

Pepper Canyon Neighborhood Planning Study

University of California San Diego, January 2019

Prepared by

University of California San Diego
Office of Campus Planning

With the Assistance of

HED and Walker/Macy

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01 | Overview



01 | Vision and Intent of Study

Vision

Pepper Canyon is a unique precinct of UC San Diego- natural features combining with an extensive array of capital projects in design and in planning. This corner of campus will become a new gateway with the light rail transit (LRT) line creating a dramatic new viewpoint into campus and a new entry at the new Gilman Bridge connecting east and west campus across the freeway.

The Pepper Canyon Neighborhood Planning Study focuses on connectivity and knitting together multiple, approximately 3400 new student housing beds with the campus and LRT.

The canyon itself is the dominant feature of this neighborhood, providing a natural connection from the east campus leading toward the central campus; Rupertus Way; Triton Pavilion; the Price Center; and the Geisel Library. Pepper Canyon West and Pepper Canyon East student housing

developments should embrace the natural views to the canyon and provide easy access to trails and bikeways through the canyon.

As Pepper Canyon becomes a new transit-oriented district (TOD), careful consideration is given to limiting vehicles, creating strong bike and pedestrian routes, and providing flexibility for rapidly changing mobility.

And yet, the Pepper Canyon Neighborhood should feel like a community and have a distinct sense of place. The community will be home for the student residents, a place of arrival and transition, and even a destination. These experiences are equally vital, as is the distinction between them.

“ UC San Diego is in the middle of ... a physical, intellectual and cultural transformation. My vision is that we will become a primarily residential campus....you would see a socially dynamic, live, learn, play community...you would see a community that is yet one more destination in San Diego, a lot of Art and Culture... a University which is one.”

— Dr. Pradeep K. Khosla, UC San Diego Chancellor



Caption

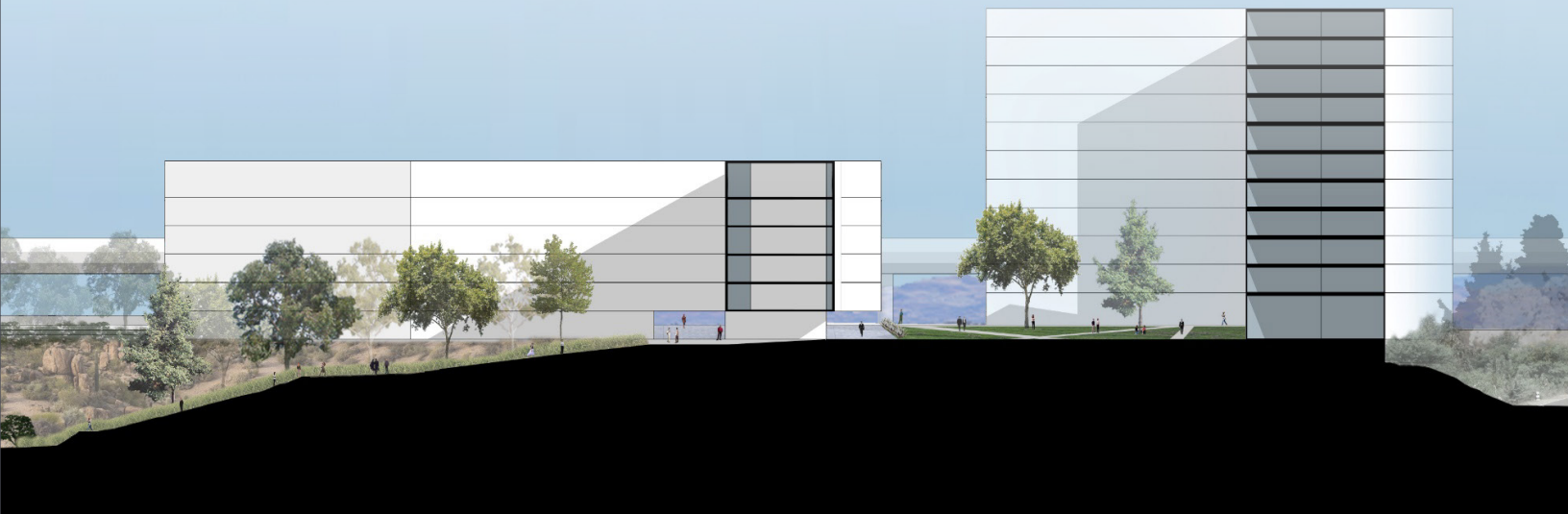
Intent of Study

The University of California San Diego (UC San Diego) Pepper Canyon Neighborhood (PCN) Study will guide future development for the 63 acres Neighborhood located at the southeast corner of the La Jolla West Campus. The Study expands on the 1989 UC San Diego Master Plan Study with more detailed urban design guidelines.

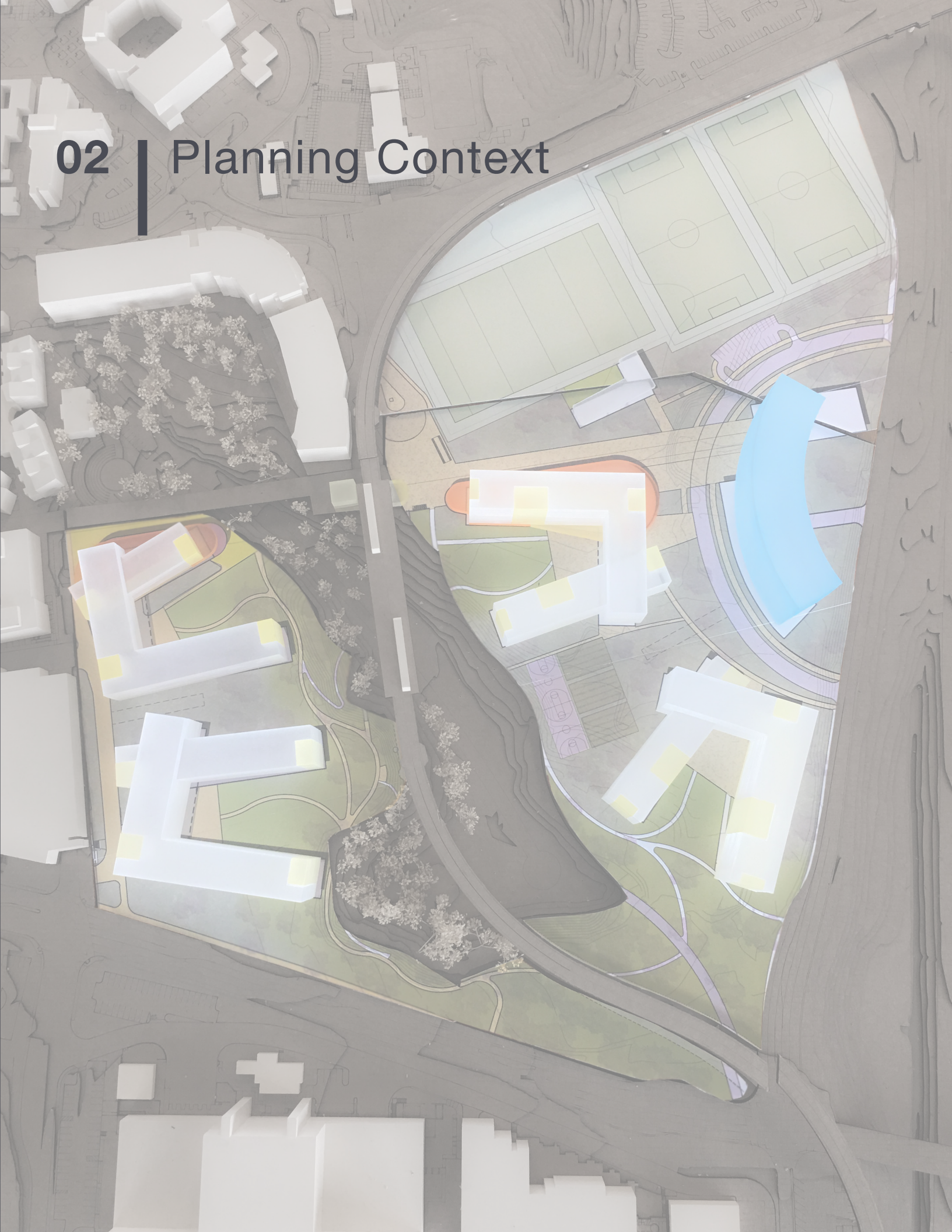
The Pepper Canyon site is generally bounded by the Interstate 5 (I-5) Freeway, Gilman and Voigt Drives and Russell Lane. The study area is influenced by its adjacency and connections to: University Center Urban Core (UCUC); East Campus via the Voigt Drive Bridge; the new Gilman Bridge; the Pepper Canyon Light Rail Transit (LRT) Trolley station; Pepper Canyon Bowl and Amphitheater; and the natural features of Pepper Canyon.

To meet campus goals to increase on-campus student housing, two major student housing projects are central to the study: Pepper Canyon West (PCW) 1,400 beds for upper division students in the near term; and Pepper Canyon East (PCE) 2,000 beds for future student housing, with the potential to house a future College. Beyond housing, the study addresses connectivity to the LRT station and broader campus.

The planning study acknowledges more than twenty projects currently in planning and design in the Neighborhood and provides a framework through which current and future projects can be developed in a cohesive manner and to create a vibrant new neighborhood for the campus. The Study outlines an overall vision for Pepper Canyon knowing that some capital projects will proceed in the near term, while others will be implemented in the future.



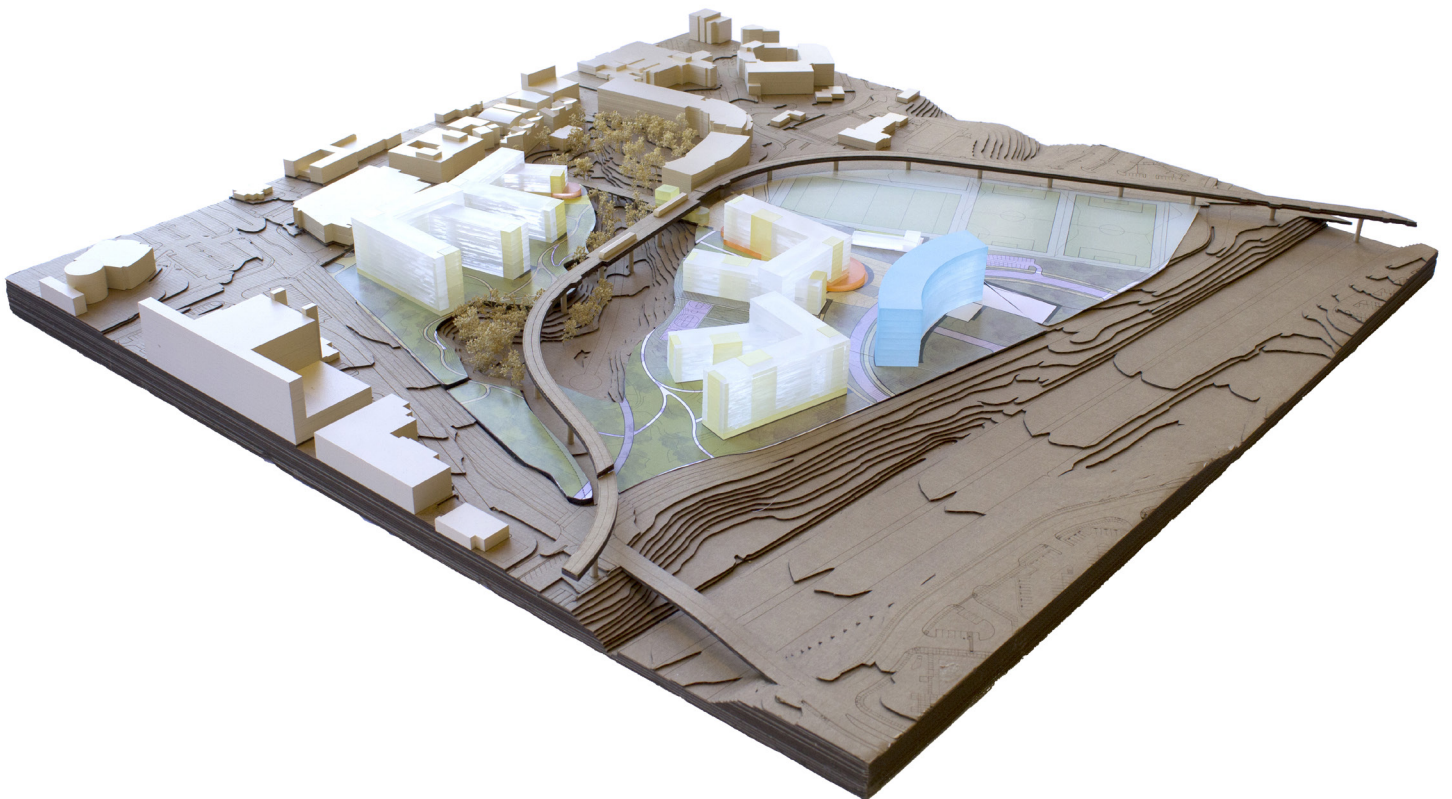
02 | Planning Context

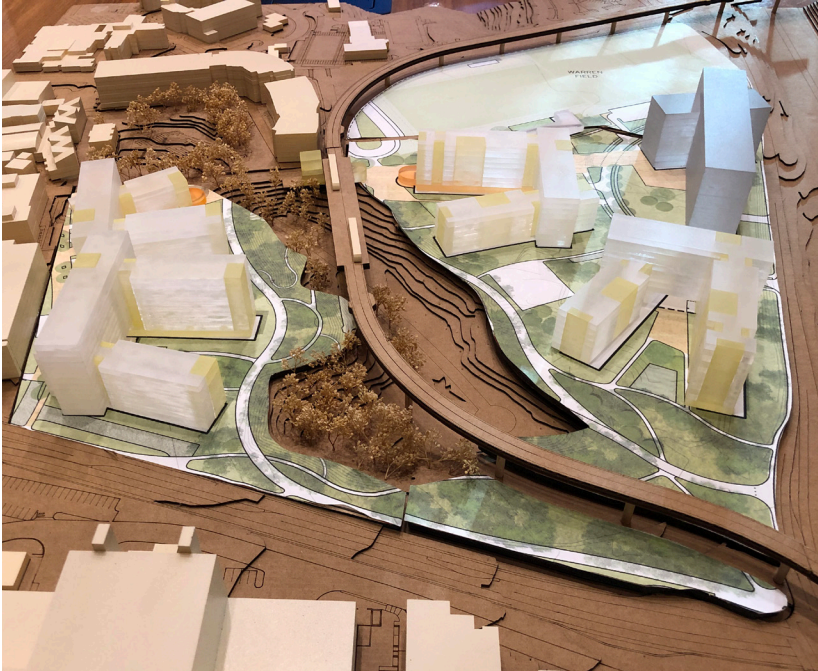
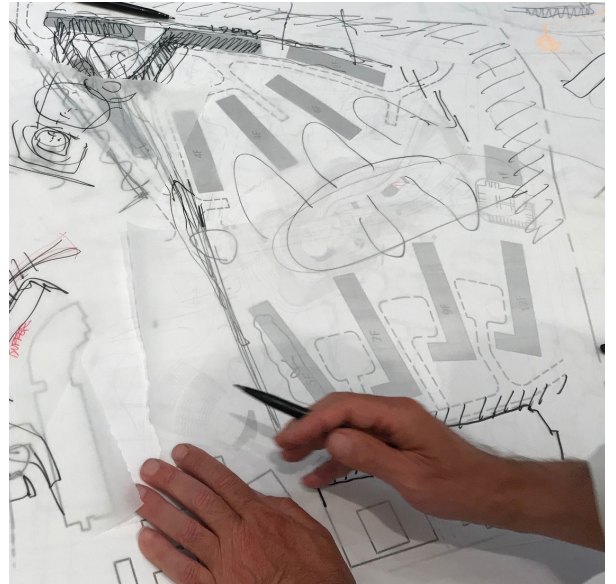


02 | Process

Process

The design team developed a participatory process to engage a range of university stakeholders and ensure that all voices were heard. Utilizing a physical model of the project as the primary tool for stakeholder participation, multiple workshops were facilitated, recorded and then distributed to confirm relevant issues and planning strategies. Strategies were evaluated for cost, program and planning impact to compare and assess their relative value. Throughout this process, the design team worked with project stakeholders; confirming requirements, exploring ideas and reaching consensus to advance the Pepper Canyon Neighborhood Study.





02 | Campus Wide Considerations

Overview

Today the existing Sixth College Neighborhood is at the edge of campus, abutting I-5. Given minimal pedestrian connections and adjacent academic uses it is also an enclave away from campus activity. With the arrival of light rail and the redevelopment of the University Center Urban Core, this portion of campus will transform in the coming years from an edge to an active doorway welcoming hundreds of people daily. As Sixth College moves to the North Torrey Pines Living and Learning Neighborhood, the Neighborhood will gain a new name and a new identity. The Pepper Canyon Neighborhood will become a hub of residential life immediately adjacent to the heart of the University.

The 1989 UC San Diego Master Plan, and subsequent Bicycle and Pedestrian Plan, Open Space Master Plan and LRDP defined aspirations, attributes and principles for campus transformation. These plans establish strategies to preserve and enhance the campus. The Pepper Canyon Neighborhood Planning Study embraces these organizing principles in the formulation of its approach.

1989 Master Plan

The Master Plan is an advisory document establishing an urban design philosophy and five guiding planning principles; Neighborhoods, Academic Corridors, University Center, The Park (now Open Space Preserve) and Connections, that have been incorporated into the LRDP, and this study.

2012 Bicycle & Pedestrian Master Planning Study

The vision of this study 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" and examines the entire UC San Diego campus.

2016 Open Space Master Planning Study

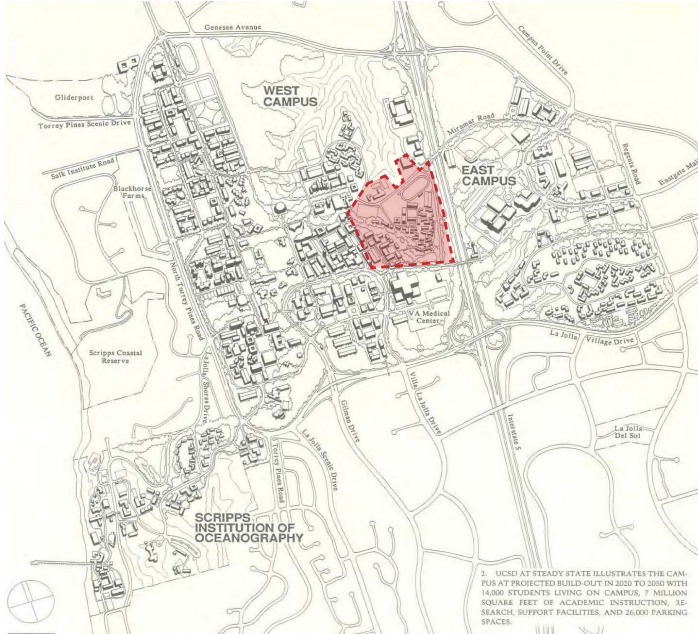
This study establishes principles to guide design of new campus open spaces and maintenance and management of existing ones.

2018 Long Range Development Plan

The recently approved LRDP is a general land use plan that outlines principles and goals for the entire La Jolla campus' growth and development. These goals include providing housing for up to 65% of students, embracing the new light rail connections, sustainable development and open space integration.

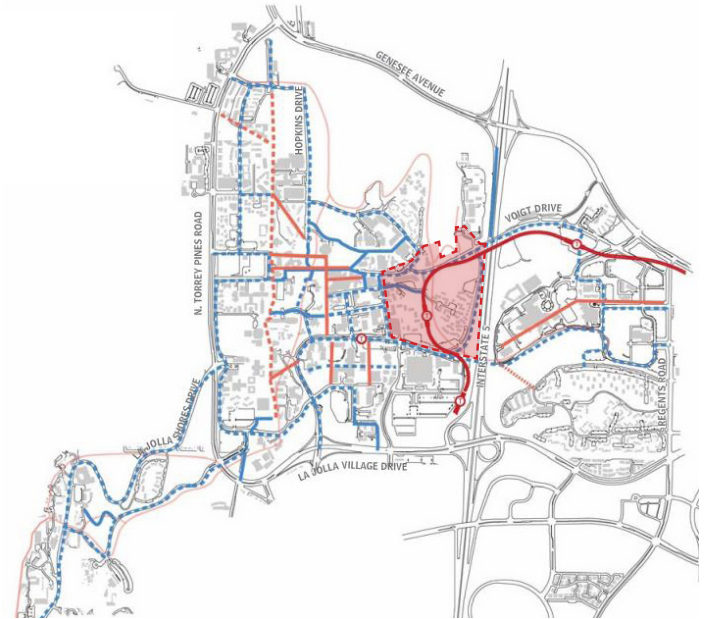


Pepper Canyon Neighborhood Prior to Light Rail Construction



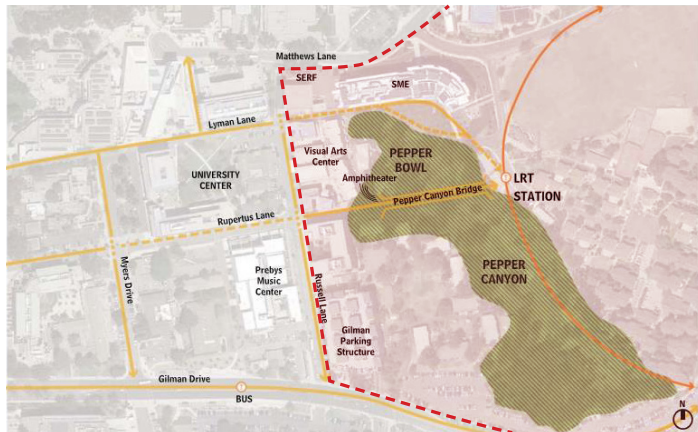
1989 Master Plan

As the campus is envisioned to densify and expand to the east, the Pepper Canyon Neighborhood will become more central to campus life.



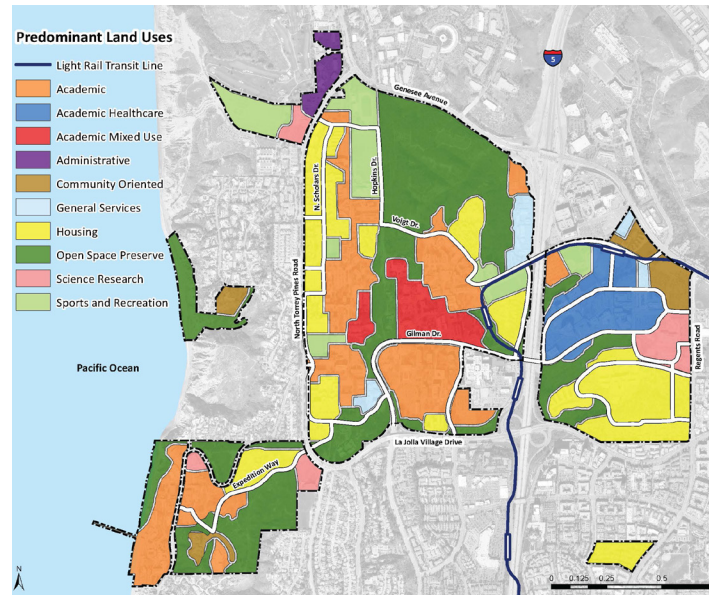
Circulation Network - 2016 Open Space Master Planning Study

With the arrival of light rail and improvements to the pedestrian network, the Pepper Canyon Neighborhood will be well served by all modes of transportation.



Pepper Canyon - 2016 Open Space Master Planning Study

The University's network of open spaces plays an important role in the perception and use of the campus. Pepper Canyon will contribute with its new green identifiable entry to campus and interconnecting the open space preserve that links campus users to their environment.



Land Use Plan - 2018 LRDP

The Pepper Canyon Neighborhood, shown in black, has been redesignated in the new 2018 LRDP to include Academic Mixed Use development. The Pepper Canyon Neighborhood Planning Study aims to densify the new housing development to allow for potential future academic mixed use development.

02 | Campus Wide Considerations



Neighborhoods

Strengthen Campus Community

The University is defined through a series of neighborhoods generally organized around Colleges and areas of study. These neighborhoods are defined physically by their landscape, building types and relationships to the larger campus setting. The neighborhoods are important to students' sense of belonging and provide much needed identity that helps create the feeling of community. These attributes help students assimilate and provide important social and academic support.

Both Pepper Canyon West and Pepper Canyon East will embrace the essential qualities of neighborhoods by clustering of buildings, focusing on the canyon and sharing open spaces and places. It will be important that further definition of the neighborhood occurs during design to reinforce the important sense of identity.



Muir College Campus



Open Space

Building on the tradition of connecting to the campus landscape

The Pepper Canyon Neighborhood provides a vital connective element within the campus open space network. In its new role as a campus gateway, Pepper Canyon's revegetation will establish a new welcoming landscape to those entering campus by all modes of travel. This Open Space Preserve will also establish an important visual and physical center to the neighborhood as well as a connecting greenspace to the Ecological Reserve to the north.

Revegetation of the eastern edge of the site will help buffer the campus from I-5 and establish a significant green visual edge to those using the freeway.



UCSD's Open Space Preserve.

02 | Site Considerations

Adjacent Projects

Pepper Canyon is undergoing major redevelopment, spurred by the LRT line and station, increased demand for student housing, and major capital projects including the DIB (Design & Innovation building) and an amphitheater. These projects are being coordinated by Campus Planning and Design & Development Services and Capital Program Management, with significant consultation with other campus entities and outside consultants. Projects noted on the right page were identified to the Pepper Canyon team at the start of this study. Because of their level of development, they are considered as 'existing' conditions for the Pepper Canyon Neighborhood Study. The Pepper Canyon team coordinated often with these entities to best ensure consistency across the Pepper Canyon study area.

University Center Urban Core

The University Center Urban Core (UCUC) Planning Study re-envisioned the Urban Core (shown below) as an area of dense, transit-oriented, mixed use development with a variety of amenities at the heart of the campus. A significant increase of activity in this area is expected based on the planned additional density. New UCUC development will be directly adjacent to the Pepper Canyon Neighborhood, across Russell Lane. The expanded Pepper Canyon student housing in proximity to the UCUC will add vibrance and activation to the campus urban core.



By MRY Architect

PCN Adjacent Projects

- 1 LRT Viaduct Construction
- 2 Voigt Dr / Lyman Ln Roundabout
- 3 Lyman Lane Re-Alignment
- 4 Warren Field Restoration
- 5 Pepper Station Work
- 6 Design & Innovation Building Project
- 7 Sewer Line Adjustment
- 8 Lyman Utility Relocations
- 9 Amphitheater
- 10 Pepper Bowl & Vicinity Public Realm Improvement
- 11 Design & Innovation Building Public Realm Improvement
- 12 Stuart Collection
- 13 Pepper Canyon West Student Housing
- 14 Gilman Dr Landscaping / Irrigation / Lighting
- 15 Gilman Dr Bridge
- 16 Switching Station
- 17 Rim Walk
- 18 I-5 Widening
- 19 University Center Urban Core

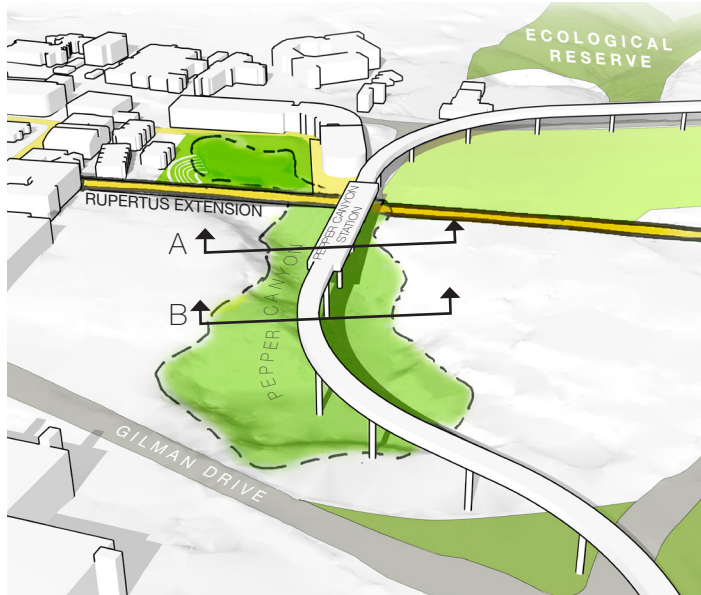


02 | Campus Wide Considerations

Pepper Canyon

The canyon itself is the primary defining element in the new neighborhood. Historically, the canyon has been an interesting natural feature with its topography and rustic plant material that harkened to the region's natural environment and established a place of solace. It also provided an important landscape linkage to the ecological reserve and other native landscapes on campus. The new San Diego Trolley initiates significant change with the elevated trackway, filling of the canyon and the development of mobility and access routes. As part of the Trolley

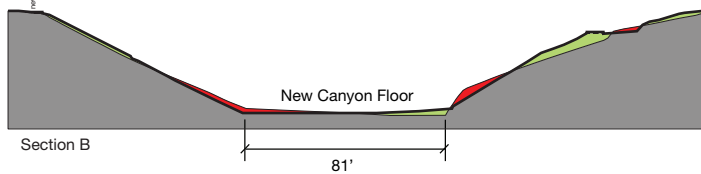
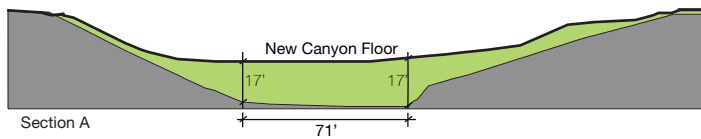
project the canyon is being regraded and replanted. Although significantly altered, the canyon remains an important opportunity to create a natural open space to be enjoyed visually and physically. This re-established landscape will provide quiet places to enjoy and study, a soft green corridor to walk through and to view. Importantly, the canyon will provide a sense of identity to those that live here.



Canyon Fill



Soft surface path with shaded seating opportunities



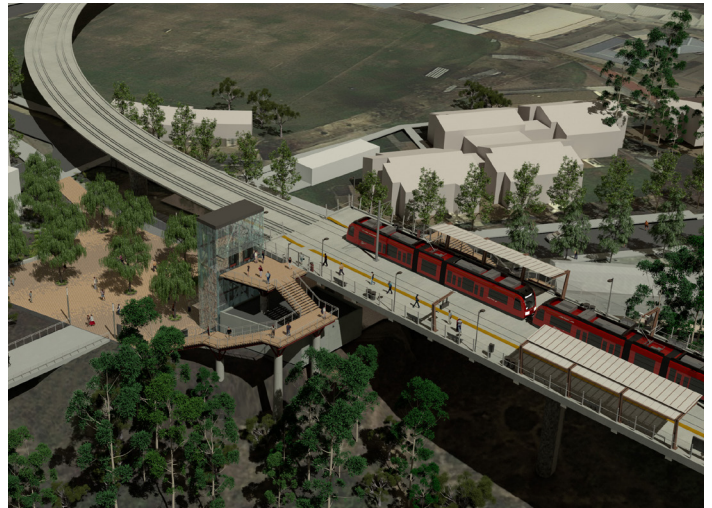
San Diego Trolley

The new light rail service to campus will be transformational. Since inception, UC San Diego has been perceived as somewhat separated from San Diego with a limited connection to the larger community. The San Diego Trolley will directly connect to the city in an efficient and identifiable manner and dramatically change the perception of the campus. The Trolley will reduce the transportation impacts on campus and subsequent parking demand. Students, staff and faculty will be able to utilize the city's benefits more directly, and, importantly, the campus will now have a new front door at Pepper Canyon Station.

This new stop will bring thousands of people to campus daily. Riders will have their first impression of the campus from the elevated railway even when passing through. This new hub of activity will bring vitality to the Pepper Canyon neighborhood and become a new center of activity and mobility for UC San Diego. Once off the train, riders will seek direct pedestrian routes to the core of campus and interconnections via bicycle and transit to other parts of campus. Student Housing development will acknowledge these connections while also facilitating the private and semi-private places needed for successful student residential life. Clearly defined edges of residential areas should provide security to residents and sculpt a range of places and spaces to live and learn.



The guideway under construction in Pepper Canyon.

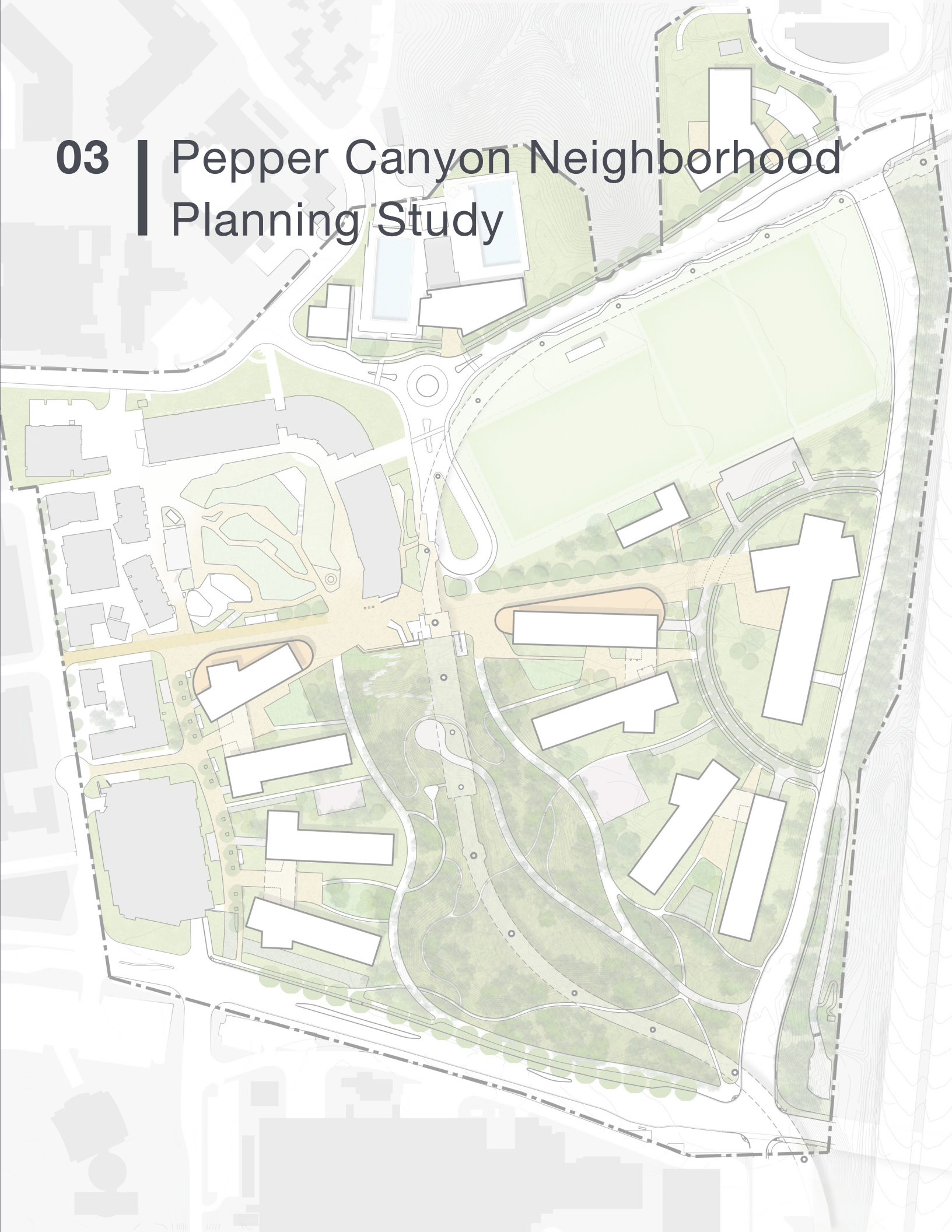


Aerial view of station. Rendering by ZGF Architects.



Pepper Canyon Station. Rendering by ZGF Architects.

03 | Pepper Canyon Neighborhood Planning Study

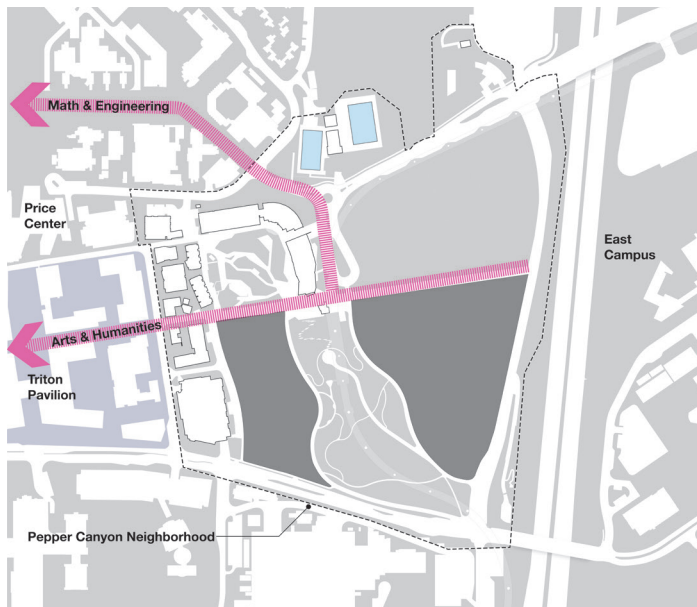


03 | Master Plan Principles

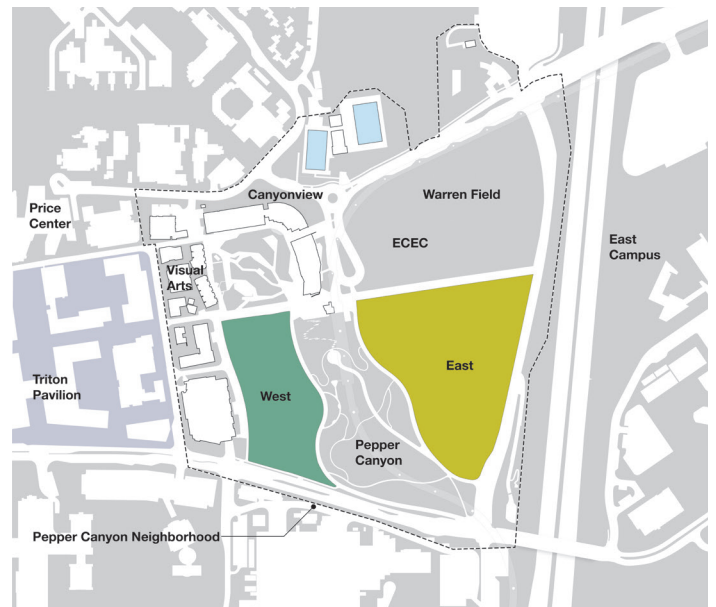
UC San Diego Master Plan Principles

UC San Diego's 1989 Master Plan established several foundational guiding principles for continued campus development. These include connections to academic sectors of campus, establishing distinct neighborhoods and preserving open space. Pepper Canyon presents a unique opportunity to embrace these goals. Rupertus Walk, running through this precinct, will be extended and enhanced, connecting to

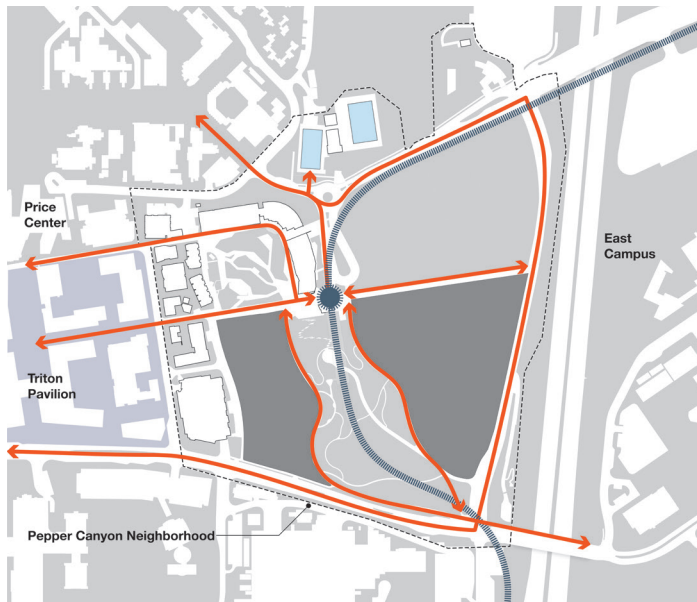
the University Center and to Ridge Walk. Mobility is enhanced by the new LRT station, and with extensive bike/ped connections from East Campus through Pepper Canyon, joining to the main campus. Vehicular traffic is minimized to promote the pedestrian-friendly environment. And Pepper Canyon itself will be restored as open space, connecting to other campus green spaces.



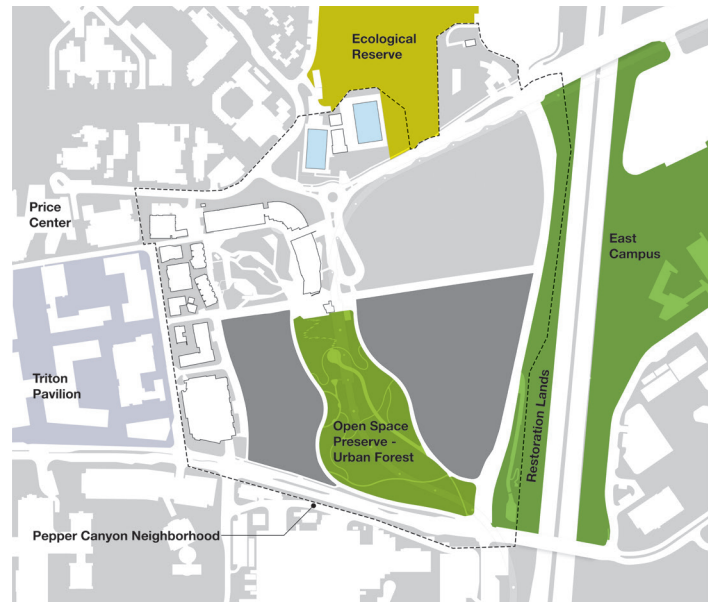
Connections to University Center and Academic Corridor



Pepper Canyon Neighborhood with East and West housing villages/communities.



Connections



Open Space Preserve

Building Community

Pepper Canyon West and East are conceived as two villages, each with multiple buildings that support community-building by developing smaller, identifiable, neighborhood-scaled buildings within the larger site. These buildings, in turn, frame spaces scaled to serve smaller groups and individuals engaged in varied kinds of student activities and interaction.

Community-building for Pepper Canyon West and East will be integrated with the two foundational concepts for the project.

Concentrate a range of programmed common and retail spaces along Rupertus Walk to activate newly formed TOD-like development at the heart of the Pepper Canyon Neighborhood.

As Pepper Canyon West has no specific college affiliation, these concepts, in tandem, will evoke the sense of place that provides a unique identity for this residential village.

The natural features of Pepper Canyon including the topography, re-vegetation and separation between the two housing villages inherently lend unique character to these residential areas. These features should be embraced and enhanced with ongoing development in the area. Future projects are encouraged to maximize natural views and vistas of the canyon. Also, the canyon restoration palette should be extended beyond the rims, to the extent feasible, into project areas and open space to create a seamless synergy between the natural landscape and the new villages.



03 | Organizing Concepts

Focus on the Canyon

Embrace Pepper Canyon and expand upon its landscape to integrate these 2 “residential villages”; with one another and with the canyon, infusing both with the unique canyon landscape as their defining characteristic.

In this context, buildings are sited to develop clear relationships, with both the canyon and Rupertus Way, providing access, character and identity for the residents. A range of spaces, places and connectors are the building blocks of community-building that support residential life

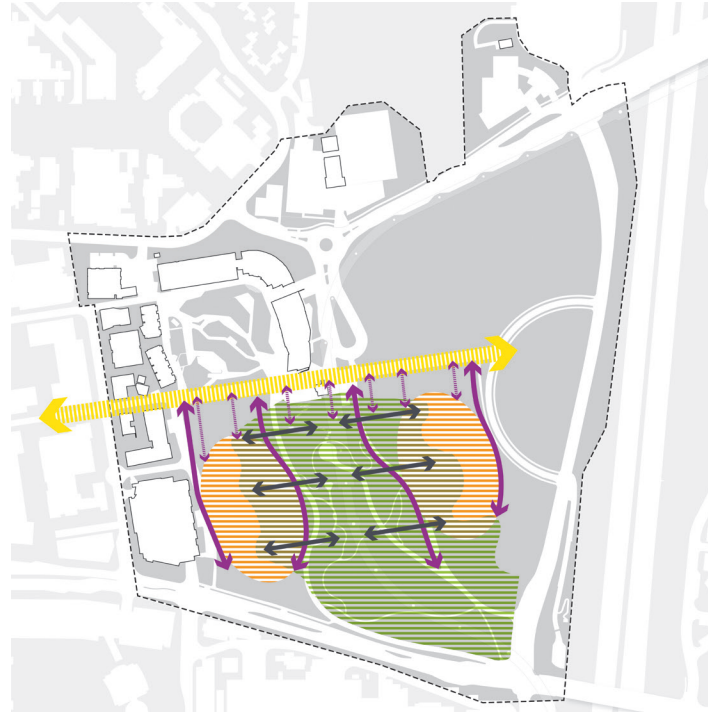
and provide the spatial hierarchy necessary for varied scales of student activity. Primary components of this spatial hierarchy include canyon, village and courtyard, with active and passive zones to support programmed activities along with spontaneous interaction and serendipitous encounters. This connective tissue of activated open spaces, integrates Pepper Canyon with its surroundings to promote a safer environment adjacent to and within the canyon itself.



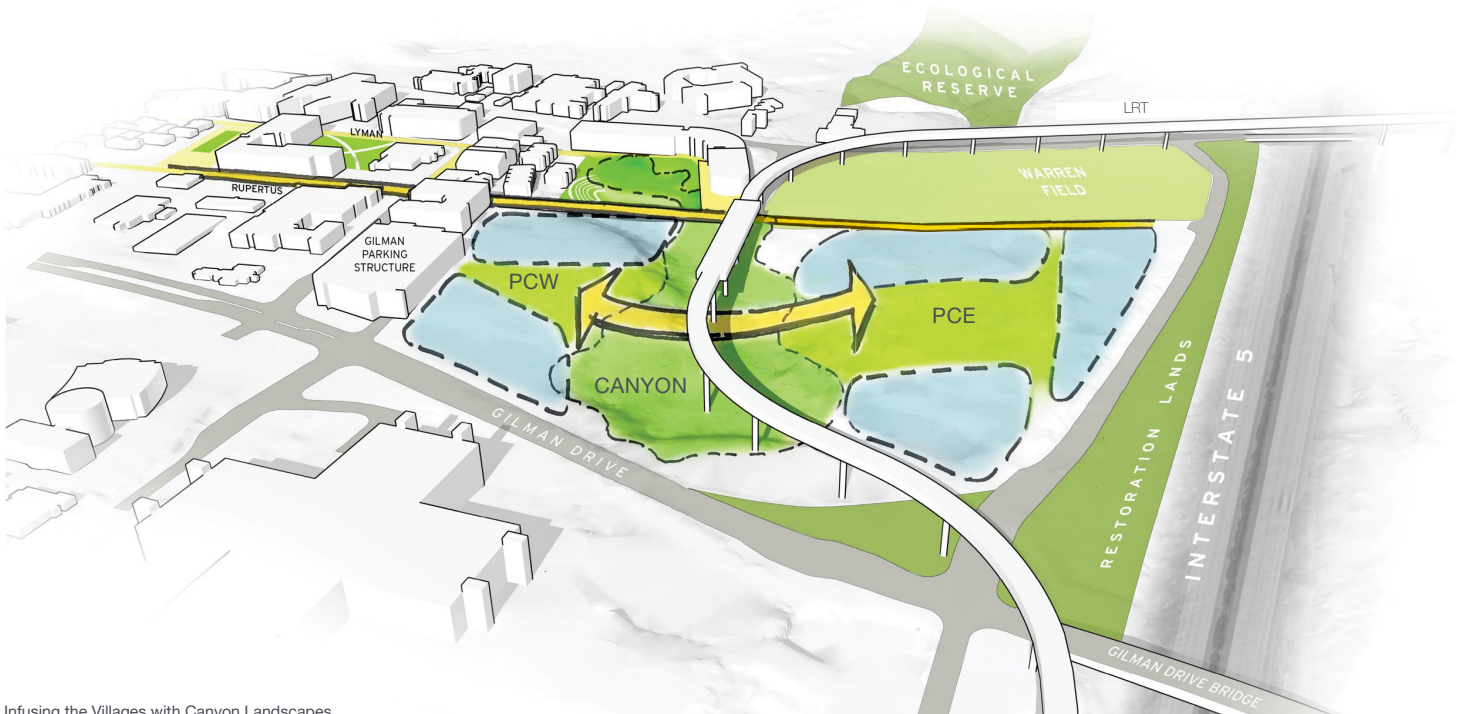
Expand the Canyon



Existing Pepper Canyon Neighborhood-buildings focused internally, separated from the canyon.

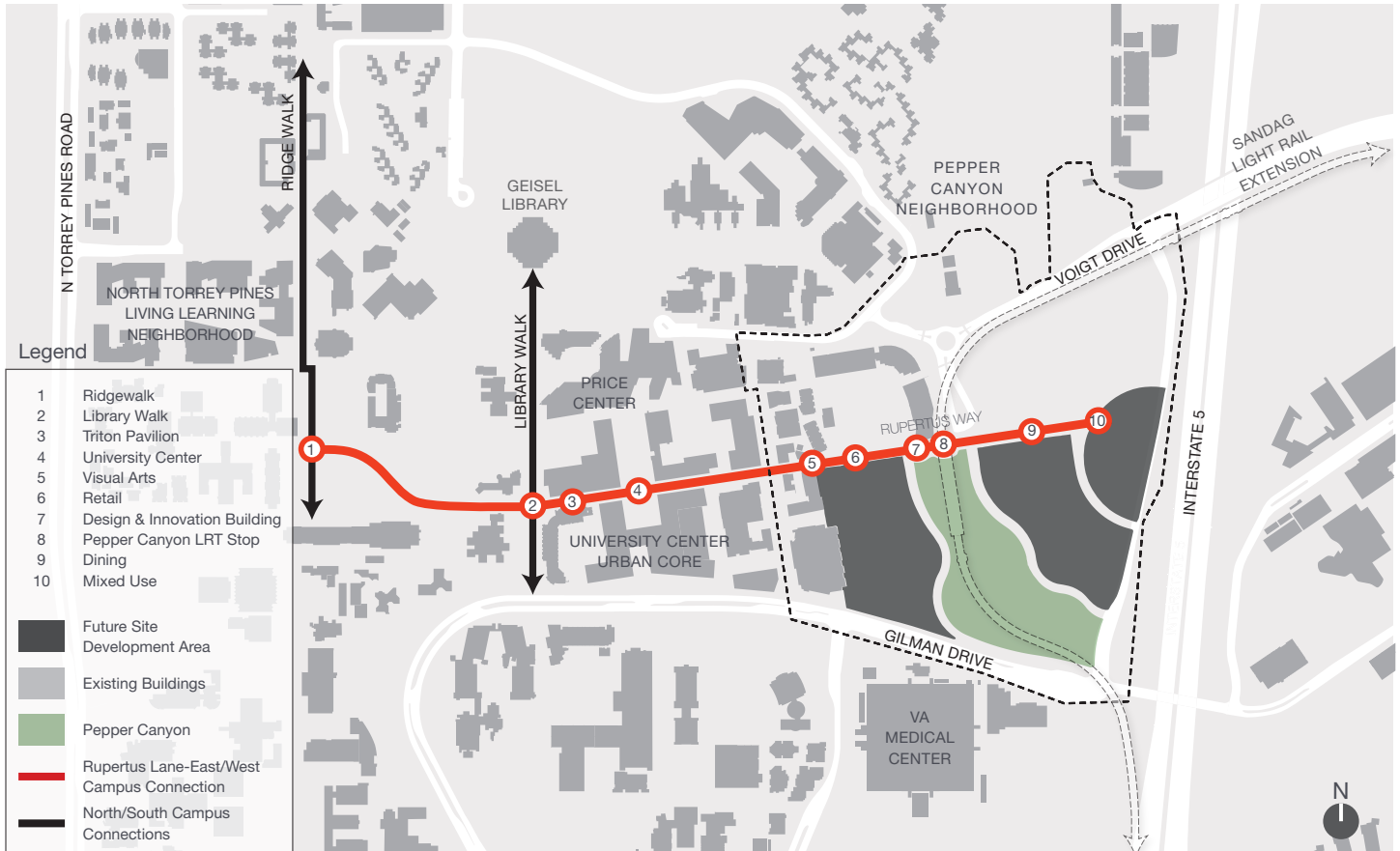


New Pepper Canyon Neighborhood-hierarchy of circulation and open spaces interconnect canyon, buildings, and Rupertus Way corridor.



Infusing the Villages with Canyon Landscapes

03 | Organizing Concepts



Neighborhood Activity Along the Rupertus Corridor

UC San Diego is already planning improvements to convert Rupertus Walk to a shared pedestrian and bicycle path and extend it westward to join with Ridge Walk. This new Rupertus Walk will create a vital east-west campus connection and will join the vibrant Library Walk leading to Geisel Library. These projects will create a strong network of campus pathways to improve pedestrian access on campus; link vital campus destinations and improve wayfinding. The proposed Triton Pavilion, part of the University Center Urban Core will be the centerpiece of the improved Rupertus Walk.

Pepper Canyon Neighborhood will be a vital new sector of campus, located directly on the eastern end of the improved Rupertus Walk. The combined Pepper Canyon projects can further extend Rupertus Walk to

the east—to the Pepper Canyon LRT station and beyond. The LRT makes campus and Pepper Canyon a new destination for thousands travelling to and from campus. Triton Pavilion will invigorate the UCUC along Rupertus, as will the proposed amphitheater, making Rupertus and this precinct a vital, active sector of campus. Rupertus Walk can be extended further to the east, nearing the I-5 freeway to further improve connectivity and invigorate this southeast portion of UC San Diego.

A Stuart Collection installation “Convergence” will be placed along Rupertus between the LRT station and Visual Arts complex. This should be augmented with retail and dining opportunities along the southern edge of Rupertus so the entire length of Rupertus Walk is vibrant, interesting and engaging.



03 | Organizing Concepts

Residential Life

Each village is envisioned as buildings and generous open spaces that provide opportunities for basketball or other recreational activities. These are conceived as clearings within extensions of the canyon landscape that also buffers these activities from the residential buildings.

U-shaped building strategy would provide most residential units with views to Pepper Canyon while framing a courtyard that is the focal point for residential life. Shared by all residents and activated by adjacent, interior common spaces, courtyards are framed by buildings yet open to the canyon. This strategy makes the courtyards feel larger and more connected to nature, thereby mitigating the increased building density in the neighborhood. Extensions of canyon landscape transition to more intentional open spaces within the courtyards to support the spatial variety that supports residential life; relaxing, socializing, discussing,

studying and contemplating. The canyon extends the dimension of the residential experience to become the “Central Park” for Pepper Canyon West and East. While open to all, the canyon will become integral to residential life and generate a sense of co-ownership and identity among village residents. The proximity of a new student village and its many residents will provide ‘eyes on the canyon’ and increase safety throughout this area.

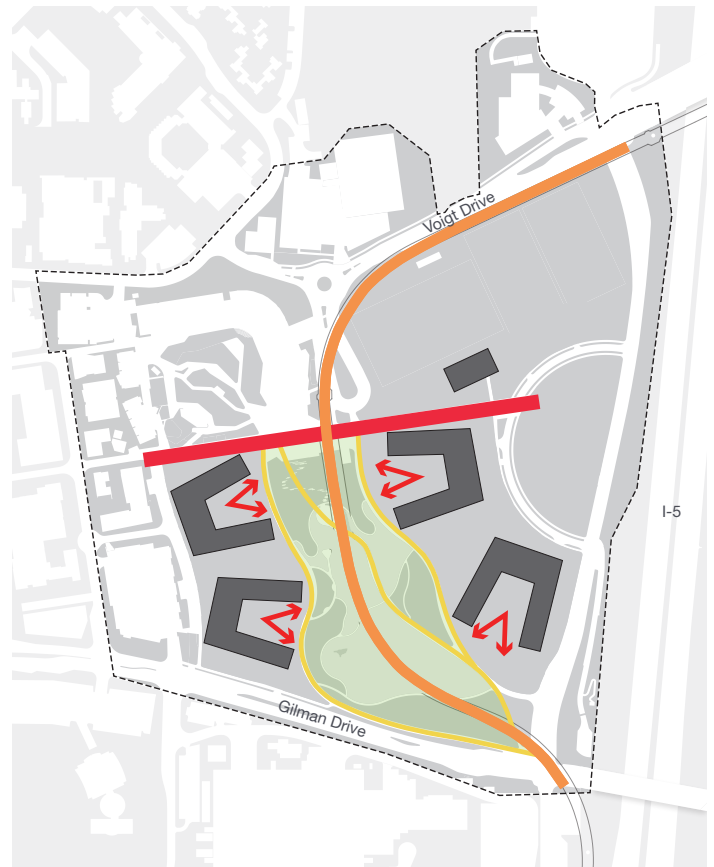
Residents of both villages are connected to one another by rustic paths running through the canyon, while more generous pedestrian and bicycle paths connect to Rupertus Walk, the LRT and other neighborhood amenities. With varied opportunities for serendipitous encounters, these connectors are extensions of the campus circulation network that integrate the Pepper Canyon Neighborhood with the University community.



Indoor-outdoor spaces



Plazas and courtyards

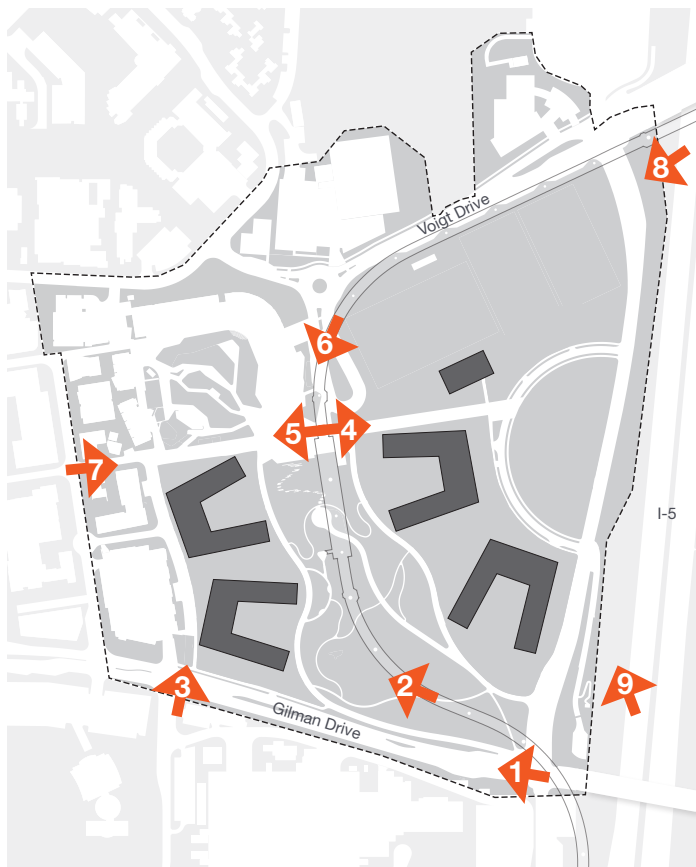


Canyon Connection

Gateways and Vistas

Completion of the new transit projects including the LRT, Gilman Bridge, and campus roadway improvements will dramatically change the character of this neighborhood. These create new opportunities to reinvigorate existing gateways. Some will be solely experiential and associated primarily with new vistas of campus. Others will be more formal and incorporate new campus signage where appropriate.

The LRT is a new gateway experience with vistas of the neighborhood for passengers on arriving trolleys, both north and south of the station, and from the station platform that overlooks the Pepper Canyon Neighborhood, Rupertus Walk and UCUC beyond. As the new focal point of an extended Rupertus Walk, the station will also serve as the marker for this campus gateway, welcoming all who arrive on campus by public transit; students, faculty, staff, their families and visitors from the surrounding communities.



Gateways and Vistas

The existing campus entry from Villa La Jolla Drive, currently defined by the Gilman Parking Structure, will be accentuated by the addition of new student housing adjacent to the structure and opposite the VA Hospital. With building height similar to the VA, thoughtful juxtaposition to the parking structure, and a landscaped setback from Gilman Drive, the new housing should generate a recomposed and more impactful, entry experience.

Campus entry signage and wayfinding graphics should be incorporated into each arrival and departure experience.

Rendering & Viewpoints to follow

Selected Views

Selected Views

Selected Views

03 | Organizing Concepts

Environmental Considerations

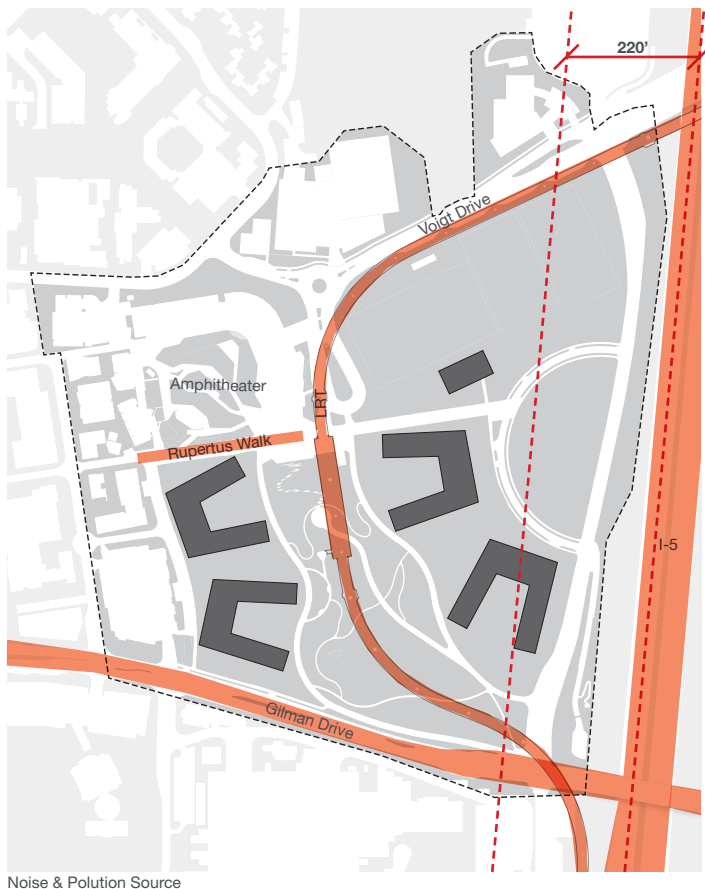
Development of the Pepper Canyon Neighborhood poses many challenges and opportunities. Specifically, the opportunity to be more dense, in an underserved corner of campus near the LRT raises environmental considerations. This study considers acoustical and air quality impacts stemming from proximity to the freeway on the east, the LRT running through the site, and busy Gilman Drive to the south.

Appendices to this study include an Exterior Noise Feasibility Study and a Planning Level Air Quality Review. These studies provide an initial assessment of the site and guidance for planning and design of projects.

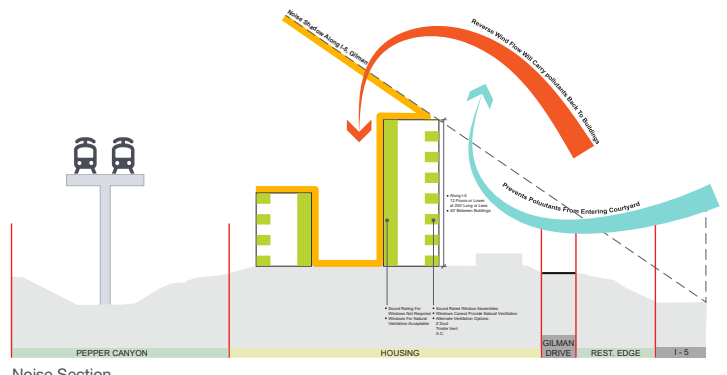
Air quality on site is assessed to be below regulated thresholds for pollutants. Yet, there may be other pollutants not yet regulated. The prevailing westerly winds benefit the site with marine air directed toward the freeway. Care should be taken to avoid extremely tall structures that could draw air from the freeway back into the site. The review makes recommendations for building heights and lengths based on a minimum freeway setback of 220 feet. Within these parameters, “natural ventilation at the student housing buildings would be acceptable in terms of air pollutant emissions from the I-5 freeway.”

Gilman Drive, the freeway and the LRT all generate on-site noise. The California Building Code (CBC) sets a not-to-exceed level of 45 CNEL (Continuous Noise Equivalent Level) in any habitable room. This applies to student housing units as well as the childcare center. On-site measurements of these three noise sources all exceeded 60 CNEL, requiring mitigation in the design and construction of habitable spaces. The shape of the building complex can self-shield to limit noise. This concept is shown in the Noise Study. However, with noise sources from three sources/directions this is unlikely to work for all habitable spaces on-site. When building shape alone does not reduce noise levels enough, the spaces can have operable windows, but may not rely on natural ventilation. In these cases, rooms will need a mechanical ventilation system with a sound attenuated vent to ensure quiet operations in those rooms. Residents can then have operable windows to use for additional ventilation, knowing that it will introduce additional outside noise into the room.

Additional information related to noise and air quality can be found in the appendices. Specific design for each project should work with acoustic and environmental consultants to confirm the performance of the specific design solution.



Noise & Pollution Source



Noise Section

View Obstruction

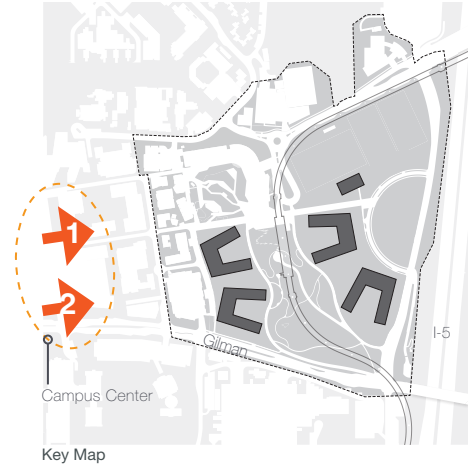
The scale of development at Pepper Canyon West will naturally result in taller buildings than those found nearby. It is likely that desirable, east-facing views from upper floors of existing buildings in the Campus Center will be impacted. Mitigating this issue should be addressed alongside related issues that are specific to Pepper Canyon West Housing. These may include building orientation, views to/from the new residential buildings, and in particular, excessive sun-shading of open spaces intended to support a variety of student activities. Open space sun-shading diagrams may be viewed in Chapter 04, page 39 and 45 of this study. While based on the site plan developed for this study, the diagrams indicate the need for additional analysis to find an appropriate balance between these potentially competing issues.



01



02



03 | Sustainability + Resiliency

Overview

Pepper Canyon Neighborhood can help support UC San Diego reach their ambitious sustainability targets. The neighborhood is conceptualized to reduce energy consumption, water use, solid waste and increase plant resiliency. Innovative approaches to new development should be explored during the design of each project to ensure sustainable strategies are embedded throughout.

Campus Energy

The carbon neutrality goal can be supported with on-site energy generation strategies that can include roof top PV (photovoltaic) arrays, and biomass. Building systems, construction materials, building orientation, and daylighting and passive ventilation can further assist in meeting the targets.

Transportation

Pepper Canyon Neighborhood provides limited parking for only service, loading and childcare facilities. The site's location near the campus core and proximity to the Gilman Transit Center, campus shuttle system and the new light rail station, lessens the need for on-site parking. As such, Pepper Canyon should excel in reduction of vehicular trips generated.

Waste Reduction

The 2020 zero waste goal may be met through extensive recycling, composting and procurement policies. A defined procurement policy that favors recycled and recyclable materials will reduce waste. Organic waste may be also be composted on-site, or an anaerobic digester could be showcased in a new building. The north Voigt pavilion (PC2) in this study (see page 47) could host a compost and waste facility along with educational components.

Material Use Reduction

Materials used for general operations, such as paper and plastic products, should be part of the waste reduction policy. Presently, 95% of construction waste is recycled. Prefabrication approaches to construction may be employed to further reduce construction waste.

Water

All buildings should reduce domestic water use via low flow fixtures. Greywater systems within the buildings may be incorporated to further reduce potable water use. Planting areas should be irrigated with reclaimed water.

Plant Material

Native or climate adaptive plant materials minimize levels of maintenance and water, and provide vital habitat for birds, and many other species of wildlife. Plant materials in this Study are recommended to be primarily climate-adaptive species, see pages 72-77.



Sustainability Goals for Pepper Canyon Neighborhood

- Meet UCSD Water Action Plan requirements
- Meet UCSD Zero Waste Plan requirements
- Reduce vehicular circulation and demand
- New buildings to the minimum LEED Silver
- Plant material selected from guidelines or approved by campus Landscape Architect
- On-site renewable energy generation

references: UCSD Sustainability, <https://sustainability.ucsd.edu/>



Keeling Apartments showcases a green roof.

| Healthy Placemaking

Healthy Placemaking is a multi-faceted concept that includes stakeholders, professional designers, educators, researchers and others to shape the built environment to integrate healthy activities and experiences. There are many opportunities to create and support vibrant, healthy communities; creating spaces for play and active recreation, designing safer and more accessible streets, providing access to green and natural environments, and fostering equitable community development. The Pepper Canyon Neighborhood Planning Study conceptualizes many of these placemaking opportunities within a holistic framework.

Recreation, Socialization and Access to Green and Natural Environments

The most unique physical attribute of this site is Pepper Canyon. As it undergoes significant regrading and replanting, this natural open space will provide access to a variety of activities in the heart of the neighborhood. Facilitating social interaction and engagement through a variety of site amenities brings communities together and helps support a sense of identity. This Study includes a number of different types of outdoor spaces to support this initiative. These include Warren Field, sports courts, student housing courtyards, public plazas and community gardens (See Outdoor Use on pages 66-67).

“Whether a city park, a community garden, a tree-lined street, or wilderness—nature in people’s daily lives reduces stress, renews the spirit, connects people to each other and increases physical activity. In short, humans are part of nature, our connection with nature is a fundamental human need, and we believe that access to nature is a basic right.”

— The Wingspread Declaration on Health and Nature, The Case for Healthy Places; Project for Public Spaces

Distinct planting and unique open spaces also contribute to a place’s unique identity. Giving residents, and the broader community the opportunity to live, learn and engage in these spaces can promote a sense of shared ownership. The Pepper Canyon Neighborhood will create its own identity, and the unique quality of the canyon itself will be the focus of this.

Green spaces provide physical and mental health benefits, and favorable environmental factors such as; improving air and water quality, protecting biodiversity and reducing the urban heat island effect.

Active Transportation and Healthy Streets

The mobility strategy for this neighborhood favors transit and pedestrian-oriented development. The circulation system is designed to prioritize pedestrian movement in the core, limiting vehicular traffic to the perimeter. (See diagram on page 59) This circulation design strengthens connections to many destinations such as dining, retail, transit stops and open spaces that are easily accessed by bike or foot. These active transportation facilities promote walkability, encourage physical activity and equitable access to and from campus.

Key Tenets for Healthy Placemaking

- Create opportunities for multiple types of social interaction
- Improve or create active transportation connections
- Provide access to green and natural environments
- Promote activity-friendly communities
- Design safe and accessible streets

References: The Case for Healthy Places, Improving Health Outcomes through Placemaking, Produced by Project for Public Spaces; A Guide to Building Healthy Streets, ChangeLabSolutions.org



Spin bikes are widely used throughout the UCSD campus. Bikeshare programs offer accessible, affordable and environmentally-friendly forms of personal mobility.

03 | Illustrative Plan

Pepper Canyon Neighborhood Planning Study

The Pepper Canyon Neighborhood Planning Study embodies the qualities identified in UC San Diego's campus plans and principles. It acknowledges the myriad of projects in this precinct and weaves these together creating a cohesive residential sector of campus to establish a supportive and welcoming place for students to learn, live and thrive. That also supports the transformation of UC San Diego into a predominantly residential campus. Focused on the redeveloped canyon, this new neighborhood will provide the private, semi-private and public spaces students seek. The neighborhood is unique with its proximity to the university's Urban Core "University Center" neighborhood, light rail station, activities along Rupertus, and connections to the Open Space Preserve. Students will live and learn in a community environment emphasizing pedestrian and bicycle connections and supporting a learning environment with its configuration of its buildings and adjacent open spaces. This is a vibrant urban neighborhood where students are enthused by activities and opportunities while also finding quiet places to study and enjoy each other's company.

Pepper Canyon is an evolving and vibrant mix of academic buildings, student housing, public realm and recreational spaces. Many of these are existing, others are active in planning, design or construction. The Pepper Canyon Neighborhood Planning Study acknowledges this existing fabric with integrated planning to add several new capital projects, necessary connections; and proposed hardscape and softscape resulting in a cohesive revitalized campus precinct. New adjacent projects such as the Amphitheater, the Design and Innovation Building, the trolley and the restored canyon will combine to create a vibrant new sector. The new projects envisioned for Pepper Canyon will build on this dynamic foundation. These active uses create an exciting setting for the two new Student Housing Villages (Pepper Canyon West and Pepper Canyon East). At the same time, the proximity and size of the canyon provide a unique opportunity for dense student housing to embrace nature.

Creating a supportive and welcoming place for students to learn, live and thrive, with a focus on the redeveloped canyon, this new neighborhood provides the private, semi-private and public spaces necessary for student success. The neighborhood is unique with its proximity to LRT-adjacent activities along Rupertus Walk, and connections to the Open Space Preserve. Students will live and learn in a community environment emphasizing pedestrian and bicycle connections and supporting a learning environment with its configuration of buildings and open spaces. While Pepper Canyon will be a unique campus neighborhood, it must also provide connectivity and consistency to the campus as a whole. This is achieved with strong pedestrian pathways, active spaces, vistas and view corridors to campus and the region, and building massing and materials similar to UC San Diego's current fabric.





For parcel map of site, see pages 80-81.

04 | Neighborhood Buildings



04 | Pepper Canyon West Student Housing

West Housing Development

Pepper Canyon West (PCW) is planned to provide approximately 1400 student beds for upper division students, without any specific college affiliation. For the purposes of this Study, the units are assumed to be apartment style consistent with current campus housing with one bed per room, configured as studios, 2-bedroom, 4-bedroom and 6-bedroom apartments, although a detailed program is yet to be developed. A limited amount of common space is envisioned, yet the ground floor facing Rupertus holds tremendous opportunities for retail options to serve residents as well as the greater campus community due to its proximity to the LRT and adjacency to Rupertus Walk. Basis for planning test fit assumptions are noted in the table.

Conceived as a residential village the buildings that make up PCW are sited to develop clear relationships with the canyon and Rupertus Walk providing access, character and identity for the residents. Campus, Gilman Drive and canyon-facing edges should inform site planning decisions regarding building height, orientation, and program. Drawing residents to Rupertus Walk, the northern edge provides retail space to serve residents and support the transit-oriented development extending from the LRT station. The western edge is occupied by a generous open space between existing campus buildings and the PCW buildings. Configured as a 'woonerf', this open space serves multiple uses. First

and foremost, it is a well-landscaped pedestrian street that serves as the main entry to this residential village. The 'woonerf' should also be designed to accommodate occasional/controlled access for service and emergency vehicles in well-defined locations that respect its pedestrian character and maintain students' safety. The eastern edge can engage the canyon with rustic connections to its more passive spaces and the park-like environment. The boundary between semi-private residential courtyards and more public canyon environment could be reinforced by the significant pedestrian and bicycle path that runs along the canyon rim. The southern edge provides a setback from Gilman Avenue and frames a significant campus entry from Villa La Jolla Drive.

In studying configurations for PCW, careful attention is needed to insure required fire lanes (and hose pull locations and distances) are created, noting that most of these points will be accessed from Russell Lane. As previously noted, Gilman Drive and the LRT both generate a level of noise requiring thoughtful consideration. Bedrooms that face either Gilman or the LRT will likely require mechanical ventilation by code. Building configurations can be reviewed by acoustical consultants to determine extent of required noise mitigation.

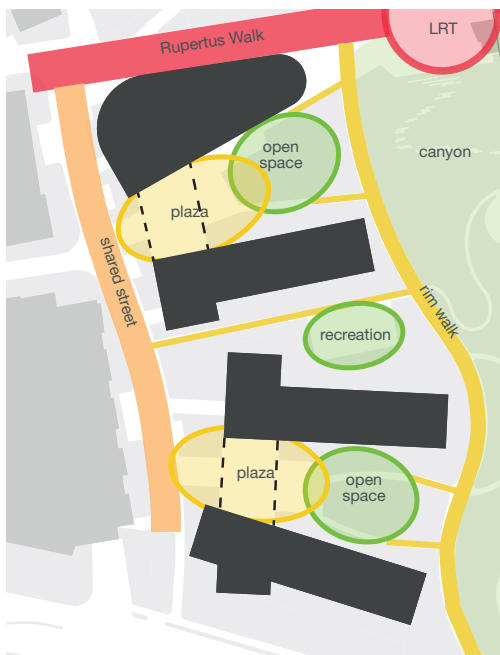
Basis for Planning		
Item	Notes	Test Fit
1400 Apartment Style		
Beds		452,500 asf
Common-Retail-Support		70,000 asf
	75% Efficiency	696,667 gsf



Mobility

The perimeter of the PCW site is defined by connections to campus and various mobility options. Rupertus Walk to the north, will be a dominant edge with a flow of pedestrians to and from the LRT. Rupertus will also feature 'Convergence', a Stuart Collection installation, and will be a vital, active campus connector. Rupertus is envisioned for pedestrians and bicycles. Separated bike and pedestrian paths will lead from east campus along the west rim of the restored Pepper Canyon, joining Rupertus near the LRT station. The West Rim Walk is immediately adjacent to PCW housing and students' access to Pepper Canyon. Separation of bikes and pedestrians should be incorporated (vertical, horizontal or planting) to clearly delineate limits of housing and discourage others from wandering through.

The western edge of PCW includes a generous setback from existing buildings that is intended to serve as the primary pedestrian entry to the PCW Village. This is a 'woonerf', a space designed for pedestrians that is occasionally shared with limited-use service and emergency vehicles. Entering from Russell Lane, these vehicles will have on-site turn-arounds and discreet loading zones within each building. Care should be taken to insure vehicles have ample space to turn around without impacting pedestrian pathways.



Pepper Canyon West Diagram



Mobility Diagram

04 | Pepper Canyon West Student Housing

Community and Neighborhood

Pepper Canyon West supports community-building by developing smaller, identifiable neighborhood-scaled buildings within the larger complex. These buildings, in turn, can provide spaces scaled to support smaller groups and varied kinds of student interaction and activity such as larger group meetings or socializing, small group study and individual contemplation.

Buildings have varied height and frame courtyards that open toward the east to provide canyon views for the maximum number of residential units. Each courtyard provides two entries to the combination of landscape and hardscape that support varied activity. Entries from the west are characterized by landscape that gradually transitions from canyon to courtyard. Entries from the east pass through a covered breezeway that incorporates entries to the buildings and covered bicycle parking. A generous open space between the buildings provides open space for basketball and/or other recreational activity.

Views to and from the light rail should be carefully designed to insure, both privacy for the residents and to maximize a dramatic first impression of campus for LRT riders. Most bedrooms should

face courtyards or open spaces framed by the buildings to maximize privacy. Many common spaces should also face inward to the create inside/outside relationships that activate the courtyards. The most active common spaces (floor lounges and living rooms) should face the canyon and the LRT serving as 'eyes on the canyon' to improve safety and security in those spaces. Rooftops are the 'fifth elevation' of the project and shall be designed for clean views, without exposed mechanical equipment.

Pepper Canyon West will be a vital neighborhood for upper division students. Adjacency to the light rail enables these young adults easy access to the San Diego region via the LRT. This TOD provides the opportunity for a lively, urban living environment in support of their matriculation. At the same time, PCW shall provide a powerful sense of community within the complex itself. A readily apparent, easy to find and easy to use strong point of entry from Rupertus and the campus will signal the edges of this student village. Within the complex, entries and shared/common spaces should be accessible and easy to find, promoting student interaction and engagement.



Pepper Canyon West Concept Plan

Massing and Scale

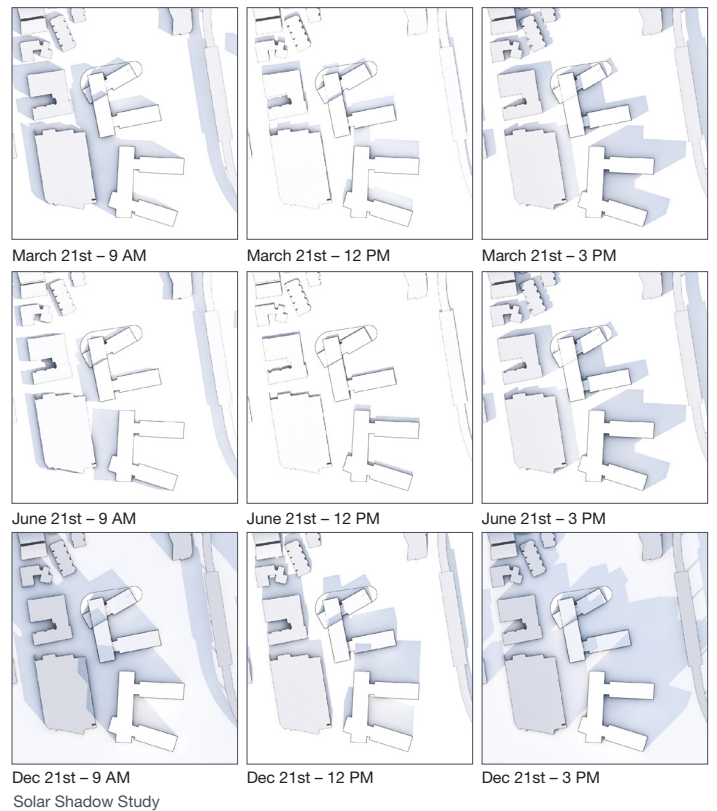
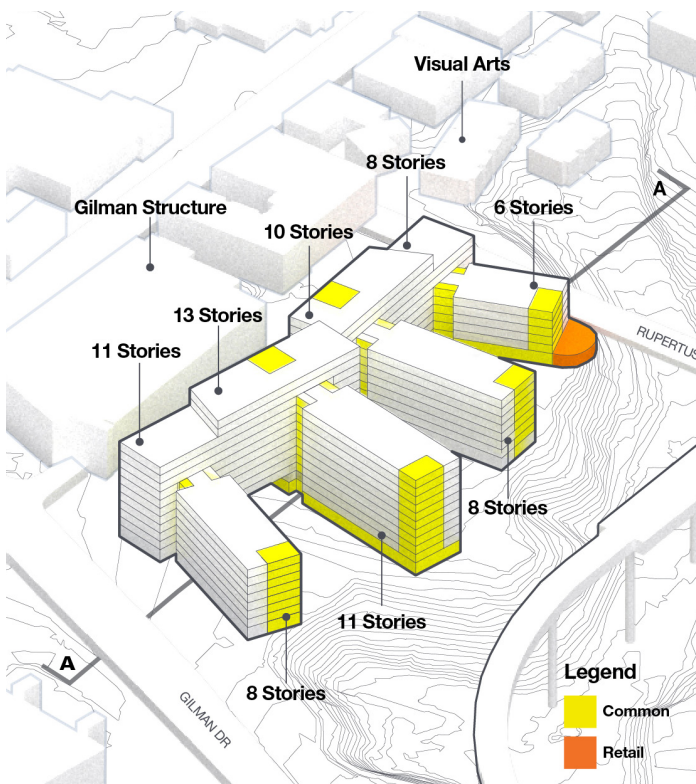
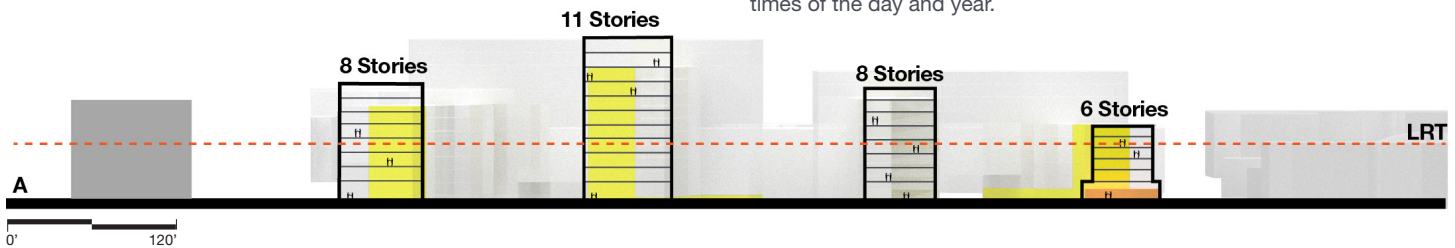
Buildings should have varied height to articulate massing, avoid a continuous wall-like character and mitigate the obstruction of views from the campus center. In the east/west direction, higher buildings cascade down from the western edge of the site to reduce scale along the canyon. In the north/south direction buildings cascade down from the center of the site; toward Rupertus Way to maintain pedestrian scale, and toward Gilman Avenue to better frame the significant campus entrance from Villa La Jolla Drive. Buildings should be designed to avoid long, uninterrupted corridors; incorporating reduced length, bends, offsets, common spaces, daylight access and similar strategies as mitigating measures.

Pepper Canyon West is a constrained site with 'front doors' on three sides of the project.

- Rupertus Walk, to the north, will be a busy pedestrian path from the

LRT to the center of campus and will be an active zone with food and retail options. The northernmost wing of PCW will be lower in height to minimize shading along the Walk and the amphitheater.

- Gilman Drive and La Jolla Village Drive on the south combine as a major entry point to the campus. As such, the southernmost wing should be lower in height to optimize this first impression. Final height and view of PCW from this southwest corner should consider heights of adjacent buildings on campus, as well as the nearby Veteran's Administration (VA) Hospital in determining final height.
- The elevated LRT on the east provides strong views to PCW. This is both an opportunity and a challenge. Care should be taken to protect residents' privacy in their apartments while creating a strong first impression for the campus with the design of the PCW complex. Student activity spaces between wings, and open spaces leading to the canyon will create pleasant outdoor, with care and attention to shading at various times of the day and year.



04 | Early Childhood Education Center (ECEC)

UC San Diego plans to augment current childcare facilities with an Infant and Toddler Center in the Pepper Canyon Neighborhood in the near future. This Early Childhood and Education Center (ECEC) will care for sixty (60) infants and toddlers, ranging from 3-24 months of age.

The ECEC near the Pepper Canyon light rail station will be unique on campus for its proximity to public transportation. Yet, ECEC must be equally convenient for parents riding or driving with young children and all their gear. Important in the near term, these mobility connections are also important after completion of all Pepper Canyon Neighborhood projects. Thus, one identified location for the ECEC site is envisioned to the east of the LRT station with parking easily accessible from Gilman Drive. While ECEC is a vital piece of the UC San Diego campus community, the young children require security, privacy and protection from the noise and exhaust emanating from the I-5 freeway.

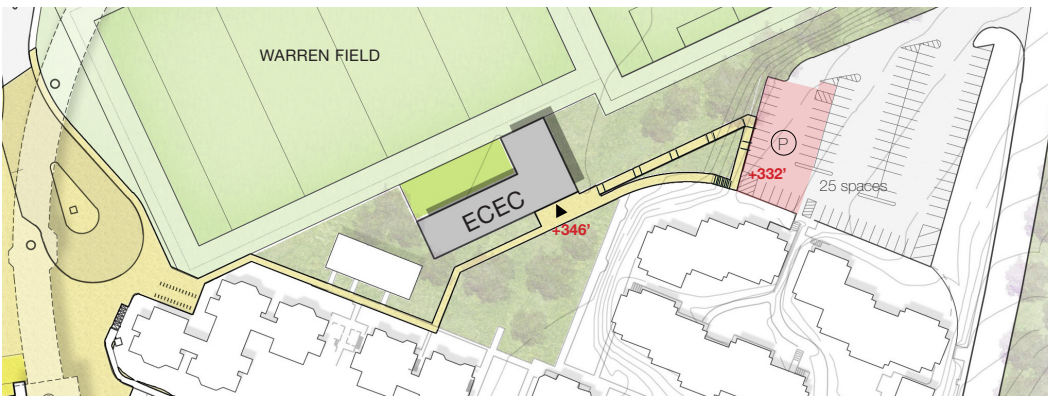
The planning concept for ECEC envisions an ‘L’ shaped building sited so the building structure protects the play yard from freeway noise and air. Each classroom will have direct access to the play area. The single building entry, at the outside corner of the ‘L’ provides easy access from both the LRT station and the parking area, enabling secure sign-in for parents.

The site may allow for construction of a larger ECEC, either now or in the future. This can be studied in consideration of existing buildings to remain during the Near Term, as well as additional space available in the future for expansion. In addition, compatible uses, such as office space, could be considered on second or third floors above ECEC. Separate access would be required.

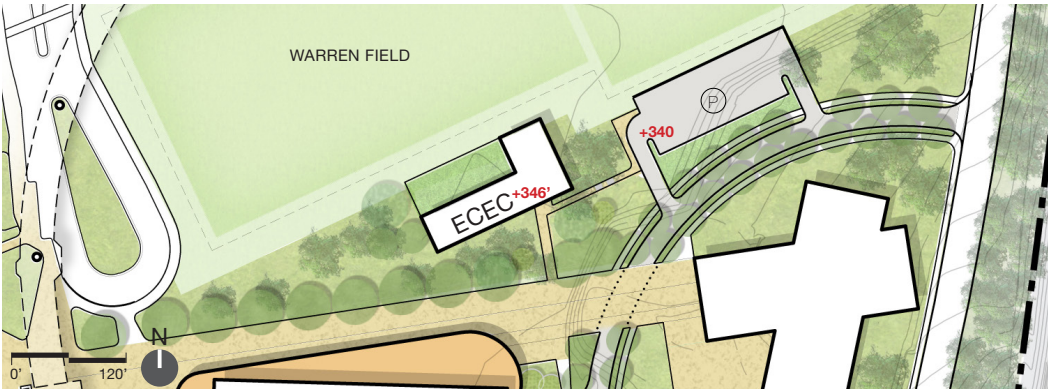
Recognizing the uniqueness of this use, this is one option studied. An alternate option to be located within Pepper Canyon West is also under consideration.

Basis for Planning

Use	Notes	Test Fit
Building	60 Infants/Toddlers	5,050 gsf
Play Yards		2,500 gsf
Parking	20 staff, 20 parents	



Near Term ECEC



Future ECEC

Canyonview Recreation

UCSD's Canyonview Aquatic Center complements the campus' primary RIMAC center. Canyonview is comprised of two Olympic-sized swimming pools. It is home to UC San Diego men's and women's water polo and swimming and diving programs.

Canyonview should be upgraded to serve general campus enrollment growth. The following recommendations will increase capacity and campus access to these vital programs.

The west pool serves intercollegiate swimming and diving. It is recommended the small office building on the west side of this site be replaced with a new, larger building devoted to Athletics. The building

may include team locker rooms; coaches' offices; and other associated uses. A rooftop pool viewing deck may be feasible.

The main Canyonview Aquatic Center building is recommended for redevelopment and expansion. The northern locker rooms should be retained and the southern portion of the existing building can be demolished. A three-story Recreation addition (approximately 14,000 gsf/floor) can be added, fronting and set back from Voigt Drive. This can easily accommodate noted program elements including a new lobby area; yoga and fitness spaces; as well as replacement administrative offices. Although Outback Adventures may also have program space here, their storage and loading areas must be located elsewhere.

There will be a new traffic circle at the intersection of Voigt and Lyman Lane, with a pedestrian sidewalk on each side of Lyman. These two walks lead directly to Canyonview, and a new entry plaza would celebrate the recreation activities and create easy access from Pepper Canyon.

Basis for Planning

Use	Notes	Test Fit
Field House	Warren Field	2,000 gsf
Outback	Loading/Storage Elsewhere	2,000 gsf
West Building	Athletics	10,000 gsf
Aquatic Center	Retain North Locker Rooms	6,000 gsf
New Rec Admin/Fitness		28,000 gsf



04 | Pepper Canyon East Student Housing

Overall Plan

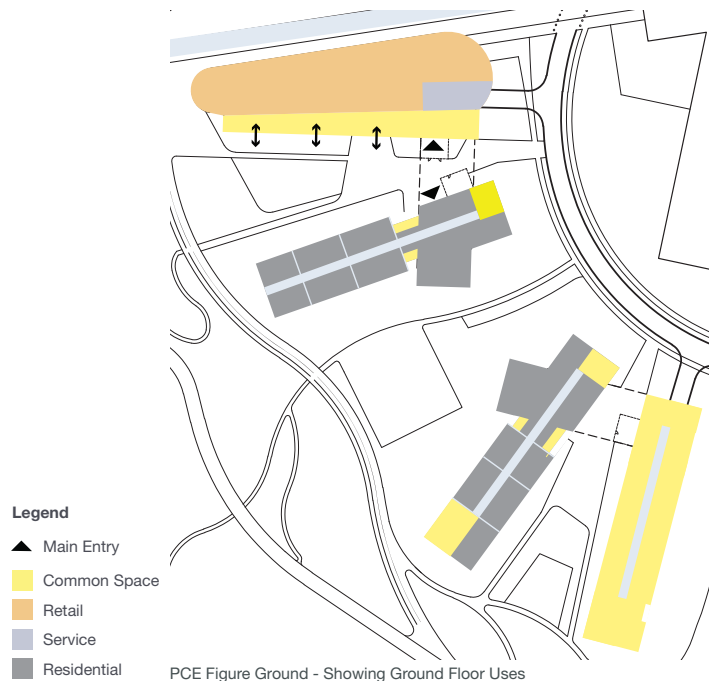
Pepper Canyon East (PCE) will provide 2000 lower division student beds potentially for a new college. For planning purposes this study followed the North Torrey Pines Living Learning Center model. The units will have one- and two-bed rooms, configured 'suite-style' in a variety of sizes from 4-beds up to 12 and 24 beds. Students will use the dining meal plan and, thus, units have limited cooking/living areas. The complex will have significant common spaces for students, as well as a dining complex available to all. Basis for Planning test fit assumptions are noted in the table.

Conceived as a residential village alongside PCW, the buildings that make up PCE are sited to develop clear relationships with the canyon and Rupertus Walk, to provide access, character and identity for the residents. Campus, I-5 Freeway, and canyon-facing edges should inform site planning decisions regarding building height, orientation, and

program. Similar to PCW, the northern edge activates Rupertus Walk with a Dining Commons and retail, while the southern edge provides a landscaped buffer/campus identifier along Gilman Avenue. The park-like canyon edge incorporates both rustic and primary circulation paths to the residential courtyards. A future mixed-use building across the street would provide additional opportunities to activate this edge.

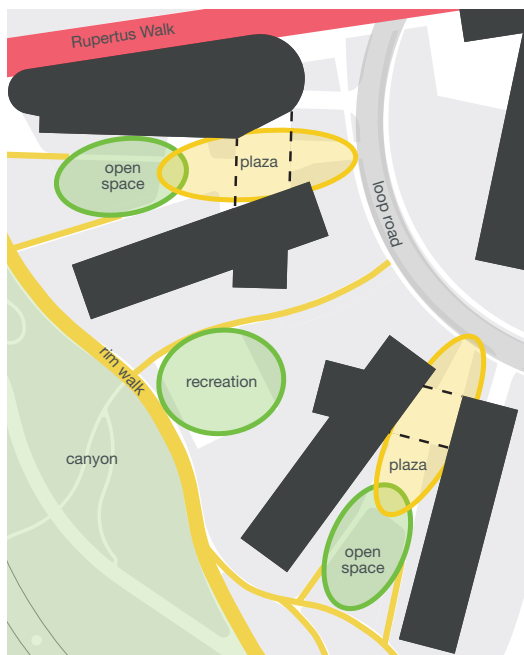
In studying configurations for PCE, careful attention is needed to insure required fire lanes (and hose pull locations and distances) are created, noting that most of these points will be accessed from the new street. As previously noted, Gilman Drive, the I5-Freeway and the LRT, each generate a level of noise that requires careful consideration of noise mitigating features. Bedrooms that face any of these will likely require mechanical ventilation by code. Building configurations can be reviewed by acoustical consultants to determine extent of required noise mitigation.

Basis for Planning		
Item	Notes	Test Fit
2,000 Suite Style Beds		676,000 asf
Common-Dining-Support		70,000 asf
	75% Efficiency	994,667 gsf

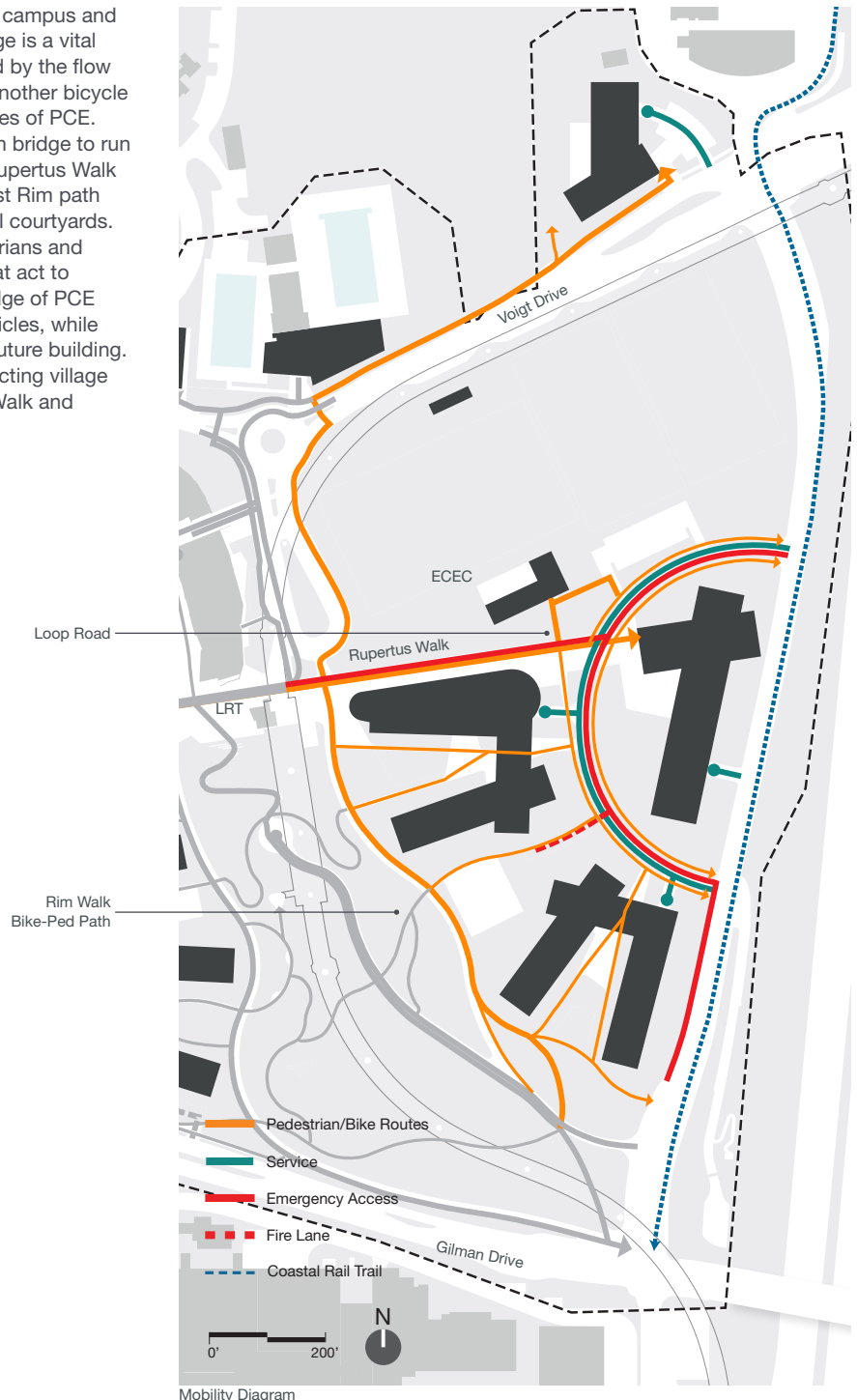


Mobility

The perimeter of the PCE site is defined by connections to campus and various mobility options. Rupertus Walk at its northern edge is a vital campus connector, a pedestrian and bicycle path activated by the flow of students to and from a Dining Commons and the LRT. Another bicycle and pedestrian path acts as the western and southern edges of PCE. This path leads from the East Campus, crossing the Gilman bridge to run along the east rim of the restored Pepper Canyon to join Rupertus Walk near the LRT station. Immediately adjacent to PCE, the East Rim path provides students with convenient access to the residential courtyards. The path will be designed with planting to separate pedestrians and bicycles, with clearly delineated boundaries for housing that act to discourage others from wandering through. The eastern edge of PCE is bounded by a new street open to public and service vehicles, while separating the housing from a building site reserved for a future building. Sidewalks with generous landscaping line the street connecting village buildings to one another, the Dining Commons, Rupertus Walk and potential retail uses.



Pepper Canyon East Diagram



Mobility Diagram

04 | Pepper Canyon East Student Housing

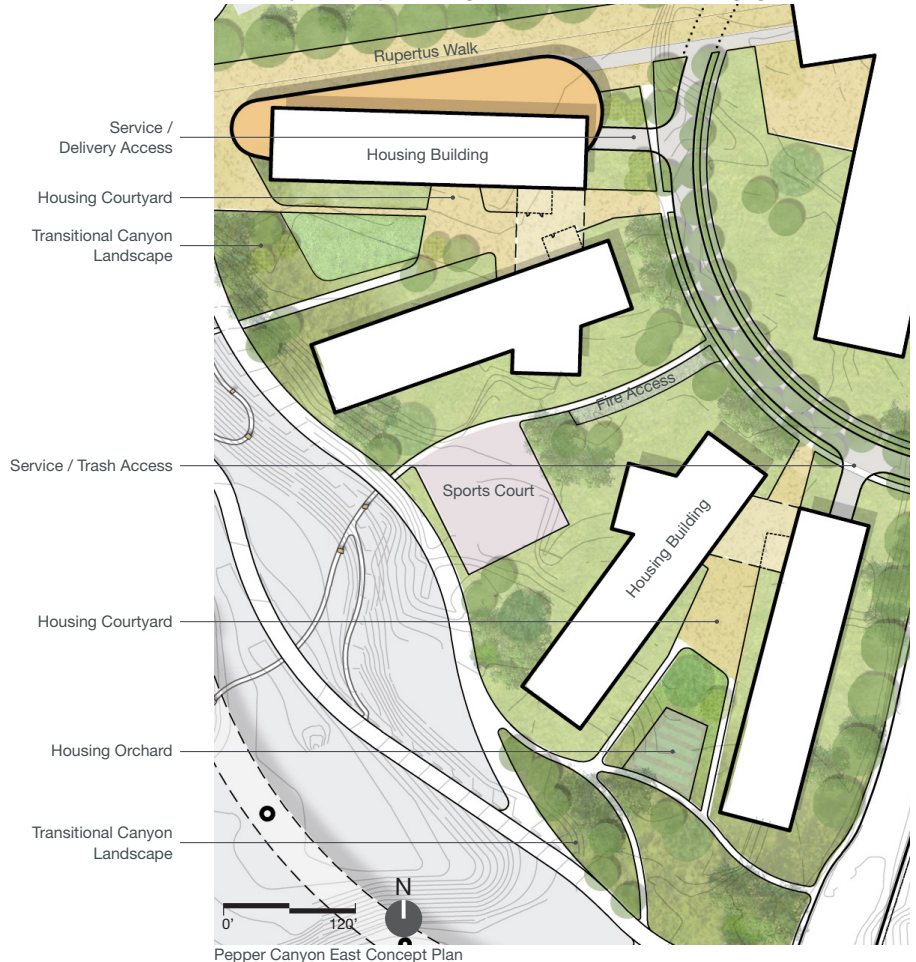
Community and Neighborhood

As Pepper Canyon East will displace over 1100 existing beds, it could become a 2-phase development and be developed as a future college. Community-building should be supported by developing smaller, identifiable neighborhood-scaled buildings within the larger complex. These buildings, in turn, can provide spaces scaled to support smaller groups and varied kinds of student interaction and activity such as larger group meetings or socializing, small group study and individual contemplation.

Buildings have varied height and frame courtyards that open toward the west to provide canyon views for the maximum number of residential units. Each courtyard provides two entries to the combination of landscape and hardscape that support varied activity. Entries from the west are characterized by landscape that gradually transitions from canyon to courtyard. Entries from the east pass through a covered breezeway that incorporates entries to the buildings and covered bicycle parking. A generous open space between the buildings provides open space for basketball and/or other recreational activity.

Views to and from the LRT should be carefully designed to insure, both privacy for the residents, and to maximize a dramatic first impression of campus for LRT riders. Most bedrooms should face courtyards or open spaces framed by the buildings to maximize privacy. Many common spaces should also face inward to create inside/outside relationships that activate the courtyards. The most active common spaces (floor lounges and living rooms) should face the canyon and the LRT to provide project identity, and to serve as 'eyes on the canyon' to improve safety and security in those spaces. Rooftops are the 'fifth elevation' of the project and shall be designed for clean views, without exposed mechanical equipment.

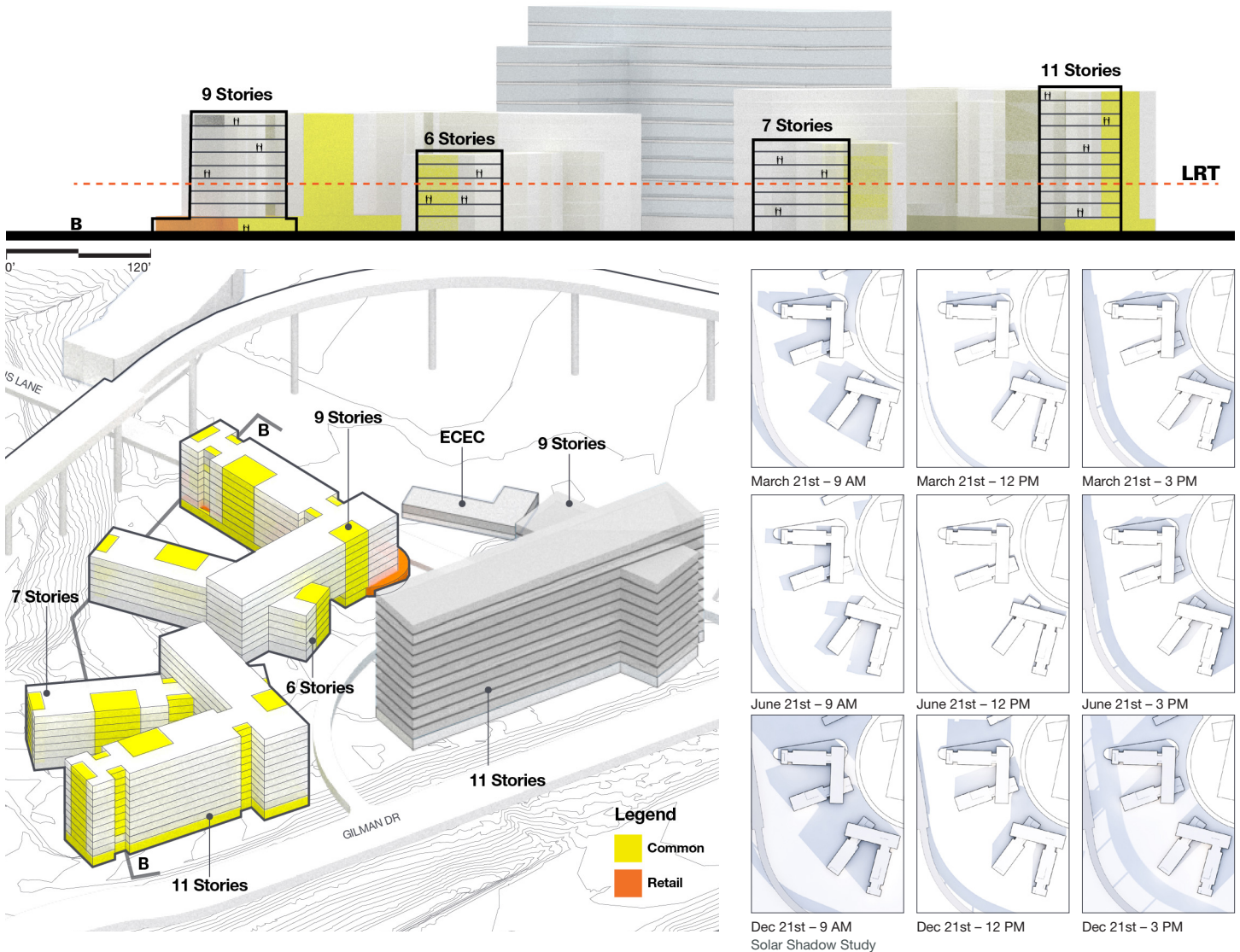
Pepper Canyon East will be a vital neighborhood for students, their home away from home, providing a powerful sense of community. PCE extends Rupertus Lane to the east and provides a strong east-west link for students from PCE to the center of campus and its academic and student life facilities. While Rupertus will be a strong urban edge, entries and shared/common spaces within the complex, should be accessible and easy to find, promoting student interaction and engagement.



Massing and Scale

Pepper Canyon East is sited between the new LRT elevated guideway on the west and the I-5 freeway on the east. The buildings serve to shield the courtyards beyond from freeway noise and create semi-private outdoor spaces for residents to gather, study and recreate. Wings on the edges of PCE, to the north, south and east of the complex shall be taller to shield outdoor spaces from freeway impacts and to create protected spaces within the complex. Building wings toward the center of the complex will be lower to minimize sun-shading of the courtyards. Taller buildings could be incorporated to accommodate more beds if necessary and provide a more articulated roof line to mitigate potential view obstruction from nearby buildings.

The protected courtyards created by the building wings will be used for a variety of student life activities. There will be access to the canyon, its trails and pathways for quiet uses and passive recreation. Likewise, more active spaces with recreational uses, such as basketball, will be provided for this large housing community in the open spaces between the buildings. Also a range of social spaces with seating for small and medium size groups shall be sited, with attention to separate quieter and noisier activities.



04 | PC1 - Mixed Use Building

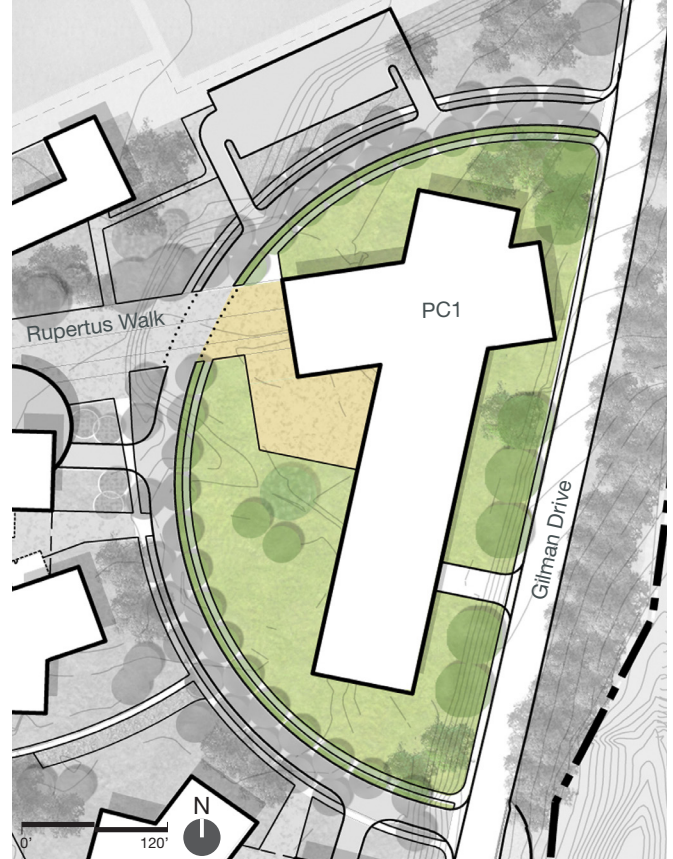
The eastern portion of the Pepper Canyon East site is designated as a future building site. While the ultimate use and size of the building are undetermined, it opens many opportunities.

The building use could be focused on transit-oriented development, such as creating an administration center where the majority of the staff can use LRT for transportation and may release additional space in the center of campus. It might be a new academic building...a bookend... for the main campus to anchor the east side of PCE and create a true living learning community in Pepper Canyon. Or, it could become home to other off-campus affiliated entities, accessed by the light rail and connected to the community. Private-public partnership (P3), via third-party development, space could provide a revenue stream an enable alternative forms of delivery.

The East Mixed-Use building is envisioned to be a taller building, located adjacent to and visible from the I-5 freeway. Setback from Gilman Drive, the envisioned commercial building provides an enormous design opportunity to create a branded landmark for UC San Diego from I-5. Additionally, this building is the visual landmark at the east end of the extended Rupertus Walk, brings activity to the east side of the new Pepper Canyon station, and adds vitality to the overall Pepper Canyon Neighborhood. This building can easily accommodate two or more levels of subterranean parking, with each of the top two levels directly accessible from the sloping Gilman Drive. This building may be constructed with, before or after PCE. If constructed before it will require demolition of some existing housing. If constructed afterwards, it can be used for surface parking or recreation before the building is needed.

Basis for Planning

Item	Notes	Test Fit
Tower (9-12 stories)	Per Floor	40,000 gsf
Below Grade Parking	Approx 150 cars/level	



| PC2 - North Voigt Building

North Voigt Building

The open space on the north side of Voigt Drive (currently Parking Lot P510) is a potential building site. It is adjacent to the Campus Services Complex (CSC) and could be incorporated into future reorganization of those facilities. The western edge of this site abuts the Ecological Preserve with 50-100 foot setbacks required to protect sensitive habitat. This creates marvelous views, but also constrains full development of the parcel.

Given the proximity to the preserve, this site provides an opportunity to bridge these uses. A 'Sustainability' Pavilion could be incorporated

into future reorganization of adjacent facilities. While embracing nature with views of the ecological preserve and serving as a teaching-learning center for students and the community, campus sustainability offices, operations and other facilities could be incorporated into the new facility. The site can easily accommodate 22,000 gsf per floor, with stories, heights and overall building sized to meet university program needs. Some site could be dedicated for parking and loading, and the western portion of the site will become open green space consistent with the canyon.

¹ Determined by environmental review of proposed project. The baseline requirement is 100 foot 'fuel modification zone' but may be reduced based on proposed landscaping materials

Basis for Planning		
Item	Notes	Test Fit
Floor Plate	Per Floor	22,000 gsf
Parking	20 spaces	



05 | Project Development



05 | Near Term Projects

UC San Diego strives for full development of Pepper Canyon and has an ambitious plan to complete the associated capital projects within a decade or so. Many of the adjacent projects are already underway with completion expected in the next couple of years. These include the LRT rail line and station; site restoration resulting from the light rail construction; and the DIB.

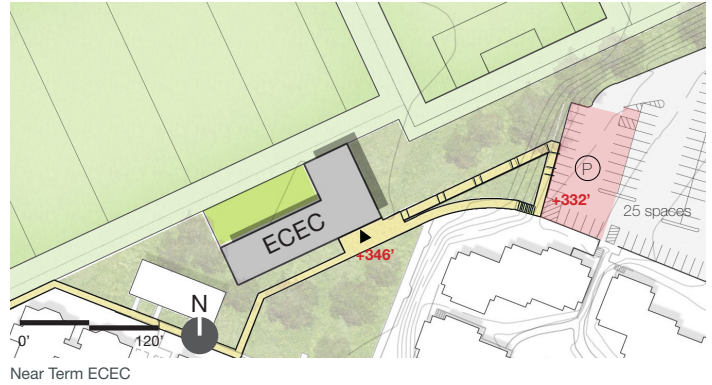
Several projects within the Pepper Canyon Neighborhood Planning Study will proceed on completion of this study into planning and design, and subsequent construction. The 'Near Term' projects include the Pepper Canyon West (PCW) student housing project, the ECEC (Early Childhood Education Center), and improvements to the Canyonview Recreation Center.

The University, consistent with UC goals, aims to provide more on-campus housing. PCW will replace 430 beds at existing and aging Sixth College Housing with a village of approximately 1400 beds for unaffiliated upper division students. The new complex is a denser, more efficient use of land.

ECEC will complement other childcare centers on campus, creating a transit-adjacent location for children of faculty, staff and students. ECEC is sited for convenient access to the LRT as well as roadways and parking, both in the Near Term, and in the future, on completion of all Pepper Canyon development. In the near-term, the ECEC could use the existing parking lot. Alternately, construction of the permanent in the near-term could reduce construction impacts in the future.

Canyonview Recreation will be improved and increase student options for recreation in this precinct of campus commensurate with the increases in student residents in this area.

This will be supplemented by a new primary bike and pedestrian pathway along the west canyon rim, new canyon trails, a new field house and the replanting and reconfiguration of Warren Field.



The near term development of ECEC utilizes the existing parking lot on the east side of the site for parking requirement. Multiple ramps will be required to achieve ADA accessibility across the existing slope site.



- 1 Pepper Canyon West Housing
- 2 ECEC
- 3 Warren Fields
- 4 Field House
- 5 Canyonview Aquatic Center Expansion
- 6 Canyon Restoration/ New Canyon Trails

05 | Future Projects

Once the Near-Term projects are well underway, campus will devise plans, programs and schedules for the Future Projects to be constructed based on developing campus needs. The Future Projects include Pepper Canyon East (PCE) Student Housing with a village of 2000 bed (likely future college); North Voigt building; and the East Mixed-Use building.

PCE will complement PCW across Pepper Canyon. Both will front on campus' extended Rupertus Walk, connecting across to the west side of campus and creating active zones for student life and persons arriving to campus from the LRT line and station.

The North Voigt building will develop a parcel adjacent to the Ecological Reserve and the Campus Services Complex (CSC). Final use of the site will be determined by the campus, mindful of setbacks from the preserve and the adjacent uses.

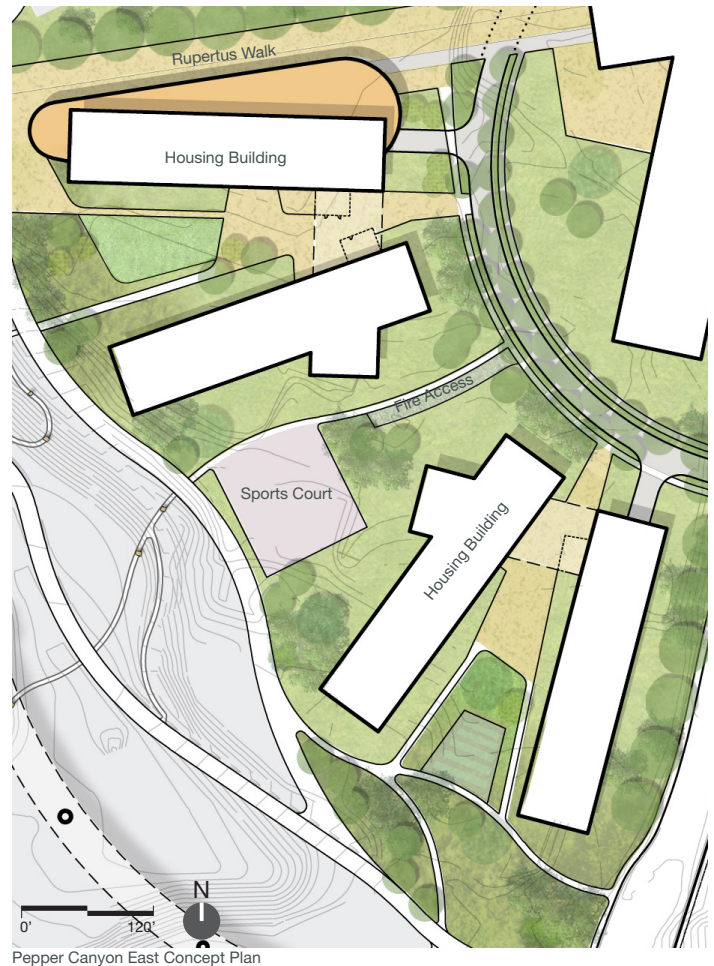
The East Mixed-Use building provides several options- it could add academic space to the east side of campus, provide a TOD (transit oriented development), campus administrative space, or program needs as determined by the University. As academic/office building there is an opportunity for a strong signature building, branded for UC San Diego, that will be visible from the I-5 freeway. Below grade parking could easily be incorporated into the future building, and in the short term, on grade parking could be provided on the site.

There will be a 3-part approach to sustainability within the Pepper Canyon Neighborhood; comply with UC system mandates, integrate with UC San Diego campus guidelines and infrastructure, and leverage or mitigate site-specific environmental conditions to reduce energy use, improve environmental comfort and promote wellness for the student population.

Beyond the near-term projects identified in this study, the Pepper Canyon Neighborhood provides significant development potential to meet campus-wide student housing needs while also providing other types of development to create a mixed use, transit-oriented neighborhood.

In the future, additional upper-division student housing or a future undergraduate college on the east side of Pepper Canyon mirrors the west housing development, embracing the canyon landscape in the spaces between buildings. The east housing adds activity to Rupertus Walk with a new dining facility and plaza, and it connects to the rest of the neighborhood and larger campus circulation network with a new shared-use bike and pedestrian path along the canyon rim. A new loop road serves new development from Gilman Drive.

In addition to meeting the need for student housing, the easternmost area of the site has capacity for a mixed-use building site which could contain academic and other types of space, adding a beneficial mix of uses close to the new San Diego Trolley. This development creates a clear eastern terminus to Rupertus Walk, and should act as a visual and physical marker with welcoming and attractive spaces in both the building and the public realm.



Pepper Canyon East Concept Plan

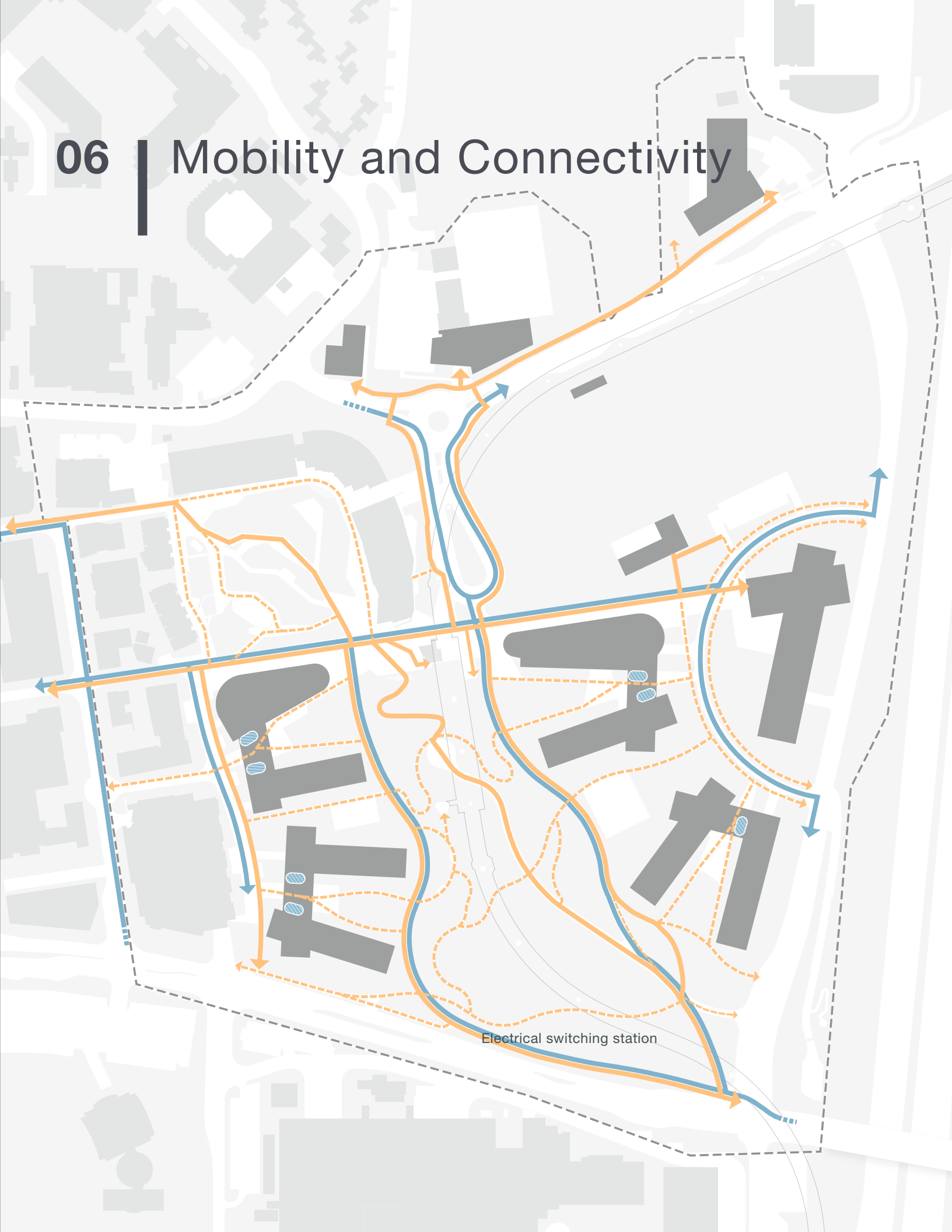
The existing parking lot P510 also presents a future development opportunity; its proximity to the Ecological Reserve makes it an ideal location to showcase sustainability and connect with the natural landscape of the Reserve.

Future projects in the Pepper Canyon Neighborhood are shown on the right page and described in detail in the Buildings section of this report.



- 1 Pepper Canyon East Housing
- 2 Mixed-Use Building (PC1)
- 3 North Voigt Building (PC2) (Sustainability Pavilion)
- 4 ECEC Updated Parking Lot and Access
- 5 Canyonview Aquatic Center Expansion

06 | Mobility and Connectivity



Electrical switching station

06 | Pedestrian and Micro-Mobility

Pedestrian Circulation and Micro-Mobility

Pepper Canyon Neighborhood promotes active transportation by providing safe multimodal connections to key destinations within the site, access to main campus and the larger regional network. The circulation network provides amenities such as differentiated paving, walkway lighting, planting, and bike storage (including space for dockless bikes) to create a safe and comfortable experience for pedestrians, bikes, electric scooters, and other micro-vehicles. Primary public pathways include Rupertus Walk, two new shared-use canyon rim trails, and a north-south route connecting to Canyonview Aquatic Center. A network of secondary connections will interlace with buildings, open space, and surrounding streets to provide complete, safe, and well-lit routes through and to the neighborhood.

Rupertus Walk will experience the highest level of traffic from light rail riders moving from the Pepper Canyon Station westward towards the

University Center Urban Core. This area will likely experience the most diverse modes of transportation that could include bikes, e-scooters, skateboards or segways. To support this level of activity, Rupertus Walk should create clear zones for shared circulation with separate adjacent spaces to sit or talk. The shared-use paths on either side of the canyon should connect Rupertus Walk to the regional bike route on Gilman Drive to the south and to East Campus. These public pathways will bring activity to the canyon edges promoting safety and providing a clear transition between the canyon and the semi-public and private spaces in Student Housing to the east and west, as illustrated in the section below.

The secondary circulation network includes shared streets, rustic trails within and across the canyon, and pedestrian paths to and through housing development. These routes should provide a quieter, calmer experience, helping to create a natural distinction between public and private spaces.



TRANSITION TO WEST HOUSING COURTYARDS
WALK 8'
BIKE PATH (TWO-WAY) 10'
PEPPER CANYON

Shared Bike Path

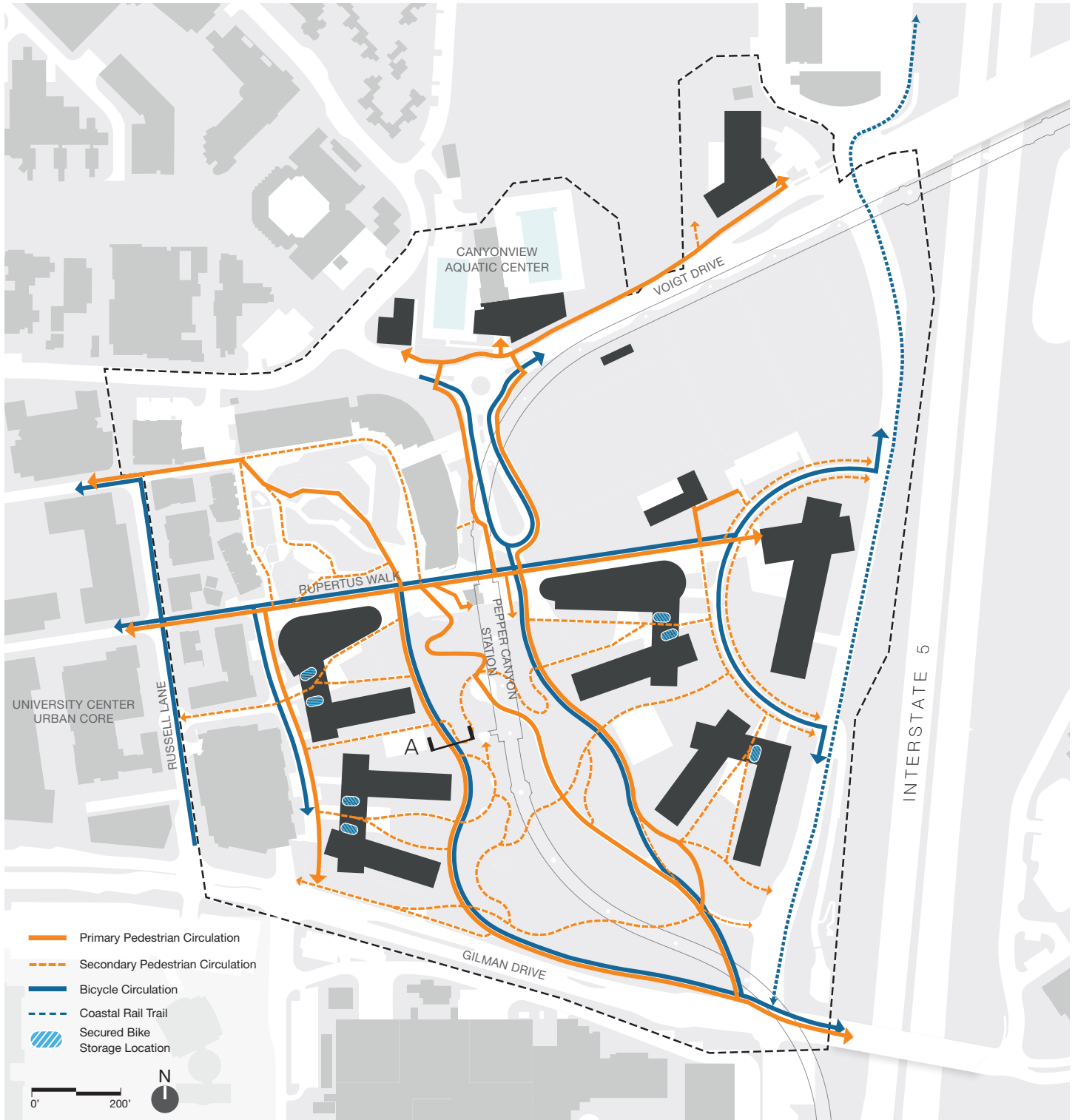
The planning study indicates a primary bike and pedestrian circulation route along the western rim of Pepper Canyon (Section A). Based on density and massing assumptions for buildings and slopes down to the canyon, the site configuration as shown in this planning study comfortably allows for an 18 foot wide path with 8 foot for pedestrians and 10 foot for two-way bike circulation.



TRANSITION TO WEST HOUSING COURTYARDS
WALK 8'
STORM WATER PLANTER 4'-5'
BIKE PATH (TWO-WAY) 10'
PEPPER CANYON

Separated Bike Path

Where building massing and slopes allow, the preferred section for the canyon rim trails includes bike and pedestrian routes separated by a stormwater facility (Section A Alternate). The section above proposes a 4 to 5 foot wide stormwater planter in addition to the total 18 foot for bikes and pedestrians. Paved crossings over this stormwater zone give pedestrians access across the bike path to access the trails and overlooks in the canyon.



06 | Vehicular

Emergency and Service

Two new vehicular access roads are proposed, one serving each of the new housing sites. On the west side, 'The Woonerf', a shared bicycle, pedestrian, and service street is proposed between the Gilman parking structure and the new west housing site (Section B), including the following elements:

- 20 foot shared paved service/emergency access/bike street
- 6 foot furnishing and planting zone
- 10 foot pedestrian path adjacent to housing

This area will not be open to private vehicles (except during move-in and move-out), and plaza-like paving will ensure a focus on bikes and pedestrians, encouraging a shared-street environment while allowing daily service for buildings at consolidated locations.

For future projects, on the east side of the neighborhood, a new one-way southbound loop road off Gilman Drive allows access for service, emergency, and private vehicles.

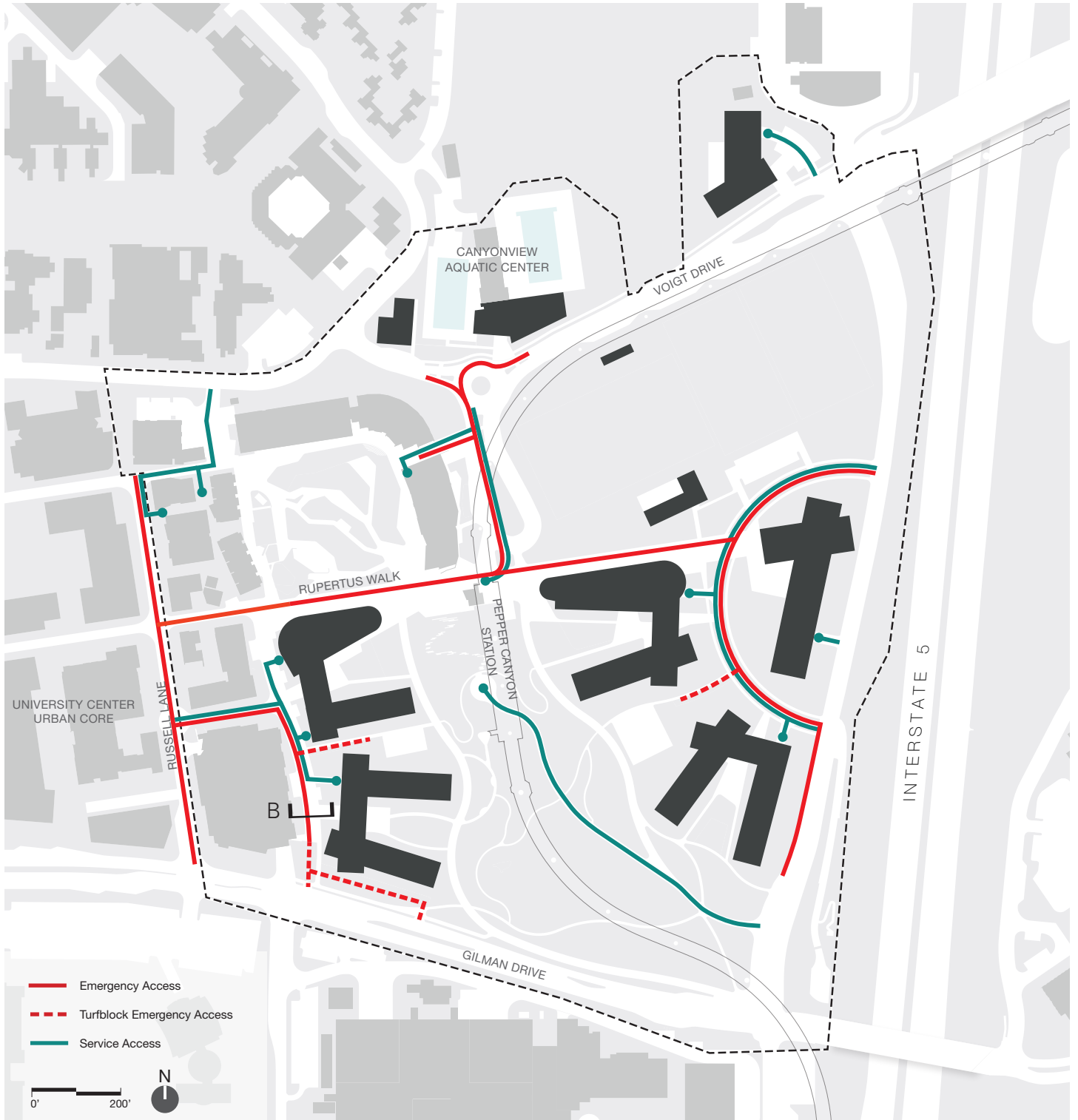
In addition to the new routes, service and emergency access to some existing buildings will be configured based on reduced vehicular access. For example, limits on vehicular access to Russell Lane north of Rupertus will shift service for the Visual Arts facility to Voigt Drive. The diagram at right shows planned building service and emergency access, with additional emergency access shown on turfblock and paths as needed.



The use of plaza-like, pedestrian-oriented paving across the entire shared street will encourage vehicles to drive slowly and carefully, enhancing safety for pedestrians.

Shared Corridor

A shared corridor west of PCW will (Section B) will accommodate pedestrians and bicyclists as well as service and emergency access.



06 | Vehicular

Transit, Rideshare and Vehicular Circulation

Campus shuttles will extend public transportation from campus to the LRT. The Campus Shuttle will travel from Lyman Lane with a new shuttle stop located at the east of the DIB. Two stops along Gilman Drive to the south will also serve the neighborhood and campus, including access to the East Campus via the Gilman Bridge.

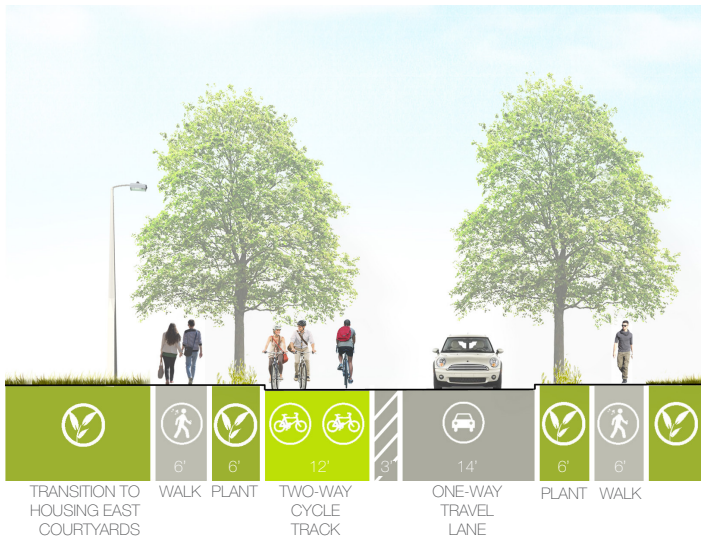
Rideshare and private vehicle access within the neighborhood is limited to existing public streets and the future one-way loop road on the eastern edge of the site. The cross-section of the loop road depends on design of future projects with options shown below.

Rideshare or Transportation Network Company (TNC) drop-off may occur along the new loop road, Voigt Drive, and Russell Lane near the Prebys Music Facility and Pepper Canyon Hall. TNC pick-up will be restricted to a designated pick-up zone at this location only.



Loop Road - Shared Lane

Based on building massing and slopes, this study shows a one-way southbound travel shared with bikes and a northbound contra-flow bike lane (Section C).

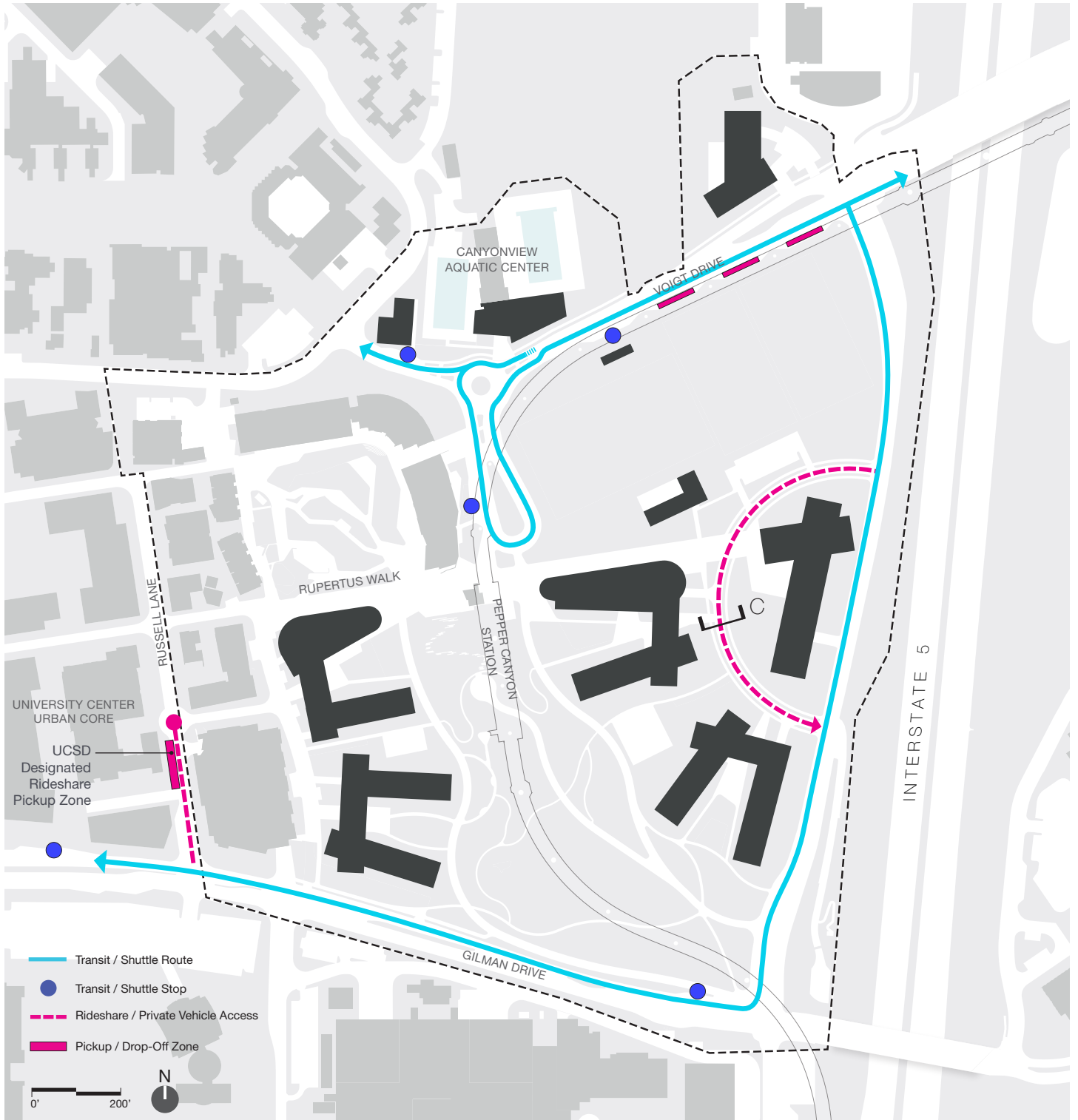


Crescent Road - Cycle Track

If the site allows, the preferred cross-section (Section C-Alternate) separates bikes from traffic with one-way vehicular travel and a two-way buffered cycle track. In both options, pedestrians are separated from the street by a 6 foot planted area with street trees at each curb.



A two-way cycle track, as shown in Section C-Alternate, can provide safer passage for cyclists and a buffer for pedestrians.



07 | Open Space and Landscape



07 | Outdoor Use

Facilitating social interaction and engagement through a variety of site amenities builds communities and creates a sense of identity. Pepper Canyon Neighborhood provides a wide variety of outdoor public and private spaces. The plan is founded on transitions from the public and to the private realm through the use of urban design strategies; providing material changes; grade separations; and built edges. The residential courtyards are oriented toward the canyon to maximize the views and access to the central open space. Courtyards will transition from private to semi-public toward the canyon, creating a sense of place within each housing complex. Active uses are distributed throughout the housing neighborhood, including sport courts and Warren Field. The main public realm on site is Rupertus Walk, which will host a variety of different types of activities and attractions such as dining, the amphitheater, retail, and access to transit. High-quality public space should also be provided in front of the new Canyonview facility, providing a clear destination north of the roundabout. In the future, a public plaza could be provided at the north Voigt sustainability pavilion.



The diagram above indicates the total site area of spaces between buildings, including internal housing courtyards and the wedges of outdoor space between building sites.

- Legend
- Outdoor Space Between Buildings
 - Housing Courtyards
 - Canyon Landscape



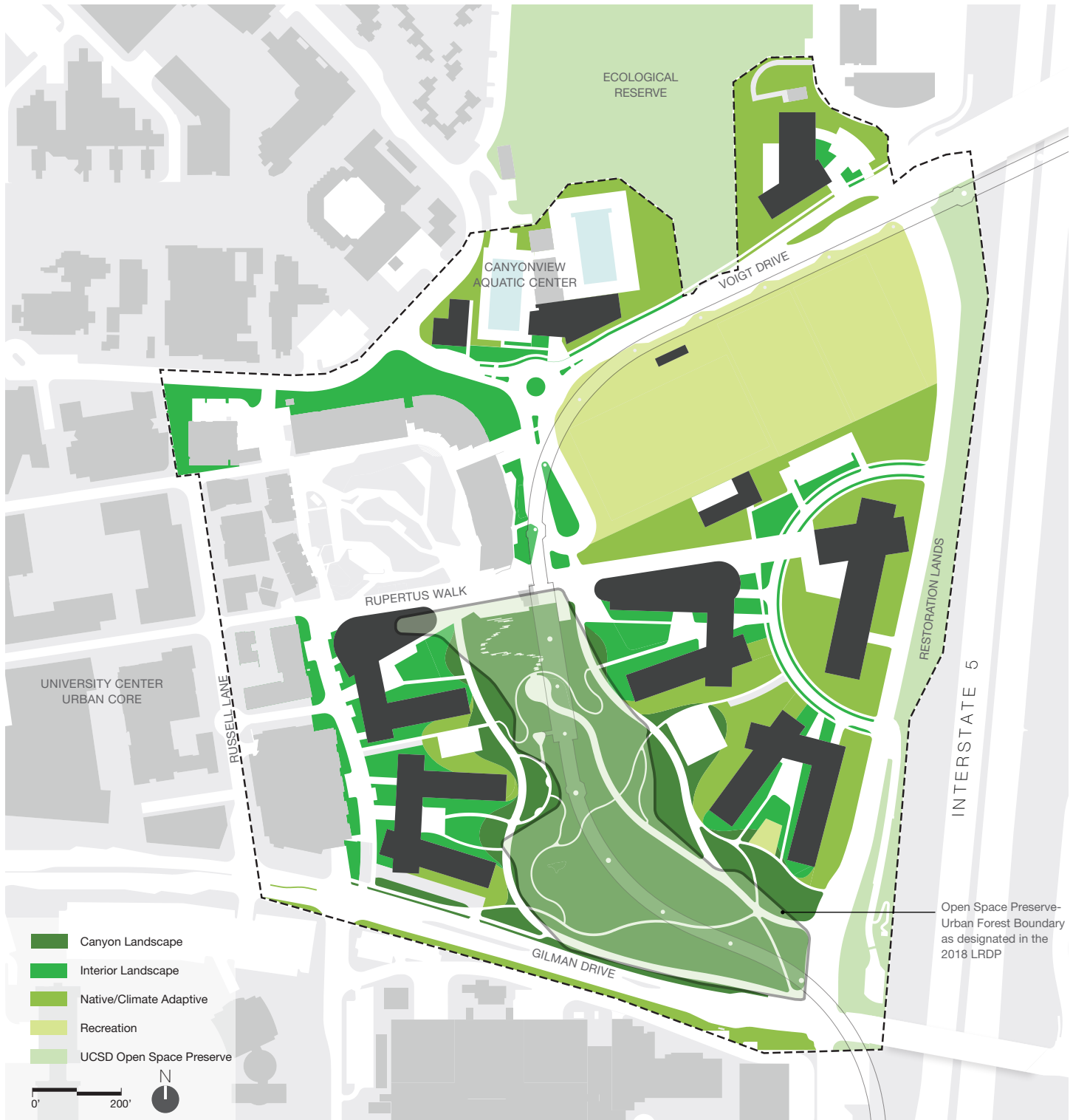
07 | Landscape Typologies

The Pepper Canyon Neighborhood includes a variety of landscape typologies, each with unique characteristics that enrich the overall sense of place. For example, landscaped areas in a public plaza or private courtyard require a different approach than the rustic, revegetated slope of a canyon. This range of landscape types, and the blending and infusion of the Pepper Canyon landscape with the housing interior spaces, will create a unique open space experience that is distinct from other places on campus while supporting the campus-wide open space framework.

The following landscape typologies describe intent for the site's varied landscapes:

- **Canyon Landscape / Urban Forest.** The landscape within Pepper Canyon will be restored as a passive open space with rustic trails and overlooks for quiet uses such as hiking, resting, taking in a view, or simply contemplation. The Canyon Landscape will provide an experience of nature while preserving safety by allowing users to see into and through the landscape. The inclusion of pedestrian-scale path lighting and other lighting throughout the canyon will also promote safety. The Canyon Landscape typology will be carried through toward the housing courtyards and blend with the other landscape typologies at its edges. It will also mark the campus when seen from Gilman Drive.
- **Interior Landscape.** Landscape areas within or around plazas, courtyards, walkways, and other parts of the campus public realm will provide visual or textural interest, comfort, or shade. The Interior Landscape typology includes usable open spaces, like lawns, as well as ornamental plants that add beauty and character to the public realm. It requires a more nuanced maintenance approach than other typologies.
- **Native/Climate Adaptive Landscape.** Transitional areas, street edges, or other swaths of open space that are not directly integrated into the campus public realm are defined as the Native/Climate Adaptive Landscape typology. These areas are intended to require less ongoing maintenance while softening and restoring the edges and transitions between building sites. They can also provide slope stabilization and stormwater infiltration.
- **Recreation.** The Warren Field area and a small community garden are identified as Recreation areas. These are unique spaces for human activity, and each will require specific maintenance regimes.
- **UC San Diego Open Space Preserve.** Two Open Space Preserve areas identified in the UC San Diego Long Range Development Plan have a direct relationship to the Pepper Canyon Neighborhood: the Ecological Reserve to the north and Restoration Lands along I-5 to the east. The restoration lands along I-5 provide an opportunity to mark the campus with a restored natural edge. The Ecological Reserve can provide a natural amenity to development on the Canyonview and north Voigt sites.







08 | Site Materials and Systems

Site Materials

Materials should be highly durable, low maintenance in a palette that complements the neighborhood's unique qualities.

Paving

- Paving of primary pedestrian areas should be high quality unit pavers, natural materials, seeded or exposed aggregate.
- Materials should be installed to ensure long term durability.
- Special detailing and materials should be used in areas such as Rupertus Walk, housing courtyards, and main entrance plazas.
- Accessible routes should be integrated in a visually cohesive manner. Routes should be direct and provide a similar quality and hierarchy of circulation as those provided for able-bodied persons.
- Non-accessible routes throughout the canyon should be a rustic material with timber stairs.
- Paving materials with postconsumer recycled content should be used where possible. Select materials that are extracted or manufactured within 500 miles of San Diego.

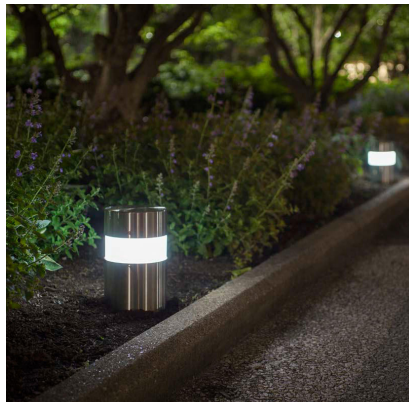
Seating

- Seating should be provided throughout the neighborhood with integrated concrete seat walls, durable hardwood, benches and picnic tables and moveable tables and chairs.

Bicycle Parking

- Bike parking should be visible, accessible and safe day and night.
- Shade and shelter over bike parking should be provided where possible.
- Sufficient bike racks should be provided to avoid unsightly random parking, based on projected use of adjacent building.
- Provide covered, secure and lighted bicycle parking within building breezeways or in close proximity to building entries.
- Bikeshare and scooter parking should be placed in a central location, in close proximity to the light rail station and shuttle stops.





Furnishings

Site furnishings are important elements of the public realm. They help define campus character and improve collegial communication and interaction by providing places to gather, study and socialize.

Furnishings should be selected and located for campus continuity but also have distinct character for different programs; the LRT station furnishings will likely need to be more durable and low maintenance, but furnishings in the housing community should be softer, and include movable chairs. Furnishings may also recognize the distinct character of adjacent buildings. This consistency and contextual consideration enhances the campus's image and helps reduce maintenance costs.

Selection of furnishings should also consider:

- Recycled content
- Durability and lifespan
- Southern California production when possible
- Minimizing use of toxic materials (paints, finishes, glues)
- Efficient repair and maintenance
- Coordination with campus lighting
- Locations to take advantage of views and shade
- Contemporary appearance

Lighting

- Exterior lighting should provide adequate illumination to allow for safe access and use of sites. Fixture pole heights between 15-20' are preferred.
- Walks and paths should be illuminated with pedestrian-scaled lighting, with particular emphasis on trails within Pepper Canyon to support pedestrian safety.
- Site flood lighting is discouraged.
- In-ground up-lighting should be avoided.
- Light illuminating from fixtures should be cast downward with full cut-off shades to preserve dark skies.
- Use minimum lighting levels required by code and campus standards; focus on contrast ratios versus standard footcandle light levels.
- Consider lighting to enhance the aesthetic qualities of the campus and highlight special features if applicable.
- Coordinate lighting locations and pole heights with tree locations and constructed elements.
- Light fixtures to be selected from campus standards. Flexibility can be provided in a case-by-case basis.

08 | Site Materials and Systems

Planting Guidelines

To achieve the intent for the landscape typologies described in Chapter 7, the following specific guidelines describe specific considerations for planting and landscape management within each of the three major landscape typologies.

Interior Landscape

- Trees should be selected and placed to provide shade along major walkways, within and around plazas and courtyards, and at building edges where appropriate.
- Planting design should encourage an indoor-outdoor relationship with public spaces within buildings.
- Plants within and at the edges of the public realm should provide color and textural interest.
- Lawn areas should be carefully sited, sized and integrated into open spaces only where a compatible use is anticipated--for example, private housing courtyards or active use open areas.
- Rain gardens can be incorporated to integrate stormwater treatment into the public realm.

Native/Climate Adaptive Landscape

- The neighborhood will express its regional identity with climate-appropriate landscapes including drought-tolerant and fire-resistant plantings.
- The design will strengthen the edges between the typologies and as much as possible, low-maintenance plants and trees will be utilized.
- These areas provide an excellent opportunity for larger stormwater swales that can integrate naturally within the landscape.

Canyon Landscape

- The natural setting of the neighborhood will be enhanced with replanting and restoration of the Canyon Landscape.
- To provide a safe environment for its visitors, densely planted trees and shrubs will be replaced with open tree canopies and pockets of low shrubs interwoven with groundcovers.
- A combination of low-growing, high-moisture and fire-resistant plants will establish a fire-safe landscape.





Interior Plant Palette

The following palette represents a suggested list of plants designated for the interior campus typology.

Trees:

- Dracaena draco – Dragon Tree
- Koelreuteria bipinnata – Chinese Flame Tree

Shrubs:

- Agave attenuata – Foxtail Agave
- Agonis flexuosa 'Nana' – Compact Peppermint Willow
- Arctostaphylos 'Howard McMinn' – McMinn Manzanita
- Artemisia californica – California Sagebrush
- Bougainvillea species – Bougainvillea
- Callistemon 'Little John' – Dwarf Bottlebrush
- Ceanothus 'Concha' – Concha Ceanothus
- Ceanothus thrysiflorus var. griseus – Carmel Creeper
- Encelia californica – Coast Sunflower
- Eriogonum fasciculatum – Common Buckwheat
- Eriogonum parvifolium – Seabluff Buckwheat
- Eriophyllum confertiflorum – Golden Yarrow
- Eschscholzia californica – California Poppy
- Galvezia speciosa – Island Bush Snapdragon
- Heteromeles arbutifolia, Toyon
- Isomeris arborea - Bladderpod
- Leptospermum laevigatum – Australian Tea Tree
- Leucodendron 'Safari Sunset' - NCN
- Lotus scoparius – Deerweed
- Melaleuca nesophila – Pink Melaleuca
- Mimulus aurantiacus – Bush Monkeyflower
- Mimulus puniceus – Red Monkeyflower
- Plecostachys serpyllifolia - NCN
- Rhus lentii – Pink Flowering Sumac
- Rhamnus crocea, Redberry
- Rhaphiolepis umbellata - Yedda Hawthorn
- Rhus integrifolia, Lemonade Berry
- Salvia apiana – White Sage
- Salvia leucophylla 'Point Sal Creeper' – Prostrate Purple sage
- Salvia leucophylla 'Point Sal' – Purple sage
- Salvia mellifera – Black Sage
- Westringia rosmariniformis – Coast Rosemary
- Artemisia californica – California Sagebrush
- Dudleya lanceolata – Lance Leaved Dudleya
- Encelia californica – Coast Sunflower
- Eriogonum fasciculatum – Common Buckwheat
- Eriogonum parvifolium – Seabluff Buckwheat
- Eriophyllum confertiflorum – Golden Yarrow
- Eschscholzia californica – California Poppy
- Lotus scoparius – Deerweed
- Mimulus aurantiacus – Bush Monkeyflower
- Mimulus puniceus – Red Monkeyflower
- Rhus integrifolia – Lemonade Berry
- Salvia apiana – White Sage
- Salvia mellifera – Black Sage

Succulents:

- Aloe arborescens – Tree Aloe
- Aloe x nobilis – Hybrid Aloe
- Dudleya lanceolata – Lance Leaved Dudleya
- Senecio mandraliscae – Blue Chalksticks

08 | Site Materials and Systems



Native/Climate Adaptive Plant Palette

The following palette represents a suggested list of plants designated for the native/adaptive typology.

Trees

- Arbutus 'Marina'
- Butia capitata
- Chitalpa tashkentensis
- Dracaena draco
- Geijera parviflora
- Koeleruteria bipinnata
- Lagerstroemia indica
- Laurus nobilis 'Angustifolia'
- Melaleuca quinquenervia
- Olea europaea 'Swan Hill'
- Parkinsonia x 'Desert Museum'
- Pistacia chinensis
- Quercus agrifolia

Shrubs

- Agave spp.
- Aloe spp.
- Arctostaphylos spp.
- Baccharis pilularis
- Ceanothus spp.
- Cercis occidentalis
- Cistus spp.
- Calandrinia grandiflora
- Dymondia margaretae
- Eriophyllum confertifolium
- Grevillea spp.
- Lampranthus species
- Lantana montevidensis
- Leucophyllum ssp.
- Mimulus aurantiacus
- Myrtus communis 'Compacta'
- Prunus ilicifolia
- Rhamnus californica
- Rosa californica
- Rosmarinus officinalis
- Westringia fruticosa
- Yucca whipplei

Grasses

- Cordyline australis
- Muhlenbergia capillaris
- Festuca glauca 'Elijah Blue'
- Phormium tenax

Canyon Plant Palette

The following palette represents a list of plants suggested for the canyon.

Northeast Slope

Trees:

Cercis occidentalis
Prunus lyonii
Platanus racemosa

Shrubs and Groundcover:

Fragaria chiloensis
Frangula californica 'eve case'
Heteromeles arbutifolia
Heuchera maxima
Mahonia repens
Rhus intergrifolia
Carex pansa

Southwest Slope

Trees:

Chilopsis linearis
Hesperocyparis forbesii
Prunus lyonii
Quercus agrifolia

Shrubs and Groundcover:

Heteromeles arbutifolia
Bahiopsis lanciniata
Eriophyllum nevinii
Agave shawii
Hesperoyucca whipplei
Opuntia littoralis

Bioswale

Shrubs and Groundcover

Abutilon palmeri
Erigeron glaucus
Fragaria chiloensis
Grindelia stricta platyphylla
Iva hayesiana
Myrica californica

Grasses and Perennials

Achillea millefolium rosea
Carex pansa
Juncus patens
Anemopsis californica
Romneya coulteri
Sisyrinchium bellum



08 | Site Materials and Systems

Street Tree Guidelines

Guidelines:

General Considerations for all lanes, walks and streets:

- Trees to conform with City of San Diego truck access standards.
- All existing trees preserved must be protected during construction, with campus requirements.
- Tree selection should promote distinct street identities by using color, scale and texture.
- All planting palettes should be climate adaptive and support a sustainable and climate appropriate low water use design.

Tree recommendations for the following lanes, walks and streets:

Rupertus Walk

Take into consideration underground utility lines at west end adjacent to new amphitheater and the DIB. The trees selected are based on the University Center Urban Core street tree selection for Rupertus walk to allow for continuity along the entire alignment of Rupertus.

- *Ulmus parvifolia* 'Drake', Chinese Elm,
- *Arbutus* 'Marina', Marina Madrone

West Housing Service Road

Medium to large scale trees. Considerations for taller limbed trees to allow for large truck access.

- *Ulmus parvifolia* 'Drake', Chinese Elm

East Housing Road

Medium to large scale trees to shade and buffer bikes and pedestrians. Considerations for taller limbed trees to allow for large truck access.

- *Ulmus parvifolia* 'Drake', Chinese Elm

Voigt Drive

Referenced from the Open Space Master Planning Study; Loop Road tree.

- *Platanus occidentalis*, Sycamore



Gilman Drive

Referenced from the Open Space Master Planning Study; campus entry tree.

- *Pinus torreyana*, Torrey Pine



08 | Site Materials and Systems

Stormwater and Utility Integration

The Pepper Canyon Neighborhood currently has projects in various stages of planning, design, and construction with overlapping scope areas within the Pepper Canyon Storm Water Basin. The projects include Lyman Lane Utility Relocation Location (Lyman), Pepper Canyon West, Design Innovation Building (DIB), SANDAG Light Rail Transit (LRT), Pepper Canyon Public Realm (Public Realm). Other future projects include the Pepper Canyon East Housing, Pepper Canyon Mixed Use (PC1-Mixed Use), Early Childhood Education Center (ECEC), and the Canyonview Aquatic Center (Canyonview). The Public Realm project covers a large area and is in varying stages of planning and design. The only project in construction is the LRT project. The Lyman project has completed the design phase and is currently in the bidding phase. The Pepper Canyon West Housing and Amphitheater portion of the Public Realm project are still in the planning phase. The Design and Innovation Building and Public Realm space around it are in the design development phase.

There are three storm water discharge points for the Pepper Canyon Neighborhood. Canyonview discharges to the north to the Miramar Reservoir Watershed, while the remaining portion of the Pepper Canyon Neighborhood discharges southerly to the Miramar Watershed. The LRT project covers a large portion across the central and southern section of pepper canyon and is constructing storm drain connections at the bottom of the canyon. The LRT project was required to incorporate storm water treatment for the entire basin (27.2 acres) discharging into the canyon. The LRT treatment consists of a bio-swale that treats and partially infiltrates into the canyon before discharging to the existing storm water system. The swale will treat 16.3 acres of impervious area,

which is a combination of the existing impervious areas along with 1.15 acres for the LRT project. The excess treatment for the existing impervious areas within the basin can provide treatment for the newly proposed projects that feed into the canyon. This excess treatment was the potential treatment capacity for the Public Realm project, Design Innovation Building, and Pepper Canyon West Housing project. The Pepper Canyon East Housing, Warren Field, Early Childhood Education Center, and Canyonview are outside of the watershed basin area and will require separate onsite treatment areas. The treatment required for the Lyman Lane Utility Relocation Location, Public Realm project, Design Innovation Building, Pepper Canyon Housing West project are based upon the amount of impervious area that is equivalent or less than the amount of impervious area that is currently discharging to the canyon. There may not be enough treatment capacity in the canyon for all the projects that drain to it and it may require onsite treatment if there is not capacity. Each project will need to provide storage capacity onsite to mitigate the post-construction flow rates. Treatment for the Pepper Canyon East Housing, Warren Field, Early Childhood Education Center, and Canyonview will require individual treatment and storage areas based on the site design elements. Treatment is only one part of the storm water equation; discharge rates from new site must mimic pre-construction conditions.

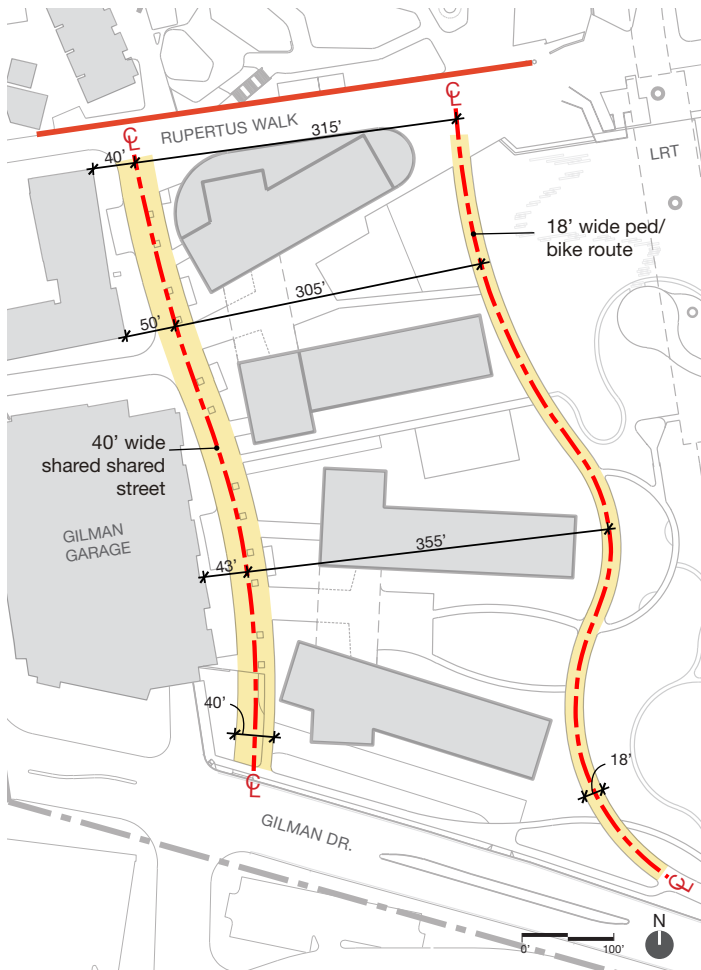


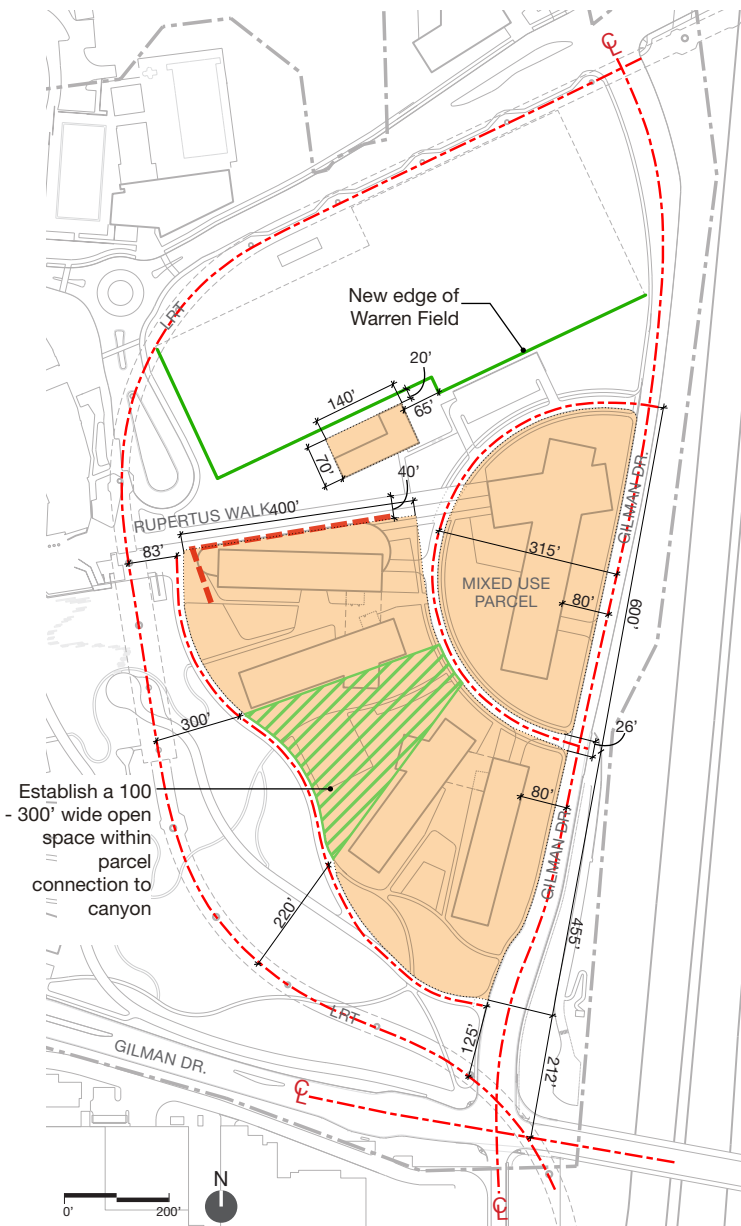
The existing utility systems for the Pepper Canyon Study are split up in various configuration based on the source, the need to be gravity dependent, and physical site features that govern the layout. The entire sewer system discharges into a 15" line in Pepper Canyon. The existing sewer system should be sized large enough to handle the future development that is proposed. The domestic water and natural gas systems are both supplied by mainlines in the roadways and will not need to be upsized for the proposed buildings. High Temperature Water is currently connected to the Canyonview Aquatic Center. The Lyman Lane Utility Relocation Location project is extending the hydronic piping for the High Temperature Water and Chilled Water to the southeast side of the Structural and Material Engineering Building to facilitate future connections on the east side of the canyon. There are no connections in range on the west side of the canyon. Extensions for individual building's heating and air conditioning needs will need to be extended from the mainline as projects are developed further. The reclaimed water main is routed through Pepper Canyon and eastward through the existing Parking Lot P401 before it heads north in Gilman Drive. There are many opportunities for all proposed projects to connect to this system. The electrical and telecom duct banks are routed in the roadways and have manholes and handholes placed throughout the neighborhood. Projects will be able to connect to existing manholes and handholes to hook up to the University's power and data system. Individual design teams will need to do a final assessment for lateral sizes for all utilities bases on project needs.



Stormwater can be detained in large swales or low-lying landscaped areas that are designed to receive and infiltrate stormwater during heavy rain events or flash flooding.

08 | Development Parcels (in progress)





08 | Architectural Expression / Program Intent

Title/Legend

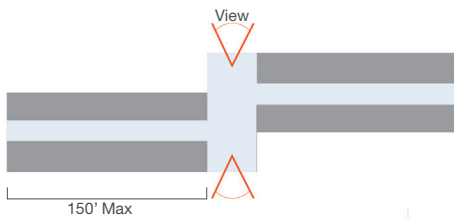
Architectural expression at Pepper Canyon West will comply with UC San Diego Campus Guidelines and develop as an extension of the two foundational design concepts for the project.

- Embrace Pepper Canyon and expand upon its landscape to integrate these 2 “residential villages”; with one another and with the canyon, infusing both with the unique canyon landscape as their defining characteristic.
- Concentrate a range of programmed common and retail spaces as destinations along the north edge of the site to activate Rupertus Way.

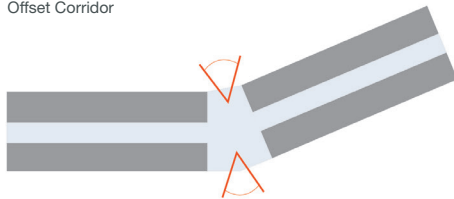
Building Massing

Buildings should have varied height to articulate massing, avoid a continuous wall-like character and mitigate the obstruction of views from the campus center. In the east/west direction, higher buildings should cascade down from the western edge of the site to reduce scale along the canyon. In the north/south direction buildings should cascade down from the center of the site; toward Rupertus Walk to maintain pedestrian scale, and toward Gilman Avenue to better frame the important campus entrance from Villa La Jolla Drive

Buildings should be designed to avoid long, uninterrupted corridors, with 150’ maximum length between points of daylight. This will provide additional opportunities to articulate the interior corridor and exterior façade. Common spaces with views could be located at points of daylight access. Bends or offsets could reduce apparent corridor length and if co-located, further emphasize the common space locations.



Offset Corridor

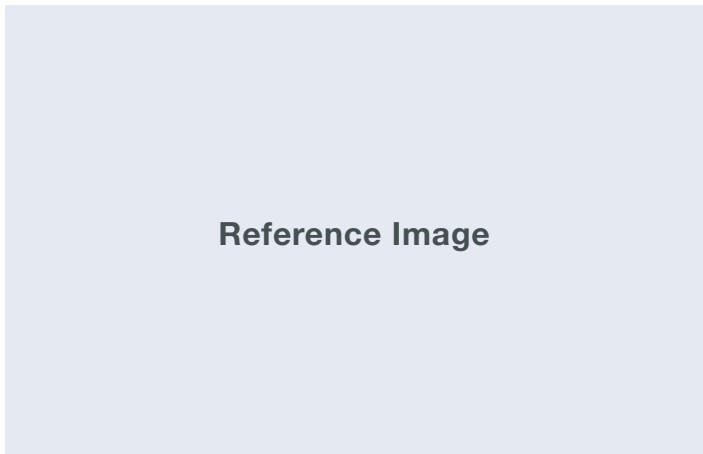
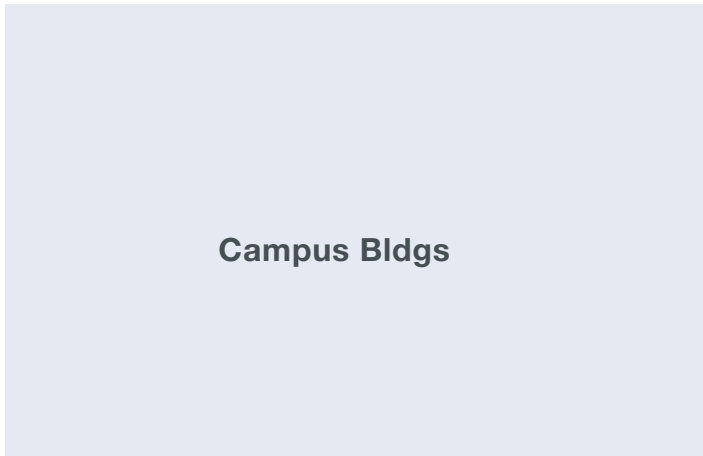


Bent Corridor



Gapped Corridor

Corridors: Daylight Access and Articulation



Materials

- Building materials at Pepper Canyon West should comply with UC San Diego Campus Guidelines.
- Materials should be high quality, durable, recyclable, low maintenance, and generally conform to the palette of materials of nearby campus buildings.
- Variation from the campus palette is acceptable to provide a special character for key elements of the building design.
- The PCW project should set the context for future color and materiality in the neighborhood and should be reviewed by the Campus Architect

Environmental factors

- Operable windows are desirable in residential units to provide environmental comfort for all units. Additional free air requirements can be addressed through trickle vents within the window assembly. Adjacency to the LRT or Gilman may raise acoustic and/or air pollution issues that, in turn, require mitigation through supplemental HVAC systems.
- Solar shading should be provided to mitigate excessive heat gain on large areas of glazing. Solar shading can also be considered for smaller windows at residential units.

Ground Floor Program

- Each building should frame an open space/courtyard that acts as an extension of the canyon. This visual relationship expands the apparent size of the courtyard and can be enhanced by ease of access to the passive open spaces and Stuart Collection Installation within the canyon.
- Courtyard entries should respond to their “campus or canyon” adjacencies. The western entry should relate to the campus and have characteristics that are public, generous and welcoming. Building entries and covered bicycle storage could be located in this zone. The eastern entry should relate to the canyon with a more rustic character and provide more discreet pathways to support student safety by demarcating semi-private residential courtyards from more public areas along the canyon edge.
- Locate common spaces to activate adjacent exterior spaces; the courtyards, Rupertus Way and the canyon.
- Minimize residential units at ground level in favor of common

spaces, particularly along Rupertus Way and Gilman Avenue.

- Common spaces should be transparent, with inside/outside relationships that utilize the courtyards as break-out spaces when appropriate.
- Locate service areas at the eastern edge of the site adjacent to the Gilman Parking Structure and Pepper Canyon Hall and minimize interface with pedestrian circulation.

Upper Floors Program

- Maximize the number of residential units at Level 2 and above.
- Maximize canyon views from residential units and common spaces.
- Provide a range of programmed common elevator lobbies, floor lounges, study rooms, rooftop lounge
- Locate common spaces at canyon-facing building ends to display activity facing the LRT, develop a lantern-like appearance at night and improve security by providing eyes on the canyon.
- Consider an accessible roof deck above retail at Level 2, to overlook Rupertus Way and the Amphitheater.
- Double-loaded corridors shall be 150 feet maximum between areas having daylight access. Mitigate apparent corridor length with offsets, bends, bridged gaps, daylighted common spaces, etc.
- Consider a special use common space at roof level to take advantage of the views to the canyon, campus and beyond.

09 | Acknowledgments and References



09 | Acknowledgments

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09 | References

UCSD Plans and Studies

University of California San Diego Master Plan, 1989
Bicycle and Pedestrian Master Planning Study, 2012
Open Space Master Planning Study, 2016
2018 Long Range Development Plan, La Jolla Campus
University Center Urban Core Planning Study, 2018
UCSD Water Action Plan
UCSD Zero Waste Plan
Latest Climate Action Plan

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Other Resources

The Case for Healthy Places, Improving Health Outcomes through Placemaking, Produced by Project for Public Spaces; A Guide to Building Healthy Streets, ChangeLabSolutions.org

10 | Appendices

November 19, 2018

HED
601 South Figueroa Street, Suite 500
Los Angeles, California 90017

Attention: **Deborah Wylie**

Subject: **University of California San Diego (UCSD) Pepper Canyon Neighborhood
San Diego, California
Exterior Noise Feasibility Study
VA Project No. 4941-014**

Dear Deborah:

Veneklasen Associates, Inc. (VA) has completed our review of the University of California San Diego (UCSD) Planning Study located in La Jolla, California. This report predicts the exterior noise level at the site using measurements and computer modeling. Using this information, interior noise levels were calculated based on the exterior noise exposure and assumed exterior wall and roof constructions typical within the region. From this, the exterior façade design as it relates to glazing requirements was determined. This report represents the results of our findings.

1.0 INTRODUCTION

This study was conducted to determine the impact of the exterior noise sources on the proposed Pepper Canyon Neighborhood located at UCSD in La Jolla, California. VA's scope of work included calculating the exterior noise levels impacting the site and determining the method, if any, required to reduce the interior and exterior sound levels to meet the applicable code requirements of the State of California.

The project consists of a planning study being conducted for future student housing in the Pepper Canyon Neighborhood of UCSD. The latest concept documents show several student housing buildings will be constructed with an approximate height of 6 to 13 stories. The major noise sources surrounding the site include the I-5 freeway to the east, Gilman Drive to the south, and the future MTS Blue Line trolley which will be routed near the site.

2.0 NOISE CRITERIA

CNEL (Community Noise Equivalent Level) is the 24-hour equivalent (average) sound pressure level in which the evening (7 pm – 10 pm) and nighttime (10 pm – 7 am) noise is weighted by adding 5 and 10 dB, respectively, to the hourly level. Since this is a 24-hour metric, short-duration noise events (truck pass-by's, buses, trains, etc.) are not as prominent in the analysis.

Leq (equivalent continuous sound level) is defined as the steady sound pressure level which, over a given period of time, has the same total energy as the actual fluctuating noise.

2.1 Interior Noise Levels – Residential

The State of California Building Code (Section 1207, "Sound Transmission") states that interior CNEL values for residential land uses are not to exceed 45 CNEL in any habitable room.

If the windows must be closed to meet an interior level of 45 CNEL, then a mechanical ventilating system or other means of natural ventilation shall be provided.

3.0 EXTERIOR NOISE ENVIRONMENT

3.1 Noise Measurements

Traffic on the I-5 freeway, Gilman Drive, and the future MTS Blue Line trolley are the primary sources of noise which will affect the future site. VA visited the site on Tuesday, July 17, 2018 and placed meters on the roof of existing buildings to capture the hourly sound levels on the site for a 24-hour period. VA also made short-term noise measurements throughout the proposed site. Table 1 and Figure 1 show the location and summary of the noise measurements. The measurements of the Metro Blue Line trolley were performed in San Ysidro, which are not shown on the map.

Note that the lower levels from the I-5 freeway at location S1 as compared to location L1 are due to shielding from the ground. Location S1 was measured on-grade at head height without direct line-of-sight to the freeway, while location L1 was measured at least 40 feet above grade with direct sight lines to the freeway.

Table 1 – Measured Sound Levels

Location	Primary Source	Measured Level, Leq dBA	Measured CNEL	Predicted CNEL
L1	I-5 Freeway	71	76	-
L2	Russell Lane	57	61	-
S1	Gilman Drive	63	-	65
S2	I-5 Freeway	66	-	72
S3	Voigt Drive	61	-	63
S4 (Not shown)	Metro Blue Line	68	-	72

Figure 1 – Aerial View of Project Site Showing Measurement Locations



3.2 Overall Exterior Exposure

Based on the measurements, VA calculated the noise level at different locations across the project site. To simplify the presentation of the exterior noise levels, VA has indicated the CNEL as it relates to the distance from the center line for each major noise source. The predicted sound levels at each distance is listed in Table 2.

Table 2 – Exterior Noise Levels

Source	Distance from Center Line, ft.	Exterior Noise Level, CNEL
I-5 Freeway	220	78
	320	77
	420	76
	520	75
	620	74
	720	73
	820	73
	920	72
	1020	72
	1120	71
Gilman Drive	45	68
	65	66
	85	65
MTS Blue Line Trolley	45	72
	65	70
	85	69

4.0 INTERIOR NOISE CALCULATIONS

4.1 Exterior Facade Construction

For the purpose of the calculations, VA has assumed the exterior wall for the future project will be consistent with the region, including a stucco finish over gypsum sheathing on steel studs with a single layer of gypsum board on the interior and batt insulation in the cavity.

VA’s calculations included the roof path, but this was insignificant in the interior noise level calculated.

4.2 Interior Average Noise Level (CNEL) – Residential

VA calculated the interior level within the student housing units given the measured noise environment and the exterior facade construction described above. Calculations were based on the following assumptions:

- Room size of 11 feet wide by 16 feet long for double occupancy. This is consistent with VA’s experience on other student housing projects.
- Two independent conditions:
 1. Corner exposure where two facades are exposed to the noise source.
 2. Single exposure where one façade is exposed to the noise source
- Glazing coverage of 35 square feet in each façade, via 5-foot by 7-foot window configurations with operable or fixed components.

Table 3 shows the predicted interior CNEL noise levels based on the windows and doors with STC ratings as shown.

Note that the STC requirements indicated in Table 3 refer to any student housing units which are directly exposed to the roadways and train line extension. It also assumes full 180-degree exposure to the noise source. Where the exposure is less than 180 degrees, a reduction in sound level occurs.

The distance required from the source to achieve a noise level of less than 60 CNEL has also been included for reference. At this distance, sound-rated assemblies are not required. As can be seen by the large distance to achieve 60 CNEL from the I-5 Freeway, sound-rated assemblies are likely to be required for any student housing units with direct exposure to the freeway.

Table 3 – Calculated Interior CNEL Noise Levels with Direct Exposure to Roadways

Source	Distance from Center Line, ft.	Exterior Noise Level, CNEL	Corner Exposure Window Rating	Single Exposure Window Rating	Interior Noise Level, CNEL
I-5 Freeway	220	78	STC 39	STC 36	< 45
	320	77	STC 37	STC 34	
	420	76	STC 36	STC 33	
	520	75	STC 35	STC 31	
	620	74	STC 34	STC 31	
	720	73	STC 33	STC 31	
	820	73	STC 32	STC 30	
	920	72	STC 32	STC 30	
	1020	72	STC 31	STC 30	
	1120	71	STC 31	STC 30	
	15520	< 60	No STC requirement. Windows can be used as natural ventilation.		
Gilman Drive	45	68	STC 32	STC 30	< 45
	65	66	STC 31	STC 30	
	85	65	STC 30	STC 30	
	285	< 60	No STC requirement. Windows can be used as natural ventilation.		
MTS Blue Line Trolley	45	72	STC 33	STC 31	< 45
	65	70	STC 31	STC 30	
	85	69	STC 30	STC 30	
	645	< 60	No STC requirement. Windows can be used as natural ventilation.		

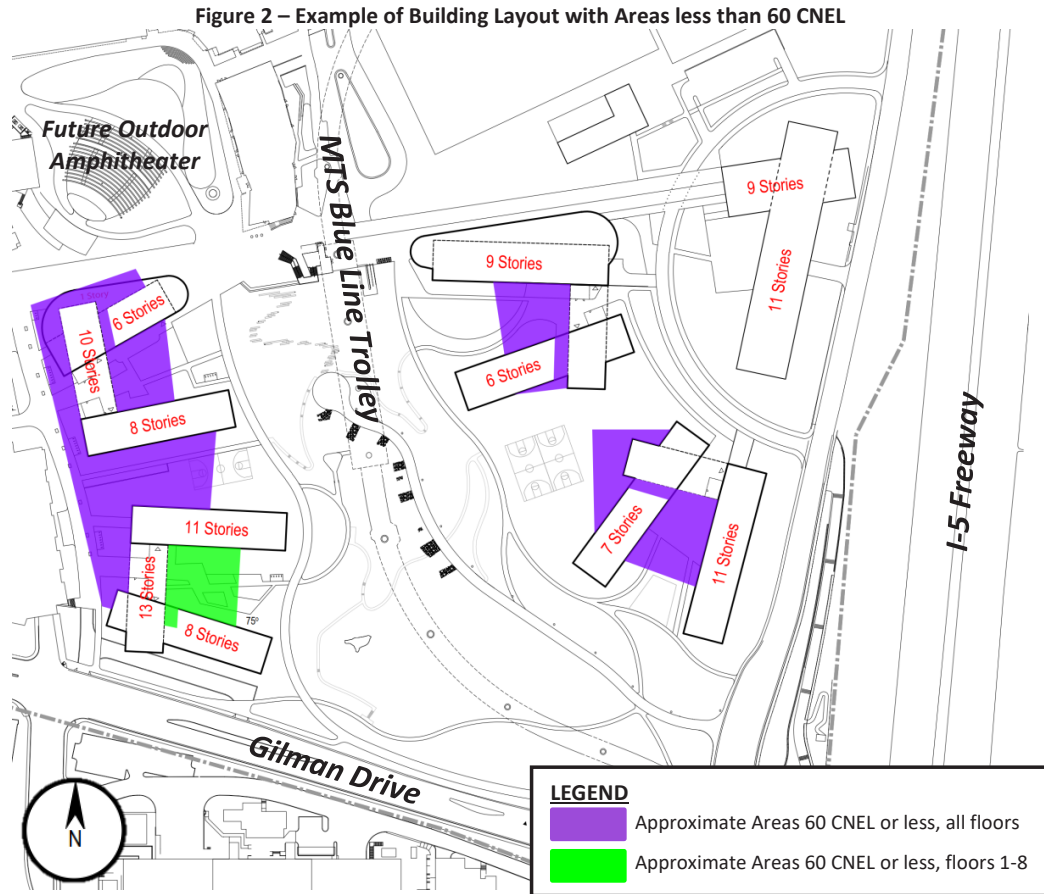
4.3 Building Layout and Shielding

As previously noted, where noise levels are 60 CNEL or less, sound-rated assemblies are not required. Where this occurs, windows can be used as natural ventilation, removing the need for a mechanical system.

The primary way to achieve this is through building layout and shielding. Where buildings are tall enough such that they remove the line of sight between the primary noise sources and other buildings on the project site, the noise levels will be significantly reduced at those buildings. In these instances, the buildings with direct exposure to the noise sources act as a barrier. Likewise, in areas where residential units do not have full exposure from the noise source, another reduction in the exterior noise level can occur.

An example of this scenario can be seen in Figure 2. Areas where the noise levels are anticipated be less than 60 CNEL due to both distance from the noise sources and building shielding have been highlighted per the legend.

Note that Figure 2 is only used as an example and that the final building layout can vary from what is shown.



4.4 Future Outdoor Amphitheater

It is understood that a future outdoor amphitheater is planned to the north of the project site. The amphitheater will include amplified events. Further information is unknown at this time.

Although there is limited information known about the amphitheater, there are several design strategies that can be incorporated to limit the noise impacts to the student housing project:

- Loudspeakers used for the amphitheater should be facing away from the student housing project. Current site plans reflect this configuration, which is acoustically preferred.
- Direct line-of-sight from the student housing to the stage of the amphitheater should be avoided. This can typically be achieved by incorporating a proscenium at the stage location.
- Provide a curfew for any events at the amphitheater. For example, a 10pm curfew may be appropriate since it is when nighttime noise levels within noise ordinances are enforced.

4.5 Mechanical Ventilation – Residential

Where the windows and doors must be kept closed to meet the noise requirements, such as those shown in Table 3 where the noise level exceeds 60 CNEL, mechanical or other means of ventilation may be required for those units. The ventilation system must not compromise the sound insulation capability of the exterior facade assembly.

Trickle vents are an option for passive ventilation in areas where exterior level exceeds 60 CNEL, assuming they provide enough airflow to meet the building code requirements. The trickle vents should include published sound insulation properties which ensure they do not limit the performance of the façade. Certain models can be used with sound-rated assemblies up to STC 39 without influencing the interior noise level. An example of this is the Renson SONOVENT®.

5.0 SUMMARY

The following summarizes the acoustical findings related to the noise criteria as described in this report.

- Exterior wall assembly as described in Section 4.1 has been utilized within the predictive calculations for interior noise.
- The roof assembly was included in our calculations and but is anticipated that it will not be a significant path of sound per typical roof constructions.
- The predicted minimum STC ratings as shown in Table 3 are anticipated to be required to meet the building code requirements per the State of California for the UCSD Pepper Canyon Neighborhood future student housing. Note that all STC ratings can be achieved with an operable or fixed assembly.
- Strategic building layout and shielding can be utilized to create areas where the exterior noise levels will be 60 CNEL or less, thus avoiding the need for mechanical or passive ventilation. Operable windows would be able to be used as the natural ventilation a general example of this can be seen in Figure 2.
- Where the windows must be kept closed to meet the noise requirements, residential mechanical ventilation, or other means of natural ventilation, may be required for all units. Trickle vents can be considered for use as passive ventilation provided they include sound insulation properties to maintain acoustical performance of the exterior façade.
- The outdoor amphitheater to the north of the project should incorporate appropriate design elements such that it limits the noise disturbances to the student housing.
- A site-specific acoustical noise study should be completed once design is in progress for the future student housing to accurately predict the required STC ratings required for the project and to precisely define areas 60 CNEL or less.

Various noise mitigation methods may be utilized to satisfy the noise criteria described in this report. Alteration of mitigation methods that deviate from requirements should be reviewed by the acoustical consultant.

If you have any questions or comments regarding this report, please do not hesitate to contact us.

Sincerely,
Veneklasen Associates, Inc.



Chris Kezon
Associate

www.veneklasen.com

FINAL REPORT



PLANNING LEVEL AIR QUALITY REVIEW FOR THE PEPPER CANYON NEIGHBORHOOD AT USCD

LA JOLLA, CA

RWDI #1804093

November 29, 2018

SUBMITTED TO

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1 INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by Harley Ellis Deveraux (HED) to conduct an air quality assessment for the proposed Pepper Canyon Neighborhood student housing for the University of California San Diego (UCSD) in La Jolla, California. This study does not consider noise impacts.

This study focuses on air quality impacts from air pollution emissions at the nearby I-5 freeway that may affect operable windows at student housing buildings close to the freeway. The university desires to use natural ventilation at the buildings to take advantage of the mild climate at the site. Natural ventilation would potentially increase pollution exposures to the building occupants.

Our feedback is qualitative and is based on:

- An architectural concept for the UCSD Pepper Canyon Neighborhood, received on November 14, 2018;
- A review of the long-term meteorological data from four nearby weather stations in the area (San Diego International Airport, Montgomery Field, Miramar Marine Corps Air Station and McClellan Palomar Airport);
- Screening-level numerical exhaust dispersion calculations for the traffic exhausts; and,
- A literature review of other research on air quality effects within close vicinities of major highways.

2 PROPOSED DEVELOPMENT

Image 1 below shows the existing Pepper Canyon area with I-5 to the east. The portion of Gilman Drive on the east side of the area will lie between I-5 and the proposed housing.

Image 2 shows the current concept for the proposed Pepper Canyon Neighborhood. The current concept shows two towers near Gilman Drive, one within 220 ft of the nearest traffic lane of I-5, oriented roughly parallel to I-5 in the north-south direction. There will be other buildings to the west of these two towers.

The current plan is to have two building heights close to I-5 that are 11 stories, but the northern-most building may have a 15 ft floor-to-floor height, higher than most residential buildings. The north-south length of the buildings closest to I-5 are approximately 400 ft for the northern building.

The buildings will use natural ventilation for all floors and buildings to take advantage of the mild climate. The air quality assessment assumed that all windows will be open and that the windows will be the primary potential impact locations (receptors) for air pollutants.

There will be trees between the freeway and the buildings. The I-5 terrain elevation is about 20 ft lower than Gilman Drive and 30 ft below the base of the buildings, though the terrain and trees will not significantly affect air quality dispersion in this area.

UCSD PEPPER CANYON NEIGHBORHOOD

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I-5 has four lanes of traffic for each direction. No detailed traffic data for this portion of I-5 were found, but another detailed study for the Pasadena/El Monte area was found that included traffic counts for many sections of major four and five lane freeways¹.

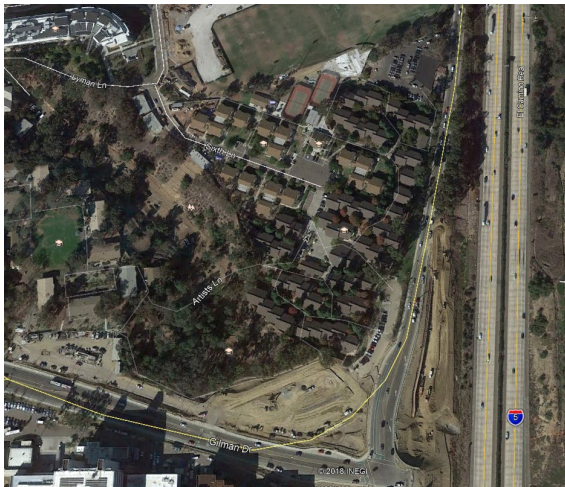


Image 1. View of existing Pepper Canyon and I-5 Freeway. (Google Maps)

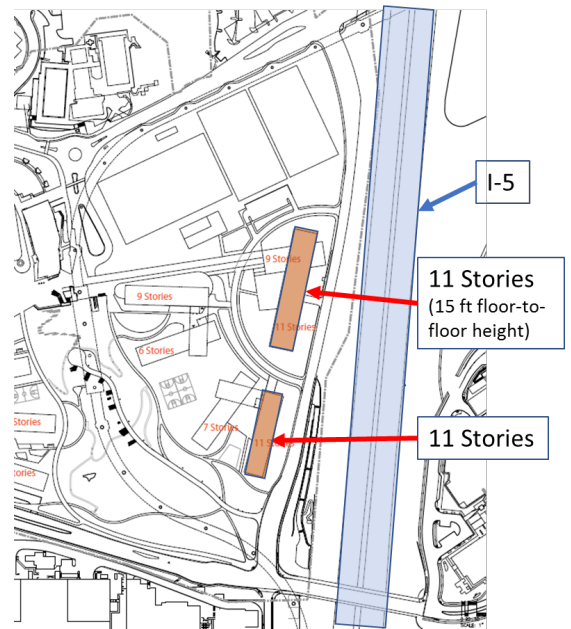


Image 2. Concept view of Pepper Canyon Neighborhood. (HED)

¹ SR 710 North Study, Air Quality Assessment Report, Volumes I and II, Prepared for Caltrans and Metro LA, January 2015.

UCSD PEPPER CANYON NEIGHBORHOOD

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WIND CLIMATE

RWDI reviewed wind data for the northern San Diego and La Jolla metropolitan area to estimate the wind climate at the site. Four stations were found to be of interest: San Diego International Airport, Montgomery Field, Miramar Marine Corps Air Station, and McClellan Palomar Airport.

Palomar has a similar distance from the Pacific Ocean as the UCSD Pepper Canyon area, but the terrain between the Palomar station and the ocean is more gradual and open compared to the terrain at UCSD. For example, there is no large cliff at the ocean near Palomar as there is at UCSD. Miramar and Montgomery are closer to UCSD but farther inland. The San Diego airport is close to the ocean but is also influenced by San Diego Bay to its south. Based on the data and terrain, Miramar may be the most representative station.

Wind "roses" are shown in Image 3 for all four stations that show the frequency of winds from various wind directions. In general, prevailing winds are from the west for most hours of the year. There may be winds from the east for 5 to 10 percent of the time. The prevailing wind direction will tend to carry pollutants from I-5 away from Pepper Canyon, which is highly beneficial.

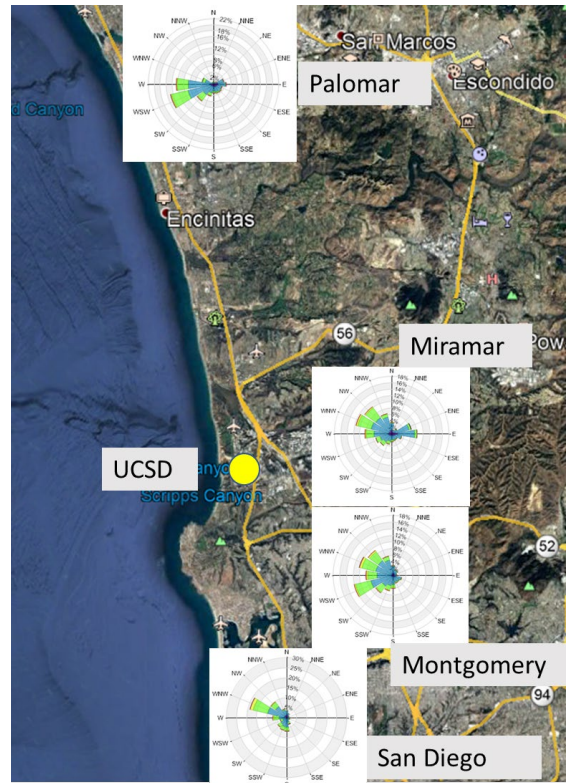


Image 3. Wind roses for four meteorological stations near UCSD



3 EXHAUST DISPERSION ANALYSIS

4.1 Regulated Air Pollutants Emitted From I-5 Freeway.

The primary focus of this report is the effects of emissions from automobiles and trucks on I-5 at the proposed student housing at Pepper Canyon. Automobiles and trucks emit a variety of air pollutants. Of main interest are several regulated air pollutants that are directly emitted by vehicles: carbon monoxide (CO), nitrogen oxides partially converted to nitrogen dioxide (NO₂), and particulate matter below 2.5 microns in size (PM_{2.5}). Ozone was not considered because it is not directly emitted from vehicles, and ozone concentrations would not vary significantly over the campus.

There are two possible approaches to determine the concentrations of these regulated pollutants at the proposed student housing: modeling and monitoring. Both methods are discussed here.

Modeling of air pollutant effects for the regulated air pollutants was conducted for another RWDI study in Southern California. After adjusting for the expected traffic levels at I-5 for the UCSD site, it was determined that concentrations of CO, PM_{2.5}, and NO₂ are expected to meet their respective ambient air concentration limits set by EPA and the State of California. This result is supported by

field data collected at a busy section of I-710 near Long Beach conducted by the South Coast Air Quality Management District (SCAQMD)² in 2012. The I-710 freeway at this location had similar traffic levels as I-5, with four lanes each way. The SCAQMD measurements indicated that for CO, NO₂, and PM_{2.5} the measured levels would also meet their respective EPA standards close to the freeway.

The modeling and SCAQMD measurements together indicate that the regulated air pollutants would not likely pose a health hazard for the proposed student housing at UCSD.

4.2 Non-Regulated Air Pollutants Emitted From I-5 Freeway.

According to the SCAQMD study², there are two non-regulated classes of air pollutants that could affect people living close to major highways: Ultrafine Particulates (UFP) and Black Carbon (BC). UFP refers to particles less than 0.1 micron in size, which is a subset of PM_{2.5}. UFP can reach deep within lungs and can pass directly into the bloodstream. Black carbon refers to carbon based

² Ambient Concentrations of Criteria and Air Toxic Pollutants in Close Proximity to a Freeway with Heavy-Duty Diesel Traffic, Final Report, South Coast Air Quality Management District, 2012.

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soot particles rising primarily from diesel engines and is an indicator of diesel particulates.

The SCAQMD study found elevated concentration levels of UFP and BC at 80 m (250 ft) of the I-710 freeway, compared to background levels away from the freeway. The elevated concentrations could extend beyond 80 m, but only two measurement distances were used in the study, 15 m and 80 m, with a local background much farther away. The SCAQMD study concluded that the UFP and BC elevated concentrations were from highway traffic.

The SCAQMD study quoted other epidemiological studies that found increased respiratory illnesses and other health effects for persons close to major roads. It is suggested by SCAQMD that the UFP and BC concentrations may be one of the causes.

UFP and BC concentrations are not regulated, meaning that no acceptable concentrations have been determined and that UFP and BC concentrations are not subject to regulatory limits. In fact, emissions rates from traffic are also difficult to determine.

Closely related to BC are diesel particulates, which the State of California has determined is a carcinogen. However, restrictions on traffic sources of diesel particulates have not been enacted other than installing diesel particulate filters for diesel engines.

Based on the SCAQMD study and other similar studies on air pollutants and health effects near major roadways, there is the possibility that adverse health effects could occur from I-5 traffic, despite meeting all current regulatory air pollution concentration limits. The design feedback given in the next section is designed to reduce the effects of the non-regulated pollutants, by reducing the

building-induced reversed (backwards) air flow from I-5 toward the buildings during prevailing winds from the west.

4 DESIGN FEEDBACK

The current plan is to have one 11-story tower approximately 220 ft west of I-5, with a floor-to-floor height of 15 ft. Another 11-story building will be located to the south of this tower, but with a lower floor-to-floor height and a larger distance from I-5. The 220 ft distance is approximately equal to the 80 m distance in the SCAQMD study. The UFP and BC concentrations at 80 m from the freeway were elevated above background, but the concentrations were significantly lower than the 15 m (50 ft) measurement distance. Therefore, the current plan is favorable in specifying a reasonable distance from I-5 for winds from the east.

Winds from the west can be an issue despite the fact that I-5 is to the east of the residential buildings. Wind interacting with building structures can create complex wake wind patterns. There is often a reverse wind flow immediately downwind of a structure in the wake of the building. The reverse wind flow could carry pollutants from I-5 back towards the student housing buildings during prevailing winds from the west, thus being detrimental to overall air quality for the buildings nearest to I-5.

Therefore, the design feedback given below is aimed toward reducing the size of the reverse flow region to avoid the reverse flow reaching I-5 and to avoid receiving concentrations of the unregulated pollutants described in Section 4.

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The size of the reverse flow region is dependent on the building height and the north-south width or length of the building.

Table 1 shows the recommended maximum building length in the north-south direction for several building heights with a 12 ft floor-to-floor height, and a distance of 220 ft from I-5. As the building height increases, the wake size increases, and the recommended maximum building length decreases.

Table 2 is similar to Table 1 with a floor-to-floor height of 15 ft instead of 12 ft, and with a distance of 220 ft from I-5. Tables 1 and 2 only apply to a separation distance from I-5 of 220 ft. Buildings farther away from I-5 would not have significant wakes reaching I-5, so no minimum building sizes are recommended for most of the development buildings, only those close to I-5.

Based on the results shown in Table 2, the northern most 11-story tower on the east side of the site could be 11 stories and a length of 400 ft and still have adequate air quality from I-5 (see highlighted table entry). This is approximately equal to the currently planned dimensions, so the currently planned dimensions are acceptable in terms of air quality from I-5. The other 11-story building to the south close to I-5 would also be acceptable.

Table 1. Maximum Building Lengths in the North-South Direction for Various Building Heights (Distance from I-5 = 220 ft; Floor-to-Floor Height = 12 ft).

Distance from I-5 = 220 ft Floor-to-Floor Height = 12 ft	
Building Height (Stories)	Maximum Recommended Building Length/Width in North-South Direction (ft)
14	385
13	445
12	520
11	620
10	750
9	910



Table 2. Maximum Building Lengths in the North-South Direction for Various Building Heights (Distance from I-5 = 220 ft; **Floor-to-Floor Height = 15 ft**).

Distance from I-5 = 220 ft Floor-to-Floor Height = 15 ft	
Building Height (Stories)	Maximum Recommended Building Length/Width in North-South Direction (ft)
14	245
13	285
12	335
11	400
10	480
9	595

5 CONCLUSIONS

This study discusses potential air quality impacts from regulated and unregulated air pollutants emitted from traffic on I-5, and the potential impacts on nearby student housing buildings that will use natural ventilation. Noise impacts are not addressed in this report.

The prevailing winds at the site are from the west and are favorable for reducing impacts from I-5. To avoid buildings wind wake zones with reversed wind directions from reaching I-5 and bringing back air pollutants from I-5, maximum building lengths are provided for several building heights and floor-to-floor ratios in Tables 1 and 2. These recommendations apply only to buildings close to Gilman Drive and at a distance of 220 ft from I-5.

Based on the results shown in Table 2, the northern-most 11-story tower with a 15 ft floor-to-floor height and 220 feet from I-5, as currently planned, would be acceptable. If this building height is increased, it is recommended to move the building farther away from I-5. The height of the 11-story building to the south is also acceptable in terms of air quality from I-5.

Based on these results, the use of natural ventilation at the student housing buildings would be acceptable in terms of air pollutant emissions from the I-5 freeway, provided that the building heights, lengths, and distances from I-5 are as described and recommended in the report.

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