



# University of California – Riverside “Energy” Research Programs

Michael Todd, PE

College of Engineering-Center for Environmental Research and Technology  
University of California-Riverside

EV 101 Workshop  
Session #4 – Green Jobs and Training  
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# UCR CE-CERT Laboratories:



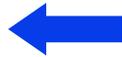
## *Emissions and Fuels Research*

Emissions measurement/analysis, fuel effects, new instrumentation/methods, after-treatment



## *Transportation Systems Research*

ITS, vehicle activity, energy/emissions modeling

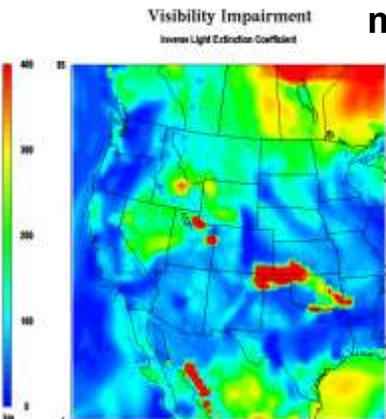


## *Atmospheric Processes Research*

secondary pollutant formation, mitigation methods

## *Environmental Modeling*

models to predict long-term regional effects; micro dispersion



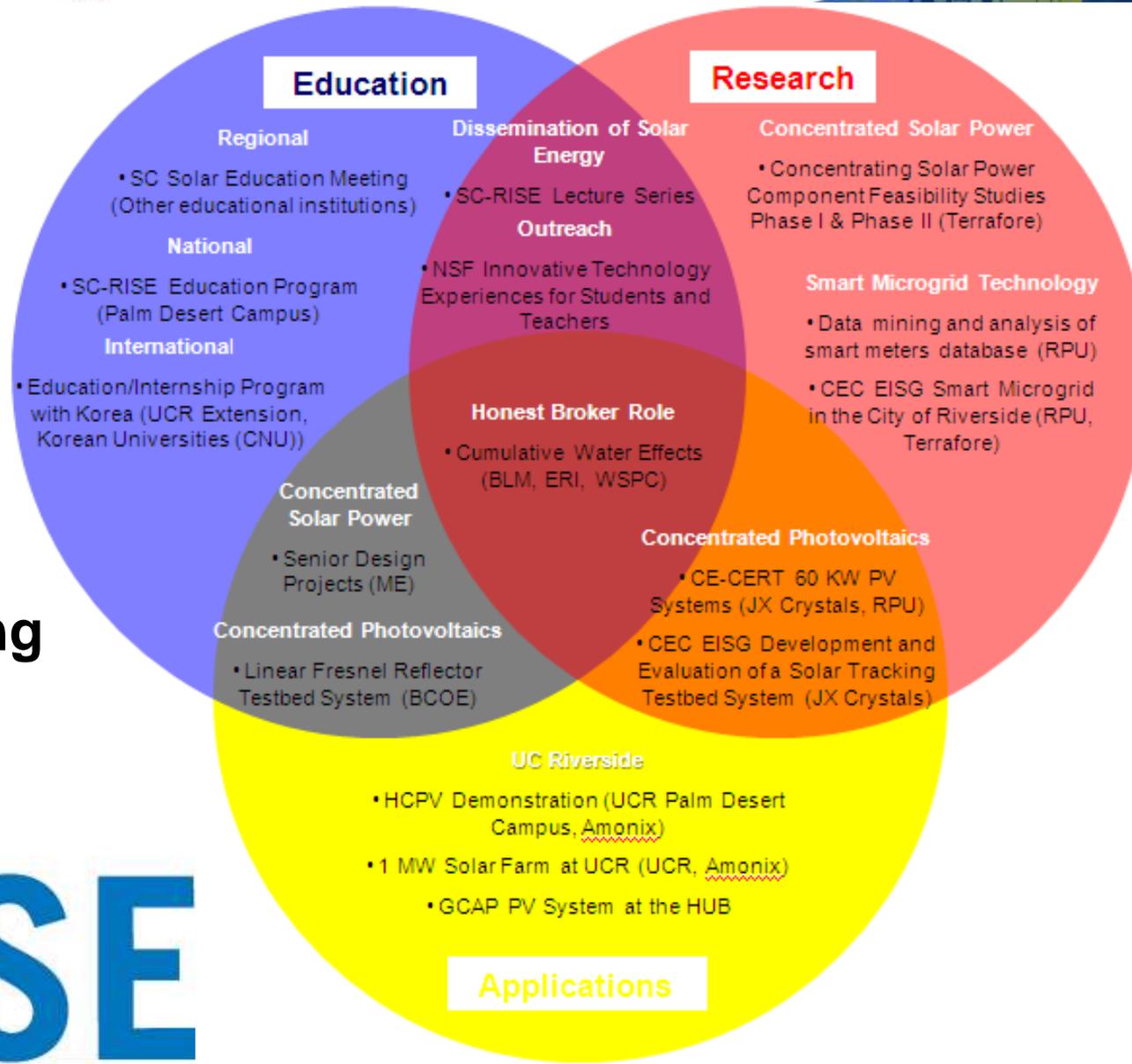
## *Sustainable Energy Research*

cellulosic ethanol, synthetic diesel fuel, solar energy





- **Research**
  - **Devices**
  - **Thermal**
  - **Biomass**
- **Applications**
  - **Integration**
  - **Systems**
  - **Evaluation**
- **Education/Training**
  - **Training**
  - **Partnerships**



**SCRISE**

**So Cal Research Initiative for Solar Energy**



# Intelligent Transportation Systems

## Targeted Benefits:

- **Improving Safety**
  - reducing accidents
  - making accidents more survivable
- **Improving Transportation Efficiency:**
  - increasing throughput
  - reducing congestion
  - maximizing economics
- **Energy/Environment:**
  - in-direct benefits of lower emissions and fuel savings
  - directed benefits to *target* lower emissions/fuel

**Our Research Focus:  
ECO-ITS**

A green arrow originates from the text 'Our Research Focus: ECO-ITS' and points towards the 'Energy/Environment' category in the list above.



UC Riverside IntelliShare System Block Diagram





- 2010 Clean Air Award
- 8.5 years of operation
- 14 papers
- 7 U.S. patents,
- 6 international
- 16 students
- nearly 125,000 trips
- 587,000 accumulated miles
- 5,250,000 packets of data



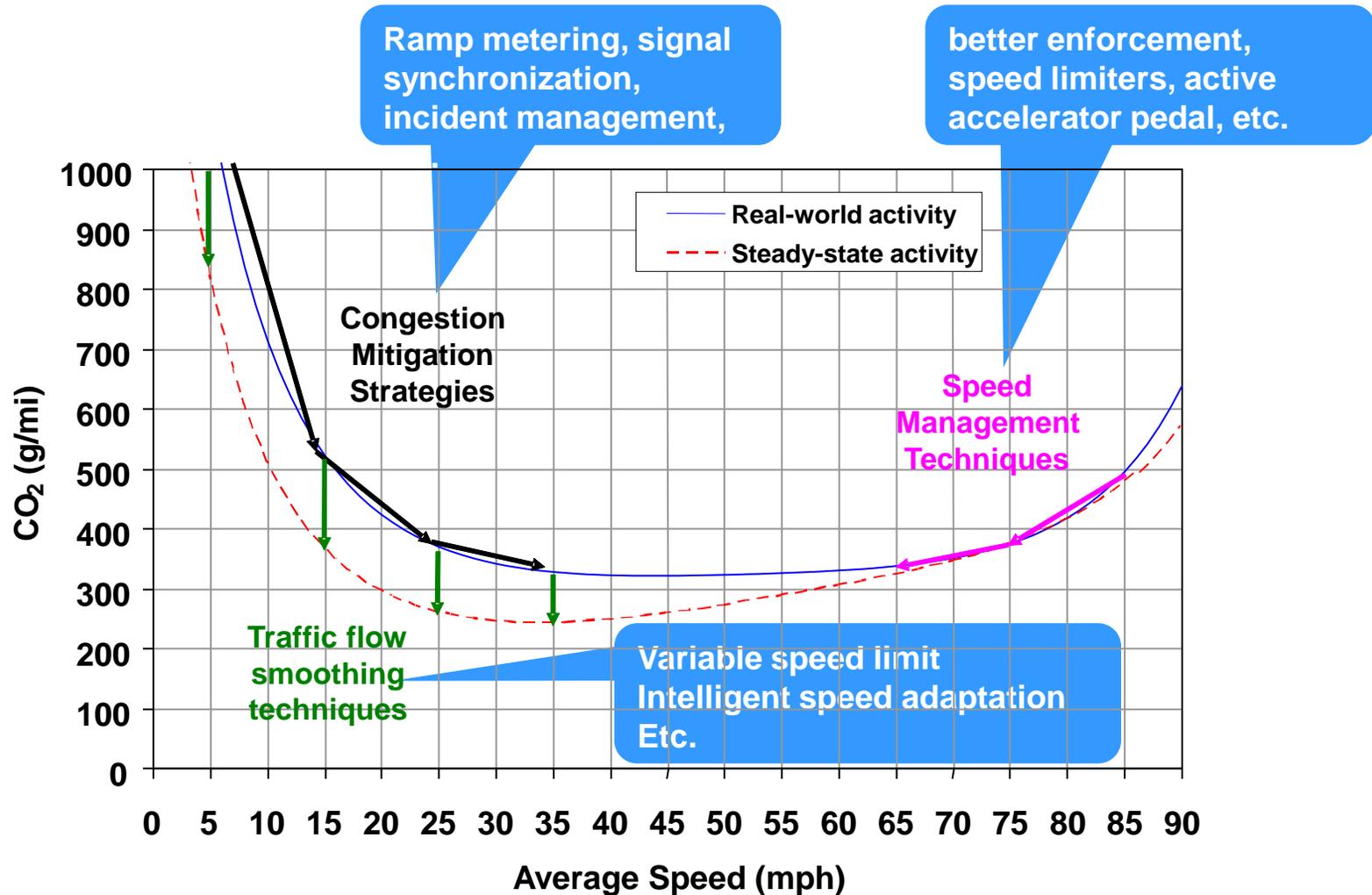


# UC Riverside ECO-ITS Research Program

- **Quantifying Emission Impacts of ITS Projects**
  - developed new mesoscale modeling methodology
  - vehicle activity research using probe vehicles
  - real-time traffic data monitoring techniques
- **Dynamic ECO-Driving Research**
  - en-route driving information
  - variable speed management
- **ECO-Routing Research**
  - light-duty vehicle implementation and testing
  - heavy-duty vehicles implementation (in Los Angeles)
  - research on congestion and road grade effects
  - navigation mobility index development



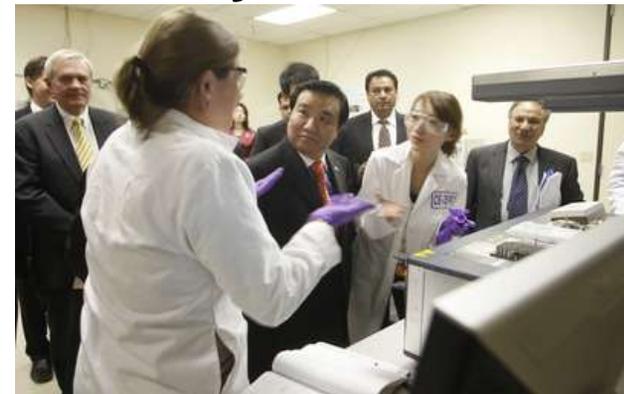
## Different ITS strategies to reduce on-road emissions





# Winston Energy Storage Research Center (WESRC)

- **\$10 million MOU for an endowment to the Bourns College of Engineering**
- **Name the Engineering Building II as Winston Chung Hall**
- **Provide two endowed professorships**
  - **Winston Chung Professorship in Energy Innovation**
  - **Winston Chung Professorship in Sustainability**
- **Establish the Winston Chung Global Energy Center within CE-CERT**





# Winston Energy Storage Research Center (WESRC)

- **Advanced battery technology**
  - **Grid integrated (wind, solar, distributed)**
  - **Passenger vehicle**
  - **Heavy duty vehicle**
  - **Battery management systems**
  - **Charging**
- **Bio-Inspired materials for innovative energy**
- **Solar thermal materials**
- **Pumped hydro energy storage**
- **What are the needs of the Energy and EV Industry?**