### Conference & Workshop 4
**April 3 & 4, 2014**

**UCR | CE-CERT 1084 Columbia Ave, Riverside, CA**

#### 8:30  Introduction - April 3, 2014
- UC Riverside  
  - Matt Barth  
  - Welcome to UCR
- SCAQMD  
  - Matt Miyasato  
  - Key Note Speaker: Air, Climate, and Energy
- UC Riverside  
  - Kent Johnson  
  - In-Use Testing, Trends, and Predictions

#### 9:00  Regulatory Developments and Trends
- China, EPD  
  - Carol Wong  
  - Recent Development of On-Board Vehicle Emissions Measurements in Hong Kong
- European Union JRC  
  - Francesco Riccobono  
  - Results of the European PN-PEMS Measurement Program for the Type A Approval of Light-Duty Vehicles in Europe
- U.S. EPA  
  - Allen Duncan  
  - In-Situ Emissions Performance of EPA2010-Compliant On-Highway Heavy-Duty Diesel Engines

#### 10:00–10:20  Break (Poster Discussions)

#### 10:20 - Regulatory Developments and Trends
- U.S. EPA  
  - Carl Fulper  
  - US Methodology and Future Data Gathering Efforts for In-Use Testing
- Sensors, Inc.  
  - David Booker  
  - Challenges and Solutions for Light Duty Real-World PEMS Testing under the auspices of the European RDE/LDV Program

#### 11:00  Research Developments
- CARB  
  - David Quiros  
  - High-speed Portable FTIR Measurements of Ammonia and Nitrous Oxides From Heavy Duty CNG Transit Buses
- Lawrence Livermore National Lab  
  - L.Y. Woo  
  - Development of Novel, Low-Cost Signal Processing for Single-Cell NOx Sensors
- Cummins Inc. & UC Riverside  
  - Tanfeng Cao  
  - Comparison of the SEMTECH ECOSTAR Continuous Particulate Measurement to the AVL Micro Soot Sensor, the AVL Advanced Particle Counter and CVS Gravimetric Particulate Measurement

#### 12:00–1:00  Lunch (Poster Discussions)

#### 1:00  Research Developments
- U.S. EPA  
  - David Hawkins  
  - Advancements and Direction in Needed Equipment (PEMS and PAMS)
- Emisense Technologies  
  - Jim Steppan  
  - Characterization of an In-Situ Electrostatic Soot Sensor with Laboratory Measurement Instruments
- A & D Technology  
  - Ron Tandy Jr.  
  - Real World Emissions Measurements, Based on FTIR Technology
- CARB  
  - John Karim  
  - Evaluation of Off-Cycle Emissions for Heavy-Duty Transit Vehicles

#### 2:20–2:40  Break (Poster Discussions)

#### 2:40  In-Use Approaches for Advanced Vehicles
- U.S. EPA  
  - James Warlia  
  - How to Develop a Test Program to Achieve Good Results for Advanced Vehicles (Hybrids, Eco Methods, Alternative Fuels, All Electrics, etc...)
- University of Vermont  
  - Britt A. Holeman  
  - Real-World Fuel Economy and Particle Number Emissions of a Hybrid-Electric Passenger Car Under Cold Climate
- CARB  
  - Donald Chernich  
  - In-Use Testing of Late Model Diesel and LNG Refuse Trucks During Regular Route Service – Lessons Learned
- So Cal Edison and AVL  
  - Ed Kellogg  
  - In-Use Testing of a Plug-In Hybrid
- West Virginia University  
  - David McKain  
  - Natural Gas Vehicles/Methane Response on Standard PEMS Unit with Crankcase Methane Emissions

#### 4:30  Panel Discussion – Kent Johnson, Consulting, Regulatory, Industry Representatives
This will be a roundtable discussion on trends, tools, and needs for in-use testing. Topics will include “Discussion on the U.S. in-use compliance program”, “How do we quantify in-use emissions outside of NTE”, “How do we quantify in-use fuel economy improvements?” and “Is in-use particle number accurate and ready for compliance testing?”

- Cummins Inc.  
  - Shirish Shimpi  
  - Senior Technical Advisor, Emissions Development
- California Air Resources Board  
  - Chandan Misra  
  - Researcher/Management Consultant
- U.S. EPA  
  - Carl Fulper  
  - Chemical Engineer, PEMS Coordinator, Data and Testing Center
- European JRC  
  - Francesco Riccobono  
  - Scientist, Institute for Energy and Transport
- UC Riverside  
  - Kent Johnson  
  - Research Faculty, Advanced Vehicles and Emissions Research

#### 5:30  End of Day 1 Workshop
8:30 - 14:00 Special Ride and Drive Event - April 4, 2014

A special ride-and-drive event to experience in-use testing on advanced hybrid electric vehicles. Ask engineers and scientists all your questions while you ride and learn about PEMS testing with the latest tools. The ride and drive will be occurring in parallel with the presentations.

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<th>Session</th>
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<td>9:00</td>
<td>Research Developments</td>
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<td>U.S. EPA Carl Fulper</td>
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<td>Emissions and Activity Measurements from Heavy-Duty Vehicles “Drayage” Results in the Houston Galveston Area</td>
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<td>North Carolina State University Brandon M. Graver</td>
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<td>Measurement of Real-World Locomotive Engine Activity and Emissions Using a Portable Emissions Measurement System</td>
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<td>Institute for Transport Studies Karl Ropkins</td>
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<td>Automating PEMS Micro-Trip Analysis</td>
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<td>10:00</td>
<td>In-use Fuel Consumption Approaches</td>
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<td>HEM Data Rick Walter</td>
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<td>Fuel Economy Calculations from In-Vehicle Network Parameters for Light &amp; Heavy Duty Vehicles</td>
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<td>North Carolina State University Gurdas Sandhu</td>
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<td>Real-World Activity and Fuel Use of Diesel and Compressed Natural Gas Refuse Truck</td>
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<td>Comparison of PEMS/PAMS and Daily Log Fuel Efficiency Data for Refuse Haulers in a Municipal Fleet</td>
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<td>PEMS Testing to Assess Emissions Implications of Electric Vehicles</td>
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<td>Eastern Research Group Michael Sabisch</td>
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<td>PAMS-based Light-Duty Vehicle Fuel Economy Pilot Study Overview</td>
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<td>12:00-13:00</td>
<td>Lunch and Continuing Ride and Drive Event</td>
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<td>13:00</td>
<td>Lessons</td>
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<td>In-Use Approaches for Advanced Vehicles</td>
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<td>60 Minute Lesson- Engine and Vehicle Networking Databases . The difficulty in performing and interpreting in-use vehicle network signals: An in-depth analysis.</td>
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<td>JC Riverside Kent Johnson</td>
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<td>Closing Remarks and Feedback</td>
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<td>14:20</td>
<td>Presentations Adjorn and Continue Ride and Drive Discussions</td>
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<tr>
<td>15:00</td>
<td>Special Guided Mountain Bike Ride - by Kent Johnson</td>
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