UCSD

BICYCLE AND PEDESTRIAN MASTER PLANNING STUDY

University of California, San Diego

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Acknowledgements:

This Bicycle and Pedestrian Master Plan Study was prepared for the University of California, San Diego and the City of San Diego.

Project Working Group members were:

Tom Allen	Academic Affairs
Jamie Bohannan	Facilities Design and Construction
Bruce Bowers	Environment Health and Safety
Erika Dominguez	UC San Diego Police Department
Yvonne Firing	Graduate Student Representative
Michael Goliner	Graduate Student Representative
Ian Happle	UC San Diego Police Department
Petr Krysl	Faculty/Community (UCPG)
Cary Landt	Student Affairs, Sports Facilities
Curt Lutz	Transportation Services
Tyler Nelson	Undergraduate Student Representative
Brian Parent	Bike and Pedal Club
Todd Pitman	Physical and Community Planning, Project Manager
Deborah Steger	Health Sciences
Kris Wells	Student Affairs, UCSD Bike Shop
Brad Werdick, Chair	Physical and Community Planning

Additional input was provided by participants at two Community Workshops, the staff of the Stuart Collection and almost 2,000 respondents via the project opinion survey.

Prepared by KTU+A Planning + Landscape Architecture of San Diego, California

Principal:	Mike Singleton, AICP-CTP, ASLA, LEED AP
Project Manager:	John Eric Holloway, ASLA, LEED Green Associate, LCI
Mobility Planners:	Joe Punsalan, GISP, LCI
	Catrine Machi, AICP, LCI

Bicycle and pedestrian planning and transportation engineering support provided by Fehr & Peers Transportation Consultants.

Senior Transportation Engineer: Charles Alexander, P.E.

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Executive Summary

This Bicycle and Pedestrian Master Planning Study will guide design and implementation of mobility infrastructure and programs as the campus population grows and facilities are planned and sited. The overall approach for this master plan study is summarized in the following paragraphs, which also constitute the planning goals for this study.

- It is imperative that a "cycling and walking perspective," guide bike and pedestrian planning. The unique characteristics, needs and priorities of these users must be taken into account when making walking and cycling decisions on use policies or facilities.
- Cycling and walking are fundamental components of campus transportation planning, which addresses bicycle facilities on and off streets, pedestrian facilities of all types, as well as modal integration at transit centers and parking facilities.
- Planning for bicycles should not be focused on any particular facility type so much as it should be focused on the safe and efficient travel of cyclists, while addressing pedestrians' needs where shared use is appropriate. This will generally require both the use of the existing transportation infrastructure and the construction of special facilities for cyclists.
- The coexistence of pedestrians, cyclists and drivers on roads and pathways requires that all are sensitive to and recognize a common set of rules. Training, education and enforcement are as important as physical planning and design.
- Facility maintenance, monitoring and performance assessment are critical for ensuring safe and efficient travel for cyclists and pedestrians. Planning for them is an ongoing process.
- Campus land use and transportation planning should continue to support projects that reduce automobile dependence. This study acknowledges and supports future land use and population projections with facility and program recommendations to continue to reduce auto reliance.

Mobility Vision

The study vision is a campus where the majority of its students, staff, faculty and visitors commonly walk, bike or use public transit to get to and around the campus, instead of automatically reaching for their car keys. Many other campuses and communities are pursuing a similar vision, but this study proposes a mobility blueprint tailored for this university's unique mix of topography, layout, transportation infrastructure and climate. The expected benefits include physical, social and mental health improvements for those who choose to bike or walk as well as lowered transportation costs and in many cases, time savings. Benefits are also available for those who do not walk or bike. These benefits include reduced traffic, lowered parking congestion, cost savings for the campus from lower parking infrastructure investments, improved air quality and lowered green house gas emissions.

> **"UC San Diego is intent upon becoming a state-of-the-art, carbon-neutral campus that embraces sustainable facility designs and maximizes "green" operations."**
>
> *Source: LRDP*

Findings and Recommendations

Bicycle Circulation

Improved campus connections with the overall regional bike network will become increasingly valuable as commuting by bicycle increases and access to the campus from surrounding areas is sought as a mobility option. Decisions by students, faculty and staff on where they choose to live and how they access the campus will be influenced by the perceived completeness and safety of bike facilities accessing the campus.

Bike-specific facilities on the campus are difficult to find and do not represent a connected network between origins (student housing, parking hubs and transit stops) and destinations (classrooms, support facilities and employment centers).

Community and Regional Connections

Connections across Interstate 5, with surrounding communities and the overall region are of paramount importance for enabling the university community to make bicycle circulation a viable commuter mode. This will require close coordination with the California Department of Transportation (Caltrans), the San Diego Association of Governments (SANDAG) and the City of San Diego to ensure that planned improvements are implemented in a timely manner and that they connect with the campus in a way that will make potential bicycle commuters seriously consider riding instead of driving.

Intra-campus Movement

Once on campus, bicycles also play a significant intra-campus travel role since the campus is large enough to make cycling convenient, but small enough to put all campus destinations within a reasonable cycling range. Quality facilities, including clear wayfinding and convenient bike parking, can make the difference between riding and not riding. Support programs can also help to encourage bicycle use, such as a centralized web portal where users can access information on bicycle facilities, suggested routes, parking, training, classes and other services to make cycling more convenient.

Pedestrian Circulation

All trips involve walking at some point. Within the campus itself, the eucalyptus-shaded walking environment is and will continue to be a distinctive campus feature and should be carefully maintained and employed as the backbone that supports the overall mobility network.

Some routes would benefit from improved lighting and better surfaces. Other routes are not direct between destinations while some are too steep to meet universal accessibility goals. Others lack adequate distinction between pathways and driving surfaces and some pathways end abruptly.

Other Mobility Modes

Linking these improvements with other mobility modes, such as shuttles, buses and light rail, enhances the effectiveness of all since some intra-campus trips and many commuting trips involve more than one mode. Making the connections between modes as seamless as possible will do much to encourage faculty, staff, students and visitors to arrive via some other mode than driving their own vehicle.

Long-range Planning

With adoption of the 2004 *Long Range Development Plan* (LRDP), the UC San Diego campus is anticipating significant enrollment growth and an increase in the proportion of undergraduate students living on campus with the stated goal of 50 percent on-campus housing for these undergraduates.

This study's recommendations support the university's long-term vision of a more sustainable footprint with a substantially smaller reliance on the automobile, as well as implications for a genuine evolution in land use planning, particularly since it will no longer be necessary to house the numbers of parked vehicles assumed in the past. The reduction in parking lots and structures from what was once envisioned will provide the space for more efficient multi-functional development, such as buildings that combine housing, classrooms and services and inspiring outdoor spaces that take advantage of the university's climate and unique character.

Introduction 1

Study Scope

The University of California, San Diego wishes to promote a safe, convenient and efficient environment for bicycle and pedestrian travel to and across campus. According to the SANDAG grant that is financing this study, the goal is to integrate this Bicycle Pedestrian Master Planning Study (BPMPS) with the City of San Diego's Bicycle Master Plan Update to enhance access, improve safety and increase the percentage of bicycle and pedestrian commuters. This BPMPS will provide for improved safety through education and training programs and identifies prioritized bicycle and pedestrian infrastructure projects.

This study is intended to provide a vision for bicycle and pedestrian circulation. It was developed through understanding current conditions, identifying bicycle and pedestrian needs throughout UC San Diego and examining potential improvement options. The study also looks at opportunities to connect and integrate existing and proposed facilities and prioritizing implementation strategies in accordance with viable funding sources. Since this study provides a framework for the university's bicycle and pedestrian network development it also supports eligibility for local, state and federal funding for bicycle and pedestrian projects.

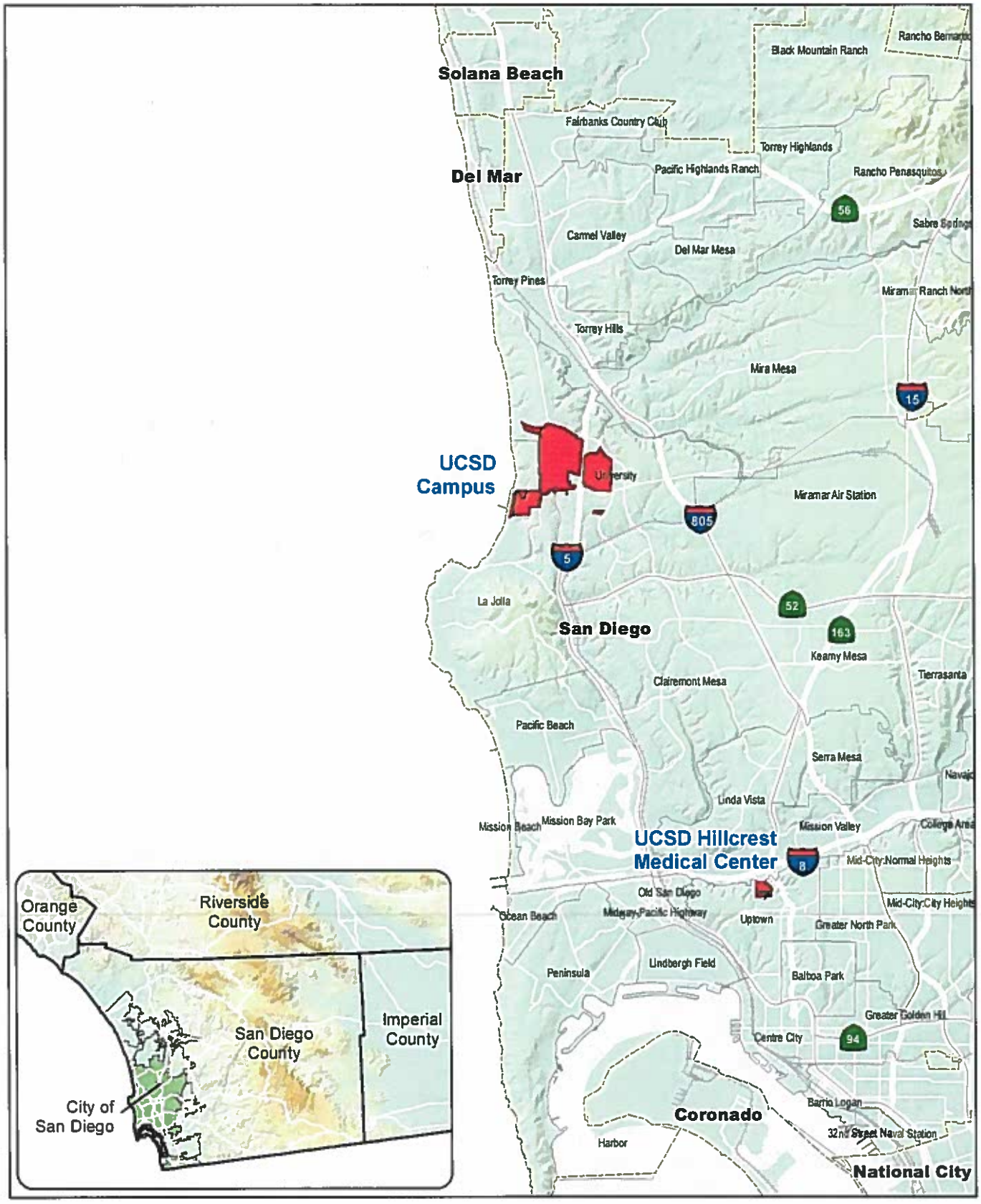
With the implementation of the recommendations of this study, the resulting network will create a more bicycle and pedestrian-friendly university community, especially if supported by driver, cyclist and pedestrian education, enforcement and promotional programs. The anticipated result is an increase in students, faculty, staff and visitors choosing to ride a bicycle or walk to and from UC San Diego destinations. Precise alignments and details will be developed during subsequent implementation phases. This study sets the foundation for decisions and identifies a blueprint for future bicycle and pedestrian development of UC San Diego so that opportunities are not lost through other infrastructure, land use and facility development decisions.

Study Area

The project study area included the University of California, San Diego campus and the UC San Diego Hillcrest Medical Center, as well as the surrounding community where opportunities for cycling and walking connections to the campus system were possible. The inclusion of the off-campus study area was to ensure that the university's bikeways and pedestrian routes would be part of a viable regional system to specifically support non-motorized transportation modes. A connected system would allow students, faculty, staff and visitors an option to walk or bike to UC San Diego without needing to drive. This study therefore addresses on-street bicycle facilities and multi-use walkways and trails both on- and off-campus (see Figure 1.1: Regional Setting).

> **"The University of California, San Diego (UCSD) Bicycle and Pedestrian Master Planning Study (BPMPS) will provide a comprehensive framework to support non-motorized transportation at the La Jolla and Hillcrest campuses."**
>
> *Source: Project Scope of Work*

Figure 1.1: Regional Setting



Study Goal, Objective and Policies

Through discussions with university staff and extensive Project Working Group input, a primary goal and objective was developed to help guide the progress of this study and subsequent implementation. Note that the chapters on bicycle and pedestrian circulation list specific actions tailored to their respective transportation types. This chapter discusses general goals, objectives and policies.

Overall Project Goal

Provide a university-wide system of safe, efficient, connected and attractive bicycle and pedestrian facilities, as well as clear programs, policies and educational efforts to promote walking and cycling.

Objective

Promote the safety of cyclists and pedestrians, while promoting the use of these and other forms of alternative transportation, by adhering to university-wide standards and practices.

Policies

Education

- Support programs for providing education and training for bicycle road safety and sharing facilities with motor vehicles and other non-motorized transportation.
- Employ an interdisciplinary and interdepartmental approach to increasing campus awareness and education.

Planning

- Develop university-wide standards for construction and maintenance of pedestrian and bicycle facilities.
- Develop and adopt a planned bikeway system, consistent with other adopted master plans, to assure that local bicycle routes will be compatible with routes of neighboring jurisdictions.
- Consider cycling routes to and through campus during planning to maximize safety and use.
- Where appropriate, require projects adjacent to proposed bikeway routes to include bicycle paths, bicycle lanes or bicycle routes as well as including bicycle-sensitive traffic signals and pedestrian crossings in all adjacent roadway development plans.
- Require the installation or rebuilding of inaccessible pedestrian and bicycle facilities with all new roadway construction projects or when significant reconstruction of existing roadways are proposed.
- Require the installation of appropriate bicycle parking infrastructure with all new facility construction and significant reconstruction of existing facilities.
- Give priority to bicycle and pedestrian facilities to provide continuity and close gaps in the bikeway and sidewalk network. Give priority to pedestrian and bicycle facilities over parking.
- Encourage the provision of showers, changing rooms, lockers and bicycle storage at locations convenient to the commuting cyclist.

Safety

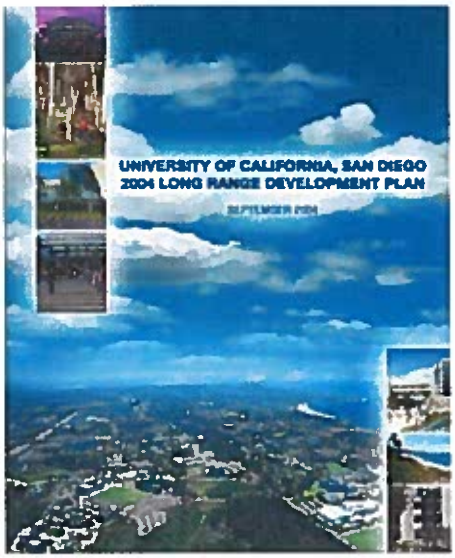
- Review new infrastructure to avoid introducing new dangers or exacerbating existing problems.
- Ensure all new pedestrian facilities meet federal and state ADA requirements as well as meeting generally accepted universal access requirements.
- Ensure vehicular regulations promote safety for cyclists and pedestrians.
- Plan for and accommodate safe passage for cyclists and pedestrians during construction wherever possible.
- Construct safe, convenient paths for bicycles and pedestrians to encourage alternate forms of transportation.
- Establish bicycle and pedestrian transportation facility maintenance and monitoring programs to promote usage and safety.
- Provide a method for reporting maintenance problems and safety issues.

Existing Plans Summary

Campus Planning

Long Range Development Plan (2004)

The Long Range Development Plan (LRDP) is a general land use plan and capacity analysis to guide UC San Diego physical development through 2020-21. Based upon academic and student life goals, the LRDP identifies institutional and development objectives, delineates UC San Diego land uses and estimates campus building capacity. Chapter 3 is particularly relevant to the BPMPS since it addresses pedestrian, bicycle and vehicular circulation and parking.

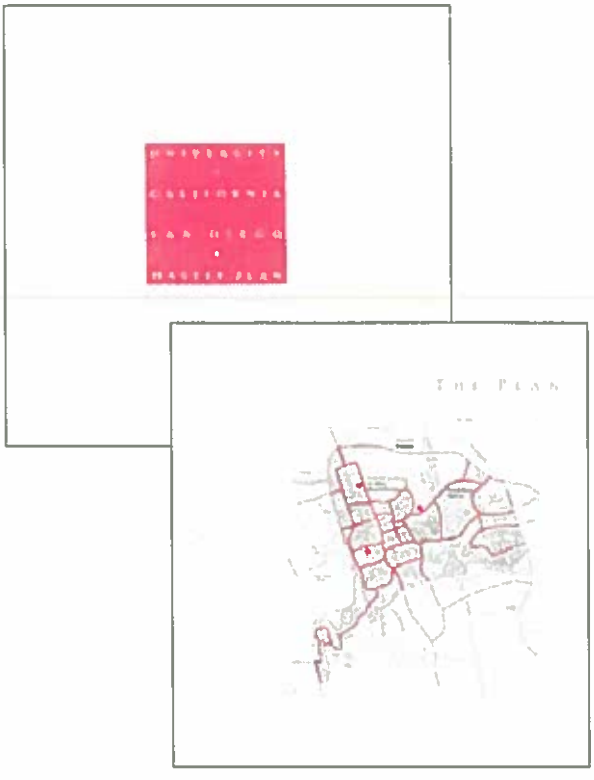


Master Plan Study (1989)

This study forms the basis for the other documents in this section. It lists five guiding principles:

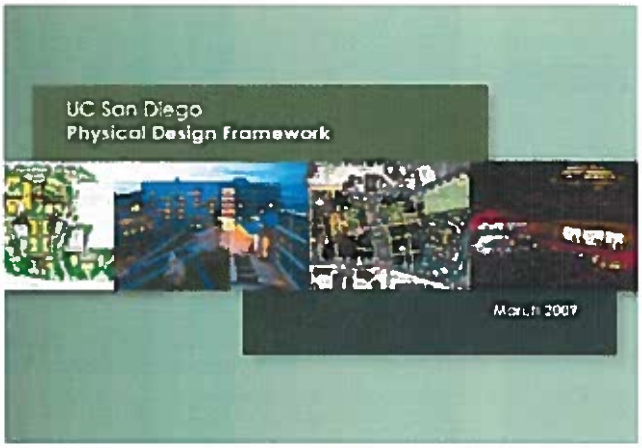
- Maintain "neighborhoods" as the "building blocks" of campus development.
- Maximize the benefits of interdisciplinary contiguity with "academic corridors."
- Make an easily accessible "University Center" the heart of campus social and academic life.
- Preserve and protect ecologically sensitive natural resources like the eucalyptus groves as a "great park."
- Maintain connecting links critical to an overall sense of coherence of place and as a community. It is also critical that the campus beneficially connect with the larger community.

The study concludes that a university's physical setting is an integral part of the educational experience for all who come to live, learn and work there. It notes that the qualities most critical to UC San Diego identity need to be preserved and enhanced as the campus has grown.



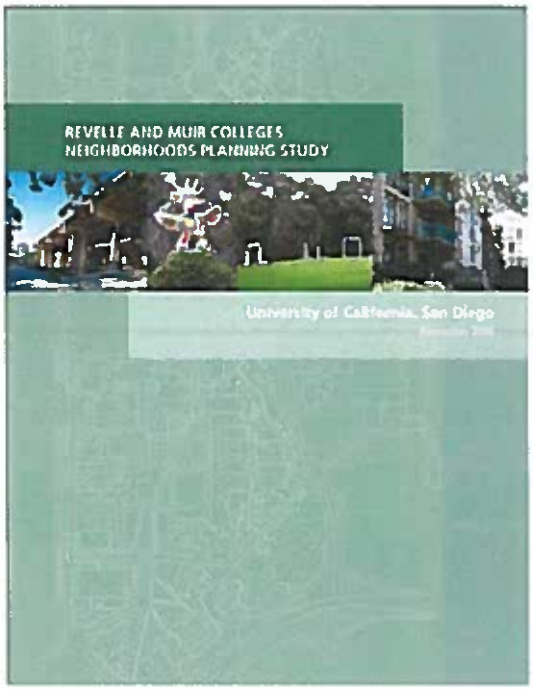
Physical Design Framework (2009)

UC San Diego's Physical Design Framework was designed to provide an effective and valid basis for developing new facilities to address key academic, strategic and auxiliary program objectives. The Physical Development Framework is a synthesis of existing plans to enable effective stewardship of UC San Diego's physical environment and implementation of individual capital projects.



Neighborhood Planning Studies (Various Dates)

To facilitate planning, UC San Diego is subdivided into college neighborhoods with distinct character. These studies guide anticipated growth within these neighborhoods and provide more detailed analysis and recommendations for development, including mobility. Connections and outdoor spaces tend to be regarded as quality of life hallmarks within these plans.

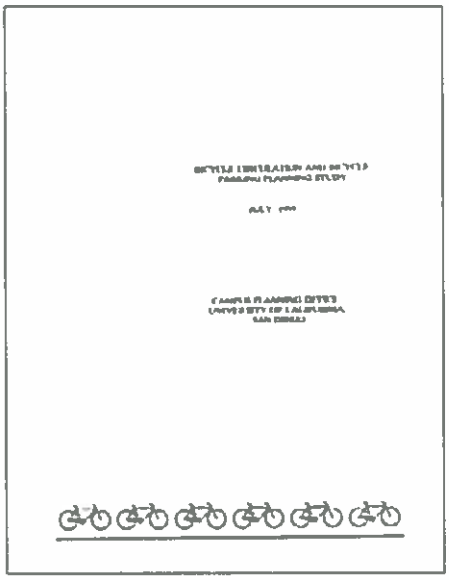


Bicycle Circulation and Bicycle Parking Planning Study (1993)

To facilitate the growing use of bicycles at UC San Diego, the campus conducted a study to evaluate then-current bicycle circulation and parking conditions and to determine the improvements needed to serve the campus community through the year 2005. The recommended plan consisted of the following components:

- A comprehensive network of bicycle routes comprised of existing and new paths to link all areas of the campus and connect to public bicycle routes adjoining campus.
- Proposed improvements to resolve safety conflicts occurring between cyclists, pedestrians and motorists along some bicycle routes.
- Type, quantity and location standards for bicycle parking.
- Funding and phasing strategies for new routes and parking facilities.

Routes shown in the study differ in places from current conditions, primarily due to the significant level of redevelopment that has occurred since its adoption.



Open Space Planning Study (In Progress)

While this study is still underway, many of the issues it is addressing correlate with those of non-motorized mobility. It seeks to ensure that the campus landscape reflects UC San Diego's commitment to sustainable practices and that "open spaces" need to be multifunctional by providing the foundation for roads, walks, courts and plazas that also support the systems to move the people that make up the UC San Diego community.

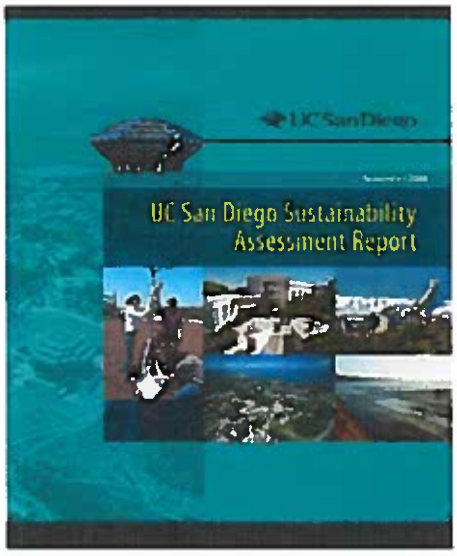
Since all bicycle and pedestrian circulation system components lie within designated open space areas, implementation will be within the scope of the Open Space Committee.

Park Grove Development Guidelines (2002)

These guidelines define the type and scope of development allowed within the Park Grove. While it does not preclude new access paths, it does specify certain restrictions in terms of location and material types and "no net loss" of space.

Sustainability Assessment Report (2008)

This document addresses 11 areas of concern and 35 indicator metrics. Each metric sets a baseline for future performance, as well as provides ideas on where the UC San Diego community can most improve. One of the areas of concern is transportation, under which are the following relevant indicators:



Indicator T1 is "Transportation Modal Split." In 2008, 53 percent of the UC San Diego population commuted to campus using alternative forms of transportation and the percentage of single occupancy vehicle commuting has continuously declined since 2001.

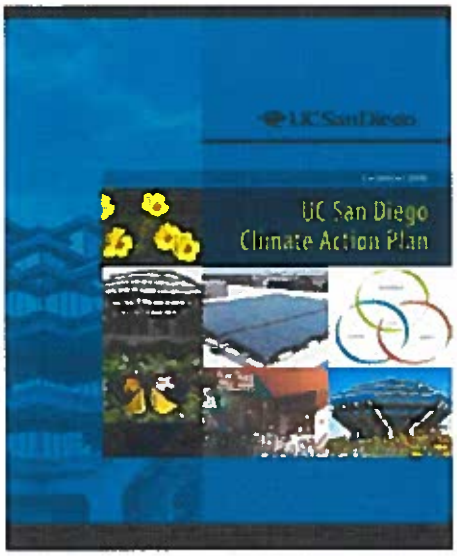
Indicator T2 is "Campus Size and Population Density," which addresses the idea is that the higher the campus density, the more campus users can commute to UC San Diego using alternative modes, such as biking or walking. By living on campus, students and others can more easily walk, bike, or take a bus to their classes and meetings. This is also benefited by density and UC San Diego is much denser than San Diego County as a whole.

Indicator T4 is "Inventory of Automobile and Bicycle Parking Spaces." Although the UC San Diego population has been growing since 2001, automobile parking space numbers have remained fairly constant.

Climate Action Plan (2008)

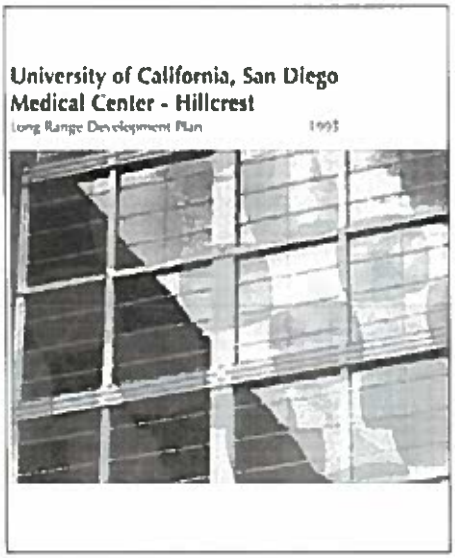
This document is a sustainability planning document with a 2050 planning horizon and builds on the *Sustainability Assessment Report*. However, this report goes a step further by creating goals, time lines and actions for achieving those goals. For example, this document considers how sustainability can be integrated throughout the curriculum so that all students gain an understanding of sustainability issues during their academic career at UC San Diego. Although called the *Climate Action Plan*, this document considers many topics not directly related to climate change and GHG emissions.

Relevant to this study, the document identifies goals for reducing emissions and impacts from transportation and mechanisms for tracking progress. It also creates a firm baseline of GHG emissions to compare against future reductions. Among the actions it lists is to improve bicycling programs.



UC San Diego Hillcrest Medical Center Long Range Development Plan (1995)

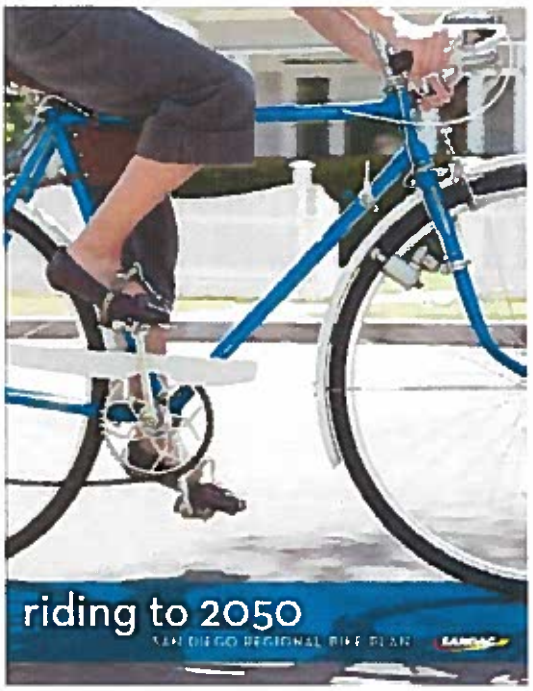
Like the La Jolla campus LRDP, this document is a general land use plan and capacity analysis guide for physical development. This LRDP establishes campus boundaries, provides guidance for organizing campus functions and suggests some urban design concepts to improve campus ambience for both the UC San Diego and the surrounding communities. Of relevance to this study are LRDP circulation goals to address limited vehicular access and a circuitous circulation pattern.



Regional Transportation Planning

Riding to 2050, San Diego Regional Bicycle Plan (2011)

Prepared by the San Diego Association of Governments (SANDAG), this plan outlines a regional strategy for making the bicycle a useful form of transportation for everyday travel. It supports implementation of the both the Regional Comprehensive Plan (RCP) and Regional Transportation Plan (RTP). The RCP calls for more transportation options and a balanced regional transportation system that supports smart growth and a more sustainable region. The RTP calls for a multimodal regional transportation system that includes a regional bicycle network.

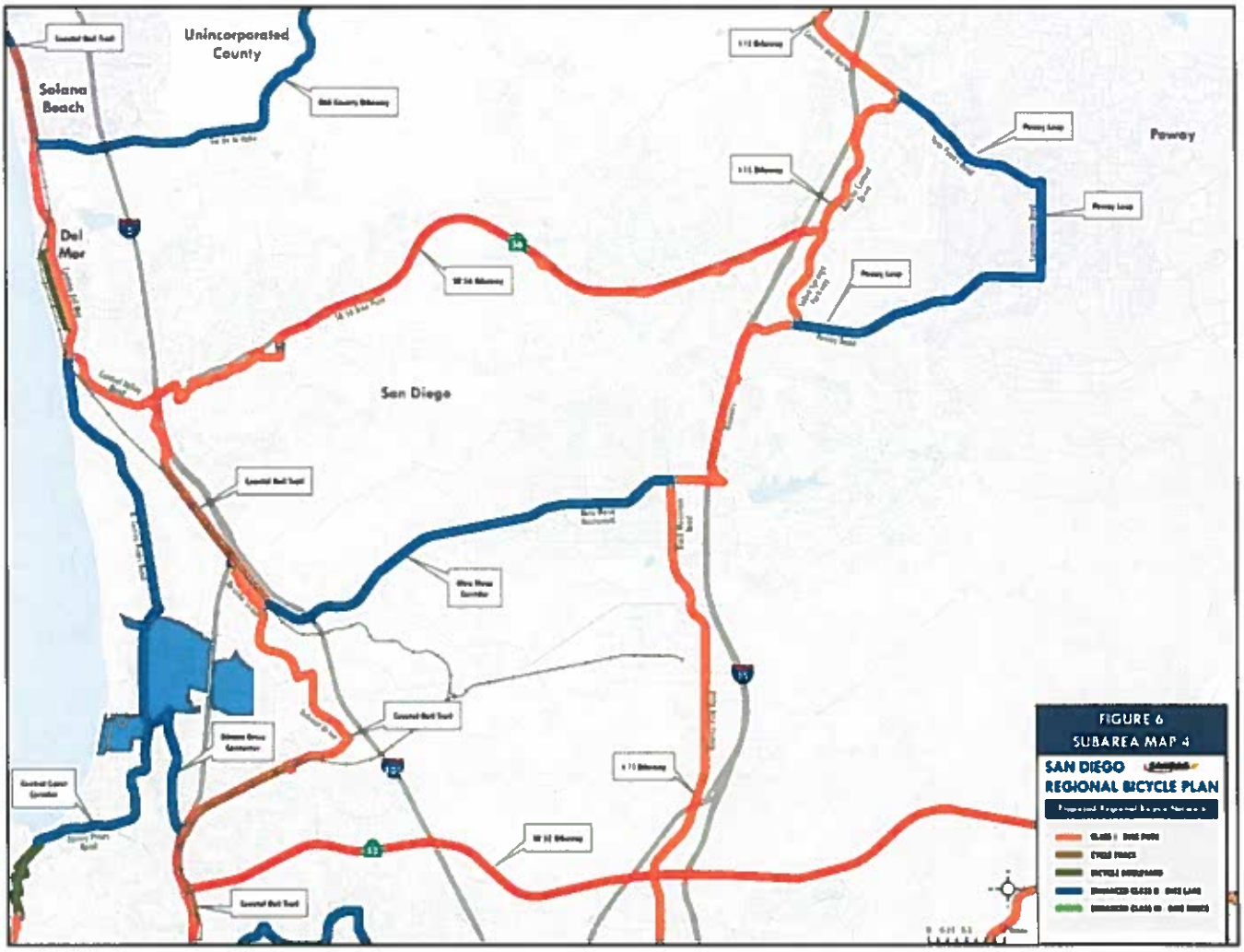


Implementation of the plan will help the region meet its mandates to reducing greenhouse gas emissions and to improve mobility goals. It also provides benefits to public health by encouraging more people to adopt a physically active mode of transportation for at least some of their trips. The plan provides detailed information on the structure of the regional bicycle network, the supporting policies and programs and the benefits of implementing the plan.

This plan specifically addresses existing and planned longer-range regional corridors through and around UC San Diego, including the following:

- Central Coast Corridor (6) coastal route between Del Mar and downtown San Diego
- Gilman Connector (7) links Corridors 11 and 6 just south of UC San Diego
- Coastal Rail Trail Corridor (11) inland route between Del Mar and downtown San Diego
- Mira Mesa Corridor (25) joining Corridor 11 from the east near Interstate 5/805 merge
- SR-52 Bikeway Corridor (36) joining Corridor 11 from the east just south of UC San Diego

These corridors are Class 1 bicycle paths or Class 2 bicycle lanes (see Chapter 2 for facility descriptions). A relevant map from the document is included on the following page.



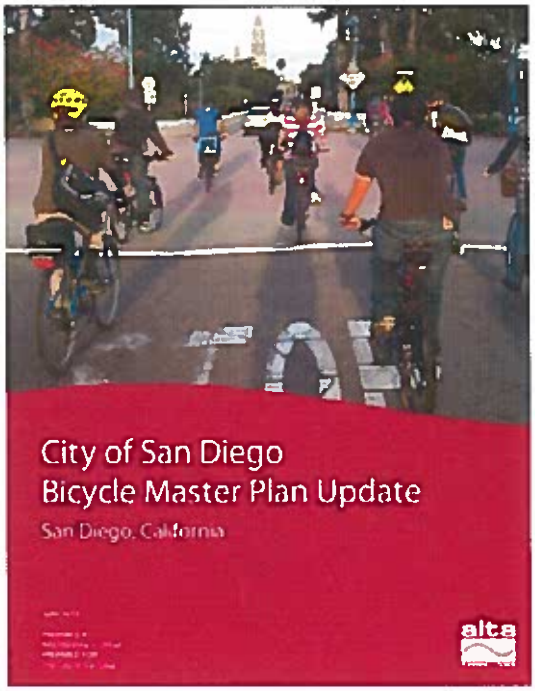
SANDAG Regional Transportation Plan - Riding to 2050: Subarea map

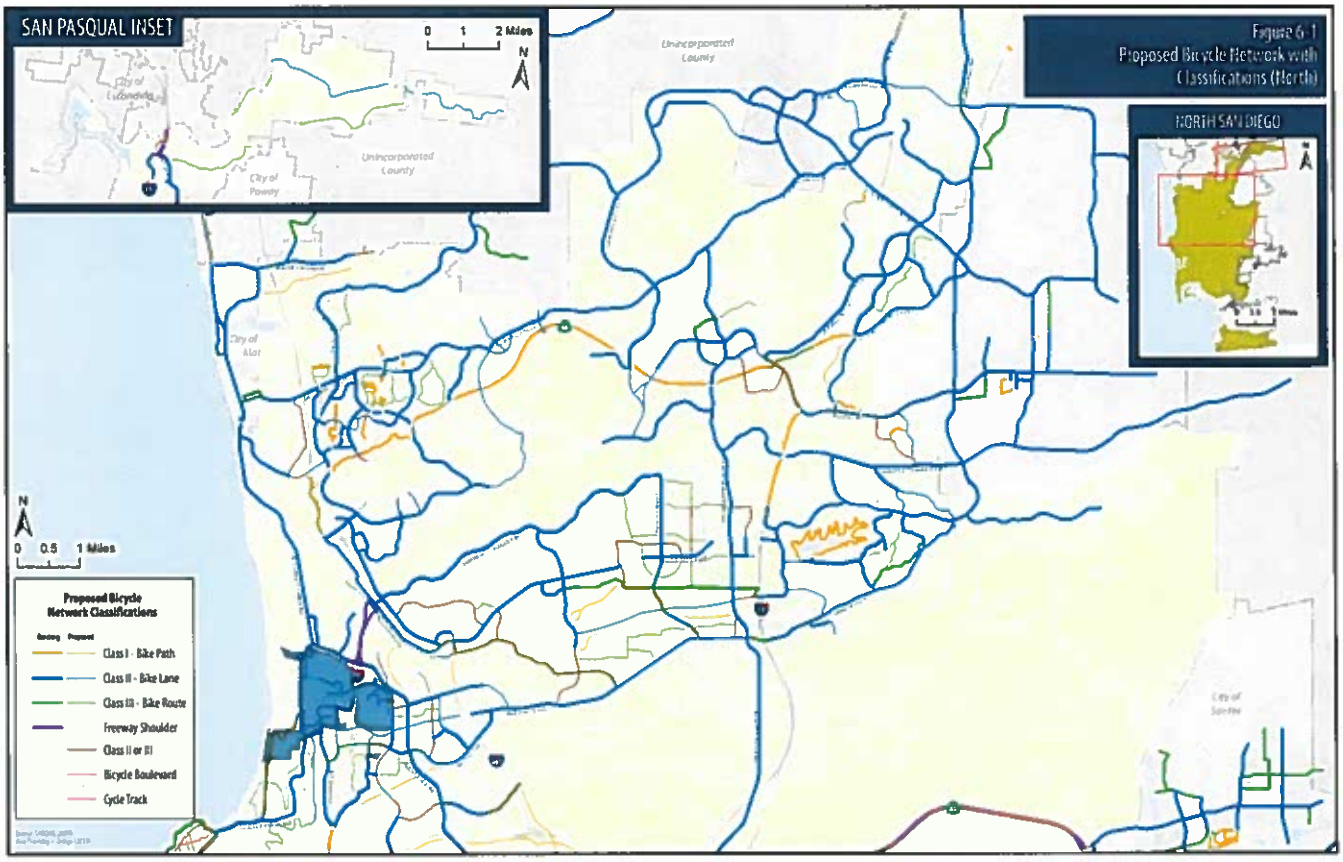
City of San Diego Bicycle Master Plan Update (2011)

This recently updated plan provides direction for expanding the existing bikeway network, connecting gaps, addressing constrained areas, improving intersections, providing for greater local and regional connectivity and encouraging more residents to bicycle more often:

> *"...as a policy document to guide the development and maintenance of San Diego's bicycle network, including all roadways that cyclists have the legal right to use, support facilities, and non-infrastructure programs over the next 20 years."*

This plan illustrates existing and proposed facilities serving communities surrounding UC San Diego. The sole high priority project is the provision of Class 2 lanes on La Jolla Village Drive between Villa La Jolla Drive and Torrey Pines Road. Two unprioritized Class 3 routes are noted on La Jolla Village Drive east of Villa La Jolla Drive and on Villa La Jolla Drive from Gilman Drive southward. (Note that the plan indicates existing Class 2 lanes on Gilman Drive north of La Jolla Village Drive, but this is not currently the case.) A map excerpt is shown on the following page.





City of San Diego Bicycle Master Plan Update: North San Diego map

Interstate 5 North Coast HOV/Express Lanes Project

The California Department of Transportation (Caltrans) is planning High Occupancy Vehicle (HOV) and express lanes on Interstate 5 to reduce congestion and increase capacity. The southern end of the project extends through UC San Diego with an HOV lane Direct Access Ramp (DAR) planned at a re-built Voigt Drive bridge. Of particular significance to this study is a Class 1 bicycle path along the west side of the freeway, providing a direct bikeway connection between the Sorrento Valley Coaster Station and Voigt Drive. As currently envisioned, this path will cross over Genesee Avenue via a shared-use path separated from the roadway.

Interstate 5/Gilman Drive Bridge

With the growth of the East Campus Health Sciences neighborhood, a second bridge over Interstate 5 is needed to connect the West Campus and the East Campus medical, teaching and housing facilities. It will reduce commute times through UC San Diego, crossing between Voigt Drive and La Jolla Village Drive. This bridge is also needed to relocate major utilities from the Voigt Drive Bridge to this location to accommodate the demolition and replacement of the Voigt Drive Bridge. Based on the major construction period needed to rebuild the Voigt Drive Bridge, the Gilman Drive Bridge is likely to be the only connection between the west and east sides of the campus for the length of the construction period.

Local Community Planning

University Community Plan (1987)

This plan encouraged the development of "housing for students and employees of the University," but UC San Diego has had to ascribe more importance than originally planned to providing housing, as well as other services and amenities, on campus.

Plan transportation goals include encouraging public transit between major activity areas such as UC San Diego, Towne Centre and La Jolla Village Square, providing pedestrian paths and bikeways to citywide systems and encouraging alternative transportation. According to the plan:

> *"The University campus will no longer be an island within the community. Transit loops, bicycle and foot paths will greatly improve movement within the large campus and connect with the rest of the community...an LRT system will be used by the majority of people who work at, reside in and attend UCSD."*

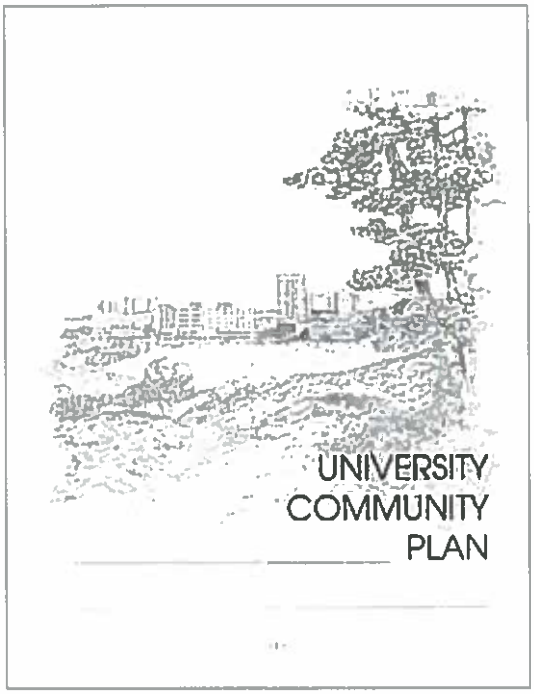
Within the plan area, Class 1 bikeways include the Rose Canyon Bikeway and portions along North Torrey Pines Road.

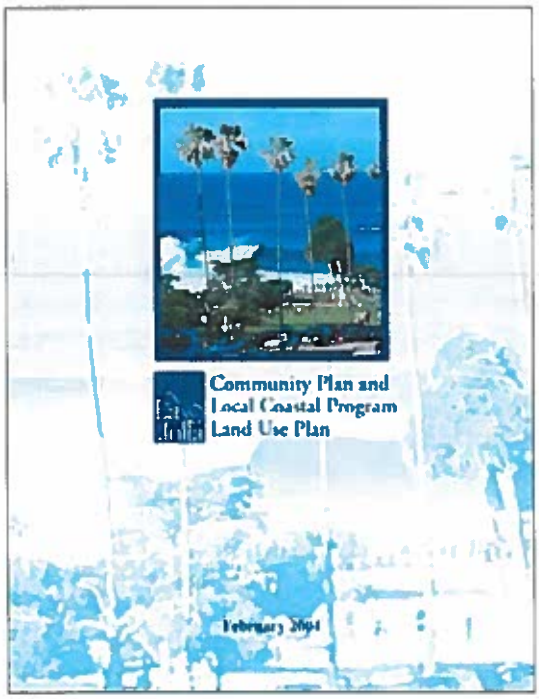
Class 2 bicycle lanes include La Jolla Colony Drive, Palmillas Drive, Arriba Street, Governor Drive, Genesee Avenue, Gilman Drive, Miramar Road, Eastgate Mall, North Torrey Pines Road and Nobel Drive. Without a parallel roadway from Sorrento Valley Road to Genesee Avenue, cyclists are permitted on the of Interstate 5 shoulder between these exits.

The proposed Coastal Rail Trail project will traverse the University Community with a route planned for Genesee Avenue from Rose Canyon to north of Eastgate Mall, where a Class 1 path is planned to connect to Sorrento Valley Road.

La Jolla Community Plan (2002)

In general, this plan seeks to preserve the predominantly single-family residential character of the La Jolla area. The plan specifically calls for modification of the Torrey Pines Road, La Jolla Parkway and La Jolla Shores Drive intersection to accommodate bicycles. It also illustrates four existing bikeway facilities connecting the community with UC San Diego, but it should be noted that they are all affected to some extent by significant grades.





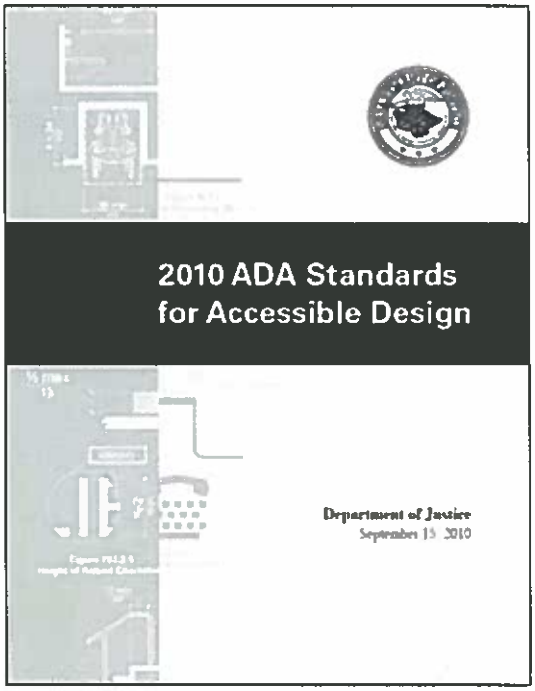
Universal Access

Federal and State Disabled and Universal Access Guidelines

The Americans with Disabilities Act (ADA) effectively set the federal standard for disabled accessibility. Prior to this, California had some of the most comprehensive standards regarding accessibility. The standards are contained in the state Title 24, first enacted in 1978 and updated periodically. Newly constructed facilities must be free of architectural barriers that restrict access or use by individuals with disabilities.

Cities in California use two technical standards for accessible design: the *Americans with Disabilities Act Accessibility Guidelines* (ADAAG) for places of public accommodation and commercial facilities covered by Title 3 of the ADA and the *State Architectural Regulations for Accommodation of the Physically Handicapped in Public Facilities,* found in Title 24 of the California Code of Regulations, also known as the California Standards Building Code.

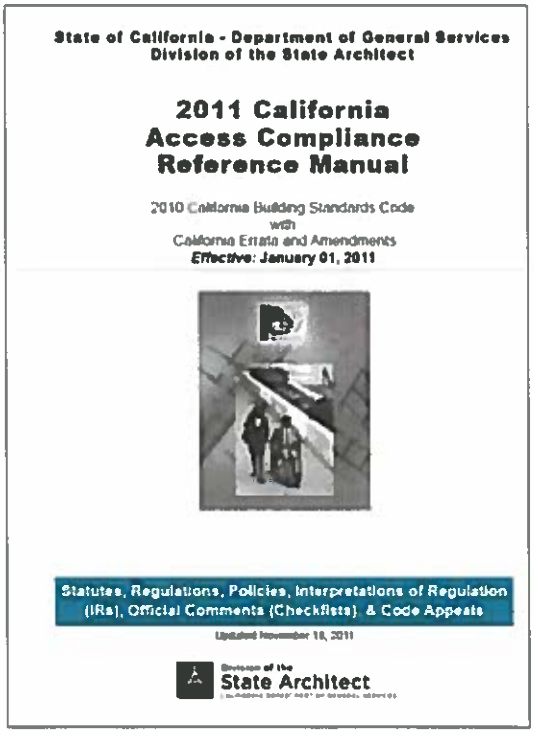
Although local building agencies are limited in that they can only enforce the provisions of the State of California (Title 24), a provision was added to the California Civil Code that determines that a violation of ADA is also a violation of the California Civil Code. Compliance with Title 24 does not preclude a potential violation of the federal ADA standard.



State of California Title 24 Summary

The federal *ADA Accessibility Guidelines* and California Title 24 differ in several technical respects, but the most important distinction between the two is that the ADA is civil rights legislation and Title 24 is a building code. Another important difference is that ADA applies to existing facilities, while Title 24 only applies when alterations, additions or new construction takes place. Therefore, if remedial work is performed to eliminate a physical barrier, the more stringent of *ADA Accessibility Guidelines* or Title 24 applies.

The ADA and Title 24 are also enforced differently. The ADA can be enforced only in a court of law when no other resolution is possible, while Title 24 is enforced by state and local building departments, either when a building permit is obtained or when a citizen complaint is filed in regard to an existing facility. Title 24 is the regulation that most directly affects the built environment on UC San Diego and provides the state leverage for implementing the federal ADA through the building review, approval and inspection process.



Complete Streets

Complete Streets Act - AB 1358

The Complete Streets Act of 2007 (AB 1358) is intended to ensure that the transportation plans of California communities meet the needs of all users of the roadway including pedestrians, cyclists, users of public transit, drivers, children, the elderly and the disabled. It does so by requiring the legislative body of a city or county, upon revision of the circulation element of their general plan, to identify how the jurisdiction will provide for the routine accommodation of all roadway users.

The bill also directs the Governor's Office of Planning and Research to amend guidelines for the development of general plan circulation elements so that the building and operation of local transportation facilities safely and conveniently accommodate everyone, regardless of their mode of travel.

Caltrans Deputy Directive 64-R1

Deputy Directive 64-Revision #1: *Complete Streets: Integrating the Transportation System* (DD-64-R1) is Caltrans's guidance on how to provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations and maintenance activities on the State Highway System. The directive instructs Caltrans personnel to address all transportation improvements (new and retrofit) as opportunities to improve safety, access and mobility for all travelers, as well as recognize bicycle, pedestrian and transit modes as integral elements of the transportation system.

The directive goes on to state that Caltrans is to develop integrated multimodal projects in balance with community goals, plans and values and that addressing the safety and mobility needs of cyclists, pedestrians and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian and transit travel is to be facilitated by creating "complete streets," beginning early in system planning and continuing through project delivery, maintenance and operations. Finally, the directive makes it clear that developing a network of complete streets will require collaboration among all Caltrans units and stakeholders.

Understanding User Needs

This study was developed with a "cyclist's and pedestrian's perspective" by planners who routinely commute by bicycle, as well as walk and fully understand the implications of alternative travel. For example, potential bicycle routes were ridden to experience them firsthand, particularly routes or locations noted in public comments as forbidding to most users due to high motor vehicle speeds or volumes. Pedestrian needs were identified during field work, through review of existing documents and substantial community input.

Figure 1.2: Typical User Types

	Typical Venues	Typical Speeds	Typical Origins and Destinations
Walker and Joggers	All facilities	1-4 mph	On-campus housing, classroom buildings, campus services
Intra-campus and Casual Cyclists	All facilities	5-15 mph	On- and off-campus housing, classroom buildings, campus services
Commuter Cyclists	Streets, bike lanes, direct routes	10-20 mph	Outside campus, campus employment centers
Skaters, Skateboarders and Scooters	Walkways, paved trails, flat terrain	5-15 mph	On- and off-campus housing, classroom buildings, campus services
"Pass-through" Recreational Cyclists	Arterials, flat or hilly circuitous routes	12-25 mph	Typically originate or extend outside campus
Campus Service Carts	Walkways, streets, service accessways	8-20 mph	On-campus housing, classroom buildings, campus services

Cycling and Walking Benefits

Increasing levels of cycling and walking to/from UC San Diego would have several positive impacts on local and regional air quality, UC San Diego and student finances and the health of the campus community.

Existing Bicycle and Pedestrian Demand

The UC San Diego *Survey of Pedestrian and Vehicle Traffic* is the best available data source to describe existing bicycle and pedestrian trips. The survey has been conducted annually since 2001. At that time, cyclists and pedestrians represented 5.3 percent and 2.1 percent of persons entering UC San Diego, respectively and the survey indicates that cycling and walking have steadily increased since 2001. According to the most recent data available (winter 2011), cyclists and pedestrians represent 2.8 percent and 8.0 percent of all persons entering UC San Diego, respectively, making their combined mode share 10.8 percent.

According to the survey, the campus entrances with the largest numbers of cyclists and pedestrians are Torrey Pines Road (578), Gilman Drive (593) and La Jolla Shores Drive (840).

The *Riding to 2050 – the San Diego Regional Bicycle Plan* includes weekday morning and evening peak hour bicycle counts, but none of the counts were on streets on or immediately surrounding the campus. The nearest count location at the intersection of Gilman Drive and the Rose Canyon Bicycle Path had 26-45 cyclists during the morning peak hour and 41-80 cyclists during the evening peak hour.

Output from the SANDAG Travel Demand Model was used to estimate existing vehicle trips to and from the UC San Diego campus and the associated vehicle miles traveled (VMT) for those trips. Analysis showed that approximately 91,000 daily vehicle trips are made to and from the campus and that these vehicle trips result in approximately 878,000 VMT daily. The average trip length for vehicle trips to and from UC San Diego is 9.6 miles, but almost 30 percent of daily vehicle trips are less than three miles. Shorter vehicle trips, those less than three miles, are the ones most responsive to conversion to bicycle or walking trips.

Future Bicycle and Pedestrian Demand

Improved cycling and walking infrastructure and programs should have a positive effect on the UC San Diego bicycle and pedestrian mode share. To estimate the future UC San Diego bicycle and pedestrian mode share, mode share data was collected for other California universities and universities well-known for their levels of cycling and walking. The following table illustrates the cycling and walking mode share data for these universities.

University Mode Share Data

University	Bicycle Mode Share	Walking Mode Share	Total
UC Santa Barbara	39.5%	12.9%	52.4%
UC Davis	41.0%	6.0%	47.0%
Colorado State Univ	31.0%	11.0%	42.0%
Univ of Oregon	15.0%	22.0%	37.0%
Univ of Washington	8.0%	25.0%	33.0%
University of Arizona	20.0%	11.0%	31.0%
CSU Chico	N/A	N/A	28.1%
Humboldt State Univ	9.0%	15.6%	24.6%
Stanford University	21.0%	Unknown	>21.0%
UCLA	3.4%	14.6%	18.0%
San Jose State	3.5%	13.3%	16.8%
CSU Channel Islands	3.9%	12.1%	16.0%
CSU Northridge	N/A	N/A	11.0%

Source: Fehr & Peers 2011

UC Santa Barbara, UC Davis and Colorado State University have cycling and walking mode shares that exceed 40 percent, but their settings are very different from UC San Diego's. Universities with similarly suburban settings, such as UCLA and CSU Northridge, have cycling and walking mode shares of 18 percent and 11 percent, respectively. This data suggest improved cycling and walking infrastructure and programs can help UC San Diego achieve a combined cycling and walking mode share of 15 percent by 2025.

Shorter vehicle trips, those less than three miles, would be most affected by an increased cycling and walking mode share. Based on analysis of the SANDAG Travel Demand Model, the average trip length for vehicle trips likely to be converted to cycling or walking trips is 2.25 miles. Increasing the cycling and walking mode share to 15 percent by 2025 would result in over 4,000 fewer daily vehicle trips to and from UC San Diego and 9,000 fewer VMT daily.

Environmental Benefits

Fewer people per capita cycle or walk in the United States than in most other parts of the world and the nation is a leader in petroleum consumption. Motor vehicle traffic is a significant contributor to air pollution, leading to many negative effects on the environment, such as increased emissions of harmful greenhouse gases including carbon dioxide, carbon monoxide, methane, nitrous oxide and volatile organic compounds. These pollutants and irritants in the air can cause asthma, bronchitis, pneumonia and decreased resistance to respiratory infections. Increased cycling, walking and using public transportation helps to reduce fossil fuel emissions, which helps to clean the air and reduce traffic congestion.

Greenhouse Gas Reductions

Climate change is a growing problem in the United States and around the world. In California, 40 percent of carbon dioxide (CO_2) emissions come from the transportation sector, making the commute to campus a major opportunity for the UC San Diego campus to reduce its carbon footprint. While CO_2 might not be the most harmful greenhouse gas, it is the most abundant. Even after accounting for the global warming potentials of other green house gases (comparing them in terms of CO_2), 95-99 percent of vehicle emissions are CO_2. The EPA found that 423 grams per mile of CO_2 are emitted from an average vehicle.

At UC San Diego, 0.95 kilograms of carbon dioxide emissions could be avoided each day if an individual with a 2.25 mile commute switched from driving to an active mode of transportation. Increasing the cycling and walking mode share to 15 percent by 2025 would result in 3,800 kilograms less CO_2 emissions daily.

Air Pollution

Although vehicles emissions have been dramatically reduced in recent decades due to regulations and technological improvements, they still contribute to poor air quality and negative human health effects. The following table shows the average pollutant emissions in grams per mile from passenger cars and light trucks, as well as the potential emissions savings if the combined cycling and walking mode share reached 15 percent by 2025.

Potential Air Pollution Reductions

Emission Rate	2025 Daily	Savings
Hydrocarbons	5.15 g/mi	46.4 kg
Carbon Monoxide	24.05 g/mi	216.5 kg
Oxides of Nitrogen	1.6 g/mi	14.4 kg
VOCs	1.65 g/mi	14.9 kg

Source: EPA

Economic Benefits

Transportation projects are often expensive and are becoming more difficult to fund. Increasing the cycling and walking mode share decreases transportation costs for UC San Diego, students, faculty and staff. Increasing the cycling and walking mode share to 15 percent by 2025 (thereby decreasing the automobile mode share by four percent) could decrease the need for additional parking spaces. Given the university's current growth projections, this decrease in parking demand could be as significant as 1,370 parking spaces. Since structured parking typically costs a minimum of $20,000 per space, building 1,370 fewer parking spaces could save UC San Diego approximately $27.5 million.

Cycling and walking are low cost activities that can be easily incorporated into an individual's daily life, such as commuting to work or running errands. In mild climate areas, such as UC San Diego's, cycling and walking can occur year round.

Students, faculty and staff can all benefit financially from improved cycling and walking infrastructure. Cycling or walking to and from work can also save money. Students who bring cars to UC San Diego and drive them to campus have higher costs of going to college than students who bike and walk to campus. Individuals who drive to campus must pay for the up front cost of their car, maintenance, insurance and a parking permit, among other costs. According to data available from the American Automobile Association (AAA) and UC San Diego, bringing a car to campus and driving it daily could cost more than $2,000 annually. Based on an wage of ten dollars an hour, a driver must work 300 hours per year to pay for his or her commute. A cyclist only has to work about 30 hours per year to commute by bicycle. Walking is even more cost-effective for shorter distances.

Health Benefits

Two thirds of Americans are obese and the epidemic has shown few signs of improving. To combat this trend and prevent a variety of diseases, the Center for Disease Control (CDC) suggests a minimum of 30 minutes of moderate intensity physical activity five days per week. Walking and cycling qualify as moderate intensity physical activity. On average, people can walk 1.2 miles and bicycle 6.25 miles in 30 minutes. An average adult burns 3.5 calories per minute while walking and 4.25 calories per minute while cycling. Therefore, members of the campus community can burn between 105 and 130 calories every 30 minutes by cycling or walking to UC San Diego.

Cardiovascular Fitness and Weight Loss

Outdoor activities that encourage cycling and walking are great ways to help lose weight since they burn fat, which helps individuals feel and function better. Exercise improves heart and lung fitness, as well as strength and stamina. Regular exercise reduces the risk of high blood pressure, heart attacks and strokes. In addition to heart disease, regular exercise can also help to prevent other health problems such as non-insulin dependent diabetes, osteoarthritis and osteoporosis. Exercise also relieves symptoms of depression and improves mental health.

Stress Reduction

Exercise in general has been shown to decrease anxiety and stress levels. Cycling, running and walking on a regular basis are fun ways to exercise and take advantage of their stress-reducing capabilities.

Field Work

Initial field work conducted during the fall and winter of 2011 consisted of walking and cycling the campus and surrounding routes to obtain first-hand experience. The majority of the field work was conducted during the fall quarter on weekdays to fully understand peak use conditions. Follow-up field work involved examining specific areas about which community input had been received, as well as detailed analysis of sites for potential recommendations.

Consultant team conducting field work

Community Input

As a UC San Diego and City of San Diego planning effort, community involvement was instrumental in the analysis of existing conditions and formulation of recommendations for this study. Several techniques were employed to gather information and perceptions from as broad a range of perspectives as possible.

Project Working Group

A Project Working Group (PWG) was formed including faculty, graduate and undergraduate students, as well as staff representatives of the Police Department, Facilities Design and Construction and Physical and Community Planning. PWG meetings were held throughout the course of the study, taking advantage of the group's familiarity and experience with the campus to formulate and review goals and objectives, suggest policies and actions and review draft documents. The PWG was also instrumental in directing the study, providing guidance on appropriate analyses and in developing recommendations.

Community Stakeholder Workshops

From the roster of people who had originally expressed an interest in participating in this study, additional community stakeholders were invited to two workshops. At the first workshop, participants were divided into small groups and supplied with large, high resolution aerial plots of the entire campus that were used to draw ideas and write comments about their knowledge of the campus walking and cycling environment. This included where they currently did or did not walk or ride and why, any existing facility gaps or other deficiencies, as well as where they would like to see additional facilities. For the second workshop, participants were again divided into groups, but his time to specifically address six focus topics generated from review of the first workshop's results. These were education outreach, east-west movement, north-south movement, Gilman Drive, community connections and bicycle parking.

Website and Surveys

Website

A study website was maintained through the draft phase of the project, on which all meeting products and notices were posted. For example, the large meeting maps were scanned at high resolution and uploaded onto the web site and were later used for discussion at subsequent PWG meetings.

On-line Survey

On-line surveys allow respondents to compose their thoughts at their leisure, often resulting in more comments overall and more in-depth insight about specific locations than what is generally provided at public meetings alone. The on-line survey for this study was developed with the PWG input. To reach as broad a campus constituency as possible, an e-mail request to complete the survey was distributed to the campus community. More than 2,000 respondents completed the survey and submitted hundreds of individual comments.

On-line Mapping Application

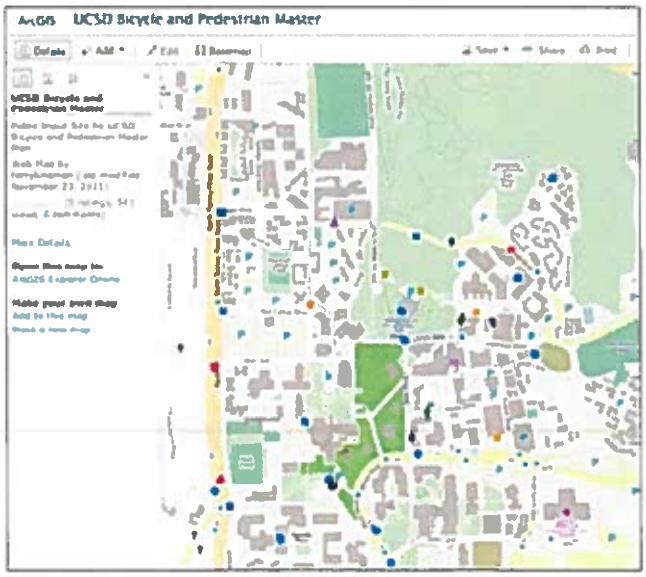
Finally, an on-line mapping application was developed for this study that allowed respondents to post comments about specific locations directly on a campus map.

Community Input Analysis

Some survey respondents noted that as walkers they felt uncomfortable at times due to wheeled user speeds. Even so, the majority felt that shared use was acceptable.

While useful information came from compiling the survey question responses, even more came from a meta-data analysis of the accompanying comments. Of particular interest were locations users felt were unsafe or uncomfortable, which were defined by sorting for comment key words and phases and then mapped based on associated location descriptors. These were often specific sites, while others were simply existing routes or more generalized areas, such as "Gilman Drive." This information was used, along with stakeholder, PWG and on-line mapping input, to help define where recommended improvements should occur, as well as where potential future ones could be considered for implementation. For more information, see the following section on safety analysis.

Community stakeholder workshop



Sample screen image of on-line mapping application

Safety Analysis

Improving a mode's safety or perceived safety can increase its appeal and potentially produce desired modal shifts. Cyclist-vehicle and pedestrian-vehicle collision data analysis can be a useful tool for identifying strategies, either infrastructure enhancements or programmatic measures, to improve cyclist and pedestrian safety. However, because such collisions are generally under-reported, this data can not be relied upon exclusively. Cyclist and pedestrian surveys can augment collision data with anecdotal evidence. For example, multiple respondents noting locations as having "close calls" often indicates an unsafe situation that merits further evaluation.

Collision Data Analysis

Data on all reported cyclist-vehicle and pedestrian-vehicle collisions within one mile of the UC San Diego campus between January 1, 2008 and December 31, 2010 was accessed from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS).

Within the period, 46 cyclist-vehicle collisions and 39 pedestrian-vehicle collisions occurred. Figure 1.3 shows the number and severity of collisions near UC San Diego. Most of the collisions (99 percent) resulted in some form of injury and two fatalities were recorded during the three year period. Note that due to under-reporting, these numbers should be considered low and that collisions on off-street paths and trails are not generally included in SWITRS data, since they do not involve pedestrian/bicycle collisions with vehicles.

Figure 1.3 shows that the majority of cyclist-vehicle and pedestrian-vehicle collisions were on the campus periphery (La Jolla Village Drive, Torrey Pines Road, Genesee Avenue) or south of campus. Locations that experienced more than one collision during the period included:

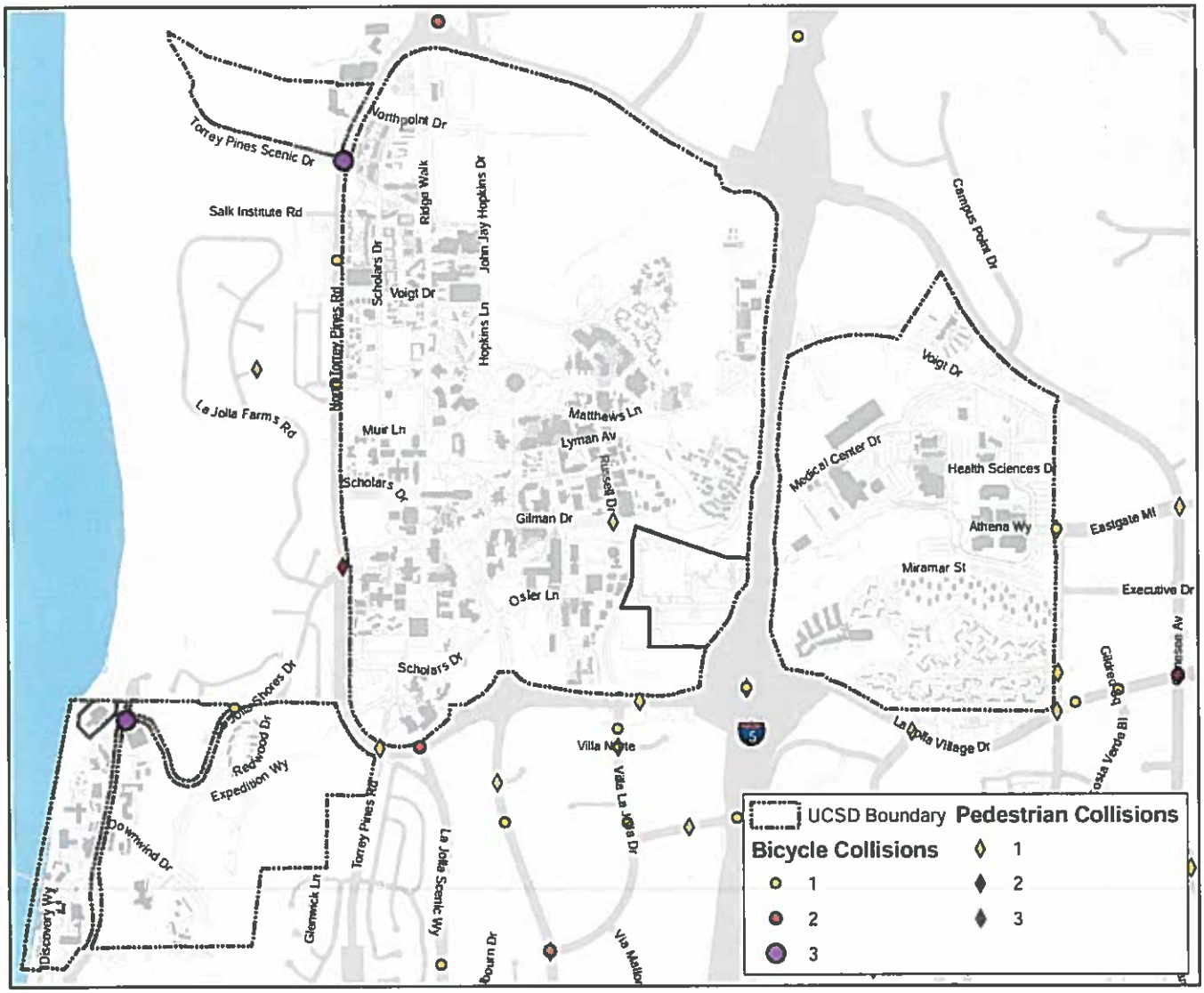
- Regents Road/Eastgate Mall intersection
- La Jolla Village Drive/Interstate 5 interchange
- Torrey Pines Road/La Jolla Village Drive intersection
- Torrey Pines Road/La Jolla Shores Drive intersection
- Torrey Pines Road/Torrey Pines Scenic Drive intersection
- Torrey Pines Road/Genesee Avenue intersection

The SWITRS data described what a pedestrian was doing immediately before a collision occurred and the most common action was "crossing in crosswalk at intersection."

The data also showed that the cyclist was at fault in 74 percent of cyclist-vehicle collisions and the pedestrian was at fault in 65 percent of pedestrian-vehicle collisions. These at-fault statistics suggest that education efforts targeted at drivers, cyclists and pedestrians may improve safety.

The data did not indicate if collision victims were UC San Diego students, but 11 cyclist-vehicle collision victims (23 percent) and 13 pedestrian-vehicle collision victims (33 percent) were of college age.

Figure 1.3: Cyclist/Vehicle and Pedestrian/Vehicle Collisions



Site-specific Survey Comment Analysis

An on-line opinion survey prepared for this study was completed by over 2,000 students, faculty and staff and their responses were used to augment the collision data analysis. Respondents' open-ended responses were queried for terms suggesting safety concerns (unsafe, dangerous, scary, collision, etc.). Over 200 responses noted safety issues and/or lack of infrastructure or facilities. Some responses noted specific locations on or near campus, such as the Voigt Drive Bridge over Interstate 5, while other responses referred to general corridors, such as Gilman Drive or Library Walk. Issues concerning frequently mentioned facilities are addressed in the following summaries and survey summary locations are shown on Figure 1.4 on the following page.

Library Walk

This heavily traveled corridor has high levels of both pedestrian and cyclist use, as well as university carts. Being a vital corridor creates conflicts between cyclists and pedestrians with no designated space for either. Many respondents said cyclists should have designated lanes on Library Walk, while others thought that bicycle facilities should be provided elsewhere and the corridor should remain exclusively pedestrian. Several respondents reported having experienced near-misses or actual collisions here.

Gilman Drive

Cyclists noted the lack of bicycle detection at traffic signals, the lack of bicycle lanes north of La Jolla Village Drive and high vehicular speeds. While bicycle lanes are present on some of Gilman Drive, respondents reported brush, sand and mud within the lanes. The "dooring" of cyclists by inattentive drivers exiting their parked cars (especially south of La Jolla Village Drive) and poor lighting were also noted.

Gilman Drive/La Jolla Village Drive Interchange

Mostly referring to Gilman Drive at La Jolla Village Drive, cyclists described the on- and off-ramps as difficult to maneuver due to high vehicle speeds and low lighting levels. Some respondents recommended signage to warn drivers of the presence of cyclists and pedestrians. Pedestrians noted the lack of sidewalks on the east side of Gilman Drive under La Jolla Village Drive and the lack of marked crosswalks at intersections.

Voigt Drive Bridge over Interstate 5

The Voigt Drive Bridge was one of the most frequently mentioned locations. The lack of bicycle lanes on the bridge was of concern to cyclists due to vehicle volumes and shuttles passing too closely to cyclists. Respondents also noted that the Voigt Drive Bridge is not a convenient route over Interstate 5 to access many campus destinations.

Ridge Walk

Some respondents indicated that cyclists need designated space due to unsafe interactions between cyclists and pedestrians on this route while others suggested cyclists should be restricted to roads. Other complaints included low light levels and utility vehicles on Ridge Walk during peak travel times.

Regents Road

Regents Road's primary issue was poor pavement quality causing cyclist discomfort and increased potential for flat tires. Respondents asked that the bicycle lanes be repainted and made safer and requested additional crosswalks.

La Jolla Village Drive/Interstate 5 Interchange

Both cyclists and pedestrians felt unsafe at this intersection. Cyclists have requested defined bicycle lanes while many pedestrians noted that they felt unsafe in crosswalks.

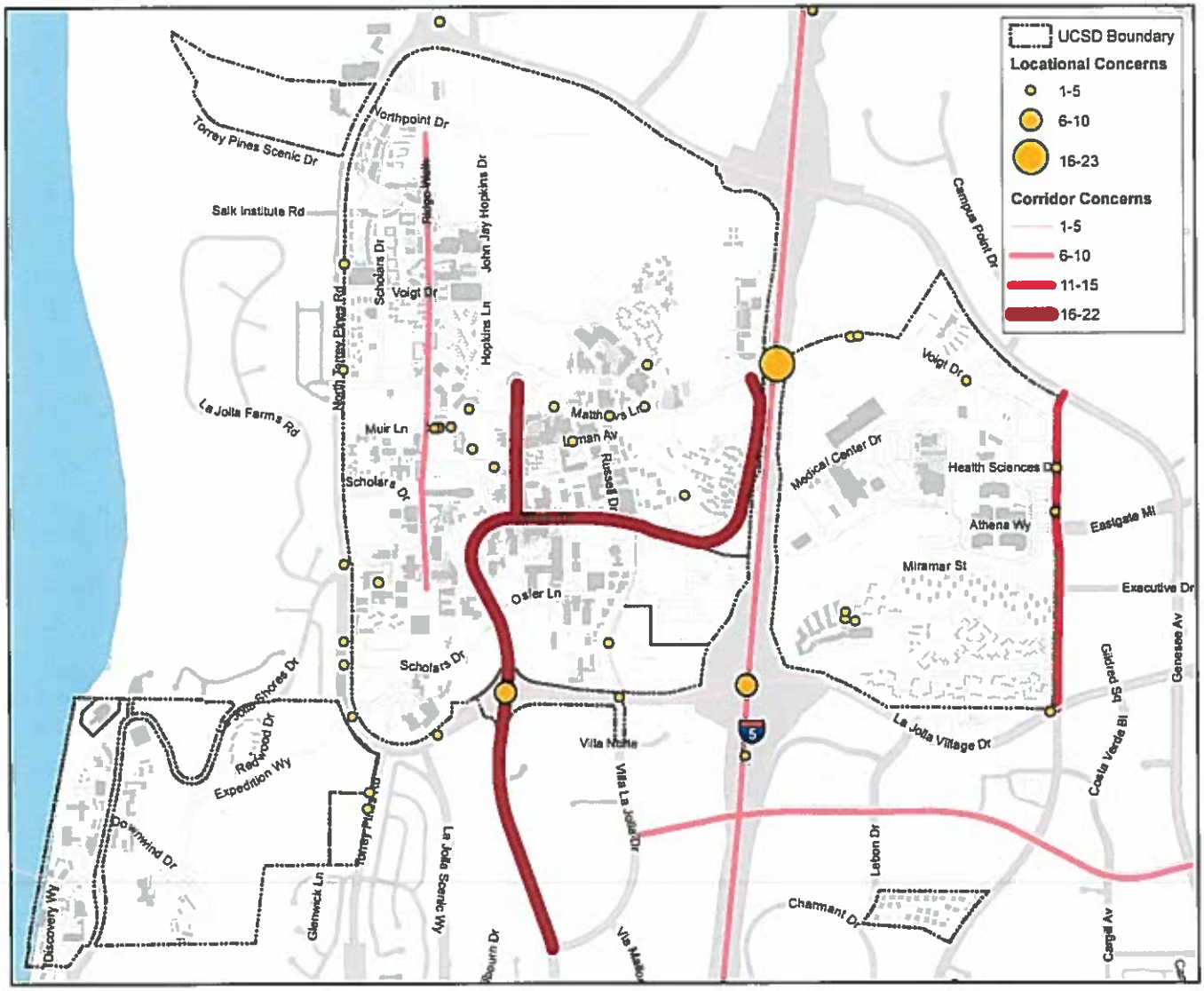
Villa La Jolla Drive

Cyclists felt unsafe riding along this corridor without bicycle lanes, forcing them to ride in the gutter or on the sidewalk. Pedestrians noted that shrubs and fallen leaves have encroached upon sidewalks.

Nobel Drive

Respondents said that the bicycle lane and parking lane alternate, causing confusion when the bicycle lane disappears. Riding next to the intermittent parking lane also made cyclists feel unsafe.

Figure 1.4: Site-specific Survey Comments



Opportunities and Constraints

Following community and staff input, field work, mapping and data analysis, it became clear that certain opportunities and constraints affect the planning and implementation of bicycle and pedestrian infrastructure on the UC San Diego campus.

Opportunities

Regional Climate

The coastal southern California climate is ideal for non-motorized mobility. It is an important asset that can be used to encourage biking or walking instead of driving, to the benefit of the entire campus community.

Campus Arterials with Bicycle Facilities

There are approximately 11 miles of roadways through campus, of which 43 percent support bicycle lanes. Villa La Jolla and Health Sciences Drive are the most heavily used roads without bicycle facilities. Gilman Drive and Voigt Drive have bicycle lanes, but significant gaps exist to complete the connection with Health Sciences Drive.

Bicycle Parking

There is ample bicycle parking across most of the campus. In 2009, a *Bicycle Parking Survey* noted areas where bicycle racks either did or did not meet demand, identified peak bicycle parking use and the type and supply of bicycle racks on campus. Bicycle parking needs were then identified at individual facilities, including how many racks were needed. The survey serves as a starting point for determining where bicycle racks are needed and for moving racks where demand is low.

Bicycle Police

UC San Diego employs police officers on bicycles, which directly supports enforcement efforts and an institutional understanding of bicycle-related safety and access issues.

Pedal Club

The Pedal Club is campus-sponsored commuter incentive program that challenges member bicycle commuters to commit to cycling for most of their commutes to UC San Diego in exchange for a complimentary occasional use parking permit and other benefits to promote commuting by bicycle instead of driving to campus.

Constraints

High Volume and High Speed Streets

Some cyclists will choose not to ride on streets with higher vehicular volumes or higher speeds. Others will choose to ride these streets but special treatments to make these streets safer are warranted. The streets that fit these categories are shown on Figures 1.5 and 1.6.

Topography

Campus hills affect walking and cycling. Expedition Way to Scripps Institution of Oceanography, for example, represents the extreme with sections of 14 percent grade, but many other areas of campus also have steep zones (see Figure 1.7). This means that cyclists and walkers may experience significant grades around and across the campus, depending upon route. In some cases, these grades may be steep enough to discourage more casual cyclists and walkers from using them, but less hilly alternate routes may not be readily available. In addition, disabled persons find some areas very difficult to access due to excessive slopes. In some areas, universal accessibility standards may require elevators.

An additional issue directly related to local topography is inexperienced or careless cyclists and skateboarders traveling too fast downhill and endangering other users, particularly pedestrians.

High Volume Pathways

Cycling is currently restricted to specific hours in certain high volume pedestrian areas, such as Library Walk and portions of Ridge Walk. Cycling is allowed throughout the campus at night and on weekends. Skateboarding is similarly restricted with additional regulations addressing specific campus areas.

Grove Reserve

The eucalyptus groves within the campus "park" also have specific restrictions that could affect recommended routes (see Figure 1.8). However, according to the LRDP, development of suitable bicycle and pedestrian paths in the Grove Reserve is allowed. Several routes exist in these areas and are heavily used.

Figure 1.5: Average Daily Vehicle Traffic (ADTs)

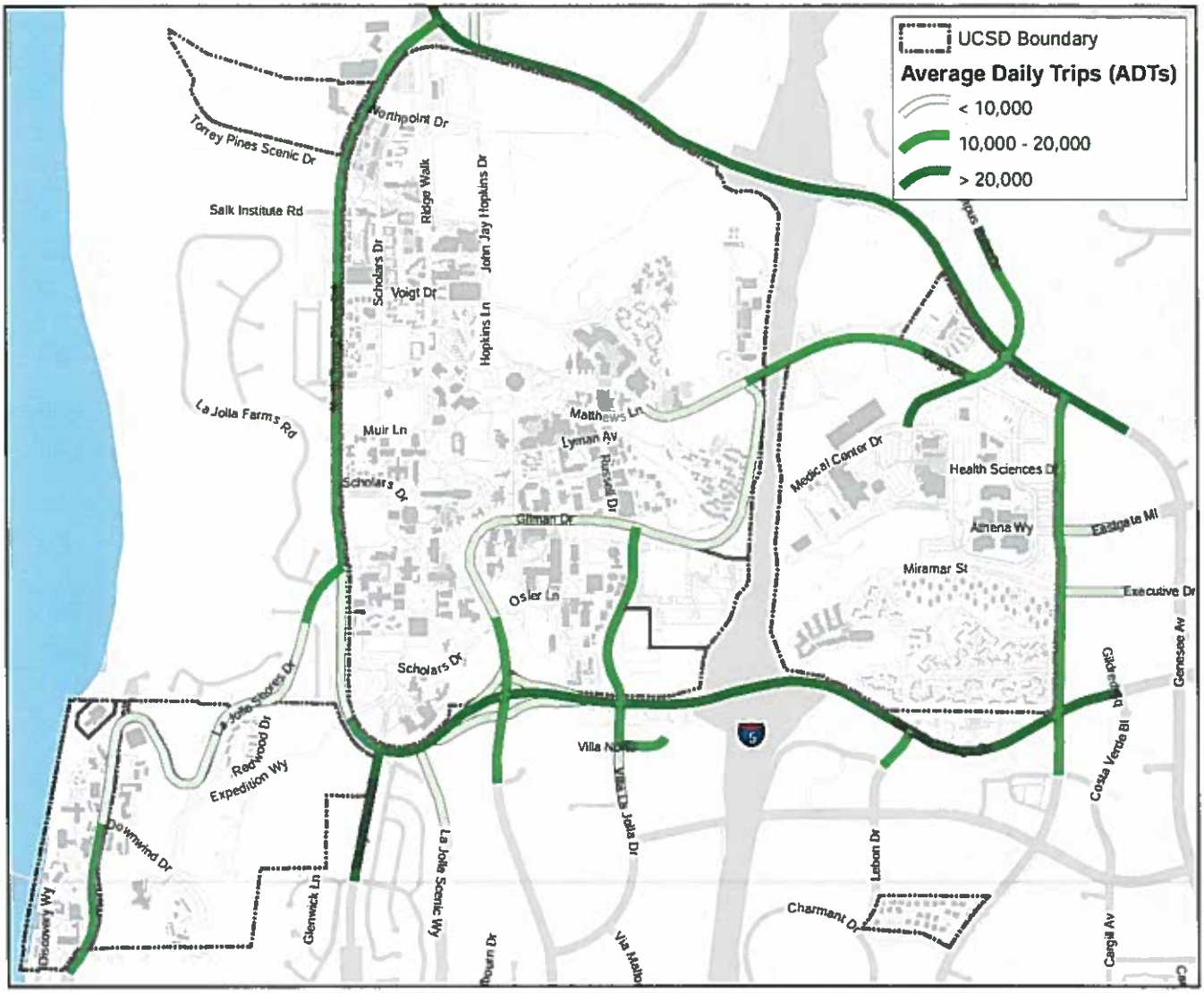


Figure 1.6: Speed Limits

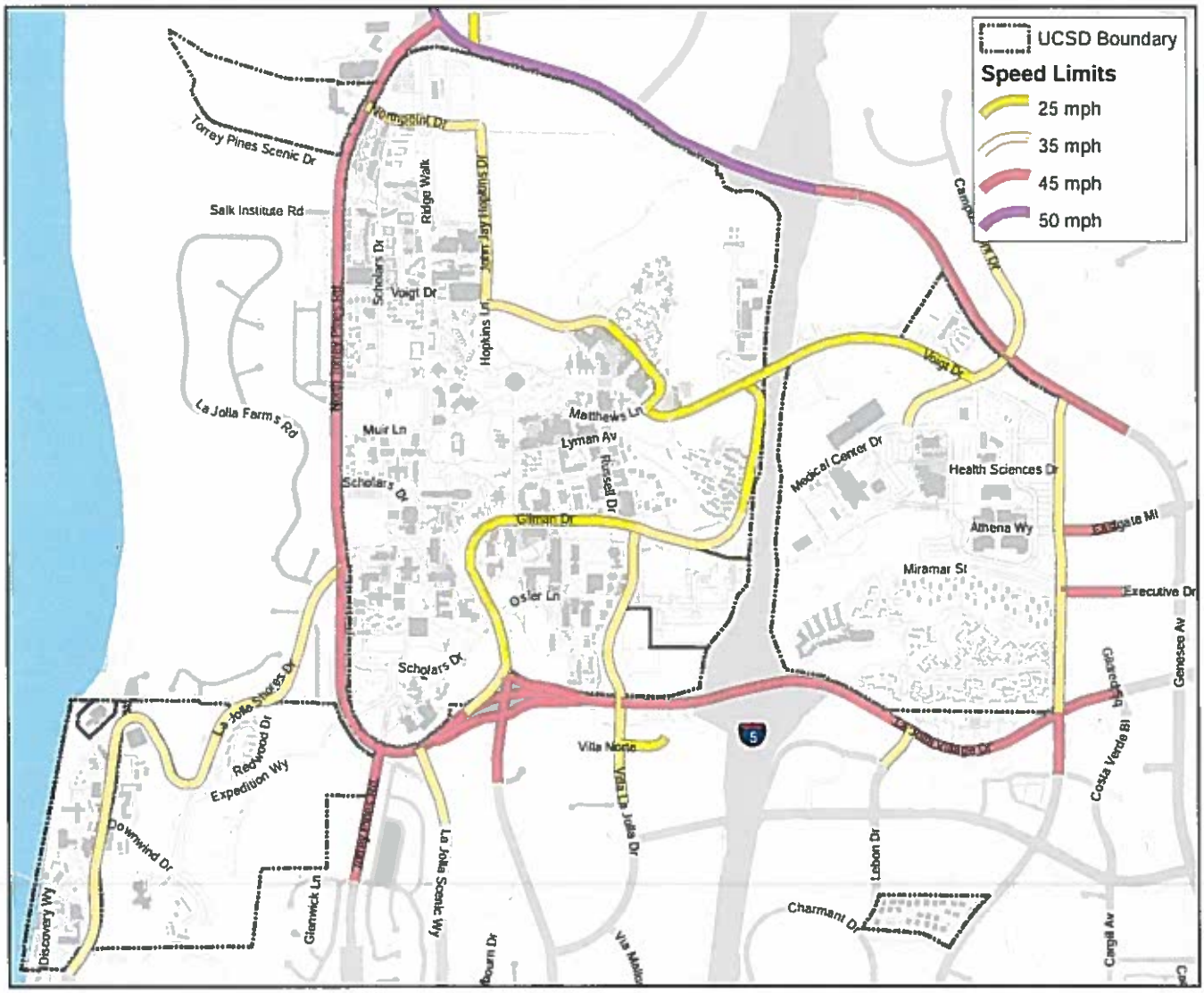


Figure 1.7: Topographic/Slope Categories

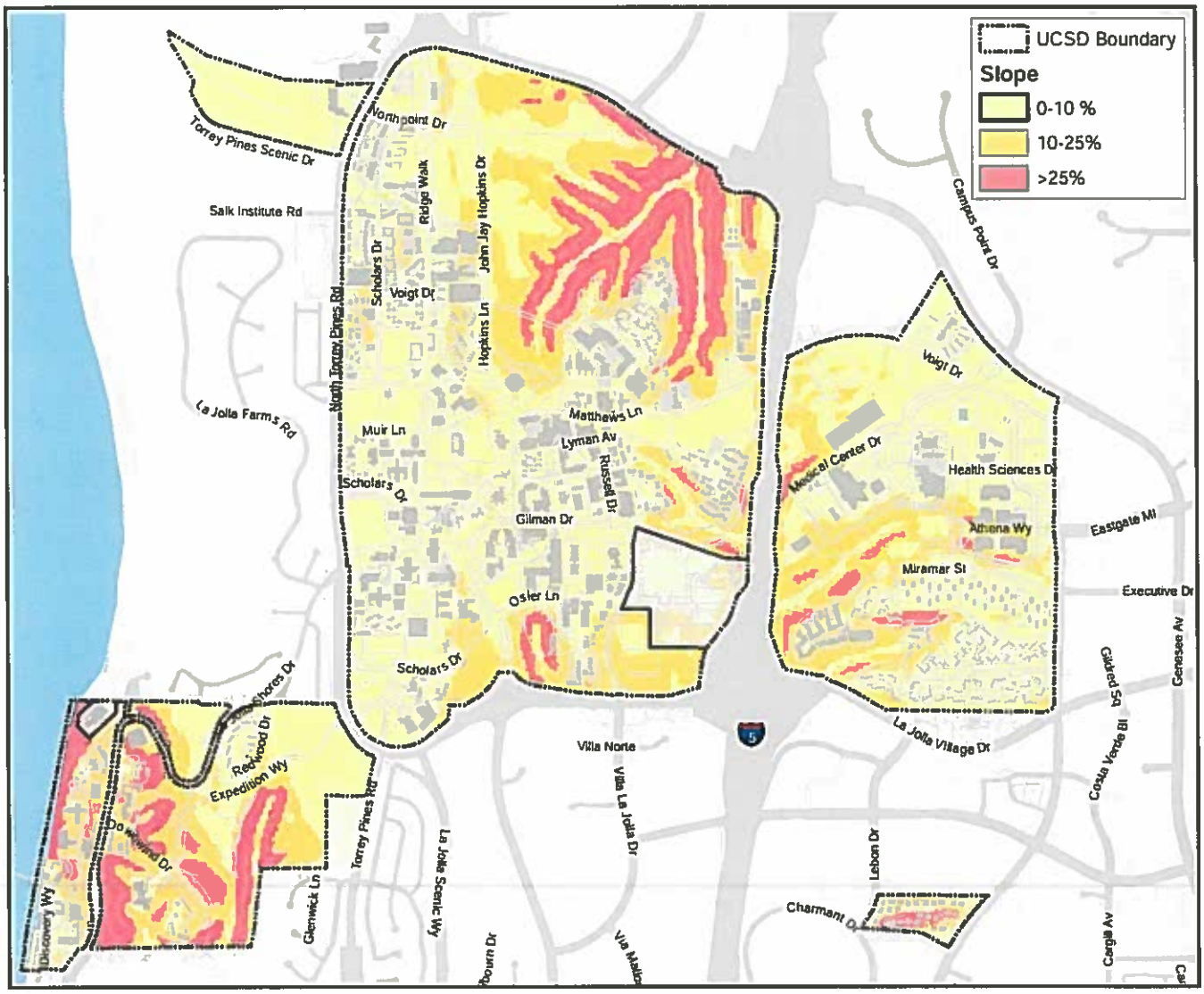
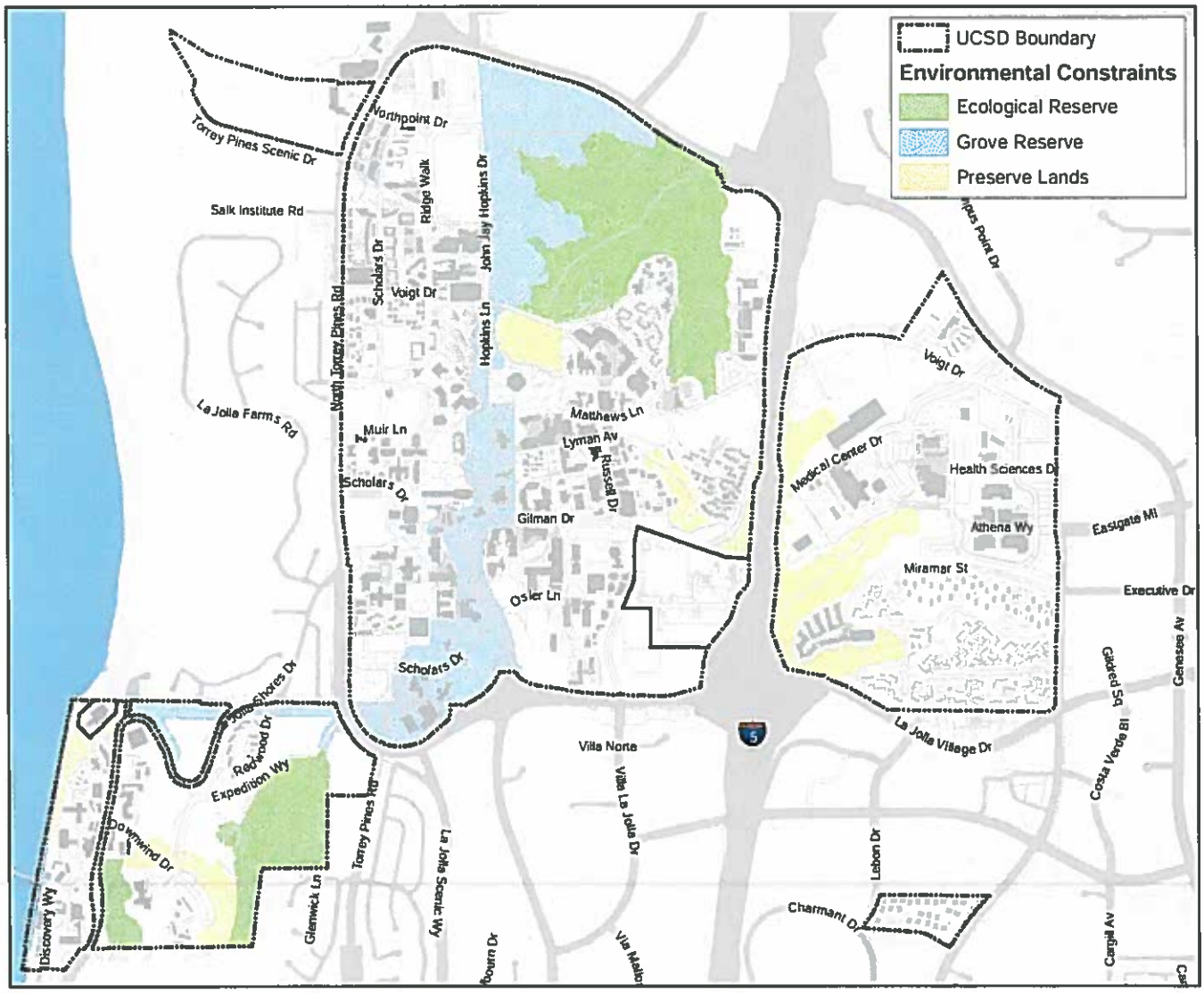


Figure 1.8: Environmental Constraints



Bicycle Circulation

2

This chapter highlights existing bicycle conditions and defines the importance of providing bicycle facilities within the overall campus circulation network.

With the typically high demand for limited transportation infrastructure funds, the value and need for bicycle facilities needs to be justified and prioritized. The goal and policies established in this study provide the justification for this component of overall circulation planning. The study also indicates priorities. When well planned and properly integrated into the university's circulation network, bicycle facilities improve safety, vehicular carrying capacity, parking reduction as well as environmental and personal health benefits.

From a transportation perspective, campus routes need to connect with regional routes, as noted in the City of San Diego's *Bicycle Master Plan Update* and the SANDAG's *Riding to 2050, San Diego Regional Bicycle Plan*. This also includes ensuring continued access to other transportation systems, such as bus, express bus, commuter rail and planned light rail.

For most cyclists, direct campus routes with the least challenging grades are desirable. Routes need to connect to neighboring areas as well as regional destinations. For some riders, UC San Diego's terrain may impose limits to easy and direct access to key destinations.

Based on a campus 1996-2008 Commute Mode Split survey, bicycle commuters make up a maximum of five percent of commutes to campus. For major universities that have invested in bicycle facilities and integrated them into their circulation network, the bicycle commuter mode split is substantially higher, up to 40% for UC Davis and 46% for UC Santa Barbara.

On average, 56 percent of students and faculty use alternative transportation such as campus shuttles, public transit, carpooling, bicycling, walking and carpooling, or some combination of these.

Proposed on-street facilities and bicycle paths must fulfill Caltrans *Highway Design Manual* Chapter 1000 requirements for bicycle facilities to be eligible for funding. The following section illustrates the facility types to consider.

> "UC San Diego aggressively encourages the use of bicycles for commuting and on-campus transportation...
>
> UCSD will continue to add designated bike lanes throughout the campus on major roads and provide other appropriate bicycle routes and bicycle parking facilities."
>
> *Source: LRDP*

Bicycle Facility Types

The State of California currently recognizes three types of bikeway facilities. For more details and information on other innovative facility types, see Appendix: Design Guidelines.

Class 1: Bicycle Paths

Class 1 bikeways (frequently referred to as bicycle paths) are facilities physically separated from motor vehicle routes, with exclusive right-of-way for bicycles and pedestrians and with motor vehicle cross flows kept to a minimum. Anywhere there is the potential for motor vehicles to encroach onto a Class 1 bicycle facility, a barrier should be provided. Any separation of less than five feet from the pavement edge of an adjacent motor vehicle route requires a physical barrier.

Unlike on-street facilities that already have defined minimum design speeds, this is a factor to consider for Class 1 facilities. On relatively flat routes, this is 25 mph.

Class 1 facilities are often important commuter connections and any proposed paths should be designed for multipurpose use. Paths should be wide enough to accommodate multiple user types. Caltrans requirements call for eight feet minimum paved width with two feet of clear space on each side. Adding two feet of additional width to these facilities to make them 10 feet wide helps prevent pavement edge damage from maintenance or patrol vehicles and accommodates higher use volumes.

Class 2: Bicycle Lanes

Class 2 facilities are marked lanes within roadways adjacent to the curb lane, delineated by appropriate striping and signage for preferential use by cyclists.

Bicycle lanes must be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. In unique situations, it may be appropriate to provide a contra-flow bicycle lane on the left side of a one-way street where it will decrease the number of conflicts (e.g., those caused by heavy bus traffic). Where this occurs, the lane should be marked with a solid, double yellow line and the width of the lane should be increased by one foot.

Under ideal conditions, the minimum bicycle lane width is five feet, but certain edge conditions can dictate additional width. However, even where the roadway width is available, Class 2 bicycle lanes should be no wider than six feet to prevent the appearance of a travel lane that could encourage motorists to drive or park within them. Additional width can be striped as a buffer on the travel lane side.

Bicycle lanes should always be placed between the parking lane and the motor vehicle lanes. If parking volume is substantial or turnover is high, an additional one or two feet of width, as a striped buffer, is desirable.

Class 1: Bike Path

Class 2: Bike Lane

Class 3: Bicycle Routes

A Class 3 facility is a suggested bicycle route marked by signs designating a preferred route between destinations. They are recommended where traffic volumes and roadway speeds are fairly low (35 mph or less).

Bicycle route guide signs are provided at decision points along designated bicycle routes, including signs to inform cyclists of bicycle route direction changes and confirmation signs for route direction, distance and destination. These signs are repeated at regular intervals so that cyclists entering from side streets will know they are on a bicycle route.

Shared roadway pavement markings (or "sharrows") are an optional signage method where posted speed limits are 35 mph or less to alert motorists to the expected presence of cyclists, as well as to direct cyclists to the proper distance out from the curb to ride to avoid suddenly opened car doors.

The designation of a roadway as a Class 3 facility should be based primarily on the advisability of encouraging bicycle use on that particular roadway. While the chosen roadways may not be free of problems, they should offer the best balance of safety and convenience of the available alternatives.

In general, the most important considerations are pavement width and geometrics, traffic conditions and appropriateness of the intended purpose. How appropriate a particular roadway is for a bicycle route includes directness and connectivity with other bicycle facilities. Directness is important for commuting cyclists, but not the case for recreational riders, for whom scenery or fitness may be the primary factor in selecting a route.

Climbing Lanes

A climbing lane is a hybrid bicycle facility comprised of a Class 2 lane in the uphill direction and a Class 3 route in the downhill direction. This facility type is particularly useful on steep roads where existing pavement width cannot accommodate Class 2 lanes in both directions, but where safer bicycle facilities are desired.

In general, the preferred configuration is Class 2 lanes in both directions. The climbing lane is only recommended on steep roads where dual Class 2 lanes cannot be accommodated. Where there is enough room for a bicycle lane in only one direction, it should always be provided on the uphill side because the effort of climbing slows all cyclists and causes them to weave more. Because it is on the uphill direction that the speed differential is greatest between vehicles and cyclists, it is prudent to provide more maneuvering space that facilitates easier and safer passing by motor vehicle drivers. The downhill Class 3 bicycle route also allows faster-moving cyclists to share the lane with motor vehicle traffic since many can actually match vehicle speeds.

The Class 2 lane in the uphill direction should employ standard pavement markings (including directional arrows) and signage as directed by the *California Manual of Uniform Traffic Control Devices* (California MUTCD). In addition, "sharrows" should be provided as part of the Class 3 facility in the downhill direction.

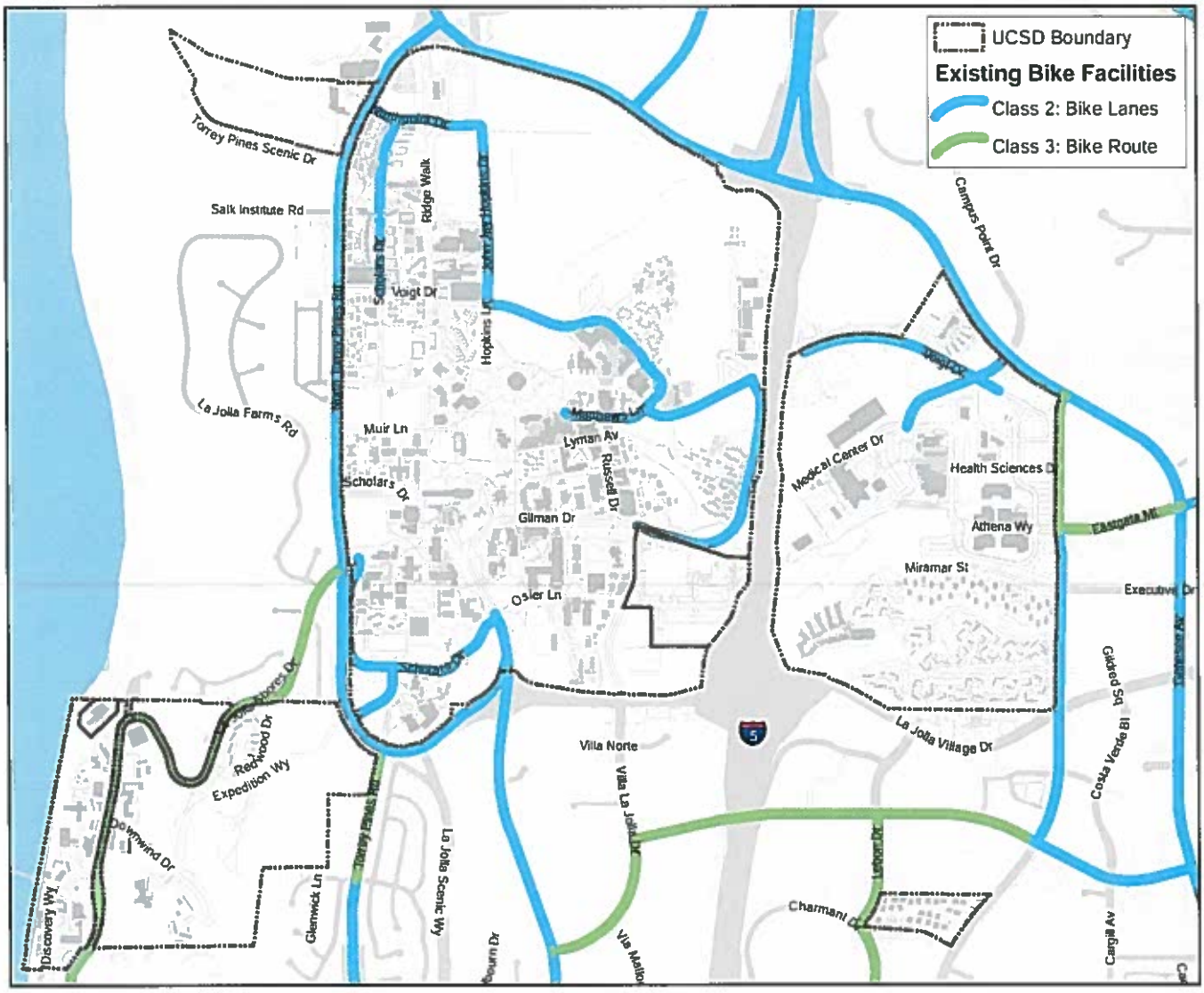
Class 3: Bike Route

Climbing Lane (Class 2 Lane uphill and Class 3 Route downhill)

Existing Infrastructure

Existing bicycle system mapping was derived from the SANDAG regional bikeway geographic information systems (GIS) data, field review and input from university staff and the Project Working Group. There are no Class 1 paths on campus, and four miles of Class 2 lanes. Note that most campus pathways are also currently used by cyclists, as well as all campus streets, including those not specifically designated as bicycle facilities (see Figure 2.1 below).

Figure 2.1: Existing Bicycle Facilities



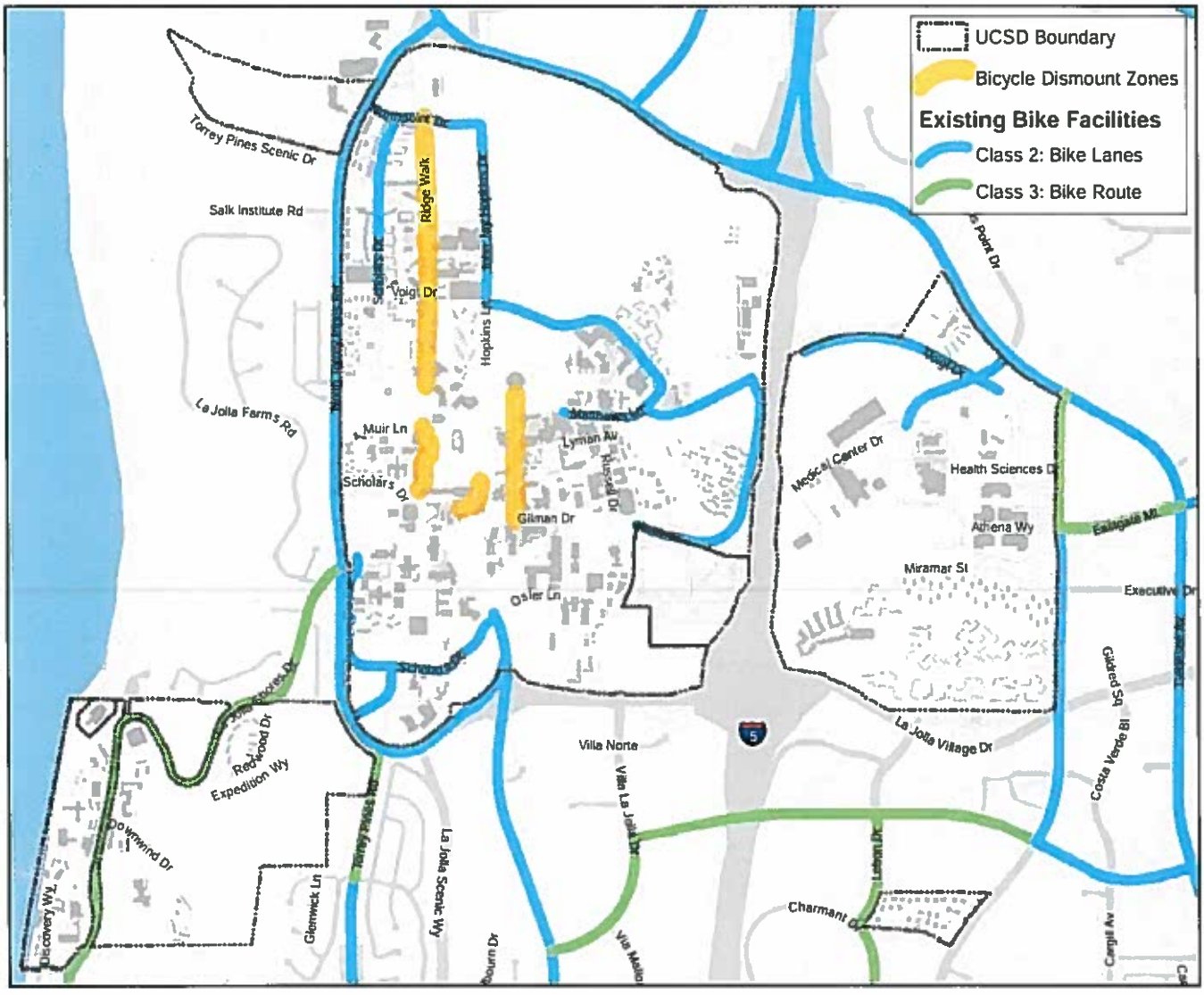
Existing Conditions

The two following figures illustrate data gathered for use in study analyses. Note that several of the constraints mapped in Chapter 1 also directly affect cycling, such as topography.

Dismount Zones

Dismount zones are highly pedestrian-oriented areas where bicycle riding is not considered suitable (see Figure 2.2 below). The most prominent dismount zone is Library Walk, which runs southward from the Geisel Library to Gilman Drive. Others occur on Ridge Walk and around the Mandeville Center within John Muir College.

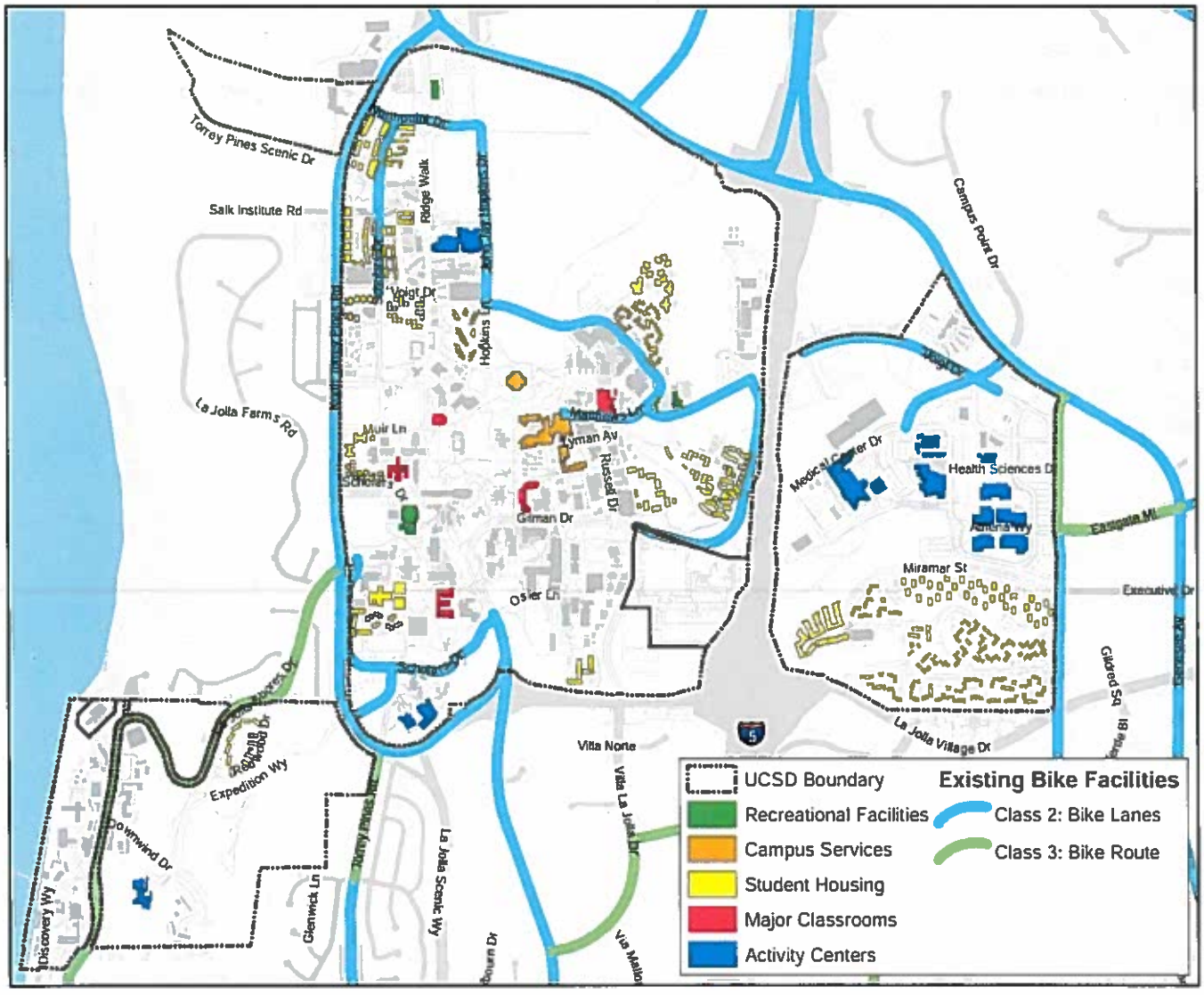
Figure 2.2: Existing Dismount Zones



Activity Centers

Activity centers are locations likely to generate bicycle use, such as the Price Center and other campus services, major classroom buildings, student housing areas and recreational facilities (see Figure 2.3 below).

Figure 2.3: Activity Centers



Bicycle Parking Assessment

Adequate bicycle parking is essential for a bikeway network to be used to its full potential. UC San Diego Transportation Services conducts bicycle parking surveys to determine bicycle parking supply and to identify facilities where supply is not meeting demand. The 2011 survey registered a total of 2,788 racks with capacity for up to 6,957 bicycles. Racks are provided at or near most UC San Diego buildings.

There are currently several rack types on campus, including inverted-U racks, wave racks, two types of wheel slot racks and single arm clamp racks. The dominant rack and current standard is the inverted-U rack. There is also secured bicycle parking in the Rita Atkinson Residences complex, Village East Building 1 and the Arbor Parking Structure at the Hillcrest Medical Center campus. Such secure parking is especially valuable for occupants of buildings that operate on a 24 hour basis.

Not only do most campus destinations provide bicycle parking, the majority is located with the cyclist's convenience and security in mind. Campus bicycle parking is generally near building entrances and in high visibility areas to discourage theft. However, some racks are located within dismount zones, which makes enforcing these zones difficult. Campus policy does not allow bicycles in offices, but this practice is known to occur.

Finally, while conveniently located throughout the campus, many of the existing inverted-U racks were installed improperly, perpendicular to their proper orientation. They therefore provide only one support point for the bicycle frame instead of two, as recommended by bicycle parking authorities and the instability allows bicycles to slide down the rack (see American Pedestrian and Bicycle Professionals (APBP) *Bicycle Parking Guidelines*, 2nd Edition).

Wave rack

Single arm clamp rack

Slot rack

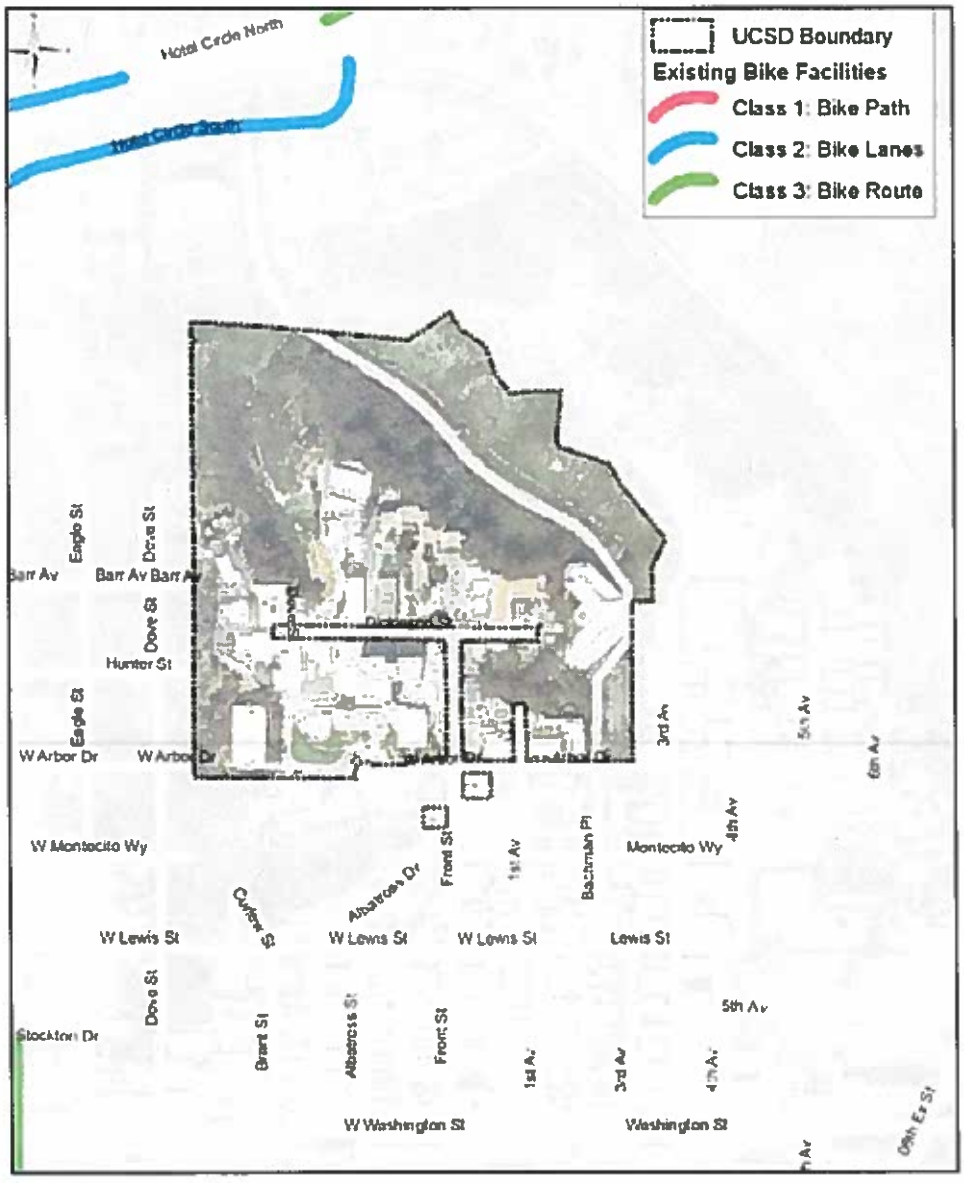
Inverted-U rack (properly installed)

Slot rack

UC San Diego Hillcrest Medical Center

Bicycle connectivity to the Hillcrest Medical Center campus is primarily via Bachman Place from the north or Washington Street from the south. Neither roadway has bicycle facilities. Bicycle parking is available on Dickinson Street and at a secure bicycle cage within the Arbor Parking Structure.

Figure 2.4: UCSD Hillcrest Medical Center Area Existing Bicycle Facilities



Bicycle Improvements

Recommended Conceptual Framework

Two very important factors must be addressed for a well-connected bicycle system at UC San Diego: connections with the adjacent community and connections to UC San Diego's colleges and neighborhoods. Additionally, the campus plays a role in accommodating north/south regional bicycle traffic. Some of this traffic is commuter and some is recreational, especially on weekends. Because of UC San Diego's topography and limited roadway options, cyclists need to traverse parts of the campus for coastal routes. Connections with the community are not just important for those passing through the campus, but are essential for providing bicycle commuters connections with the adjacent community and with regional bicycle facilities (see Figure 2.6).

Connections between the various destinations and undergraduate colleges are also critical for both bicycle use and walking. These connections have been emphasized in previous master plans and neighborhood studies, as well as in the 2004 *Long Range Development Plan*. A conceptual framework of bicycle and pedestrian connections are shown in Figure 2.6.

Proposed Bicycle Network

Based on stakeholder, staff, Project Working Group and survey input, as well as mapping, analysis and field work, a bicycle network was delineated that employs existing on-street facilities and shared-use pathways to support bicycle travel to and across the campus. Routes on multi-use pathways were carefully considered and are recommended to occur in conjunction with supporting education, encouragement and enforcement initiatives (see Figure 2.7). This bicycle network corresponds with the on-street facilities shown in the City of San Diego's *Bicycle Master Plan Update*, as well as ensures connections with important planned regional facilities such as the Class 1 path parallel with Interstate 5 north of Voigt Drive that will connect with the Sorrento Valley Coaster station as part of the Interstate 5 widening project, and the Gilman Drive Bridge over Interstate 5, which is planned to have Class 2 lanes.

Figure 2.5: Conceptual Framework for Campus Connections and Regional Campus Pass-through Facilities

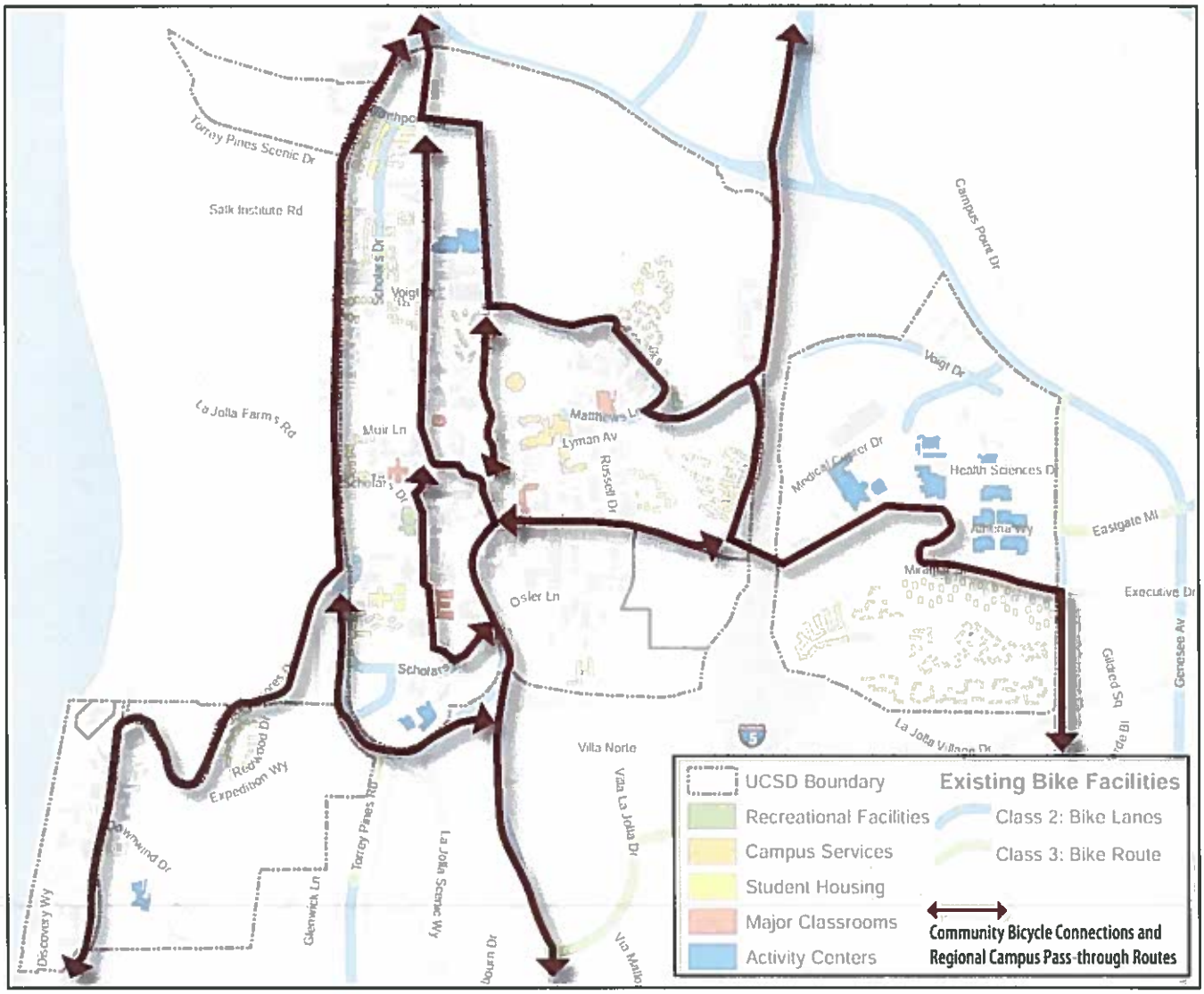
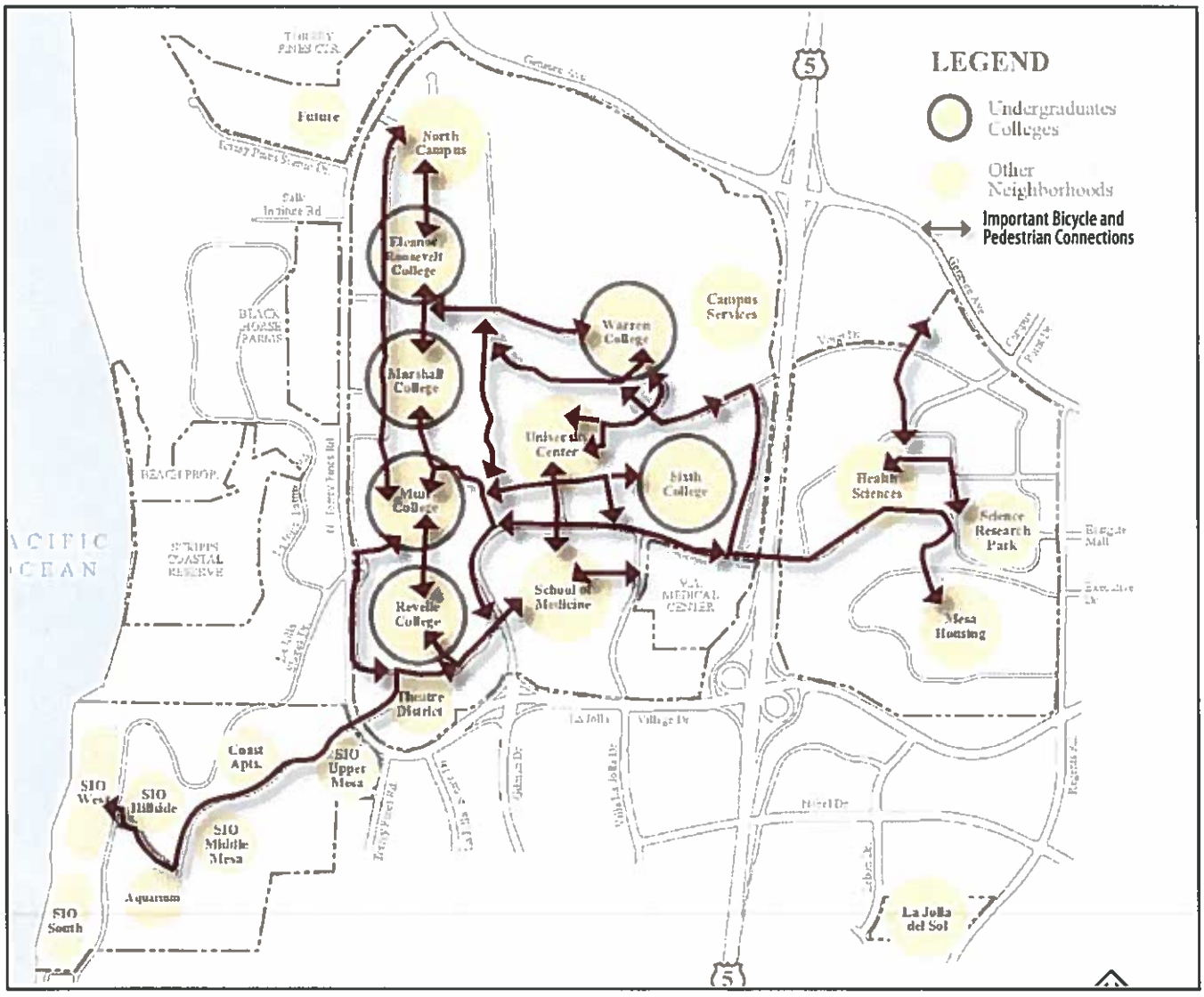
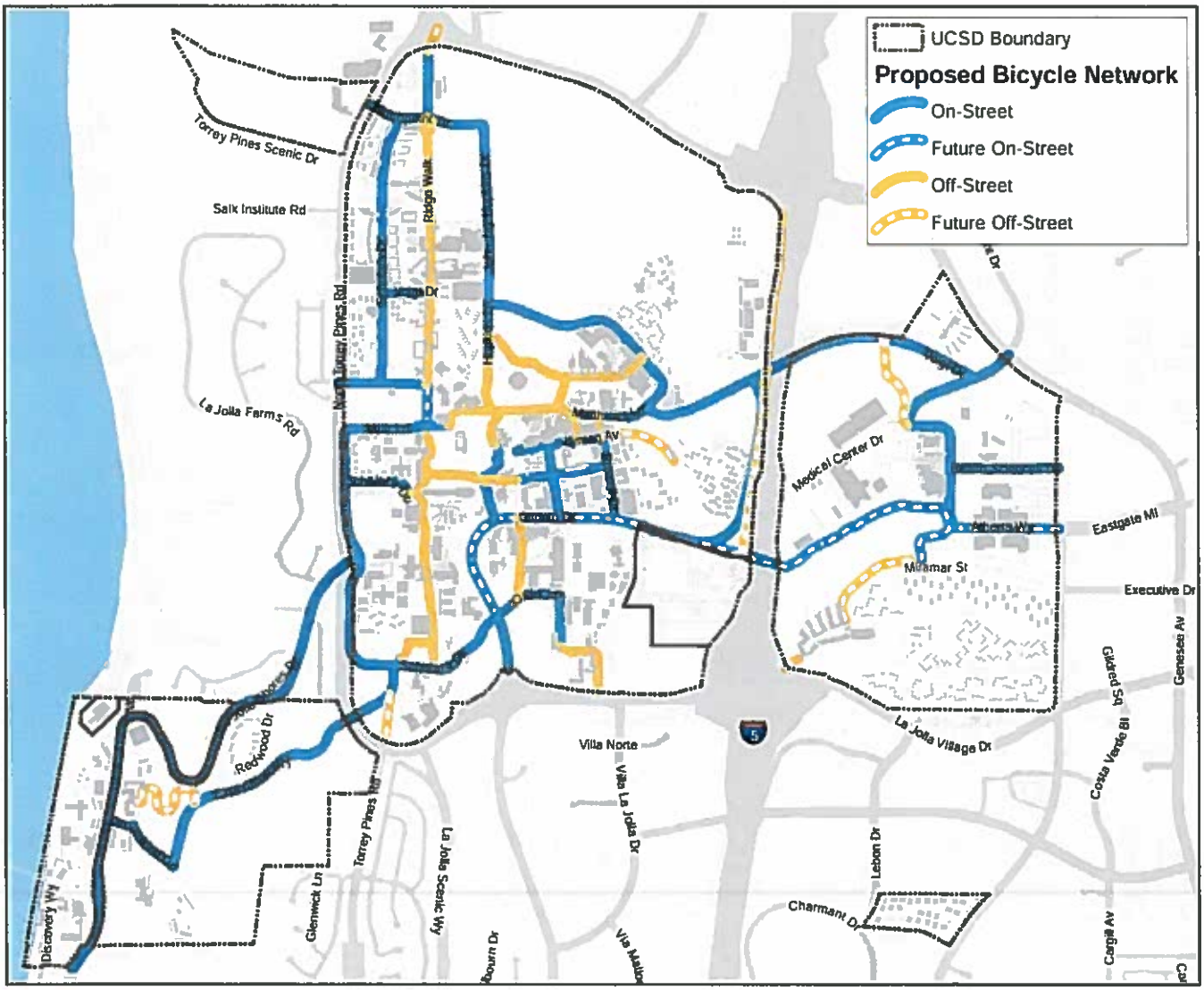


Figure 2.6 Conceptual Framework for On-campus Connections



(Underlying image from 2004 LRDP)

Figure 2.7: Proposed Bicycle Network



Other Bicycle Facility Recommendations

Bicycle Wayfinding System

A wayfinding system to direct cyclists to the most appropriate routes for bicycle use could employ simple directional "tags" applied to signs panels (see simulated example at right). Primarily when implementing the priority projects (discussed in Chapter 5), several locations will require additional directional signage oriented to cyclists to direct them to designated preferred routes. An example is Priority Project 3A (Page 82), where at least one sign will be needed to help direct cyclists to a new proposed bicycle-specific facility.

Proposed Bicycle Parking Improvements

Based on PWG input and other public comment, UC San Diego should implement policies to increase bicycle parking education and options for students and faculty. Examples include:

- Provide fee-based indoor bicycle parking for faculty who wish to park their bicycle in their workspace.
- Bicycle racks should meet all standards and guidelines for parking access, safety and fire codes.
- Provide secured long-term bicycle parking cages at parking garages and major on-campus transit hubs.
- Add secure bicycle parking facilities (i.e., cages or interior rooms) and shower facilities with lockers at new and significantly remodeled buildings. Provide adequate temporary bicycle parking and circulation during construction.
- When funds become available or when site reconstruction occurs, re-align existing inverted-U bicycle racks to their proper orientation.
- Colleges and departments should coordinate bicycle parking needs, design and placement to support uniform bicycle parking capacity, including the potential for re-allocation of underused racks.

Proposed bicycle wayfinding tag

Proposed Bicycle Parking Rack Types

Is does not make economic sense to recommend a new campus-wide rack standard, especially where large numbers of serviceable inverted-U racks are already in place.

Even if a single campus-wide rack type is not feasible, in general, groups of racks within view of each other or within the same building complex should be of the same type. This should be the case within colleges, for instance. In areas where large of numbers of the current standard inverted-U racks are already in place, additional racks should be of the same type.

However, whenever a significant number of new racks are being considered, it is generally recommended to use Peak Racks' products (www.peakracks.com) because these are reasonably priced, one-piece racks that support bicycles very well and allow easy locking of the frame and front wheel. Specifically designed for space efficiency and ease of use, Peak Racks feature a vertical stagger to minimize handlebar tangling. The racks are available in multiple configurations holding from two to eight bicycles, including space-saving angled and double-sided models, in a number of finishes. The smaller capacity versions are especially useful for providing bicycle parking spaces in otherwise unusably small or irregular areas.

Where aesthetics are a greater concern, Park-a-Bike (www.parkabike.com) type racks should be considered. These are also superior to standard inverted-U type racks and their simple angular design can be attractive, especially in groups. These are available exclusively as two-bike racks, but are designed for ganged installation using a horizontal stagger. Park-a-Bike can also be ordered with customized frame padding, as well as a Quick Response (QR) tag on the top of the rack, scannable via a smartphone equipped with a QR reader app. The default tag directs users to a video on how to properly lock a bicycle. (See Page 121 for more information on QR codes.)

Peak rack

Park-a-Bike rack

Proposed Bicycle Parking Requirements

Residence Halls

For each residence hall room, provide two covered bicycle parking spaces. Wherever possible, secure parking, such as a lockable room within the building, is preferred.

Classroom, Office and Other Buildings

Provide bicycle parking for at least five percent of the building occupancy, or as otherwise stated in the campus *Bicycle Parking Survey*, whichever is greater.

Transit Stations and Parking Lots/Structures

Providing bicycle parking at transit centers and parking lots and structures is intended to encourage more campus community members to use bicycles to move around the campus, even if they do not ride there from home. This may be particularly effective at the planned light rail stations.

For short-term parking, provide spaces for five percent of projected morning peak period daily ridership.

For long-term parking, provide covered spaces for 1.5 percent of morning peak period daily ridership.

Long-term parking at transit stations can consist of a wide variety of fixture types and site plan layouts and includes both racks in cages and bicycle rooms, as well as lockers located in a variety of different settings, both indoors and outdoors. Site design should focus is on ensuring the safety of users while maintaining exclusive access to these areas. Outreach to users to educate them about the presence of the facilities. Campus long-term parking may include:

- Easy access via effective guide signage
- Free-standing shelter
- Indoor cage or room
- Safeguards for users such as effective lighting and visible surveillance

Higher security long term bicycle parking may include:

- Leased (keyed or smartcard) lockers
- On-demand (self-lock or smartcard) lockers
- Keycard/code access garage cage or bicycle room

Long-term parking, whether bicycle lockers or cages, should be approved by the Design Review Board to coordinate aesthetics with the surrounding area. Bicycle cages should incorporate properly installed campus-approved racks.

Secure bicycle parking at Rita Atkinson Residences

Locker/Shower/Changing Facility Awareness

An essential element for making bicycle commuting from off-campus possible is shower and changing facilities within a reasonable walking distance of the commuter's final destination. There are a number of changing rooms and shower facilities on the campus, but better awareness of their locations may encourage more of the campus community to bike instead of drive. A publicity and wayfinding program is recommended, such as highlighting the locations on campus maps, both on-site and on websites. Leadership in Energy and Environmental Design (LEED) credits are available for projects that incorporate bicycle parking and shower and locker facilities.

2 Bicycle Circulation

Pedestrian Circulation

3

At some point, all trips involve walking and UC San Diego is an inherently pedestrian campus. The eucalyptus-shaded walking environment of the central campus is and will continue to be a distinctive university feature. Planning decisions can take advantage of the campus pedestrian attributes to fulfill mobility and sustainability goals.

The current pedestrian network employs a combination of paved and unpaved pathways of varying dimensions and materials. Pedestrian bridges provide access across La Jolla Village Drive to and from the major developments south of the campus, at Scripps Institution of Oceanography across La Jolla Shores Drive, across Villa La Jolla Drive at the Veterans Administration Medical Center and across Gilman Drive just north of Osler Lane.

Campus policies regulate bicycle and skateboard use on certain pedestrian pathways. In addition, in terms of both facilities access and programmatic accommodation, UC San Diego planning is in compliance with the Americans with Disabilities Act (ADA).

"UCSD's topography, surroundings, and climate make walking a practical and enjoyable way of navigating the campus."

Source: LRDP

Pedestrian Facility Types

College campuses require differing levels of pedestrian improvements based on campus roadways, pathways, levels of use, user type, topography and land uses. This section defines the pathway classifications and the corresponding design treatment levels appropriate for each type.

UC San Diego's facilities fit into the following walking facility categories (see Figures 3.1 through 3.5 on the following pages for details).

Campus Roads

Campus roads may or may not have sidewalks that support heavy pedestrian levels in mixed-use areas. These roads are the campus connections from adjacent neighborhoods and are required to meet California MUTCD requirements. Gilman Drive, Campus Point Drive, Northpoint Drive and La Jolla Shores Drive are examples of this type of route. They provide both the connection to off-campus destinations and intra-campus connections.

This route type is primarily used by motor vehicles and often has adjacent 4-5 foot sidewalks. These roads are sometimes the most convenient way to connect to the different schools on campus. An example is Voigt Drive connecting Warren and Roosevelt Colleges.

Campus Walks and Corridors

Campus walks and corridors are the backbone network of the UC San Diego campus. They support high volume pedestrian traffic and moderate bicycle and skateboard traffic. Campus delivery and maintenance vehicles also use these routes. These routes connect major housing, classroom, athletic and research facilities. They are typically concrete and occasionally are designed with interlocking paving or decorative concrete. Because these corridors connect to all the other route types, access and safety treatments will vary at their connections. Bicycles are not allowed Monday to Friday between 8:30 a.m. and 5:30 p.m. on two major corridors, Ridge Walk and Library Walk. Skateboards are not allowed on Peterson Hill, Library Walk or Warren Mall.

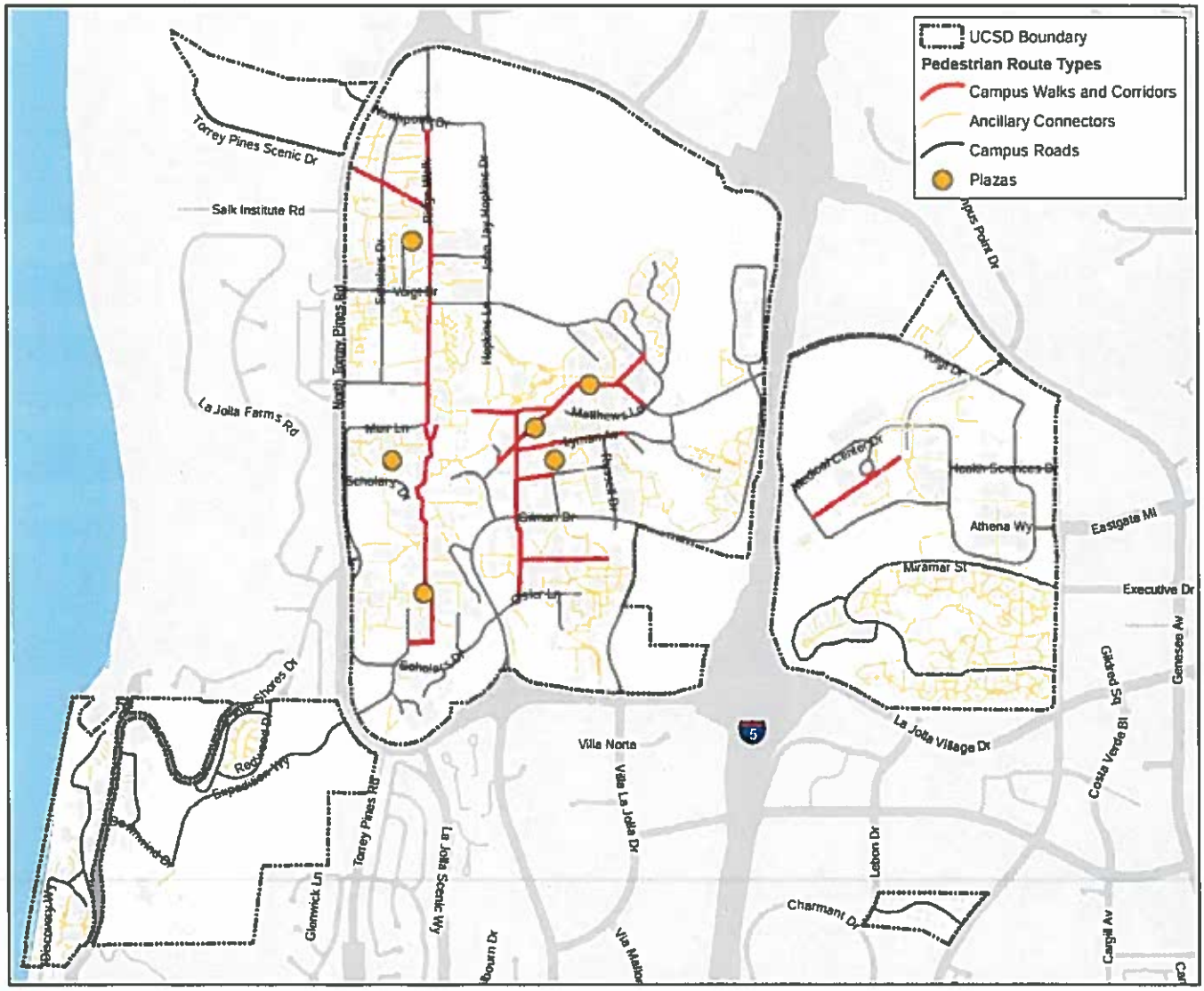
Ancillary Connectors

Connectors are routes that connect major corridors, campus roads and plazas between buildings, parking lots and structures and pedestrian bridges. These pathways form the largest portion of the campus route network as they meander around larger buildings, connect smaller buildings and residence halls and pass through the eucalyptus groves and landscaped areas. They are typically paved, but in some instances are unpaved as a natural-surface trail to retain the rustic feel of the area. Asphalt is generally used within the eucalyptus grove. A few connectors, such as one immediately north of the Eleanor Roosevelt College Administration Building that crosses Scholars Drive North, double as fire lanes with a sustainable landscape design that provides both open space and a meandering pathway.

Plazas

Plazas are campus social gathering places that generate high pedestrian use and, when allowed, bicycle use. Plazas typically have amenities that allow students to stop, socialize, eat and study. Amenities include benches, tables, grassy open spaces, shade structures, bicycle parking and nearby cafes or restaurants. Plazas can be found throughout campus such as near the Price Center, Thornton Hospital, within colleges and between most residence hall buildings. These open spaces usually accommodate wheelchairs in paved, flat areas.

Figure 3.1: Pedestrian Facility Types



Campus Walks and Corridors

Heavily used intra-campus routes that connect major destinations and residence halls - typically a multi-use facility.

Figure 3.2: Campus Walks and Corridors

Primary Surface: Typically concrete (plain or decorative) or interlocking paving. Restrictions vary by location. Typically used by all modes except private vehicles.

Ridge Walk

Library Walk

Ancillary Connectors

Pathways that connect major corridors, campus roads, plazas, buildings and pedestrian bridges.

Figure 3.3: Ancillary Connectors

Primary Surface: Concrete, asphalt and in some cases, unpaved. Typically less than ten feet wide. Some restrictions on bicycle and skateboard use.

Sustainable treatments can include: Decomposed granite (DG) buffer, infiltration trench, core joints on the pathway, root barriers and four foot minimum distance from trees.

Unpaved pathway near Moores Cancer Center

Paved pathway at Muir College

Plazas

Campus gathering place that generates high pedestrian and bicycle use.

Figure 3.4: Plazas

Primary Surface: Concrete or decorative paving. Landscaped areas, with trees, seating and tables. Typically near larger classrooms/lab buildings. Some restrictions on bicycle and skateboard use.

Warren College

Town Square

Campus Roads

On-campus roads supporting moderate bicycle and pedestrian levels. These roads are primarily used for motor vehicle traffic across campus.

Figure 3.5: Campus Road Sidewalk Facilities

Typical adjacent street for on-campus and off-campus connections used by campus shuttles and public transportation. Bicycle lanes adjacent to sidewalk, when they occur.

Primary Surface: Concrete curb. Moderate pedestrian and skateboard use.

Scholars Drive

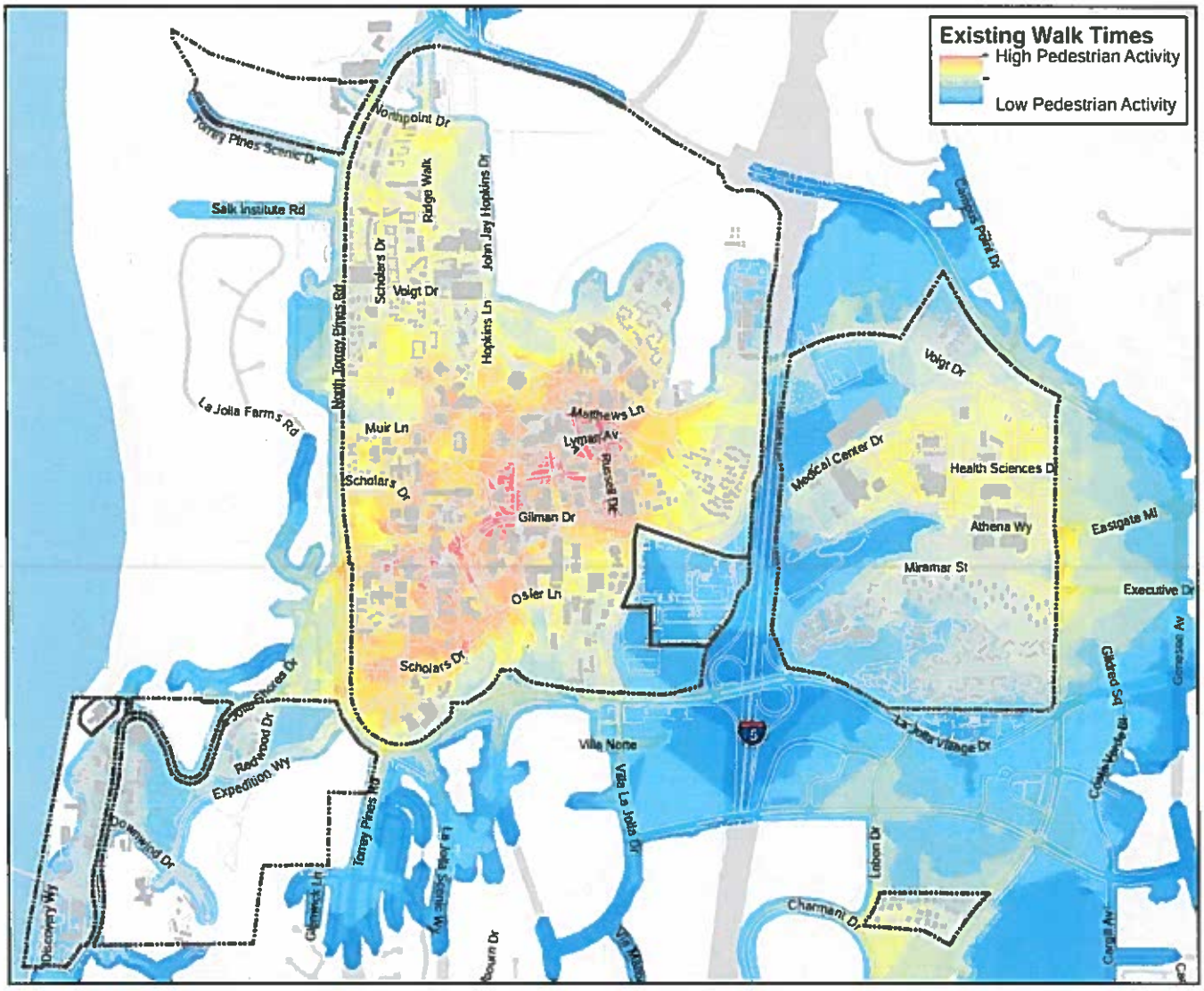
Gilman Drive at Osler Lane

Walk Time Analysis

A geographic information systems-based (GIS) walk time analysis was performed to determine the relative levels of walking likely to occur both currently and if missing connections were added, particularly the Gilman Bridge over Interstate 5. To help preserve the campus' highly pedestrian oriented nature, the analysis model was created to help identify areas for prioritizing improvements where the largest pedestrian concentrations can be expected (see Figures 3.6 and 3.7 below).

The model utilized data collected from UC San Diego planning staff, the City of San Diego, SANDAG and the Metropolitan Transit System (MTS). It utilized the existing pathway network to connect activity areas likely to attract pedestrians. These included student housing, recreation facilities, student services, major attractions (Price Center, Geisel Library, etc.) and transit stops.

Figure 3.6: Existing Walk Times

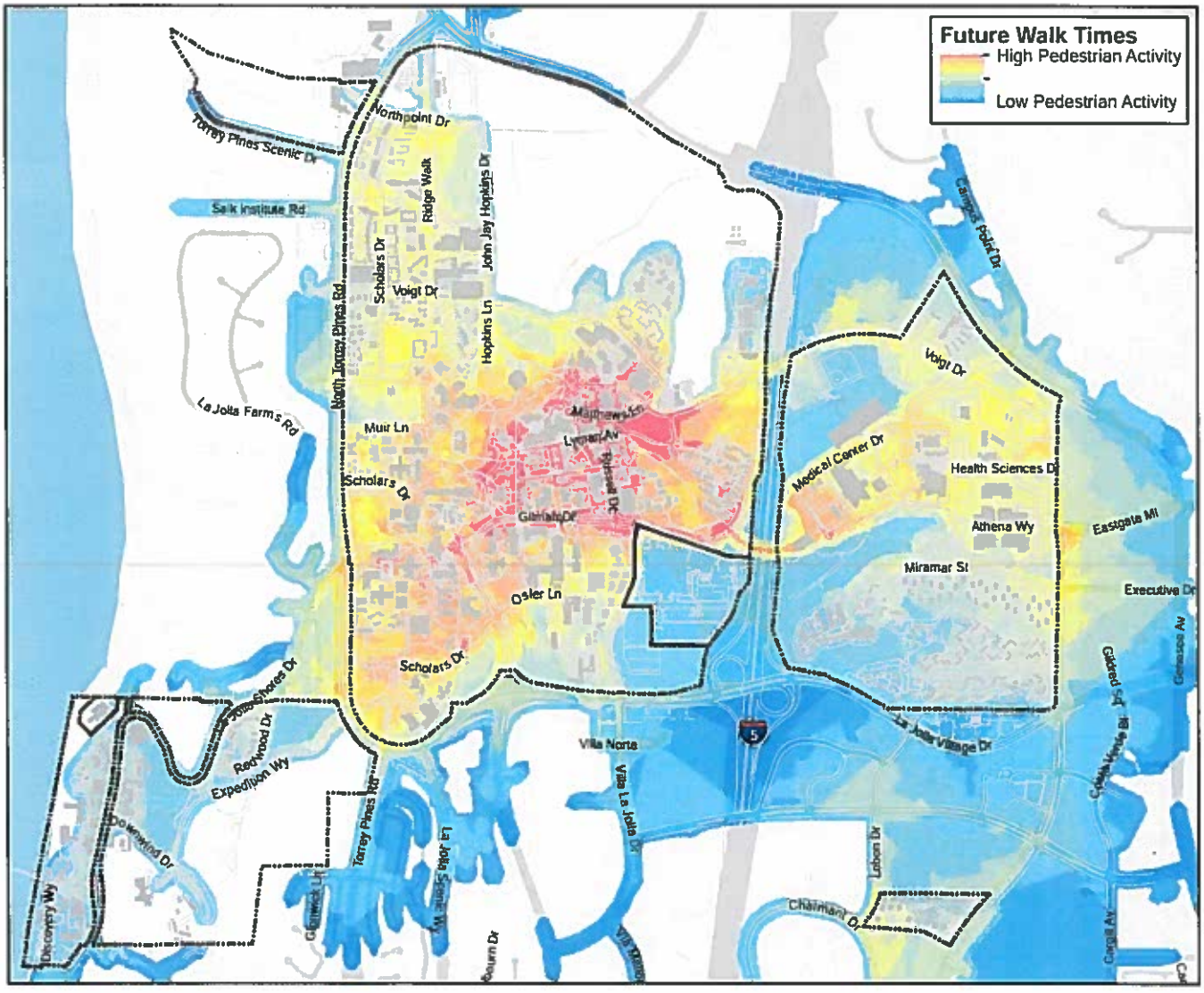


Walk times of three, five, seven and ten minutes were used from these locations and overlaid to create a composite of each walk time. Three miles per hour was used as an average walking speed. In the resulting maps, areas in red reflect higher pedestrian levels based on the accumulated walk times of the affected activity areas. Areas in blue are likely to have the least relative amount of pedestrian activity due to the small amount of walk time overlay. Activity areas closer together, between 0-5 minutes apart, scored higher because of their proximity to each other. The longer the walk times to access an area, the lower the score.

Not surprisingly, the model identified the campus center as having the highest level of pedestrian activity since the majority of the activity areas are located there.

The model was then modified to include future conditions, specifically the Light Rail Transit (LRT) stations and the planned Gilman Bridge over Interstate 5, as well as all planned medical buildings on the East Campus. The resulting model graphic illustrates the potential increase in pedestrian activity and connectivity when these new activity areas and important connections are completed.

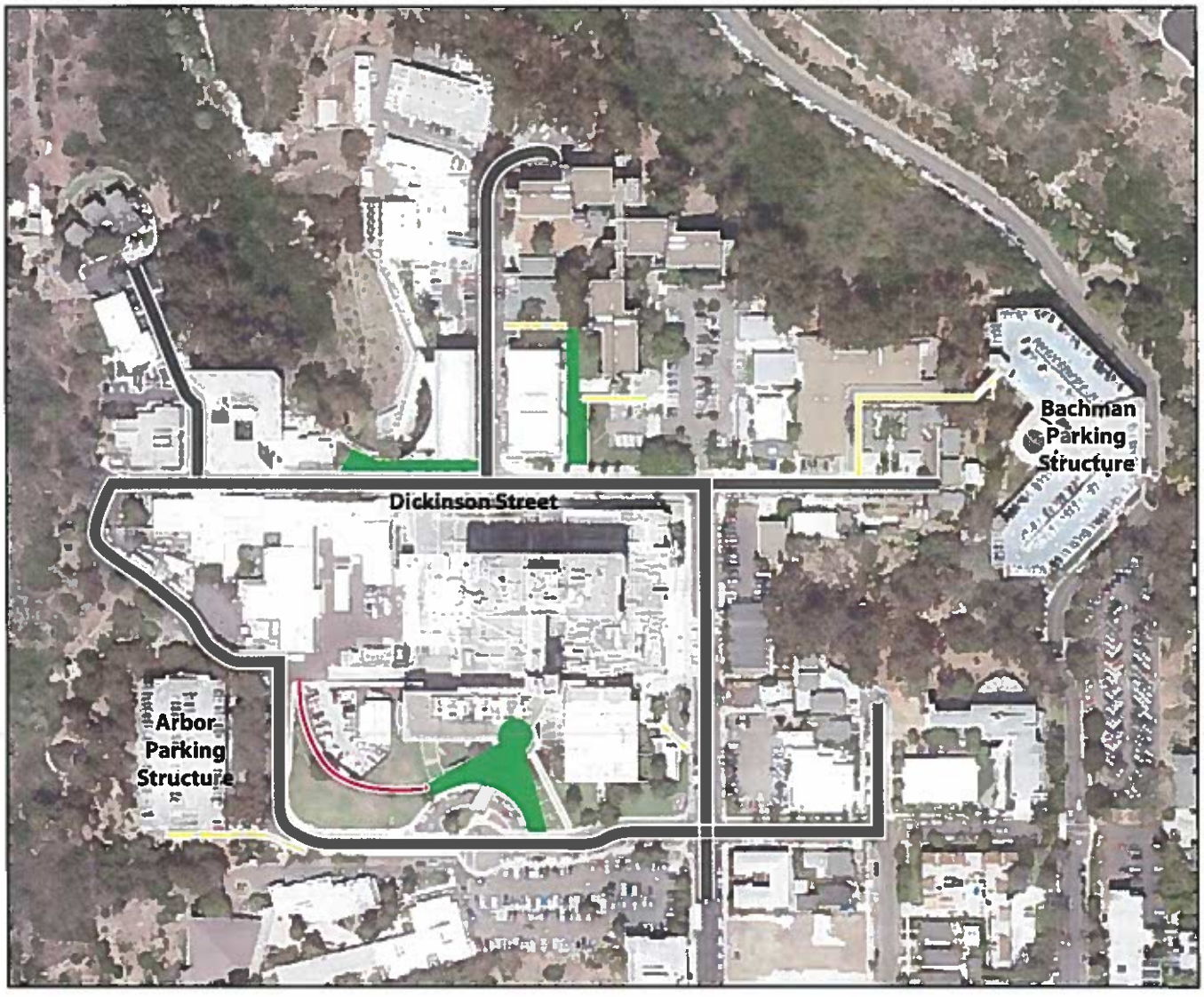
Figure 3.7: Future Walk Times



UC San Diego Hillcrest Medical Center

Pedestrian connectivity within the Hillcrest Medical Center campus employs sidewalks along area streets. There is a single campus walk joining the Arbor Parking Structure to the Medical Center entrance. A walkway from the upper level of the Bachman Parking Structure provides a connection to Dickinson Street, which also carries heavy pedestrian traffic.

Figure 3.8: UCSD Hillcrest Walking Facilities



Pedestrian Improvements

Recommended Conceptual Framework

Pedestrian connections are needed at the beginning and end of every trip, no matter what mode of transportation is used in between. Therefore, pedestrian connections are needed across campus. The level of pedestrian connection is based upon the demand in a particular location. The higher the traffic through an area, the more space and accommodations are needed in the pedestrian environment. Refer to Figure 2.3 for major activity centers as they relate to primary destination points on the campus. Refer to Figure 3.6 and 3.7 for areas of intensive pedestrian activity and future need. Refer to Figure 2.6 for important pedestrian connections (and bicycle connections) needed to connect major destinations, neighborhoods and the undergraduate colleges.

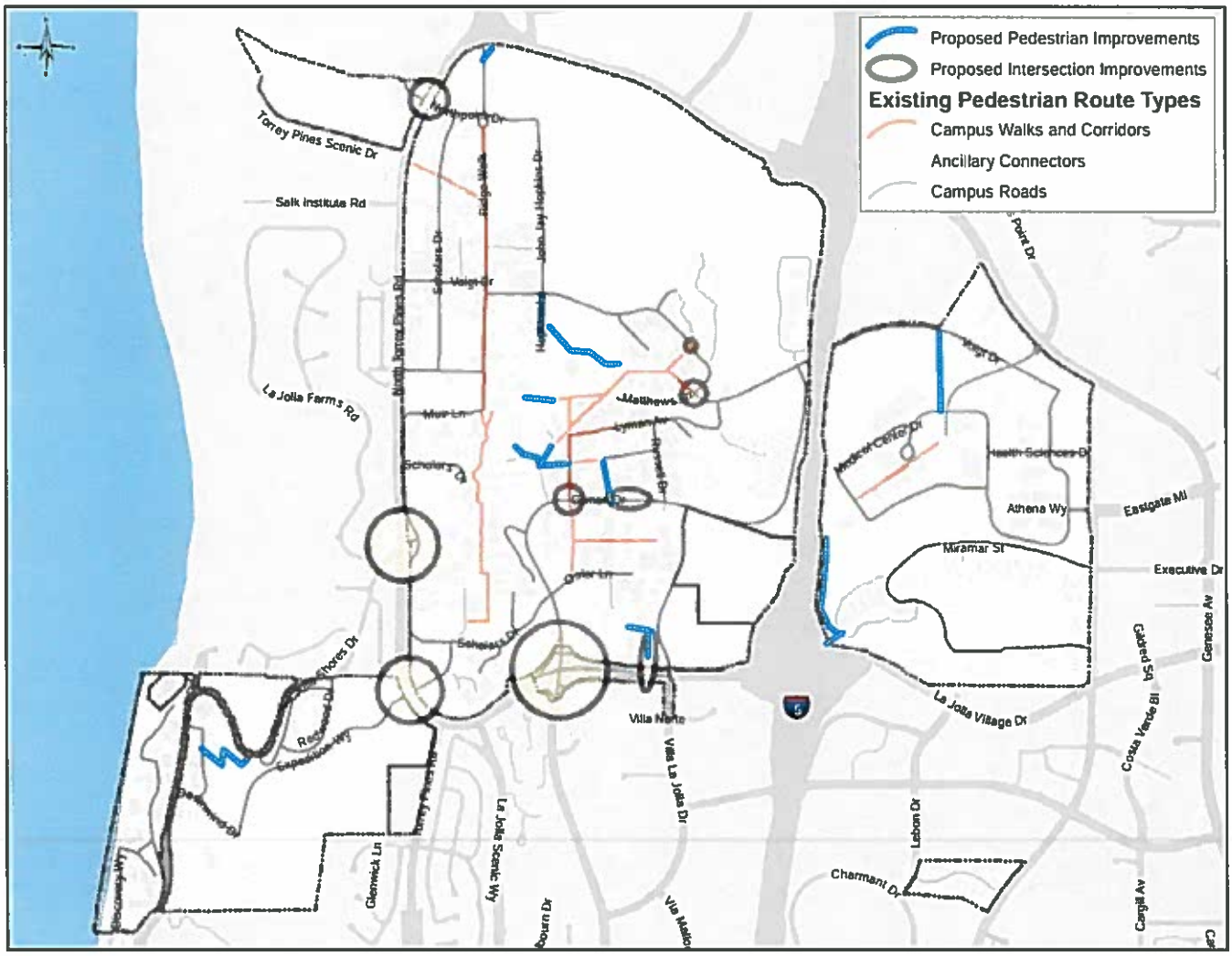
Within the campus itself, the eucalyptus-shaded walking environment is and will continue to be a distinctive campus feature and should be carefully maintained and employed as the backbone that supports the overall mobility network.

Likewise, the campus does function with a series of pedestrian protected plazas, walks, promenades and corridors and is therefore not in need of major new pedestrian facilities. However, care must be given to those pedestrian-dominant areas being considered for additional bicycle traffic as multi-use trails to make certain this does not negatively affect pedestrian use in these areas.

Proposed Pedestrian Network

This plan recommends several new projects to be added to the pedestrian network (see Figure 3.9). Some of these projects are new connections while others are improvements to existing pedestrian facilities. Some provide better routes between destinations, while others provide more accessible and safe connections.

Figure 3.9: Proposed Pedestrian Network



Other Pedestrian Facility Recommendations

Other possible pedestrian recommendations include the addition of improved lighting, surface treatments, signage and regulatory restrictions requiring walk zones for cyclists.

- Lighting improves wayfinding, security and visibility of trip hazards. Some routes would benefit from improved lighting and better surfaces. Intersection safety will also improve with increased lighting.
- Many pedestrian facilities lack adequate distinction between walkways and driving surfaces. Striping, curbs and other vertical delineators are advisable in some areas on the campus.
- Some areas are too congested for safe shared use. These areas have been recommended as areas marked as "Dismount Zones" and should be signed as such. Regulations prohibiting cycling currently exist, but the locations are not clearly signed or are inconsistently mapped. Additionally a "pedestrian only" marking or stencil may be developed to further communicate the regulations in these congested areas.

Campus Roads

The interface between pedestrian, bicycle and motor vehicle traffic must be examined closely to provide the appropriate balance of safety measures for all users. Traffic calming measures can be important amenities for cyclists and pedestrians using this route type. A "Complete Streets" approach to design that accommodates all roadway users, not just vehicle drivers, is recommended for campus roadway planning.

Campus Walks and Corridors

These support high volume pedestrian traffic and moderate bicycle and skateboard traffic. Campus delivery and maintenance vehicles also use these routes. In areas with high levels of activity, such as special events on Library Walk, high pedestrian traffic and limited space, traffic may be limited to pedestrian only.

Ancillary Connectors

These pathways are the largest network of routes on campus because they meander around larger buildings, connect smaller buildings and residence halls, particularly through the eucalyptus groves and landscaped areas. These are to be considered shared facilities where users must travel at prudent speeds and those traveling faster need to yield to slower users.

Trail Surface Suitability

Within the central campus area, UC San Diego employs asphalt for paving within the eucalyptus groves. In other areas, such as the Ecological Reserve at the north end of the campus, the pathways are natural surface.

While asphalt has probably been in use for some time due to its ease of repair, it is not a particularly sustainable product. It is a by-product of petroleum refining, releases hydrocarbons and is impermeable, concentrating and channeling rainfall instead of allowing it to be absorbed into the underlying soil.

The matrix on the following page lists potential off-street trail and pathway surface types and their inherent characteristics, primarily in terms of their sustainability.

Figure 3.10: Off-street Trail and Pathway Surface Suitability Matrix

Surface Material		Material Cost	Maint Cost	Repair Cost	Low Reflectivity/ Heat Island Effect	Stormwater Permiability	Water Quality Impacts (Hydrocarbons)	Water Quality Impacts (Sediments)	Appropriate Setting	Tree Root / Trip Hazards	ADA Compliance
Asphalt		Low	High	Low	High	Low	High	Mod	Roadways/ Parking	High	Mod
Pervious Asphalt		Mod	High	Mod	Mod to High	High	High	Low	Roadways/ Parking	Mod	High
Concrete		Mod	Low	Mod	Low	Low	Low	Low	Minor Walkways	Low	High
Enhanced Concrete		Mod to High	Low to Mod	High	Mod	Low	Low	Low	Major Walkways/ Plazas	Low	High
Pervious Concrete		Mod	Mod	Mod	Low	High	Low	Low	Parking/ Plazas/Nat Areas	Low	High
Integral Color with Rustic Materials such as DG/Sands		High	Low	High	Mod	High	Low	Mod	Landscaped/ Nat Areas and Groves	Low	High
Grouted Pavers		High	Low	Mod	Low	Low to Mod	Low	Low	Urban Plaza	Low	High
Ungrouted Pavers		High	Low	Low	Low	Low to Mod	Low	Mod	Urban Plaza	Mod	High
Compacted Native Soil		Low	Mod	Low	Low	High	Low	High	Rustic Grove	High	Low
Decomposed Granite		Low	Mod	Low	Low	High	Low	High	Rustic Grove	Mod	Low
Stabilized Decomposed Granite (Polymer-based Stabilizer)		Mod	Mod	Low	Low	Low	Low	Mod	Rustic Grove	Low	Mod to High

Related Transportation Modes

4

Regional and local transit is an important component of campus mobility access. The campus works to discourage the use of private vehicles in a positive way by making other mobility modes equally convenient. Connecting different modes, such as shuttles with commuter rail, is one way the campus accomplishes this. Encouraging the use of transit instead of driving and parking on campus also supports the university's "green" goals and reduces congestion and green house gas emissions. For the purposes of this study, consideration of other transportation modes is an opportunity to expand bicycle and pedestrian use through convenient linkages and potential collaboration to serve all users. Likewise, transit ridership is increased when a walkable and bikeable destination is provided.

"Regional and local transportation systems are playing an ever larger role in efforts to ensure access to the campus. UCSD is working closely with regional public transit agencies to ensure service improvements will occur at the earliest possible date."

Source: LRDP

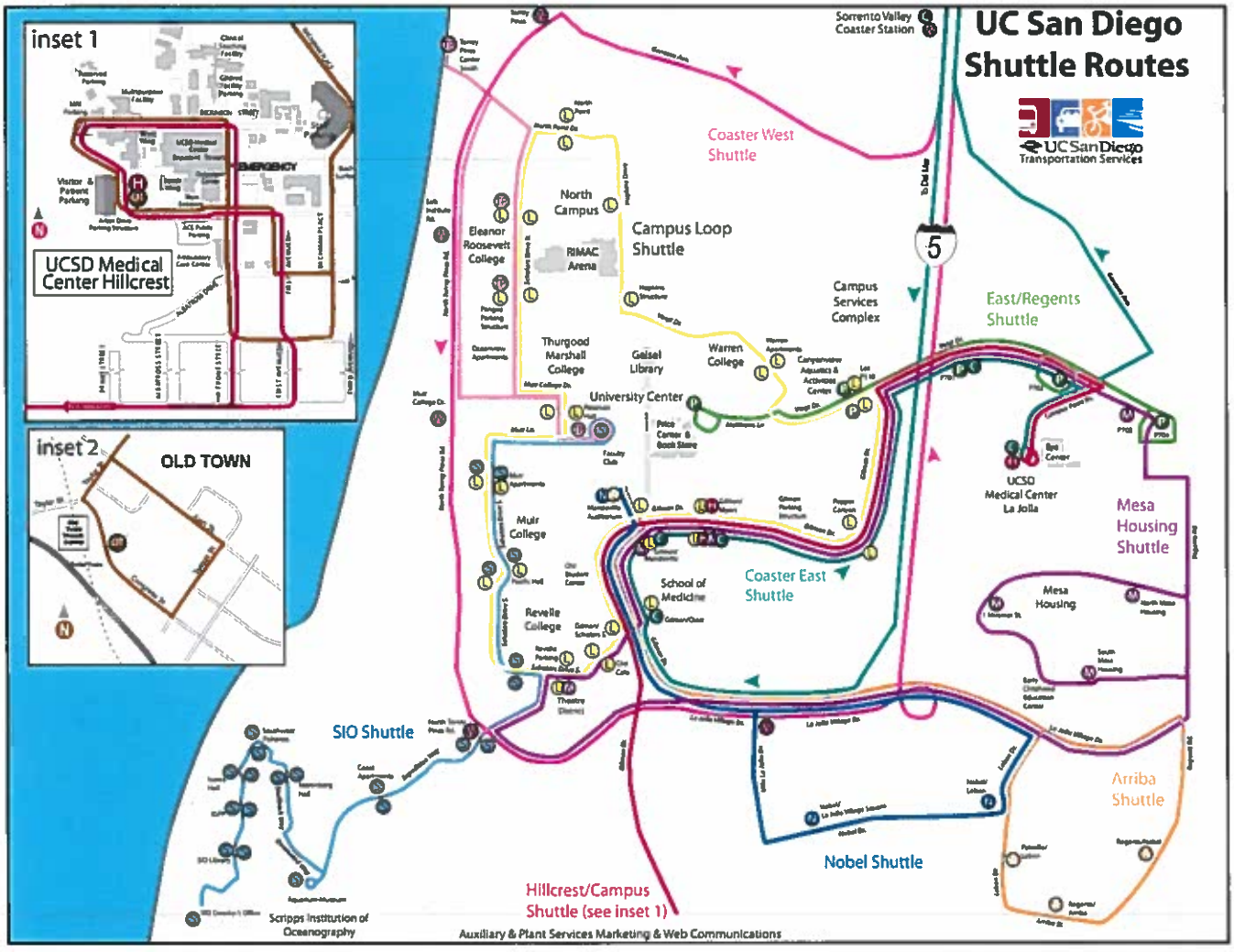
Shuttle Services

UC San Diego Transportation Services operates an extensive shuttle system for students, faculty and staff. Routes are designated by letter on the UC San Diego Shuttle Map (Figure 4.1) as follows:

- A: Arriba Shuttle connects Mandeville Auditorium and Regents Road area
- N: Nobel Shuttle connects Mandeville Auditorium and Nobel Drive area
- L: Campus Loop connects West Campus parking structures and colleges
- W: Coaster Shuttle West connects West Campus and Sorrento Valley Coaster Station
- C: Coaster Shuttle East connects southern portion of West Campus and medical center area with Sorrento Valley Coaster Station
- P: East/Regents Shuttle connects Regents Road area and campus center
- H: Hillcrest/Campus Shuttle connects Hillcrest and La Jolla medical centers
- OT: Hillcrest/Old Town Shuttle connects Hillcrest Medical Center and Old Town Transit Center
- M: Mesa Housing Shuttle connects Mesa Housing and campus center
- S: Scripps Institution of Oceanography connects SIO and campus center
- TP: Torrey Pines Center Shuttle connects Torrey Pines Center and campus center

There is also a seasonal Holiday Airport Shuttle for students only from Peterson Hall to Lindbergh Field.

Figure 4.1: Shuttle Routes



Bus Services

UC San Diego Transportation Services works closely with the regional public transit agencies SANDAG and MTS to encourage faculty, staff and students to use public transit. One example is a subsidy for students to purchase a "College Pass" from MTS, which allows unlimited use of public transit throughout San Diego. Another example is the UC San Diego Bus Zone. Staff, faculty and students with a free Bus Zone sticker on their current, valid photo ID card ride free for unlimited stops on six bus routes serving the La Jolla campus:

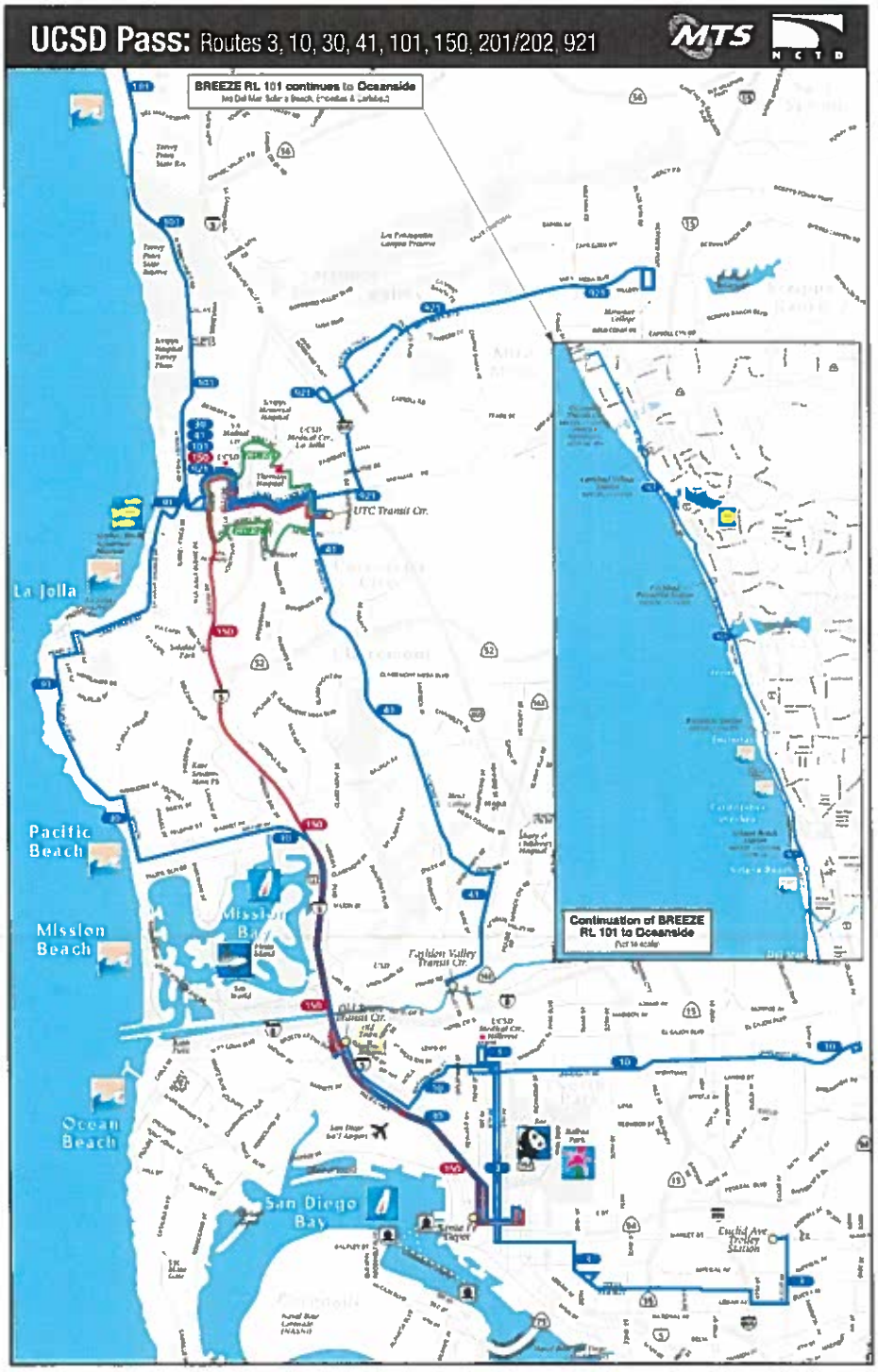
- Route 30: UTC, La Jolla, Pacific Beach, Old Town, downtown San Diego
- Route 41: VA Hospital, UTC, Clairemont, Fashion Valley
- Route 101: UTC, Del Mar, Solana Beach, Encinitas, Carlsbad, Oceanside
- Route 150: UTC, VA Hospital, Old Town, downtown San Diego
- Route 201/202 SuperLoop: UTC area
- Route 921: UTC, Mira Mesa

Two routes serve the UC San Diego Hillcrest Medical Center:

- 3: Hillcrest, downtown San Diego, Euclid Avenue Trolley Station
- 10: Old Town, Mission Hills, Hillcrest, North Park, City Heights, College Avenue

Outside the Bus Zone, other transit options are provided by the rest of the MTS system, including all city bus routes and the trolley. MTS also offers on-line trip planning.

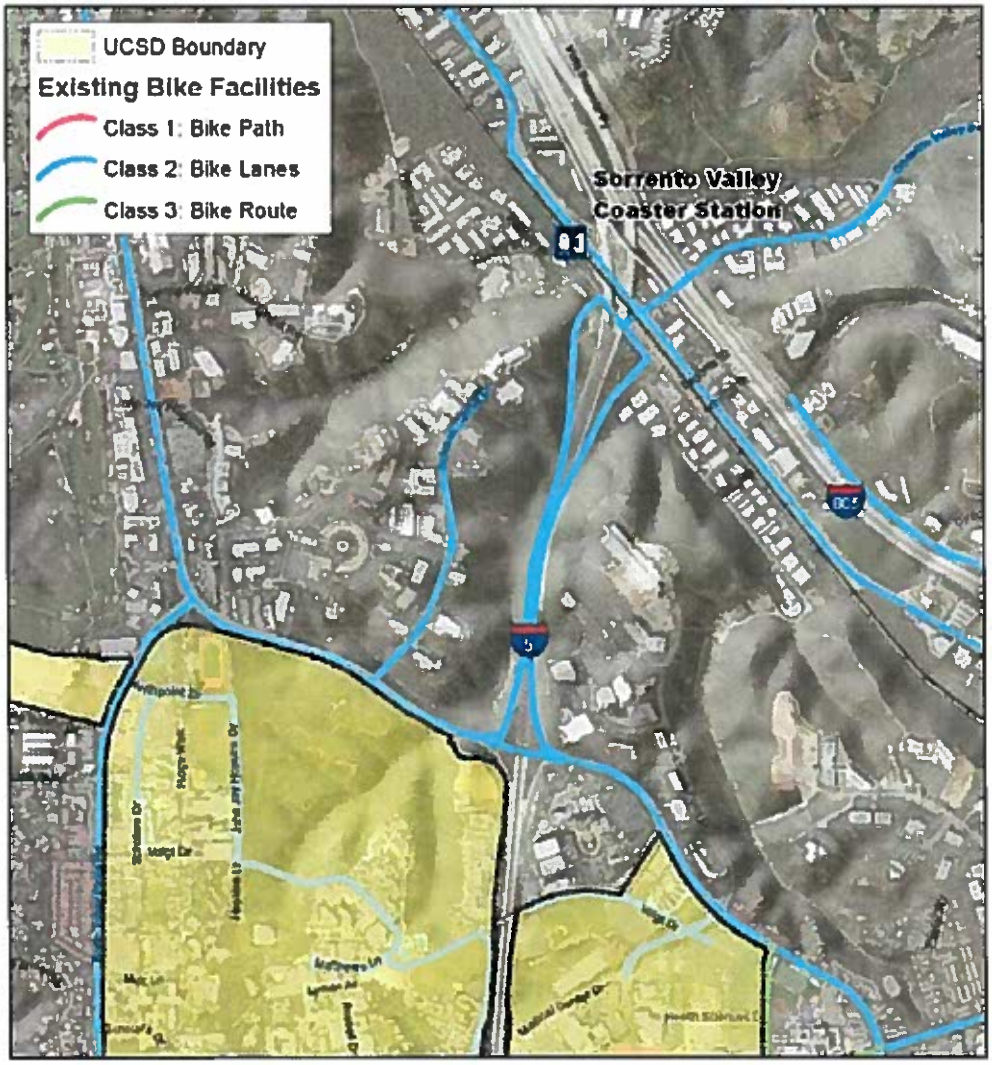
Figure 4.2: Bus Zones



Commuter Rail

The North County Transit District (NCTD) operates a commuter rail line whose closest stop to UC San Diego is at the Sorrento Valley Coaster Station just north of the campus. This line connects eight stations between Oceanside and downtown San Diego. The Coaster then connects with multiple transit systems in Oceanside and the MTS bus and trolley system at the Old Town and downtown San Diego stops. The Sorrento Valley Station is currently connected to the campus via the Coaster Shuttles noted previously. Plans are underway to provide a bicycle path along Interstate 5 to Voigt Drive as part of the Interstate 5/Genesee Avenue interchange project.

Figure 4.3: Commuter Rail



Other Planned Transit

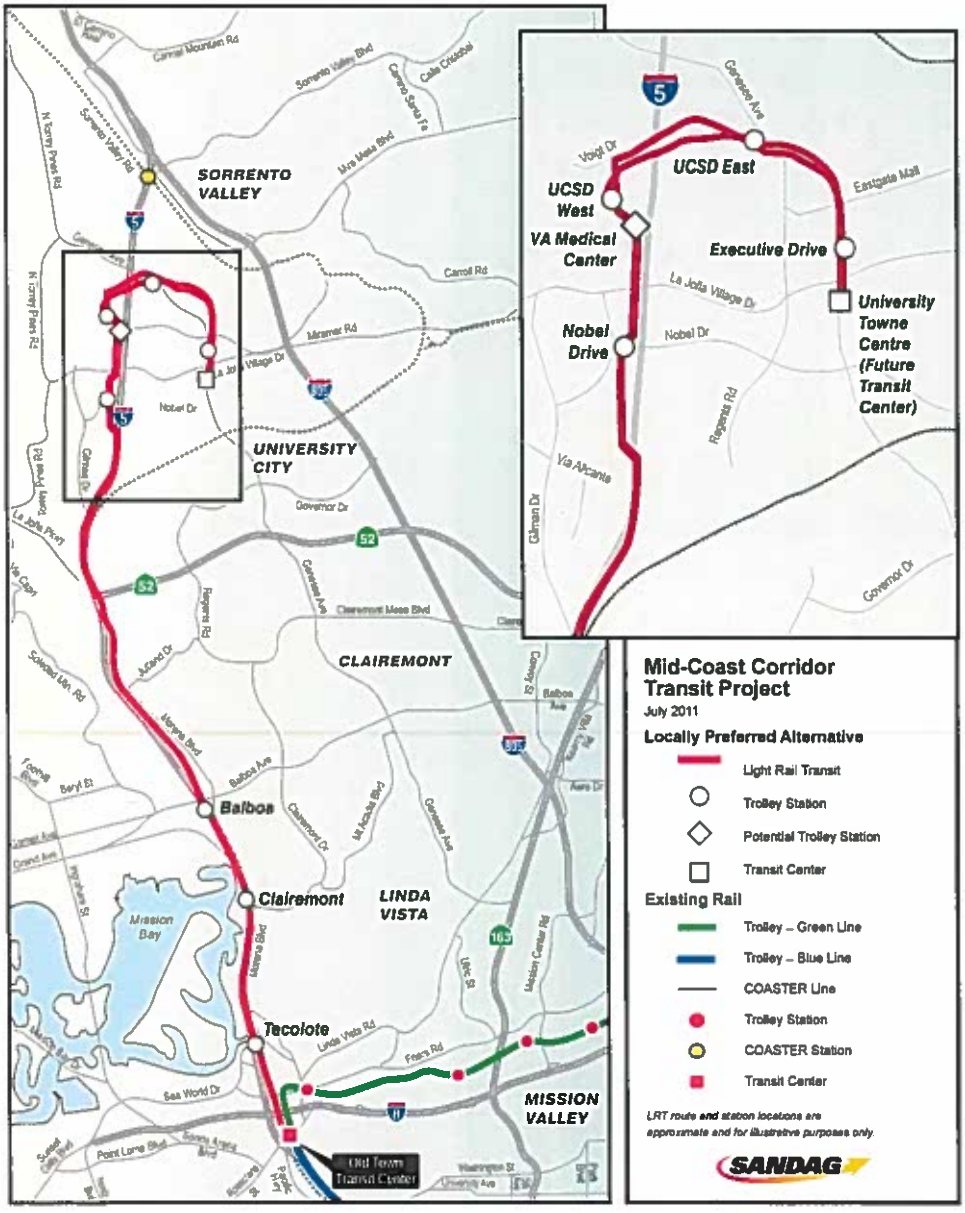
Planning is underway to expand the MTS trolley system to include a route through the UC San Diego campus. The Mid-Coast Corridor Transit Project will extend light rail transit (LRT) service from the Old Town Transit Center to the University City community serving major activity centers such as UC San Diego, Westfield UTC, Old Town and downtown San Diego.

The route follows the existing railroad right-of-way north from Old Town Transit Center to Gilman Drive, then crosses to the west side of Interstate 5 to a station at Nobel Drive and continues on to serve the UC San Diego campus, the medical center on the east side of Interstate 5 and terminates at the Westfield UTC transit center.

Two campus stations are planned. The UC San Diego West Station will be located in the central campus east of Russell Drive and north of Gilman Drive. The UC San Diego Campus East Station will be located east of Interstate 5 on Voigt Drive, south of Genesee Avenue.

A shuttle and bus transit center is also planned for Gilman Drive at Myers Drive within walking distance of the planned UC San Diego West Station.

Figure 4.4: Planned Light Rail



Project and Program Recommendations

5

Priority Projects and Programs

Within the overall recommended network, a number of discrete projects emerged as particularly important in achieving active transportation improvements. Of these selected projects, five were chosen as the top priorities and addressed to a higher degree of detail to support near-term implementation.

The remaining projects are included as longer-term improvements, but all are intended to support active transportation by encouraging more members of the UC San Diego community to bike or walk to and around the campus, instead of driving. Bicycle and pedestrian icons indicate which mode each project serves, with most serving both to some degree.

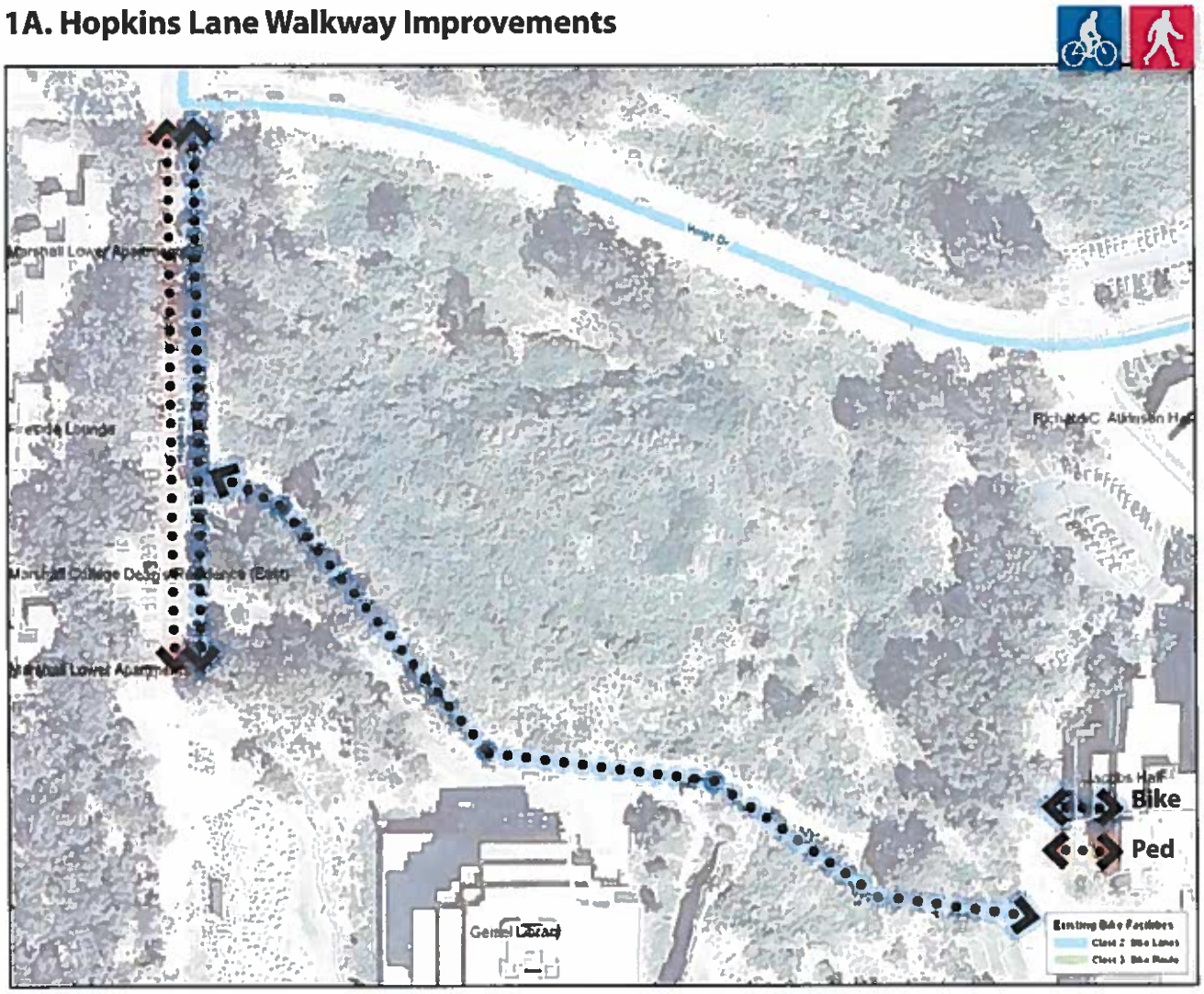
Projects not within UC San Diego's jurisdiction are grouped following the on-campus projects. These include a number of intersection improvements on streets immediately around the campus and within the right-of-way of adjacent Interstate 5. Implementation of these projects will require coordination with appropriate agencies, primarily the City of San Diego and Caltrans.

A series of encouragement and education programs are also included, with more detailed descriptions of the top three priority programs.

Based on project scope and the number and variety of project and program types, the top five projects and top three programs represent the top priority recommendations and have been highlighted in the following sections of this chapter.

Recommended Projects

1A. Hopkins Lane Walkway Improvements



Problem:

- Missing sidewalk on west side of Hopkins Lane.
- West leg stop bars too far into Voigt Drive/Hopkins lane intersection.

Proposed Improvement:

- Change parking configuration to parallel parking and add sidewalks and sharrows and move stop bars back an appropriate distance. *(This route would provide a direct route to the library from Voigt Drive via Hopkins Lane.)*

1B. Library Walk Bicycle Bypass (north of Library)

Problem:

- Need alternate bicycle routes around Library Walk.

Proposed Improvement:

- Investigate connection between Hopkins Lane and Warren College as a formalized multi-modal connection. Would require lighting and paving upgrades. *(May require removal of parking spaces on Hopkins Lane to make entrance more visible.)*

Background

Hopkins Lane and the pathway north of the Geisel Library connect large amounts of student housing in Eleanor Roosevelt College and North Campus to the academic buildings in Warren College. Hopkins Lane is also the primary pathway to the central campus from the Hopkins Parking Structure. Just south of the Geisel Library, Library Walk is a bicycle dismount zone. Both facilities are used by cyclists, pedestrians and electric carts. Hopkins Lane is also used by vehicles. The proposed improvements would improve Hopkins Lane for cyclists and pedestrians, as well as improve the pathway north of the Geisel Library to alleviate congestion on Library Walk.

This project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and online surveys, the campus community indicated Hopkins Lane and the pathway north of the Geisel Library as an area for improvement, especially to alleviate congestion on Library Walk.

Description of Need

Library Walk is one of the campus' foremost activity centers. It is an open space, a transportation corridor and an event programming space. It is typically packed with students between classes. Because of its high use levels, Library Walk is a bicycle dismount zone to reduce the possibility of cyclist versus pedestrian conflicts.

No suitable and direct facilities for cyclists or pedestrians exist between Eleanor Roosevelt College, North Campus and Warren College. Voigt Drive is a relatively direct connection with bike lanes and sidewalks, but it is not well-used by cyclists or pedestrians because of its somewhat indirect path, higher traffic speeds and steep grades.

In its existing condition, Hopkins Lane has narrow sidewalks on its east side only. It has a combination of student parallel parking and 90 degree parking on both sides. Street lighting is intermittent. There is a book drop-off loop frequently used by drivers to drop-off books or passengers. Pedestrians often walk in the middle of the street. Due the high rate of parking turnover and traffic volumes, the roadway configuration is currently not suitable for cyclist or pedestrian transportation.

The pathway north of the library has a varying width of approximately six to eight feet. Pavement quality is generally poor and adjacent landscaping encroaches on the path. Pathway lighting is intermittent.

Project Description

Improving Hopkins Lane and the pathway north of the Geisel Library would give students traveling by bicycle between Eleanor Roosevelt College, North Campus and Warren College a high-quality facility that bypasses Library Walk. To make path access more visible, two parking spaces should be removed where it intersects with Hopkins Lane and lighting should be increased at the path entrance.

The proposed project would add sidewalks along Hopkins Lane to encourage pedestrians away from walking in the street. It would add sharrows on Hopkins Lane to indicate a shared lane for bicycles and vehicles and to encourage proper cyclist positioning. The proposed project would also improve the pathway north of the Geisel Library by widening it to eight to 10 feet, replacing the worn asphalt and improving the connection to the Snake Path and Warren College. Lighting would be added along Hopkins Lane and the pathway north of the Library, where a two foot decomposed granite sidepath would be added adjacent to the eight feet of asphalt paving. This sidepath would be compacted and polymer-stabilized to prevent loose material from drifting onto the asphalt portion.

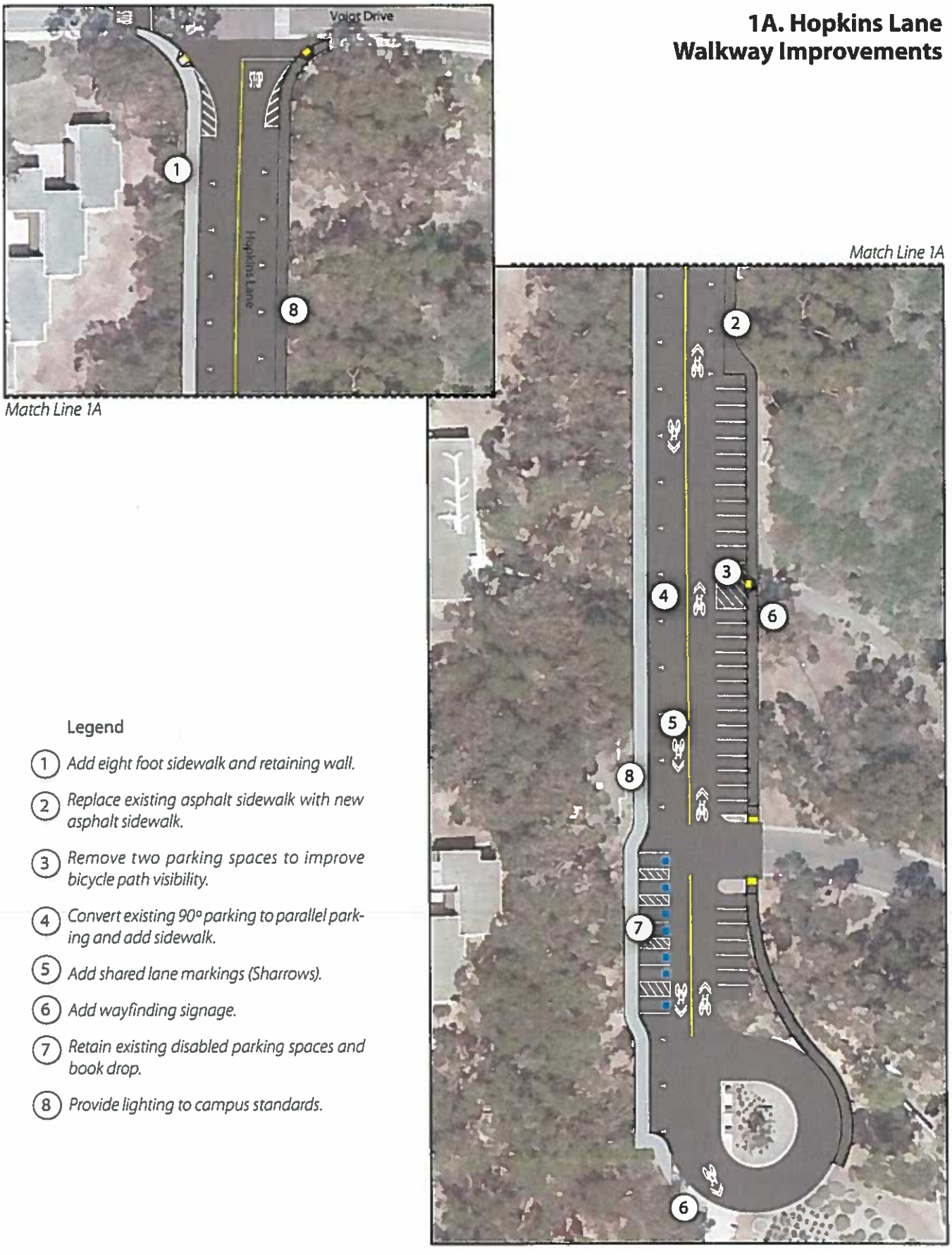
Cost Estimate

$282,350

Candidate Funding Sources

- UC San Diego infrastructure project

1A. Hopkins Lane Walkway Improvements



Legend

1. *Add eight foot sidewalk and retaining wall.*
2. *Replace existing asphalt sidewalk with new asphalt sidewalk.*
3. *Remove two parking spaces to improve bicycle path visibility.*
4. *Convert existing 90° parking to parallel parking and add sidewalk.*
5. *Add shared lane markings (Sharrows).*
6. *Add wayfinding signage.*
7. *Retain existing disabled parking spaces and book drop.*
8. *Provide lighting to campus standards.*

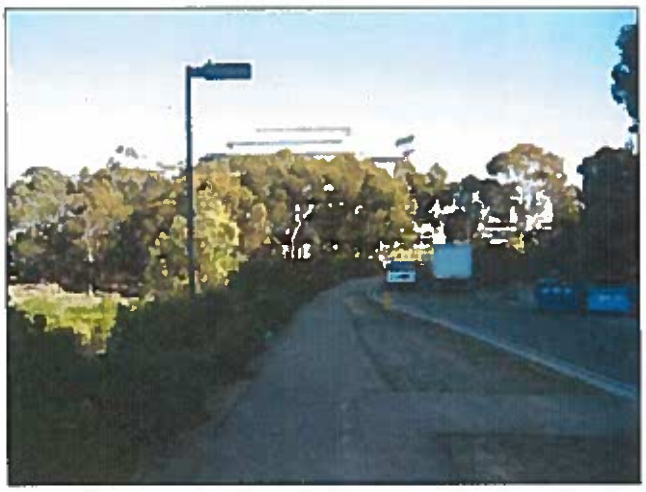
1B. Library Walk Bicycle Bypass (north of Library)


Legend 1B
1 Widen path to ten feet.
2 Trim encroaching vegetation.
3 Add curb ramp to Geisel Library service entrance.
4 Widen path to eight feet with two foot polymer-stabilized decomposed granite side path.
5 Add native soil and mulch to both sides of Snake Path to achieve ten foot width.
6 Provide lighting to campus standards.
6
4
5
N
NOT TO SCALE
Match Line 1B

Shared lane markings (Sharrows) indicate a shared lane for cyclists and vehicles and recommended cyclist positioning within the roadway.

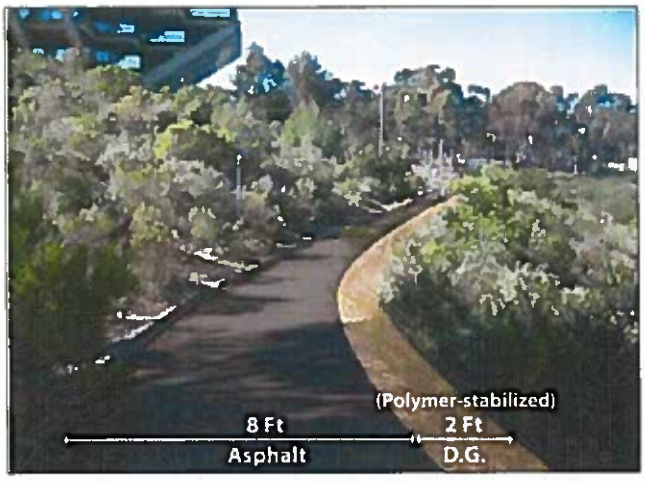
Wide walkways allow pedestrians to comfortably walk side-by-side and encourage walking on them instead of in the street.

Tuncated domes alert the sight-impaired to roadway crossings. Typically yellow to contrast with concrete walkways, thyey can be other colors as long as they provide sufficient contrast with the surface.



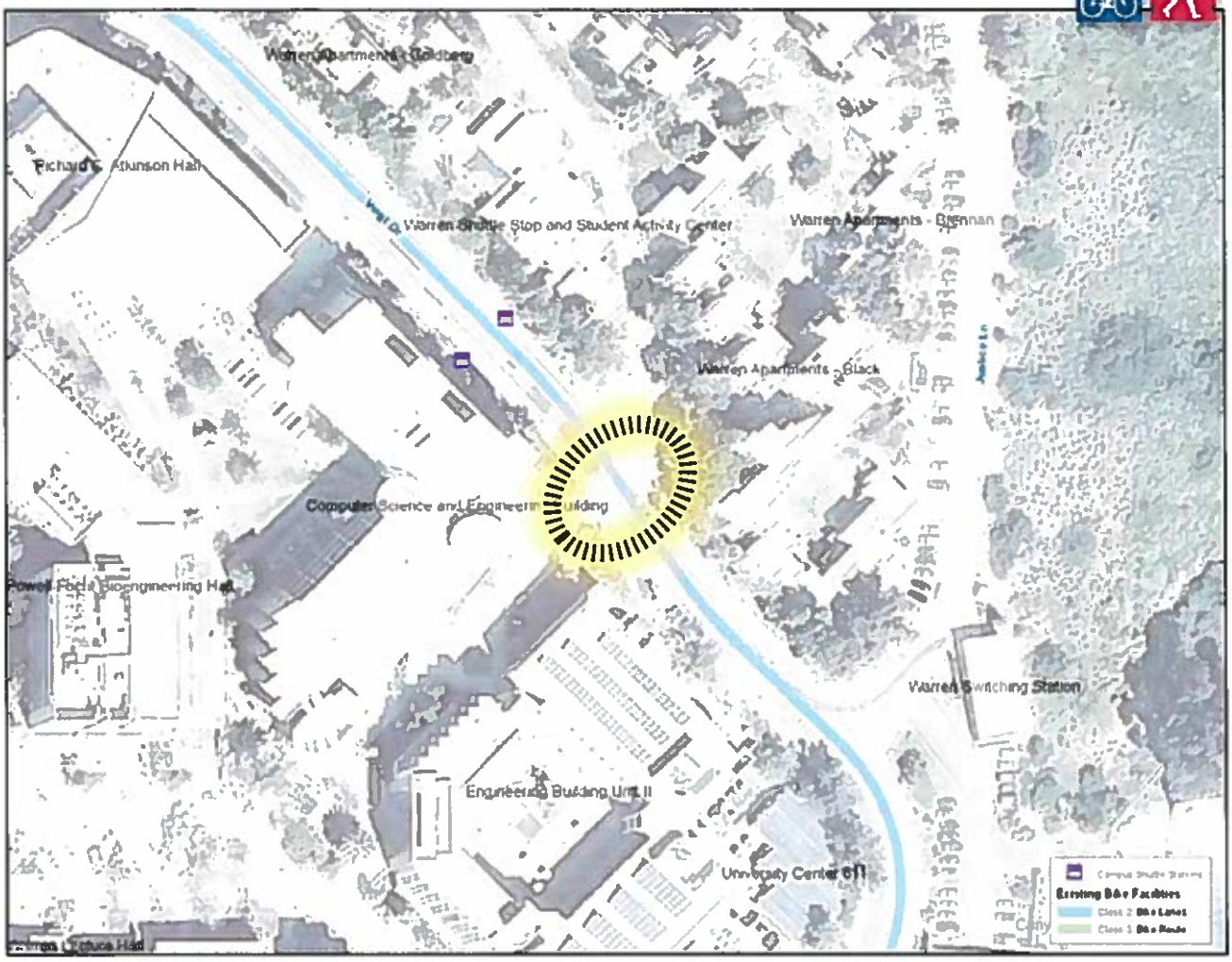
New light fixtures should match the existing black "shoebox" style found throughout the area.

No new pavement will be added adjacent to the Snake Path. Instead, vegetation should be trimmed back and native soil and mulch added along the sides.



The path will be asphalt with polymer-stabilized decomposed granite on one side.

2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing



Problems:

- Crossing conflict. *(May need to "calm" bicycle, skateboard and pedestrian traffic. Some drivers do not yield to crossing cyclists, skateboarders and pedestrians. Likewise, many cyclists, skaters and pedestrians cross without hesitation or regard for right-of-way.)*
- Constant flow of traffic in all directions from all uses.
- Poor crosswalk visibility to approaching eastbound drivers on Voigt Drive due to vertical curvature.

Proposed Improvements:

- Add truncated domes *(resolves one problem only).*
- Remove existing speed table and replace with California MUTCD-compliant design. *(US Traffic Calming Guide includes suggested best practices for bicycle-compatible speed tables.)*
- Existing signage at crossing not standard nor consistent with California MUTCD and California Vehicle Code. *(California law requires drivers to yield (not stop) for pedestrians within crosswalks.*
- Install functional chicanes where pedestrians and cyclists approach street to induce them to slow before crossing. *(Such diversions need to be highly visible and allow for emergency vehicle access.)*
- Consider stop sign or signal if pedestrian volumes meet California MUTCD warrant.

Background

The Voigt Drive crossing in Warren College is heavily used by students since it connects large quantities of student housing north of Voigt Drive with academic buildings south of Voigt Drive. The purpose of the proposed project is to improve safety for pedestrians, cyclists and other users.

The project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and on-line surveys, this crossing was noted as a location for improvement. Collisions occurred here during the course of the study.

Description of Need

The Warren College Apartments and the Warren College Residence Halls provide housing for a significant portion of the UC San Diego campus population north of Voigt Drive. South of Voigt Drive, highly-used academic buildings within Warren College include Warren Lecture Hall and the engineering buildings. Anyone who walks between the residential and academic buildings in Warren College must use this crossing.

The existing crossing features a raised crosswalk with signage for both drivers and cyclists/pedestrians, full-time flashing beacons in advance of the crosswalk and several clusters of "Bott's dots." Voigt Drive has two vehicle lanes and carries hundreds of vehicles per hour. The speed limit on Voigt Drive is not well-defined. Westbound, there are signs that clearly indicate the speed limit is 25 miles per hour. However, the nearest eastbound speed limit sign is over 1,000 feet away and indicates that the speed limit is 35 miles per hour. Closer to the crosswalk, there are "25" stencils on the roadway. Because of existing vertical and horizontal curvature, eastbound sight distance is limited to approximately 160 feet. Downhill pathways leading to the crosswalk often result in cyclists, skateboarders and other wheeled users crossing Voigt Drive at unsafe speeds.

UC San Diego staff and participants in the community workshops indicated that the existing speed table is not performing well because of its gentle slope and height. They noted incidences of close calls and at least one recent collision. Pedestrians and cyclists at the crosswalk are often inattentive. Yield compliance by drivers is moderate.

Crosswalk improvements would provide students, faculty and staff with a safe crossing between the residential and academic buildings.

Project Description

Two options are proposed for the crossing across Voigt Drive at Warren College:

Option A would remove the existing raised crosswalk and replace it with high-visibility crosswalk striping and curb ramps. It would add California MUTCD-compliant signage including "State Law: Yield to Pedestrians Within Crosswalk." Within the pathway south of the crosswalk, sections of paving would be replaced with cobbles mortared in place to create a chicane effect to slow downhill cyclists and skateboarders as they approach the crossing.

West of the crosswalk, speed humps would be added to Voigt Drive to slow eastbound vehicles. The proposed speed humps are designed to produce acceptable vehicle speeds for the available eastbound sight distance. As an optional enhancement, Rapid Rectangular Flashing Beacons (RRFBs) with remote detection are recommended.

Option B would remove the existing raised crosswalk and replace it with high-visibility crosswalk striping, curb ramps and a traffic signal with pedestrian-friendly timing. California MUTCD-compliant signage would be provided to alert drivers of the traffic signal. On the pathway south of the crosswalk, sections of paving would be replaced with mortared cobbles to provide a chicane effect to slow downhill cyclists and skateboarders.

Option A could be implemented in the near-term to address existing need. Given the anticipated increase in traffic volume associated with the Voigt Drive Direct Access Ramp (DAR), Option B should be implemented with the Caltrans North Coast Project.

Cost Estimate

Option A: $26,770 ($74,770 with optional RRFB installation)

Option B: $196,480

Candidate Funding Sources

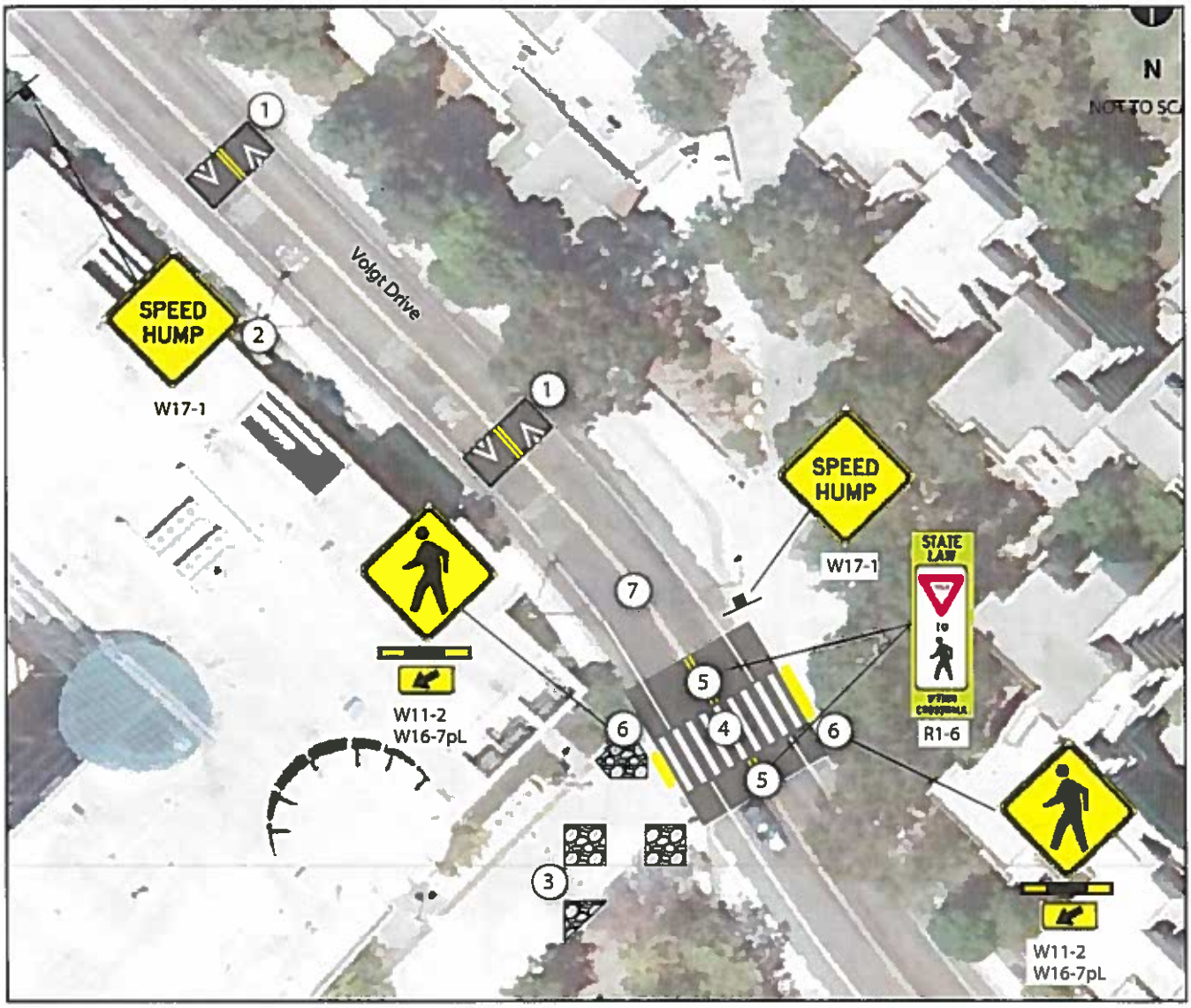
Option A:

- UC San Diego infrastructure project
- Highway Safety Improvement Program (HSIP)

Option B:

- Caltrans North Coast Project

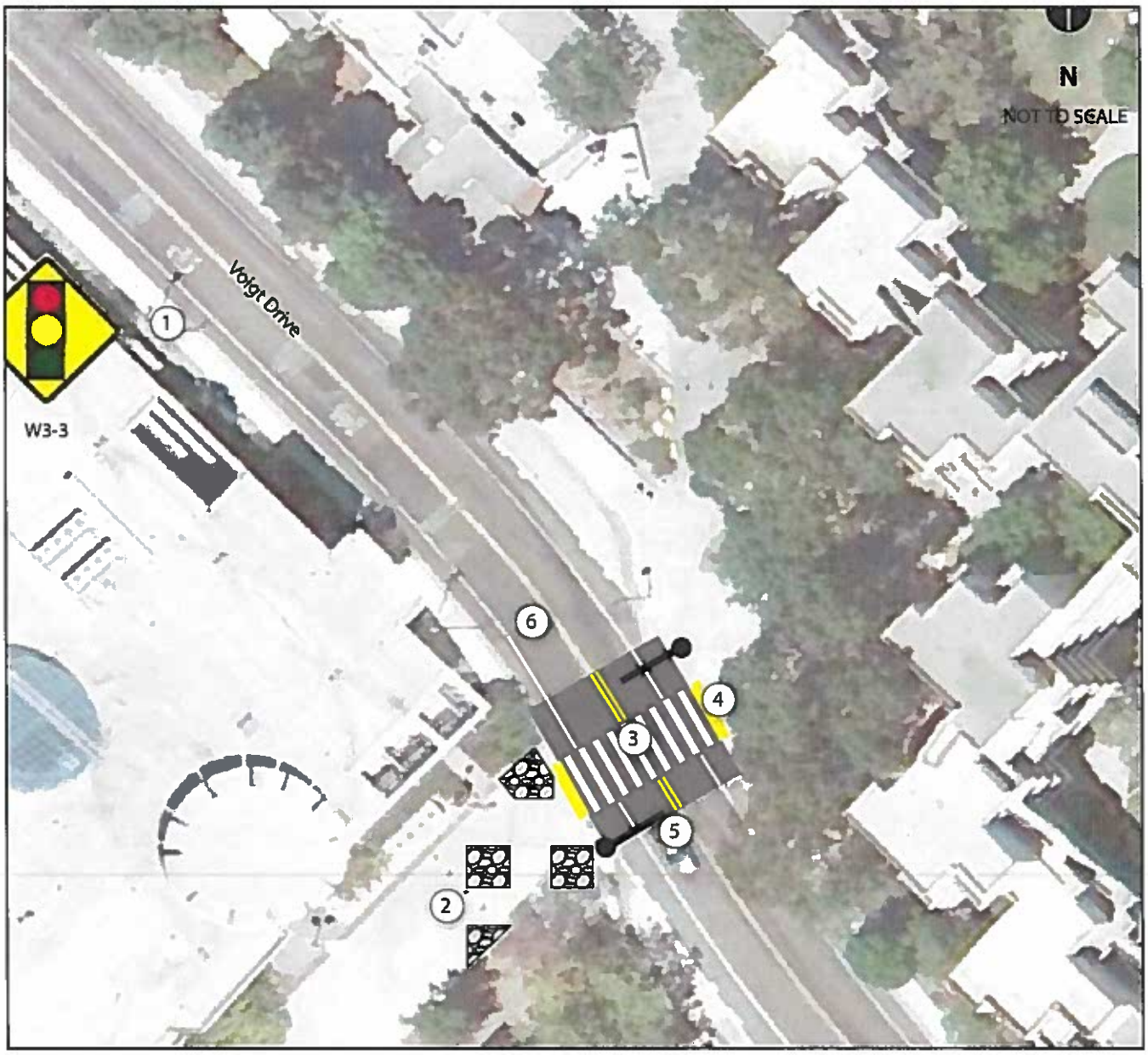
2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing - Option A



Legend 2 - Option A (Yield-controlled Crossing)

1. *Add 14 foot long, four inch high sinusoidal speed humps.*
2. *Remove existing flashing beacon.*
3. *Add chicanes to reduce approach speeds. Employ fixed-in-place cobble to maintain emergency access.*
4. *Replace existing raised crosswalk with at-grade crosswalk and high-visibility striping.*
5. *Add MUTCD-compliant crosswalk signage.*
6. *Optional: Install Rapid Rectangular Flashing Beacons (RRFBs) with remote detection.*
7. *Provide lighting to campus standards.*

2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing - Option B



Legend 2 - Option B (Signalized Crossing)

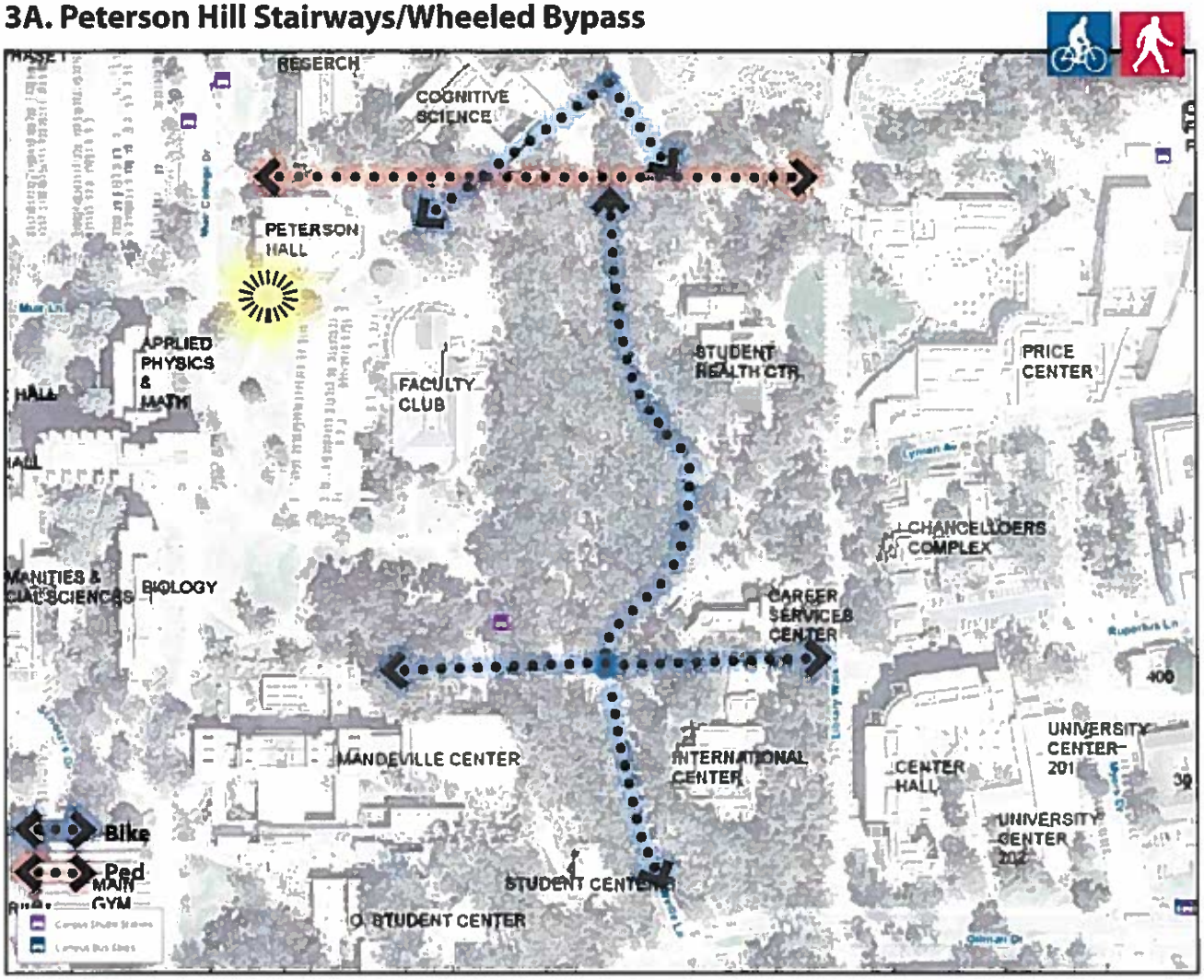
1. *Remove existing flashing beacon.*
2. *Add chicanes to reduce approach speeds. Employ fixed-in-place cobble to maintain emergency access.*
3. *Replace existing raised crosswalk with at-grade crosswalk and high-visibility striping.*
4. *Add truncated domes.*
5. *Add traffic signal with pedestrian-friendly phasing/timing*
6. *Provide lighting to campus standards.*

The traffic signal should have vehicle and pedestrian-controlling indicators and should be timed to prioritize pedestrian travel during class change periods.

The chicane is intended to coordinate with the existing paving scoreline pattern. Specific concrete sections would be replaced with fixed-in-place cobble.

Cobble should be large enough to discourage riding across them by cyclists and skateboarders, but small enough to allow continued access for emergency vehicles.

3A. Peterson Hill Stairways/Wheeled Bypass



Problems:

- Steep grade encourages excessive wheeled vehicle speeds.

Proposed Improvements:

- To reduce bicycle and skateboarder speed, add stairs to the central, main connection between Peterson Hall and Library Walk. This will divert wheeled traffic to the north and both separate and slow bicycle and skateboard traffic.
- To improve pedestrian circulation to the south of Peterson Hall, improve crosswalk with high-visibility crosswalk markings, add truncated domes and in-pavement "knockdown" signs directing drivers to yield to pedestrians.

3B. Grove Path Connection

Problems:

- Bicycles currently not allowed Monday through Friday, 8:30 a.m. to 5:30 p.m. *(Some lack of compliance likely due to lack of alternate routes.)*
- No skateboarding allowed.
- High pedestrian activity area with numerous conflict points.

Proposed Improvements:

- Create parallel path for cyclists within adjacent eucalyptus grove utilizing existing asphalt paving. *(Need to consider impact, design, materials and precise alignment within grove for no net loss of trees. Must recognize multiple user types and multiple potential crossing points.)*
- Future rebuilding of International Center may allow for direct connection to central campus via Rupertus Way.

Background

Peterson Hill and paths through the Stuart Collection's "Two Running Violet V Forms" connect Thurgood Marshall and Muir Colleges to Library Walk, which is a bicycle dismount zone. These pathways are used by cyclists, pedestrians and campus carts. The proposed improvements would reduce bicycle, skateboard and other wheeled traffic speeds down Peterson Hill, provide a bicycle route alternative to Library Walk and a direct connection to Warren College.

This project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and online surveys, members of the campus community indicated the area west of Library Walk as an area for improvement, especially to alleviate congestion on Library Walk.

Description of Need

Library Walk is one of the campus' foremost activity centers. It serves as an open space, a transportation corridor and an event programming space. It is typically packed with students between classes. Because of its high level of use, to reduce the possibility of cyclist versus pedestrian conflicts, Library Walk is a bicycle dismount zone.

In its existing condition, the pathway on Peterson Hill is 12-14 feet wide and fairly steep. Downhill bicycle and skateboard speeds are high, but most users walk their bicycles and skateboards when going uphill. Cyclists, skateboarders and other wheeled users going down Peterson Hill at high speed meet the pedestrian-congested Library Walk at the bottom.

No suitable and direct alternatives to Library Walk exist for north-south bicycle travel. Mandeville Lane, the driveway to Parking Lot P415 and a path near the Stuart Collection's "Two Running Violet V Forms" parallel Library Walk, but none have amenities for cyclists. Mandeville Lane and the shuttle loop near Mandeville Auditorium are busy with shuttle bus traffic. Additionally, the driveway to Parking Lot P415 is usually congested with pedestrians during times between classes.

Improvements to the area would provide a north-south route for bicycle travel so that cyclists can conveniently avoid Library Walk. East-west pathway improvements would benefit both cyclists and pedestrians.

Project Description

The proposed project would use stairs on the pathway up Peterson Hill to overcome the path's steep grade. Pedestrians could continue to use the pathway, but cyclists, skateboarders and other wheeled users would use the less-steep existing wide path to the north to access Library Walk. By separating wheeled and pedestrian users and slowing downhill cyclists and skateboarders, the project would improve safety for all pathway users. Grading for implementation may need to address subsurface utilities in this area.

The proposed project would also create a north-south route for bicycle travel by adding wayfinding signage, bicycle route signage and sharrows to Mandeville Lane and the driveway to Parking Lot P415. Sharrows indicate a shared lane for bicycles and vehicles, as well as recommend proper cyclist positioning within the roadway. Where the driveway to Parking Lot P415 is currently congested with cyclists and pedestrians, a median bio-swale will separate the two user types, with a paved crossover to allow vehice turnaround. Sharrows will clearly indicate on which side of the median cyclists should ride.

The proposed project would also improve the pathway north of the of the shuttle bus loop by widening it to eight feet and replacing the worn asphalt. Landscaping or a median at the west wide of the pathway would discourage cyclists from riding through the shuttle bus loop.

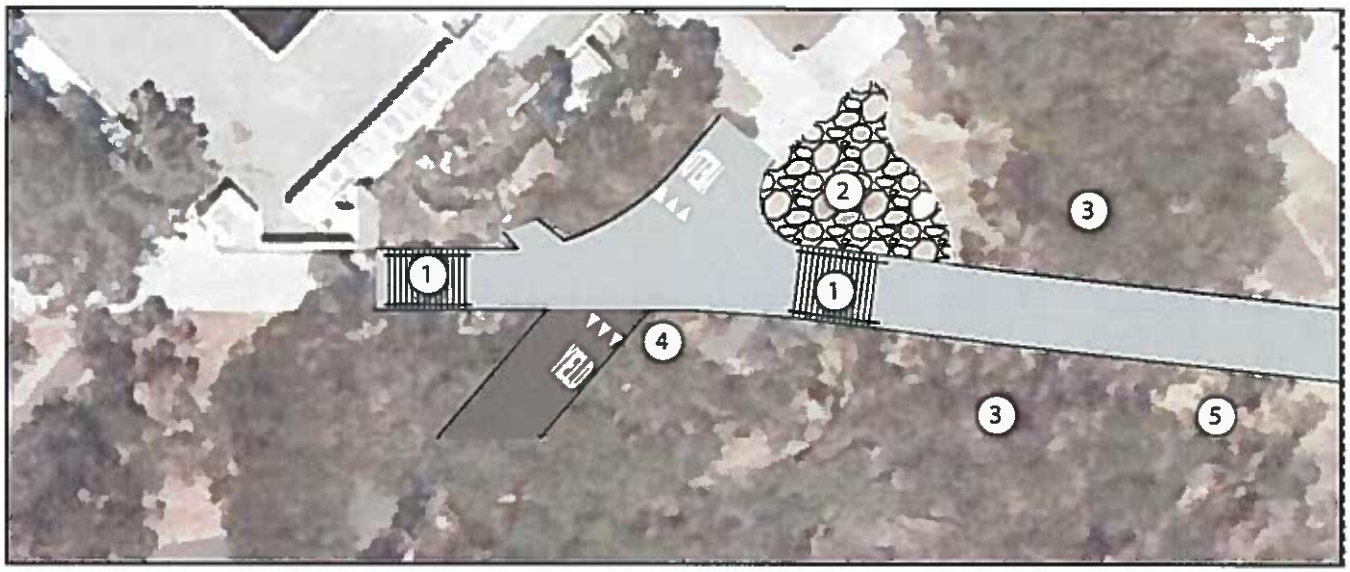
Cost Estimate

$88,600

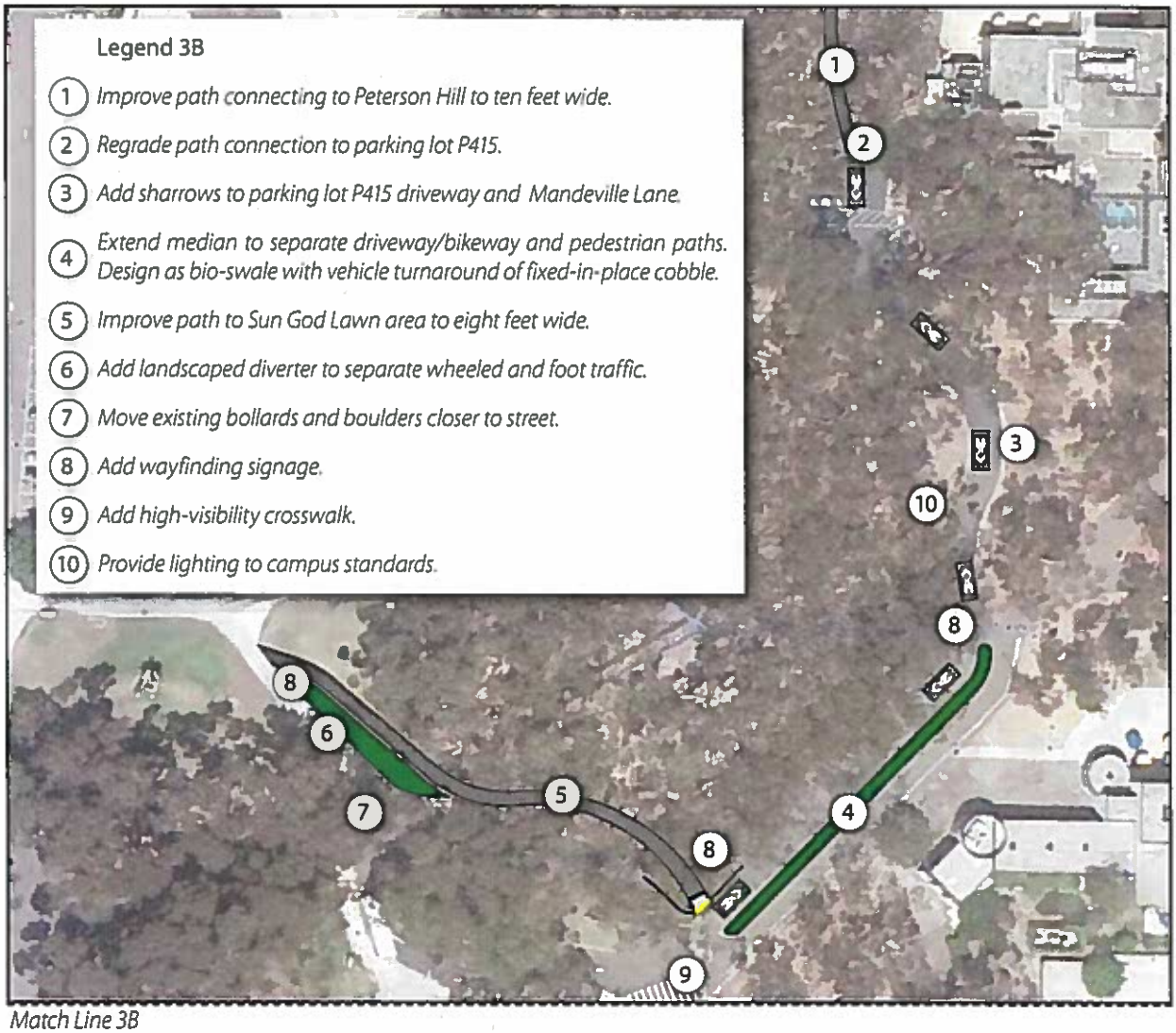
Candidate Funding Sources

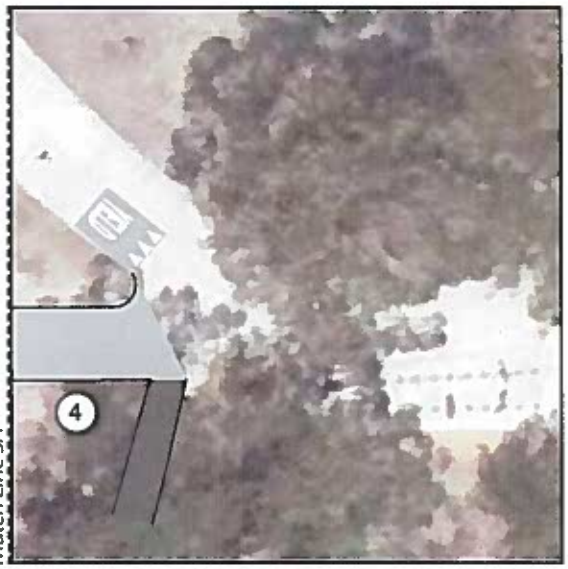
- UCSD infrastructure project

3A. Peterson Hill Stairways/Wheeled Bypass



3B. Grove Connection Path





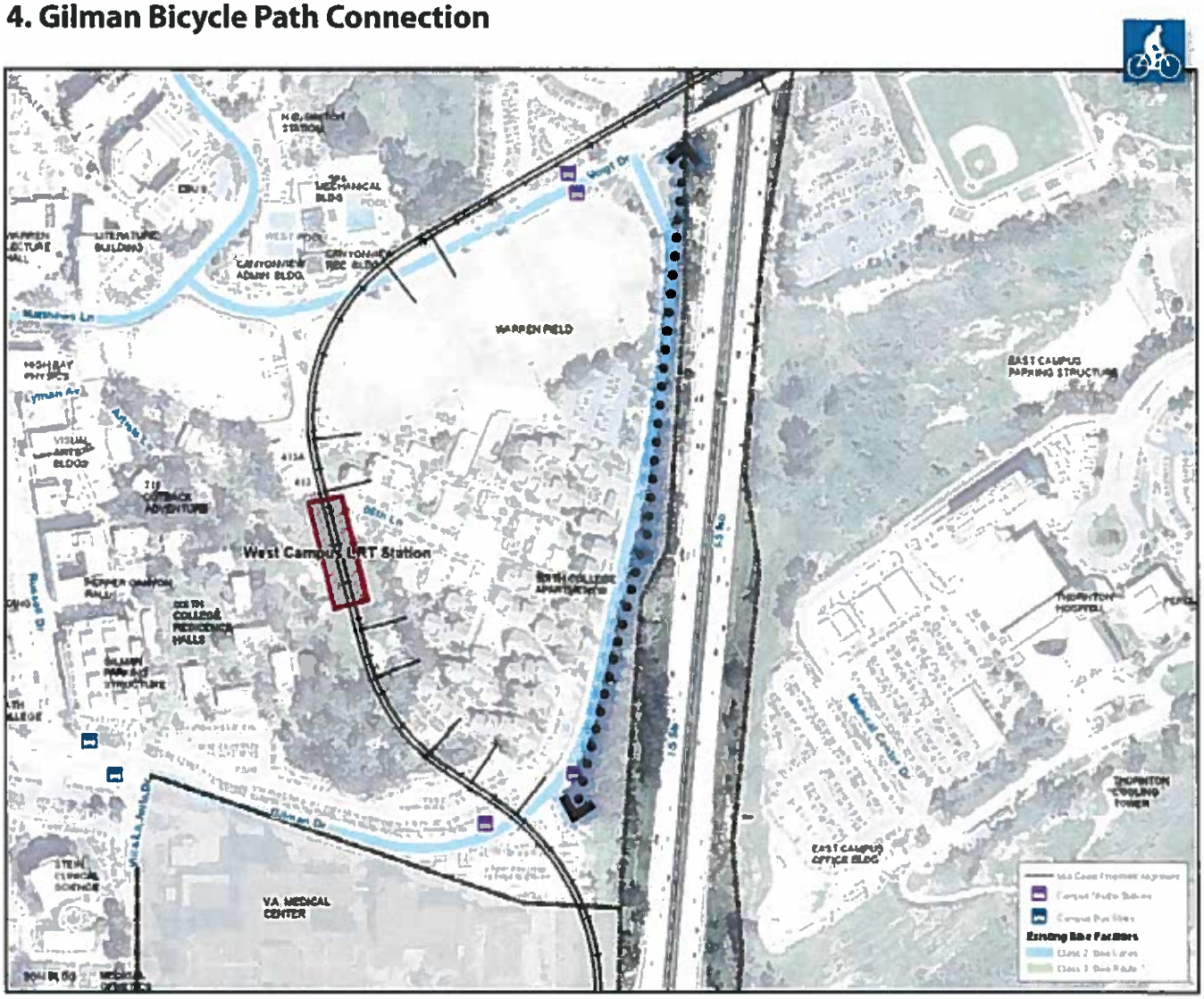
Match Line 3A

Legend 3A

1. *Add stairs east and west of pathway intersection, approximately 13 stairs per flight (six inch risers and 14 inch treads suggested). Provide reflective detailing and anti-skateboard devices at stairs.*
2. *Add landscaping and boulders in this area.*
3. *Add Eucalyptus to grove as appropriate.*
4. *Add wayfinding signage.*
5. *Provide lighting to campus standards.*

Match Line 3B

4. Gilman Bicycle Path Connection



Problem:

- With construction of Class 1 bicycle path along Interstate 5 corridor, terminus of bicycle path is at Voigt Drive.

Proposed Improvement:

- Continue Class 1 bicycle path along Gilman Drive via joint-use agreement between UC San Diego and Caltrans. *(Bicycle path would connect north to Class 1 at new Voigt Drive bridge and south to bicycle facility on new Gilman Drive bridge.)*

Background

The Interstate 5/Genesee Avenue Interchange Project, funded by Caltrans, SANDAG and the City of San Diego, will include the construction of a Class 1 bicycle path between the Sorrento Valley Coaster Station and UC San Diego. The path will generally follow the west edge of Interstate 5. As planned, the path will terminate north of Voigt Drive near the Campus Services Complex. This planned project is highly anticipated by the community.

This project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and online surveys, the campus community indicated a desire for a bicycle path to connect to the future Caltrans bicycle path.

Description of Need

UC San Diego is one of the region's top universities and a major employer and students, faculty and staff travel to the campus from throughout the region. Campus commuters predominantly drive. Approximately 11 percent of the campus community currently walks or bikes to campus and another 11 percent currently takes transit. The Metropolitan Transit System (MTS) is the primary commuter transit provider on campus. Regional commuter rail, provided by the North County Transit District, comes within 1.5 miles of the UC San Diego campus, but has no convenient connection for commuters who wish to walk or bike to campus

The proposed bicycle path west of Interstate 5 will provide a basic connection between the Sorrento Valley Coaster Station and UC San Diego. However, as proposed, the bicycle path in Caltrans' right-of-way will stop just north of Voigt Drive, far from key campus destinations.

Extending the bicycle path south of Voigt Drive will offer students, faculty, staff and visitors a safe and viable transportation option for biking to the UC San Diego campus from the Sorrento Valley Coaster Station. Members of the campus community would use the facility year-round.

Project Description

The proposed project would add a Class 1 bicycle path on the east side of Gilman Drive between Voigt Drive and the future Gilman Drive bridge over Interstate 5. This segment is approximately 2,000 feet in length and would better connect to key campus destinations and the Veterans Administration Medical Center. The path would connect directly to the Voigt Drive/Gilman Drive intersection and the intersection of Gilman Drive with the new Gilman Drive Bridge over Interstate 5.

Gilman Drive Options

North End

At the north end of the project, the Class 1 bicycle path along Interstate 5 could connect to Voigt Drive with an underpass of Gilman Drive immediately south of their intersection in addition to an at-grade crossing at the intersection. This would provide a safer connection to the campus for cyclists transitioning to Voigt Drive westward into the campus, if a Class 1 pathway was also provided.

South End

At the south end of the project, the Class 1 bicycle path could pass under the proposed Gilman Drive alignment at the bridge over Interstate 5 and loop around to align with the proposed north-south leg of Gilman Drive to form a four-way, stop-controlled intersection. The fourth leg would be the southern terminus of the Class 1 bicycle path. This would be a safer transition for cyclists leaving the bicycle path and proceeding on Gilman Drive.

Mid-segment

If North Coast Project construction of does not leave enough space for the development of both a Class 1 bicycle path and Class 2 bicycle lanes on Gilman Drive, Class 3 bicycle route could instead be designated and defined by signage and sharrows since they do not require additional space like Class 2 bicycle lanes. In any case, the Class 1 bicycle path should be included. If, for some reason, it can not be implemented, a Class 2 or 3 facility on Gilman Drive must be maintained to support this regionally significant route.

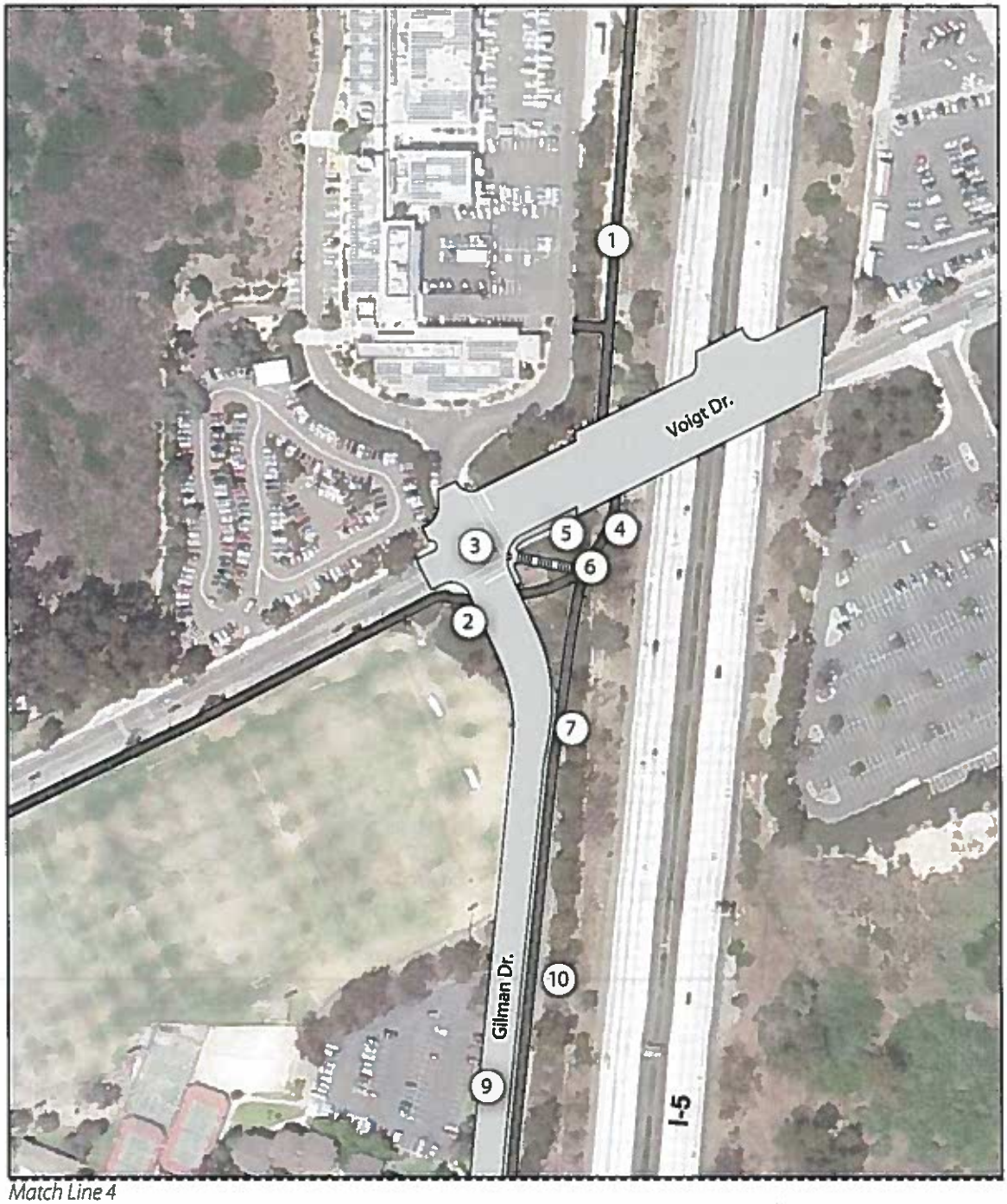
Cost Estimate

$407,640

Candidate Funding Sources

- Caltrans North Coast Project

4. Gilman Drive Bicycle Path Connection

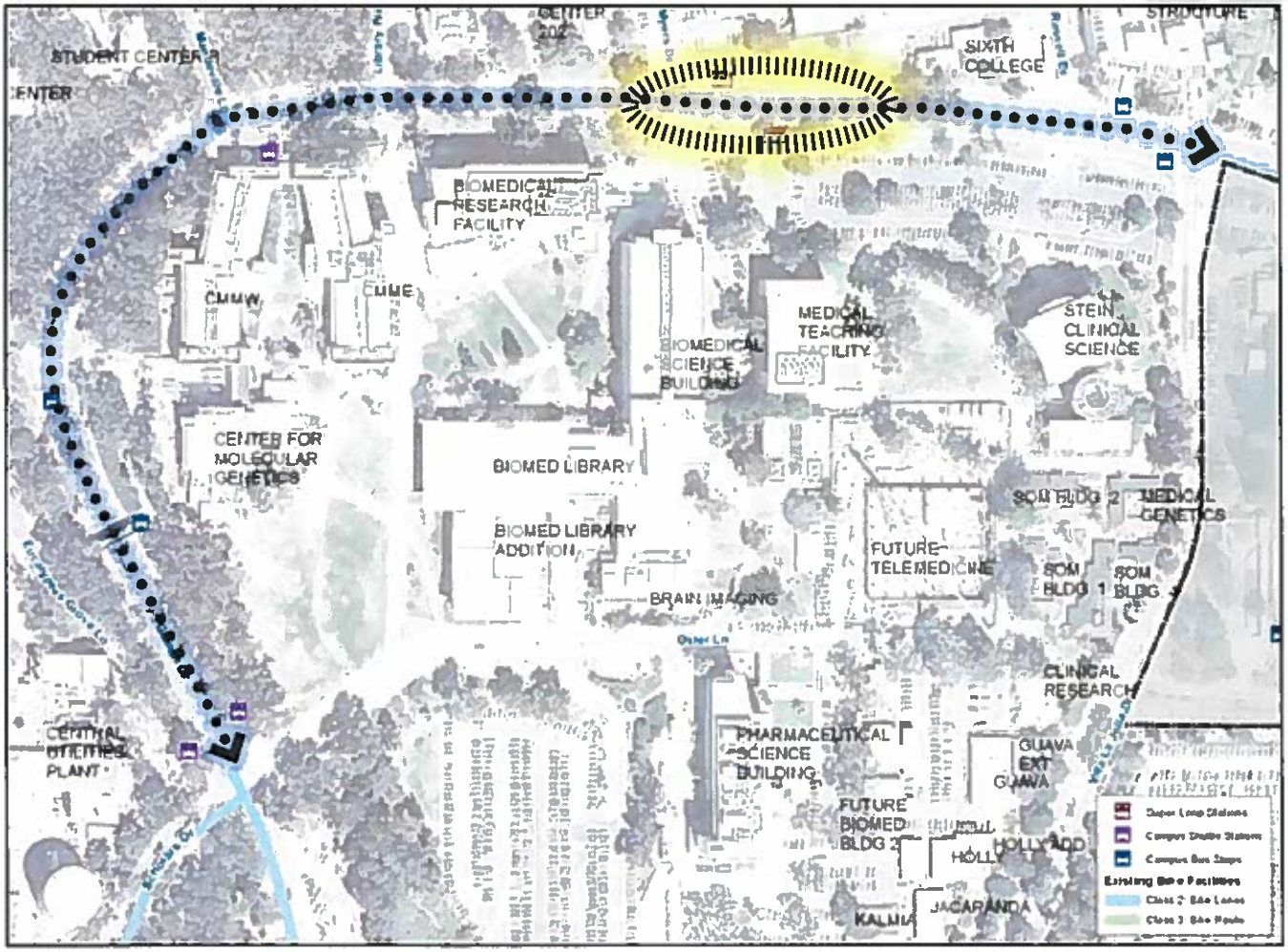


Match Line 4

Match Line 4


Gilm
I-5
Legend 4
1 Connect to future Caltrans Class 1 path.
2 Add underpass at Gilman Drive.
3 Add advanced stop bars to intersection south and west legs.
4 Cross under Voigt Drive to connect to Voigt/ Gilman intersection.
5 Add landing at corner for cyclists to position themselves where they are most visible to motorists.
6 Add stairs with bicycle tray.
7 Construct 10-12 foot wide shared-use (Class 1) path.
8 Connect to future Gilman Drive Bridge over Interstate 5.
9 If Class 2 lanes can not be accommodated on Gilman Drive due to Interstate 5 widening impacts, provide Class 3 route.
10 Provide lighting to campus standards.
7
9
10
8
N
NOT TO SCALE

5. Gilman Drive Bicycle Lane Connection



Problems:

- Gap in bicycle facility network on Gilman Drive between Villa La Jolla and Osler Lane.
- Pedestrians cross Gilman Drive outside marked crosswalk.

Proposed Improvement along Gilman Drive:

- Extend Class 2 bicycle lane by narrowing median and travel lanes between Osler Lane and Villa La Jolla Drive.

Proposed Improvement at Myers/Gilman intersection:

- Add traffic signal.
- Square-up intersection with smaller radii curb extensions.
- Install median barrier to direct pedestrians to crosswalk.
- Implement Gilman Transit Hub plans for re-alignment and median planting to create natural barrier to control crossings.

Background

Gilman Drive is the most traveled roadway on campus. It connects to off-campus housing south of La Jolla Village Drive and runs through the core of campus. It also provides access to the Veterans Administration Medical Center. Gilman Drive has bicycle lanes along most of its alignment through the UC San Diego campus, but it does not along this 2,800 foot segment between Osler Lane and Villa La Jolla Drive.

This project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and online surveys, the campus community indicated Gilman Drive as a location for improvement, especially for cyclists.

Description of Need

Gilman Drive goes through the core of the UC San Diego campus. It provides access to many of UC San Diego's colleges and carries student, faculty, staff and commercial traffic. Gilman Drive is a bus route for UC San Diego shuttles and for Metropolitan Transit System buses.

No suitable facilities for cyclists currently exist on Gilman Drive between Osler Lane and Villa La Jolla Drive. Anyone who currently bicycles on Gilman Drive shares the lane with vehicles. This segment of Gilman Drive has four vehicle lanes (two in each direction) and carries over 900 vehicles per hour during peak hours. The speed limit on Gilman Drive is 25 miles per hour. However, vehicles exceed this speed limit, especially west of Mandeville Road. This roadway configuration and traffic volume is not suitable for bicycle transportation, especially for inexperienced cyclists.

Project Description

The proposed bicycle lanes would safety accommodate cyclists of varying skill levels. Adding bicycle lanes to Gilman Drive would offer students, faculty and staff a safe and viable transportation option for bicycling to or through campus. The bicycle lanes would also benefit visitors or staff of the Veterans Administration Medical Center.

The proposed project would provide space for bicycle lanes on both sides of Gilman Drive between Osler Lane and Villa La Jolla Drive by narrowing the existing median and lanes. Lane narrowing as part of this project may also serve as a traffic calming measure by reducing motor vehicle speeds.

This project also proposes to enhance the Myers Drive intersection with "bike boxes," special bicycle-only advance stop areas. Bike boxes encourage cyclists to position themselves in the optimum location when waiting for the traffic signal to turn where they are most visible to drivers.

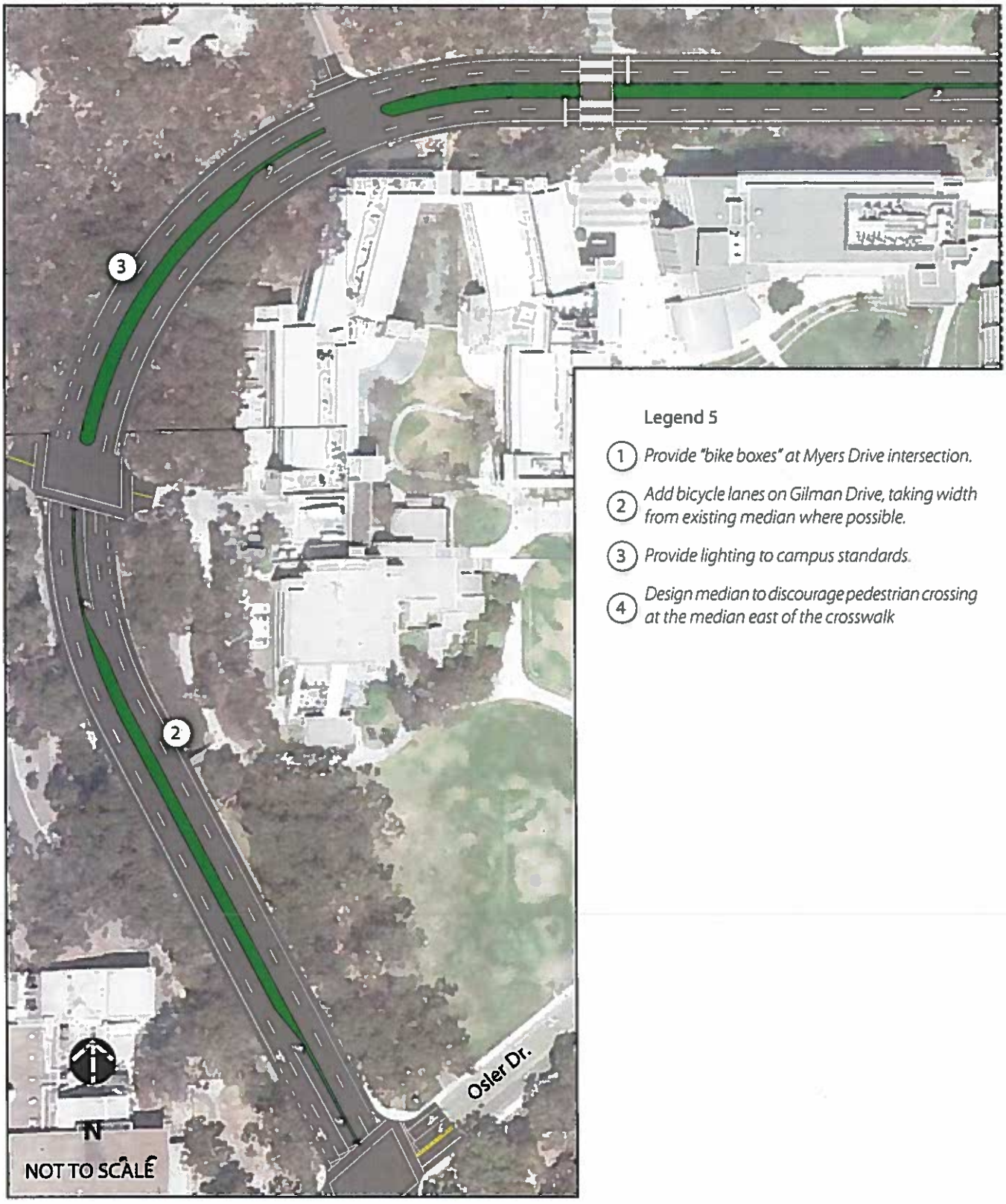
Cost Estimate

$775,520

Candidate Funding Sources

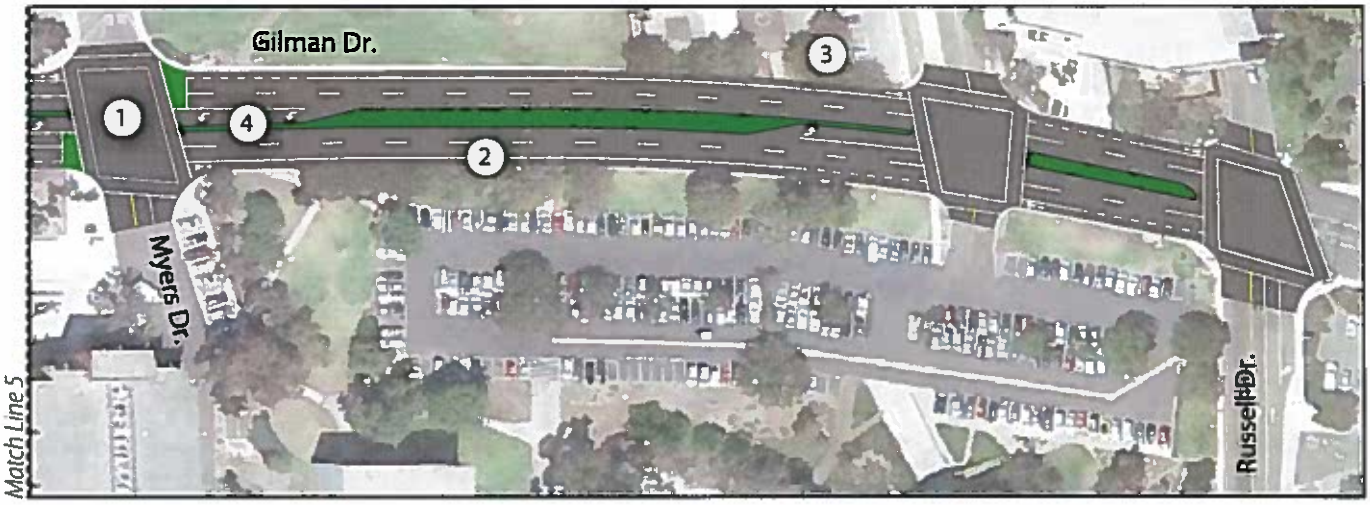
- SANDAG TransNet Bicycle and Pedestrian Projects grants
- SANDAG Transportation Development Act Bicycle and Pedestrian Projects grants
- California Bicycle Transportation Account (BTA)
- Highway Safety Improvement Program (HSIP)

5. Gilman Drive Bicycle Lane Connection

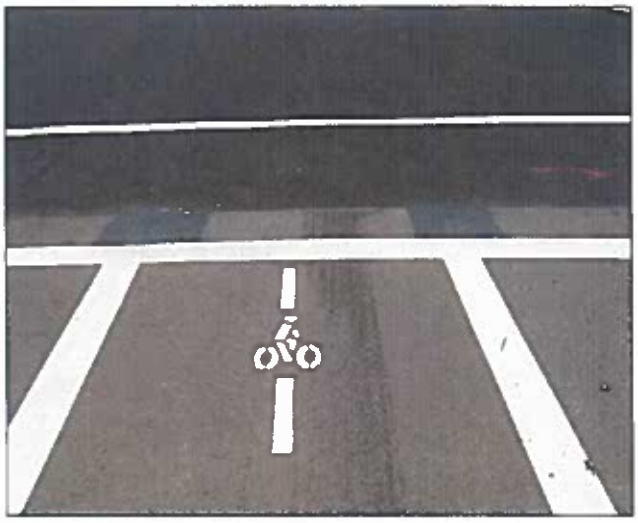


Legend 5

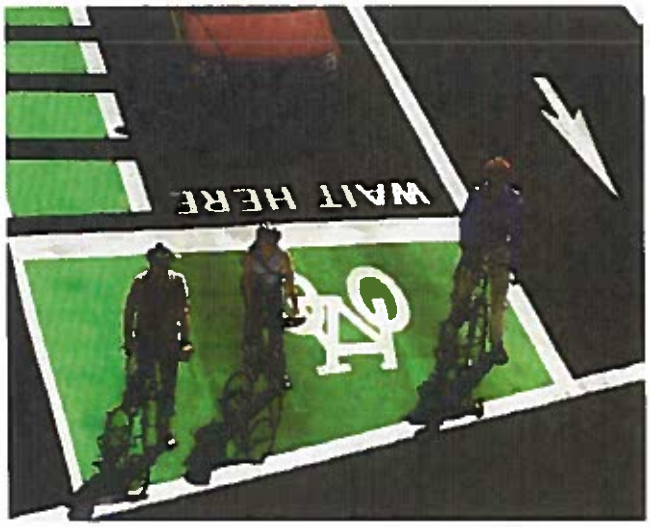
1. *Provide "bike boxes" at Myers Drive intersection.*
2. *Add bicycle lanes on Gilman Drive, taking width from existing median where possible.*
3. *Provide lighting to campus standards.*
4. *Design median to discourage pedestrian crossing at the median east of the crosswalk*



Bicycle lanes on Gilman Drive will make this high-volume route more bicycle-friendly.

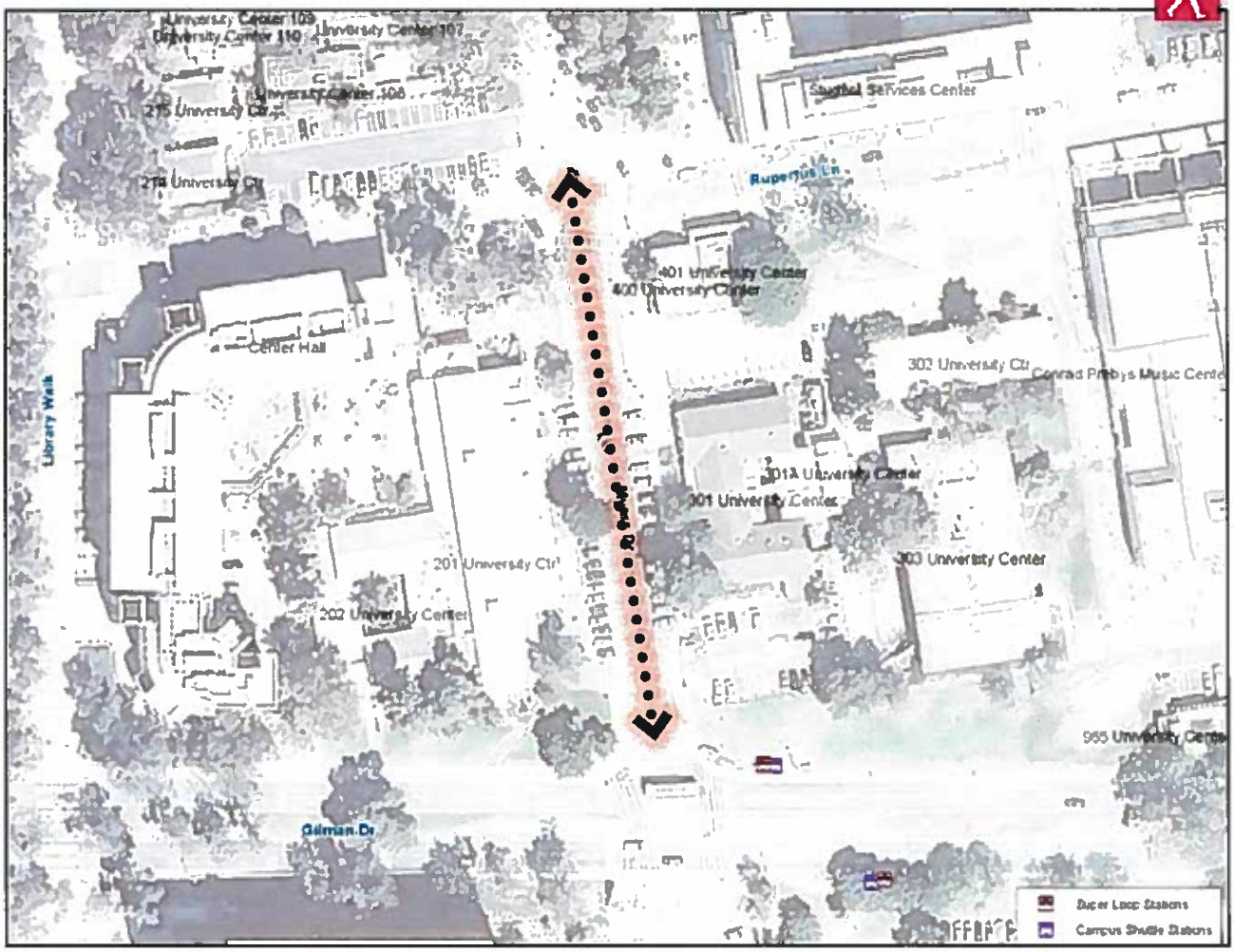


Bicycle detection will ensure cyclists can trip signal sensors when needed at newly signalized intersections on Gilman Drive.



Bike boxes provide an advance stop position for cyclists to ensure their visibility to drivers and to encourage proper cyclist positioning when traveling straight through an intersection that allows vehicle turning.

6. Myers Drive Walkway Improvements



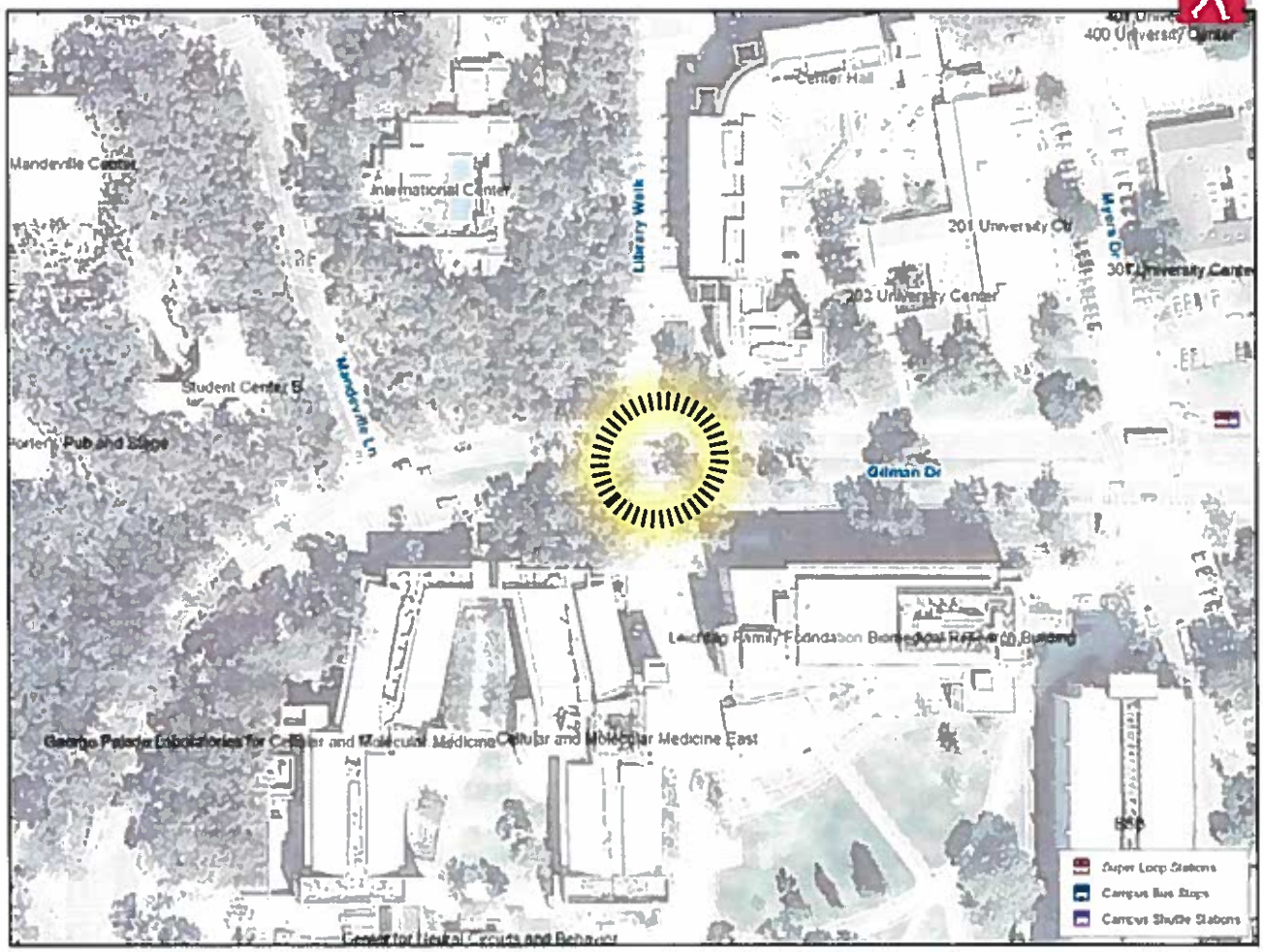
Problem:

- Pedestrians walk within Myers Drive because existing walkway is narrow and hidden behind parked vehicles.

Proposed Improvement:

- Widen sidewalk along east side of Myers Drive by moving parking back to make room for walkway and narrowing one-way roadway.

7. Library Walk Crossing at Gilman Drive

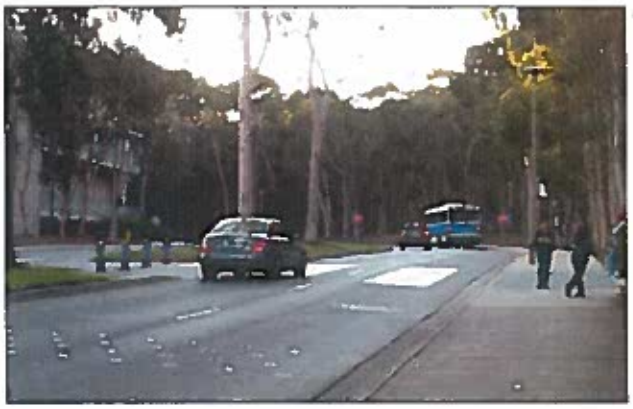


Problems:

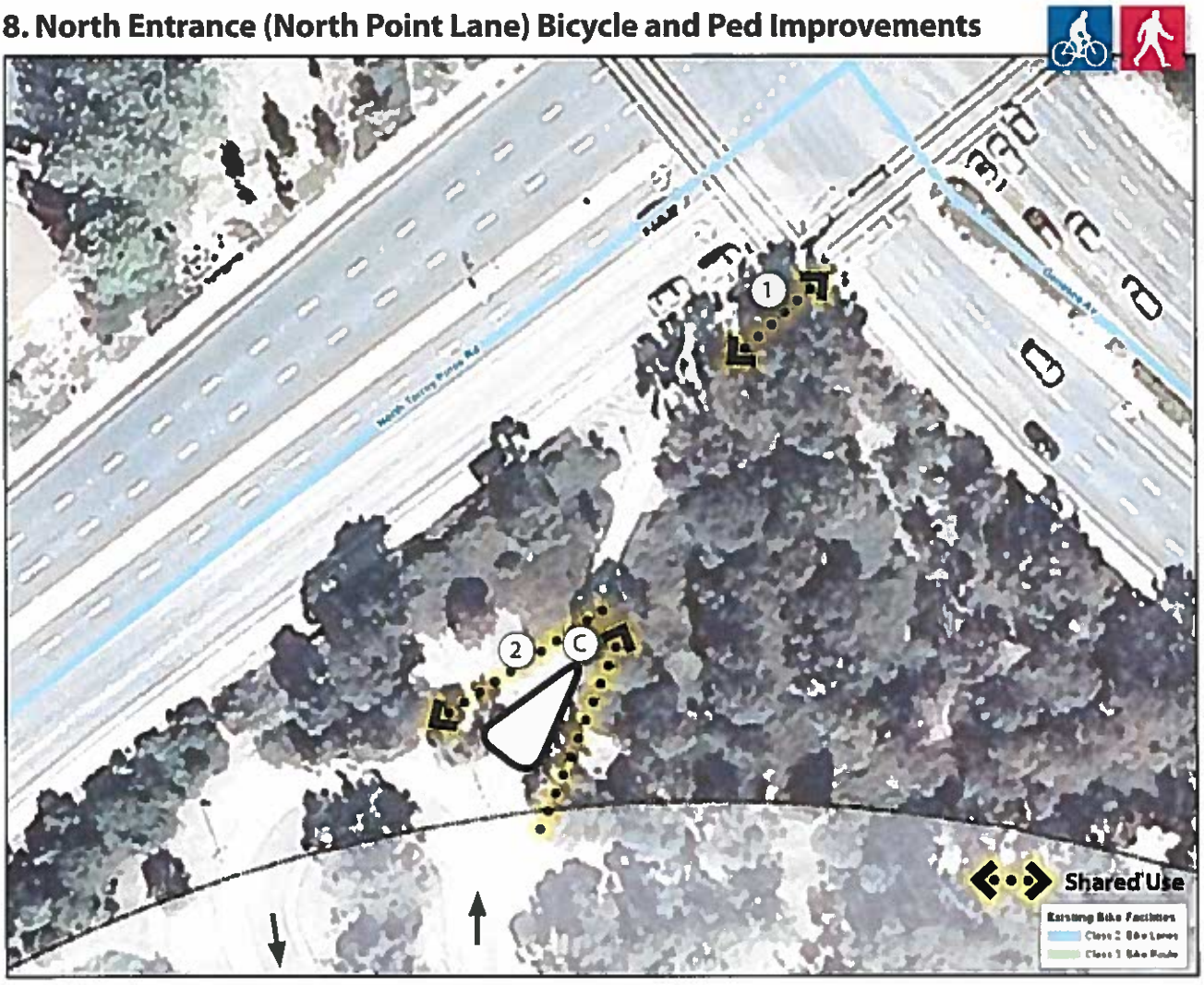
- Pedestrian crossing conflict occurs at crosswalk with multi-lane, multi-threat crossing issue.
- High traffic volumes in both directions.
- Vehicles approach Library Walk crosswalk at high speeds.

Proposed Improvement:

- Install planned signal since traffic counts and pedestrian crossings meet California MUTCD warrant.



8. North Entrance (North Point Lane) Bicycle and Ped Improvements

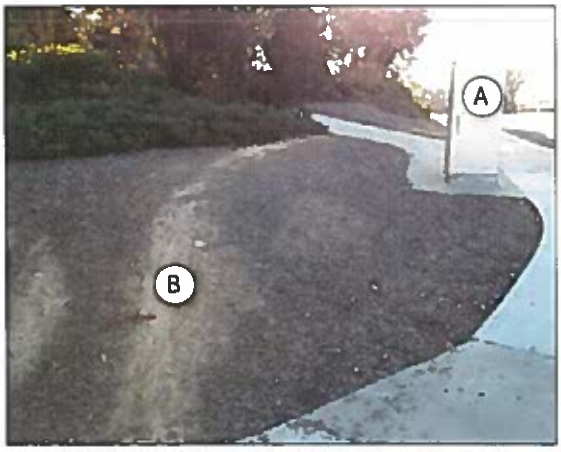


Problems:

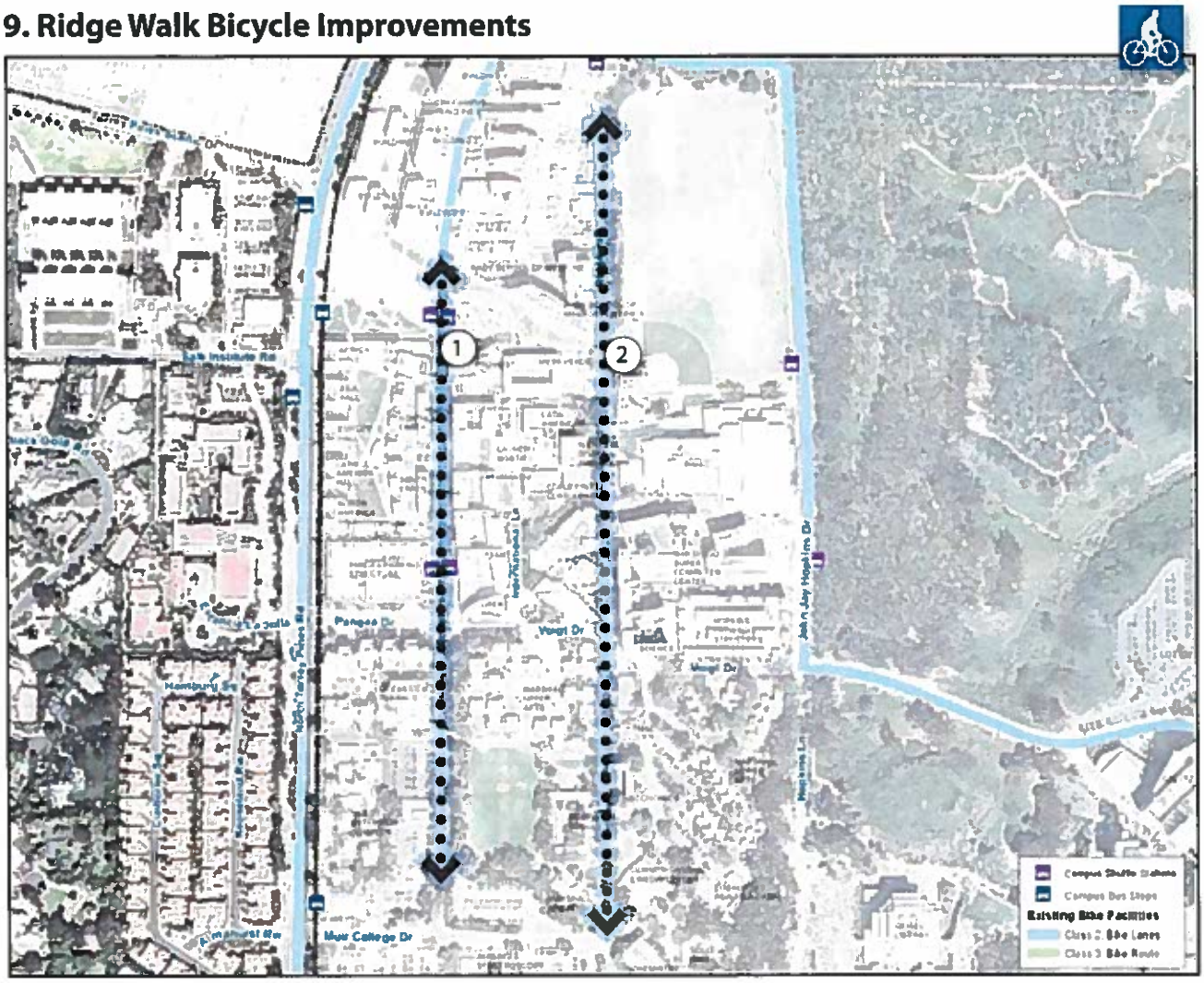
- (A) Cyclists regularly access campus via path between intersection's southeast corner and North Point Lane.
- (B) Obstacles at intersections southeast corner (signal pole, signal controller box, landscaping embankment) make it difficult to maneuver a bicycle between the crosswalk and path.
- (C) Path connection and geometry at North Point Lane encourages wrong-way bicycling.
- Missing bicycle detection.

Proposed Improvements:

- (1) Add additional flat, paved space at the intersection's southeast corner (requires a short retaining wall)
- (2) Re-route path to enter North Point Lane at its north end and add "one-way" signage for southbound cyclists.
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.



9. Ridge Walk Bicycle Improvements



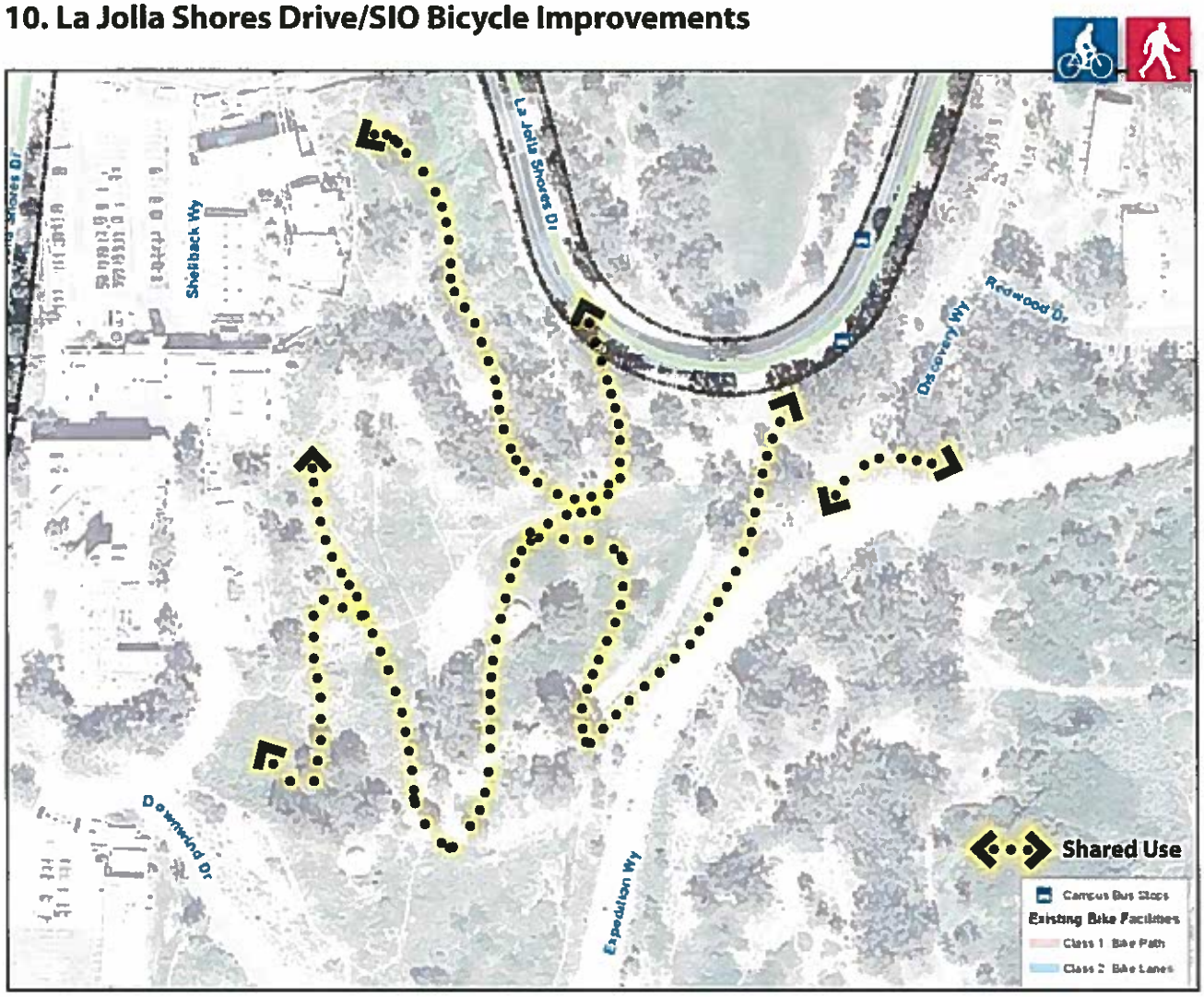
Problems:

- Apparent discrepancy in on-line policy: *(http://blink.ucsd.edu/safety/emergencies/security/bike.html)*, which states first that cycling is not allowed on: *"The section of Ridge Walk from the south edge of the Social Sciences complex to the north edge of the Institute of the Americas complex."* However, the same website page also states: *"Biking also is not permitted on Library Walk and Ridge Walk weekdays 8:30 a.m.–5 p.m.,"* which appears to apply to all of Ridge Walk.
- Critical north/south connection.

Proposed Improvements:

- Allow bicycles. *(20 foot width is sufficient for shared multi-modal path.)*
- Improve wayfinding and identity. *(Scholars Drive (1) will remain preferred north/south route for cyclists, but speed tables within bicycle lanes need to be remedied. Ridge Walk (2) will remain secondary, but important.)*

10. La Jolla Shores Drive/SIO Bicycle Improvements



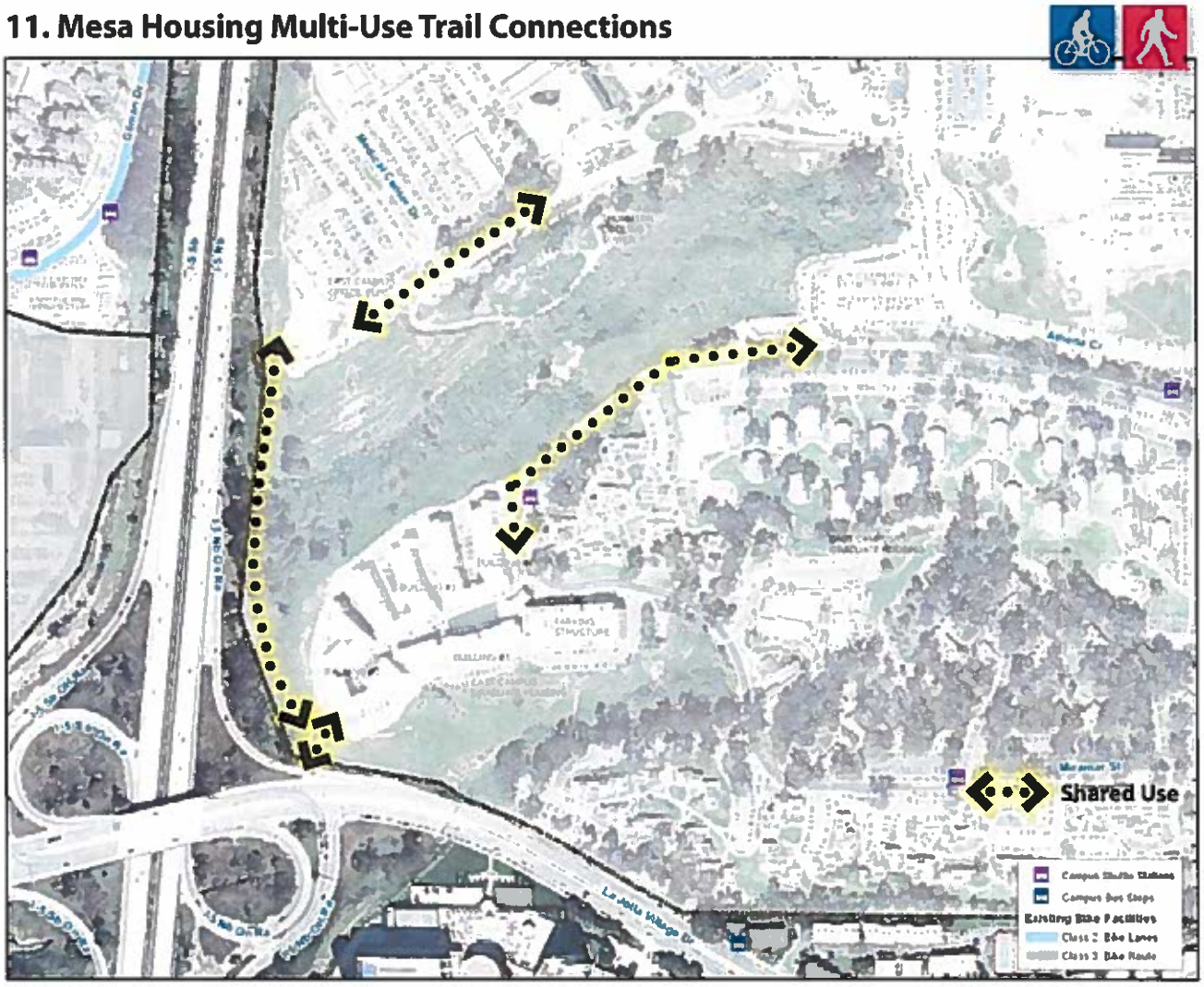
Problems:

- Need more direct off-street connections with SIO while limiting environmental impacts
- No ADA access available.
- Existing trails too steep, resulting in erosion.

Proposed Improvements:

- Formalize connection between short-cuts in disturbed area between Expedition Way and La Jolla Shores Drive. *(Any proposed route would need to be somewhat circuitous due to steep grades and to avoid planned SIO development footprints.)*

11. Mesa Housing Multi-Use Trail Connections



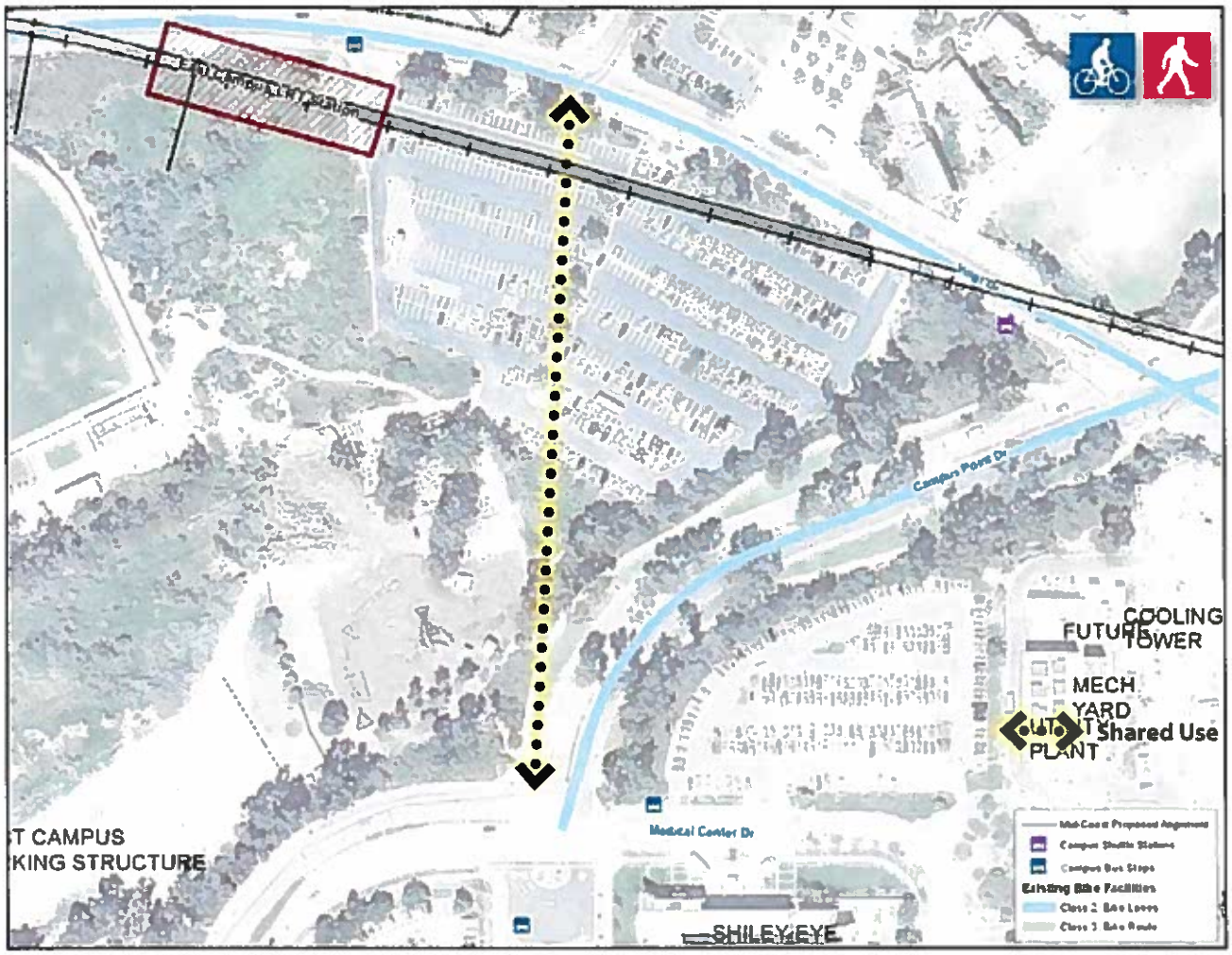
Problem:

- Missing pedestrian connections.
- Incomplete multi-use pathway.

Proposed Improvements:

- Connect multi-use pathway with proposed Gilman Bridge approach.
- Install multi-use pathway on north side of Miramar Street to connect to existing pathway.
- Provide pedestrian connection south of Mesa Housing to La Jolla Village Drive.
- Provide multi-use pathway connection between Mesa Housing and future Gilman Bridge.

12. Realigned Campus Point Dr. to East Campus LRT Station with New Bike/Ped Connections



Problem:

- Missing pedestrian connections.

Proposed Improvement:

- Re-align Campus Point Drive incorporating "Complete Street" amenities such as adequate space for bicycles and pedestrians to address anticipated high-use multi-modal connection between major employer/destination and future East Campus LRT station.

13. Campus-wide Recommendations

- Implement California MUTCD-standard regulatory signage, lighting and striping.
- Post dismount zone signage such as "Walk Zone" or "Dismount Zone" where appropriate.
- Install bicycle ramps on high-use stairways.

14. Bicycle Parking Recommendations

Problem:

- Inadequate quantity of parking in some locations.

Proposed Improvements:

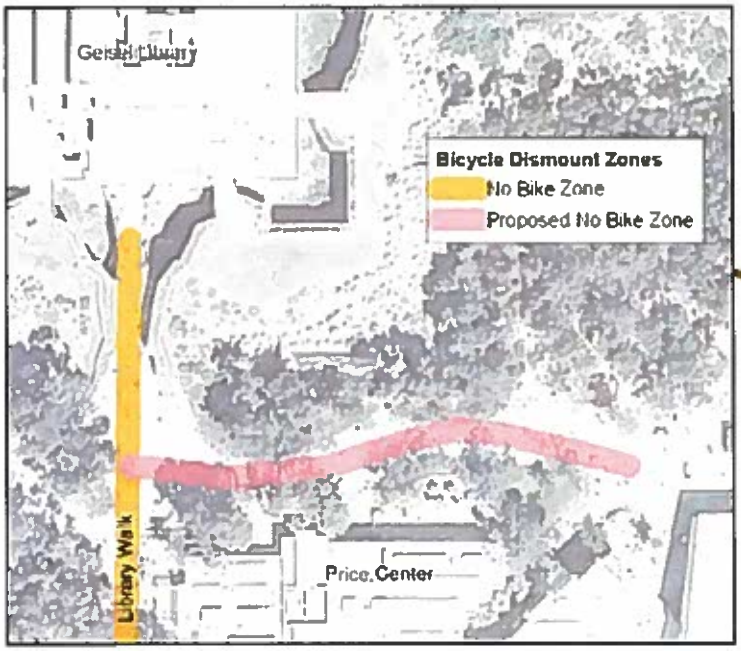
- Extend dismount zone and add parking east of Library Walk towards Matthews Lane. *(Compliance may be improved if users must dismount at bottom of hill.)*
- Install additional bicycle parking near Price Center Plaza and Warren College and other areas where demand warrants (see following graphic and table).

The following deficiencies in bicycle parking spaces were derived from UC San Diego's Transportation Services' *Bicycle Parking Survey* and field work. The "deficit" column represents the number of bicycles per location subtracted from the "capacity" column. The zeros in the capacity column represent locations where bicycles were being parked, even though there were no racks. Locations with deficiencies are shown in the figure on the following page, as well as a blow-up of the area proposed for additional bicycle parking and an extension of the dismount zone.

Bicycle Parking Deficiencies

FACILITY	Capacity	Max Bikes	Deficit
Scripps Institution of Oceanography			
Experimental Aquarium	0	4	-4
Old Scripps	0	1	-1
Roger Revelle Student Center	0	1	-1
Sumner Auditorium	0	1	-1
Thomas Wayland Vaughan Hall	0	4	-4
IGPP 2000 - Revelle Laboratory	0	2	-2
IGPP Munk Laboratory	0	2	-2
Isaacs Hall	0	1	-1
Fred N. Spiess Hall	8	12	-4
Nierenberg Hall	0	1	-1
Theater District			
Joan and Irwin Jacobs Center for La Jolla Playhouse	0	1	-1
Mandell Weiss Theatre Shop	0	1	-1
Revelle College			
Argo Hall	92	102	-10
Challenger Hall	16	19	-3
Galathea Hall	16	18	-2
Mayer Annex	0	7	-7
Muir College			
Applied Physics and Mathematics	56	57	-1
Biology Building	16	19	-3
Crafts Center/Grove Gallery	0	1	-1
Faculty Club Expansion	0	1	-1
McGill Hall	0	2	-2
Recreation Gymnasium	0	1	-1
Student Center A - Building 2	8	9	-1
Student Center A - Building 3 Addition	0	1	-1
Student Center A - Northeast Expansion	0	4	-4
Student Center B	0	1	-1
Humanities and Social Sciences	2011 recommendation		
Marshall College			
102 Marshall College	0	3	-3
103 Marshall College	0	2	-2
Extended Studies and Public Programs - Building A	0	1	-1
Marshall College Residence Hall Center	10	11	-1
Marshall Upper Apartments G	0	2	-2
Marshall Upper Apartments H	0	2	-2
Marshall Upper Apartments J	0	6	-6
Marshall Upper Apartments K	0	5	-5
Marshall Upper Apartments M	0	5	-5
Sequoyah Hall	6	7	-1
Thurgood Marshall College Residence Hall R	3	4	-1
Oceanview Terrace	2011 recommendation		
Roosevelt College			
Africa Hall	10	20	-10
Asante House Meeting Rooms	0	3	-3
Asante House West	0	3	-3
Asia Hall	10	22	-12
Cafe Ventanas	0	4	-4
Copley International Conference Center	0	4	-4
Cuzco House West	0	4	-4
Earth Hall	0	36	-36
ERC Administration South	0	5	-5
Europe Hall	10	23	-13
Geneva Hall East	0	10	-10
Geneva Hall West	0	5	-5
Great Hall	0	1	-1
Hopkins Parking	0	8	-8
Institute of the Americas Addition	0	1	-1
Kathmandu House East	0	4	-4
Kathmandu House West	0	4	-4
Latin America Hall	10	29	-19
Middle East Hall	8	10	-2
North America Hall	0	14	-14
Oceania Hall	0	1	-1
Pangea Parking Structure	32	45	-13
Robinson Building 1 - Administration	0	1	-1
San Diego Supercomputer East Expansion	0	3	-3
San Diego Supercomputer Office Addition	0	2	-2

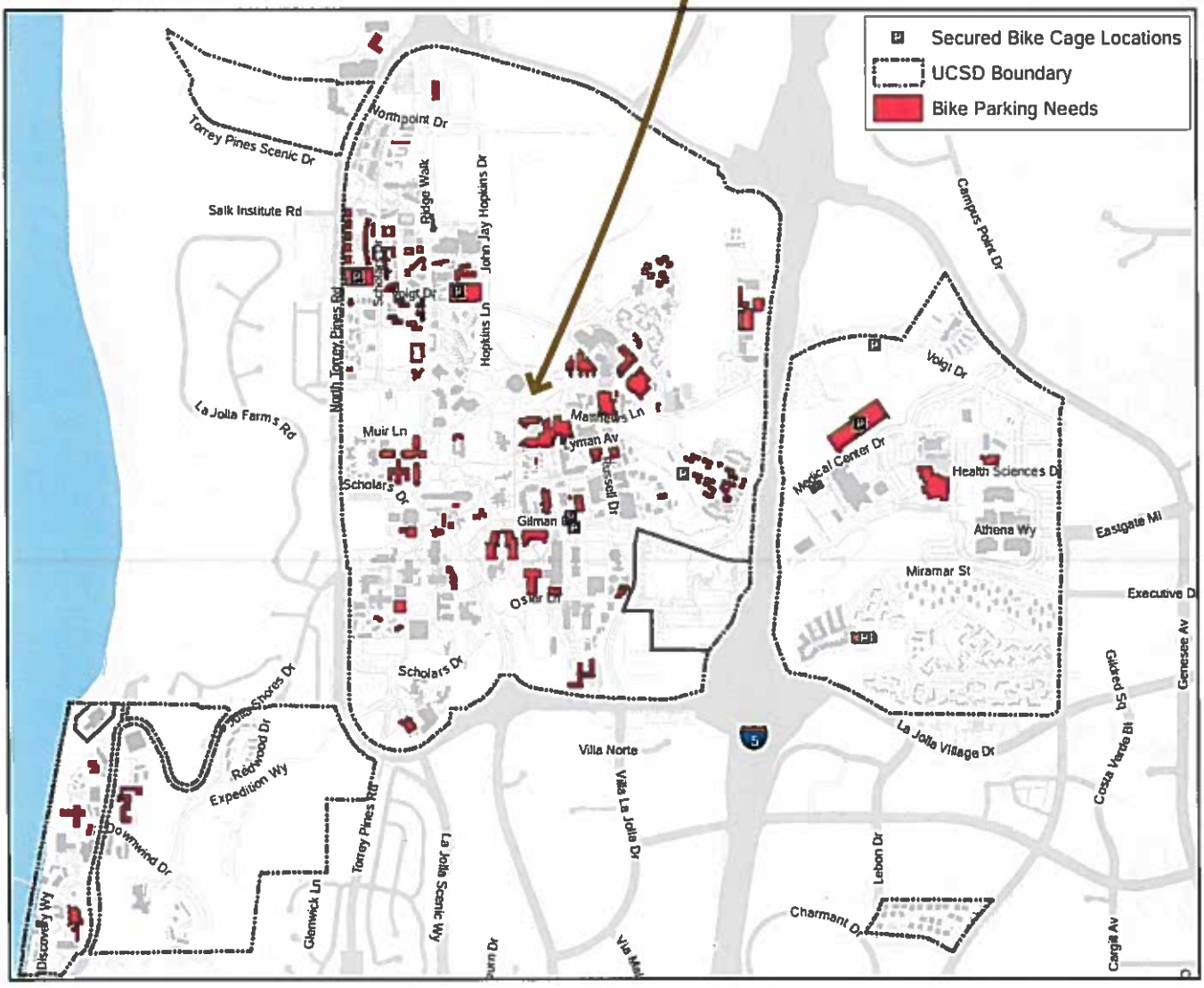
FACILITY	Capacity	Max Bikes	Deficit
North Campus			
North Campus Housing Phase I	16	20	-4
North Campus Tennis Courts	0	1	-1
Recreational and Intramural Athletic Complex Annex B	8	9	-1
Spanos Athletic Training Facility	10	23	-13
Torrey Pines Center North	0	4	-4
Warren College			
Computer Science and Engineering Building	36	60	-24
Engineering Building Unit II	0	7	-7
Frankfurter Hall B	8	26	-18
Harlan Hall	22	33	-11
Irwin Mark and Joan Klein Jacobs Engineering Hall	0	4	-4
Stewart Hall	16	25	-9
Warren Administrative Module	0	2	-2
Warren Lecture Hall	24	65	-41
Campus Services Complex			
Campus Services Complex - Building C	8	9	-1
Campus Services Complex - Building D	0	1	-1
Campus Services Complex - Building H	0	1	-1
Campus Services Complex - Trailer 7	0	3	-3
Campus Services Complex Fleet Services Building	0	1	-1
Campus Services Complex Shops	0	1	-1
Sixth College			
413A University Center	0	6	-6
789 Sixth College	0	1	-1
Canyonview Recreation and Athletics Administration	0	3	-3
Foodworx	16	22	-6
Matthews Apartments A	8	15	-7
Matthews Apartments B	8	10	-2
Matthews Apartments C	17	23	-6
Matthews Apartments D	0	2	-2
Matthews Apartments E	0	1	-1
Sixth College Apartments 600	0	4	-4
Sixth College Apartments 700	0	2	-2
Sixth College Apartments 900	0	2	-2
Sixth College Apartments 1000	24	25	-1
Sixth College Apartments 1300	8	11	-3
Sixth College Apartments 1400	5	6	-1
Sixth College Apartments Lodge	6	8	-2
Sixth College Residence Hall 706	24	26	-2
Visual Arts Facility- Building 2	0	1	-1
West Campus LRT Station	Long-term enclosed parking		
School of Medicine			
Biomedical Sciences Building Addition	0	1	-1
Cellular and Molecular Medicine East	8	15	-7
George Parade Laboratories for Cellular and Molecular Medicine	8	9	-1
Leichtag Family Foundation Biomedical Building	16	18	-2
School of Medicine - Building 4	0	2	-2
W.M. Keck Building	0	1	-1
Pharmaceutical Science Building	2011 recommendation		
Rita Atkinson Graduate Housing	2011 recommendation		
University Center			
201 University Center	0	1	-1
301A University Center	0	4	-4
303 University Center	0	2	-2
409 University Center	0	8	-8
Price Center East Expansion	24	32	-8
Price Center West	80	91	-11
University Center 106	0	1	-1
Expand existing bike parking at Library Walk and Peterson Hill	2011 recommendation		
Gilman Drive Transit Center	Long term enclosed parking		
Health Sciences			
Radiation Oncology PET/CT Center	0	1	-1
Thornton Modular Office Building 2	0	1	-1
Thornton Modular Office Building 3	0	1	-1
Moores Cancer Center	2011 recommendation		
East Campus LRT Station	Long-term enclosed parking		



Proposed Dismount Zone Extension

(See location on map below)

Bicycle Parking Deficiencies



Off-Campus Projects

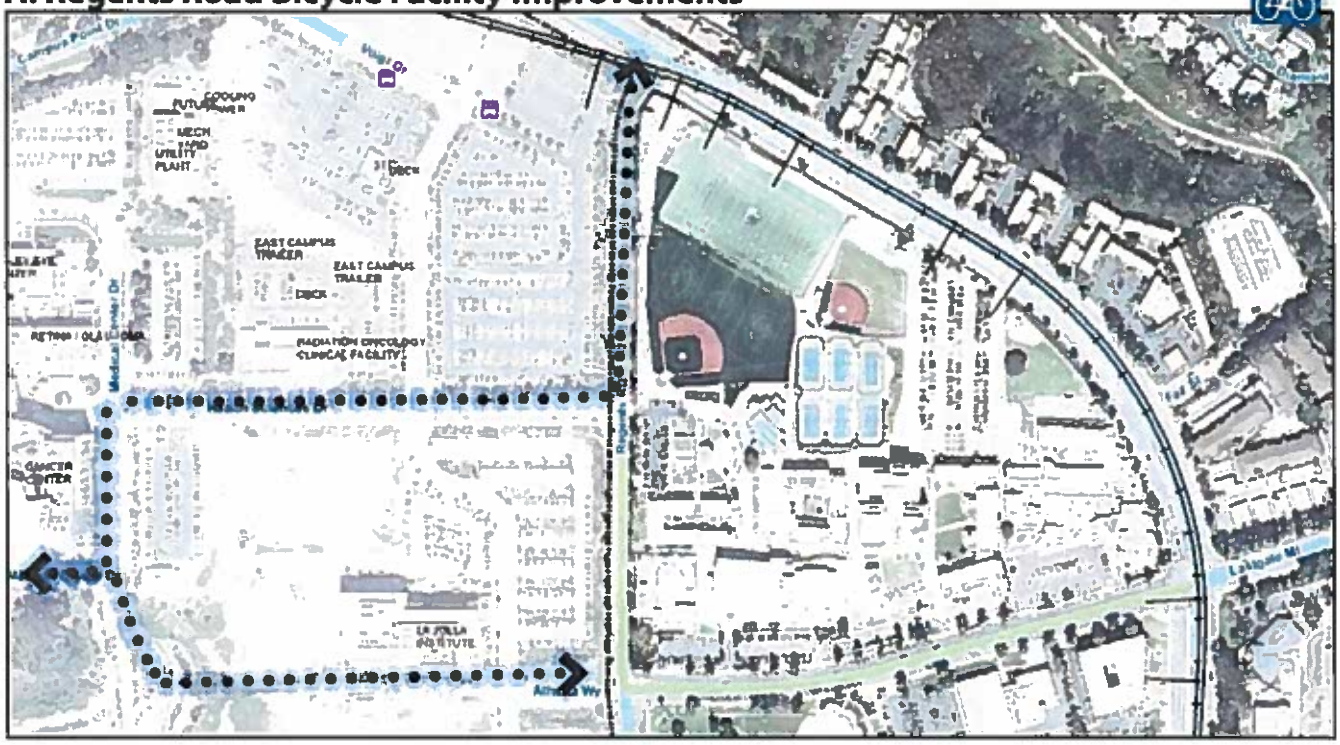
Bicycle and pedestrian trips at a college campus can be classified as intra-campus trips from an on-campus origin to a destination on-campus, or off-campus trips from an off-campus origin to a on-campus destination (and vice versa).

Enhancement of on-campus roadways and paths will improve conditions for cyclists and pedestrians making intra-campus trips. However, enhancements are also needed on off-campus streets to improve conditions for cyclists and pedestrians making off-campus trips. Off-campus trips commonly include commutes to/from campus residences. Common UC San Diego off-campus trip origins/destinations include:

- Residential and commercial uses south of La Jolla Village Drive
- Residential uses east of Regents Drive
- Scripps Institution of Oceanography
- Commercial uses north of campus along Torrey Pines Road

From these origins/destinations, cyclists and pedestrians typically travel through one of several campus gateways where enhancements can improve cycling and walking conditions. The following projects address these gateways.

A. Regents Road Bicycle Facility Improvements



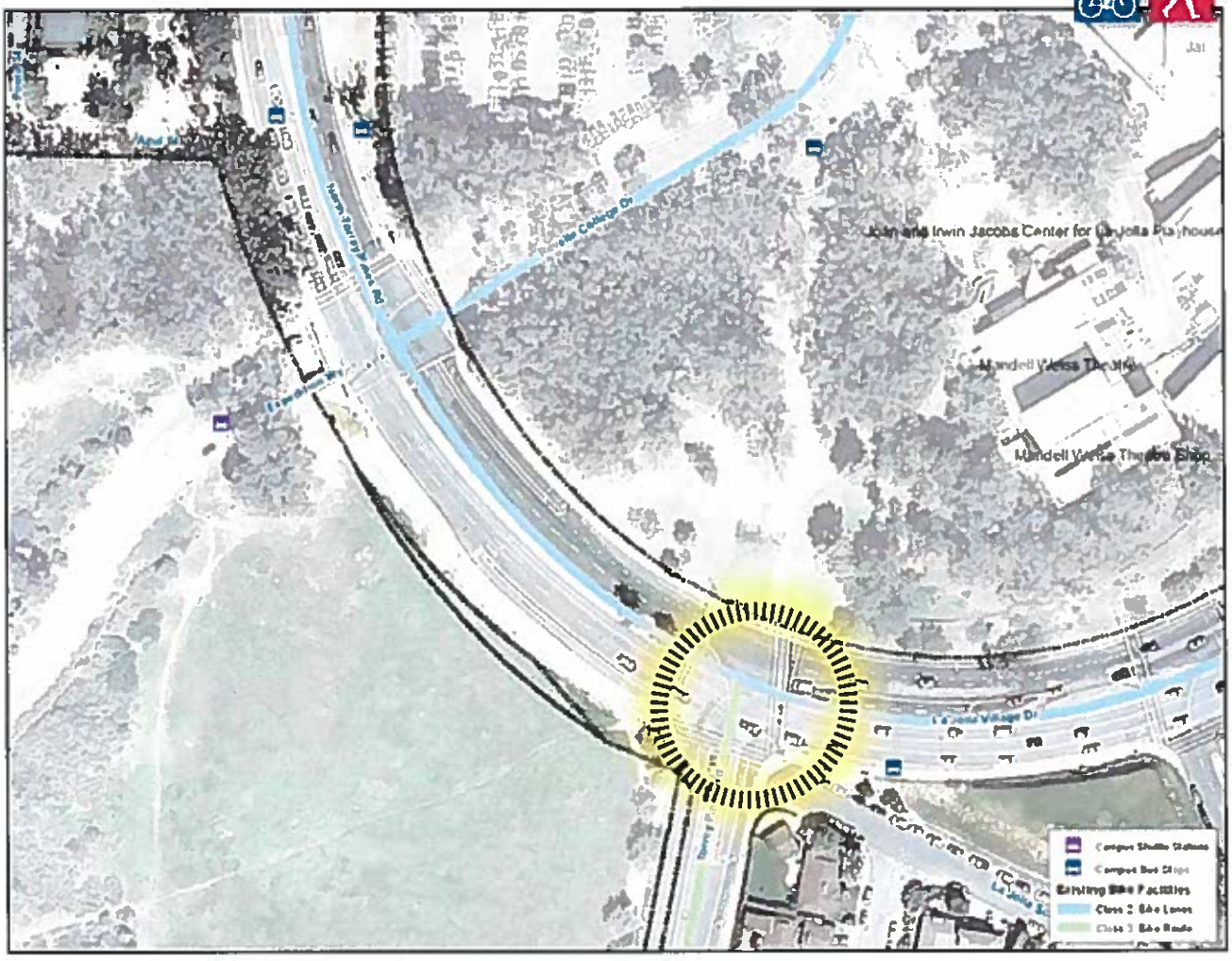
Problems:

- Narrow bicycle lanes between La Jolla Village Drive and Eastgate Mall.
- No bicycle lanes between Eastgate Mall and Genesee Avenue.
- Poor bicycle lane pavement quality, especially north of Executive Drive.
- Insufficient lighting, especially between Eastgate Mall and Genesee Avenue.
- Missing crosswalks across Regents Road/Eastgate Mall intersection's west and north legs.
- Missing bicycle detection at several intersections.
- Numerous curb cuts.

Proposed Improvements:

- Where pavement quality is poor, overlay roadway with new asphalt.
- Widen bicycle lanes between La Jolla Village Drive and Eastgate Mall with 11 foot travel lanes.
- Add bicycle lanes between Eastgate Mall and Genesee Avenue.
- Improve lighting on Regents Road, especially between Eastgate Mall and Genesee Avenue.
- Add crosswalks at Regents Road/Eastgate Mall intersection west and north legs.
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.
- Install "Bicycles May Use Full Lane" signage on approaches to Regents Road/Eastgate Mall intersection.

B. Crossing at Torrey Pines Road and La Jolla Village Drive



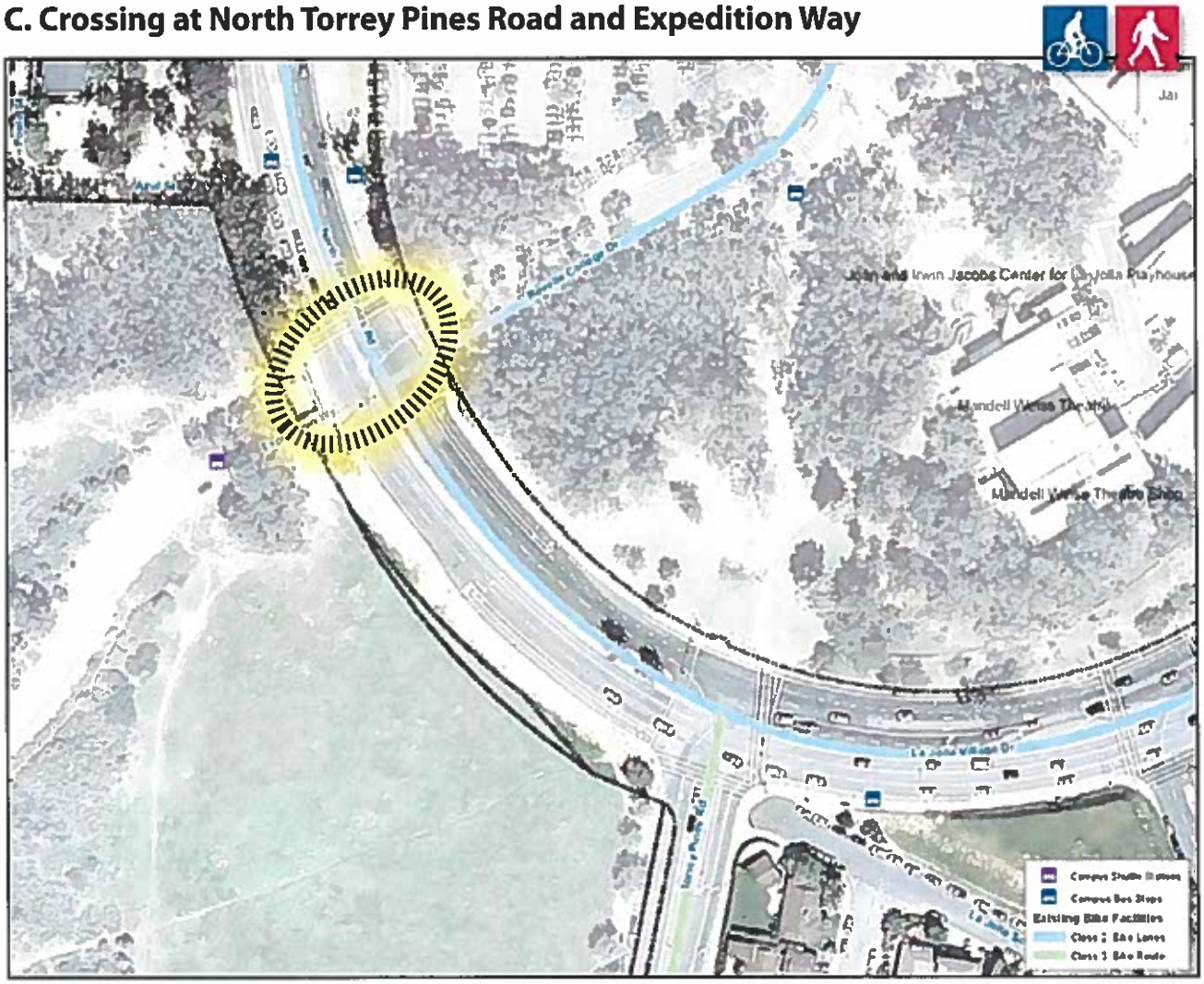
Problems:

- Missing crosswalk across intersection west leg.
- Missing bicycle detection.

Proposed Improvements:

- Improve bicycle and pedestrian amenities at intersection, including adding missing crosswalk.
- Install bicycle detection in all appropriate lanes and install Type D limit line detector loops.
- Modify signal timing to accommodate minimum green splits for cyclists.

C. Crossing at North Torrey Pines Road and Expedition Way



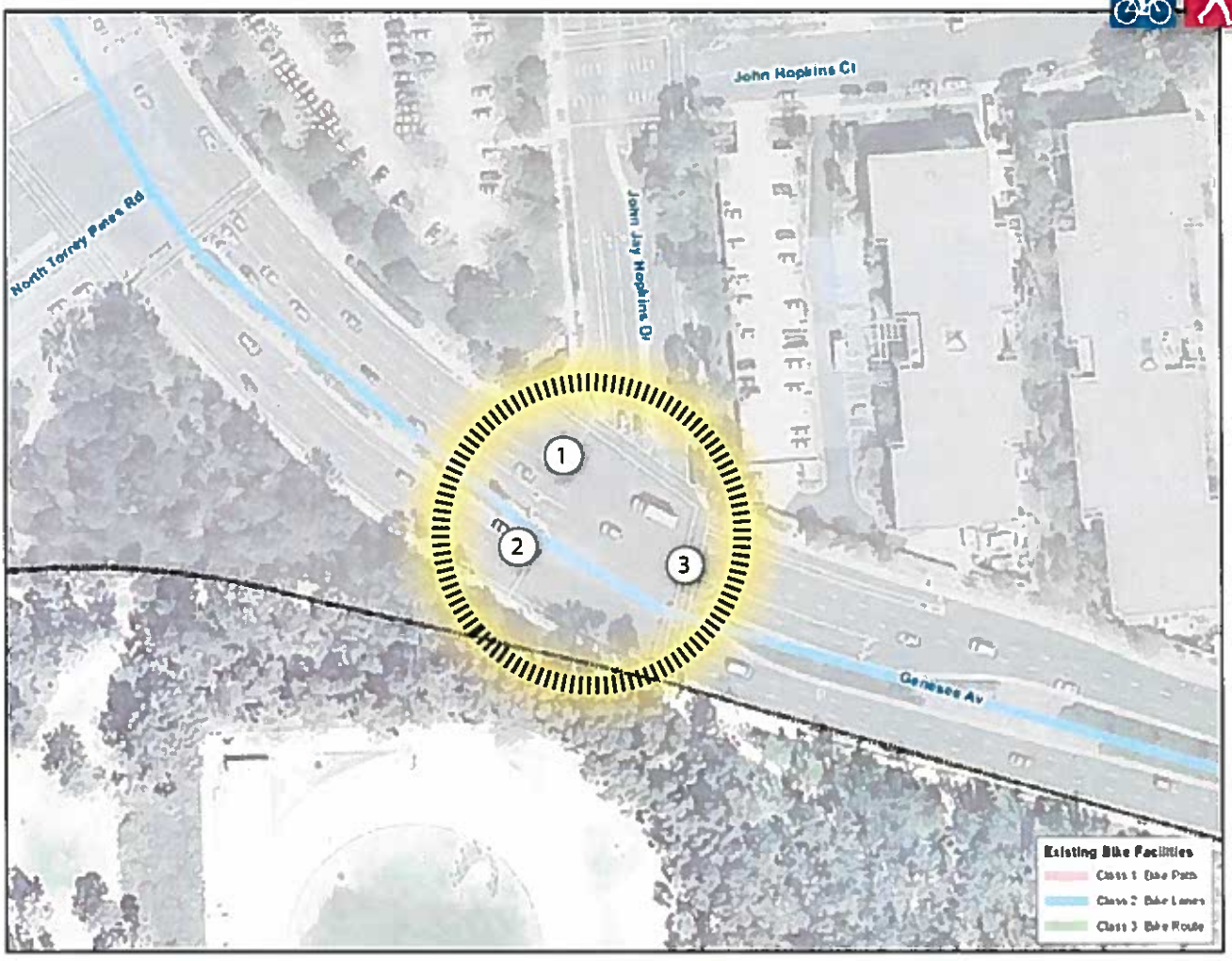
Problems:

- Missing crosswalk across intersection south leg.
- Both sides of Revelle College Drive missing sidewalks between North Torrey Pines Road and Scholars Drive.
- Missing bicycle detection.

Proposed Improvements:

- Improve bicycle and pedestrian amenities, including adding missing crosswalk.
- Add sidewalks to both sides of Revelle College Drive between North Torrey Pines Road and Scholars Drive.
- Install bicycle detection in all appropriate lanes and install Type D limit line detector loops.
- Modify signal timing to accommodate minimum green splits for cyclists.

D. John J. Hopkins Dr./Genesee Ave. Intersection Bike/Ped Improvements



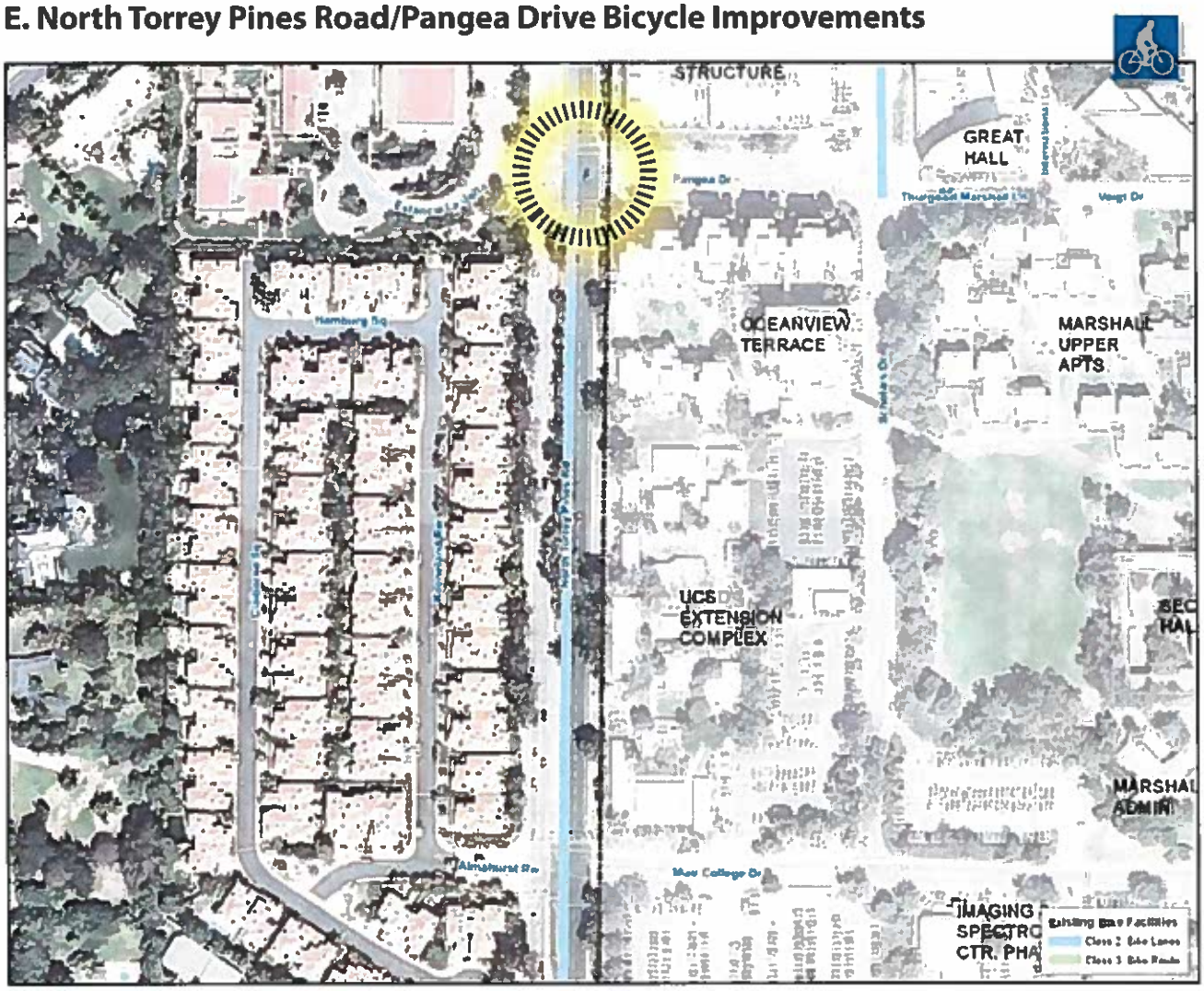
Problems:

- (1) Missing crosswalk across intersection west leg.
- (2) Geometry creates large crossing distance on west side.
- (3) No median refuges. No middle crossing actuator.
- Missing bicycle detection.

Proposed Improvements:

- Add crosswalk at intersection west leg. *(This should have minimal effect on traffic operations since "walk" phase will be concurrent with southbound left-turn green.)*
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.

E. North Torrey Pines Road/Pangea Drive Bicycle Improvements



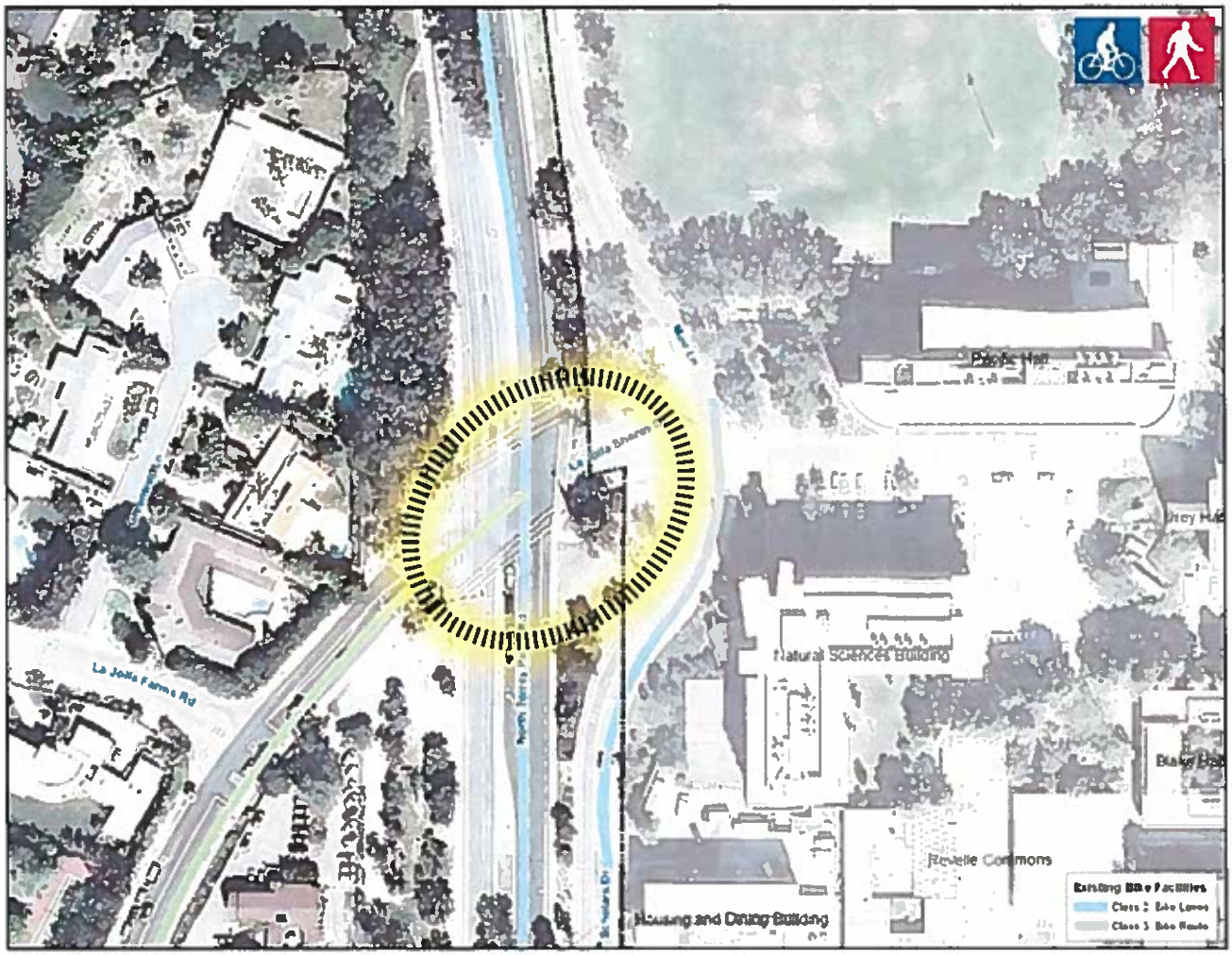
Problem:

- Missing bicycle detection.

Proposed Improvement:

- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.

F. La Jolla Shores Dr. and North Torrey Pines Rd. Bike and Ped Improvements



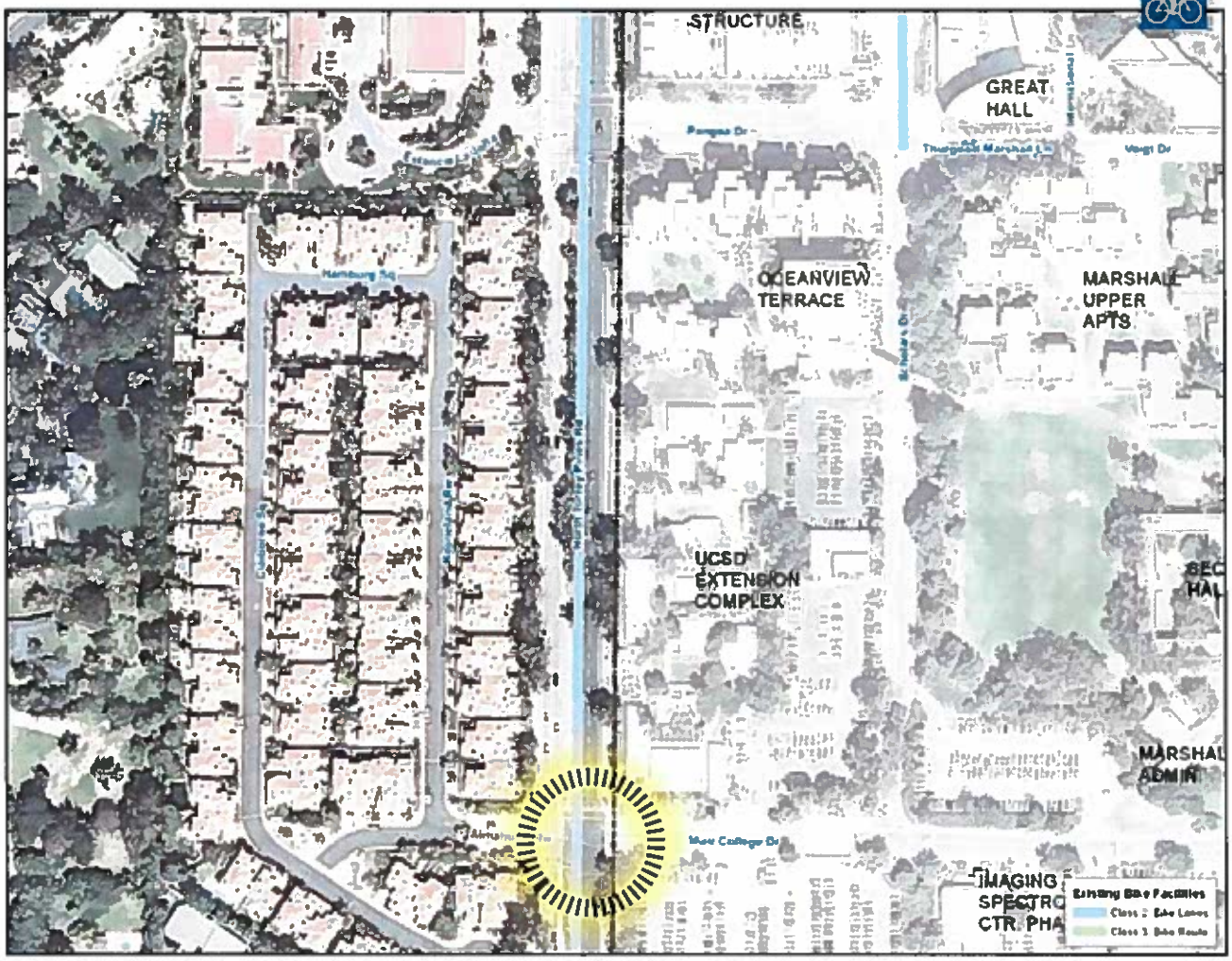
Problems:

- Pedestrians cross outside marked crosswalk due to oblique angles and large crossing distance.
- Missing bicycle detection.

Proposed Improvements:

- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.
- Reduce crosswalk length in conjunction with project to close La Jolla Shores Drive campus entrance.

G. North Torrey Pines Road/Muir College Drive Bicycle Improvements



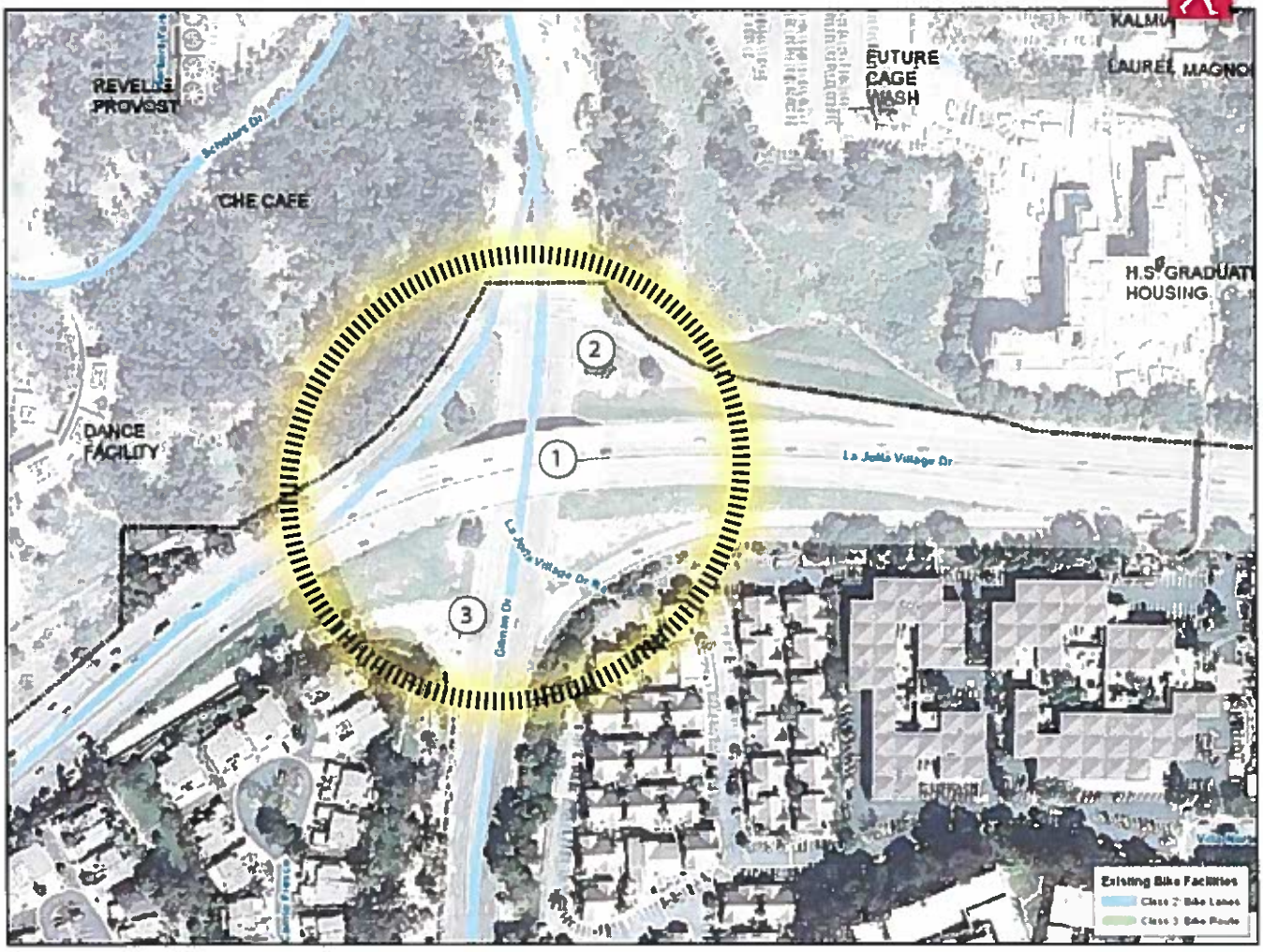
Problems:

- Missing crosswalk across intersection south leg.
- South side of Muir College Drive missing sidewalks east of North Torrey Pines Road.
- East side of North Torrey Pines Road missing sidewalks.
- Missing bicycle detection.

Proposed Improvements:

- Add crosswalk at intersection south leg.
- Construct sidewalks on south side of Muir College Drive east of North Torrey Pines Road.
- Construct sidewalks on east side of North Torrey Pines Road.
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.

H. Gilman Drive/La Jolla Village Drive Interchange Ped Improvements



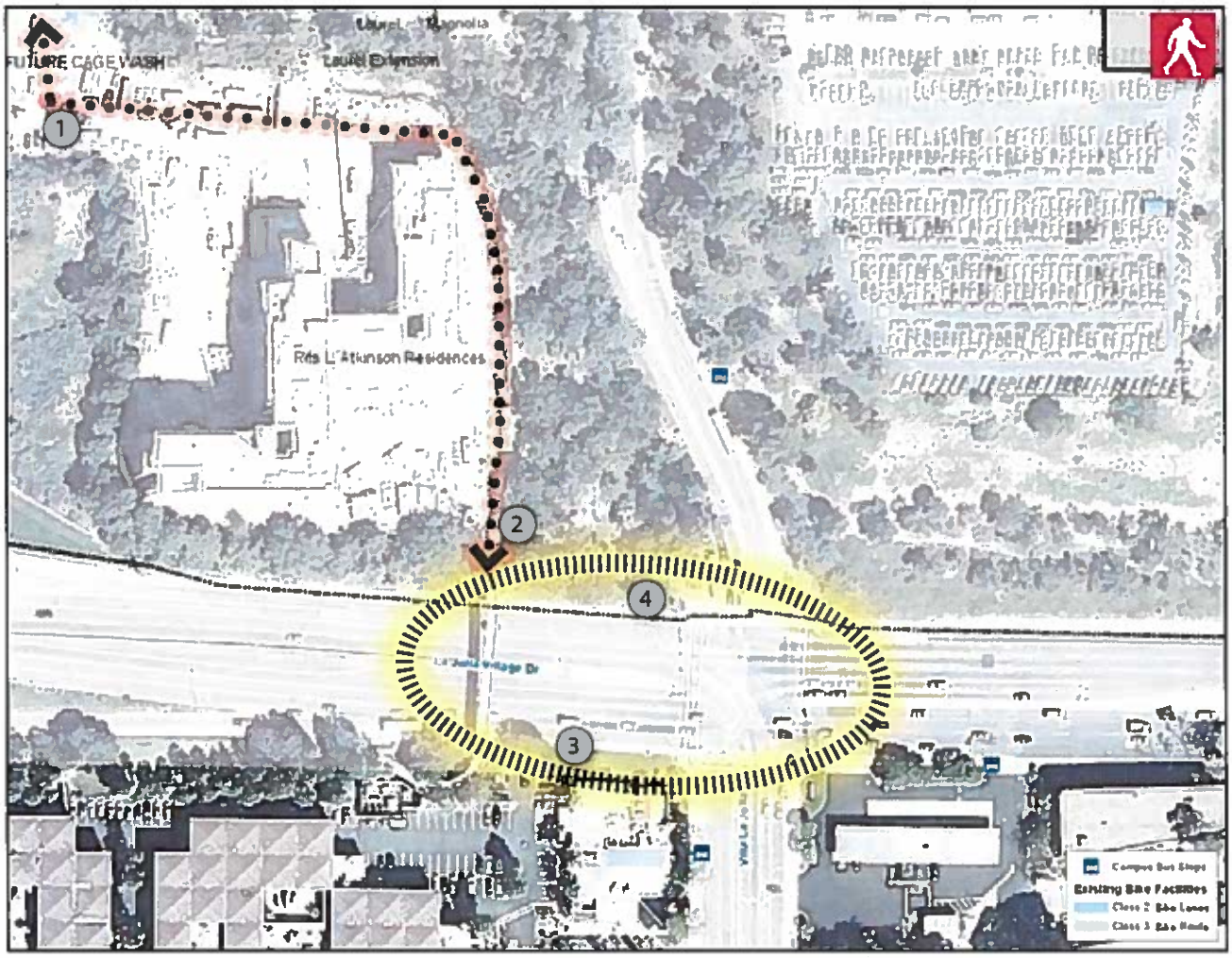
Problems:

- (1) No sidewalks through intersection on east side of Gilman Drive.
- (2) At Gilman Drive/La Jolla Village Drive westbound intersection, high vehicle speeds at free southbound right-turn and some drivers do not yield to pedestrians, as well as conflicts between cyclists and vehicles.
- (3) At Gilman Drive/La Jolla Village Drive eastbound intersection:
    - High vehicle speeds at free northbound right-turn and some drivers do not yield to pedestrians.
    - Eastbound right-turn drivers often do not obey stop sign.
    - Conflicts between cyclists and vehicles.

Proposed Improvements:

- Add sidewalks on east side of Gilman Drive. *(May require retaining walls under La Jolla Village Drive overpass.)*
- Reconfigure southbound right turn with smaller turn radius at Gilman Drive/La Jolla Village Drive westbound intersection. *(If possible, control movement with traffic signal.)*
- Reconfigure northbound right-turn with smaller turn radius at Gilman Drive La Jolla Village Drive eastbound intersection.

I. Villa La Jolla Dr. Ped Bridge and La Jolla Village Dr. Ped Access Improvements



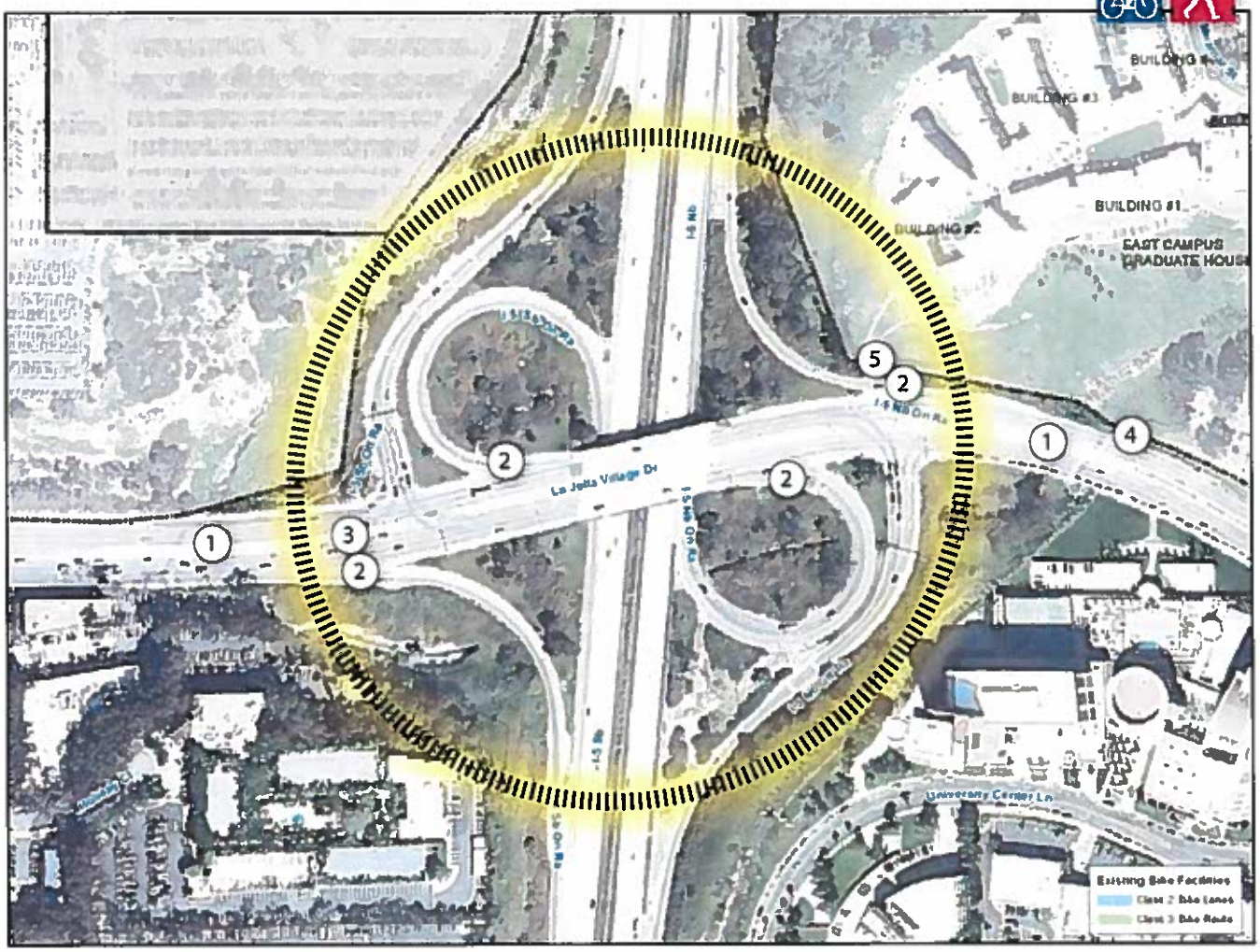
Problems:

- Missing crosswalk across intersection east leg. *(May be too much left turning traffic to allow.)*
- No bicycle lanes on Villa La Jolla Drive or La Jolla Village Drive.
- (1) Difficult to find bicycle/pedestrian bridge from School of Medicine.
- (2) Narrow path to bicycle/pedestrian bridge (north of La Jolla Village Drive) .
- (3) Narrow sidewalk on south side of La Jolla Village Drive between bicycle/pedestrian bridge and Villa La Jolla Drive.
- (4) No connection between sidewalk on north side of La Jolla Village Drive and bicycle/pedestrian bridge.
- Missing bicycle detection.

Proposed Improvements:

- Add crosswalk at intersection east leg. *(Should have minimal effect on traffic operations since "walk" phase will be concurrent with northbound through and right-turn green.)*
- Improve wayfinding to/from bicycle/pedestrian bridge.
- If possible, widen path north of La Jolla Village Drive to bicycle/pedestrian bridge.
- Widen sidewalk on south side of La Jolla Village Drive between bicycle/pedestrian bridge and Villa La Jolla Drive.
- Add connection between sidewalk on north side of La Jolla Village Drive and bicycle/pedestrian bridge.
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.

J. Interstate 5/La Jolla Village Drive Interchange Bike and Pedestrian Safety



Improvements

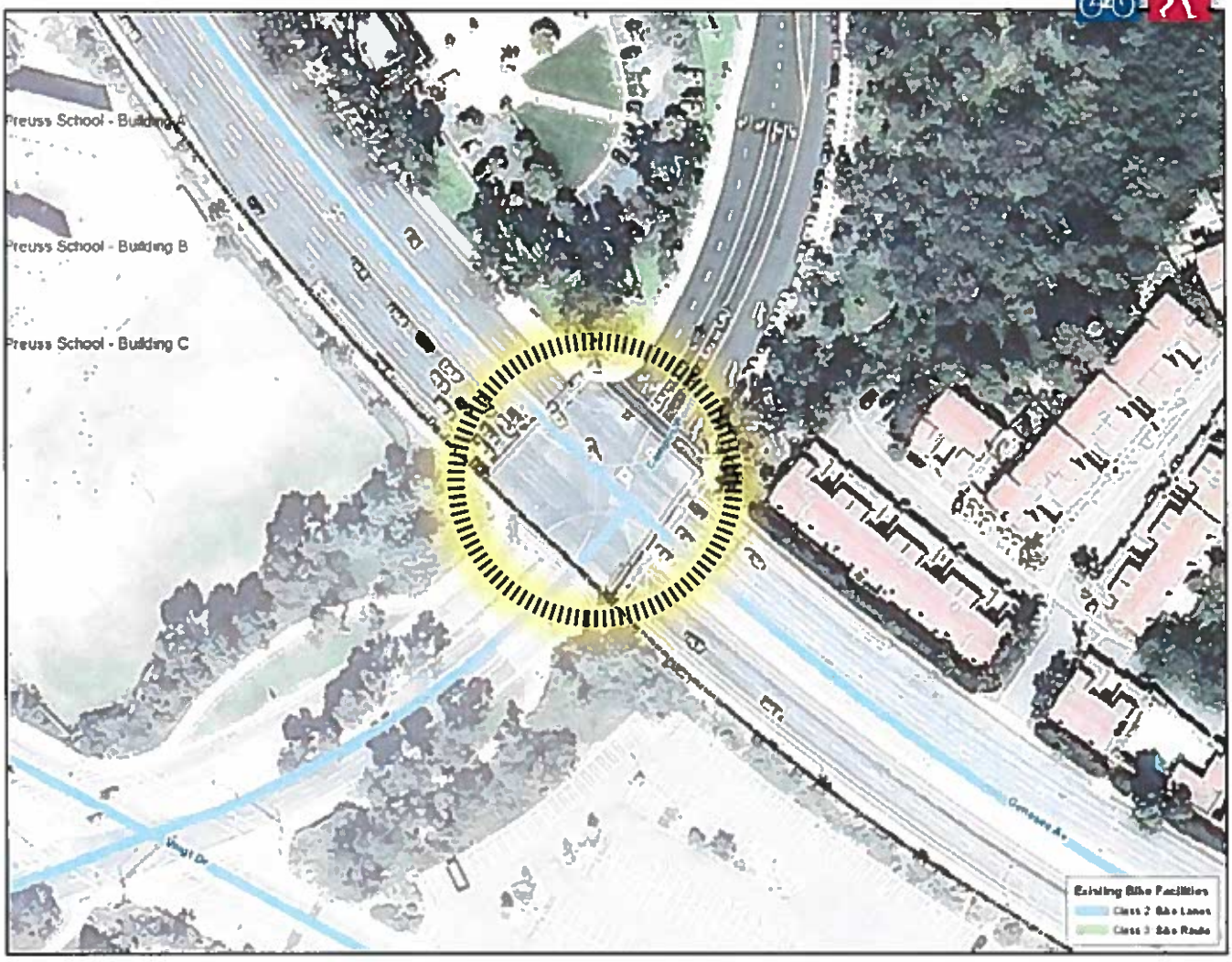
Problems:

- (1) No bicycle lanes east or west of interchange make navigation by bicycle difficult.
- (2) On-ramps (both slip on-ramps and loop on-ramps) encourage drivers to make high speed movements with little attention for cyclists and pedestrians.
- (3) No crosswalks across La Jolla Village Drive at interchange. *(Nearest crosswalks across La Jolla Village Drive are on west side of La Jolla Village Drive/Villa La Jolla Drive intersection and La Jolla Village Drive/Lebon Drive intersection.)*
- (4) Missing sidewalks on north side of La Jolla Village Drive east of Interstate 5.
- (5) Missing formal connection from Mesa Housing.

Proposed Improvements:

- Reconfigure on-ramps with smaller turn radii to slow vehicles. (If possible, control right turns with traffic signals.)
- Improve bicycle lanes at on-ramps.
- Enhance crosswalks with appropriate measures to improve yield compliance.
- Construct sidewalks on north side of La Jolla Village Drive east of Interstate 5.
- Add crosswalks to each ramp terminal intersection:
  - At Interstate 5 southbound/La Jolla Village Drive intersection, add crosswalk across intersection west leg.
  - At Interstate 5 northbound/La Jolla Village Drive intersection, add crosswalk across intersection east leg. *(Requires reconfiguration of Interstate 5 northbound slip on-ramp.)*
  - Add formal pathway connection between Mesa Housing and La Jolla Village Drive.

K. Genesee Avenue/Campus Point Drive Bicycle and Ped Improvements



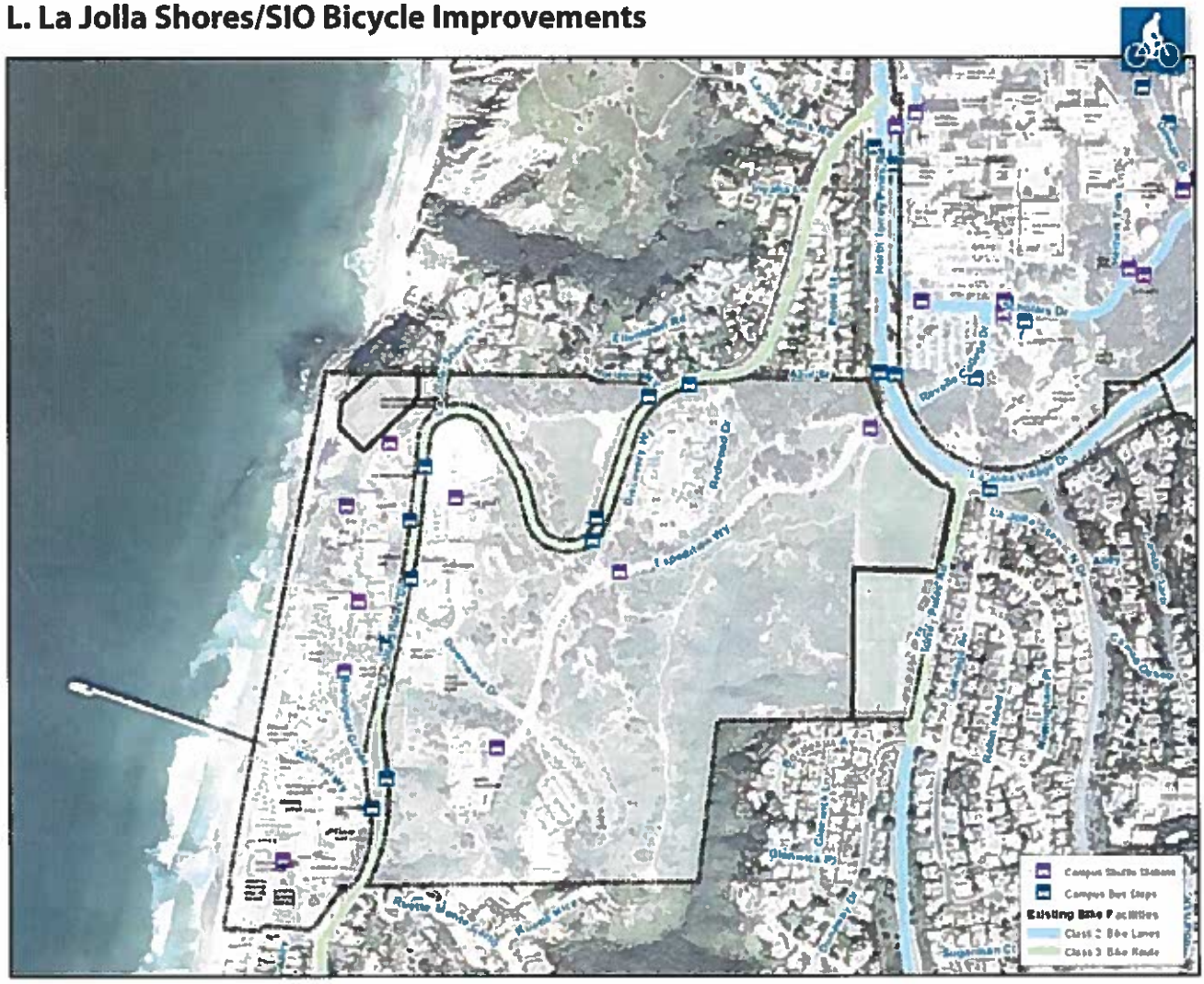
Problems:

- Missing crosswalks across intersection west leg.
- Missing bicycle detection.

Proposed Improvements:

- Add crosswalks at intersection west leg.
- Install bicycle detection in all appropriate lanes (Type D limit line detector loops).
- Modify signal timing to accommodate minimum green splits for cyclists.

L. La Jolla Shores/SIO Bicycle Improvements



Problems:

- Steep grades allow cyclists to descend at high speeds, but makes climbing difficult.
- Grade combined with 40 foot width and parallel parked vehicles causes conflicts with some safety concerns.

Proposed Improvements:

- Install Class 3 route with "Sharrows" southbound and Class 2 "climbing lane" northbound with appropriate signage in downhill direction.
- Remove parking on one side to accommodate configuration.

"Climbing lane" configuration: Class 2 lane uphill and Class 3 route downhill with "Sharrows" positioned at least four feet from curb (per California MUTCD)

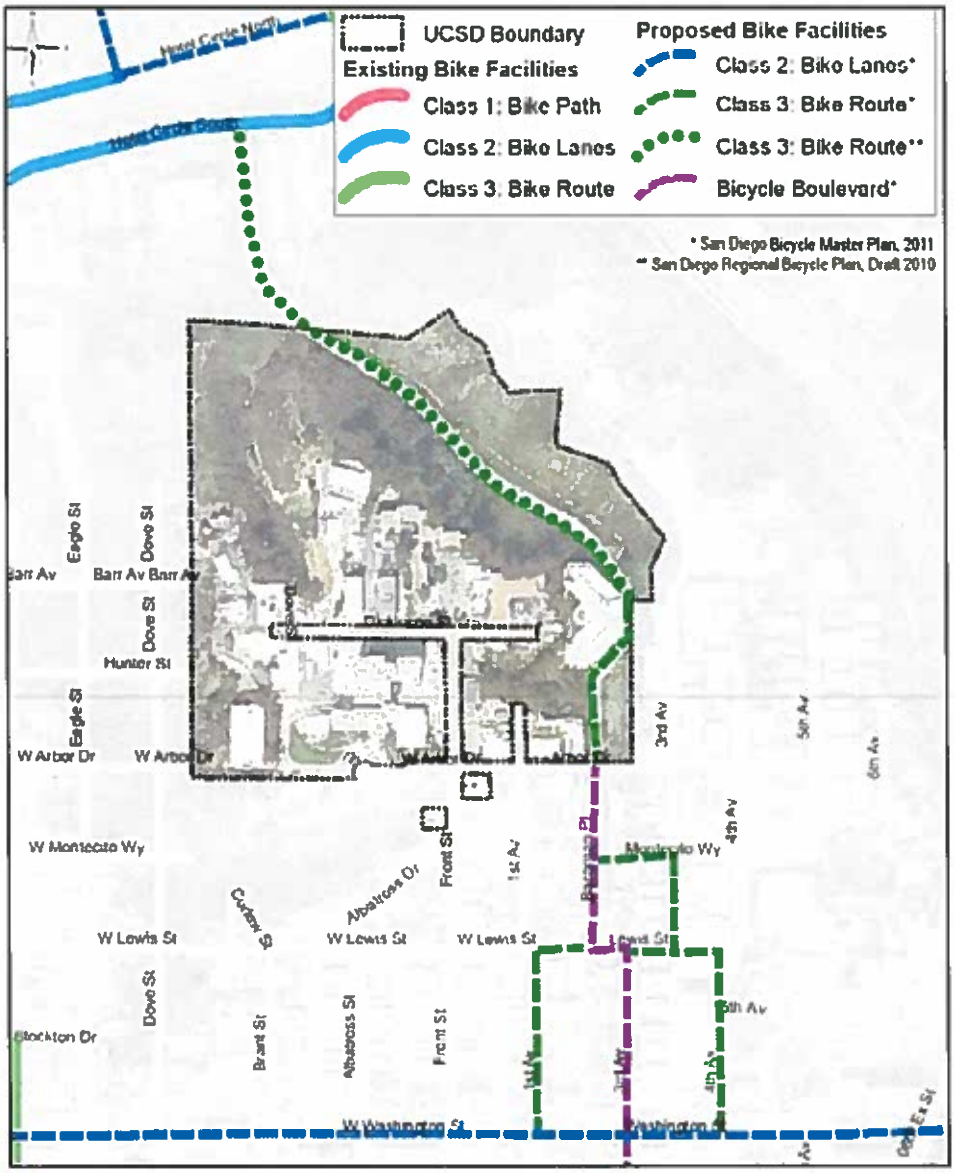
R4-11 Sign

UC San Diego Hillcrest Medical Center

The sole recommendation for this area in the City of San Diego *Bicycle Master Plan Update* is a Class 3 bicycle facility on the upper segment of Bachman Place only, south of the Bachman Parking Structure. This would connect with a proposed bicycle boulevard continuing southward into Hillcrest.

However, considering the relative importance of this bicycle connection between Mission Valley and Hillcrest, it is recommended that an enhanced Class 3 bicycle route be extended north along the length of Bachman Place to Hotel Circle South, as shown in SANDAG's *San Diego Regional Bicycle Plan*. In this case, sharrows and "Bicycles May Use Full Lane" regulatory signs are appropriate enhancements (see bottom of previous page for example). In addition, pathways are needed on each side of Bachman Place, south of the parking structure.

Proposed UCSD Hillcrest Medical Center Area Bicycle Facilities



Top Three Priority Programs

Like the top five projects, the top three priority programs were developed with substantial Project Working Group assistance. These top three programs are intended to be implemented in sequential order and were chosen based on the principle that these efforts would provide a solid foundation that will serve to support future programs as they are implemented.

- Website – Maintain a portal for all information relating to active transportation programs and policies.
- Marketing Campaign – Create a consistent message and branding to unify the outreach effort for active transportation at UC San Diego. This will influence the website design and supply outreach and education materials.
- UC San Diego Bicycle Instructors – Train faculty, staff, students, RAs and affiliates as UC San Diego bicycle instructors.

Prior to implementing the three priority programs, it is important to transition the Bicycle and Pedestrian Master Planning Study's Project Working Group (PWG) into a UC San Diego Active Transportation Committee (ATC). The Commute Solutions and Transportation Services marketing manager will chair the ATC, with membership from Physical and Community Planning, Environmental Health and Safety, Facilities Management, UCSD Pedal Club, Campus Police and faculty and student representatives. The chair of the ATC is responsible for the development and implementation of campus programs. The committee would provide appropriate oversight for these programs and would continue the PWG's collaborative environment between campus departments, faculty, staff and students.

A second step to take prior to implementing these programs, is to make contact with interested faculty and staff to provide implementation assistance. These resources could include Rady School of Management faculty who may be able to help with website and marketing, the Recreation Program for adding "effective cycling" classes and the Department of Education Studies to assist with finding instructors and helping to develop curriculum. Wherever possible, it is important to utilize existing campus resources.

The following pages describe the top three programs and their suggested goals and actions.

a. UCSD Active Transportation Website

Program Goals

A successful UCSD Active Transportation Website will be a place to locate digital education and outreach materials, maps, policies and general information about cycling and other active transportation modes on and around UC San Diego. It will also be a place to post event notices and information about campus resources such as the Triton Bikes program, Pedal Club bicycle commuter incentive programs, or the campus Bike Shop. It will provide a single location for events, notices and clubs housed under different campus departments and programs. It will also serve as a place to promote social rides and clubs, new outreach and education programs and notices of new facilities.

Program Actions

Website as Program Priority #1

A website is the critical first step for success in reaching the campus community with further outreach programs. Without this information foundation, the promotion and education efforts would be missing the follow-up resource a website provides.

Utilizing Campus Resources

In an effort to utilize the existing resources on campus, it would be ideal if a web-design project could emerge from a UC San Diego marketing or computer science class. Efforts should be made to reach out to interested faculty and students to design and build the website.

Website Administration

Additionally, there will be a need for designated website administration who will be not only responsible for content, relevancy and website updates, but also ensure the collaborative spirit of an all-inclusive site is maintained. It is counterproductive to administer multiple pages of disparate information housed under the individual departments responsible for each element. It would be best if the website administrator was in close communication with, or actual member of the Active Transportation Committee.

Examples

- Bicycling at Stanford: http://transportation.stanford.edu/alt_transportation/BikingAtStanford.shtml
- UC Davis Bicycling Program: http://taps.ucdavis.edu/bicycle/
- Biking at UC Irvine: http://bike.uci.edu/default.cfm
- Bike Long Beach: http://www.bikelongbeach.org/

b. Marketing Campaign

Program Goals

A marketing campaign will provide direction for branding the UC San Diego's active transportation image and provide an outreach campaign with ideas on how best to reach and communicate basic education or event promotion to the campus community. Outreach can include a public education campaign message series about campus "rules of the road," safe cycling and other information for campus-wide distribution. Messages can be distributed via campus newspapers, websites, smartphone apps, information kiosks, bus stop signs, etc.

This project can also be a collaboration with a marketing class through the Rady School of Management, or a project utilizing UC San Diego Creative Services and Publications in University Communications and Public Affairs.

Program Actions

It is important that this effort be concurrent with the website creation so that the branding is consistent across all efforts. At minimum, the website will need to be updated with the branding guidance if the programs must happen sequentially.

The development of educational marketing materials about bicycle and pedestrian safety must be properly vetted by the necessary campus officials, committees and ideally, local bicycling advocates at the San Diego County Bicycle Coalition and WalkSanDiego.

It will also be important to work within existing campus branding guidelines by working with the UC San Diego Marketing Council and consulting the UC San Diego Graphic Guidelines. The Council is currently working on a campus wide branding initiative that can provide a framework to guide an active transportation-specific campaign.

Links

- UC San Diego Graphic Guidelines: http://www.publications.ucsd.edu/
- UC San Diego Marketing Council: http://blink.ucsd.edu/go/marketingcouncil
- San Diego County Bicycle Coalition: http://www.sdcbc.org/
- WalkSanDiego: http://www.walksandiego.org/

c. UC San Diego Bicycle Instructors

Program Goals

UC San Diego bicycle instructors would serve as a resource for teaching bicycle education at orientation events, recreational classes or as diversion programs to reduce a citation fine. Targeting faculty, staff, students, RAs and affiliates to become UC San Diego bicycle instructors utilizes campus resources as suggested in previous goal statements. A group of trained instructors will be critical to draw upon as additional education programs come to fruition.

To recruit and train a group of instructors through the League of American Cyclists, the first step is to hold a two day introductory safe cycling skills course, Traffic Skills 101, taught on-campus with curriculum tailored to UC San Diego. This course can be taught by an active League Certified Instructor. Interested participants are then eligible to be trained as bicycle instructors, League Certified Instructors (LCIs), in a follow-up three day course.

Program Actions

A bicycling education program will need to be selected or created. There are existing, nationally known programs to utilize as samples. A campus insurance representative or risk management employee should be consulted on the merits of selecting the desired method of training and certification. Additionally, existing bicycling educators of the San Diego County Bicycle Coalition should be consulted for their input on bicycling education in the region. Collaboration can be beneficial with finite resources and time. Providing this class at a reduced rate at a convenient location and time would help to entice users to attend. As precedent, there has been a successful bicycle education partnership between Cal State Long Beach and the City of Long Beach's bicycle education campaign.

Examples

- League of American Cyclists (LAB) – League Certified Instructors (LCI): http://www.bikeleague.org/programs/education/index.php, http://www.bikeed.org/
- Savvy Cycling: http://cyclingsavvy.org/

Additional Programs

Following establishment of the top three programs, the following could then be implemented:

d. 60 Minute Introductory "Effective Cycling" Class

Offer this class to gauge interest in full-day classes. Provide "credit" or incentive for attendance.

e. Employ Colleges to Reach Students During Orientation

Coordinate orientation outreach and bicycle registration. Orientation is an excellent opportunity to reach new students. They can be educated about proper bicycling, UC San Diego rules and policies, where to and not to ride and park their bicycles. This could be best accomplished through each college. Develop funding for a program to distribute vouchers for lights, helmets and locks for students who register their bicycles and/or complete an "effective cycling" course. Give out maps, route finding apps, regulations and other bicycle commuting information.

f. Bicycle Ambassador Program

Bicycle ambassadors provide safety and public awareness outreach. Their "job" is to promote safety for all users - cyclists, skateboarders, drivers and pedestrians - and encourage all campus community members to ride their bicycles more. Ambassadors can employ "guerilla marketing" techniques to connect with students and staff, such as approaching cyclists seen riding inappropriately, or talking to people with bicycles at shuttle stops or at parking lots to suggest routes they could ride for more of their commutes. This could also include invitations to scheduled instructional group rides and maintenance clinics or other more direct assistance, such as on-the-spot minor repairs and adjustments.

g. Bicycle Violation Diversion Program

Diversion programs usually offer citation recipients the opportunity to attend an educational class in exchange for reducing or removing the citation. According to Risk Management, UC San Diego is not required to utilize the City of San Diego's programs and should create its own internal campus program.

Example: Stanford University

h. Bicycle Map

A bicycle map provides an opportunity to inform users where best to ride and park their bicycle, showers/changing facility location and the back panel is a great place to incorporate bicycle safety information. This map should be re-printed as often as facilities change and should be distributed free-of-charge as well as made available on-line for downloading.

Examples: University of Arizona, Princeton University

i. Bicycle Share

The existing Triton Bikes program would benefit from a dedicated maintenance program, expanded bicycle refurbishment services and more promotion. It could also be more formalized by providing new, branded bicycles, such as systems in place at several universities. Many of these bicycle share programs brand themselves by employing custom-painted bicycles. Some are quite sophisticated, using automatic locking stations accessible via smartphone apps that provide real-time information on both available bicycles and parking slots.

Examples: UC Irvine, NYU

j. Bicycle Registration

Bicycle registration aids in the retrieval and identification of stolen bicycles and helps campus parking and police to make sure bicycles are properly locked in designated areas. It can help in creating a bicycle-commuting database to track trends. UC San Diego requires California state registration, but with some other registration systems, users can track their commute distance, as well as other statistics, such as greenhouse gas (GHG) emissions or carbon saved by not driving.

Examples: UC Irvine, University of Oklahoma

k. Commuter Incentives

Users can participate in Bike to Work Week, track their miles and compete for prizes. This can be incorporated with the existing UC San Diego commuter incentive program via the Pedal Club. Give users an incentive not to use their parking passes.

Example: Stanford University

l. Campus Bike Station

A bike station is a facility designed for bicycle commuters that typically requires membership to use secure bicycle parking, and often showers, changing rooms or lockers. Bike stations are usually located in conjunction with multi-modal transit centers. Some are staffed and offer free valet parking during the day, and most are secured by key or electronic card access after normal business hours. Other services can include electronic bicycle route-planning kiosks, fee-based or self-repair services, parts and accessory sales, bicycle rentals, educational opportunities such as Smart Cycling courses and bicycle maintenance classes and distribution of general educational and promotional materials.

Examples: University of Minnesota, UC Davis

m. Green Campus Program

Green Campus works with campus communities to integrate energy efficiency through education and outreach, green workforce development, academic infusion and projects that target measurable energy savings. This is an existing program supported by the Alliance to Save Energy and UC San Diego Facilities Management. Implementing this study's recommendations correlate with Green Campus objectives and can form the basis for collaborative marketing and outreach.

From the UC San Diego Green Campus website:

> *"If you usually drive to work or school, commit to carpooling, taking public transit, biking, or walking several times a week to cut down on the greenhouse gases emitted when you drive a car."*

Emerging Technologies

Because the world of emerging technologies is ever-changing, this section should be considered merely a snapshot in time of what exists at the time of this writing. As a university, there is constant pressure to keep up with the "latest and greatest" technologies to stay competitive with other campuses and relevant in the eyes of students. These tools can help to supplement the sharing of information between students, faculty and staff at UC San Diego. Information sharing continues to be faster, easier, more customizable and more convenient.

n. Route Tracking

Route tracking can employ a smartphone's global positioning system (GPS) capabilities to later map on-line where the riding, walking or running occurred and see the routes others use. This can help route planning, as well as track mileage, calories burned or reductions in vehicle miles traveled (VMT) and green house gas (GHG) emissions. This can be a basis for competition between student groups for prizes or tracked for commuter incentives.

Google Street View tricycle

This can be done on-line through SANDAG's iCommute website, with a general app like Map My Ride or Endomondo, or this functionality could be added to UC San Diego's existing app. The benefit of a customized app is that the campus can use the data for tracking active transportation trips to be used for incentives, prizes and awards, but also general knowledge about those trips on campus. It can be helpful for learning popular routes students use, when and how often facilities are utilized and to track changes as encouragement programs are implemented and facilities are expanded. This can provide excellent benchmarking data over time similar to how the campus bicycle parking survey is utilized now. This type of information can also be particularly useful for future grant applications.

Example: iCommute - http://www.icommutesd.com/

o. Wayfinding

A custom map app created for UC San Diego could also include information about where to ride on campus and where bicycle parking is located. It can provide information beyond the standard racks and provide information on long-term or indoor storage solutions, as well as provide the ability to report problems with racks, facilities or even report close-calls.

Google Maps currently provides an online/smartphone app function to acquire directions to an address and allows the user to select from various transportation modes, including walking or biking. As the Bicycle and Pedestrian Master Planning Study is implemented, it will be important to update Google with the latest biking and walking routes on campus.

Additionally, Street View in Google Maps allows the user to virtually move through a place with 360 degree street-level imagery. A university campus can request the Street View team to visit their location and collect imagery using a special tricycle that can access campus pathways that their other vehicles can not. Once the images are added to Street View, students will be able to explore the campus virtually. This can be a great asset, particularly for new and prospective students.

Examples: University of Oregon, Google Maps - http://maps.google.com/help/maps/streetview/partners/

p. Quick Response (QR) Codes

A Quick Response or QR code is an image that functions similar to a barcode, readable by smartphones equipped with an appropriate reader app. The most widely used type consists of black squares arranged in a pattern on a white background that make up a code containing letters, characters and numbers. The QR code can therefore contain a link to a website or video or other digital content on-line. Users encountering a QR code scan it with a smartphone or tablet camera enabled with a QR Code reader app and the device will load an encoded Web URL onto the device's Web browser. Posting a QR code assumes the user will recognize what to do with the QR code and have a smartphone and QR reader app. Therefore, it is best to reserve the use of these codes for added information or convenience. For example, a QR code posted on a campus map could be encoded to direct users to the campus active transportation website to find more information about campus routes.

QR Codes can be used to provide additional information for wayfinding, bicycle parking and transit information, as well as instructional videos, contact information and more. For example, one bicycle rack manufacturer employs a QR code sticker on its racks that links to an instructional video on how to properly lock a bicycle.

Example QR code

q. Condition Reporting

With the power of a smartphone, it is now easy to take a photo, record the time, date and location and add a text description. Pairing this functionality with an app can allow individuals to report issues such as graffiti, overgrown plantings, roadway problems, broken sidewalks, lighting problems, trash, irrigation leaks, etc. The most widely used such app is City Sourced, which produces apps customized for a number of cities across the country. Locally, their app directs reported issues to the City of San Diego. It may be possible to coordinate with the City to receive information on reports from on-campus or to contract with City Sourced for a campus-specific version of their app.

Example: City Sourced - http://www.citysourced.com/default.aspx

r. Close-Call Reporting

Crash data provides a wealth of information regarding locations with safety concerns. This can help to determine if an education campaign or engineering fix can address crash patterns. However, this is a reactionary measure. A method for reporting "close-calls" where crashes nearly happened, can help to capture valuable information before there is a serious incident. Additionally, this can be a venue to report a crash that results in no damage or injury and therefore would have otherwise gone unreported.

Example: City of Louisville, Kentucky - http://www.louisvilleky.gov/BikeLouisville/close_call_form.htm

s. RFID Tags

Radio Frequency Identification (RFID) is a widely used technology employed in many ways. It is a data collection and marking technology that uses electronic tags for storing data and a reader device to retrieve the data. Tags are made up of an RFID chip attached to an antenna and most derive their power from the radio frequency waves coming from the reader.

Like bar codes, RFID tags identify items. However, unlike bar codes, which must be in close proximity and line-of-sight to the scanner for reading, RFID tags do not require line-of-sight and can be embedded within objects, such as bicycle frames. Depending on the type of tag and application, they can be read at a varying range of distances.

A common use of RFID tags is commuter tracking for incentive programs, but it is also used for bicycle registration programs. Installing RFID tags on or in bicycle frames allows them to be easily scanned and compared with a "hot list" of stolen bicycles. The tags may not deter thieves, but they are connected to the police database, which aids bicycle recovery.

A downside to using RFID technology for incentive programs and use level surveys compared to smartphone apps is that signals must be tracked via readers installed in specific locations, such as at campus gateways.

One sophisticated use of RFID tags is a system that involves embedding tags in bicycles whose owners are registered in a university's theft-prevention program. When parking their bicycles in designated "safe zones," users call in their location to a server with their GPS-enabled smartphones. On their return, they call to check out. If the bicycle is moved without calling and entering a pin code to check out, closed circuit cameras zoom in on the area. One downside is that students using the system have started to forgo the check-in/check-out procedure because the safe zones have experienced far less crime and theft.

Example: University of Portsmouth, Ohio State University

Safety and Regulatory Recommendations

6

On campuses, where there is substantial annual population turnover, it is important to provide a structured environment where expectations are clear. This is not the place for the "less is more" design philosophy. An important aspect of this is developing and enforcing consistent policies, programs and enforcement, which also helps prevent signage "overkill."

Regulatory Policies

On shared facilities, all users must travel at a prudent speed and those traveling faster must yield to slower users.

It is recommended that Ridge Walk be opened to mixed use as a shared facility.

It is also recommended that Library Walk continue to be closed to bicycles and skateboards.

Finally, there should not be regulations specific to the day of week or time. Instead, use should be simply allowed or not allowed on a 24 hour, seven day basis. This will improve users' understanding of the regulations, as well as simplify regulatory signage and enforcement.

Regulatory Signage

To effectively enforce regulations, supporting signage must be consistently posted. The following recommendations address conditions known to occur on the campus.

- Utilize signs for their proper purpose.
- Place signs appropriately and facing the intended direction.
- Signs on roadways must be California MUTCD-compliant.
- Particularly for dismount zones, signs must be installed at every potential entry and exit. In situations where a sign is not feasible, a pavement marking may be appropriate. If pavement markings are used, they should be as close in design to the signs as possible (see example system below).

Example dismount zone sign system (Ft. Collins, CO)

Enforcement

With the likelihood of increased use on mixed use facilities, the campus should increase the number of police officers on bicycles. This could also provide the capacity to manage the recommended bicycle diversion program.

In addition, the following are programs that have proven effective in deterring bicycle theft and illegal parking.

Bait Bicycles

Among the theft-deterrent actions that have been employed at universities are "bait bicycles." Police fit bicycles with a covert tracking system and leave it (insecurely) locked at a prominent location. If the bicycle is moved, police are alerted to track the stolen bicycle. This type of initiative can also aid in intelligence-gathering. For example, tracking the signal may provide insight into the offender's movements after thefts and potential locations of stolen goods and markets. Anecdotal evidence suggests that such interventions increase arrest rates.

Examples: University of Toronto

Booting

Locking bicycles to trees or street furniture is generally less secure than locking to purpose-built racks. A university implemented an enforcement campaign in which police and student security monitors first issued warnings to cyclists who illegally locked their bicycles. Repeat offenders then had their bicycles "booted" with a bright orange U-lock with instructions on where to pay a fine to have the lock removed. Bicycle theft has fallen from around 350 incidents per year before intervention to fewer than 150 per year for the two-year period afterward.

Example: University of Minnesota

Golf Cart/Utility Vehicle Policies

While a study should be conducted and subsequent policy adopted regarding golf cart/utility vehicle use on campus, this study can provide guidance as it relates to non-motorized campus traffic.

In general, utility vehicles/golf carts should be operated with the utmost courtesy, care and consideration for the safety and convenience of other pathway users. All other users, including inline skaters, skate boarders, cyclists and wheelchair or mobility assistance devices users, should have the right-of-way at all times. Under no circumstances should a utility vehicle/golf cart operator force another user off a pathway.

On UC San Diego streets, operators should not exceed posted speed limits for motorized vehicles. On off-street pathways, operators should not exceed the speed of other pathway users. Operators also should not attempt to pass other users if they cannot do so without making the other user change their route of travel.

Utility vehicle/golf carts should be prohibited from parking where they would impede or interfere with pathway user or vehicular traffic flow on roadways, ramps or off-street pathways. Utility vehicle/golf cart use should be restricted to specific permitted areas or routes and violation of posted rules shall result in revocation of the cart permit.

In addition to policies, UC San Diego should determine where utility vehicle/golf cart use is to be permitted. For example, vehicles could be limited to paths no narrower than twice their width. This would preclude use on many of the existing grove pathways and the route north of the library.

If it is difficult to develop a written description of the permitted use area, a map depicting this area can be used, which would be required to be posted in all utility vehicles. Additionally, if vehicle use must be permitted on narrow paths for necessary building access, the "no passing rule" should be strictly enforced.

Overall, UC San Diego should aim to reduce the amount of utility vehicles on campus. Permits should be limited to those who require a vehicle to perform a critical function. If a utility vehicle is not essential, applicants should be encouraged to utilize other campus options, such as the UC San Diego Triton Bikes program. The reduction of utility vehicles on UC San Diego will simplify enforcement and help to reduce utility vehicle conflicts with other pathway users.

Examples: Florida Atlantic University, Tulane University and the University of Missouri.

Proposed Regulations

General

Utility vehicles/golf carts shall be operated with the utmost courtesy, care and consideration for the safety and convenience of pedestrians and other pathway users. Pedestrians, cyclists, inline skaters, skate boarders, or wheelchair or mobility assistance device users have the right-of-way at all times and under all circumstances. Under no circumstances may a utility vehicle/golf cart operator force another user off a pathway. Utility vehicle operators shall maintain a distance of at least ten (10) feet behind any pedestrian or cyclist.

Golf carts/utility vehicle drivers must be especially attentive to the needs of disabled persons, due to their vision, hearing or mobility limitations.

Utility vehicles shall not be operated in a manner that may endanger passengers, other individuals or damage UC San Diego property. All utility vehicles must travel in the direction of the flow of traffic (when traveling on streets) and must obey all UC San Diego traffic regulations and signs.

At no time shall utility vehicles/golf carts be operated on public streets or city sidewalks, except as may otherwise be permitted on the attached map to access certain UC San Diego property that is not adjacent to other campus property, or that is not easily accessible.

Designated UC San Diego Use Areas

The use of utility vehicles is restricted to designated UC San Diego routes. A laminated copy of a map of designated use areas must be carried in all utility vehicle at all times.

As necessary, revised routes and/or maps will be sent out via e-mail to the contact person for each department with a utility vehicle to advise of temporary route changes due to construction or other projects or events. It will be the responsibility of the contact person to distribute this information to all utility vehicle operators within their department.

Except in emergencies, carts and utility vehicles may be operated only on roadways and sidewalks at least six (6) feet wide.

Parking

Parking is allowed only on hard, paved surfaces (e.g. asphalt, concrete, brick) or on packed gravel surfaces. Parking in any non-designated area, including but not limited to the following, is strictly prohibited and will result in the issuance of a citation:

- Parking on soft surfaces such as landscaping, unpaved surfaces (except for packed gravel surfaces designated as permitted parking areas on the attached map), and natural covered areas such as those areas covered by mulch
- Parking in front of entrances to buildings, stairways, handicap ramps, or main thoroughfares
- Parking so as to impede or interfere with normal pedestrian or vehicular traffic flow on roadways, ramps or sidewalks
- Parking to block fire lanes, entrances to buildings, stairways, disability ramps, main thoroughfares, or fire suppression equipment
- Parking in designated parking spaces without a valid permit

Speed Limits

On UC San Diego streets, operators shall not exceed posted speed limits for motorized vehicles.

Speed must be reduced to a minimum when driving along or near pedestrians or other users.

On off-street pathways, operators shall not exceed the speed of other user traffic present. Operators shall not attempt to pass pedestrians or cyclists at any time.

The recommended speed on off-street pathways is five (5) mph and in a congested area, the speed should be no faster than that of other users moving in the same area.

6 Safety and Regulatory Recommendations

Implementation and Costs

7

Implementation is crucial to the success of any plan and identifying a project funding source is the most important step towards project implementation. The goal of the Bicycle and Pedestrian Master Planning Study is to implement all of the recommended projects and programs within 20 years. Implementation support is anticipated from competitive grants, new building projects and other campus programs.

Noted that the funding sources for many BPMPS projects have yet to be identified and/or committed. The BPMPS is not a programming document, but instead a prioritization of the campus' bicycle and pedestrian infrastructure needs.

Cost Estimates

Detailed cost estimates were developed the for the Top 5 priority projects. Planning-level cost estimates were developed for all other projects in the Proposed Bicycle and Pedestrian Networks (Figures 2.7 and 3.9).

Unit Costs

The following table shows the unit cost assumptions for typical bicycle and pedestrian infrastructure improvements used to develop cost estimates for the Proposed Bicycle and Pedestrian Networks (Figures 2.7 and 3.9). These cost estimates were developed based on recent construction bid results in California. All costs are assumed to be in 2012 dollars. More disaggregated cost estimates were used to develop cost estimates for the Top 5 priority projects.

Description	Unit	Cost
Class 1 bicycle path (assumes 4" HMAC over 8" Class 2 AB)	Linear Foot	$150
Class 2 bicycle lanes (minor restriping)	Linear Foot	$13
Class 2 bicycle lanes (major restriping with slurry seal)	Linear Foot	$40
Class 2 bicycle lanes (streetscape reconstruction)	Linear Foot	$600
Class 3 bicycle route	Linear Foot	$1
Sidewalks (assumes minimal grading)	Square Foot	$5
Sidewalks (assumes grading and retaining wall)	Square Foot	$24
Curb and gutter	Linear Foot	$21
Signs	Each	$150
Decomposed granite	Square Foot	$2.50
Bicycle rack	Each	$225
Restriping, minor	Linear Foot	$13
Restriping, major (includes slurry seal)	Linear Foot	$40
Retaining wall	Linear Foot	$80
Bicycle detection (Type D detectors within vehicle lanes)	Intersection Approach	$4,000
Crosswalk at signalized intersection (no detector modifications)	Each	$2,200
Crosswalk at signalized intersection (with detector modifications)	Each	$5,000
Traffic signal	Each	$120,000 - $250,000
Roundabout	Each	$1.5 million
New roadway	Mile	$4.9 million

The following table shows all projects proposed in the BPMPS and provides an estimated cost for each project. The entire list of bicycle and pedestrian projects is estimated to cost $13.9 million. Of that, the Top 5 priority projects are estimated to cost $1.7 million, and the remainder is $12.2 million.

Project Name	Project Type	Est. Cost
Top 5 Priority Projects		
1. Hopkins Lane walkway improvements	Streetscape and path improvements	$283,000
2. Warren College/Voigt Drive crossing	Crosswalk improvements	$27,000
3. Peterson Hill/Grove Path wheeled bypass	Path improvements	$92,000
4. Gilman Drive/Interstate 5 bicycle path connection	Class 1 bicycle path	$487,000
5. Gilman Drive bicycle lane connection	Class 2 bicycle lanes	$775,000
Other Proposed Projects		
Bicycle parking (campus wide)	Bicycle parking	$59,000
Crossing at North Torrey Pines Road and Expedition Way	Intersection/streetscape improvements	$237,000
Crossing at Torrey Pines Road and La Jolla Village Drive	Intersection improvements	$19,000
Expedition Way Bicycle lanes and route	Class 2 bicycle lanes/Class 3 route	$35,000
Genesee Avenue/Campus Point Drive	Intersection improvements	$24,000
Gilman Drive/Interstate 5 bridge bicycle lanes	Class 2 bicycle lanes	N/A
Gilman Drive/La Jolla Village Drive	Intersection improvements	$5,000,000
Interstate 5/La Jolla Village Drive	Intersection improvements	$72,000
John J. Hopkins Drive/Genesee Avenue	Intersection improvements	$19,000
La Jolla Shores/SIO bicycle facilities	Class 2 bicycle lanes/Class 3 route	$85,000
La Jolla Shores Drive/N. Torrey Pines Road	Intersection improvements	$21,000
La Jolla Shores Drive/SIO path	Path improvements	$11,000
Library Walk crossing at Gilman Drive	Crosswalk improvements	$156,000
Lyman Avenue bicycle route	Class 3 bicycle route	$1,000
Mesa Housing multi-use trail	Path improvements	$297,000
Muir College Drive bicycle lanes	Class 2 bicycle lanes	$546,000
Muir Lane bicycle lanes	Class 2 bicycle lanes	$624,000
Myers Drive	Streetscape improvements	$14,000
North Entrance	Path and intersection improvements	$26,000
North Point Lane bicycle route	Class 3 bicycle route	$2,000
North Torrey Pines Road/Muir College Drive	Intersection/streetscape improvements	$348,000
North Torrey Pines Road/Pangea Drive	Intersection improvements	$16,000
Osler Lane bicycle route	Class 3 bicycle route	$2,000
Villa La Jolla Drive and La Jolla Village Drive bridge access	Intersection and path improvements	$43,000
Realigned Campus Point Drive to East Campus LRT Station	Roadway realignment	$826,000
Regents Road bicycle lanes	Class 2 bicycle lanes, etc.	$916,000
Revelle College bicycle path	Class 1 bicycle path	$177,000
Ridge Walk bicycle improvements	Path improvements	$4,000
Rupertus Way bicycle route	Class 3 bicycle route	$1,000
Russell Drive bicycle route	Class 3 bicycle route	$1,000
Scholars Lane - La Jolla Shores Drive and Muir Lane	Class 2 bicycle lanes	$495,000
Scholars Lane - Muir College and Pangea Drives	Class 2 bicycle lanes	$582,000
Scholars Lane - Scholars Drive South and Bio. Bldg.	Class 3 bicycle route	$1,000
Torrey Pines bicycle path	Class 1 bicycle path	$62,000
UCSD Hillcrest Medical Center	Class 3 bicycle route	$3,000

Candidate Funding Sources

This section describes the many potential sources of funding for financing the recommended bikeway network and related programs. A variety of funding sources, including federal, state, regional and local funding programs, can be used to construct the proposed bicycle and pedestrian improvements. Many of the federal, state and regional programs are competitive and involve the completion of extensive applications with clear documentation of the project need, costs and benefits. These competitive funding programs provide one-time grants for use on capital projects and, for the most part, cannot be used for ongoing programs.

Federal and State Programs

The majority of public funds for bicycle and pedestrian projects are derived through a core group of federal and state programs. Federal funds from the Surface Transportation Program (STP), Transportation Enhancements (TE) and Congestion Mitigation Air Quality (CMAQ) programs are allocated to SANDAG and distributed accordingly.

Limited amounts from the Local Transportation Fund (LTF), derived from a quarter cent of the general sales tax collected statewide, can be used for bicycle and pedestrian facilities.

Off-campus projects that could also benefit local schools may be competitive for Safe Routes to School funding. State and federal Safe Routes to School programs are potential funding sources for both bicycle and pedestrian planning and infrastructure projects that improve access to schools. Caltrans administers two Safe Routes to School programs: the state-legislated program (SR2S) and the federal program (SRTS). Each program has unique differences that affect project selection.

Bicycle facilities can also be funded through the California Bicycle Transportation Account (BTA). Annually, $7.2 million is available for projects through the BTA.

In 2010, the California Strategic Growth Council (SGC) awarded $20 million through the Proposition 84 Sustainable Communities Planning Grant and Incentives Program. The SGC will award $20 million more in grants in both 2011 and 2012 (totaling $40 million). Eligible projects include plans that support greenhouse gas emission reduction and sustainable communities.

Caltrans Transportation Planning Grants are available to jurisdictions and can be used for planning or feasibility studies. The maximum funding available per project is $300,000.

The California Office of Traffic Safety (OTS) administers the General OTS Grant opportunities. Pedestrian safety is a priority area for grant funding. Funding can be used for certain law enforcement equipment, for signage (vehicle speed feedback signs) and for outreach materials and campaigns.

The Highway Safety Improvement Program (HSIP) is a core federal-aid program that aims to reduce traffic fatalities and serious injuries on public roads. Caltrans administers the program in California and received $74.5 million for the 2010/11 federal fiscal year. HSIP funds can be used for projects such as bicycle lane or sidewalk projects on local roadways, improvements to Class 1 multi-use paths, or for traffic calming measures. Applications that identify a history of incidents and demonstrate their project's improvement to safety are most competitive for funding.

New policies at the federal level have resulted in a series of programs that promise to provide increased funding in the coming years for bicycle projects. The HUD-DOT-EPA Interagency Partnership for Sustainable Communities has generated a series of new grant programs, including Urban Circulator, TIGER and Sustainable Communities Planning grants. DOT Secretary Ray LaHood recently announced a new DOT policy initiative, indicating: *"well-connected walking and bicycling networks [are] an important component for livable communities."*

Regional and Local Funding

The primary source of San Diego region funding for bicycle and pedestrian infrastructure and programs is TransNet, the half cent sales tax for local transportation projects. The passage of the TransNet Extension Ordinance committed two percent of TransNet annual revenues for active transportation of traffic calming infrastructure projects and programs (beginning Fiscal Year 2009). TransNet funds can be used as matching funds for other federal and state funding sources. However, not all federal and state funding sources allow the use of TransNet funds as matching funds. TransNet estimates that over $4 million will be available each year for active transportation projects in the San Diego region. The TransNet program will end in 2048, pending further reauthorization.

SANDAG administers Transportation Development Act (TDA) funding, using funds from the Local Transportation Fund (LTF), which is derived from a quarter cent of the general sales tax collected statewide. SANDAG allocates two percent of TDA funds for facilities provided for the exclusive use of pedestrians and cyclists.

TransNet and TDA funds are distributed through a competitive process on an annual basis. In 2010, the programs made a total of approximately $7.7 million available for bicycle and pedestrian projects in the region.

Many campus bicycle and pedestrian improvements are funded through the budgets of new building or infrastructure projects. For example, when new buildings are being planned, budgets often include funding for new bicycle parking and any new roadway or pathway improvements needed to allow for changes in bicycle and pedestrian circulation associated with the projects.

Potential Future Funding Sources

UC San Diego can implement its own funding mechanisms for infrastructure projects and programs. Candidate funding sources used at other universities include a dedicated campus parking fee increment or a dedicated student fee increment. Either source could be used for new bicycle or pedestrian programs. A full-time Bicycle and Pedestrian Coordinator position would be an effective use of funding from these sources.

Project Partnering

UC San Diego can leverage its own funds by partnering with appropriate agencies on relevant projects. The most likely project partners include the City of San Diego for improvements to City of San Diego roadways and intersections and Caltrans for improvements to state highways. Project partners can agree to project fair-share contributions or can coordinate on grant application efforts.

Implementation Responsibility

The study's comprehensive approach to UC San Diego's bicycle- and pedestrian-related issues will facilitate the implementation of improvements on campus, at gateways with the City of San Diego and with other bicycle-related organizations and businesses.

In general, the Office of Resource Management and Planning will manage implementation, primarily through Transportation Services, Community and Physical Planning, Facilities Management, and Facilities Design and Construction. The UC San Diego capital project development process, which consists of six phases, will most likely to apply to projects proposed through the *Bicycle and Pedestrian Master Plan Study*:

- Initial planning
- Preliminary plans
- Working drawings
- Construction
- Equipment
- Post-occupancy