

DOE's Vehicle Technologies Office

Energy Efficient Mobility Systems



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Sarah Oleksak
BEBs and the Bigger Energy Picture

BEB's and the Bigger Energy Picture for Your Community

1. Get to know the DOE Vehicle Technologies Office
2. BEB Resources: Alternative Fuels Data Center & DOE Clean Cities program
3. New! Energy Efficient Mobility Systems

DOE Vehicle Technologies Office (VTO)

We fund R&D and deployment of advanced transportation technology that:

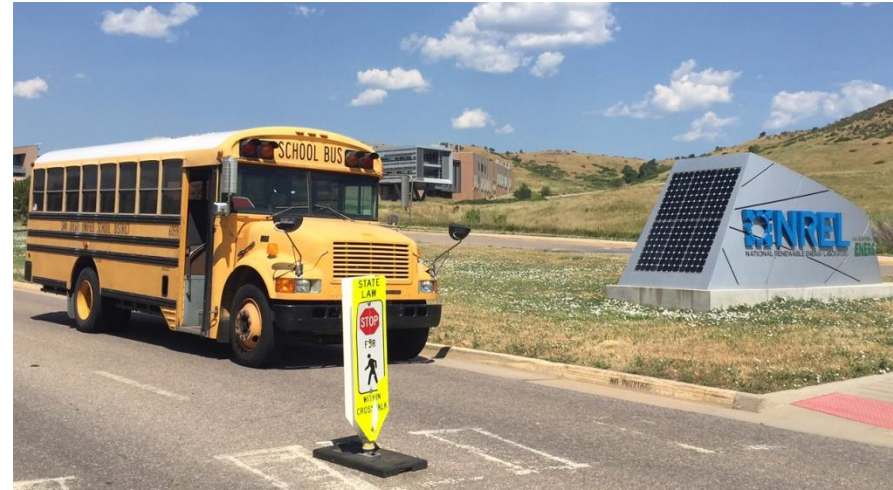
- improves energy *efficiency*
- increases domestic energy *security*
- reduces operating *cost* for consumers & business
- improves global *competitiveness* of US Industry

VTO R&D Highlight: V2G Electric School Bus Project

Blue Bird Body Company

Key Partners: National Strategies LLC, National Renewable Energy Laboratory, South Coast Air Quality Management District, Rialto Unified School District

Project Funding: \$9.9M total, \$4.9M DOE



Summary:

- Develop a battery-electric school bus that can quickly attain total-cost-of-ownership (TCO) parity with conventional diesel buses

Project Impact/Takeaway:

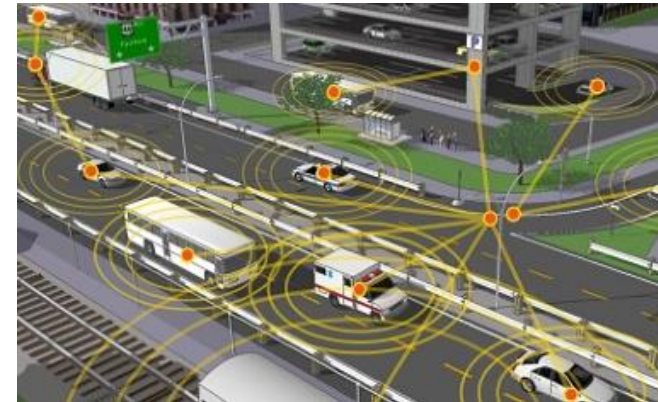
- Rapid market penetration for EV school buses
- Demonstration of a dual-use grid-scale energy-storage resource
- Demonstration of a path to TCO parity that may apply to other heavy-duty EVs

Deployment Activity Scope

Light-, medium-, and heavy-duty vehicles



Alternative Fuel Infrastructure



Energy Efficient
Mobility Systems

Alternative Fuels Data Center

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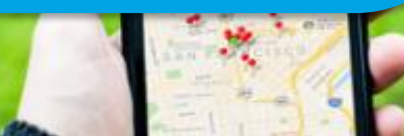
Biodiesel



Hydrogen

Altern
for Ev

Thanks to the new Android app, the
Alternative Fueling Station Locator
is now more mobile than ever.



Information by State



select a state

Information by Fleet Application

Delivery
ServicesRefuse
Collection

Public Transit

School
Transportation

Maps & Data

- U.S. Alternative Fueling Stations by Fuel Type
- Alternative Fuel Vehicles in Use
- U.S. Hybrid Electric Vehicle Sales by Model

Fuel Prices



Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. Enter a state to see a station count or see [stations data by state](#).

Find Stations | Plan a Route

address, ZIP, or state... **Go**

Electric

[more search options](#)

16,107 electric stations
43,877 charging outlets
in the United States

Excluding private stations

Location details are subject to change. We recommend calling the stations to verify location, hours of operation, and access.

ABOUT THE DATA

Embed | Submit New Station

Google **CART**

Map data ©2017 Google, INEGI | [Terms of Use](#)

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Data last updated: 08/02/2017

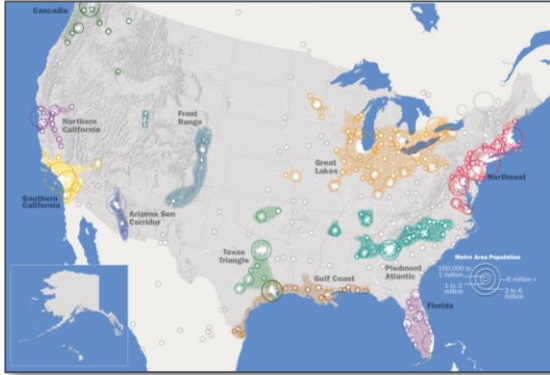
Clean Cities: locally-based Public-Private Partnerships

*Nearly 100 coalitions with thousands of stakeholders,
representing ~80% of U.S. population*

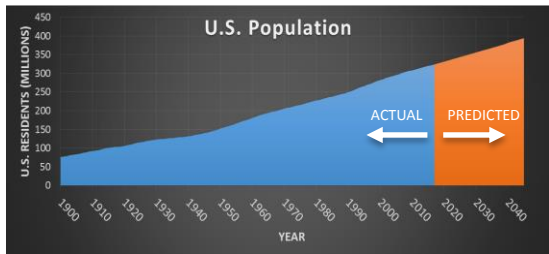


Converging trends are shaping mobility

Population



75% of population in 11 Megaregions.



Population expected to grow by 70 million in next 30 years.

Demographics

Americans are Living Longer



By 2045, the number of Americans over age 65 will increase by **77%**. About **one-third** have a disability that limits mobility.

Millennials are Connected & Influential

There are 73 million Americans aged 18 to 34, and they drove 20% fewer miles in 2010 than at the start of the decade.



Technology



Integration of Connected & Automated Vehicles



Introduction of Shared Service Platforms



Advancements in Vehicle Powertrain Technology



Deeper Application of Big Data



Faster Processing Speeds at Decreasing Cost

Trends are causing a fundamental disruption



Connectivity



Ride-hailing



New Powertrains

Consumers & Industry are leading the introduction of disruptive business models & technologies.

- How will this disruption lead to new energy efficiency opportunities?
- What are the risks to energy use and how can we overcome them?
- What are the most promising innovation levers for energy efficiency?



Automation

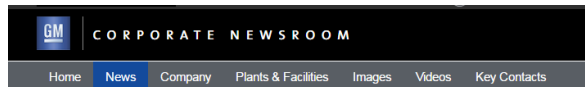


Car-sharing



New Modes

Fundamental disruption will have dramatic energy impacts



GM and Lyft to Shape the Future of Mobility

2016-01-04

Print Email Word

DAIMLER

ng-term strategic alliance to create an ir

AUTONOMOUS DRIVING

Driving autonomously through Nevada
Freightliner Inspiration Truck

Google, Fiat Chrysler Begin Work on Self-Driving Minivan

Alphabet Inc. unit also will establish self-driving engineering center in Detroit area



+200%



Potential Increase in Energy Consumption

2050 Baseline Energy Consumption



-60%

Potential Decrease in Energy Consumption

Energy Efficient Mobility Systems (EEMS)

Identifies & supports technologies & innovations that encourage a maximum-mobility, minimum-energy future

Research & Development



\$3.8M for 2017 R&D Projects

High-Performance Computing & Big Data Analytics

Analysis & Modeling



U.S. DEPARTMENT OF ENERGY
SMARTMOBILITY
Systems and Modeling for Accelerated Research in Transportation

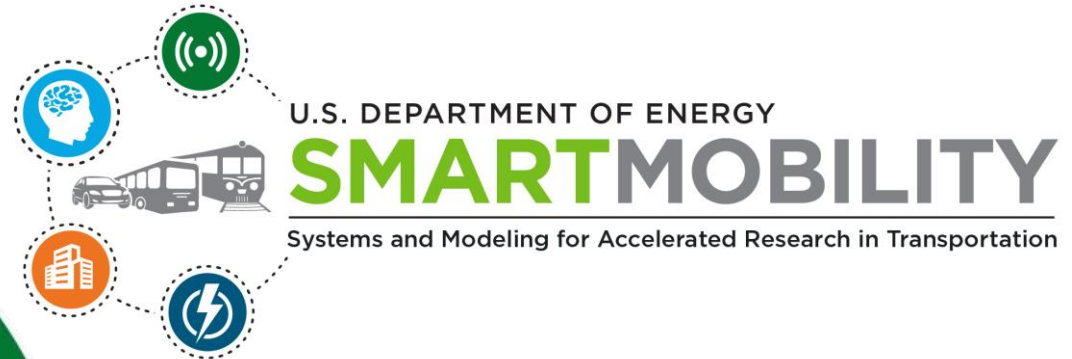
Living Labs



\$5.6M for 2017 Living Lab Projects

EEMS Technical Assistance

SMART Mobility Consortium: Five National Laboratories



Multi-Year, Multi-Lab Effort (3 years, 5 labs)

- Energy implications of connectivity & automation
- Multi-modal transport of people and goods
- City-scale urban mobility models for planning
- Informed fueling infrastructure investments
- Understanding consumer mobility decisions

DOE and DOT MOU on Transportation Systems

1. Collaborate on EEMS and Smart City Challenge
2. Lead and establish best practices on data
3. Leverage DOE expertise on transportation electrification and petroleum reduction practices
4. Leverage DOT expertise on connected and automated vehicles and public transportation systems
5. Utilize existing stakeholder networks



What does EEMS mean for Transit Authorities?

- How can an energy strategy contribute to your sustainability goals? Let's incorporate energy metrics into your performance indicators today.
- Let's work together to identify the data sets that you have – and need to have – to make system-level energy decisions.
- You can look to DOE and our national labs as a source for technical assistance.
- Your region may be participating in one of our forthcoming EEMS projects... or not... either way there will be lots of lessons learned to share.

What does EEMS mean for BEBs?

- Example 1: Our *Advanced Fueling Infrastructure* work will provide insights into charging infrastructure siting for BEBs
- Example 2: Our *Mobility Decision Science* work will examine energy impacts of consumer choice in how they move between public and private transit options
- Example 3: We want to partner with transit authorities to offer up our big data analytics / high performance computing resources to help answer energy efficient mobility challenges