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VIA ELECTRONIC MAIL TO: DOE–QTRmailbox@hq.doe.gov.
AND MAILED FIRST CLASS TO:

Dr. Koonin and Members of the DOE-QTR Team
Department of Energy
Office of the Under Secretary for Science (S4)
1000 Independence Avenue, S.W.
Washington, DC 20585.

Re: DOE–QTR RFI – Support For Continuing Research And Development Of Fuel Cells For Heavy Duty Urban Transportation Applications

Dr. Koonin and Members of the DOE-QTR Team:

I urge you to review and continue the Department's support for research and development of hydrogen fuel cells for use in heavy duty urban transportation applications. Fuel cells provide the clean, quiet, reliable, long lasting and fast refuelable power needed for heavy duty applications in dense urban areas.

A. Who Am I

I am a 63 year old retired attorney who has been active in civic and political affairs for the past 50 years. For the past thirteen years I have been a publically elected at-large member of the Board of Directors of the Alameda-Contra Transit District ("AC Transit"). I saw my first PEM (Proton Exchange Membrane) fuel cell in 1960 at my uncle's laboratory at General Electric in Schenectady, New York. My uncle, Dr. Robert T. Foley, was an investigator on the NASA grant for the fuel cell for Project Gemini. These comments are mine, and not necessarily those of AC Transit's Board of Directors or Management.

B. What Is AC Transit

AC Transit is a legislatively created special district which provides bus transit service to a population of 1.3 million in 360 square miles on the east side of the San Francisco Bay. It does so with about 2,000 largely unionized employees and a budget of about $320 million per year. It is one of the three transit districts in the United States whose directors are directly elected by the public. AC Transit has about 600 heavy-duty urban buses, and those buses board about 200,000 people every day. It is the successor to the private Key System, which was incorporated in 1903.

C. AC Transit's Fuel Cell Program

AC Transit started its fuel cell program in 1999 and began testing its first fuel cell bus in 2003 (a 30' Thor with a UTC (United Technology Corporation) fuel cell). In 2005 it received three custom made 40' buses (Van Hools with UTC fuel cells, one of which now has run over 9,000 hours with no failures or degradation in power). We now have 9 of 12 new 40' fuel cell buses, which we are sharing with four other San Francisco Bay Area transit agencies. Our new buses use 120 kW PureMotion® fuel cells from UTC in Hartford, Connecticut and advanced lithium-ion batteries from EnerDel, Inc. of Indianapolis, Indiana.

Our first hydrogen station came used grid powered electrolysis. It was at our operating division in Richmond, and was provided by the California Fuel Cell Partnership and Hydrogenics. We built a second station with the Chevron that produced 150Kg/day using high temperature steam reformation of natural gas. The first two stations produced in excess of 65,000 Kgs of hydrogen between 2002 and 2010 when we decommissioned the Chevron station after five years of operation. We are almost finished building a hydrogen production plant that uses solar energy to create electricity and then uses that electricity to electrolyze water. Some of that solar energy comes from photo-voltaic cells provided by an FTA (Federal Transit Administration) TIGGER I (Transit Investments for Greenhouse Gas and Energy Reduction) grant.

AC's program has an educational component. We have assisted our partner, Sunline Transit of Thousand Palms, California and College of the Desert of Palm Desert, California in the development of a Community College fuel cell maintenance curriculum. We are also partnering with the Lawrence Hall of Science of Berkeley, California, the Chabot Space and Science Center of Oakland, California, and the Schatz Energy

Research Center at Humboldt State University, in the development of middle and high school science curricula about hydrogen fuel cells.

AC's program has strong support from our congressional delegation and recently received a support letter signed by 19 out of 22 members of the Bay Area state legislative delegation (some were out of town) in support of our application to the California Department of Energy for grant funding.

Technology validation for this and other heavy duty fuel cell projects around the United States is provided by the Department's excellent National Renewal Energy Laboratory. For more information on AC Transit's fuel cell program see: http://www.actransit.org/environment/the_hyroad/.

D. Why Fuel Cells

A typical urban transit bus weighs between 20 and 30 thousand pounds, needs to be able to operate 18 to 20 hours and travel 200 to 250 miles a day. At the end of the day it comes back to a yard (AC Transit calls them "Divisions") that serves 150 to 250 buses. The buses need to be refueled and serviced quickly and sent off for needed minor or preventative maintenance, or parked for "pull out" the next morning. Fuel cells are the only zero emission technology that meets these criteria.

Zero emission is increasingly important. In a dense urban area, such as most of AC Transit's service area, our residents deal with trucks, trains and, in several locations, ocean going ships. They all emit substantial amounts of particulate matter and other local pollutants, leading to a serious asthma problem, particularly among our District's children and seniors. With the passage of Assembly Bill 32, California, at least, has clearly recognized the problem of global warming caused by greenhouse gases.

AC's diesel buses now all meet CARB (the California Air Resources Board)'s Urban Bus Rules, so are dramatically cleaner than other pre-2010 diesel engines. Our fuel cell buses, however, produce no pollution at the bus and over 40% less greenhouse gases "well to wheal" than the equivalent diesel buses – and that is producing the hydrogen with high temperature steam reformation of natural gas. As noted above, when AC's electrolysis plant using solar electricity is finished, we will be producing zero carbon hydrogen

In addition, fuel cell buses are very quiet. Noise pollution is an increasing issue with urban transit agencies.

Two of the often cited issues with fuel cell vehicles – lack of a hydrogen infrastructure and problems with hydrogen storage – are not issues with urban buses. As noted above, all the buses come "home" to a division at night to be refueled and the addition of roof mounted tanks to an already large vehicle causes no problems.

AC Transit, like most government jurisdictions, particularly local jurisdictions in California, is under financial stress. AC Transit is doing this pioneering work with heavy duty urban applications of fuel cells for ourselves and our constituents, but also as a demonstration for California and the country. We continue to need the support of the Department and other Federal agencies.

Thank you for this opportunity to comment on the Department's Quadrennial Technology Review. If you have any questions, please feel free to call or e-mail me at the number or e-address above. If Secretary Chu would like to be picked up by a fuel cell bus when he is home in Berkeley, I would be happy to arrange that.

Very truly yours,

H. E. Christian Peeples

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Cc: AC Transit Board of Directors
Mary V. King, Interim General Manager
Carol Babington, Interim General Council
Jaimie Levin , Director of Alternative Fuels Policy

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