

FRESNO COUNTY RURAL TRANSIT AGENCY

2035 Tulare Street, Suite 201, Fresno, CA 93721

Phone: 559-233-6789 Fax: 559-233-9645

Webpage: www.ruraltransit.org

FRESNO COUNTY RURAL TRANSIT AGENCY (FCRTA)

AGENDA

DATE: Thursday, September 25, 2014

TIME: 5:30pm, **AFTER** the Fresno Council of Governments (FCOG) Meeting

PLACE: FCOG / FCRTA Offices

Sequoia Conference Room

2035 Tulare Street, Suite 201

Fresno, CA 93726

(Corner of Tulare and Van Ness Ave. - above Club One

Park in Underground Garage - Entrance off Tulare & Van Ness Ave.

Exit Elevator on Tulare St., Turn Left, Enter Lobby Door,

Up Elevator to Second Floor, Left to Sequoia Conference Room)

Americans with Disabilities Act (ADA) Accommodation

The Fresno COG / FCRTA offices and restrooms are ADA accessible. Individuals with disabilities may call (559-233-4148) / FCRTA (559-233-6789) at least 3 days in advance, to request auxiliary aids and/or translation services necessary to participate in the public meeting / public hearing. If Fresno COG / FCRTA are unable to accommodate an auxiliary aid or translation request for a public hearing after receiving proper notice, the hearing will be continued on a specified date when accommodations are available.

AB 23 Requirement: In accordance with the Brown Act and AB23 the amount of stipend paid to members of the Board of Directors for attending this meeting of the Fresno County Rural Transit Agency, is \$50.00.

ROLL CALL

- I. Public Presentations - This portion of the meeting is reserved for persons wishing to address the FCRTA Board on items within its jurisdiction, but not on this Agenda.

NOTE: The public may also comment on any Agenda item, as they are presented, prior to action by the FCRTA Board.

ACTION ITEMS

- II. Approve "Executive Minutes of July 31, 2014" (Attachment).
- III. Recognition of the Beginning of the FCRTA 36th Year of Service (Attachment).
- IV. Recognition Presentation: Former Huron Transit Driver for 32 Years, Mayor Sylvia Chavez.
- V. Retirement of the FCRTA General Manager, Jeffrey D. Webster, after 35 Years (Attachment).

REVIEW AND COMMENT ITEMS

- VI. Zero Emission Rural Transit (ZERT) Electric Bus Grant Application Submission by the US Hybrid Corporation in Partnership with University of California at Merced and the FCRTA to the San Joaquin Valley Air Pollution Control District (Attachment).

(Continued to Page 2)

**A JOINT POWERS AGENCY TO PROVIDE A COORDINATED TRANSIT SYSTEM FOR RURAL FRESNO COUNTY
THE CITIES OF: COALINGA; FIREBAUGH; FOWLER; HURON; KERMAN; KINGSBURG; MENDOTA; ORANGE COVE; PARLIER; REEDLEY; SANGER; SAN JOAQUIN; SELMA; & FRESNO COUNTY**

INFORMATIONAL ITEMS

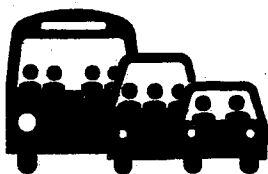
- VII. Status Report: Sanger Transit Express to Reedley College began on August 11, 2014 (Oral Report).
- VIII. Status Report: Lanare Transit Demonstration Program began on September 8, 2014 (Oral Report).
- IX. Status Report: Upgraded CNG Pump Installations in Firebaugh; Kerman; then Huron (Oral Report).
- X. Status Report: Bus Stop Shelters in Huron (Obtained Attached Encroachment Permit from Caltrans for Installations on State Highway 269, Lassen Avenue); Fowler; and Kingsburg (Oral Report).

CLOSED SESSION

- XI. Public Employment and Appointments - Title - General Manager - Government Code Section 54957(b)(1).

ACTION ITEM

- XII. Approve Retirement of General Manager (Jeffrey D. Webster), Early Termination of Current Employment Agreement through December 31, 2014, effective September 30 2014,
- XIII. Approve Appointment of General Manager (Moses Stites), Employment Agreement effective October 1, 2014.



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FRESNO COUNTY RURAL TRANSIT AGENCY (FCRTA)

Executive Minutes

DATE: Thursday, July 31, 2014

TIME: 5:30pm, **AFTER** the *Fresno Council of Governments (FCOG) Meeting*

PLACE: FCOG / FCRTA Offices

Sequoia Conference Room
2035 Tulare Street, Suite 201
Fresno, CA 93726

Members Attending: Councilmember Ron Lander, City of Coalinga
Councilmember Marcia Sablan, City of Firebaugh
Mayor David Cardenas, City of Fowler, Vice Chairman
Mayor Sylvia Chavez, City of Huron
Mayor Gary Yep, City of Kerman
Mayor Chet Reilly, City of Kingsburg
Mayor Robert Silva, City of Mendota
Mayor Gabriel Jimenez, City of Orange Cove
Mayor Armando Lopez, City of Parlier
Mayor Robert Beck, City of Reedley
Mayor Joshua Mitchell, City of Sanger
Councilmember Jim Avalos, City of Selma
Supervisor Judith Case-McNairy, County of Fresno

Jeffrey D. Webster, General Manager
Moses Stites, Operations Manager
Arthur Witte, Legal Counsel

Absent: Mayor Amarpreet Dhaliwal, City of San Joaquin. Chairman

The meeting was called to order by Mayor Cardenas (Fowler) Vice Chair.

ROLL CALL

QUORUM: At the start of the meeting there were 13 members present, representing 18 votes. There was a quorum and business was in order.

- I. Public Presentations - This portion of the meeting is reserved for persons wishing to address the FCRTA Board on items within its jurisdiction, but not on this Agenda.

There were no public presentations.

ACTION ITEMS

- II. Approve "Executive Minutes of June 26, 2014"

Following an expressed opportunity for public comment, a motion was made by Mayor Silva (Mendota) and seconded by Mayor Beck (Reedley) to approve the Executive Minutes of June 26, 2014 as submitted. A vote was called for and the motion carried.

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THE CITIES OF: COALINGA; FIREBAUGH; FOWLER; HURON; KERMAN; KINGSBURG; MENDOTA; ORANGE COVE; PARLIER; REEDLEY; SANGER; SAN JOAQUIN; SELMA; & FRESNO COUNTY

REVIEW AND COMMENT ITEMS

- III. None.

INFORMATIONAL ITEMS

- IV. Status Report on Huron Transit Inter-City Service Expansion
Moses Stites, Operations Manager gave a brief update. Service started on July 1st. Mr. Stites handed out a copy of the current schedule.

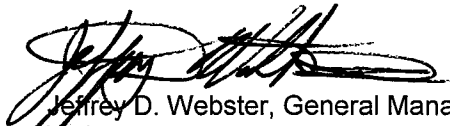
QUORUM: 8:23 pm Mayor Yep (Kerman) left. There were 12 members present representing 17 votes.

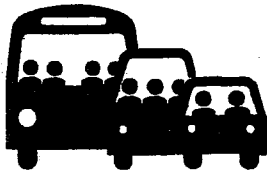
- V. Status on Rural City Transit Services to Drought Relief Program
Mr. Stites gave a brief update on what is being done by FCRTA regarding this program.
- VI. Status Report on the Implementation of the Shuttle Transit Program
Mr. Stites reported on the implementation of the Shuttle Transit Program. This service connects from the Greyhound Bus station. The information will be publicized in newspapers as well as Senior Citizen facilities and other locations in the in the affected Cities.
- VII. Status Report of the Sanger Transit Express to Reedley College
Mr. Stites reported that service will start on August 11, 2014 with a ribbon cutting ceremony at the Sanger Community center on August 5, 2014.
- VIII. Status Report on the Zero Emission Rural Transit (ZERT) - Hydrogen Fuel Cell Project with US Hybrid Corporation for the San Joaquin Valley Air Pollution Control District
Mr. Stites reported gave a brief report. A copy of the commitment letter dated July 2, 2014 to the Air District was distributed. Staff will keep the Board updated on the implementation of this project.
- IX. Status Report on the Implementation of the Lanare Transit Demonstration Program

Mr. Webster gave an update on the implementation of this demonstration program which is scheduled to begin September 8, 2014. The community representatives recently decided that they wanted to reduce their previous request for a five (5) days a week (Monday through Friday) service. Now they are just requesting service on two (2) days a week, specifically Monday and Thursday.

There being no further business, the meeting was adjourned.

Respectfully submitted,


Jeffrey D. Webster, General Manager
vmd



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September 1, 2014

MEMORANDUM

TO: FCRTA Board of Directors;
FCOG Policy Board;
FCOG / FCRTA Policy Advisory Committee;
FCOG Transportation Technical Committee;
FCOG Social Service Transportation Advisory Council;
Service Contractors;
Associated Employees;
Transit Patrons; and
The General Public.

FROM:  Jeffrey D. Webster, General Manager and
 Moses Stites, Operations Manager.

SUBJECT: Recognition of the Beginning of the FCRTA's 36th Year of Service.

ACTION ITEM

The circumstance that lead to the formation of the Agency was one of mutual problem solving. No one was sure if our services would continue to be justifiable or necessary. The operations have been carefully nurtured, evaluated and modified to be an exemplary service for our rural residents, worthy of the local, State and National recognition that we continue to receive. We have provided over 10.5 million passenger trips and *"our services are still picking-up!"*.

During the previous thirty-five (35) years, a countless number of elected officials, policy advisory and technical personnel have worked closely with the general public in implementing the Fresno Council of Government's (Fresno COG) planned rural transit services throughout Fresno County. The staffs of Member Agencies and Service Contractors (both past and present) have done their collective best to ensure safe and efficient rural transit services to our elderly, disabled, and general public patrons.

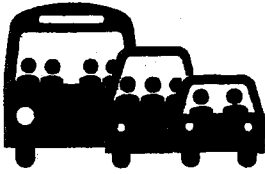
Indeed, nearly every conceivable alternative transportation arrangement has been tested and evaluated to promote viable transit services in meeting the needs of our rural population. Our services have remained simple and cost effective, to ensure that our transit fares remain among the lowest in the State and Nation. Our guiding principals and policies were established with the user in mind, and as such addressed many issues that would later be mandated by government regulation to the entire transit industry. They included: special driver and sensitivity training for our vehicle operators, 100% accessible vehicles to the disabled and alternatively fueled vehicles (propane, compressed natural gas, electric battery and *soon hydrogen fuel cell*) to address air quality concerns. We recognize that we have many opportunities for further improvements.

During the coming year, we will be recognizing our milestones and accomplishments. Our marketing budget will be utilized to highlight several events to show appreciation to our patrons, employees, contractors, vendors, and member agencies.

As we celebrate our thirty-sixth (36th) year on September 27th, *everyone should be congratulated!*

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June 25, 2014

MEMORANDUM

TO: FCRTA Board of Directors; and
The General Public.

The General Public

FROM:  Jeffrey D. Webster, General Manager

SUBJECT: My Retirement as Your FCRTA General Manager after 35 Years

ACTION ITEM

I want to thank each of you, and your respective City Councils and County Board of Supervisors, Managers and Staffs, the drivers, dispatchers, transit coordinators, transit supervisors, mechanics, and all the other support personnel and contractors for the opportunity to be the first General Manager of this Joint Powers Agency (JPA). It has been a truly rewarding experience to have worked for the Fresno County Rural Transit Agency these last thirty-five (35) years (*not including the previous 8 years with the Fresno Council of Governments in various planning capacities*). Our Agency has been very successful in servicing the transit needs of the general public including the elderly, disabled, and youth. Our services have grown and expanded to meet the needs that were reasonable, and unreasonable, to meet.

We were sensitive from the beginning to have conducted individual community outreach meetings to seek input in the development of each jurisdiction's individual transit service. We were very sensitive to ensure that we understood the needs of the elderly, the disabled, the youth, and the general public. We made sure that each of our vehicles were wheelchair lift equipped (*11 years before it was mandated by the Americans with Disabilities Act*). We also made sure that each transit subsystem was coordinated to ensure access between and "to" and "from" the Fresno-Clovis Metropolitan Area (FCMA). We worked with the common carriers in our area, Greyhound, Trailways, Orange Belt Sages Lines only to see them discontinue their services following "*deregulation*". We discontinued the use of diesel powered vehicles to respond to air pollution concerns. We favored alternative fuels: propane; compressed natural gas; and electric battery (*before they were mandated by the Clean Air Act*). Greenhouse gas emission reductions have challenged us to consider the possibility of operating hydrogen powered fuel cells vehicles, where the only emission is water vapor.

We have served the thirteen (13) rural incorporated Cities and another twenty-five (25) unincorporated communities and the three (3) Indian Rancherias of: Big Sandy; Cold Springs; and Table Mountain. We currently operate twenty-two (22) subsystems. But over the years we received comments of unmet transit needs. We have tried to provide demonstration services for ninety (90) days, to determine if minimum performance evaluation criteria could be achieved, to warrant continuation.

In 1990, the County received funding to locally implement the federal "Welfare to Work" program. We were approached to expand our services from 6am to 6pm, Monday through Saturday. The County was particularly interested in our service expansion to provide transportation to employment, training, health care and child care. Despite a concentrated effort, the program was discontinued as program

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participation decline over a three (3) year period. We adjusted our services again to match our patrons actual usage.

Our vehicle fleet has remained responsive to our patrons needs. Over the years, we have operated: coach buses; a contemporary bus and a trolley; large and small cut-away vans; regular, extra-wide and 4 wheel drive modified vans; and mini-vans. The vehicles passenger capacities have included 37, 31, 24, 23, 22, 19, 17, 14, 10, 4 seats with 1 or 2 wheelchair positions. Our floors have been high, medium and low. We have used wheelchair lifts and ramps to ensure accessibility. Our latest vehicle purchase includes low floor vehicles with 1, 3 and 6 wheelchair locations and ramps that are rated up to 1,000 pounds to ensure access by morbidly obese individuals in heavy duty, dual electric battery powered wheelchairs and other personal equipment, who exceed the federal maximum standard of 600 pounds..

We have been very successful at securing State and Federal Grant funding to augment our Transportation Development Act and Measure "C" funds to *sustain* our services for years to come.

The Measure-C Expenditure Plan included a provision that local transit services were to be "free" to the elderly (65+). Later it was determined that the California Public Utilities Commission (PUC) had adopted a regulation stipulating that the "disabled" were to receive the same considerations as the elderly, so they too are provided "free" services, within each of the rural incorporated Cities..

At the encouragement of a Congressman and a Governor we looked for ways to address farm labor transportation. We joined with Kings, Madera, and Tulare County in considering an expansion of Kings Area Rural Transit's Commuter Vanpools to the nine (9) prisons in the valley. After several years attempting to negotiate a compromise with the US Department of Labor, Ron Hughes finally received appropriate permission to pursue a program with Caltrans and the California Highway Patrol. After several more years the program grew to a couple dozen vehicles. But interest continued to grow, the individual counties realized that such a program was an extension of their rideshare programs. When the economy began to decline. Workers needed the means to get jobs in other parts of the State. I started to receive requests from Mayors and City Managers wanting to know if there was anything that the FCRTA could do. I was told that one stumbling block was the average daily share of the vanpool cost was \$5.00. Some thought that cost needed to be reduced somehow. I approached Ron Hughes wondering what his vehicles were currently costing, around \$28,500 each. I asked what the daily participant share might be if the cost of the vehicle were excluded. We determined that it could be reduced by \$2.00. I examined our Capital Reserve funds and proposed to our Board of Directors the possibility that we could utilize \$1 million dollars and by thirty-five (35) new vehicles for commuter vanpool services by rural residents of Fresno County. They agreed, and the vehicle were purchased and made available for use. It didn't take long for all the vehicles to be in use. The following year, Ron approached us to determine our willingness to purchase additional vehicles for use by farm workers in Fresno County. I approached the Board with the same request another \$1 million dollars for thirty-five (35) additional vehicles, and they agreed, because they had been receiving positive comments about the program from their constituents. The vehicles were purchased, introduced and placed into regular service. The Kings County program continued to grow and other county's wanted to participate. The Kings County Board of Supervisors sensed possibility liability issues, so they encouraged Ron to consider other possible arrangements. After a year and a half of investigational studies, Ron Hughes inquired if there was any collective interest in forming a Joint Powers Agency to take over the entire program. After another year, a group of single County COG's worked out the details to establish a new entity, CalVans. Today, they are in fourteen (14) Counties and growing. They are financially self sufficient, but they are always seeking additional Local, State and Federal funds in the years ahead. Fresno Council of Governments Board Member on the CalVans Board of Directors is Mayor Sylvia Chavez from Huron.

We have been members, and I have actively participated in various leadership capacities for: the State Associations (California Transit Association, California Association for Coordinated Transportation and

the Caltrans Rural Transit Assistance Program) and National Associations: the Community Transit Association of America; the American Public Transportation Association, the Transportation Research Board, the National Rural Transit Assistance Program, and the Institute of Transportation Engineers.

The Agency and I have received recognition and awards over the years, including: the Federal Transit Administration's Administrator's *Outstanding Public Service Award* "in recognition of FCRTA's *outstanding efforts in coordination of rural public transit service, and efficient and effective service delivery*"; the Community Transportation Association of America's *"Transit Manager of the Year"* Award; and the California Association for Coordinated Transportation's *"Transportation Manager of the Year"* Award.

I have previously had an opportunity to mentor Mr. Moses Stites for five (5) years when he managed the Fresno Economic Opportunities Commission's Transit Systems as the Fresno Council of Governments designated Urban and Rural Consolidated Transportation Service Agency in direct response to State Legislation to ensure Fresno County's Social Service Agencies did their part in coordinating and consolidating their respective transit services to their respective clients. He helped to develop a driver training program for the then new General Public Paratransit Vehicle (GPPV) license. We had the first program in the State to receive the California Highway Patrol Headquarter's and California Department of Education's formal approval of our twenty (20) hours of classroom and twenty (20) hours of "behind the wheel" training, before a driver could take the California Department of Motor Vehicles and California Highway Patrol test and back ground check towards receiving their new driver's license. Our program was utilized by countless transit agencies around the State. During that time, he attending conferences sponsored by the Community Transit Association of America, while attending he took a two (2) day course and was tested, allowing him to submit an application, with reference letters and was ultimately award his designation as a Certified Community Transit Manager (CCTM).

Our association continued as he went to work for Caltrans for eighteen (18) years overseeing developments near their facilities and assessing fees when warranted to mitigate impacts. Next he went to work for the California Public Utilities Commission (PUC) overseeing railroad projects up and down the State. But its important to know that he became a FEOC Commissioner for eighteen (18) years including his last twelve (12) years as the Board of Directors Chairman, all the while overseeing the FCEOC Transit Systems.

Overlapping in that same time period, when I had completed my four (4) years term as the Western Regional Representative on the Community Transit Association of America's National Board of Directors, Moses was elected to serve in the same position, and has done so for the last nineteen (19) years. I have served as the California State Delegate to the organization.

After 23 years, he retired from the State, he remained interested in public transit. When our new advertized position for an Operations Manager was released nationwide, he decided to apply. After carefully reviewing the 181 submitted applications, I selected him as the most qualified candidate for the position. After a six (6) month probationary period, he became my choice to succeed me as I considered retirement.

During the past two and a half (2-1/2) years we have accomplished many projects together. They include the smooth transition of our previous vehicle maintenance contractor to the City of Fresno's Fresno Area Express (FAX) Fleet Maintenance Services, with Caltrans approval. He established a program to shuttle vehicles back and forth for scheduled maintenance and repairs. He coordinated the implementation of a "Centralized Dispatch Center" as promised in FCRTA's portion of the Measure-C Expenditure Plan. He set-up an opportunity for a vehicle washing and detailing program, He oversaw assigned individuals to install and maintain our new CNG pumps. Moses also took the lead for seeking suggestions from elected officials and member agency staff as to where the new Solar powered Bus Stop Shelters and benches could be located in the Cities. He coordinated the work with City Staff, Contractors, and Arnold Napoles, FAX Equipment Supervisor and his team for the actual installations,

with Caltrans approval. Each completed shelter has been personalized with two (2) City's logos in full color. We completed a procurement of forty (40) replacement and expansion vehicles with the help of our lead maintenance supervisor, Art Penson with the City of Fresno. The vehicles are being equipped with upgraded Audio / Video Surveillance recording equipment and now that signal will be transmitted back to the Centralized Dispatch Center for live monitoring to ensure the safety and security of our passengers and drivers. We are implementing a new Daily Vehicle Inspection Program with hand held terminals that transmit the results by cellular signal to our lead mechanic to assist in determining if our vehicles are ready for service, any discrepancies automatically generate a work order to ensure the problem is fixed. We will also have the ability to receive remote diagnostic condition reporting of the in-service vehicle to track the vehicles operating condition. But our real accomplishment has been our computer assisted dispatching software program. It allows us to receive service requests in "real time" (not the usual 24 hour prior reservations). When the patron calls our toll free 1-800-325-7433 number they can select an English or Spanish dispatcher. When they give us their name, the dispatcher can access their previous file to assist in determining their confidential information including; name, address, home and cellular phone number, emergency contact phone number, the names and birth dates (so we can wish them a Happy Birthday) of any other family member who may also ride, a list of their common destinations, their mobility status including frail elderly, disabled, utilized mobility device, their fares, and any other important information. We are able to monitor a vehicles location, to know which vehicle may be the close to the rider. The dispatcher presses a button and the details are transmitted by cellular connection to a computerized tablet in the vehicle. The driver sees the service request and they can proceed to that location. If they are delayed by other trips, they can press a button and a bilingual recorded phone call is made to that persons phone "stating that they are on their way so be ready to ride!". The benefits of this system is there is no need for the dispatcher to write down on paper the details, radio the driver, wait for them to pull over to jot down the information on a form. With the computerized system everything is a simple button, the time of pick-up and that location, the number of passenger and the fares that they are charged, their group classification (elderly, disabled, general public), the actual route the vehicle took and the time the person gets off the vehicle. The two-way radio communication is nearly eliminated. I should mention that when the dispatching program was introduced to the staff, they did want anything to do with it. Moses made sure appropriate training occurred to each individual. In a few long months of transition, each and every employee has embraced the program, they now love it, and they would never under any circumstances want to go back to their previous methods. I should also mention that the current Surface Transportation Act stipulates that each transit agency is to have a designated Certified Safety and Security staff member. Moses attended two (2) day training program put on by the Federal Transit Administration, and was tested following the course. He received his Certificate from the FTA and was recognized to be the first to do so in the State of California.

Mr Stites and I have indeed worked close together and we are both ready to change places. The Board members have embraced his talents and "can do" attitude in everything he does in life. (By the way, he has been an active volunteer on the "Big Brothers and Big Sisters" for years, and he has been serving as President this last year.) He will stay the course at the direction of the Board of Directors for many years to come. I am confident that new services will be implemented and the annual ridership will continue to increase significantly. I will remain available to assist him in his new duties, as requested.

I want to again thank you for the opportunity to serve you and the general public for all these years!.

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Section 1.0 Executive Summary

In response to the San Joaquin Air Pollution Control District RFP TAP 14-01, US Hybrid Corporation, Fresno County Rural Transit Agency (FCRTA), and UC Merced are proud to propose a Zero Emission Rural Transit (ZERT) Bus. The goal of ZERT Bus is to demonstrate the capability of a fuel cell powered bus for rural communities. Immediate annual benefits include the reduction of 4,737 gallons of fossil fuel, 71,545 pounds of GHG, 86 pounds of NO_x, 6,251 pounds of ROG/VOCs, 4.3 pounds of PM, and near complete elimination of noise.

US Hybrid, an electric, hybrid, and fuel cell component design, manufacturing, and vehicle integration company will develop the ZERT Bus. FCRTA will operate the ZERT Bus and provide real-time user feedback. UC Merced will perform systems level modeling, performance evaluation, and a Well-to-Wheels (WTW) analysis. The proposed vehicle will utilize an Eldorado AeroElite 290, a 30 kW Hydrogenics fuel cell system, a 28 kWhr battery system, and a plug-in charge port for overnight charging. The ZERT Bus will be able to seat 25 passengers and be wheelchair accessible. The vehicle's dimensions and passenger accommodations are designed to be similar to those of cutaway buses currently in FCRTA service.

In eliminating fossil fuel consumption, ZERT Bus will completely eliminate NO_x, PM_{2.5}, and other combustion derived toxics. These emissions reductions address the District's *Health Risk Reduction Strategy*. Another benefit to the rural regions of San Joaquin Valley will be virtually silent ZERT Bus operation. Co-benefits include completely eliminating GHG emissions and providing the rural areas of SJV much needed clean transportation. ZERT Bus will also provide demand for the Coalinga Hydrogen Station, the crucial connection between Southern and Northern California that enables Governor Brown's vision of the "Hydrogen Highway."

ZERT Bus technology is near commercialization. One such vehicle currently operates in Hawaii on Joint Base Pearl Harbor-Hickam (JBPHH), two are in production for Hawaii Volcanoes National Park, and one is in production for Hawaii MTA. The successful demonstration of ZERT Bus will prove the technology is not only able to meet military transport and municipal public transit needs, but also those of rural transit. Therefore, the ZERT Bus demonstration will significantly advance the commercialization of the technology.

The estimated total project cost for the design, assembly, and demonstration of ZERT Bus is \$1.02M. US Hybrid will provide 49.6% of the project cost and seeks \$500,420 of funding from San Joaquin Valley Air Pollution Control District. The capital costs of ZERT Bus will be returned in less than 5 years and will offer more than \$18,000 in annual fossil fuel savings. ZERT Bus leverages existing manufacturing processes and therefore offers lower total capital and operational costs for commercial production, thus enabling quicker adoption across SJV.

In addition to previous deployments of ZERT Bus technology, US Hybrid currently has an active program in developing fuel cell vehicles for goods movement and specialty vehicle sectors. US Hybrid's contact and project administrator for this project is Justin Chow and the project technical lead is US Hybrid President and CEO, Dr. Abas Goodarzi, who has over 30 years of electric and hybrid vehicle experience. Assuming an award date of January 2015, the proposed start date is February 2015 with delivery in October 2015, which coincides with the opening of the hydrogen station at Coalinga. In the following 12 month demonstration period, US Hybrid will support the vehicle operation, service, and maintenance. Afterwards, FCRTA will have the option to operate the ZERT Bus for up to 5 years through a separate contract.

Section 2.0 Project Proposal

Section 2.1 Introduction

US Hybrid Corporation, Fresno County Rural Transit Agency (FCRTA), and UC Merced are proposing a Zero Emission Rural Transit (ZERT) Bus to advance the development of near- and long-term zero emission mobile solutions in San Joaquin Valley Air Pollution Control District (SJVAPD). US Hybrid will design, develop, and integrate the ZERT Bus, while FCRTA will operate it and provide user data and feedback to UC Merced for modeling, performance, and WTW analysis. The vehicle will utilize an Eldorado AeroElite 290, a 30 kW Hydrogenics HD30 fuel cell system, a 28 kWhr battery system and 200 kW direct electric traction system with a plug-in J1772 Level II charge port for overnight charging. ZERT Bus will meet all FCRTA vehicle and passenger requirements and eliminate fuel costs, noise, and emissions.

Section 2.2 Vehicle Operator: FCRTA

Rural public transportation in the San Joaquin Valley is provided by the Fresno County Rural Transit Agency (FCRTA), either as rural inter-city and inter-county services or as local rural community services (Attachment 1). The intercity programs of Auberry, Coalinga, Del Rey, Dinuba Connection, Firebaugh-Mendota, Huron, Orange Cover, Southeast Transit and Westside Transit provided 96,777 trips, 0.6% of annual trips provided but making important regional connections for rural Fresno County residents. In total, FCRTA supports transportation in fourteen Fresno County communities. The 373,834 trips that these services provided in FY 2012/13 accounted for just 2.2% of trips countywide, while representing significant local mobility for residents of these small rural towns. The 28 active vehicles and 42 back up vehicles associated with these programs represent 5.6% of the public transportation fleet countywide.

Section 2.3 Vehicle Designer, Developer, and Integrator: US Hybrid

Based in Torrance, CA, US Hybrid specializes in the design and manufacture of integrated power conversion components for electric, hybrid, and fuel cell vehicles and systems ranging from 3 to 320 kW, as well as systems for renewable energy generation and storage. US Hybrid offers comprehensive engineering expertise and experience in vehicle powertrains and components, including DC-DC converters, energy management systems, high-performance AC motors, and controllers. The company's technical services and products target niche OEM applications including: transit (buses, shuttles), cargo transport (port trucks), municipal services (street sweepers, refuse trucks, utility service), construction (pick-up trucks, wheel loaders), agricultural (farming and goods-handling equipment), and mining industries (dump trucks).

Section 2.4 Local University: University of California, Merced

The University of California, Merced is the newest and 10th campus in the UC system and the first American research university founded in the twenty-first century. UC Merced also serves as a major base of advanced research and as a stimulus to economic growth and diversification throughout the region. UC Merced celebrates its location in the San Joaquin Valley, reflecting the Valley's landscape, history, resources and diverse cultures, while building on and expanding its connections to the emerging global society.

Section 2.5 Proposed Mobile Solution

Section 2.5.1 Vehicle Route

The vehicle will operate on the Huron Transit Inter-City Service Route (Attachment 2). This 5 stop route spans approximately 30 miles, with the third stop being Harris Ranch, the location of the Coalinga Hydrogen Station. The service is Monday through Friday 9AM-5PM, and runs back and forth on the five stops. A detailed description is in Attachment 1.

Section 2.5.2 Description of Technology

The proposed vehicle technology is the result of iterative testing from on-going development and production (Section 7). The ZERT Bus vehicle frame is an Eldorado AeroElite 290, which has a GVWR of 8,850 kg/19,500 lbs. The carriage can seat 25 passengers and can be wheel chair accessible, as in the case with the two ZERT Buses US Hybrid is deploying to Hawaii Volcanoes National Park. The chassis is a Ford F550 with a 201" wheel base.

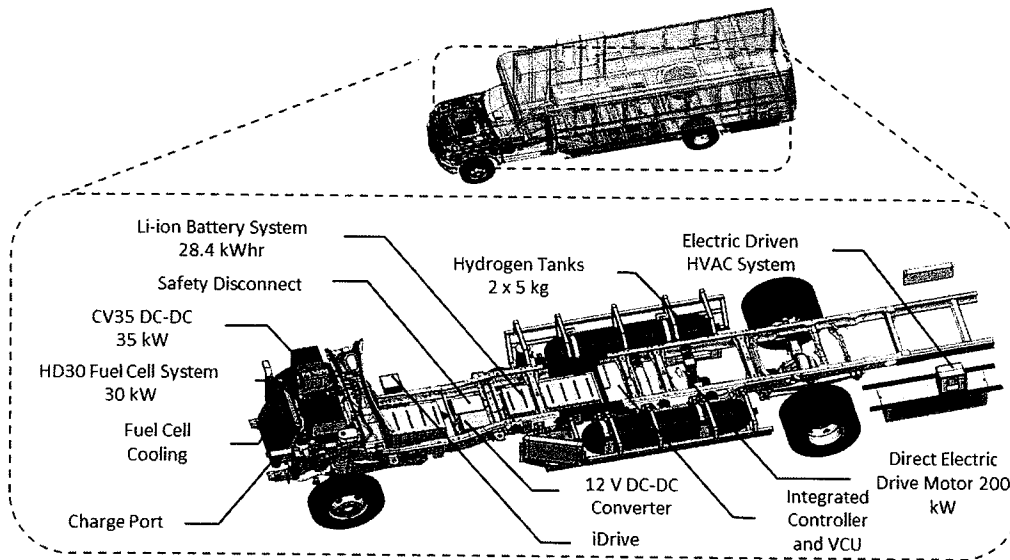


Figure 1 Enlarged Fuel Cell Powertrain

The core technology of ZERT Bus is the powertrain, Figure 1. The powertrain drives the vehicle via a 200 kW direct electric drive motor, a 30 kW HD30 fuel cell system, and a 28.4 kWhr battery system. A 35 kW CV35 DC-DC converter and a 12 V DC-DC converter support the drive system and hydrogen tanks power the fuel cell. Smart telematics from the iDrive transmit real-time data for performance analysis, an integrated controller determines the most efficient distribution of power to the wheels, and a vehicle control unit (VCU) determines voltage settings. A SAE J1772-Level II charge port is available for the battery to be charged overnight. A radiator cooling loop removes heat from the fuel cell and an electric driven HVAC affords the driver and passengers thermal homeostasis.

Power to the wheels is provided by the fuel cell and battery, which are in parallel configuration. The fuel cell provides base load power in range extender mode, while the battery is a buffer, providing power for transient acceleration and recovery of energy during

regenerative braking to enhance fuel economy and reduce brake wear and maintenance. The CV35 unit converts the voltage setting as desired by the VCU. The fuel cell will recharge the battery when its power is not needed for vehicle propulsion. At the driver's discretion, ZERT Bus can drive in all-electric mode or in fuel cell battery hybrid mode for up to 15 miles.

Section 2.5.3 Features, Benefits, and Co-Benefits

Fuel cell range extenders for vehicles could potentially have comparable or better performance than internal combustion engine propulsion systems or battery electric vehicles alone. As in ZERT Bus, the electric drivetrain can take advantage of the benefits of batteries for delivering power and the fuel cell system for energy storage and peak power needs.

In terms of vehicle compatibility, ZERT Bus' carriage has been designed by US Hybrid to have similar, if not exact, seating and wheelchair accessibility as the cutaway buses currently in FCRTA service. However, all-electric mode enables virtually zero noise for passengers, which is a luxury for the typical senior citizens that Dial-a-Ride services. Even when operating in fuel cell-battery hybrid mode, noise will be less than that of a conventional cutaway buses for public transit. This is an important feature for operation in a region where noise is especially sensitive.

In terms of range, ZERT Bus will carry passengers along the FCRTA Huron Inter-City service route mentioned. As determined from previous projects, ZERT Bus will have a range of 125 miles. Therefore, only one refuel will be required for every roundtrip between Coalinga and Huron. An all-electric range of 15 miles is also available.

Hydrogen fueling time is only slightly longer to that of gasoline, on the order of 10 to 15 minutes for a full tank, ensuring low downtime. In addition, the vehicle is designed and equipped to take advantage of overnight charging using standard SAE J1772 Level II charge ports. At 6.6 kW charging, the battery charge will take about 4 hours. However the fuel cell is sized to provide charge sustaining operation, meaning plug-in battery charging is not necessary if fuel cell only operation is desired.

The electric driven motors and auxiliaries provide maximum operational benefit. The electric motor system eliminates costly and inefficient automatic transmission of the gasoline version. Electric motor acceleration and handling is not only faster in response but also smoother. Additionally, electric powertrains enable fewer moving parts, reducing wear and tear. This translates to lower life cycle costs and more carrying capacity.

As will be shown in detail in the Air Quality Benefit Analysis, ZERT Bus fully supports San Joaquin Valley's Air Quality objectives by having no criteria pollutant emissions. In doing so, ZERT Bus directly addresses the extreme ozone status and PM_{2.5} non-attainment status of San Joaquin Valley Air Pollution Control District.

Two co-benefits arise from ZERT Bus. The first is cost savings to FCRTA in the form of avoided fossil fuel combustion. FCRTA currently uses gasoline powered cutaway buses. Shown in the fuels and emissions analysis, fossil fuel savings will be substantial.

Beyond reductions in ozone and PM_{2.5} precursors, ZERT Bus emits no greenhouse gases. Fuel cells only have water vapor and heat as byproducts of their electrochemical reactions between hydrogen and oxygen that produce electricity. Batteries, of course, do not emit greenhouse gases either. Therefore, by driving all electric or fuel cell-hybrid electric, FCRTA's carbon footprint will be significantly reduced.

Section 2.5.4 Tasks and Methods to Be Undertaken

US Hybrid will design ZERT Bus at their Torrance headquarter. US Hybrid will work closely with FCRTA to ensure the vehicle's powertrain will be sized and adapted from previous projects to meet the drive cycle requirements of FCRTA's existing cutaway buses. It will be designed to accommodate as many passengers as FCRTA requires and be 100% wheelchair accessible. Strong modeling, computer aided design (CAD), and simulation capabilities will validate the design.

Following the design phase, ZERT Bus components will be procured and developed. US Hybrid will procure necessary components and develop the power electronics supporting powertrain operation, including the DC-DC converters, DC-AC inverters, integrated controllers, and iDrive telematics. Various advanced analysis and diagnostic tools for power electronics will be used to test and approve integration readiness. A machine shop is also available for prototyping. US Hybrid will work with the hydrogen station provider, First Element Fuel, and the California Fuel Cell Partnership (CaFCP) to ensure fueling protocol meets SAE standards.

The next phase consists of ZERT Bus integration and testing. This process involves lift and assembly equipment in US Hybrid's vehicle integration bay, including multiple tooling, diagnostic, and verification methods. Close proximity of personnel allows for seamless QA/QC and communication. The ZERT Bus sub-systems will be tested individually and as a whole.

ZERT Bus will then be deployed for demonstration. Final calibrations will be done to fine-tune the vehicle. Once approved, the ZERT Bus will be delivered for operation. The vehicle will be part of its cutaway bus fleet and operate five (5) days per week on the Huron to Coalinga route from 7 am until 5 pm and refueled as needed at the Coalinga hydrogen station. US Hybrid will provide warranty similar or better than that of existing FCRTA cutaway buses during the demonstration period. After the demonstration period, US Hybrid will support and monitor the ZERT Bus through its telematics and project management protocols.

While ZERT Bus is being demonstrated by FCRTA, US Hybrid will support and monitor it. US Hybrid will continuously record and analyze real-time data using US Hybrid's proprietary iDrive telematics. iDrive was developed for medium- and heavy duty commercial vehicles as well as vehicles operating in extreme environments. The iDrive uses CAN data telematics, based on the cellular system and Wi-Fi. The complete vehicle data including current, voltage, power, speed, driver command, operation status, faults, operation time and complete fault history is communicated every 2 seconds. The iDrive data has been calibrated against UC Riverside's dynamometer and other Cummins and Allison diagnostic data reporting. The iDrive data is web-based and it is password protected. Authorized access to view and analyze the data will be provided to the operator, service, diagnostics, and dispatch personnel as required. Furthermore, the field data collected from iDrive will be used to determine the drive cycle and propulsion energy demand of the ZERT bus. A driver survey will complement these data. These field data will be implemented in the well-to-wheel analysis performed by UC Merced.

For the entirety of the project, US Hybrid will deliver quarterly progress reports to SJVAPCD. US Hybrid will also lead project evaluation and develop of a final report after 3 years of executing the grant agreement. After the project, FCRTA will have the option to operate the ZERT Bus for up to 5 years through a separate contract.

Section 2.5.5 Associated Work Products and Deliverables for Each Task

To accomplish the project, the project team will perform the following tasks shown in Table 1. An expanded version with more details can be seen in the project budget in Section 3.

Task #	Description	Deliverables	Duration
1	Design	CAD and simulation results	1 M
2	Procure and Develop	Documentation and photographs	3 M
3	Integrate and Test	Documentation and photographs	4 M
4	Deploy and Demonstrate	Vehicle deployment, training, and first responder manual	12 M
5	Support and Monitor	Operation analysis (UC Merced) and progress reports	12 M

Table 1 Project Tasks and Deliverables

Section 2.5.6 Project Schedule

The project's pre-deployment phases will be only 8 months because of the near commercialization status of ZERT Bus technology. This facilitates quicker on-site demonstrate to provide San Joaquin Valley residents clean transportation, Table 2:

Task		Month								
		1	2	3	4	5	6	7	8	9-20
1	Design									
2	Procure and Develop									
3	Integrate and Test									
4	Deploy and Demonstrate									
5	Support and Monitor									

Table 2 ZERT Bus Project Schedule

Section 3.0 Project Budget

Section 3.1 Overall Budget

The total project cost is \$1.02M. \$500K is requested from San Joaquin APCD (49%), \$506K provided by US Hybrid (49.6%), and \$14K provided by UC Merced (1.4%). The requested SJVAPCD contribution is only 1/8 of the \$4M TAP14-01 budget. Following the guidelines for eligible expenses in the RFP, only materials and sub-contracting costs are factored into the requested \$500K. As can be seen in Table 3, which clearly delineates all expenses by subtask, all design costs in Task 1 are covered by US Hybrid. Subsequent tasks contain materials costs and only Task 5 contains sub-contracting costs.

Direct costs consist of labor, materials, and sub-contracting. Indirect costs consist of fringe (28%), overhead from labor (67%), overhead from materials (16.75%), and G&A (8.7%). Indirect costs are not applied to subcontracted labor.

Task/Subtask	Description	Direct Cost			Indirect Cost				Source of Funding		
		Labor	Material & Sub-contract	Direct Cost Total	Fringe 28%	Overhead 67% Labor, 16.7% Mat	G&A 8.7%	Indirect Cost Total	SJVAPCD	Matching US Hybrid	Matching UC Merced
1.0	Design	\$ 24,022	\$ -	\$ 24,022	\$ 6,726	\$ 20,601.27	\$ 4,467	\$ 55,816.83	\$ -	\$ 55,816.83	\$ -
1.1	Simulate ZERT Bus to analyze fuel economy and performance over FCRTA drive cycle										
1.2	Design vehicle powertrain components and sub-systems										
1.3	Deliverable: ZERT Bus Design										
2.0	Procure and Develop	\$ 37,780	\$ 347,170	\$ 384,950	\$ 10,578	\$ 90,551.10	\$ 42,289	\$ 528,368.42	\$ 347,170.00	\$ 181,198.42	\$ -
2.1	Procure ZERT Bus platform										
2.2	Procure and develop FC, BOP, H2 tanks, fueling, and cooling										
2.3	Procure and develop BOP and power conversion systems										
2.4	Procure and develop powertrain components and sub-system										
2.5	Procure and develop electric auxiliary sub-systems and telematics										
3.0	Integrate and Test	\$ 59,050	\$ 21,020	\$ 80,070	\$ 16,534	\$ 54,162.13	\$ 13,117	\$ 163,882.78	\$ 21,020.00	\$ 142,862.78	\$ -
3.1	Integrate & test FCP system (FCPP+BOP+Cooling + tank+ refueling)										
3.2	Integrate FC control and power conversion systems										
3.3	Integrate powertrain system, including battery system										
3.4	Integrate auxiliary system and telematics										
4.0	Deploy and Demonstrate	\$ 16,060	\$ 10,180	\$ 26,240	\$ 4,497	\$ 15,478.21	\$ 4,021	\$ 50,235.71	\$ 10,180.00	\$ 40,055.71	\$ -
4.1	Provide operator service manual										
4.2	Provide operator service training										
4.3	Provide first responder manual										
4.4	Deploy ZERT Bus										
5.0	Support and Monitor	\$ 18,960	\$ 140,550	\$ 159,510	\$ 5,309	\$ 39,802.22	\$ 17,802	\$ 222,423.05	\$ 122,050.00	\$ 86,373.05	\$ 14,000.00
5.1	Data collection, travel, and reporting monthly and quarterly										
5.2	Operation support, spare parts, incremental fuel cost & driver										
5.3	Operation analysis (UC Merced)										
5.4	Final Report and surveys										
Totals		\$ 155,872	\$ 518,920	\$ 674,792	\$ 43,644	\$ 220,595	\$ 81,696	\$1,020,726.79	\$ 500,420.00	\$ 506,306.79	\$ 14,000.00
									49.0%	49.6%	1.4%
									SJVAPCD %	US Hybrid %	UC Merced %

Table 3 ZERT Bus Overall Budget Breakdown

In Table 4, labor costs are broken down for each level of staff, with non-principal personnel in parenthesis. The majority of the personnel are identified, with only the Technicians/Fabricators to be determined. The same indirect rates are applied except for overhead from materials.

Personnel	Rate	Hours	Total	Fringe	OH	G&A	Total Burdened
Technical Lead - Abas Goodarzi	\$95.19	134	\$12,755.46	\$3,571.53	\$10,939.08	\$2,372.15	\$29,638.22
Project Manager - Don Kang	\$95.19	219	\$20,846.61	\$5,837.05	\$17,878.05	\$3,876.87	\$48,438.58
Project Engineer - Aaron Shay	\$47.12	634	\$29,855.26	\$8,359.47	\$25,603.87	\$5,552.22	\$69,370.82
Electrical Engineer (Christophe Salgues)	\$42.65	638	\$27,210.70	\$7,619.00	\$23,335.90	\$5,060.41	\$63,226.00
Mechanical Engineer (Jarod Doran)	\$42.65	639	\$27,253.35	\$7,630.94	\$23,372.47	\$5,068.34	\$63,325.10
Technicians/Fabricator (TBD)	\$29.80	1142	\$34,031.60	\$9,528.85	\$29,185.50	\$6,328.90	\$79,074.85
Project Administrator - Justin Chow	\$30.38	129	\$3,919.02	\$1,097.33	\$3,360.95	\$728.82	\$9,106.12
Total		3535	\$ 155,872	\$ 43,644	\$ 133,676	\$ 28,988	\$ 362,180

Table 4 ZERT Bus US Hybrid Labor Budget Breakdown

Section 3.2 UC Merced Budget

The following budget represents a 20-month project. UC Merced will be a subcontractor to US Hybrid Corporation in the proposed project. UC Merced will contribute a 33.3% cost-share for its associated work in Task 5, modeling and analysis of ZERT Bus. Software is an essential durable good and will help enable UC Merced's aspirations to become a tier 1 research institution in energy and engineering. Labor includes installation and utilization of the software. The subcontract budget by subtask is shown in Table 5 and by contribution in Table 6.

Graduate student salary and fringe will be covered by the requested funds. The student will be employed at 23% of the time in the academic year and 25% time in the summer period in both years. Responsibilities will include conducting experiments and preparing presentations/publications of findings. The UC Merced composite fringe benefit rate for the graduate student researcher is 1.4%. An escalation rate of 3% per year is applied in year 2.

For the conduct of the proposed work, travel will include several trips between UC Merced and US Hybrid and/or local transportation agencies. Funds are requested to cover domestic travel expenses for Dr. Abel Chuang. Travel expenses include airfare, meals, lodging, and ground transportation. All travel will be reimbursed in accordance with UC policies.

Commercial software will be purchased from COMSOL at an educational discount of \$7,760. The cost includes licenses for Comsol Multiphysics, Fuel Cell/Battery Module, Optimization Module, and Livelink for Matlab. The software will be used for Well-to-Wheel analysis. The project assigned graduate student will receive vendor-led COSMOL software training. Two-day vendor led training will be performed at a rate of \$750 per person.

UC Merced's on-campus indirect overhead cost rate of 55% is applied to this project.

	Subtask#1	Subtask#2	Total
Labor: Student Salary and Fringe	\$7,389	\$7,389	
Travel: Domestic	\$1,904	\$1,904	
Supply: Software License and Training	\$5,684	\$2,826	
Total Direct Costs	\$14,977	\$13,462	\$27,097
Total Indirect Costs	\$7,452	\$7,452	\$14,903
Total	\$22,429	\$19,571	\$42,000

Table 5 UC Merced Budget Breakdown by Subtask

	Request	Cost-Share	Total
Labor: Student Salary and Fringe	\$7,389	\$7,389	
Travel: Domestic	\$2,406	\$1,402	
Supply: Software License and Training	\$8,269	\$241	
Total Direct Costs	\$18,064	\$9,032	\$27,097
Total Indirect Costs	\$9,935	\$4,968	\$14,903
Total	\$28,000	\$14,000	\$42,000

Table 6 UC Merced Budget Breakdown by Contribution

Section 4.0 Project Organization

Section 4.1 Project Management Structure

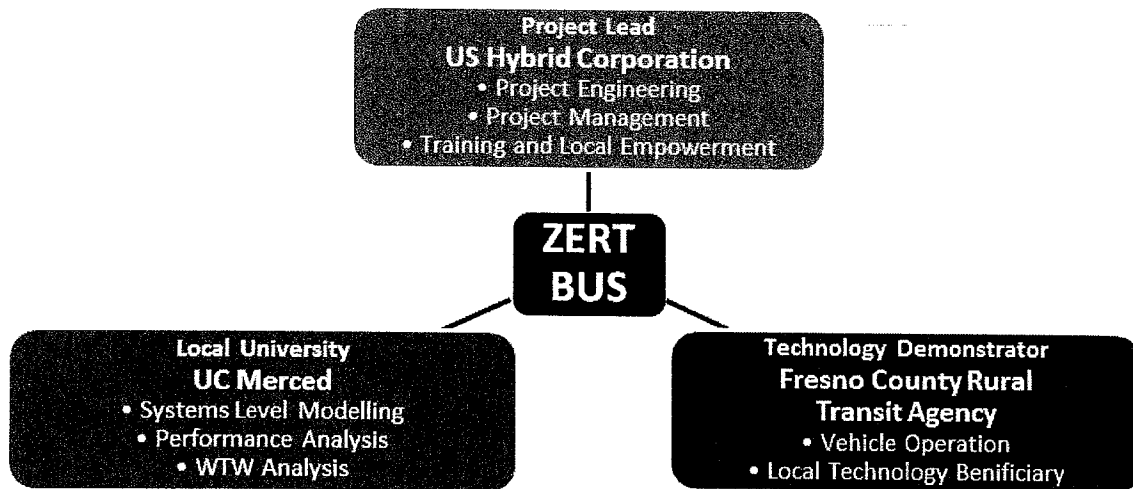


Figure 2 ZERT Bus Project Team Organization

The project team consists of the lead applicant, US Hybrid Corporation, as well as FCRTA and UC Merced, Figure 2. US Hybrid will provide project management and oversight. While ZERT Bus is in demonstration, FCRTA will communicate data and performance with US Hybrid. In parallel, US Hybrid will work with UC Merced on systems modeling and WTW analysis.

Section 4.2 Seeding Technology and Job Growth in the Valley

The ZERT Bus team was strategically selected based on readiness, competency, and experience. Members were selected with the long term intention of on-going use of zero emission technology in the San Joaquin Valley and building capacity at local colleges and universities. US Hybrid's vision is to empower local entities within San Joaquin Valley with zero emission technology through creating Zero Emission Hubs (ZHUB). ZHUBs comprise of a Project Lead, a Technology Demonstrator, and a Local College and University, all of which are brought together by the technology that is being advanced. ZERT Bus is an example of a ZHUB project, where, in Figure 2, project partners are centered about ZERT Bus. Hopefully, ZERT Bus is the first of many ZHUB projects that will benefit San Joaquin Valley.

ZHUB projects are envisioned to support transportation within San Joaquin Valley's disadvantaged communities as well as industries specific to the Central Valley such as agriculture. ZHUBs enable valley residents and students to be trained to maintain and operate zero emission technology long after the demonstration phase is complete, thereby sustaining and promoting clean air quality, job growth, and local economies in San Joaquin Valley. Through the ZHUB approach, zero emission technology commercialization will be facilitated.

Section 4.3 Project Monitoring Procedures



Figure 3 Production Risk Management

US Hybrid will adhere to an extensive project management plan to ensure that all work is completed in an effective and efficient manner in accordance with the proposed ZERT Bus project schedule. The management team will execute and track progress towards successful completion of tasks via well established and meticulously documented processes. US Hybrid has established the Risk Management Strategy to ensure reliability and efficiency, Figure 3. Additionally, the US Hybrid team will focus on core competencies and employ expert outsourced engineering talent as necessary to ensure overall project efficiency.

Section 4.4 Facilities Available

At US Hybrid's Torrance facilities, strong modeling, computer aided design (CAD), and simulation capabilities are available, including: MATLAB Simulink, Ansoft Magnetic, Item Soft, FlowWorks 2010 for Computational Fluid Dynamics including thermal and flow, Maple, ProE, Solid Works 2010+Cosmos for Finite Element Analysis (FEA), a customized version of AVL Advisor, Mathcad 14, AutoCAD 2010, CAN vector, and Spice for circuits and components.

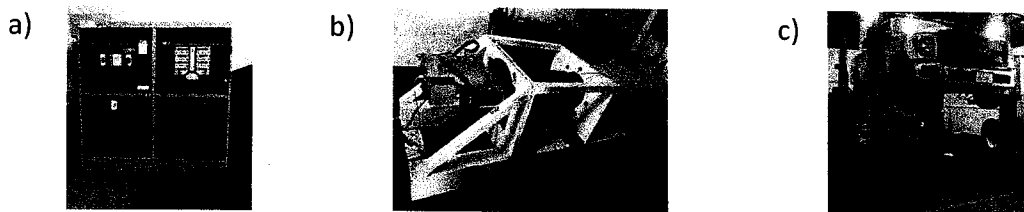


Figure 4 a) AV600, b) Dynamometer and c) Vehicle Lift

Various advanced analysis and diagnostic tools are also available for power electronics and powertrain development, Figure 4, including: high potential testing equipment, power analyzers, 30kW AC load with symmetric and asymmetric load test capabilities, single and three phase power analyzers, and CAN vector diagnostics. US Hybrid will also develop the propulsion system consisting of the fuel cell system, battery system, and electric motor system, in addition to the electric auxiliaries. The company's facility is equipped with thermal and mechanical testing equipment that will be used, including: thermal chambers, spectrum analyzer, leakage testing equipment with various data collection, digital oscilloscopes with 200 MHz to 2GHz bandwidth, two 200kW adjustable speed induction motor drive dynamometer test stands with power analyzers and torque transducers, a 15kW adjustable speed, PM motor test stand, and a fluid dynamic test stand. A machine shop is available for prototyping. The integration process will be facilitated by assembly equipment located in US Hybrid's vehicle integration bay.

Section 5.0 Assigned Personnel

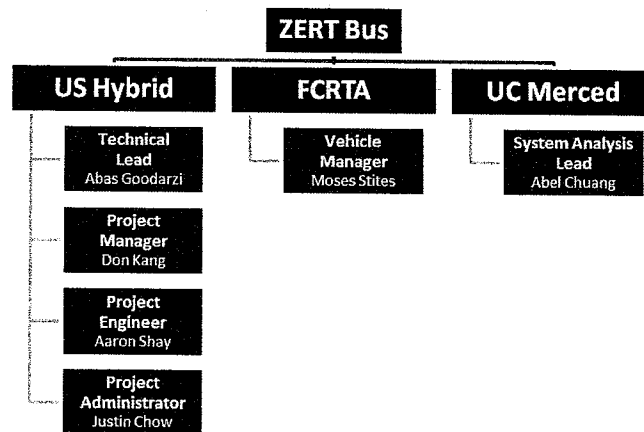


Figure 5 Assigned Personnel Chart

Section 5.1 US Hybrid Team Professional and Academic Backgrounds

Abas Goodarzi, Technical Lead

Background: Dr. Abas Goodarzi is founder and President of US Hybrid Corporation. He has a 30+ year career in power electronics, energy management systems, renewable energy, motor controls, motors, and controllers. Prior to US Hybrid, Dr. Goodarzi was Senior Scientist for Hughes Aircraft Company, directing the development of the General Motors EV1 drive train. Dr. Goodarzi worked at the Ford Motor Company on a Hybrid Fuel Cell Power Converter and held a position at Mack/Volvo working on its Hybrid Air Force Re-Fueler.

Key Areas of Knowledge: Power Electronics, High-power-density Motors and Controllers, Energy Storage and Energy Management Systems, Renewable Energy

Education: Ph.D. Power Electronics, University of Missouri, Columbia, 1987
M.S. Power Electronics, University of Missouri, Columbia, 1983
B.S. Power System, California State University, Sacramento, 1981
Registered Professional Electrical Engineer, California since 1985

Don Kang, Project Manager

Background: Don Kang is Vice President of engineering at US Hybrid Corporation. He has over 22 years of expertise and experience in electric, hybrid, and fuel cell power train system. As Technical Manager at Hughes Power Control System, Mr. Kang led the engineering the GM EV1 power train. He was also the President of ITC, which was a joint venture between Enova System and Hyundai Heavy Industry and co-founder and VP of engineering of Enova System.

Key Areas of Knowledge: Power Electronics, Powertrain Systems, Controllers, Electric Charging and Infrastructure Support and Design, Project Management

Education: M.S. Electrical Engineering, University of California, Los Angeles, 1982
B.S. Electrical Engineering, University of California, Los Angeles, 1979

Aaron Shay, Project Engineer

Background: Aaron Shay has over 20 years of experience in electric and hybrid vehicles design and fabrication with the recent 10 years focused on medium- and heavy- duty vehicles, including transit buses. Mr. Shay has expertise in mechanical design and vehicle integration. Mr. Shay currently leads the US Hybrid mechanical engineering team for ZERT Bus Technology.

Key Areas of Knowledge: Mechanical Packaging, Thermal Systems, Power Electronics Interfacing, Vehicle Component and Subsystem Integration, Compliance Engineering, Failure Analysis

Education: A.A., Santa Rosa Junior College, 1990
2 year automotive repair, welding and machinist program, 1991

Justin Chow, Project Administrator

Background: Justin Chow has over 7 years of environment and energy science and engineering experience. Mr. Chow was a researcher at UC Irvine's National Fuel Cell Research Center, where he evaluated the performance of a Solid Oxide Fuel Cell - Gas Turbine Hybrid for long-haul locomotive application. He has experience in systems level reporting, tracking, and progress.

Key Areas of Knowledge: Alternative Energy Systems, Fuel Cells, Fuel Cell Gas Turbine Hybrids, STEM Outreach, Thermal Systems, Pollution Control and Mitigation, Project Oversight

Education: M.S. Mechanical Engineering, University of California, Irvine, 2013
B.S. Environmental Engineering, Columbia University, 2011

Section 5.2 FCRTA Professional and Academic Backgrounds**Moses Stites, Vehicle Manager**

Background: Moses Stites has been in the Transportation field since 1985, 18 years with Caltrans, 4 years with the CA. Public utilities Commission (CPUC) and 8 years in Public Transit.

Key Areas of Knowledge: Public Transit, Local and State compliance with State and Federal DOT, CHP-Motor Carrier Safety, FTA Section 5311 compliance, transit safety and security.

Education: B.S. Criminology, Cal State University Fresno, 1979
Continuing FTA education coursework for public transit operators

Section 5.3 UC Merced Professional and Academic Backgrounds**Abel Chuang, Assistant Professor, Mechanical Engineering**

Background: Prof. Abel Chuang has 20 years of research experience including the last 10 years working on fuel cell technology. He worked at General Motors for seven years as a senior research engineer and a team lead developing fuel cell car. Dr. Chuang is a well-established fuel cell expert and has more than 15 invited presentations, 10 publications, and 6 patents.

Key Areas of Knowledge: PEM fuel cell, heat exchanger, thermal management, two-phase heat transfer and fluid flow, loop heat pipe, porous material, and carbon fiber.

Education: Executive MBA, Rochester Institute of Technology, 2009
Ph.D., Mechanical Engineering, Penn State University, 2003
M.S., Aerospace Engineering, NCKU, Taiwan, 1997
B.D., Aerospace Engineering, NCKU, Taiwan, 1995

Section 6.0 Air Quality Benefit Analysis

Section 6.1 Emission Reductions Calculations

ZERT Bus directly addresses San Joaquin Valley Air Pollution Control District's *Health Risk Reduction Strategy* by eliminating NO_x, the critical precursor to ozone and PM_{2.5}. Also, by operating on hydrogen, ZERT Bus eliminates GHGs and ROG/VOCs.

ZERT Bus environmental performance is compared to that of the baseline case of a standard gasoline cutaway bus currently operated by FCRTA. FCRTA's buses drive approximately 25,440 miles per year and achieve approximately 5.37 MPG. Hydrogen fuel economy is based on average 2.5 gasoline gallon equivalent (GGE) factor for US Hybrid fuel cell vehicles. As directed by the RFP, emissions are based on Best Available Control Technology (BACT) levels, which is 2008+ for gasoline (Attachment 3) and emission factors for greenhouse gas inventories (Attachment 4). An energy content of motor gasoline of approximately 45 bhp per gallon is used (Attachment 5). For emissions, EPA non-methane hydrocarbons (NMHC) and carbon monoxide (CO) standards are combined for ROG/VOCs. This assumption falls in line with ARB's definition of ROG/VOCs (<http://www.arb.ca.gov/html/gloss.htm>).

Vehicle	Annual Usage			Emission Rate (g/gal)				Annual Emissions (lb/yr)			
	Mileage Driven	Fuel Economy	Fuel Used	NO _x	ROG/VOC	PM	CO ₂ e	NO _x	ROG/VOC	PM	CO ₂ e
	Miles	MPG or MPkg	Gallons or kg								
Gasoline	25440	5.37	4736.84	9.08	659.83	0.45	7552.00	85.98	6251.00	4.30	71545.26
Hydrogen	25440	13.43	1894.74	0	0	0	0	0	0	0	0

Table 7 ZERT Bus Air Quality Benefits

Based on the analysis displayed in Figure 6, an entire year of ZERT Bus operation eliminates 100% of all NO_x, ROG/VOCs, PM_{2.5}, as well as CO₂e.

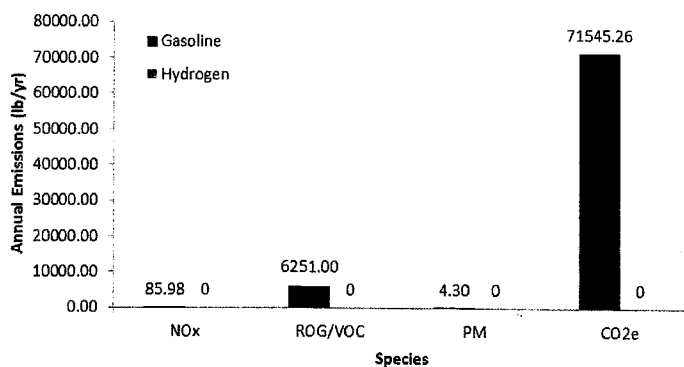


Figure 6 ZERT Bus Annual Emissions

At the completion of this project, UC Merced will have developed a well-to-wheel model with the input of actual field data from the ZERT bus. The actual benefit from energy demand and greenhouse emission will be validated. The successful completion of this study would allow us to accurately determine the economic and environmental impact of the ZERT bus, which will ultimately decide the true value of the ZERT bus commercialization.

Section 6.2 Emissions Associated Cost Estimates

First Element Fuel (FE Fuel) conservatively estimates the cost of hydrogen for the first

two years (if FCRTA desires longer operation) will be \$14/kg. FE Fuel estimates that the cost will fall to \$10/kg for any additional operation. Annual expenses will be based on the initial \$14/kg.

Vehicle	Unit Fuel Cost	Annual Fuel Cost		Annual Incremental Fuel Cost	
	\$/gas gallon or \$/kg H2	Years 0-2	Years 2-5	Years 0-2	Years 2-5
Gasoline	\$ 3.80	\$ 18,000.00	\$ 18,000.00	\$ 8,526.32	\$ 947.37
Hydrogen	\$ 14.00	\$ 26,526.32	\$ 18,947.37		

Table 8 ZERT Bus Fuel Cost

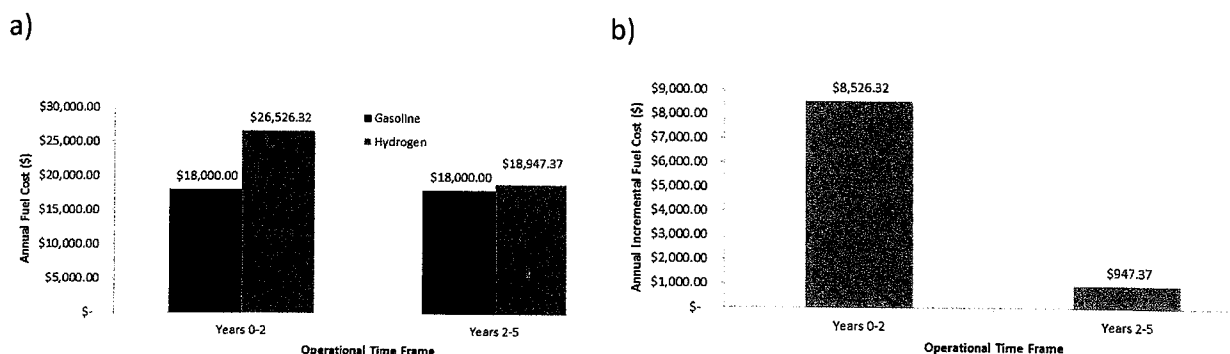


Figure 7 a) Annual Fuel Costs and b) Annual Incremental Fuel Costs

Because of the novelty of fuel cell-battery technology, annual hydrogen fueling costs will be higher during initial operation during years 0-2 as well as any subsequent years 2-5, Figure 7. The annual expenses, in the form of incremental cost, will be \$8,525.32 for the initial 0-2 years and \$947.37 for years 2-5. The drop is due to the tier pricing structure proposed by FE Fuel.

Section 6.4 Technology Cost-Effectiveness

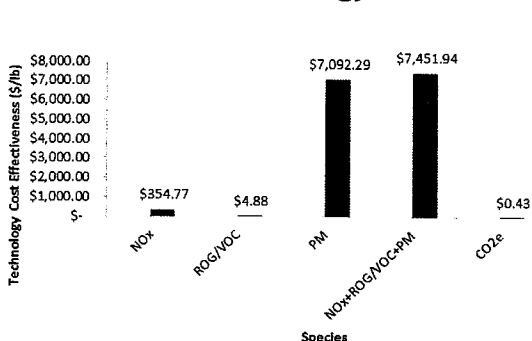


Figure 8 ZERT Bus Technology Cost Effectiveness

ZERT Bus technology will be an extremely competitive transportation choice post-commercialization, especially for NOx, ROG/VOCs, and GHGs. ZERT Bus, though proposed for up to 5 years of FCRTA operation, has a technology life of 10 years. This corresponds to a capital recovery factor of 0.111. Estimated capital cost is \$198,000, which is the incremental cost for the systems and subsystems of the fuel cell-electric powertrain, energy storage, and controls. This future cost estimate is based on ongoing and completed US

Hybrid Hawaii ZERT Bus technology projects.

The dollars per pound of emissions reduced, Figure 8, includes the annualized capital costs and ongoing operating costs or savings incurred through the use of ZERT Bus. They are highest for PM at \$7,092.29/lb, which is due to gasoline having low PM compared to other fossil fuels like diesel. However, NOx and ROG/VOCs emissions from gasoline are significant, so

their cost effectiveness of \$354.77/lb and \$4.88/lb, respectively, are lower. The most cost effective category is GHGs, which at \$0.43/lb, is incredibly rewarding for San Joaquin Valley.

Lower lifecycle costs can eventually pay off, particularly in a future regulatory environment that may require zero or near-zero emission vehicles. US Hybrid estimates that its fuel cell power plant is currently ~\$2000/kW. Based on a typical drive cycle, the technology could break even in approximately ~5 years. This estimate is based on a ~\$7/kg hydrogen, though, and \$4.5/gallon gasoline. However, as fuel cell technology improves and

production volume increases, and cost of hydrogen fueling becomes cheaper from increased sales of hydrogen vehicles, breakeven may be driven down to 1-2 years by 2020, Figure 9.

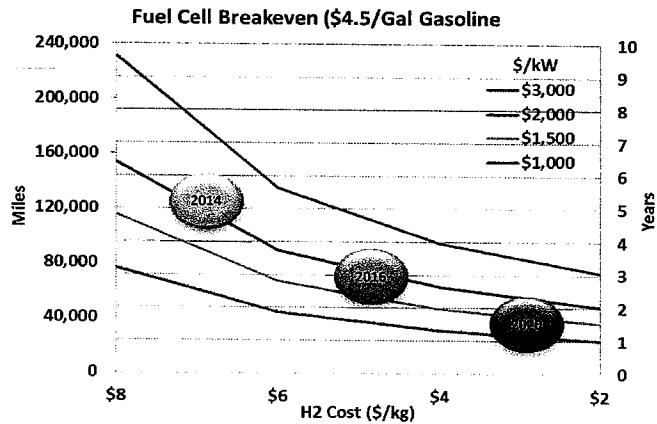


Figure 9 Future Fuel Cell Breakeven

Section 6.5 Tasks and Deliverables that Verify Air Quality Benefits

In this project, a well-to-wheel analysis of primary energy demand and greenhouse

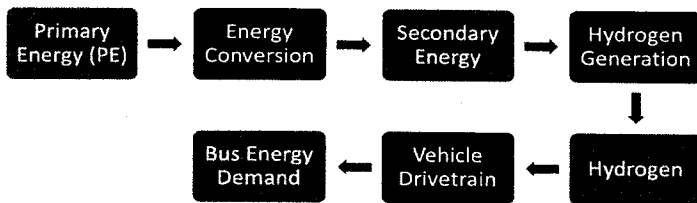


Figure 10 Well-to-Wheel Analysis Energy Demand and GHG Emissions

emission for the operation of the ZERT bus will be performed by UC Merced. Figure 10 illustrates the energy flow from primary energy (well) to bus energy demand (wheel). All blue boxes represent energy and all green boxes represent energy conversion processes. The bus energy

demand will be taken from the actual driving data of ZERT Bus during the one-year demonstration period. These data will be implemented in the well-to-wheel analysis cycle to validate air quality benefits from ZERT Bus.

Section 6.6 Area of Social and Environmental Vulnerabilities

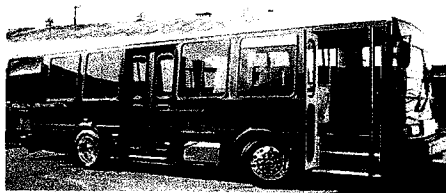
The state is using the Office of Environmental Health Hazard Assessment (OEHHA) Health Screening tool, CalEnviroScreen 2.0, to define disadvantaged communities throughout California. It is the nation's first comprehensive screening methodology to identify California communities that are disproportionately burdened by multiple sources of pollution. According to the results of CalEnviroScreen 2.0, FCRTA operates routes in the highest scoring areas for disadvantaged communities in the valley (Attachment 6). The Huron Transit Inter-City Service route is in the top 81-90% category (Attachment 7). Therefore, ZERT Bus' successful demonstration offers not only direct ground level air quality benefits, but also GHG, fuel savings, and social co-benefits. ZERT Bus's service in the FCRTA fleet will be a distinguished asset in protecting rural communities considered disadvantaged.

Section 7.0 Capability and References

Section 7.1 US Hybrid ZERT Bus Experience and History

The first ZERT technology, Figure 11a, was demonstrated on Joint Base Pearl Harbor-Hickam in 2004 and decommissioned in 2011. Fueled by on-site hydrogen from solar powered electrolyzers, the 20kW fuel cell bus was the first fuel cell vehicle in Hawaii and the first in the US Air Force. US Hybrid engineers, then under Enova Systems, integrated the entire powertrain and auxiliaries. They also developed the controls software and calibrated the vehicle for JPBHH needs. Hawaii Center for Advanced Transportation Technologies (HCATT) initiated the bus demonstration. The project was funded by the DOE, FTA, and the State of Hawaii, while the National Renewable Energy Laboratory (NREL) supported technical evaluation.

a)



b)

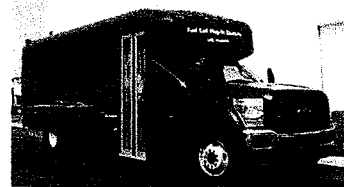


Figure 11 a) Generation 1 (2002) ZERT Bus Technology and b) Generation 2 (2013) ZERT Bus Technology

Today, ZERT Bus technology has achieved generation 2 maturation, Figure 11b. Improving on generation 1 designs, US Hybrid engineers, in collaboration with the seasoned team from before, developed a 30 kW fuel cell Eldorado cutaway bus and delivered it in 2013 to JPBHH. Two buses with Generation 2 ZERT Bus technology are also in production for Hawaii Volcanoes National Park for delivery in 2015 and will transport visitors around the park. There, two buses will climb over 4,000 ft and travel over 200 miles on hydrogen from local geothermal power. The fourth bus is in production for Hawaii MTA, the first ever fuel cell powered cutaway bus in service of a transit authority. The contract was just awarded to US Hybrid in June 2014.

US Hybrid's experience in developing and deploying ZERT Bus technology exemplifies its near commercialization status and potential for meeting future San Joaquin Valley transit needs. Therefore, ZERT Bus will significantly advance the commercialization of the technology.

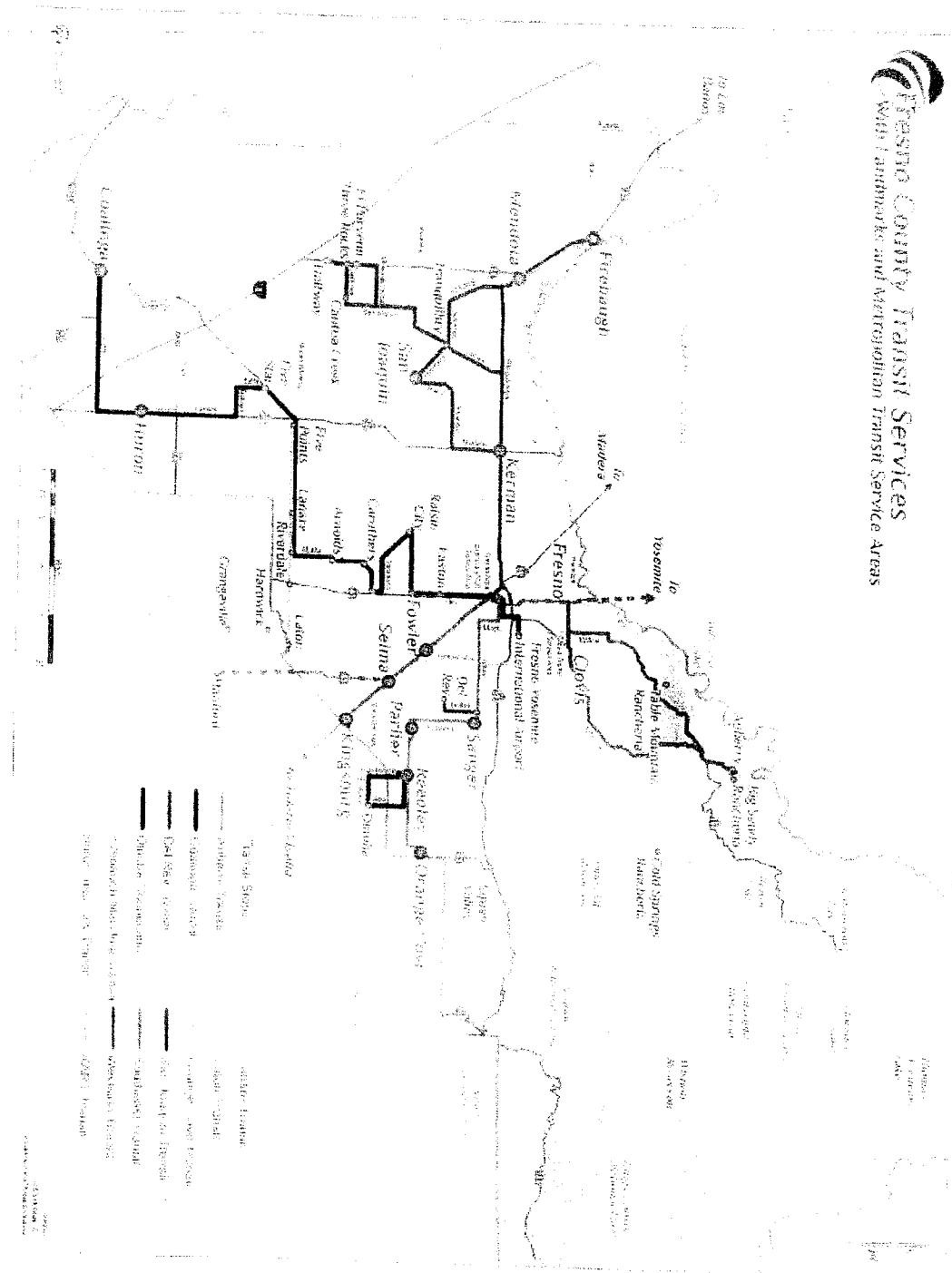
Reference: Stan Osserman, Director HCATT, (808) 594-0100, stan@htdc.org

Section 7.2 UC Merced Experience and History

Mechanical Engineering Professor Abel Chuang has strong expertise in fuel cell system for automotive application. He has seven years of experience as a senior research engineer and five years as a team leader of the Fuel Cell Laboratory at General Motors. Combined with the resources at UC Merced, Dr. Chuang is well-positioned to take on the well-to-wheel analysis proposed in this project. Dr. Chuang's laboratory is located in the Science and Engineering 2 (SE) building. SE2 is a 3-story, 102,000 gross sq ft building located in the core section of campus. The building also includes shared laboratories, laboratory support space, teaching laboratories and offices and administrative office space. Faculty members are assigned space in modern collaborative inter-disciplinary suites housing an array of state-of-art instrumentation.

Reference: Dr. Wenbin Gu, GM Staff Research Engineer, (585) 953-5552, wenbin.gu@gm.com

Attachment 1 FCRTA Service Map



Attachment 2 FCRTA Huron Transit Inter-City Service Schedule

Simplified schedule, one round trip in the morning and two round trips in the afternoon to permit the driver to better serve the actual passengers on-board the vehicle for each trip. The bus will stop at Harris Ranch or I-5 and 198 Developments, when requested by passengers. When in Coalinga, passengers may be dropped – off and pick-up again within an approximately 90 minutes time period, before the scheduled return trip to Huron.

Huron Transit Inter – City Service

Monday through Friday services between Huron, the interchange developments at Interstate – 5 and State Highway 198 and Coalinga

Service provided by a twenty – two (22) passenger, wheelchair accessible, modified van

Fares for Elderly (60+); Disabled; Low Income; Children 0-18; and General Public
\$2.50 per One – Way Trip; \$5.00 per round trip
Exact Change Requested

For other information, please call, toll free: 1-800-325-7433

Scheduled Fixed Route Services (Service Delays Subject to Inclement Weather)

Designated Locations:	Morning Service	Mid-Day Service	Afternoon Service
<u>Huron to Coalinga</u>			
West America Bank	09:00 AM	12:30 PM	3:30 PM
Huron Post Office	09:02 AM	12:32 PM	3:32 PM
Harris Ranch	09:15 AM	12:45 PM	3:45 PM
I-5 / HWY 198	09:17 AM	12:47 PM	3:47 PM
West Hill College / Elm & Cherry	09:30 AM	01:00 PM	4:00 PM
Shuttle Time For Drop-Off and Pick-Ups	90 minutes	90 minutes	
<u>Coalinga to Huron</u>			
West Hill College / Elm & Cherry	11:00 AM	2:30 PM	4:15 PM
I-5 / HWY 198	11:13 AM	2:43 PM	4:28 PM
Harris Ranch	11:15 AM	2:45 PM	4:30 PM
Huron Post Office	11:28 AM	2:58 PM	4:43 PM
West America Bank	11:30 AM	3:00 PM	5:00 PM

Attachment 3 Heavy-Duty Highway Spark-Ignition Engines - Exhaust Emission Standards

<http://www.epa.gov/otaq/standards/heavy-duty/hdsi-exhaust.htm>

Engine	Year	GVW (lb)	Emission (g/bhp-hr)					
			HC	NMHC	NOX	NMHC+NOX	CO	PM
SI	2005- 2007	≤ 14,000	1.1	-	1	-	14.4	-
		> 14,000	1.9	-	1	-	37.1	-
	2008+	All	-	0.14	0.2	-	14.4	0.01

Attachment 4 EPA Emissions Factors for Greenhouse Gas Inventories

<http://www.epa.gov/climateleadership/documents/emission-factors.pdf>

Fuel Type	kg CO ₂ per unit	Unit
Aviation Gasoline	8.31	gallon
Biodiesel (100%)	8.45	gallon
Compressed Natural Gas (CNG)	0.0545	scf
Diesel Fuel	10.21	gallon
Ethane	4.05	gallon
Ethanol (100%)	5.75	gallon
Jet Fuel (kerosene type)	9.75	gallon
Liquefied Natural Gas (LNG)	4.46	gallon
Liquefied Petroleum Gases (LPG)	5.68	gallon
Methanol	4.10	gallon
Motor Gasoline	8.78	gallon
Propane	5.72	gallon
Residual Fuel Oil	11.27	gallon

Source:

Federal Register (2009) EPA; 40 CFR Parts 86, 87, 89 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, 261 pp. Tables C-1 and C-2. Table of Final 2013 Revisions to the Greenhouse Gas Inventory Protocol Core Module Guidance - Direct Emissions from Mobile Combustion Sources, Table B-5.

LNG sourced from: EPA (2008) Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance - Direct Emissions from Mobile Combustion Sources, Table B-5.

Methanol sourced from: The Climate Registry (2013); General Reporting Protocol for the Voluntary Reporting Program Version 2.0, Default Emission Factors, Table 13.1 US Default CO₂ Emission Factors

Fuels.

Attachment 5 EPA Gasoline Energy Content Conversions

<http://www.epa.gov/appdstar/pdf/brochure.pdf>

Unit Conversions, Emissions Factors, and Other Reference Data

Other Conversions:

Energy Unit Conversions:

To Convert	To	Multiply By
mmBtu	Btu	10^6
Quads	Btu	10^{15}
kWh	Wh	10^3
MWh	kWh	10^3
GWh	MWh	10^3
TWh	MWh	10^6
kWh	Btu	3,412 (delivered**)
kWh	Quads	3.412×10^{-12} (delivered)
kWh	Btu	10,107 (primary)* (10,000 is often used for convenience)
Therms	Btu	10^5
Horsepower (hp) (mechanical)	kW	0.7456
Btu	Joule (J)	1,054.2
kWh	Joule (J)	3.6×10^6 (delivered)

Source: Primary kWh to Btu number from U.S. DOE/EIA, 2004 Annual Energy Outlook, 2004, Appendix H.

* Based on this heat rate, electric generation is approximately 34% efficient.

** The term *Source* may also be used for Primary, and the term *Site* may also be used for Delivered energy. Electricity, delivered is the amount of electric energy delivered to the final customer after electric losses.

Electricity, primary is the amount of energy (fuel) an electric generator must consume to generate and supply electric energy to consumers.

Energy (Heat) Content (kWh, Btu) of Fuels:

Fuel	Energy Content (Btu)
Coal (1 ton)	2.1×10^7
Oil (1 barrel)	5.8×10^6
Natural Gas (1 cubic foot)	0.97×10^6 (1,000 is often used for convenience)
Gasoline (1 gallon)	1.2×10^8

Attachment 6 San Joaquin Valley CalEnviroScreen 2.0 Results

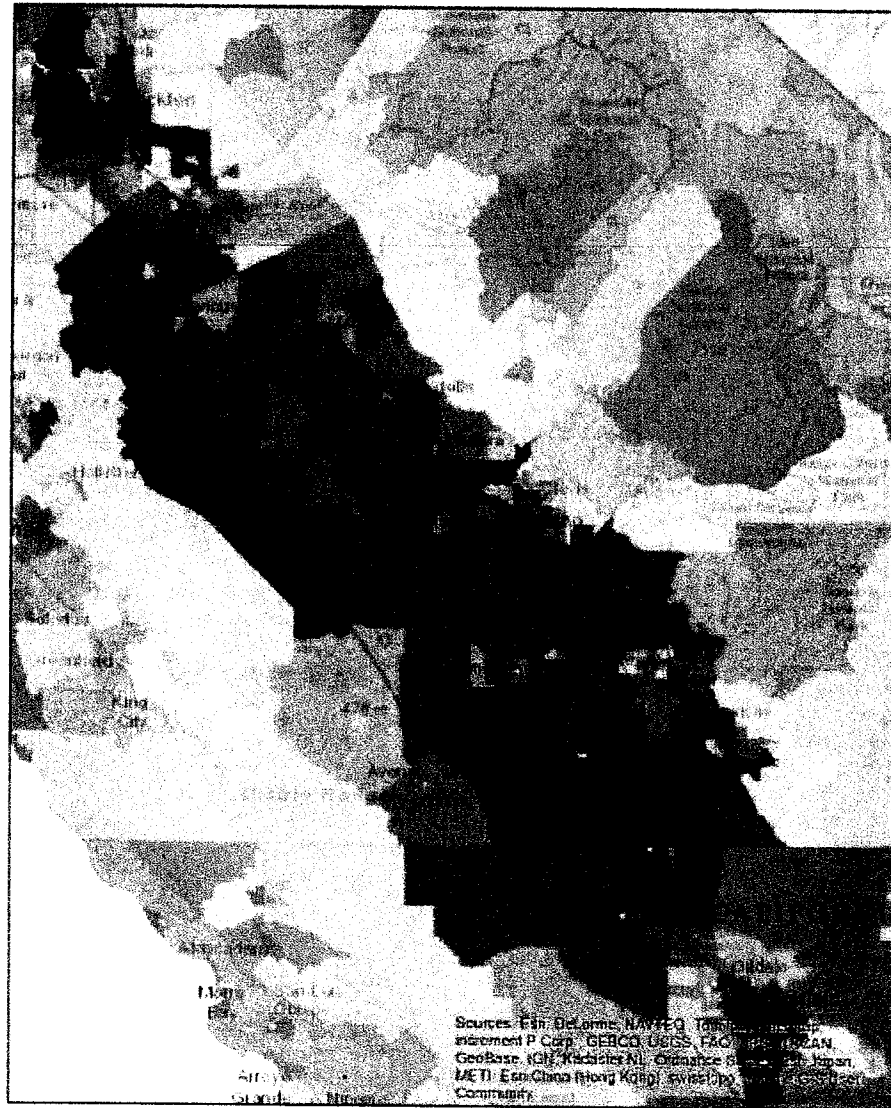
<http://oehha.ca.gov/ei/ces2.html>

CalEnviroScreen 2.0

CalEnviroScreen 2.0 Results

lowest scores highest scores

Each color represents 10% of the scores



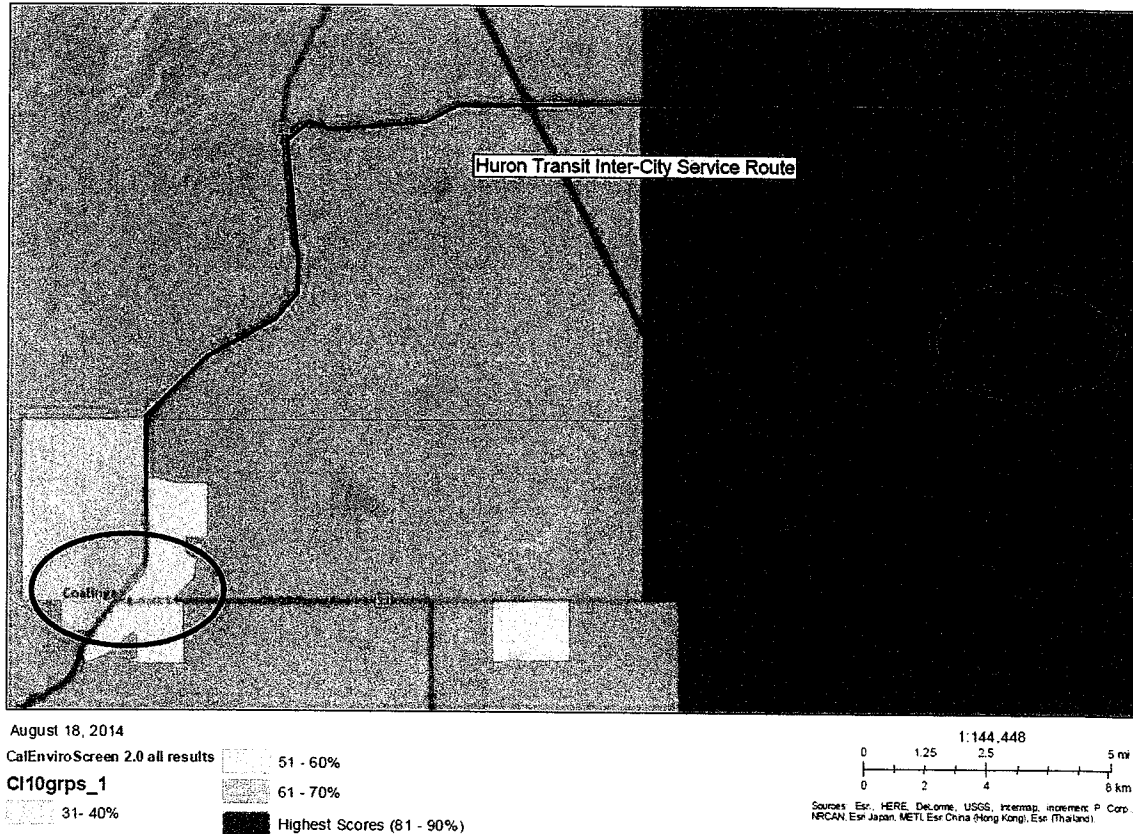
Basemap source: (c) ESRI and its data suppliers

0 10 20 40 Miles

Attachment 7 FCRTA Huron Transit Inter-City Service CalEnviroScreen 2.0 Map

<http://oehha.ca.gov/ej/ces2.html>

CalEnviroScreen 2.0 results



Attachment 8 FCRTA Letter of Commitment



FRESNO COUNTY RURAL TRANSIT AGENCY

2035 Tulare Street, Suite 201, Fresno, CA 93721

Phone: 559-233-6789 Fax: 559-233-9645

Webpage: www.ruraltransit.org

July 2, 2014

Chelsea Gonzales
Air Quality Specialist
San Joaquin Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726-0244

Re: Zero Emission Rural Transit (ZERT) bus project

Dear Chelsea,

This letter of commitment shall serve as evidence that Fresno County Rural Transit Agency (FCRTA) has the capacity to carry out the responsibilities described in the proposal for Zero Emission Rural Transit bus as submitted by US Hybrid Corporation in support of Technology Advancement Program Demonstration Project TAP 14-01. This project will demonstrate an innovative emission reduction for mobile sources that is near commercialization. Upon selection for an award by the San Joaquin Valley Air Pollution Control District, FCRTA will be the rural transit bus operator.

The Fresno County Rural Transit Agency is a Joint Powers Agency (JPA) providing daily (M-F) general public transit services in rural Fresno County for both incorporated cities and unincorporated communities in the County. We serve the 13 rural cities with Intra-City service and provide Inter-City corridor general public transit service into Fresno on a daily basis (M-F). We have been serving the general public, disabled and senior residents of Fresno County since 1979.

I am confident in the ability of FCRTA to successfully undertake the Zero Emission Rural Transit bus project and we are dedicated to helping the San Joaquin Valley Air Pollution Control District meet its air quality goals. Please feel free to contact me if you have any questions.

Sincerely,

Jeffrey D. Webster
FCRTA General Manager

Cc: Moses Stites, FCRTA Operations Manager

A JOINT POWERS AGENCY TO PROVIDE A COORDINATED TRANSIT SYSTEM FOR RURAL FRESNO COUNTY
THE CITIES OF: COALINGA, FIREBAUGH, FOWLER, HURON, KERNAN, KINGSBURG, MENDOTA, ORANGE COVE, PARLER, REEDLEY, SANGER, SAN JOAQUIN, SELMA & FRESNO COUNTY

Attachment 9 UC Merced Letter of Commitment (1)

UNIVERSITY OF CALIFORNIA

BERKELEY • DAVIS • DOWNE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

UNIVERSITY OF CALIFORNIA, MERCED
5200 North Lake Road
MERCED, CALIFORNIA 95343

August 8, 2014

Chelsea Gonzales
Air Quality Specialist
San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726-0244

Subject: Letter of Commitment - Technology Advancement Program Demonstration Project TAP 14-01

Dear Chelsea Gonzales,

This letter is provided as evidence of my commitment to participate as a subcontractor in the above-named project in the event of an award. The University of California, Merced (UC Merced) is capable of carrying out the responsibilities described in the proposal for Zero Emission Rural Transit Bus submitted by US Hybrid Corporation for Technology Advancement Program Demonstration Project TAP 14-01. This project will demonstrate an innovative emission reduction technology for mobile sources that is near commercialization.

The UC Merced campus is the first American research university founded in the twenty-first century, and serves as a major base of advanced research and as a stimulus to economic growth and diversification throughout the San Joaquin Valley of California. Our institution is very well positioned to contribute to the project, and seeks to further collaborations between researchers and industry partners in the area of clean air technology developments. This partnership will facilitate continued innovation to address the environmental challenges faced by the region we serve.

As a subcontractor on the project, I am also pleased to support the project by providing one undergraduate student to work full time during the summer period on the project under my supervision. This opportunity will provide for a valuable educational and training experience for the student. My previous seven years as a senior research engineer, and five years in which I served as project leader of the Fuel Cell Laboratory at General Motors, combined with the resources here at UC Merced, have well-positioned me to undertake and successfully complete the proposed studies.

I am dedicated to the success of the project and I give it my strongest support. Please feel free to contact me via phone (209-228-2435) or email (achuang5@ucmerced.edu) if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Abel Chuang", is written over a horizontal line.

Abel Chuang, Ph.D.
Assistant Professor of Engineering
University of California, Merced

Attachment 10 UC Merced Letter of Commitment (2)

UNIVERSITY OF CALIFORNIA

BERKELEY · DAVIS · IRVINE · LOS ANGELES · MERCED · RIVERSIDE · SAN DIEGO · SAN FRANCISCO



SANTA BARBARA · SANTA CRUZ

August 21, 2014

Chelsea Gonzales
Air Quality Specialist
San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726-0244

Subject: Technology Advancement Program Demonstration Project TAP 14-01

Dear San Joaquin Valley Air Pollution Control District:

As Interim Dean of the School of Engineering, I agree to the following proposed cost-sharing contingent upon US Hybrid Corporation being awarded TAP 14-01 proposal entitled, "Zero Emission Rural Transit Bus", and naming Co-Principal Investigator Abel Chuang, Ph.D., University of California, Merced as a subcontractor under the prime award.

As in-kind cost-share contribution, \$7,389 in Graduate Student Researcher Level V salary and fringe, \$1,402 in travel funds, \$241 in materials and supplies, and the respective indirect costs at the federally-negotiated rate of 55% totaling \$4,968 will be covered for the grant period of February 1, 2015 to October 31, 2016.

These expenses total to \$14,000 and represent a 33.3% cost-share of the total sub-contract budget as requested by the lead application, US Hybrid Corporation.

Should you have any questions, please do not hesitate to contact me.

Best regards,

A handwritten signature in black ink, appearing to read "Erik Rolland".

Erik Rolland
Professor and Interim Dean
School of Engineering
University of California, Merced

Attachment 11 California Fuel Cell Partnership Letter of Support



DRIVING FOR THE FUTURE

California Fuel Cell Partnership
3300 Industrial Blvd., Suite 1000
West Sacramento, CA 95691
(916) 371-2870

www.fuelcellpartnership.org
info@calfcfp.org

August 7, 2014

Chelsea Gonzales
Air Quality Specialist
San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726-0244

Re: Letter of Support - Technology Advancement Program Demonstration Project
TAP14-01

Dear Ms. Gonzales:

The California Fuel Cell Partnership (CaFCP) is pleased to have US Hybrid as a member organization and fully supports US Hybrid's proposal for a Zero Emission Rural Transit Bus submitted as part of San Joaquin Valley Air Pollution Control District's Technology Advancement Program Demonstration Project TAP14-01. This project will demonstrate an innovative emission reduction for mobile sources that is near commercialization, and we expect it will support the operation of the planned Coalinga hydrogen station which, we are confident, will begin operations in the fourth quarter of 2015.

CaFCP is one of the world's leading fuel cell and hydrogen organizations focused on commercializing hydrogen fuel cell vehicles. With more than 30 members representing government, automakers, energy sector, industry and others, we collaborate on activities that advance the technology, often creating consensus that saves time, effort and money.

US Hybrid Corporation is an electric motor and components supplier specializing in the design and manufacture of power conversion systems for medium and heavy-duty electric, hybrid, and fuel cell commercial buses and trucks to enable them to become more reliable and fuel-efficient. The project's technology will be developed and supported by US Hybrid's existing staff of experts and industry leaders.

We are confident that US Hybrid will successfully undertake the ZERT Bus project. This project offers CaFCP the opportunity to support the San Joaquin Valley Air Pollution Control District's air quality goals while advancing fuel cell technology in heavy duty transportation.

Please do not hesitate to contact me or our staff if you have any questions.

Sincerely,

Bill Elrick
Acting Executive Director

Chrysler
Daimler
GM
Honda
Hyundai
Nissan
Toyota
Volkswagen
Automotive Fuel Cell Cooperation
Cal/EPA Air Resources Board
California Energy Commission
South Coast AQMD
U.S. Department of Energy
U.S. Environmental Protection Agency
AC Transit
Air Liquide
Air Products
Bullard Power Systems
Bay Area Air Quality Management District
CALSTART
CalState LA
CA Dept of Food and Agriculture
CIE
CEERT
Energy Independence Now
Hydrogenics
ITM Power
Linde North America, Inc.
NREL
PowerTech Labs
Proton OnSite
Swedish National Laboratories
Southern California Gas Company
SunLine Transit Agency
University of California, Berkeley
UC Davis-ITS
UC Irvine-MFERC
US Hybrid

The California Fuel Cell Partnership is a collaboration in which several companies and government entities are independent participants. It is not a joint venture, legal partnership or unincorporated association.

Attachment 12 First Element Fuel Letter of Support

Chelsea Gonzales
Air Quality Specialist
San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726-0244

August 11, 2014

Subject: Letter of Support - Technology Advancement Program Demonstration Project TAP 14-01

Dear Chelsea,

This letter of support is to express that FirstElement Fuel Inc. (FE Fuel), the developer, owner, and operator of the Coalinga hydrogen station, plans to have the station open and capable of dispensing hydrogen at 350 bar. FE Fuel is pleased to be supporting a project that demonstrates an innovative emission reduction technology for mobile sources by providing the needed hydrogen fueling capability.

FE Fuel is a California based company dedicated to providing access to retail hydrogen fuel for fuel cell vehicle customers. FE Fuel received a \$27.6 Million award from the California Energy Commission to develop, own and operate 19 hydrogen station projects throughout the state of California, as well as financial backing from Toyota. One of our planned stations is located at 24505 W Dorris Ave (Harris Ranch), Coalinga, CA 93210 and is estimated to be online no later than April 2015. With a daily dispensing capacity of 180 kilograms of hydrogen per day, the station should meet the estimated requirements of 10 kilograms of hydrogen per day, 350 bar refueling, Monday through Friday for the proposed shuttle bus. In fact, FE Fuel believes that the added fueling demand will help our business case for the station, which is expected to be underutilized on weekdays for several years after its initial opening and welcomes the additional fueling opportunity.

I am confident in the ability of FE Fuel to successfully operate the Coalinga hydrogen station for the Zero Emission Rural Transit Bus project and FE Fuel would be committed to fueling the proposed shuttle bus once the station is open and operating. We are also dedicated to helping the San Joaquin Valley Air Pollution Control District meet its air quality goals and would be proud to be your partner in this project. Please feel free to contact me if you have any questions.

Sincerely,



Dr. Shane Stephens-Romero
President and Co-Founder
FirstElement Fuel, Inc.
shane.stephens@fefuel.com
949-922-3456

ENCROACHMENT PERMIT

TR-0120 (REV. 2/2005)

In compliance with (Check one):

- ☒ Your application of September 9, 2014
- ☐ Utility Notice No. _____ of _____
- ☐ Agreement No. _____ of _____
- ☐ Your Reference No. _____

TO:

Fresno County Rural Transit Agency (FCRTA)
2035 Tulare Street, Suite 201
Fresno, CA 93721

Attn: Moses Stites

Phone: (559) 233-6789 ext 244 Fax: (559) 233-9645

Permit No.
0614-NBS-0679Dist/Co/Rte/PM
06/ FRE / 269 / PM 8.98 AND 9.01Date
September 12, 2014Fee Paid
\$ EXEMPTDeposit
\$ EXEMPTPerformance Bond Amount (1)
\$ N/APayment Bond Amount (2)
\$ N/A

Bond Company

Bond Number (1)

Bond Number (2)

, PERMITTEE

and subject to the following, **PERMISSION IS HEREBY GRANTED to:**

Enter upon the State Highway Right of Way on State Route 269 (S. Lassen Ave) at Post Miles 8.98 Southbound, to erect one new bus shelter, and at Post Mile 9.01 Northbound, to remove existing bus shelter, and erect one new bus shelter. The new shelters shall provide four-foot clearance for the passage of wheel chairs, this distance to be measured between back of in-place curbs to the front of the shelters, THIS REQUIRES REMOVAL AND RE-SETTING OF THE IN- PLACE BENCHES. Permittee shall Submit a Completed Certification of Compliance with Americans with Disabilities ACT (ADA), Form TR-0405, Post Construction, within ten days of job completion. All work shall be as per applicable sections of 2010 Standard Plans and Specifications, California MUTCD 2012, General and Special Provisions, and approved drawing. Prior work approval : 0612-NBS-1026, 0613-NBS-0062.

NOTIFICATION: two (2) working days prior to start of work within State right-of-way, PERMITTEE shall NOTIFY: **CALTRANS INSPECTOR RAMIRO HERNANDEZ at (559) 445-6497 office, or 559-288-8553 cell.**
A pre-job meeting with the Caltrans Inspector is required.

This permit is not a property right and does not transfer with the ownership of the property.

The following attachments are also included as part of this permit
 (Check applicable):

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | General Provisions TR-0045 |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Utility Maintenance Provisions |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Special Provisions <u>TR-0400</u> |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Cal-OSHA Permit No., if required: _____ |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Storm Water Pollution Protection Plan _____ |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | The information in the environmental documentation has been reviewed and is considered prior to approval of this permit. |

In addition to fee, the Permittee will be billed actual costs for:

- | | | |
|---|--|------------|
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Review |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Inspection |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Field Work |

(If any Caltrans effort expended)

This permit is void unless the work is complete before **March 16, 2015**

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.

No project work shall be commenced until all other necessary permits and environmental clearances have been obtained.

YFS 7.0 4.0
 cc: DO, RH, Maintenance

APPROVED:

Sharri Bender Ehler, Director, District 6 – Central Region

BY:

[Signature]
 Joe O. Espinosa, Chief, District 6 - Permit Branch

Attach: Approved Drawing, CRF

Permit Engineer: Youssef Shapour 559-445-6483

FM 91 1436

Permittee: Fresno County Rural transit agency (FCRTA)
Permit No: 0614-NBS-0679
Date: September 12, 2014

Restart Notification: When work has been interrupted for more than 5 working days, an additional notification is required to resume work unless waived by the Caltrans Inspector.

Authorized Work Force: All work in the State's Right of Way is to be performed by Fresno County, or City of Fresno (FAX) employees. No Contractors are authorized

Traffic Control and Lane Closure:

- If planned work is within 6 feet from the edge of travel lane on State Right of Way, that lane shall be closed.
- **Work requiring traffic control** shall be conducted between the hours of **9:00 AM and 3:00 PM**, Monday through Friday, or as otherwise authorized by the Caltrans Inspector or issuance of an Encroachment Rider Permit. The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays, the day preceding designated legal holidays, and when construction operations are not actively in progress.
- Lane, ramp and shoulder closures shall be conducted in accordance with the applicable portions from the **"California Manual on Uniform Traffic Control Devices (California MUTCD 2012), the latest revised editions of the State of California Department of Transportation Standard Plans and Specifications, or 2006 T-sheets of Standard Plans"**. The California MUTCD can be found at the following link:
- <http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CaliforniaMUTCD.pdf>
- Notification of temporary lane/shoulder closures or traffic detours shall be faxed at (559) 445-5100 or Emailed to D6LCS@dot.ca.gov **WEEKLY*** to the District-6 Encroachment Permits Office. Notification shall be submitted for consideration, using the attached **Closure Reporting Form (CRF)** with Permit No. **0614-NBS-0679**, referenced.
- **Notification shall be made by Monday, 5:00 PM, the week prior to the proposed closure.**

If the request is approved, you will receive the required **Closure ID Numbers to be called in,** on the date(s) of the closure, to the District TMC @ (559)445-6166

If the request is rejected, you may revise and resubmit your request by consulting Caltrans Permit Inspector.

NO WORK SHALL BE PERFORMED ON, OVER OR NEAR THE HIGHWAY TRAVELED WAYS OR SHOULDERS DURING INCLEMENT WEATHER CONDITIONS (Fog, Rain, etc.)

Pedestrian Safety: Unobstructed access shall be provided continuously to pedestrian traffic. When the work area encroaches upon a sidewalk, walkway, or crosswalk area, special consideration must be given to pedestrian safety. Pedestrian detours, protective barricades, fencing, handrails and/or bridges, together with warning and guidance devices and signs shall be used as necessary to provide a safe and well defined passageway for pedestrians, especially for blind and other physically handicapped.

Safety Clothing: All personnel working within the State right of way shall wear protective safety clothing approved by the new ANSI guidelines.

Indemnification of State: The Permittee is responsible for any and all incidents arising out of the exercise of this Permit, and will defend, indemnify and protect Caltrans against any and all claims of every type and description alleged to have resulted from the permitted activity.

Acceptance of Conditions: Beginning work on this Permit constitutes full agreement and acceptance of all conditions, terms and provisions contained herein, attached hereto, or incorporated by reference.

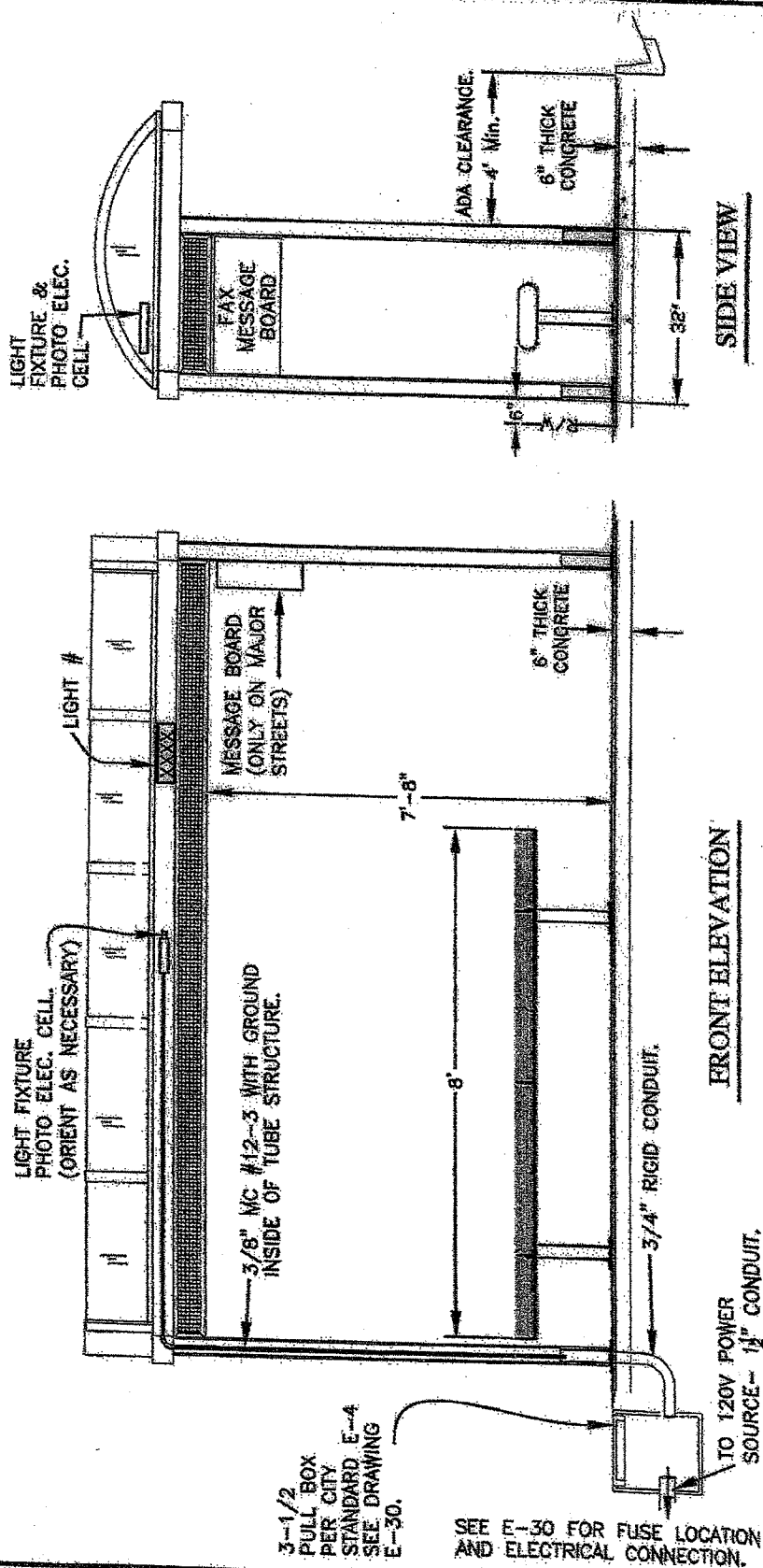
Notice of Completion: Immediately upon completion of the permitted work; described herein, the PERMITTEE shall fill out and mail the attached Notice of Completion card to:

Fresno Permits Office, 1352 W. Olive Avenue, Fresno, CA 93728

GENERAL NOTES:

1. BUS SHELTERS SHALL BE PLACED IN CITY OF FRESNO RIGHT OF WAY. CONTACT CITY OF FRESNO TRAFFIC ENGINEERING FOR EASEMENT REQUIREMENTS IF ADA CLEARANCE IS NOT MET.
2. A 6" CONCRETE PAD SHALL BE PLACED UNDER SHELTER FOR REINFORCEMENT. LIMITS OF PAD SHALL ALLOW FOR FUTURE ADDITION TO SHELTER. CONTACT TRAFFIC ENGINEERING FOR REQUIREMENTS.
3. LIGHT FIXTURES TO BE COOPER LIGHTING FIXTURE. HW-H-50-120.
4. BUS SHELTER LIGHT(S) SHALL BE NUMBERED. NUMERICAL SEQUENCE SHALL BE OBTAINED FROM P. C. & E. NUMBERS TO BE 2' HIGH AND INSTALLED AS SHOWN ON THIS STANDARD DRAWING.

These plans have been approved for
 Encroachment Permit No. 0614-185-0679
 by *[Signature]* on 02.12.2014



**FAX PASSENGER SHELTER
 DETAIL**

NOT TO SCALE

REF. & REV.
 NOV. 2007

CITY OF FRESNO
P-88

CERTIFICATION OF COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT (ADA)

TR-0405 (NEW 05/2013)

Permit No.

0614-NBS-0679

Dist/Co/Rte/PM

06/FRE/269/8.22 & 9.01

Encroachment permit projects that create, alter or affect pedestrian facilities are required to be designed and constructed in accordance with the policies and standards in Design Information Bulletin 82 (DIB 82). Certification of compliance must be submitted by the permittee or permittee's authorized representative prior to the issuance of an encroachment permit or rider and after construction is completed. DIB 82 can be found at:

<http://www.dot.ca.gov/hq/opd/dib/dibprg.htm>

A separate TR-0405 form must be used for the Design and Post Construction Certifications. A California Licensed Professional Engineer's or Architect's Stamp is required except when an authorized Caltrans representative signs the form (at the discretion of the District Permit Engineer).

Design Certification (prior to issuance of encroachment permit)

☐ I _____ a California Licensed Professional Engineer or Architect, do hereby certify that:
☒ I, YOUSSEF SHAPOUR, an authorized Caltrans representative, do hereby certify that:

☒ This project has been designed in accordance with DIB 82.

☐ This project has **NOT** been designed in accordance with DIB 82. An approved Exception to Accessibility Design Standards is attached

SIGNATURE

Youssef Shapour

TITLE

Transportation Engineer

DATE

09.12.2014**Post Construction Certification**

☐ I _____ a California Licensed Professional Engineer or Architect, do hereby certify that:
☐ I _____ an authorized Caltrans representative, do hereby certify that:

☐ This project has been constructed in accordance with DIB 82.

☐ This project has **NOT** been constructed in accordance with DIB 82. An approved Exception to Accessibility Design Standards is attached.

SIGNATURE

TITLE

DATE

CA LICENSED PROFESSIONAL ENGINEER or
ARCHITECT'S STAMP

I attest to the technical information contained herein
and have judged the qualifications of all technical spe-
cialists providing engineering data upon which recom-
mendations, conclusions, and decisions were based.