

UC San Diego

Voigt Electric Mobility Hub



2022 USDOT RAISE Grant Application

Total Project Costs: **\$65,012,000**

Local Match: **\$37,300,000**

Previously Expended UC San Diego Funds: **\$2,712,000**

Requested RAISE Funds: **\$25,000,000**

Submitted by:

University of California San Diego

UEI#: UYTTZT6G9DT1

April 14, 2022

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EXECUTIVE SUMMARY



SAFETY (\$0.19M)

Improves safety for pedestrians, cyclists and motorists by installing a separated cycle track and a new signalized intersection and crosswalk.



ENVIRONMENTAL SUSTAINABILITY (\$2.35M)

Electrifies last-mile transit connections with 25 electric bus charging stations. Adds 400 level 2 public charging stations.



QUALITY OF LIFE (\$2.7M)

Enables redevelopment of surface parking as housing and open spaces; enables public access to campus and coastal resources.



IMPROVES MOBILITY AND COMMUNITY CONNECTIVITY (\$52.9M)

Installs two ADA bus stops, creates three shared micro-mobility hubs; increases access to light-rail stations; provides electric car sharing; adds secure parking for 200 bikes.



ECONOMIC COMPETITIVENESS (\$135.1M)

Supports redevelopment of 10.2 acres of surface parking into educational, research, healthcare and housing uses.



STATE OF GOOD REPAIR (\$0.8M)

Creates a permanent training and operations center for essential transit workers that are currently housed in a temporary trailer on a site that will be redeveloped.



PARTNERSHIPS AND COLLABORATION

Continues close collaboration with Caltrans, San Diego Association of Governments (SANDAG), San Diego Gas & Electric, and the Metropolitan Transit System (MTS).



INNOVATION (\$15.8M)

Adaptive Load Management allows four times the chargers with same peak load; V2G uses bus batteries for emergency power.



\$1 : \$4.09
COST : BENEFIT



100%
LAND OWNED



60%
LOCAL MATCH



95%
CONSTRUCTION DOCS
BY GRANT AWARD

CEQA

COMPLETED

NEPA

CATEGORICAL
EXCLUSION
ANTICIPATED

Figure 1: Overall Area Map





1. PROJECT DESCRIPTION

THE VOIGT ELECTRIC MOBILITY HUB (VEMH) will electrify Triton Transit's last-mile connections to regional Light Rail Transit (LRT), free up valuable land by consolidating parking supply, and more than double UC San Diego's capacity for EV charging.

The VEMH project sits on Voigt Drive, roughly equidistant between two newly-opened stations of the UC San Diego Blue Line Trolley. The Trolley provides a one-seat ride from the US-Mexico border to UC San Diego – one of the world's great public research universities and academic medical centers (Figure 1). When the VEMH project is completed in 2024, transit riders and motorists, many from underserved, overburdened and disadvantaged communities will benefit from safer and cleaner last-mile transportation options and more secure parking facility equipped with 400 EV charging stations (Figure 2, Figure 3).

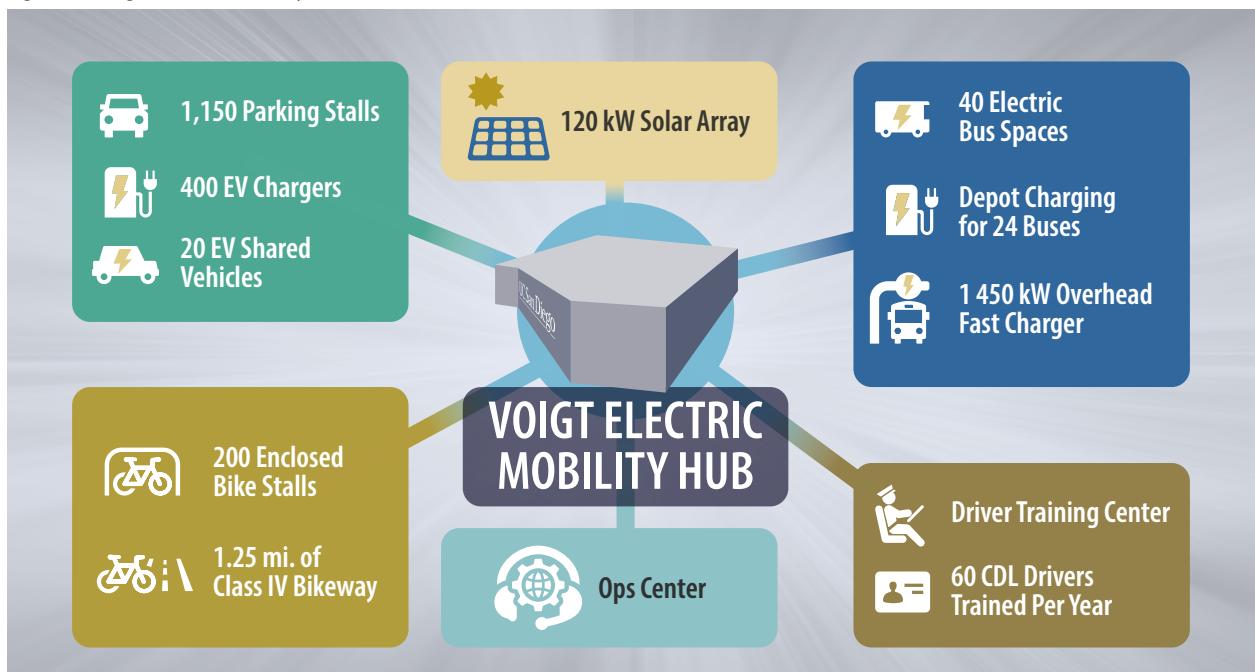
The project includes:

- ▶ **A new "bus barn"** with depot charging for 24 electric transit buses at a time, storage for an additional 16 transit buses, and charging for 30 light duty microtransit and paratransit vehicles
- ▶ **Shared-use 450 kW pantograph charging** for public and private transit and freight
- ▶ **Active transportation and electric micromobility facilities** including 200 secured bike parking spaces and protected Class IV bikeways
- ▶ **Paid, shared-use parking** to support LRT-riders, campus commuters, affordable housing residents and event attendees
- ▶ **On-site solar power generation**
- ▶ **A commercial driver training facility** and transit operations base
- ▶ **400 Level II EV charging stalls** with leading-edge adaptive load management

Figure 2: Project Location and Elements



Figure 3: Voigt Electric Mobility Hub Elements



► **Improved last-mile transit and active transportation connections** that make LRT viable for greater number of commuters and reduces impacts on the underserved, overburdened, and disadvantaged communities south of the campus along the I-5 corridor

► **Investments in an area of Persistent Poverty** with an EJ Screen Demographic Index in the 79th percentile

In early 2020, the VEMH project was within 30 days of breaking ground, when the onset of the SARS-CoV-2 pandemic disrupted UC San Diego's capital program.

The \$25 million funding we are now requesting from US DOT will allow the university to proceed with this critical investment in green infrastructure.

At the core of the project is Triton Transit's Transit Operations Center, a 40-vehicle bus yard and barn, along with administrative space, a commercial driver training facility, and driver comfort facilities. The bus barn will host 150 kW depot chargers for 24 zero-emission transit buses in a secure, weather-protected environment (Figure 4) and features an on-street, shared-use 450 kW inverted pantograph fast charger for campus, regional, and private transit and delivery vehicles (Figure 5).

The facility also includes weather-protected charging and parking for 22 electric carts that support microtransit and door-to-door ADA transportation among the more than 630 buildings on UC San Diego's 1,158-

Figure 4: Example of overnight depot charging



Figure 5: Example of overhead fast charging

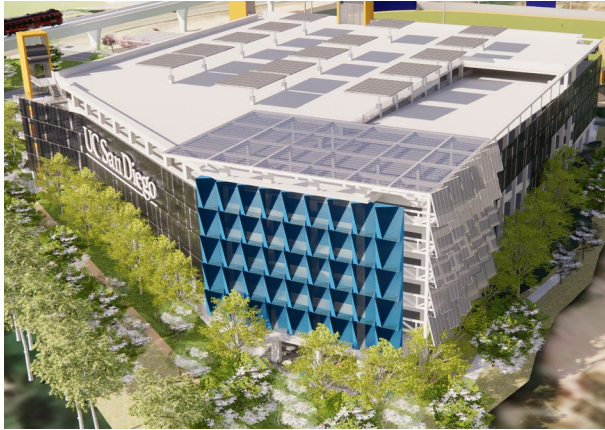


acre campus. This investment in electric transit infrastructure will accelerate the electrification of Triton Transit vehicles, with the full fleet of transit and operations support vehicles to be electrified by 2030.

Triton Transit operates eight fixed routes that are fare-free and open to the public, along with on-demand and paratransit services. With the campus' large size and varying topography, these are essential resources to ensure that the campus is available to all, regardless of age, income, or ability.

The university's driver training and safety program graduates approximately 60 new commercial drivers each year, the vast majority of whom are BIPOC. The program provides one of the best-paying student jobs on campus along with a social and

Figure 6: Roof-top and Architectural Photovoltaic Veil



professional community that supports student well-being and academic success.

The VEMH project leverages a sloped site to provide daylight space and locate the Transit and Transportation Demand Management administration and training center on-grade beneath the bus barn. This 14,216 gross square feet facility provides a permanent home for the more than 200 student and career drivers and administrative staff that provide critical mobility services to UC San Diego visitors and patients, students, faculty, and staff. The team currently operates from a temporary trailer.

The VEMH facility will generate electricity through roof-top panels and innovative architectural solar panels built into the side cladding of the structure (Figure 6). This energy will be supplemented with 100% renewable energy that UC San Diego procures as a Direct Access customer with the local utility, San Diego Gas & Electric. The 400 Level II charging ports feature adjustable load management and will support publicly accessible EV carsharing and shared-use electric fleet vehicles in addition to commuter and residential charging. The parking will support commuters (nearly 25% of whom carpool), campus residents, and visitors attending campus sports, cultural events, and performances at the nearby

Epstein Family Amphitheater and Prebys Music Center, Price Center, and Geisel Library.

On weekends the garage will serve as a park and ride option for southbound Long Distance Corridor travelers on I-5 and I-805, diverting private automobile trips to LRT and reducing air pollution and traffic congestion impacts for historically underserved, overburdened, and disadvantaged communities in south San Diego.

On Voigt Drive, the project will add 1.25 miles of Class IV protected cycletrack spanning I-5 and linking the two campus LRT stations, three medical centers (UC San Diego, Scripps, and VA San Diego), the Canyon View Aquatic Center, and the Preuss School, UC San Diego's on-campus charter school serving high-potential students from low-income families and underserved, overburdened and disadvantaged communities. The VEMH will feature charging for electric bike and scooter sharing, digital pedestrian wayfinding, and two 100-stall secure bicycle parking facilities, one at the VEMH and one at the UC San Diego La Jolla Health Campus LRT station (Health Campus Station). The two bike Secure Parking Areas (SPAs) will have electronically controlled access and security cameras to provide the highest level of security for micromobility users and their vehicles.

The VEMH, through both new connectivity and decarbonizing existing transportation options, will help to fulfill the potential of the new UC San Diego Blue Line Trolley by helping ensure that the resources of a globally-recognized public university are accessible to residents of the entire region, regardless of age, income or physical ability.

PROJECT CONTEXT

The VEMH is critical infrastructure to support UC San Diego's 2018 Long Range Development Plan (LRDP). Demand for a UC San Diego education has created unprecedented growth. As of fall 2021, the campus enrolled nearly 42,000 students representing an increase of nearly 10,000 students over the last five years. Guided by the LRDP, which was developed through

broad community input, the campus has embraced its urban identity and is densifying rapidly. The campus has opened new on-campus residences for more than 4,000 students in the last two years and are on pace to deliver residences for an additional 1,500 students each year for the next three years, all with rents 20% below market, unbundled parking, and bundled transit-passes.

Through a combination of increasingly sophisticated parking charges, incentives and support for alternative transportation, and a robust last-mile transit service provided by the largely student-operated Triton Transit, UC San Diego has increased the proportion of faculty and staff that uses alternatives to travel to campus from 36% to 55% in the last 20 s. Notably, there is no free parking on campus today. Parking charges and daily commuter choice are integral parts of the University's demand management programs (e.g., our award-winning Triton Commuter Club - see [Appendices](#)), which target carbon neutrality for all commuter travel and no more than 40% of employee trips in single occupancy vehicles by 2050. The campus is further diverting trips to the pedestrian mode or campus transit by investing in on-campus housing, bringing the combined drive alone rate for all populations to just 17%. Within the decade, UC San Diego will have the largest on-campus population of any US university.

To accommodate continued growth of the academic, research, healthcare, and residential programs, the LRDP envisions the campus' remaining surface parking lots being converted to higher and better uses that directly support the university's academic, research, and public service missions. In simple terms, it is unsustainable for the university to continue the surface-parking model. Similarly, the current Triton Transit bus yard is expected to be displaced by campus development within the next five years.

ENVIRONMENTAL COMMITMENTS

The University's environmental and climate goals call for carbon neutrality for scope one and two by 2025 and for scope three by 2050. The VEMH enables the conversion of the Triton Transit buses from Compressed Natural Gas to Battery-Electric Buses and more than doubles the number of publicly available EV chargers to 700 – accelerating the high adoption of EVs among University members. In compliance with CEQA, UC San Diego has analyzed the environmental effects it foresees associated with the implementation of the 2018 LRDP, including the VEMH, in an associated Environmental Impact Report (EIR), certified by the Regents in conjunction with approval of the 2018 LRDP.



EV CHARGING

UC San Diego hosts the largest employer-based but publicly accessible EV charging deployment in southern California and has negotiated deep discounts from EVs dealers for university affiliates. Campus research has shown that for every new charger on campus 7 commuters switch to EVs.

The 400 ports of the VEMC are expected to yield 2800 new EV commuters.

UC San Diego's commitment to public charging is highly impactful. Over 44,000 unique drivers have charged at UC San Diego in the past 5 years, more than half of whom live outside San Diego county. These Long Distance Corridor travelers make up a significant portion of network users.

Statement of Work



MOBILITY & SAFETY ELEMENTS

- Spin Hubs for shared e-bikes and scooters added at VEMH, Central Campus Station, and Health Campus Station
- New signalized intersection and crosswalk with audible pedestrian beacon connecting two new ADA bus stops
- 1.25 miles of Class IV protected cycletrack and signalized intersection with micromobility detection
- Two new 100-bike Secure Parking Areas (SPAs) with controlled access, security cameras, repair stations, and personal effects storage
- New fire access road providing secondary approach to the VEMH and Triton Ballpark
- Moment frame construction and glass-backed elevators to improve sightlines
- Pedestrian bridge and plaza eliminate conflicts with entering and departing vehicles



STRUCTURE

- Long span, cast-in-place, post-tensioned concrete structure
- Weather-protected depot charging for 24 electric transit buses and 30 microtransit, paratransit and operations support vehicles
- 14,000 gross square feet of administrative, operations, and training space
- 1,150 parking stalls, including 400 public level 2 charging stations



INNOVATIVE ELEMENTS

- Adaptive load management technology serves more customers by flattening peak loads and eliminating the need to move vehicles midday
- Bidirectional DC fast charging supports continued V2G research and bus battery use for building support during power events
- Parking sensors and guidance reduce circulation and emissions
- Artificial Intelligence-aided security camera system that identifies anomalous activity and alerts security personnel
- ATMS signal with real-time adaptive traffic control integrated with the City of San Diego signal network
- Interior LED lighting mesh network increases light levels when vehicular or pedestrian motion is detected



SUSTAINABILITY AND PLACEMAKING

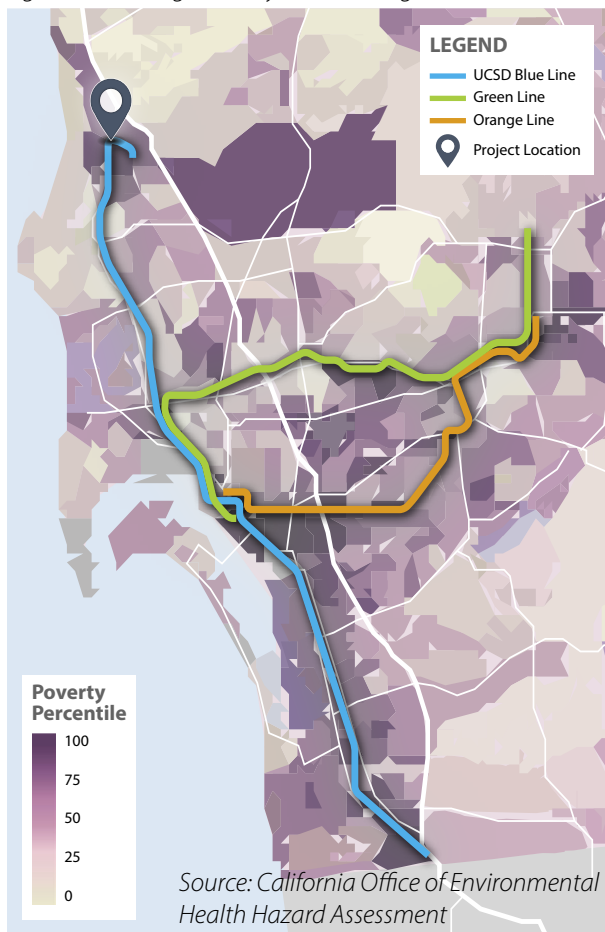
- Vegetated drainage basins to treat rooftop stormwater
- Perforated screens, static and kinetic panels, and campus branded signage
- Photovoltaic architectural cladding and rooftop solar
- Designed to GBCI Parksmart Gold certification criteria
- New pedestrian plaza and pre-function area between VEMC and Triton Ballpark
- Interactive digital wayfinding kiosks

2. GEOGRAPHY & DEMOGRAPHICS OF THE PROJECT SITE

The Project Site is located entirely within Census Tract 6073008305, which meets the definition of a USDOT Area of Persistent Poverty (see [Appendices](#)), but not a historically disadvantaged community. The State of California has determined that the number of people living below twice the poverty level is high, ranking this Census Tract in the 82nd percentile across California (see [Appendices](#)).

This designation as a Low-Income Community (Figure 7) qualifies the site as a CA Air Resources Board Priority Population for Investments which “is especially vulnerable to the impacts of climate change” (see [Appendices](#)). The population is 42% White, 40% Asian American, 11% Hispanic, 3% African American and 5% Other (see [Appendices](#)).

Figure 7: San Diego County Disadvantaged Communities



The Project site Demographic Index in EPA’s EJ Screen places the site in the 79th percentile. The Project site exceeds the USDOT objective to address the disproportionate negative environmental impacts of transportation on underserved, overburdened, or disadvantaged communities at the site itself, in addition to the substantial benefits to the underserved, overburdened and disadvantaged communities along the Light Rail Trolley and MTS service area who will benefit from more effective transit due to improved last-mile options and many overburdened communities in the I-5 corridor south of the project site, some rating as high as the 97th percentile in EJ Screen’s Demographic Index that will see reduced traffic, noise and particulate emissions as the project shifts travelers to LRT.

SPECIFIC PROJECT LOCATION

The UC San Diego Campus is located in the City of San Diego, adjacent to the communities of La Jolla and University City. The campus is composed of three distinct, but contiguous, geographical areas: the Scripps Institution of Oceanography, the West Campus, and the East Campus. The Project is located on the East Campus, adjacent to many of UC San Diego’s public service programs, including UC San Diego Health La Jolla and The Preuss School, a unique charter middle and high school serving more than 800 low-income and first-generation students. The East Campus is separated from the West Campus by the I-5 freeway. The 2.9-acre Project site is situated north of the Altman Clinical and Translational Research Institute (ACTRI) and Jacobs Medical Center, south of Voigt Drive, immediately east of I-5, and immediately west of the Triton Ballpark. The Project site is located immediately south of the new Mid-Coast Extension of the UC San Diego Blue Line Trolley (LRT).

3. GRANT FUNDS, SOURCES, AND USES OF PROJECT FUNDS

PROJECT COSTS

Table 1: Project Budget

	Previously Expended UC San Diego Funds (unapplied, ineligible match)	UC San Diego Funds	RAISE Grant Funds
PROJECT PLANNING			
Project Design - 50% CD	\$1,291,000	\$0	\$0
Project Design - 95% CD	\$0	\$300,000	\$0
CONSTRUCTION COSTS			
Office, Training, & Electric Bus Barn	\$0	\$0	\$9,070,000
400 EVSE Public Charging	\$0	\$0	\$2,150,000
Solar Veil	\$0	\$0	\$1,435,000
Shared-Use Parking Structure	\$0	\$30,312,000	\$11,860,000
ITS: Signal, Sensors, & Guidance	\$0	\$778,000	\$0
Two 100 Bike Secure Parking Areas (SPAs) & Cycletrack	\$0	\$0	\$585,000
Site & Infrastructure	\$0	\$5,810,000	\$0
<i>Sub Total</i>	<i>\$2,712,000</i>	<i>\$37,300,000</i>	<i>\$25,000,000</i>
<i>% Eligible Expenses</i>	<i>N/A</i>	<i>59.9%</i>	<i>40.1%</i>
Project Total			\$65,012,000

SOURCES OF FUNDS

A letter from Pierre Ouillet, Vice Chancellor and CFO, affirming the availability and commitment of the local match funding is included in the [Appendices](#).

4. MERIT CRITERIA

4A. SAFETY

In 2021 Chancellor Khosla directed the campus to prioritize pedestrians, reduce campus speed limits to 20 mph, and deepen investment in active transportation. The VEMH, located outside of the pedestrianized central campus but closer to it than existing surface parking lots, helps encourage travelers onto campus transit and active modes for the last mile, reducing traffic and making the pedestrian-focused campus possible.

Currently, there is a Class II bike lane between the Central Campus Station and Genesee Ave. It was observed that up to 100 bicyclists were traveling westbound along Voigt Drive during the AM peak hour and up to 100 bicyclists were traveling eastbound along Voigt Drive during the PM peak hour.

The VEMH project will enhance safety for cyclists, pedestrians and drivers by adding a Class IV separated cycle track on 1.25 miles of Voigt Drive, extending from Genesee Avenue to the Central Campus LRT station, using design elements that UC San Diego

Figure 8: Example of Existing Campus Cycle Track



has successfully applied on cycle tracks across campus (Figure 8, Figure 9).

The VEMH facility also provides both passive and active security measures that are not present at the parking and transit facilities being replaced, including security cameras, license plate readers, enhanced lighting, secure micromobility parking, and access-controlled parking for opening and closing shift transit workers. It will leverage UC San Diego's innovative Artificial Intelligence system to monitor security camera feeds from the facility for unusual or concerning behavior and trigger alerts to campus police when anomalies are detected.

The project will continue the campus investment in Advanced Traffic Management System (ATMS) technology and incorporating Cubic's SyncroGreen real-time adaptive traffic control in the new signal at the project entry. As part of the broader ATMS project, this signal will both adapt to traffic conditions and communicate with nearby campus and City traffic signals to optimize flow during peak periods. Video detection of micromobility users will ensure that they receive equal weight and are not required to activate signals (Figure 10).

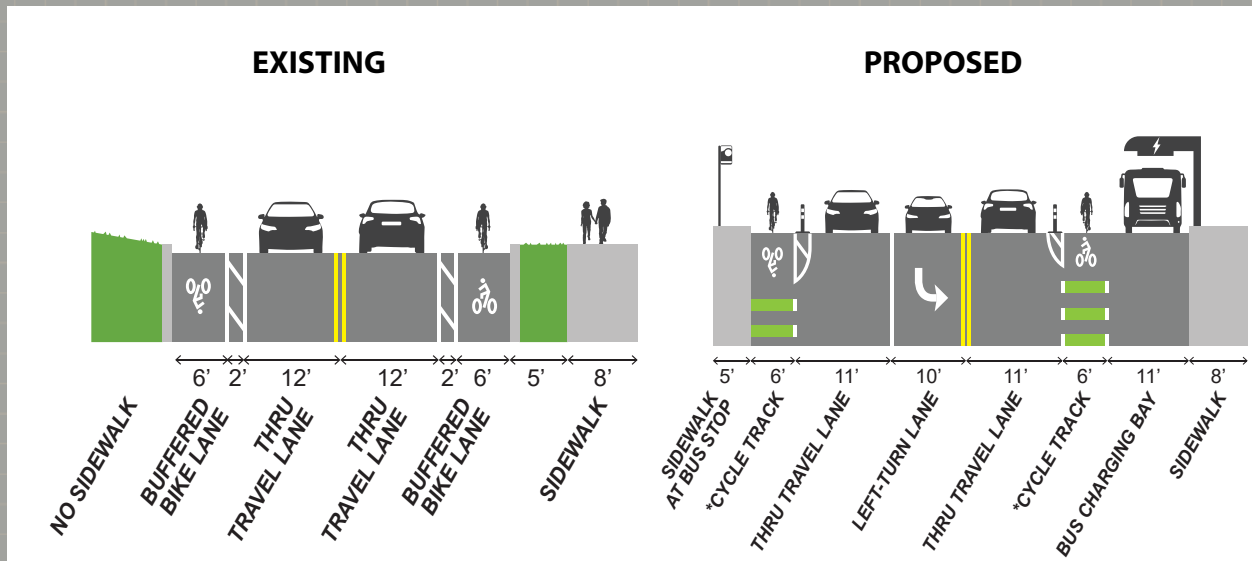
The project will concentrate parking a full half-mile closer to UC San Diego's campus police department and will serve as a primary parking location for both campus police and security personnel, providing a meaningful boost to personal safety and the security of property in the facility.

Emergency power at VEMH, including V2G power, will provide backup for life safety equipment, security, telecommunication, egress lighting, and all other safety and security monitoring systems.

VOIGT DRIVE IMPROVEMENTS

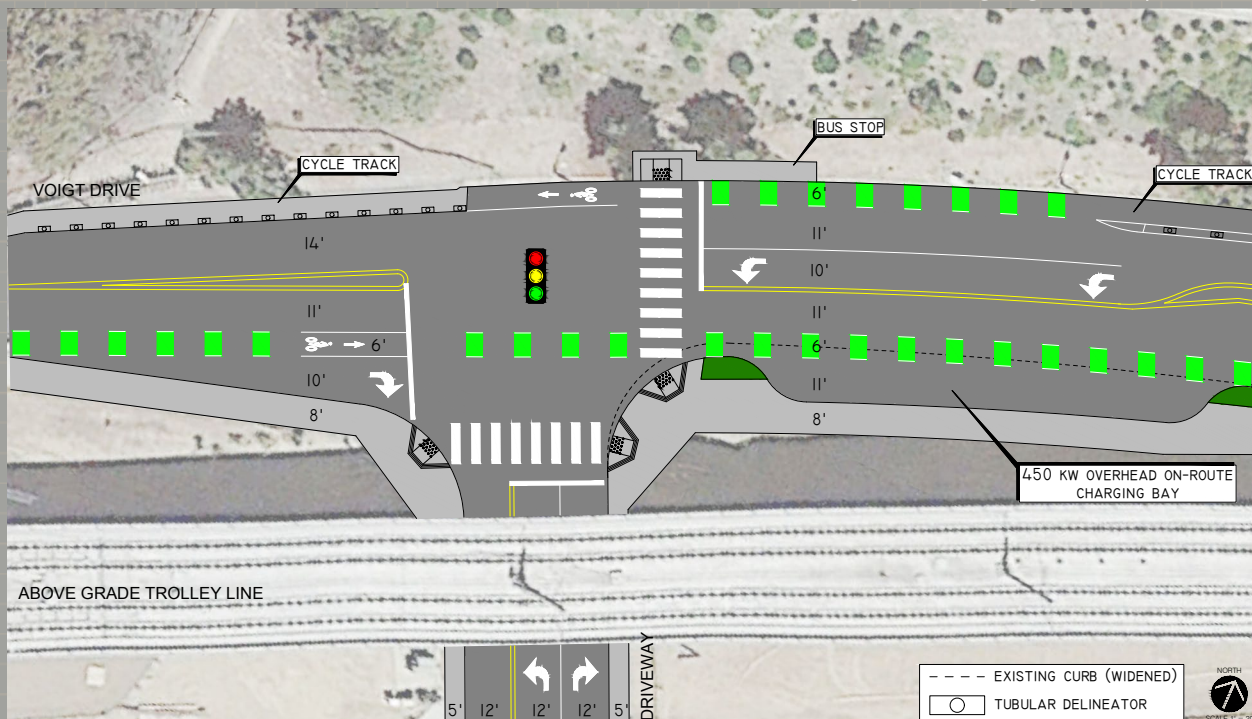
The Project upgrades Class II bike lanes to Class IV protected cycletracks, narrows lanes to reduce speeds, adds new bus stops, provides 450kW inverted pantograph charging.

Figure 9: Voigt Cross Section



The project adds a north-south crossing with audible beacon, connecting the VEMH to the new bus stop and Scripps hospital campus. A new adaptive signal allows safer turning movements.

Figure 10: Voigt Signal and Cycle Track



4B. ENVIRONMENTAL SUSTAINABILITY

The VEMH features a host of environmental sustainability improvements for the campus and adjacent communities and furthers the university's commitment to achieving net neutrality by 2025. These benefits flow in large part from the transition from vehicles with internal combustion engines to battery electric vehicles – both university-owned transit buses and privately-owned vehicles that convert to EVs due to the provision of 400 electric car charging stations.

As noted previously, the VEMH project also contains an expansion in bicycle facilities both in terms of both end-of-trip amenities and on-street improvements. Two bike SPAs with 100 secured bike parking stalls each as well as lockers for personal effects, and 1.25 miles of protected cycletrack are projected to generate an additional 275 daily bike trips.

In addition to providing electric mobility options, the VEMH also generates a significant amount of energy through solar panels on the roof and on the cladding of the structure. The 120 kW of electricity produced will support the campus's effort to decarbonize its operations by 2025.

Finally, while the conversion to EVs reduces the volume of pollutants in stormwater runoff, the consolidation of surface parking in a parking structure reduces the overall volume of runoff per parking stall and ensures that runoff is treated, yielding a triple benefit for stormwater quality.

The EPA's EJ Screen indicates that the Project site is significantly impacted, with an air toxics hazard index in the 78th percentile, traffic proximity in the 87th percentile, and wastewater discharge in the 95th percentile. These significant environmental concerns, paired with the Project site EJ Screen Demographic Index in the 79th percentile make the site a strong candidate for environmental justice investment. This specific investment, one that reduces air toxics associated with combustion, reduces VMT with last mile active transportation and transit connections, and reduces runoff by transitioning surface parking to structured parking, is uniquely responsive to the conditions at the site and the needs of the surrounding community.

4C. QUALITY OF LIFE

The VEMH is a modal interchange and investment in electrified and active transportation last-mile connections. It

removes barriers for individuals and communities by connecting to jobs and opportunity. By prioritizing connections to the UC San Diego Blue Line Trolley (Figure 11) and the underserved, overburdened and disadvantaged communities of south San Diego County and the border region, it proactively addresses racial equity and other disparities. Beyond providing last-mile

Figure 11: UC San Diego Blue Line Trolley Central Campus Station



Photo Credit: Althea Tien for The UC San Diego Guardian

Figure 12: Pepper Canyon West Housing and Open Space Preserve (to be built on existing surface parking)



connections that open opportunity for these communities, the VEMH will facilitate mode shift from private automobiles to LRT, reducing noise, particulate emissions, and other environmental impacts in the I-5 Corridor.

The VEMH fits within the broader context of UC San Diego's commitment to sustainable travel, which routinely receives SANDAG's "Diamond Award". The university's U-Pass program, the deeply discounted FaSt Pass (employee transit pass program), and the provision of fare-free public transit for all in the last mile combine to go beyond the common practice. Additionally, in facilitating the pedestrian-oriented, 20 mph campus with a network of free internal transit and Class IV bikeways, the VEMH will significantly enhance a low-income (81st percentile) and ethnically diverse (73rd percentile) community. Its inclusion of electric carsharing and shared electric micromobility provide the community with new mobility options beyond what is currently available. Further, its inclusion of 400 EV charging stations provides a community charging resource that is generally unavailable in the multifamily housing developments that dominate the University City neighborhood.

The VEMH consolidates campus parking resources, freeing underutilized land to enable, among other projects, two new on-campus housing developments immediately adjacent to the Central Campus LRT station. These developments will provide homes for more than 4,000 campus residents at rents 20-30% below market, with unbundled parking and provision of fare-free transit access for residents. This significantly reduces the combined transportation and housing cost burden for these new campus residents.

Reclaimed land is not only being dedicated to academic, residential, and research facilities. UC San Diego also invests heavily in the public realm, creating pockets of relief and natural resources to balance increasing density. Pepper Canyon Open Space Preserve is one such example and will replace half of parking area P406 at the corner of Gilman Drive and Pepper Canyon Drive, providing a new open space amenity for both the public and the more than 4,000 residents that will live in the Pepper Canyon neighborhood (Figure 12).

Figure 13: Current Triton Transit Operations Temporary Trailer



Figure 14: Future Transit Base of Operation
Outdoor Break Space for Drivers and Staff



Figure 15: Triton Transit's SIO shuttle at Scripps Beach



The project enhances connectivity between UC San Diego's campus center and the Preuss School, enabling Preuss scholar access to UC San Diego campus resources and UC San Diego student engagement at Preuss as mentors and tutors.

The project also represents a significant investment in the quality of life of an essential workforce that keeps the campus moving: the staff of Triton Transit and the Transportation Demand Management program. Today, their home base is a temporary trailer with as many as six people to an office and no dedicated training space (Figure 13). The VEMH features state-of-the-art training facilities, ample breakrooms and lockers and more restrooms for drivers and other staff (Figure 14). Driving a Triton Transit bus is one of the best paid student jobs on campus; one that often paves the way to a lifetime career in transportation. Operators earn a Commercial Driver's License, and many go on to work in transportation planning, engineering or in leadership roles in the industry.

Triton Transit's Scripps Institution of Oceanography (SIO) Shuttle provides 15-minute service to Scripps Beach, Birch Aquarium, and other coastal resources. The fare-free service provides access to outdoor recreation to everyone in the community (Figure 15).

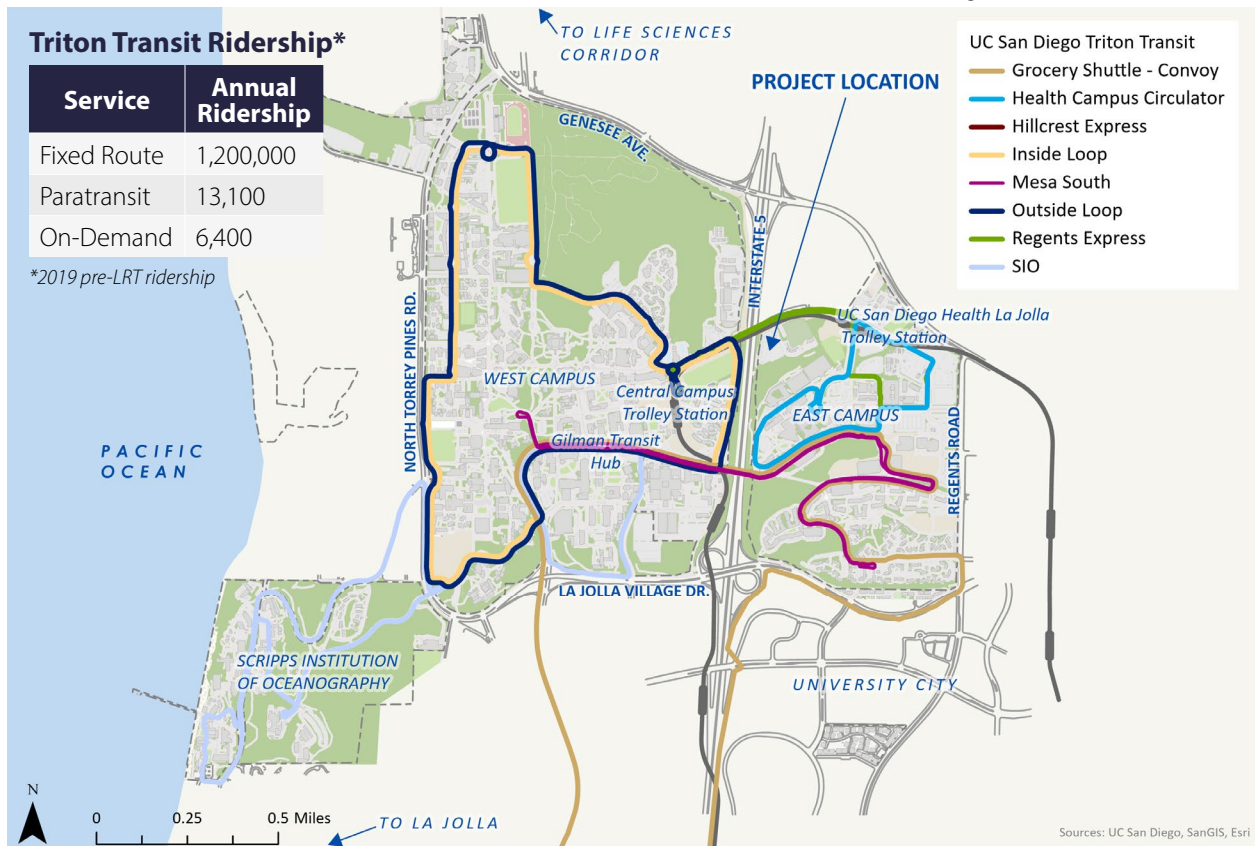


Figure 16: Triton Transit Routes

4D. IMPROVES MOBILITY AND COMMUNITY CONNECTIVITY

As the mobility arm of a public university, improving community connectivity is in Triton Transit’s DNA. Connecting the greater San Diego community to the education, employment, research, healthcare, cultural and coastal resources on the UC San Diego campus is an explicit goal of the VEMH project and Triton Transit (Figure 16). The VEMH will enable Triton Transit, which carries 1.2M people per year, to provide fare-free, electrified last-mile transit and active transportation connections to all of these resources, increasing social and economic opportunity.

The federal investment in the VEMH will allow UC San Diego to electrify transit and replace/improve both transit and parking assets without creating a cost-burden on the users of those replacement assets. The project also

mitigates individual mobility costs through its integration of the Innova electric car-share system, a program with no membership fee that allows one-way rentals at rates comparable to shared micromobility devices.

Beyond replacing the behind-the-scenes infrastructure that is essential to transit operations and electrification, the project adds new customer-facing elements, including bus stops, shelters, real-time arrival displays, and ADA-compliant interactive digital wayfinding that improves access to Triton Transit’s fare-free last-mile network. A new signalized crossing with universal design features such as audible beacons, tactile pavement markers, and curb cuts will ensure that these stops, like the entire campus transportation system, support all-users. Each of these elements increases accessibility for travelers in the pedestrian and transit modes, priorities for both the campus and USDOT.



Working as a student driver at Triton Transit was more than a job, it was the beginning of true passion for transit and community mobility and a springboard for a career in transit operations and administration. UC San Diego and Triton Transit have helped launch the careers of hundreds of transportation professionals and I'm excited to return as General Manager and to cultivate a new generation of transit leaders.

– Jose Perez, Triton Transit General Manager
UC San Diego Class of 2005

The university's shared micromobility program currently supports 60,000 trips per month, ensuring that the costs of owning and maintaining a micromobility device are not barriers to accessing the active transportation network and moving freely throughout the campus and neighborhood. The VEMH expands this shared micromobility, increasing the number of charging hubs by 40%. For those who do wish to own a personal micromobility device, the project will provide the two bike Secure Parking Areas ("SPAs") with 100 enclosed bike and scooter storage stalls, protected by card access and monitored 24/7 by an AI-enabled security camera system that alerts campus police to irregular activity. The SPAs at the main VEMH facility and at the Health Campus Trolley station will also include amenities such as personal effects storage and a repair station with commonly used tools and a tire inflation station.

4E. ECONOMIC COMPETITIVENESS AND OPPORTUNITY

A major motivation for UC San Diego in proposing the VEMH is to improve economic strength and opportunity. The VEMH will enable the university to more efficiently use its tightly constrained real estate – for higher value uses than the current uses of surface parking and the Triton Transit bus yard. By allowing the university to use more of its campus property for activities central to its trifold mission of teaching, research, and service to the community, this project delivers large and sustained increases in economic competitiveness and opportunity. Further, the more-than-doubling of the campus' electric-vehicle charging capacity will facilitate the electrification of the private car fleet, building capacity in the economically dynamic clean-transportation sector.

UC San Diego is one of the world's top 20 research universities and a major driver of the region's economy, with an annual economic impact to the State of California of \$16.5 billion). The campus is 6th in the

nation in “contributions to social mobility, research, and public service.” Consolidating parking and other transportation resources in the six-level VEMH structured facility releases 10.2 acres of valuable campus real estate for UC San Diego to continue to grow and expand its education, research, healthcare and public service missions.

Much of the land released by this project sits on the East Campus adjacent to the UC San Diego Health La Jolla Campus, and Science Research Park (SRP), the University’s home to a host of technology transfer and joint research enterprises. Enabling the continued growth of the UC San Diego Health Campus and SRP, which is a key component of the 2018 LRDP, improves the economic strength of the city and region by creating and expanding high-quality, well-paying jobs, and stimulating both spin-off and supportive businesses throughout the region.

As previously discussed in Sections 4c and 4d, the Project’s parking component will enable the repurposing of two surface parking lots as well as the surface bus yard to develop location-efficient, affordable housing for more than 4,000 residents. Every one of those residents will have unlimited, fare-free access to the adjacent LRT system, Triton Transit’s last-mile service, and regional bus service.

Additionally, the university’s LRDP proposes public-private partnership developments on East Campus surface parking lots, including an intergenerational housing facility, a hotel and conference center, patient family extended-stay housing, and additional research and clinical facilities. These projects are projected to generate \$85+ million in tax revenue alone for the city over 20 years.

UC San Diego is host to robust cultural and coastal resources that are regional destinations, from iconic architecture and public art installations to nationally significant performing arts venues such as the La

Jolla Playhouse, to the coastal resources at Scripps Institution of Oceanography and the Birch Aquarium. By enabling fare-free, electrified, last-mile connections to these resources, the VEMH will also facilitate tourism and spur economic activity.

UC San Diego students, like at many campuses in the state, are facing a housing crisis leading to greater competition for nearby housing and rapidly escalating rents. Triton Transit provides the first-mile connection from affordable (20-30% below market) campus housing and connects the ~18,000 campus residents to the regional transit network. This project lays the foundation for electrifying that vital first mile.

Local Labor Component

McCarthy Building Companies (the builder in the Design-Build entity) will provide the concrete forming, placing, and finishing for the Voigt Electric Mobility Hub project. The concrete work (and associated supervision) in cast in place concrete parking structures is typically roughly half of the total labor hours for this type of project. McCarthy has union labor agreements with the Laborers, Carpenters, and Cement Masons unions throughout California, ensuring that local labor and career-development opportunities are embedded within the construction program.

The VEMH will also require payment of prevailing wage rates in order to subcontract for the project. This will provide a level playing field encouraging a broad array of both union and non-union subcontractors to pursue opportunities during VEMH’s construction.

Support for Cultural and Healthcare Facilities

The project provides advance mitigation for 800 spaces that will be lost to development in the Pepper Canyon neighborhood and on the UC San Diego Health La Jolla Campus. The shared parking will support the adjacent Triton Ballpark, Canyon View Aquatic Center,

Figure 17: Example of failing pavement conditions at existing facility.



and the Epstein Family Amphitheater, all within walking distance, and a host of other cultural resources that can be reached with a fare-free ride on Triton Transit. By consolidating existing parking resources into a single, modern and secure facility with a parking guidance system and sensors that push real-time parking information to the campus app and third-party platforms, the project can improve the experience of parking availability without creating additional traffic.

4F. STATE OF GOOD REPAIR

If improvements proposed by the project are not made, Triton Transit and the UC San Diego transportation program face one of two futures. Either the economic growth envisioned by the LRDP will not be realized when the need to preserve legacy transportation facilities becomes a barrier to redevelopment, or Triton Transit and the transportation program will need to move to an off-campus site within the next five years, increasing deadheading and exposure to traffic impacts. These would be direct threats to system efficiency and reliability.

The VEMH leverages existing land resources to serve more people by constructing the multi-level combined parking and transit operations facility. This is not mere replacement of a failing facility (Figure 17), nor limited to

releasing the potential of underutilized land resources. It is also a significant modernization that electrifies both mass transportation and individual transportation, improves safety and security, and improves on-campus circulation. USDOT's investment in the project will allow this modernization to occur without creating a significant cost burden on the underserved, overburdened and disadvantaged communities (71% nonwhite, 72% receiving financial aid) that disproportionately use the campus-edge parking facilities that are slated to be redeveloped.

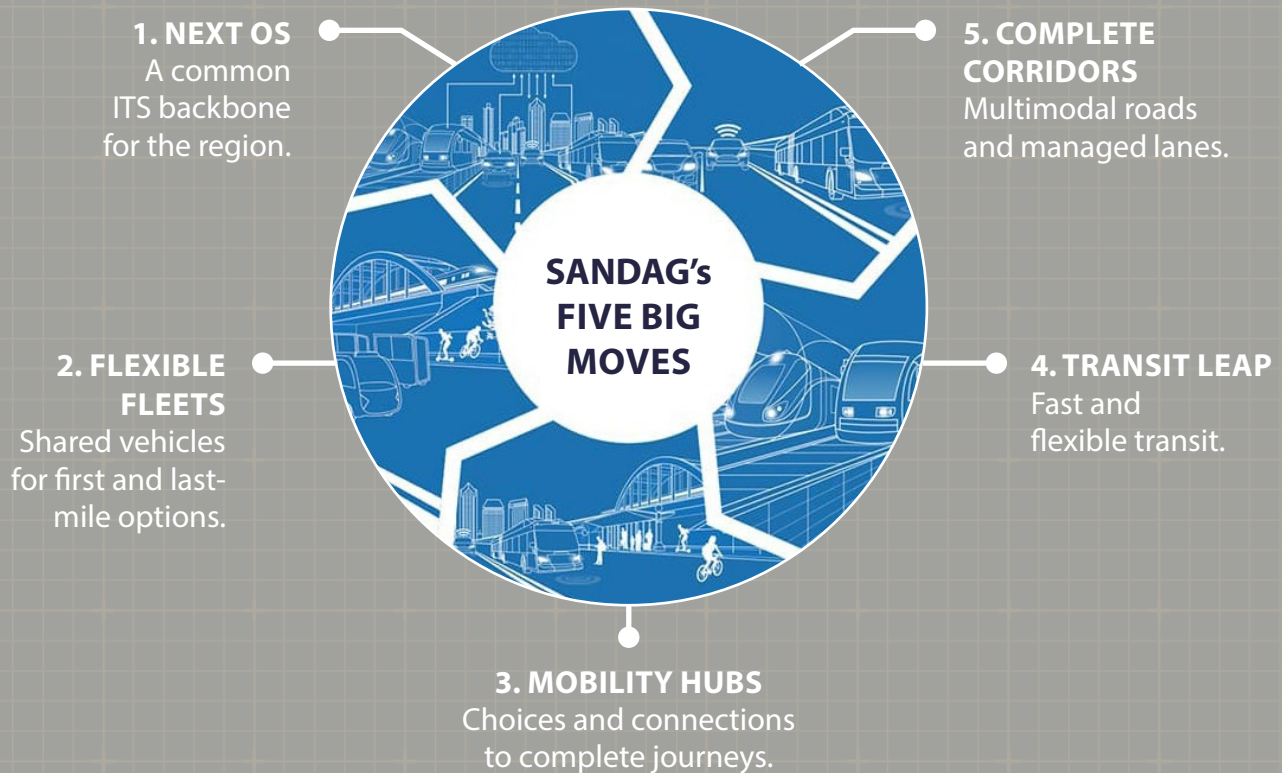
Also, the project's commitment to the ParkSmart standard from US Green Building Council, ensures that USDOT's investment will be maintained through the inclusion of maintenance plans and consideration of lifecycle costs.

SECTION 4G. PARTNERSHIPS AND COLLABORATION

Collaborating with Other Public and Private Entities

UC San Diego has worked closely with Caltrans, San Diego Association of Governments (SANDAG, the metropolitan planning organization), and the Metropolitan Transit System (MTS) over the last decade to help bring the UC San Diego Blue Line Trolley to campus and execute a host of collaboratively funded and developed transportation improvements, including the Gilman Bridge over I-5, the Pepper Canyon bike and pedestrian facility, the Central Campus and Health Campus LRT stations, reconstruction of the Genesee and Campus Point intersection and Campus Point Drive and Voigt Drive realignment and widening that added transit and micromobility facilities and prepared Voigt Drive to receive the future Caltrans managed-lane direct access ramp from I-5.

Figure 18: SANDAG Regional Plan



Triton Transit and MTS collaborate as a matter of course on service planning and coordination to ensure the effectiveness of regional transit in connecting the community to the campus and campus transit in providing effective last-mile connections. The joint-use pantograph charging included in the project is one example of how the partners collaborate to ensure operational efficiency and maximize the benefit of infrastructure spending.

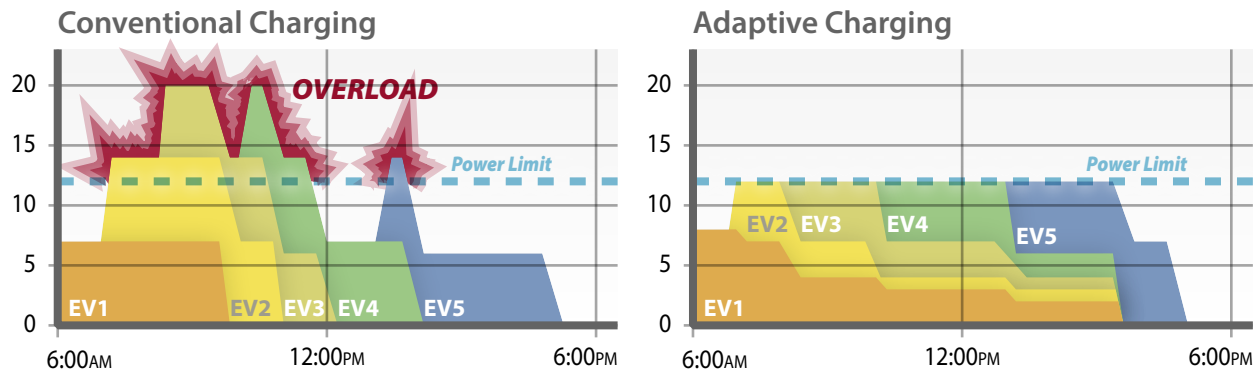
UC San Diego's support for SANDAG's regional plan and its "Five Big Moves" (Figure 18) for regional mobility is so strong that the campus has echoed the plan, translating the Five Big Moves for the region into Five Little Moves on and adjacent to the campus – though there is nothing little about the campus's ambitions or investment.

1. **Next OS:** VEMH contributes to regional ITS with an ATMS adaptive signal, parking sensors and guidance, and smart charging.

2. **Flexible Fleets:** VEMH augments Triton Transit's frequent service with public electric carsharing and shared micromobility.
3. **Mobility Hubs:** VEMH pairs robust mobility choices with transportation infrastructure to connect the hub to destinations.
4. **Transit Leap:** VEMH extends the reach of LRT and express bus service with last-mile local service and microtransit.
5. **Complete Corridors:** VEMH provides complete streets today and anticipates Caltrans' planned HOV direct access ramp.

McCarthy Building Companies, the project's design-build partner is also focused on providing a high level of involvement from Local, Small, Emerging, Woman Owned, and Disadvantaged or Disabled Veteran Business Enterprises and local workers from within the bounds of the community, colloquially

Figure 19: Adaptive Load Management



referred to as XBEs. McCarthy has successfully implemented similar efforts on numerous other projects in the Southern California area over the past number of years and has achieved goals specific to individual targeted groups ranging from 3% to over 45%.

The VEMH project team has worked closely with the Preuss School to understand the unique needs of their students, who are drawn from underserved, overburdened, and disadvantaged communities. Provision of active transportation connections to West Campus resources, shared electric charging infrastructure that may be used by their school bus operator, and secure micromobility storage at the Health Campus station, immediately adjacent to the Preuss School, are all informed by that continuing collaboration and the specific needs articulated by Preuss School leadership.

Project Partners

The University's close collaboration with San Diego Gas & Electric on EV charging is based on a shared vision outlined in the Path Forward to Net Zero plan. For this project, SDG&E's Power Your Drive 2.0 program will do all the utility upgrades in front of the meter. UC San Diego will make upgrades behind the meter. The early determination from the utility is that there currently is enough power in the local supply for the planned EV charging installation (see [Appendices](#)).

4H(i) INNOVATIVE TECHNOLOGIES

The 400 EV chargers in the VEMH will be managed by an innovative Adaptive Load Management technology (ALM). By actively managing the energy going to every vehicle, ALM dramatically flattens the peak power draw and allows us to more than quadruple the number of chargers in the facility without overloading the connecting grid infrastructure (Figure 19). This will also allow EV car owners parking in these new EV stalls to remain parked for up to 12 hours. This is a substantial advantage over the current four-hour limit in UC San Diego's existing 300 Level II EV chargers which do not have ALM technology. Users are therefore required to move their EV car midday and search for parking at the time-of-day when locating an open spot is most challenging, adding to traffic and reducing employee productivity.

Beyond spreading the load of charging, the ALM technology provides the opportunity to innovate by taking advantage of pricing signals, both from the existing SDG&E sub-Load Aggregation Points (Sub-LAP) and a layered signal of marginal GHG emissions from the Self Generation Incentive Program (SGIP).

The VEMH project's DC fast charging for the Triton Transit fleet will be bi-directional, allowing bus batteries to provide backup

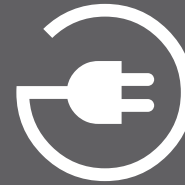
power for lighting and life safety systems in the event of a utility disruption. The project builds on the extensive work of UC San Diego's Center for Energy Research and Strategic Energy Initiative in V2G technology and its ability to make the campus microgrid both more resilient and more sustainable. UC San Diego has hosted multiple V2G research projects and intends to coordinate with our bus and battery manufacturers to allow Triton Transit's rolling stock and the VEMH to bring that research to scale.

4H (ii) INNOVATIVE PROJECT DELIVERY

The VEMH project utilizes a design-build contract to minimize both schedule and budget risk. This strategy will allow the design to be finalized and construction to commence swiftly following NEPA review and approval (anticipated to be confirmation of a Categorical Exclusion, as explained in Section 4.1), resulting in timely delivery and mitigating the risk of additional cost escalation. With the University's construction partner, McCarthy Building Companies already under contract, we have designed to budget with a high degree of confidence and know that the final stipulated sum price will be consistent with the budget and allow the project to proceed without extensive value engineering.

4H (iii) INNOVATIVE FINANCING

UC San Diego has incorporated third party support from vendors, utilities, and state-administered grant programs to rapidly grow its EV charging network without burdening consumers with unanticipated costs. Further, the university leverages rebate programs including California's Low Carbon Fuel Standard credits to offset operating costs and provide seed money for EV infrastructure expansion. This allows UC San Diego to align environmental and consumer interests and offer daytime charging for campus



LEADING THE EV REVOLUTION

UC San Diego's unique private-public-academic partnerships support research and development of the next generation of smart chargers. The university has won multiple awards for its innovation in the EV space, including:

- ▶ 2018 received GreenTech Media's Grid Edge Innovation Award
- ▶ 2018 Plug in America "Outstanding Organization Award"
- ▶ 2017 "Best Practices in Sustainable Practices in Sustainable Transportation" by the California Council of Higher Education Sustainability Conference
- ▶ 2020, 2018, 2016, 2014 Energy Storage North America Conference Outstanding Mobility Awards
- ▶ 2019 Smart Energy Decisions for "Innovating the Art of the Possible in EV Grid Integration"

The VEMH will be an extension of UC San Diego's living lab for electrification of transportation.

commuters and the general public during the day when the grid is flush with renewables but at rates comparable to the low, overnight rates charged by utilities for home charging.

5. PROJECT READINESS: ENVIRONMENTAL RISK

5A. PROJECT SCHEDULE

The project schedule is summarized by milestones in the Gantt chart below, with reference and alignment to the RAISE obligation and funding deadlines. These summaries are based on a mature, detailed project that includes major project milestones and activities to achieve these milestones, including all permitting approvals and procurement processes. Concurrence and final approval of the draft NEPA Categorical Exclusion, prepared by UC San Diego as Joint Lead Agency, would occur following receipt of the awarded RAISE Grant.

While cost escalation during the pandemic has required a degree of redesign, we are currently at 50% Construction Documents (CDs) and intend to advance to 95% CDs prior to award notification. Assuming notification of award by November 1, 2022 the project

schedule envisions obligation of funds and notice to proceed by 3/28/23, and substantial completion in September of 2024.

There are very few risks to the project's schedule: the construction is part of a design-build contract with fixed-cost, and the university is the owner, developer, jurisdiction, and land use authority for all elements of the project.

The University is the Authority Having Jurisdiction (AHJ) for matters of code regulations on university projects and is considered the Lead Agency under the California Environmental Quality Act (CEQA). Final approval rests with the University of California Regents (or their delegate) through UC Office of the President to the UC San Diego Chancellor.

All property required for this project is wholly-owned by the university

Table 2: Project Schedule

TASK	COMPLETE	2022		2023				2024			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Project Planning	■										
CEQA Submittal	■										
Design through 50% CD	■										
Design through 95% CD		■									
Grant Approval		■									
NEPA Categorical Exclusion			■								
Design through 100% CD				■							
Permit Issued					■						
Notice to Proceed					■						
Construction						■	■	■	■		
Substantial Completion										■	
Final Acceptance											■

Figure 20: Student outreach event on campus, Jan. 15, 2020



and unencumbered. The project has adjacencies with Caltrans (the I-5 freeway) and the Metropolitan Transit System (UC San Diego Blue Line Trolley elevated structure) which are being coordinated as part of the project development. Both Caltrans and MTS have provided letters of support for this grant application.

Community Involvement

The VEMH project is an implementation of the goals and objectives outlined in the University's 2018 LRDP, which had robust community involvement, including consultation with tribal governments (Figure 20). The UC San Diego community is ethnically diverse, with approximately 70% of students and 50% of staff coming from BIPOC backgrounds. Regular Community Advisory Group (CAG) meetings allowed representatives from the broader community to engage with campus administration on the 2018 LRDP. The meetings provided a forum for UC San Diego and the community to better understand each other's priorities and improve the collective understanding of the campus' future development. Also, as part of the 2018 LRDP engagement process UC San Diego contacted California Native American tribes traditionally and culturally affiliated with the San Diego region to solicit

COMMUNITY INVOLVEMENT

The following is a partial list of community involvement events for the Long Range Development Plan.

- ▶ 12 meetings with the CAG between August 2016 and May 2018.
- ▶ On-campus student workshops on October 25, 2017, and November 8, 2017, to solicit feedback from students.
- ▶ Presentations to campus stakeholders, including student, academic, and administrative groups.
- ▶ Online student surveys soliciting feedback on LRDP-related issues.
- ▶ Updates for local community planning groups:
 - La Jolla Town Council
 - La Jolla Community Planning Association
 - La Jolla Shores Association
 - University Community Planning Group
 - University City Community Association
- ▶ Meetings/coordination with local agencies to obtain input on technical analyses conducted on the proposed 2018 LRDP EIR:
 - California Coastal Commission (CCC)
 - California Department of Fish and Wildlife (CDFW)
 - California Department of Transportation (Caltrans)
 - City of San Diego
 - Metropolitan Transit System (MTS)
 - San Diego Unified School District
 - San Diego Association of Governments (SANDAG)

Figure 21: Designathon



their interest in being notified of proposed campus development projects as part of the planning process pursuant to Assembly Bill 52.

The project was developed in collaboration with the Campus/Community Planning Committee (C/CPC), and the Design Review Board (DRB) which consists of campus community and subject matter experts that advise the chancellor and provide feedback on proposed projects.

The C/CPC has reviewed, advised, and endorsed the VEMH (previously referred to as the Voigt East Parking Structure). Key input from the C/CPC The committee provided comments to the DRB that have led to further refinement of facade treatments, expansion of bicycle and micromobility storage, and improved pedestrian connections to the facility.

The C/CPC also reviewed the project in the context of the broader East Campus Planning Study, which considers the VEMH's placement in the campus fabric, public realm, and future adjacencies. Longer term improvements, such as a potential direct access ramp from a proposed managed-lane system on I-5, were also considered in the project siting and design.

The DRB reviewed the project in September 2019 and discussed site connectivity, massing and facade features, views from surrounding areas, and the comments

provided by C/CPC. DRB input was similarly incorporated into the final design.

UC San Diego routinely uses the designathon process, a multiday community-based user-centered design process to identify, analyze, and develop opportunities for campus improvements. The ultimate design of the VEMH is heavily influenced by the 2019 Pepper Canyon Mobility Hub designathon, sponsored by SANDAG, and the 2020 Tactical Urbanism for Safer Streets designathon (Figure 21). These initiatives engaged more than 300 community members and 60 practicing-professional mentors in over four days of discovery and design of the cycletracks, shared mobility, and transit amenities incorporated in the VEMC. Together, these community planning exercises were recognized with the 2020 Academic Award of San Diego Section of the American Planning Association and they will be featured during the 2022 APA National Planning Conference in San Diego.

5B. REQUIRED APPROVALS

i. NEPA status

UC San Diego's VEMH project is anticipated to qualify for a Categorical Exclusion (CE) under the National Environmental Policy Act (NEPA) pursuant to 23 CFR Part 771.118(c)(9) (see [Appendices](#)).

ii. Reviews, approvals, and permits

UC San Diego shall serve as Lead Agency for Project review and approval under the California Environmental Quality Act (CEQA). No other environmental permits or reviews are anticipated.

The design complies with all requirements of the 2016 California Building Code, the Americans with Disabilities Act, the Clean Water Act, NFPA 13 & 14, CalGreen, UC San Diego Design & Construction Standards, as well as all other Federal and State statutes, codes & regulations.

Approval of the Project's CEQA document and associated MMRP will occur through the UC Delegated Approval Process along with Project design. Documentation for all environmental permits, reviews, and reports referenced in this section is included in the [Appendices](#).

iii. Environmental Studies

UC San Diego, acting as Joint Lead Agency, oversaw the preparation of the following environmental studies to evaluate potential project impacts and incorporate recommended mitigation.

Biological Mapping and Wetland Demarcation.

Development would be located within a previously disturbed/developed area (existing surface parking lot). Mitigation for nesting birds under the Migratory Bird Treaty Act will be implemented to avoid impacts (see [Appendices](#)).

Geotechnical Investigation. Materials encountered during boring consisted of fill, Scripps Formation and Ardath Shale. Based on the results of the Project-specific geotechnical investigation, the potential for seismic-related liquefaction is considered very low due to the types of soils and depths to groundwater (see [Appendices](#)).

Hydrology and Water Quality Study. The hydrology and water quality study analyzed the existing and proposed drainage patterns and peak flow rates associated with the proposed project. No adverse impact to the receiving drainage system is anticipated because the proposed peak flow rate will be less than existing (see [Appendices](#)).

Transportation Study. A project-specific Transportation Study was prepared to evaluate and provide recommendations to accommodate the additional traffic that will be attracted to the proposed parking structure within the UC San Diego campus (LLG, April 2022). The analysis concluded that improvements at both

study intersections would require traffic signals and other roadway improvements in order to maintain an acceptable level of service. As such, with implementation of the recommended intersection and roadway improvements, both intersections are calculated to operate at an acceptable level of service (LOS D or better), reducing overall vehicle delay (see [Appendices](#)).

Reclaimed Water. The project landscape planting will be irrigated with reclaimed water. The reclaimed water system is private and owned by UC San Diego, however, the main feed of reclaimed water to the campus is supplied by the City of San Diego. When new development projects are constructed on campus, we are required to submit an application provide a set of irrigation drawings to both the City of San Diego and the County of San Diego to obtain a permit allowing the use of reclaimed water to the proposed site. The reclaimed water permit is to demonstrate that no cross-connection between reclaimed water and potable water has occurred.

Munitions Removal. UC San Diego will follow all required policies and project requirements within the UC San Diego Environmental Health and Safety – Soils Management Policy (see [Appendices](#)).

iv. DOT Communication

UC San Diego has worked closely with Caltrans in the project area and a letter of support from Caltrans is included in the appendices. Sufficient documentation for DOT review of the Project's recommended NEPA CE is provided in the [Appendices](#).

v. Right of Way Acquisition

The VEMC project is not on a state right-of-way and does not impact state DOT-managed routes. No right-of-way acquisition is required; UC San Diego owns the VEMC project property. The proposed traffic signal on Voigt Drive falls within UC San Diego right of way;

however, is in close proximity to the Caltrans right of way from Interstate 5. The project will coordinate with Caltrans and submit a set of traffic signal plans for review and approval through Caltrans. There are no anticipated objections from Caltrans given the traffic on Voigt Drive and across the Interstate 5 overcrossing is strictly UC San Diego traffic.

vi. Public Engagement

UC San Diego/McCarthy conducted a community outreach meeting with stakeholder organizations in the region, including a roundtable meeting and site visit to initiate. The meeting focused on equity and social justice measures that could be implemented as part of the project design and construction, in compliance with UC San Diego’s internal policies. These equity and social justice measures provide discrete benefits tailored to community preferences and are largely related to environmental improvements.

Community comments are being integrated into the project design. A plan for additional public outreach has been developed. The plan will be implemented by UC San Diego/McCarthy during subsequent stages of design, from 30% through construction. The plan outlines outreach activities, including virtual community and stakeholder meetings, interactive online open houses, community mailers, and informational signage and an information booth at UC San Diego Campus.

5b2. State and Local Approvals

A permitting strategy and estimated schedule have been prepared for the project to provide an efficient review process for the duration of the permitting efforts. These have been integrated into the project schedule to minimize or eliminate delays associated with state and local permitting processes. Please reference the attached letters of support for documentation of state and local support.

5C. PROJECT RISKS AND MITIGATION STRATEGIES

Table 3: Risks and Mitigation Strategies

RISK	MITIGATION STRATEGY
Damaging existing utilities, critical infrastructure	Conducted early subsurface utility mapping and modeling and McCarthy policy for working on a live campus in a critical environment.
Environmental risk	Carefully planned site logistics and SWPPP – also see CEQA Addendum 3 to the 2018 LRDP EIR. The project team will adhere to the UC San Diego Formerly Used Defense Site Awareness Program safety precautions. If unexploded military ordnance, debris, or contamination is encountered or suspected, work will be stopped, the site will be secured, and established reporting procedures will be implemented. With the project site already having been developed (baseball field and surface parking lot), the likelihood of encountering old munitions has been deemed as low.
Labor shortages	McCarthy has labor agreements with the Carpenters, Laborers & Cement Masons unions and through our XBE subcontractor outreach plans
Escalating costs	McCarthy’s Integrated Design Delivery protocol includes continuous cost modeling is used along with targeted procurement strategies to lock in prices in a timely manner.

6. BENEFIT COST ANALYSIS

Benefit-Cost Analysis (BCA) was performed for the VEMH to the standards in USDOT’s guidance dated March 2022 . BCA establishes the extent to which a proposed investment delivers overall economic value.

The strategy that guided our efforts throughout the preparation of the BCA was to claim all benefits that can reasonably be anticipated from implementing the VEMH, while making conservative assumptions at every decision point, ensuring that the ‘true’ B/C ratio can be interpreted as being larger than the calculated numerical value of B/C = 4.09.

HEADLINE RESULTS OF THE BENEFIT-COST ANALYSIS

Table 4 presents the headline results of the VEMH’s Benefit-Cost Analysis, along with a summary breakdown (detailed results for the full set of 32 categories of identified Project

Impacts are contained in the [Appendices](#) and accompanying spreadsheet).

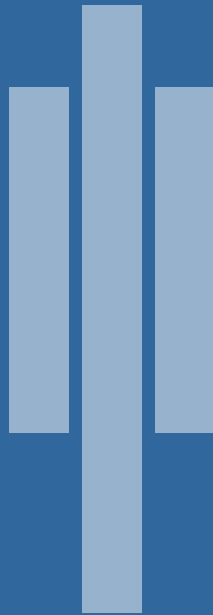
The calculated Benefit/Cost ratio is 4.09, and the Net Present Value is \$158M. These metrics are consistent with a strong business case.

The VEMH provides a wide range of benefits accruing broadly across the community. These accrue in the form of consolidating surface parking, mobility benefits, safety benefits, operational savings for UC San Diego’s Triton Transit, cost savings for EV-car drivers, reductions in negative externalities (emissions, noise, and congestion), and health benefits from increased cycling. The largest of the categories of benefits is the re-orientation of campus space away from low-value surface parking, followed by the travel-time benefits to travelers from the proximity of the VEMH to the University Center.

Table 4: Headline results of Benefit-Cost Analysis of proposed VEMH project

IMPACTS	COSTS*	BENEFITS*
Benefit/Cost Ratio = 4.09; Net Present Value = \$158M		
Capital cost	\$47.8M	
Other costs to be incurred by UC San Diego in future (O&M and EV bus acquisition); treated as “disbenefits” per USDOT guidance		-\$9.2M
Land made available for re-allocation from surface parking/bus yard to core University use		\$128.6M
Travel time savings to motorists/travelers (parking located closer to University Center)		\$55.7M
Time savings (EV Adaptive Load Management allowing full-shift charging)		\$15.8M
Operational benefits to UC San Diego’s Triton Transit (reduced fleet maintenance costs and depreciation, operational savings, and provision of new office/training space)		\$7.1M
Net savings to private motorist/traveler users of VEMH from reduced gasoline consumption, increased electricity consumption, and reduced private-car O&M costs		\$3.9M
Reduced externalities from car use (crashes, emissions, noise, congestion)		\$3.7M
Health impacts (increased cycling)		\$2.7M
Residual value of VEMH assets after 30-year analysis period		\$3.7M

*discounted to 2020 per BCA instructions



For Letters of Support and Appendices, please visit:
voigtelectricmobilityhub.ucsd.edu