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EV Access thru EV Lowriding

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Executive Summary

Sacramento Academic and Vocational Academy (SAVA), a 7th-12th grade public charter school, will build its first electric vehicle (EV), a customized 1964 Chevorlet Impala with an all electric drivetrain and a hydraulically operated suspension system. The suspension allows each corner of the chassis to have individually controlled height adjustment. The lowrider holds significant cultural relevancy within communities of color, and will be built by youth in an underserved community with guidance by academic, private, and public sector partners. This demonstration project will support the development of a new EV pathway within SAVA's Transportation department. The project utilizes the latest in engineering tools and resources for design and development, creating useful course content for education and training. This type of culturally significant EV project will promote awareness and adoption of EV vehicles within communities of color, and will be the first EV lowrider to be showcased in traditional lowrider car shows.

1.0 Electric Vehicle Access through EV Lowriding

California is instituting aggressive goals to lower carbon emissions. Part of the initiative includes banning the sale of new internal combustion engine (ICE) equipped light-duty vehicles by 2035. EVs need to be accepted by all, and accessible to all, specifically, to underserved communities of color. Lowriders, steeped in California history, were engineered by marginalized populations. They were built by the community, and are a visual demonstration of art,identity, and cultural pride. The EV lowrider will be built by youth in the community, guided by professionals that also live and work in the community, and will showcase EV technology. Both traditional lowrider craftsmanship and innovative technology will be leveraged to create familiarity, affinity, and adoption of the electric vehicle revolution.

A lowrider is a customized car with a lowered body that emerged among Mexican American/Chicano youth in the 1940s [1]. Lowrider also refers to the driver of the car and their participation in lowrider car clubs, which remains a part of Chicano culture and has since expanded internationally and inclusively to different ethnic backgrounds and cultures. Representing a rich heritage, these customized cars have become moving artworks, having been painted with bright colors, intricate designs, and unique aesthetic features such as shiny wheels, chrome plating, hand-painted murals, and its traditionally lowered vehicle height. A growing car enthusiast community has been thriving since the lowrider's inception. Many diverse cultures have also adopted the Chicano lowrider culture, which led to the birth of long-standing automobile clubs and local businesses designed to support these vehicles, and an inter-generational narrative that has been passed between generations of families living in underserved communities.

In 1958, California saw the emergence of the Chevrolet Impala, which featured an X-shaped frame that was perfectly suited for lowering and modifying with hydraulics [2]. Local jurisdictions began to enact laws that made it illegal to operate modified cars with any part lower than the bottoms of its wheel rims. Customizers began developing ways of bypassing these restrictions through the use of hydraulic pumps and valves that allowed lowriders to change the ride height. Lowriders continue to be a symbol of Mexican American/Chicano identity, community building, expression, pride and education. Similar to the muscle car era of the late 1960s and early 1970s that shaped a generation of enthusiasts, celebrities and cultural icons, lowriders have also shaped Californian history by having families pass on years of engineering, design, and cultural pride.

1.1 Preparing our Youth for the ElectricVehicle Revolution

The Northern California region economy will grow by 6% through 2025 and the advanced transportation and logistics industry is expected to add 6,972 new jobs in this timeframe [3]. Building infrastructure and vehicle electrification will generate 100,000 new jobs statewide annually over the next 20 years [4]. The California Mobility Center, an academic, private and public consortium in Sacramento, is expected to generate 6,500 green jobs over the next seven years to meet vehicle electrification demands in CA.

The EV lowrider project will help meet the above need by developing a high school EV auto conversion curriculum that will prepare students entering the workforce or post secondary training programs in the clean energy field. The lowrider car is a strategic component of this project, since SAVA serves a predominantly Hispanic demographic; and lowriders have a strong cultural significance to the Sacramento Hispanic community. SAVA serves a very diverse student population (55% Hispanic, 28% African-American, 70% low-income, and 23% pecial education). SAVA's model provides access to underserved populations ensuring all students have access and opportunities to train for high skill, high wage careers in clean energy which pay on average 29% higher than the statewide median wage [5].

In partnership with SAVA, the Sacramento Lowrider Commission, Sacramento Metropolitan Air Quality Management District (Sac Metro Air District), California Auto Museum, Sacramento lowrider community, and Sacramento Municipal Utility District (SMUD) are using this EV lowrider as a culturally-relevant learning tool to promote zero emission vehicles (ZEV) and clean energy jobs to an under represented community. SAVA and its collaborating partners will create unique opportunities to bolster the clean energy workforce and ensure the next generation of the workforce is as diverse as the communities served by the school.

2.0 The EV Lowrider project —– Innovating Traditional Lowriders

A gas-powered vehicle will be converted into an electric vehicle. This EV conversion will be completed by students at SAVA under the guidance of instructors, community mentors and industry experts.

The EV lowrider will be used as a rolling classroom in the community. This project will inform underserved communities about job opportunities in the clean energy field and promote the importance of EV's throughout the region. Students and consortium partners will present at community events detailing the process of converting a gas-powered vehicle to an EV and its impacts on the environment, community, and youth.

2.1 The EV Lowrider Project — Engineering Background

The vehicle will be designed using physics based modeling to help size and select automotive grade hardware for the powertrain, and accurately predict vehicle perfomance. The high voltage battery system features active monitoring to capture metrics for readiness towards second life use cases. The theory, technology and methods introduced will guide the community with additional training and education towards green energy related jobs. The engineering behind the EV lowrider began with a formation of system performance requirements using the 1964 Chevrolet Impala. Estimations of drivable range, top speeds and auxiliary loads all have direct impact on overall battery sizing and capacity. Aside from the drivability of the vehicle, the additional features of the vehicle which make the Impala into a "lowrider" include items from automotive aftermarket including electrical loads from audio equipment and a hydraulic suspension system. Along with the aftermarket equipment, the general chassis will focus on electrical load safety, convenience, and comfort.

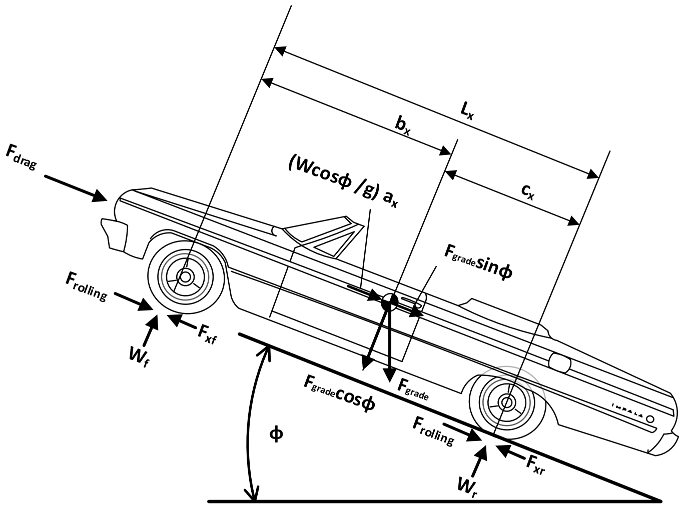
Additionally, the physical operating conditions of the lowrider involve low frequency/high amplitude vibrations and motion from the hydraulic suspension equipment.

2.1.1 Drivetrain

The powertrain of the EV lowrider will consist of an electric motor, and a gear reduction or transmission. The output of the transmission will be coupled via driveshaft to a fixed final drive ratio of the rear axle that is retained from the stock Impala. To replace the fuel system that traditionally fed the gasline internal combustion engine, batteries will be used to store the electrical energy/fuel.

The sizing and selection of those components begins with a free-body diagram depicting the loads imparted onto the body while driving. The summation of forces is summarized in **Figure 1** and **Equation 1**.

Fig. 1: 1964 Chevrolet Impala EV lowrider free-body diagram



(eq.1) $F_{tractive} = F_{drag} + F_{RollingResistance} + F_{angle}$

The frontal area (A) of the impala is determined with physical measurements. This value is used along with the aerodynamic drag coefficient (Cd) and generalized air density (ρ), velocity (V) to formulate the drag force defined in **Equation 2**.

(eq.2) $F_{drag} = Cd* \rho *A*(V^2/2)$

The four tires of the vehicle create a friction force that resists the vehicle motion, considered as rolling resistance. The compound of the tires against pavement is approximated by a dimensionless coefficient of friction (C_r). The formula for the the resistive forces are a function of the vehicle mass (m) and gravity (g) in **Equation 3.**

(eq. 3) $F_{RollingResistance} = m*g*Cr$

As the vehicle is driving and subject to loads from any incline or road elevation change, an additional resistive force is generated due to the angle of inclination (ϕ). The force generated while on an incline is shown in **Equation 4.**

(eq. 4) $F_{angle} = m*g*\sin(\phi)$

2.1.2 Electrical Subsystem

The electrical subsystem is divided into two isolated systems: Low voltage (LV) (12Vdc), and high voltage (HV) (400Vdc). The LV system supports chassis level hardware, while the isolated HV system supports the traction drive and power electronics.

2.1.3 LV: Safety, Comfort and Convenience

The LV circuit of the lowrider will consist of factory safety and convenience features including headlights/high beams, turn signal lights, horn and interior lights. However, with the addition of a high-power audio system and hydraulic pump for the suspension, the LV loads will exceed most power limits of vehicle alternators. With a high voltage bus on the vehicle, a high output DC-DC converter will be used to convertHV into useful LV.

The vehicle will be stationary when it's displayed, but will be capable of engaging the hydraulic suspension and high-power stereo system during shows, events, and promotional activities. will. To handle the high 12V DC loads, the vehicle will be equipped with a 4kW DC-DC step down converter. The the DC-DC converter specifications are identified in **Table 1**. As part of the LV wiring, the controller area network (CAN) communication system will couple all HV components to the vehicle control unit (VCU). To ensure minimal electromagnetic interference (EMI), the CAN cabling will include braided isolation.

Table 1: 1964 Chevrolet Impala EV DC-DC Converter

Parameter	**Value**	**Unit**	**Notes**
Input voltage	Min: 240 Max: 430 Nominal: 350	Vdc	
Input Current	19	A	Continuous output requirement of battery
Output Voltage	Min: 9 Max: 16 Nominal: 13.5/14.4	Vdc	
Output Current	229-278A	A	
CAN Communications	J1939, Low: 250 kBit/s High: 500 kBit/s		

2.1.4 HV- Propulsion, Safety, Energy Storage and Charging

The HV system, which includes the DC-DC converter, will operate at a nominal 400Vdc. The HV bus will support the propulsion system powering the vehicle. The system includes a single 3 phase permanent magnet synchronous motor through an inverter.

For safety, a series of system diagnostics will be performed by the VCU and power distribution unit (PDU). The will remain electrically isolated from the LV system through continual resistance checks performed by the VCU. All HV cabling will include an interconnecting high voltage interlock system (HVIL) to automatically disable the HV system through the PDU, should any physical case occur of disconnection. All HV cabling will be also isolated from EMI in a similar manner as the CAN network, with braided HV cabling.

The traditional gasoline fuel tank will be replaced with a lithium nickel cobalt aluminum (NCA) chemistry battery, using 21700 cells. The battery will supply power to the HV bus, with thermal and performance management through the battery management system (BMS). The BMS is divided into hardware at the cell and master level. The cell hardware safely captures and broadcasts individual temperatures, voltage and current delivery to the master BMS. The master BMS determines any voltage imbalance or temperature change which may impact system safety, to safely direct the PDU and internal battery contactor to open and prevent power throughput.

Charging of the vehicle will allow for SAE J1772 Level 2 input. The charging system will allow up to 208V / 50A to replenish battery capacity. Charge control and PDU protection will be managed by the VCU and the J1772 protocol for pilot / proximity detection.

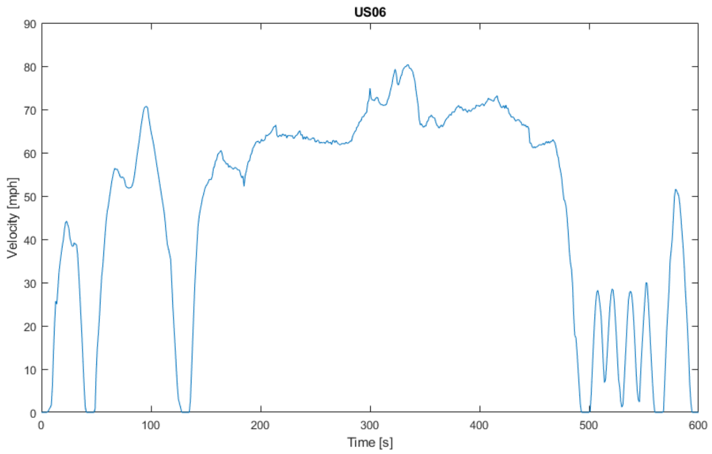
2.1.5 Thermal System

Thermal performance of all HV hardware will be optimized through a LV CAN enabled variable flow rate coolant pump used to support flow through all power electronics, propulsion, and battery system. A series of temperature measurements will ensure the sufficient flow through closed loop control of the pump through the VCU.

2.1.6 Physics Based Modeling and Simulation

The vehicle powertrain sizingwill be optimized using MATLAB/Simulink to replicate the system performance using the values defined in **Equation 1.** Physics based modeling will enable replication of system hardware performance to help capture peak and continuous power demand. The vehicle parameters will be used and simulated with Environmental Protection Agency (EPA) test cycles used for vehicle validation. Such cycles will include various city, freeway and mixed loop conditions. For example, the test cycle US06 route includes a combination of high and low speed operations as shown in **Figure 2.**

Figure 2: 1964 Chevrolet Impala EV Lowrider EPA Test Cycle, US06



Based on the combination of audio, cabin and hydraulic system electrical loads, the simulation created an approximation of 0.44kWh / mile. Based on modeling, simulation results, and the goal of approximately 100 miles of range, the project will require approximately 40-45kWh of useable capacity.

While the modeling and simulation provide insight into expected system performance, further enhancement of the model allows for VCU development using model-based control. The results also helped provide performance requirements for hardware including the motors and battery. Due to the nature of the project, off the shelf solutions (OTS) for subsystem power electronics were selected. The motor selected has a potential for 80kW of continuous power, and up to 225kW of peak power. The unit will operate at a nominal 350V and can use up to 300A continuously. Based on the performance expectations, the battery must have the potential for 350A, and up to 600A peak for 30 seconds. Due to the availability of second use batteries, a used battery from a production EV was used.

2.1.7 Mechanical Integration

An EV conversion with a vehicle of this vintage requires minimally evasive methods to incorporate the system hardware. Computer aided drafting (CAD) allows for precise location and fitment of system hardware, along with further analysis for additional mounting and fixtures added to the vehicle using finite element analysis (FEA). Traditionally, a vehicle of this vintage is not designed for EV hardware hence 3D scanning will be used to help optimize space constraints and component layout. Furthermore, the high impact suspension loading conditions of the lowrider hydraulic system were modeled to support design of additional vibration.

2.1.8 Calibrating and Tuning

The EV lowrider powertrain and system design is still currently under development. Upon completion, the final assembly will be validated using a 4 wheel drive hub dynamometer (dyno). The dyno allows for continual operation in a controlled, safe environment by coupling the hydraulic based units directly on the hub of the vehicle. The advantage of such a design reduces complications with friction and tire displacement found with roller type dyno systems.

Further testing and analysis will also include charging and HV safety, isolation and functional safety measures commonly found with ISO26262.

3.0 EV Access through Transformative Projects

The EV Lowrider project will support the creation of an EV pathway that will excite Sacramento's diverse communities about the EV revolution. The EV Lowrider will be used as a rolling classroom in underserved communities. This project will bring awareness of job opportunities in the clean energy field and help promote the importance of EVs and the green revolution throughout the region. EV students and consortium partners will present at community events and workshops detailing the process of completing an EV conversion, share the environmental impact of converting a gas powered vehicle to an EV, and promote EV programs.

3.1 Education

The EV Lowrider project will support the creation of an EV pathway across the consortium that will:

- Increase the workforce in our region with qualified applicants to fill high demand clean energy jobs. SMUD alone needs to fill 3600 positions in the Sacramento region to meet their zero carbon emissions goal by 2030.
- Ensure the green revolution is equitable and accessible to all demographic groups by providing training and access to highwage, high skill clean energy jobs to underserved populations. This project will help close equity gaps in CTE enrollment across our region and increase graduation rates of those same subgroups. Data from the California Department of Education shows SAVA's significant underserved populations have graduation rates lower then the statewide average of 83.6% (Hispanics - 80.5%, African American - 72.5%, Low Income - 80.4%, Students with disabilities -68.6%).
- Align SAVA's EV pathway to clean energy with similar programs from American River College and support students in the matriculation process to further their training at the post secondary level.
- Convert a gas-powered vehicle into an electric vehicle. This EV conversion vehicle will be completed by students at SAVA under the guidance of pathway instructors, community mentors and industry experts.
- Provide and expand mentorship opportunities to students from consortioum partners (American River College, California Mobility Center, SMUD, Sacramento Lowrider Commission and Sac Metro Air District to help design the conversion project.

In addition to developing a two year EV pathway aligned to industry standards and feeds into local post secondary programs. The project sponsors will present the pilot project at various innovation, engineering, auto, and lowrider shows and conferences on:

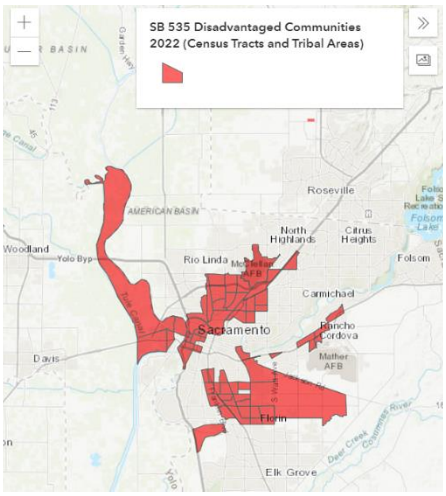
- Idea origination
- Significance/applicability
- Curriculum and module development process and descriptions
- Scalability, replicability
- Lowrider demonstration
- Early-stage community feedback and interest
- National/International interest- roadshow, exposure
- Student experience

3.2 EV Adoption in Underserved Communities

While showcasing the EV lowrider in the community, the promotion of EV programs are also necessary, especially in underserved communities that lack public transportation systems. EV Programs like the Sac Metro Air District's Our Community CarShare (OCCS) program provides innovative zero emission transportation solutions in underserved or disadvantaged communities (DACs) by providing a fleet of electric vehicles. This program makes electric vehicles available at a discounted rate to low-income community members around the Sacramento region. OCCS' mission is to raise awareness and educate the public on the benefits of electric vehicles, strengthen local economies by providing a zero-emission transportation option, and reduce emissions from traditional internal combustion vehicles in the Sacramento region. The OCCS is funded through local Sac Metro Air District and Cap-and-Trade dollars from California's Climate Investments that fund projects that help reduce greenhouse gas emissions, reach the State's climate goals, and provide economic benefits to DACs, who have historically been disproportionately reliant on public transportation or have faced economic burdens of owning and maintaining personal vehicles.

Sacramento's Clean Cars 4 All (CC4A) is an incentive program offered to income qualified residents in disadvantaged communities. The program provides financial incentive grants to help residents retire their old vehicles and replace them with zero or near-zero emission vehicle or transit cards. Depending on income and mobility options, participants can receive up to $9,500 for the purchase of an eligible new or used vehicle or the lease of an eligible new vehicle. Participants can also opt-in for transit cards instead of vehicles. CC4A can help Californians transition to clean vehicles and enjoy the clean air and cost-saving benefits zero emission vehicles provide. California is committed to reducing greenhouse gas emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. Reducing transportation emissions is a huge part of meeting the state's goals since transportation sector accounts for 40% of California's emissions.

Figure 3. SB 535 Disadvantaged Communities 2022, Census Tracts and Tribal Areas



According to the Sac Metro Air District, DACs, shown in Figure 3, are disproportionately impacted by pollution from gasoline consumption and production. These communities tend to be near busy roads and freeways, exposing residents to dangerous levels of emissions. The constant exposure to high levels of pollution leads to higher rates of asthma, cancer, and other pollution-related illnesses. This exposure also increases health costs and contributes to more missed school and workdays.

Research has shown that driving electric and plug-in hybrid vehicles can save families resources in the long term. An analysis published by the University of Michigan in 2023 [8] show that more than 90% of vehicle owning households in the United States would see a reduction in the percentage of income spent on transportation energy—the gasoline or electricity that powers their cars, SUVs and pickups—if they switched to electric vehicles. Because electricity is significantly cheaper than gas, and due to battery electric cars also having fewer moving parts that require less maintenance than gas or diesel engines, households that embrace EVs would not only help reduce the amount of climate warming greenhouse gases in their local communities, but also net a positive impact on overall savings during the operating lifespan of the vehicle.

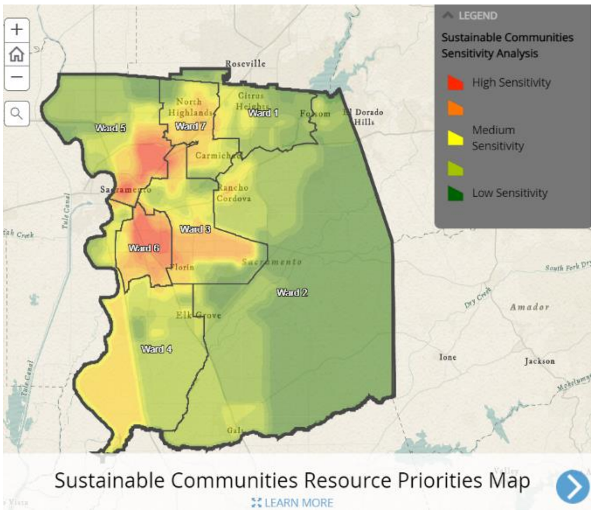
The same analysis published by the University of Michigan in 2023 show that high transportation energy burdens will still exist disproportionately in disadvantaged communities. EV ownership in the U.S. has thus far been dominated by households with higher incomes and education levels, leaving the most vulnerable populations behind. Policy interventions are needed to increase EV accessibility so that all Americans can benefit from the EV transition." [8] This study further examined EV energy costs through the lens of distributive justice by calculating the EV energy burden (percentage of income spent on EV charging) for the entire United States. The study further identified disparities that will require targeted policies to promote energy accessibility and resources for lower-income communities. This included the subsidizing of charging infrastructure, as well as strategies to reduce electricity costs and increase the availability of low-carbon transportation modes such as public transit, bicycling and car sharing.

By triangulating communities with the biggest economic and environmental concern, the EV Lowrider project sponsors will also support existing local programs programs that educate the community members of the environmental, economic, and social benefits of electric vehicles. Showcasing the EV lowrider in underserved communities, allows community members to identify with an innovative culturally iconic vehicle that represents the community. This type of engagement allows the opportunity for community members to directly connect to an EV, which can lead to greater EV adoption. This correlation has been identified in existing OCCS communities and the CC4A programs. The Sac Metro Air District's CC4A participant data indicates that applicants living in OCCS communities are more likely to trade in their internal combustion engine vehicle for an EV.

4.0 EV Charging Infrastructure in Disadvantaged Communities

The lowrider project is committed to furthering educational pathways and supporting inclusive charging infrastructure in Sacramento's economically and geographically diverse communities. Project sponsors have committed to partnerships and local incentives through EV charging grants provided by the Sac Metro Air Dsitrict and SMUD. SMUD, which is a community owed utility company, strategically invests in disadvantaged neighborhoods by providing competitive and formulaic grant programs and creating accessible mapping tools, seen in **Figure 4**, that analyze current data to indicate the local areas most likely to be underserved or lack community development, income, housing, employment opportunities, transportation, medical treatment, nutrition, education and clean environment. In its continued goals of providing comprehensive resources for communities most in need, SMUD's project portfolio continues to align regional investments toward the goal of creating and supporting healthy, vibrant and economically sustainable neighborhoods.

Figure 4: Sacramento Municipal Utility District Sustainable Communities Resource Map



The lowrider will find a long term home within the California Automobile Museum, who has been Sacramento's regional attraction since 1986, and has helped preserve, exhibit and teach the story of the automobile and its influence on the world. In an effort to support and attract EV drivers and visitors, the museum will host a number of level 2 and direct current fast chargers (DCFCs) that will be installed for the benefit of the public, as well as host charging services for the region's growing EV market that includes government vehicles, transit shuttles, and freight-related delivery fleets, in addition to visitors that operate light and medium electric vehicles.

5.0 Conclusion: Educational, Community and EV Commitment

The project will include the development of a full two year EV pathway educational and training program at SAVA that is aligned to industry standards. The EV pathway will feed into local post secondary programs for students to continue their education in the sustainable energy space. The lowrider car will be used as both a teaching and marketing tool that will encourage a predominately Hispanic demographic into embracing alternative fuels, electric vehicles, and the green economy. As lowriders have a strong cultural significance to the Hispanic community, the lowrider vehicle will be showcased in different social and cultural events, as well as career technical education forums and vocational programs.

This project is a collaboration of key stakeholders that are committed to educating communities and future generations to adopt zero emision vehicles while simultaneously developing future pathways for community members of underserved communities to enter trades involved in the renewable energy space. The lowrider workgroup, who is comprised of key stakeholders from organizations representing government, non-profit, private, and academic entities, will continue in its endeavor to devote financial resources, allocate staff hours, and commit volunteer services. It will continue to support the project's efforts in educating communities on the environmental, economic, and social benefits of zero emission vehicles, while also preserving a rich cultural heritage for generations to come. Members of the lowrider workgroup are listed below:

- American River College (RC) —Will provide college counselors and automotive department faculty to meet with SAVA EV pathway students and share post-secondary options available in the automotive and clean energy fields at ARC.
- Bluedot Energies— As a private partner, Bluedot will provide electric vehicle supply equipment (EVSE) charging infrastructure at the California Automobile Museum, and continue to develop technical career pathways for students within the SAVA program.
- California Automobile Museum— Will provide field trip opportunities for students to learn about the progress and development of automobiles throughout history.

- Ohm Electric Cars— Will provide subject matter expertise to successfully plan and design the EV conversion project and support for EV curriculum development.
- Sacramento Lowrider Commission— Will provide guidance and support in the design and implementation of the EV conversion. They will also help connect SAVA students with industry partners for job shadow and internship opportunities.
- Sacramento Metropolitan Air Quality Management District— Will provide connections to community partners and resources that will help in the development of curriculum and implementation of this pathway.
- Sacramento Municipal Utility District (SMUD) Will provide connections to community partners and resources that will help in the development of EV curriculum and implementation of this pathway.
- SAVA Consortium— This consortium consists of three separate charter schools (SAVA, SAVA-EGUSD and SAVA SCUSD). These three schools share a similar educational model and have a significant focus on providing CTE pathways for under served students. The three schools will work together, provide a facility, teachers and classroom equipment to successfully convert the EV lowrider.

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Presenter Biography

Jaime R. Lemus is a descendent of the Purepecha Indigenous people of Michoacan, Mexico. He was raised by farm working parents in the Salinas Valley, and in 1998, Jaime attended U.C. Davis where his passion in the environment led to air and wastewater quality research. Jaime started his career at the Sacramento Metropolitan Air Quality Management District in 2001, and since, gained a wide breadth of experience working in multiple divisions in various capacities. He was appointed Division Manager of the Transportation and Climate Change Division in 2019, and now leads the District in promoting zero emission innovative transportation strategies, regional climate impact mitigation and regional air quality.

Morri Elliott is the Executive Director of Educational Programs for Gateway Community Charters (GCC) and former Principal at Sacramento Academic & Vocational Academy (SAVA). At SAVA, he led the creation and implementation of over ten different career pathway programs. Morri has twice been named ACSA Region 3 Administrator of the Year and currently serves on the Executive Board for the California Association for Career & Technical Education (CACTE).

Aashish (Ash) Dalal BS/MS Mechanical Engineering, from the University of California at Davis, as a research student under the infamous Dr. Andrew Frank, the inventor of the plug-in hybrid. Ash learned about hybrid vehicle design through the FutureTruck competition, which he carried forward in hybrid/electric powertrain design for passenger vehicle, defense, off-highway utility, medium/heavy duty truck, and auxiliary power system markets. Ash combined his passion for cars to start Ohm Electric Cars, an engineering consulting and conversion company in Dixon, CA. At Ohm, Ash supports emerging companies as well as local workforce development to support the emergence of green technology.

ShaVolla Rodriguez's passion for the lowriding culture started with her dad's black 1972 Grand Prix with a chain steering wheel. ShaVolla organizes cruise nights, toy drives, feeding the homeless and many other community efforts. At the beginning of 2022, ShaVolla co-curated "The Art of Lowriding" at the California Auto Museum, which led to the creation of the first Sacramento Lowrider Commission. ShaVolla serves as the Sacramento Lowrider Commission's Youth and Arts Liaison, and has been working with different community leaders throughout Sacramento to revitalize lowriding culture among the youth.

Jofil Borja is the President of Government Affairs and Business Development for Bluedot Energies. He brings over a decade of experience in legislative and regulatory affairs, transportation, land-use, and housing policies, as well as managing public-private-partnerships. He previously served an Assistant Deputy Director for the California Transportation Commission, which oversaw multi-billion dollar transportation investments raised by California's recent gas tax legislation. He was the Senior Officer for Government and Community Relations for Sacramento Regional Transit District and is currently an appointed County Planning Commissioner for Sacramento County, a member of the Sacramento Public Health Board, and an elected Director of Heritage Community Credit Union. He is a graduate of University of California, Berkeley, and an MPA-MBA candidate at Claremont Lincoln University where he is a member of the Lincoln Institute of Land Policy 75 Fellows program.