



**UCLA/Westwood Zero Emission Transit Service Expansion: Deploying Wireless  
Charging at Scale**  
Transit and Intercity Rail Capital Program Cycle 7  
Narrative Document  
*July 2024*

## 2024 TIRCP APPLICATION: UCLA PROJECT NARRATIVE

### A. Project Summary Data

- i. **Project Title:** UCLA/Westwood Zero Emission Transit Service Expansion: Deploying Wireless Charging at Scale
- ii. **Applicant Name:**
  - ❖ Lead Applicant: The University of California, Los Angeles (UCLA)
  - ❖ Co-Applicant(s): CALSTART and Electreon Wireless Inc.
- iii. **Project Priority:** High – UCLA is submitting one application.
- iv. **Project Purpose and Need:**

The proposed UCLA/Westwood Zero Emission Transit Service Expansion: Deploying Wireless Charging at Scale is a transformative endeavor that seeks to combine a robust electric vehicle (EV) wireless charging infrastructure plan, zero emission bus (ZEB) and technology investments, expansion of university transit services, new connectivity to the Los Angeles Metro Rail and other existing services, and future multi-agency planning efforts to realize a shared inductive charging platform across multiple transit agencies. In tandem with procuring and upfitting ZEBs with wireless charging capabilities, this multi-faceted initiative will establish stationary (static) and in-motion (dynamic) wireless EV charging solutions, expand free transit offerings to university employees, create a new intermodal transit hub at the Los Angeles County Metropolitan Transportation Authority's (Metro) new Westwood heavy rail rapid transit (D-Line) in the station on UCLA's southwest campus, and create an action plan with stakeholders to achieve an SAE International standard for wireless charging. UCLA has partnered with CALSTART and Electreon Wireless, Inc. to plan and implement a revolutionary technology that, when deployed at scale, has the potential to transform the entire EV market and the landscape of public transit in and around Los Angeles by reducing range anxiety, battery sizes, pressure on the electrical grid, and greenhouse gas emissions (GHGs).

Electreon's solution provides static and dynamic wireless charging to any vehicle type, in any driving mode—while stationary, driving slowly, or driving at regular speeds on the roadway. The automated, hands-free nature of this technology creates the opportunity to charge at more points throughout the day, in any location. Electreon's innovative solution addresses the biggest challenges associated with the widespread adoption of EVs, including higher vehicle costs (associated with the need for larger, more expensive batteries), limited range, and stress on the grid. These challenges are particularly acute for medium-and heavy-duty (MD/HD) vehicles, which are responsible for 20 percent of California's transportation GHGs. To achieve the state's goals of carbon neutrality by 2045 and avoid the worst impacts of climate change, decarbonizing this sector (the largest source of GHGs in California) is essential. But such a transition is unlikely to occur rapidly without key policy intervention or investments in public infrastructure that make EV adoption sustainable and feasible.

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Renowned as one of the world's leading research institutions, UCLA stands at the forefront of discovery, innovation and progress, attracting top-tier faculty, researchers, and students who are eager to explore and develop new technologies and policies that benefit the greater good. UCLA's combination of research excellence, strong industry partnerships and commitment to sustainability makes it the best public agency for showcasing new technologies like wireless EV charging. Located in Los Angeles, a city facing significant traffic congestion and pollution issues, UCLA is strategically positioned to deploy at scale technologies that address urban transportation challenges. The university has a responsibility to contribute positively to society by exploring and demonstrating technologies that can address critical challenges.

In four years, all eyes will be on Los Angeles for the LA28 Olympic and Paralympic Games, for which UCLA will play a major role in housing many of the world's participating athletes. By leveraging its unique strengths as a trusted global leader, UCLA can effectively demonstrate to the domestic and international communities the potential and benefits of this innovative technology, paving the way for an SAE standard, broader adoption of EVs, and contributing to a more sustainable future for Californians.

### Need for Fleet Transition and Scalable Charging Solution:

UCLA is set amidst a spirited, busy urban area that has a community of 86,000 students, staff, and daily visitors, 77 percent of which commute to campus on a regular basis. Complimentary for Bruins and visitors alike, the UCLA BruinBus provides transit services to students, staff, and visitors, connecting with routes from seven other transit agencies. BruinBus routes are focused on linking major student residential neighborhoods, the Westwood Village commercial district, the Ronald Reagan UCLA Medical Center, academic buildings, and many other university facilities. In compliance with the California Air Resource Board's (CARB) Advanced Clean Fleets (ACF) Regulation established to meet the goals of Executive Order N-79-20, UCLA created a Bus Replacement Plan to electrify the remaining 8 compressed natural gas (CNG) vehicles in its fleet of 15 full-size transit buses, 7 of which are already battery electric buses (BEBs). ACF requires that all sales of MD/HD vehicles be 100 percent electric by 2027, but this cannot be achieved without EV fast-charging infrastructure on campus.

The University of California (UC) Sustainable Practices Policy adopts fleet and campus electrification as GHGs reduction strategies that reduce environmental impact from fleet travel. In alignment with the state's ambitious climate goals and decarbonization plan, UCLA maintains strict compliance with it by requiring zero emission vehicle (ZEV) purchases whenever one is available in the desired vehicle classification; however, there remains a need for fast charging stations on campus, especially for MD/HD ZEVs including the BruinBus fleet. UCLA operates the public fixed-routes service at no cost to riders with operating costs covered by UCLA parking net revenues. However, these subsidies are fixed for the next ten years, save for an inflation allowance. These are not

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sufficient to allay the hefty costs of ZEBs, along with the heavy-duty charging infrastructure they require, creating a need for funding to meet state regulations.

37 percent of UCLA's active fleet of 886 vehicles is battery-electric, earning it the title of Greenest University Fleet in 2023 by the National Association of Fleet Administrators (NAFA) Green Fleet Awards. The majority of these are light-duty EVs that can utilize a standard parking spot to charge, but 87 are MD/HD EVs in need of an on-demand fast-charging option to keep campus operations productive. Per existing UCLA protocols, all vehicle acquisitions will be zero emission by 2035 unless unavailable in a given classification. Furthermore, virtually all vehicles operated by UCLA are expected to be zero emission by 2035. For UCLA, this means that all existing parking solutions for fleet vehicles will need to be electrified, requiring significant utility upgrades on campus to supply power. Throughout fiscal year 2024, the university fleet traveled a total of 2,284,373 vehicles miles. By 2045, nearly all vehicle miles traveled (VMT) by the university fleet will be from EVs. Considering UCLA's aggressive vehicle procurement policy in the ever-congested heart of a very densely developed section of West Los Angeles proximate to the I-405 and Wilshire Boulevard National Highway System corridors, a scalable efficient charging solution that transcends the one to two vehicles per charger model is in high demand, more urgently for the nearly 10 percent comprised of MD/HD vehicles.

As part of the City of Los Angeles's collective effort to host LA28, UCLA will serve as the Olympic Village for the Summer Games, which will require the daily transport of some 15,000 athletes to competition venues around the Los Angeles region and approximately 2,700 buses to do so. Many of these buses will be BEBs and will need to be charged, yet the campus lacks the infrastructure and utility to support such as massive operation. UCLA needs a scalable, efficient solution that can not only serve the needs of Olympic operations, but that can be a sustained, worthwhile investment in public infrastructure for many years to come.

### Need for Increased Service and Access to Public Transit:

During Fall Quarter 2023, almost 20,000 students resided in on-campus housing (19,634), including nearly 18,000 undergraduate students (17,798) and over 1,800 graduate students (1,836). This amounts to a 27 percent increase from 2019, when fewer than 15,500 students resided on campus. More Bruins live in UCLA Housing's on-campus residential halls and apartments than ever before yet, BruinBus currently doesn't provide service to the Hill, which houses 14,490 undergraduates, leaving the entire northwest campus community with unmet transportation needs.

Due to heavy traffic volumes in the Westwood section of Los Angeles, partly caused by legacy infrastructure that prioritizes cars and trucks over high-occupancy and healthy modes of transportation, the impact of GHGs in the region is a major ongoing concern. UCLA Transportation has offered employees various subsidized public transit passes to

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combat the effects of California's transportation sector, the number one source of climate pollution accounting for about 50 percent of the state's GHG<sup>1</sup>. These efforts were recognized in 2023 when the university was honored with a National Award of Excellence by the Association of Commuter Transportation for its long-running transportation demand management program that has supported a reduction in traffic (pre-Covid) by more than 17 percent despite an increase in campus population by 50 percent since 1990. Between its steadfast green fleet purchasing policy and substantial efforts to mitigate traffic congestion on the Westside of Los Angeles, UCLA continues to be one of the region's leaders in sustainable transportation. To meet the UC's goals of reducing GHGs and SOV travel, UCLA will need to continue incentivizing employees to opt for public transit options, especially as the campus community continues to grow.

### Need for Connectivity with Metro Heavy-Rail:

By 2028, Metro's D-Line (Purple Line) Extension Project will open a new UCLA/Westwood subway station currently being built upon a section of UCLA Parking Lot 36 in the southwest campus. While there are many buses serving Westwood daily, this would be the first time that UCLA will be served by a heavy-rail station, providing more rapid access to other parts of Los Angeles. This massive infrastructure addition to the region will see an increase in Purple Line ridership and alighting in Westwood, especially from UCLA employees who would have an easier commute using rapid transit. A facility to transfer passengers from the Metro station to BruinBus and other agencies serving UCLA is crucial to ensure that public transportation infrastructure is safe for riders and pedestrians. Additionally, providing MD/HD charging at such a facility for bus operators is especially essential for commuter lines serving Westwood.

### Need for Wireless Charging SAE International Standard:

UCLA's position as a leader in sustainable transportation, in addition to the region's transit riding propensity, makes it a prime location for testing and implementing the latest, cutting-edge EV charging equipment. With more than 906 daily bus trips on Westwood Boulevard (on weekdays), UCLA envisions shared use opportunities with the seven transit agencies providing services to Westwood and Bruin commuter transit pass holders: Metro, Santa Monica Big Blue Bus (BBB), Culver CityBus (CCB), Long Beach Transit (LBT), Los Angeles Department of Transportation (LADOT), Antelope Valley Transit Authority (AVTA) and Santa Clarita Transit (SCT). Achieving this would require coordination between stakeholders to form a consensus on adopting a wireless charging standard.

Moreover, UCLA envisions this technology being deployed beyond the UCLA campus into Westwood Village and throughout the Westside. With the commitment and support of various stakeholders including the City of Los Angeles and the Los Angeles Department of Water and Power (LADWP), UCLA proposes an infrastructure deployment plan over three phases: 1.) UCLA campus deployment, 2.) Westwood Village deployment, and 3.)

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<sup>1</sup> California Energy Commission: [Transforming Transportation \(ca.gov\)](https://www.energy.ca.gov/)

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Westwood Blvd deployment. The completion of these three phases would connect the UCLA main campus with the newly acquired Westside Pavilion property, UCLA Research Park. Connecting these transportation innovations to an off-campus university property about two and a half miles south of campus provides the best opportunity to advance induction charging technology and discover best practices for knowledge sharing in the transit industry and beyond. It would also call for an SAE International standard as infrastructure deployment on city streets should guarantee compatibility, safety, and reliability across different vehicle manufacturers.

Collaboration with local authorities will be a major component of infrastructure expansion and the lessons learned will inform the systematic implementation of this infrastructure plan on a larger scale. The UCLA area, historically impacted by vehicle traffic, provides a diverse urban environment with varying infrastructure challenges that will exist in other parts of the city, making UCLA one of the most practical testing grounds to evaluate the technology's effectiveness in a real-world, car-centric, urban setting. Successful implementation at UCLA can serve as a model for other urban centers across California and beyond, demonstrating the feasibility and benefits of integrating wireless charging into city infrastructures. In essence, UCLA's combination of academic excellence, agreements with seven regional transit agencies, proximity to industry leaders, urban environment, and commitment to sustainability makes it an ideal candidate for implementing California's first transformative wireless charging infrastructure plan.

### Project Scope:

The UCLA/Westwood Zero Emission Transit Service Expansion project is organized into 6 Project Elements designed to address the array of transportation needs and motivations described above for a capital project of this scale:

- I. Zero Emission Bus Transition & Fleet Expansion: Electrify the aging CNG BruinBus fleet and replace 2 unreliable ZEBs as part of the university's requirements to fully decarbonize. Increase the frequency of the BruinBus service to accommodate expected increases in ridership due to the arrival of UCLA/Westwood Station by 2028. Create a new route that directly serves the residential halls and a densely developed student neighborhood adjacent to campus. Restore one inactive BruinBus route.
- II. Upfitting Electric BruinBuses: Upfit 3 existing BYD buses and 2 existing New Flyer buses with wireless charging receivers to utilize the charging infrastructure upon completion.
- III. Transit Hub & Bruin Pass Expansion: Build a Transit Hub between the bus depot and the new UCLA/Westwood Station providing direct connectivity among BruinBus, the Purple Line, and transit and paratransit agencies with the potential benefit of opportunity charging for up to eight regional transit agencies. Expand free transit passes to all employees.
- IV. Static Inductive Charging Infrastructure: Install stationary wireless street charging infrastructure at three layover locations shared with other agencies on the UCLA

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campus, two of which exist in low-income communities (LICs). Install stationary wireless charging at the bus depot, also located in a LIC. Improve safety at the bus depot by minimizing the use of cords and provide opportunity charging for agencies serving the UCLA area.

- V. Dynamic Inductive Charging Infrastructure: Install in-motion wireless street charging along two primary campus routes of Westwood Plaza and Charles E Young Dr East and South and create shared-use opportunities with agencies serving the UCLA area.
- VI. Coordinating Services & Deployment at Scale: Work with the City of Los Angeles, LADWP and a consortium of agencies and stakeholders to establish plans for dynamic roads along Westwood Boulevard, through the Westwood business district to Pico Boulevard, connecting the campus with the newly acquired UCLA Research Park. Form a consortium of agencies and stakeholders to develop an SAE standard for wireless EV charging.

The coalescence of these project elements with the Los Angeles Metro Rail provides an opportunity to plan and implement a bus charging system that can be shared with multiple agencies and providers serving passengers transferring through the Transit Hub. UCLA has the right mix of need, use, and capability for maximizing the value of Transit and Intercity Rail Capital Program (TIRCP) grant funds. Monetary support to implement an inductive charging proof of concept at scale will help set the pathway to an SAE standard for BEB inductive charging. This implementation will provide significant real world transit service that leverages the events in Westwood and the UCLA campus over the next five years, providing significant visibility to the technology utilized and allowing UCLA to showcase the capabilities and benefits of static and dynamic inductive charging to the transit community worldwide.

### v. **Project Location:**

UCLA is in the Westwood neighborhood of West Los Angeles, often the epicenter of traffic congestion on the Westside with the notorious 405 freeway running nearby and the main arterial network choked with traffic.

The UCLA campus lies between two major Los Angeles streets traveling east and west, Sunset and Wilshire Boulevards situated to the north and south of campus, respectively. Running north and south through the medical campus is Westwood Boulevard (city property) which turns into Westwood Plaza (campus property). The heart of the campus is accessible from Westwood Plaza at the Charles E Young Drive intersection, which roughly loops around the inner perimeter of the campus past Wyton Circle and back to Westwood Plaza. At the most northern point of Westwood Plaza is Gateway Plaza, a turnaround with numerous bus layovers and passenger drop-off points. It's also the central entry point to the campus. Almost 14,500 students live on the main campus in residency halls and dormitories in the northwestern part of the main campus.

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Discontinuous from the main campus is the southwest campus. A diagonal strip of land between Veteran and Gayley Avenues, the southwest campus is a LIC that houses over 4,000 students, including over 1,800 graduate students at the Weyburn Terrace Apartments. On Kinross Avenue is the UCLA Transit Operations and Maintenance Yard (bus depot). This location is where BruinBus drivers begin and end their shifts and where the buses break and park overnight. Across the street and south of the bus depot is UCLA Parking Lot 36 situated between Kinross Avenue and Wilshire Boulevard, north and south of Lot 36, respectively. Upon the southern section of Lot 36 along Wilshire Blvd is the location of the new UCLA/Westwood Metro station.

The UCLA/Westwood Zero Emission Transit Service Expansion has two parallel initiatives: deployment and expansion. Both initiatives have been planned out across three phases. Phase 1 will deploy wireless EV infrastructure solely on UCLA property and consists of various static charging projects and an electrified pathway on campus streets equipped with dynamic charging capabilities. Phase 2 will continue to electrify Westwood Boulevard from Le Conte Avenue to Wilshire Boulevard. Phase 3 will extend the dynamic road south of Wilshire Boulevard to Pico Boulevard at UCLA Research Park. Only Phase 1 deployment is within the scope of this application.

The static sites include three bus layovers: Gateway Plaza (also utilized by agencies like LBT and BBB), Weyburn Terrace and Kinross Avenue. The Kinross site will also be the location for a newly imagined transfer hub and charging facility where local bus realignments will take place in anticipation of the station's opening. This transfer hub will connect with the Metro subway station, which will provide direct heavy rail transit from the Westside to Union Station in Downtown Los Angeles, connecting UCLA with East and South Los Angeles including parts of the San Gabriel Valley via the various LA Metro Rail lines. UCLA will also have connectivity to the Orange, Riverside, San Bernardino, Ventura and San Diego Counties via the Metrolink commuter rail. The Amtrak intercity rail will also be accessible through this heavy rail connection from Westwood without the need for bus travel. Adjacent to these plans in the bus depot, inductive chargers will also be installed on several parking spots.

Dynamic inductive charging will be utilized at key bus stops along BruinBus routes that are also shared with local transit agencies. On Charles E Young Dr East, the dynamic road ranges from Wyton Circle, continuing to Parking Structure 2, past Murphy Hall to the Westwood Plaza intersection. The dynamic road will continue along Westwood Plaza, past the Medical and Stein Plazas, to the Le Conte Avenue intersection where the main campus's southern property line ends. These installations will offer both enroute charging while the vehicle is in motion as well as additional stationery charging while the bus is parked at layovers and stops.

The BruinBus service expansion will take place on UCLA property in Phase 1. Currently, BruinBus has four active routes: Weyburn (U1), Wilshire (U2), University Apartments

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(U4) and Safe Ride (U5) which doesn't operate during the summer. U1 has a 3.27-mile-long route that begins service at Weyburn Terrace Apartments. Currently, U1 is the only BruinBus route serving the southwest campus and its surrounding LICs. It passes through Kinross Avenue, the site of the Transit Hub, and takes riders directly to north campus via Hilgard Avenue without stopping. U1 is also the only active route that stops at Gateway Plaza, the entry point to the heart of campus. U2 is 2.87 miles long and travels through Westwood Boulevard, Westwood Plaza and Charles E Young Drive East and South, all of which are project locations for dynamic charging infrastructure. U2 also lays over at Wilshire Center, providing last mile transit to the LICs south of Wilshire Boulevard. U4 is BruinBus's longest route and stops twice at university apartments in Palms and Mar Vista. Like U2, this route would utilize all the dynamic infrastructure on campus property. U4 would also utilize the infrastructure along Westwood Boulevard to UCLA Research Park, planned for Phase 2 and 3. U5 is a similar route to U1, but only runs in the evenings for the UCLA Safe Ride program, which provides complimentary evening transportation between campus buildings, on-campus housing and nearby residential areas for all students, employees and visitors. U5 is only active beginning from Fall Quarter to the end of Spring Quarter. U3 (Gateway) is a 1.57-mile route that connects Weyburn Terrace with Gateway via Westwood Plaza. It is currently inactive but is part of UCLA's expansion plan to reinstate this route to increase frequency at the Weyburn Terrace, medical campus, and Gateway Plaza stops.

**Table 1: Shared Use Opportunities at Project Locations**

Location	Infrastructure Type	Phase 1: UCLA	Phase 2: Transit Agencies	Phase 3: City of Los Angeles
Charles E Young Dr	Dynamic	U1, U2, U3, U4, U5	BBB	
Gateway Plaza	Static	U1, U2, U3, U4, U5	BBB, CCB, LBT, Waymo	
Kinross/Transit Hub	Static	U1, U3	BBB, CCB, LBT	
Transit Yard	Static	5 BruinBuses	Replacement BruinBuses	Replacement BruinBuses
Westwood Plaza	Dynamic	U1, U2, U3, U4, U5	BBB, CCB, LBT, Metro, Waymo	
Weyburn Terrace	Static	U1, U3, U5	LBT	
Westwood Blvd (Le Conte Ave)	Dynamic	U4	AVTA, BBB, CCB, LBT, Metro, SCT, Waymo	LADOT
Westwood Blvd (Pico Ave)	Dynamic	U4	AVTA, BBB, CCB, LBT, Metro, SCT, Waymo	LADOT

UCLA BruinBus routes service several Priority Populations, particularly low-income students residing near campus. The following low-income census tracts will directly

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benefit from this endeavor: 6037265201, 6037265202, 6037265303, 6037265304, 6037265305, 6037265510, 6037271902 (U4), 6037269904 (U4), 6037269903 (U4), and 6037269904 (U4). Weyburn Terrace and the Transit Hub will both be built in 6037265305, where the Transit Yard and under-construction UCLA Metro station also exist.

vi. **Project Mode(s):**

- ❖ Local Bus: BruinBus
- ❖ Heavy Rail: Metro D-Line
- ❖ Commuter Bus: AVTA, Santa Clarita, Metro

vii. **Multi-Agency Coordination:**

This project is built on a foundation of multi-agency coordination to maximize its impact on bus transit services across Los Angeles. The collaborative efforts include:

- City of Los Angeles and Mayor's Office: Partnerships are in place with the city to introduce new technologies and support the LADOT bus fleet, enhancing transit services and reducing emissions.
- LADWP: As the primary grid provider for UCLA and Westwood Avenue, LADWP is a key partner. Coordination focuses on power availability, integration with their D-Line investment, and exploring potential match funding for the project.
- AVTA and LBT: Discussions with AVTA and LBT are underway to integrate their coach buses with the proposed wireless charging infrastructure in future phases. This integration could significantly reduce emissions and operational costs by eliminating unnecessary trips.
- Metro: Interested in the insights gained from this project for potential charging applications to their own bus fleet as well as the 2,700 additional buses that will be used during LA28.
- California Department of Transportation (Caltrans): Support is aimed at Caltrans with deployment consideration of wireless charging technology on public roads, potentially paving the way for its implementation on CA State roads.

Additional Support from Key Stakeholders:

- Assemblymember Pilar Schiavo: Chair of the Select Committee on Electric Vehicles and Charging Infrastructure, Assemblymember Schiavo's endorsement strengthens the project's value in deploying static and dynamic wireless charging solutions.
- Los Angeles City Council District 5: Coordination is ongoing with District 5 on both the current project and potential future expansion phases, ensuring local support and alignment with community needs.
- LA28 Organizers: This project aligns with LA28's challenge of charging the 2,700 buses needed for the games. Static and dynamic wireless charging is believed to offer an effective solution for this large-scale event.

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- Waymo: Potential collaboration with Waymo is being explored to extend the project's benefits to robotaxis, integrating wireless charging technology to support autonomous vehicle (AV) operations.

This comprehensive multi-agency approach ensures the project's impact extends beyond a single entity, fostering a collaborative ecosystem for advancing wireless charging technology in Los Angeles.

### viii. Greenhouse Gas Emissions Reductions

**Table 2: Results of the CARB Quantification Tool**

Project Name: UCLA/Westwood Zero Emission Transit Service Expansion: Deploying Wireless Charging at Scale							
Identifying Descriptor	Quantified GHG Component 1	Quantified GHG Component 2	Quantified GHG Component 3	Quantified GHG Component 4	Quantified GHG Component 5	Quantified GHG Component 6	TotalProject
Replace 7 ICE Transit Buses w/ BEB Transit Buses, Upfit for Inductive, & Bruin Pass Exp.	Replace 1 ICE Transit Bus w/ BEB Coach Bus & Bruin Pass Expansion	Replace 2 kaput BEB w/ 25-ft cut-away BEBs, Upfit for Inductive, & Bruin Pass Exp.	Upfit Existing BEB for Inductive Charging & Deploy Static Charging Infrastructure (Includes Kinross Transit Hub)	Deploying Dynamic Charging Infrastructure on Charles E Young Dr & Westwood Plaza	Coordinating Services & Deployment at Scale		
GHG Emission Reduction Start Date (Year)	2026; 2026; 2026	2026; 2026; 2026	2025; 2025; 2025	2025; 2027; 2028	2029; 2029	2025	
<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>
Total GHG Emission Reductions (MTCO <sub>2e</sub> )	3,484	7,344	655	150,067	1,988	3,985	<b>167,522</b>
Total GGRF Funds Requested (\$)	\$7,052,300	\$2,118,000	\$1,054,000	\$5,189,000	\$4,055,000	\$91,700	<b>\$19,560,000</b>
Total GHG Emission Reductions/Total GGRF Funds Requested (MTCO <sub>2e</sub> /\$)	0.000494	0.003468	0.000621	0.028920	0.000490	0.043456	<b>0.008565</b>
<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>
TIRCP GHG Emission Reductions (MTCO <sub>2e</sub> )	3,484	7,344	655	150,067	1,988	3,985	<b>167,522</b>
TIRCP Funds Requested (\$)	\$7,052,300	\$2,118,000	\$1,054,000	\$5,189,000	\$4,055,000	\$91,700	<b>\$19,560,000</b>
TIRCP GHG Emission Reductions/TIRCP Funds Requested (MTCO <sub>2e</sub> /\$)	0.000494	0.003468	0.000621	0.028920	0.000490	0.043456	<b>0.008565</b>
<b>TIRCP Funds Requested/TIRCP GHG Emission Reductions (\$/MTCO<sub>2e</sub>)</b>	<b>2,024</b>	<b>288</b>	<b>1,610</b>	<b>35</b>	<b>2,040</b>	<b>23</b>	<b>117</b>

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### Table 3: Results of the CARB Quantification Tool

Project Name: <b>UCLA/Westwood Zero Emission Transit Service Expansion: Deploying Wireless Charging at Scale</b>							
	Quantified GHG Component 1	Quantified GHG Component 2	Quantified GHG Component 3	Quantified GHG Component 4	Quantified GHG Component 5	Quantified GHG Component 6	TotalProject
Identifying Descriptor	Replace 7 ICE Transit Buses w/ BEB Transit Buses, Upfit for Inductive, & Bruin Pass Exp.	Replace 1 ICE Transit Bus w/ BEB Coach Bus & Bruin Pass Expansion	Replace 2 kaput BEB w/ 25-ft cut-away BEBs, Upfit for Inductive, & Bruin Pass Exp.	Upfit Existing BEB for Inductive Charging & Deploy Static Charging Infrastructure (Includes Kinross Transit Hub)	Deploying Dynamic Charging Infrastructure on Charles E Young Dr & Westwood Plaza	Coordinating Services & Deployment at Scale	
<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>	<b>Total CCI</b>
Passenger VMT Reductions (miles)	9,694,391	23,407,159	2,006,890	458,453,130	6,506,221	10,936,866	<b>511,004,657</b>
Fossil Fuel Use Reductions (gallons)	385,267	743,367	66,209	15,108,810	199,422	401,520	<b>16,904,594</b>
Fossil Fuel Energy Use Reductions (kWh)	(1,519,220)	(203,083)	(7,798)	(335,277)			<b>(2,065,378)</b>
Energy and Fuel Cost Savings (\$)	\$20,925	\$4,874	(\$1,053)	(\$45,262)			<b>(\$20,516)</b>
Passenger Travel Cost Savings (\$)	\$5,865,106	\$14,161,331	\$1,214,169	\$277,364,143	\$3,936,264	\$6,616,804	<b>\$309,157,817</b>
ROG Emission Reductions (lbs)	181	272	30	6,618	63	250	<b>7,413</b>
NOx Emission Reductions (lbs)	709	1,401	150	33,279	348	1,204	<b>37,090</b>
PM2.5 Emission Reductions (lbs)	128	303	27	6,078	83	154	<b>6,773</b>
Diesel PM Emission Reductions (lbs)	0	0	0	15	0	1	<b>17</b>
<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>	<b>TIRCP</b>
Passenger VMT Reductions (miles)	9,694,391	23,407,159	2,006,890	458,453,130	6,506,221	10,936,866	<b>511,004,657</b>
Fossil Fuel Use Reductions (gallons)	385,267	743,367	66,209	15,108,810	199,422	401,520	<b>16,904,594</b>
Fossil Fuel Energy Use Reductions (kWh)	(1,519,220)	(203,083)	(7,798)	(335,277)			<b>(2,065,378)</b>
Energy and Fuel Cost Savings (\$)	\$20,925	\$4,874	(\$1,053)	(\$45,262)			<b>(\$20,516)</b>
Passenger Travel Cost Savings (\$)	\$5,865,106	\$14,161,331	\$1,214,169	\$277,364,143	\$3,936,264	\$6,616,804	<b>\$309,157,817</b>
ROG Emission Reductions (lbs)	181	272	30	6,618	63	250	<b>7,413</b>
NOx Emission Reductions (lbs)	709	1,401	150	33,279	348	1,204	<b>37,090</b>
PM2.5 Emission Reductions (lbs)	128	303	27	6,078	83	154	<b>6,773</b>
Diesel PM Emission Reductions (lbs)	0	0	0	15	0	1	<b>17</b>

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ix. **Funding Requested:**

TIRCP Request: The total TIRCP funding requested is \$19,850,000 (57% of total project costs)

Non-TIRCP Match: The total match funds are \$15,100,041 from multiple non-TIRCP sources (43% of total project costs)

Total Project Costs: \$34,950,041

x. **Point of Contact:**

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**B. Project Costs**

The full project costs are \$34,420,041, with \$11,502,041 invested by UCLA, \$1,728,000 funds anticipated through the Volkswagen Environmental Mitigation Trust for California, \$1,080,000 anticipated from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) and \$550,000 of conditionally awarded CEC EnergIIIZE grant funds. Total TIRCP funds requested are \$19,560,000. Work on all elements of this project is ready to begin immediately upon the award announcement.

In 2023, UCLA received a conditional award of \$750,000 from the CEC's EnergIIIZE Jump Start Program for the installation of 8 dual nozzle Level 3 chargers at the Transit Yard. \$550,000 of this award will pay for utility upgrades at the Transit Yard, one of the static project locations. UCLA will use the award to fund utility upgrades that will provide some of the power needed for this project. Funds should be used before final commissioning in March 2026.

5 electric buses already in UCLA's fleet will be equipped with wireless charging receivers to directly support the efforts of this project. UCLA will hire the necessary vehicle operators to increase ride frequency and service a new route at the Hill. UCLA will also cover the costs of vehicle maintenance of all electric buses being used throughout this project.

To ensure ongoing operating and maintenance costs of the project are funded through the useful life of the project, UCLA has budgeted maintenance costs into its Bus Replacement Plan over the next four years and has accounted for vacant driver positions in its annual budget. UCLA also has a capital fund for infrastructure projects that are necessary for state and federal compliance, such as EV charging.

UCLA, CALSTART and Electreon have developed the scope of work and budget based on collaboration with supporting partners. Project management by UCLA will be an in-

## 2024 TIRCP APPLICATION: UCLA PROJECT NARRATIVE

kind effort. CALSTART is requesting \$432,000 in total for project technical assistance, wireless charging deployment assessment, and multi-agency expansion planning. Electreon is requesting \$710,000 for project design and management, route analysis and multi-agency expansion planning. A detailed budget is provided in the Supporting Documentation.

**Table 4: Project Costs Summary**

#	Project Element	TIRCP	Local Match	Source of Match	Project Costs
I	Zero-Emission Bus Replacement and Fleet Expansion	\$ 10,194,300	\$ 11,085,226	UCLA, HVIP, VWT	\$ 21,279,526
II	Upfitting Electric Bruin Buses	\$ 575,000	\$ 2,639,815	UCLA	\$ 3,214,815
III	Transit Hub & Bruin Pass Expansion	\$ 2,684,000	\$ 165,000	UCLA	\$ 2,849,000
IV	Static Inductive Charging Infrastructure	\$ 2,340,000	\$ 895,000	UCLA, CEC	\$ 3,235,000
V	Dynamic Inductive Charging Infrastructure	\$ 3,965,000	\$ 165,000	UCLA	\$ 4,130,000
VI	Coordinating Services & Deployment at Scale	\$ 91,700	\$ 150,000		\$ 241,700
<b>TOTAL:</b>					<b>\$ 34,950,041</b>

### **C. Eligibility**

As part of the University of California, a state-controlled institution of higher education, UCLA is a public agency that owns and operates regularly scheduled bus transit services, thus meeting the eligibility criteria for TIRCP.

### **D. Expanded Project Summary**

#### **Summary:**

The UCLA/Westwood Zero Emission Transit Service Expansion will convert 8 CNG BruinBuses with 7 zero emission transit buses and 1 over-the-road electric coach, and 2 unreliable electric buses with 25ft buses. Static charging stations will be installed on 4 parking spots at the Transit Yard. 5 zero emission BruinBuses will be equipped with Electreon’s wireless receivers, and 3 BruinBus layovers shared with other agencies will be converted to static inductive stations. A Transit Hub will be built next to the new Metro station upon the Kinross induction charging site. 2 UCLA area roadways will be upgraded with dynamic wireless charging capabilities in this project: Charles E. Young Drive East and South and Westwood Plaza, both on the UCLA campus. BruinBus will expand its services on campus and UCLA will expand free transit pass offerings to all UCLA employees. This multifaceted infrastructure project aims to reduce GHGs and VMT while providing safe, streamlined connectivity to the LA Metro Rail and promoting public transit options to the UCLA community. To sustain the lifespan of the project and grow its charging network, the project team will advocate for a region-wide wireless charging standard and partner with various transportation providers serving the UCLA area.

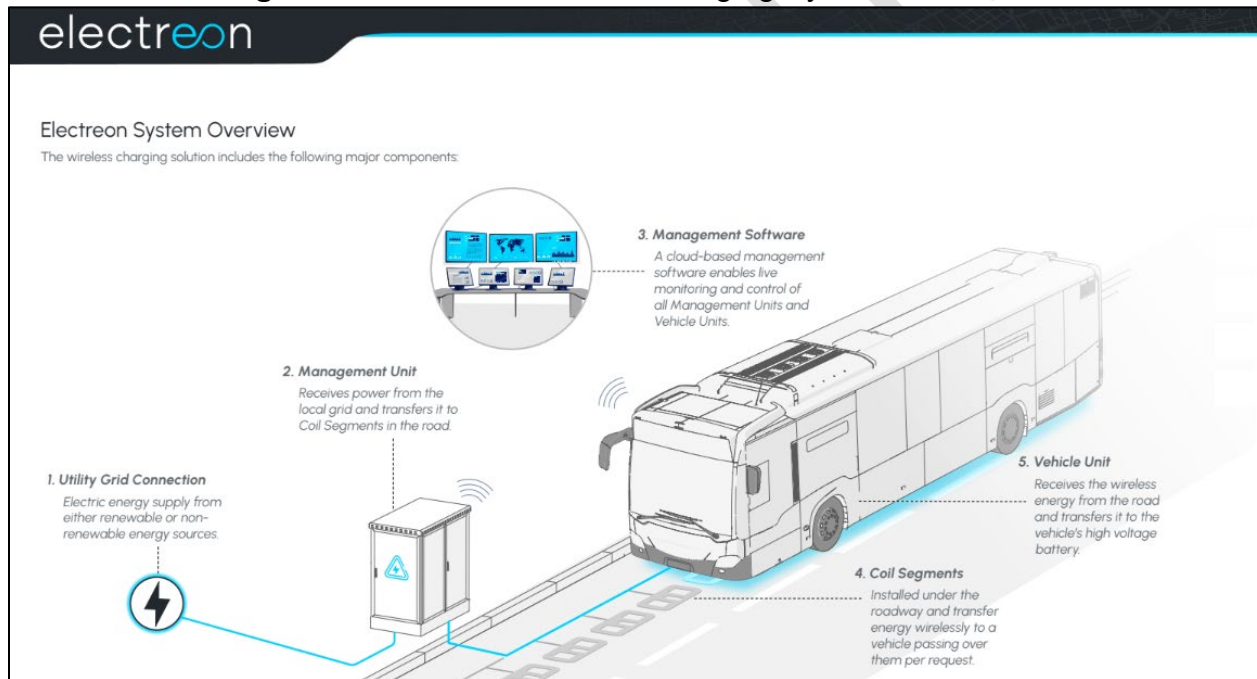
## 2024 TIRCP APPLICATION: UCLA PROJECT NARRATIVE

### Detailed Project Description:

#### *i. Transportation Challenges Addressed by the Project and Intended Outcomes:*

Los Angeles is notorious for its severe traffic congestion. The city's extensive freeway network often experiences gridlock, particularly during peak hours. This congestion is driven by a high population density, a significant number of commuters, and the widespread preference for SOVs. The heavy traffic contributes to significant air pollution, making Los Angeles one of the cities with the worst air quality in the United States. The combination of vehicle emissions and the region's geographical and climatic conditions traps pollutants, leading to smog and health issues. The high volume of vehicles accelerates wear and tear on roads, necessitating constant maintenance and improvements. As the UCLA community continues to grow each year, dedicated space for charging and parked vehicles is in short supply. But the most pressing challenge for the region is the state's transition to EVs without an effective systematic solution to charge them on a grand scale.

**Figure 1: Electreon Wireless Charging System Overview**



Electreon offers a safe, universal charging solution that works for cars while parked or driving. Its wireless receivers (vehicle unit(s)) are integrated below the vehicle chassis, and rubber-coated copper coil segments are installed under the road's top asphalt layer in selected areas. The coils are connected to Electreon's Management Unit (MU), which is connected to the grid. The power transfer takes place between the coils and the receiver(s) that connect to the vehicle battery, allowing the vehicle to charge wirelessly. Compared to traditional plug-in charging, static and dynamic charging can help UCLA and California's public transportation operators (and other fleets and subsequently private vehicles) in reducing operational bottlenecks and capital costs, thus reducing the overall

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total cost of ownership for fleets. It achieves this by minimizing battery size and cost while extending vehicle range through opportunity charging during operational hours (or in addition to overnight charging) that does not require a change in schedules or driver behavior. It also alleviates grid pressure by enabling flexible top-up charging throughout the day and night, spread across multiple locations. The system can incorporate efficient use of renewables, including on-site solar energy. This would reduce the need for expensive and delay-inducing grid upgrades at facilities. The intended outcome of deploying this infrastructure is showcase a charging solution that works with Los Angeles city infrastructure, particularly for transit agencies utilizing MD/HD ZEVs.

Another primary challenge in transitioning to an EV future is the development of adequate charging infrastructure. In UCLA's case, the campus lacks adequate power to complete this transition. UCLA's Co-generation Plan is at capacity, meaning significant utility upgrades from LADWP will be required campus-wide to be able to accommodate the influx of EVs in California over the next decade. Statewide, a comprehensive network of charging stations will be required to support this growing number. This includes fast-charging stations along highways and more charging points in urban and rural areas. However, these needs come with significant challenges. The increased demand for electricity to charge EVs puts pressure on California's electrical grid, which is already strained by frequent heatwaves and wildfires. While the cost of EVs is decreasing, they are still more expensive than traditional internal combustion engine (ICE) vehicles. Incentives and subsidies help, but making EVs accessible to a broader population, especially low-income households and DACs, remains a challenge. Many consumers are still hesitant to switch to EVs due to concerns about range anxiety, battery life, and the perceived inconvenience of charging. Increasing public awareness about the benefits of EVs and addressing misconceptions are essential for greater adoption.

Effective policies and regulations are crucial for accelerating the transition to EVs. This includes stricter emissions standards, incentives for EV purchases, investments in research and development, and call for industry-wide standards. Policymakers need to balance these initiatives with the interests of various stakeholders, including the automotive industry and consumers. Addressing the transportation challenges in Los Angeles and California requires a multi-faceted approach that includes improving public transit, upgrading infrastructure, and promoting sustainable practices. Transitioning to an EV future is a critical part of this strategy but comes with its own set of challenges that need to be carefully managed through coordinated efforts between government, industry, and the public. Los Angeles also faces the challenge of limited space for infrastructure and limited parking availability. The one-to-one or one-to-two ratio of cars and chargers is neither efficient nor effectively scalable in a place as dense as Southern California. With its extensive road network and heavy traffic, California is a hub for vehicular activity. According to the California Department of Transportation, it's estimated that over 13 million vehicles are on the road on an average day. This translates to more than 34,000 cars and trucks per lane mile. Notably, this number is highest during peak hours, typically

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between 4 pm and 7 pm on weekdays, when rush hour congestion is at its worst. A better solution that can serve many EVs at once will be necessary for the state's transition to a fully electric car market. The goal of widespread adoption of EVs poses a significant challenge to the grid infrastructure in California<sup>2</sup>. The surge in demand for electricity caused by the mass adoption of EVs could potentially strain the existing grid, leading to issues such as peak load challenges and increased strain on local power distribution networks. Electreon's wireless charging is unique to other traditional (i.e., plug-in or pantograph) EV charging competitors because it is specifically designed to reduce grid pressures while increasing adoption of EVs through flexible, enroute charging that reduces their total cost of operations while not changing the vehicle's operational schedule or driver behavior.

The policy drivers behind UCLA engaging in this grant opportunity revolve around meeting the obligations set forth in the UC Sustainable Practices Policy and AFC Regulation. UCLA has set an even more ambitious goal of electrifying its entire MD/HD fleet by 2028 in advance of LA28, to meet the UC's carbon reduction target and Sustainable Practice Policy. Currently, nearly 50 percent of the BruinBus fleet is electric with 8 CNGs remaining in need of replacement. Of the existing 7 battery electric buses, 1 has been inoperable for six months and another, of the same build, runs sub optimally. Three more electric buses, while of better quality, run on limited range. The 2 remaining buses are the newest additions to the fleet and manage the majority of UCLA's zero emission fixed route transit service. In summation, the majority of UCLA's current ZEBs cannot be relied on for a whole day of operation. Because UCLA is racing to hit its emissions reduction target, the Bus Replacement Schedule prioritizes CNG replacements before electric ones, meaning that despite being on track for electrification, UCLA will have to run zero emission services at reduced frequency because of the state of disrepair or complications associated with the 5 problematic buses, which have poor maintenance and part support.

Another significant challenge with these buses is their incompatibility with today's standard Level 3 chargers. All 5 are legacy models of the BYD brand and use a proprietary (or rather, an old European and Asian standard) charging port and cannot receive the standard CCS-Combo plug fast charge expected from direct current fast chargers (DCFCs). Electreon offers an alternative charging solution that can meet the challenges faced by early adopters of EVs. The project team intends to prevent this from happening with wireless EV charging by seeking to establish an SAE standard.

**Table 5: Bus Replacement Schedule**

Make	Model	Year	Seats	Fuel Type	Replace	
ELDORADO	EZ RIDER II	2007	36	CNG	2019	Electric
ELDORADO	EZ RIDER II	2007	36	CNG	2019	Electric
ELDORADO	EZ RIDER II	2008	36	CNG	2020	Electric

<sup>2</sup> [California grid will require major upgrade to meet EV demands: Study](#)

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ELDORADO	EZ RIDER II	2009	36	CNG	2021	Electric
ELDORADO	EZ RIDER II	2009	36	CNG	2021	Electric
ELDORADO	EZ RIDER II MAX	2010	36	CNG	2022	Electric
ELDORADO	EZ RIDER II MAX	2010	36	CNG	2022	Electric
ELDORADO	EZ RIDER II MAX	2013	39	CNG	2025	Electric
BYD	ELECTRIC BUS	2016	32	ELECTRIC	2026	
BYD	ELECTRIC BUS	2016	32	ELECTRIC	2026	
BYD	ELECTRIC BUS	2019	35	ELECTRIC	2031	
BYD	ELECTRIC BUS	2019	35	ELECTRIC	2031	
BYD	ELECTRIC BUS	2019	35	ELECTRIC	2031	
NEW FLYER	ELECTRIC BUS	2023	39	ELECTRIC	2035	
NEW FLYER	ELECTRIC BUS	2023	39	ELECTRIC	2035	



The rapid expansion of the university's zero emission fleet is overwhelming the limited number of available charging stations, as evidenced by nearly half of BruinBuses being electric in the absence of permanent charging infrastructure to support them. Currently, electric BruinBuses are being charged with portable chargers at the Transit Yard, pending the installation of 8 dual port Level 3 chargers scheduled for March 2026. This temporary solution (shown in the photo on the left) has already been proven hazardous with staff injury from tripping over the charging cords (called out in red), hence, the need for permanent charging infrastructure with fewer physical safety risks. The BYDs owned by UCLA use a different kind of plug and socket type than US standard and they also do Alternating Current (AC) to DC conversion on board instead of accepting DC from the charger, providing two different layers of incompatibility with standard DCFCs. The Transit Yard will be able to accommodate the Bruin

Bus fleets' charging needs, but the balance of UCLA's MD/HD fleet (approximately 70 vehicles) will require; unfortunately, not all locales for fleet vehicles are reasonably capable of receiving sufficient connectivity and capacity to the electrical grid.

The deployment of zero emission buses has been a rocky process with many of the early adopters experiencing significant issues in terms of stranded assets, non-standardized chargers, etc. BEB's currently cost more than ICE vehicles and are unable to replace ICE vehicles at a one-to-one ratio due to range limitations. The current plug in charging paradigm, wherein vehicles and chargers are required at a one-to-one ratio, or a two-to-one ratio becomes cost and space prohibitive at scale and obtaining sufficient grid connectivity at transit yards is often cost prohibitive or impracticable within the necessary timeframe. Further, the nighttime charging of fleets of vehicles en masse exacerbates peak period demand and greatly increases the average carbon intensity values for the electrical power provided. Per the 2024 Low Carbon Fuel Standard Annual Updates to

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Lookup Table Pathways published by CARB, the proposed Carbon Intensity Values (gCO<sub>2</sub>e/MJ) for Smart Charging or Electrolysis in 2024 and reproduced below, time of day has a significant and quantifiable impact on the intensity of greenhouse gas emissions.

**Table 6:** Proposed CI Values (gCO<sub>2</sub>e/MJ) for Smart Charging of Electrolysis in 2024

	Q1	Q2	Q3	Q4
12:01 AM - 1:00 AM	85.72	86.59	89.68	95.47
1:01 AM - 2:00 AM	85.68	84.70	86.53	91.41
2:01 AM - 3:00 AM	85.68	84.65	85.89	89.16
3:01 AM - 4:00 AM	85.68	84.63	85.65	88.71
4:01 AM - 5:00 AM	85.68	85.87	85.52	90.64
5:01 AM - 6:00 AM	91.36	94.66	87.65	102.34
6:01 AM - 7:00 AM	114.29	93.24	99.38	125.34
7:01 AM - 8:00 AM	112.49	29.65	95.42	123.85
8:01 AM - 9:00 AM	66.73	2.39	60.16	101.88
9:01 AM - 10:00 AM	30.52	1.73	7.39	40.79
10:01 AM - 11:00 AM	0.43	3.12	12.83	32.68
11:01 AM - 12:00 PM	0.00	49.54	21.65	8.00
12:01 PM - 1:00 PM	0.00	52.72	31.96	9.52
1:01 PM - 2:00 PM	0.00	54.68	44.83	11.87
2:01 PM - 3:00 PM	0.00	58.39	55.08	42.10
3:01 PM - 4:00 PM	29.93	63.36	104.30	77.72
4:01 PM - 5:00 PM	66.48	27.29	109.71	129.86
5:01 PM - 6:00 PM	110.60	31.80	136.01	151.32
6:01 PM - 7:00 PM	143.63	78.84	148.41	154.45
7:01 PM - 8:00 PM	138.45	153.41	155.80	150.29
8:01 PM - 9:00 PM	128.01	154.52	147.51	143.39
9:01 PM - 10:00 PM	106.65	131.10	125.97	128.46
10:01 PM - 11:00 PM	92.20	98.98	107.44	114.36
11:01 PM - 12:00 AM	86.21	88.62	95.54	99.91

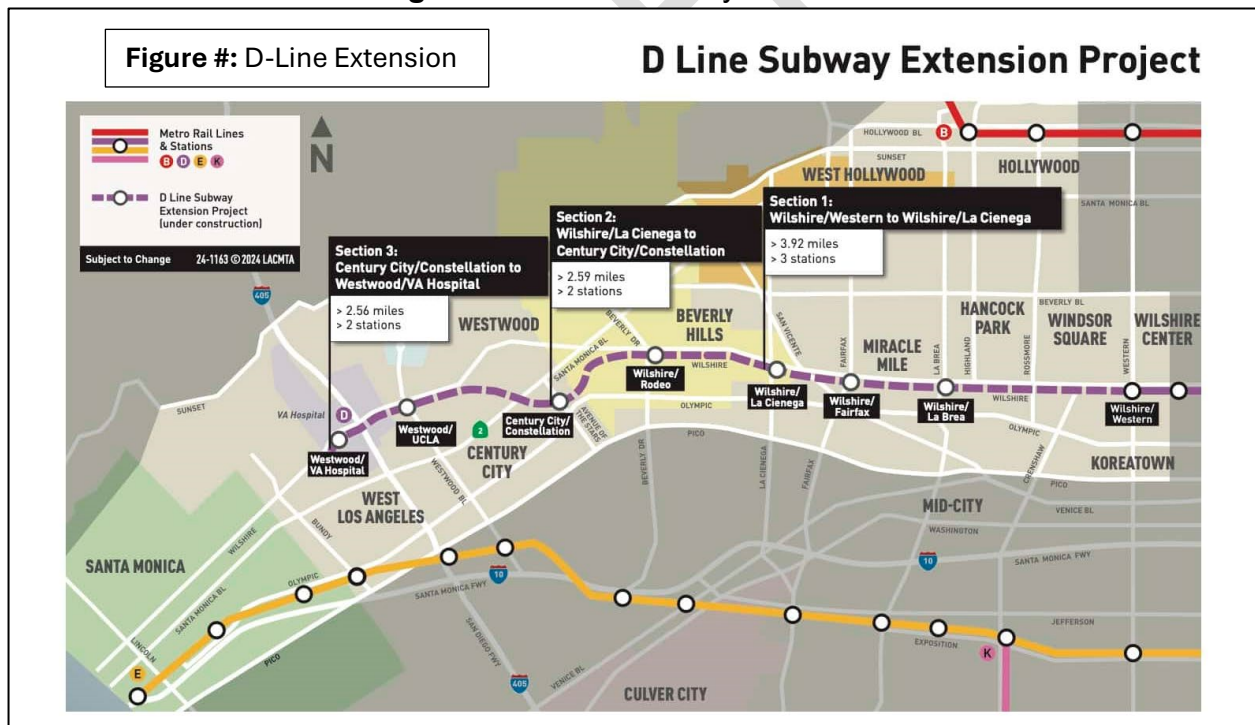
Carbon intensity values on this table range from 0 to 155.80. For the purposes of delineating a cut off between periods of “high” carbon intensity and periods of “low” carbon intensity a value of 60 (gCO<sub>2</sub>e/MJ) was selected because this provided largely consistent cut offs across the various quarters of the year, supportive of proposing uniform periods of charging timing throughout the year. The yellow lines overlaid on **Table 2** above delineate the sweet spot for “low” carbon intensity EV charging. Any EV charging that can be transitioned to the hours of 9 am until 3 pm will result in substantive greenhouse gas reductions over time. Using vehicle telematics to track charging by time of day should enable the quantification of these benefits following project deployment. This represents a real and substantive means of reducing greenhouse gas emissions, the quantification



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paradigm is likely to shift with the Metro Purple Line Extension Project, which will connect West and East Los Angeles for the very first time via light rail or subway. The Purple Line (D-Line) Extension Project will expand Metro’s heavy rail network to include the Mid-Wilshire district, Beverly Hills, Century City and Westwood by 2028. Between the D-Line and B-Line (Red Line) traveling westward from Downtown, the average boardings per weekday is 133,413 as of 2019. With the addition of stations in these major job centers in a post-pandemic environment, ridership on public transportation is expected to significantly increase. Per Los Angeles City Mayor and Metro Board Chair, Karen Bass, the D-Line extension will make Metro transit available to 53,300 more weekday riders traveling between Downtown and the Westside, an approximate projection of a 40 percent increase in ridership<sup>3</sup>. This massive shift of people opting for public transportation will significantly impact providers across Los Angeles, especially now that more Southern California residents and visitors, particularly traveling from low-income and DACs, will have easier access to the economic opportunities of the Westside. Home to one of the region’s worst traffic conditions, UCLA has a responsibility to improve the lives of Californians and its own Bruin community members and explore effective solutions for one of the city’s persistent challenges—how to mitigate traffic.

Figure 3: D Line Subway Extension



<sup>3</sup> [Tunneling Complete for LA Metro D Line Subway Extension Project](#)

Figure 4: AM Traffic Impacts

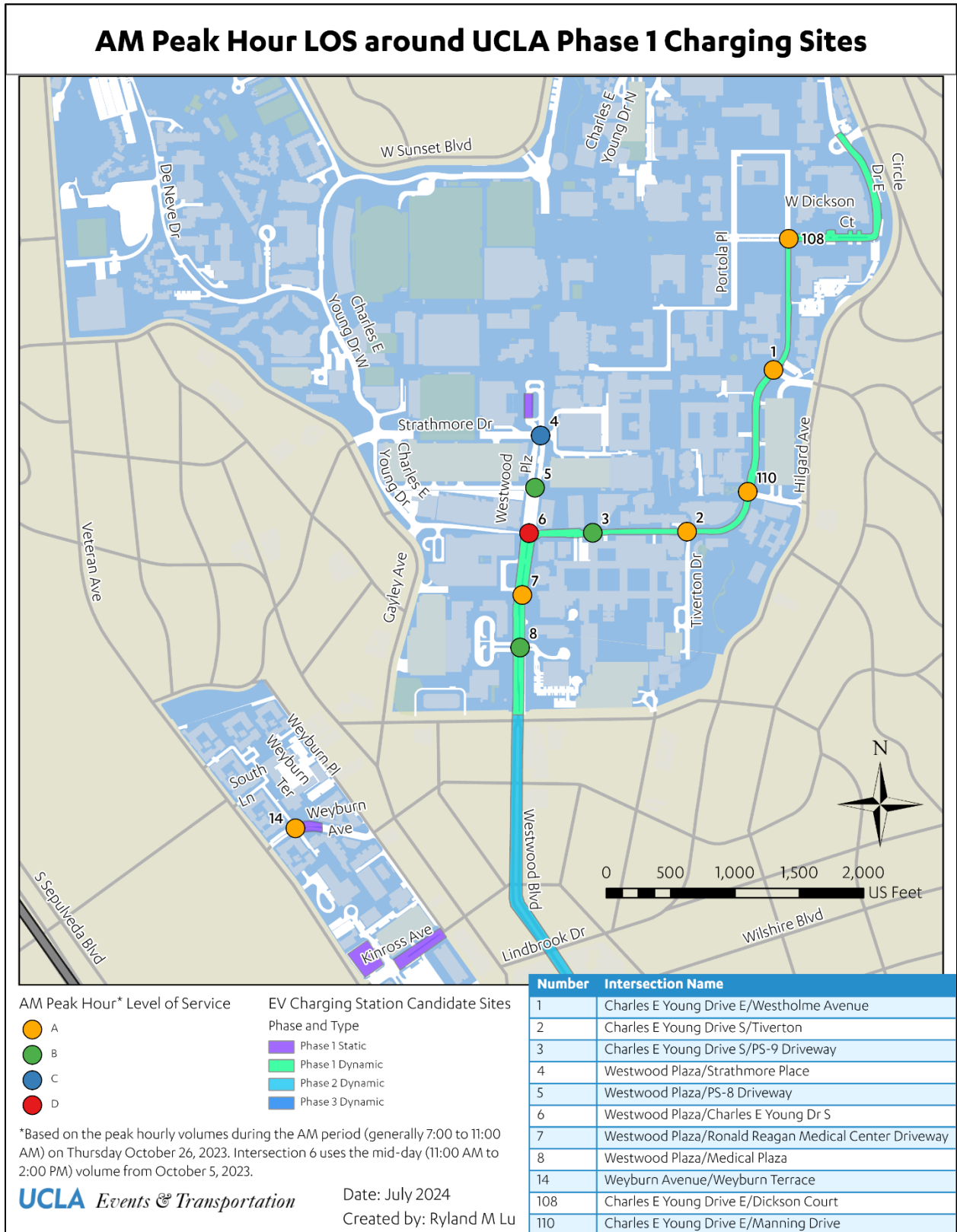
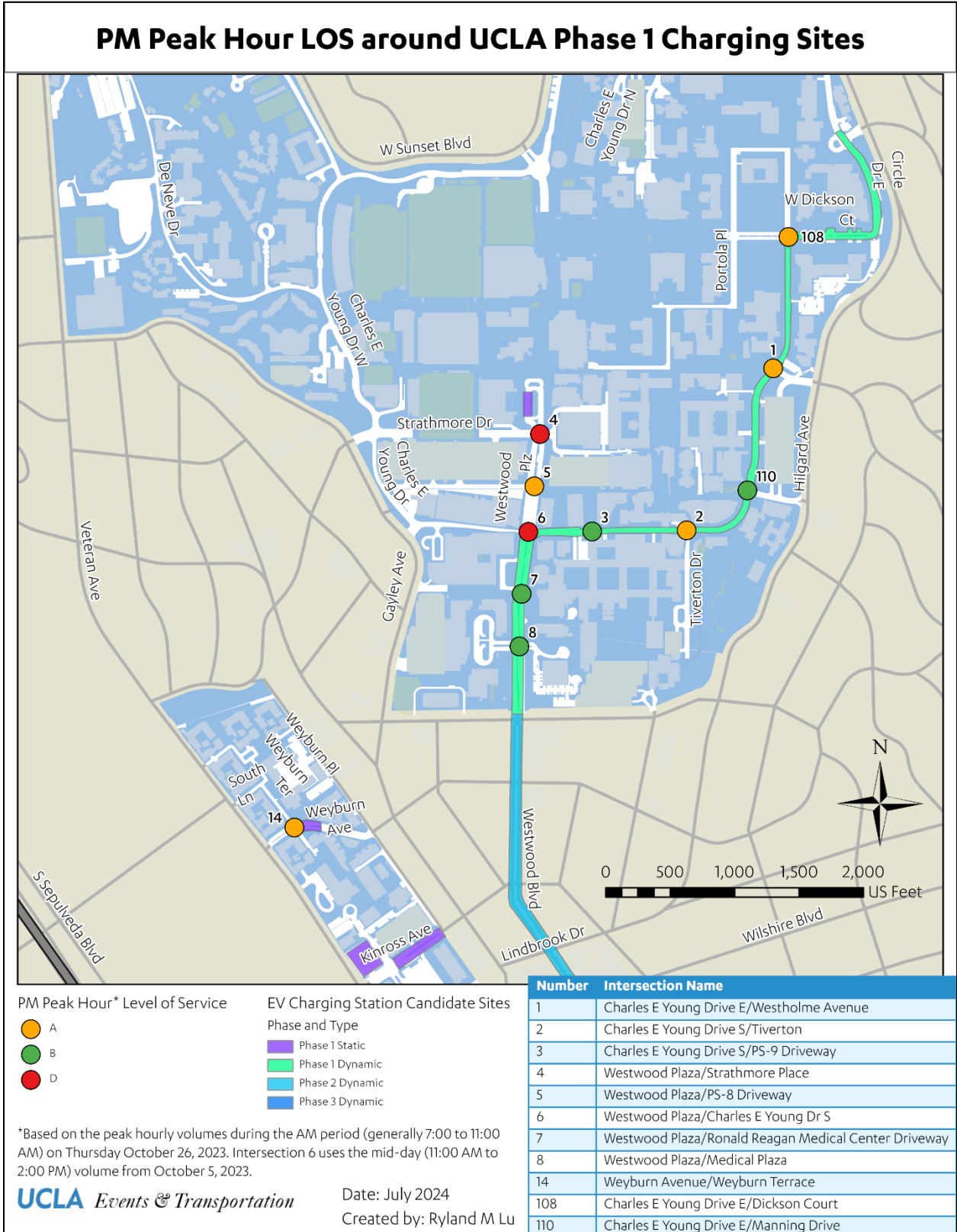


Figure 5: PM Traffic Impacts



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At UCLA, the current service frequency of BruinBus is insufficient to meet the demands of the growing Bruin community of students, employees, patients, and visitors. This is particularly evident among residents of the southwest campus and off-campus students living south of campus, who often face overcrowded buses and long wait times. Despite the challenges posed by budget constraints, a nationwide shortage of qualified bus operators, and an aging bus fleet, UCLA is fully committed to electrification, investing in infrastructure and expanding public transportation services. While UCLA has received some grant funds from the CEC's EnergIIZE program for the permanent installation of stationary DCFCs inside the bus depot, additional funding is needed to address the outstanding charging needs for the campus's MD/HD electric vehicles.

Each UCLA student body (32,000 undergraduates and 16,000 graduate students) has voted in student fees to pay for transit passes for all students every academic year; they, plus another several thousand transit using employees have established the area as one of largest transit activity centers in the region. This is evidenced by the fact that seven different public transit agencies serve the UCLA campus, along with Amtrak's Thruway Bus service and Flixbus' long-range bus service. Despite the degree of connectivity between these agencies, there remains the outstanding need to connect Priority Populations to the UCLA area and the challenge of promoting and incentivizing public transportation options. The Bruin U-Pass program for undergraduates was launched, distributing almost 20,000 public transit passes during fall quarter, while the Bruin Grad Pass program entered its fourth successful year. For a small quarterly fee, these student passes provide easy, unlimited fare-free rides throughout Los Angeles County, so students can use it for their commute to school or to explore the city, never needing a car and its associated expenses. The Commuter All Access Pass grants faculty and staff unlimited rides on the seven transit agencies other than BruinBus serving the campus and nearly all transit lines throughout Los Angeles County at an affordable price. Additionally, UCLA implemented a public transit pilot program for lower-income employees, distributing over 300 passes last year. With 54 percent of low-income employees living SB535 communities, the pilot was successful at targeting Priority Populations. Around 8 percent of employees (over 38,000) and over 24 percent of student commuters used public transit for their daily travel to UCLA last year, and both figures are higher than in 2022 when around 6 percent of employees and 22 percent of student commuters traveled by public transit. The robust growth in commutes by transit modes reflects the effectiveness of UCLA's expansion of transit pass programs.

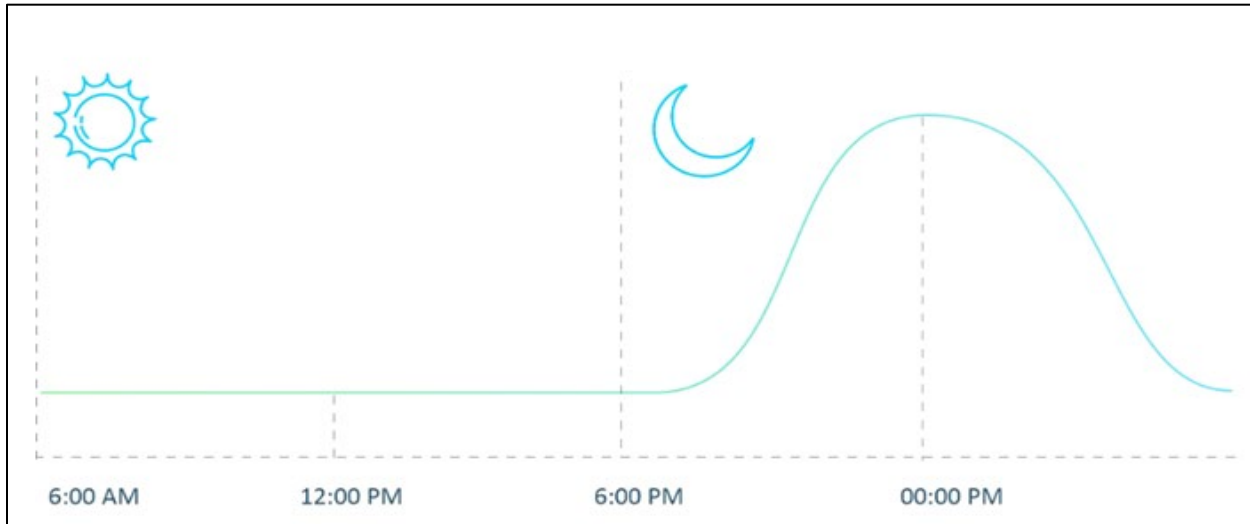
*ii. Anticipated Benefits and Expected Users and Beneficiaries (Priority Populations):*

Since the vehicles using Electreon's wireless solution can "charge-as-you-go" enroute as they drive, and because the technology can be deployed nearly anywhere along a vehicle's journey, a vehicle can utilize its idle time, whether short or long, for charging as part of an automatic, hands-free process. As a result, the vehicle can operate on smaller and less expensive batteries, benefit from a longer range, and shave peak energy demand as their charging requirements can be distributed through space and time. This

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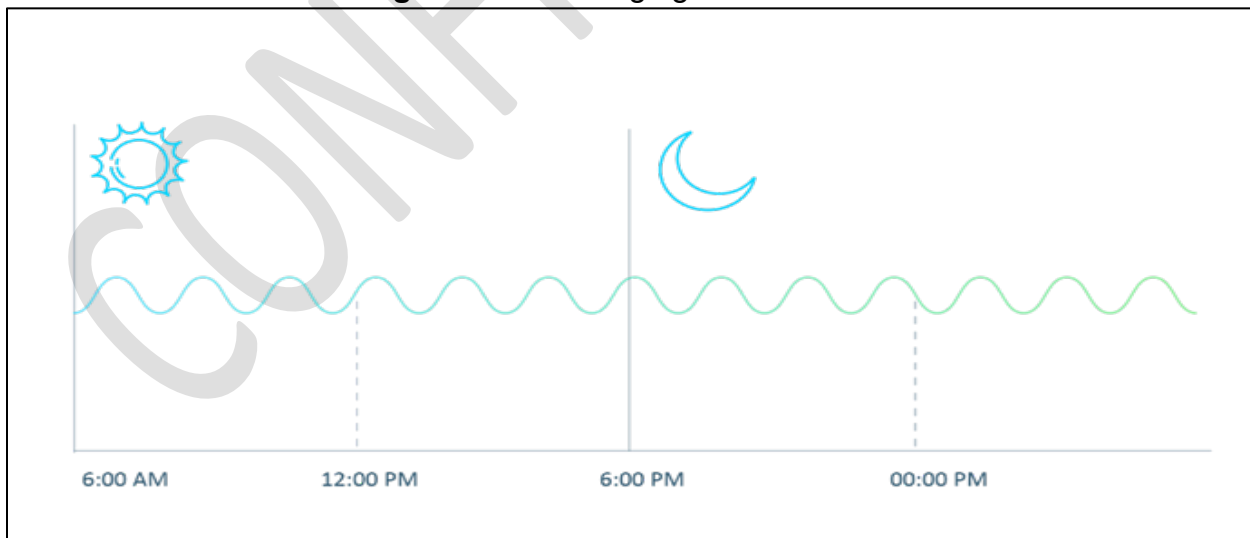
is because wireless, enroute charging occurring strategically throughout a driver's journey at scheduled short stops and stretches of roadway distributes the charging process throughout the day, helping alleviate the demand on the grid and reducing pressure, as opposed to having, for example, numerous electric vehicles in a fleet charging simultaneously at a single point in time for an extended period, i.e. from nearly empty to full batteries, resulting in large pressures on the grid.

**Figure 6: EV Charging Scenario One**



*Standard plug-in charging at fleet depots, resulting in peak fleet transport electricity demand placing unnecessary stress on the grid.*

**Figure 7: EV Charging Scenario Two**



*Time and space distributed wireless charging scenario, spreading fleet transport electricity demand and mitigating grid stress.*

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Electreon's wireless EV charging system offers a range of significant benefits that enhance the efficiency and sustainability of EV operations. One key advantage is the system's ability to enable internal combustion engine (ICE) to EV vehicle replacement parity. By increasing vehicle uptime, it allows fleet operators to extend the operational hours of EVs, reducing the need to add more vehicles to their fleet to meet operational needs previously serviced by diesel vehicles, which typically have more range. Additionally, Electreon's continuous charging approach minimizes battery degradation, leading to an extended battery lifespan and substantial cost savings on replacements.

The system also promotes automatic, inclusive, and accessible charging, making it suitable for users of all abilities with its hands-free operation. Lighter EVs with smaller batteries, facilitated by Electreon's technology, contribute to decreased road damage by causing less wear and tear on road surfaces. The wireless system is designed to require minimal maintenance, as it has fewer exposed components and is resilient to harsh weather conditions, resulting in lower upkeep costs.

**Figure 8:** Dynamic Inductive Charging Infrastructure



*Deployment of the dynamic road on 14<sup>th</sup> Street, Detroit, Michigan; November 2023.*

Moreover, Electreon's shared charging platform can charge any EV, regardless of make or model, making it a versatile and efficient solution. Multiple vehicles can charge simultaneously from a single unit, transforming roads and parking areas into charging assets. This wireless design accommodates vehicles of all sizes, unlike overhead

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systems that are limited to taller vehicles. The shared charging approach reduces the demand for individual chargers, streamlining infrastructure and resource management. Below table summarizes some of the challenges for fleet transition describe earlier and some of the benefits of wireless charging.

**Table 7: Summary of Challenges and Benefits of Wireless Charging**

Challenges for Fleet Transition	Inductive Charging Benefits
Large capacity batteries add cost and weight; operations and maintenance costs.	Lower cost of ownership due to significant reduction in capital costs of batteries, charging costs, and maintenance. Smaller battery kWh capacity results in lower cost and carbon footprint from battery manufacturing, as well as a lighter battery, resulting in an overall lighter vehicle weight; this would allow vehicles to carry more passengers and cargo and reduce deterioration of roads, as well as reduce emissions and material from battery production.
Large footprint for charging infrastructure.	Smaller footprint for charging at depots and terminals; more flexibility for hidden charging infrastructure.
Cost of energy during peak hours.	In-route charging allows for energy to be consumed throughout the day, often reducing energy costs significantly.
Lack of shared charging infrastructure – different fleet charger for each fleet vehicle type and low utilization.	Inductive charging turns roadways into shared charging assets. Electreon’s system is vehicle, model and battery agnostic.
Long operational downtimes to charge.	Ease of deployment at depot and in-route, allowing for increased driving range for full shift of daily operations.
Time and labor costs of plug-in chargers at scale.	No need for human intervention for charging saves time and money.
Battery degradation from fast charging	More frequent charging allows for lower charge rates that result in improved battery preservation. Charge management systems allow for automation and optimization of charging schedules.

As host of the Olympic Village for the LA28 Games, UCLA will be a global point of interest over the next several years while commuter throughput is expected to significantly increase, especially with the arrival of the new UCLA/Westwood Station by 2028 as part

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of Metro's Purple Line (D-Line) Extension Project. Bringing riders only 2/3 mile away from the center of campus, this massive subway extension will be the first time that Southern California residents and visitors have a direct connection from Downtown Los Angeles to the Beverly Hills, Century City, and Westwood, the region's second largest job center, by rail. Connecting the relatively job-rich West to the lower-income East side of the city will vastly expand access to opportunity, jobs, and education for disadvantaged communities (DACs). Further, most residences surrounding UCLA, many of which house students, are in LICs. This milestone will significantly increase foot traffic to Westwood Village while stimulating demand and ridership across local transit agencies, magnifying UCLA's economic impact as the largest employer in Southern California and emphasize the need for expanding public transit services and scaling up creative and efficient EV charging solutions for public transportation.

### *iii. Specific Components and Elements:*

UCLA's partnership with Electreon and CALSTART will introduce static and dynamic inductive EV street charging to the Los Angeles Metropolitan Area. As previously mentioned, the UCLA/Westwood Zero Emission Transit Service Expansion has two parallel initiatives, the first being deployment which will advance the first five transformative elements:

#### I. Zero Emission Bus Transition & Fleet Expansion:

The transition to zero-emission transit vehicles is a key component of UCLA's strategy to reduce greenhouse gas emissions (GHGs) in alignment with the UC Sustainable Practices Policy. Project Element 1 is entirely focused on the procurement of zero-emission buses (ZEBs) for the BruinBus fleet, a critical step in this environmental commitment.

This element of the project focuses on completing the conversion of the UCLA BruinBus fleet to electric propulsion and installation of inductive charging infrastructure on UCLA property. Throughout this stage, UCLA will fulfill its Bus Replacement Plan of transitioning to a fully ZEB fleet of 15 by 2028, in time for the arrival of LA28.

Currently, BruinBus has nearly half of its fleet electrified, consisting of 7 ZEBs and 8 compressed natural gas (CNG) buses. However, the fleet's operational efficiency is compromised as 1 of the seven ZEBs has been out of service for six months, and another is nearing the end of its lifecycle. These two buses, along with the eight CNG buses, need to be replaced to ensure reliable service. The plan includes procuring two cutaway buses to operate on routes where 40-foot transit buses cannot travel, thus expanding service coverage.

The reliability of ZEBs has significantly impacted the frequency of service across BruinBus routes. The downtime of electric buses has led to reduced service frequency, affecting overall efficiency and user satisfaction. Additionally, a shortage of vehicle

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operators has compounded this issue. Dispatchers are forced to make daily judgment calls on which routes to prioritize based on the day's trends and available resources. This reactive approach underscores the need for a more robust and reliable fleet as well as sufficient staffing.

To fulfill service demands, particularly with the upcoming opening of the new Metro station, hiring additional drivers is a crucial subcomponent of Project Element 1. Ensuring that there are enough operators to meet the increased demand will enhance the reliability and frequency of transit services. This proactive hiring strategy will also prepare BruinBus for the increased ridership expected during the LA28 Olympics.

Project Element 1's focus on procuring zero-emission transit vehicles is essential for meeting UCLA's sustainability goals and ensuring efficient transit operations. By addressing the current challenges of unreliable ZEBs and a shortage of vehicle operators, the project aims to enhance service frequency and coverage. The transition to a fully electrified BruinBus fleet by 2028 will not only support the university's environmental objectives but also improve the overall transit experience for the UCLA community. With strategic procurement and operational planning, BruinBus is well-positioned to meet future transportation demands and contribute to a sustainable urban mobility framework.

This project will reduce GHGs by helping convert 100 percent of UCLA's bus fleet to zero emission. With funding, UCLA could address its problematic buses concurrently while eliminating CNG emissions without having to compromise service frequency due to an out-of-commission electric bus. Additionally, a new route that can serve two purposes, a growing student population and the coordination of athlete transportation from the Olympic Village, will allow UCLA to wholistically expand its transit services for every Bruin, whether they are residents or commuters, including those from Priority Populations.

### II. Upfitting Electric BruinBuses:

The transition to sustainable transportation is a priority for UCLA, and the deployment of wireless charging infrastructure is a critical step in this direction. As part of this initiative, the project team has planned to upfit five functioning electric buses with Electreon's wireless receivers. This upgrade will ensure that these buses can begin utilizing the new wireless charging infrastructure immediately upon its commissioning. The selected buses include three legacy BYD models and two New Flyers. This selection ensures a diverse representation of the current fleet, demonstrating the versatility and adaptability of the wireless charging system across different bus manufacturers and models. equipment on BYD builds, providing a solution for legacy BYD charging.

A significant challenge in this project is that three of the selected buses are legacy BYD models, which use a "proprietary" charging port. This proprietary technology means that these buses cannot utilize the standard DCFC infrastructure commonly available. As a result, these BYD models require specific modifications to integrate with Electreon's wireless charging system. To overcome this challenge, the project team will execute a

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strategic agreement with BYD, now called RIDE. This agreement will allow the utilization of Electreon's technology, ensuring that the legacy BYD buses can be retrofitted with the necessary wireless receivers. This collaboration is crucial for maintaining the operational efficiency of these buses and ensuring they can benefit from the advanced wireless charging infrastructure, as well as meet all safety and performance standards.

With the exception of the zero emission coach, all new bus acquisitions will also be upfitted.

### III. Transit Hub & Bruin Transit Pass Expansion:

UCLA is undertaking a comprehensive initiative to enhance transit connectivity and promote sustainable transportation options for its community. This initiative involves the construction of a new transit hub on Kinross Avenue adjacent to the UCLA/Westwood D-Line Station, the installation of static inductive chargers for opportunity charging, the expansion of the Employee Transit Pass Program, and the realignment of bus lines and ride-hailing services to the new hub. Additionally, a linear transit hub with multiple bus stops and substantial passenger amenities will be constructed along Kinross Avenue.

Located adjacent to the UCLA/Westwood D-Line Station, this hub will provide seamless transfer and connectivity for heavy-rail passengers. The hub is designed to facilitate efficient and convenient access to various modes of transportation, integrating bus services, ride-hailing options, and rail connections. This strategic location aims to streamline the transit experience for passengers, reducing travel times and improving overall accessibility to and from the campus.

As part of the transit hub construction, static inductive chargers will be installed to provide opportunity charging for electric buses. This cutting-edge technology allows buses to recharge during short stops, ensuring they remain operational throughout the day without the need for extended downtime. The inductive charging infrastructure not only supports the transition to a fully electric bus fleet but also enhances the reliability and efficiency of transit services. By incorporating this innovative solution, UCLA is reinforcing its commitment to sustainability and reducing its carbon footprint. These passes will also serve as an attractor for transit agencies to partner with UCLA for a more unified regional effort for deployment.

In conjunction with the transit hub development, UCLA will expand its Employee Transit Pass Program to be free for all employees. This program is designed to alleviate commuting expenses and promote the use of public transportation. The expanded program provides unlimited rides on 26 transit agencies in Los Angeles County, including seven that directly service UCLA. By offering free transit passes, UCLA aims to encourage more employees to opt for public transit, thereby reducing traffic congestion and vehicle emissions.

To maximize the effectiveness of the new transit hub, bus lines and ride-hailing services will be realigned to connect with the hub. This realignment ensures that passengers can easily transfer between different modes of transportation, enhancing the overall

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connectivity of the transit network. The integration of ride-hailing services provides additional flexibility and convenience for passengers, enabling them to complete their journeys with minimal hassle. This coordinated approach to transit planning is expected to improve service frequency and coverage, making public transportation a more attractive option for the UCLA community.

The project also includes the construction of a linear transit hub with multiple bus stops and substantial passenger amenities along Kinross Avenue. This design features a series of well-planned bus stops equipped with shelters, seating, real-time arrival information, and other passenger conveniences. The linear transit hub is intended to enhance the comfort and accessibility of transit services, providing a user-friendly environment for passengers. These amenities are crucial for encouraging the use of public transportation and improving the overall transit experience.

The construction of the transit hub on Kinross Avenue, coupled with the installation of static inductive chargers, the expansion of the Employee Transit Pass Program, and the realignment of bus lines and ride-hailing services, represents a significant advancement in UCLA's transportation infrastructure. By integrating multiple modes of transit and enhancing passenger amenities, UCLA is promoting sustainable transportation solutions and improving connectivity for its community. These efforts not only support the university's sustainability goals but also provide practical benefits for daily commuters.

#### IV. Static Inductive Charging Infrastructure:

UCLA is committed to advancing sustainable transportation solutions as part of its broader environmental and operational goals. A key element of this commitment is the implementation of stationary wireless charging infrastructure across various strategic locations. This initiative will enhance the efficiency and reliability of the university's electric bus fleet, reducing emissions and operational downtime. The following sections detail the specific locations and benefits of installing stationary wireless charging systems.

One of the primary locations for the installation of stationary wireless charging systems is at the bus layover areas. These layover points are where buses typically wait between trips, making them ideal for opportunity charging. By installing wireless charging pads at these locations, buses can recharge during these intervals without the need for manual plug-in, thereby ensuring they remain fully operational throughout the day. This technology not only enhances the efficiency of the bus fleet but also minimizes disruptions to service due to battery depletion.

Another critical installation site for stationary wireless charging is the bus depot. The Transit Yard serves as the central hub for bus maintenance and overnight storage. By equipping this area with wireless charging infrastructure, buses can be recharged during non-operational hours, ensuring they start each day with a full charge. This setup reduces the reliance on traditional charging stations and streamlines the charging process, contributing to more effective fleet management and operational readiness.

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The deployment of static wireless charging infrastructure will extend to several key locations, including the Transit Yard, the bus bay on Weyburn Avenue, and the centrally located Gateway Plaza. Each of these sites has been strategically chosen to maximize the charging opportunities for the electric bus fleet. The Transit Yard will serve as the primary charging location during off-peak hours. The bus bay on Weyburn Avenue provides a convenient mid-route charging point, and Gateway Plaza offers a central location for buses operating in the heart of the campus. These installations will collectively ensure that buses have ample opportunities to recharge throughout their routes, maintaining continuous service.

In addition to the aforementioned locations, stationary wireless charging systems will be installed at the Kinross Transit Hub. This new hub, adjacent to the UCLA/Westwood D-Line Station, is a crucial part of UCLA's transit infrastructure enhancement. By integrating wireless charging capabilities at the Kinross Transit Hub, buses can recharge while passengers transfer between different modes of transportation. This setup not only improves the efficiency of the bus fleet but also enhances the overall transit experience for passengers by reducing wait times and increasing the reliability of services.

### V. Dynamic Inductive Charging Infrastructure:

UCLA is advancing its commitment to sustainable transportation by implementing dynamic wireless charging infrastructure along key bus lanes. This innovative technology allows electric buses to charge while in motion, ensuring continuous operation without the need for extended stops. The strategic placement of dynamic wireless charging systems on Charles E. Young Drive East, Charles E. Young Drive South, and Westwood Plaza will significantly enhance the efficiency and reliability of the university's electric bus fleet. The university's direct control over campus roadways facilitates the seamless integration of these charging systems, underscoring UCLA's leadership in sustainable transit solutions.

The installation of dynamic wireless charging infrastructure along Charles E. Young Drive East is a pivotal component of UCLA's transportation strategy. This busy thoroughfare is a critical route for many campus buses, making it an ideal location for implementing in-motion charging technology. By equipping this roadway with dynamic chargers, buses can recharge their batteries as they travel, maintaining a high level of service without the need for frequent stops. This advancement will not only improve operational efficiency but also reduce downtime, ensuring that buses can meet the demands of peak travel times effectively. Similarly, Charles E. Young Drive South will be outfitted with dynamic wireless charging infrastructure. This route, which services several important campus destinations, will benefit from the continuous charging capabilities provided by dynamic technology. The installation of these systems will enable electric buses to sustain their energy levels throughout their routes, enhancing the reliability and consistency of transit services. This technology will support UCLA's goal of reducing greenhouse gas emissions by maintaining a robust and efficient electric bus fleet.

Westwood Plaza, a central hub of campus activity, is another key location for the deployment of dynamic wireless charging. This area experiences high volumes of bus traffic, making it a strategic site for in-motion charging infrastructure. The implementation

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of dynamic charging along Westwood Plaza will allow buses to recharge seamlessly as they navigate this busy corridor, ensuring uninterrupted service and improved energy efficiency. This initiative will contribute to the overall sustainability of UCLA's transportation system, supporting the university's environmental objectives.

All dynamic charging roadway locations on campus are entirely owned and operated by the University of California. This ownership grants UCLA direct control over any changes or improvements to the road surface, including the installation of necessary charging equipment for both dynamic and static charging. This autonomy ensures that the integration of wireless charging technology can be carried out efficiently and effectively, without external constraints. The university's ability to manage these installations directly is a significant advantage, enabling rapid implementation and ongoing maintenance to meet the evolving needs of the campus transportation system.

The deployment of dynamic wireless charging infrastructure along key UCLA bus lanes represents a transformative step in the university's commitment to sustainable transit solutions. By implementing this technology on Charles E. Young Drive East, Charles E. Young Drive South, and Westwood Plaza, UCLA is enhancing the efficiency, reliability, and sustainability of its electric bus fleet. The university's control over campus roadways further facilitates the seamless integration of these systems, ensuring that UCLA remains at the forefront of innovative and environmentally responsible transportation practices.

The second initiative of this project is expansion and entails the last project element:

### VI. Coordinating Services & Deployment at Scale

The coordinating services and deployment at scale element includes planning the extension of the static and dynamic charging network to the portion of Westwood Boulevard that runs through Westwood Village, south of the UCLA campus. This Phase connects UCLA's main transit hub at Gateway Plaza to the second portal of the Purple Line Subway in Westwood, located at the intersection of Westwood Boulevard and Wilshire Boulevard (see picture 8). Static and Dynamic wireless charging will be proposed along Westwood Boulevard from Westwood Village (at Wilshire Boulevard) to the new UCLA Research Park, generally located at Westwood Boulevard and Pico Boulevard, approximately two and half miles south of the main UCLA campus.

There will also efforts to add two commuter bus service providers, specifically Antelope Valley Transit Authority (AVTA) coach bus service to Westwood/UCLA—which already uses electric buses—and Long Beach Transit, which is bringing electric coach buses online in fall 2024. AVTA buses travel more than 60 miles each way between the Antelope Valley and Westwood. Given that its commuter service provides four bus runs each morning and four bus runs each evening, AVTA has expressed interest in parking its buses in Westwood. Ideally, the buses could charge between their morning runs on the 405 and their afternoon runs in the opposite direction, avoiding the 60-plus mile each way

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deadhead runs in the middle of the day. Long Beach Transit would also employ a similar operational model should enough static charging pads be available, avoiding deadhead trips of 30 miles each way.

The D-Line Expansion Project will have a major role in realizing this, however, to further reduce SOV travel to no more than 30 percent of Bruin commuters by 2050, UCLA will need to incentivize its community to choose public transportation and experience first-hand the rapid connectivity that the heavy rail expansion will provide to West Los Angeles.

#### *iv. Expected users and Beneficiaries of the Project:*

Wireless EV charging offers economic and operational benefits to both commercial fleet operators as well as local residents and passengers. These benefits include, but are not limited to, the system's seamless installation, low maintenance, minimal disturbance to real estate and less visual, exposed hazards susceptible to vandalism, and increased service uptime for passengers through extended range.

The hands-free, automatic charging capability of the system enables vehicles to utilize idle time for charging, regardless of their location along the route. This operational efficiency not only increases vehicle availability but also reduces the need for large and costly battery capacities. As a result, fleet operators and EV owners experience lower total cost of ownership due to reduced grid connectivity requirements and optimized battery usage, leading to significant cost savings over the system's lifespan.

While initially focused on low-income residents and public transit, the project's success will ripple outward to benefit a broader range of customers. A scaled deployment of wireless charging throughout the state as a result of the seamless installation, minimal maintenance, and increased uptime of wireless charging technology can eventually extend to delivery fleets, industrial trucks, municipal vehicles, and private EV users. The vehicle-agnostic nature of the system fosters widespread adoption, allowing diverse vehicles to charge simultaneously. Future expansion to public roads, campuses, airports, and ports further accelerates the transition to electric mobility across various urban settings. This widespread adoption and infrastructure growth ultimately benefits LICs more broadly by making EVs more accessible and affordable through smaller batteries and extended range.

UCLA's strategic focus on LICs coupled with its phased approach towards broader adoption, showcases a commitment to prioritizing Priority Populations, and subsequently scaling to advance sustainable transportation solutions more broadly. This project, and the potential expansion of the solution, can result in major GHG emission reduction, not only from CNG fleet replacement but with additional benefits rarely seen, reduction in battery size, increased vehicle uptime, and therefore production and shifting the fleet charging profile from high nighttime peak demand to an even demand throughout the day allowing for much higher utilization of renewable sources in charging the fleet.

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By incorporating en-route opportunity charging made possible by the dynamic and static wireless charging systems, multiple transit and other vehicle fleets will be able to take advantage of new opportunity charging availability in Southern California’s second largest transit trip destination outside of downtown Los Angeles – Westwood and the UCLA campus. A new seamless intermodal transit transfer hub will be created at the new D-Line heavy-rail metro station in Westwood Village, enhancing safety for pedestrians and increasing the attractiveness of using public transportation to access greater UCLA campus/Westwood subarea.

UCLA Transportation’s BruinBus public transit services will be expanded, a route will be added, and service frequency will be increased. Seven different transit agencies serve the project area, including longer-distance commuter routes that will gain unique benefits from opportunity charging equipment during the midday. All these benefits will facilitate an increase in ridership, intermodal and interagency connections and directly serve the LA28 Olympic village on the UCLA campus.

### **E. Project Benefits and Impacts**

Project benefits are detailed in the following sections. The table below summarizes the primary and secondary scoring criteria, and how each project element meets the requirements.

**Table 8: Benefits Criteria**

Benefit Criteria	E <sup>4</sup>	E <sup>5</sup>	E <sup>6</sup>	E <sup>7</sup>	E <sup>8</sup>	E <sup>9</sup>
Reduce GHGs	Yes	Yes	Yes	Yes	Yes	Yes
Increase Ridership	Yes	Yes	Yes	Yes	Yes	Yes
Integrate Rail and Transit Operations	Yes	Yes	Yes	Yes	Yes	Yes
Improve Safety	Yes	Yes	Yes	Yes	Yes	Yes
Implement Sustainable Community Strategies	Yes	Yes	Yes	Yes	Yes	Yes
Benefit Priority Populations	Yes	Yes	Yes	Yes	Yes	Yes
Collaboration across Rail Operators	Yes	Yes	Yes	Yes	Yes	Yes
Achieve Geographic Equity	Yes	Yes	Yes	Yes	Yes	Yes
Consistent with Regional Planning	Yes	Yes	Yes	Yes	Yes	Yes

4 Zero-Emission Bus Transition & Fleet Expansion

5 Upfitting Electric Bruin Buses

6 Transit Hub & Bruin Pass Expansion

7 Static Inductive Charging

8 Dynamic Inductive Charging

9 Coordinating Services & Deployment at Scale

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Benefit Freight Movement	Yes	Yes	Yes	Yes	Yes	Yes
Leverage Non-State Funds	Yes	Yes	Yes	Yes	Yes	Yes
Demonstrated Financial Plan	Yes	Yes	Yes	Yes	Yes	Yes

i. *Reduce GHGs:*

As detailed in the CARB Benefits Calculator tool, which is attached to this application, the overall project will reduce 167,522 metric tons of CO2 emissions, reduce passenger VMT by 511,004,657 miles, and reduce fossil fuel usages by 16,904,594 gallons, over a 12-year useful life for the BEBs and the inductive charging infrastructure and over the 50-year useful life for the Kinross Transit Hub and Paseo connection to the METRO D-Line Westwood Station.

The full transition of the Bruin Bus Fleet to Zero Emission combined with the massive expansion of the Bruin Pass program will reduce approximately 11,483 metric tons of CO2 emissions over the project life and prevent the release of harmful emissions, including 458 lbs of particulate matter under 2.5 micrometers (PM2.5), which has a considerable health impact on the local community.

In alignment with the state’s ambitious climate goals, this endeavor is a strategic investment that targets two sustainable transportation directives outlined in the UC Sustainable Practices Policy: to implement GHGs reduction strategies that reduce environmental impact from fleet travel and to reduce SOV travel to no more than 30% of all student and employee commuters by 2050.

Table 6 shows a summary breakdown of the GHG emissions reductions across the various project components.

**Table 9:** Greenhouse Gas Reductions Overview

	<b>GHG Emissions Reductions (MTCO2e)</b>	<b>Fossil Fuel Use Reductions (gallons)</b>
Bruin Employee Transit Pass Expansion	251	25,262
Bruin Bus Service Expansion	9,830	1,016,917
Kinross Transit Hub	146,056	14,695,843
Service Coordination => Increased Transit Trips	3,958	401,520

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### ii. *Increase Ridership:*

To calculate rider inputs to appropriately calculate GHG emissions reductions, UCLA in coordination with CALSTART made various ridership assumptions. As the project has various components, this section is organized by the major components and subcomponents.

***Bruin Employee Transit Pass Expansion:*** Last year, UCLA significantly expanded public transit access for employees and students alike. The affordable new Commuter All Access Pass grants faculty and staff unlimited rides on the seven transit agencies other than BruinBus serving the campus and nearly all transit lines throughout LA County. UCLA also expanded partially subsidized transit pass offerings to employees in the lowest salary band, distributing over 300 passes during 2023. Last year, nearly 28,000 (27,960) public transit passes were distributed or sold to UCLA employees and students during fall quarter, an all-time high for UCLA Transportation. Over 2,000 (2,097) passes were distributed to employees and nearly 26,000 passes were given or sold to undergrad and graduate students. The Bruin U-Pass and Bruin Grad Pass subsidized student pass programs were, by far, the most popular transit products – with 19,690 and 5,937 orders placed, respectively.

In 2023, UCLA Transportation introduced the Bruin U-Pass, a student fee-based quarterly transit pass for all undergraduates, these student passes provide easy, unlimited fare-free rides throughout LA County, so students can use it for their commute to school or to explore the city, never needing a car and its associated expenses. The Bruin U-pass program for undergraduates distributed almost 20,000 public transit passes to student during the fall quarter, while the Bruin Grad Pass program entered its fourth successful year. These new programs greatly improved access to campus for members of the Bruin community who might otherwise have challenges paying for either a transit pass or private mobility to campus. These university programs aim to enhance sustainability, access, and equity.

As part of its commitment to transportation equity UCLA conducted the Student Mobility Survey in November 2023, during the fall quarter, which is considered to be the period of peak campus activity and population, some of the most pertinent findings from this survey are captured in the [UCLA State of the Commute 2023](#):

Compared with the previous year, the biggest change in student commuting was the increase in public transit trips. Public transit student commutes increased from under 22% in 2022, to 24.4% in 2023. Drive alone commutes, by contrast, decreased from over 25% of trips in 2022, to 19.3% of trips in 2023. The inverse trends in public transit and drive alone mode splits indicate that the Bruin U-Pass program has been successful at encouraging off-campus students to switch from driving to transit use for their commutes. Whereas driving alone had the largest non-walking student mode share in 2022, public transit accounted for the largest non-walking mode in 2023.

Despite these many gains and UCLA's standing offer of one free quarter of transit to any employee interested in trying transit, 39.8% of UCLA employees commuted by SOV in

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2023. Encouraging employees to shift to transit is the primary motivation behind UCLA's ambitious plan to move forward with one consolidated employee pass that is fare-free, all-access, unlimited rides for any TAP agency in 2025. Reducing the share of employees and students traveling by SOV to less than 30% by 2050 is part of UCLA's Sustainability goals and is increasingly critical considering the area's burgeoning congestion.

***Bruin Bus Service Expansion:*** During Fall Quarter 2023, almost 20,000 students resided in on-campus housing (19,634), including nearly 18,000 undergraduate students (17,798) and over 1,800 graduate students (1,836). This amounts to a 27% increase from 2019, when fewer than 15,500 students resided on campus. More Bruins live in UCLA Housing's on-campus residential halls and apartments than ever before. The record-setting resident student population reflects the university's guarantee of up to four years of housing for first-year undergraduate students and two years of housing for transfer students. This guarantee was enabled by the opening of Olympic and Centennial Halls, two new undergraduate housing complexes on the Hill, and the Southwest Campus and Gayley Heights apartments in 2021.

The Bruin Bus Service open to the public and is used by many navigating the UCLA campus. The Bruin Bus Service was one of many campus operations that was dramatically impacted by the COVID-19 pandemic. As the onsite UCLA population fell service levels were pared down in response to decreased demand and due to difficulty finding and maintaining qualified drivers on staff. As in person classes and student life resume the Bruin Bus Service seeks to resume operating at pre-pandemic levels by:

- ***Increasing Service Frequency on U1 by 50%***
- ***Doubling Service Frequency on U2***
- ***Reinstating U3***

To serve the record number of students living on campus and in the adjacent North Village student housing buildings, UCLA is replacing two of their 40-foot ICE transit buses with two 25-foot battery electric cut-aways. This will allow the Bruin Bus to provide service on a new flexible North Village Route which travels from the center of the UCLA campus to Westwood North Village, the primary undergraduate housing cluster outside of the residence halls. Full size transit buses were unable to safely navigate this densely developed residential area on the steep and aptly name Hill. This route seeks to reduce dependency on Transportation Network Company (TNC) use and ease vehicular congestion while enhancing ridership on the other Bruin Bus routes by providing one or more stops proximate to housing.

This expansion of zero-emission service will be made possible through a combination of Battery Electric Vehicle and infrastructure investments. Insufficient access to adequate power at existing facilities is a prevalent issue faced by transit providers seeking to transition to Battery Electric Bus operation. As is the current inability for BEBs to replace ICE vehicles on a one-to-one ratio without access to midday opportunity charging. Further, the limitation of plug-in chargers needing to be paired with vehicles on a one-to-

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one or one-to-two ratio adds significant capital costs to the fleet transition process and exacerbate existing space limitations in transit facilities. To overcome these obstacles UCLA seeks to deploy Static and Dynamic Inductive chargers in strategic campus locations.

Kinross Transit Hub: UCLA has long been working to minimize congestion in and around campus, per the Westwood Bus Study completed by UCLA in 2023, since 1990 UCLA's population has increased by 54% and its built square footage has increased by 39%, despite this vehicle traffic to/from campus has decreased by 17% over the same period. UCLA has become such a thriving nexus for transit providers that on an average weekday 906 buses ply Westwood Blvd alone. This has spurred UCLA Transportation to sponsor a study on options to de-densify bus volume along this corridor. When LA Metro completed the Environmental Impact Report for the Purple Subway Extension (Section 3) Uber and Lyft were barely a consideration. Metro's First/Last Mile Plan addresses bicycle and pedestrian elements but not transit operations. This study contemplated numerous potential transit hub locations that might integrate the Purple D-line, which will connect to Westwood Station in 2028, with the confluence of bus services while spreading some of the Westwood Blvd bus trips across less heavily trafficked roads. Due in large part to Metro's construction timeline and their concurrent use of Lot 36 for construction staging well into the future, Kinross was determined to be the most viable option.

This Transit hub will be located on Kinross Ave. between Lot 36/Rehab Center Driveway and Gayley Alley, a road that is conveniently owned and operated by UCLA. The Kinross Transit Hub takes advantage of the planned installation of static inductive chargers for 8 buses to charge during layovers and invests in a series of system integration improvements to drive ridership, including two Pavilions, four benches, four LED Screens displaying real time arrivals, and critically a Paseo connecting the Metro Westwood Station to the Kinross Transit Hub in a manner both safe and comfortable to pedestrians. Once complete the Kinross Hub should be capable of through putting 54 peak hour service arrivals in each direction, easing the congestion on Westwood Blvd and providing an opportunity for transits operating Commuter Bus services, such as Antelope Valley Transit Authority (AVTA) a place to safely layover their 4 over the road coaches rather than deadheading 120 miles each during peak congestion. The cost and congestion savings realized from these vehicle miles reduced is compelling; AVTA has requested permission to use the hub to layover and operates an all BEB fleet, in the future they may wish to avail themselves of the static charging infrastructure as well.

Additional significant emissions benefits are expected to be realized by shifting night time peak period charging to daytime charging, lessening peak period demand and substantially decreasing the Carbon Intensity values through increased renewable energy availability. As part of the proposed CALSTART Study Assessing the Deployment of Inductive Charging at Scale and Lessons Learned we intend to quantify EV charging shifted to the hours of 9 am - 3 pm and demonstrate that load shifting as a project

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component results in substantive greenhouse gas reductions over time. Using vehicle telematics to track charging by time of day should enable the quantification of these benefits following project deployment. This represents a real and substantive means of reducing greenhouse gas emissions, the quantification of which will be instrumental in conveying the true environmental benefits of inductive charging technology.

### *iii. Integrate State's Transit and Rail Operations:*

In the next decade, UCLA will see the development of a new Kinross transit hub situated between the Transit Yard and the UCLA/Westwood METRO rail station, which will realign local transit operations and ride hailing services to Kinross Ave. The proposed Kinross Transit Hub includes the construction of a Paseo, a walkway connecting the Kinross Transit Hub to the LA Metro D-Line via the Westwood station. When the Westwood station comes online in 2028 the influx of riders from the METRO D-Line will further bolster the multitude of opportunities for partnership and connectivity with other agencies and providers in the greater Los Angeles area.

The Pacific Surfliner already provides rail service between LA and San Diego, including service to LA's Union Station (800 North Alameda St). CC6R the Rapid 6 Green Line connects Westwood Boulevard & Weyburn Ave to LAX and the city bus center (1.5 miles from Union Station). The UCLA Westwood @ Weyburn station ties to Union Station in Downtown LA by transit via multiple bus routes connecting to Expo/Sepulveda on the METRO E rail line which can be taken to Historic Broadway where you can take the METRO A line to Azusa to get to Union Station.

### *iv. Improve Safety:*

Several injuries have occurred on site at the Transit Yard due to obtrusive charging cables. Mismanagement of charging equipment has caused operational issues with buses in the past, taking them out of rotation for maintenance. Eliminating the need to interface with the charging equipment mitigates the risk of mishandling it. Operating underground and with minimal exposed components, Electreon therefore recedes visual hazards such as wires or surface changes that can pose risks to drivers and pedestrians. This design also ensures durability against various weather conditions that could otherwise impact and damage exposed charging infrastructure, enhancing road safety, reducing depot hazards, and minimizing disruptions in service (Electreon's wireless power transfer efficiency is not significantly affected by extreme temperature, wind, rain, or road surface debris). Furthermore, in terms of operational safety, Electreon's technology minimizes the risk of electrical accidents and trip hazards associated with traditional plug-in stations' cables and cords. With no physical connection required, there's no risk of cables being damaged or causing obstructions in parking areas or depots, reducing safety hazards from open outlets or connectors as well.

Electreon's solution builds grid resiliency by optimizing its use. The system's ability to facilitate flexible charging throughout the day and at multiple locations reduces the

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concentration of charging demands at specific times and locations. This distributed approach minimizes the likelihood of grid overload during peak hours, thereby enhancing grid resilience without necessitating costly infrastructure upgrades. By enabling vehicles to charge seamlessly while in motion or during scheduled stops, the system mitigates the strain on the grid that typically occurs with conventional plug-in charging, which tends to concentrate energy demand at specific times, such as evenings, at a specific location, such as the overnight bus garage/depot.

Electreon's smart grid management software also improves grid safety by Through the utilization of the Open Charge Point Protocol (OCPP), Electreon's system integrates with smart grid technologies to optimize charge management and curtailment. Real-time data exchange and control capabilities allow for dynamic adjustments in charging profiles based on grid conditions. For instance, during periods of high demand or grid constraints, the system can intelligently manage charging loads, prioritizing critical needs and ensuring efficient utilization of available grid capacity.

The system's distributed charging approach, coupled with the ability to charge vehicles throughout the day and in various locations, effectively spreads out energy demand over time and space. This reduces the magnitude of sudden spikes in energy consumption, especially during peak demand periods. By avoiding simultaneous charging of numerous vehicles at specific points, the system helps flatten the demand curve, ultimately leading to reduced peak demand and alleviating pressure on the grid infrastructure for the entire city/community.

v. *Implement Sustainable Community Strategies:*

The UC Sustainable Practices Policy is the campus's strategy to mitigate the impact GHGs by calling for vehicle and campus electrification as a GHGs reduction strategy. Widespread adoption of EVs will require a strategic and sustainable approach to charging. Plug-in charging in many cases does not meet the needs of larger fleet vehicles, including buses and trucks. These vehicles are major contributors to pollution, and electrifying them will have significant environmental benefits. Electrification of these vehicles will require charging solutions that are sustainable, scalable, cost-effective, and meet operational needs of the fleet. The global EV adoption needs to consider the high carbon footprint of battery manufacturing; each kWh of battery production has a carbon footprint, and requires a coordinated supply chain and materials sourcing effort in order to produce. In addition to this, the emissions related to electricity generation and storage from traditional grid sources, as well as the notion that millions of plug-in chargers will need to be manufactured for hundreds of millions of EVs that will take to the roads in the next decade, does not underline electrification as a sustainable long-term strategy.

Electreon's shared charging platform that can charge multiple vehicles simultaneously lessens the need for large-scale development of plug-in chargers, many of which operate on a one charger to one vehicle ratio and whose manufacturing at a large scale would generate added CO2 emissions. Providing a charging solution that can be deployed on-

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route, anywhere, in any setting, along any journey - will help reduce the need for larger kWh sized batteries, as driving range is extended, ultimately leading to a significant reduction in carbon emissions in battery manufacturing when deployed at scale.

While standards for wireless charging are still in development and expected to be published in 2025, this is not a risk for the project itself but rather an important factor for the broader wireless charging market. Electreon is proactively involved in shaping these standards through its leadership and active participation in relevant SAE committees (eg. co-chairing J2954/3), ensuring its alignment with future benchmarks and contributing to the development process.

### *vi. Benefit Priority Populations*

This project will directly benefit the student LICs near campus that BruinBus serves. The project will also benefit employees residing in DACs by providing free transit passes in advance of the opening of the Purple Line station.

### *vii. Collaboration Across Rail Operators*

UCLA is not collaborating with rail operators but connecting campus infrastructure to the LA Metro Rail, which connects to Union Station. Amtrak and Metrolink are connected to Union Station, meaning that commuters from the Westside can access commuter and intercity rails without having to switch modes of transportation.

### *viii. Achieve Geographic Equity*

West Los Angeles is a major job center in the region. Metro's Extension Project will provide connectivity with these areas which have traditionally been less accessible via public transportation. For the first time, East and West Los Angeles will have a major rail connecting them, increasing opportunities to the neighboring Priority Populations along the Purple Line.

### *ix. Consistent with Regional Planning*

Electreon's technology is able to facilitate the integration of renewable energy sources, such as solar panels, into the charging process. By strategically deploying wireless charging infrastructure along routes or in locations with access to renewable energy generation, the system can utilize clean energy sources from solar panels along the roadway. This approach minimizes reliance on non-renewable energy sources during charging, contributing to environmental sustainability and reducing the overall carbon footprint of electric vehicle operations.

### *x. Expected Ridership Benefits*

Employees would have access to free transit passes every quarter for the next five years, incentivizing them to continue taking public transit. Riders would have the benefit of safe transfers between heavy rail and bus or walking to campus.

### *xi. Impact on Other Transit Services*

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Looking far ahead into the future, UCLA will also be a primary destination for the Sepulveda Transit Corridor Project, a major service being developed to connect the San Fernando Valley and the Westside. The natural barrier created by the Santa Monica Mountains makes traveling along this corridor a significant challenge for cars, and even more so for public transportation. Transit modes do not offer a sufficiently timely option for many commuters traveling from the San Fernando Valley. The development of a new rail providing rapid connectivity to the UCLA campus will relieve traffic congestion in the region.

### **F. Disadvantaged Communities, Low-Income Communities, and/or Low-income Households**

UCLA has a significant level of social and economic diversity within its undergraduate and graduate student populations. As many as 6,200 (6,246) students registered in Fall Quarter 2023 came from a DAC. DACs in Los Angeles with high concentrations of these students include areas with good transit connections, like Koreatown and West Adams. UCLA Transportation provides low-cost and no-cost transportation for all students, especially for Bruins from disadvantaged backgrounds.

UCLA employs 13,439 staff members residing in Senate Bill 535 (SB 535) Disadvantaged Communities, 7,255 of which make less than \$70,000 a year. **Figure 12** shows DAC zip codes with the most Tier 1 employees (income of \$68,000 a year or less) and **Figure 13** shows the DAC zip codes with the most employees. The City of Hawthorne, surrounded by three freeways, is the most impacted region for Bruin employees encompassing DAC and LIC Priority Populations.

To help address GHGs in these communities, UCLA implemented a public transit pilot program for lower-income employees, distributing over 300 passes last year. The purpose of the pilot was to aid and improve commutes for some of the lower paid positions within Administration, many of whom reported that public transit was their only means to work. The effort proved to be a success and will continue as a strategy to promote public transit options among UCLA employees to reduce GHGs and increase ridership among the seven partnering transit agencies serving Westwood. With TIRCP funds, UCLA aims to make these employee transit passes free for all employees for the duration of the grant to incentivize the transition from SOVs to public transportation in anticipation of the new UCLA/Westwood Metro station.

In 2023, UCLA assessed the accessibility of campus by transit from DACs. It was found that during peak evening hours, a UCLA student can commute by transit from campus to the northern edge of Palms (a neighborhood popular among students) within 30 minutes. During both morning and evening peak hours, students living in the rest of Palms, the greater West Los Angeles area, West Hollywood (along the Sunset Strip to approximately La Cienega) and as far east as West Adams (along the Metro E Line) can commute to and from campus by transit in 45 minutes or less. These 45-minute travel time areas

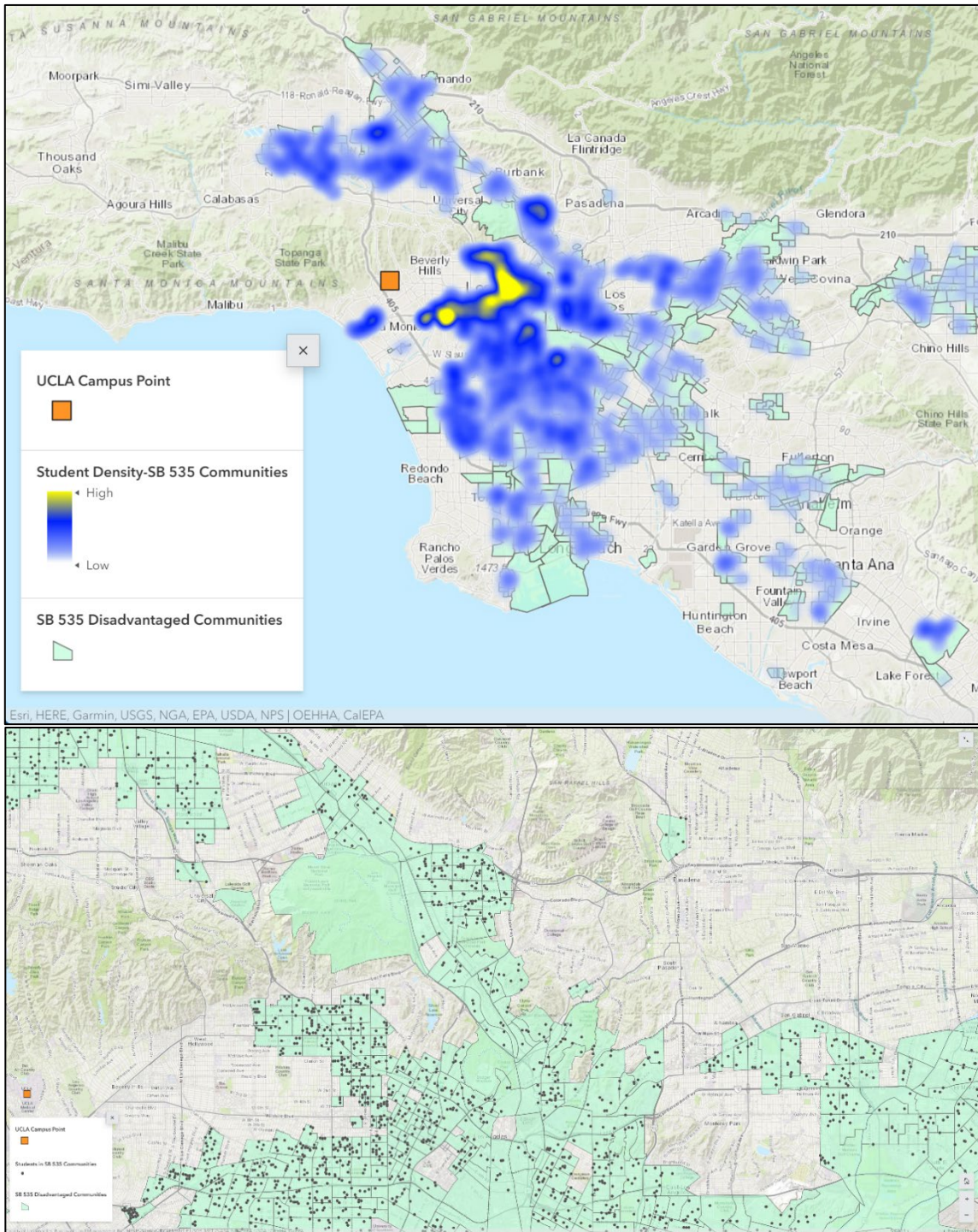
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include DACs in the Santa Monica Pico neighborhood along the E Line (Expo) through Palms and into West Adams. For students traveling between campus and South Los Angeles (off Metro's E and K Lines), Mid-Wilshire, and Culver City, the morning and evening commutes are within 60 minutes. During peak morning hours, students residing in DACs in Hollywood can reach campus within 60 minutes as well. The morning and evening peak hour travel time areas both reach numerous DACs in the Mid-City and South Los Angeles areas.

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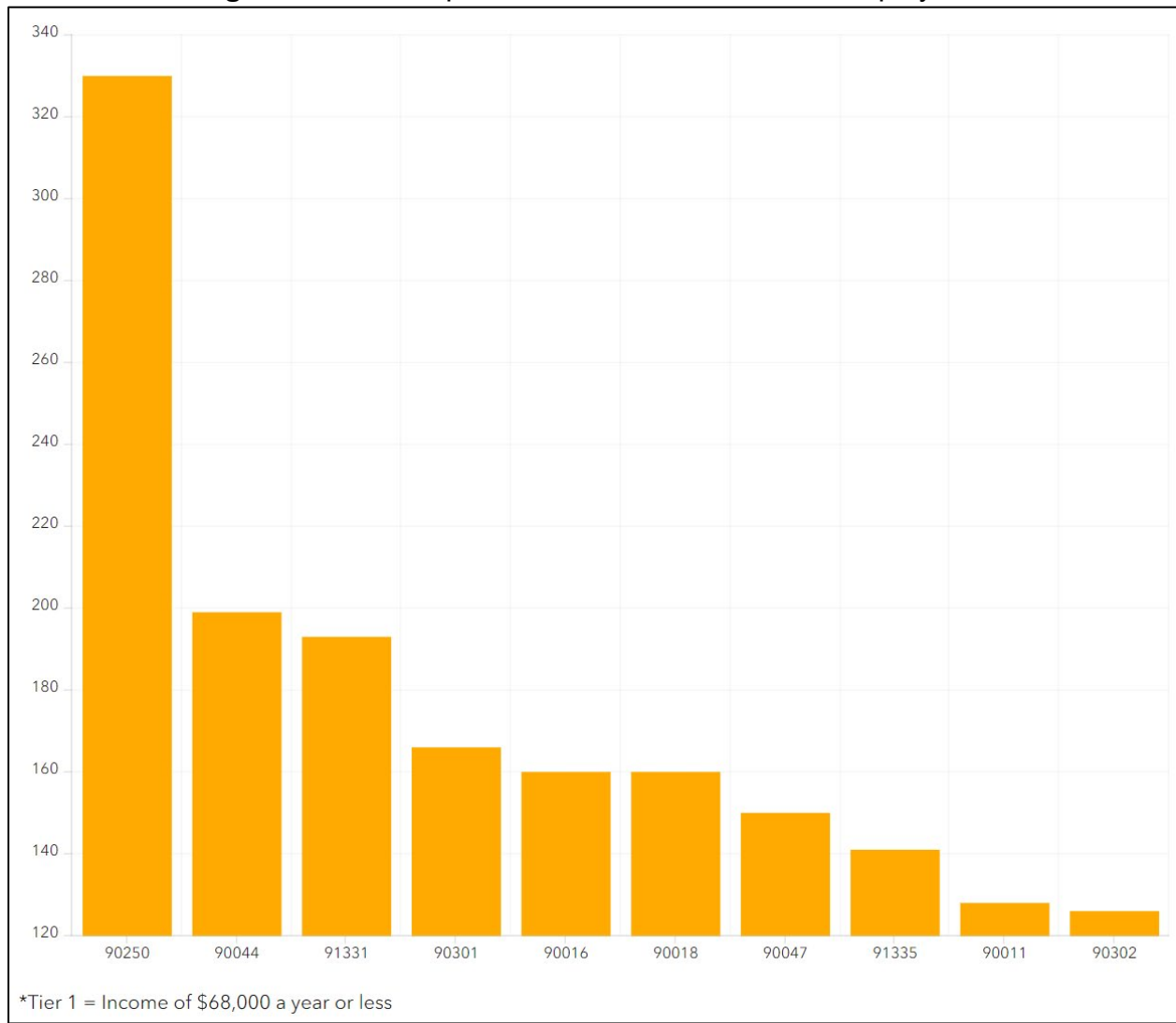
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**Figure 11: Map of SB535 UCLA Students Living in Disadvantaged Communities**



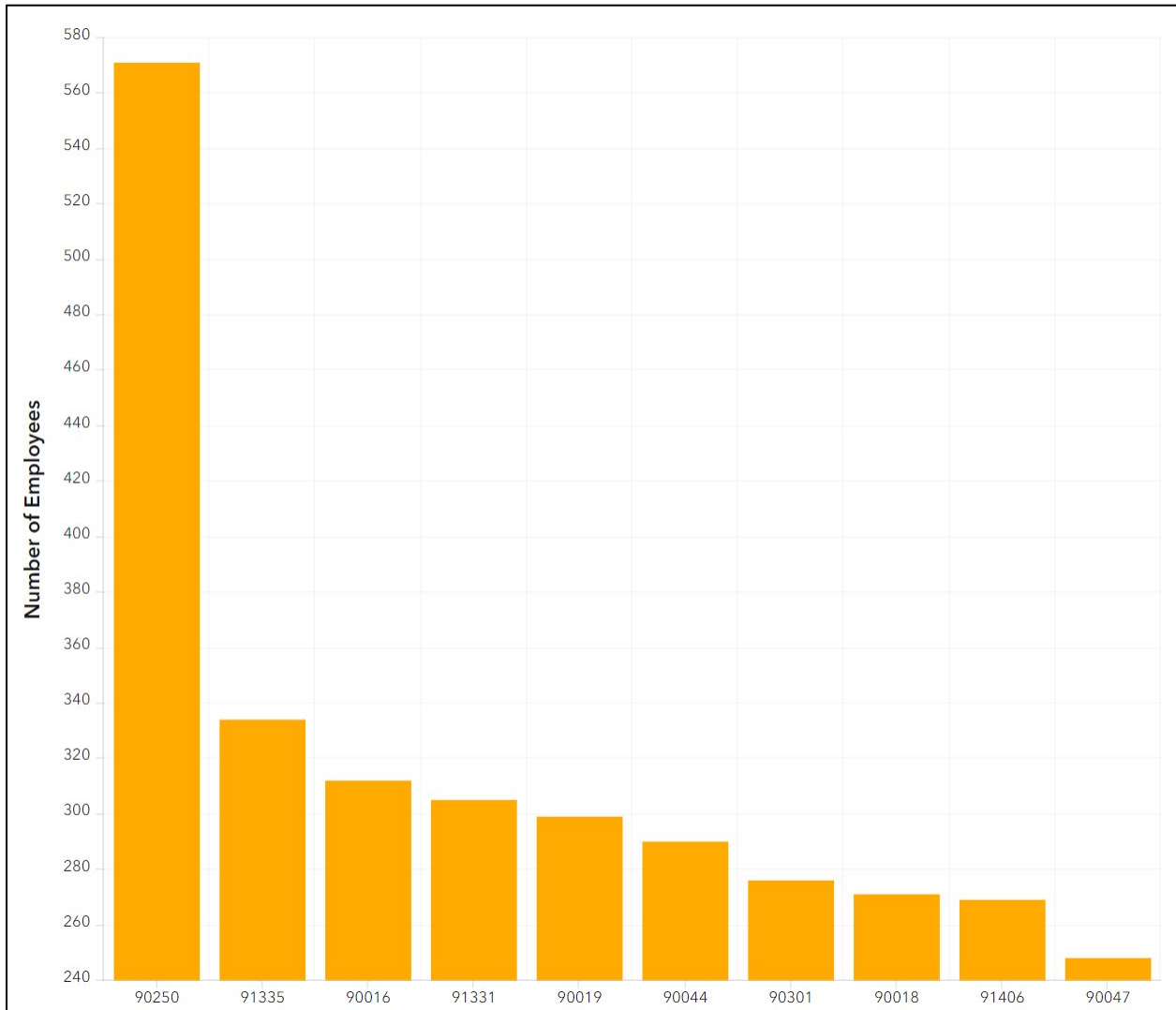
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**Figure 12: DAC Zip Codes with the Most Tier 1 Employees**



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**Figure 13: DAC Zip Codes with the Most UCLA Employees**



### **G. Employment and Workforce Development and Training Benefits**

The University of California takes pride in its ongoing commitment to working effectively with its labor unions. Currently, UC negotiates with fifteen systemwide bargaining units and eight unions. As of April 2024, there are over 137,000 represented employees in systemwide bargaining units.

This project will provide significant employment and workforce development benefits, particularly for priority populations. UC's commitment to workforce development is evident in its various training and apprenticeship programs. The agreement between the University and Teamsters Local 2010 includes provisions for the establishment of apprenticeship programs in multiple trades and crafts, such as electricians, plumbers, and sheet metal workers. These apprenticeships not only provide on-the-job training but also ensure systematic classroom instruction, enhancing the skill set of the workforce

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and preparing them for long-term career opportunities. The University supports career advancement through structured programs. The Teamsters Local 2010 and the University have established a Professional Development Working Group specifically for the Skilled Trades Bargaining Unit at UCLA. This group is tasked with developing career development programs that enhance the skill sets of employees to meet departmental needs. This project specifically aims to benefit priority populations by incorporating inclusive hiring practices and offering targeted training programs. The university's policy includes a two-thirds reduction in educational fees for employees, encouraging continued education and skill enhancement. Moreover, initiatives like the Professional Development Working Group focus on creating tailored career development programs to meet departmental needs and support employee advancement.

The budget allocated for the wireless EV charging infrastructure planning and construction is substantial, reflecting UC's adherence to union agreements. These agreements ensure that employees receive fair wages and benefits, which include healthcare, retirement plans, and professional development opportunities. By aligning the project budget with these agreements, UC not only supports fair labor practices but also enhances the quality and sustainability of the workforce involved in the project. UCLA is experienced in recruiting, hiring, training, and integrating new staff to ensure that employees are qualified to provide quality, safe services to the Bruin community.

### **H. Proposed Project Implementation and Project Management**

Data collection to validate the impact of the project for these customer segments will involve a comprehensive assessment of ridership patterns, transit usage data, bus technical data (such as extended range from charging, improved operational service, energy consumption rate, and charging times during the day). Surveys, interviews, and collaboration with both the transit agency that will operate the bus fleet and local residents will aid in refining these estimates and validating the project's impact on the served customer segments.

**Table X: Project Timeline**

Timeline	Year 1	Year 2	Year 3	Year 4	Year 5
Project Element I: Procurement of Zero-Emission Bus Replacement and Fleet Expansion	Start Q1		End Q1		
Project Element II: Upfitting Electric Bruin Buses	Start Q1	End Q1			
Project Element III: PLANNING AND CONSTRUCTION Kinross Transit Hub	Start Q2		End Q1		
Project Element III: OPERATION AND MAINTENANCE Kinross Transit Hub			Start Q2		End Q4
Project Element III: OPERATIONS of Buses			Start Q2		End Q4
Project Element IV: PLANNING AND CONSTRUCTION Transit Yard Static Inductive Charging Infrastructure	Start Q3	End Q2			

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Project Element IV: PLANNING AND CONSTRUCTION Gateway Static Inductive Charging Infrastructure	Start Q3	End Q4	
Project Element IV: PLANNING AND CONSTRUCTION Wayburn Static Inductive Charging Infrastructure	Start Q3	End Q4	
Project Element IV: OPP AND MAINT Static Inductive Charging Infrastructure		Start Q2	End Q4
Project Element IV: OPERATIONS of Buses		Start Q2	End Q4
Project Element V: PLANNING AND CONSTRUCTION Dynamic Inductive Charging Infrastructure	Start Q1	End Q2	
Project Element V: OPP AND MAINT Dynamic Inductive Charging Infrastructure		Start Q3	End Q4
Project Element V: OPERATIONS of Buses		Start Q3	End Q4
Project Element VI: LA28, Phase 2 and Phase 3 Planning	Start Q1		End Q4

### **I. Project Readiness**

As a government agency, the UC is required to comply with California Environmental Quality Act (CEQA) and typically acts as both the project proponent and Lead Agency. UCLA’s Assistant Director of Environmental Planning for Capital Programs in coordination with the UC Office of the President will make any determinations regarding the appropriate level of CEQA review. For projects in California, an Environmental Impact Report (EIR) is often required under the California Environmental Quality Act (CEQA). The EIR details the potential environmental impacts and outlines measures to mitigate those impacts. Other processes for infrastructure projects may include an Environmental Impact Assessment (EIA) to identify the potential environmental effects of a proposed project. This assessment considers impacts on air and water quality, noise, wildlife, vegetation, and more.

UCLA, specifically, has its own sustainability policies and practices, such as aiming for LEED certification for buildings, reducing greenhouse gas emissions, and conserving water, which further align its infrastructure projects with environmental protection requirements.

UCLA already has partnerships with the seven transit agencies serving Westwood and plans to form an advisory group to discuss expansion and shared use opportunities. Of those agencies, AVTA has provided a letter of commitment to this endeavor. UCLA has also received a letter of support from Pilar Schiavo, representing Santa Clarita Valley in California’s 40th State Assembly district.

Electreon is prepared to provide full support for the wireless infrastructure elements of the project, from route analysis to infrastructure design. CALSTART is a renowned non-

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profit organization dedicated to accelerating the transition to clean transportation. Their extensive experience in implementing advanced transportation technologies and clean vehicle programs ensures that the project is guided by industry-leading knowledge and practices. With decades of experience, CALSTART has successfully managed and executed numerous large-scale transportation projects. Their involvement indicates that the project has the strategic oversight and operational expertise needed to meet its goals efficiently and effectively. CALSTART's established relationships with key stakeholders, including government agencies, private sector partners, and research institutions, enhance the project's ability to secure necessary resources and support. This network is invaluable for facilitating collaboration and overcoming potential challenges. CALSTART provides critical technical and logistical support, from planning and deployment to monitoring and evaluation. Their comprehensive approach ensures that all aspects of the project are meticulously planned and executed, minimizing risks and maximizing impact. As an organization with a successful history of securing funding for clean transportation initiatives, CALSTART's involvement signals strong potential for attracting additional financial support. This access to funding is crucial for ensuring the project's financial stability and sustainability. CALSTART is at the forefront of innovation in the clean transportation sector. Their inclusion in the project team ensures that the latest technologies and best practices are integrated into the project, enhancing its effectiveness and future-proofing the infrastructure. CALSTART's mission aligns closely with the project's objectives of reducing emissions and promoting sustainable transit solutions. Their commitment to sustainability further underscores the project's alignment with broader environmental goals and policies. Having CALSTART on the project team unequivocally demonstrates project readiness by bringing in expert leadership, technical support, extensive networks, and a proven track record of success. Their involvement ensures that the project is well-positioned to achieve its objectives and deliver substantial benefits in clean transportation and sustainable transit solutions.

Wireless charging has been implemented in many other countries as well as the state of Michigan, but not in California. Conditions between US states vary similarly to conditions across countries, with Michigan and southern California having distinctly different climates, costs, and challenges. A general lack of awareness on how inductive charging systems integrate with roads, vehicles, and grid infrastructure, as well as the perceived risk associated with both new technology and given the unpredictability of the EV market, is a challenge for potential adopters. The lack of a wireless charging standard is also a major barrier to introducing this technology on a large scale. Formulating a standard and adopting it at scale involves the coordination of multiple stakeholders, and the associated costs, benefits, and challenges will be highly localized. An at-scale deployment in one of Los Angeles economic, educational, and employment centers provides the perfect conditions to showcase the transformative potential for the region.

The wireless infrastructure can provide shared-use opportunities with other operators, as well as reduce the potential hazard of obtrusive equipment. One of the most distinct

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features of Electreon's wireless solution is the hidden infrastructure beneath the surface of the road, making it safe and appealing option for EV charging. The level of strain that EV charging infrastructure can cause on the electrical grid is also a major safety concern, especially since human society is heavily dependent on electricity as a resource. Electreon's wireless solution can reduce that pressure by spreading energy demand over space and by charging during off-peak times and at times when there is renewable energy generation.

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