Phase 2: Electric Shuttle Van

Submitted by: Mister Prayed (mrprayed@gmail.com, 907.460.8395) on 11/8/10

Amount Requested

$5100 Project Essential + $3466 Project Discretionary = $8566 Project Total

Proposal Summary

This project represents phase 2 of the UAF Campus Electric Shuttle Van (ESV). These funds will enable the ESV operation during winter months while tangibly representing and promoting, to students, faculty, and community, the progressive use and innovative benefit of the SIREN fee. Additionally, this sustainability project illustrates a partnering relationship between different UAF departments and disciplines, namely Transportation Services, Mechanical Engineering, and Business Administration.

Although $8,566 total project funding has been requested, the value received is much more. The Project Essential request of $5100 represents primarily equipment costs necessary to ensure safe and comfortable winter operation of the ESV while underscoring that accompanying labor costs to install and maintain equipment is minimized by volunteer effort. Otherwise, the labor cost can easily match and most likely will exceed the equipment budget due to the learning curve phenomenon associated with implementing UAF’s first ESV. In the quest for sustainability, volunteer management and workers glean valuable insight and experience transformative to the evolving electric vehicle construct while holding this project’s cost down 50% or better. Additionally, 50 hours of heated garage space to perform necessary work has been provided by Transportation Services, albeit on an intermittent access basis, yet the relevant point emphasizes zero facility costs for this endeavor. Project Discretionary funds of $3466 represent an appearance makeover for the shuttle van by Auto Trim Design to “wrap” the vehicle in an attractive finish promoting the SIREN fee initiative by testimonial example. This negotiated price tentatively represents a 40% savings as design costs have been waived and material costs reduced 20%. Finally, the SIREN purpose of “investing in energy efficiency programs and renewable energy projects” becomes a realized experience easily recognized, acknowledged, and shared by all.

Technical Advisors and Collaborators

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Budget Detail

Project Total ------------------------$8,566
Supplies Subtotal -------------------$4,350
Services Subtotal -------------------$4,216

**Category: Supplies**

1- Undercarriage Propane Tank and mount $500
2- Exterior Propane Heater Hilton Industries $650
3- 1994 Ford E350 Heater Controls $200
4- Operational Repairs and/or Contingency Modifications $2,500
5- Leak Repair & Interior Panels $500
------- Supplies Category Subtotal: $4,350-------

**Category: Services**

6- Differential Maintenance $750
7- Wrap $3,466
------- Services Category Subtotal: $4,216 -------

Budget Justification

1- Tank to hold fuel for cabin heat
2- Specialized heater that heats the glycol
3- Van had a/c controls, we need to obtain the heater-only type controls
4- Vehicle Modifications/Repairs required after placed in service
5- Van interior needs work
6- Young's Gear to check out the Differential upgrade, or FS
7- Auto Trim Design vehicle wrap to promote this SIREN project to heighten community awareness and student fee’s use

Project Value

Usage of the ESV will reduce fuel consumption and high maintenance cost of current vans. Van can be recharged during off-peak electrical usage periods. An anticipated reduction in operational costs as compared to diesel fueled shuttle vans, so that the van will break even in about 3-5 years contingent to fuel price escalation. Students directly benefit from an ESV by providing a necessary transport service to the general campus population without the noise and air pollution resultant from gasoline or diesel powered motors. Additionally, students specifically engaged with this project are gaining hands on experience with electrical energy applications for the transportation industry while collecting field data on this electric shuttle van’s year round operation in the interior Alaska environment.
Implementation Plan

Michael Golub and Mr. Prayed, as graduate students within the Mechanical Engineering and MBA programs, respectively, shall be involved with the UAF student volunteers in the finish assembly of the shuttle van. Additionally, interest has been displayed by high school students from Effie Kokrine Charter School and RISE employees to complete and successfully maintain this project. Coordination to place vehicle with the shuttle service shall be arranged with Martin Klein. Work on the van continues to be performed in the evening in the Facility Service’s garage when space is available. Mr. Prayed and Mr. Golub will continue to seek outside funding for continued facility and program development. Ideally, this program, with proven success, will be integrated into the normal operational budget of the UAF Transportation and Parking Services Department.

Qualifications & Experience

I am an older graduate student with valuable life experience. I have thirty years of construction experience within Alaska as a worker, estimator, foreman, supervisor, project manager, and contractor. Construction employs innovation and resourcefulness to maintain budgetary control and timelines. I supervised on the Exxon oil spill clean-up, federal construction projects at Ft. Wainwright and Eielson, state school and road projects, a city park project, and residential projects within the private sector. I own and maintain numerous pieces of heavy equipment, which requires knowledge of mechanical, electric, hydraulic and pneumatic systems. I remain affiliated with the Alaska Railroad Corporation and have facilitated safety initiatives therein. I studied power generation while employed at the UAF power plant. I am a member of the Cold Climate Housing Research Center, Alaska Center for Applied Technologies, and Arctic Innovation Competition. I remain CEO of Astar Corporation and President of A House of Prayer, a non-profit community service organization. I have co-published research in behavioral toxicology with UAF Professor Emeritus Charles R. Geist and UAF Professor Kelly Drew. I authored a federal CETA grant and performed as a laboratory supervisor during this research. I worked as a teaching assistant instructing Neuroanatomy (Psy 460) for two years with the Psychology Department. I have returned for graduate study to gain credentials necessary to facilitate community initiatives and refine my grant writing abilities.

This project originally emerged as a mechanical engineering pursuit initiated by graduate student Michael Golub’s inspiration, resourceful determination, and persevering commitment. The phase 1 project titled, “Electric Shuttle Bus Conversion Project”, proposed April 20, 2010, converts Transportation and Parking Services’ surplus shuttle bus capable of hauling 11-passengers, a 1994 Ford E350 Diesel Van, to electric power via sixty 90 amp-hr LiFePO4 batteries, a 249v DC controller, and an 11” Transwarp electric motor bolting directly to the drive shaft. This project is merely hours away from completion noting the elimination of the diesel motor required modification of vehicle controls and accessories while acknowledging work accomplished by contributions from UAF course ES166 along with
volunteer management and labor. Summer operation parameters specify the van will be able to run for 50 miles per charge recommending the Red Route, a 1.3 mile loop for 10 hours per day. The phase 1 proposal operates the ESV only during 100 days of the summer, with a seven year break-even period and stipulates a phase 2 proposal to achieve year round use. Year round use shortens the break-even period.

Separately from the phase 1 ESV project, the evolution of the Arctic Innovation Competition by the School of Management during the past two years has seen its first place $10,000 prize awarded to Chris Hunter, in 2009, for an innovative battery controller that multiplies effective battery life currently in trial application via the Pentagon with Major Todd Hathaway, and then in 2010, for a uniquely revolutionary and proprietary electric motor design multiplying the operating efficiency coefficient. These are two key components of an electric vehicle and I have been working with Mr. Hunter as project manager towards a prototype for gathering operational field data. In this pursuit, I sought after a surplus vehicle from Martin Klein, Associate Director of Transportation and Parking Services, who inferred that another vehicle may be available next year, but in the interim redirected me to Mr. Golub’s current ESV project. Meeting and participating in the construction of the ESV with Michael Golub, volunteers, and RISE employees provided consensus that complimentary assets will be gained from a unified ESV program. Simultaneously, I am collaborating with university leadership towards an Arctic Dreams Factory, an incubator endeavoring to take innovation through prototype towards production to create new businesses while facilitating intellectual property development with value capture to ideally provide sustainability to the university’s endowment. I believe the potential of this ESV project is noteworthy and deserving of my time and contributions. Thank you.

Sincerely;

Prayed

Group/Department
Transportation Services
Sustainability Area
Energy & Transportation

Supporting Documentation (if provided) follows: