



A REVOLUTION FOR A BROKEN HART

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TEAM REV

Team REV's mission is to *design and build a personally operated electric vehicle (EV) as a proof of concept to supplement the Honolulu Authority of Rapid Transits (HARTs) light rail to service users whose needs are not met by the existing public transportation system.* With the caREVan proof of concept vehicle, the team strives to address current engineering problems faced here on Oahu, and take the next step towards sustainable transport.

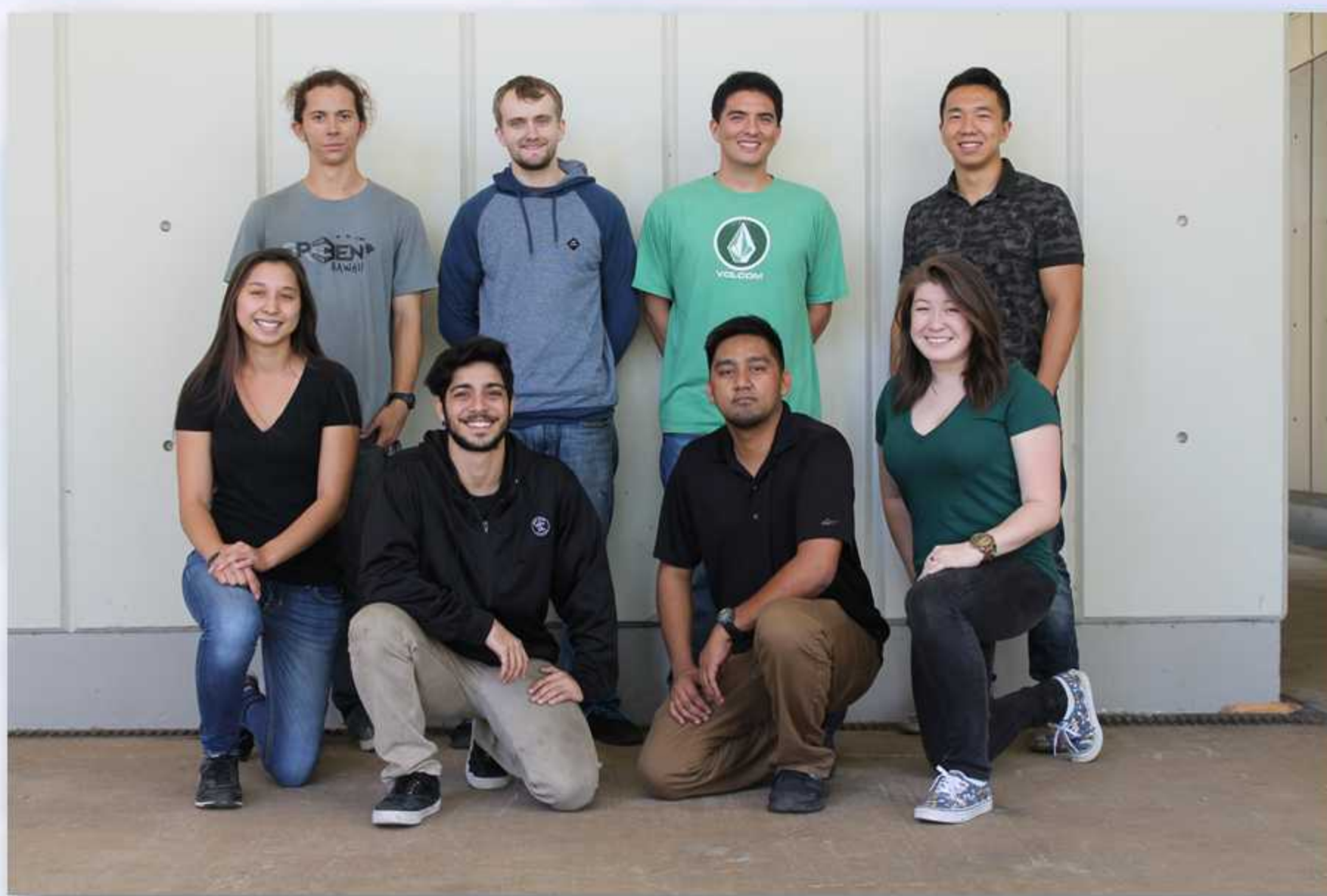


Figure 1: Team REV

Front Row: Kirsten Makanui, Bijan Mandanizadeh, Mark Tesoro, Shelby Patton

Back Row: Naish Harlan, Ryan Pierce, TJ Watanabe, Benliu He

EV CONCEPT

The purpose of the caREVan is to encourage the innovation of zero emission transportation options and apply this practice to take a proactive approach in solving realistic problems pertaining to the future light rail system. The caREVan is a proof-of-concept electric vehicle designed to supplement HARTs light rail and bridge the transit gap from various rail stations to final destination for rail riders. It will also provide further development opportunities for undergraduates interested in EV design.



Figure 2: Projected HART rail line with stations [1]

caREVan Functional Requirements

- Range: 30 miles/charge
- Volumetric Capacity: 150 cubic feet, 3ft x 3ft x 10ft unobstructed volume
- Weight Capacity: 700+ pounds
- Enclosed and lockable passenger/cargo areas
- Speed > 45 miles per hour
- Must reach top speed within 10 seconds
- Legally access all public roads

CAREVAN DESIGN

POWER SUPPLY

- 48 lithium-ion battery cells packed into six individual modules
- Repurposed Stow 'n Go seating compartment turned battery housing
- Auxiliary 12-Volt system

POWER DELIVERY

- Curtis AC-76 brushless motor and controller
- Innovative "powertrain box" connecting motor to differential
- Custom controller cooling system

VEHICLE INTEGRITY

- Safety and street legality
- Spacious interior passenger/cargo cabin with "one-plus-one" seating arrangement
- Preservation of vehicle handling and maneuverability

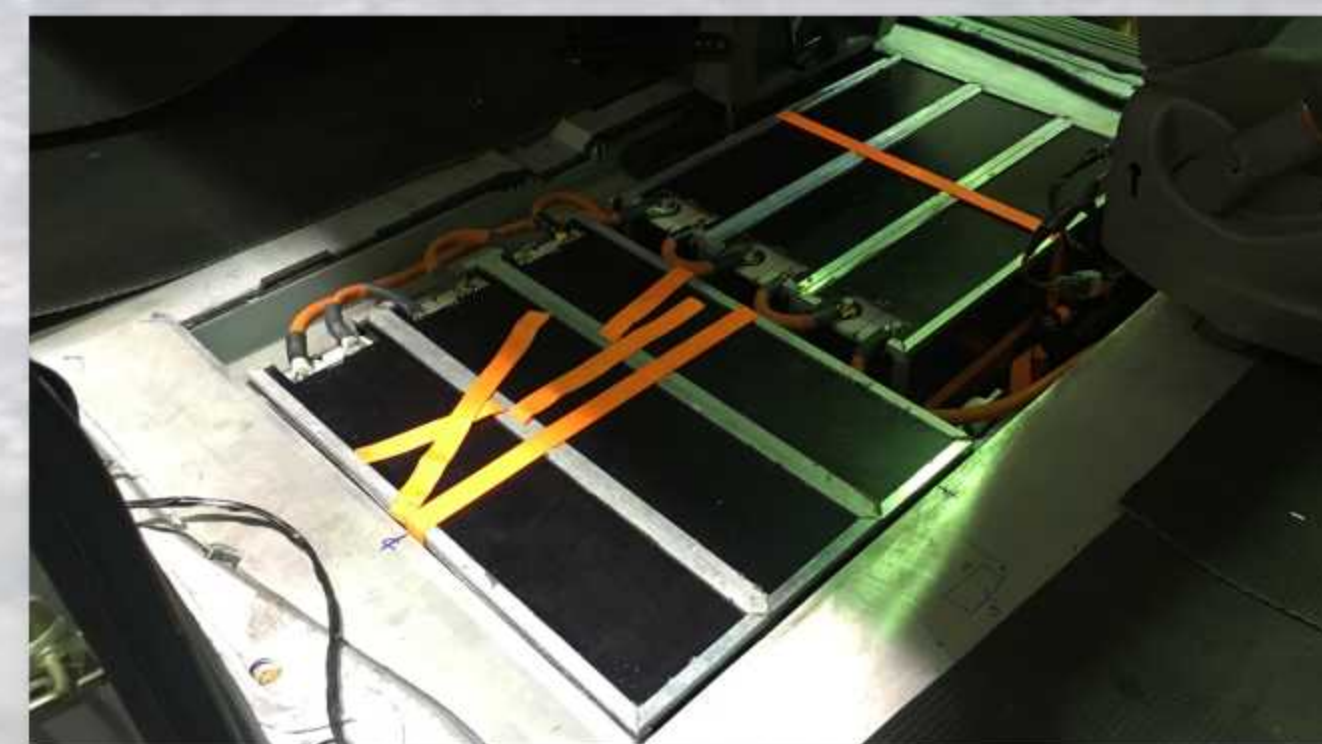
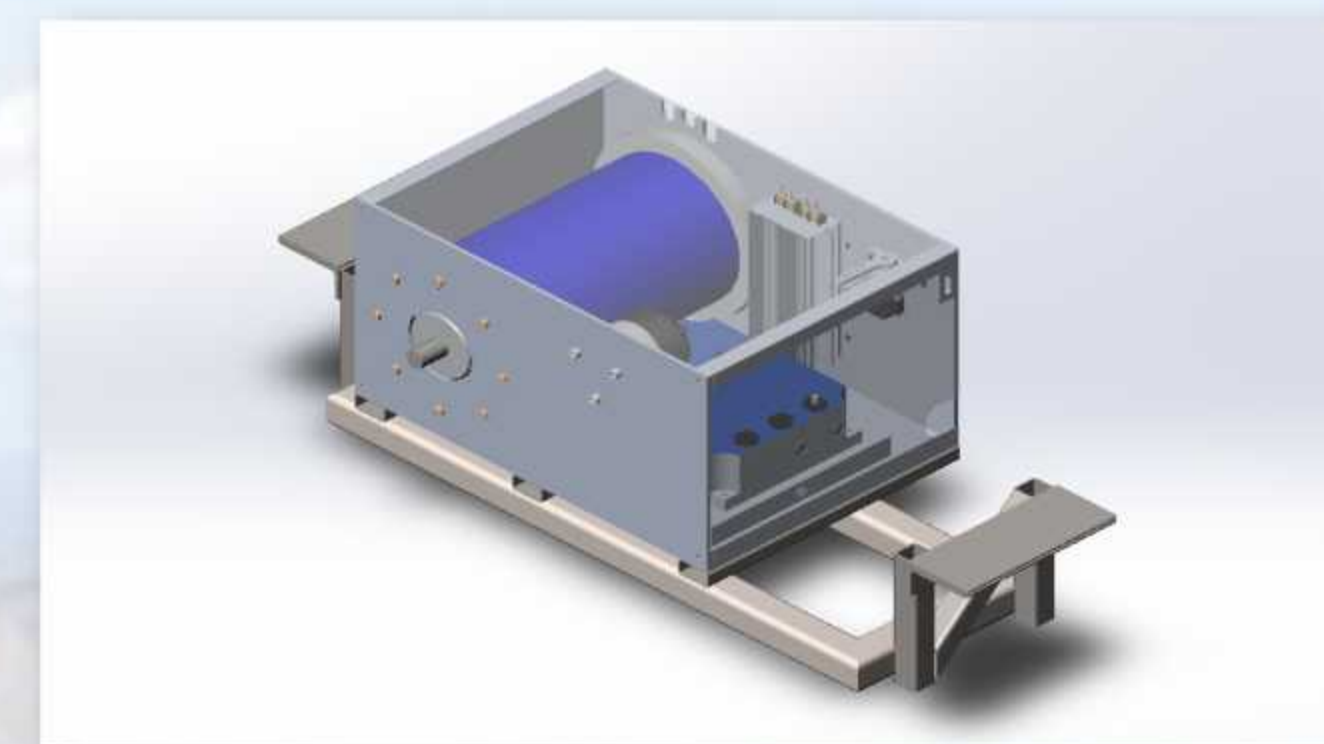


Figure 3: SolidWorks render vs. manufactured battery housing (left) and "powertrain box" (right)

FINAL RESULTS

- Top Speed: 40 miles per hour

- Cargo Capacity: 164.5 cubic feet

- Range per Charge: 31 miles

- Payload Capacity: 700+ pounds

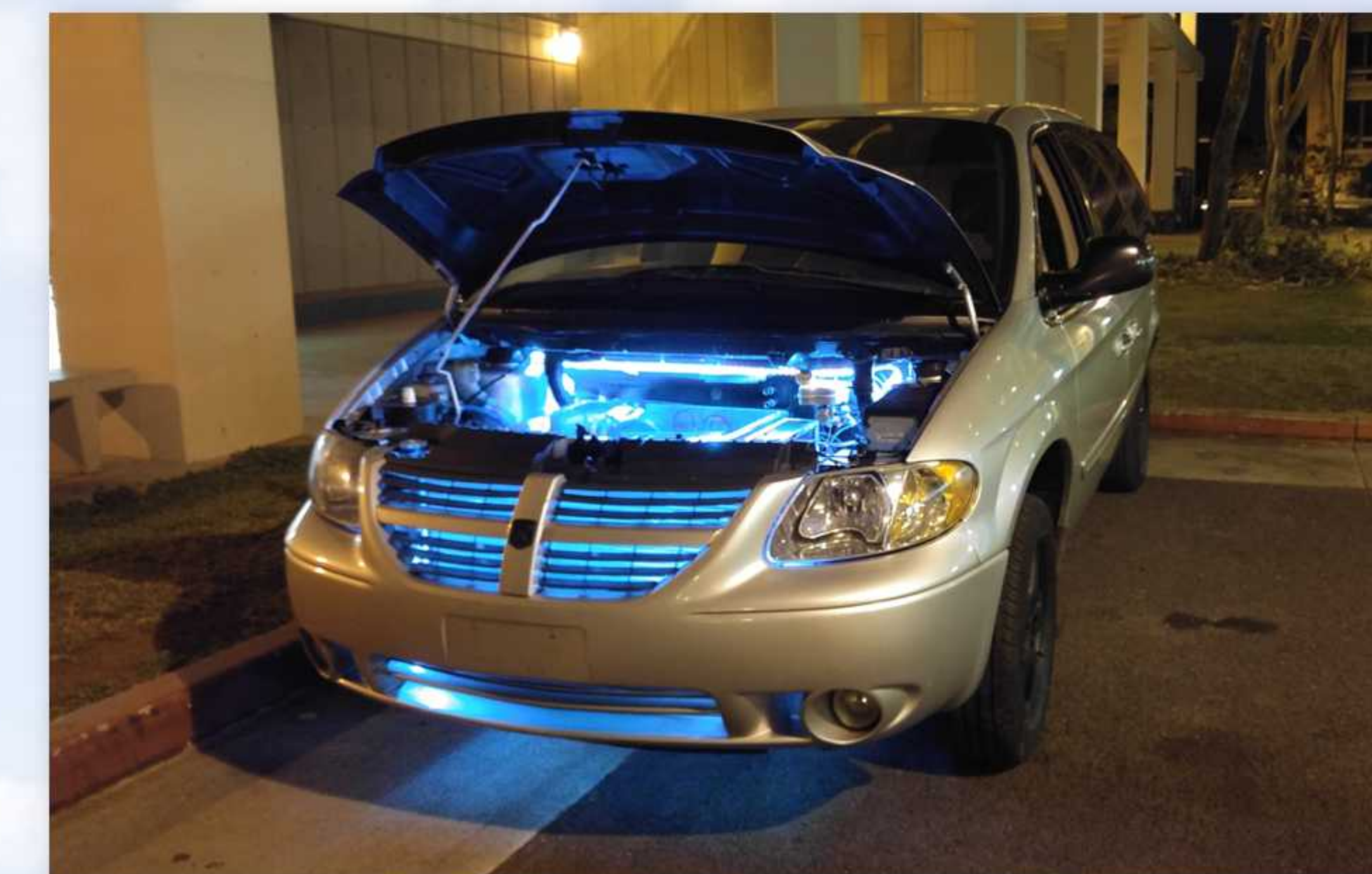


Figure 5: The caREVan in its full glory

NEXT STAGE DEVELOPMENT

- Validation of safety requirements for fleet vehicle
- Intelligent user interface for car share implementation
- Charging station compatibility
- Innovative interior vehicle organization and storage design

ACKNOWLEDGEMENTS

Dr. A Zachary Trimble, Brennan Yamamoto, Lewis Moore, Brenden Minei, Aaron Toyama, Caton Gabrick, Henry Weiland
Recruits: Herbert Allen, Angusina Campbell, Richard Huang, Aaron Nagamine

REFERENCES

[1] Honolulu Rail Transit, "Interactive Route Map," from <http://www.honolulurail.org>

MANUFACTURING



Figure 4: Manufacturing process of battery modules and housing