidance

- 14' minimum depth
- A “No Turn on Red” (MUTCD R10-11) sign shall be installed to prevent vehicles from entering the Bike Box.
- A “Stop Here on Red” sign should be post mounted at the stop line to reinforce observance of the stop line.
- A “Yield to Bikes” sign should be post-mounted in advance of and in conjunction with an egress lane to reinforce that bicyclists have the right-of-way going through the intersection.
- An ingress lane should be used to provide access to the box.
- A supplemental “Wait Here” legend can be provided in advance of the stop bar to increase clarity to motorists.
- Requires permission to experiment from the Federal Highways Administration.



Discussion

Bike boxes should be placed only at signalized intersections. Bike boxes should be used in locations that have a large volume of bicyclists and are best utilized in central areas where traffic is usually moving more slowly.

Additional References and Guidelines

- NACTO. Urban Bikeway Design Guide. 2014
- FHWA. Interim Approval (IA-14). 2011

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

Existing Locations

- None

Potential Locations

- TBD

5.6.2 Bike Lanes at Right Turn Only Lanes

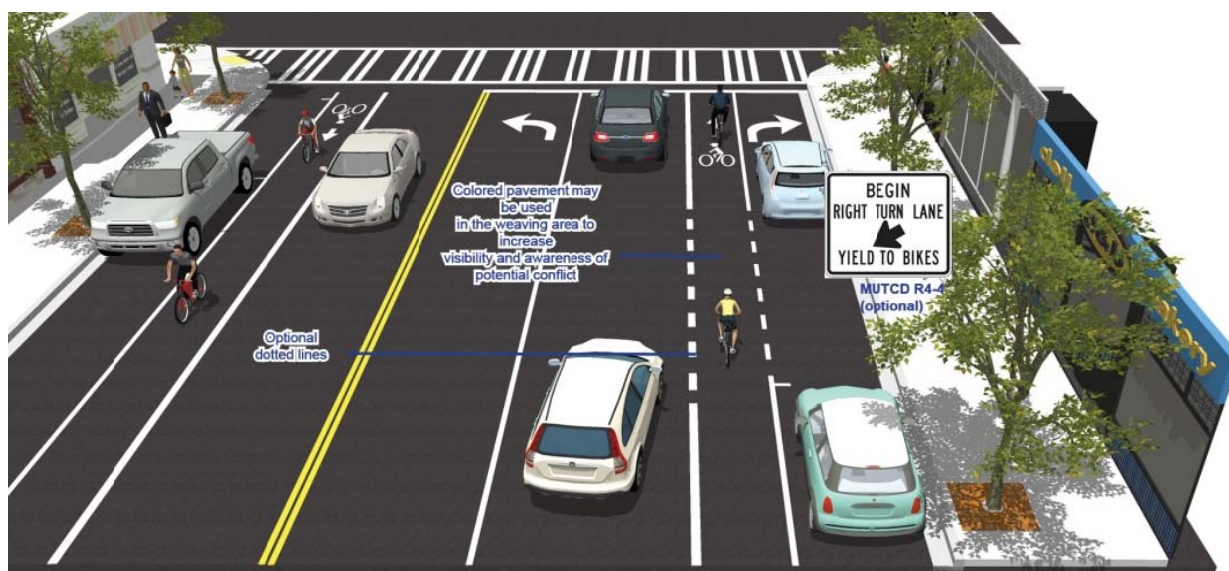
Description

Class II bike lanes may be placed between the right-turn lane and the right-most through lane. Bicyclists would access the bike lane pocket through a weave zone, with signage or pavement markings indicating that motorists should yield to bicyclists through the conflict area.

Guidance

At right turn only lanes:

- Continue existing bike lane width; standard width of 5 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.





Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- NACTO. Urban Bikeway Design Guide. 2014.
- Caltrans. California HDM. 2012.
- Caltrans. Complete Intersections. 2010.

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

Existing Locations

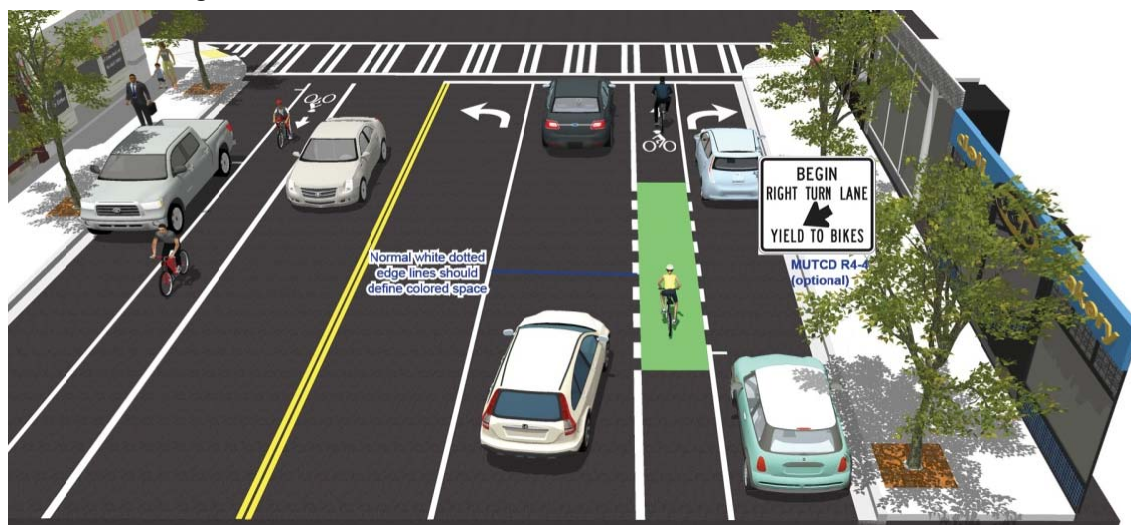
- Pacific Coast Highway at Camino Capistrano, San Clemente (see photo on previous page)
- Pacific Coast Hwy at Crown Valley Pkwy, Dana Point

5.6.3 Colored Bike Lanes in Conflict Areas

Description

The Federal Highway Administration (FHWA) has granted the State of California approval for optional use of green colored pavement in marked bicycle lanes and in extensions of bicycle lanes through intersections and other traffic conflict areas. It should be noted that the green colored pavement as

described under this approval is used for two different situations: first, to denote a lane that is exclusively used for bicyclists and second, to advise motorists and bicyclists that they are sharing the same patch of pavement and should beware of each other's presence. Local agencies have adopted different philosophies on the usage of green colored pavement. Some agencies use green colored pavement only for Class II lanes where bicyclists have exclusive use, and leave the conflict zones uncolored. Other agencies use the green colored pavement only in conflict zones, such as the weave zone shown in the figure below.



Discussion

The best practices for green colored pavement are still evolving. As of this date, more agencies use green colored pavement for conflict zones than for exclusive bicyclist lanes. The amount of green paint used by such agencies varies dramatically. Some agencies fill the entire conflict zones with solid green paint, while others use a pattern of green stripes. Some agencies use green colored pavement across every driveway, alley, and cross streets, while others reserve the use of green colored pavement for conflict zones that merit special attention. The precise design of green colored pavement remains at the discretion of the local agencies.

It should be noted that the combination of a shared lane marking (“sharrow”) within green colored pavement, as is used on Second Street in the Belmont Shores community of Long Beach, is no longer approved for new experimentation by the FHWA. However, the FHWA may accept for experimentation the use of green colored pavement as a “background conspicuity enhancement”.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- NACTO. Urban Bikeway Design Guide. 2014.
- Caltrans. California HDM. 2012.
- Caltrans. Complete Intersections. 2010.

Existing Locations

- None

Potential Locations

- Pacific Coast Hwy at Crown Valley Pkwy, Dana Point
- Lake Forest Dr. at Jeronimo Rd., Lake Forest

5.6.4 Combined Bike Lane / Turn Lane*Description*

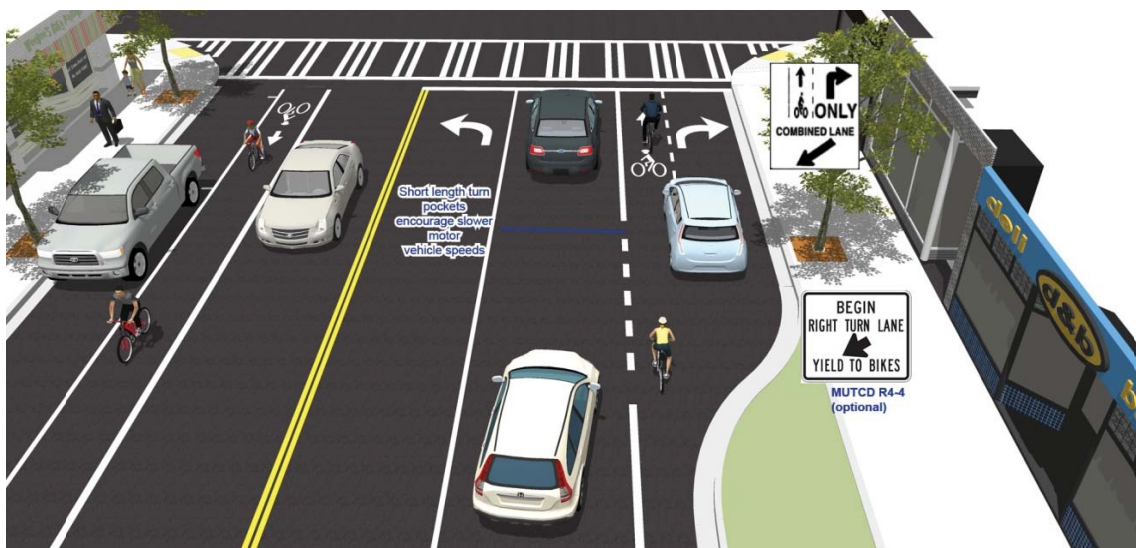
The combined bicycle/right turn lane places a standard-width bike lane on the left side of a dedicated right turn lane. A dotted line delineates the space for bicyclists and motorists within the shared lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane. This treatment has been used at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.

Guidance

The FHWA has disallowed the experimental use of combined bike lane/turn lane markings. Previously, typical installations were as follows:

Maximum shared turn lane width is 13 feet; narrower is preferable.

- Bike Lane pocket should have a minimum width of 4 feet with 5 feet preferred.
- A dotted 4 inch line and bicycle lane marking should be used to clarify bicyclist positioning within the combined lane, without excluding cars from the suggested bicycle area.
- A “Right Turn Only” sign with an “Except Bicycles” plaque may be needed to make it legal for through bicyclists to use a right turn lane.



Discussion

Unless the FHWA resumes granting permission to experiment with a combined bike lane/turn lane, this treatment will not be recommended.

Additional References and Guidelines

- NACTO. Urban Bikeway Design Guide. 2014.
- AASHTO. Guide for the Development of Bicycle Facilities. 2012.

Existing Locations

- None

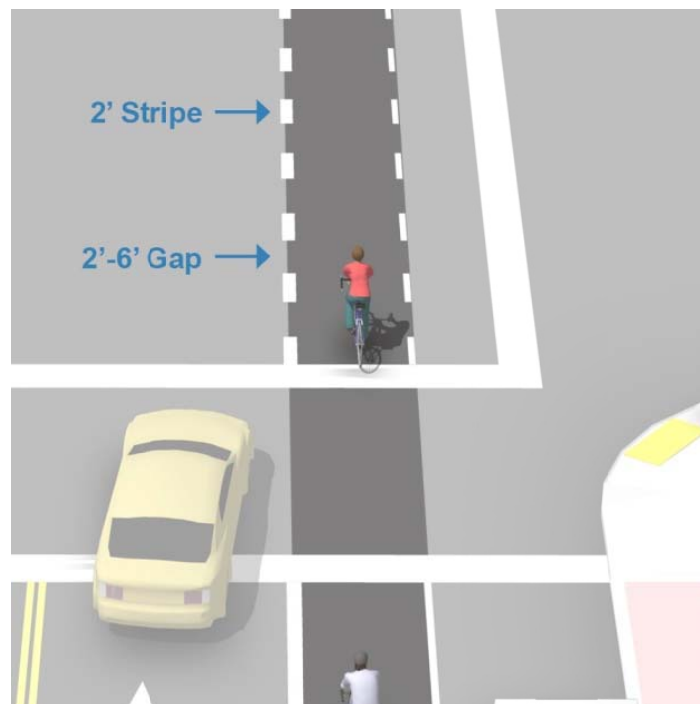
5.6.5 Intersection Crossing Markings

Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Guidance

- See MUTCD Section 3B.08: “dotted line extensions”



Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- NACTO. Urban Bikeway Design Guide. 2014.

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

Existing Locations

- None

Potential Locations

- Pacific Coast Hwy, Dana Point and Laguna Beach



5.6.6 Two-Stage Turn Box

Description

A two-stage turn box provides bicyclists a way to make left turns at multi-lane signalized intersections from a right side cycle track or bike lane. Bicyclists are often reluctant to weave into traffic to turn left. A two-stage left turn box allows bicyclists to continue straight while the traffic signal displays green for the original direction of travel, during one stage of a traffic signal, and then wait for the second stage when the cross street receives a green light to complete the move.

Guidance

- A two-stage turn box to facilitate a jughandle turn at a T-intersection is presently allowed in the Federal and California MUTCD's.
- A two-stage turn box for use other than for a jughandle turn at a T-intersection is experimental. Required design elements include a bicycle symbol pavement marking, a pavement marking turn or through arrow, full-time turn on red prohibition for the cross street, and passive detection of bicycles if the signal phase that permits bicyclists to enter the intersection during the second stage of their turn is actuated.
- Green colored pavement is optional.

Discussion

While two-stage turns may increase bicyclist comfort in many locations, this configuration typically results in higher average signal delay for bicyclists versus a vehicular style left turn maneuver.

Additional References and Guidelines

- NACTO. Urban Bikeway Design Guide. 2014.

Materials and Maintenance

Paint can wear more quickly in high traffic areas.

Existing Locations

- None

Potential Locations

- Antonio Pkwy at Santa Margarita Pkwy, Rancho Santa Margarita
- Marguerite Pkwy at Oso Pkwy, Mission Viejo

5.6.7 Bike Lanes at Diverging Ramp Lanes

Description

Some arterials may contain high speed freeway-style designs such as merge lanes and exit ramps, which can create difficulties for bicyclists. The entrance and exit lanes typically have intrinsic visibility problems because of low approach angles and feature high speed differentials between bicyclists and motor vehicles. Strategies to improve safety focus on increasing sight distances, creating formal crossings, and minimizing crossing distances.

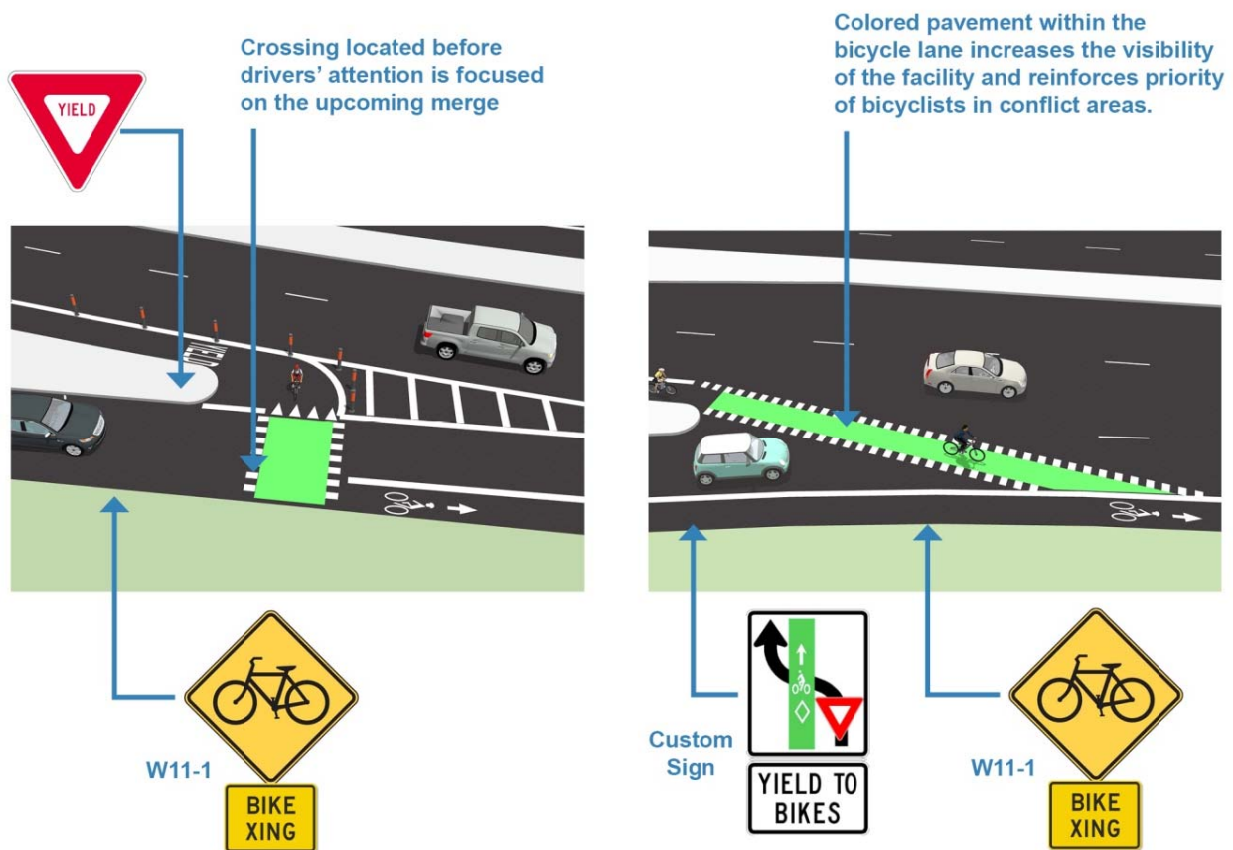
Guidance

Entrance Ramps:

- Angle the bike lane to increase the approach angle with entering traffic. Position crossing before drivers' attention is focused on the upcoming merge.

Exit Ramps:

- Use a jug handle turn to bring bicyclists to increase the approach angle with exiting traffic, and add yield striping and signage to the bicycle approach.



Discussion

Green colored pavement is optional.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- Caltrans. Complete Intersections. 2010.

Materials and Maintenance

Locate crossing markings out of wheel tread when possible to minimize wear and maintenance costs.

Existing Location with Proposed Improvement

- San Juan Creek Rd at Valle Rd, San Juan Capistrano
- Research Dr. at Irvine Center Dr., Irvine

5.6.8 Freeway Interchange Design

Description

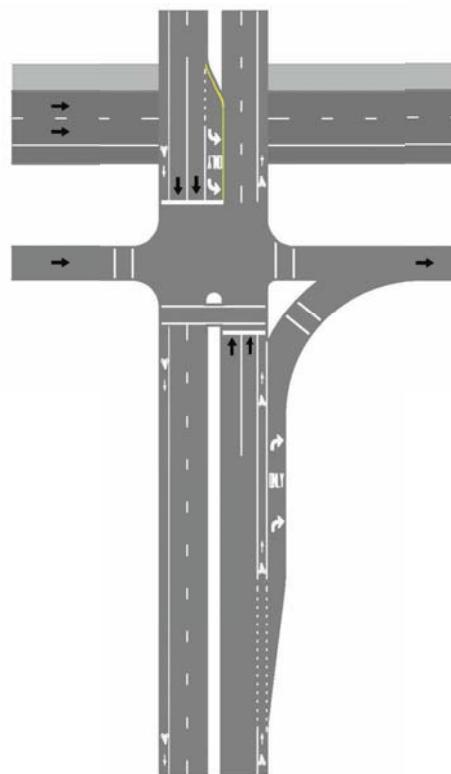
Freeway Interchanges can be significant obstacles to bicycling if they are poorly designed. Travel through some interchange designs may be particularly challenging for young bicyclists. Key design features at conflict areas through interchanges should be included to improve the experience for bicyclists.

*Guidance***Entrance Ramps:**

- A right-turn lane should be configured with a taper as an “add-lane” for motorists turning right onto the freeway entrance ramp.
- A bike lane should be provided along the left side of the right turn lane. Dotted through bike lane striping provides clear priority for bicyclists at right turn ‘add lane’ on-ramps.

Exit Ramps:

- Motorists exiting the freeway and turning onto the crossroad should be controlled by a stop sign, signal, or yield sign, rather than allowing a free flowing movement.



Discussion

The on-ramps should be configured as a right-turn-only “add lane” to assert through bicyclist priority. Designs that are functional for bicycle passage typically encourage slowing or require motor vehicle traffic to slow or stop. Designs that encourage high-speed traffic movements are difficult for bicyclists to negotiate.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- Caltrans. Complete Intersections. 2010.

Materials and Maintenance

Locate crossing markings out of wheel tread when possible to minimize wear and maintenance costs.

5.7 Signalization

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, traffic volumes, anticipated bicycle crossing traffic, and the configuration of planned or existing bicycle facilities. Signals may be necessary as part of the construction of a protected bicycle facility such as a cycle track with potential turning conflicts, or to decrease vehicle or pedestrian conflicts at major crossings. An intersection with bicycle signals may reduce stress and delays for a crossing bicyclist, and discourage illegal and unsafe crossing maneuvers.



5.7.1 Bicycle Detection and Actuation

Loop or Video Detectors

For signalized intersection movements that do not normally receive a green light unless actuated by a car or pedestrian, the California Vehicle Code requires installation of detectors capable of detecting bicyclists at the limit line. This is most commonly handled with either inductive loop detectors or with video detection. Traffic actuated signals should be sensitive to bicycles, should be located in the bicyclist's expected path, and stenciling should direct the bicyclist to the point where the bicycle will be detected. This allows the bicyclist to stay within the lane of travel without having to maneuver to the side of the road to trigger a push button.

Push Button Actuation

A bicyclist pushbutton may be used to supplement the required limit line detectors. These buttons should be mounted in a location that permits their activation by a bicyclist without having to dismount.

Discussion

Proper bicycle detection should meet two primary criteria: 1) accurately detects bicyclists and 2) provides clear guidance to bicyclists on how to actuate detection (e.g., what button to push, where to stand). The requirement for bicycle detection at all new and modified approaches to traffic signals is included in the CA MUTCD 2014.



Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- NACTO. Urban Bikeway Design Guide. 2014.
- California MUTCD. 2014.
- Caltrans. Policy Directive 09-06. 2009.
- Caltrans. Complete Intersections. 2010.

Materials and Maintenance

Signal detection and actuation for bicyclists should be maintained with other traffic signal detection and roadway pavement markings.

5.7.2 Bicycle Signal Heads

Description

The California MUTCD authorizes the use of bicycle signal heads only at locations that meet Caltrans Bicycle Signal Warrants. FHWA's Interim Approval IA-16, dated December 24, 2013, specifies a more detailed application of bicycle signal indications. Bicycle signal heads may be used for a movement that is not in conflict with any simultaneous motor vehicle movements at a signalized intersection, including right or left turns on red. The bicycle movement may not be modified by lane-use signs, turn prohibition signs, pavement markings, separate turn signal indications, or other traffic control devices.

The size of signal lenses may be 4 inches, 8 inches, or 12 inches in diameter, with the 4-inch lens size reserved only for supplemental near side mountings.

Additional References and Guidelines

- California MUTCD. 2014.
- FHWA Interim Approval IA-16, 2013.

Materials and Maintenance

Bicycle signal heads require the same maintenance as standard traffic signal heads, such as replacing bulbs and responding to power outages.

5.7.3 Active Warning Beacons

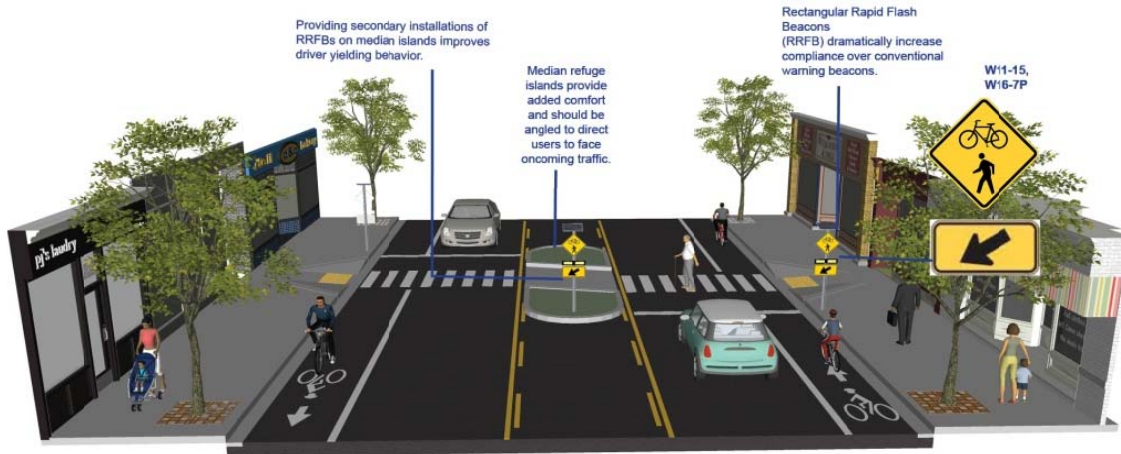
Description

Active warning beacons are user-actuated illuminated devices designed to increase motor vehicle yielding compliance at crossings of multi-lane or high volume roadways. Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or Rectangular Rapid Flash Beacons (RRFB). RRFBs have blanket approval in California per FHWA MUTCD IA 11.

Guidance

Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic signals.

- Warning beacons shall initiate operation based on pedestrian or bicyclist actuation and shall cease operation at a predetermined time after actuation or, with passive detection, after the pedestrian or bicyclist clears the crosswalk.



Additional References and Guidelines

- NACTO. Urban Bikeway Design Guide. 2014.
- California MUTCD. 2014.
- FHWA. Interim Approval (IA-11). 2008.
- Caltrans. Complete Intersections. 2010.

Materials and Maintenance

Depending on power supply, maintenance can be minimal. If solar power is used, RRFBs can run for years without issue.

Existing Locations

- Shady Canyon Trail at Shady Canyon Rd, Irvine

Potential Locations

- Aliso Creek Bike Path at Los Alisos Blvd, Lake Forest

5.7.4 Pedestrian Hybrid Beacons

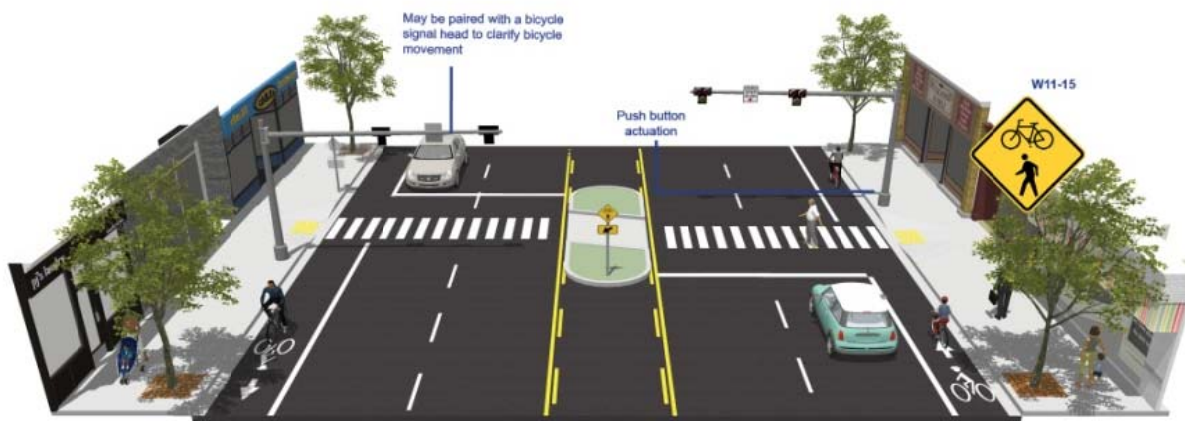
Description

A pedestrian hybrid beacon, also known as a High-intensity Activated CrossWalk (HAWK), consists of a signal-head with two red lenses over a single yellow lens on the major street, and pedestrian and/or bicycle signal heads for the minor street. The signal normally displays dark indications to motor vehicle traffic. When actuated by a pedestrian, the signal displays a yellow light, followed by an interval where both red lights are displayed steadily during the pedestrian walk interval, followed by alternating flashing red indications during the pedestrian clearance interval. As used in other states, pedestrian hybrid beacons are used to improve non-motorized crossings of major streets in locations where side-street volumes do not support installation of a conventional traffic signal or where there are concerns that a conventional signal will encourage additional motor vehicle traffic on the minor street. However, due to California law that prohibits the installation of STOP signs on approaches to signalized intersections, hybrid beacons may only be used at mid-block crossing locations.

Guidance

Pedestrian hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable user crossing.

- If installed within a signal system, signal engineers should evaluate the need for the pedestrian hybrid beacon to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk



Discussion

An alternative to a pedestrian hybrid beacon is a standard signal face that displays a flashing red indication during the pedestrian clearance phase. The advantage of a standard signal face is that it displays no dark indications that could be interpreted by a motorist to be a symptom of a power outage that requires coming to a stop.

Additional References and Guidelines

- California MUTCD. 2014.

Materials and Maintenance

Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

Existing Locations for Potential Improvement

- Laguna Niguel Family YMCA Bike Path at Crown Valley Pkwy, Laguna Niguel
- Creekside Access Rd at Aliso Viejo Pkwy and Briar Glenn, Aliso Viejo

5.8 Shared Roadways

On shared roadways, bicyclists and motor vehicles use the same roadway space. These facilities are typically used on roads with low speeds and traffic volumes; however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided. Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.



Signed Shared Roadway



Marked Shared Roadway

5.8.1 Signed Shared Roadway

Description

Signed shared roadways are Class III facilities generally located on roadways with lower speeds and lower traffic volumes. Class III facilities are designated as roadways with no striped bicycle lanes, but include signage to indicate the roadway is a bicycle route. Shared roadways can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.



Bicycle Boulevard

Guidance

“BIKE ROUTE” - This sign (D11-1) is intended for use where no unique designation of routes is desired. Directional changes should be signed with appropriate arrow sub-plaques (D1-1b) or directional signage

“Bicycles May Use Full Lane”- This sign (R4-11) sign may be used:

- On roadways where there are no bicycle lanes or adjacent shoulders usable by cyclists and where travel lanes are too narrow for cyclists and motor vehicles to safely operate side-by-side.
- In locations where it is important to inform all road users that cyclists may occupy the travel lane.



Discussion

A Bicycle May Use Full Lane sign (R4-11) may be used on a lane that is too narrow for a bicycle and an automobile to share the road side by side within the same lane).

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs, and will need periodic replacement due to wear.

Existing Locations

- South Ola Vista, San Clemente (see photo above)
- Pacific Coast Hwy, Laguna Beach

Potential Locations

- Calle Amanecar, San Clemente
- Via California, San Juan Capistrano

5.8.2 Marked Shared Roadway

Description

The shared lane marking (SLM) or “sharrow” is commonly used where parking is allowed adjacent to the travel lane. The center of the marking should be located where bicyclists would be clear of the open doors of parked cars. This often results in the bicyclists being near the center of the right-most travel lane.

Guidance

Shared lane markings may be considered in the following situations:

- On constrained roadways too narrow to stripe with bicycle lanes
- To delineate space within a wide outside lane where cyclists can be expected to ride
- On roadways where it is important to increase vehicle driver awareness of cyclists
- On roadways where cyclists tend to ride too close to parked vehicles





Discussion

Class II bike lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. Sharrows shall not be used on shoulders, on designated Bike Lanes, or to designate Bicycle Detection at signalized intersections. (MUTCD 9C.07)

Additional References and Guidelines

- Caltrans HDM Chapter 300
- California MUTCD 2014
- NACTO Urban Bikeway Design Guide, 2012
- Model Design Manual of Living Streets, 2011

Existing Locations

- Gleneyre St, Laguna Beach (see photo above)
- South Ola Vista, San Clemente

Potential Locations

- Blue Lantern St, Dana Point
- Low volume, low speed streets

5.8.3 Bicycle Boulevard

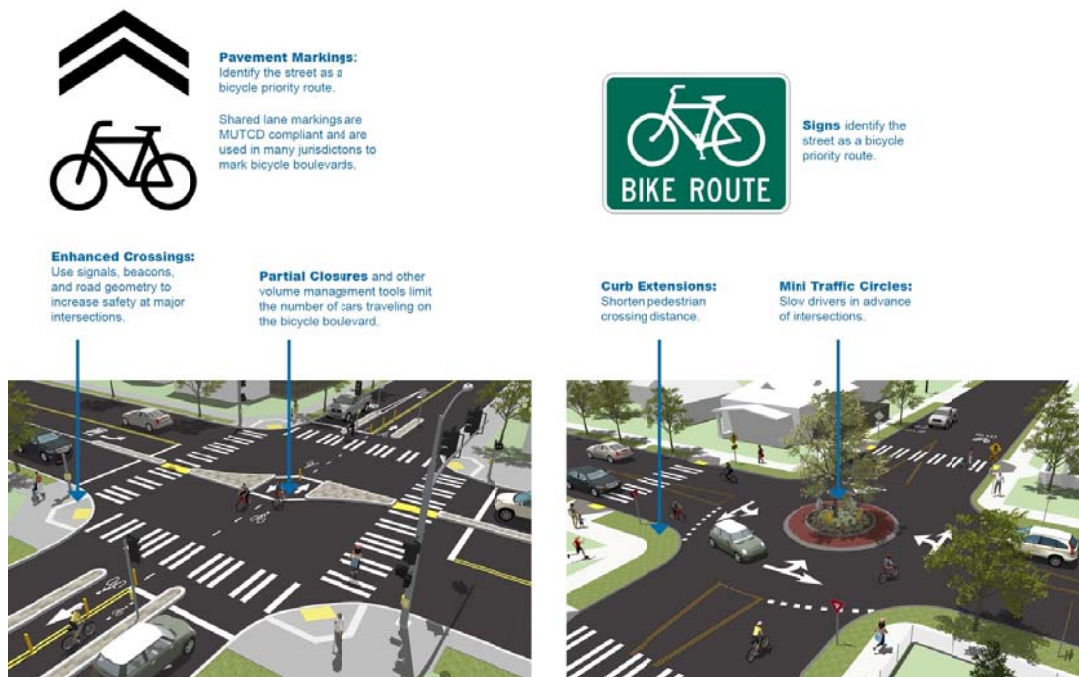
Description

Bicycle boulevards are low-volume, low-speed streets modified to enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments may allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.

Guidance

Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.

- Bicycle boulevards should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Implement volume control treatments such as traffic diverters based on the context of the bicycle boulevard and using engineering judgment. Target motor vehicle volumes range from 1,000 to 3,000 vehicles per day.
- Intersection crossings should be designed to slow motor vehicles, enhance safety for bicyclists and pedestrians and minimize delay for bicyclists.





Discussion

The term “bicycle boulevard” implies a facility that encourages bicycle usage while reducing motor vehicle volumes and/or speeds to a greater extent than on a typical Class III route. Some of the treatments used to encourage cycling may include preferential treatment by means of exclusions from turn restrictions, contra-flow access through a one-way street, exclusive traffic signal phases, or the re-orientation of stop sign control to favor the bicycle boulevard. Traffic calming techniques may include bulbouts, chokers, traffic circles, roundabouts, speed humps, turn restrictions, or barricades.

Additional References and Guidelines

- Caltrans HDM Chapter 300
- California MUTCD 2012
- NACTO Urban Bikeway Design Guide, 2012
- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- FHWA Mini-Roundabouts. 2010

Existing Locations

- Traffic circle at Calle Colima, San Clemente (see photo above)

Potential Locations

- TBD

5.9 Bikeway Signing

The ability to navigate through a city is informed by landmarks, natural features and other visual cues.

Signs throughout the city may indicate to bicyclists:

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations



Wayfinding Signage

These signs will increase users' comfort and accessibility to the bicycle systems. Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)



Wayfinding Sign Placement

A community-wide bicycle wayfinding signage plan would identify:

- Sign locations
 - Sign type – what information should be included and design features
 - Destinations to be highlighted on each sign – key destinations for bicyclists
 - May include approximate distance and travel time to each destination
- Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.

5.9.1 Wayfinding Sign Types

Description

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

Confirmation Signs

- Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route.
- May include destinations and distance/time. Do not include arrows.



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Turn Signs

- Indicate where a bikeway turns from one street onto another street. Can be used with pavement markings.
- Include destinations and arrows.



Decisions Signs

- Mark the junction of two or more bikeways.
- Inform bicyclists of the designated bike route to access key destinations.
- Destinations and arrows are required, distances are optional but recommended.
- The inclusion of bicycle travel time is nonstandard, but is recommended.



Discussion

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- NACTO. Urban Bikeway Design Guide. 2014.

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

5.9.2 Wayfinding Sign Placement

Guidance

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

Decisions Signs

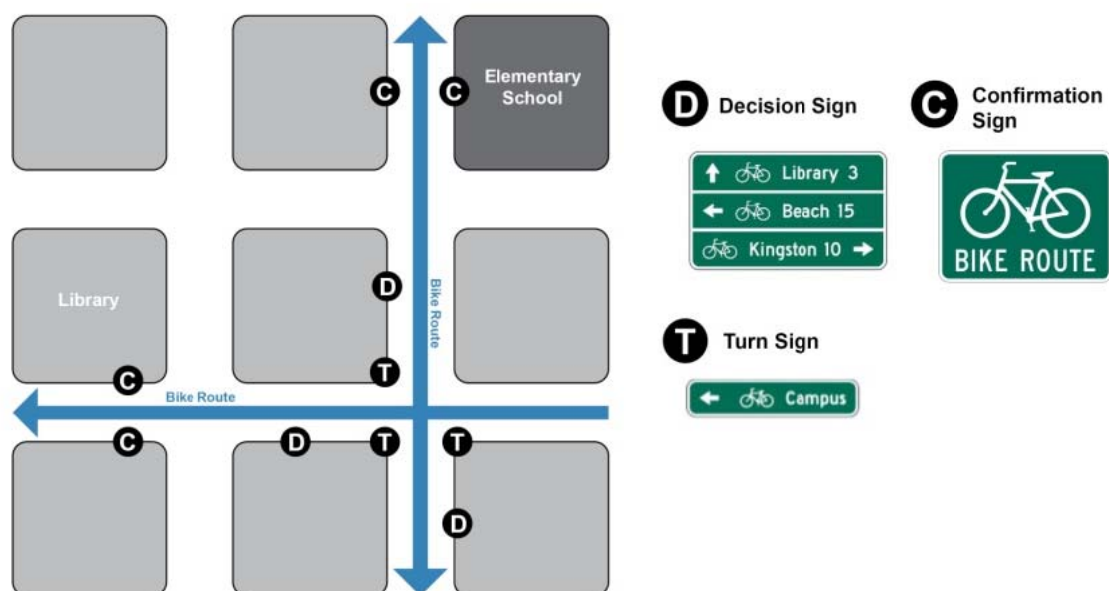
- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

Confirmation Signs

- Every one-quarter to one-mile interval on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 feet of a turn or decision sign). It should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

Turn Signs

- Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through). Pavement markings can also indicate the need to turn to the bicyclist.



Discussion

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- California MUTCD. 2014.
- NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

5.10 Retrofitting Existing Streets to Add Bikeways

Most major streets are characterized by conditions (e.g., high vehicle speeds and/or volumes) for which dedicated bike lanes are the most appropriate facility to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, many major streets have physical and other constraints that would require street retrofit measures within existing curb-to-curb widths. As a result, much of the guidance provided in this section focuses on effectively reallocating existing street width through striping modifications to accommodate dedicated bike lanes.

Although largely intended for major streets, these measures may be appropriate for any roadway where bike lanes would be the best accommodation for bicyclists.



5.10.1 Lane Narrowing

Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 feet and sometimes 10 feet wide travel lanes to create space for bike lanes.

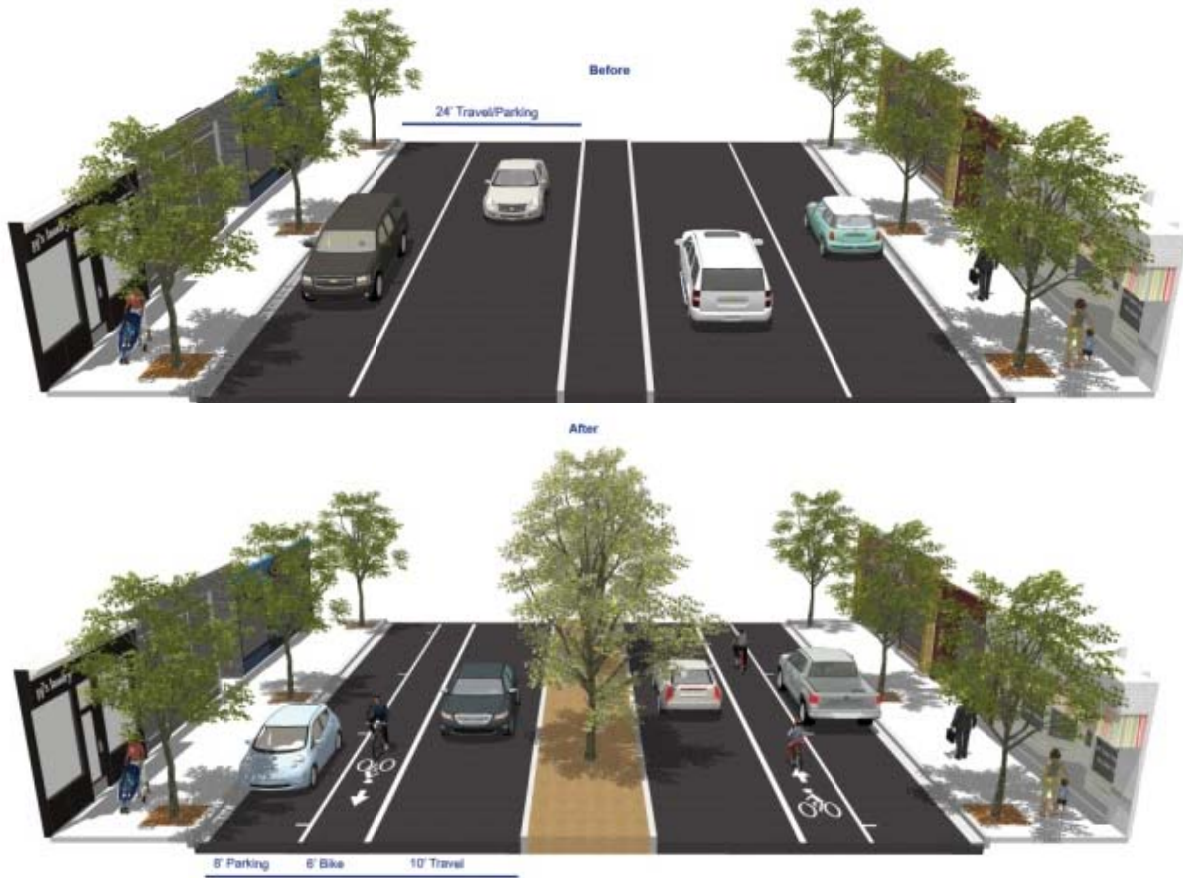
Guidance

Vehicle lane width:

- Before: 10 to 15 feet
- After: 10 to 11 feet

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment



Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in certain situations to provide space for bike lanes.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- AASHTO. A Policy on Geometric Design of Highways and Streets. 2004.
- Caltrans. California HDM. 2012.
- Caltrans. Main Streets. 2005.

Materials and Maintenance

Repair rough or uneven pavement surface.

5.10.2 Lane Reconfiguration

Description

The removal of a single travel lane will generally provide sufficient space for two bike lanes on each side of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects.

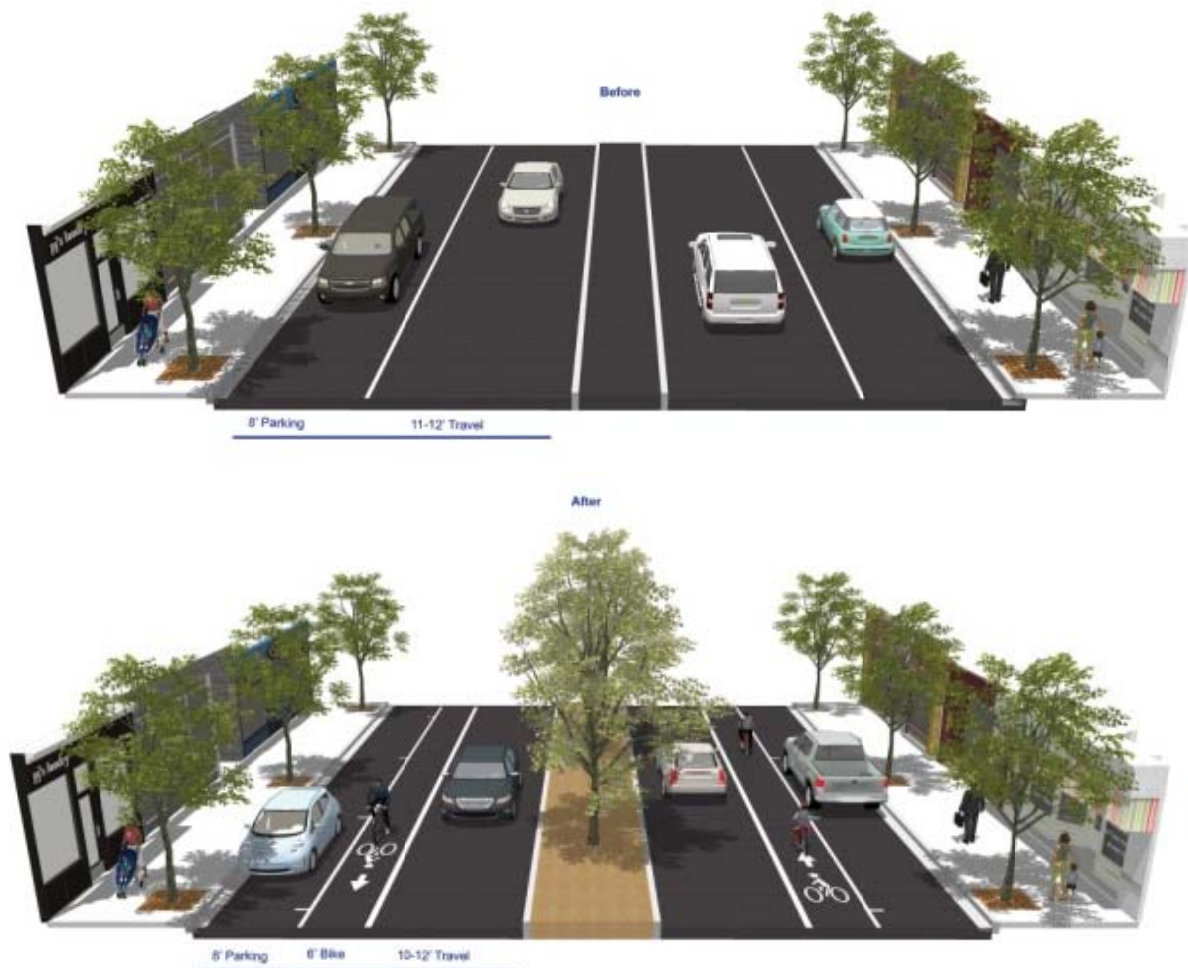
Guidance

Vehicle lane width:

- Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



Discussion

Depending on a street's existing configuration, traffic operations, user needs and safety concerns, various lane reduction configurations may apply. For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes.

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- FHWA. Evaluation of Lane Reduction "Road Diet" Measures on Crashes. 2010.
- Caltrans. Main Streets. 2005.

Materials and Maintenance

Repair rough or uneven pavement surface.

5.1 | Bicycle Support Facilities

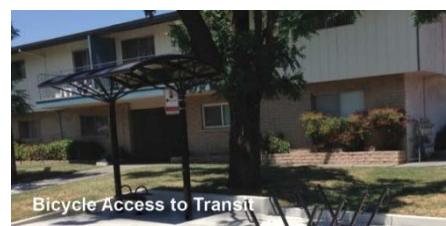
Facilities

Bicycle Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of two hours or less, or long-term parking for employees, students, residents, and commuters.

Access to Transit

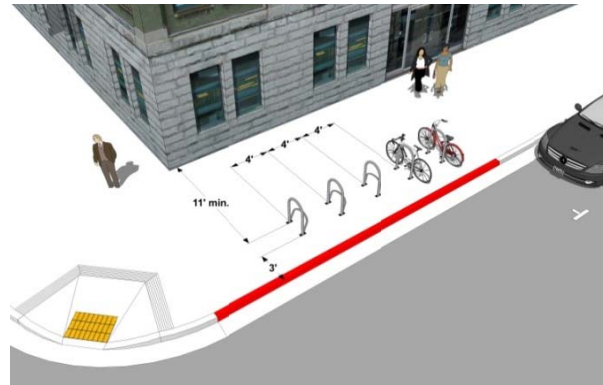
Safe and easy access to bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Providing bicycle access to transit and space for bicycles on buses and rail vehicles can increase the feasibility of transit in lower-density areas, where transit stops are beyond walking distance of many residences. People are often willing to walk only a quarter- to half-mile to a bus stop, while they might bike as much as two or more miles to reach a transit station.



5.1.1.1 Bicycle Racks

Description

Secure bicycle parking at likely destinations is an integral part of a bikeway network. Adequate bicycle parking should be incorporated into any new development or redevelopment project. Bicycle parking should be given a balanced level of importance when considering car parking improvements or development. In commercial areas where bicycle traffic is more prevalent, as well as parks and shopping centers, increased bicycle parking is recommended.

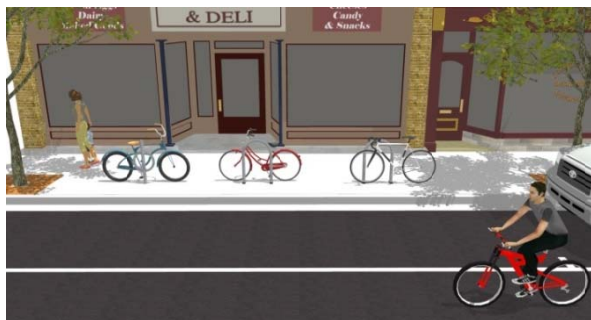


Bicycle rack type plays a major role in the utilization of the bicycle racks. Only racks that support the bicycle at two points and allow convenient locking should be used. The Association for Pedestrian and Bicycle Professionals (APBP) recommends selecting a bicycle rack that:

- Supports the bicycle in at least two places, preventing it from falling over
- Allows locking of the frame and one or both wheels with a U-lock
- Is securely anchored to ground
- Resists cutting, rusting and bending or deformation

Guidance

- Does not bend wheels or damage other bicycle parts
- Accommodates high security U-shaped bicycle locks
- Accommodates securing the frame and wheels
- Does not trip pedestrians
- Are easily accessed yet protected from motor vehicles
- Are covered if users will leave their bicycles for long periods
- Located in areas that cyclists are most likely to travel



Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- APBP. Bicycle Parking Guide 2nd Edition. 2010.

Materials and Maintenance

Use of proper anchors will prevent vandalism and theft.

5.1.1.2 On-Street Bicycle Corral

Description

Bicycle corrals are generally former vehicle parking stalls converted to bicycle parking. Most have been on-street conversions, but they are now being incorporated into shopping center parking lots as well. Corrals can accommodate up to 20 bicycles per former vehicle parking space. On-street bicycle corrals provide many benefits where bicycle use is high and/ or growing:

Businesses - Corrals provide a much higher customer to parking space ratio and advertise “bicycle friendliness.” They also allow more outdoor seating for restaurants by moving the bicycle parking off the sidewalk. Some cities have instituted programs that allow local businesses to sponsor or adopt a bicycle corral to improve bicycle parking in front of their business.

Pedestrians - Corrals clear the sidewalks and those installed at corners also serve as curb extensions

Cyclists - Corrals increase the visibility of cycling and greatly expand bicycle parking options

Vehicle drivers - Corrals improve visibility at intersections by preventing large vehicles from parking at street corners and blocking sight lines

Guidance

See guidelines for sidewalk Bicycle Rack placement.

- Can be used with parallel or angled parking
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side
- Can be customized and have been designed and fabricated to complement specific locations



Discussion

In many communities, the installation of bicycle corrals is driven by requests from adjacent businesses, and is not a city-driven initiative. In other areas, the city provides the facility and business associations take responsibility for the maintenance of the facility.

Additional References and Guidelines

- APBP. *Bicycle Parking Guide 2nd Edition. 2010.*

Materials and Maintenance

Physical barriers may obstruct drainage and collect debris. Establish a maintenance agreement with neighboring businesses.

5.1.1.3 Bicycle Lockers*Description*

Bicycle parking facilities intended for long-term parking must protect against theft of the entire bicycle and its components and accessories.

Three common ways of providing secure long-term bicycle parking are:

- Fully enclosed lockers accessible only by the user, either coin-operated, or by electronic, on-demand locks operated by “smartcards” equipped with touch-sensitive imbedded RFID chips.
- A continuously monitored facility that provides at least medium-term type bicycle parking facilities generally available at no charge
- Restricted access facilities in which short-term type bicycle racks are provided and access is restricted only to the owners of the bicycles stored there

Perhaps the easiest retrofit is the bicycle locker. Generally, they are as strong as the locks on their doors and can secure individual bicycles with their panniers, computers, lights, etc., left in place. Some bicycle locker designs can be stacked to double the parking density.

Lockers with coin-operated locks can be a target of theft and may attract various unintended uses. This can be mitigated by installing lockers with mesh sides to allow periodic inspection.

Guidance

Minimum dimensions: width (opening) 2.5 feet; height 4 feet; depth 6 feet.

- Four-foot side clearance and 6-foot end clearance.
- Seven-foot minimum distance between facing lockers.
- Locker designs that allow visibility and inspection of contents are recommended for security.
- Access is controlled by a key or access code.



Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
- APBP. *Bicycle Parking Guide 2nd Edition*. 2010.

Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

5.1.1.4 Secure Parking Areas (SPA)

Description

A Secure Parking Area for bicycles, also known as a Bike SPA or Bike & Ride (when located at transit stations), is a semi-enclosed space that offers a higher level of security than ordinary bike racks. Accessible via key-card, combination locks, or keys, Bike SPAs provide high-capacity parking for 10 to 100 or more bicycles. Increased security measures create an additional transportation option for those whose biggest concern is theft and vulnerability.

Guidance

Key features may include:

- Closed-circuit television monitoring
- Double high racks & cargo bike spaces
- Bike repair station with bench
- Bike tube and maintenance item vending machine
- Bike lock “hitching post” – allows people to leave bike locks
- Secure access for users



Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free.



Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012
- APBP. Bicycle Parking Guide 2nd Edition. 2010

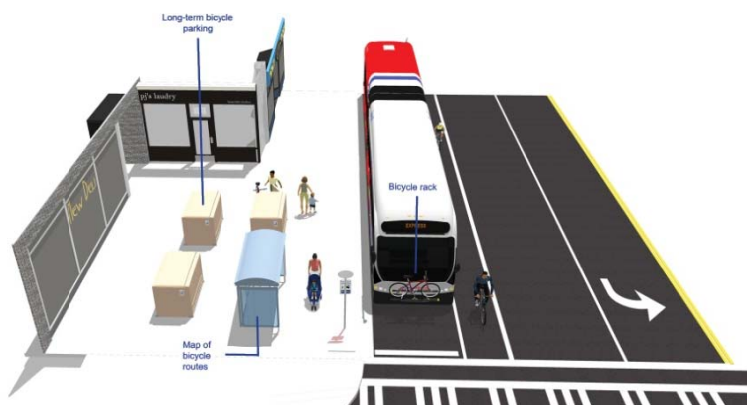
Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

5.1.1.5 Bicycle Access to Transit

Description

Safe and easy access to transit stations and secure bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Bicycling to transit reduces the need to provide expensive and space consuming car parking spaces. Many people who ride to a transit stop will want to bring their bicycle with them on the transit portion of their trip, so buses and other transit vehicles should be equipped accordingly.



For staircases at bus or rail transit stations, bicycle access could be facilitated with bicycle staircase side ramps. These consist of narrow channels just wide enough to accommodate bicycle tires, installed below the hand rails of stair cases. Cyclists could place their bicycles onto the side ramps and walk them up or down the stairs, with the bicycles rolling within the channels. Examples of bicycle staircase side ramps can be found at the El Monte Bus Station and at BART's 16th Street Station.

Guidance

- Provide direct and convenient access to transit stations and stops from the bicycle and pedestrian networks.
- Provide maps, wayfinding signage and pavement markings from the bicycle network to transit stations.

Bicycle Parking

- The route from bicycle parking locations to station/stop platforms should be well-lit and visible.
- Signing should note the location of bicycle parking, rules for use, and instructions as needed.
- Provide safe and secure long-term parking such as bicycle lockers at transit hubs. Parking should be easy to use and well maintained.

Discussion

Providing bicycle routes to transit helps combine the long-distance coverage of bus and rail travel with the door-to-door service of bicycle riding. Transit use can overcome large obstacles to bicycling, including distance, hills, riding on busy streets, night riding, inclement weather, and breakdowns.

Additional References and Guidelines

- APBP. Bicycle Parking Guide 2nd Edition. 2010.
- FHWA. University Course on Bicycle and Pedestrian Transportation.
- Lesson 18: Bicycle and Pedestrian Connections to Transit. 2006.

Materials and Maintenance

Regularly inspect the functioning of long-term parking moving parts and enclosures.



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5.12 Bikeway Facility Maintenance

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities. The following recommendations provide a menu of options to consider enhancing a maintenance regimen.

5.12.1 Sweeping

Description

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, potentially causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.

Guidance

Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.

- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- Perform additional sweeping in the fall in areas where leaves accumulate.



Note - some separated bike facilities (cycle tracks) that employ curbs or other physical barriers for separation may be too narrow for a standard street sweeper, which requires a 10-foot wide clearance. If this is the case, arrangements need to be made for smaller equipment to be used on a regular basis to keep the facility clean.

5.12.2 Gutter-to-Pavement Transition and handling standing water

Description

On streets with concrete curbs and gutters, 1 to 2 feet of the curbside area is typically devoted to the gutter pan, where water collects and drains into catch basins. On many streets, the bikeway is situated near the transition between the gutter pan and the pavement edge. This transition can be susceptible to erosion, creating potholes, and a rough surface for travel. These areas can also be prone to retaining standing water during and after rains.



Guidance

Ensure that gutter-to-pavement transitions have no more than a $\frac{1}{4}$ " vertical transition.

- Examine pavement transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.
- Inspect the pavement two to four months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- Provide at least three feet of pavement outside of the gutter seam and four feet is preferred.
- When adding new bike facilities such as separated lanes, roundabouts, and traffic circles, check for potential drainage issues. Installing bioswales to capture runoff and avoid standing water in bike lanes is becoming a standard part of building bike facilities in bike-friendly communities such as Portland and Long Beach.

5.12.3 Roadway Surface

Description

Bicycles are much more sensitive to subtle changes in roadway surface than are motor vehicles. Various materials are used to pave roadways, and some are smoother than others. Compaction is also an important issue after trenches and other construction holes are filled. Uneven settlement after trenching can affect the roadway surface nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks. When resurfacing streets, use the smallest chip size and ensure that the surface is as smooth as possible to improve safety and comfort for bicyclists.



Guidance

Maintain a smooth pothole-free surface.

- Ensure that on new roadway construction, the finished surface on bikeways does not vary more than $\frac{1}{4}$ ".

- Maintain pavement so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Inspect the pavement two to four months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- If chip sealing is to be performed, use the smallest possible chip on bike lanes and shoulders. Sweep loose chips regularly following application.
- During chip seal maintenance projects, if the pavement condition of the bike lane is satisfactory, it may be appropriate to chip seal the travel lanes only. However, use caution when doing this so as not to create an unacceptable ridge between the bike lane and travel lane.

5.12.4 Drainage Grates

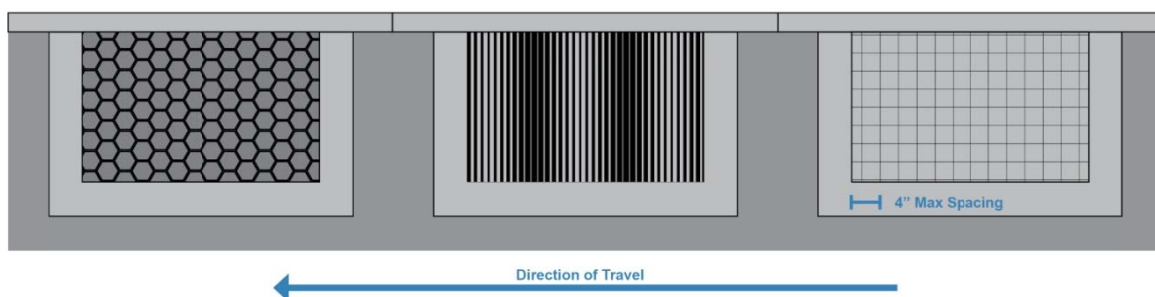
Description

Drainage grates are typically located in the gutter area near the curb of a roadway. Drainage grates typically have slots through which water drains into the municipal storm sewer system. Many older grates were designed with linear parallel bars spread wide enough for a tire to become caught so that if a bicyclist were to ride on them, the front tire could become caught in the slot. This would cause the bicyclist to tumble over the handlebars and sustain potentially serious injuries.

Guidance

Require all new drainage grates be bicycle-friendly, including grates that have horizontal slats on them so that bicycle tires and assistive devices do not fall through the vertical slats.

- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary – temporary modifications such as installing rebar horizontally across the grate should not be an acceptable alternative to replacement.



5.12.5 Bikeway Maintenance and Operations

Description

Motor vehicle traffic tends to “sweep” debris like litter and broken glass toward the roadway edges where it can accumulate in bicycle lanes. Maneuvering to avoid such hazards can cause a cyclist to fall. In this way, proper maintenance directly affects safety and street sweeping must be a priority on roadways

with bicycle facilities, especially in curb lanes and along the curbs themselves. Law enforcement can assist by requiring towing companies to fully clean up crash sites to prevent glass and debris from being left in place or simply swept to the curb or shoulder after collisions.

When any roadwork repairs are done by the City or other agencies, the roadway must be restored to satisfactory quality with particular attention to surface smoothness suitable for cycling. Striping must be restored to the prior markings, or new markings if called for in a project. Bicycles facilities also sometimes seem to “disappear” after roadway construction occurs. This can happen incrementally as paving repairs are made over time and are not promptly followed by proper re-striping. When combined with poor surface reconstruction following long periods out of service due to road work, bikeway facilities can be “lost,” which can discourage cycling in general. Construction projects that require the demolition and rebuilding of adjacent roadways can cause problems maintaining and restoring bikeway function.

Construction activities controlled through permits, such as driveway, drainage and utility work can have an important effect on roadway surface quality where cyclists operate in the form of mismatched pavement heights, rough surfaces or longitudinal gaps in adjoining pavements, or other pavement irregularities. Permit conditions should ensure that pavement foundation and surface treatments are restored to their pre-construction conditions, that no vertical irregularities will result and that no longitudinal cracks will develop. Strict specifications, standards and inspections designed to prevent these problems should be developed. A five year bond should be held to assure correction of any deterioration that might occur as a result of faulty reconstruction of the roadway surface.

Bicycle facilities should be swept regularly, at least twice a month, and preferably more often for heavily traveled routes. Also, adjacent shrubs and trees should be kept trimmed back to prevent encroachment into the pathway or obstructing cyclists’ views.

Guidance

Colored Pavement Materials:

- Waterborne Paints
 - o Over the past 10 years, transportation agencies in the United States have gradually replaced conventional solvent paints with waterborne paints that have low Volatile Organic Compounds (VOC) and other newer pavement marking materials. Waterborne traffic paints are the most widely used and least expensive pavement marking material available. Glass beads are either pre-mixed into the paint or dropped onto the waterborne paint to provide retro-reflectivity.
 - o Waterborne paints generally provide equal performance on asphalt and concrete pavements but have the shortest service life of all pavement marking materials. This paint type tends to wear off rapidly and lose retro-reflectivity quickly after being exposed to factors such as high traffic volumes. Although still a widely used material,

waterborne paint is also used as an interim marking material until they can apply something more durable.

- Regular Solvent Paint
 - This type of paint can be used universally for just about any pavement needing paint and is the least expensive. Sometimes additives such as reflective glass beads for reflectivity and sand for skid resistance are widely used to mark road surfaces. This is typically considered a non-durable pavement marking and is easily worn by vehicle tires and often requires annual re-application.
- Durable Liquid Pavement Markings
 - Durable Liquid Pavement Markings (DLPM) include epoxy and Methyl Methacrylate (MMA). Epoxy paint has traditionally been viewed as a marking material that provides exceptional adhesion to both asphalt and concrete pavements when the pavement surface is properly cleaned before application. The strong bond that forms between epoxy paints and both asphalt and concrete pavement surfaces results in the material being highly durable when applied on both pavement surfaces. These markings are highly durable and can be sprayed or extruded but generally require long no-track times.
- Thermoplastics
 - Thermoplastics are a durable pavement marking material composed of glass beads, pigments, binders (plastics and resins) and fillers. There are two types of thermoplastics: hydrocarbon and alkyd. Hydrocarbon thermoplastics are made from petroleum-derived resins; and alkyd thermoplastics are made from wood-derived resins. One of the added advantages of using thermoplastic is that the material can be re-applied over older thermoplastic markings, thereby refurbishing the older marking as well as saving on the costs of removing old pavement markings. Although thermoplastic materials usually perform very well on all types of asphalt surfaces, there have been mixed results when they have been applied on concrete pavements.

Paint Type Estimated Product Life Advantage Disadvantages:

- Waterborne
 - Paints 9-36 months * Inexpensive * Quick-drying * Longer life on low-volume roads * Easy clean-up and disposal * Short life on high-volume roads * Subject to damage from sands/abrasives * Pavement must be warm or it will not adhere.
- Regular
 - Solvent Paint 9-36 months* * Inexpensive * Quick-drying * Longer life on low-volume roads * Short life on high-volume roads * Subject to damage from sands/abrasives * Easy clean-up and disposal * Pavement must be warm or it will not adhere.

Durable Liquids for Pavement Markings:

- Epoxy
 - o 4 Years* * Longer life on low-volume roads * More retro-reflective * Slow drying * Requires coning and/or flagging during application * Heavy bead application- may need to be cleaned off of roadway * High initial cost * Subject to damage from sands/abrasives
- Thermoplastic
 - o 3-6 Years* * Long life on low-volume roads * Retro-reflective * No beads needed * Any temperature for application * Recommended use for symbols and spot treatments * Subject to damage from sands/abrasives * Cost prohibited if used for large scale applications * Shown to wear quickly in conflict areas * Life of pavement marking will depend on traffic volume, road condition and application time of year

Source:

NACTO. Urban Bikeway Design Guide. 2014.

FHWA. Durability and Retro-Reflectivity of Pavement Markings (Synthesis Study). 2008

Use of Green Paint:

One significant change is the FHWA's interim approval for the use of green colored pavement within bicycle lanes in mixing or transition zones, such as at intersections and in other potential conflict zones where motor vehicles may cross a bicycle lane. They are intended to warn drivers to watch for and to yield to cyclists when they encounter them within the painted area. FHWA studies have also shown that green bicycle lanes improve cyclist positioning as they travel across intersections and other conflict areas.

Jurisdictions within the State must notify Caltrans before proceeding with green bicycle lane projects because the agency is required to maintain an inventory, but since Caltrans has requested to participate in this interim approval, the process has been streamlined because FHWA experimental treatment protocol is no longer required.

Source:

NACTO. Urban Bikeway Design Guide. 2014.

http://mutcd.fhwa.dot.gov/resources/interim_approval/ia14/index.htm

6.0 FUNDING STRATEGIES

The federal and state government, along with regional and local governmental agencies, spend billions of dollars each year to fund transportation programs. These programs range from major highway and bridge projects to local street repair. Only a small percentage of these dollars is used for planning, developing, and constructing bike-related projects and programs. However, even though the percentage is small, tens of millions of dollars are made available on a yearly basis for funding active transportation projects for both biking and walking. While the competition for these funds is fierce, a well-crafted application to fund needed infrastructure and educational programs stands a good chance of being funded.

A major source of funding for bike and pedestrian projects is the Federally funded Moving Ahead for Progress in the 21st Century (MAP-21) Program. The Act was signed into law on July 6, 2012. The bill, which was reauthorized for FY 2014-2015, provides \$25.2 billion dollars nationwide of which just under \$2.4 billion is allocated to California. Eligible activities include:

- Transportation alternatives
- Recreational trails program
- Safe Routes to School Program
- Planning, designing, or constructing roadways with the right-of-way of former interstate routes for other divided highways.

Many federal and state grants require some level of matching funds. As a result most programs rely on more than one source of money. Developing a strategy to put together all of the required funds is important, as grants will not be awarded without specifying the sources of matching funds. The strategy may include matching a state grant with a federal grant, or the use of local or regional funds.

Many cities have hired a bike coordinator to not only help develop and oversee an effective bike program, but also to coordinate their funding efforts. These positions, which now often use the term active transportation to include both bike and walking, can help cities leverage their existing investments in street repair and maintenance as well as local returns from gas tax and developer fees. Cities such as Long Beach have brought in over \$20 million dollars in bike and pedestrian-related funds over the past 10 years. Recently Orange County cities were awarded over \$14 million dollars to fund bike and pedestrian projects between and FY 2015-2016. An active transportation coordinator can help your city obtain a portion of these active transportation funds.

For additional information, SCAG, OCTA and Safe Routes to Schools all have resources that can be used to help determine the most effective strategy to obtain federal, state and regional funds for active transportation projects.

To help agencies determine funding sources for projects along the proposed corridors, a summary by source type is provided with details regarding types of eligible projects, match requirements, and use.



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6.1 Federal Programs

6.1.1 Partnership for Sustainable Communities

Partnership for Sustainable Communities is an interagency partnership between HUD, DOT and the EPA.

- HUD offers funding opportunities to help communities realize their own visions for building more livable, walkable, and environmentally sustainable regions.
- DOT offers funding opportunities to support more livable walkable communities.
- EPA offers grants to support activities that improve the quality of development and protect human health and the environment.

Grants are offered periodically and can be found at www.sustainablecommunities.gov/partnership-resources.

6.1.2 Department of the Interior – Land and Water Conservation Fund (LWCF)

The LWCF state assistance program provides matching grants to help states and local communities protect parks and recreation resources. This 50:50 matching program is the primary federal investment tool to ensure that families have easy access to parks and open space, hiking and riding trails, and neighborhood recreation facilities.

The program is administered through the National Parks Service. Grants are allocated on an as-requested basis. The state prioritizes and selects eligible projects for LWCF assistance. For more info, visit <http://www.nps.gov/ncrc/programs/lwcf/manual/lwcf.pdf>.

6.1.3 Rivers, Trails, and Conservation Assistance Program (RTCA)

This program, funded through the National Park service, provides technical assistance in the form of visioning, program planning, goal setting, and community outreach. In the past, these grants have been used to establish high-level plans for the Santa River Trail and the LA River. Project proposals are due August 1st of each year. For more information on these grants, see www.nps.gov/orgs/rtca/apply.htm

6.1.4 Community Transformation Grants

The Center for Disease Control (CDC), through their Community Transformation Grant (CTG) program, offers grants designed to "create healthier communities by making healthy living easier and more affordable where people work, live, learn and play." Active living is one focus of the grant program. An example project is promoting improvements in sidewalks and street lighting to make it safe and easy for people to walk and ride bikes. Class I and Class IV bike facilities are types of bike infrastructure that may be supported by the CTG program. For more information on these grants see www.cdc.gov/nccdphp/dch/programs/communitytransformation/funds/index.htm



6.2 State Programs

6.2.1 Active Transportation Program (ATP)

California's Active Transportation Program was created in 2013 to encourage increased use of active modes of transportation, such as biking and walking. According to the California Transportation Commission (www.catc.ca.gov/programs/ATP.htm):

The ATP consolidates various transportation programs, including the federal Transportation Alternatives Program, state Bicycle Transportation Account, and federal and state Safe Routes to School programs into a single program to:

- *Increase the proportion of biking and walking trips,*
- *Increase safety for non-motorized users,*
- *Increase mobility for non-motorized users,*
- *Advance the efforts of regional agencies to achieve greenhouse gas reduction goals,*
- *Enhance public health, including the reduction of childhood obesity through the use of projects eligible for Safe Routes to Schools Program funding,*
- *Ensure disadvantaged communities fully share in program benefits (25% of program), and*
- *Provide a broad spectrum of projects to benefit many types of active transportation users.*

Program funding is segregated into three components and is distributed as follows:

- *50% to the state for a statewide competitive program,*
- *10% to small urban and rural regions with populations of 200,000 or less for the small urban and rural area competitive program, and*
- *40% to Metropolitan Planning Organizations (MPO) in urban areas with populations greater than 200,000 for the large urbanized area competitive program.*

For the Orange County area, the ATP is overseen by the Southern California Association of Governments (SCAG). For Fiscal Years 2014-15 and 2015-16, the area of Southern California governed by SCAG received a total of \$74.3 million for funding bike and pedestrian projects of which about 25% (\$18 million) was allocated to disadvantaged communities². Of the total funding available in the SCAG region, 17 projects were funded in Orange County for a total of \$13 million. The grants ranged from a low of \$126,000 to a maximum of \$2.6 million with a median of \$475,000. Fifteen of the grants in Orange County were for infrastructure development and two were for planning.

² ATP guidelines prescribe that no less than 25% of overall program funds benefit disadvantaged communities, which are defined as having a median household income less than 80% of the statewide median, or among the most disadvantaged 10% in the state (according to the latest version of the CA Communities Environmental Health Screening Tool), or at least 75% of the public school students in the project area are eligible to receive free or reduced meals under the National School Lunch Program.

For ATP Cycle I matching funds of a least 11.47% were required for all projects except for projects predominantly benefiting a disadvantaged community, stand-alone non-infrastructure projects (for example community safety and bike education programs) and safe routes to school projects. The source of the matching funds was any combination of local, private, state or federal funds. Matching funds were required to be expended in the same project phase (permits and environmental studies; plans, specifications, and estimates; right-of-way capital outlay; support for right-of-way acquisition; construction capital outlay; and construction engineering) as the Active Transportation Program funding. The matching requirements for ATP Cycle II are subject to change pending finalization of the program's guidelines.

For fiscal year 2016-17 and 2017-18, the funding available for the SCAG region should be similar. The next round of grant submittals will be due in March 2015. The most current information on the ATP program can be found at www.catc.ca.gov/programs/ATP.htm

6.2.2 AB2766

Since 1991 local governments have received AB 2766 funds to implement programs that reduce air pollution from motor vehicles. AB 2766 specifies that a Motor Vehicle Registration fee surcharge of \$6 per vehicle be collected by the Department of Motor Vehicles and given to the South Coast Air Quality Management District (SCAQMD) for disbursement. Of this fee, 40% goes to local governments. The local funds are designed to help cities meet requirements of the federal and state Clean Air Act.

The AB 2766 guidelines indicate that the design, development, and installation of bicycle routes, bikeways/bike paths and bike trail improvements are eligible for AB 2766 funding. The guidelines go on to specify:

Bike lanes, paths or routes are most effective when they reduce commute and non-recreational auto travel by encouraging and increasing the use of bicycles. A bike path must eliminate and/or decrease single commuter vehicle trips and miles traveled, while improving safety and accessibility. Bike paths strictly used for recreational activities will not qualify as an eligible project because there are no motor vehicle emission reductions or vehicular commuter trips reduced or eliminated.

Other bike facilities that promote and facilitate the increased use of non-motorized transit are also eligible. This would include bike racks, lockers, signals, and bus racks; and the installation of bike storage units with park and ride facilities or at the end of bicycle trails. In addition, the purchase of electric or standard bicycles in lieu of gas powered vehicles for police officers, community service personnel, and community residents is eligible. For more on AB 2766 funding see www.aqmd.gov/docs/default-source/transportation/ab2766-motor-vehicle-subvention-fund-program/ab2766-resource-guide.pdf?sfvrsn=2



6.2.3 Climate Ready Grant Program – California State Coastal Conservancy

The purpose of the Climate Ready grant program is to help advance the planning and implementation of on-the-ground actions that will lessen the impacts of climate change on California's coastal resources. The Coastal Conservancy fund may include trails and other public access to and along the coast.

The stages of a project generally funded by the Coastal Conservancy include pre-project feasibility studies, property acquisition, planning (for large areas or specific sites) and design, environmental review, construction, monitoring, and, in limited circumstances, maintenance. For more information see www.scc.ca.gov/category/grants/

6.2.4 Greenhouse Gas Reduction Fund: Affordable Housing and Sustainable Communities program

The auction proceeds from the State's Cap and Trade Program are appropriated in the Greenhouse Gas Reduction Fund. A minimum of 50% of the funds must be used for affordable housing.

A portion of these funds will be made available for bicycle-related projects on a competitive basis through the Strategic Growth Council's Affordable Housing and Sustainable Communities program (AHSC). Eligible projects will include those that result in a reduction of greenhouse gas emissions by increasing accessibility of housing, employment centers, and key destinations via low-carbon transportation options (walking, biking and transit), resulting in fewer vehicle miles traveled (commonly known as transit-oriented development). At least 50% of these funds will be targeted at disadvantaged communities. For updates on the program see <http://sgc.ca.gov/index.php>

6.3 Regional & Local Programs

6.3.1 OCTA Bicycle Corridor Improvement Projects (BCIP)

In 2012, the OCTA Board of Directors authorized 10% of Federal Congestion Mitigation and Air Quality (CMAQ) funds that are currently authorized under MAP-21 to be set aside for bicycle and pedestrian projects that are "ready to go" as determined through competitive calls for projects.

Eligible applicants include the 35 local government agencies in Orange County. Eligible agencies must be able to receive federal funding through OCTA or must be able to provide authorizing resolutions and cooperative agreements from their controlling bodies or through Caltrans as a direct recipient of Federal Highway Administration (FHWA) funds.

In the 2014 funding cycle, \$4.3 million dollars were allocated for bike and pedestrian projects with a minimum grant size of \$100,000 and a \$1 million maximum. However, projects that required more than \$1 million could be segmented into smaller phases and submitted as individual projects. Projects that were prioritized as part of a multi-jurisdictional active transportation planning effort (such as this district



5 Bikeways Strategy) received up to 10 additional points for coordination. A minimum local match of 12% was required for each grant application.

The 2016 BCIP plan is currently under review by OCTA staff with announcements regarding the plan by early 2016. For more information about the BCIP see <http://www.octa.net/BCIPcall.aspx>

6.3.1 Developer Impact Fees

Under California law, developers can be charged a one-time fee to offset impacts of their project. Traffic mitigation fees, infrastructure improvement fees, and fees for improving sewer and water systems to accommodate new development are common examples of development impact fees. "Exaction" is a broader term for impact fees, dedications of land, and in-lieu fees that are imposed to fund public improvements necessitated by the proposed development. School facility fees, park land dedication requirements, and road dedications and improvements are all examples of exactions.

In order for these impact fees to be imposed, the responsible agency must:

1. Identify the purpose to which the fee is put;
2. Demonstrate a reasonable relationship between the fee and purpose for which it is charged;
3. Identify all sources and amounts of funding anticipated to be used to finance the incomplete improvements; and
4. Designate the approximate dates on which the above funding is expected to be deposited into the appropriate account or fund.

For more on the Developer Impact Fee program see the California Natural Resources Agency website www.ceres.ca.gov/planning/financing/chap4.html

San Francisco has used this fee to fund transportation projects ranging from buses and street cars to bike facilities. As of 2012 the development fee had generated over \$100 million dollars to support transit-related projects. To find out more about the San Francisco program see <http://www.metroplanning.org/news/newsletters/173>

6.4 Private Programs

There are a variety of private sources that may be tapped for funding bike-related programs. Some of the more prominent sources are discussed below.

6.4.1 People For Bikes Grant Program

Formerly known as the Bikes Belong Program, PeopleforBikes (www.peopleforbikes.org) is a bike industry-sponsored non-profit that provides community grants as well as support for advocacy.



The PeopleforBikes Community Grant Program provides funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.

Since 1999, the program has awarded 272 grants to non-profit organizations and local governments in 49 states and the District of Columbia. Their investments total nearly \$2.5 million and have leveraged \$650 million in public and private funding. For more information on the grant program see www.peopleforbikes.org/pages/community-grants

People-for-Bikes also sponsors the Green Lane Project, which is aimed at helping cities build better bike lanes to create low-stress streets. The program focuses on protected bike lanes, which are on-street lanes separated from traffic by curbs, planters, parked cars, or posts.

The Green Lane Project hosts hands-on workshops and study tours for city leaders, provides technical and strategic assistance, and delivers targeted grants designed to get protected bike lanes on the ground.

For more information on the Green Lane Project including an excellent video on protected bike lanes see <http://www.peopleforbikes.org/green-lane-project>.

6.4.4 Kaiser Permanente Healthy Eating Active Living (HEAL) Program

For over 60 years Kaiser Permanente has offered grants to charitable and community based organizations.

According to the Kaiser Permanente website:

Our Community Health Initiatives take a prevention-driven approach to health, supporting policies and environmental changes that promote healthy eating and active living (often referred to as HEAL) in neighborhoods, schools and workplaces. Our work also addresses community economic development, environmental sustainability and neighborhood safety—key factors in promoting healthy communities. We work with community-based organizations and residents to translate their vision for healthy communities into visible, concrete changes—and ultimately healthier neighborhoods.

Cities such as Long Beach have used HEAL grants as part of their bike program neighborhood outreach and education effort. The Long Beach grants were obtained through their Public Health Department. For more on Kaiser Permanente grants see <http://share.kaiserpermanente.org/article/grants-overview>.

7.0 APPENDICES

A. Sample Letter of Support

The following is an example of a letter of support that would be prepared by an individual city and submitted as part of a grant funding application.

Date

Funding Agency

Address

City, State, Zip

Subject: Letter of Support for Funding Grant Application for (insert Project name)

To Whom it May Concern:

The City of (insert name) is submitting this letter in support of the funding grant application submitted by (insert lead agency) for the (insert project name). This proposed bikeway project represents an important piece of the regional bikeway network in south Orange County. We recognize the benefits that the project will provide not only to (insert city name), but all cities within this section of the county.

This proposed project was identified as a focus corridor as part of the District 5 Bikeways Collaborative, a joint effort involving our city, the project applicant, the Orange County Transportation Authority (OCTA), and other neighboring local agencies. Our city was an active participant in the District 5 Bikeways Collaborative. This collaborative effort focused on regional bikeway planning and the identification of bikeway projects and improvements that would provide benefits throughout Orange County's Supervisorial District 5. The collaborative was one of many projects undertaken by OCTA to improve regional bikeways planning throughout Orange County.

Improving bikeway facilities within District 5 is a key priority for our city. Bikeway facilities help to provide our residents and commuters with alternatives to automobile travel and provide safe and convenient bikeways to encourage people to travel by bicycle. We enthusiastically support the consideration of the (insert project name) for funding through this program.

Sincerely,

City Contact

Title



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B. Facilitation Efforts

Preparation of this report was a collaborative effort, with facilitation by OCTA of input from public stakeholders, agency staff, and elected officials. Preparation of the strategy included the following efforts.

Project Development Team (PDT) Summary

A project development team (PDT) was convened with planning and engineering representatives from each member agency within District 5, as well as OCTA, OCCOG, and project consultant team staff. The PDT met on multiple occasions to discuss project goals and objectives, opportunities and constraints, preliminary corridor alignments, and draft ranking criteria. Meetings were held at Laguna Hills Community Center (October 2013 & May 2014), Lake Forest City Hall (December 2013), San Juan Capistrano Council Chambers (April 2014), Laguna Beach City Hall (July 2014), and San Juan Capistrano Community Center (September 2014). Attendance at the PDT meetings ranged between 20-30 attendees. The PDT membership included the following representatives:

- City of Aliso Viejo – Shaun Pelletier
- City of Dana Point – Brad Fowler
- City of Irvine – David Law
- City of Laguna Beach – Scott Drapkin
- City of Laguna Hills – Ken Rosenfield, Humza Javed, and Katie Crockett
- City of Laguna Niguel – Edgar Abrenica
- City of Laguna Woods – Douglas C. Reilly
- City of Lake Forest – Carrie Tai
- City of Mission Viejo – Philip Nitollama and Greg Stones
- City of Rancho Santa Margarita – Anthony Viera and Nate Farnsworth
- City of San Clemente – Tom Frank
- City of San Juan Capistrano – Joe Mankawich and George Alvarez
- County of Orange – Khalid Bazmi, Joe Sarmiento, Sam Ahi, and Hany Ahmed
- Caltrans – Romeo Estrella and Marlon Regisford
- Transportation Corridor Agencies (TCA) – Valarie McFall
- OCTA – Charlie Larwood, Gary Hewitt, Carolyn Mamaradlo, Marlon Perry, Paul Martin, Nathan Wheadon



Focus Group Meetings

Focus group meetings were organized with PDT representatives to create smaller working groups consisting of groups of cities. During the focus group meetings, large-format boards were printed for brainstorming potential bikeway corridors. The printed materials included the identification of water and rail corridors, the transportation network, existing and proposed bikeways, major destinations, and other key features for consideration and collaborative brainstorming.

Focus group meeting #1 occurred on January 13, 2014 at the City of Mission Viejo with representatives from Mission Viejo, Lake Forest, Laguna Woods, Laguna Hills, Rancho Santa Margarita, County of Orange, and Caltrans. Focus group meeting #2 occurred on January 27, 2014 at the City of Dana Point with representatives from Dana Point, Laguna Beach, San Clemente, County of Orange, and Caltrans. Focus group meeting #3 occurred on January 30, 2014 at the City of Laguna Niguel with representatives from Laguna Niguel, Aliso Viejo, and County of Orange.

From the three focus group meetings, the “Potential Bikeway Corridors” inventory map was developed to identify potential corridors which agencies would like to develop in the future. From these potential corridors, the nine regional bikeway corridors were developed. Figure B-1 illustrates the potential bikeway corridors initially identified by the PDT members. While not all of these connections were ultimately designated on the recommended regional network, they may still be considered in localized planning and implementation efforts by the respective cities and County agencies.

These potential bikeway corridors can be identified and serve as local spur connections from the nine regional bikeway corridors and other bikeway facilities throughout District 5. These local spur connections will help build a larger bikeway network with additional connectivity to regional and local bikeway corridors as well as regional and local destinations and attractions.

C. Outreach

Media

Information regarding the District 5 regional bikeways was provided at www.octa.net/Share-the-Ride/Bike/Bikeways-Planning/Regional-Bikeways-Planning. The webpage includes a project overview, background, schedule, and a map illustrating the existing bikeways network in the project area along with the potential bikeway corridors in District 5. The webpage was updated regularly with project materials including meeting materials, meeting dates, and contact information. Additionally, outreach events schedules within the community were posted to the webpage to provide notification to the community. The project website includes a marketing contact from OCTA in the frame on the right with phone and email contact information provided.



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PDT IDENTIFIED POTENTIAL BIKEWAY CORRIDORS

OCTA District 5 Bikeways Collaborative



BIKEWAY CORRIDORS

- Potential Bikeway Corridors

LEGEND

- Transportation Center
- Rail
- Schools
- Colleges
- Parks / Open Space
- Waterbody
- City Boundary
- Supervisory District 5

Attachment: Memorandum to the Traffic Commission Concerning Bicycle Safety (3019 : Electric Bicycle, Bicycle, and Motorized Mobility Device

Questionnaires

Questionnaire #1

An initial online questionnaire was distributed to gather input that would be useful for developing the regional bikeway corridor alignments and in consideration of the types of connections to serve. The results of this questionnaire were provided to the PDT and considered in developing the draft corridors. There were a total of 167 respondents through the OCTA webpage. Below are the results of the questionnaire:

1. How often do you ride your bicycle?		
Answer Options	Response Percent	Response Count
4-7 days a week	41.3%	69
2-3 days a week	31.1%	52
Once a week	13.2%	22
Less than once a week	14.4%	24
<i>answered questions</i>		167
<i>skipped questions</i>		0

2. Why do you ride your bicycle (check one that applies most often)?		
Answer Options	Response Percent	Response Count
To go to work/school	31.7%	52
To go shopping/run errands; For entertainment; To socialize	12.8%	21
To exercise; For recreation	55.5%	91
Other (please specify)		16
<i>answered questions</i>		164
<i>skipped questions</i>		3

3. How far do you usually ride your bike?		
Answer Options	Response Percent	Response Count
0-3 miles	14.5%	24
4-6 miles	18.7%	31
7-9 miles	12.7%	21
10 miles or greater	54.2%	90
<i>answered questions</i>		166
<i>skipped questions</i>		1

4. Which of the following do you use to ride your bicycle (check all that apply)?

Answer Options	Response Percent	Response Count
Off street paths (e.g. sidewalks, trails, etc.)	80.2%	134
Residential streets or streets with a speed limit below 35 MPH	79.0%	132
Streets with a speed limit over 35 MPH and with a bike lane	70.7%	118
Streets with a speed limit over 35 MPH and no bike lane	46.1%	77
Other (please specify)		12
<i>answered questions</i>		167
<i>skipped questions</i>		0

5. What is the biggest challenge to bicycling in your neighborhood?

Answer Options	Response Percent	Response Count
Steep hills	14.5%	22
High-speed traffic	32.9%	50
Long distances	0.7%	1
Lack of bicycle facilities (e.g. bike lanes, bike parking, etc.)	52.0%	79
Other (please specify)		30
<i>answered questions</i>		152
<i>skipped questions</i>		15

6. Have you ever been in an accident on or with a bike?

Answer Options	Response Percent	Response Count
Yes	38.8%	64
No	61.2%	101
If yes, please describe (optional).		54
<i>answered questions</i>		165
<i>skipped questions</i>		2

If yes, please describe (optional).

Number	Response Text
1	Hit & run in Laguna Beach. The driver sideswiped me then took off.
2	I have had 3 minor collisions with cars while on my bike and had one major solo crash. All within the last 9 yrs.
3	I was run off the road by an automobile, separated shoulder
4	Another cyclist riding the wrong way hit me head-on.
5	Mechanical failure

If yes, please describe (optional).	
6	A block of wood fell off a truck. I was biking on the road and I couldn't get out of the way. So I fell on the street and I feared getting hit from the cars behind me.
7	It was my own fault. Did not involve a car.
8	Twice years ago between J Serra and Avery (minor scrapes). Too many close calls to count.
9	Hit by a car twice. Once was my fault the second time I was in a painted bicycle lane in downtown Anaheim and I was cut off by a car.
10	Never a car/bike collision, because I ride like a driver. And I have been spared the bad fortune of being in the trajectory of an impaired motorist.
11	Driver ran a stop sign on T intersection.
12	Almost. The SE corner of Campus and Culver is an accident waiting to happen. Cars turning east to Campus tend to go without stopping or looking.
13	Too many close calls and aggressive or unaware drivers who drive too close to a bicyclist or sound their horns as they pass.
14	Hit by a truck (vehicle failed to yield). Hit a pedestrian who jaywalked (she was cited). Skidded on oil while turning.
15	A driver made an illegal maneuver coming from a stop and hit me on the side, while I was crossing the intersection with a green light.
16	I've been run down 2 times both knee , operations , uninsured , hit and run
17	I have not been hit by a car, but have had plenty of close calls with cars driving into the Class II bike lane and almost hitting me.
18	I have been grazed, (not too serious), by a car, on two separate occasions.
19	Since I'm 60, and have been riding most of my life, I've been in several serious ones. Fortunately none were life threatening.
20	children on the bike path stopping abruptly.
21	With another rider, cutoff, cracked helmet in half. No hand signals used by the offending rider.
22	Many times it is people in some type of motorized vehicle who is driving much too fast or turning carelessly with little to no regard of a bicyclists right of way
23	Slipping on wet roads and falling on mountain trails.
24	About 30 years ago I hit a sidewalk adjacent, raised planter (OK, I used to ride on sidewalks as a kid) and broke my ankle.
25	sideswiped on Hamilton bridge, followed and driven into curb on w16th in Costa mesa
26	DO YOU MEAN BIKE CRASHES? (THEY ARE USUALLY AVOIDABLE AND ARE NOT ACCIDENTS.) DURING 70 YEARS OF BICYCLING: - SEVERAL WITH STATIONARY OBJECTS. - MAYBE 4 WITH OTHER CYCLISTS - NEVER WITH A MOTOR VEHICLE.

If yes, please describe (optional).	
27	I rear-ended a truck that cut me off.
28	Hit by a car who turned in front of me without notification. No bike lane.
29	slipped on wet surface, fell, bruised hand
30	Hit by a car in South Carolina. Other crashes by myself or in races.
31	Car turning right did not look right and hit me and took off
32	Ran off the road by a car on Jamboree Blvd.
33	Motorist made a sudden right turn in front of me on Crown Valley Parkway and I collided with the vehicle.
34	I slipped on wet pavement and had skin abrasions in 2004
35	Car swerved into bike lane on Lambert Road in North Orange County and struck me. The car kept driving without stopping.
36	Car wanted to make a right hand turn and parked me into the curb. Car made an oncoming left hand turn trying to out run me in the intersection.
37	I have been hit by a truck, and thrown over the handlebars of my bicycle, among other accidents. I ALWAYS wear a helmet!
38	Was wearing a high visibility 3m scotchlite sweater and was hit by a car turning. He never even looked in my direction when pulling into the street. Pulled out right in front of me.
39	about 14 years ago, someone turning right against a red light as I was in the crosswalk, struck me, destroying my bike. Luckily, I rolled over the hood and landed on my feet. Driver took me to emergency care then to Jax Bicycle Center to buy me a new bike.
40	I have been twice struck by cars that were turning into shopping centers. In one of these hit-and-run accidents, I was thrown onto my knee, which resulted in hemorrhagic bursitis ligament strain, and a chondral fracture of the patella. As a result, I now have arthritis in that knee and underwent arthroscopic debridement 2 1/2 weeks ago. My life has been forever altered by a vehicle that came up from behind and suddenly cut across my path without warning.
41	on sidewalk, something jammed in my spokes
42	Many years ago (and not in California) I was riding in a designated bike lane when a car in the oncoming lanes turned left in front of me. I collided with the passenger-side of the car, went over the hood, and was saved from significant trauma by my helmet.
43	stopped too fast and fell off, trying to avoid turning vehicle in the right lane where I was going straight (thankfully, didn't collide with another vehicle or bike)
44	Hit from the rear while making a left hand turn on my bike.
45	Several. Only one involving a driver, in Corona Del Mar on PCH. Inattentive driver turned right suddenly in front of me and another biker after having just passed us seconds before.
46	Another cyclist hit me. Also a car almost hit me in the bike lane.

If yes, please describe (optional).	
47	the car driver was not looking and backed out of there drive way and hit me
48	I fell from my bike while transitioning from the street (bike lane) to an off street bike trail. The road surface, gutter, and curb created a situation in which caused my front tire to track in the gutter and not to the path smoothly causing me to lose control and fall.
49	I was hit by a car in an intersection and bumped into a car in a crosswalk. I almost get hit by a car every time I ride my bike!
50	was riding on sidewalk and car cut in front of me
51	I was riding in a fairly low-speed limit medium density residential area with shops and a car coming from a 25 mph residential area ran through a stop sign speeding. In order to avoid the car, which I judged was going over 30 mph, I knew I had to fall into the street and off my bike. So I got off my bike and hit the road and my bike rolled on top of me, but I avoided the car. I wasn't wearing a helmet. I managed to get by with a few scrapes and a bruised elbow. Since then, I am overly cautious and will bike slower and stop more frequently to avoid dangerous cars.
52	Hit by a car as it was turning on to PCH in Laguna Beach.
53	Fell off braking for a bunny crossing the path :-)
54	Taking a corner too quickly, touching wheels, and hit a street reflector

Other Comments	
Number	Response Text
1	I am interested in the Citizens Advisory Committee
2	Off street bike paths are needed desperately.
3	More dedicated trails for bikes and safe connections to Metrolink and more bus runs for bike racks
4	Why can't we place K rails on bike routes that parallel major roads
5	Vehicle speed limits are too high on most streets making for a dangerous combination when bicycles are put into the mix. There should be more traffic control police to slow things down!
6	We need more bike paths/lanes along the major streets. Sidewalks are cluttered with electrical boxes, street light boxes, power poles, etc.; sidewalks don't allow enough space for bike traffic.
7	great information and survey
8	I've heard talk of a bike/ pedestrian bridge being added to the west side of the existing train bridge over San Juan Creek behind SJC City Hall. The "Trail" on the east side of San Juan Creek from Doheny currently dead ends at the San Juan Creek/ Trabuco Creek terminus. Most people who ride that trail just carry their bikes over the train tracks (it's illegal, but MUCH safer than riding northbound Camino Capistrano into San Juan from the beach). If the trail was extended over San Juan Creek by a bridge it would alleviate the need to travel northbound on Camino Capistrano altogether. Thanks for your time.
9	Please keep working hard to improve cycling in north Orange County. Your hard work isn't going unnoticed.
10	Thanks for the great work. Orange County Cycle Paths could always be better and the obvious gaps and disconnects are frustrating ... but despite that they are a great amenity, and we should be grateful for what you do! Thank You
11	Creating safe and well-lit bike lanes to major centers such as CSUF, Fullerton College, Fullerton Transportation Center, Brea Mall, Honda Center, Angel Stadium etc., will encourage bicycle usage and relieve congestion and pollution and allow persons to consider this viable year-round option for commuting and travel. I am grateful for what has been done so far and would encourage more active work in this undertaking. Please make it safe and convenient for us to ride our bikes.

Other Comments	
Number	Response Text
12	Cycling for recreation or commuting is safe and FUN in Orange County! Spread the word about Safe Cycling by encouraging people to take the TS101 classes. Slow down and enjoy the ride!!!
13	Please install more Class I bikeways!!!
14	Thank you for supporting transportation by bicycle!
15	It's important to build bikeways now. My friends are dying on the road. Drivers don't like bike riders. We need a circular bike only path that actually circles Orange County and allows riders to enter the path and be safe from cars. We should work to do this now. We need to use the old railroad tracks.
16	Please start including bicycle facilities on all transportation projects. This is a zero emission transportation mode and needs to get priority funding.
17	We need more areas specifically for cyclists that are off road and safe, painted lines in the street do nothing to impede motorists from running over or into cyclists as most motorists do not even regard the bike lane as its own part of road.
18	Preserve and improve trail along east side of San Juan Creek from Camino Cap to Doheny Beach.
19	I would use my bicycle much more often for shopping if there were ways to get to even a few destinations, like Irvine spectrum, without competing with car traffic, especially at night.
20	Please consider a bikeway connection on Irvine Blvd between Tustin Ranch Road and Newport Blvd. Thank you!
21	I need A TUNE UP WITH NEW TIRES & TUBES.
22	By far the biggest hazard is highway overpasses with no bike path. Getting across highways safely on a bike is very difficult, and there are many of them in OC.
23	Santa Ana is one of the most unfriendliest bike cities I've ever known!
24	We need to get the word out to the community that riding is safe and fun. The best way to do that is have a ciclavia event in orange county. Close the streets somewhere on a Sunday and have a festival type event like in LA. How about downtown Santa Ana? Families, food trucks, music, art, bikes, corporate sponsors, etc. I am willing to help, but don't know who to contact or how to get started! Eric
25	Great Job OCTA!!!!
26	Need to study Amsterdam as that MAJOR EU city has more bikes than cars. And car traffic mixed with bike traffic.
27	none of this survey seems to be about South County, which is the worst place for bike riding at present. Few trails and almost none link to one another.
28	Please install a class 1 bike lane on the unused Pacific Electric Right of Way, which cuts through OC and bisects Garden Grove.
29	I drive and I ride. I share the road.
30	Give buses the capacity for more than two bicycles.
31	Consider reaching out to OC bike clubs to get more bike rider input.
32	I would ride to work if there was a safe trail or bike lane.
33	As long as people on bikes run stop signs & red lights; ride against traffic in the street; unpredictably ride on and off of the sidewalks... motorists are going to continue to disrespect and dislike us. Better public education and enforcement of the vehicle code for both bikes and cars is much needed.
34	Bikes and high speed cars just don't mix well. More truly dedicated bike trails, like the River Trail would be great.
35	There needs to be designated parking areas for landscapers and maintenance vehicles that do not impede bike traffic using designated bike lanes or paths. A turnout area for maintenance purposes needs to be created in greenbelt (similar to bus stops) that provides for the safety of the bicyclist and the maintenance crews working in the street.
36	I would like to help bring attention to drivers of bicyclists rights to share the road and navigate intersections with our safety as a number one priority. Secondly I could useful in helping develop bike trails and lanes to encourage pedestrian and bicycle routes for pedestrians also.
37	Like the fact that you are doing surveys to making biking safer.... too many cyclists are being killed.

Other Comments	
Number	Response Text
38	Long somewhat flat trails away from traffic are the best. A neurologist I know made me promise him that he would never, ever find me riding in traffic. I think the biggest problem riding in bike lanes is that cyclists tend to think that all the traffic is watching out for them. Not so true.
39	I live in Westminster and just to get out of the city is a huge hassle, McFadden and bolsa are TERRIBLE for bikes
40	We need more bike lanes in South Orange County, especially Mission Viejo, Laguna Niguel and Aliso Viejo. Thanks!
41	The City Council of Aliso Viejo is doing a lot to make Aliso Viejo very bike friendly, but Pacific Park, from the 73 to Wood Canyon Drive is not safe for bicyclists, in my opinion. The speed limit is 50, but most of the time there is little traffic and some drivers thunder through at 60 and even 70 mph. Furthermore, this stretch of Pacific Park is now a 4 lane street, but, in my opinion, it can be reduced to a 2 lane street; the bike lanes can be expanded and separated from traffic with a row of trees or shrubbery. With the beautiful views, this area can become great for bicyclists. For example, people can ride their bikes from their homes to the shopping mall on Aliso Creek, to the Aliso Viejo library, and to the different park areas.
42	Orange County's level of bike (un-?)safety is so severe I am too afraid to use city streets. It's just not worth it and there is such a large system of trails I don't really see the point. But this seriously limits the metropolitan area's ability to encourage alternative uses for transportation.
43	I don't live in the 5th District. It is the place to ride, when will you have a survey for the other districts? I want to ride my work from Tustin to Santa Ana. It's far too dangerous even though it's a straight shot via streets. Help!
44	Wahoo!

Questionnaire #2

A second questionnaire that asked respondents to identify corridors they would be most likely to utilize was distributed online, during outreach events, and at the second Roundtable event. The survey included a graphic showing the preliminary regional bikeway corridors for the respondents to select the top three regional corridors they would like to see studied further. A sticker survey was conducted during the Roundtable #1 meeting for the participants to select the top three corridors they would like to see studied further. The table below shows the results of the online and sticker survey.

Corridor	Online Questionnaire	Roundtable #1 Sticker Survey	Total Survey Score
PCH Corridor	82	14	96
Laguna Canyon Corridor	59	3	62
Aliso Creek Corridor	54	4	58
Muirlands/Cabot Corridor	35	12	47
Antonio/La Pata Corridor	18	5	23
San Juan Creek Corridor	18	4	22
El Toro/Alicia Corridor	20	1	21
Portola/Santa Margarita Corridor	17	2	19
Oso Parkway Corridor	9	4	13

Bikeways Roundtables

Two roundtables provided the opportunity for public input on the project. The first roundtable provided project information and a presentation was made on the potential corridors and the proposed ranking criteria. Public input was requested and a group discussion was facilitated. Large-format boards were provided describing each of the draft corridors. The second roundtable included a presentation focused on key changes since the first roundtable and the ranking of the nine regional bikeway corridors. Attendees included public stakeholders from bicycle advocacy groups as well as elected officials and community residents. Attendees at the roundtables were provided various opportunities to provide feedback including participating in the group discussion, provide comments on the boards directly, and through comment sheets.

Bikeways Roundtable 1: Laguna Hills Community Center

The first bikeways roundtable was conducted in Laguna Hills on Wednesday, May 28, 2014, at the Community Center to provide detailed information to members of the public and solicit input on the draft corridors and ranking criteria. Approximately 30 people attended. A presentation was given, discussing the regional context and background, with an overview of each draft corridor. Large-format boards were also provided to illustrate the alignments and characteristics of each draft corridor. The ranking criteria were summarized in the PowerPoint presentation. Input from stakeholders and the public helped refine and prioritize the corridors as well as identify non-engineering ideas for improving bicycling within District 5. Roundtable materials were provided at the workshop and on the OCTA website, which included the presentation given in PDF format, a project factsheet, the Draft Regional Bikeways Corridors Map, and the draft evaluation criteria.

Bikeways Roundtable 2: San Juan Capistrano Community Center

The second bikeways roundtable was conducted in San Juan Capistrano on Wednesday, September 17, 2014, at the Community Center to provide a quick summary of the refined corridors and ranking analysis and to discuss the next steps for the feasibility studies. Large-format boards were provided to illustrate the proposed bikeway corridors and the top three ranked corridors. A presentation was given, discussing the proposed corridors with changes identified as a result of the first bikeways roundtable. Roundtable materials were provided at the roundtable and on the OCTA website, which included the presentation given in PDF format, the Regional Bikeways Corridors Map, and the corridor ranking results.

D. Corridor Ranking Criteria

Corridor Ranking Criteria Definitions and Scoring

Since raw measures are in different units, they have been normalized to provide a “weighted score” in order to combine scores across the different scales. For example, the number of collisions per mile for a given corridor is transformed into a normalized score between 0 and 100 using the formula given below. To maintain consistency (100 is best), the maximum and minimum terms have been reversed if the scoring is done on a measure where lower values are more desirable.

$$\text{Normalized Value} = 100 \times \frac{\text{Actual value}}{\text{Maximum value in range}}$$

Below is a discussion of the criteria and weighting utilized in the ranking analysis.

I. Level of Traffic Stress (LTS): addresses perceived safety related to traffic volume, traffic speed and existing bikeway type. The foundation for the traffic stress analysis is based on The Mineta Transportation Institutes’ Low-Stress Bicycle and Network Connectivity model. High-stress routes are prioritized for treatment. Weight: 1.0

- Stress increases with the number of traffic lanes, traffic speed, and lack of existing bikeway facilities. LTS scores can range from 1 (low stress) to 4 (high stress).

STRESS CATEGORY	STRESS INDICATOR
LTS 1	Suitable for almost all cyclists, including children trained to safely cross intersections.
LTS 2	Suitable to most adult cyclists but demanding more attention than might be expected from children.
LTS 3	Suitable to many adults currently riding bikes in American cities.
LTS 4	Suitable to very few people, the “strong & fearless” cyclists who will ride in nearly any setting.

- The criteria for level of traffic stress (LTS) used on the District 5 Regional Bikeway Corridors were the following:

FACTORS	LTS 1		LTS 2		LTS 3			LTS 4			
Bike Facility	Class I	Class II	Class II	None or Class III	None or Class III	None or Class III	Class II	None or Class III	None or Class III	None or Class III	Class II
Number of Lanes	No effect	2	No effect	2-3	2-3	4-5	4 or more	2-3	4-5	6 or more	No effect
Speed (mph)	No effect	Up to 25	30	Up to 25	30	Up to 25	35	35 or more	30 or more	No effect	40 or more

(No effect) = Factor does not trigger an increase on this level of traffic stress.

- The LTS analysis scoring calculations of each corridor were derived by first identifying the LTS score of each street segment within a corridor. The distance of all street segments with the same LTS score (1-4) within a corridor were calculated in miles.
 - The magnitude of each LTS score (1-4) was calculated using the total distance of each LTS among the corridor (in miles), as shown in the formula below:
 - $(\text{LTS Score}) \times (\text{Total Distance of LTS Among Corridor (miles)})$
 - The raw score for each corridor was calculated by adding the magnitude of each LTS score category and dividing that by the length of the corridor (in miles) as show in the formula below:
 - $(\text{Magnitude of all LTS score categories}) / (\text{Length of Corridor (miles)})$

2. Reported Collisions: addresses safety through five years of reported data, normalized by crashes per mile. Unlike automobile crashes, the lower volume of bike crashes and lack of robust, long term exposure data (i.e. number of bicyclists using each corridor) means that this dataset is less statistically sound than others. However, it is still commonly reported and easily understood. Weight: 1.0

Crash data were obtained from the California State Wide Integrated Traffic Records System (SWITRS), which provides a statewide compilation of all vehicle, pedestrian and bicycle related crashes on public streets and highways.

- For each corridor, a 100-foot buffer was defined. All reported collisions for the five year period (2007-2011) were counted. The total reported collisions were divided by corridor length in miles. Corridors with higher collisions per mile are prioritized for treatment.

3. Economic Efficiency: measures the financial benefits associated with the corridor, normalized by the number of anticipated users, and divided by planning level construction cost estimates. Weight: 0.75

- Using National Cooperative Highway Research Program (NCHRP) Report 552 methods, ¼, ½, and 1 mile buffers are drawn around each corridor to obtain population and journey-to-work mode share data. The bike commute share rate is factored up to estimate the rate of all existing adult bicyclists (both commute and non-commute). This rate is applied to the population around the corridor to provide an estimated number of existing bicyclists. To estimate the number of new bicyclists induced by new bikeways, a multiplier is applied to the number of existing bicyclists. Based on these ridership levels, the cumulative financial value for annual mobility, health, recreation, and reduced auto use benefits is calculated.
- The assumptions in the NCHRP method are modified to more conservative values (for example, rather than assuming that a new corridor facility would result in usage by new riders 365 days per year, usage was estimated for only 12 days per year). Also, all benefit figures are calculated using the original dollar values rather than updated to 2015 values. These simplifications and conservative assumptions are considered appropriate given the high-level comparative nature of the assessment. The economic evaluation assumes a 30-year analysis period, 0.57% annual population growth rate and a 5% discount rate. The net present value (NPV) of benefits is divided by cost.
- The calculation methodology is comprised of the following categories of data and calculations to determine the benefit-cost ratio (BCR).
 - **American Community Survey (ACS) Data** – contains data used to determine the following information based on the ACS data and the NCHRP Report 552 methodology.
 - Total Population
 - Adult Population
 - Workers 16+
 - Bike Commuters (Bicycle Only)
 - Bicycle Mode Share (mean percentage within buffer)
 - Adult Population (not cumulative)
 - Commuters (Workers 16+)
 - **Calculated Rates** – contains the adult bicycling rates calculated using the ACS bicycle commute mode share (C) and the formula below provided in the NCHRP Report 552 methodology.

$$T_{\text{moderate}} = 0.4 + 1.2C$$

7.0 APPENDICES

The table below summarizes the Benefit-Cost Analysis for the nine study corridors.

	Calculated Rates	EXISTING		NEW		Annual Mobility Benefits	Annual Health Benefits	Annual recreation Benefits	Annual Reduced Auto Use	Annual Combined Benefits	Project Life Combined Benefits (30 yrs)	Cost	Benefit-Cost Ratio
		Bike Commuters	Adult Bicyclists	Bike commuters	Adult Bicyclists	Bike commuters existing + new	New adults	New adults - new bike commuters	New bike commuters			Maintenance not included	
Corridor													
Aliso Creek Trail		578	1879	769	2044	\$1,964,491	\$261,586	\$152,990	\$109,369	\$2,488,436	\$37,757,162	\$9,107,852	4.5
Quarter-Mile	1.9%	266	611	514	1,179								
Half-Mile	1.7%	184	515	205	571								
One Mile	1.3%	127	754	50	294								
Antonio/La Pata/Pico		131	528	139	527	\$318,057	\$67,416	\$46,518	\$19,781	\$451,773	\$6,153,177	\$12,284,675	0.6
Quarter-Mile	0.8%	43	146	83	282								
Half-Mile	0.8%	30	133	34	148								
One Mile	0.7%	58	248	22	97								
Laguna Cyn Rd/El Toro/ Alicia		460	1194	356	1065	\$948,965	\$133,868	\$83,219	\$50,130	\$1,216,183	\$17,983,490	\$11,170,302	1.8
Quarter-Mile	1.0%	64	253	124	488								
Half-Mile	1.2%	109	291	121	323								
One Mile	1.4%	287	650	112	254								
Laguna Canyon		50	160	45	134	\$109,251	\$17,197	\$10,775	\$6,339	\$143,562	\$2,060,800	\$13,271,851	0.2
Quarter-Mile	0.9%	11	29	21	56								
Half-Mile	0.9%	12	38	13	42								
One Mile	0.9%	27	93	11	36								
Muirlands/Cabot/Camino Capistrano		865	2604	1055	2785	\$2,460,708	\$356,483	\$207,626	\$150,070	\$3,174,886	\$48,703,636	\$8,182,863	6.4
Quarter-Mile	3.0%	352	821	680	1,584								
Half-Mile	2.6%	243	702	269	779								
One Mile	2.0%	270	1,082	105	422								
Oso Parkway		118	446	104	385	\$268,429	\$49,330	\$33,728	\$14,841	\$366,329	\$5,062,515	\$6,148,519	1.0
Quarter-Mile	0.8%	25	89	47	172								
Half-Mile	0.8%	29	104	32	115								
One Mile	0.7%	65	253	25	99								
Pacific Coast Highway		216	631	226	693	\$528,474	\$88,729	\$56,004	\$32,224	\$705,432	\$10,110,333	\$5,345,509	2.2
Quarter-Mile	0.9%	63	206	122	397								
Half-Mile	1.0%	62	181	69	201								
One Mile	1.0%	91	244	35	95								
Portola Santa Margarita		76	316	84	318	\$189,685	\$40,721	\$28,080	\$11,970	\$270,456	\$3,669,629	\$7,239,154	0.6
Quarter-Mile	0.8%	25	86	48	165								
Half-Mile	0.8%	22	87	25	97								
One Mile	0.7%	29	143	11	56								
San Juan Creek Trail		323	898	407	975	\$1,087,270	\$124,793	\$68,127	\$57,936	\$1,338,125	\$20,878,928	\$4,183,833	5.2
Quarter-Mile	3.8%	135	288	260	555								
Half-Mile	3.5%	102	252	114	280								
One Mile	2.7%	86	358	34	140								
TOTAL		2814	8637	3182	8907	\$7,875,330	\$1,140,123	\$687,067	\$452,660	\$10,155,182	\$152,379,670	\$76,934,558	2.2

Note: Calculations above are based on the methodology described in the National Cooperative Highway Research Program Report 552

- o **Existing Adult Bicyclists** – applies the calculated adult bicycling rates to the adult population to estimate the number of existing adult bicyclists.
- o **New Adult Bicyclists** – applies multipliers for each buffer (1/4, 1/2, and 1-mile), provided in the NCHRP Report 552, to the calculated existing adult bicyclists values to calculate the number of new bicyclists.
- o **Annual Mobility Benefits** – assumes monetary value for time people are willing to add to trips in order to use designated biking facilities (\$4.08 for Class I and \$3.60 for Class II). Annual commuter trips are calculated based on the number of existing and new bicyclists multiplied by 364.8 commute trips per year. This is more conservative (48wks/4days/1.9trips) than what is recommended in the NCHRP Report 552 (50x5x2). Then, the percentage of Class I vs. II trips are determined based on the percentage of existing conditions along the corridor.
- o **Annual Health Benefits** – uses the annual per-capita cost savings from physical activity of \$128 to calculate the annual health benefits of new adult bicyclists.
- o **Annual Recreation Benefits** – uses the calculated new adult bicyclists, the calculated new bike commuters, the days per year of bike recreational use, and the “typical” day which is valued at \$10, to calculate the Annual Recreation Benefit.
- o **Annual Reduced Auto Use** – uses the calculated new bike commuters, the savings per mile, each way trip distance value, and the calculated commute trips per year to calculate the annual reduced auto use benefit for new bike commuters. Savings per mile and each-way-trip distance values were provided in the NCHRP Report 552 methodology.
- o **Combined Benefits** – is the sum of annual mobility, health, recreation, and reduced auto use benefits.
- o **NPV Combined Benefits** – uses a 30 year analysis period, an annual population growth rate of 0.57%, and a discount rate of 5% (values provided in the NCHRP Report 552 methodology) to calculate the NPV combined benefits.
- o **Cost** – is the value calculated from the planning-level construction cost estimates calculated for each corridor, which do not include right-of-way, utility impacts, and maintenance costs.
- o **Benefit Cost Ratio (BCR)** – uses the NPV combined benefits and the construction cost estimates to calculate the BCR.

4. Trip Demand: Based on the Bicycle Priority Index (BPI), a measure of population and employment density, land use, local schools, and transit that influences usage. Weight: 0.75

- OCTA Bicycle Priority Index GIS output: score per acre. Higher numbers represent a higher estimated potential demand and therefore a higher priority for treatment. The BPI calculations use the origins and destination calculated values within a 1/4 mile buffer for each corridor.
- The following data are used in the BPI calculations:

ORIGINS

FACTOR	MAX VALUE
Population Density (Base)	10
Population Growth (2035)	8
Population Density less than 18 years old (US CENSUS ACS)	8
Land-Use Mix	8
Bicycle to Work (US CENSUS ACS)	8
Bicycle Network Proximity (Existing)	8

DESTINATIONS

FACTOR	MAX VALUE
Employment Density (Base)	8
Employment Growth (2035)	8
Universities/Colleges (Enrollment)	8
Metrolink Rail Stations (AM Alightings)	8
Schools (Elementary, Middle, High School)	8
Parks, Local Retail/Public Services	4
Bus Stops (PM Trips)	6

- The BPI is determined using the following formula for each corridor:
 - o $(\text{Sum of Origin Values} + \text{Sum of Destination Values}) / (\text{Quarter-Mile Service Area (in acres)})$

5. Public Support: incorporates public priorities through a Public Demand Index. The public input was acquired through Roundtable #1 and online surveys. Combination of online survey questions regarding the selection of the top three desired corridors and the roundtable “sticker survey” votes. Weight: 0.5

6. Physical Constraints: A subjective assessment of freeway crossings, on-street parking impacts, channel crossings, railroad crossings, slope, the number of unsignalized street crossings, the need for roadway infrastructure/bridge or bridge crossings, and the need for roadway widening. Fewer constraints result in a higher score, as the corridor will be easier to implement. Weight: 0.5

- The scoring of each individual category was weighted differently by how significant the constraint would be. A total raw score and weighted score was then determined based on the sum of all individual category scores.
 - **Freeway Crossings** – measured by the number of freeway crossings that occur along the entire corridor.
 - **On-street Parking** – measured by the length (miles) of on-street parking along the entire corridor divided by the corridor length (miles).
 - **Channel Crossings** – measured by the number of channel crossings that occur along the entire corridor divided by the corridor length (miles).
 - **Railroad Crossings** – measured by the number of railroad crossings that occur along the entire corridor.
 - **Slope** – measured by the length (miles) of a roadway or bikeway facility having a slope of greater than 5% divided by the corridor length (miles).
 - **Unsignalized Street Crossings** – measured by the number of unsignalized crossings along the entire corridor divided by the corridor length (miles).
 - **Need for Roadway Infrastructure/Bridge or Bridge Crossings** – measured by the number of locations where roadway infrastructure or a new bicycle/pedestrian bridge or improved bridge crossings were needed throughout the corridor.
 - **Need for Roadway Widening (for proposed facilities)** – measured by the length (miles) of roadway widening needed for proposed facilities divided by the corridor length (miles).
 - **Existing vs. Proposed Bikeways** – measured by the ratio of existing versus proposed bikeway facilities of the entire corridor.
- 7. **Completes the Network:** This is measured by the number of intersections with other existing and proposed bikeways. Although partly captured in the BPI method, the number of links/crossings with existing or proposed bikeways (from CBSP and this project) is recalculated here as the BPI does not include the proposed corridors. Connections to Class 3 bikeways were not considered. Note that this is largely a function of length; therefore the number of connections has been divided by miles. Weight: 0.25
- 8. **Completes the Corridor:** the portion of the corridor that is already built to at least minimum Caltrans standards for the bikeway type that is proposed. A high ratio (near 100%) means that the corridor has no existing bikeways to build on. This helps to prioritize corridors which are already partially built. This factor is also part of the LTS Index. Weight: 0.25.

E. Corridor Cost Estimates – Detailed Summary

Cost estimates were prepared for each corridor to determine planning-level estimates and were used in the economic efficiency criteria. The costs utilized in the ranking analysis include new bicycle/pedestrian bridges, freeway interchange improvements, and construction costs, but do not include environmental clearance, design, utility impacts, right-of-way, or maintenance costs. The table below summarizes the planning-level cost estimates for each corridor.

The basis for the cost estimates are shown in the following table.

Item	Unit	Rate	Comment
Upgrade Existing Facility	Linear Foot	\$0.30	Signs and other upgrades
Upgrade Class II to Separate Bikeway	Linear Foot	\$100	Based on Long Beach Costs for upgrading to a Class I separated bikeway. Applied to corridors with high volumes.
New Class I Facility	Linear Foot	\$150	Installation of new Class I Facility where no existing path exists. 10' path construction, striping, and amenities
New Class 2 Facility	Linear Foot	\$11	Based on signing and striping of Class II facility where no existing facility exists.
New Class 2 Facility w/ Widening	Linear Foot	\$300	Based on signing and striping, curb/sidewalk removals, new sidewalks and pavement for 4' widening in each direction where no existing facility exists.
New Class 3 Facility	Linear Foot	\$2.50	Based on striping, bike pavements symbols, and wayfinding signs approximately every 800 ft
Intersection Signs	Each	\$780	Bike Sign and Directional Arrow/Route Label
Major Intersection	Each	\$50,000	Assumed Average Cost of Intersection Treatment
Grading/Retraining Wall	Linear Foot	\$500	Assumes Grading and Approx. 6-8ft Retaining Wall in areas where Class I is being proposed in areas of steep existing grades.
Bridge Crossing	Square Foot	\$80	Assuming 80 per SF for Bridge with a 12' Wide Bridge
New Bridge	Square Foot	\$100	Assuming 100 per SF for construction of new Bridge
Roundabout	Each	\$200,000	Based on Long Beach
Fwy Interchange Treatment	Each	\$2,000,000	Rough cost for proposed treatment at interchange, which may involve ped/bike crossing signals at ramps, street and or bridge widening, etc.

The table below shows the cost breakdown for each of the nine corridors.

Corridor	Facility Improvements	Mileage	Cost
A: Pacific Coast Highway (PCH)	Class I (new/grading/retaining wall)	5.6	\$6,967,000
	Class II (upgrade/new)	9.7	\$1,901,190
	Class III (upgrade/new)	6.5	\$19,696
	Intersection Signing		\$12,480
	Major Intersection Improvements		\$400,000
	Bridge Crossing		\$590,400
	30% Contingency		\$2,967,230
	Total	21.8	\$12,857,996
B: Laguna Canyon	Class II (upgrade/widen)	7.8	\$7,163,631
	Class III (upgrade)	1.0	\$1,586
	Intersection Signing		\$3,900
	30% Contingency		\$2,150,735
	Total	8.8	\$9,319,852
C: El Toro/Alicia/Laguna Canyon	Class I (upgrade)	0.5	\$840
	Class II (upgrade/new/widen)	13.0	\$8,175,112
	Class III (upgrade)	1.9	\$3,051
	Intersection Signing		\$11,700
	Major Intersection Improvements		\$250,000
	Freeway Interchange Improvements		\$2,000,000
	30% Contingency		\$3,132,211
	Total	15.4	\$13,572,914
D: Portola/Santa Margarita	Class I (new/grading/retaining wall)	0.6	2,080,000
	Class II (upgrade)	6.5	3,430,000
	Intersection Signing		8,580
	Major Intersection Improvements		50,000
	30% Contingency		1,670,574
	Total	7.1	7,239,154
E: Aliso Creek	Class I (upgrade/new/grading/retaining wall)	19.8	\$6,986,420
	Class II (upgrade)	2.0	\$3,240
	Intersection Signing		\$16,380
	30% Contingency		\$2,101,812
	Total	21.8	\$9,107,852
F: Muirlands/Cabot/Camino Capistrano	Class I (upgrade/new)	7.0	\$2,061,990
	Class II (upgrade/new)	8.0	\$3,525,800
	Class III (upgrade/new)	3.6	\$28,960
	Intersection Signing		\$9,360
	Major Intersection Improvements		\$150,000
	Bridge Crossing		\$518,400
	30% Contingency		\$1,888,353
	Total	18.6	\$8,182,863

Corridor	Facility Improvements	Mileage	Cost
G: Oso Parkway	Class I (upgrade)	1.6	\$2,610
	Class II (upgrade)	8.8	\$4,670,000
	Intersection Signing		\$7,020
	Major Intersection Improvements		\$50,000
	30% Contingency		\$1,418,889
	Total	10.5	\$6,148,519
H: Antonio/La Pata/Pico	Class I (upgrade/new)	1.2	\$181,530
	Class II (upgrade/new)	14.7	\$6,985,700
	Class III (new)	1.9	\$25,500
	Intersection Signing		\$7,020
	Major Intersection Improvements		\$250,000
	Freeway Interchange Improvements		\$2,000,000
	30% Contingency		\$2,834,925
	Total	17.8	\$12,284,675
I: San Juan Creek	Class I (upgrade/new)	8.5	\$2,162,093
	Intersection Signing		\$6,240
	Major Intersection Improvements		\$50,000
	Bicycle/Pedestrian Bridge		\$1,000,000
	30% Contingency		\$965,500
	Total	8.5	\$4,183,833

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Attachment 2



CITY OF LAGUNA HILLS

APPENDIX TO BIKEWAYS, TRAILS & OPEN SPACE MASTER PLAN



PREPARED BY:



The Dangermond Group
Creative Project Planning & Design

NOVEMBER 10, 2001

Large Format Maps and Exhibits

Open Space

- Open Space Map
- Open Space Matrix

Bikeways

- Existing Bikeways Map
- Bikeway Opportunities and Constraints Matrix
- Bikeways Opportunities and Constraints Map

Trails

- Nellie Gail Trail System
- Existing Trails Map
- Trails Opportunities and Constraints Matrix
- Trails Opportunities and Constraints Map

Bikeway and Trails Alternatives

- Proposed Trails Map
- Proposed Bikeways Map
- Proposed Bikeway, Trails and Plazas Map
- Bikeways and Trails Existing and Proposed Map

Conceptual Plans

- Edison Easement/La Paz Road Conceptual Alignment
- Edison Easement with Alicia Pkwy Overpass
- Lakes Area Trail Conceptual Alignment

Trail Plazas

- Information Signage Example
- Trailhead Plaza
- Proposed Plazas and Parking Map

Bikeway and Trail Sections

- Multi-use Corridor with Flat Condition
- Multi-use Corridor with Slope Condition

Existing Habitat Maps

- Alicia Parkway Revegetation
- Veeh Ranch Park
- Aliso Creek
- Cabot Road Open Space
- Edison Easement
- La Paz Road/Gallup Circle
- Oso Parkway East
- Oso Parkway West

Improvements by Priority

Priority 1 – Proposed Improvements

Priority 2 – Proposed Improvements

Priority 3 – Proposed Improvements

Legend

City of Laguna Hills

EXISTING OPEN SPACE

August 15, 2000

PARKS - FEE INTERESTS

- 1—CLARINGTON PARK (PL57J-101) LOT 2 TR. 9881
2—BECKENHAM PARK (PL64A-101) LOT 2 TR. 7864
3—STOKPORT PARK (PL64B-101) LOT 60 TR. 8103
4—MENDOCINO PARK (PL64E-101) LOT 206 TR. 9044
5—ALISO HILLS (PL64F-101) LOT 207 TR. 9044
6—UNNAMED PARK (PL64V-101) LOT 22 TR. 11235
7—COSTEAU PARK (PL65A-101) LOT 71 TR. 7186
(PL65A-102) BK. 9993/245 D.R.
8—MACKENZIE PARK (PL65B-101.01) LOT 118 TR. 7080
(PL65B-102) BOOK 11476/135 D.R.
(PL65B-103) BOOK 11887/845 D.R.
(PL65B-104) BOOK 11727/1581 D.R.
9—KNOTTY PINE PARK (PL65C-101) LOT 99 TR. 8225
10—EL CONEJO PARK (PL65K-101) LOT 119 TR. 9403
11—SAN REMO PARK (PL57B-101) LOT 222, TR. 7311
12—SANTA VITTORIA PARK (PL57C) LOT 246, TR. 7371 & PCL 2, PH 47/20
13—VEEH RANCH PARK (PL 57A-101) LOT 5 & 6, TR. 8333
14—PCL 2, PH 16/12 D.R. 82-167572 - GLOBE SITE
15-20 RESERVED FOR FUTURE

OPEN SPACE - FEE INTERESTS

- 21—DS571-101.1 TR. 9881 LOT B¹
22—DS571-101.2 TR. 9881 LOT C
23—DS571-101.3 TR. 9881 POR. LOT A
24—DS571-101.4 TR. 9881 POR. LOT A
25—DS571-101.5 TR. 9881 POR. LOT A
26—DS571-101.6 TR. 9881 POR. LOT A
27—DS571-101.7 TR. 9881 POR. LOT A
28—DS571-102 : D.R. 13939/1529 TR. 8962 LOT A
29—DS64C-101 TR. 9292 LOTS 215, 216 & 217²
30—DS64C-102 P.M. 85/37-41
31—DS64D-101 TR.7864 LOTS 4, 6 & 7¹
32—DS64D-102 P.M.B. 85/23-24¹
33—DS64H-101 D.R. 13161/1052
34—DS64H-201 TR. 10085 LOTS 1 & 7
35—DS65L-101 : TR. 9403 LOTS A, B, C, & D¹
36—DS65L-102.01 TR. 9035 LOTS A, B, & C
37—DS65L-103 : TR. 9044 LOTS A, B & C
38—DS65L-104 : TR. 9937 LOTS A & B¹
39—DS65L-105 : TR. 9199 LOTS A & B¹
40—DS65L-107 : D.R. 10306/13 (TR. 7007 LOTS B, C, & POR. LOT A)
41—DS65U-101 : RES. 83-335019 TR.9296 LOT 276
42—LA65G -101: TR. 6924 LOTS A, B, C, E¹
43—LA65G-102 : D.R. 10319/874 TR. 7050 LOTS A, B, C₅
44—DS571-101.8 - POR. LOT A, TR. 9881
46-58—RES. NO. 98-09-22-3, LOT 8, TR. 10885 - RECREATION & SCENIC PURPOSES
-RESERVED NO. FOR FUTURE

- NOTE:
1. RESERVING BLANKET EASEMENTS FOR PURPOSES OF THE EXIST. REGIONAL RIDING AND HIKING TRAIL AND BIKEWAY, INCLUDING BUT NOT LIMITED TO EQUESTRIAN, HIKING AND BICYCLE USES.
2. RESERVING A BLANKET EASEMENT OVER LOT 215 FOR REGIONAL TRAILS AND RELATED PURPOSES, INCLUDING BUT NOT LIMITED TO EQUESTRIAN, HIKING AND BICYCLE PURPOSES.
3. EXCEPT THOSE PORTIONS WITHIN LOT C DESCRIBED IN DEEDS RECORDED 5/10/82 AS DOC. NOS. 82-160397; 82-160398; 82-160399; & 82-160400
4. EXCEPT PORTION DESCRIBED IN DEED REC. 8/16/78 IN BK. 12602/897
5. DOCUMENTS HAVE AMBIGUOUS WORKING WHICH MIGHT BE CONSTRUED AS CONVEYING FEE, THE INTENT HERE IS TO OUTCLAIM ALL COUNTY INTREST WHETHER FEE OR, AS PRESUMED IN COUNTY FILES, EASEMENT.

OPEN SPACE EASEMENTS

- 51—DS64H-202 : TR. 12043 LOT A - SCENIC
52—DS64H-203 : TR. 12044 LOTS A & B - SCENIC
53—DS64H-204 : TR. 12045 LOTS A, B & C - SCENIC
54—DS64P-101 : TR. 9196 LOTS A & B - SCENIC
55—DS64D-102 : P.M. 255/30-35 PAR. 2,4,6 & 7 - SCENIC PRESERVATION
56—DS64T-101 : TR.12495 LOTS A & B - SCENIC
57—DS64T-102 : TR. 12496 LOT A - SCENIC
58—DS64T-103 : TR. 12497 LOT A - SCENIC
59—DS64T-104 : TR. 12498 LOT A - SCENIC
60—DS64T-105 : TR. 12499 LOT A - SCENIC
61—DS64T-106 : TR. 12503 LOT A - SCENIC
62—DS64T-107 : TR. 12504 LOT A - SCENIC
63—DS65D-102 : TR.9063 POR. LOTS A & B - SCENIC, SLOPES & DRAINAGE
64—DS65R-101 : D.R. 83-335020 LOT 196 OF TRACT 9293 - SCENIC
65—DS65R-102 : TR.13300 LOT A - SCENIC PRESERVATION
66—DS65T-101 : D.R. 83-335021 LOT 274 OF TRACT 9296 - SCENIC & REC. TRAILS
67-75 RESERVED FOR FUTURE

76—SLOPE AND DRAINAGE EASEMENT

PER TRACT 9863, MISCELLANEOUS MAPS BOOK 642/11-16

77—EASEMENT FOR PEDESTRIAN WALKWAY AND

EASEMENT FOR TRAFFIC SIGNAL DEVICES AND MAINTENANCE
PER PARCEL MAP 88-162, MISCELLANEOUS MAPS BOOK 255/30-35

78—TR. 8861 - PEDESTRIAN EASEMENT

79—TR. 8862 - PEDESTRIAN EASEMENT

80—TR. 8863 - PEDESTRIAN/STORM DRAIN EASEMENT

LANDSCAPE EASEMENTS

- 81—TR. 7080 LOTS A, B, C, D & E
82—D.R. 11459/152 POR. LOT 8 TRACT 7864
83—D.R. 11854/531 POR. LOT 9 TRACT (7864)
84—D.R. 12146/1100, (D.R. 11564/1601) POR. LOTS 47 THROUGH 58 TRACT (8103)
85—D.R. 12146/1100, (D.R. 11564/1601) POR. LOTS 1 THROUGH 30 TRACT 8171
86—TRACT 9035¹
87—D.R. 82-124495 TR. 9294
88—TRACT 9295
89—D.R.82-124495 TR. 9296 EXCEPT THAT PORTION THEREOF VACATED PER D.R. 90-278694
90—PER TRACT 9403
91—D.R. 63-005270 LOT A TR. 9820
92—D.R. 83-005270 LOTS A, B & C TR. 10464
93—TR. 12091 POR. LOT 3
94—TR. 7371, LOTS A-I
95—D.R. 11045/702 LOTS 176-182, 191, 192, 199, 211-213 AND TR. 7311
96—TR. 7311, LOTS A, B & C - LANDSCAPE SITES

1. 5'x6' AREAS - SEE RECORD MAP FOR LOCATIONS
97—INST. NO. 19960475123, POR. LOT 55, TR. 12551
98—INST. NO. 19960508691, POR. LOT 48, TR. 12551
99—INST. NO. 19960613228, POR. LOT 56, TR. 12551

- 100 RESERVED FOR FUTURE

TRAILS AND RELATED PURPOSES

- 101—TRACT 7049 POR. LOT 22 - PEDESTRIAN
102—TR64G-101 : TRACT 10464 LOT C - BICYCLE & PED.
103—TR64G-105 : TRACT 10885-POR. LOTS 2,3,6-PED. & BIKE TRAIL
104—TR64G-106 : D.R. 13961/1359 (TR. 10885-POR. LOT 2) - PED. BIKE TRAIL
105—TR65N-101 : TRACT 9294 - PED. & BIKE TRAIL
106—TR65N-102 : TRACT 9296 - PED. & BIKE TRAIL
107—TR65N-103 : TRACT 9295 - PED. & BIKE TRAIL
108—TR65N-105 : TRACT 9403 POR. LOT 36 -PED. TRAIL
109—TR65N-106 : P.M.255/30-35 - PED. WALKWAY
110—DS65T-101 : D.R. 83-33521 (TR. 9296 LOT 274-REC. TRAIL
111—TR64G-108 : TRACT 12091 - BIKE TRAIL
112—TR64G-104 : TRACT 9945 LOT A
113—D.R. 12738/1571³
114—INST. NO. 19980015389-TR. 12237, POR. LOT A-EQUESTRIAN TRAIL
115—BIKE TRAIL EASEMENT

- NOTE:
1. SEE ALSO "DRAINAGE EASEMENTS" LIST FOR NOTED LOCATIONS
2. EXCEPT THAT PORTION LYING WESTERLY OF THE EASTERLY R/W LINE OF NELLIE GAIL ROAD
3. INCLUDED HERE BECAUSE ITS MULTIPLE USE DEDICATION INCLUDES TRAIL PURPOSES.

DRAINAGE AND UTILITY EASEMENTS

- 121—D.R. 10175/621 6-15-72-DRAINAGE
D.R. 10175/627
122—D.R. 10339/384 09-22-72-STORM DRAIN
123—D.R. 10567/248 02-23-73-DRAINAGE
124—D.R. 11298/946 12-04-74-STORM DRAIN
125—D.R. 11321/1763 01-13-75-DRAINAGE
126—D.R. 11343/401 02-20-75-STORM DRAIN
127—D.R. 13961/1359 02-26-81-STORM DRAIN
128—D.R. 13965/122 03-02-81-STORM DRAIN
129—D.R. 14193/1051 08-25-81-DRAINAGE
130—TRACT 5641 - SAN. SEWER & WATER
131—TRACT 5678 - SAN. SEWER
132—TRACT 7049 - STORM DRAIN
133—TRACT 7186 - DRAINAGE
134—TRACT 7778 - STORM DRAIN
135—TRACT 7927 - STORM DRAIN
136—TRACT 8171 - DRAINAGE
137—TRACT 8225 - STORM DRAIN
138—TRACT 8962 - STORM DRAIN
139—TRACT 9035 - STORM DRAIN
140—TRACT 9044 - STORM DRAIN
141—TRACT 9199 - STORM DRAIN
142—TRACT 9292 - STORM DRAIN
143—TRACT 9293 - STORM DRAIN
144—TRACT 9294 - STORM DRAIN
145—TRACT 9295 - STORM DRAIN
146—TRACT 9296 - STORM DRAIN
147—TRACT 9403 - DRAINAGE
148—TRACT 9848 - DRAINAGE
149—TRACT 10885 - STORM DRAIN
150—TRACT 11237 - STORM DRAIN
151—TRACT 11238 - STORM DRAIN
152—TRACT 11240 - STORM DRAIN
153—TRACT 11241 - STORM DRAIN
154—TRACT 11557 - STORM DRAIN
155—TRACT 12043 - STORM DRAIN
156—TRACT 12044 - STORM DRAIN
157—TRACT 12045 - STORM DRAIN
158—TRACT 12282 - STORM DRAIN
159—TRACT 12493 - STORM DRAIN
160—TRACT 12494 - STORM DRAIN
161—TRACT 12495 - STORM DRAIN
162—TRACT 12499 - STORM DRAIN
163—TRACT 12549 - STORM DRAIN
164—TRACT 12550 - STORM DRAIN
165—TRACT 12551 - STORM DRAIN
166—TRACT 12911 - STORM DRAIN
167—TRACT 13188 - STORM DRAIN
168—TRACT 13190 - STORM DRAIN
169—TRACT 13304 - STORM DRAIN
170—P.M. 108/37-38 - INGRESS/EGRESS TO DRAIN
171—P.M. 120/34-35 - STORM DRAIN
172—P.M. 255/30-35 - STORM DRAIN
173—TRACT 7371- STORM DRAIN
174—TRACT 7311- STORM DRAIN
175—TRACT 8860- STORM DRAIN/DRAIN/FLOOD PLAIN
176—TRACT 8861/PM 120/17-21 - STORM DRAIN
177—TRACT 8862 - STORM DRAIN
178—PM 134/15 - STORM DRAIN
179—PM 117/37 - STORM DRAIN
180—D.R. 12218/287 - STORM DRAIN
181—PM 90/33 - DRAINAGE
182—PM 147/37 - STORM DRAIN
183—PM 244/30 - STORM DRAIN
184—D.R. 10184/872 - STORM DRAIN
185—PM 147/43 - DRAINAGE
186—D.R. 11643/1822 - STORM DRAIN/FLOOD CONTROL/WATER CONSERVATION
187—D.R. 11856/363 - STORM DRAIN
188—D.R. 10220/751 - DRAINAGE
189—INST. NO. 19960356392 - STORM DRAIN
190—TR. NO. 8860 - STORM DRAIN
300—
301—INST. NO. 19990447564-TRAFFIC SIGNAL EQUIP & MAINTENANCE
302-310 RESERVED FOR FUTURE

IRREVOCABLE OFFERS (FEE)

- 191—TRACT 9296 - LOT 273 - PARK
192—TRACT 9863 - LOT 2 - PARK
193—TRACT 10885 - LOT 4 - PARK
194—
195—TRACT 11237 - LOT A - OPEN SPACE
196—TRACT 11537 - LOT 2 - PARK
197—TRACT 11537 - LOT A - REC. & OPEN SPACE
198—TRACT 12091 - LOT 4 - PARK
199—TRACT 12091 - LOT 6 - REC. & OPEN SPACE
200—TRACT 12493 - LOT C - REC. & OPEN SPACE
201—TRACT 12494 - LOT B - REC. & OPEN SPACE
202—TRACT 12505 - LOT A - REC. & OPEN SPACE
203—TRACT 12507 - LOT A - REC. & OPEN SPACE
204—TRACT 12550 - LOT 50 - PARK & RECREATION
205-210 RESERVED FOR FUTURE

- NOTE:
1. SUBJECT TO EXISTING REGIONAL TRAIL EASEMENTS

IRREVOCABLE OFFERS (EASEMENT - LANDSCAPE MAINTENANCE)

- 211—TRACT 9196 - LOTS A & B
212—TRACT 9198 - LOT A
213—TRACT 9200 - LOTS E,H,K,M
214—TRACT 11238 - LOT A
215—TRACT 11241 - LOTS A & B
216—TRACT 11242 - LOT A-EXCEPT POR. PER D.R. 84-303133
217—TRACT 12043 - LOT A (SAME AREA AS ITEM 34)
218—TRACT 12044 - LOTS A & B (SAME AREA AS ITEM 35)
219—TRACT 12045 - LOTS A, B, C (SAME AREA AS ITEM 36)
220—TRACT 12495 - LOTS A & B (SAME AREA AS ITEM 39)
221—TRACT 12496 - LOT A (SAME AREA AS ITEM 40)
222—TRACT 12497 - LOT A (SAME AREA AS ITEM 41)
223—TRACT 12498 - LOT A (SAME AREA AS ITEM 42)
224—TRACT 12499 - LOT A (SAME AREA AS ITEM 43)
225—TRACT 12503 - LOT A (SAME AREA AS ITEM 44)
226—TRACT 12504 - LOT A (SAME AREA AS ITEM 45)
227—TRACT 12237 - POR. LOT A ACCEPTED FOR ROAD RIGHT OF WAY
228-230—RESERVED FOR FUTURE

FLOOD PLAIN

- 240—TR. 9612 - FLOOD PLAIN - SLOPE
241—PM 202/1 - FLOOD PLAIN
242—D.P. 10991/1899 - FLOOD PLAIN
243-249—RESERVED FOR FUTURE

VEHICULAR ACCESS

- 250—TR. 8333 - VEHICULAR ACCESS
251-259—RESERVED FOR FUTURE

STREET AND HIGHWAYS

- 260—INST. No. 97-0528653 - STREET & HIGHWAY PURPOSES
261—INST. No. 97-0578937 - STREET & HIGHWAY PURPOSES
262—INST. No. 19960341843 - RIGH OF WAY DEDICATION/RELINQUISHMENT OF ACCESS RIGHTS
263—INST. No. 19960345573 - PUBLIC ROAD PURPOSES
264—INST. No. 19960356391 - RIGHT OF WAY & PUBLIC ROAD EASEMENT
265—INST. No. 19960473202 - EASEMENT & RIGHT OF WAY FOR PUBLIC ROAD PURPOSES
266—INST. No. 19960541716 - RIGHT OF WAY DEDICATION/RELINQUISHMENT OF ACCESS RIGHTS
267—INST. No. 1990236439 - STREET & HIGHWAY PURPOSES
268-280—RESERVED FOR FUTURE

MOLITON MIGUEL WATER DIST. ESMTS.

- 280—INST. No. 95-0005433 - ESMT FOR SEWER, WATER & RECLAIMED WATER
281—INST. No. 1999 - ESMT FOR SEWER, WATER & RECLAIMED WATER
282-290 RESERVED FOR FUTURE

PARK OWNERSHIP

PARKS - FEE INTERESTS

EXISTING BIOTIC AND HABITAT AREAS

CITY OF LAGUNA HILLS PARKS

NELLIE GAIL PARKS

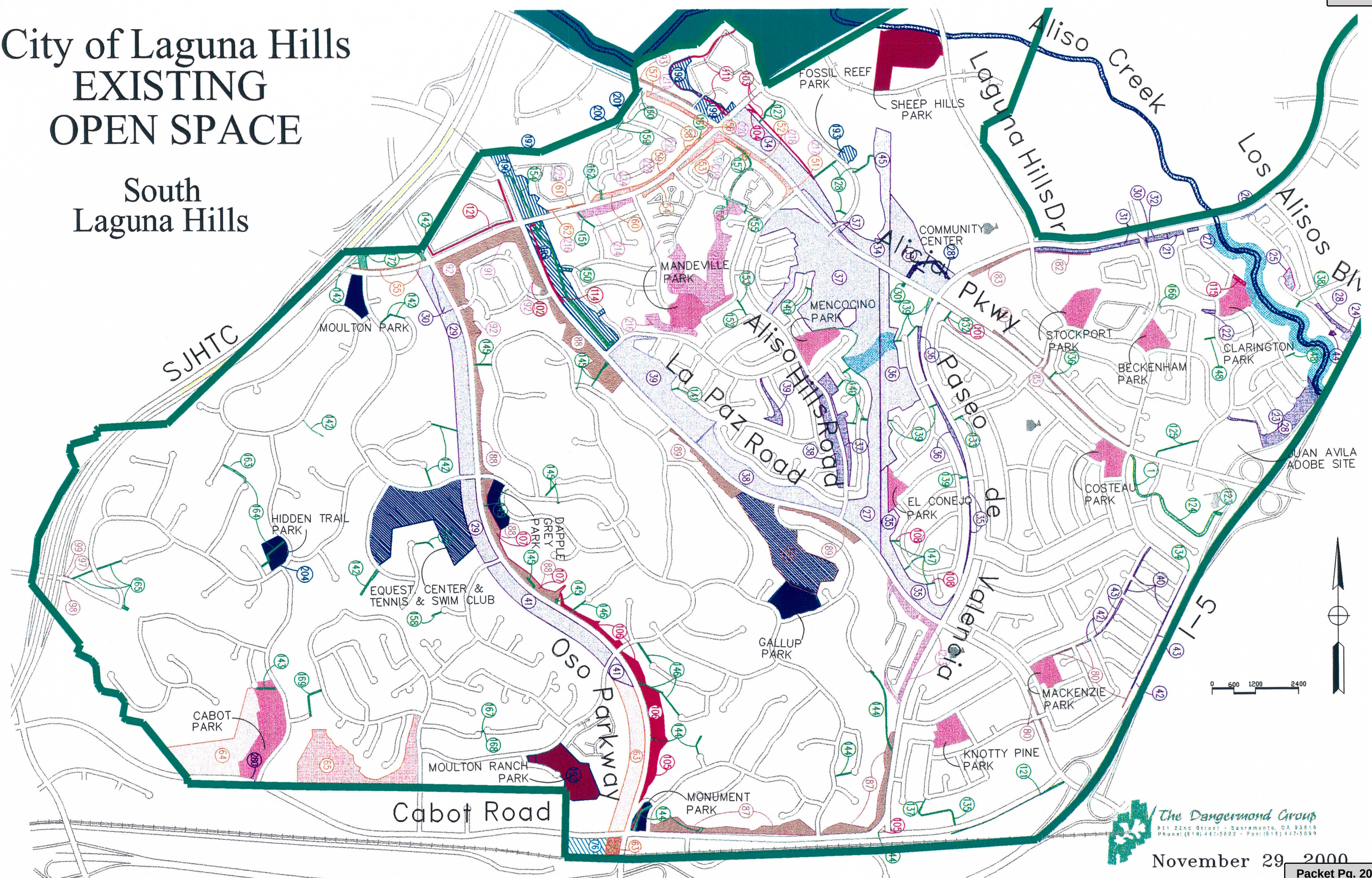
COUNTY PARKS

OTHER PARKS

ADJACENT CITIES' PARKS

City of Laguna Hills EXISTING OPEN SPACE

South
Laguna Hills

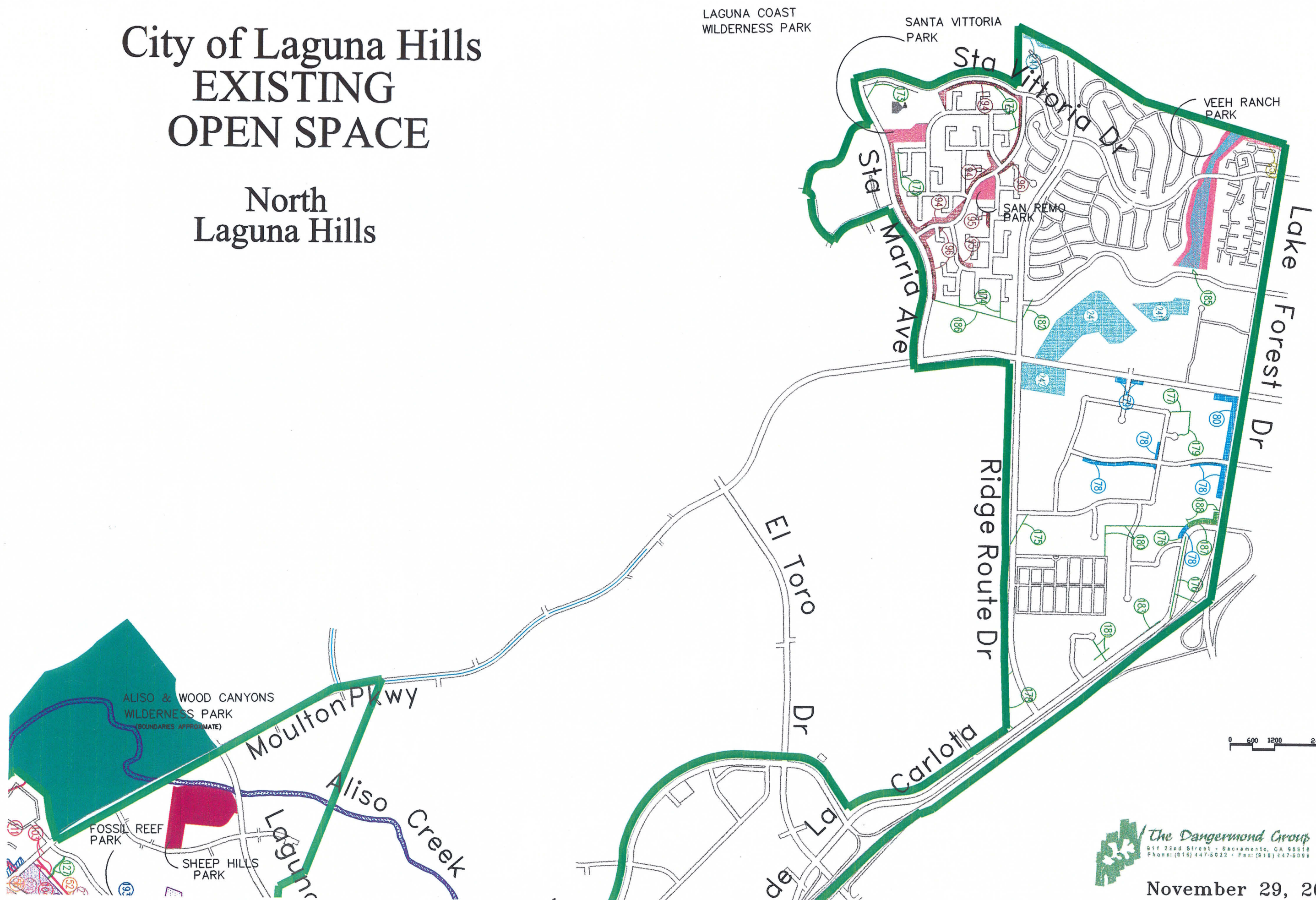


The Dangermond Group
811 22nd Street • Sacramento, CA 95818
Phone: (916) 441-5022 • Fax: (916) 447-5099

November 29, 2000

City of Laguna Hills EXISTING OPEN SPACE

North
Laguna Hills



 **The Dangermond Group**
911 22nd Street • Sacramento, CA 95818
Phone: (916) 447-5022 • Fax: (916) 447-5098

November 29, 2000

Laguna Hills Open Space

		Acreage	Location	Responsible Municipality	Existing Connections	Proposed Connections	Key Interest Point
Laguna Hills Open Space							
	64	Open Space Easement	14.8	West side of Cabot Road just south of Cabot Park	Laguna Hills	Cabot Park on Nellie Gail Trail westbound to Hidden Trail Park and northbound to Equestrian Center and Oso Parkway	None
	65	Open Space Easement	17.0	South side of Vista Viejo southerly along City Limit to just north of Rapid Falls	Laguna Hills	Informal bikeway	Bridlewood Drive - potential Class II or III Bikeway link from Vista Viejo to Oso Parkway
	55	Open Space Easement	0.5	West side of Moulton Parkway from Oso Parkway southerly to Nellie Gail Road	Laguna Hills	None	None
	29,41	Open Space Fee Interest	41.5	South side of Oso Parkway from Moulton Parkway to just east of Bridlewood	Laguna Hills	Nellie Gail Trail is a segment of a trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway on Roadway both sides	None
	63	Open Space Easement	10.2	South side of Oso Parkway from just east of Bridlewood to Cabot	Laguna Hills	Nellie Gail Trail is a segment of a trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway on Roadway both sides	None
	88	Landscape Easement	4.0	North side of Oso Parkway from Haven Drive to Nellie Gail Road	Laguna Hills	Class I Bikeway and Nellie Gail Trail are segments of the Bikeway and Trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway both sides of road	None
	88,107	Landscape Easement, Pedestrian and Trail Easement	4.6	North side of Oso Parkway from Nellie Gail Road to about 1/8 mile east of Nottingham	Laguna Hills	Class I Bikeway and Nellie Gail Trail are segments of the Bikeway and Trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway both sides of road	None
	106	Trails	1.7	North side of Oso Parkway from approximately 1/8 mile east of Nottingham to Bridlewood	Laguna Hills/ Nellie Gail	Class I Bikeway and Nellie Gail Trail are segments of the Bikeway and Trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway both sides of road	None
	105, 106	Trails	6.9	North side of Oso Parkway from Bridlewood to Hitching Rail Road	Laguna Hills/ Nellie Gail	Class I Bikeway and Nellie Gail Trail are segments of the Bikeway and Trail extending from Moulton Parkway to Cabot Road: Class II, III Bikeway both sides of road	None
	63	Open Space Easement	1.0	South side of Oso Parkway from Cabot Road to Railroad Tracks	Laguna Hills	None	Potential Class II Bikeway and Equestrian Trail into Mission Viejo
	87	Landscape Easement	6.2	West side of Cabot Road from Hitching Rail Road to Nellie Gail Road	Laguna Hills	Nellie Gail Trail linking Oso Parkway to Nellie Gail Road	Possible Class I bikeway
	87	Landscape Easement	4.5	West side of Cabot Road from Nellie Gail Road easterly on south side of Paseo de Valencia to just east of Mackenzie Street	Laguna Hills	Nellie Gail Trail linking Nellie Gail Road to Paseo de Valencia; Class II, III Bikeway adjacent on Cabot	Possible Class I bikeway
	213	Irrevocable Offer - Landscape Easement	0.3	East side of Firenze from Paseo de Valencia southerly to Nova	Laguna Hills	None	Possible Class I Bikeway and Trail if segments are added just south of Monte Vista and from Appaloosa to segment #88
	213	Irrevocable Offer - Landscape Easement	2.0	South side of Paseo de Valencia from Firenze westerly to La Paz, and east side of La Paz southerly about 1/16 mile	Laguna Hills	None	Potential for obtaining 1) easement between # 87 and Firenze to link Cabot Road to La Paz or 2) easement thru Edison Easement east of La Paz to link south through #27 & #37 west of La Paz.
	213	Irrevocable Offer - Landscape Easement	1.2	East side of La Paz from about 1/16 mile south of Paseo de Valencia southerly to Monte Vista	Laguna Hills	None	Potential linkage through Edison easement east of La Paz to Edison easement West of La Paz, crossing La Paz and south to Moulton
	213	Irrevocable Offer - Landscape Easement	0.1	East side of La Paz from Monte Vista southerly about 1/32 mile	Laguna Hills	None	Potential Class I Bikeway and Trail if links are completed just south of Monte Vista and from Appaloosa to segment #88
	89	Landscape Easement	1.9	Southeast side of La Paz from Gallup Circle northerly about 1/4 mile	Laguna Hills	None	Potential Class I Bikeway and Trail if links are completed just south of Monte Vista and from Appaloosa to segment #88
	89	Landscape Easement	1.6	Southeast side of La Paz from Appaloosa northerly about 1/4 mile	Laguna Hills	None	Potential Class I Bikeway and Trail if links are completed just south of Monte Vista and from Appaloosa to segment #88
	88	Landscape Easement	6.8	Southeast side of La Paz from Charlton Drive northerly about 1/4 mile	Laguna Hills	None	Potential Class I Bikeway and Trail if if links are completed jjust south of Monte Vista and from Appaloosa to segment #88

Laguna Hills Open Space

		Acreage	Location	Responsible Municipality	Existing Connections	Proposed Connections	Key Interest Point
Laguna Hills Open Space							
	92, 102	Landscape Easement	9.8	Southeast side of La Paz from Charlton southerly to Moulton Parkway continuing on east side of Moulton Parkway southerly to Oso Parkway and then easterly to Haven Drive	Laguna Hills	Class I Bikeway on Oso Parkway Segment	Potential Class I Bikeway and Trail if links are completed just south of Monte Vista and from Appaloosa to segment #88
	38,39	Open Space - Fee Interest	11.1	Northwest side of La Paz from Aliso Hills Drive southerly to Alameda Avenue	Laguna Hills	None	Potential Class I Bikeway and trail If grades allow
	114	Trails	0.6	Northwest side of La Paz from Moulton Parkway northeasterly about 1/4 mile	Laguna Hills	None	Potential Class I Bikeway and trail If grades allow
	195	Irrevocable Offer - Fee	11.7	Northwest side of La Paz from Moulton Parkway northeasterly to Alameda Avenue	Laguna Hills	None	Potential Class I Bikeway and trail If grades allow
	196	Irrevocable Offer - Fee	5.6	Northwest side of La Paz from City Limit northeasterly to Moulton Parkway	Laguna Hills	Equestrian and Hiking Trail	None
	197	Irrevocable Offer - Fee	0.1	Extension north along City Limit from site #196 northerly about 1/16 mile	Laguna Hills	Equestrian and Hiking Trail	None
	39	Open Space - Fee Interest	1.1	Northwest side of Tocaloma Court from Alameda Avenue to end of cul de sac	Laguna Hills	None	None
	38	Open Space - Fee Interest	3.9	South side of Aliso Hills Drive from Alameda Avenue easterly to about 1/16 mile west of La Paz	Laguna Hills	None	Potential Class I Bikeway and trail If grades allow
	37	Open Space - Fee Interest	2.8	North side of Aliso Hills Drive from just east of LaSerra easterly to Bonita Drive	Laguna Hills	None	None
	62	Open Space Easement	0.1	West side of Moulton Parkway from about 1/16 mile north of La Paz northerly for about 1/16 mile	Laguna Hills	None	Potential Class I Bikeway and trail to Alicia
	61	Open Space Easement	<0.1	West side of Moulton Parkway from Louisa Street southerly about 1/16 mile	Laguna Hills	None	Potential Class I Bikeway and trail to Alicia
	58,59,60	Open Space Easement	1.3	West side of Moulton Parkway northerly from Louisa Street to Alicia Parkway	Laguna Hills	None	Potential Class I Bikeway and trail to Alicia
	214	Irrevocable Offer easement - Landscape Maintenance	<0.1	East side of Moulton Parkway from Mandeville Drive southbound about 1/8 mile	Laguna Hills	None	None
	54	Open Space Easement	0.6	East side of Moulton Parkway from Gordon southerly about 1/8 mile	Laguna Hills	None	None
	51,52,53	Open Space Easement	3.4	East side of Moulton Parkway from Gordon north, northeasterly along east side of Alicia Parkway to Aliso Hills Drive	Laguna Hills	None	Potentail Class I Bikeway and trail to Alicia
	198	Irrovocable Offer - Fee	2.2	About 1/16 mile north of Alicia Parkway - southerly from Laguna Court (west of Moulton)	Laguna Hills	None	None
	199	Irrevocable Offer - Fee	2.3	West side of Alicia Parkway southerly from Moulton Parkway to Laguna Court	Laguna Hills	None	Possible Class I Bikeway and trail north if either 1.) annexation of segment on east side of Moulton to Laguna Hills Drive) or 2.) extension of trail proposed in county area; and east to Aliso & Woods Canyon Park if eastment is possible
	34,37	Open Sapce - Fee Interests	12.1	West side of Alicia Parkway northeasterly from Moulton Parkway to about 1/8 mile southwest of Paseo de Valencia	Laguna Hills	Class I Bikeway linking to new Community Center	Equestrian and pedestrian trail leading to Community Center from Moulton Parkway
	33	Open Space - Fee Interests	3.8	West side of Alicia Parkway from Paseo de Valencia southwesterly about 1/8 mile	Laguna Hills	Class I Bikeway linking to new Community Center	Equestrian and pedestrian trail leading to Community Center from Moulton Parkway

Laguna Hills Open Space

		Acreage	Location	Responsible Municipality	Existing Connections	Proposed Connections	Key Interest Point
Laguna Hills Open Space							
	27, 35, 36, 37	Open Space - Fee Interests	76.6	East side of Alicia Parkway from Aliso Hills Drive easterly to La Paz, along La Paz from southerly to Aliso Hills Drive and northerly to Paseo de Valencia	Laguna Hills	Edison Maintenance Road	Edison Easment extends across site east to west - potential Class I Bikeway and Equestrain and Pedestrian Trail
	45	Open Space - Fee Interests	5.4	From western City Limit easterly to about 1/8 mile west of Alicia Parkway - strip is located about 1/4 mile south of Laguna Hills Drive	Laguna Hills	None	PotentialClass I Bikeway and Equestraina and Pedestrian Trail if easement across probable homeowner property can connect it to Sheep Hills Park which has trail leading into Aliso & Woods Canyon Park
	35, 36	Open Space - Fee Interests	1.7	South side of Paseo de Valencia from about 1/16 mile east of Alicia Parkway easterly to about 1/8 mile west of La Paz	Laguna Hills	None	None
	80	Pedestrian/Strom Drain Easement	0.4	Northwest side of La Paz Road from Rickenbacker northeasterly to about 1/16 mile north of Mc Intyre	Laguna Hills	None	None
	80	Pedestrian/Strom Drain Easement	0.1	East side of Mackenzie from just north of Padua Drive southeasterly to about 1/16 mile southeast of Padua Drive	Laguna Hills	None	None
	40, 42, 43	Open Space - Fee Interest	0.6	North side of Mackenzie Street from Costeau Street southeasterly to just north of Padua Drive	Laguna Hills	None	Potential connection from Cabot Road Class II Bikeway by way of La Paz southwest, up Mackenzie to Alicia Parkway and continuing on Alicia Parkway to trail link to Aliso
	80	Landscape Easement	<0.1	Extends from end of #42 southeasterly about 1/16 mile		None	None
	40, 42, 43	Open Space - Fee Interest	0.4	North side of El Dorado Drive from Wells Fargo on the west to just beyond Presidio Drive on the east	Laguna Hills	None	Potential alternate route from Cabot Road to Aliso Creek
	84	Landscape Easement	0.4	Northwest side of Alicia Parkway about 1/8 mile south of Wilkes Place and continuing along north side of Wilkes place westerly to York Circle	Laguna Hills	None	Potential Class I Bikeway integrated with Class II along Alicia corridor
	85	Landscape Easement	1.0	Northwest side of Alicia Parkway from Costeau Street southerly to Wilkes Place, continuing about 1/16 mile along north side of Wilkes Place	Laguna Hills	None	Potential Class I Bikeway integrated with Class II along Alicia corridor
	83	Landscape Easement	0.9	East side of Paseo de Valencia from Stockport to about 3/16 miles south	Laguna Hills	Class I Bikeway and Equestrian and Pedestrian trail linking Aliso Creek to High School, stops short of new Community Center	None
	82	Landscape Easement	0.4	East side of Paseo de Valencia from Stockport to Beckenham Street	Laguna Hills	Class I Bikeway and Equestrian and Pedestrian trail links Aliso Creek to High School	None
	21, 27, 30, 31, 32	Open Space - Fee Interests	2.3	East side of Paseo de Valencia from Stockport Street on the south to just past Kennington Drive on the North	Laguna Hills	Class I Bikeway and Equestrian and Pedestrian trail links Aliso Creek to High School	None
	22	Open Space - Fee Interests	0.2	Strip from Weyburn Drive on the north, southerly about 1/16 mile (across from Jorie Drive)		None	None
	23, 28	Open Space - Fee Interests	4.9	Southeast side of Aliso Creek along south side of I-5 offramp easterly to Katie Avenue	Laguna Hills	Multi-Use Trail	Juan Avila Adobe Site
	24, 28	Open Space - Fee Interests	0.9	Southeast side of Los Alisos Boulevard from I-5 south to just north of Avenida de la Carlota	Laguna Hills	None	None
	44	Open Space - Fee Interests	<0.1	Northeast end of Christina Court cul de sac	Laguna Hills	Entry to Aliso Creek Class I Bikeway and Equestrian and Pedestrian Trail	None

Laguna Hills Open Space

		Acreage	Location	Responsible Municipality	Existing Connections	Proposed Connections	Key Interest Point
Laguna Hills Open Space							
	25	Open Space - Fee Interests	0.7	Located between northwest end of Christina Court cul de sac and Southampton Court	Laguna Hills	None	
	26	Open Space - Fee Interests	0.2	East side of Pase de Valencia from Los Alisos Blvd on the north heading south about 1/16 mile	Laguna Hills	Sadewalk used as Class I Bikeway	?????
	14	Park - Fee Interests	0.2	Northeast side of Avenida de LaCarlota about 1/8 mile north of Paseo de Valencia ramps to I-5	Laguna Hills	None	Globe Site
Laguna Hills Historical Sites							
	23,28	Juan Avila Adobe Site	4.0	Aliso Creek and 405 Freeway	Laguna Hills	Aliso Creek Trail Southwest to Pasel de Valencia and East to Alicia Parkway	Juan Avila Adobe
Laguna Hills Parks							
	2	Beckenham Park	2.8	Mendocino Ave	Laguna Hills	None	None
		Cabot Park	8.8	Alicia & Costeau St.	Laguna Hills	Nellie Gail Trail links Cabot Park to 1. Neighborhood Park at Nellie Gail & Oso; 2. Laguna Niguel at Greenfield & SJHTC; 3. Proposed trail southerly to Laguna Niguel at Crown Valley & Forbes & northerly to Cabot & Oso.	Potential for Laguna Hills to accept maintenance and liability for Nellie Gail Trail connectors
	1	Clarington Park	3.5	Clarington Drive	Laguna Hills	Adjacent to Aliso Creek Trail	Potential trail head for Aliso Creek Trail
	7	Costeau Park	3.7	Cousteau Street	Laguna Hills	None	Potential link to Alicia Parkway and Cabot Road
	10	El Conejo Park	2.0	El Canejo Lane	Laguna Hills	Adjacent to Edison Easement	Potential trail head for Edison Easement Trail
	9	Knotty Pine Park	3.9	Knotty Pine Road	Laguna Hills	None	None
	6	Mandeville Park	3.3	Mandeville Drive	Laguna Hills	None	None
	8	Mackenzie Park	2.9	Rapid Falls Road	Laguna Hills	None	Potential link to Alicia Parkway and Cabot Road
	4	Mendocino Park	3.9	Aliso Hills Drive	Laguna Hills	Directly south of Edison Easement and Habitat area	Potential Class I Bikeway along Aliso Hills Drive (on street parking makes this difficult) with potential Class II Bikeway east
	3	Stockport Park	4.0	Stockport	Laguna Hills	None	None
	193	Fossil Reef Park	0.8	Via Lomas	Laguna Hills	None	Marine Fossils
Nellie Gail Parks							
		MoultonPark	2.2	Nellie Gail Road & Moulton Pky	Nellie Gail	None	Potential Class II Bikeway
		Dapple Grey Park	6.6	Nellie Gail Road & Oso Parkway	Nellie Gail	Nellie Gail Trail links 1. to Gallup Park northerly and 2. Nellie Gail Equestrian Center, Tennis & Swim Club southerly and 3. Continues southerly to Hidden Trail Park	Potential for Laguna City to Accept Maintenance and Liability
		Hidden Trail Park	2.4	Stageline Drive & Hidden Trail Road	Nellie Gail	Nellie Gail Trail links to 1. Cabot Park at Rapid Falls Rd & Cabot; 2. Laguna Niguel at Greenfield ETC; 3. Bears northerly to Dapple Grey Park at Nellie Gail & Dapple Grey Drive	Potential for Laguna City to Accept Maintenance and Liability
		Gallup Park	4.6 Developed Area 15.5 Natural Area	Nellie Gail Road & Gallup Circle	Nellie Gail	East, West linkage along La Paz by Laguna Hills multi-use trail	Potential Class I Bikeway and Equestrian and Pedestrian trail along east side of La Paz
		Monument Park	1.2	Oso Parkway and Hitching Rail Road	Nellie Gail	North, south linkage along Cabot Road by Laguna Hills Class II, III Bikeway	Potential Class II Bikeway along Cabot
		Equestrian Center & Tennis and Swim Club	23.0			Segment of Nellie Gail system linking to Cabot Park at Cabot Road	Potential for Laguna City to Accept Maintenance and Liability

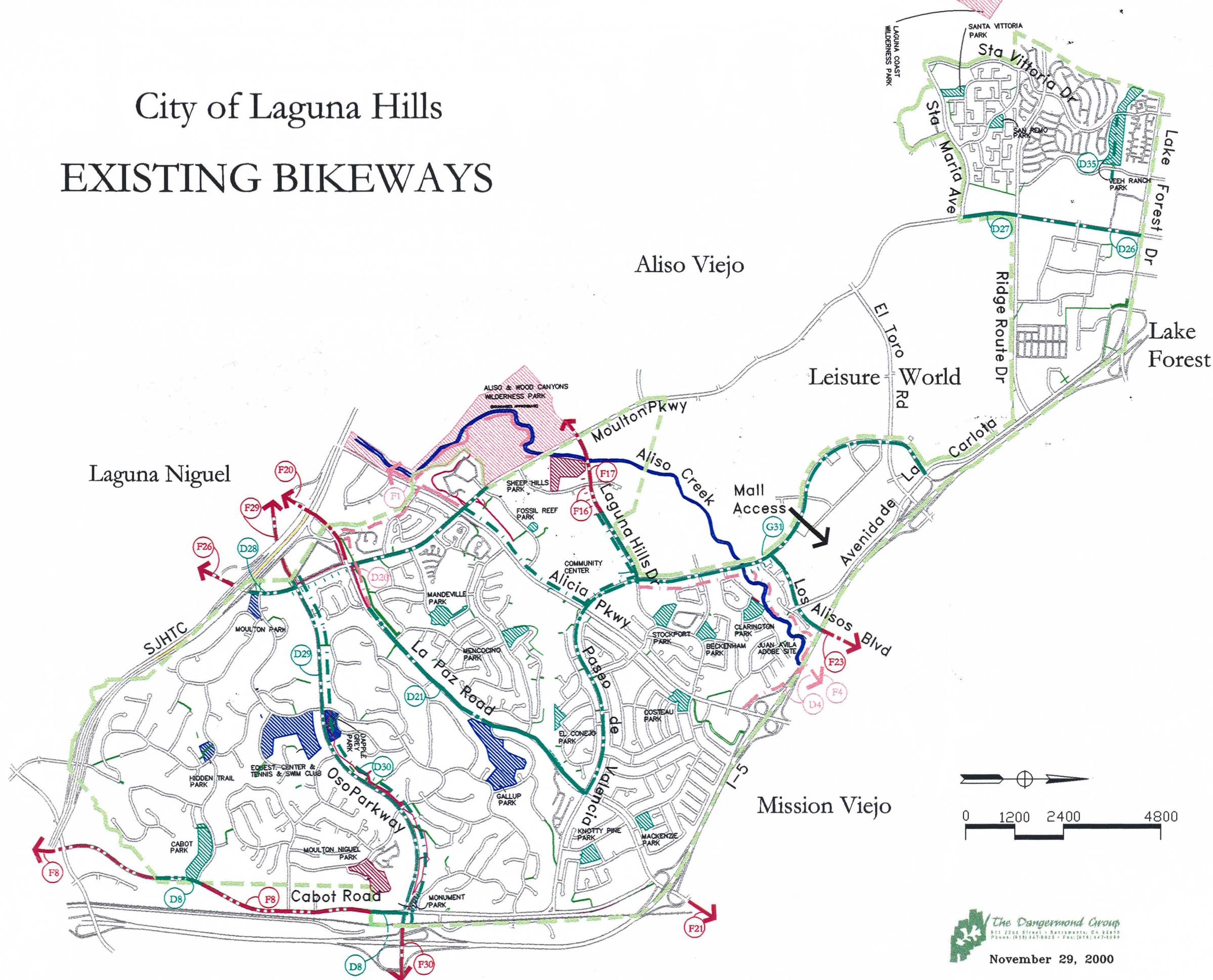
Laguna Hills Open Space

			Acreage	Location	Municipality Responsible	Existing Connections	Proposed Connections	Key Interest Point
Other Parks								
		Sheep Hills Park	11.5	Moulton Parkway and Laguna Hills	County of Oran	Link along Aliso Creek into Aliso and Wood Canyons Wilderness Park	Potential link east across probably homeowner property to Open Space Easement 45 and on to Community Center	Tot-lot, Baseball Diamond, Soccer Field
		Moulton Ranch Park	8.7	Bridlewood Drive	Irrevocable Offer - Moulton Ranch Homeowners	None	Potential Class II Bikeway if not too steep and if road is wide enough	
		Laguna Village (in annexed area)	5.0	Ridge Route & Santa Vittoria Drive	Homeowners Association		Potential Class II Bikeway to 1.) heading south on Santa Vittoria to Laguna Coast Wilderness Park if extension of Santa Maria Avenue is completed and 2.) heading east on Ridge Route Drive to Laguna Hills Shopping Center by way of Avenida de la Carlota heading south	Tot-lot, Recreation Bldg.
Annexed Area Parks								
	11	San Remo Park	1.0	Santa Maria Ave	Laguna Hills	None	None	
	12	Santa Vittoria Park	4.0	San Remo Drive	Laguna Hills	None	Potential Class II Bikeway 1.) westbound on Santa Maria Ave (if extended) to Laguna Coast Wilderness Park and 2.)eastbound on Santa Maria Avenue, northbound on Moulton Parkway to Ridge Route Drive eastbound to Avenida de la Carloata southbound to Laguna Hills Shopping Center	
	13	Veeh Ranch Park	16.0	Jalisco/Grande Avenida	Laguna Hills	None	Potential Class II Bikeway north on Santa Vittoria Drive if sufficient right of way and grades allow, then west on Lake Forest Drive to San Diego Creek Class I Bikeway and Equestrian and Pedestrian Trail	
Annexed Area Open Space								
	94	Landscape Easement	5.1	North side of Santa Maria Avenue from Santa Vittoria Park eastbound to San Remo Drive, along west side of San Remo Drive to Santa Vittoria Drive and along east side of Santa Vittoria Drive southbound to Barbera	Laguna Hills	None	Potential Class I Bikeway from 1.) Santa Vittoria Park eastbound, linking to potential Class II Bikeway eastbound to Moulton Parkway and 2.) northbound on San Remo Drive to Santa Vittoria Drive	
	95	Landscape Easment	0.2	Northeast side of Palermo from end of Napoli around the corner southbound	Laguna Hills	None	None	
	95	Landscape Easment	0.2	South side of Taranto from Verona heading east about 1/32 mile	Laguna Hills	None	None	
	96	Landscape Easment	1.3	North side of Santa Maria Avenue from about 1/8 mile east of Moulton Pkwy to San Remo Drive along east side of San Remo Drive to just past Rimini	Laguna Hills	None	Potential Cass I Bikeway 1.) eastbound to link to Possible Class II Bikeway eastbound to Moulton Parkway and 2.) westbound to San Remo Drive and northbound to Santa Vittoria Drive	
	96	Landscape Easment	0.2	North side of San Remo from Taranto north about 1/16 mile	Laguna Hills		None	
	78	Pedestrian Easement	1.2	East side of Del Lago Drive from about 1/8 mile south to La Cadena Drive and then along the south side of La Cadena Drive to about 1/16 mile west of Del Lago Drive	Laguna Hills	None	None	
	78	Pedestrian Easement	1.0	South side of Lake Forest Drive from about 1/16 mile east of Del Lago Drive westbound along east side of Del Lago Drive south about 1/16 mile	Laguna Hills	None	None	

Laguna Hills Open Space

		Acreage	Location	Municipality Responsible	Existing Connections	Proposed Connections	Key Interest Point
Annexed Area Open Space							
	78	Pedestrian Easement	0.2	South side of Avenida de La Carlota westbound about 1/32 mile from just west of Plaza Point		None	
	79	Pedestrian Easement	0.4	East side of Moulton Parkway extending north and south from El Pacifico Drive about 1/32 miles		None	
	80	Pedestrian Easement	1.7	South side of Lake Forest Drive from Del Lago Drive to Moulton Parkway and southbound on Moulton Parkway about 1/16 mile		None	
Adjacent Area Open Space							
		San Diego Creek		Terminus of Lake Forest Drive	City of Irvine	None	Potential Class II Bikeway
Adjacent Area Parks							
		Aliso & Wood Canyons Wilderness Park		Creek & West of Alicia Parkway at SJHTC	County of Orange	None	
		Laguna Coast Wilderness Park		County of Orange - west of terminus of Santa Maria Avenue	County of Orange	None	

City of Laguna Hills EXISTING BIKEWAYS



LEGEND

CITY OF LAGUNA HILLS BIKEWAYS

- EXISTING CLASS I BIKEWAY
- EXISTING CLASS II BIKEWAY
- EXISTING CLASS III BIKEWAY
- EXISTING MULTI-USE TRAIL
- EXISTING WIDE SIDEWALK

COUNTY BIKEWAYS

- EXISTING CLASS I BIKEWAY
- EXISTING CLASS II BIKEWAY
- EXISTING CLASS III BIKEWAY
- EXISTING MULTI-USE TRAIL

ADJACENT CITIES' BIKEWAYS

- EXISTING CLASS I BIKEWAY
- EXISTING CLASS II BIKEWAY
- EXISTING CLASS III BIKEWAY
- EXISTING MULTI-USE TRAIL
- EXISTING WIDE SIDEWALK

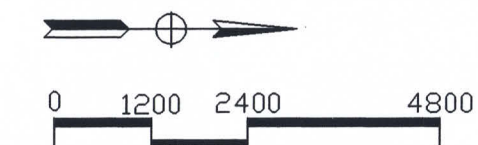
DRAINAGE AND UTILITY EASEMENTS

- DRAINAGE AND UTILITY EASEMENTS

- LAGUNA HILLS CITY LIMIT

NOTE:

- REFER TO NUMBERED CELLS ON TRAILS MATRIX



	A	B	C	D	E	F	G
	Corridor	Users	Type	Existing Bikeway/Trail	Destination	Linkages to Adjacent Communities	Opportunities/Constraints
1	Alicia Parkway	Bic/Ped	BW	Class I Bikeway, northwest side from southern City limit north to Paseo de Valencia	Aliso Creek Bikeway into Aliso & Woods Canyon Park/Community Center	Southern linkage - County Class I Bikeway joins with Aliso Creek Trail in Aliso Viejo	Potential for Class II Bikeway from Paseo de Valencia to I-5, linking residential neighborhoods to Community Center/Elementary School/Costeau Park
2						Northern linkage - No bikeway in Mission Viejo and inadequate right-of-way	Adequate right-of-way for Class II Bikeway from Paseo de Valencia north to City limit.
3	Aliso Creek Corridor	Bic/Ped	BW	Class I Bikeway (County facility) on northwest bank of creek from Paseo de Valencia to I-5 undercrossing.	Laguna Hills City Hall, Aliso & Wood Canyons Park (detours around Leisure World)	Southern linkage - Terminates at Leisure World	
4				Class I Bikeway splits just south of City limit with extension eastbound to Alicia Pkwy		Northern linkage - Extends into Mission Viejo (beneath I-5)	
5	Aliso Hills Dr.	None	None	None	Mendocino Park	None	Adequate right-of-way for Class II Bikeway linking La Paz Road to Alicia Parkway. Difficult grades. Parking at Mendocino Park creates a conflict. Potential link to Mendocino Park.
6	Avenida de Carlota	None	None	None	None	Southern linkage - none	Reduction of right-of-way by I-5 widening precludes Bikeway on northeast side from Ridge Route Drive south to El Toro Road. Street width varies from El Toro Road south to Los Alisos Blvd. - sidewalk on southwest side of street has many commercial driveway aprons.
7						Northern linkage - Terminates into I-5-ramps	
8	Cabot Road	Bic/Ped	BW	Class III Bikeway from southern City limit north to Oso Parkway	Cabot Park	Southern and eastern linkages - Class III Bikeway extends into Laguna Niguel and Mission Viejo	Right-of-way adequate for Class II and III from Oso Parkway to La Paz Road. Eventual connection heading south to Dana Point anticipated by the County via the Miguel Trail.
9							Adequate right-of-way for Class II or III Bikeway from Oso Parkway north to La Paz Road.
10	Calle de la Louisa	None	None	None	Laguna Hills Mall	None	Existing on-street parking on private street precludes a Class II bikeway unless parking is restricted.
11	Community Center	Bic/Ped/Eques	MT	None	None	None	Existing utility road along south of Community Center can be utilized as a Multi-Use Trail. Potential connections to Aliso Creek Trail along proposed Edison Easement Trail - west.

	A	B	C	D	E	F	G
	Corridor	Users	Type	Existing Bikeway/Trail	Destination	Linkages to Adjacent Communities	Opportunities/Constraints
12	Edison Easement Trail - East and West	Bic/Ped/Eques	MT	Existing unpaved Edison access road extends from LaPaz Road to Alicia Parkway and from Community Center west to Indian Hill Lane in annexation area.	Community Center/Elementary School/Sheep Hills Park	Western linkage - Edison Easement - east extends beyond City limit to Indian Hill Lane (just east of Sheep Hills Park).	Potential to connect LaPaz Road to Alicia Parkway. Will require regrading and paving of portions of Edison access road as well as construction of new trail segments. Corner access can be achieved at La Paz & Paseo de Valencia where the grades support a Multi-Purpose Trail along northern perimeter, joining the existing utility road to at Conejo Park. Connectors from Aliso Hills Drive are possible.
13							Western linkage - Graded Bikeway along southern perimeter of Community Center could connect to Edison service road to the west which could be regraded to reduce grade, and connected to Sheep Hills Park
14	El Toro Road	None	None	None	None	None	Width varies in Laguna Hills - Limited right-of-way for Class II or III Bikeways. South side of street is in Laguna Woods along Leisure World perimeter.
15						Northern linkage - No bikeway in Mission Viejo and currently inadequate right-of-way.	
16	Laguna Hills Drive	Bic/Ped	BW	Class I Bikeway, south side, from Paseo de Valencia west to City limit.	Aliso Creek Bikeway into Aliso & Woods Canyons Park/Sheep Hills Park/Laguna Hills High School/Community Center	Western linkage - Wide sidewalk replaces Class I Bikeway in annexation area.	
17		Bic		Class II Bikeway from Paseo de Valencia west to Aliso Creek Trail.	Same	Western linkage - Class III continues in Aliso Viejo, however, on-street parking at Sheep Hills Park (staging area for park) is a potential hazard.	
18	Lake Forest Drive	None	None	None		Eastern Linkage - Adequate right-of-way over I-5 for Class II bikeway. Roadway narrows in Lake	Adequate right-of-way for Class II Bikeway on south side, inadequate on north side. Potential linkage to Veeh Ranch Park.
19						Western Linkage - Ends at City limit - extension is in progress.	
20	La Paz Road	None	None	County Multi-Use Trail on northwest side from existing La Paz Road trail tunnel, through Moulton Parkway tunnel west to Aliso Creek.	Aliso Creek in Aliso & Woods Canyon Park/Nellie Gail Trail/MacKenzie Park/Edison Easement Trail - west.	Southern Linkage - Class II bikeway in Laguna Niguel	Potential for Multi-Use Trail on north side within drainage depression, extending from existing trail heading north to Aliso Hills Drive, with potential connection to Edison Easement Trail - west.
21				Class II Bikeway,		Northern Linkage - Existing Class II bikeway northbound from Muirlands Blvd. The sidewalk is the only connection under I-5. Inadequate right-of-way north of high school in Mission Viejo.	Steep grades from Paseo de Valencia east to City limits. Class II Bikeway feasible for experienced bicyclists.
22	Los Alisos Blvd.	Bic	BW	Class II Bikeway within City limits		Southern Linkage - Bikeway terminates at Leisure World/Connects to Bikeway on Paseo de Valencia	
23						Northern Linkage - Class II Bikeway over Freeway into Lake Forest	
24	Los Caballeros	None	None	None	None	None	Adequate right-of-way for Class II Bikeway on street side of bus lane. Private Street.
25	Moulton-Niguel service road			None	None	None	Potential connection to Edison Easement Trail - east by utilizing and extending existing Moulton-Niguel Water District service road. Steep grades.

	A	B	C	D	E	F	G
	Corridor	Users	Type	Existing Bikeway/Trail	Destination	Linkages to Adjacent Communities	Opportunities/Constraints
26	Moulton Parkway	Bic	BW	Class II Bikeway from Ridge Route north to northern City limit in North Laguna Hills	Aliso & Woods Canyons Park/Leisure World Equestrian Center/Sheep Hills Park/Aliso Creek Bikeway	Southern Linkage - Class II Bikeway in Laguna Niguel	Insufficient right-of-way for bikeway from Santa Maria Avenue south to El Toro Road.
27		Bic	BW	Class III Bikeway from Santa Maria Avenue north to Ridge Route Drive in North Laguna Hills		Northern Linkage - In Irvine there is no existing bikeway and inadequate right-of-way to add one.	
28		Bic	BW	Class III Bikeway from City limit north to Oso Parkway			Wide non-curb adjacent sidewalk on east side of street from Oso Parkway north to La Paz Road
29	Oso Parkway	Bic	BW	Class II Bikeway from western City limit to eastern City limit	Nellie Gail Tennis & Swim Center/Dapple Grey Park	Western Linkage - Continues as Class II Bikeway in Laguna Niguel	
30		Bic/Ped	BW	Class I Bikeway on north side from Moulton Parkway east to Cabot Road		Eastern Linkage - Freeway crossing not striped - resumes as Class II Bikeway in Mission Viejo	
31	Paseo de Valencia	Bic/Ped	BW	Class I Bikeway on east side from Stockport north to Aliso Creek Trail	Laguna Hills Mall/Aliso Creek Bikeway /Clarington Park/Laguna Hills High School/Community Center/El Conejo Park/Elementary School/Knotty Pine Park		Class I transitions to Class II south of the corner of Los Alisos Blvd. where there are two vehicular right turn lanes creating a potential hazard. This should be studied further to develop a solution.
32		Bic	BW				Turn lanes limit right-of-way for Class II Bikeway at Paseo de Valencia and Cabot Road.
33				Class I Bikeway on west side from Alicia Parkway north to Laguna Hills Drive			Class II Bikeway on east and west sides from elementary school to La Paz Road
34	Ridge Route Drive	None	None	None	None	Potential Western Linkage - Roadway terminates at privately owned open space at City limit. Proposed possible extension to Bake Parkway and Laguna Canyon Road.	Potential Class II Bikeway. From Moulton Parkway to western City limit the south side of the road is in Aliso Viejo.
35	San Diego Creek Tributary	None	None	Class I Bikeway through Veeh Ranch Park	None	None	Potential for Multi-Use Trail along southwest side of creek utilizing existing service road. Potential for connection to Veeh Ranch Park.
36							Potential Class I Bikeway along periphery of lakes - dependant on obtaining easements.
37	Santa Maria Avenue	None	None	None		Western Linkage - Roadway terminates at privately owned open space in Laguna Woods, possible extension to Laguna Coast Wilderness Park	Potential Class II Bikeway linking to Vittoria Drive and possibly through Laguna Woods to Laguna Canyons Wilderness Park
38	Transportation Center	None	None	Bike Racks available - OCTC (Orange County Transportation Center)	Residential neighborhoods	Irvine Metrolink Station	Recommend enclosed bike lockers
39	Santa Vittoria Drive	None	None	None	Veeh Ranch Park/service road along San Diego Creek tributary	Southern Linkage - Roadway terminates at Laguna Woods	Potential for Class II Bikeway
40		None	None			Northern Linkage - No Bikeway on Tesla in Irvine	Potential links to Veeh Ranch Park and potential trail along San Diego Creek Tributary

Legend:

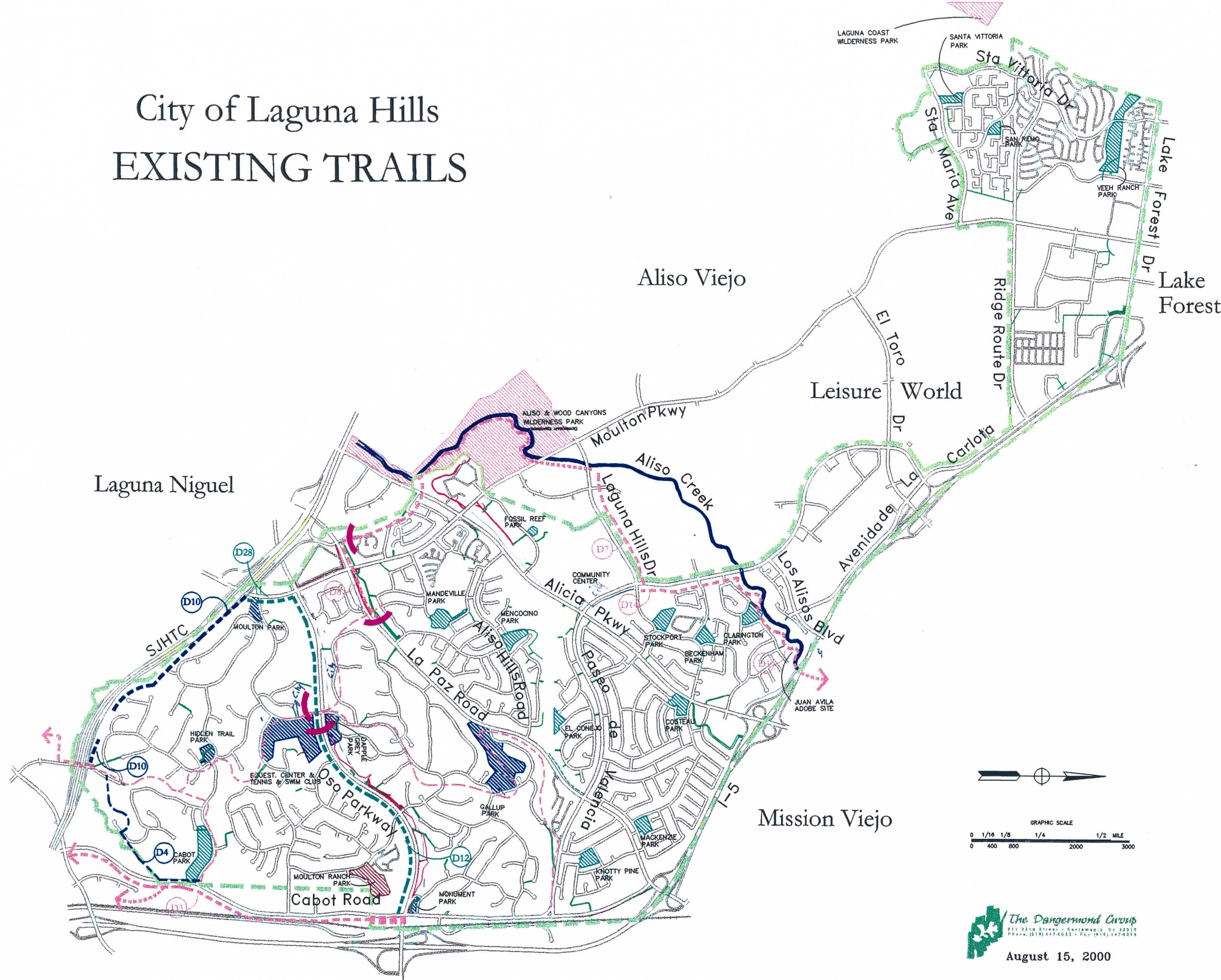
BW = Bikeway

MT = Multi-use Trail

City of Laguna Hills BIKEWAY OPPORTUNITIES AND CONSTRAINTS



City of Laguna Hills EXISTING TRAILS



LEGEND

CITY OF LAGUNA HILLS TRAILS

EXISTING TRAIL

EXISTING MULTI-USE TRAIL

COUNTY TRAILS

EXISTING TRAIL

EXISTING MULTI-USE TRAIL

PROPOSED TRAIL
(EXIST NELLIE GAIL)

ADJACENT CITIES' TRAILS

EXISTING TRAIL

EXISTING MULTI-USE TRAIL

POTENTIAL PUBLIC TRAIL EASEMENT

EXISTING NELLIE GAIL TRAIL

DRAINAGE AND UTILITY EASEMENTS

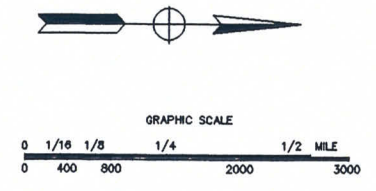
DRAINAGE AND UTILITY EASEMENTS

LAGUNA HILLS CITY LIMIT

TUNNELS WITHIN CITY LIMITS

NOTE:

G14 REFER TO NUMBERED CELLS
ON TRAILS MATRIX



The Dangermond Group
811 22nd Street • Sacramento, CA 95816
Phone: (916) 447-4022 • Fax: (916) 447-4024
August 15, 2000

Laguna Hills

Trails User/Inventory Matrix - 5/5/00

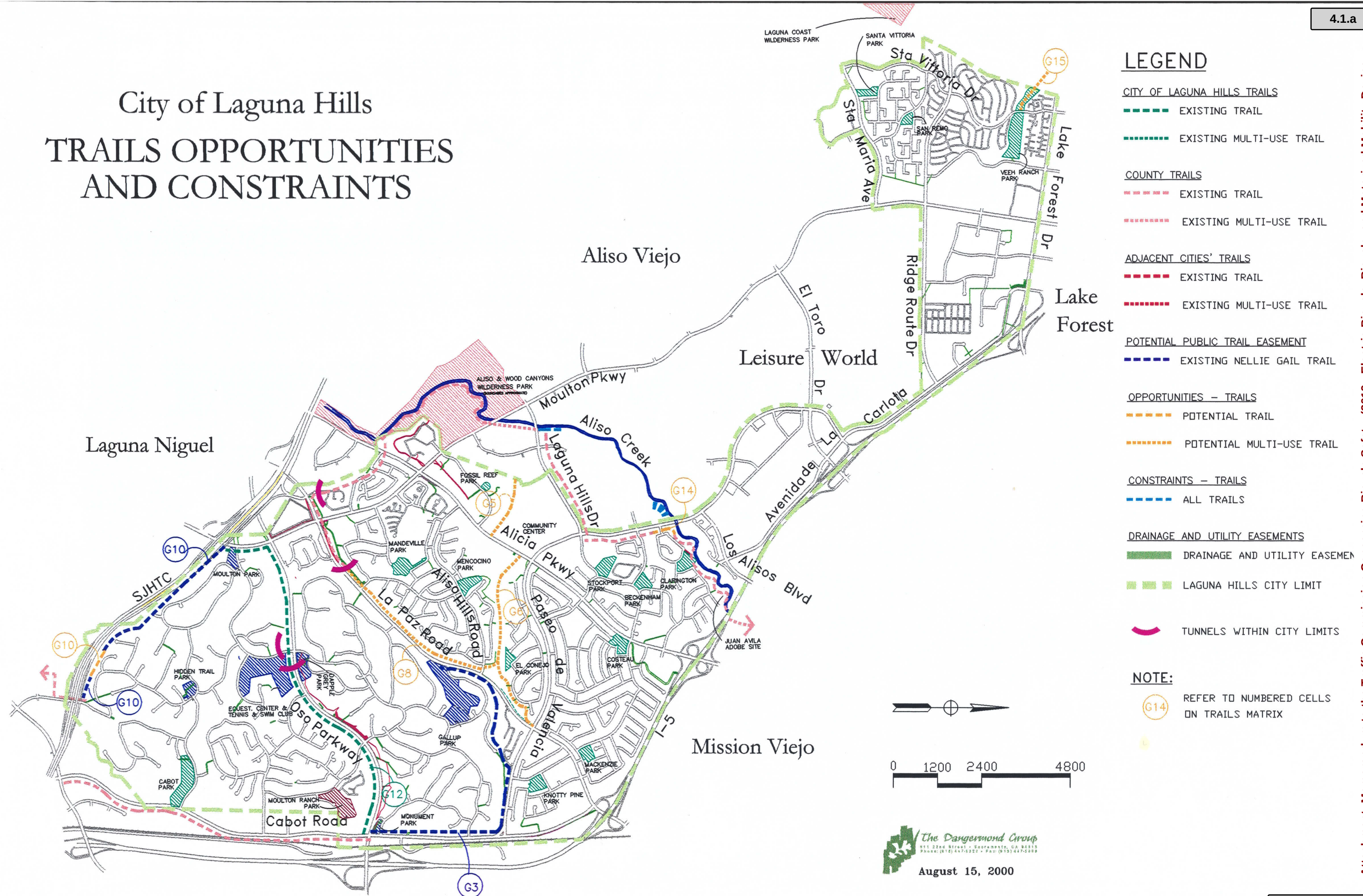
	A	B	C	D	E	F	G
	Corridor	Users	Type	Existing Bikeway/Trail	Destination	Linkages to Adjacent Communities	Improvements/Modifications/Restrictions
1	Aliso Creek	Eques/Ped/Off-road Bic	T	County trail, southeast bank of creek, from Paseo de Valencia to I-5	Clarington Park	South - Ends at Leisure World	
2						North - Ends at I-5	
3	Cabot Road	Eques/Ped/Off-road Bic	T	Narrow County trail, east side of road, from City limit to Oso Parkway on north	Informal City trail along south side of Oso Parkway	Anticipated linkage with Oso Creek Trail System to Dana Point	County proposes obtaining easement and widening trail south of Oso Parkway. Continuation of trail north of Oso potentially achieved by cooperative easement with Nellie Gail to utilize existing trail on west side of Cabot.
4				Nellie-Gail trail on west side of Cabot (on City of Laguna Hills land)	Nellie Gail trail along north side of Oso Parkway		
5	Edison Easement - West	Bic/Ped/Eques	MT	None (existing Southern California Edison service road)		West - Extension to Sheep Hills Park would cross proposed annex land	Room for multi-use trail on Community Center and Edison Easement land. Could be connected to City limit on west.
6	Edison Easement - East	Bic/Ped/Eques	MT	None (existing unpaved Edison access road extends from LaPaz to Alicia)	Community Center/Elementary School/Sheep Hills Park		Connection from LaPaz to Alicia by regrading portions of the Edison access road. Two potential access points: 1. Corner of La Paz and Paseo de Valencia, and 2. La Paz and Aliso Hills Road with an at-grade crossing
7	Laguna Hills Drive	Eques/Ped/Off-road Bic	T	County trail, north side, from Paseo de Valencia to western City limit	Aliso Creek trail into Aliso & Wood Canyons Park	By-passes leisure World	
8	La Paz Road	Bic/Ped/Eques	MT	County trail, north side of street, from Nellie Gail tunnel crossing, west under Moulton, continuing north to County Aliso Creek Trail in Aliso & Woods Canyon Parks	Aliso Creek in Aliso & Woods Canyon Park/Nellie Gail trail/MacKenzie Park	South - tunnel crossing beneath Moulton Parkway and continuing west to County Aliso Creek Trail	Multi-use Trail on north side in open space from Moulton to Aliso hills Drive - potential connection to the EdisonEasement Trail west
9						North - Class II bikeway from Muirlands Blvd.north. Over I-5 the only connection is the sidewalk	
10	Off-road - SJHTC - north perimeter	Eques/Ped/Off-road Bic	T	Nellie Gail trail, from Moulton to just east of Pinestrap Circle - interrupted by Cal Trans fenced no access area - picks up again just west of Greenfield		Link County trail from Laguna Niguel to Aliso & Woods Canyon	Utilize existing Nellie Gail Trail to link the following two segments: 1. Moulton Way to Pinestrap Circle, and 2. Greenfield segment. Need easement over CalTrans no access area at top of slope
11	Moulton Parkway	Eques/Ped/Off-road Bic	T	Trail from City Limit on north heading south to La Paz			
12	Oso Parkway	Eques/Ped/Off-road Bic	T	Trail on south side of street from Moulton to Cabot	Southbound County trail, east side of Cabot Road		Existing Nelli-Gail trail is located on slope. A second trail is located at base of slope on City easement Laguna Hills anticipates formalizing a trail closer to the street where the grades are less steep.
13		Eques/Ped/Off-road Bic	T	Trail on north side of street from Moulton to Cabot			
14	Paseo de Valencia	Ped/Eques	T	Trail on northeast side from Laguna Hills Drive to just south of Aliso Creek	County Aliso Creek trails, north and south by-passes Leisuer World		Complete trail from Kennington to Aliso Creek turn off on north side of street
15	San Diego Creek Tributary Trail	Bic/Ped/Eques	MT	Service road along south bank of San Diego Creek tributary	None in City	Joins San Diego Creek north in Irvine	Multi-use trail could use easement on existing service road
16	Lakes Area Trail	Bic/Ped/Eques	MT	None - Parking available at County Courthouse	Veeh Ranch Park	San Diego Creek Tributary Trail	Privately owned land
17	La Paz Road/Oso Parkway Connector	Eques/Ped/Off-road Bic	T	Nellie Gail trail, from Oso Parkway, between Falcon Hills and Nellie Gail, to La Paz tunnel	Link Oso Parkway Trail with La Paz trail	Aliso Creek Trail by way of La Paz trail	Nellie Gail HOA land

Legend

T = Equestrian/Pedestrian Trail

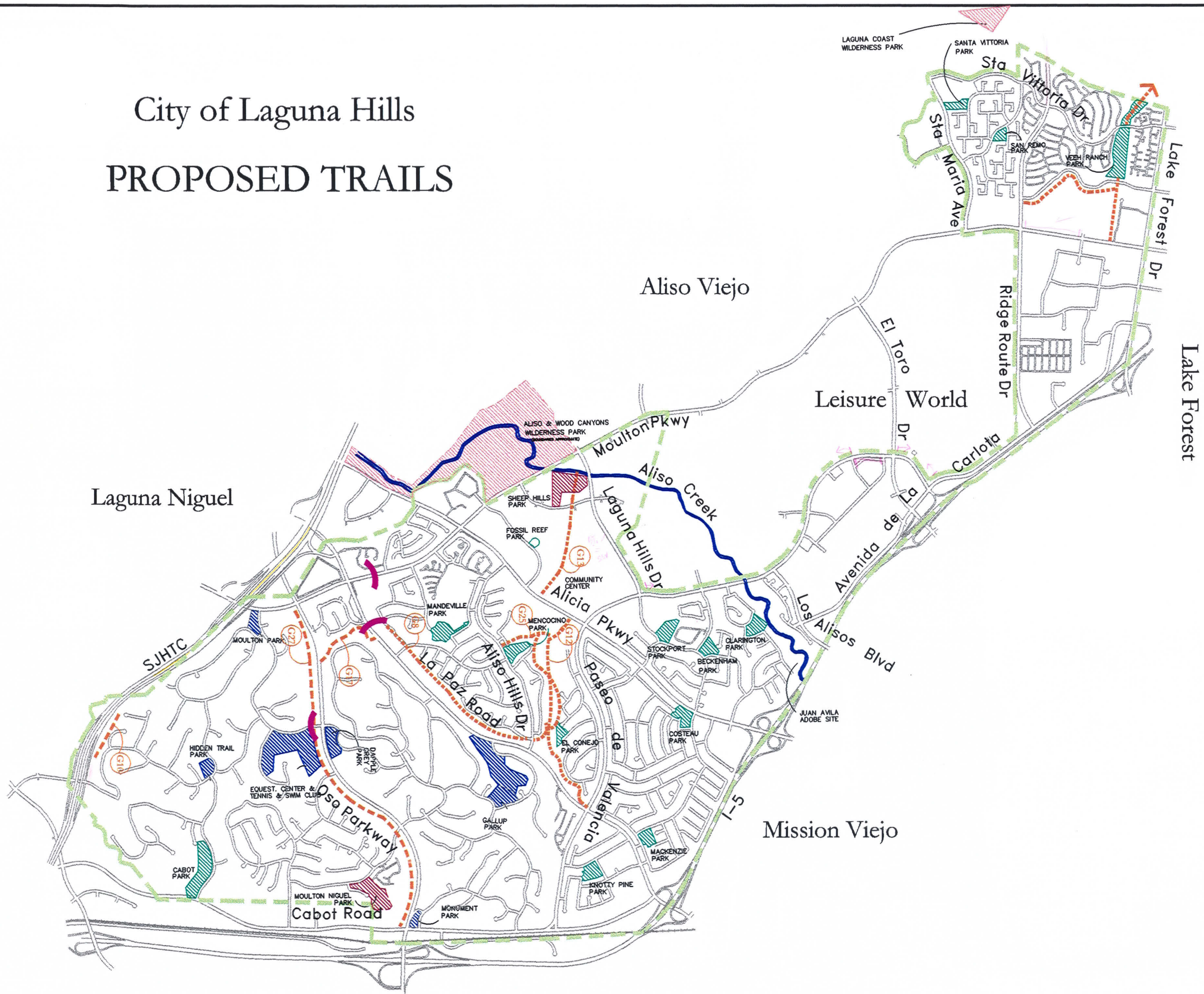
MT = Multi-Use Corridor

City of Laguna Hills TRAILS OPPORTUNITIES AND CONSTRAINTS



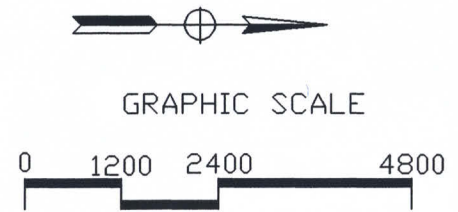
The Dangermond Group
111 22nd Street • Sacramento, CA 95815
Phone: (916) 447-9222 • Fax: (916) 447-5000
August 15, 2000

City of Laguna Hills PROPOSED TRAILS



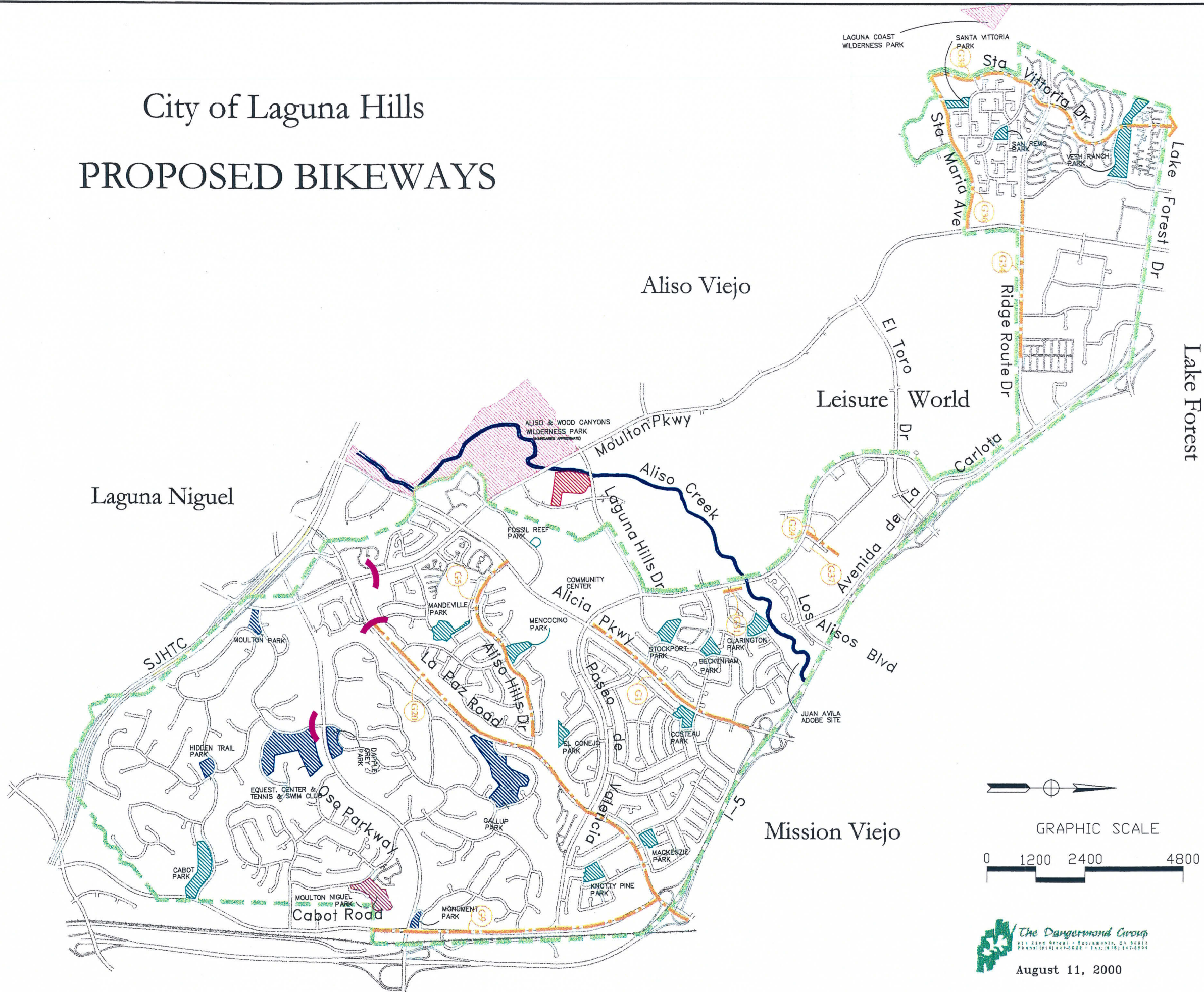
LEGEND

- OPPORTUNITIES – BIKEWAYS & TRAILS
- PROPOSED MULTI-USE TRAIL
 - PROPOSED TRAIL
- DRAINAGE AND UTILITY EASEMENTS
- LAGUNA HILLS CITY LIMIT
 - TUNNEL



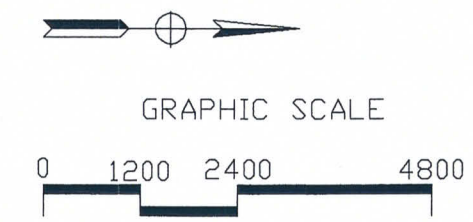
 **The Dangermond Group**
511 22nd Street • Broomfield, CO 80020
Phone: (303) 447-3022 • Fax: (303) 447-3025
January 18, 2001

City of Laguna Hills PROPOSED BIKEWAYS



LEGEND

- OPPORTUNITIES — BIKEWAYS & TRAILS**
- PROPOSED CLASS I BIKEWAY
 - PROPOSED CLASS II BIKEWAY
 - PROPOSED CLASS III BIKEWAY
- DRAINAGE AND UTILITY EASEMENTS**
- LAGUNA HILLS CITY LIMIT
 - TUNNEL

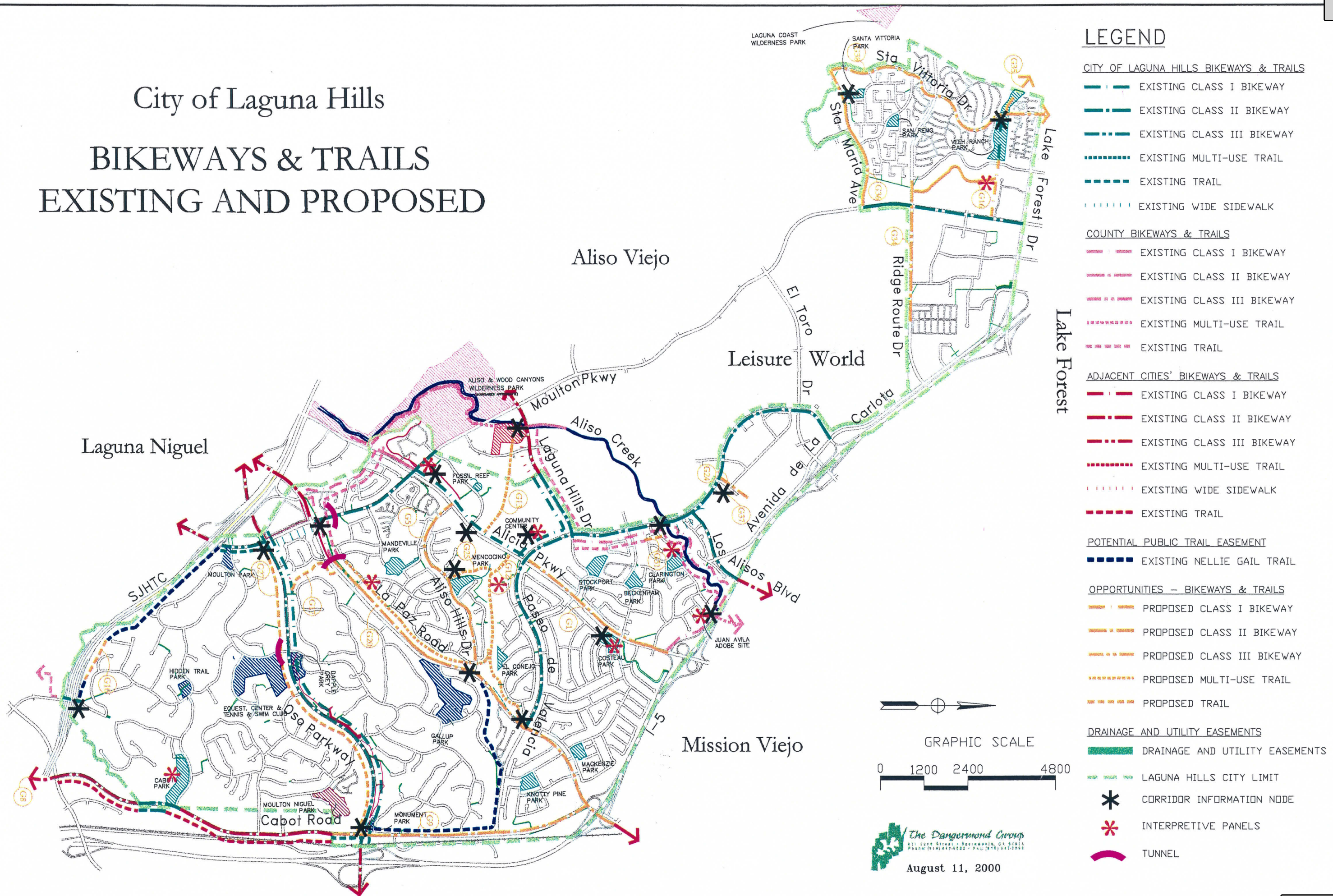


The Dangermond Group
August 11, 2000

City of Laguna Hills

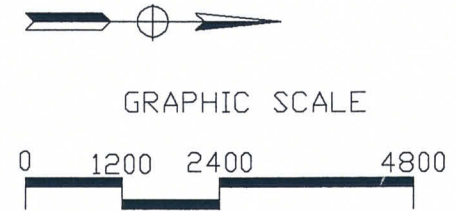
BIKEWAYS & TRAILS

EXISTING AND PROPOSED



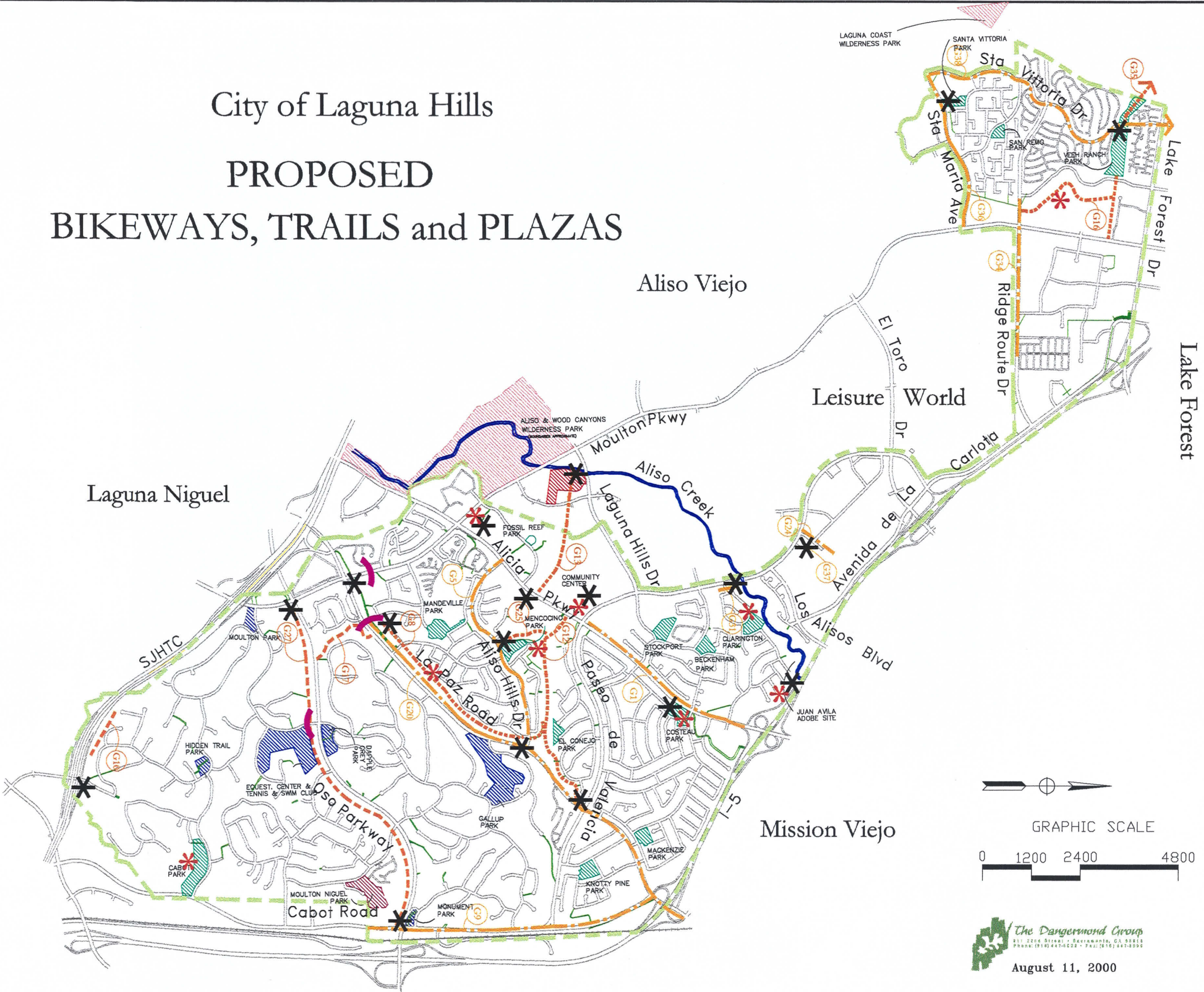
LEGEND

- CITY OF LAGUNA HILLS BIKEWAYS & TRAILS**
 - EXISTING CLASS I BIKEWAY
 - EXISTING CLASS II BIKEWAY
 - EXISTING CLASS III BIKEWAY
 - EXISTING MULTI-USE TRAIL
 - EXISTING TRAIL
 - EXISTING WIDE SIDEWALK
- COUNTY BIKEWAYS & TRAILS**
 - EXISTING CLASS I BIKEWAY
 - EXISTING CLASS II BIKEWAY
 - EXISTING CLASS III BIKEWAY
 - EXISTING MULTI-USE TRAIL
 - EXISTING TRAIL
- ADJACENT CITIES' BIKEWAYS & TRAILS**
 - EXISTING CLASS I BIKEWAY
 - EXISTING CLASS II BIKEWAY
 - EXISTING CLASS III BIKEWAY
 - EXISTING MULTI-USE TRAIL
 - EXISTING WIDE SIDEWALK
 - EXISTING TRAIL
- POTENTIAL PUBLIC TRAIL EASEMENT**
 - EXISTING NELLIE GAIL TRAIL
- OPPORTUNITIES — BIKEWAYS & TRAILS**
 - PROPOSED CLASS I BIKEWAY
 - PROPOSED CLASS II BIKEWAY
 - PROPOSED CLASS III BIKEWAY
 - PROPOSED MULTI-USE TRAIL
 - PROPOSED TRAIL
- DRAINAGE AND UTILITY EASEMENTS**
 - DRAINAGE AND UTILITY EASEMENTS
- LAGUNA HILLS CITY LIMIT**
- CORRIDOR INFORMATION NODE**
- INTERPRETIVE PANELS**
- TUNNEL**



The Dangermond Group
811 West Street • Orange, CA 92668
Phone: (714) 947-6222 • Fax: (714) 947-6222
August 11, 2000

City of Laguna Hills PROPOSED BIKEWAYS, TRAILS and PLAZAS



LEGEND

OPPORTUNITIES – BIKEWAYS & TRAILS

- PROPOSED CLASS I BIKEWAY
- PROPOSED CLASS II BIKEWAY
- PROPOSED CLASS III BIKEWAY

OPPORTUNITIES – BIKEWAYS & TRAILS

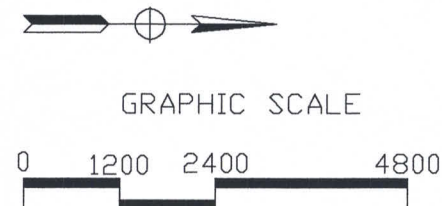
- PROPOSED MULTI-USE TRAIL
- PROPOSED TRAIL

DRAINAGE AND UTILITY EASEMENTS

- DRAINAGE AND UTILITY EASEMENTS

LAGUNA HILLS CITY LIMIT

- CORRIDOR INFORMATION NODE
- INTERPRETIVE PANELS
- TUNNEL



The Dangermond Group
811 2216 Street • Sacramento, CA 95811
Phone: (916) 447-8022 • Fax: (916) 447-8090
August 11, 2000



LAKE AREA TRAIL CONCEPTUAL ALIGNMENT Laguna Hills

Legend

- Existing Trail
- Proposed Corridor
- ✱ Wayfinding Signage Plaza
- ✱ Information Signage Plaza



EDISON EASEMENT/ LA PAZ ROAD CONCEPTUAL ALIGNMENT Laguna Hills

Legend

-  Edison Easement
-  Existing Trail
-  Proposed Multi-Use Corridor
-  Bridge
-  Proposed Loop Trail
-  Wayfinding Signage Plaza
-  Information Signage Plaza



The Dangermond Group
Recreation & Environmental Planning

November 22, 2000



EDISON EASEMENT/ LA PAZ ROAD CONCEPTUAL ALIGNMENT ALTERNATE WITH ALICIA PARKWAY OVERPASS Laguna Hills

Legend

- Edison Easement
- Existing Trail
- Proposed Multi-Use Corridor
- Bridge
- Proposed Loop Trail
- Wayfinding Signage Plaza
- Information Signage Plaza

The Dangermond Group
Recreation & Environmental Planning
November 22, 2000

Pacific Coast Birds

From fall through spring, large flocks of migrating shorebirds gather along the beach to feed on shellfish, sand crabs, and beach hoppers. Each species hunts in its own way by probing in the sand, chasing surface prey, turning over pebbles, or exploring beached kelp. Their specialized feeding habits allow the various species to coexist without competition.

California beaches mark the edge of another habitat rich with bird life — the open ocean. Most ocean-going birds rarely venture close to shore, remaining at sea to follow schools of fish, squid, and zooplankton. The sea birds commonly seen near shore are dependent on the coastline for food or roosting. Scoters feed only in shallow water, while pelicans, gulls, and cormorants can feed far out to sea but return to land to sleep.

Brown pelicans
glide inches above the water in
flocks of up to 20 birds.

Surf scoters

easily crush bottom-dwelling
shellfish with their
thick beaks.

Sanderlings scurry after the waves,
searching the wet sand for small
bits of food.

Marbled godwits
use their long beaks to probe
the sand for small shellfish.

Killdeer lead enemies away from their
rocky nests by putting on a "broken wing" act.

Western gulls are most
common coast birds; can practically
anything and adjust easily to people.

EXISTING TRAILS

INTERPRETIVE
PANELS

DECOMPOSED
GRANITE PAVING

TENSION FABRIC
STRUCTURE W/ WOOD
OR CONC. POSTS

NATIVE VEGETATION

DRINKING FOUNTAIN

WOOD BENCHES

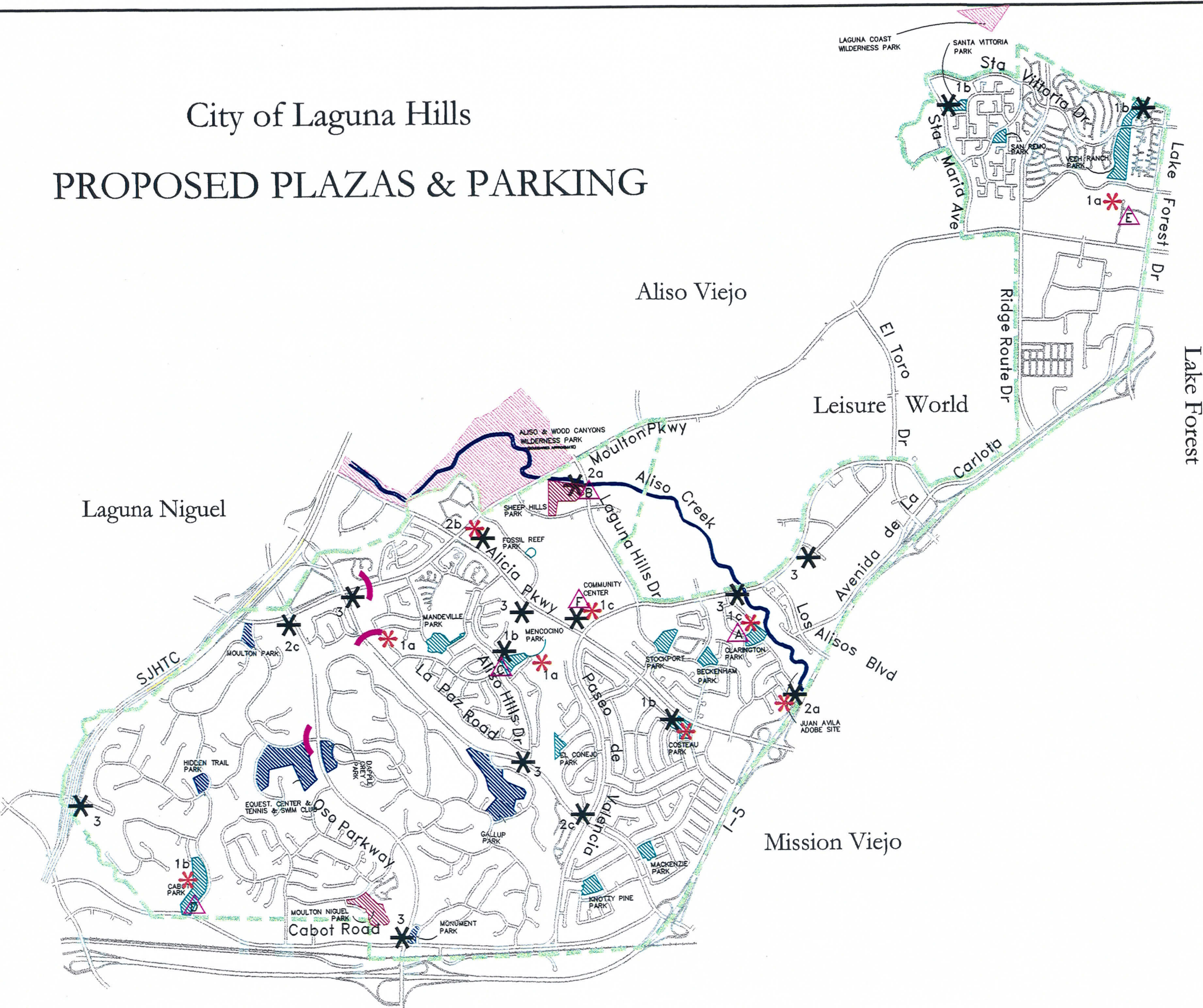
RELOCATED
BOULDERS

Trailhead Plaza

Scale 1/4" = 1'

Attachment: Memorandum to the Traffic Commission Concerning Bicycle Safety (2019 : Electric Bicycle, Bicycle, and Motorized Mobility Device

City of Laguna Hills PROPOSED PLAZAS & PARKING



LEGEND

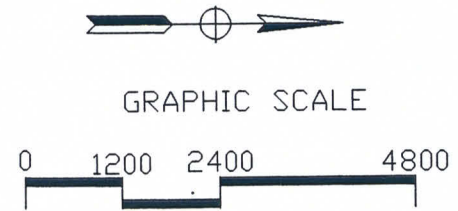
DRAINAGE AND UTILITY EASEMENTS

- LAGUNA HILLS CITY LIMIT
- CORRIDOR INFORMATION PANEL
- INTERPRETIVE PANEL
- TUNNEL
- PLAZA TYPE

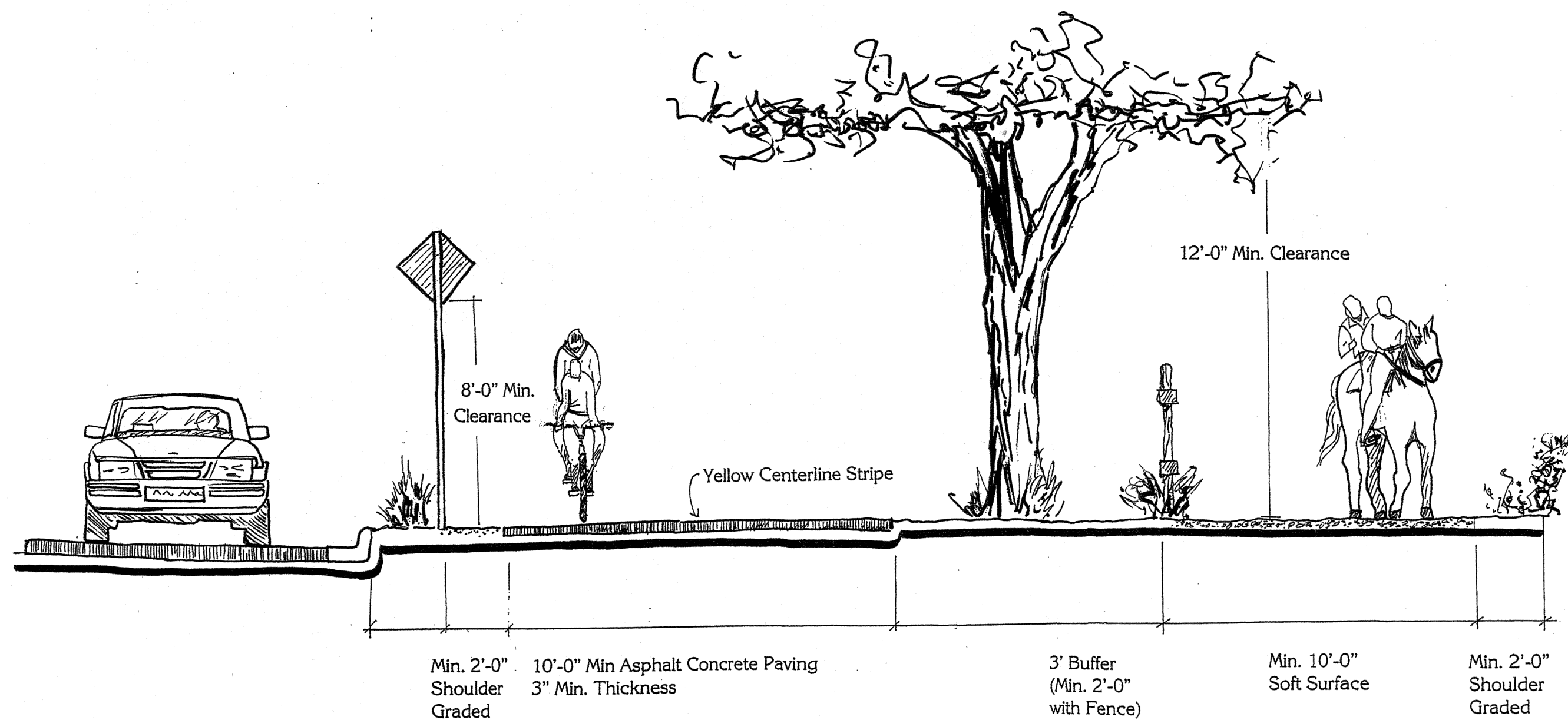
Note:
Panels are to be located at plazas adjacent to trails and Class I Bikeways. The plaza type numbers are described on the Plaza Cost Estimate.

EXISTING & PROPOSED PARKING

- A On-street parking at Clarington Park - access to County Aliso-Creek Trail and Class I Bikeway
- B On-street parking at Sheep Hills Park - access to County Aliso-Creek Trail and Class I Bikeway
- C On-street parking at Mendicino Park - access to proposed Edison Easement Trail and Class I Bikeway
- D Off-street parking at Cabot Park - access to Nello Gail Trails and to existing Class II Bikeway on Cabot
- E Off-street parking at courthouse - access to proposed connection to existing Veeh Ranch Park Class I Bikeway
- F Off-street parking at Community Center - access to Class I Bikeway along Alicia Blvd.

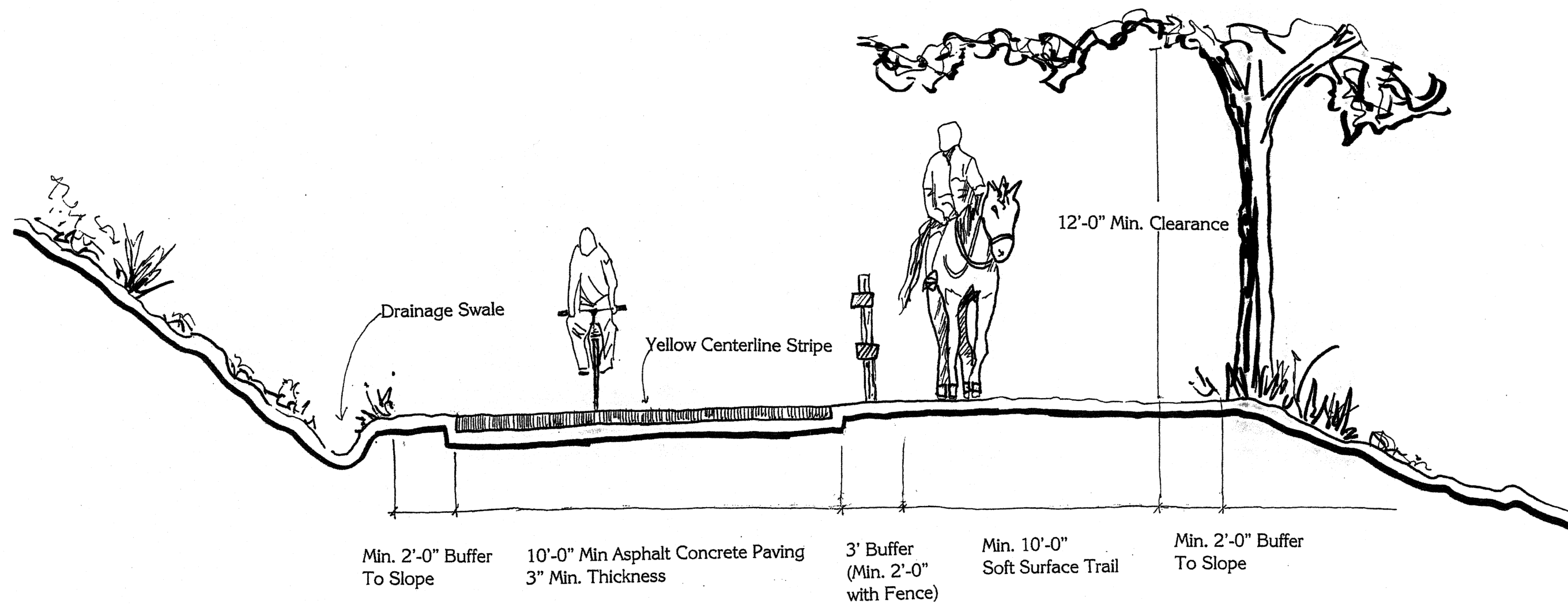


The Dangermond Group
November 22, 2001



Bikeway and Trail Sections

Multi-use Corridor
With Flat Condition



Bikeway and Trail Sections

Multi-use Corridor
with Slope Condition



HABITAT INVENTORY ALICIA PARKWAY REVEGETATION Laguna Hills

Legend

	Coastal Sage Scrub (CSS)		Riparian - Disturbed
	CSS - Revegetation		Riparian - Emergent
	CSS - Mixed with Landscape		Riparian - Revegetation
	Grassland - Non-Native		Disturbed
	Grassland - With coyote Brush		Mulefat
	Mixed- Ruderal/ Non-Native Grassland/Landscape		Ornamental Landscape
	Mixed - Multiple Species		Willow



Legend

	Coastal Sage Scrub (CSS)
	CSS - Revegetation
	CSS - Mixed with Landscape
	Grassland - Non-Native
	Grassland - With coyote Brush
	Mixed- Ruderal/ Non-Native Grassland/Landscape
	Mixed - Multiple Species
	Riparian - Disturbed
	Riparian - Emergent
	Riparian - Revegetation
	Disturbed
	Mulefat
	Ornamental Landscape
	Willow



North
NTS

HABITAT INVENTORY VEEH RANCH PARK Laguna Hills



HABITAT INVENTORY

ALISO CREEK

Laguna Hills

Legend

	Coastal Sage Scrub (CSS)
	CSS - Revegetation
	CSS - Mixed with Landscape
	Grassland - Non-Native
	Grassland - With coyote Brush
	Mixed- Ruderal/ Non-Native Grassland/Landscape
	Mixed - Multiple Species
	Riparian - Disturbed
	Riparian - Emergent
	Riparian - Revegetation
	Disturbed
	Mulefat
	Ornamental Landscape
	Willow

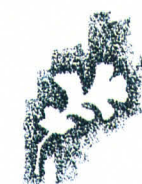


North
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HABITAT INVENTORY CABOT ROAD OPEN SPACE Laguna Hills

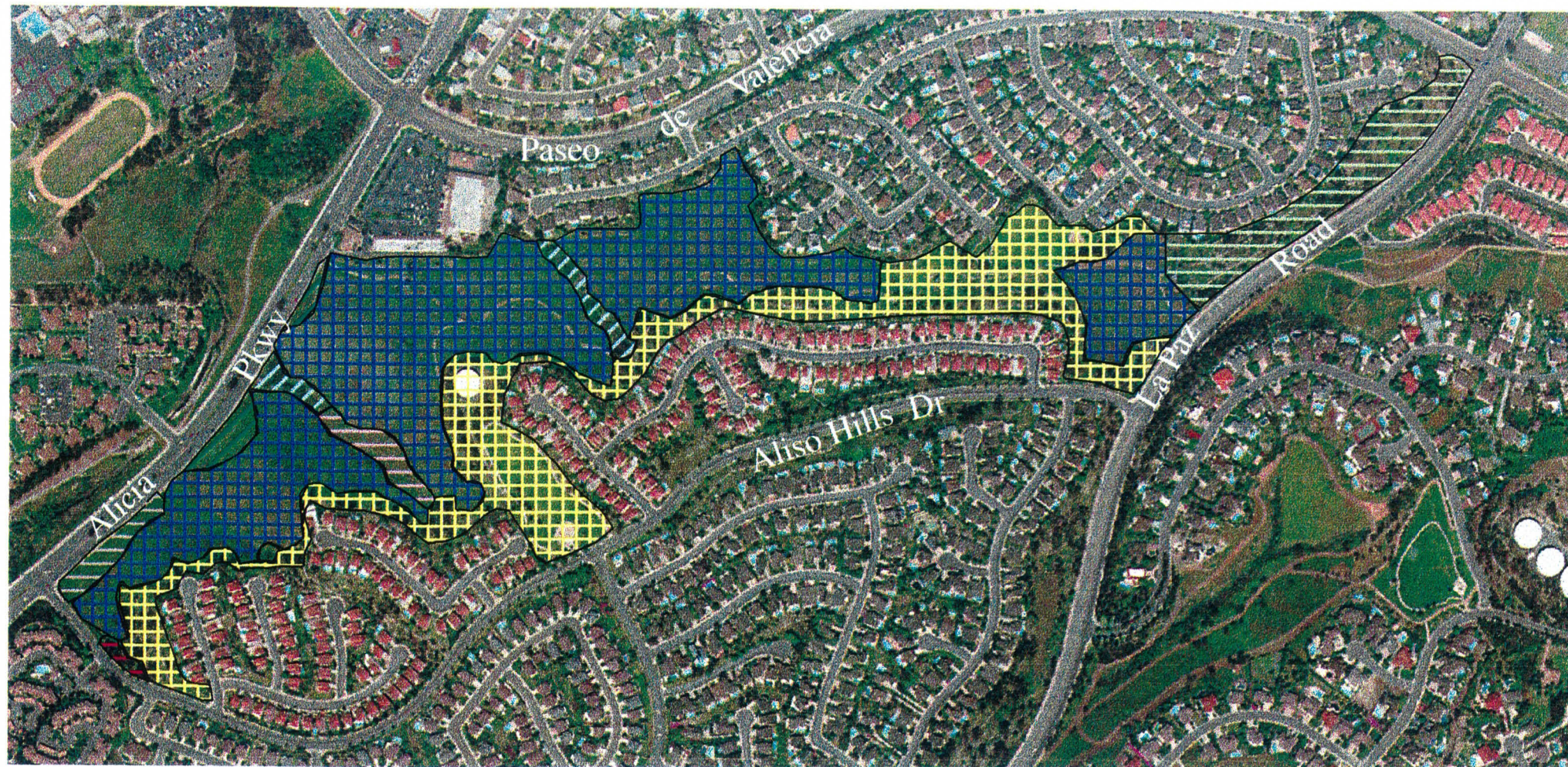
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	Grassland - With coyote Brush
	Mixed- Ruderal/ Non-Native Grassland/Landscape
	Mixed - Multiple Species
	Riparian - Disturbed
	Riparian - Emergent
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	Disturbed
	Mulefat
	Ornamental Landscape
	Willow



The Dangermond Group
Recreation & Environmental Planning

July 24, 2000

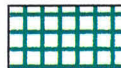
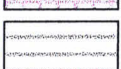
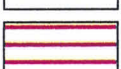


HABITAT INVENTORY

EDISON EASEMENT

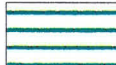
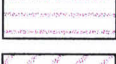
Laguna Hills

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-  Disturbed
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-  Ornamental Landscape
-  Willow



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-  Riparian - Emergent
-  Riparian - Revegetation
-  Disturbed
-  Mulefat
-  Ornamental Landscape
-  Willow



NTS

HABITAT INVENTORY LA PAZ ROAD/GALLUP CIRCLE Laguna Hills





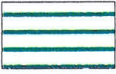
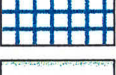
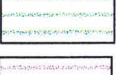
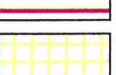
North
NTS

HABITAT INVENTORY

OSO PARKWAY EAST

Laguna Hills

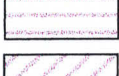
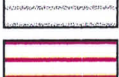
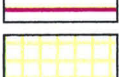
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-  Mulefat
-  Ornamental Landscape
-  Willow





Legend

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-  CSS - Mixed with Landscape
-  Grassland - Non-Native
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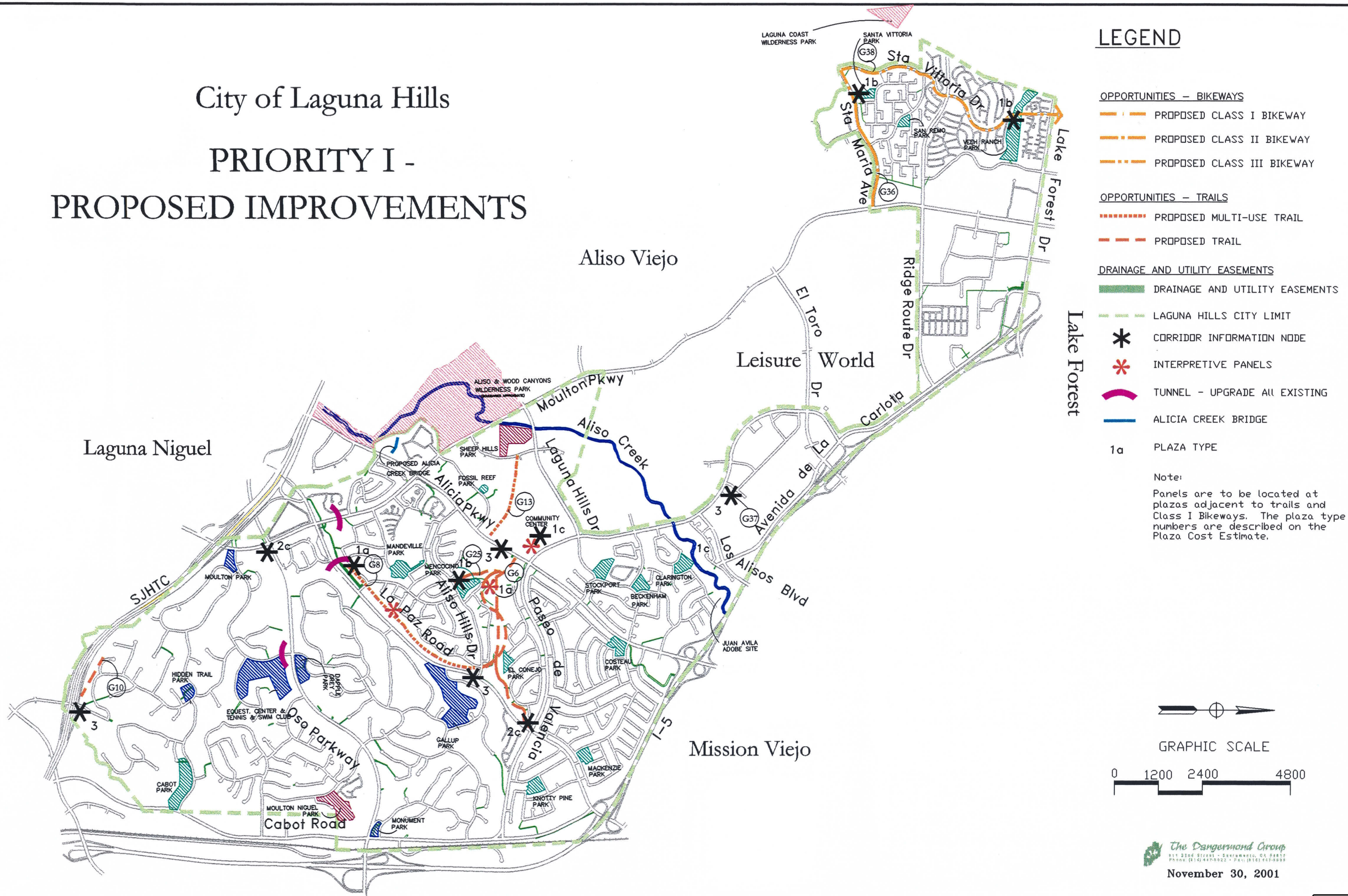


HABITAT INVENTORY OSO PARKWAY WEST Laguna Hills



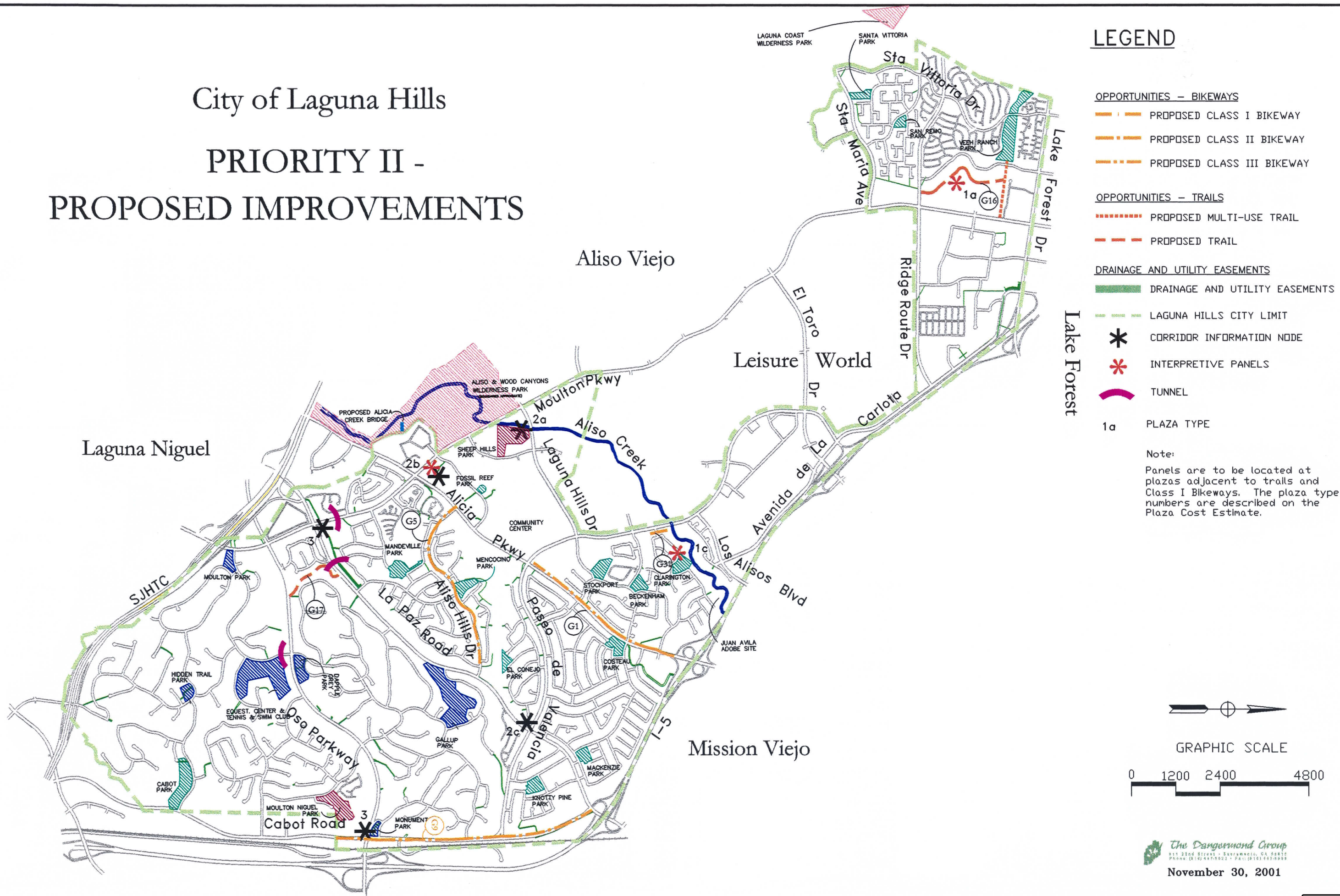
City of Laguna Hills

PRIORITY I - PROPOSED IMPROVEMENTS



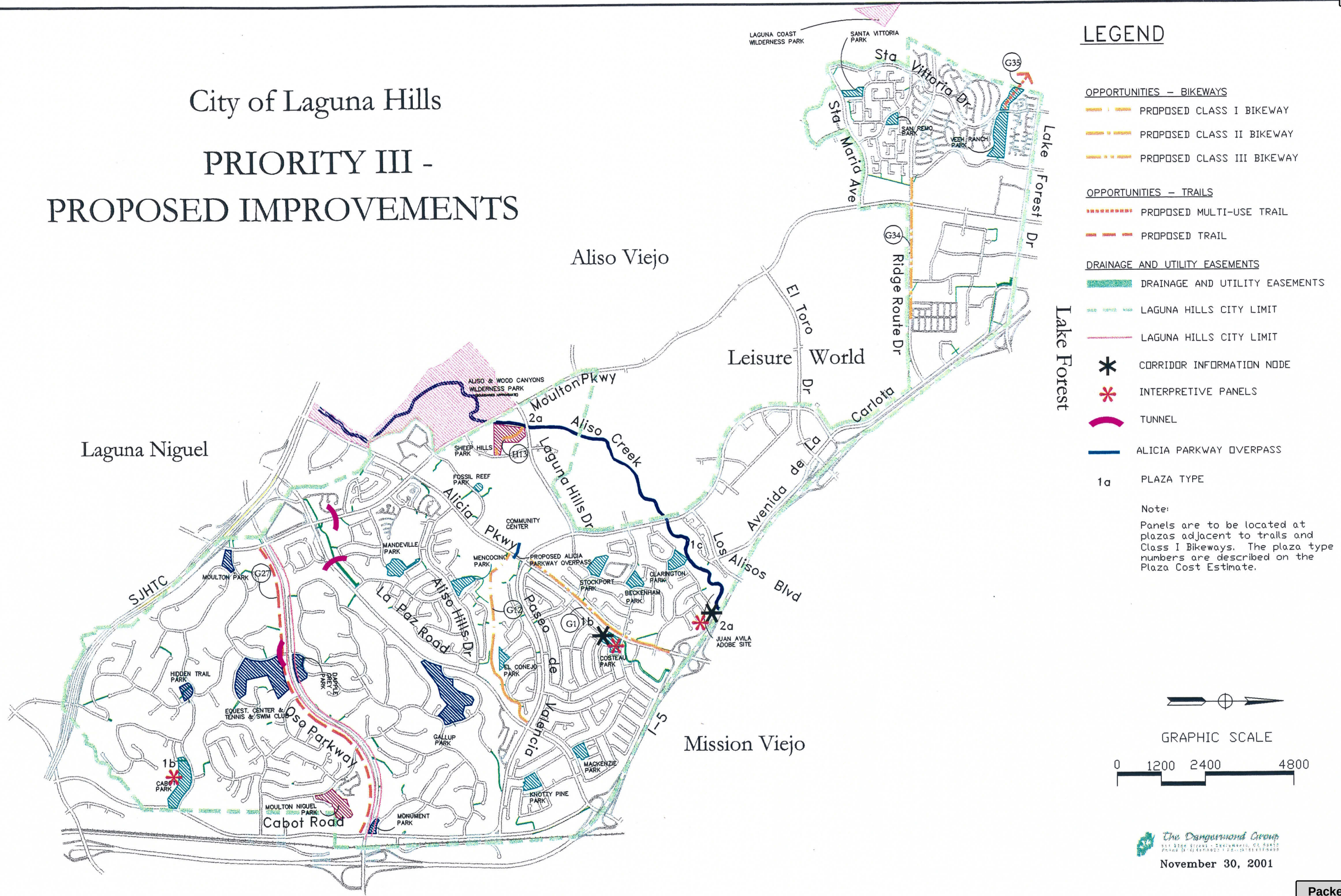
City of Laguna Hills

PRIORITY II - PROPOSED IMPROVEMENTS



City of Laguna Hills

PRIORITY III - PROPOSED IMPROVEMENTS



Attachment 3

CITY OF LAGUNA HILLS

AGENDA REPORT PUBLIC SERVICES DEPARTMENT

ISSUE: **ADOPTION OF THE 2009 ORANGE COUNTY TRANSPORTATION
AUTHORITY COMMUTER BIKEWAYS STRATEGIC PLAN AS THE
CITY'S BICYCLE TRANSPORTATION PLAN**

SUMMARY:

The Orange County Transportation Authority (OCTA) has recently released the 2009 Commuter Bikeways Strategic Plan (CBSP). The CBSP encourages the development of a safe and convenient bikeway system focusing on the needs of commuters, and on strategies that will make bicycling a more attractive alternative to driving. It also provides criteria for prioritizing projects and identifies potential grant funding sources. This plan was developed in coordination with Orange County's local jurisdictions and public participants. Adopting this plan as the City's Bicycle Transportation Plan will make the City eligible for State of California Bicycle Transportation Account (BTA) funds. The Traffic Commission recommended this plan for adoption at its November 18, 2009, meeting.

BACKGROUND:

The OCTA adopted the CBSP on May 22, 2009. The CBSP is a regional planning document that identifies existing and proposed bikeways in Orange County. Through the cooperation of the cities and the County, an inventory was taken of existing bikeways and priorities for new bikeways were identified. Prioritization of the proposed bikeways, as identified in the plan, was based on several factors, including input from local jurisdictions and the public, as well as connectivity to transit and regional destinations. A copy of the complete CBSP is available on the OCTA website at www.octa.net/bikeways.aspx.

In addition to analysis of existing and proposed bikeways, the CBSP also contains

**RECOMMENDATION: THAT THE CITY COUNCIL ADOPT THE OCTA CBSP AS
THE CITY BICYCLE TRANSPORTATION PLAN IN ORDER FOR THE CITY TO MEET
ELIGIBILITY REQUIREMENTS FOR STATE BICYCLE TRANSPORTATION
FUNDING.**

120809/DEPT/PUBLIC SERVICES/CINDY/AGENDA/CITY COUNCIL/OCTA BIKEWAYS STRATEGIC PLAN

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OCTA Bikeways Strategic Plan
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information regarding several aspects of bicycle commuting. The CBSP provides information on bicycle amenities, such as bike lockers, parking, signage, and trail markings. There is discussion of safety and education programs, innovative treatments, bikeway fundamentals, and funding sources, as well.

The CBSP complies with the eligibility requirements of the BTA, which is administered by Caltrans. The City is eligible to adopt the OCTA plan as its own Bicycle Transportation Plan (BTP). Upon adoption of the CBSP, the City is able to pursue State funds whenever they become available for bicycle facility improvements.

Attached to this report is the introduction of the CBSP and the section providing background information about the bikeways and commuters in Laguna Hills. Also attached are tables of existing and proposed bikeways and the estimated cost to perform all of the proposed upgrades. This sheet also depicts the Regional Priority Proposed Bikeway in Laguna Hills, which is Cabot Road from La Paz Road to Oso Parkway. The bikeway is currently a Class III bikeway (on-road, shared-lane signed bicycle route), and is to be upgraded in the future to a Class II bikeway (on-road, striped and signed bicycle lane). Regional priorities were selected based upon improvements that will provide the greatest benefit to the commuters.

The City's 2009 General Plan states, in part, "bicycling for recreation and transportation is a practical option for many in Laguna Hills. Increasing cycling opportunities in the City is an important citywide goal. To achieve this goal, the City will provide a convenient network of bike paths and lanes that connect residences, jobs, shopping, services, transit, recreation, civic uses, and schools. Convenient and secure bicycle parking, showers at places of employment, and an educated driving public can make biking more attractive. The City has an existing system of bikeways that provide internal community links as well as bicycle access to many of the surrounding communities. Laguna Hills utilizes the standards developed by Caltrans to classify bikeways within the City. The City will continue to explore opportunities to upgrade and expand the bike network. A comprehensive bike network will provide an alternative to driving and will connect neighborhoods to shopping, jobs, services, schools, other activity centers, as well as the regional transportation systems." Adoption of the 2009 OCTA CBSP as the City's BTP is consistent with the recently adopted General Plan.

A comprehensive and complete bicycle network will greatly benefit the public in Orange County. As the plan is implemented by local jurisdictions, bikeways and improved bicycle facilities will make a positive contribution to Orange County's goal of a balanced transportation system.

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FISCAL IMPACT:

The proposed bikeway improvement cost for the City is estimated to be \$1,861,720. Projects will be implemented on an individual basis as funding is obtained in future years.

RECOMMENDATION: THAT THE CITY COUNCIL ADOPT THE OCTA CBSP AS THE CITY BICYCLE TRANSPORTATION PLAN IN ORDER FOR THE CITY TO MEET ELIGIBILITY REQUIREMENTS FOR STATE BICYCLE TRANSPORTATION FUNDING.

ATTACHMENTS:

- CBSP Chapter 1 Introduction
- Laguna Hills Bicycle Commuter information
- Laguna Hills Existing and Proposed Bikeways Tables
- Orange County Bikeways Map Section 7
- City of Laguna Hills Bicycle Network Exhibit, Figure M-3

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CHAPTER 1. Introduction

1.1. Purpose & Need

This Commuter Bikeways Strategic Plan (CBSP) has been developed by the Orange County Transportation Authority (OCTA) to encourage the enhancement of Orange County's regional bikeways network, in order to make bicycle commuting a more viable and attractive travel option.

There are a number of challenges that must be overcome for Orange County to excel as a bicycling region, including improving safety, access to key destinations, coordination of plans, and support facilities. Furthermore, there are also opportunities, such as increasing congestion, climate change, and oil dependency that bicycling can play a large role in mitigating. The goal of the CBSP is to help address these many challenges by providing:

- A strategy for improving the regional bikeway network;
- Eligibility for state Bicycle Transportation Account (BTA) funds;
- Identification of roles and responsibilities for OCTA regarding bikeways; and
- Documentation of existing and planned Orange County bikeways.

The projects described in this plan are a compilation of projects planned by Orange County Cities and the County of Orange. The CBSP is a long range, financially unconstrained planning document. Funding for these projects will not be limited to the OCTA Call for Projects. It will be the responsibility of each implementing agency to identify funding sources for the projects within their purview.

1.2. Setting

According to the 2005 American Community Survey (U.S. Census Bureau), less than 1 percent of Orange County's population commutes by bicycle. The vast majority of commuters (77.3%) commute to work by driving alone. This shows how automobile dependent Orange County currently is, and why many of the streets and freeways are at, or close to, maximum capacity. The Orange County Projections, produced by the Center for Demographic Research (out of California State University, Fullerton), estimates Orange County's 2005 population of 3,059,950 to grow by nearly 600,000, more than 19 percent, by 2035, which will only put more demand on transportation infrastructure.

Much of the early suburban development took place in Northern Orange County, and infrastructure facilities were geared towards commutes into Los Angeles. The Pacific Electric rail cars served much of this area, until their service was stopped in the early 1960s. It was at that time that Orange County residents began to be more dependent on automobiles for their commutes.

North Orange County was designed with grid-pattern road networks, much like Los Angeles. The grid-pattern, along with the relatively level topography, is beneficial to bicycle commuters, as it allows them to maneuver through short blocks, for more direct routes. Unfortunately, many of these streets were not designed to support the demand that we see today. They are often narrow, and not designed to safely accommodate automobiles together with bicycles. However, these roadways, along with some of the watersheds and abandoned rail rights-of-way, retain opportunities to make bicycling more viable.

Much of South Orange County was developed as planned communities over the last 30 years. The roadway networks are generally wider and more circuitous than in North County. The advantage to these roads is that many of them were designed with bike lanes along the shoulders. However, South

OCTA Call for Projects

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County has more elevation changes, and the planned communities tend to be relatively low density with housing separated from work and shopping centers. This layout often results in longer trips, and the lower densities consequently result in fewer job opportunities near the residential communities. Nonetheless, many opportunities still exist, such as providing improved access and facilities at transit stations.

Applying the strategies discussed in this plan, and implementing the local jurisdictions' projects, will help to create a regional bikeway network that will benefit Orange County communities, from the bicycle dependent, to casual cyclists, and people of all income levels. Furthermore, the build-out of the bikeway network, along with the favorable climate in the region, could make Orange County an even more enjoyable place to live and work.

1.3. Bikeway Fundamentals

Bicycles share equal rights and responsibilities with other vehicles on the road, according to the California Department of Transportation (Caltrans). However, while bicyclists share all the same rights and responsibilities of motorists, bicycle-specific facilities are often provided in an effort to enhance safety for both bicyclists and motorists. Bicyclists also need to be conscious of their skill and comfort levels when choosing their travel routes. The following sections provide a brief overview of the various classes of bikeways, and some general characteristics of the different skill levels of bicyclists.

1.3.1. Classes of Bikeways

There are three classes of commuter bikeways:

- Class I – off-street paved bike paths
- Class II – on-road striped and signed bicycle lanes
- Class III – on-road shared-lane signed bicycle routes

Off-street paths are facilities on a separate right-of-way from roadways, and are usually shared by bicyclists and pedestrians. Shared paths should not be used as high-speed bikeways, as the safety of the other non-motorized users must be considered.

Bicycle lanes are on-street facilities that use painted stripes and stencils to delineate the right of way assigned to bicyclists and motorists, and to provide for more predictable movements by each.

Bicycle routes are signed on-street facilities that accommodate vehicles and bicycles in the same travel lane. Bicycles are permitted on most roadways; however, for safety purposes, signed bicycle routes are often found on streets with lower speeds and traffic volumes.

1.3.2. Bicyclist Skill Levels

The American Association of State Highway and Transportation Officials, or AASHTO, published the *Guide for the Development of Bicycle Facilities* in 1999. This guide provides descriptions for the three general skill levels of bicyclists, as summarized by the A,B, and C typologies below:

- **Advanced** or experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay, and they are typically comfortable riding with motor vehicle traffic.
- **Basic** or more casual adult riders may also be using their bicycles for transportation purposes, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles.

- Children, who still require access to key destinations in their community, such as schools, convenience stores and recreational facilities. They prefer residential streets with low motor vehicle speeds, linked with shared-use paths and busier streets with well-defined pavement markings between bicycles and motor vehicles, so they can avoid riding in the travel lane of major arterials.

The “commuter” bicyclists that this plan refers to are generally the type A riders, but the implementation of the plan will benefit all types.

1.4. Orange County Bikeways

There are currently more than 1000 miles of bikeways in Orange County, with roughly another 700 miles that have been planned. It is the responsibility of the local jurisdictions to plan, implement, and maintain the bikeways in Orange County. These local jurisdictions include all of the 34 Orange County cities, the County of Orange, and Caltrans. All existing and planned bikeway data presented in this plan was submitted by these local jurisdictions. The commuting habits within Orange County region can be generally characterized with the following data:

Population: Approximately 3 million residents

Jurisdictions: 34 cities, the County of Orange, and Caltrans

Commuting Characteristics:

- Mode share (2000 U.S. Census):
 - 77% drive alone
 - 13% carpool
 - 3% public transportation
 - 2% walk
 - 1% ride a bicycle
- Average Daily Vehicle Hours of Delay (SCAG 2008 RTP)
 - In 2003, the average daily VHD was 686,000 hours
 - By 2035, VHD is projected to increase by 407,000 hours to 1,093,000
- Average Vehicle Miles Traveled (SCAG 2008 RTP)
 - In 2003, the average daily VMT was 70,458,000
 - By 2035, VMT is projected to increase by 14,829,000 to 85,287,000

Bikeways:

- 1037.7 miles built
 - 26% Class III bike routes
 - 65% Class II bike lanes
 - 9% Class I off-street paths

Overview of the bikeway planning roles for OCTA:

- Suggest regional priorities for optimal use by local jurisdictions;
- Assist in coordinating plans between jurisdictions;
- Provide planning and design guidelines; and
- Participate in outreach efforts to encourage bicycle commuting.

3.16. Laguna Hills

Laguna Hills is primarily composed of residential neighborhoods. The City's main destination is the Laguna Hills regional shopping center. Many portions of the City are suitable for equestrian uses, and these activities have been long established. Laguna Hills has several smaller shopping centers located along some of the arterial streets, including Moulton and Alicia Parkways, El Toro and La Paz Roads, Paseo de Valencia, and Lake Forest Drive.

Population

32,156

Estimated Number of Bicycle Commuters

Estimated Bicycle Commuters	Number
Estimated Total Number of Bicycle Commuters and Utilitarian Riders	247
Estimated Adjusted Mode Share	1.2%
Estimated Current Bicycle Trips	
Total Daily Bicycle Trips	494
Reduced Vehicle Trips per Weekday	319
Reduced Vehicle Miles per Weekday	1,012
Future Potential Bicycle Commuters	
Future number of new bicycle commuters	120
Total Future Daily Bicycle Commuters	367
Future Total Daily Bicycle Trips	734
Future Reduced Vehicle Trips per Weekday	536
Future Reduced Vehicle Miles per Weekday	2,464
Future Reduced Vehicle Miles per Year	652,905
Future Air Quality Benefits	
Reduced HC (metric tons/year)	4
Reduced CO (metric tons/year)	13
Reduced NOX (metric tons/year)	1
Reduced CO2 (metric tons/year)	69,448
Emissions rates from EPA report 420-F-00-013 "Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks." 2000.	

Bikeways

Laguna Hills Existing Bikeways

Street	From	To	Class	Mileage
Alicia Pkwy (w/b)	Paseo De Valencia	Moulton Pkwy	I	0.76
Paseo De Valencia (sb)	Laguna Hills Dr	Alicia Pkwy	I	0.28
San Diego Fwy Path s/s	Alicia Pkwy.	North of Georgia Sue Dr.	I	0.33
J01 Bike trail (County of Orange)	I-5 fwy	w/o Moulton Pkwy	I	1.8
Alicia Pkwy	Moulton Pkwy	Paseo De Valencia	II	0.76
Paseo De Valencia (nb)	Alicia Pkwy	El Toro Rd	II	1.50
Paseo De Valencia (sb)	El Toro Road	Alicia Pkwy	II	1.50
Paseo De Valencia	Alicia Pkwy	La Paz Rd.	II	0.91
Alicia Pkwy	Paseo de Valencia	Hon Ave	II	0.83
Laguna Hills Dr w/b	Paseo De Valencia	Moulton Pkwy	II	0.70
Laguna Hills Dr e/b	Moulton Pkwy	Paseo De Valencia	II	0.70
Oso Pkwy (e/b)	Moulton Pkwy	Cabot Rd	II	1.71
Oso Pkwy (w/b)	Cabot Rd	Moulton Pkwy	II	1.71
Moulton Pkwy (n/b)	City bdry near Glenwood Dr.	La Paz Rd	II	1.72
Moulton Pkwy (s/b)	City bdry near Glenwood Dr.	City bdry near Nellie Gail Rd	II	2.18
Moulton Pkwy	Lake Forest Dr.	Ridge Route Dr.	II	0.56
Los Alisos Blvd (e/b)	Paseo De Valencia	San Diego Fwy (City bdry)	II	0.43
Los Alisos Blvd (w/b)	San Diego Fwy (City bdry)	Paseo De Valencia	II	0.43
Lake Forest Dr (e/b)	Del Lago Dr	Santa Vittoria	II	0.76
Lake Forest Dr (w/b)	Santa Vittoria Dr	Del Lago Dr.	II	0.76
La Paz Rd e/b	Cabot Rd	I-73	II	2.37
La Paz Rd w/b	I-73	Cabot Rd	II	2.37
Cabot Rd.	La Paz Rd.	s/o Oso Pkwy	III	1.18
			TOTAL	26.3

Regional Priority Proposed Bikeways

Street/Path	From	To	Class	Mileage
Cabot Rd	La Paz Rd.	Oso Pkwy.	Class II	1.19

Laguna Hills Proposed Bikeways

Street/Path	From	To	Class	Mileage
Ridge Route Dr.	Mill Creek	Santa Vittoria	Class II	0.46
Ridge Route Dr	Mill Creek	East of Sea Isle Rd.	Class II	0.68
Aliso Hills Dr	Alicia Pkwy	La Paz Rd	Class II	0.9
Alicia Pkwy	Moulton Pkwy.	Ramona St.	Class II	0.22
Moulton Pkwy	Ridge Route Dr.	Santa Maria Ave.	Class II	0.25
Moulton Pkwy (n/b)	Nellie Gail Rd	La Paz Rd	Class II	0.56
Paseo De Valencia	La Paz Rd.	Cabot Rd.	Class II	0.59
Avenida de La Carlota	Ridge Route Dr.	Los Alisos Blvd	Class III	1.44
Avenida de la Carlota	Ridge Route Dr.	Lake Forest Dr.	Class III	0.73
El Toro Rd (w/b)	City bdry near Ave Carlota	Paseo De Valencia	Class III	0.34
El Toro Rd (e/b)	Paseo De Valencia	City bdry near Ave Carlota	Class III	0.34
Santa Vittoria Dr	Santa Maria Ave	Lake Forest Dr	Class III	1.27

Street/Path	From	To	Class	Mileage
Lake Forest Dr (e/b)	Del Lago Dr.	City Bdry near I-5 fwy	Class III	0.37
Lake Forest Dr (w/b)	City Bdry near I-5 fwy	Del Lago Dr.	Class III	0.37
El Toro Road	Avenida de la Carlota	City Bdry near I-5 fwy	Class III	0.06
Alicia Pkwy	Hon Ave.	City Bdry near I-5 fwy	Class III	0.18
La Paz Rd.	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.08
Oso Pkwy	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.05
			TOTAL	8.89

Laguna Hills Proposed Bikeway Cost Estimates

Facility	Miles	Unit Cost (per mile)	Total
Class II	6.49	\$280,000	\$1,817,200
Class III	2.12	\$21,000	\$44,520
		Total	\$1,861,720

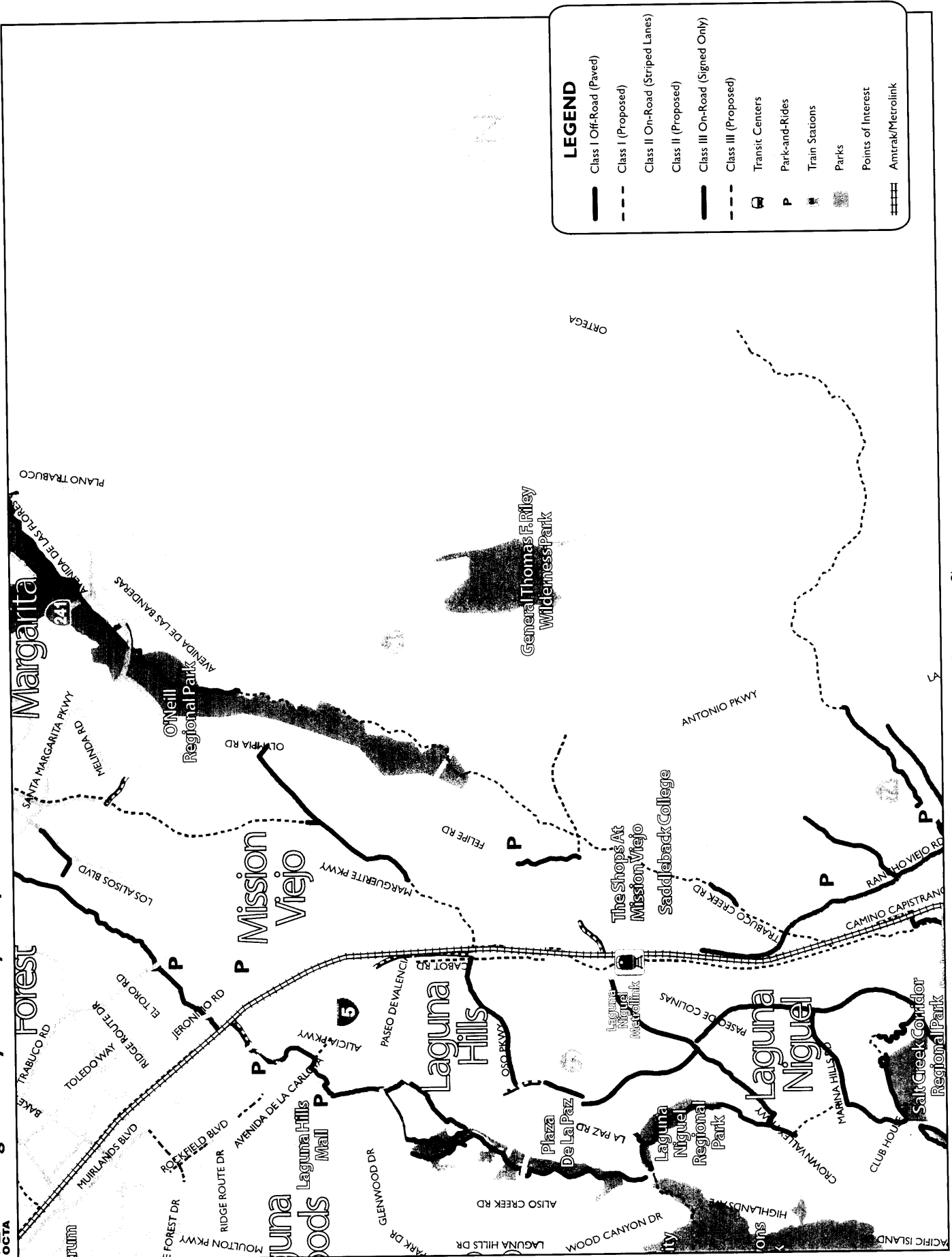
Orange County Bikeways Map / Section 7



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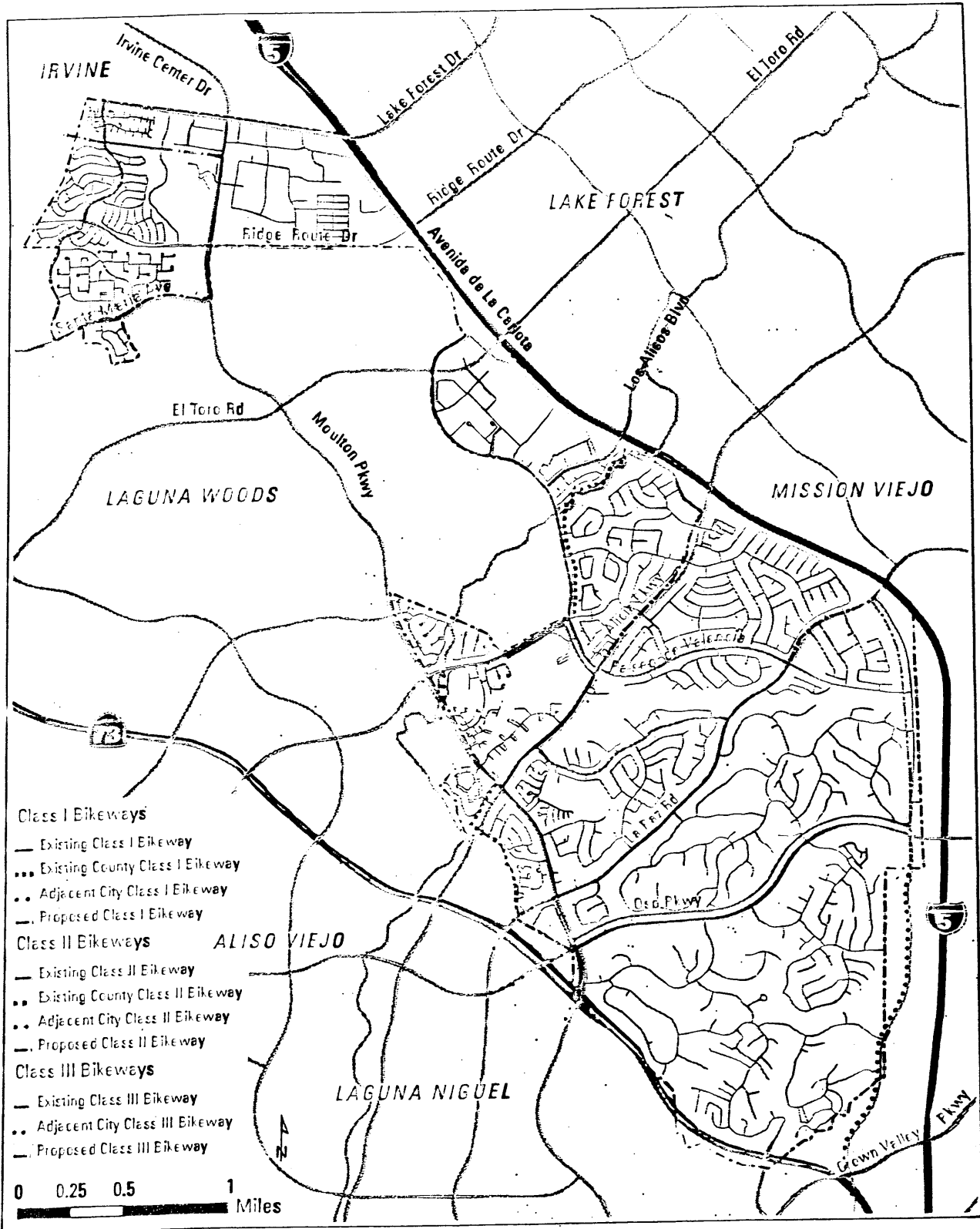
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- LEGEND**
- Class I Off-Road (Paved)
 - Class I (Proposed)
 - Class II On-Road (Striped Lanes)
 - Class II (Proposed)
 - Class III On-Road (Signed Only)
 - Class III (Proposed)
 - Transit Centers
 - Park-and-Rides
 - Train Stations
 - Parks
 - Points of Interest
 - Amtrak/Metrolink

(to section 8)



Source: City of Laguna Hills, 2001.

Figure M-3
Bicycle Network

Attachment 4

CITY OF LAGUNA HILLS

AGENDA REPORT PUBLIC SERVICES DEPARTMENT

ISSUE: UPDATE OF THE CITY'S BIKEWAYS, TRAILS & OPEN SPACE MASTER PLAN

SUMMARY:

The Implementation Plan of the 2009 General Plan Mobility Element recommends an update of the 2001 Bikeways, Trails & Open Space Master Plan (Master Plan) along with a review of pedestrian, bicycle, and equestrian connectivity throughout the City. Staff has developed an update of the Master Plan in order to attain consistency with the previously adopted Bicycle Transportation Plan and the General Plan Mobility Element. The Traffic Commission approved the Master Plan update at its meeting of January 19, 2011, and the Parks and Recreation Commission approved the update at its meeting of February 2, 2011. City Council approval is recommended.

BACKGROUND:

The General Plan was adopted in July 2009, and included an Implementation Program. Implementation Program M-5 of the Mobility Element recommends an update of the Master Plan. In accordance with the Implementation Program, staff reviewed the Master Plan and sought public input for the update of the Master Plan via the Traffic Commission and the Parks and Recreation Commission. In performing the review, staff identified gaps and barriers to pedestrian, bicycle, and equestrian connectivity and identified appropriate means and locations for overcoming those barriers. Staff also updated the Trails component of the Master Plan to add and include a pedestrian/walkability component that identifies areas throughout the City where barriers to connectivity exist and measures and/or techniques to improve walkability and safety can be implemented over time.

The City adopted the Orange County Transportation Authority (OCTA) Commuter Bikeways Strategic Plan as the City's Bicycle Transportation Plan in December 2009. This Plan identifies improvements to the City's current bicycle transportation system and allows the City to meet eligibility requirements for State Bicycle Transportation funding.

RECOMMENDATION: THAT THE CITY COUNCIL APPROVE THE UPDATES TO THE BIKEWAYS, TRAILS & OPEN SPACE MASTER PLAN.

Agenda Report
Update of the City's Bikeways, Trails &
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The City's Master Plan has also been updated to reflect projects listed in the Bicycle Transportation Plan.

The following sections of the Master Plan were updated:

Bikeways

Staff revised the Bikeways section of the Master Plan using the same format as the original 2001 Master Plan. The updated Bikeways section is included as an attachment to this report and includes a list of existing and proposed bikeways throughout the City and a list of bikeways opportunities and constraints. A major update to the original plan involved reviewing and updating the existing and proposed bikeways and trails. Many Class II Bikeways have been installed since 2001, including: Alicia Parkway east of Paseo de Valencia to Hon Avenue on the north side and Bentley Lane on the south side; La Paz Road from Paseo de Valencia to Cabot Road; and Moulton Parkway from Via Lomas to the City limits north of Glenwood. A Class III Bikeway was also created along Cabot Road from La Paz Road to south of Oso Parkway. A full listing of existing bikeways is shown in Table 1 of the updated Bikeways Section (attached). Additional connectivity can be achieved by completing the proposed bikeways. The updated section is also consistent with the adopted 2009 Bicycle Transportation Plan.

Trails

Staff has revised the Trails section of the Master Plan, again utilizing the same format as the original 2001 Master Plan. While performing its review, staff inventoried existing trails and sidewalks including consideration of opportunities, constraints, and safety concerns throughout the City. However, the format of the Master Plan was modified to include a sidewalks and pedestrian component as described under the Implementation Program of the Mobility Element of the 2009 General Plan. Hence, the name of this section was changed to Trails and Pedestrian Walkability. Staff inventoried sidewalks and reviewed connectivity and safety. The updated section is included as an attachment to this report.

Upon updating the foregoing sections of the Master Plan, the City will be in compliance with the Implementation Program Goal M-5 of the Mobility Element in the General Plan and will also be consistent with the Bicycle Transportation Plan.

FISCAL IMPACT:

Costs will vary for each individual project and will be proposed through Capital Improvement Program Budget cycles. Staff will also seek State funds for bikeway related projects listed in the City's Bicycle Transportation Plan as opportunities arise.

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RECOMMENDATION: THAT THE CITY COUNCIL APPROVE THE UPDATES TO THE BIKEWAYS, TRAILS & OPEN SPACE MASTER PLAN.

ATTACHMENTS:

- Bikeways Section of the City of Laguna Hills Bikeways, Trails & Open Space Master Plan
- Trails and Pedestrian Walkability Section of the City of Laguna Hills Bikeways, Trails, and Open Space Master Plan

BIKEWAYS

Introduction

The City of Laguna Hills has an existing system of bikeways that provides internal community links as well as bicycle access to many of the surrounding communities. In addition, there are several arterial highways that have adequate right-of-way to accommodate additional bikeways that would fill in missing links, allowing for a more complete circulation pattern.

Information regarding existing bikeways was collected from the following sources:

- Field observation
- City of Laguna Hills 2001 Bikeways, Trails, & Open Space Master Plan
- Communications with City of Laguna Hills staff
- Communications with County of Orange staff
- Previous stakeholder meetings and communications with interested persons
- City of Laguna Hills 2009 Bicycle Transportation Plan
- Review by the City's Traffic Commission

The City adopted its Bicycle Transportation Plan in 2009. This plan shows the City's existing and proposed bikeways with constraints and recommendations.

To provide a consistent method of defining bikeways this planning effort utilizes the Caltrans standards for classifying bikeways. It defines Class I, Class II, and Class III as follows:

- Class I bikeway (Bike Path). Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross-flow minimized.
- Class II bikeway (Bike Lane). Provides a striped lane for one-way bike travel on a street or highway.
- Class III bikeway (Bike Route). Provides for shared use with pedestrian or motor vehicle traffic.

In addition to bikeways and trails, multi-use corridors may exist for both bikeway and trail users. These can consist of either of two alternatives: a bikeway and trail separated by a fence or median or a bikeway with a soft shoulder wide enough to be used as a trail.

Existing Bikeways

The bikeways have been expanded since the 2001 Bikeways, Trails & Open Space Master Plan was issued. The existing bikeways are listed in Table 1 below:

Table 1

Street	From	To	Class	Mileage
Alicia Pkwy (w/b)	Paseo de Valencia	Moulton Pkwy	I	0.76
Paseo de Valencia (sb)	Laguna Hills Dr	Alicia Pkwy	I	0.28
San Diego Fwy Path s/s	Alicia Pkwy.	North of Georgia Sue Dr.	I	0.33
J01 Bike trail (County of Orange)	I-5 fwy	w/o Moulton Pkwy	I	1.8
Laguna Hills Drive	Paseo de Valencia	Indian Hill lane	I	0.48
Oso Parkway (w/b)	Cabot Rd	Moulton Pkwy	I	1.71
Alicia Pkwy	Moulton Pkwy	Paseo de Valencia	II	0.76
Paseo de Valencia (nb)	Alicia Pkwy	El Toro Rd	II	1.50
Paseo de Valencia (sb)	El Toro Rd	Alicia Pkwy	II	1.50
Paseo de Valencia	Alicia Pkwy	La Paz Rd.	II	0.91
Alicia Pkwy	Paseo de Valencia	Hon Ave	II	0.83
Laguna Hills Dr (w/b)	Paseo de Valencia	Moulton Pkwy	II	0.70
Laguna Hills Dr (e/b)	Moulton Pkwy	Paseo de Valencia	II	0.70
Oso Pkwy (e/b)	Moulton Pkwy	Cabot Rd	II	1.71
Oso Pkwy (w/b)	Cabot Rd	Moulton Pkwy	II	1.71
Moulton Pkwy (n/b)	City bdry near Glenwood Dr.	La Paz Rd	II	1.72
Moulton Pkwy (s/b)	City bdry near Glenwood Dr.	City bdry near Nellie Gail Rd	II	2.18
Moulton Pkwy	Lake Forest Dr.	Ridge Route Dr.	II	0.56
Los Alisos Blvd (e/b)	Paseo de Valencia	San Diego Fwy (City bdry)	II	0.43
Los Alisos Blvd (w/b)	San Diego Fwy (City bdry)	Paseo de Valencia	II	0.43
Lake Forest Dr (e/b)	Del Lago Dr	Santa Vittoria	II	0.76
Lake Forest Dr (w/b)	Santa Vittoria Dr	Del Lago Dr.	II	0.76
La Paz Rd e/b	Cabot Rd	I-73	II	2.37
La Paz Rd w/b	I-73	Cabot Rd	II	2.37
Cabot Rd.	La Paz Rd.	s/o Oso Pkwy	III	1.18
			Total	28.0

The following bikeways form a strong north-south connection:

- A Class II bikeway exists on Paseo de Valencia, on both the easterly and westerly sides, from El Toro Road to La Paz Road. This section includes a Class I bikeway on the easterly side of Paseo de Valencia from Aliso Creek to Laguna Hills Drive and on the westerly side of Paseo de Valencia from Laguna Hills Drive to Alicia Parkway.
- A Class II bikeway exists on the east side of Moulton Parkway from the City boundary near Glenwood Drive to La Paz Road, and on the west side of Moulton Parkway from the City boundary near Glenwood Drive to the City boundary near Nellie Gail Road.
- A Class II bikeway exists on Moulton Parkway, on both the east and west sides, from Lake Forest Drive to Ridge Route and is in the process of being extended to Santa Maria Drive.
- A Class III bikeway exists along Cabot Road, on both the east and west sides, from La Paz Road to south of Oso Parkway.

The following bikeways form a strong east-west connection:

- A Class II bikeway exists on Alicia Parkway, on the northerly side, from Moulton Parkway to Hon Avenue and, on the southerly side, from Moulton Parkway to Bentley Lane. This section also includes a Class I bikeway along the northerly side of Alicia Parkway from Paseo de Valencia to Ramona Street (City boundary).
- A Class II bikeway exists on La Paz Road, on both the northerly and southerly sides, from Cabot Road to the I-73.
- A Class II bikeway exists on Oso Parkway, on both the north and the south sides, from Moulton Parkway to Cabot Road. This section also includes a Class I bikeway along the north side of Oso Parkway from Cabot Road to Moulton Parkway. A decomposed granite trail exists on the south side of Oso Parkway from Moulton Parkway to Bridlewood Drive that serves as both a walking path and bike trail.
- A Class II bikeway exists on Laguna Hills Drive, on both the north and south sides, from Moulton Parkway to Paseo de Valencia. A Class I bikeway exists on the south side from Paseo de Valencia to approximately 800 feet east of Indian Hill Lane.
- A Class II bikeway exists on Los Alisos Blvd., on both the north and south sides, from Paseo de Valencia to the I-5 freeway (City boundary).
- A Class II bikeway exists on Lake Forest Drive, on both the north and south sides, from Santa Vittoria to Del Lago Drive.
- A combined City and County bikeway system exists easterly from the I-5 / Aliso Creek open space area to the east side of Paseo de Valencia then southerly to Laguna Hills Drive then westerly toward Moulton Parkway.

Connections between the central portion of the City and north Laguna Hills are a significant challenge. Some examples are below:

- There is insufficient right-of-way to provide a bicycle connection along Avenida de la Carlota from Ridge Route Drive to Los Alisos Boulevard.
- There are segments of Moulton Parkway with insufficient right-of-way in the City of Laguna Woods.
- There is no bike lane on El Toro Road.

External links include:

- The bikeway beneath the I-5 corridor at Aliso Creek, behind the homes on Georgia Sue connecting into Mission Viejo, and along Aliso Creek into Aliso and Wood Canyons Wilderness Park.

Although there may be opportunities within the City to add additional bike lanes, unless there are destinations within the City or links outside the City, the expense to create the trails may not be justified. The development of Class I bikeways is particularly

expensive and not an option in most areas. However, Class I bikeways are planned within the Southern California Edison transmission power line corridor from La Paz Road to Alicia Parkway and continuing from Alicia Parkway to Indian Hill Lane. A Class I bikeway is also planned in the La Paz Open Space from Paseo de Valencia to Moulton Parkway.

While much of the infrastructure in the City of Laguna Hills is in place, there are still practical opportunities for additional Class II and Class III bikeways that would increase the livability of the community. In particular, planning emphasis was directed toward identifying:

- Safe and convenient routes to enhance connectivity throughout the City.
- Linkages to nearby wilderness and open space areas including:
 - Aliso and Wood Canyons Wilderness Park
 - Laguna Coast Wilderness Park
 - Aliso Creek
 - Oso Creek-Trabuco Canyon Corridor
 - San Diego Creek-Santa Ana River Corridor

Additionally, other objectives used to evaluate bikeway and trail opportunities and constraints included:

- Safe and convenient links between residential neighborhoods and the Laguna Hills Mall, north Laguna Hills, and the remainder of the City.
- Links to existing and potential bikeways in adjacent cities including:
 - Laguna Niguel – to the south
 - Mission Viejo – to the east and north
 - Irvine – to the northwest
 - Laguna Woods – to the west
 - Lake Forest – to the northeast
 - Aliso Viejo – to the west
- Cost.
- Stakeholder acceptability.

Bikeway Opportunities and Constraints

Striping opportunities for bikeways including Class II and III improvements are listed in Table 2 below. Some of these locations will not be feasible until roadway widenings are implemented.

Table 2

Street/Path	From	To	Class	Mileage
Ridge Route Dr.	Mill Creek	Santa Vittoria	Class II	0.46
Ridge Route Dr	Mill Creek	Avenida de la Carlota	Class II	0.68
Aliso Hills Dr	Alicia Pkwy	La Paz Rd	Class II	0.9
Alicia Pkwy	Moulton Pkwy.	Ramona St.	Class II	0.22

Street/Path	From	To	Class	Mileage
*Moulton Pkwy	Ridge Route Dr.	Santa Maria Ave.	Class II	0.25
Moulton Pkwy (n/b)	Nellie Gail Rd	La Paz Rd	Class II	0.56
Paseo de Valencia	La Paz Rd.	Cabot Rd.	Class II	0.59
Avenida de la Carlota	Ridge Route Dr.	Los Alisos Blvd	Class III	1.44
Avenida de la Carlota	Ridge Route Dr.	Lake Forest Dr.	Class III	0.73
El Toro Rd (w/b)	City bdry near Ave Carlota	Paseo de Valencia	Class III	0.34
El Toro Rd (e/b)	Paseo de Valencia	City bdry near Ave Carlota	Class III	0.34
Santa Vittoria Dr	Santa Maria Ave	Lake Forest Dr	Class III	1.27
Lake Forest Dr (e/b)	Del Lago Dr.	City Bdry near I-5 fwy	Class III	0.37
Lake Forest Dr (w/b)	City Bdry near I-5 fwy	Del Lago Dr.	Class III	0.37
El Toro Road	Avenida de la Carlota	City Bdry near I-5 fwy	Class III	0.06
Alicia Pkwy	Hon Ave.	City Bdry near I-5 fwy	Class III	0.18
La Paz Rd.	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.08
Oso Pkwy	Cabot Rd.	City Bdry near I-5 fwy	Class III	0.05
			Total	8.89

*Under Construction 2010/2011

Other opportunities for bikeway improvements are listed below:

1. A bicycle route from the north Laguna Hills portion of the City to the Laguna Hills Mall and the Community Center would provide an important linkage helping to unite the two portions of the City. Each of the following alternate routes were explored; however, each present significant constraints:
 - Avenida de la Carlota from Ridge Route Drive to Los Alisos Boulevard – there is inadequate right-of-way for a bicycle route. Although there is a sidewalk along the west side of the street, in addition to conflicts with pedestrians, there are many commercial aprons that make bicycle travel on the sidewalk not recommended.
 - Moulton Parkway from Ridge Route Drive to El Toro Road has varying widths with inadequate right-of-way in some areas. Adding more right-of-way would require acquisition of an easement from Laguna Woods Village private property, and this is not in the City of Laguna Hills. The City of Laguna Woods has long term plans to accomplish this project.
 - El Toro Road from Moulton Parkway to Paseo de Valencia has inadequate right-of-way as it passes through the City of Laguna Woods. Creating a bikeway would be the responsibility of the City of Laguna Woods.

No other linkages suitable for bicycles were found between north Laguna Hills and the central portion of the City.

2. Linkages from north Laguna Hills into adjacent cities are, likewise, severely constrained, primarily because of insufficient right-of-way in the adjacent city. Routes that were explored include:

- Santa Maria Avenue and Ridge Route Drive into Irvine – There is a small sliver of privately owned land interposed between the City of Laguna Woods and Laguna Coast Wilderness Park. This would need to be purchased by others before a bikeway route could be implemented.
 - Lake Forest Drive into Irvine – Construction of an extension of Lake Forest Drive is currently underway. A bike lane can be connected in the future to the existing bike lane along Lake Forest Drive from Santa Vittoria Drive to Del Lago Drive.
 - Lake Forest Drive into Lake Forest – There is insufficient right-of-way for a bikeway approaching and crossing the I-5.
 - There is the possibility of a Class I bikeway or multi-use corridor utilizing the existing utility road along the south side of the San Diego Creek tributary (near Veeh Ranch Park) leading into Irvine and potentially linking into the San Diego Creek trail system.
3. While linkages outside the north Laguna Hills area are limited, there are potential linkages within this area. A loop could be created by the addition of the following bikeway links:
- Santa Maria Avenue from Moulton Parkway westbound to Santa Vittoria Drive – There is adequate right-of-way for a Class II bikeway. However, most of Santa Maria Avenue lies within the City of Laguna Woods.
 - Santa Vittoria Drive from Santa Maria Avenue northbound past Veeh Ranch Park to Lake Forest Drive – There is adequate right-of-way for a Class II bikeway, however, parking, which is in high demand, may have to be eliminated.
 - West side of “lakes” from Veeh Ranch Park southbound to Ridge Route Drive – Privately owned commercial parcels may lend themselves to a bikeway easement in the future.
4. Linkage opportunities into adjacent communities to the north and east of the City are limited. The following routes for Class I, Class II, and Class III linkages into the Cities of Laguna Woods, Lake Forest, and Mission Viejo were explored and found to present significant constraints:
- El Toro Road into Lake Forest – There is insufficient right-of-way near the I-5 and the City of Lake Forest for a bikeway.
 - Alicia Parkway into Mission Viejo – There is insufficient right-of-way near the I-5 and in the City of Mission Viejo for a bikeway.
 - Paseo de Valencia provides an important link within the City of Laguna Hills, however, the Class II bikeway terminates at the I-5 corridor (Avenida de la Carlota) at its northern end and has insufficient right-of-way to extend beyond La Paz Road at its southern end.

Two existing, adjacent routes extend into Mission Viejo:

- Los Alisos Boulevard east bound into Mission Viejo – Existing Class II bikeways provide a link from Los Alisos Boulevard in Laguna Hills to Mission Viejo.

- Aliso Creek Trail east bound into Mission Viejo – An existing Class I bikeway traverses beneath the I-5 corridor linking the City of Laguna Hills with Mission Viejo (County Trail).
5. Existing linkages to adjacent cities to the south, southwest, and southeast of the City are more common and include:
- Oso Parkway – An existing Class II bikeway in the City of Laguna Hills links beneath the I-73 with an existing Class II bikeway in Laguna Niguel on the west and with an existing Class II bikeway in Mission Viejo on the east. A Class I bikeway along the north side of Oso Parkway exists from Cabot Road to Moulton Parkway.
 - Cabot Road – An existing southbound Class II bikeway begins at Oso Parkway and connects with existing Class III bikeways in the Cities of Mission Viejo and Laguna Niguel at it passes in and out of the City of Laguna Hills.
6. Opportunities in the City are available to connect existing bikeways and complete several circuits. These would link residential neighborhoods with important destinations within the City such as:
- The Community Center
 - Laguna Hills Mall
 - Elementary and Middle Schools
 - Laguna Hills High School
 - City parks
 - Aliso Creek

See Table 2 for a list of bikeway striping opportunities.

Alicia Parkway – Most of the portion of Alicia Parkway in the City of Laguna Hills has a Class I or Class II bikeway. A Class II or III bikeway may be able to be created along the north side of Alicia Parkway from Hon Avenue to the easterly City limits, and along the south side from Bentley Lane to the easterly City limits, for connectivity with the City of Mission Viejo, subject to determining bicycle routing across the Alicia / I-5 bridge.

La Paz Road – The open space parallel to the north side of La Paz Road, from Moulton Parkway to Paseo de Valencia, presents an excellent opportunity to expand the bikeway network in the City of Laguna Hills. A proposed multi-use trail project is listed in the future CIP. A trail system at this location could provide several good links including:

- A link to Paseo de Valencia
- A link to Aliso Hills Drive

- A link to the Edison Easement – This would be useful assuming a cooperative agreement can be reached to allow a multi-use corridor easement over the existing Edison utility road
- A link to Aliso Creek – Via the existing westbound County trail.
- A link to Oso Parkway – If an easement could be obtained over the existing Nellie Gail Trail passing just east of the Falcon Hill Community (behind the homes on Buckboard Lane).

Edison Easement – The Edison Easement extends from Cabot Road westward to Indian Hill Lane, diagonally crossing the mid-section of the City. It has the potential to carry school aged children from neighborhoods and local schools to the Community Center between La Paz Road at Paseo de Valencia and Alicia Parkway at Community Center Drive. The segment from La Paz Road to Alicia Parkway has many steep grades and adding a bike trail to this site would require extensive grading and retaining walls. The existing Edison maintenance road would lend itself well to a pedestrian/equestrian trail with minimal improvements. The segment from the Community Center west to Indian Hill Lane is more conducive to a multi-use trail. Both of these projects are listed under the future CIP.

7. Additional bikeway opportunities that would add significant value to the City of Laguna Hills Bikeway System and are located in adjacent communities include:
 - El Toro Road – Laguna Woods – Add Class II bikeway eastbound from Moulton Parkway to Paseo de Valencia.
 - San Diego Creek tributary – Irvine – Add multi-use corridor along the north and south side of the tributary to San Diego Creek (Veeh Ranch Park area).

TRAILS AND PEDESTRIAN WALKABILITY

Introduction

The trail system in the City of Laguna Hills is composed of trails maintained by the City of Laguna Hills, the County of Orange, and the Nellie Gail and Lomas Laguna Homeowners Associations. Most of the trail segments are owned in fee by the entity maintaining them.

The primary values of the trail system within the City of Laguna Hills are:

1. To provide internal trails for local walking and horseback riding; and
2. To serve as links to trails into nearby wilderness areas.

Because of the suburban nature of the City and the limited developed open space, pedestrian activity is generally limited to suburban sidewalks. Sidewalks connect all the arterial highways throughout the City. Sidewalks also connect the major facilities including: schools, the Community Center, the Civic Center, parks, Laguna Hills Mall, etc. Connectivity to the various major venues throughout the City has been greatly enhanced by the recent City's Wayfinding Sign Program.

Along with suburban sidewalks, the City also contains County Aliso Creek trails and the Nellie Gail private trails. The Nellie Gail trails are primarily intended for resident and guest equestrian uses. Signal buttons at equestrian height are provided at several intersections and there are four existing tunnels beneath major arterials in the city to provide safer linkages for equestrians and hikers.

Inventory

Information regarding existing open space was collected from the following sources:

- Field observation
- City of Laguna Hills Bikeways, Trails, & Open Space Master Plan
- Communications with the City of Laguna Hills staff
- Communications with County of Orange staff

Existing Trails

Sidewalks constitute the majority of pedestrian by-ways provided by the City of Laguna Hills. Equestrian-zoned property within the City is limited to the Nellie Gail community that has built its own system of trails. Additionally, internal trails connecting to the open space in surrounding communities are maintained by the County of Orange.

City of Laguna Hills Maintained:

The City recently completed the Oso Parkway Landscaping Improvement Project which included the construction of a decomposed granite trail along the south side of Oso

Parkway eastbound from Moulton Parkway to Cabot Road. This trail is used as a hiking and biking trail. Equestrian use on this trail is prohibited between Moulton Parkway and Bridlewood Drive as there is a Nellie Gail equestrian trail upslope of this location.

There is a paved trail along the north side of Oso Parkway from Nellie Gail Road to Cabot Road which is used as both a hiking and a biking trail.

There is a Class I bikeway along the south side of Laguna Hills Drive that is used both as a bikeway and a walkway.

There is a trail alongside Veeh Ranch Park.

There is an equestrian trail along the perimeter of Cabot Park along Rapid Falls Road.

County of Orange Maintained:

The County of Orange maintains several trails within the City of Laguna Hills creating cross-city connections and providing access to neighboring communities. Although a few of the County trails are surfaced with green waste mulch, most have a decomposed granite or native soil surface.

Trails along Aliso Creek are an important component of the County trail system within the City. They provide an important link from the I-5 corridor to the Aliso and Wood Canyons Wilderness Park. The Aliso Creek Trail system, which includes a portion of a County trail, begins under the I-5 corridor north of the Juan Avila Adobe site (north of Georgia Sue Drive). It proceeds westbound along Aliso Creek and wraps around Paseo de Valencia to Laguna Hills Drive and eventually reaches Aliso and Wood Canyons Wilderness Park through other pathways.

The County maintains a southbound trail along the east side of Cabot Road that connects to the Oso Creek/Trabuco Canyon system near Crown Valley Parkway, providing a future link to the southern communities and the beach.

The County maintains an important small trail segment in the City of Laguna Hills that links the existing Nellie Gail Trail with the County maintained Aliso Creek Trail into Aliso and Wood Canyons Wilderness Park as follows:

- The trail runs along the north side of La Paz Road from the Nellie Gail Trail (east of Moulton Parkway) tunnel connection to the westbound La Paz Trail to Moulton Parkway at La Paz Road through a tunnel connection and then northerly along the westerly City boundary to join with the Aliso Creek Trail north of Alicia Parkway. A portion of this trail is maintained by the Lomas Laguna HOA.
- An alternate route is to use the sidewalk north to the intersection of Moulton Parkway and Alicia Parkway and head west on the Class I bikeway on the north side of Alicia Parkway that joins the Aliso Creek bikeway to the northwest.

Nellie Gail Ranch Owner's Association Maintained:

A unique component of the Laguna Hills trail system is the Nellie Gail trails network. Nellie Gail, located in the south portion of the city, is a community of homes on large lots that are zoned for horses. The homes are connected by a trail network that was built and is maintained by the Nellie Gail Ranch Owners Association. The trail network provides not only an internal trail system; it also provides connections to County trails leading into large wilderness parks in adjacent communities. The trails are unpaved. Accessibility standards are exceeded in many places and the surface is unfavorable for some users. Although signs are posted along the trails notifying visitors the trail is private, the trail is likely used by non-resident equestrians and pedestrians.

While most of the trail system is internal to the Nellie Gail community, a few segments are important links to other trail systems as follows:

- Nellie Gail Trail along Greenfield Drive crosses the San Joaquin Hills Transportation Corridor (I-73) and connects with a southbound County trail in Laguna Niguel.
- Caltrans access barrier fence interrupts a complete east-west trail corridor blocking the trail from Pinestrap Circle to just west of Greenfield Drive on the north side of I-73. If this segment were opened the link would be complete. However, in a past review, Caltrans denied this connection request.

An important link to the Aliso Creek trail to the Aliso and Wood Canyons Wilderness Park is as follows:

- A Nellie Gail Trail along the east side of Moulton Parkway and on the south side of Oso Parkway links to the City boundaries.
- A trail crosses beneath Oso Parkway just west of Nottingham Street, and runs westerly, just east of the Falcon Hill development, leading to La Paz Road.
- A trail crosses beneath La Paz Road and completes a westbound link to the County maintained trail along the north side of La Paz Road and then proceeds north bound to the County maintained Aliso Creek Trail westerly of Moulton Parkway [County Trails].

Trails and Sidewalks Opportunities and Constraints

Most of the trails in the City are County or Nellie Gail Trails. However, there are still good opportunities for additional trails and linkages that would increase the livability of the community.

Objectives used to identify trail opportunities and constraints are similar to those used for identifying bikeway opportunities and constraints and include:

- Safe and convenient links between residential neighborhoods, schools, and the Community Center, and nearby wilderness and open space areas including:
 - Aliso and Wood Canyons Wilderness Park
 - Laguna Coast Wilderness Park
 - Aliso Creek
 - Oso Creek-Trabuco Canyon Corridor
 - San Diego Creek-Santa Ana River Corridor
- Links to existing and potential trails in adjacent cities including:
 - Laguna Niguel – to the south
 - Mission Viejo – to the east and north
 - Irvine – to the northwest
 - Laguna Woods – to the northwest
 - Lake Forest – to the north
 - Aliso Viejo – to the west
- Cost
- Stakeholder acceptability

The following list of opportunities and constraints helps to highlight those trail and sidewalk improvements that would be of beneficial use:

Trails

- An existing Nellie Gail equestrian and hiking trail along the northern edge of the I-73 was interrupted by a Caltrans access fence when the corridor was built. Negotiating a realignment of the fence would allow a long-range connection from the Niguel Trail in Laguna Hills to Moulton Parkway.
- An existing hiking trail in Veeh Ranch Park could be connected to the Water District utility easement on the north and a trail along the west edge of the “Lakes,” providing access to riparian habitat along the Lakes and San Diego Creek.
- The Edison Utility Corridor could provide an equestrian/hiking trail connecting La Paz Road to the Community Center. Similar easements have been granted by Southern California Edison in adjacent communities. This trail could connect to a similar trail along the north edge of La Paz Road. This project is listed as a future CIP.
- A trail connection along the north side of La Paz Road could provide a scenic corridor connecting the County trail at Moulton Parkway to the Edison easement trail near Paseo de Valencia. This project is listed as a future CIP.
- Augmenting the existing Edison utility road from Alicia Parkway to Indian Hill Lane. This project is listed as a future CIP.

Sidewalks

- Moulton Parkway southbound from El Pacifico to Ridge Route:

A new sidewalk is being constructed as a part of the Moulton Parkway Smart Street Project.

- Paseo de Valencia southbound from Calle de la Plata to Laguna Hills Drive:
It is anticipated that when Paseo de Valencia is widened (future CIP), new sidewalk shall be included at this section.
- Cabot Road northbound from the south City limits to Paseo de Valencia:
There is no sidewalk on the east side of Cabot Road, and no plans for constructing sidewalk along this stretch due to physical constraints including adjacent railroad and no services or point of interests.
- Nellie Gail Ranch Community:
There are limited sidewalks in this community except for along one side of collector streets. This was a community design feature and is not anticipated to be changed. However, there are equestrian trails throughout this community. The trails are used by pedestrians and can be considered a replacement to the street sidewalk.
- South Side of Oso Parkway:
A concrete sidewalk has been replaced with a decomposed granite walking trail.

Attachment 5

Electric Bikes CVC 312.5(a)

Electric Bike Enforcement

All classes of electric bicycles fall under the same CVC rules as regular bicycles

Classification 1

"Low speed pedal assisted electric bicycle" - provides assistance only when rider is pedaling, ceases to assist once bicycle reaches 20 MPH.

Classification 2

"Low speed throttle assisted electric bicycle" - equipped with a motor that may be used exclusively to propel the bicycle, ceases to assist once bicycle reaches 20 MPH.

Classification 3

"Speed pedal assisted electric bicycle" - provides assistance only when the rider is pedaling, ceases to assist once bicycle reaches 28 MPH, equipped with a speedometer.

CVC 21213 (a) A person under 16 years of age shall not operate a class 3 electric bicycle. **(b)** A person shall not operate or ride upon a class 3 electric bicycle on a street, bikeway, public path or trail without a properly fitted and fastened bicycle helmet.

E-Bikes have different classifications, with different rules for each. Know what class your bike falls in, so you can follow the appropriate bike laws.

Bicycle Type	Minimum Age	Driver's License	License Plate	Helmet
Bicycle	N/A	No	No	17 & under
Class 1 E-Bike	N/A	No	No	17 & under
Class 2 E-Bike	N/A	No	No	17 & under
Class 3 E-Bike	16	Yes	Yes	Yes

E-Bike / Bike Checklist

Equipment

- handlebars - properly adjusted
- pedals - turn freely
- brakes - properly adjusted
- lights - good condition
- Reflectors - good condition
- Seat - solid, properly adjusted
- Frame - no cracks or breaks
- Hand Grips - tight
- Chain - properly adjusted, oiled
- Chain protector - solid
- Wheels - properly aligned, no broken/loose spokes
- Tires - no cuts, have tread, properly inflated
- Derailleur - bent, loose
- Sprocket - properly adjusted
- Fork - tight, turns freely
- Axel - oiled, properly adjusted
- Mirrors - properly adjusted, clear and not cracked
- Speedometer - operating and in working order

Other items

- Warning device - good operating condition
- Carrying rack - properly mounted



EMERGENCY 9-1-1
(or crime in progress)

Non-Emergency Dispatch (949) 770-6011

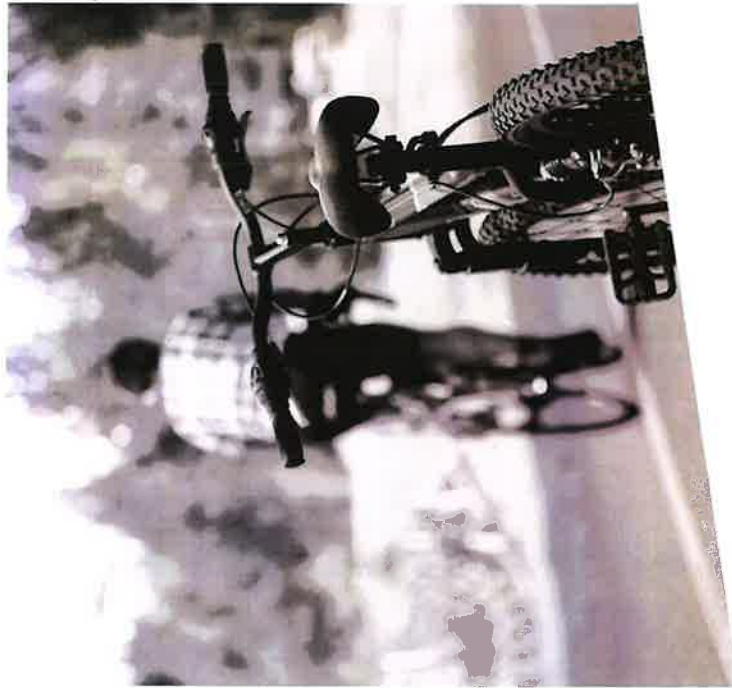
Laguna Hills Police Services

24035 El Toro Rd.

Laguna Hills, CA 92653



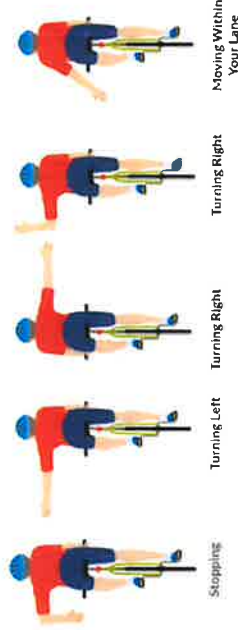
4.1.a



Be Predictable

Use Hand Signals

- Signal to others what you intend to do.
- Signal as a courtesy and for self-protection.
- Signal before entering an intersection or coming to a stop.



Pass With Care

- Use caution at intersections.
- Pass on the left.
- Call out or use a bell when passing.
- Do a quick shoulder check before you change lanes.

Drive Your Bike

- Ride in the same direction as traffic.
- Keep both hands on the handlebars, ready to brake.
- Use the bike lane when possible.

Bike Safety Tips

Be Equipped

Wear a bike helmet

- Wear your helmet for every ride, even for short trips.
- Adjust straps for a proper fit.
- Protect your brain - your most valuable asset.

Register your bike

- Registration provides legal proof of ownership if your bike is lost or stolen.

Use a bike rack and lock up

- Use a designated bike rack.
- Lock the wheel and frame to the rack with a U-shaped lock.
- Don't block entryways or lock your bike to

Be alert to the following:

1

Obey Signs, Signals & Laws

- Obey all traffic laws when bicycling.
- Stop at all stop signs and red lights.
- Ride in the same direction as traffic, not against it.
- Don't cover both ears with headphones.

2

Be Visible At Night

- Use lights: front white lights and red rear reflectors are required by law.
- Wear bright or light-colored clothing or reflective gear.
- Add extra lights and reflectors if you can.

3

Yield To Pedestrians

- Show courtesy and respect for all road and path users.
- Take extra care at intersections and driveways.
- Give an audible warning when passing.

California Vehicle Code 21200(a)

Bicycle riders have all the rights and are subject to all the responsibilities and duties as drivers of vehicles. This means, for example, bicyclists must perform such actions as:

- Follow traffic signals
- Obey speed limits
- Stop at stop signs
- Bike on the right-hand side of the road

Attachment: Memorandum to the Traffic Commission Concerning Bicycle Safety (2019 : Electric Bicycle, Bicycle, and Motorized Mobility Device

Attachment 6

Carlsbad, California Municipal Code

Title 10 VEHICLES AND TRAFFIC

Chapter 10.56 OPERATION OF REGULATED MOBILITY DEVICES

10.56.010 Definitions.

10.56.020 Operation of regulated mobility devices.

10.56.030 Enforcement.

10.56.040 Exemptions.

10.56.050 Severability.

10.56.010 Definitions.

“Bicycle” has the same meaning as in California [Vehicle Code](#) Section 231, as it may be amended from time to time.

“Electric bicycle” has the same meaning as in California [Vehicle Code](#) Section 312.5, as it may be amended from time to time.

“Electric personal assistive mobility device” has the same meaning as in California [Vehicle Code](#) Section 313, as it may be amended from time to time.

“Electrically motorized boards” has the same meaning as in California [Vehicle Code](#) Section 313.5, as it may be amended from time to time.

“Low speed vehicle” has the same meaning as in California [Vehicle Code](#) Section 385.5, as it may be amended from time to time.

“Motorized scooter” has the same meaning as in California [Vehicle Code](#) Section 407.5, as it may be amended from time to time.

“Operator” means a person who owns, operates, and/or controls a regulated mobility device.

“Public area” means any outdoor area that is open to the members of the public for public use, whether owned or operated by the city or a private party.

“Regulated mobility device” means a bicycle, electric bicycle, electric personal assistive mobility device, electrically motorized board, low-speed vehicle, motorized scooter, shared mobility device, and any other similar vehicle.

“Rider” means a traveler riding in or on a regulated mobility device who is not operating it.

“Shared mobility device” has the same meaning as in California [Civil Code](#) Section 2505, as it may be amended from time to time.

“Vehicle” has the same meaning as in California [Vehicle Code](#) Section 670, as it may be amended from time to time. (Ord. CS-419 § 2, 2022)

10.56.020 Operation of regulated mobility devices.

- A. **Prohibition of Regulated Mobility Devices Where Posted.** It is prohibited to operate or ride on a regulated mobility device in public areas where such prohibition is posted by signs or as otherwise set forth in this chapter. A list of public locations where regulated mobility devices are prohibited shall be on file in the city clerk’s office. The list may be amended from time to time by resolution of the city council.
- B. **No Operating or Riding on Sidewalks and Public Facilities.** No person shall operate or ride a regulated mobility device upon any sidewalk, in any public drainage facility, culvert, ditch, channel, or any other public athletic/sports court, or gymnasium in the city.
- C. **Duty to Operate with Due Care, Reduce Speed.**
1. The operator of a regulated mobility device shall exercise all due care and shall reduce the speed of the device, obey all traffic control devices, and take all other action relating to operation of the device as necessary to safeguard the operator, passengers, and any persons or other vehicles or devices in the immediate area. It shall also be unlawful to transport any other person upon the bar, handle bars, floorboard or other area of regulated mobility device not designed for passenger riding or designed for a single person, or cling to or attach oneself or one’s regulated mobility device with an operator or rider on board to any moving vehicle or motorized or non-motorized wheeled device.
 2. Persons operating or riding a regulated mobility device on a city trail must dismount the regulated mobility device where the trail width is less than five feet and a pedestrian or equine is within a distance of 50 feet from the regulated mobility device. (Ord. CS-419 § 2, 2022; Ord. CS-139 § 1, 2011; Ord. NS-151 § 1; 1991; Ord. 3062 § 8)

10.56.030 Enforcement.

In lieu of a fine or administrative citation as authorized by this code, and in lieu of filing charges in any court having jurisdiction over a violation, the police chief or designee may allow a violator of this chapter to complete a police department provided safety course for regulated mobility devices. (Ord. CS-419 § 2, 2022; Ord. 3064 § 3; Ord. 3062 § 11)

10.56.040 Exemptions.

A. Public Agency Personnel. Notwithstanding any other provision of this chapter, or any other section of this code, city and public agency personnel may operate regulated mobility devices or other vehicles at any place in the city in the performance of their official duties.

B. Disability. This chapter is not intended to apply to or otherwise restrict regulated mobility devices used in a safe manner by physically disabled persons as defined under the Americans with Disabilities Act (42 U.S.C. Section 12101 et seq.). (Ord. CS-419 § 2, 2022)

10.56.050 Severability.

If any portion of this chapter, or its application to particular persons or circumstances, is held to be invalid or unconstitutional by a final decision of a court of competent jurisdiction, the decision will not affect the validity of the remaining portions of this chapter or the application of the chapter to persons or circumstances not similarly situated. (Ord. CS-419 § 2, 2022)

Contact:

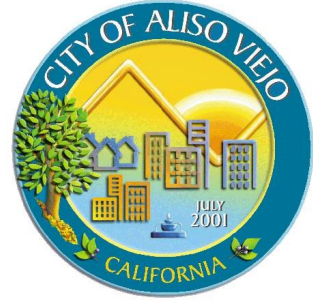
City Clerk: 442-339-2808

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Attachment 7

City of Aliso Viejo

AGENDA ITEM



DATE: September 7, 2022

TO: Mayor and City Council

FROM: Captain Scott Merrill, Chief of Police Services

SUBJECT: AMENDMENT TO ALISO VIEJO MUNICIPAL CODE CHAPTER 10.06, PEDESTRIAN, BICYCLE, AND SKATEBOARD REGULATIONS, AND CHAPTER 11.10, PARKS, TO REGULATE ELECTRIC BICYCLES, BOARDS, AND OTHER MOTORIZED RECREATIONAL OF ELECTRIC TRANSPORTATION

Recommended Actions:

1. Find that the proposed Ordinance is exempt from the California Environmental Quality Act pursuant to State CEQA Guidelines Sections 15378(a), 15301(c), and 15061(b)(3); and
2. Introduce for first reading an Ordinance titled:

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ALISO VIEJO, CALIFORNIA, AMENDING CHAPTER 10.06 (PEDESTRIAN, BICYCLE, AND SKATEBOARD REGULATIONS) OF TITLE 10 (STREETS AND SIDEWALKS) AND CHAPTER 11.10 (PARKS) OF TITLE 11 (PARKS AND PUBLIC SPACES) OF THE ALISO VIEJO MUNICIPAL CODE, ESTABLISHING REGULATIONS RELATING TO ELECTRIC BICYCLES, MOTORIZED SCOOTERS, AND OTHER ELECTRICALLY MOTORIZED BOARDS ON SIDEWALKS AND PARKS IN THE CITY.

Fiscal Impact:

There is no fiscal impact associated with the recommended action.

Background:

The City of Aliso Viejo ("City") currently regulates the use of non-motorized bicycles, scooters, roller skates and in-line skates on sidewalks and trails, and in parks. In recent years, however, the use of motorized recreational transportation such as electric bicycles and electric skateboards have grown in popularity throughout the State, including within the City.

While the Vehicle Code regulates electric bicycles and boards, it leaves room for local agencies to impose some local regulations. The proposed ordinance (Attachment 1) would regulate motorized recreational transportation in the same manner that non-motorized recreational transportation is currently regulated by the Aliso Viejo Municipal Code (“AVMC”).

Discussion:

By adopting the proposed ordinance, the City will be regulating these new forms of electronically powered modes of transportation and giving law enforcement the ability to address an issue that has been a cause for concern for both the public and law enforcement. OCSO will have the ability to issue citations when contacting a subject or subjects who are in violation of the AVMC. Additionally, due to the number of issues with these modes of transportation, it is prudent to update the sections of the AVMC related to parks within the City to further address the matter. The proposed ordinance will give law enforcement the ability issue citations in both public and private parks, provided appropriate signs are posted.

While enforcement is important, the primary purpose of the proposed ordinance is to reduce unnecessary risk to members of the public. Staff recognizes motorized recreational transportation has a place in the community as long as it is being operated in a safe manner. Given the concerns for both the transportation operators and pedestrians, the proposed ordinance would generally provide as follows:

- **Definitions.** Defines electric bicycles, electrically motorized boards (i.e., electric skateboards), electric personal assistive mobility devices (i.e., segways), and motorized scooters (collectively, “motorized recreational transportation”) to match Vehicle Code definitions, as they may be amended;
- **Sidewalks.** Motorized recreational transportation may be ridden or operated on sidewalks at a speed not to exceed five miles per hour and only at a speed that is reasonable, taking into account weather, visibility, and pedestrian traffic. This is similar to existing regulations on nonmotorized recreational transportation like bicycles;
- **Prohibitions:** Motorized recreational transportation may not be ridden or operated on certain sidewalks such as within a commercial center or complex, and in City parking lots. This prohibition matches the current prohibitions on the use of nonmotorized bicycles, rollerblades, etc. The Public Works Director could designate additional prohibitions where these modes of transportation could be operated.
- **ADA Carve-out.** Wheelchairs and other power-driven mobility devices may be ridden or operated on sidewalks and in parks at the speed of pedestrian traffic and in a manner that is safe for the user and pedestrians.

- Parks - Skateboards. Prohibits motorized boards and electric scooters from being ridden or operated in parks or recreational areas except in designated areas, or unless the owner of a private park provides consent. These prohibitions are similar to existing AVMC prohibitions on nonmotorized skateboards, roller skates, and in-line skates.
- Parks – Bicycles. Allows electric bicycles to be ridden or operated in a designated park or recreational area as long as the operation does not endanger any person, and in no event more than 10 miles per hour. This follows the existing allowance of non-motorized bicycles within designated parks and recreational areas.

Environmental:

This Ordinance is not a “project” subject to the California Environmental Quality Act (CEQA). The Ordinance does not qualify as a project because it has no potential to result in either a direct, or reasonably foreseeable indirect, physical change in the environment. (State CEQA Guidelines, § 15378, subd. (a).) The language simply regulates the use of motorized recreational transportation such as electric bicycles on sidewalks and parks within the City. Even if this Ordinance is considered a “project” subject to CEQA, it is categorically exempt pursuant Section 15301, subdivision (c) because it consists of minor alteration of existing sidewalks and pedestrian crossings involving negligible or no expansion of existing or former use. In addition, the Ordinance falls within the “common sense” exemption set forth in State CEQA Guidelines section 15061, subdivision (b)(3), which exempts activity from CEQA where “it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment.” Here, it can be seen with certainty that there is no possibility that the Ordinance may have a significant effect on the environment because the Ordinance simply regulates the use of motorized recreational transportation, such as electric bicycles, on sidewalks and parks within the City; it will not result in any development or in any new activity with the potential to impact the environment. City staff shall cause a Notice of Exemption to be filed as authorized by CEQA and the State CEQA Guidelines.

Attachments:

1. Proposed Ordinance
2. Draft Ordinance (Redline)

ORDINANCE NO. 2022-____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ALISO VIEJO, CALIFORNIA, AMENDING CHAPTER 10.06 (PEDESTRIAN, BICYCLE, AND SKATEBOARD REGULATIONS) OF TITLE 10 (STREETS AND SIDEWALKS) AND CHAPTER 11.10 (PARKS) OF TITLE 11 (PARKS AND PUBLIC SPACES) OF THE ALISO VIEJO MUNICIPAL CODE, ESTABLISHING REGULATIONS RELATING TO ELECTRIC BICYCLES, MOTORIZED SCOOTERS, AND OTHER ELECTRICALLY MOTORIZED BOARDS ON SIDEWALKS AND PARKS IN THE CITY

WHEREAS, the City of Aliso Viejo (“City”) is authorized under its police power to enact regulations to preserve the public, health, and safety; and

WHEREAS, the City’s Code currently regulates the operation of bicycles within the City but does not explicitly address electric bicycles, motorized scooters, and electrically motorized boards, which have seen increased usage throughout the City and State; and

WHEREAS, the City wishes to update its Code to explicitly refer to the aforementioned electric modes of transportation and to define those terms in the same manner as they are used in the Vehicle Code so that there is no confusion or inconsistency between local and State law; and

WHEREAS, the Vehicle Code provides that local authorities, like the City, may regulate electric bicycles, motorized scooters, and electrically motorized boards in a manner that does not conflict with State law; and

WHEREAS, the City wishes to regulate electric bicycles, motorized scooters, electrically motorized, and similar motorized recreational forms of transportation as allowed by State law.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ALISO VIEJO AS FOLLOWS:

SECTION 1. Recitals. The above recitals are true and correct and incorporated herein.

SECTION 2. CEQA. This Ordinance is not a “project” subject to the California Environmental Quality Act (CEQA). The Ordinance does not qualify as a project because it has no potential to result in either a direct, or reasonably foreseeable indirect, physical change in the environment. (State CEQA Guidelines, § 15378, subd. (a).) The language simply regulates the use of motorized recreational transportation such as electric bicycles on sidewalks and parks within the City. Even if this Ordinance is considered a “project” subject to CEQA, it is categorically exempt pursuant Section 15301, subdivision (c) because it consists of minor alteration of existing sidewalks and pedestrian crossings involving negligible or no expansion of existing or former use. In addition, the Ordinance

falls within the “common sense” exemption set forth in State CEQA Guidelines section 15061, subdivision (b)(3), which exempts activity from CEQA where “it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment.” Here, it can be seen with certainty that there is no possibility that the Ordinance may have a significant effect on the environment because the Ordinance simply regulates the use of motorized recreational transportation, such as electric bicycles, on sidewalks and parks within the City; it will not result in any development or in any new activity with the potential to impact the environment. City staff shall cause a Notice of Exemption to be filed as authorized by CEQA and the State CEQA Guidelines.

SECTION 3. Code Amendment. Chapter 10.06, titled, “Pedestrian, Bicycle, and Skateboard Regulations,” of Title 10 (Streets and Sidewalks) of the Aliso Viejo Municipal Code, is hereby amended and restated to read in its entirety as follows:

“Chapter 10.06 PEDESTRIAN, BICYCLE, AND SKATEBOARD REGULATIONS¹

Sections:

10.06.010 Definitions.

10.06.020 Bicycle operation.

10.06.030 Bicycles and other recreational transportation on sidewalks.

10.06.040 Skateboards, roller skates and similar pedestrian traffic.

10.06.050 Pedestrian movements.

10.06.010 Definitions.

“Electric bicycle” means an electric bicycle equipped with both fully operable pedals and an electric motor, as further defined by Vehicle Code section 312.5, as it may be amended from time to time. “Electrically motorized board” means any wheeled device that has a floorboard designed to be stood upon when riding, is designed to transport only one person, and has an electric propulsion system, as further defined by Vehicle Code section 313.5, as it may be amended from time to time.

“Electric personal assistive mobility device” means a self-balancing, nontandem two-wheeled device that can turn in place, designed to transport only one person, with an electric propulsion system, as further defined by Vehicle Code section 313, as may be amended from time to time.

“Motorized scooter” means any two-wheeled device that has handlebars, has either a floorboard that is designed to be stood upon when riding or a seat and

¹ **Cross-references:** violations and penalties generally, Chapter 1.06 AVMC; skateboards, roller skates and in-line skates in parks, AVMC 11.10.140; bicycles in parks, AVMC 11.10.220.

footrests in place of the floorboard, and is powered by and electric motor, as further defined by Vehicle Code section 407.5, as may be amended from time to time. "Motorized vehicle" shall have the same meaning as "motorized vehicle" or "moped," as further defined by Vehicle Code section 406, as it may be amended from time to time.

10.06.020 Bicycle operation.

- A. Direction of Travel. Persons riding or operating a bicycle or electric bicycle on a bicycle trail or path may proceed in either direction except on those trails or paths designated for one-way traffic by appropriate markings or signs.
- B. Walking Bicycles. Bicycles and electric bicycles may be walked subject to all provisions of the law applicable to pedestrians.

10.06.030 Recreational transportation on sidewalks.

- A. Riding on Sidewalks. Bicycles, electric bicycles, roller skates, roller blades, nonmotorized and motorized scooters, nonmotorized skateboards, electrically motorized boards, electric personal assistive mobility devices, and other similar nonmotorized and motorized forms of transportation may be ridden or operated on all sidewalks within the City at a speed not to exceed five miles per hour except as otherwise prohibited by this chapter. Motorized vehicles shall not be permitted to be ridden upon sidewalks.
- B. Nonmotorized and motorized recreational transportation, as provided in subsection (A) of this section, shall be operated at a speed that is reasonable or prudent, having due regard for weather, visibility, pedestrian and vehicular traffic, and the surface and width of the sidewalk, and in no event at a speed that endangers the safety of any person or property.
- C. Prohibitions. Notwithstanding subsection (A) of this section, bicycles, electric bicycles, roller skates, roller blades, nonmotorized and motorized scooters, nonmotorized skateboards, electrically motorized boards, electric personal assistive mobility devices, and other similar nonmotorized and motorized forms of transportation shall not be ridden or operated upon the following:
 1. Sidewalks within a commercial or business center or complex;
 2. Sidewalks adjacent to any public school building when school is in session;
 3. Sidewalks and parking lots adjacent to or within any community or recreation center when in use;

4. Sidewalks adjacent to a church during services;
 5. Parking lots of any property owned or operated by the City; or
 6. Any pedestrian overcrossing or other sidewalk where prohibited by posted signs.
- D. Public Works Director to Designate Additional Prohibitions. Notwithstanding subsection (A) of this section, the public works director, or his or her designee, may designate and declare certain portions of sidewalk where the riding or operation of bicycles, electric bicycles, roller skates, roller blades, nonmotorized and motorized scooters, nonmotorized skateboards, electrically motorized boards, electric personal assistive mobility devices, and other similar nonmotorized and motorized forms of transportation is prohibited.
- E. Public Works Director to Post Signs. The public works director, or his or her designee, shall erect and maintain signs adjacent to sidewalks designating limits and prohibitions authorized by this chapter.
- F. No Effect on ADA Power-Driven Mobility Devices. Notwithstanding anything to the contrary, wheelchairs and other power-driven mobility devices used as a mobility aid by a person with a disability may be ridden or operated on all sidewalks in the City at the speed of pedestrian traffic and in a manner which is safe for the user and other pedestrians.
- G. Yielding Right-of-Way. Whenever any person is riding a bicycle, electric bicycle, roller skates, roller blades, a nonmotorized or motorized scooter, a nonmotorized skateboard, electrically motorized board, electric personal assistive mobility devices, or other similar nonmotorized or motorized form of transportation, such person shall yield right-of-way to any and all pedestrians. A person riding or operating any such form of transportation shall further yield to all traffic upon entering a roadway or driveway.

10.06.040 Skateboards, roller skates and similar pedestrian traffic.

- A. No person shall ride a nonmotorized skateboard, electric personal assistive mobility devices, roller skates, roller blades, nonmotorized scooter, or other conveyance propelled by human power other than a bicycle, or cause or permit the same to roll or coast on the roadway of any street in the city.
- B. The provisions of subsection (A) of this section shall not apply to cul-de-sacs where the length of the cul-de-sac is 500 feet or less.

10.06.050 Pedestrian movements.

The public works director, or his or her designee, is hereby authorized to place and maintain signs or markings to prohibit or to restrict pedestrian crossings at certain intersections.”

SECTION 4. Code Amendment. The following definitions are hereby added to Section 11.10.020 of Chapter 11.10 (Parks) of Title 11 (Parks and Public Places) of the Aliso Viejo Municipal Code to read as follows:

“11.10.20 Definitions.

The following definitions apply to the use of these terms for purposes of this chapter:

‘Electric bicycle’ means an electric bicycle equipped with both fully operable pedals and an electric motor, as further defined by Vehicle Code section 312.5, as it may be amended from time to time.

‘Electrically motorized board’ means any wheeled device that has a floorboard designed to be stood upon when riding, is designed to transport only one person, and has an electric propulsion system, as further defined by Vehicle Code section 313.5, as it may be amended from time to time.

‘Electric personal assistive mobility device’ means a self-balancing, nontandem two-wheeled device that can turn in place, designed to transport only one person, with an electric propulsion system, as further defined by Vehicle Code section 313, as may be amended from time to time.

‘Motorized scooter’ means any two-wheeled device that has handlebars, has either a floorboard that is designed to be stood upon when riding or a seat and footrests in place of the floorboard, and is powered by and electric motor, as further defined by Vehicle Code section 407.5, as may be amended from time to time.”

SECTION 5. Code Amendment. Section 11.10.140 (Skateboards, roller skates and in-line skates) of Chapter 11.10 (Parks) of Title 11 (Parks and Public Places) of the Aliso Viejo Municipal Code is hereby amended in its entirety and restated to read as follows:

“11.10.140 Skateboards, roller skates and in-line skates.

- A. Skateboards. No person shall ride a skateboard, including but not limited to scooters and mountain skateboards, or similar conveyances propelled by human power, other than a bicycle, or cause or permit same to roll or coast in any designated park or recreational area except in areas designated and under conditions established by the director or, in the case of a private park, the consenting owner.

- B. Electrically motorized board. No person shall ride an electrically motorized board, or similar conveyances propelled by motor, including, without limitation, a motorized scooter or an electric personal assistive mobility device, or cause or permit same to roll or coast in any designated park or recreational area except in areas designated and under conditions established by the director or, in the case of a private park, the consenting owner.
- C. Roller Skates and In-Line Skates. No person shall ride roller skates, in-line skates, or similar conveyances propelled by human power, other than a bicycle, or cause or permit it to roll or coast in any designated park or recreational area where the director or, in the case of a private park, the consenting owner, has posted signs to prohibit such activity. No person shall ride roller skates, in-line skates, or similar conveyances on any unpaved trail in any designated park or recreational area except in areas designated and under conditions established by the director or, in the case of a private park, the consenting owner.
- D. No Effect on ADA Power-Driven Mobility Devices. Notwithstanding anything to the contrary, wheelchairs and other power-driven mobility devices used as a mobility aid by a person with a disability may be ridden or operated at the speed of pedestrian traffic and in a manner which is safe for the user and other individuals."

SECTION 6. Code Amendment. Section 11.10.220 (Bicycles) of Chapter 11.10 (Parks) of Title 11 (Parks and Public Places) of the Aliso Viejo Municipal Code is hereby amended in its entirety and restated to read as follows:

"11.10.220 Bicycles.

- A. Designated Trails. No person shall operate a bicycle or an electric bicycle on a road or trail in any designated park or recreational area except upon roads or trails designated for bicycle and/or electric bicycle traffic by the director or, in the case of a private park, the consenting owner.
- B. Unsafe Operation. No person shall operate a bicycle or an electric bicycle in any designated park or recreational area in any manner that endangers any person or animal or at a speed that is greater than is reasonable or prudent, having due regard for other users and the surface, width, and grade of the road or trail, and in no event in excess of 10 miles per hour, unless a greater speed is posted.
- C. Bicycle and Electric Bicycle Parking. No person shall leave a bicycle or electric bicycle lying on its side on a road or trail in any designated park or recreational area in such a way to obstruct pedestrian, equestrian, or vehicle traffic.

- D. Helmets. No person under 18 years of age shall operate a bicycle or an electric bicycle, or ride upon a bicycle or an electric bicycle as a passenger on any road, bikeway or trail in any designated park or recreational area unless that person is wearing a properly fitted and fastened bicycle helmet. The bicycle helmet must meet the standards set forth in California Vehicle Code Section 21212.
- E. No Effect on ADA Power-Driven Mobility Devices. Notwithstanding anything to the contrary, wheelchairs and other power-driven mobility devices used as a mobility aid by a person with a disability may be ridden or operated at the speed of pedestrian traffic and in a manner which is safe for the user and other individuals."

SECTION 7. Severability. If any provision of this Ordinance or the application thereof to any person or circumstance is held invalid by a court of competent jurisdiction, such invalidity shall not affect other provisions or applications of the Ordinance which can be given effect without the invalid provision or application, and to this end the provisions of this Ordinance are severable. The City Council hereby declares that it would have adopted this Ordinance irrespective of the invalidity of any particular portion thereof.

SECTION 8. Effective Date. This Ordinance shall take effect 30 days after its adoption.

SECTION 9. Publication. The City Clerk shall certify as to the adoption of this Ordinance and shall cause a summary thereof to be published within 15 days of the adoption and shall post a certified copy of this Ordinance, including the vote for and against the same, in the Office of the City Clerk, in accordance with Government Code Section 36933.

SECTION 10. Record of Proceedings. The documents and materials associated with this ordinance that constitute the record of proceedings on which these findings are based are located at Aliso Viejo City Hall, 12 Journey, Suite 100, Aliso Viejo, California 92656. The City Clerk is the custodian of the record of proceedings.

PASSED, APPROVED AND ADOPTED this ____ day of _____, 2022.

Ross Chun
Mayor

APPROVED AS TO FORM:

ATTEST:

Scott C. Smith, City Attorney

Mitzi Ortiz, MMC, City Clerk

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss.
CITY OF ALISO VIEJO)

I, MITZI ORTIZ, City Clerk of the City of Aliso Viejo, California, DO HEREBY CERTIFY that foregoing Ordinance No. 2022-____ was duly passed and adopted by the City Council of the City of Aliso Viejo at its regular meeting held on the ____ day of _____, 2022, by the following roll call vote, to wit:

AYES:

NOES:

ABSENT:

MITZI ORTIZ, MMC
CITY CLERK

(SEAL)

Attachment 8

- Parent Resources
- [School Emergencies](#)
- [School Policies and Procedures](#)
- [Say Something Anonymous Reportin...](#)
- [Supporting Healthy and Resilient Te...](#)



E-bike Vehicle Codes

CA Vehicle Code 312.5 Defines Class 1-3 Ebikes.

Ca Vehicle Code 21213 further prohibits any person under the age of 16 from operating a Class 3 electric bike.

CVC 407.5(a) – Defines what a motorized scooter is.

A “motorized scooter” is any two-wheeled device that has handlebars, has a floorboard that is designed to be stood upon when riding, and is powered by an electric motor. This device may also have a driver seat that does not interfere with the ability of the rider to stand and ride and may also be designed to be powered by human propulsion.

Operators of motorized scooters:

1. Are subject to same laws as driver of a vehicle (ride in direction of traffic, not against it, while on a highway)
2. Are subject to same lighting requirements during darkness
3. Do not need Insurance, registration or a license plate
4. Must ride on right side of the roadway
5. If bicycle lane is present, must ride within bicycle lane

E-BIKE SAFETY



Bike Safety with The Orange County Sheriff's Department

Bike Safety with The Orange County Sheriff's Departm...



City Bike/e-Bike Resources

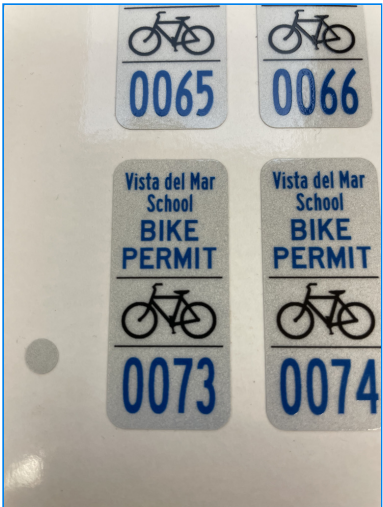
- [City of Mission Viejo](#)
- [City of Laguna Niguel](#)
- [City of San Juan Capistrano](#)
- [City of Aliso Viejo](#)



Safety Bike Helmet

E-bike Resources

- [E-Bike-Rules-Of-The-Road-Flier](#)
- [Motorcycle-VC-Reference-Sheet](#)
- [Motorized-bike-and-scooter-chart](#)



Sample Bike Parking Permit

Example of New Permit Process

Ladera Ranch Middle School New Permit Process for eBikes, Bicycles, Scooters and Skateboards

This upcoming 2022-2023 school year, students will be required to apply for a permit if they are planning on riding to school. Students wishing to ride a bike, eBike, scooter or skateboard must complete the application, watch a video, and complete a quiz with 100% accuracy. After completing the application process, students will then receive a parking permit placard which will be placed on their transportation.

Students who do not have a permit, will not be allowed to ride to school. Parking Permits will be available to students who complete the process, but due to safety and space constraints, LRMS will be limiting the number of permits given to students through a lottery system. A student's parking permit is a privilege and may be revoked based on not following behavior expectations and behaving unsafely arriving to and leaving campus.

4. With any passengers in addition to the operator.
5. Carrying any package, bundle, or article that prevents the operator from keeping at least one hand upon the handlebars.
6. Upon a sidewalk, except as may be necessary to enter or leave adjacent property.
7. On the highway with the handlebars raised so that the operator must elevate his or her hands above the level of his or her shoulders in order to grasp the normal steering grip area.
8. And attach the motorized scooter or himself or herself while on the roadway, by any means, to any other vehicle on the roadway.

as we get closer to the opening of school.

Please note that if your child will be riding a Class 3 bicycle to school, it will need to be adjusted to a Class 2 speed and you will need to attest to this. We cannot allow our students to ride a Class 3 bicycle to campus since none of our students are 16 yet. Individuals must be 16 to ride Class 3 bicycles.

Safe Routes to School Program

- Enforcing protocols for Electronic Bike (eBike) Safety including:
- a. Storage-eBikes should be stored in a designated area on campus, on a hard and level surface with the capacity to hold all bikes permitted through the school. eBikes should never block ingress or egress or be placed in any location that would compromise safety and access.
- b. Charging-Students using eBikes need to charge their equipment prior to arriving on campus. District outlets should not be used for charging.
- c. Security-It is the responsibility of the student to lock and secure the eBike. The District is not responsible for damage or theft of eBikes on campus, or enroute to and from campus.
- d. Permits-Each site is responsible for establishing a process for the distribution of permits for eBikes, which includes education, an application process, and is based on the maximum storage capacity at a particular site.
- e. Education-Each site will require a student to complete a safety training and pass a quiz on the material as part of the permit requirements.
- f. Placards-Each site will develop and distribute a parking placard for eBikes that indicates all requirements for registration and training have been met. The placard must be attached and visible at all times on campus. Sites have the discretion to determine the location of the eBike placard.
- g. Class 3 eBikes-Individuals must be 16 years of age to operate a Class 3 eBike.
- h. Enforcement-eBikes without school-issued placards, and eBikes blocking ingress/egress or walkways, will be confiscated and students will be subject to progressive discipline.
1. Safety-Students must walk eBikes upon entering campus and at all times while on campus, including parking lots and pathways, Students in possession of an eBike must have a helmet with them while they are with their eBike (CVC 21212a, 21235)



CONTACT US

CAPISTRANO UNIFIED SCHOOL DISTRICT
33122 Valle Rd
San Juan Capistrano, CA 92675

(949) 234-9200
(949) 493-8729 (fax)

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The Capistrano Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, gender, gender identity, gender expression, immigration status, nationality, race or ethnicity, religion, sex, sexual orientation, or association with a person or a group with one or more of these actual or perceived



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CMSP-Web Site of California's Official
Motorcycle Safety and Training
Program

MOTORCYCLES, *Motorized* BICYCLES, & *Motorized* SCOOTERS, POCKET BIKES



CHP policy
Enforcement guidelines regarding
other modes of transportation
contained in HPM 100.68, Chapter 4.

CMSP is sponsored and administered by the California Highway Patrol (CHP) pursuant to California Vehicle Code, Section 2931, which established the program in 1986.

This publication is a brief synopsis of the California Vehicle Code and related codes. The contents are designed to facilitate a quick reference and should not be considered a complete statute. Users should refer to the specific code(s) if more detailed information is required.



MOTORCYCLES

Motorcycle - has a seat or saddle for the use of the rider, and is designed to travel on not more than three wheels in contact with the ground.

Section 400 (a) CVC.

- Two-wheeled motorcycles require an M-1 endorsement.
- Three-wheeled motorcycles and/or sidecar require only a Class C license, per Section 12804.9 CVC.
- DOT-compliant helmet required.



Motor-Driven Cycle - is a motorcycle with a motor that displaces less than 150cc. Section 405 CVC.

- Two-wheeled motor-driven cycle requires an M-1 endorsement.
- Three-wheeled motor-driven cycle requires a Class C license.
- DOT-compliant helmet required.

VEHICLE CODE SECTIONS PERTAINING TO MOTORCYCLE

- I 5200b **ONE LICENSE PLATE ISSUED**, rear installation required when only one plate is issued.
- I 5201 **IMPROPERLY MOUNTED LICENSE PLATE**, secure, horizontal mounting and clearly visible. (Refer to code 12500b.)
- I 12500b **LICENSED DRIVER, OUT OF CLASS**, or no endorsement to operate two-wheel motorcycle. (Refer to code for exemptions.)
- I 12509.5c **USE OF INSTRUCTION PERMIT**, shall not drive motorcycle during darkness, on a freeway, or with a passenger.
- I 22107 **UNSAFE TURN OR LANE CHANGE WITHOUT APPROPRIATE SIGNAL**, prohibited.
- I 22108 **TURNING WITHOUT SIGNALING**, during last 100 feet.
- I 22110a,b **HAND/LAMP SIGNAL NOT GIVEN**, signal lamp to be used unless vehicle not required to and not equipped with turn signals. (Refer to code.)
- I/C 22502a **PARALLEL/CURB PARKING**, one wheel or fender must touch curb.
- I 24253b **BATTERY**, capable of keeping taillamp on for 15 min. if engine stops. Applies to vehicles manufactured after 01/01/1971.
- I 24600a **TAILLAMP**, must have one taillamp.
- I 24600e **RED TAILLAMP**, must be red and visible for 1,000 feet. If vehicle manufactured before 01/01/1969, must be visible for 500 feet.
- I 24603a **STOPLAMPS**, one or more stoplamps are required.
- I 24607a **REAR REFLECTORS**, must have one reflector, visible at night from 100 to 350 feet.
- I 24951b4 **LAMP-TYPE TURN SIGNAL**, turn signal required if manufactured after 01/01/1973.

- I 25251.2 **MODULATED HEADLAMP**, prohibited during darkness
- I 25650.5 **HEADLAMPS**, motorcycles manufactured after 01/01/1978 must have 1 and not more than 2 headlamps which light up when the engine is started, and remain lit as long as the engine is running.
- I 26101a **MODIFIED LIGHTING - SELL**, prohibited to sell device to modify original design or performance of lighting safety glazing material or other device (includes illegal light covers).
- I 26101b **MODIFIED LIGHTING - USE**, prohibited to use vehicle with installed device to modify original design or performance of lighting safety glazing material or other device (includes illegal light covers).
- I 26311a **BRAKES**, front and rear brakes required on motorcycle manufactured after 01/01/1966. (Refer to code for exemptions.)
- I 26453 **BRAKES**, all maintained in good condition and in good working order.
- I 26701c **GLAZING MATERIAL**, if windshield has glazing material, it must be safety glazing material. Applies to motorcycles manufactured after 01/01/1969.
- I 26701d **TINTED WIND DEFLECTOR**, no red, blue, or amber wind deflector.
- I 26708a1 **WINDSHIELD APPLICATION - MATERIAL PROHIBITED**, any object or material placed, displayed, installed, affixed, or applied upon the windshield.
- I 26709a **MIRROR**, must have one which enables the driver to see 200 feet to the rear.
- I 27150a **ADEQUATE MUFFLER**, excessive exhaust noise.
- I 27150b **ADEQUATE MUFFLER**, loud off road vehicles.
- I/M 27150.1 **ILLEGAL EXHAUST**, selling, installing.
- I 27151a **MODIFICATION OF EXHAUST SYSTEM**, prohibited.
- I 27400 **HEADSETS AND EARPLUGS IN BOTH EARS**, prohibited. (Refer to code for exemptions.)
- I 27800 **PASSENGERS**, must sit to rear or ride in a side car. Requires a securely attached seat and footrest. Feet must be on footrest while such vehicle is in motion.
- I 27801a **SEAT**, must be so positioned that driver, when seated can touch the ground with feet.
- I 27801b **HANDLEBARS**, must be so positioned that the driver's hands are no more than 6 inches above shoulder height.
- I 27803b **MANDATORY HELMET LAW**, unlawful to operate motorcycle, motor-driven cycle, or motorized bicycle, if driver or any passenger is not wearing a helmet meeting FMVSS 218. (Except motorized bicycles as specified in 406(b). See page 4.)
- I 27803c **MANDATORY HELMET LAW**, unlawful to ride as passenger if driver or any passenger is not wearing a helmet which meets requirements of FMVSS 218.

Attachment: Memorandum to the Traffic Commission Concerning Bicycle Safety (2019 : Electric Bicycle,

MOTORIZED SCOOTERS

Motorized Scooter - a two-wheeled device with handlebars and a floorboard designed to be stood upon when riding, that is powered by an electric motor. May also have a driver seat that does not interfere with the ability of the rider to stand and ride. May also be designed to be powered by human propulsion. Section 407.5 (a) CVC.



- Requires a Class C license.
- Bicycle helmet required.

VEHICLE CODES PERTAINING TO MOTORIZED SCOOTER

- I 21212a BICYCLE HELMET REQUIRED**, under 18 years old.
- M 21221.5 DRIVING UNDER THE INFLUENCE**, no person may operate a motorized scooter upon a highway while under the influence of an alcoholic beverage or any drug.
- I 21223a-c MOTORIZED SCOOTER OPERATED DURING DARKNESS**, refer to code.
- I 21226b MUFFLER REQUIRED**, a motorized scooter shall at all times be equipped with a muffler.
- I 21226d EXHAUST MODIFICATION**, the exhaust system shall be modified in a manner that will amplify or increase the noise level.
- I 21227b OPERATION REQUIREMENT**, it is unlawful for a scooter to be operated that does not meet one of the following: operate in a manner so that the electric motor is disengaged or ceases to function when the brakes are applied or operate in a manner so that the motor is engaged through a switch or mechanism that, when released, will cause the electric motor to disengage or cease to function.
- I 21228a,b RIGHT CURB/ROADWAY EDGE**, failure to operate as close as possible to right curb/roadway edge and walk scooter across street when turning left.
- I 21229a,b WITHIN BICYCLE LANE**, any person operating a motorized scooter upon the roadway shall ride within an established bicycle lane.
- I 21235 MOTORIZED SCOOTER PROHIBITED OPERATION** the operator of a motorized scooter shall not: **(a)** operate a motorized scooter unless it is equipped with a brake, **(b)** operate a motorized scooter on a highway with a speed limit in excess of 25 miles per hour unless operated within a Class II bicycle lane, **(c)** operate a motorized scooter without wearing a properly fitted and fastened bicycle helmet meeting the requirements of Section 21212 VC, **(d)** operate a motorized scooter without a valid driver license or instruction permit, **(e)** carry any passengers in addition to the operator, **(f)** carry any package, bundle or article that prevents the operator from keeping at least one hand upon the handlebars, **(g)** operate a motorized scooter while the operator is using a mobile electronic device.

scooter upon a sidewalk, except as may be necessary enter or leave adjacent property, **(h)** operate a motorized scooter with handlebars requiring the rider's hands to be elevated above the level of their shoulders, **(i)** leave a motorized scooter on a sidewalk in any manner that does not allow adequate path for pedestrian traffic, **(j)** attach a motorized scooter nor him/herself by any means to another vehicle on the roadway. (Refer to Section 22411 CVC for maximum speed limit.)

- I 22411 MAXIMUM SPEED**, no person shall operate a motorized scooter in excess of 15 mph.

POCKET BIKES



Pocket Bike - a two-wheeled motorized device that has a seat or saddle, and not designed or manufactured for highway use. Section 473 (a) CVC.

VEHICLE CODE SECTIONS PERTAINING TO POCKET BIKES AND MOTORIZED BICYCLES

- I 21720 OPERATE ON PRIVATE PROPERTY ONLY.**
- I 21721a IMPOUND AUTHORITY**, for a pocket bike if operated in violation of 21720 CVC. Hold 48 hours minimum. (Refer to code.)
- I 21968 MOTORIZED SKATEBOARD**, operate on private property only.

MOPEDS OR MOTORIZED BICYCLES

Moped - a two or three-wheeled device with fully operative pedals for propulsion by human power, or having no pedals if: 1) powered solely by electric energy, 2) has an automatic transmission, 3) has a motor which produces less than two gross brake horsepower, and 4) has a maximum speed of 30 mph on level ground. Section 406 (a) CVC.

- Requires an M-1 or M-2 endorsement.
- DOT-compliant helmet required.



Motorized Bicycle - has fully operative pedals for propulsion by human power and an electric motor that: 1) produces less than 1,000 watt output

2) is incapable of a speed greater than 20 mph on level ground, and 3) is incapable of further increasing speed beyond 20 mph using human power in conjunction with the electric motor.

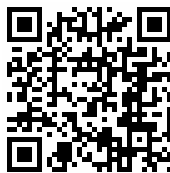
Section 406 (b) CVC.

- Not a motor vehicle. (No insurance, license, or registration required.)
- Rider required to be 16 years of age or older.
- Bicycle helmet required.

- I 23135 **MODIFIED MOTORIZED BICYCLES**, operating when modified.
- I 23330b **VEHICULAR CROSSING**, unauthorized use.
- I 24015a **MOTORIZED BICYCLE EQUIPMENT REQUIREMENTS**, headlamp, taillamp, stoplamp, side rear reflectors, and adequate brakes.
- I 24015b **MOTORIZED BICYCLE EQUIPMENT REQUIREMENTS**, mirror, horn, and muffler.
- I 24016a **ELECTRIC MOTORIZED BICYCLE**, (1) comply with equipment and manufacturing requirements for bicycles or requirements for motor-driven cycles, and (2) electric motor disengages when brake is applied or switch mechanism is released.
- I 24016b1 **ELECTRIC MOTORIZED BICYCLE**, operator must wear bicycle helmet meeting requirements of Section 21212 CVC.
- I 24016b4 **ELECTRIC MOTORIZED BICYCLE**, operator must be 16 years of age or older.
- I 24016c **ELECTRIC MOTORIZED BICYCLE**, modification to increase speed prohibited.



CHP 888



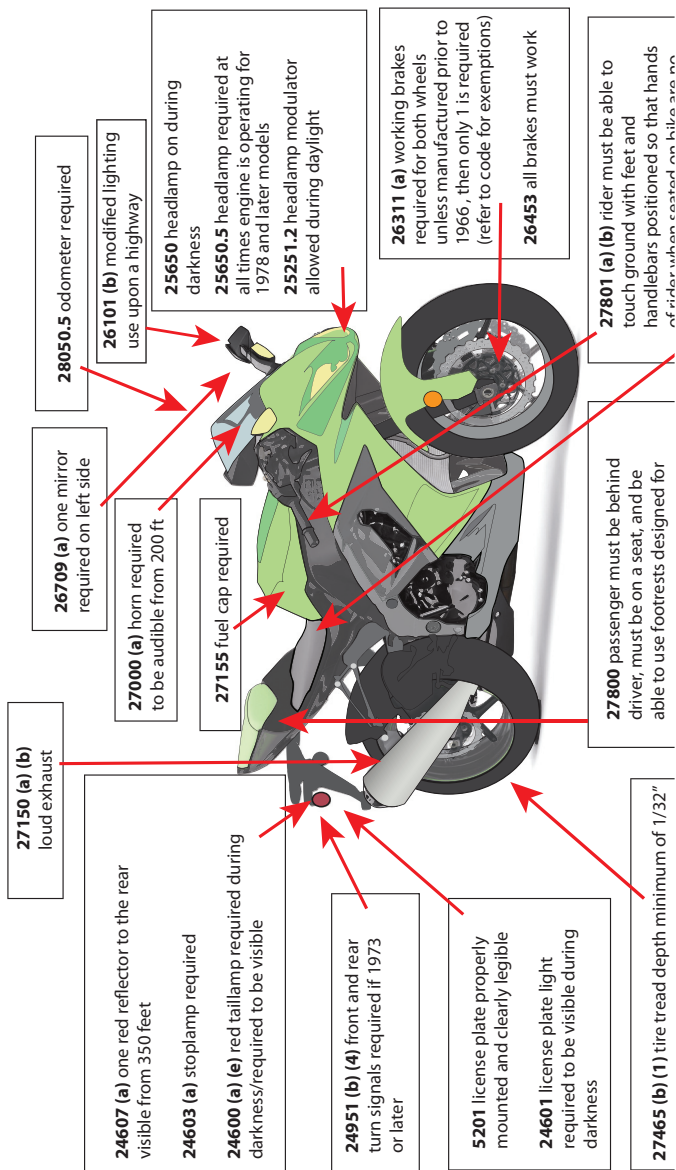
Motorcycles and
Similar Vehicles



CHP YouTube Channel



How to
Identify Unsafe
Motorcycle Helmets



Attachment: Memorandum to the Traffic Commission Concerning Bicycle Safety (2019 : Electric Bicycle,



To find out more information about the California Motorcyclist Safety Program (CMSP), go to:
<http://www.chp.ca.gov/programs/motorcycle.html>

SPECIAL NOTATIONS. The following notations are used in conjunction with appropriate code sections:

M = Misdemeanor I = Infraction C = Subject to civil process

Attachment 9

Electric Bicycles

Electric bicycles, more commonly referred to as E-bikes, are growing in popularity because they allow people of many ages and abilities to get out and enjoy the fun and enjoyment of cycling with assistance from an electric motor. Just like a traditional bicycle, there are many different styles of e-bikes, from cargo e-bikes to beach cruisers to mountain bikes, making them useful and fun in many ways. E-bikes also provide a great alternative to getting into a car to travel around town.



If you ride, or are considering riding an e-bike in and around Laguna Niguel, please take the time to learn what is and isn't allowed, what the applicable laws are, and follow guidelines and recommendations for the riding safety of yourself and others.

What is an Electric Bicycle?

An E-bike is an electric bicycle equipped with fully operable pedals and an electric motor of less than 750 watts.

- The same rules of the road that apply to traditional human-powered bicycles apply to all types of electric bikes and human-powered bicycles.
- Electric bicycles do not require registration, licensing or insurance like a car or motorcycle.

E-bike 101

California designates three classes of electric bicycles. Knowing the class of your E-bike will tell you where and how you can ride.

Class 1	Class 2	Class 3
Bikes with a top assisted speed of 20 mph that must be pedaled to operate.	Bikes with a top assisted speed of 20 mph that can be operated without pedaling by using a handlebar-mounted throttle.	Bikes with a top assisted speed of 28 mph that must be pedaled to operate.
<u>Rider Requirements</u> ◦ No minimum age ◦ Helmet required for riders age 17 and under	<u>Rider Requirements</u> ◦ No minimum age ◦ Helmet required for riders age 17 and under	<u>Rider Requirements</u> ◦ Minimum age 16 ◦ Helmet required for all ages

Where to Ride

- Allowed wherever regular bicycle are permitted

Where to Ride?

- Allowed wherever regular bicycle are permitted

Where to Ride?

- Allowed in bike lanes or separated bikeways adjacent to the roadway
- **NOT** allowed on trails

It is against the law in California to modify or otherwise tamper with electric bicycles in a way that changes the speed capability, unless the rider also changes the bicycle's classification. Electric bicycles with motors of more than 750 watts, and bicycles with gas motors are technically motorcycles according to the law and require Class M licenses, registration, insurance, and meet the minimum age requirement.

Voluntary Bike Registration

Laguna Niguel Police Services will be operating a voluntary bicycle registration program free for all Laguna Niguel residents. This exciting new program will allow residents to bring their bicycles, both electric and non-electric, to Police Services headquarters to register them. Bicycle registration services will also go mobile and be available at community events. By registering a traditional bicycle or E-bike, you increase your chances of recovering your bicycle if it is ever lost or stolen. Residents can either register their bicycle in the Police Services Lobby or by [completing this form](#).



Protect your Bicycle

Bicycles are lucrative targets for thieves. Take every precaution to ensure that your bike is safe.

- When done using your bike, put it away - inside if possible and out of sight.
- When out and about on your bike, always lock it securely and keep an eye on it.
- Use a good lock! Make sure your lock has a high-security rating and learn to use it wisely.
- Where to lock it? Look for something totally immovable that can't be cut.
- How to lock it? Lock at the lowest point possible between bike frame and the locking object or cycle stand. This makes access and leverage points harder for thieves. Lock the frame and one wheel to the stand.
- If you have parts or components that are easily removed, take them with you.

Electric Bicycle Feedback

Have you noticed unsafe e-bike riding behavior? If so, please let us know by completing the [attached comment form](#). By providing information, you are helping your community become educated on the issue. Information provided in this form will allow the City to utilize resources to inform residents strategically.

Rules of the Road

All cyclists (e-bike riders included) are subject to all the same rules of the road as motorists. Cyclists who don't follow the rules are subject to ticketing and fines as defined by the California Vehicle Code or Municipal Code.

Make sure to follow these guidelines:

- Traffic lights, signs, and signals apply to all road users, including electric bicycle riders
- Cyclists must ride to the right edge of the road as practical. If you're riding slower than traffic, ride in the bike lane. You can leave the bike lane to turn left, pass someone, avoid a road hazard or avoid cars turning right
- Must stop at red lights and stop signs
- Cyclists can ride no faster than 5 mph on City sidewalks
- Cyclists must yield the right-of-way to any and all pedestrians on City sidewalks
- Always yield the right-of-way to pedestrians on City trails
- Must stop before a right turn at red lights
- Riding against the flow of traffic is prohibited

- When a bicycle lane is available, bicyclists are required to use the bike lane unless traveling as fast as traffic
- It is illegal to carry passengers on your electric bicycle unless your bike has an extra permanent seat or when using a child safety seat
- Weaving in and out of traffic is prohibited
- Be aware of other road users, and try to match the average speed
- Always wear a properly-fitted bicycle helmet with the chin strap securely fastened

Bike Safety with The Orange County Sheriff's Department



Contact Us

Virgil Asuncion

Chief of Police Services

Phone: (949) 362-4346

Non-Emergency Dispatch: (949) 770-6011

Jason Howell

Administrative Sergeant

Phone: (949) 362-4346

Tamberlyn Luketich

Secretary

[Email](#)

Phone: (949) 362-4303

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City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Traffic Signal Master Plan Update and Construction of New Traffic Signals

RECOMMENDATION: That the Traffic Commission recommend: 1) City staff and its Traffic Engineering Consultant update the Traffic Signal Master Plan; and 2) City staff return to the Traffic Commission with recommendations on traffic signals to construct using available CARITS funding for approval by City Council.

SUMMARY:

The new Public Works Director/City Engineer contacted the County of Orange regarding the City's existing \$1.27M balance within the Coastal Road Area Improvements and Traffic Signal (CARITS) fund. Based upon discussions with County staff, this funding may be used to construct new traffic signals to increase driver safety on arterial highways and/or replace traffic signal equipment that will reduce delays on arterial highways. The Public Works Director/City Engineer is recommending using the CARITS funds to construct some of the traffic signals that are on the City's traffic signal warrant lists.

BACKGROUND:

The new Public Works Director/City Engineer contacted the County of Orange regarding the City's existing \$1.27M balance within the Coastal Road Area Improvements and Traffic Signal (CARITS) fund. This housing developer paid funding program was established by the County in 1990 to fund arterial highway widenings and the

Traffic Signal Master Plan Update and Construction of New Traffic Signals

November 16, 2022

Page 2

installation of traffic signals to alleviate the effects of the construction of new residential housing generally west of I-5 and south of El Toro Road. Based upon discussions with County staff, this funding may be used to construct new traffic signals to increase driver safety on arterial highways and/or replace traffic signal equipment that will reduce delays on arterial highways. The Public Works Director/City Engineer is recommending using the CARITS funds to construct some of the traffic signals that are on the City's traffic signal warrant lists.

Under the previous City administration, the CARITS funds were intended to be used for the addition of a southbound lane on Paseo de Valencia between Kennington Drive and Laguna Hills Drive to help alleviate peak flow afternoon traffic turning from southbound Paseo de Valencia onto Laguna Hills Drive. However, due to environmental issues encountered after the design was complete that increased the estimated project cost to \$4M, the project was abandoned in 2018.

The Public Works Director/City Engineer investigated if the abandoned Paseo de Valencia project would qualify for OC Go (Measure M one-half cent sales tax) competitive grant funds to make up for the CARITS funding shortfall; however, the project did not meet the minimum traffic volume requirements for funding under the recently closed call for Arterial Capacity Enhancement projects.

In reviewing allowable uses of CARITS funds, the Public Works Director/City Engineer negotiated with the County to allow the City to use the entire \$1.27M balance to fund the construction of new traffic signals at locations where none exist today that have been backlogged on the traffic signal warrant list for approximately 20 years.

The Public Works Director/City Engineer recommends using the City's on-call traffic engineering consultant, Hartzog & Crabill, to update the 2016 Traffic Signal Master Plan (TSMP) to verify the locations that meet the California Manual of Uniform Traffic Control Devices-based traffic signal warrant analysis warrants for the installation of new traffic signals.

The City utilizes a TSMP to aid in the planning of potential future installations of new traffic signals where warranted and which meet other factors. Traffic signals are only to be installed if they meet one or more "warrants" as established in the Traffic Manual of

Traffic Signal Master Plan Update and Construction of New Traffic Signals

November 16, 2022

Page 3

the State of California. However, traffic signals are not required to be installed solely because the site has met one or more warrants. The TSMP applies readily measurable warrants against data that was collected as a part of the analysis. This information primarily relies upon traffic volume counts, traffic collision history and the physical conditions of the site. The data analysis is followed by scoring criteria to aid in the prioritization of new traffic signals.

Provided that the Traffic Commission and City Council approve of this use of CARITS funds to update the TSMP and to construct new traffic signals, the Public Works Department anticipates being able to construct at least three new traffic signals using the CARITS funds currently on deposit with the City. If any leftover funds are available after the conclusion of the traffic signal construction projects, City staff recommends upgrading existing controllers and/or traffic signal interconnect cables in an effort to improve traffic flow.

The two most recent versions of the TSMP, the 2007 TSMP and the 2016 TSMP, are provided for the review of the Traffic Commission. Combined, the documents identify up to five new traffic signals as meeting one or more State warrants. Locations identified in the 2007 or 2016 TSMP as noted below include:

1. Alicia Parkway/Via Lomas (2007, 2016)
2. Paseo de Valencia/Alisal Avenue (2016)
3. Paseo de Valencia/Ericson Way (2016)
4. La Paz Road/Appaloosa Place (2007, 2016)
5. La Paz Road/Alameda Avenue (2007)

La Paz Road at Alameda Avenue, which was on the 2007 TSMP list for traffic signal installation, did not meet the CA MUTCD warrants in the 2016 TSMP assessment. However, the Public Works Director/City Engineer, as part of performing an updated TSMP recommends evaluating this intersection again.

Coincidentally, recently, a citizen contacted Mayor Wheeler asking for a pedestrian crossing at Paseo de Valencia/Alisal Avenue. Construction of a traffic signal at this location would provide a safe, marked crosswalk at the intersection.

Traffic Signal Master Plan Update and Construction of New Traffic Signals

November 16, 2022

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Ericson Way and Alisal Avenue are contiguous to one another on Paseo de Valencia. Theoretically, the implementation of a traffic signal at one of these intersections would help provide a gap in traffic for traffic turning from the other intersection; therefore, both intersections may not require signalization if one of the locations has a traffic signal. The same scenario may hold true for Appaloosa Place and Alameda Avenue on La Paz Road.

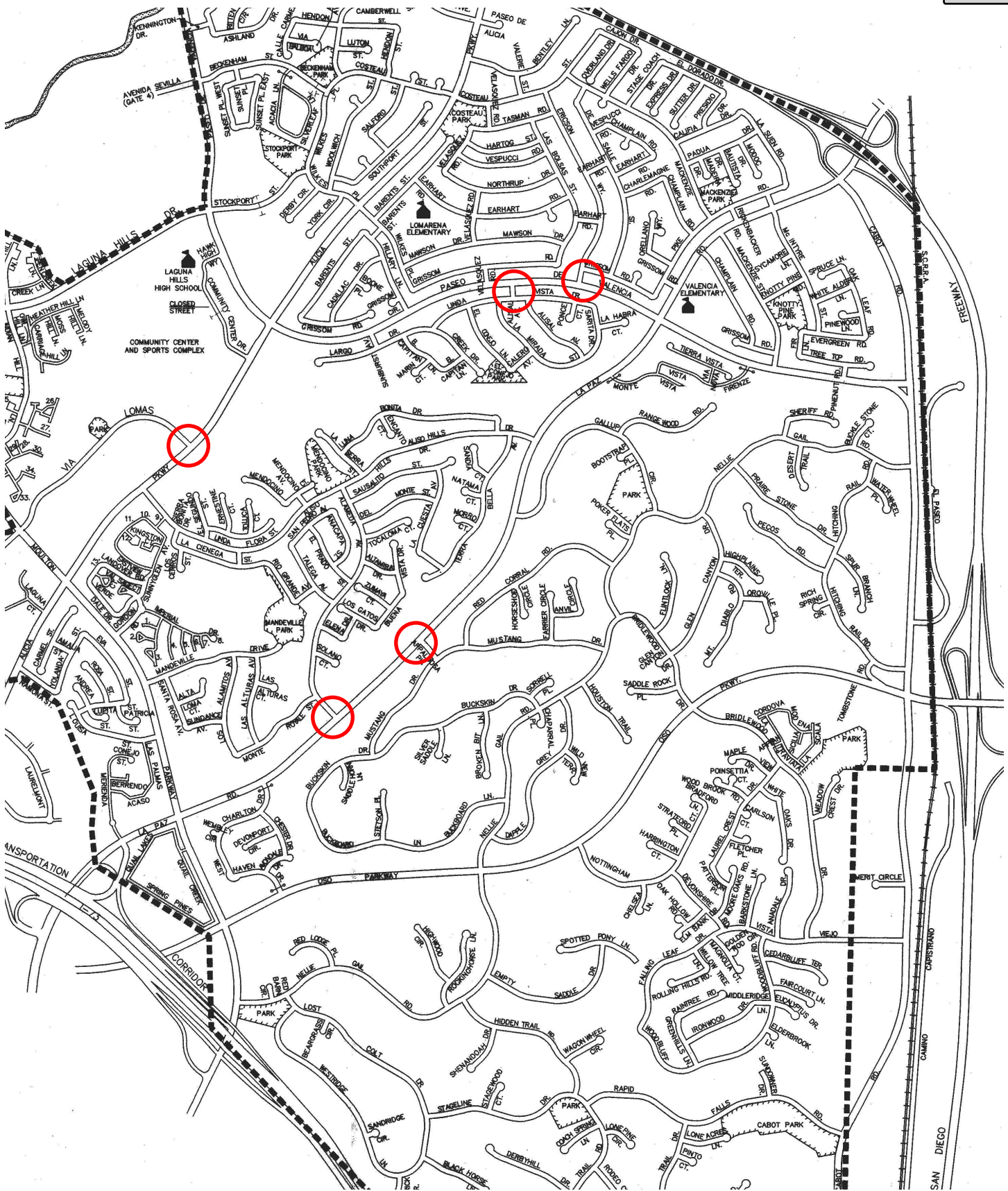
Consequently, City staff recommends that Hartzog & Crabill update the TSMP and, if both signals on Paseo de Valencia and on La Paz Road are warranted, include an engineering analysis in the TSMP determining if both traffic signals on Paseo de Valencia at Alisal Avenue and Ericson Way and on La Paz Road at Appaloosa Place and Alameda Avenue would be required.

FISCAL IMPACT:

The update to the TSMP could be accomplished within the existing Traffic Engineering budget for the Public Works Department. If recommended by the Traffic Commission, the construction of three new traffic signals and associated improvements has an anticipated cost of approximately \$1.2 million. This funding will need to be authorized by City Council for this work as a FY 2022-2023 capital improvement project budget amendment.

ATTACHMENTS:

- Vicinity Map
- 2007 Traffic Signal Master Plan
- 2016 Traffic Signal Master Plan



2007 and 2016 Traffic Signal Warrant Locations

CITY OF LAGUNA HILLS

AGENDA REPORT PUBLIC SERVICES DEPARTMENT

ISSUE: TRAFFIC SIGNAL MASTER PLAN UPDATE

SUMMARY:

On a periodic basis, the City prepares a Traffic Signal Master Plan Update to evaluate intersections at which new traffic signals may meet minimum established standards for installation. This evaluation provides assistance to the City Council in prioritizing future traffic signal installations. It is noted that intersections meeting the minimum standard for a traffic signal installation are not required to have a traffic signal installed. Rather, this information is a tool for considering such installations. The consulting Traffic Engineers of Hartzog & Crabill have completed the Traffic Signal Master Plan Update for City Council review and approval. The Traffic Commission, at the meeting of September 19, 2007, reviewed the Traffic Signal Master Plan and took two actions. The first action was to accept the report as presented. The second action was to recommend to the City Council that no new traffic signals be constructed without further additional detailed study at any selected location.

BACKGROUND:

The Traffic Signal Master Plan, attached, has been updated by the consulting Traffic Engineers of Hartzog & Crabill. The Master Plan, followed the procedures in previous editions, evaluated potential new traffic signal installations against the minimum standards (warrants) used by the State of California for traffic signals. The City currently operates 47 traffic signals. A total of 19 additional arterial highway intersections without traffic signals were evaluated for traffic signal needs. Four locations were found to meet the minimum standards for traffic signal installation. Following an established prioritization procedure, these four locations were rated and then ranked in priority order as follows:

1. Moulton Parkway at Gordon Road
2. Alicia Parkway at Via Lomas
3. La Paz Road at Appaloosa Place
4. La Paz Road at Alameda Avenue

RECOMMENDATION: THAT THE CITY COUNCIL RECEIVE AND FILE THE TRAFFIC SIGNAL MASTER PLAN UPDATE.

Agenda Report
Traffic Signal Master Plan
Page 2

Intersections that meet the minimum warrants for traffic signal installation do not require that a traffic signal be installed. Rather, this information is a planning tool used to consider the future installation of a traffic signal. At the above four intersections, the minimum warrants were met related to traffic volumes but none of the locations met the warrant for traffic collision history. The installation of a traffic signal can lead to increased numbers of traffic collisions although the severity may be different than at non-signalized intersection. Alternatives to a traffic signal include converting Tee intersections into right turn only intersections thereby eliminating either one or both of the left turn movements currently allowed. This can improve traffic flow and reduce traffic collision events. All four of the above intersections are Tee intersections.

The Traffic Commission, at the meeting of September 19, 2007, reviewed the Traffic Signal Master Plan and took two actions. The first action was to accept the report as presented. The second action was to recommend to the City Council that no new traffic signals be constructed without further additional detailed study at any selected location. The Traffic Commission expressed a desire to evaluate alternative traffic controls to traffic signal installations, particularly at Tee intersections that might be adequately served with right turn only movements, before a new traffic signal is constructed.

FISCAL IMPACT:

The construction cost of a traffic signal is approximately \$250,000 with annual maintenance and power costs of about \$3,000. The Capital Improvement Program Budget includes funding for a new traffic signal in the "future" budget category.

RECOMMENDATION: THAT THE CITY COUNCIL RECEIVE AND FILE THE TRAFFIC SIGNAL MASTER PLAN UPDATE.

ATTACHMENTS:

- Traffic Signal Master Plan Update

City of Laguna Hills
Traffic Signal Master Plan
Plan Update

Prepared for:
City of Laguna Hills
24035 El Toro Road
Laguna Hills, Ca. 92653

Prepared by:
Hartzog & Crabill, Inc.
275 Centennial Way, St. 208
Tustin, CA. 92680
(714) 731 – 9455

August 2007



August 10, 2007

Mr. Kenneth H. Rosenfield, P.E.
City Engineer
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA. 92653

Subject: ***Traffic Signal Master Plan – 2007***

Dear Ken:

In accordance the City's recent authorization, Hartzog & Crabill, Inc. is pleased to submit this 2007 update of the Laguna Hills Traffic Signal Master Plan. The procedure followed established formats of (1) an evaluation of existing conditions, (2) a review of intersection locations that could eventually become warranted for construction, and (3) the prioritization of the warranted signals.

The evaluation shows that four intersections have become either new candidates for construction or remain so from earlier updates. Of those, the highest rank for this time period is Moulton Parkway at Gordon road. This is followed by Alicia Parkway at Via Lomas. Given the numerous elements that have been used in prioritizing those signals, we recommend that they be considered for construction as funds are available. The other two that were found to be warranted, but of a lesser construction priority are La Paz Road at Appaloosa Place and La Paz Road at Alameda Avenue.

In terms of future traffic signals, we recommend that new counts be taken each year along with an assessment of accidents at the unsignalized intersections. Then, through a relatively simple process, the numbers of this report, along with the various point scores shown in the tables, can be updated. As always, we appreciate the opportunity of preparing this administrative document for you use. During your review of its contents, please do not hesitate to call for added detail or other clarifications.

Very Truly Yours:

Hartzog & Crabill, Inc.

Jerry Crabill, P.E.

275 Centennial Way, Suite 208, Tustin, CA 92780 Phone: (714) 731-9455

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Executive Summary

Goals and Objectives

Similar to earlier versions of the City's Traffic Signal Master Plan, the goal of the year 2007 assessment was to provide City staff with a useful and logical planning tool for traffic signal construction. Our objective was to create a prioritized intersection signalization list for existing locations. While changeable depending on future conditions, the list would clearly show the many reasons behind (1) our decision for prioritization of traffic signal installations and (2) supporting documentation toward City decisions for future budgeting.

Study Methodology

The study's methodology was straightforward and consistent with previous Traffic Signal Master Plans. Since most signal construction decisions are based on warrant satisfaction described by Caltrans, our work relied on new 2007 traffic counts at 19 candidate intersection locations. Those volumes were input into signal construction criteria relating to traffic entering the various intersections. Other criteria also used included evaluating cross traffic needs to enter the main traffic flow on the City's arterial highways. A detailed evaluation of accidents at all locations was also conducted. Since the "types" of accidents that most often can be corrected by a traffic signal is the broadside, left turn or pedestrian involved accidents, the City's computer database of accidents was investigated for those elements.

All of the data collected and analyzed via the above was then compiled into a logical process of construction prioritization. This involves a list showing the City where signals are currently needed, why such needs have materialized since the last update (year 2003), and the order by which the new signals should be constructed.

The same rating system was used as in previous studies. This involved the preparation of several tables that present existing traffic volumes and accidents in different comparative ways. Using that information, and coupled with our experience as to the best location for traffic signals, the priority rating system was used as an aid in making final traffic signal construction priority recommendations.

The Need For Warranted Traffic Signals

It is noted that the primary use of the results in this report is to assist City planners in the decision process toward the installation of traffic signals. While good justification for the installation of a signal is based on Caltrans warrants, signals are not factually required simply because they meet certain warrants. The final decision to install a signal should not be based solely thereon. Since traffic signals may increase certain types of collisions, other elements such as delay, congestion, approach conditions, driver confusion, future land use, and other evidence for the need for such driver right a way assignment must also be factored into the results of this assessment.

SIGNAL MASTER PLAN RESULTS FOR 2007

The evaluation of existing 2007 traffic volumes, accidents, and other important elements revealed that four intersections have become or remain (from the 2003 assessment) candidates for signalization. These locations are:

- (1) *Moulton Parkway at Gordon Road,*
- (2) *Alicia Parkway at Via Lomas*
- (3) *La Paz Road At Appaloosa Place*
- (4) *La Paz Road at Alameda Avenue.*

*City of Laguna Hills
Traffic Signal Master Plan Update
August 2007*

City of Laguna Hills
2007 Traffic Signal Master Plan

Introduction

The City of Laguna Hills requested that the 2003 City-wide Traffic Signal Master Plan be updated to reflect changes in traffic conditions. Since those conditions are directly related to the need for traffic signals at various locations, it follows that new requirements for signalization may now be necessary. To that end, the following information prepared by Hartzog & Crabill identifies those changes along with any new intersections where signalization should be considered.

The Importance of Traffic Signals and Growth Monitoring

The control of traffic by means of signalized intersection operation has long proven to be an effective technique to reduce accidents and generally improve the quality of traffic flow. To assist the City in the maintenance of a satisfactory signal monitoring program, this report has been prepared as part of a continuing series of periodic signal evaluations: assisting in signal improvement decisions as well as the necessary municipal budgeting process. This plan will also be useful to maintain and/or upgrade/prioritize the existing signal system and to provide a prioritization of future traffic signal installations.

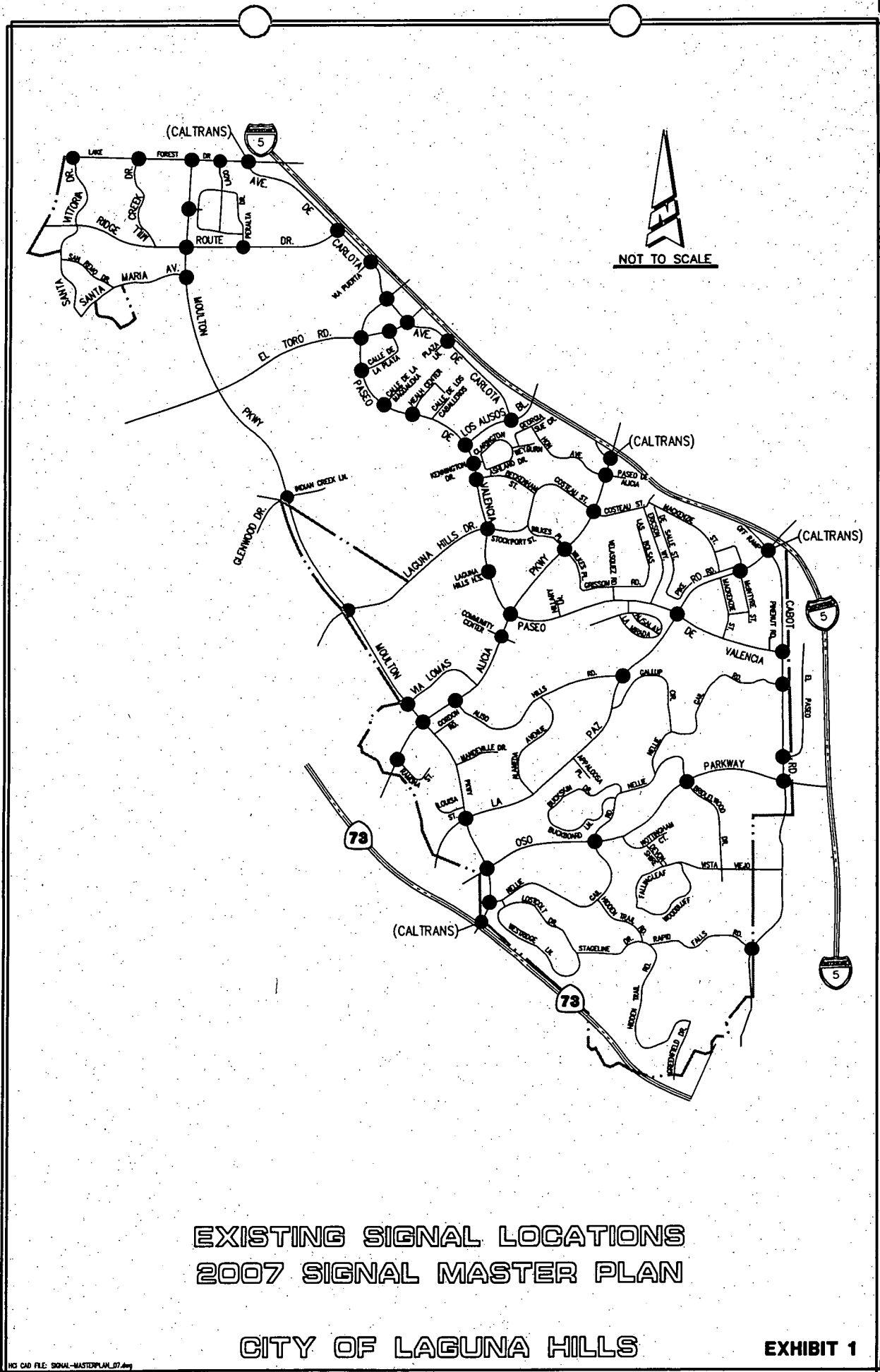
The importance of traffic signals is clearly exemplified by their significant influence over the orderly flow of area traffic volumes. When justified, properly designed and maintained, a signal may achieve one or more of the following:

- Reduce the frequency of certain types of accidents
- Effect orderly traffic movement
- Provide for a continuous platoon of traffic flow
- Allow vehicle and pedestrians to better cross opposing directions of traffic

However, should a signal be unjustified or poorly maintained, one or more of the following may result:

- Increased accident frequency
- Excessive delay (driver frustration)
- Disregard of signal indications
- Circuitous travel by alternate routes

Therefore, it is evident that a reduced intersection accident potential, and in particular, the maintenance of optimal traffic flow, is not possible without properly selected and maintained signal equipment. To achieve those goals, it is the intent of this update document to provide Laguna Hills decision makers with a logical and defensible document as to the time frame for eventual traffic signal construction. Exhibit 1 shows signals that currently exist in the City.



The Need for Warranted Traffic Signals

It is noted that the primary use of the results in this report is to assist City planners in the decision process toward the installation of traffic signals. While good justification for the installation of a signal is based on Caltrans warrants, signals are not factually required simply because they meet certain warrants. The final decision to install a signal should not be based solely thereon. Since traffic signals may increase certain types of collisions, other elements such as delay, congestion, approach conditions, driver confusion, future land use, and other evidence for the need for such driver right a way assignment must also be factored into the results of this assessment.

2007 Traffic Signal Update Methodology

Inasmuch as several Master Plans and Updates have been prepared for the City, all having been used to track and identify when and where traffic signals should be constructed (prioritized to recognize budget limitations), this update re-evaluates the various analysis elements used in previous reports to provide for a consistent analysis and comparison. In all, the process involved about 15 steps. Using a continuation of the City's logical process in monitoring traffic volumes and accidents, new traffic counts at key locations were collected (those intersections where signals have been projected for the future). Further, recognizing that intersection conditions may have changed for locations never before considered for signalization, the new count program also includes those intersections as well. All of the new traffic counts are presented in Table 1 – covering 19 candidate signal locations.

Table 1
Traffic Volumes At Potential Signal Locations
(Presents Volumes for All Studied Locations Regardless of Warrant Satisfaction)

Loc	Major Street (Speed Limit)	Traffic Volumes		Minor Street (Speed Limit)	Traffic Volumes	
		Approach Direction	2007 Volumes		Approach Direction	2007 Volume
1	St. Vittoria (45 mph)	NB	807	Ridge Route Dr.	EB	N/A
		SB	2468		WB	2122
		Total	3215		Total	2122
2	Ridge Rt. Dr (45 mph)	EB	2252	Mill Creek Dr.	NB	N/A
		WB	2122		SB	938
		Total	4374		Total	938
3	St. Maria Ave. (45 mpg)	EB	4281	San Remo Dr.	NB	N/A
		WB	3116		SB	1388
		Total	7397		Total	1388
4	P.D.V. (45 mph)	EB	N/A	Calle Caballeros (Right Turn Only)	NB	N/A
		WB	N/A		SB	N/A
		Total	N/A		Total	N/A

Table 1. (Continued)

5	P.D.V. (45mph)	EB	5651	Hillary Lane	NB	N/A
		WB	5759		SB	416
		Total	11,410		Total	416
6	P.D.V. (45 mph)	EB	5651	Velasquez Road	NB	N/A
		WB	5759		SB	335
		Total	11,410		Total	335
7	P.D.V. (45 mph)	NB	5651	Alisal Ave.	NB	1194
		SB	5759		SB	N/A
		Total	11,410		Total	1194
8	P.D.V. (45 mph)	EB	5651	Ericson Way	NB	N/A
		WB	5759		SB	759
		Total	11,410		Total	759
9	P.D.V. (45 mph)	EB	3269	Mackenzie St.	NB	N/A
		WB	2813		SB	172
		Total	6082		Total	172
10	P.D.V. (45 mph)	EB	3269	Pine Nut Rd.	NB	N/A
		WB	2813		SB	517
		Total	6082		Total	517
11	Oso Parkway (50 mph)	EB	N/A	Nottingham Ct (Right turn Only)	NB	N/A
		WB	N/A		SB	N/A
		Total	N/A		Total	N/A
12	La Paz Rd. (45 mph)	EB	8410	Alameda Ave.	NB	N/A
		WB	8136		SB	868
		Total	16,546		Total	868
13	La Paz Rd. (45 mph)	EB	7373	Appaloosa Place	NB	1094
		WB	8136		SB	N/A
		Total	15,509		Total	1094
14	La Paz Rd. (45 mph)	NB	7373	Gallup Dr.	EB	N/A
		SB	8136		WB	588
		Total	15,509		Total	588
15	Alicia Pkwy. (45 mph)	NB	22,991	Via Lomas	EB	2447
		SB	21,600		WB	N/A
		Total	44,591		Total	2447
16	Moulton Pkwy (45 mph)	NB	10,469	Gordon Rd.	EB	N/A
		SB	10,636		WB	1003
		Total	21,105		Total	1003
17	Moulton Pkwy (45mph)	NB	10,469	Mandeville Drive	EB	N/A
		SB	10,636		WB	740
		Total	21,105		Total	740
18	Moulton Pkwy (45 mph)	NB	10,469	Louisa St.	EB	607
		SB	10,636		WB	N/A
		Total	21,105		Total	607
19	Moulton Pkwy (45 mph)	NB	10,469	Indian Hill Lane	EB	N/A
		SB	10,636		WB	577
		Total	21,105		Total	577

In a manner identical to previous Signal Master Plans, the primary determination of the need for the construction of a traffic signal is via the use of Caltrans warranting criteria; with the new 2007 volumes being first input in "Warrant 1 and 2" worksheets published by Caltrans. Briefly, Warrant 1 is satisfied when the traffic volumes given in Table 2a (either hourly or daily depending on data availability) exist on the major street and on the higher volume minor street approach to the intersection. Warrant 2 (Table 2b) is brought into play when traffic volumes on the major street are so heavy that traffic on the minor intersection street suffers excessive delay or hazard in entering or crossing the major street.

This update analysis produced a list of locations (not yet prioritized) where traffic signals are currently warranted. These locations are shown on Exhibit 2 as well as Table 3. It is noted that in order to maintain consistency with the earlier Signal Master Plans, Table 3 and the several others in this report show all of the candidate locations for signals – however, those locations that are warranted with this update are shown via highlight. Once complete, the various data are then used to prioritize the intersections that warrant a signal.

Table 2a
Minimum Daily Traffic Volumes – Warrant 1

(Warrant 1 Based on Estimated Average Daily Traffic)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Vehicles/day on Major Street (Total both approaches)		Vehicles/day on higher volume Minor street (one direction only)	
Number	Number	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or more	1	9,600	6,720	2,400	1,680
2 or more	2 or more	9,600	6,720	3,200	2,240
1	2 or more	8,000	5,600	3,200	2,240

(Warrant 1 Based on Hourly Volumes – Eighth Highest hour)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	500	350	150	105
2 or more	1	600	420	150	105
2 or more	2 or more	600	420	200	140
1	2 or more	500	350	200	140

Table 2b
Interruption of Continuous Traffic – Warrant 2
(Warrant 2 Based on Estimated Average Daily Traffic)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Vehicles/day on Major Street (Total both approaches)		Vehicles/day on higher volume Minor street (one direction only)	
Number	Number	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
2 or more	1	14,400	10,800	1,200	850
2 or more	2 or more	14,400	10,800	1,600	1,120
1	2 or more	12,000	8,400	1,600	1,120

(Warrant 2 Based on Hourly Volumes – Eighth Highest Hour))

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	750	525	75	53
2 or more	1	900	630	75	53
2 or more	2 or more	900	630	100	70
1	2 or more	750	525	100	70

Because an intersection theoretically could be signalized if it is 80% or more warranted (per Caltrans warranting procedures), Table 4 shows the “percentage warranted” values for each location. As discussed later in this report, Warrant 6 measures an intersection’s recent accident history where a signal could be considered for construction depending on the number and severity of collision that are correctable by a signal. In this 2007 case, the results show that none of the candidate intersections for signals are warranted via their accident experience. Warrant 8 is included because of the fact that under certain circumstances, a signal may be constructed if warrants 1 and 2 are 80% satisfied.

Table 5 presents the indicated list of non-prioritized intersections where signals are now warranted.

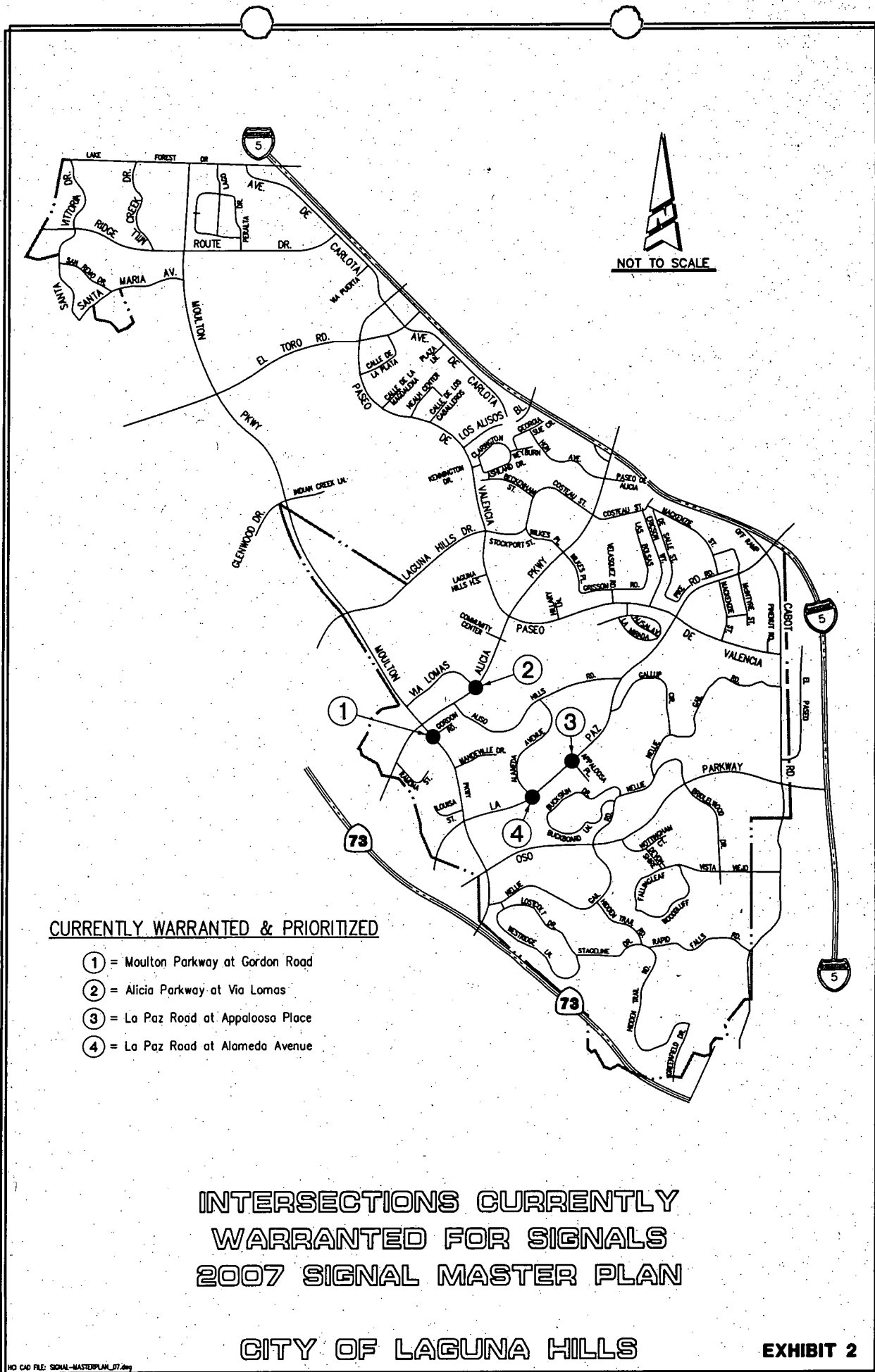


Table 3
Signal Warrants – Existing Volumes

Loc	Major Street	Minor Street	Warrant Satisfied (12 Month Period)			
			1	2	6	8
1	Santa Vittoria	Ridge Route Dr.	NO	NO	NO	YES
2	Ridge Route Dr.	Mill Creek Dr.	NO	NO	NO	YES
3	St. Maria Ave.	San Remo Dr.	NO	NO	NO	NO
4(a)	P.D. Valencia	Calle Caballeros	N/A	N/A	N/A	N/A
5	P.D. Valencia	Hillary Lane	NO	NO	NO	NO
6	P.D. Valencia	Velasquez Road	NO	NO	NO	NO
7	P.D. Valencia	Alisal Ave.	NO	NO	NO	NO
8	P.D. Valencia	Ericson Way	NO	NO	NO	NO
9	P.D. Valencia	Mackenzie Street	NO	NO	NO	NO
10	P.D. Valencia	Pine Nut Road	NO	NO	NO	NO
11(b)	Oso Parkway	Nottingham Court	N/A	N/A	N/A	N/A
12	La Paz Road	Alameda Avenue	NO	YES	NO	N/A
13	La Paz Road	Appaloosa Place	NO	YES	NO	N/A
14	La Paz Road	Gallup Drive	NO	NO	NO	NO
15	Alicia Parkway	Via Lomas	YES	YES	NO	N/A
16	Moulton Pkwy	Gordon Road	NO	YES	NO	N/A
17	Moulton Pkwy	Mandeville Drive	NO	NO	NO	NO
18	Moulton Pkwy	Louisa Street	NO	NO	NO	NO
19	Moulton Pkwy	Indian Hill	NO	NO	NO	NO

- (a) This location is right turn only for sb Calle Caballeros at PDV
 (b) This location is right turn only for nb Nottingham at Oso Parkway
 (c) Warrant 8 looks at signals that are not fully warranted by 1/2/6 but where warrants 1 and 2 are both 80% satisfied.

Table 4
Signal Warrants – Percentage Satisfied

Loc	Major Street	Minor Street	Percentage Warrant Satisfied			
			1	2	6(1)	8 (3)
1	Santa Vittoria	Ridge Route Dr.	48/100	32/100	0	100
2	Ridge Route Dr.	Mill Creek Dr.	65/56	43/98	0	100
3	St. Maria Ave.	San Remo Dr.	100/83	73/100	0	N/a
4	P.D. Valencia	Calle Caballeros	N/a	N/a	N/a	N/a
5	P.D. Valencia	Hillary Lane	100/25	100/49	0	50
6	P.D. Valencia	Velasquez Road	100/20	100/39	0	50
7	P.D. Valencia	Alisal Ave.	100/71	100/80	0	N/a
8	P.D. Valencia	Ericson Way	100/45	100/89	0	N/a
9	P.D. Valencia	Mackenzie Street	91/10	60/20	0	50
10	P.D. Valencia	Pine Nut Road	91/31	60/61	0	0
11	Oso Parkway	Nottingham Court	N/a	N/a	N/a	N/a
12	La Paz Road	Alameda Avenue	100/52	100/100	0	0
13	La Paz Road	Appaloosa Place	100/65	100/100	1	N/a
14	La Paz Road	Gallup Drive	100/35	100/69	1	0
15	Alicia Parkway	Via Lomas	100/10 0	100/100	3	N/a
16	Moulton Pkwy	Gordon Road	100/60	100/100	4	N/a
17	Moulton Pkwy	Mandeville Drive	100/44	100/88	0	N/a
18	Moulton Pkwy	Louisa Street	100/36	100/71	1	0
19	Moulton Pkwy	Indian Hill	100/34	100/68	0	0

1. Recent 36-month accident period, number of which correctable by signal.
2. Calle Caballeros and Nottingham have been restricted to right turns only (4 & 11)
3. 100% means that both warrants 1 and 2 are 80% satisfied.

Table 5
Intersections that Are Currently Warranted for a Traffic Signal
(Not Prioritized – See Table 13 for Prioritization)

1. La Paz Road at Alameda Avenue
2. La Paz Road at Appaloosa Place
3. Alicia Parkway at Via Lomas
4. Moulton Parkway at Gordon Road

Priority Rating System (Identifies Possible Order of Construction Per Available Funds)

With the above information in place, the next step involved the prioritization of the warranted signals. This was done by reviewing traffic and safety characteristics identified in seven “rating items.” Again, the following was done in an identical manner as the earlier Traffic Signal Master Plans prepared for the City.

Rating Item 1 – Satisfaction of Caltrans Warrant 2 (Interruption of Continuous Traffic)

By using the data of Warrant 2, a rating item is created by using volumes of major street traffic. The reason centers on the fact that by such traffic being so large, it creates a danger for crossing vehicles or pedestrians. Table 6 shows the information relative to Warrant 2.

**Table 6 – Rating Item 1
Warrant 2 Satisfaction
(Interruption of Continuous Traffic)**

	Loc	Major Street				Minor Street				Poin ts
		Name	Lanes	Volume		Name	Lanes	Volumes		
				Leg 1	Leg 2			Leg 1	Leg 2	
	1	Santa Vittoria	2	807	2468	Ridge Route	1	2122	-	1
	2	Ridge Route	2	2252	2122	Mill Creek	1	938	-	0
	3	Santa Maria	2	4281	3116	San Remo	1	1388	-	9
	4	PDV	N/A	N/A	N/A	Calle Caballeros	Right	Turn	Only	
	5	PDV	2	5651	5759	Hillary Lane	1	416	-	9
	6	PDV	2	5651	5659	Velasquez Road	1	335	-	9
	7	PDV	2	5651	5659	Alisal Avenue	1	1194	-	9
	8	PDV	2	5651	5659	Ericson Way	1	759	-	9
	9	PDV	2	3269	2813	Mackenzie Street	1	172	-	3
	10	PDV	2	3269	3813	Pine Nut Road	1	517	-	3
	11	Oso Parkway	N/A	N/A	N/A	Nottingham Court	Right	Turn	Only	
	12	La Paz Road	2	8410	8136	Alameda Avenue	1	868	-	9
	13	La Paz Road	2	7373	8136	Appaloosa Pl.	1	1094	-	
	14	La Paz Road	2	7373	8136	Gallup Drive	1	588	-	10
	15	Alicia Parkway	2	21,600	22,991	Via Lomas	1	2447	-	10
	16	Moulton Parkway	2	10,469	10,636	Gordon Road	1	1003	-	
	17	Moulton Parkway	2	10,469	10,636	Mandeville Drive	1	740	-	10
	18	Moulton Pkwy	2	10,469	10,636	Louisa Street	1	607	-	10
	19	Moulton Parkway	2	10,469	10,636	Indian Hill	1	577	-	0

Attachment: 2007 Traffic Signal Master Plan (2017 : Traffic Signal Master Plan Update and Construction of New Traffic Signals)

Rating Item 2 – Coordinated Movement

This rating item takes into account how a particular signal would impact the orderly flow of traffic. A higher rating is given to a signal if it produces a disbursed flow of traffic. A lower rating occurs if the signal contributes to concentrated flow. Table 7 presents our conclusion for this rating item.

**Table 7 – Rating Item 2
Coordinated Movement
(Signals Currently Warranted are Highlighted)**

Loc	Major Street	Minor Street	Approaching Platoon			Points
			Intact	Spread	Disburse	
1	Santa Vittoria	Ridge Route			X	
2	Ridge Route	Mill Creek			X	
3	Santa Maria	San Remo			X	
4 (a)	PDV	Calle Caballeros	N/a	N/a	N/a	
5	PDV	Hillary Lane			X	
6	PDV	Valasquez Road			X	
7	PDV	Alisal Avenue			X	
8	PDV	Ericson Way			X	
9	PDV	Mackenzie St.			X	
10	PDV	Pine Nut Road	X			
11(b)	Oso Parkway	Nottingham Ct.	N/a	N/a	N/a	
12	La Paz Road	Alameda Ave.			X	5
13	La Paz Road	Appaloosa Pl.			X	5
14	La Paz Road	Gallup Drive			X	
15	Alicia Pkwy	Via Lomas		X		3
16	Moulton Pkwy	Gordon Road		X		3
17	Moulton Pkwy	Mandeville Dr.		X		
18	Moulton Pkwy	Louisa Street		X		
19	Moulton Pkwy	Indian Hill Ln.	X			

- (a) This location is sb right turn only for Calle Caballeros at PDV
 (b) This locations is nb right turn only for Nottingham at Oso.

Rating Item 3 – Accident Evaluation Results

A high intersection accident rate can be a sign of vehicles trying to enter the flow of traffic or cross the street when there are insufficient gaps in major street traffic. Therefore, the signal's potential to reduce or eliminate certain types of accidents generates points that can be used in the rating system – points that are consistent for all locations studied. Table 8 presents the results of this analysis element.

Table 8 – Rating Item 3**Traffic Accidents**

(Evaluates All Study Intersections Regardless of Warrant Satisfaction. Includes
 Broadsides, Left Turns and Ped Involvement)
 (Intersections Currently Warranted Via 2007 Volumes Are Highlighted)

	Location	Major Street	Minor Street	Correctable Accidents 3 Year Period		Points
				Total	Ave.	
	15	Alicia Parkway	Via Lomas	3	1.0	10
	16	Moulton Pkwy	Gordon Road	4	1.33	13
	18	Moulton Parkway	Louisa Street	1	0.33	3
	2	Ridge Route	Mill Creek	0	0	0
	5	PDV	Hillary Lane	0	0	0
	10	PDV	Pine Nut Road	0	0	0
	17	Moulton Pkwy	Mandeville Drive	0	0	0
	7	PDV	Alisal Avenue	0	0	0
	6	PDV	Velasquez Road	0	0	0
	3	Santa Maria	San Remo	0	0	0
	8	PDV	Ericson Way	1	0.33	3
	9	PDV	Mackenzie Street	0	0	0
	12	La Paz Road	Alameda Avenue	0	0	0
	13	La Paz Road	Appaloosa Place	1	0.33	3
	14	La Paz Road	Gallup Drive	1	0.33	3
	1	Santa Vittoria	Ridge Route	0	0	0
	4 (a)	PDV	Calle Caballeros	N/a	N/a	N/a
	11 (a)	Oso Parkway	Nottingham Court	N/a	N/a	N/a
	19	Moulton Pkwy	Indian Hill Ln.	0	0	0

(a) Right Turn Only Location

Rating Item 4 – Special Conditions

This rating item considers extenuating circumstances that are not covered in other rating items or warrants. These could include for example the presence of school, churches, parks, and other public buildings. The various items found that relate to this rating item are in the following table.

Table 9 - Rating Item 4
Special Conditions

Loc	Major St.	Minor Street	Special Conditions						Pts.
			Sch	Chch	Pub Bldg/Park	Curve	Hill	Sight Distance	
1	St. Vittoria	Ridge Route			x		x	x	7
2	Ridge Rt.	Mill Creek			x		x	x	7
3	St. Maria	San Remo	x			x	x	x	10
4	PDV	Calle Caballeros							N/A
5	PDV	Hillary Lane	x			x	x	x	10
6	PDV	Velasquez	x			x	x	x	10
7	PDV	Alisal Ave.				x	x	x	7
8	PDV	Ericson Way				x	x	x	7
9	PDV	Mackenzie Street	x			x	x	x	10
10	PDV	Pine Nut Rd.	x			x	x	x	10
11	Oso Pkwy	Nottingham Ct.							N/A
12	La Paz Rd.	Alameda Ave.					x	x	5
13	La Paz Rd.	Appaloosa Pl.					x		2
14	La Paz Rd.	Gallup Rd.				x	x	x	7
15	Alicia Pkwy	Via Lomas			x				2
16	Moulton Pkwy	Gordon Road				x	x	x	7
17	Moulton Pkwy	Mandeville Dr.			x	x	x	x	10
18	Moulton Pkwy	Louisa St.				x	x	x	7
19	Moulton Pkwy	Indian Hill Lane				x	x	x	7

Rating Item 5 – Safety Index

This rating item uses accident totals to create a Benefit/Cost ratio. Since there are always several types of costs associated with accidents, it follows that the benefit of installing a traffic signal can be compared and rated to the cost of the different types of accidents. Table 10 provides the indicated safety index data.

Table 10 – Rating Item 5
Safety Index

Loc	Major Street	Minor Street	Three Year Accidents			
			Fatal	Injury	PDO	Pts
1	Santa Vittoria	Ridge Route Dr.	0	0	0	0
2	Ridge Route Dr.	Mill Creek Dr.	0	0	2	0
3	St. Maria Ave.	San Remo Dr.	0	0	1	0
4	P.D. Valencia	Calle Caballeros	N/A	Right	Turn	Only
5	P.D. Valencia	Hillary Lane	0	0	0	0
6	P.D. Valencia	Velasquez Road	0	0	0	0
7	P.D. Valencia	Alisal Ave.	0	0	1	0
8	P.D. Valencia	Ericson Way	0	3	0	8
9	P.D. Valencia	Mackenzie Street	0	0	0	0
10	P.D. Valencia	Pine Nut Road	0	0	0	0
11	Oso Parkway	Nottingham Court	N/A	Right	Turn	Only
12	La Paz Road	Alameda Avenue	0	0	1	0
13	La Paz Road	Appaloosa Place	0	1	2	3
14	La Paz Road	Gallup Drive	0	3	1	8
15	Alicia Parkway	Via Lomas	0	3	6	8
16	Moulton Pkwy	Gordon Road	0	4	6	10
17	Moulton Pkwy	Mandeville Drive	0	2	0	5
18	Moulton Pkwy	Louisa Street	0	3	1	8
19	Moulton Pkwy	Indian Hill Lane	0	0	0	0

Rating Item 6 – Environmental Conditions

This evaluation looks at the environmental ramifications of a signal such as time delays, pollutant generation, aesthetic values and resource losses. Table 11 provides the information and the various rating points assigned to each.

Table 11 – Rating Item 6
Environmental Impact Assessment

Loc	Major Street	Minor Street	Environmental Impact			Pts.
			Minimal	Moderate	Substantial	
1	Santa Vittoria	Ridge Route	X			5
2	Ridge Route	Mill Creek	X			5
3	Santa Maria	San Remo	X			5
4	PDV	Calle Caballeros	N/a	Right	Turn Only	N/a
5	PDV	Hillary Lane	X			5
6	PDV	Velasquez Road	X			5
7	PDV	Alisal Avenue	X			5
8	PDV	Ericson Way	X			5
9	PDV	Mackenzie Street	X			5
10	PDV	Pine Nut Road	X			5
11	Oso Parkway	Nottingham Court	N/a	Right	Turn Only	N/a
12	La Paz Road	Alameda Avenue		X		2
13	La Paz Road	Appaloosa Place	X			2
14	La Paz Road	Gallup Drive	X			2
15	Alicia Parkway	Via Lomas	X			5
16	Moulton Parkway	Gordon Road	X			2
17	Moulton Parkway	Mandeville Drive	X			2
18	Moulton Parkway	Louisa Street	X			2
19	Moulton	Indian Hill Ln.	X			2

Rating Item 7 – Highway Geometry

In general, it is more cost effective and more productive to signalize a four – legged intersection than one of the “TEE” configuration. Also, a signal at the intersection of two arterial streets will better serve the community than will a signal at the intersection of two local residential streets. (Table 12).

Table 12 – Rating Item 7
Highway Geometry

Loc.	Inter Type	Major Street		Minor Street		Pts.
		Name	Class.	Name	Class.	
1	4	Santa Vittoria	Arterial	Ridge Route Dr.	Collector	4
2	T	Ridge Route	Arterial	Mill Creek Dr.	Collector	3
3	T	Santa Maria	Arterial	San Remo Dr.	Collector	3
4	T	PDV	Arterial	Calle Caballeros	Collector	N/A
5	T	PDV	Arterial	Hillary Lane	Collector	3
6	T	PDV	Arterial	Velasquez Road	Collector	3
7	T	PDV	Arterial	Alisal Avenue	Collector	3
8	T	PDV	Arterial	Ericson Way	Collector	3
9	T	PDV	Arterial	Mackenzie Street	Collector	3
10	T	PDV	Arterial	Pine Nut Road	Collector	3
11	T	Oso Parkway	Arterial	Nottingham Court	Collector	N/A
12	T	La Paz Road	Arterial	Alameda Avenue	Collector	3
13	T	La Paz Road	Arterial	Appaloosa Place	Collector	3
14	T	La Paz Road	Arterial	Gallup Drive	Collector	3
15	T	Alicia Parkway	Arterial	Via Lomas	Collector	3
16	T	Moulton Pkwy	Arterial	Gordon Road	Collector	3
17	T	Moulton Pkwy	Arterial	Mandeville Drive	Collector	3
18	T	Moulton Pkwy	Arterial	Louisa Street	Collector	3
19		Moulton Pkwy	Arterial	Indian Hill Ln.	Collector	3

N/A = Right Turn Only Intersection

Taking all of the above rating criteria into consideration, existing unsignalized intersections that satisfy Caltrans warrants for signalization can be prioritized for possible construction. Those prioritized locations are shown in list below with Table 13 showing the greater detail of the prioritization process.

1. Moulton Parkway at Gordon Road
2. Alicia Parkway at Via Lomas
3. La Paz Road at Appaloosa Place
4. La Paz Road at Alameda Avenue

Table 13
Priority Ranking of Unsignalized Intersections Meeting Warrants
(Prioritized)

			Rating Item Number Maximum Points							
			1	2	3	4	5	6	7	Total
Loc	Major Street	Minor Street	10	5	20	15	10	5	5	70
16	Moulton Parkway	Gordon Road	10	3	13	7	10	2	3	48
15	Alicia Parkway	Via Lomas	10	3	10	2	8	5	3	41
13	La Paz Rd.	Appaloosa Place	9	5	3	2	3	2	3	27
12	La Paz Rd.	Alameda Avenue	9	5	0	5	0	2	3	24

Note: For reference/comparison to the above in non – prioritized format, refer to Table 5.

In terms of future traffic signals, it is recommended that this update be performed on a periodic basis. The reason concerns fluctuating traffic volumes along with accident levels that change from year to year. For that reason, we recommend that new counts be taken each year along with an assessment of accidents at the unsignalized intersections. Then, through a relatively simple process, the numbers of this report, along with the various point scores shown in the tables can be updated.

RATING ITEMS

RATING ITEM 1
INTERRUPTION OF CONTINUOUS TRAFFIC (10 POINTS MAXIMUM)
(Warrant 2)

Vehicles attempting to cross the major flow of traffic or enter that flow can cause the traffic on the through street to be delayed or slow down unnecessarily. The installation of a signal at such locations can actually speed up the traffic flow on the major street. Table A1 shows the percent of the maximum assigned points based on the major street daily volume. For example, an intersection where the traffic volume on the major street average 11,000 vehicles per day would receive 70% of the maximum allowed. In the above example, the intersection would receive 7 points for this rating area.

Table A1 – Percent of Maximum Points – Interruption of Continuous Traffic

Major Street Volume Of at Least...	Percent of Maximum
4,700	0 (0)
5,600	10 (1)
6,400	20 (2)
7,300	30 (3)
8,200	40 (4)
9,000	50 (5)
10,000	60 (6)
10,700	70 (7)
11,600	80 (8)
12,400	90 (9)
17,500	100 (10)

RATING ITEM 2
COORDINATED MOVEMENT (5 POINTS MAXIMUM)

When a traffic signal turns green and the waiting vehicles start down the roadway, they are in a relatively compact grouping referred to as a "platoon". As this group of vehicles progress down the street, they become more and more disbursed due to difference in driving speeds. As a result, some of the cars in the original platoon are unable to make it through the next signal and are forced to stop. In some cases, the installation of a signal between the original two can keep this platoon intact and actually reduce the overall driving delay. This item depends on engineering judgment and should include present and future traffic demands of the area.

A signal may be justified when it forms a part of an interconnected or coordinated system and would serve the purpose of maintaining traffic volumes in relatively concentrated platoons of vehicle. Typically, the following question could be asked: "Would a signal at this location cause the platoon approaching the next signal to be concentrated (5 points), moderately concentrated (2 points) or disbursed (0 points)?"

RATING ITEM 3 **ACCIDENT HAZARDS**

A high intersection accident rate can be a sign of vehicles (and pedestrians) trying to enter the flow of traffic or cross the street when there are insufficient gaps in the major street traffic. Only those accidents susceptible to correction by traffic signals should be considered when evaluating this item. And even then, only if less restrictive measures such as warning signs, proper lighting, painted markings, etc., have failed. Accidents which are susceptible to correction by a traffic signal are normally considered to be "broadside" or right-angle accidents, left turn accidents and those accidents involving pedestrians. In this item, the maximum number of points is assigned to the intersection with the highest number of correctable accidents and 0 is assigned to the lowest. Table A5 illustrates the points that would be assigned if the highest intersection had six accidents and the lowest intersection had none.

TABLE A5 - Percent of Maximum Points - Accident Hazard

Correctable Accidents	Points
6	(20)
5	(16)
4	(13)
3	(10)
2	(6)
1	(3)
0	(0)

RATING ITEM 4 SPECIAL CONDITIONS (15 POINTS MAXIMUM)

This item considers extenuating circumstances that are not covered in other items in this rating system. These may include the proximity of schools, churches, public buildings, and other traffic and pedestrian generators; an abrupt change from a rural to an urban area; the need for police control during portions of the day; a steep hill; a horizontal curve; or restricted sight distance. This requires engineering judgment based on physical inspection of the site. Equal weights should be given to each of the items considered here. In table A6, the percentages and points based on how many of 6 conditions were located.

TABLE A6 - Percent of Maximum Points - Special Conditions

Conditions Located	Points
6	100(15)
5	83(12)
4	67(10)
3	50(7)
2	33(5)
1	17(2)
0	0(0)

RATING ITEM 5
SAFETY INDEX (15 POINTS MAXIMUM)

A safety index is the Benefit /Cost ratio for a safety improvement expressed as a number. The costs and benefits are directly related to the number of accidents at a location, which are susceptible to correction, by a traffic signal. Points are assigned by setting the highest Benefit/Cost ratio to the maximum allowed points and the minimum Benefit/Cost ratio to zero. Ratings in between are allocated a proportion of the number of points between zero and the maximum. Normally, a two-year accident history is used to derive the benefit that would be achieved if those accidents were prevented through the installation of a traffic signal. The accidents are grouped into categories with costs and weighted. The "benefit" portion of the ratio is actually the estimated cost of the various severity categories as listed below.

Table A7 – "Costs" of Traffic Accidents

Category	Cost
Fatal Accidents	\$287,175
Injury Accidents	\$8,085
Property Damage Accidents	\$520

Table A8 – Typical Signal Installation Costs in Southern California

Intersection Type	Cost
Four Leg Intersection	\$250,000
T Intersection	\$200,000

Rating Item 6
Environmental (5 Points Maximum)

This is the only rating item that can actually be assigned negative points. An evaluation of the environmental considerations should be made including time delays, pollutant generation, aesthetic values and resource losses. A project that minimizes problems would receive the maximum 5 points while a project that has a substantial adverse effect would receive a negative 5 points. Gradations may be employed between the two limits.

Rating Item 7
Highway Geometry (5 Points Maximum)

In general, it is more cost effective and more productive to signalize a four – legged intersection than one of the “TEE” Configuration. Also, a signal at the intersection of two arterial streets will better serve the community than will a signal at the intersection of two local residential streets.

Higher Volume Street Is...	Lower Volume Street Is....	Percent of Maximum Points if....	
		Intersection is T	Intersection is 4 Legged
Local	Local	0	0
Collector	Local	10 (0)	20 (1)
	Collector	30 (1)	40 (2)
Arterial	Local	50 (2)	60 (3)
	Collector	70 (3)	80 (4)
	Arterial	90 (4)	100 (5)

**CITY OF LAGUNA HILLS
TRAFFIC COMMISSION
AGENDA REPORT
TRAFFIC ENGINEER DEPARTMENT**

ISSUE: TRAFFIC SIGNAL MASTER PLAN – AUGUST 2007 DRAFT

SUMMARY:

On a periodic basis, the City prepares a Traffic Signal Master Plan Update to evaluate intersections at which new traffic signals may meet minimum established standards for installation. This evaluation further provides assistance to the City Council in prioritizing future traffic signal installations. It is noted that intersections meeting the minimum standard for a traffic signal installation are not required to have a traffic signal installed. Rather, this information provides a tool for considering such installations. The consulting Traffic Engineers of Hartzog and Crabill have completed the August 2007 Draft Traffic Signal Master Plan and is provided to the Traffic Commission for review and acceptance of recommendations.

BACKGROUND:

The Traffic Signal Master Plan has been updated since its last issue in April 2003. The consulting Traffic Engineers of Hartzog and Crabill have completed this August 2007 draft report, attached. The Master Plan, following the procedures in previous editions, evaluated potential new traffic signal installations against the minimum standards (warrants) used by the State of California for traffic signals. The City currently operates 47 traffic signals. A total of 19 arterial highway intersections without traffic signals were evaluated. Four locations were found to meet the minimum standards for traffic signal installation. Following an established prioritization procedure, these four locations were rated and then ranked in priority order as follows:

1. Moulton Parkway at Gordon Road
2. Alicia Parkway at Via Lomas
3. La Paz Road at Appaloosa Place
4. La Paz Road at Alameda Avenue

RECOMMENDATION: THAT THE TRAFFIC COMMISSION APPROVE THE TRAFFIC SIGNAL MASTER PLAN UPDATE AND RECOMMEND TO THE CITY COUNCIL THE ACCEPTANCE OF THE TRAFFIC SIGNAL PRIORITIZATION LISTING.

SEPTEMBER 19, 2007, ITEM NO. 4.1

Agenda Report
Traffic Signal Master Plan Draft
Page 2

Intersections that meet the minimum warrants for traffic signal installation do not require that a traffic signal be installed. Rather, this information is a planning tool used to consider the future installation of a traffic signal. At the above four intersections, the minimum warrants being met related to traffic volumes but none of the locations met the warrant for traffic collision history. Often, the installation of a traffic signal can lead to increased numbers of traffic collisions although the severity may be different than at non-signalized intersection. Alternatives to a traffic signal include converting Tee intersections into right turn only intersections thereby eliminating either one or both of the left turn movements currently allowed. This can improve traffic flow and reduce traffic collision events. All four of the above intersections are Tee intersections.

The Traffic Commission is requested to review the Traffic Signal Master Plan Update – August 2007 Draft and approve the recommended traffic signal prioritization. The report is planned to be presented to the City Council in October 2007.

FISCAL IMPACT:

The construction cost of a traffic signal is approximately \$250,000 with annual maintenance and power costs of about \$3,000. The Capital Improvement Program Budget includes funding for a new traffic signal in the "future" budget category.

RECOMMENDATION: THAT THE TRAFFIC COMMISSION APPROVE THE TRAFFIC SIGNAL MASTER PLAN UPDATE AND RECOMMEND TO THE CITY COUNCIL THE ACCEPTANCE OF THE TRAFFIC SIGNAL PRIORITIZATION LISTING.

ATTACHMENTS:

Master Plan of Traffic Signals Update – August 2007 Draft

City of Laguna Hills
Traffic Signal Master Plan
Plan Update

Prepared for:
City of Laguna Hills
24035 El Toro Road
Laguna Hills, Ca. 92653

Prepared by:
Hartzog & Crabill, Inc.
275 Centennial Way, St. 208
Tustin, CA. 92680
(714) 731 - 9455

August 2007

August 10, 2007

Mr. Kenneth H. Rosenfield, P.E.
City Engineer
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA. 92653

Subject: ***Traffic Signal Master Plan – 2007***

Dear Ken:

In accordance the City's recent authorization, Hartzog & Crabill, Inc. is pleased to submit this 2007 update of the Laguna Hills Traffic Signal Master Plan. The procedure followed established formats of (1) an evaluation of existing conditions, (2) a review of intersection locations that could eventually become warranted for construction, and (3) the prioritization of the warranted signals.

The evaluation shows that four intersections have become either new candidates for construction or remain so from earlier updates. Of those, the highest rank for this time period is Moulton Parkway at Gordon road. This is followed by Alicia Parkway at Via Lomas. Given the numerous elements that have been used in prioritizing those signals, we recommend that they be considered for construction as funds are available. The other two that were found to be warranted, but of a lesser construction priority are La Paz Road at Appaloosa Place and La Paz Road at Alameda Avenue.

In terms of future traffic signals, we recommend that new counts be taken each year along with an assessment of accidents at the unsignalized intersections. Then, through a relatively simple process, the numbers of this report, along with the various point scores shown in the tables, can be updated.

As always, we appreciate the opportunity of preparing this administrative document for you use. During your review of its contents, please do not hesitate to call for added detail or other clarifications.

Very Truly Yours:

Hartzog & Crabill, Inc.

Jerry Crabill, P.E.

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Executive Summary

Goals and Objectives

Similar to earlier versions of the City's Traffic Signal Master Plan, the goal of the year 2007 assessment was to provide City staff with a useful and logical planning tool for traffic signal construction. Our objective was to create a prioritized intersection signalization list for existing locations. While changeable depending on future conditions, the list would clearly show the many reasons behind (1) our decision for prioritization of traffic signal installations and (2) supporting documentation toward City decisions for future budgeting.

Study Methodology

The study's methodology was straightforward and consistent with previous Traffic Signal Master Plans. Since most signal construction decisions are based on warrant satisfaction described by Caltrans, our work relied on new 2007 traffic counts at 19 candidate intersection locations. Those volumes were input into signal construction criteria relating to traffic entering the various intersections. Other criteria also used included evaluating cross traffic needs to enter the main traffic flow on the City's arterial highways. A detailed evaluation of accidents at all locations was also conducted. Since the "types" of accidents that most often can be corrected by a traffic signal is the broadside, left turn or pedestrian involved accidents, the City's computer database of accidents was investigated for those elements.

All of the data collected and analyzed via the above was then compiled into a logical process of construction prioritization. This involves a list showing the City where signals are currently needed, why such needs have materialized since the last update (year 2003), and the order by which the new signals should be constructed.

The same rating system was used as in previous studies. This involved the preparation of several tables that present existing traffic volumes and accidents in different comparative ways. Using that information, and coupled with our experience as to the best location for traffic signals, the priority rating system was used as an aid in making final traffic signal construction priority recommendations.

The Need For Warranted Traffic Signals

It is noted that the primary use of the results in this report is to assist City planners in the decision process toward the installation of traffic signals. While good justification for the installation of a signal is based on Caltrans warrants, signals are not factually required simply because they meet certain warrants. The final decision to install a signal should not be based solely thereon. Since traffic signals may increase certain types of collisions, other elements such as delay, congestion, approach conditions, driver confusion, future land use, and other evidence for the need for such driver right a way assignment must also be factored into the results of this assessment.

SIGNAL MASTER PLAN RESULTS FOR 2007

The evaluation of existing 2007 traffic volumes, accidents, and other important elements revealed that four intersections have become or remain (from the 2003 assessment) candidates for signalization. These locations are:

- (1) *Moulton Parkway at Gordon Road,*
- (2) *Alicia Parkway at Via Lomas*
- (3) *La Paz Road At Appaloosa Place*
- (4) *La Paz Road at Alameda Avenue.*

*City of Laguna Hills
Traffic Signal Master Plan Update
August 2007*

City of Laguna Hills
2007 Traffic Signal Master Plan

Introduction

The City of Laguna Hills requested that the 2003 City-wide Traffic Signal Master Plan be updated to reflect changes in traffic conditions. Since those conditions are directly related to the need for traffic signals at various locations, it follows that new requirements for signalization may now be necessary. To that end, the following information prepared by Hartzog & Crabill identifies those changes along with any new intersections where signalization should be considered.

The Importance of Traffic Signals and Growth Monitoring

The control of traffic by means of signalized intersection operation has long proven to be an effective technique to reduce accidents and generally improve the quality of traffic flow. To assist the City in the maintenance of a satisfactory signal monitoring program, this report has been prepared as part of a continuing series of periodic signal evaluations: assisting in signal improvement decisions as well as the necessary municipal budgeting process. This plan will also be useful to maintain and/or upgrade/prioritize the existing signal system and to provide a prioritization of future traffic signal installations.

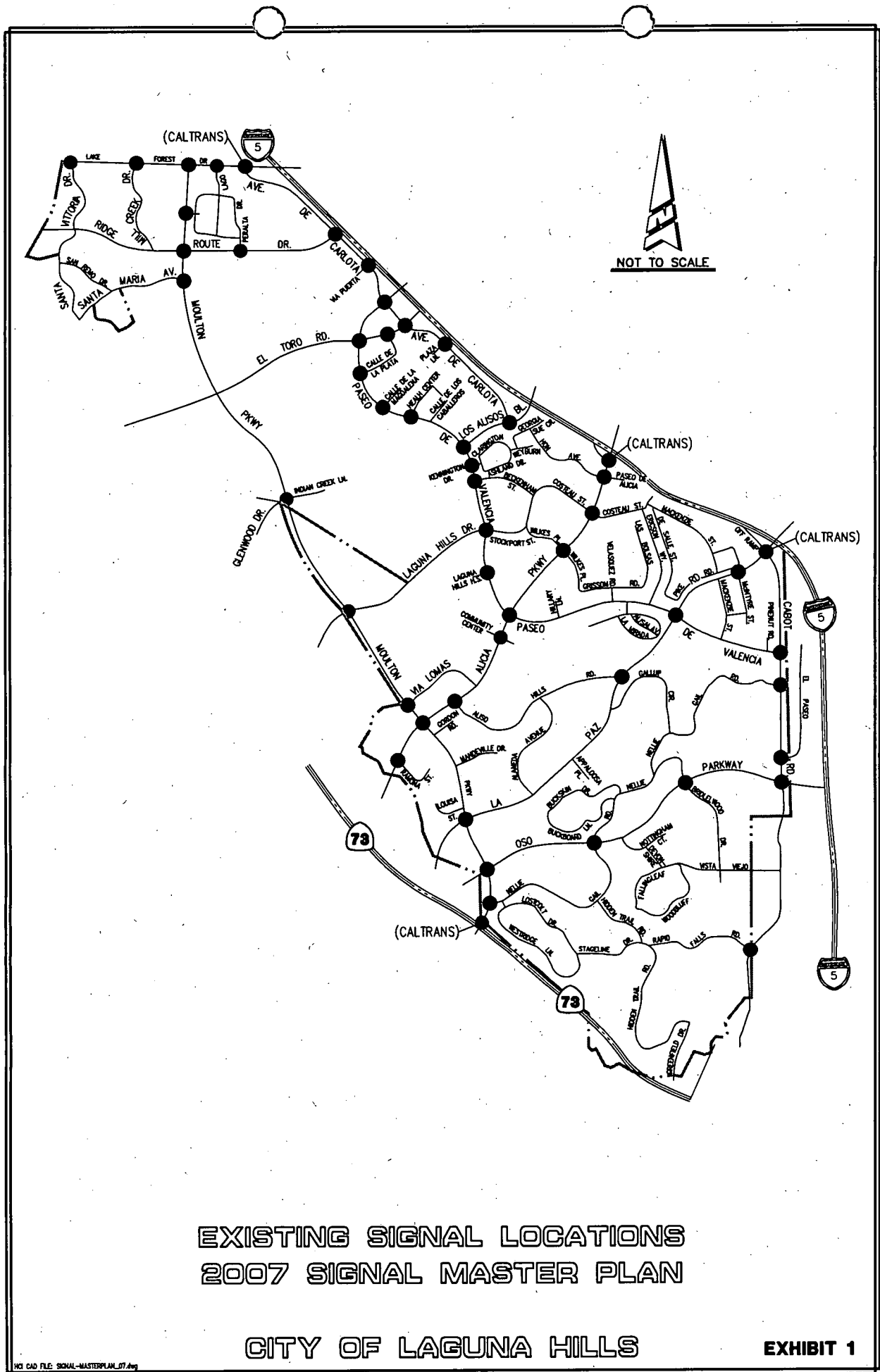
The importance of traffic signals is clearly exemplified by their significant influence over the orderly flow of area traffic volumes. When justified, properly designed and maintained, a signal may achieve one or more of the following:

- Reduce the frequency of certain types of accidents
- Effect orderly traffic movement
- Provide for a continuous platoon of traffic flow
- Allow vehicle and pedestrians to better cross opposing directions of traffic

However, should a signal be unjustified or poorly maintained, one or more of the following may result:

- Increased accident frequency
- Excessive delay (driver frustration)
- Disregard of signal indications
- Circuitous travel by alternate routes

Therefore, it is evident that a reduced intersection accident potential, and in particular, the maintenance of optimal traffic flow, is not possible without properly selected and maintained signal equipment. To achieve those goals, it is the intent of this update document to provide Laguna Hills decision makers with a logical and defensible document as to the time frame for eventual traffic signal construction. Exhibit 1 shows signals that currently exist in the City.



The Need for Warranted Traffic Signals

It is noted that the primary use of the results in this report is to assist City planners in the decision process toward the installation of traffic signals. While good justification for the installation of a signal is based on Caltrans warrants, signals are not factually required simply because they meet certain warrants. The final decision to install a signal should not be based solely thereon. Since traffic signals may increase certain types of collisions, other elements such as delay, congestion, approach conditions, driver confusion, future land use, and other evidence for the need for such driver right a way assignment must also be factored into the results of this assessment.

2007 Traffic Signal Update Methodology

Inasmuch as several Master Plans and Updates have been prepared for the City, all having been used to track and identify when and where traffic signals should be constructed (prioritized to recognize budget limitations), this update re-evaluates the various analysis elements used in previous reports to provide for a consistent analysis and comparison. In all, the process involved about 15 steps. Using a continuation of the City's logical process in monitoring traffic volumes and accidents, new traffic counts at key locations were collected (those intersections where signals have been projected for the future). Further, recognizing that intersection conditions may have changed for locations never before considered for signalization, the new count program also includes those intersections as well. All of the new traffic counts are presented in Table 1 – covering 19 candidate signal locations.

Table 1
Traffic Volumes At Potential Signal Locations
(Presents Volumes for All Studied Locations Regardless of Warrant Satisfaction)

Loc	Major Street (Speed Limit)	Traffic Volumes		Minor Street (Speed Limit)	Traffic Volumes	
		Approach Direction	2007 Volumes		Approach Direction	2007 Volume
1	St. Vittoria (45 mph)	NB	807	Ridge Route Dr.	EB	N/A
		SB	2468		WB	2122
		Total	3215		Total	2122
2	Ridge Rt. Dr (45 mph)	EB	2252	Mill Creek Dr.	NB	N/A
		WB	2122		SB	938
		Total	4374		Total	938
3	St. Maria Ave. (45 mpg)	EB	4281	San Remo Dr.	NB	N/A
		WB	3116		SB	1388
		Total	7397		Total	1388
4	P.D.V. (45 mph)	EB	N/A	Calle Caballeros (Right Turn Only)	NB	N/A
		WB	N/A		SB	N/A
		Total	N/A		Total	N/A

Table 1 (Continued)

5	P.D.V. (45mph)	EB	5651	Hillary Lane	NB	N/A
		WB	5759		SB	416
		Total	11,410		Total	416
6	P.D.V. (45 mph)	EB	5651	Velasquez Road	NB	N/A
		WB	5759		SB	335
		Total	11,410		Total	335
7	P.D.V. (45 mph)	NB	5651	Alisal Ave.	NB	1194
		SB	5759		SB	N/A
		Total	11,410		Total	1194
8	P.D.V. (45 mph)	EB	5651	Ericson Way	NB	N/A
		WB	5759		SB	759
		Total	11,410		Total	759
9	P.D.V. (45 mph)	EB	3269	Mackenzie St.	NB	N/A
		WB	2813		SB	172
		Total	6082		Total	172
10	P.D.V. (45 mph)	EB	3269	Pine Nut Rd.	NB	N/A
		WB	2813		SB	517
		Total	6082		Total	517
11	Oso Parkway (50 mph)	EB	N/A	Nottingham Ct (Right turn Only)	NB	N/A
		WB	N/A		SB	N/A
		Total	N/A		Total	N/A
12	La Paz Rd. (45 mph)	EB	8410	Alameda Ave.	NB	N/A
		WB	8136		SB	868
		Total	16,546		Total	868
13	La Paz Rd. (45 mph)	EB	7373	Appaloosa Place	NB	1094
		WB	8136		SB	N/A
		Total	15,509		Total	1094
14	La Paz Rd. (45 mph)	NB	7373	Gallup Dr.	EB	N/A
		SB	8136		WB	588
		Total	15,509		Total	588
15	Alicia Pkwy. (45 mph)	NB	22,991	Via Lomas	EB	2447
		SB	21,600		WB	N/A
		Total	44,591		Total	2447
16	Moulton Pkwy (45 mph)	NB	10,469	Gordon Rd.	EB	N/A
		SB	10,636		WB	1003
		Total	21,105		Total	1003
17	Moulton Pkwy (45mph)	NB	10,469	Mandeville Drive	EB	N/A
		SB	10,636		WB	740
		Total	21,105		Total	740
18	Moulton Pkwy (45 mph)	NB	10,469	Louisa St.	EB	607
		SB	10,636		WB	N/A
		Total	21,105		Total	607
19	Moulton Pkwy (45 mph)	NB	10,469	Indian Hill Lane	EB	N/A
		SB	10,636		WB	577
		Total	21,105		Total	577

In a manner identical to previous Signal Master Plans, the primary determination of the need for the construction of a traffic signal is via the use of Caltrans warranting criteria; with the new 2007 volumes being first input in "Warrant 1 and 2" worksheets published by Caltrans. Briefly, Warrant 1 is satisfied when the traffic volumes given in Table 2a (either hourly or daily depending on data availability) exist on the major street and on the higher volume minor street approach to the intersection. Warrant 2 (Table 2b) is brought into play when traffic volumes on the major street are so heavy that traffic on the minor intersection street suffers excessive delay or hazard in entering or crossing the major street.

This update analysis produced a list of locations (not yet prioritized) where traffic signals are currently warranted. These locations are shown on Exhibit 2 as well as Table 3. It is noted that in order to maintain consistency with the earlier Signal Master Plans, Table 3 and the several others in this report show all of the candidate locations for signals – however, those locations that are warranted with this update are shown via highlight. Once complete, the various data are then used to prioritize the intersections that warrant a signal.

Table 2a
Minimum Daily Traffic Volumes – Warrant 1

(Warrant 1 Based on Estimated Average Daily Traffic)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or more	1	9,600	6,720	2,400	1,680
2 or more	2 or more	9,600	6,720	3,200	2,240
1	2 or more	8,000	5,600	3,200	2,240

(Warrant 1 Based on Hourly Volumes – Eighth Highest hour)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	500	350	150	105
2 or more	1	600	420	150	105
2 or more	2 or more	600	420	200	140
1	2 or more	500	350	200	140

Table 2b
Interruption of Continuous Traffic – Warrant 2
(Warrant 2 Based on Estimated Average Daily Traffic)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
2 or more	1	14,400	10,800	1,200	850
2 or more	2 or more	14,400	10,800	1,600	1,120
1	2 or more	12,000	8,400	1,600	1,120

(Warrant 2 Based on Hourly Volumes – Eighth Highest Hour))

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	750	525	75	53
2 or more	1	900	630	75	53
2 or more	2 or more	900	630	100	70
1	2 or more	750	525	100	70

Because an intersection theoretically could be signalized if it is 80% or more warranted (per Caltrans warranting procedures), Table 4 shows the “percentage warranted” values for each location. As discussed later in this report, Warrant 6 measures an intersection’s recent accident history where a signal could be considered for construction depending on the number and severity of collision that are correctable by a signal. In this 2007 case, the results show that none of the candidate intersections for signals are warranted via their accident experience. Warrant 8 is included because of the fact that under certain circumstances, a signal may be constructed if warrants 1 and 2 are 80% satisfied.

Table 5 presents the indicated list of non-prioritized intersections where signals are now warranted.

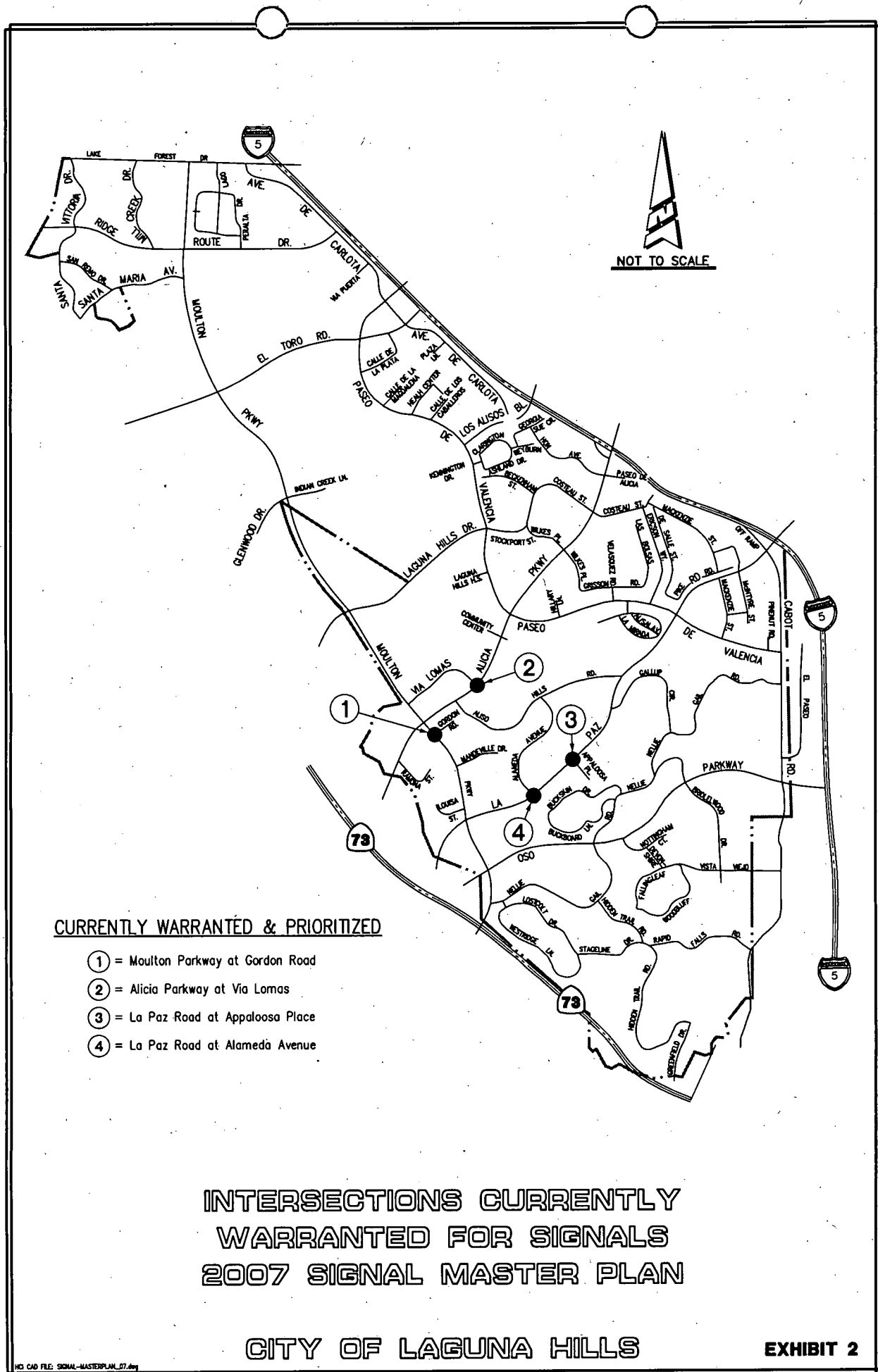


Table 3
Signal Warrants – Existing Volumes

Loc	Major Street	Minor Street	Warrant Satisfied (12 Month Period)			
			1	2	6	8
1	Santa Vittoria	Ridge Route Dr.	NO	NO	NO	YES
2	Ridge Route Dr.	Mill Creek Dr.	NO	NO	NO	YES
3	St. Maria Ave.	San Remo Dr.	NO	NO	NO	NO
4(a)	P.D. Valencia	Calle Caballeros	N/A	N/A	N/A	N/A
5	P.D. Valencia	Hillary Lane	NO	NO	NO	NO
6	P.D. Valencia	Velasquez Road	NO	NO	NO	NO
7	P.D. Valencia	Alisal Ave.	NO	NO	NO	NO
8	P.D. Valencia	Ericson Way	NO	NO	NO	NO
9	P.D. Valencia	Mackenzie Street	NO	NO	NO	NO
10	P.D. Valencia	Pine Nut Road	NO	NO	NO	NO
11(b)	Oso Parkway	Nottingham Court	N/A	N/A	N/A	N/A
12	La Paz Road	Alameda Avenue	NO	YES	NO	N/A
13	La Paz Road	Appaloosa Place	NO	YES	NO	N/A
14	La Paz Road	Gallup Drive	NO	NO	NO	NO
15	Alicia Parkway	Via Lomas	YES	YES	NO	N/A
16	Moulton Pkwy	Gordon Road	NO	YES	NO	N/A
17	Moulton Pkwy	Mandeville Drive	NO	NO	NO	NO
18	Moulton Pkwy	Louisa Street	NO	NO	NO	NO
19	Moulton Pkwy	Indian Hill	NO	NO	NO	NO

- (a) This location is right turn only for sb Calle Caballeros at PDV
 (b) This location is right turn only for nb Nottingham at Oso Parkway
 (c) Warrant 8 looks at signals that are not fully warranted by 1/2/6 but where warrants 1 and 2 are both 80% satisfied.

Table 4
Signal Warrants – Percentage Satisfied

Loc	Major Street	Minor Street	Percentage Warrant Satisfied			
			1	2	6(1)	8 (3)
1	Santa Vittoria	Ridge Route Dr.	48/100	32/100	0	100
2	Ridge Route Dr.	Mill Creek Dr.	65/56	43/98	0	100
3	St. Maria Ave.	San Remo Dr.	100/83	73/100	0	N/a
4	P.D. Valencia	Calle Caballeros	N/a	N/a	N/a	N/a
5	P.D. Valencia	Hillary Lane	100/25	100/49	0	50
6	P.D. Valencia	Velasquez Road	100/20	100/39	0	50
7	P.D. Valencia	Alisal Ave.	100/71	100/80	0	N/a
8	P.D. Valencia	Ericson Way	100/45	100/89	0	N/a
9	P.D. Valencia	Mackenzie Street	91/10	60/20	0	50
10	P.D. Valencia	Pine Nut Road	91/31	60/61	0	0
11	Oso Parkway	Nottingham Court	N/a	N/a	N/a	N/a
12	La Paz Road	Alameda Avenue	100/52	100/100	0	0
13	La Paz Road	Appaloosa Place	100/65	100/100	1	N/a
14	La Paz Road	Gallup Drive	100/35	100/69	1	0
15	Alicia Parkway	Via Lomas	100/10 0	100/100	3	N/a
16	Moulton Pkwy	Gordon Road	100/60	100/100	4	N/a
17	Moulton Pkwy	Mandeville Drive	100/44	100/88	0	N/a
18	Moulton Pkwy	Louisa Street	100/36	100/71	1	0
19	Moulton Pkwy	Indian Hill	100/34	100/68	0	0

1. Recent 36-month accident period, number of which correctable by signal.
2. Calle Caballeros and Nottingham have been restricted to right turns only (4 & 11)
3. 100% means that both warrants 1 and 2 are 80% satisfied.

Table 5
Intersections that Are Currently Warranted for a Traffic Signal
(Not Prioritized – See Table 13 for Prioritization)

1. La Paz Road at Alameda Avenue
2. La Paz Road at Appaloosa Place
3. Alicia Parkway at Via Lomas
4. Moulton Parkway at Gordon Road

Priority Rating System (Identifies Possible Order of Construction Per Available Funds)

With the above information in place, the next step involved the prioritization of the warranted signals. This was done by reviewing traffic and safety characteristics identified in seven “rating items.” Again, the following was done in an identical manner as the earlier Traffic Signal Master Plans prepared for the City.

Rating Item 1 – Satisfaction of Caltrans Warrant 2 (Interruption of Continuous Traffic)

By using the data of Warrant 2, a rating item is created by using volumes of major street traffic. The reason centers on the fact that by such traffic being so large, it creates a danger for crossing vehicles or pedestrians. Table 6 shows the information relative to Warrant 2.

Table 6 – Rating Item 1
Warrant 2 Satisfaction
(Interruption of Continuous Traffic)

	Loc	Major Street				Minor Street				Poin ts
		Name	Lanes	Volume		Name	Lanes	Volumes		
				Leg 1	Leg 2			Leg 1	Leg 2	
	1	Santa Vittoria	2	807	2468	Ridge Route	1	2122	-	1
	2	Ridge Route	2	2252	2122	Mill Creek	1	938	-	0
	3	Santa Maria	2	4281	3116	San Remo	1	1388	-	9
	4	PDV	N/A	N/A	N/A	Calle Caballeros	Right	Turn	Only	
	5	PDV	2	5651	5759	Hillary Lane	1	416	-	9
	6	PDV	2	5651	5659	Velasquez Road	1	335	-	9
	7	PDV	2	5651	5659	Alisal Avenue	1	1194	-	9
	8	PDV	2	5651	5659	Ericson Way	1	759	-	9
	9	PDV	2	3269	2813	Mackenzie Street	1	172	-	3
	10	PDV	2	3269	3813	Pine Nut Road	1	517	-	3
	11	Oso Parkway	N/A	N/A	N/A	Nottingham Court	Right	Turn	Only	
	12	La Paz Road	2	8410	8136	Alameda Avenue	1	868	-	9
	13	La Paz Road	2	7373	8136	Appaloosa Pl.	1	1094		
	14	La Paz Road	2	7373	8136	Gallup Drive	1	588	-	10
	15	Alicia Parkway	2	21,600	22,991	Via Lomas	1	2447	-	10
	16	Moulton Parkway	2	10,469	10,636	Gordon Road	1	1003		
	17	Moulton Parkway	2	10,469	10,636	Mandeville Drive	1	740	-	10
	18	Moulton Pkwy	2	10,469	10,636	Louisa Street	1	607	-	10
	19	Moulton Parkway	2	10,469	10,636	Indian Hill	1	577	-	0

Rating Item 2 – Coordinated Movement

This rating item takes into account how a particular signal would impact the orderly flow of traffic. A higher rating is given to a signal if it produces a disbursed flow of traffic. A lower rating occurs if the signal contributes to concentrated flow. Table 7 presents our conclusion for this rating item.

**Table 7 – Rating Item 2
Coordinated Movement
(Signals Currently Warranted are Highlighted)**

Loc	Major Street	Minor Street	Approaching Platoon			Points
			Intact	Spread	Disburse	
1	Santa Vittoria	Ridge Route			X	
2	Ridge Route	Mill Creek			X	
3	Santa Maria	San Remo			X	
4 (a)	PDV	Calle Caballeros	N/a	N/a	N/a	
5	PDV	Hillary Lane			X	
6	PDV	Valasquez Road			X	
7	PDV	Alisal Avenue			X	
8	PDV	Ericson Way			X	
9	PDV	Mackenzie St.			X	
10	PDV	Pine Nut Road	X			
11(b)	Oso Parkway	Nottingham Ct.	N/a	N/a	N/a	
12	La Paz Road	Alameda Ave.			X	5
13	La Paz Road	Appaloosa Pl.			X	5
14	La Paz Road	Gallup Drive			X	
15	Alicia Pkwy	Via Lomas		X		3
16	Moulton Pkwy	Gordon Road		X		3
17	Moulton Pkwy	Mandeville Dr.		X		
18	Moulton Pkwy	Louisa Street		X		
19	Moulton Pkwy	Indian Hill Ln.	X			

- (a) This location is sb right turn only for Calle Caballeros at PDV
 (b) This locations is nb right turn only for Nottingham at Oso.

Rating Item 3 – Accident Evaluation Results

A high intersection accident rate can be a sign of vehicles trying to enter the flow of traffic or cross the street when there are insufficient gaps in major street traffic. Therefore, the signal's potential to reduce or eliminate certain types of accidents generates points that can be used in the rating system – points that are consistent for all locations studied. Table 8 presents the results of this analysis element.

Table 8 – Rating Item 3**Traffic Accidents**

**(Evaluates All Study Intersections Regardless of Warrant Satisfaction. Includes
Broadsides, Left Turns and Ped Involvement)**

(Intersections Currently Warranted Via 2007 Volumes Are Highlighted)

	Location	Major Street	Minor Street	Correctable Accidents 3 Year Period		Points
				Total	Ave.	
	15	Alicia Parkway	Via Lomas	3	1.0	9
	16	Moulton Pkwy	Gordon Road	4	1.33	12
	18	Moulton Parkway	Louisa Street	1	0.33	3
	2	Ridge Route	Mill Creek	0	0	0
	5	PDV	Hillary Lane	0	0	0
	10	PDV	Pine Nut Road	0	0	0
	17	Moulton Pkwy	Mandeville Drive	0	0	0
	7	PDV	Alisal Avenue	0	0	0
	6	PDV	Velasquez Road	0	0	0
	3	Santa Maria	San Remo	0	0	0
	8	PDV	Ericson Way	1	0.33	3
	9	PDV	Mackenzie Street	0	0	0
	12	La Paz Road	Alameda Avenue	0	0	0
	13	La Paz Road	Appaloosa Place	1	0.33	3
	14	La Paz Road	Gallup Drive	1	0.33	3
	1	Santa Vittoria	Ridge Route	0	0	0
	4 (a)	PDV	Calle Caballeros	N/a	N/a	N/a
	11 (a)	Oso Parkway	Nottingham Court	N/a	N/a	N/a
	19	Moulton Pkwy	Indian Hill Ln.	0	0	0

(a) Right Turn Only Location

Rating Item 4 – Special Conditions

This rating item considers extenuating circumstances that are not covered in other rating items or warrants. These could include for example the presence of school, churches, parks, and other public buildings. The various items found that relate to this rating item are in the following table.

Table 9 - Rating Item 4
Special Conditions

Loc	Major St.	Minor Street	Special Conditions						Pts.
			Sch	Chch	Pub Bldg/Park	Curve	Hill	Sight Distance	
1	St. Vittoria	Ridge Route			X		x	x	7
2	Ridge Rt.	Mill Creek			X		x	x	7
3	St. Maria	San Remo	x			x	x	x	10
4	PDV	Calle Caballeros							N/A
5	PDV	Hillary Lane	x			x	x	x	10
6	PDV	Velasquez	x			x	x	x	10
7	PDV	Alisal Ave.				x	x	x	7
8	PDV	Ericson Way				x	x	x	7
9	PDV	Mackenzie Street	x			x	x	x	10
10	PDV	Pine Nut Rd.	x			x	x	x	10
11	Oso Pkwy	Nottingham Ct.							N/A
12	La Paz Rd.	Alameda Ave.					x	x	5
13	La Paz Rd.	Appaloosa Pl.					x		2
14	La Paz Rd.	Gallup Rd.				x	x	x	7
15	Alicia Pkwy	Via Lomas			X				2
16	Moulton Pkwy	Gordon Road				x	x	x	7
17	Moulton Pkwy	Mandeville Dr.			X	x	x	x	10
18	Moulton Pkwy	Louisa St.				x	x	x	7
19	Moulton Pkwy	Indian Hill Lane				x	x	x	7

Rating Item 5 – Safety Index

This rating item uses accident totals to create a Benefit/Cost ratio. Since there are always several types of costs associated with accidents, it follows that the benefit of installing a traffic signal can be compared and rated to the cost of the different types of accidents. Table 10 provides the indicated safety index data.

**Table 10 – Rating Item 5
Safety Index**

Loc	Major Street	Minor Street	Three Year Accidents			
			Fatal	Injury	PDO	Pts
1	Santa Vittoria	Ridge Route Dr.	0	0	0	0
2	Ridge Route Dr.	Mill Creek Dr.	0	0	2	0
3	St. Maria Ave.	San Remo Dr.	0	0	1	0
4	P.D. Valencia	Calle Caballeros	N/A	Right	Turn	Only
5	P.D. Valencia	Hillary Lane	0	0	0	0
6	P.D. Valencia	Velasquez Road	0	0	0	0
7	P.D. Valencia	Alisal Ave.	0	0	1	0
8	P.D. Valencia	Ericson Way	0	3	0	8
9	P.D. Valencia	Mackenzie Street	0	0	0	0
10	P.D. Valencia	Pine Nut Road	0	0	0	0
11	Oso Parkway	Nottingham Court	N/A	Right	Turn	Only
12	La Paz Road	Alameda Avenue	0	0	1	0
13	La Paz Road	Appaloosa Place	0	1	2	3
14	La Paz Road	Gallup Drive	0	3	1	8
15	Alicia Parkway	Via Lomas	0	3	6	8
16	Moulton Pkwy	Gordon Road	0	4	6	10
17	Moulton Pkwy	Mandeville Drive	0	2	0	5
18	Moulton Pkwy	Louisa Street	0	3	1	8
19	Moulton Pkwy	Indian Hill Lane	0	0	0	0

Rating Item 6 – Environmental Conditions

This evaluation looks at the environmental ramifications of a signal such as time delays, pollutant generation, aesthetic values and resource losses. Table 11 provides the information and the various rating points assigned to each.

Table 11 – Rating Item 6
Environmental Impact Assessment

Loc	Major Street	Minor Street	Environmental Impact			Pts.
			Minimal	Moderate	Substantial	
1	Santa Vittoria	Ridge Route	X			5
2	Ridge Route	Mill Creek	X			5
3	Santa Maria	San Remo	X			5
4	PDV	Calle Caballeros	N/a	Right	Turn Only	N/a
5	PDV	Hillary Lane	X			5
6	PDV	Velasquez Road	X			5
7	PDV	Alisal Avenue	X			5
8	PDV	Ericson Way	X			5
9	PDV	Mackenzie Street	X			5
10	PDV	Pine Nut Road	X			5
11	Oso Parkway	Nottingham Court	N/a	Right	Turn Only	N/a
12	La Paz Road	Alameda Avenue		X		2
13	La Paz Road	Appaloosa Place	X			2
14	La Paz Road	Gallup Drive	X			2
15	Alicia Parkway	Via Lomas	X			5
16	Moulton Parkway	Gordon Road	X			2
17	Moulton Parkway	Mandeville Drive	X			2
18	Moulton Parkway	Louisa Street	X			2
19	Moulton	Indian Hill Ln.	X			2

Rating Item 7 – Highway Geometry

In general, it is more cost effective and more productive to signalize a four – legged intersection than one of the “TEE” configuration. Also, a signal at the intersection of two arterial streets will better serve the community than will a signal at the intersection of two local residential streets. (Table 12).

Table 12 – Rating Item 7
Highway Geometry

Loc.	Inter Type	Major Street		Minor Street		Pts.
		Name	Class.	Name	Class.	
1	4	Santa Vittoria	Arterial	Ridge Route Dr.	Collector	4
2	T	Ridge Route	Arterial	Mill Creek Dr.	Collector	3
3	T	Santa Maria	Arterial	San Remo Dr.	Collector	3
4	T	PDV	Arterial	Calle Caballeros	Collector	N/A
5	T	PDV	Arterial	Hillary Lane	Collector	3
6	T	PDV	Arterial	Velasquez Road	Collector	3
7	T	PDV	Arterial	Alisal Avenue	Collector	3
8	T	PDV	Arterial	Ericson Way	Collector	3
9	T	PDV	Arterial	Mackenzie Street	Collector	3
10	T	PDV	Arterial	Pine Nut Road	Collector	3
11	T	Oso Parkway	Arterial	Nottingham Court	Collector	N/A
12	T	La Paz Road	Arterial	Alameda Avenue	Collector	3
13	T	La Paz Road	Arterial	Appaloosa Place	Collector	3
14	T	La Paz Road	Arterial	Gallup Drive	Collector	3
15	T	Alicia Parkway	Arterial	Via Lomas	Collector	3
16	T	Moulton Pkwy	Arterial	Gordon Road	Collector	3
17	T	Moulton Pkwy	Arterial	Mandeville Drive	Collector	3
18	T	Moulton Pkwy	Arterial	Louisa Street	Collector	3
19		Moulton Pkwy	Arterial	Indian Hill Ln.	Collector	3

N/A = Right Turn Only Intersection

Taking all of the above rating criteria into consideration, existing unsignalized intersections that satisfy Caltrans warrants for signalization can be prioritized for possible construction. Those prioritized locations are shown in list below with Table 13 showing the greater detail of the prioritization process.

1. Moulton Parkway at Gordon Road
2. Alicia Parkway at Via Lomas
3. La Paz Road at Appaloosa Place
4. La Paz Road at Alameda Avenue

Table 13
Priority Ranking of Unsignalized Intersections Meeting Warrants
(Prioritized)

			Rating Item Number Maximum Points							Total
			1	2	3	4	5	6	7	
Loc	Major Street	Minor Street	10	5	20	15	10	5	5	70
16	Moulton Parkway	Gordon Road	10	3	12	7	10	2	3	47
15	Alicia Parkway	Via Lomas	10	3	9	2	8	5	3	40
13	La Paz Rd.	Appaloosa Place	9	5	3	2	3	2	3	27
12	La Paz Rd.	Alameda Avenue	9	5	0	5	0	2	3	24

Note: For reference/comparison to the above in non – prioritized format, refer to Table 5.

In terms of future traffic signals, it is recommended that this update be performed on a periodic basis. The reason concerns fluctuating traffic volumes along with accident levels that change from year to year. For that reason, we recommend that new counts be taken each year along with an assessment of accidents at the unsignalized intersections. Then, through a relatively simple process, the numbers of this report, along with the various point scores shown in the tables can be updated.

RATING ITEMS

RATING ITEM 1
INTERRUPTION OF CONTINUOUS TRAFFIC (10 POINTS MAXIMUM)
(Warrant 2)

Vehicles attempting to cross the major flow of traffic or enter that flow can cause the traffic on the through street to be delayed or slow down unnecessarily. The installation of a signal at such locations can actually speed up the traffic flow on the major street. Table A1 shows the percent of the maximum assigned points based on the major street daily volume. For example, an intersection where the traffic volume on the major street average 11,000 vehicles per day would receive 70% of the maximum allowed. In the above example, the intersection would receive 7 points for this rating area.

Table A1 – Percent of Maximum Points – Interruption of Continuous Traffic

Major Street Volume Of at Least...	Percent of Maximum
4,700	0 (0)
5,600	10 (1)
6,400	20 (2)
7,300	30 (3)
8,200	40 (4)
9,000	50 (5)
10,000	60 (6)
10,700	70 (7)
11,600	80 (8)
12,400	90 (9)
17,500	100 (10)

RATING ITEM 2
COORDINATED MOVEMENT (5 POINTS MAXIMUM)

When a traffic signal turns green and the waiting vehicles start down the roadway, they are in a relatively compact grouping referred to as a "platoon". As this group of vehicles progress down the street, they become more and more disbursed due to difference in driving speeds. As a result, some of the cars in the original platoon are unable to make it through the next signal and are forced to stop. In some cases, the installation of a signal between the original two can keep this platoon intact and actually reduce the overall driving delay. This item depends on engineering judgment and should include present and future traffic demands of the area.

A signal may be justified when it forms a part of an interconnected or coordinated system and would serve the purpose of maintaining traffic volumes in relatively concentrated platoons of vehicle. Typically, the following question could be asked: "Would a signal at this location cause the platoon approaching the next signal to be concentrated (5 points), moderately concentrated (2 points) or disbursed (0 points)?"

RATING ITEM 3 **ACCIDENT HAZARDS**

A high intersection accident rate can be a sign of vehicles (and pedestrians) trying to enter the flow of traffic or cross the street when there are insufficient gaps in the major street traffic. Only those accidents susceptible to correction by traffic signals should be considered when evaluating this item. And even the, only if less restrictive measures such as warning signs, proper lighting, painted markings, etc., have failed. Accidents which are susceptible to correction by a traffic signal are normally considered to be "broadside" or right-angle accidents, left turn accidents and those accidents involving pedestrians. In this item, the maximum number of points is assigned to the intersection with the highest number of correctable accidents and 0 is assigned to the lowest. Table A5 illustrates the points that would be assigned if the highest intersection had six accidents and the lowest intersection had none.

TABLE A5 - Percent of Maximum Points - Accident Hazard

Correctable Accidents	Points
6	(20)
5	(16)
4	(13)
3	(10)
2	(6)
1	(3)
0	(0)

RATING ITEM 4 SPECIAL CONDITIONS (15 POINTS MAXIMUM)

This item considers extenuating circumstances that are not covered in other items in this rating system. These may include the proximity of schools, churches, public buildings, and other traffic and pedestrian generators; an abrupt change from a rural to an urban area; the need for police control during portions of the day; a steep hill; a horizontal curve; or restricted sight distance. This requires engineering judgment based on physical inspection of the site. Equal weights should be given to each of the items considered here. In table A6, the percentages and points based on how many of 6 conditions were located.

TABLE A6 - Percent of Maximum Points - Special Conditions

Conditions Located	Points
6	100(15)
5	83(12)
4	67(10)
3	50(7)
2	33(5)
1	17(2)
0	0(0)

RATING ITEM 5
SAFETY INDEX (15 POINTS MAXIMUM)

A safety index is the Benefit /Cost ratio for a safety improvement expressed as a number. The costs and benefits are directly related to the number of accidents at a location, which are susceptible to correction, by a traffic signal. Points are assigned by setting the highest Benefit/Cost ratio to the maximum allowed points and the minimum Benefit/Cost ratio to zero. Ratings in between are allocated a proportion of the number of points between zero and the maximum. Normally, a two-year accident history is used to derive the benefit that would be achieved if those accidents were prevented through the installation of a traffic signal. The accidents are grouped into categories with costs and weighted. The "benefit" portion of the ratio is actually the estimated cost of the various severity categories as listed below.

Table A7 – "Costs" of Traffic Accidents

Category	Cost
Fatal Accidents	\$287,175
Injury Accidents	\$8,085
Property Damage Accidents	\$520

Table A8 – Typical Signal Installation Costs in Southern California

Intersection Type	Cost
Four Leg Intersection	\$250,000
T Intersection	\$200,000

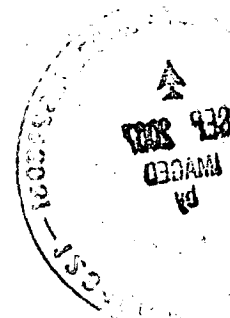
Rating Item 6
Environmental (5 Points Maximum)

This is the only rating item that can actually be assigned negative points. An evaluation of the environmental considerations should be made including time delays, pollutant generation, aesthetic values and resource losses. A project that minimizes problems would receive the maximum 5 points while a project that has a substantial adverse effect would receive a negative 5 points. Gradations may be employed between the two limits.

Rating Item 7
Highway Geometry (5 Points Maximum)

In general, it is more cost effective and more productive to signalize a four – legged intersection than one of the “TEE” Configuration. Also, a signal at the intersection of two arterial streets will better serve the community than will a signal at the intersection of two local residential streets.

Higher Volume Street Is...	Lower Volume Street Is....	Percent of Maximum Points if....	
		Intersection is T	Intersection is 4 Legged
Local	Local	0	0
Collector	Local	10 (0)	20 (1)
	Collector	30 (1)	40 (2)
Arterial	Local	50 (2)	60 (3)
	Collector	70 (3)	80 (4)
	Arterial	90 (4)	100 (5)





Trammell Hartzog, President
 Jerry Crabill, P.E., (Retired)
 Gerald J. Stock, P.E., Executive
 Vice President

275 Centennial Way
 Suite #208
 Tustin, CA 92780

Phone: (714) 731-9455
 FAX: (714) 731-9498

www.hartzog-crabill.com

1

May 7, 2007

Mr. Ken Rosenfield, P.E.
 Director of Public Services
City of Laguna Hills
 24035 El Toro Road
 Laguna Hills, California 92653

SUBJECT: Proposal to Prepare Year 2007 Traffic Signal Master Plan Update

Dear Mr. Rosenfield:

In accordance with the City's recent request, we are pleased to submit this proposal covering the year 2007 update of the Traffic Signal Master Plan. The format of our work will be similar to the 2003 Master Plan. While a considerable amount of data will be reviewed and analyzed in the report, one of its most significant results will be a series of tables providing the City with anticipated timeframes for the warranting of future traffic signal construction.

Briefly, the information in the report will be covered in three sections. These will include:

- (1) A detailed Executive Summary,
- (2) An explanation of our data collection and analysis efforts for 16 individually discussed aspects of the work, and
- (3) A discussion of the procedures and results of the "Priority Rating System".

The latter is significant in that its results will be responsible for the final decisions described in the year 2007 Traffic Signal Master Plan Update.

Attachment: 2007 Traffic Signal Master Plan (2017 : Traffic Signal Master Plan Update and Construction of New Traffic Signals)

Mr. Ken Rosenfield, P.E.
May 7, 2007
Page 2

ANALYSIS PROCEDURES

Traffic Counts

Historically the City has been using a "Traffic Volume and Growth Chart" to assist in its traffic planning efforts, and a recent citywide traffic count update (ADT update) is in progress as a separate project. Hence, part of our work will include the submittal of the ADT update.

Using the ADT information, we will look at warranting procedures prescribed by the California Manual of Uniform Traffic Control Devices (California MUTCD) that are based on recent daily traffic volumes. Those warrants are "Minimum Daily Traffic Volumes" and "Interruption of Continuous Traffic". Detailed explanations of how the volumes were used will be provided in the report along with numerous tables to ensure clarification. Explanations will also be provided as to how the volumes were used in reaching our conclusions for traffic signal warranting priorities.

Accidents

Given new accident analysis software, we propose to expand our 2003 and year 2006 accident review efforts. By doing so, we can complete another California MUTCD warrant and better define those intersections where signals are possibly needed because of accident frequency and types. Briefly, we will provide the City with accident evaluation data for each intersection that (1) can be used as part of our conclusions in signal warranting priority, and (2) be used by the Sheriff department in targeting high accident locations.

Other Signalization Warrants per California MUTCD

The California MUTCD prescribes that City's look at a total of (8) eight warrants when considering the construction of a traffic signal. Therefore, in addition to the above three warrants, our work will include an assessment of other important issues/warrants such as School Area safety needs, Peak Hour Delay/Volume warrants, and others. This will ensure that the full extent of State requirements will be satisfied.

Priority Rating System

Since the budgeting of signals is always an important annual issue, a significant portion of the update will involve the preparation of seven rating systems. By using those systems (both individually and collectively), a clear, and defensible list of traffic signals, either to be constructed now or in the near/far future can be developed.

Mr. Ken Rosenfield, P.E.
May 7, 2007
Page 3

Tables and Exhibits

Clear and understandable tables/exhibits will support all work for this project. Traffic volume data will be organized in graphic/tabular form as will the effort behind the creation of the signal construction priority system. Four exhibits will be prepared showing the following:

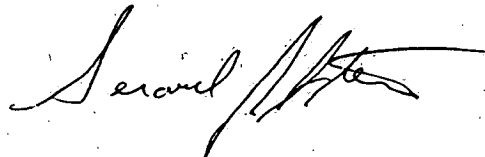
1. The location of existing traffic signals.
2. Those intersections that are currently warranted per this 2007 update.
3. Intersections whose analysis elements indicate that a signal may be needed sometime in the future.
4. All combined signal scenarios that could eventually materialize in the City.

ESTIMATED PROJECT COST

We anticipate that the cost to prepare the entire project will be **\$11,500.00**. The project will be one that pulls together new traffic volumes, a detailed assessment of the citywide accidents, the preparation of a new/updated Traffic Volume Chart and the preparation of the detailed year 2007 Traffic Signal Master Plan Update. The anticipated schedule for this work is a completion as of June 30, 2007.

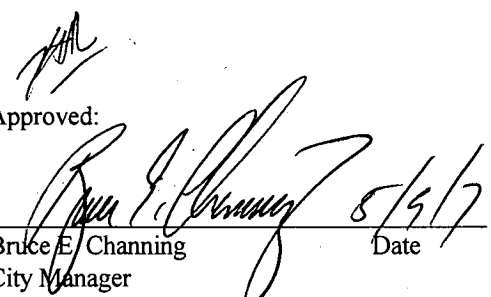
As always, it has been a pleasure preparing this proposal for the City. Given the importance of the Master Plan, we are confident that the use of the update will be a valuable instrument to assist the City in its administrative decisions toward traffic signal construction timeframes. Should you have any questions, please contact us at (714) 731-9455.

Sincerely yours,
HARTZOG & CRABILL INC.



Gerald J. Stock
Executive Vice President
City and Traffic Engineering Services

Approved:


Bruce E. Channing
City Manager

5/9/07
Date



CITY OF LAGUNA HILLS
24035 El Toro Road
Laguna Hills, CA 92653
PHONE: (949) 707-2600 • FAX: (949) 707-2633

LETTER OF TRANSMITTAL

To: Jerry Stock
Hartzog and Crabill

Date: May 7, 2007

Job No. _____

Project: Turning Movement Counts

Attn: _____

Via: Messenger Pickup ☒ Express Mail ☒ Blueprinter Facsimile # _____ Pages _____

We are forwarding herewith:
☒ Originals ☐ Copies ☐ Report Other ☐ Specifications Other _____

Description: _____
 Map of proposed turning movement counts for citywide traffic circulation study. Counts to be taken morning, noon and evening peak hours.

This material is:
☐ For your approval. ☐ Approved by us.
☒ For your review. ☐ Returned by us.
☐ For your files. ☐ For use on job.
☐ Per your request. ☐ For Signature

Remarks: _____
 Jerry – would you suggest any other locations? I'd also like a truck classification count on all arterials. Please send a proposal. I want the counts taken before school lets out, before about June 15th.

From: CITY OF LAGUNA HILLS

COPIES TO:



Kenneth H. Rosenfield, P.E.
 Director of Public Services/City Engineer

Received By: _____

Tull

Confirmation Report - Memory Send

Page : 001
 Date & Time: 03-30-2007 02:58pm
 Line 1 :
 Line 2 : +
 Machine ID : Laguna Hills

Job number : 346
 Date : 03-30 02:57pm
 To : 917147319498
 Number of pages : 001
 Start time : 03-30 02:57pm
 End time : 03-30 02:58pm
 Pages sent : 001
 Status : OK

Job number : 346

*** SEND SUCCESSFUL ***

To: Jerry Stock

HARTZOG & CRABILL, Inc.

Trammell Hartzog, President
 Jerry Crabill, P.E. (Retired)
 Gerald J. Stock, P.E., Executive
 Vice President

275 Centennial Way
 Suite 208
 Tustin, CA 92780

Phone: (714) 731-9455
 FAX: (714) 731-9498
 www.hartzog-crabill.com

March 28, 2007

Mr. Ken Rosenfield, P.E.
 City Engineer
 City of Laguna Hills
 24035 El Toro Road
 Laguna Hills, California 92653

Subject: Proposal to Provide Traffic Engineering Services for the 2007 Traffic Flow Map and Volume Table

Dear Mr. Rosenfield:

Hartzog & Crabill, Inc. (HCI) is pleased to submit this proposal to provide professional traffic-engineering services to the City of Laguna Hills for the 2007 Traffic Flow Map update. These services include: collecting the traffic counts as necessary to upgrade the 2005 Traffic Flow Map and Volume Table to 2007 conditions and updating the Traffic Flow Map and Volume Table with the new traffic data.

These tasks are described in further detail in our Scope of Work below:

SCOPE OF WORK**Task 1 - Collect Traffic Counts**

Upon the City's Notice-to-Proceed, HCI will secure 24-hour Average Daily Traffic (ADT) directional weekday traffic counts at (82) permanent count station locations.

- All traffic counts will be conducted in the time period between mid-April through mid-May 2007.
- HCI will secure and incorporate the most recent traffic count data from any other applicable agencies into the flow map.
- The City will receive the traffic counts for review before incorporation into the flow map.

Consulting Traffic Engineers to Government Agencies

3/30/07
 Proceed w/ work:
 Ken Rosenfield

Attachment: 2007 Traffic Signal Master Plan (2017 : Traffic Signal Master Plan Update and Construction of New Traffic Signals)



Trammell Hartzog, President
 Jerry Crabill, P.E. (Retired)
 Gerald J. Stock, P.E., Executive
 Vice President

275 Centennial Way
 Suite 208
 Tustin, CA 92780

Phone: (714) 731-9455
 FAX: (714) 731-9498
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March 28, 2007

Mr. Ken Rosenfield, P.E.
 City Engineer
City of Laguna Hills
 24035 El Toro Road
 Laguna Hills, California 92653

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- The City will receive the traffic counts for review before incorporation into the flow map.

*3/30/07
 Proceed w/ work.
 Ken Rosenfield*

Mr. Ken Rosenfield, P.E.

March 28, 2007

Page 2

SCOPE OF WORK (continued)

Task 2 – Update Existing City Flow Map and Volume Table

The Traffic Volume Table will be updated with the 2007 traffic count information. As you know, this table lists each roadway alphabetically with all segments of that roadway listed in one column and the corresponding traffic volumes (ADT) in an adjacent column per year.

The Traffic Volume Table task will also include a comparison of 1994, 1996, 1998, 2001, 2003, and 2005 traffic volumes. The volume table will be provided on the back of the Traffic Flow Map for convenience and ease of reference.

Following the table update, the new traffic volumes will be entered into the citywide flow map. This consists of updating the Traffic Flow Map line widths for all major and minor arterials and collector roadway classifications. The flow map uses a graphical method to show the traffic volumes using varied line widths that proportionately correspond to the measured traffic volume for each roadway segment. This method of presentation allows for quick viewing of not only specific roadway volumes, but also a macroscopic view of the surrounding traffic flow characteristics.

Upon completion of Tasks 1 and 2, the updated map and table will be printed and a draft copy of each will be submitted to the City for review and comment. Both the map and the table will be prepared on a full "D" size sheet (24" x 36").

Task 3 – Finalize and Reproduce Traffic Flow Map and Volume Table

Following any changes required by the City of the initial map and table submittals, the original 24" x 36" sheets will be photographically reduced to an 11" x 17" PMT (photomechanical transfer). From the PMT, 75 double-sided copies of the Traffic Flow Map/Volume Table will be generated on 11" x 17" cardstock.

Mr. Ken Rosenfield, P.E.

March 28, 2007

Page 3

PRODUCTS

At the completion of this project, the following products shall be provided to the City:

- All 2007 traffic count data in a binder.
- One (1) original 24" x 36" Mylar Final Flow Map and Volume Table
- One (1) original 11" x 17" PMT of Final Flow Map and Volume Table
- Fifty (50) double-sided 11" x 17" Traffic Flow Map/Volume Table on cardstock

SCHEDULE

Following the City's Notice-to-Proceed, HCI estimates that it will require six (6) weeks to secure the traffic count data, two (2) weeks to complete Tasks 2 and 3, one (1) week for City review, and two (2) weeks to finalize and deliver the project products.

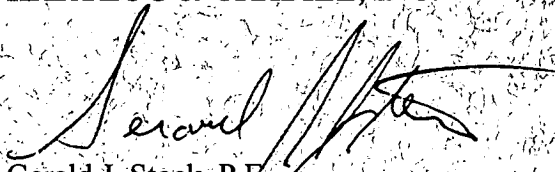
Therefore, we estimate project completion in eleven (11) weeks.

PROFESSIONAL FEES

HCI is proposing a fixed fee cost of \$1,950.00 for our services outlined above, plus the cost of obtaining and administering all traffic counts. The estimated cost of obtaining the traffic counts is \$9,372.50, which includes (82) 1-day ADT count locations and a 15% administration fee. An invoice for the traffic counts from the supplier will also be forwarded to the City. Therefore, the total proposed project cost is **\$11,322.50**.

We look forward to the City's acceptance of this proposal and to the beginning of the project. If you should have any questions or need more information, please contact our office at (714) 731-9455.

Very Truly Yours,
HARTZOG & CRABILL, INC.



Gerald J. Stock, P.E.
 Vice President
 City & Traffic Engineering Services

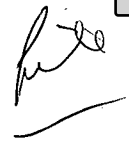
City Wide Traffic Counts
 GJS/prh

Hartzog Crabill, Inc.
Time Sheet

4.2.b

MARCH 2007

Project Name	Job #	PM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL TO DATE	
Cleaned Lounge/Office/File Rm, Ect	OH	TH	0.25	0.25			0.25	0.25	0.25	0.25	0.25			0.25	0.25	0.25	0.25	0.25			0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25					5	
General Work: Phones, Staff Mtg, Lunch P/U, SOQ, Binding	OH	TH	3	2			2.75	3	3	3	3			2	2.75	2.5	1.75	2			3	2	2	2.75	3.5		3.75	3.5	2					53.25	
Faxes/Emails (TH/JS)	OH	TH								0.25				0.25	0.25	0.5	0.5						0.5	0.75			0.25							3.25	
Billing-Current Invoices/New System Inputting	OH	TH	1				1.5	4	4	2.75	4			4.5	6.25	4.5	5.75				4.75	5.25	4.75	1.5			2	2.5						59	
Billing-Past Due Invoices/Notices	OH	TH	0.5	3.5							0.25																							4.25	
Accts Payable-Posting	OH	TH					1											1.5									0.5							3	
Accts Receivable-Posting	OH	TH		1						1								1			0.5			1.75		0.5	1							6.75	
Update HCI Lists G/Y's	OH	TH	0.25	1			0.25	1.5	1		2			2							1				2.25		0.25							11.5	
Inventory Office Supplies Needed	OH	TH																					0.25											0.25	
Out-Bank, Vons, Office Depot, Post Office	OH	TH		0.25										0.25				1.75					0.25		1.75									4.25	
Expense Sheets reviewed for processing	OH	TH	0.5				0.25			0.25				7																				1	
Timesheets Updated for Staff	OH	TH	0.25								0.25			0.25								0.25	0.25	0.5										1.75	
Proposals/Reports-Clean Up or Bound/Copy	OH	TH	1.5																										2					3.5	
Review City Accts with TH or JS (Bellflower 1002) (RSM 1448)	OH	TH																					2.5											2.5	
Binders Updated-Billing/Payments and Filing & Reorganization. File Cabinets	OH	TH	2	1																			0.75			0.25	1.5	2						7.5	
Deliveries or Pick-Ups (BV ENG)	1531	TH								1																									1
Orange Co.-B.V.-Haw Gardens Research for Jerry, preparation on new contract agreement	?	JS																1.5																	
Sir-Speedy- Bonding- City of Brea (6 sets) Mike/Jerry (waited)	?	JS																0.75																	
Sir-Speedy- Bonding- City of Glendora (4 sets) Mike/Jerry	?	JS																									0.5								
Resumes Mike-Bureau Veritas																						1													
Overnight-ShipGSO	OH	TH		0.5			0.25	0.25		0.25					0.25		0.75	0.5			0.25		0.25	0.25			0.25	0.25						4	
Laguna Hills-Multiple Stop Analysis-Bonding and Processing	1529	JS														1																			1
R/L-Plan Checks with Jstock (Dictated Reports) and-Lori Wolfe/Bellflower	1374	JS												0.5		1.5																		2	
Update Sub-Cons Information-Payments & Deposit Records (TH)	OH	TH																										1							1
Sub-Cons Billing to Cities/Clients-Mtg w/JS or TH	OH	TH					1																0.25											1.25	
Sir Speedy-SEPAC Manuals-	?	TH		0.25																															0.25
Work at Home-To update Y & G	OH	TH									2.25													2											4.25
Tustin Drop Off/Pick Up Plans	1541	TH									0.25				0.25	0.25		0.5				0.25												1.5	
Chino-Sir Speedy-Copy and Radar Report Preparation	1492	JSFF					1.75																												1.75
Sir Speedy-City of Monrovia	1433	JSFF	1				1.25		0.75	0.75								0.25																	4
CR-Copies for City of Glendora	?	TH															0.5																		0.5
HOLIDAY																																			0
SICK																																			0
VACATION																																			0
DAILY TOTAL:			10.25	9.75	0	0	10.25	9	9	9.5	12.25	0	0	10	10	10.5	9.5	10	0	0	9.75	9	8.5	11.5	9.5	0	0	8.5	10	6.25	0	0	0		193



Trammell Hartzog, President
Jerry Crabill, P.E. (Retired)
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275 Centennial Way
Suite 208
Tustin, CA 92780

Phone: (714) 731-9455
FAX: (714) 731-9498

www.hartzog-crabill.com

April 18, 2007

Mr. Ken Rosenfield, P.E.,
City Engineer
City of Laguna Hills
24035 El Toro Road
Laguna Hills, California 92653

**SUBJECT: Request for Proposal – Engineering and Traffic Survey
for Speed Limits, City Wide**

Dear Mr. Rosenfield,

Per your request, Hartzog & Crabill, Inc. (HCI) is pleased to submit this proposal for an engineering and traffic survey for speed limits in the City of Laguna Hills. We welcome this opportunity to continue our established professional relationship with you and your staff.

The following study approach presents our intended Scope of Work Project Manager, Schedule, and Professional Fees:

SCOPE OF WORK

Task 1 – Initial Meeting

HCI will arrange a meeting with the City to establish/verify lines of communication. The meeting will also include the discussion of other items such as, enforcement, court requirements, traffic laws, the various 47 roadway segments for survey, City criteria, recent changes in the establishment of recommended speed limits contained within the California Manual on Uniform Traffic Control Devices (CA-MUTCD), any information we will need from the City, and the project schedule.

Mr. Kenneth Rosenfield, P.E.
April 18, 2007
Page 2 of 4

SCOPE OF WORK (continued)

Task 2 – Speed Data Collection

Radar will be used to collect sample data of 100 or more vehicles, or as many vehicles passing through the 47 identified speed zone study areas over a 1-1/2 hour period of time for each non-peak hour survey location (in each direction of travel for multi-lane or divided roadways). To provide the City with as much supporting information as possible, the city will be provided with photocopies of tally sheets for each of the radar surveys. The structure of the report will match the current formats and maps established by the City, unless directed otherwise. We will of course, offer improvements thereon for the City's consideration if requested.

Task 3 – Accident Evaluations

This task will involve an evaluation of speed related accident record information, which will be collected from the City to determine the extent to which speeding is a casual factor in reported accidents over a three-year period. That information will be utilized in the overall analysis of the individual roadway segments for recommendations of appropriate speed limits. The accident analysis will also be geared toward a comparative review of posted speed limits and whether or not the posting is a casual factor in the area accident picture.

Task 4 – Analyze Speed Data

Vehicular speed data will be analyzed and graphically displayed utilizing a special microcomputer plotting and calculation program. This program is used exclusively for engineering and traffic surveys to develop speed limits. It produces necessary information such as the 85th percentile speed (the critical speed), the 10 mile per hour pace speed range, average vehicle speed, and percentage of vehicles in the pace. All of this information is clearly and concisely formatted and presented by the program, and will be provided for easy reference within the report.

Task 5 – Field Inspections

HCI staff will conduct field inspections to determine whether or not prevailing roadway and/or land use characteristics, as they effect or are affected by speeding, are readily apparent to the driver. These characteristics include residential density, pedestrian activity, and bikeways. It is noted that this task will include a review of the speed limits that are currently posted on streets outside of the City (if applicable for this evaluation). Pursuant to the California Vehicle Code section 627, residential density, pedestrian, and bicycle safety will be considered in the engineering and traffic survey. In this manner, the report submitted to the City will be consistent with posted speed limits on those street limits, which may cross City boundaries.

Mr. Kenneth Rosenfield, P.E.
April 18, 2007
Page 3 of 4

SCOPE OF WORK (continued)

Task 6 – Speed Limit Recommendations

Speed survey measurements, accident data, field observations, and the experience that we bring to the project as professional municipal traffic engineers will be used to make professionally acceptable adjustments for the purpose of establishing recommended speed limits within the City. For those areas where streets in the City join roadways of other agencies, appropriate recommendations will be developed to be compatible with both jurisdictions. All findings, conclusions, and recommendations will be combined into a final report document suitable for use in the enforcement of speed limits using radar. The document will be formatted per City report format and according to the desires of the City.

Task 7 – Present Final Report

Mr. Gerald J. Stock will be available to present the results of the study to City staff as well as to answer any questions that may arise.

PROJECT MANAGER

Mr. Gerald J. Stock, P.E., T.E., will serve as project manager and the person responsible in charge. Mr. Stock's experience is based on a background of consulting municipal civil and traffic engineering services. Within the past twelve months alone, he has completed Engineering and Traffic Surveys for the Cities of San Juan Capistrano, Laguna Niguel, Monterey Park, Coto De Caza, Yucaipa, and Moorpark.

SCHEDULE

HCI is prepared to begin work following your notice to proceed. The analytic portion of this project (i.e., all speed surveys, accident analyses, and field investigations) will be completed within four weeks from the receipt of a notice to proceed. Should inclement weather conditions arise, those days will be added to job time.

The final draft report will be submitted to the City within six weeks of the notice to proceed and the final report will be delivered within one week following receipt of comments from the City. Both the draft and final reports will include a letter certifying that a duly Registered Traffic Engineer (Mr. Gerald J. Stock) conducted the surveys.

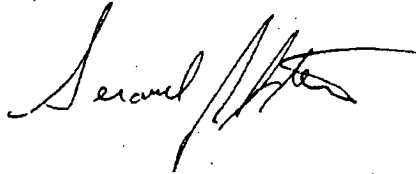
Mr. Kenneth Rosenfield, P.E.
April 18, 2007
Page 4 of 4

PROFESSIONAL FEES

HCI proposes a lump sum not-to-exceed fee amount of **\$11,750.00**, which includes Tasks 1-7, as listed above. Our fee includes the successful completion of all engineering services in conducting the survey for 47 roadway segments, as well as full documentation of radar data collected. Meetings in addition to those described in the above tasks will be billed in addition to the above referenced fees. These fees are **\$140.00 per hour** per our current rate schedule.

We appreciate the opportunity to prepare this proposal for your review. We look forward to providing these services for you and the successful completion of the project. Should you have any questions or desire additional information, please contact us at (714) 731-9455.

Sincerely,
HARTZOG & CRABILL, INC.



Gerald J. Stock, P.E.
Executive Vice President
City and Traffic Engineering Services

Laguna Hills Radar – 2007

GJS/prh

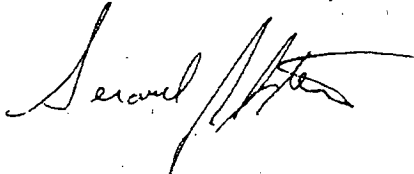
Mr. Kenneth Rosenfield, P.E.
April 18, 2007
Page 4 of 4

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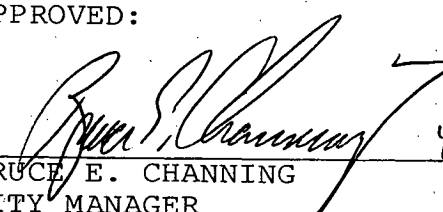


Gerald J. Stock, P.E.
Executive Vice President
City and Traffic Engineering Services

Laguna Hills Radar – 2007

GJS/prh


APPROVED:


BRUCE E. CHANNING
CITY MANAGER

4/23/07
DATE

CITY OF LAGUNA HILLS TRAFFIC SIGNAL MASTER PLAN 2016 PLAN UPDATE

Prepared for:

**City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653**

**Attention: Mr. Kenneth H. Rosenfield, P.E.
Director of Public Services**

Presented by:

**Hartzog & Crabill, Inc.
Traffic Engineers
17852 E. 17th Street, Suite 101
Tustin, CA 92780
(714) 731-9455**



April 15, 2016

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EXECUTIVE SUMMARY

Goals and Objectives

Similar to earlier versions of the City's Traffic Signal Master Plan (TSMP), the goal of this assessment based upon 2015 data is to provide City staff with a useful and logical planning tool for future traffic signal construction. The objective in developing the assessment is to establish a prioritized listing of those existing intersections that may qualify for future traffic signal installation. While priorities may change depending upon future traffic and demographic conditions, the methodology used in the current analysis will continue to provide a basis for evaluation and relative prioritization of existing and future candidate intersections, and provide supporting documentation for the City's budgeting decisions relative to traffic signal construction.

Study Methodology

The study methodology for this analysis is consistent with previous Traffic Signal Master Plan assessments. Since most traffic signal construction decisions are based on satisfying criteria, or Warrants, as described and specified in the State of California Manual on Uniform Traffic Control Devices (CA MUTCD), new 2015 twenty-four hour, directional traffic counts were conducted at each of the 19 candidate locations. The resulting traffic count data was input into the appropriate CA MUTCD Warrants for the Major and Minor streets at each of the candidate intersections. Also, using the Statewide Integrated Traffic Records System (SWITRS) database, the previous three year accident history at each of the candidate intersections was analyzed and the resulting findings incorporated into the study. Additionally, street and adjacent development characteristics such as horizontal and vertical street alignment, sight distance, lane and intersection configuration, and the candidate intersections' proximity to schools, parks, churches and other land uses that would benefit or be negatively impacted from a traffic signal installation were considered in the prioritization process.

The same basic rating system as used in previous assessments is utilized in the current study, where each element of the study such as traffic volumes, accident history, street characteristics, etc., is given a numerical value based on a variety of factors. The total point values for each of the candidate intersections is compiled and a prioritization is established based on highest to lowest point totals. New intersections or current candidate intersections experiencing a change in characteristics can be comparatively evaluated and prioritized using this methodology.

EXECUTIVE SUMMARY (continued)

Traffic Signal Justification

As noted, the intended use of this analysis is to assist City planners in their determination as to where and when traffic signal control is needed and should be installed. While justification for the installation of traffic signals is based on the CA MUTCD warrants, traffic signals are not factually required because they simply meet one or more of the Warrant criteria. An equally important factor in the decision making process is the engineering professionals' judgment based on his/her knowledge of the conditions and circumstances of the location in question, along with community priorities, funding, and other factors.

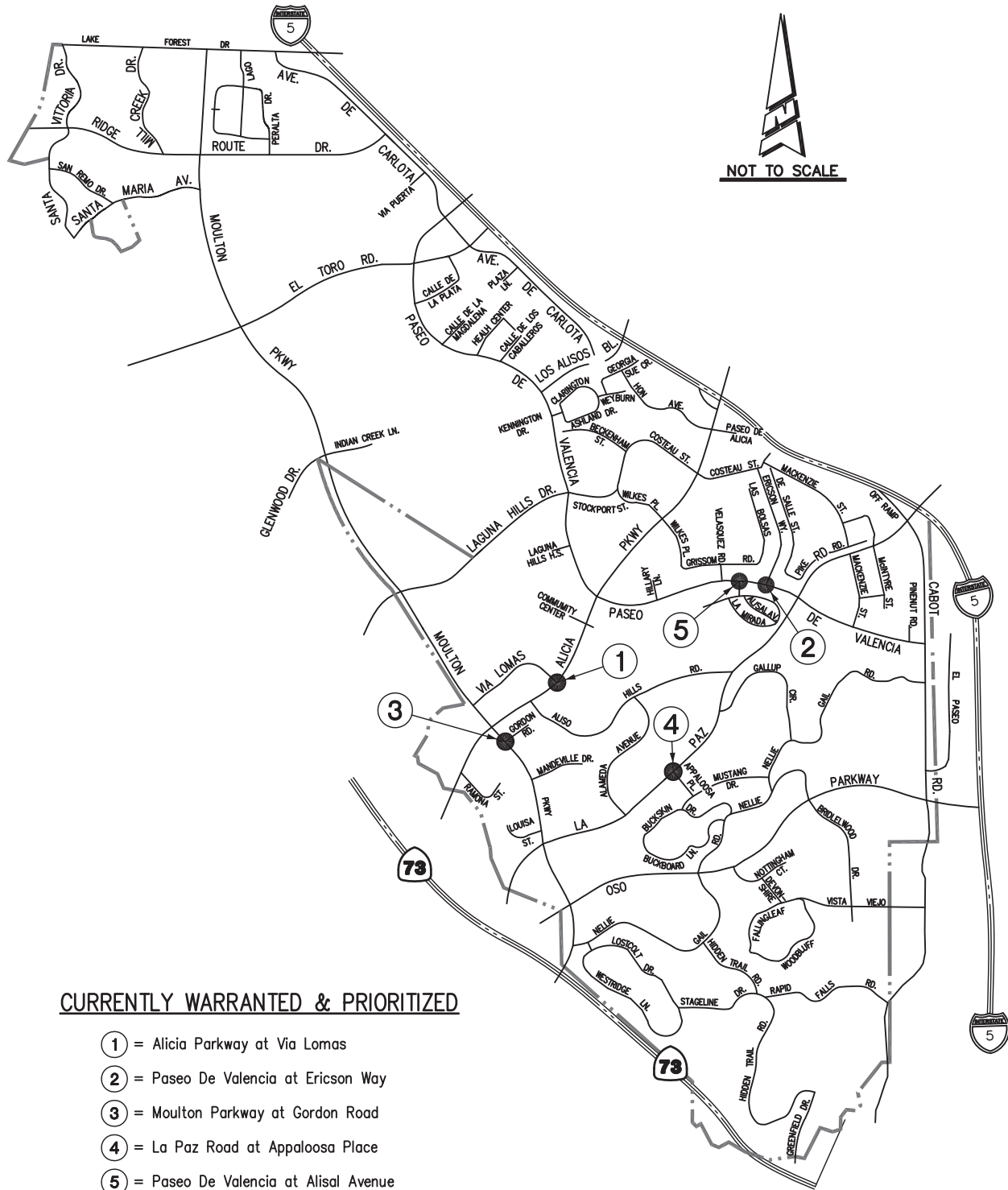
Study Findings

Results of the Traffic Signal Master Plan assessment indicate that the following five (5) candidate locations, in priority order, have met the minimum MUTCD requirements for traffic signal installation:

<u>Location</u>	<u>Intersection</u>
15	Alicia Parkway at Via Lomas
8	Paseo de Valencia at Ericson Way
16	Moulton Parkway at Gordon Road
13	La Paz Road at Appaloosa Place
7	Paseo de Valencia at Alisal Avenue

It should be further noted that Location 12, La Paz Road at Alameda Avenue, which was on the 2007 TSMP list for traffic signal installation, did not meet the CA MUTCD Warrants in this assessment.

Please see Exhibit 1 on the next page for a citywide map overview.



INTERSECTIONS CURRENTLY WARRANTED FOR SIGNALS 2015 SIGNAL MASTER PLAN

CITY OF LAGUNA HILLS

EXHIBIT 1

Packet Pg. 401

ANALYSIS COMPONENTS AND RESULTS

Introduction

The City of Laguna Hills requested that Hartzog & Crabill, Inc. (HCI), Traffic and Transportation Engineers, assist them in upgrading their Citywide Traffic Signal Master Plan (TSMP) to reflect existing traffic and land use conditions. To accomplish this task HCI developed or obtained current traffic counts, accident histories and characteristics, street geometrics and adjacent land uses that may be positively or negatively affected by traffic signal construction; applied this data to recognized standards for traffic signal installation; and, prioritized the 19 candidate intersections provided by the City for possible traffic signal installation.

It is anticipated that the updated TSMP will provide the basis for the City's planning, budgeting and construction of future traffic signals.

The Importance of Traffic Signals and Growth Monitoring

The control of vehicle, pedestrian and bicycle traffic by means of signalized intersection operation has long proven to be an effective technique to reduce accidents and generally improve the quality of traffic flow. To assist the City in the maintenance of a satisfactory signal monitoring program, this report has been prepared as part of a continuing series of periodic signal evaluations with a goal of assisting in future signal improvement decisions and the municipal budgeting process.

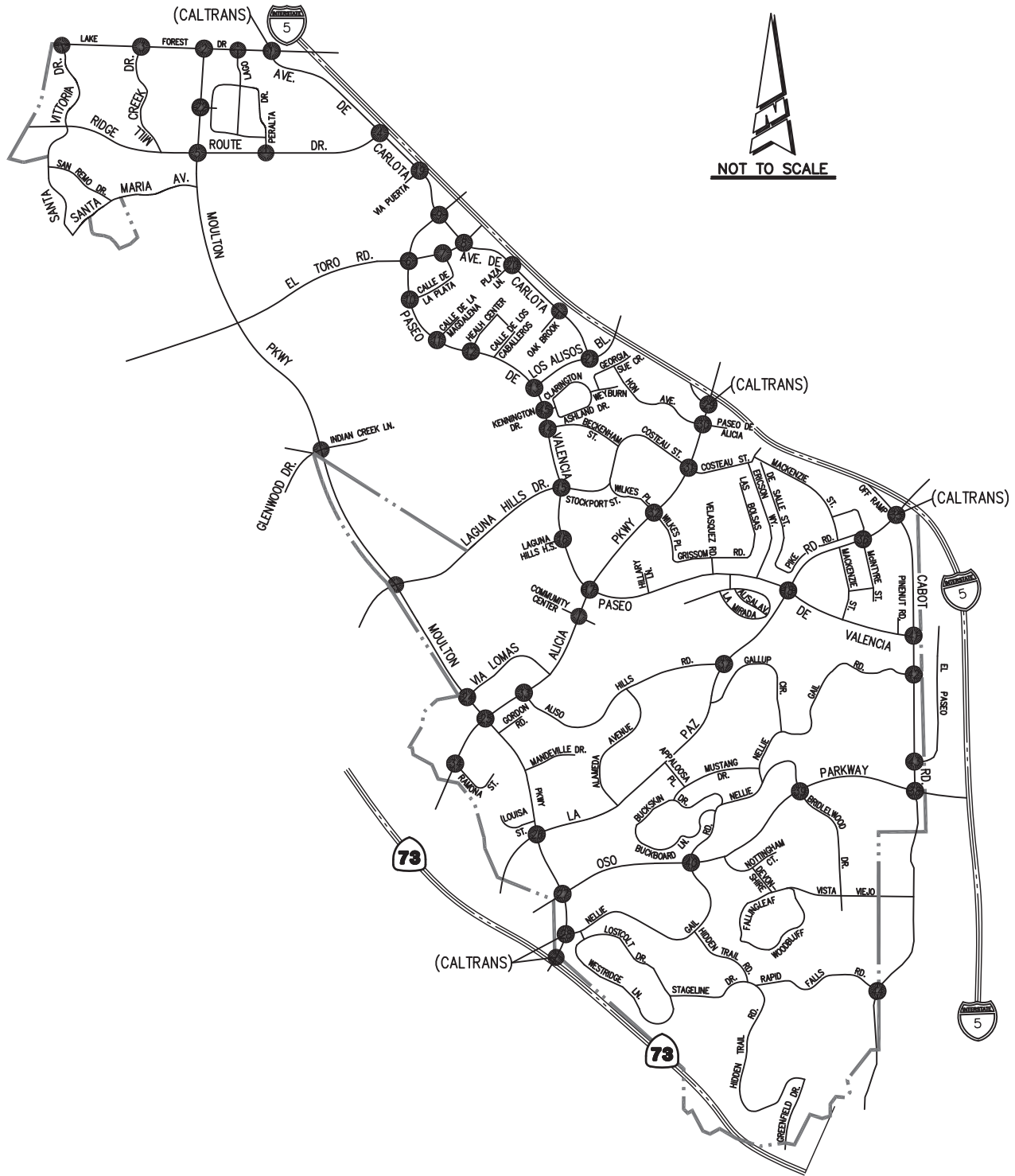
The importance of traffic signals is clearly exemplified by their significant influence over the orderly flow of area traffic volumes. When justified, properly designed and maintained, a traffic signal may achieve the following:

- Reduce the frequency of certain types of accidents
- Effect orderly traffic movement
- Provide for a continuous platoon of traffic flow
- Allow vehicle and pedestrians to better cross opposing directions of traffic

However, should a traffic signal be unjustified or poorly maintained, any or all of the following may result:

- Increased accident frequency
- Excessive delay (driver frustration)
- Disregard of signal indications
- Circuitous travel via alternate routes imparting adjacent increase in traffic

The existing City Traffic Signal System is shown on Exhibit 2 (next page).



EXISTING SIGNAL LOCATIONS 2015 SIGNAL MASTER PLAN

CITY OF LAGUNA HILLS

EXHIBIT 2

Packet Pg. 403

Traffic Signal Justification

While justification for the installation of traffic signals is based, in large part, on the CA MUTCD requirements and Warrants, traffic signals are not factually required because they simply meet one or more of the Warrant criteria. An equally important part of the decision making process is the engineering professionals' judgment based on his/her knowledge of the conditions and circumstances associated with the location in question, along with community priorities, funding, and other factors. However, the CA MUTCD Warrants do have a standing in law and, subsequently, the installation of an unwarranted traffic signal or the failure to install a warranted traffic signal without sound justification or a viable alternative solution can have serious ramifications in respect to liability. Neither action should be taken without legal counsel.

Study Methodology

The study methodology used for this analysis update is generally consistent with previous TSMP assessments with the exception that the State of California Department of Transportation (Caltrans) requirements and Warrants for traffic signal installation have been superseded by those of the CA MUTCD. The study data, tables and exhibits have been modified to reflect this change.

To evaluate the 19 candidate intersections and provide a basis for comparison with the 2007 Traffic Signal Master Plan, new 24-hour, directional traffic counts were conducted at each intersection. The resulting count data was applied to the appropriate CA MUTCD Warrants for traffic signal installation. Also, using the Statewide Integrated Traffic Records System (SWITRS) database, the accident history for the previous three years for each of the intersections was prepared and evaluated to determine if there had been 5 or more reported accidents of a type considered correctible by traffic signal control having occurred during any consecutive twelve months of the 3-year period. No studied locations met this criteria.

Street and adjacent development characteristics such as horizontal or vertical street alignment, sight distance, lane and intersection configuration and the candidate intersections' proximity to schools, parks, churches and other land uses that would benefit or be negatively impacted by traffic installation were considered in the prioritization process.

The same basic rating system as used in previous assessments is utilized in this study whereas each element of the study such as traffic volumes, accident history, street characteristics, etc., is given a numerical value based on a variety of factors. The total point value for each of the candidate intersections is totaled and a priority or ranking of the intersections is established based on highest to lowest point totals. New intersections or current candidate intersections experiencing a change in characteristics can be comparatively evaluated and relatively prioritized using this methodology.

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

The 2015 traffic counts per direction of travel for each candidate intersection are shown on Table 1 below.

Table 1
2015 Traffic Volumes at Candidate Intersections

Location	Major Street	Traffic Volumes		Minor Street	Traffic Volumes	
	Name (Speed Limit)	Approach Direction	2015 Volumes	Name (Speed Limit)	Approach Direction	2015 Volumes
1	Santa Vittoria (30 mph)	NB	2,302	Ridge Route Dr.	EB	N/A
		SB	2,857		WB	1,991
		Total	5,159		Total	1,991
2	Ridge Route Dr. (45 mph)	EB	2,141	Mill Creek Dr.	NB	N/A
		WB	2,781		SB	1,192
		Total	4,922		Total	1,192
3	St. Maria (40 mph)	EB	3,640	San Remo Dr.	NB	N/A
		WB	4,381		SB	1,389
		Total	8,021		Total	1,389
4	P.D. Valencia (40 mph)	EB	N/A	Calle Caballeros (RTO)	NB	N/A
		WB	9,291		SB	848
		Total	9,291		Total	848
5	P.D. Valencia (45 mph)	EB	5,784	Hillary Ln.	NB	N/A
		WB	5,300		SB	423
		Total	11,024		Total	423
6	P.D. Valencia (45 mph)	EB	5,623	Velasquez Rd.	NB	N/A
		WB	5,248		SB	353
		Total	10,910		Total	353
7	P.D. Valencia (45 mph)	EB	5,482	Alisal Ave.	NB	1,018
		WB	5,352		SB	N/A
		Total	10,834		Total	1,018
8	P.D. Valencia (45 mph)	EB	5,647	Ericson Wy.	NB	N/A
		WB	5,248		SB	892
		Total	10,895		Total	892

N/A = Non-Applicable. Typically the minor street leg of a "T" intersection.
RTO = Right Turn Only.

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Table 1
(continued)

9	P.D. Valencia (45 mph)	EB	2,966	Mackenzie St.	NB	N/A
		WB	2,791		SB	460
		Total	5,697		Total	460
10	P.D. Valencia (45 mph)	EB	2,904	Pine Nut Rd.	NB	N/A
		WB	2,901		SB	397
		Total	5,805		Total	397
11	Oso Pkwy. (50 mph)	EB	14,776	Nottingham Ct. (RTO)	NB	355
		WB	N/A		SB	N/A
		Total	14,776		Total	355
12	La Paz Rd. (50 mph)	EB	8,454	Alameda	NB	N/A
		WB	7,583		SB	813
		Total	16,037		Total	813
13	La Paz Rd. (50 mph)	EB	8,109	Appaloosa Pl.	NB	1,032
		WB	7,905		SB	N/A
		Total	16,014		Total	1,032
14	La Paz Rd. (50 mph)	NB	8,189	Gallup Dr.	EB	N/A
		SB	8,129		WB	549
		Total	16,318		Total	549
15	Alicia Pkwy. (45 mph)	NB	21,144	Via Lomas	EB	1,407
		SB	23,067		WB	N/A
		Total	44,211		Total	1,407
16	Moulton Pkwy. (45 mph)	NB	11,600	Gordon Rd.	EB	N/A
		SB	11,056		WB	1,024
		Total	22,656		Total	1,024
17	Moulton Pkwy. (45 mph)	NB	11,284	Mandeville Dr.	EB	N/A
		SB	11,332		WB	517
		Total	22,616		Total	517
18	Moulton Pkwy. (45 mph)	NB	11,416	Louisa St.	EB	630
		SB	10,763		WB	N/A
		Total	22,179		Total	630
19	Moulton Pkwy. (50 mph)	NB	12,558	Indian Hill	EB	N/A
		SB	11,693		WB	662
		Total	24,251		Total	662

N/A = Non-Applicable. Typically the minor street leg of a "T" intersection.
RTO = Right Turn Only.

Traffic Volume Warrants

Entering traffic volumes are a major consideration in the determination as to if a traffic signal is needed or justified at an intersection. Over a period of many years and untold hours of research, transportation professionals such as the Institute of Transportation Engineers (ITE) and leading transportation agencies such as Caltrans have established threshold traffic volumes to determine the number of vehicles on a Major street that would preclude the safe access or crossing of that street by traffic on the Minor street. The threshold traffic volumes have been further refined to consider the number of lanes on both the Major and Minor Street and whether the intersection is considered a 'Urban' or 'Rural' environment (i.e., the typical 'Rural' intersection usually experiences higher approach speeds on the Major Street and the threshold volumes on the Minor Street are reduced to compensate for this condition). This reduction can also be applied to Major Streets in an urban environment if the speed on the Major Street exceeds 40MPH, as do all of the Major Streets of the candidate intersections. The threshold volumes are shown on Table 2 as Warrant 1 – Condition A (see next page).

A second factor relative to traffic volumes at an intersection is consideration of the delay experienced by the motorist on the Minor Street as he/she attempts to access or cross the Major Street. The Warrants address this issue through Warrant 1 - Condition B whereas threshold volumes are reduced for the Minor Street and increased for the Major Street. These threshold volumes are also shown on Table 2 (next page).

The 2015 traffic volumes were applied to Warrant 1 – Condition A and Warrant 1-Condition B as shown in Table 3 (following page). As noted, 18 of the 19 Major Streets at the candidate intersections have approach speeds at or in excess of 40 MPH, therefore the Rural criteria of Warrant 1A and 1B is applicable for these streets. The Rural criteria represents 80% of the Urban criteria.

Table 4 further reflects the 80% factor by expressing the Major and Minor Street traffic volumes as the percent of the traffic volume criteria; consequently, when the Major and Minor Street traffic volumes exceed 80%, that warrant is satisfied.

Table 4 also consolidates Table 3 to a single Yes or No relative to meeting the traffic volume warrants, but includes Warrant 7, which considers the accident history of the intersection. As will be explained later in this study, it has a traffic volume component.

Table 5 indicates those intersections that have met the minimum Traffic Volume and Accident Warrants for traffic signal installation.

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Table 2
Minimum Traffic Volumes

Warrant 1 – Condition A
Based on Estimated Average Daily Traffic Volume

Approach Lanes On Major Street	Approach Lanes On Minor Street	Vehicles/day on Major Street (Total both approaches)		Vehicles/day on higher volume Minor Street (one direction only)	
Number	Number	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or more	1	9,600	6,720	2,400	1,680
2 or more	2 or more	9,600	6,720	3,200	2,240
1	2 or more	8,000	5,600	3,200	2,240

(Warrant 1 Based on Hourly Volumes – Eight Highest Hours)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	500	350	150	105
2 or more	1	600	420	150	105
2 or more	2 or more	600	420	200	140
1	2 or more	500	350	200	140

Warrant 1 – Condition B
Interruption of Continuous Traffic

Approach Lanes On Major Street	Approach Lanes On Minor Street	Vehicles/day on Major Street (Total both approaches)		Vehicles/day on higher volume Minor Street (one direction only)	
Number	Number	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
2 or more	1	14,400	10,800	1,200	850
2 or more	2 or more	14,400	10,800	1,600	1,120
1	2 or more	12,000	8,400	1,600	1,120

(Warrant 2 Based on Hourly Volumes – Eight Highest Hours)

Approach Lanes On Major Street	Approach Lanes On Minor Street	Major Street Total Approach Volumes		Minor Street Highest Approach Volumes	
Number	Number	Urban	Rural	Urban	Rural
1	1	750	525	75	53
2 or more	1	900	630	75	53
2 or more	2 or more	900	630	100	70
1	2 or more	750	525	100	70

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Table 3
Traffic Signal Warrants – Percentage Satisfied

Location	Major Street	Minor Street	CA MUTCD Warrants							
			Traffic Volume % of Warrant Met						Correctible Accidents	
			1A major/minor	Met	1B major/minor	Met	1A & 1B major/minor	Met	7	Met
1	Santa Vittoria	Ridge Route Dr.	64/83		43/166		61/234		1	
2	Ridge Route Dr.	Mill Creek Dr.	73/71		48/140		N/A		0	
3	St. Maria Ave.	San Remo Dr.	119/83		80/163		N/A		0	
4	P.D. Valencia	*Calle Caballeros	N/A		N/A		N/A		N/A	
5	P.D. Valencia	Hillary Ln.	165/25		110/50		N/A		0	
6	P.D. Valencia	Velasquez Rd.	142/21		108/42		N/A		1	
7	P.D. Valencia	Alisal Ave.	161/61		107/120	✓	N/A		0	
8	P.D. Valencia	Ericson Wy.	162/53		108/105	✓	N/A		1	
9	P.D. Valencia	Mackenzie St.	85/27		57/54		N/A		0	
10	P.D. Valencia	Pine Nut Rd.	86/24		58/47		N/A		1	
11	Oso Pkwy.	*Nottingham Ct.	N/A		N/A		N/A		N/A	
12	La Paz Rd.	Alameda	239/48		148/96		N/A		0	
13	La Paz Rd.	Appaloosa Pl.	238/61		159/121	✓	N/A		0	
14	La Paz Rd.	Gallup Dr.	243/33		147/65		N/A		0	
15	Alicia Pkwy.	Via Lomas	658/84		439/166	✓	N/A		2	
16	Moulton Pkwy.	Gordon Rd.	337/61		225/120	✓	N/A		1	
17	Moulton Pkwy.	Mandeville Dr.	437/31		224/61		N/A		1	
18	Moulton Pkwy.	Louisa St.	330/38		260/74		N/A		1	
19	Moulton Pkwy.	Indian Hill	361/39		241/78		N/A		2	

* Right Turn Only

Warrant 1A – Minimum Vehicle Volume. See Table 2 for threshold traffic volumes.

Warrant 1B – Interruption of Continuous Traffic. See Table 2 for threshold traffic volumes.

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Warrant 1A & 1B Combination – Applicable to Location 1 only as approach speeds at intersection is below 40 mph. Urban criteria applies. Criteria is 80% of 1A and 1B.
 Warrant 7 – Correctable Accidents in a previous 12 month period. Minimum Criteria is 5 Correctable Accidents.

Table 4
Signal Warrants – Existing Traffic Volumes

Location	Major Street	Minor Street	Warrant Satisfied (12 Month Period)			
			1A	1B	7	1A & 1B
1	Santa Vittoria	Ridge Route Dr.	NO	NO	NO	NO
2	Ridge Route Dr.	Mill Creek Dr.	NO	NO	NO	N/A
3	St. Maria Ave.	San Remo Dr.	NO	NO	NO	N/A
4	P.D. Valencia	*Calle Caballeros	N/A	N/A	N/A	N/A
5	P.D. Valencia	Hillary Ln.	NO	NO	NO	N/A
6	P.D. Valencia	Velasquez Rd.	NO	NO	NO	N/A
7	P.D. Valencia	Alisal Ave.	NO	YES	NO	N/A
8	P.D. Valencia	Ericson Wy.	NO	YES	NO	N/A
9	P.D. Valencia	Mackenzie St.	NO	NO	NO	N/A
10	P.D. Valencia	Pine Nut Rd.	NO	NO	NO	N/A
11	Oso Pkwy.	*Nottingham Ct.	N/A	N/A	N/A	N/A
12	La Paz Rd.	Alameda	NO	NO	NO	N/A
13	La Paz Rd.	Appaloosa Pl.	NO	YES	NO	N/A
14	La Paz Rd.	Gallup Dr.	NO	NO	NO	N/A
15	Alicia Pkwy.	Via Lomas	NO	YES	NO	N/A
16	Moulton Pkwy.	Gordon Rd.	NO	YES	NO	N/A
17	Moulton Pkwy.	Mandeville Dr.	NO	NO	NO	N/A
18	Moulton Pkwy.	Louisa St.	NO	NO	NO	N/A
19	Moulton Pkwy.	Indian Hill	NO	NO	NO	N/A

* Right Turn Only

Warrant 1A – Minimum Vehicle Volume. See Table 2 for threshold traffic volumes.

Warrant 1B – Interruption of Continuous Traffic. See Table 2 for threshold traffic volumes.

Warrant 1A & 1B Combination – Applicable to Location 1 only as approach speeds at intersection are below 40 mph. Urban criteria applies. Criteria is 80% of 1A and 1B.

Warrant 7 – Correctable Accidents in a previous 12 month period. Minimum Criteria is 5 Correctable Accidents.

Table 5
Intersections Meeting Minimum Warrants for Traffic Signal Installation
Traffic Signal Warrants – Percentage Satisfied

<u>Location</u>	<u>Intersection</u>
7	Paseo de Valencia at Alisal Avenue
8	Paseo de Valencia at Ericson Way
13	La Paz Road at Appaloosa Place
15	Alicia Parkway at Via Lomas
16	Moulton Parkway at Gordon Road

Priority Rating System

Prioritization of those locations meeting the minimum warrants for traffic signalization in this assessment was accomplished by reviewing the traffic and safety characteristics identified in the seven rating items. This procedure is identical to that used in previous assessments.

Rating Item 1 – Satisfaction of Warrant 1 – Condition B (Interruption of Continuous Traffic)

The greater the traffic volume is on the Major Street the more difficult, and sometimes hazardous, it is for vehicular and pedestrian traffic on the Minor Street to access or cross the Major Street. Using this premise, a rating item is created where points are allocated in ascending order based on the traffic volume on the Major Street. The point allocation for the candidate streets is shown on Table 6 (next page).

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Table 6 – Rating Item 1
Warrant 1B Satisfaction
(Interruption of Continuous Traffic)

Location	Major Street				Minor Street				Points
	Name	Lanes	Volume		Name	Lanes	Volume		
			Leg 1	Leg 2			Leg 1	Leg 2	
1	Santa Vittoria	1/1	2,302	2,857	Ridge Route Dr.	2	1,991	-	0
2	Ridge Route Dr.	2/2	2,141	2,781	Mill Creek Dr.	1	1,192	-	0
3	St. Maria Ave.	2/2	3,640	4,381	San Remo Dr.	1	1,389	-	3
4	P.D. Valencia	N/A	N/A	N/A	*Calle Caballeros	N/A RTO	N/A	-	N/A
5	P.D. Valencia	2/2	5,784	5,300	Hillary Ln.	1	423	-	7
6	P.D. Valencia	2/2	5,623	5,248	Velasquez Rd.	1	353	-	7
7	P.D. Valencia	2/2	5,482	5,352	Alisal Ave.	1	1,018	-	7
8	P.D. Valencia	2/2	5,647	5,248	Ericson Wy.	1	892	-	7
9	P.D. Valencia	2/2	2,900	2,791	Mackenzie St.	1	460	-	1
10	P.D. Valencia	2/2	2,904	2,901	Pine Nut Rd.	1	397	-	1
11	Oso Pkwy.	N/A	N/A	N/A	*Nottingham Ct.	N/A RTO	N/A	-	N/A
12	La Paz Rd.	2/2	8,454	7,583	Alameda	1	813	-	9
13	La Paz Rd.	2/2	8,109	7,905	Appaloosa Pl.	1	1,032	-	9
14	La Paz Rd.	2/2	8,189	8,129	Gallup Dr.	1	546	-	9
15	Alicia Pkwy.	3/3	21,144	23,067	Via Lomas	1	1,407	-	10
16	Moulton Pkwy.	3/3	11,600	11,056	Gordon Rd.	1	1,084	-	10
17	Moulton Pkwy.	3/3	11,284	11,332	Mandeville Dr.	1	517	-	10
18	Moulton Pkwy.	3/3	11,416	10,763	Louisa St.	1	630	-	10
19	Moulton Pkwy.	3/3	12,558	11,693	Indian Hill	2	662	-	10

* Right Turn Only

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Rating Item 2- Coordinated Movement

Points are increased if a proposed traffic signal can be incorporated into a coordinated system without significantly impacting the system operation. Conversely, fewer points are given if a proposed signal cannot be effectively incorporated into a coordinated system and the operation of the system is degraded. Table 7 shows HCI's assessment of this rating item.

Table 7 – Rating Item 2
Coordinated Movement

Loc.	Major Street	Minor Street	Approaching Platoon			Points
			Intact	Spread	Disburse	
1	Santa Vittoria	Ridge Route Dr.			X	0
2	Ridge Route Dr.	Mill Creek Dr.			X	0
3	St. Maria Ave.	San Remo Dr.			X	0
4	P.D. Valencia	*Calle Caballeros	N/A	N/A	N/A	N/A
5	P.D. Valencia	Hillary Ln.			X	0
6	P.D. Valencia	Velasquez Rd.			X	0
7	P.D. Valencia	Alisal Ave.			X	0
8	P.D. Valencia	Ericson Wy.			X	0
9	P.D. Valencia	Mackenzie St.			X	0
10	P.D. Valencia	Pine Nut Rd.			X	0
11	Oso Pkwy.	*Nottingham Ct.	N/A	N/A	N/A	N/A
12	La Paz Rd.	Alameda			X	0
13	La Paz Rd.	Appaloosa Pl.			X	5
14	La Paz Rd.	Gallup Dr.			X	0
15	Alicia Pkwy.	Via Lomas		X		3
16	Moulton Pkwy.	Gordon Rd.		X		3
17	Moulton Pkwy.	Mandeville Dr.		X		2
18	Moulton Pkwy.	Louisa St.		X		2
19	Moulton Pkwy.	Indian Hill	X			5

* Right Turn Only

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Rating Item 3 – Accident Evaluation Results

An elevated intersection accident rate can be an indication that there are insufficient gaps in the traffic stream on the Major Street to allow traffic on the Minor Street to merge onto or cross the Major Street. This condition usually results in increased incidences of broadside, left-turn, and vehicle/pedestrian/bicycle types of collisions occurring at the intersection. As these types of accidents are generally correctible by the installation of a traffic signal, points are allocated in the prioritization process based on the number of potentially correctible accidents a traffic signal installation may preclude. Table 8 represents the results of this analysis factor and incorporates the traffic volume component intended with the Accident Warrant.

Table 8 – Rating Item 3
Accident Evaluation Results

Location	Major Street	Minor Street	Warrant Requirements					Intersection Satisfies Accident Warrant	Poin
			⁽¹⁾ TOTAL	⁽²⁾ CORRECTIBLE	⁽³⁾ One Condition 80% Satisfied				
			Accidents	Accidents	Warrant 1A	Warrant 1B	Warrant 4		
			(12 months)	(12 months)					
1	Santa Vittoria	Ridge Route Dr.	1	1					3
2	Ridge Route Dr.	Mill Creek Dr.	0	0					0
3	St. Maria Ave.	San Remo Dr.	0	0					0
4	P.D. Valencia	*Calle Caballeros	3	0	N/A	N/A	N/A	N/A	0
5	P.D. Valencia	Hillary Ln.	0	0					0
6	P.D. Valencia	Velasquez Rd.	1	1					3
7	P.D. Valencia	Alisal Ave.	0	0		✓			0
8	P.D. Valencia	Ericson Wy.	1	1		✓			3
9	P.D. Valencia	Mackenzie St.	0	0					0
10	P.D. Valencia	Pine Nut Rd.	0	0					0

Attachment: 2016 Traffic Signal Master Plan (2017 : Traffic Signal Master Plan Update and Construction of New Traffic Signals)

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Table 8 – Rating Item 3 (cont'd)
Accident Evaluation Results

Location	Major Street	Minor Street	Warrant Requirements					Intersection Satisfies Accident Warrant	Points
			⁽¹⁾ TOTAL Accidents (12 months)	⁽²⁾ CORRECTIBLE Accidents (12 months)	⁽³⁾ One Condition 80% Satisfied				
					Warrant 1A Min Vol.	Warrant 1B Interruption	Warrant 4 Peds		
11	Oso Pkwy.	*Nottingham Ct.	1	1	N/A	N/A	N/A	N/A	3
12	La Paz Rd.	Alameda	0	0					0
13	La Paz Rd.	Appaloosa Pl.	1	1		✓			3
14	La Paz Rd.	Gallup Dr.	0	0					0
15	Alicia Pkwy.	Via Lomas	5	2		✓			6
16	Moulton Pkwy.	Gordon Rd.	2	2		✓			6
17	Moulton Pkwy.	Mandeville Dr.	1	1					3
18	Moulton Pkwy.	Louisa St.	1	1					3
19	Moulton Pkwy.	Indian Hill	2	2					6

* Right Turn Only

✓ Warrant requirements satisfied.

(1) Greatest number of accidents occurring in a continuous 12 month period in a previous 3 year period.

(2) Broadside, left-turning, and vehicle/pedestrian/bicycle accidents.

(3) Traffic Volume component of accident warrant.

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Rating Item 4 – Special Conditions

This rating item considers area facilities, conditions and circumstances that are not addressed in other rating items that could benefit from an adjacent or nearby traffic signal installation. These include, for example, the presence of schools, churches, parks, and other public buildings. The identified facilities and conditions are shown on Table 9.

Table 9 – Rating Item 4
Special Conditions

Location	Major Street	Minor Street	Special Conditions							Points
			School	Church	Public Bldg/ Park	Curve	Hill	Sight Distance	Other	
1	Santa Vittoria	Ridge Route Dr.			X		X	X		7
2	Ridge Route Dr.	Mill Creek Dr.			X		X	X		7
3	St. Maria Ave.	San Remo Dr.	X			X	X	X		10
4	P.D. Valencia	*Calle Caballeros								N/A
5	P.D. Valencia	Hillary Ln.	X			X	X	X		10
6	P.D. Valencia	Velasquez Rd.	X			X	X	X		10
7	P.D. Valencia	Alisal Ave.				X	X	X		7
8	P.D. Valencia	Ericson Wy.				X	X	X		7
9	P.D. Valencia	Mackenzie St.	X			X	X	X		10
10	P.D. Valencia	Pine Nut Rd.	X			X	X	X		10
11	Oso Pkwy.	*Nottingham Ct.								N/A
12	La Paz Rd.	Alameda					X	X		5
13	La Paz Rd.	Appaloosa Pl.					X			2
14	La Paz Rd.	Gallup Dr.				X	X	X		7
15	Alicia Pkwy.	Via Lomas	X		X					6
16	Moulton Pkwy.	Gordon Rd.				X	X	X		7
17	Moulton Pkwy.	Mandeville Dr.			X	X	X	X		10
18	Moulton Pkwy.	Louisa St.				X	X	X		7
19	Moulton Pkwy.	Indian Hill				X	X	X		7

* Right Turn Only

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Rating Item 5 – Safety Index

This rating item uses accident totals and characteristics to develop a Benefit/Cost ratio. As there are always several costs associated with accidents depending upon their severity, and as the cost of traffic signals varies depending, in general, upon their configuration, a ratio and subsequent point allocation can be made by relating the accident and traffic signal cost factors. The resultant safety index is shown on Table 10.

Table 10 – Rating Item 5
Safety Index

Location	Major Street	Minor Street	Correctable Accidents (Consecutive 12 month Period)			
			Fatal	Injury	PDO	Points
1	Santa Vittoria	Ridge Route Dr.	0	0	1	0
2	Ridge Route Dr.	Mill Creek Dr.	0	0	0	0
3	St. Maria Ave.	San Remo Dr.	0	0	0	0
4	P.D. Valencia	Calle Caballeros	0	0	0	0
5	P.D. Valencia	Hillary Ln.	0	0	0	0
6	P.D. Valencia	Velasquez Rd.	0	1	0	7
7	P.D. Valencia	Alisal Ave.	0	0	0	0
8	P.D. Valencia	Ericson Wy.	0	1	0	7
9	P.D. Valencia	Mackenzie St.	0	0	0	0
10	P.D. Valencia	Pine Nut Rd.	0	0	1	0
11	Oso Pkwy.	Nottingham Ct.	0	1	0	7
12	La Paz Rd.	Alameda	0	0	0	0
13	La Paz Rd.	Appaloosa Pl.	0	0	0	0
14	La Paz Rd.	Gallup Dr.	0	0	0	0
15	Alicia Pkwy.	Via Lomas	0	1	1	7
16	Moulton Pkwy.	Gordon Rd.	0	0	1	0
17	Moulton Pkwy.	Mandeville Dr.	0	1	0	7
18	Moulton Pkwy.	Louisa St.	0	1	0	7
19	Moulton Pkwy.	Indian Hill	0	1	1	7

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Rating Item 6 – Environmental Conditions

This subjective evaluation considers the ramifications of a traffic signal installation on the adjacent environment. Such factors would include increased pollution generated by idling vehicles, impact on aesthetics, or loss of habitat. HCL's evaluation of potential environmental impact associated with traffic signal installation at the study intersections is shown on Table 11.

Table 11 – Rating Item 6
Environmental Impact Assessment

Loc.	Major Street	Minor Street	Environmental Impact			Points
			Minimal	Moderate	Substantial	
1	Santa Vittoria	Ridge Route Dr.	X			5
2	Ridge Route Dr.	Mill Creek Dr.	X			5
3	St. Maria Ave.	San Remo Dr.	X			5
4	P.D. Valencia	Calle Caballeros	N/A	Right	Turn Only	N/A
5	P.D. Valencia	Hillary Ln.	X			5
6	P.D. Valencia	Velasquez Rd.	X			5
7	P.D. Valencia	Alisal Ave.	X			5
8	P.D. Valencia	Ericson Wy.	X			5
9	P.D. Valencia	Mackenzie St.	X			5
10	P.D. Valencia	Pine Nut Rd.	X			5
11	Oso Pkwy.	Nottingham Ct.	N/A	Right	Turn Only	N/A
12	La Paz Rd.	Alameda		X		2
13	La Paz Rd.	Appaloosa Pl.	X			2
14	La Paz Rd.	Gallup Dr.	X			2
15	Alicia Pkwy.	Via Lomas	X			5
16	Moulton Pkwy.	Gordon Rd.	X			2
17	Moulton Pkwy.	Mandeville Dr.	X			2
18	Moulton Pkwy.	Louisa St.	X			2
19	Moulton Pkwy.	Indian Hill	X			2

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Rating Item 7 – Highway Geometry

Traditionally, streets are assigned classification and, subsequently, a number of through and turning lanes based on the traffic volumes that the street has or is expected to reach. The service area, land use, number of feeder streets and length of the street determine or produces the traffic volume on a given street. Typical classifications are Arterial, Collector, or Local with a function of single-lane Local streets distributing traffic to multilane Collector streets, and the Collector streets distributing traffic to multilane Arterial streets. Street geometry is the number of lanes a street has, and intersection geometry is the configuration of the intersecting streets (i.e., usually a 4-legged or T-configuration). Under normal circumstances, a traffic signal installation at an Arterial/Arterial intersection with its inherently greater traffic volumes and service area will have a greater Cost/Benefit than a traffic signal installed, for example, at a Collector/Local intersection. The geometry based ranking of the candidate intersections is shown on Table 12.

Table 12 – Rating Item 7
Highway Geometry

Loc.	Inter. Type	Major Street		Minor Street		Points
		Name	Class.	Name	Class.	
1	4	Santa Vittoria	Arterial	Ridge Route Dr.	Collector	4
2	T	Ridge Route Dr.	Arterial	Mill Creek Dr.	Collector	3
3	T	St. Maria Ave.	Arterial	San Remo Dr.	Collector	3
4	T	P.D. Valencia	Arterial	Calle Caballeros	Collector	3
5	T	P.D. Valencia	Arterial	Hillary Ln.	Collector	3
6	T	P.D. Valencia	Arterial	Velasquez Rd.	Collector	3
7	T	P.D. Valencia	Arterial	Alisal Ave.	Collector	3
8	T	P.D. Valencia	Arterial	Ericson Wy.	Collector	3
9	T	P.D. Valencia	Arterial	Mackenzie St.	Collector	3
10	T	P.D. Valencia	Arterial	Pine Nut Rd.	Collector	3
11	T	Oso Pkwy.	Arterial	Nottingham Ct.	Collector	3
12	T	La Paz Rd.	Arterial	Alameda	Collector	3
13	T	La Paz Rd.	Arterial	Appaloosa Pl.	Collector	3
14	T	La Paz Rd.	Arterial	Gallup Dr.	Collector	3
15	T	Alicia Pkwy.	Arterial	Via Lomas	Collector	3
16	T	Moulton Pkwy.	Arterial	Gordon Rd.	Collector	3
17	T	Moulton Pkwy.	Arterial	Mandeville Dr.	Collector	3
18	T	Moulton Pkwy.	Arterial	Louisa St.	Collector	3
19	T	Moulton Pkwy.	Arterial	Indian Hill	Collector	3

City of Laguna Hills - Traffic Signal Master Plan 2016 Update

Locations Satisfying Minimum Warrant Criteria and Priority Ranking

The findings of City of Laguna Hills' Traffic Signal Master Plan 2016 Update indicates that the following five (5) locations have satisfied the minimum CA MUTCD warrants for traffic signal installation:

7. Paseo de Valencia at Alisal Avenue
8. Paseo de Valencia at Ericson Way
13. La Paz Road at Appaloosa Place
15. Alicia Parkway at Via Lomas
16. Moulton Parkway at Gordon Road

Table 13 ranks the warranted locations based on the rating system employed in the Traffic Signal Master Plan Update.

Table 13
Priority Ranking of Study Intersections
Meeting Minimum Warrants for Traffic Signal Installation

Location	Major Street	Minor Street	Rating Item Number							
			1	2	3	4	5	6	7	Total
	Maximum Points		10	5	20	15	10	5	5	70
15	Alicia Pkwy.	Via Lomas	10	3	6	6	7	5	3	40
8	P.D. Valencia	Ericson Wy.	7	0	3	7	7	5	3	32
16	Moulton Pkwy.	Gordon Rd.	10	3	6	7	0	2	3	31
13	La Paz Rd.	Appaloosa Pl.	9	5	3	2	0	2	3	24
7	P.D. Valencia	Alisal Ave.	7	0	0	7	0	5	3	22

Recommendations

HCI recommends that this TSMP Update act as a guide for future traffic signal installation in the City of Laguna Hills. HCI also recommends that the TSMP be re-evaluated on a periodic basis to address changes in traffic volumes, accident history, and in the character and operational characteristics of the study intersections, as well as for inclusion of new locations as the need for potential traffic signalization occurs.

RATING ITEMS

RATING ITEM 1
Interruption of Continuous Traffic (10 Points Maximum)
(Warrant 1B)

Vehicles attempting to cross the major flow of traffic, or enter that flow, can cause the traffic on the Through street to be delayed or slow down unnecessarily. The installation of a signal at such locations may actually speed up the traffic flow on the Major street. Table A1 shows the percent of the maximum assigned points based on the Major street daily volume. For example, an intersection where the traffic volume on the Major street averages 11,000 vehicles per day would receive 70% of the maximum allowed. In this example, the intersection would receive 7 points for this rating area.

Table A1 – Percent of Maximum points – Interruption of Continuous Traffic

Major Street Volume Of at Least...	Percent of Maximum and Points Allowed
4,700	0% (0 points)
5,600	10% (1 points)
6,400	20% (2 points)
7,300	30% (3 points)
8,200	40% (4 points)
9,000	50% (5 points)
10,000	60% (6 points)
10,700	70% (7 points)
11,600	80% (8 points)
12,400	90% (9 points)
17,500	100% (10 points)

RATING ITEM 2
Coordinated Movement (5 Points Maximum)

When a traffic signal turns green and the waiting vehicles start down the roadway, they are in a relatively compact grouping referred to as a “platoon”. As the group of vehicles progresses down the street, they become more and more disbursed due to differences in driving speeds. As a result, some of the cars in the original platoon are unable to pass through the next signal and are forced to stop. In certain cases, the installation of a signal between the original two intersections can keep this platoon intact and actually reduce the overall driving delay. This item depends on engineering judgment and should include present and future traffic demands of the area.

A signal may be justified when it forms a part of an interconnected or coordinated system and would serve the purpose of maintaining traffic volumes in relatively concentrated platoons of vehicles. Typically, the following question is asked: “Would a signal at this location cause the platoon approaching the next signal to be intact (5 points), spread (2 points), or disbursed (0 points)?”

RATING ITEM 3 **Accident Hazards**

An elevated intersection accident rate can be a sign of vehicles (and pedestrians) trying to enter the flow of traffic or cross the street when there are insufficient gaps in the Major street traffic. Only those accidents susceptible to correction by traffic signals should be considered when evaluating this item. And even then, only if less restrictive measures such as warning signs, proper lighting, painted markings, etc., have failed. Accidents which are susceptible to correction by a traffic signal are normally considered to be “broadside” or right-angle accidents, left-turn accidents, and those accidents involving vehicles/pedestrians. In this item, the maximum number of points is assigned to the intersection with the highest number of correctible accidents and 0 is assigned to the lowest. Table A2 illustrates the points that would be assigned if the highest intersection had six accidents and the lowest intersection had none.

Table A2 – Percent of Maximum Points – Accident Hazard

Correctible Accidents	Points
6 or more	20
5	16
4	13
3	10
2	6
1	3
0	0

RATING ITEM 4
Special Conditions (15 Points Maximum)

This item considers extenuating circumstances that are not covered in other items in the rating system. These may include the proximity of schools, churches, public buildings, and other traffic and pedestrian generation; an abrupt change from rural to an urban area; the need for police control during portions of the day; a steep hill; a horizontal curve; or restricted sight distance. This requires engineering judgment based on physical inspection of the site. Equal weights should be given to each of the items considered here. In Table A3, the percentages and points are based on how many of 6 conditions were located at an intersection.

Table A3 – Percent of Maximum Points – Special Conditions

Conditions Located	Points
6	100% (15 points)
5	83% (12 points)
4	67% (10 points)
3	50% (7 points)
2	33% (5 points)
1	17% (2 points)
0	0% (0 points)

RATING ITEM 5
Safety Index (15 Points Maximum)

A safety index is the Benefit/Cost ratio for a safety improvement expressed as a number. The costs and benefits are directly related to the number of accidents at a location which are susceptible to correction by a traffic signal. Points are assigned by setting the highest Benefit/Cost ratio to the maximum allowed points and the minimum Benefit/Cost ratio to zero. Ratings in between are allocated a proportion of the number to points between zero and the maximum. The accidents are grouped into categories, with costs, and weighted. The “benefit” portion of the ratio is actually the estimated cost of the severity categories as listed below.

Table A4 – “Costs” of Traffic Accidents

Category	Cost
Fatal Accidents	\$4,800,000
Injury Accidents	\$67,400
Property Damage Accidents	\$10,200

Table A5 – Typical Signal Installation Costs in Southern California

Intersection Type	Cost
Four Legged Intersection	\$400,000
T Intersection	\$300,000

RATING ITEM 6
Environmental Conditions (5 Points Maximum)

This is the only rating item that can actually be assigned negative points. An evaluation of the environmental impacts associated with a traffic signal installation is performed, and a point value made for each location. A project that has minimum impacts receives the maximum 5 points while a project that could have a substantial adverse effect receives a negative 5 points. Gradations may be employed between the two limits.

RATING ITEM 7
Highway Geometry (5 Points Maximum)

In general, it is more cost effective and more productive to signalize a four-legged intersection than a T-intersection. Also, a traffic signal at an intersection of two arterial streets will better serve the community than will a traffic signal at an intersection of two local residential streets.

Higher Volume Street Is...	Lower Volume Street Is...	Maximum Points if...	
		Intersection is T	Intersection is 4 Legged
Local	Local	0	0
Collector	Local	0	1
	Collector	1	2
Arterial	Local	2	3
	Collector	3	4
	Arterial	4	5



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Speed Feedback Signs

RECOMMENDATION: That the Traffic Commission approve the installation of two speed feedback signs, one on Paseo de Valencia and one on La Paz Road.

SUMMARY:

The Public Works Department has examined its budget and believes it has budget for the installation of two speed feedback signs. It is recommended that the first sign be installed facing eastbound La Paz Road traffic just west of Paseo de Valencia, and the second sign be installed facing southbound Paseo de Valencia traffic just west of La Paz Road on a trial basis for the next six months to determine their effectiveness.

BACKGROUND:

Based upon a suggestion from Commissioner Caputo, the Public Works Director/City Engineer understands the Traffic Commission may wish to install speed feedback signs in the vicinity of Valencia Elementary School to address concerns over speeding motorists.

DISCUSSION:

Generally, speed feedback signs are effective at reducing the prevailing speed of passing traffic. However, their effectiveness can diminish over time as motorists become accustomed to their presence. Despite this, the Public Works Director/City Engineer is in support of this request because the speed feedback signs are being prioritized for use

Speed Feedback Signs

November 16, 2022

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on an arterial highway near an elementary school with non-school hour significantly higher posted speed limits. Public Works will install these speed feedback signs on a trial basis for the next six months to determine their effectiveness. It should be noted unforeseen field conditions may prevent the installation of the speed feedback signs on the poles depicted in the attachment. In this case, Public Works staff will find another nearby suitable location.

FISCAL IMPACT:

The cost for the purchase and installation of two speed feedback signs is approximately \$15,000 and within the Streets Maintenance budget.

ATTACHMENTS:

- Proposed Speed Feedback Sign Locations

Proposed Speed Feedback Sign Location No. 1



Potential Speed
Feedback Sign
Location ->

Attachment: Proposed Speed Feedback Sign Locations (3018 : Speed Feedback Signs)

Proposed Speed Feedback Sign No. 2



Attachment: Proposed Speed Feedback Sign Locations (3018 : Speed Feedback Signs)



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Radar Trailer Schedule

RECOMMENDATION: That the Traffic Commission receive and file the report.

SUMMARY:

The Public Works Director/City Engineer has produced a rotating list of City-wide locations for deployment of the radar trailer with the intention of leaving the radar trailer out for four to five days at a time instead of the current practice of leaving it out for only one day at a time during City staff working hours.

BACKGROUND:

Currently, the Public Works Department produces a bi-monthly look ahead calendar for the deployment of the radar trailer for Traffic Commission review. Traditionally, this calendar has shown the radar trailer deployed for six days per month, clustered into two three-day periods Tuesdays through Thursdays. The radar trailer has been deployed between approximately 9:00 a.m. and 3:00 p.m. on these days because the radar trailer is not left out overnight to prevent vandalism of the trailer. To current City staff's recollection, City staff was told vandalism happened one-time years ago prior to any current Public Works staff being with the City, and this schedule was implemented to prevent vandalism from occurring again. However, this schedule causes an undue burden on the Public Works Supervisor because he must retrieve the trailer from the City's storage unit every morning after the beginning of his workday and must return the trailer to the City's storage unit every afternoon before the end of his workday taking away time from his other duties. This type of schedule also prevents the radar

Radar Trailer Schedule

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trailer from being effective because the trailer is typically absent on City roadways during the morning and evening commute hours.

The Public Works Director/City Engineer has produced a rotating list of City-wide locations for deployment of the radar trailer with the intention of leaving the radar trailer out for four to five days at a time instead of the current practice of leaving it out for only one day at a time during City staff working hours.

Based upon locations where the radar trailer has been placed in the past, the proposed rotating locations list is as follows:

1. Linda Vista n/o Alisal (25 MPH)
2. Bentley e/o Valerie (25 MPH)
3. Largo w/o Sunburst (25 MPH)
4. Nellie Gail e/o Desert Trail (25 MPH)
5. Rapid Falls w/o Sundowner (25 MPH)
6. Hidden Trail across from 27783 (25 MPH)
7. Nellie Gail w/o Empty Saddle (25 MPH)
8. Mustang w/o Appaloosa (25 MPH)
9. Bridlewood s/o Laurel Crest (25 MPH)
10. Lost Colt e/o Beargrass (25 MPH)
11. San Remo Mid-Block (30 MPH)
12. Mill Creek s/o Lake Forest (30 MPH)
13. Santa Vittoria Mid-Block (30 MPH)
14. Glen Canyon w/o Nellie Gail (25 MPH)
15. Vista Viejo Mid-Block (30 MPH)
16. Hitching Rail Mid-Block (25 MPH)
17. Aliso Hills Drive Mid-Block (25 MPH)
18. Wilkes s/o Alicia (25 MPH)
19. Mackenzie s/o La Paz (25 MPH)
20. Woodbluff w/o Middleridge (25 MPH)
21. Greenfield (in the median) in front of 27802 (30 MPH)

FISCAL IMPACT:

None.



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Do Not Block Intersection Signs

RECOMMENDATION: That the Traffic Commission recommend: 1) City staff present a Resolution to the City Council for adoption authorizing the establishment of "Do Not Block Intersection" locations and signage at the discretion of the City Engineer.

SUMMARY:

The 1987 "Anti-Gridlock Law" enumerated California Vehicle Code (CVC) Section 22526, which prohibits motorists from entering an intersection on a green or yellow light whenever the opposite side of the intersection is obstructed regardless of the presence of a DO NOT BLOCK INTERSECTION sign at the intersection. However, the new Public Works Director/City Engineer believes there is merit in hanging DO NOT BLOCK INTERSECTION signage at this intersection and other City intersections to educate motorists of the need to keep intersections clear and to allow additional enforcement under CVC Section 21461. State law (CVC Section 21461) requires the City Council to approve the installation of DO NOT BLOCK INTERSECTION signs by resolution or ordinance because these are considered regulatory signs.

BACKGROUND:

The new Public Works Director/City Engineer recently drove on northbound Avenida de la Carlota during the lunch time hour, and witnessed motorists routinely blocking the intersection while turning left from southbound Avenida de la Carlota onto eastbound El Toro Road and travelling eastbound on El Toro Road causing gridlock around the intersection. In addition, one frustrated motorist drove through the gridlock through a

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red light. The Public Works Director/City Engineer also received a written complaint from a motorist about the same issue.

Normally, gridlock occurs when vehicles enter an intersection and end up stopped within the intersection thereby blocking through traffic in a conflicting direction of travel when the traffic signal for the conflicting direction of travel is green. This may cause a ripple effect that impedes traffic flow in all directions, well beyond the intersection, as in the case of El Toro Road and Avenida de la Carlota. This may cause frustration to other drivers who have the right of way and in some cases it will cause aggressive driving by those who become aggravated, which creates an unsafe environment for others on the roadway.

The 1987 “Anti-Gridlock Law,” which is memorialized as California Vehicle Code Section 22526, prohibits entering an intersection on a green or yellow light whenever the intersection is so congested that you are unable to pass through to the other side of intersection.

The anti-gridlock section states, “A driver of a vehicle shall not enter an intersection or marked crosswalk unless there is sufficient space on the other side of the intersection or marked crosswalk to accommodate the vehicle driven without obstructing the through passage of vehicles from either side.”

This section also regulates turns at an intersection and states, “A driver of a vehicle which is making a turn at an intersection who is facing a steady circular yellow or yellow arrow signal shall not enter the intersection or marked crosswalk unless there is sufficient space on the other side of the intersection or marked crosswalk to accommodate the vehicle driven without obstructing the through passage of vehicles from either side.”

The size of the intersection has no bearing in this violation, nor is signage prohibiting stopping in an intersection required to enforce this law. When cited, City staff has been informed motorists are sometimes surprised when advised of the law. The motorist often responds by indicating the light was green or yellow when he/she entered the intersection. The statute indicates the color of the light is not relevant. It simply states that you must remain beyond the intersection unless you are able to traverse the entire intersection once you have entered.

Additionally, the anti-gridlock statute is applicable regardless of whether or not a traffic control device is present.

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If the intersection is also marked DO NOT BLOCK INTERSECTION by posted signs or roadway markings, the motorists that stop in the intersection behind stopped traffic are not only violating the anti-gridlock law, but they are also violating California Vehicle Code Section 21461, failing to obey an official traffic control device.

This section states, "It is unlawful for a driver of a vehicle to fail to obey a sign or signal of a regulatory nature erected or maintained to enhance traffic safety and operations or to indicate and carry out the provisions of this code or a local traffic ordinance."

While DO NOT BLOCK INTERSECTION signs are present at the intersection of Avenida de la Carlota and Paseo de Valencia/southbound Interstate 5 off-ramp, the City Clerk was not able to find any ordinances or resolutions supporting the installation of these signs. The Public Works Director/City Engineer assumes these signs were installed by the California Department of Transportation to alleviate gridlock at this location for motorists existing southbound Interstate 5, despite the intersection being wholly owned and controlled by the City of Laguna Hills.

Consequently, City staff recommend that the Traffic Commission recommend City staff present a resolution to City Council for adoption authorizing the establishment of DO NOT BLOCK INTERSECTION locations and signage at the discretion of the City Engineer and to keep the list of locations on file with the City Clerk.

FISCAL IMPACT:

The installation of new signage can be accomplished within the existing FY 2022-2023 budget.

ATTACHMENTS:

- California Vehicle Code Section 22526 (1987 'Anti-Gridlock Law')
- California Vehicle Code Section 21461
- Photos of existing Do Not Block Intersection signage at Avenida de la Carlota and Pase de Valencia

State of California

VEHICLE CODE

Section 22526

22526. (a) Notwithstanding any official traffic control signal indication to proceed, a driver of a vehicle shall not enter an intersection or marked crosswalk unless there is sufficient space on the other side of the intersection or marked crosswalk to accommodate the vehicle driven without obstructing the through passage of vehicles from either side.

(b) A driver of a vehicle which is making a turn at an intersection who is facing a steady circular yellow or yellow arrow signal shall not enter the intersection or marked crosswalk unless there is sufficient space on the other side of the intersection or marked crosswalk to accommodate the vehicle driven without obstructing the through passage of vehicles from either side.

(c) A driver of a vehicle shall not enter a railroad or rail transit crossing, notwithstanding any official traffic control device or signal indication to proceed, unless there is sufficient undercarriage clearance to cross the intersection without obstructing the through passage of a railway vehicle, including, but not limited to, a train, trolley, or city transit vehicle.

(d) A driver of a vehicle shall not enter a railroad or rail transit crossing, notwithstanding any official traffic control device or signal indication to proceed, unless there is sufficient space on the other side of the railroad or rail transit crossing to accommodate the vehicle driven and any railway vehicle, including, but not limited to, a train, trolley, or city transit vehicle.

(e) A local authority may post appropriate signs at the entrance to intersections indicating the prohibition in subdivisions (a), (b), and (c).

(f) A violation of this section is not a violation of a law relating to the safe operation of vehicles and is the following:

(1) A stopping violation when a notice to appear has been issued by a peace officer described in Section 830.1, 830.2, or 830.33 of the Penal Code.

(2) A parking violation when a notice of parking violation is issued by a person, other than a peace officer described in paragraph (1), who is authorized to enforce parking statutes and regulations.

(g) This section shall be known and may be cited as the Anti-Gridlock Act of 1987.

(Amended by Stats. 2010, Ch. 216, Sec. 11. (AB 2144) Effective January 1, 2011.)



State of California

VEHICLE CODE

Section 21461

21461. (a) It is unlawful for a driver of a vehicle to fail to obey a sign or signal defined as regulatory in the federal Manual on Uniform Traffic Control Devices, or a Department of Transportation approved supplement to that manual of a regulatory nature erected or maintained to enhance traffic safety and operations or to indicate and carry out the provisions of this code or a local traffic ordinance or resolution adopted pursuant to a local traffic ordinance, or to fail to obey a device erected or maintained by lawful authority of a public body or official.

(b) Subdivision (a) does not apply to acts constituting violations under Chapter 9 (commencing with Section 22500) of this division or to acts constituting violations of a local traffic ordinance adopted pursuant to Chapter 9 (commencing with Section 22500).

(Amended by Stats. 2004, Ch. 203, Sec. 1. Effective January 1, 2005.)



Attachment: Photos of existing Do Not Block Intersection signage at Avenida de la Carlota and Pase de



Attachment: Photos of existing Do Not Block Intersection signage at Avenida de la Carlota and Paseo de