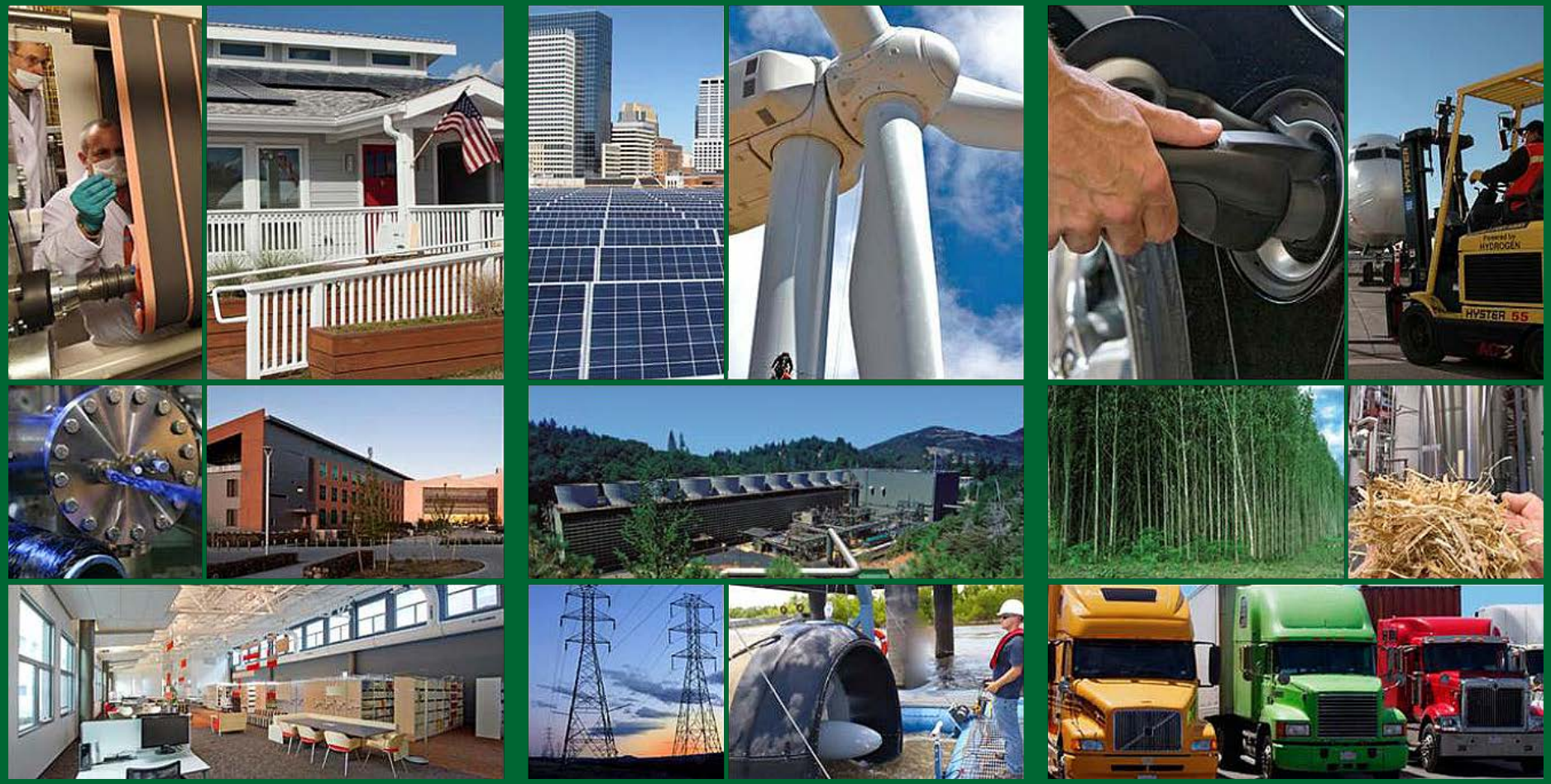
DOE's Vehicle Technologies Office

Analysis



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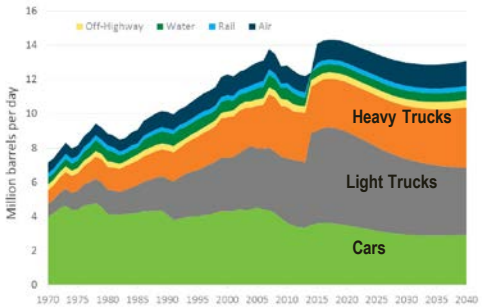
Rachael Nealer
Technical Project Manager
Office of Energy Efficiency and Renewable Energy

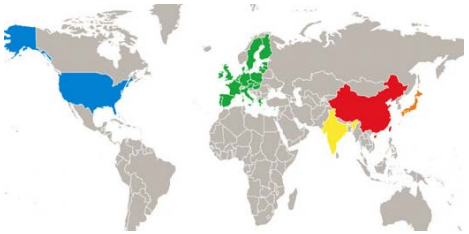
U.S. Transportation & Energy Drivers

70% of total U.S. petroleum usage is for transportation



On-road vehicles account for **85%** of transportation petroleum usage

Transportation is the **2nd** most expensive spending category after housing



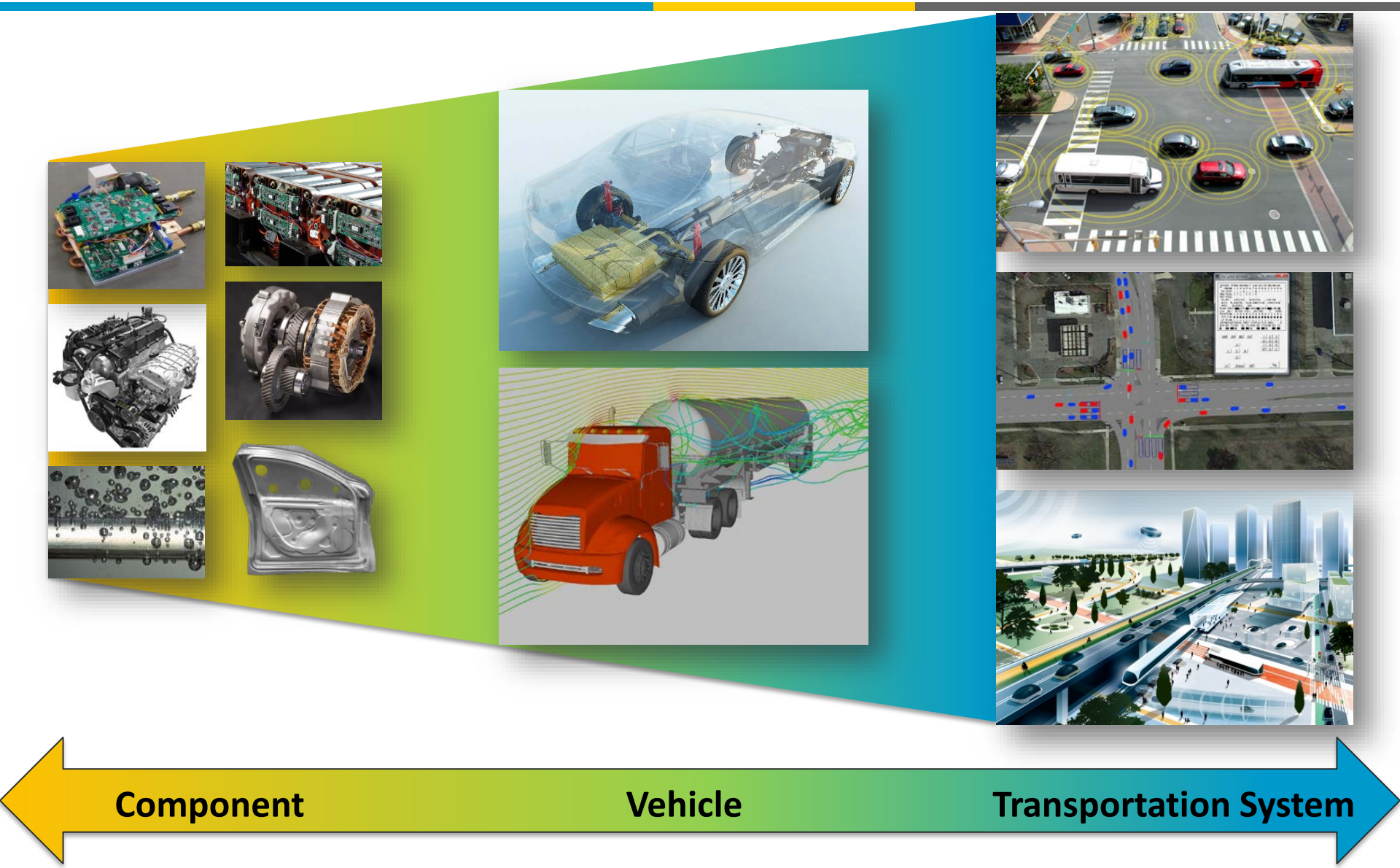
75% of cars & trucks are sold outside US - Innovation drives US global competitiveness and domestic supply base

Source: Transportation Energy Data Book, 2016

Key Questions and Direction for Analysis

- What R&D to invest in to improve efficiency, save consumers money, create economic growth, and protect human health
  - Track trends like VMT, vehicle ownership, fuel choices, and infrastructure
  - EV sales are growing, what are the infrastructure needs? How will EVs impact the grid? Does it save consumers money and improve human health?
  - Freight transportation is growing, how do we improve efficiency of moving goods we buy?
- What will the future look like if we meet all our subprogram targets? What if our subprograms fall short?

Analysis Supports VTO Sub-programs



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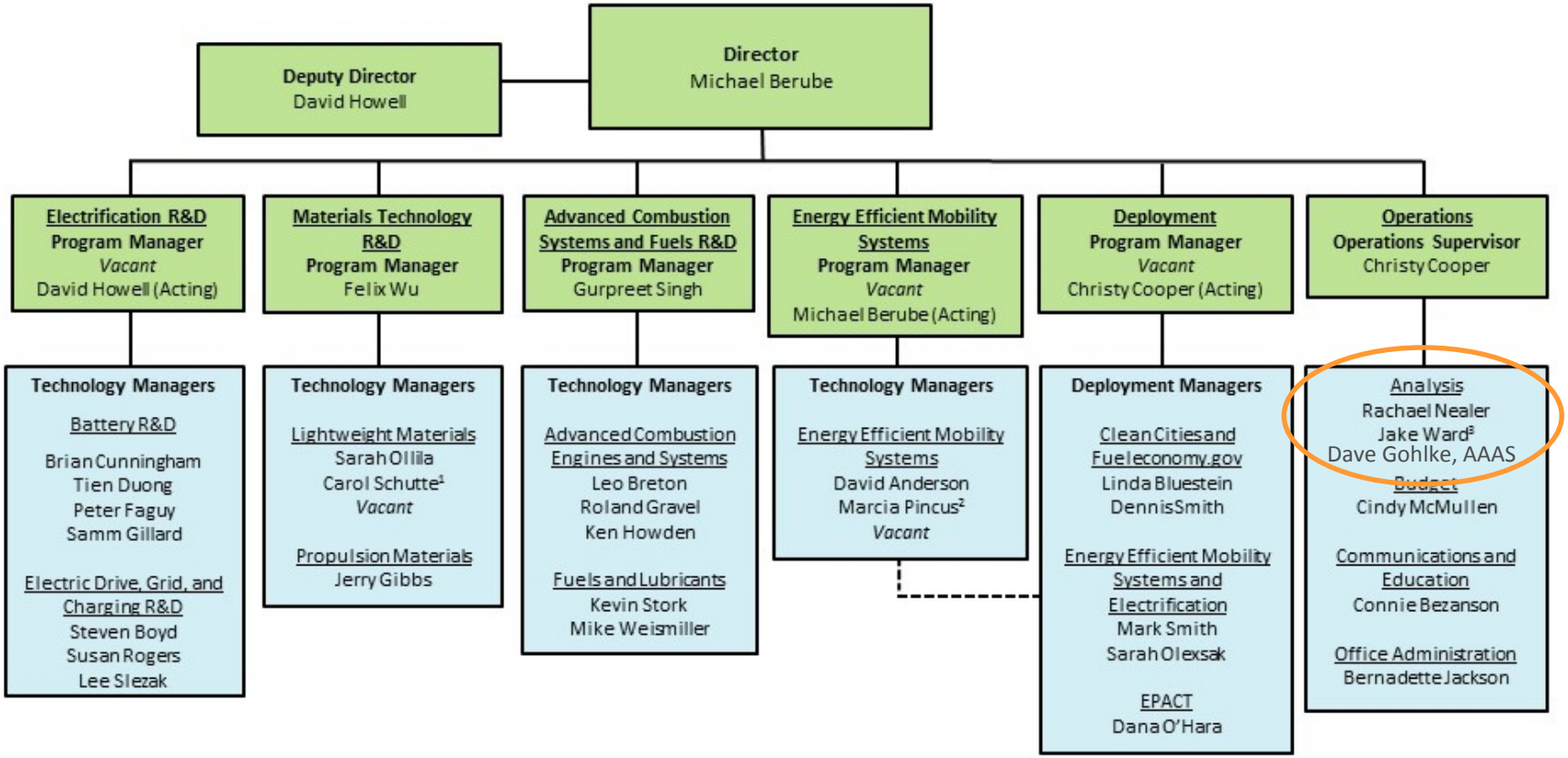
Vehicle Technologies Office



[1] *Detailed to DOC/NTIS*
[2] *Detail from DOT/FHWA*
[3] *Part time status, based at NETL-Pittsburgh*

January 2017

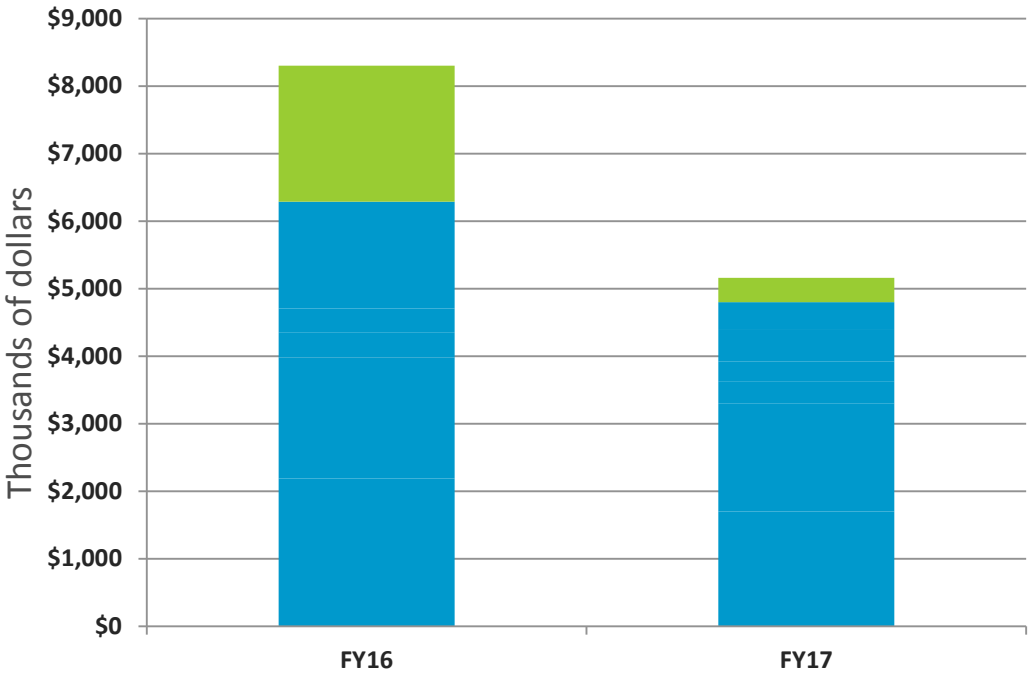
VTO Analysis (VAN) Program Overview

strategy

Create and maintain a strong foundation of data, build relevant analytical models, and execute insightful integrated analyses critical transportation energy problems

budget

- FY16 budget restructure increased Analysis budget; lead to co-funding SMART mobility consortium
- FY17 enacted aligned with historical levels at just over $5M
- National Laboratory support from ANL, ORNL, LBNL, NREL, and Sandia



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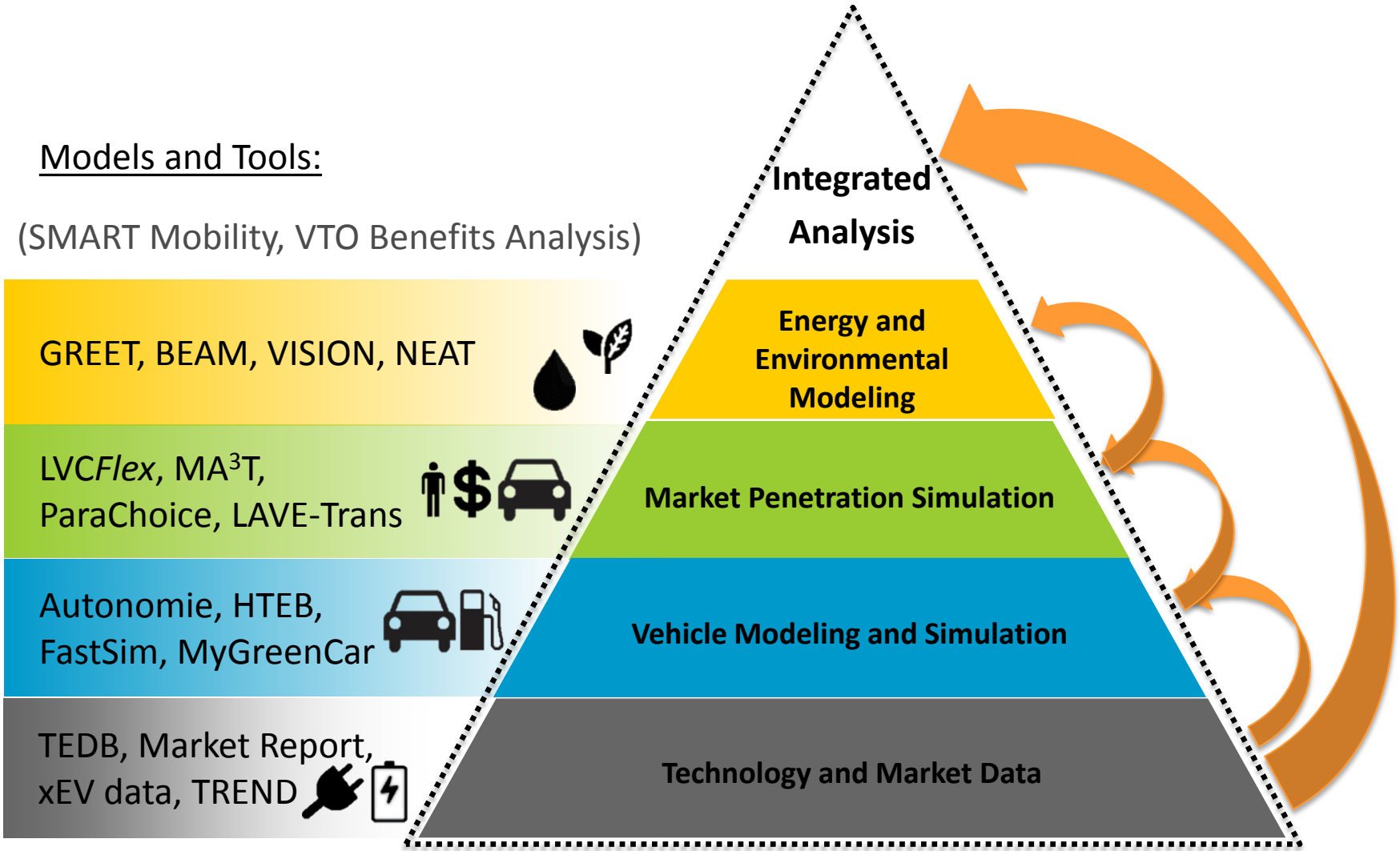
VTO Analysis (VAN) Core Program at a Glance



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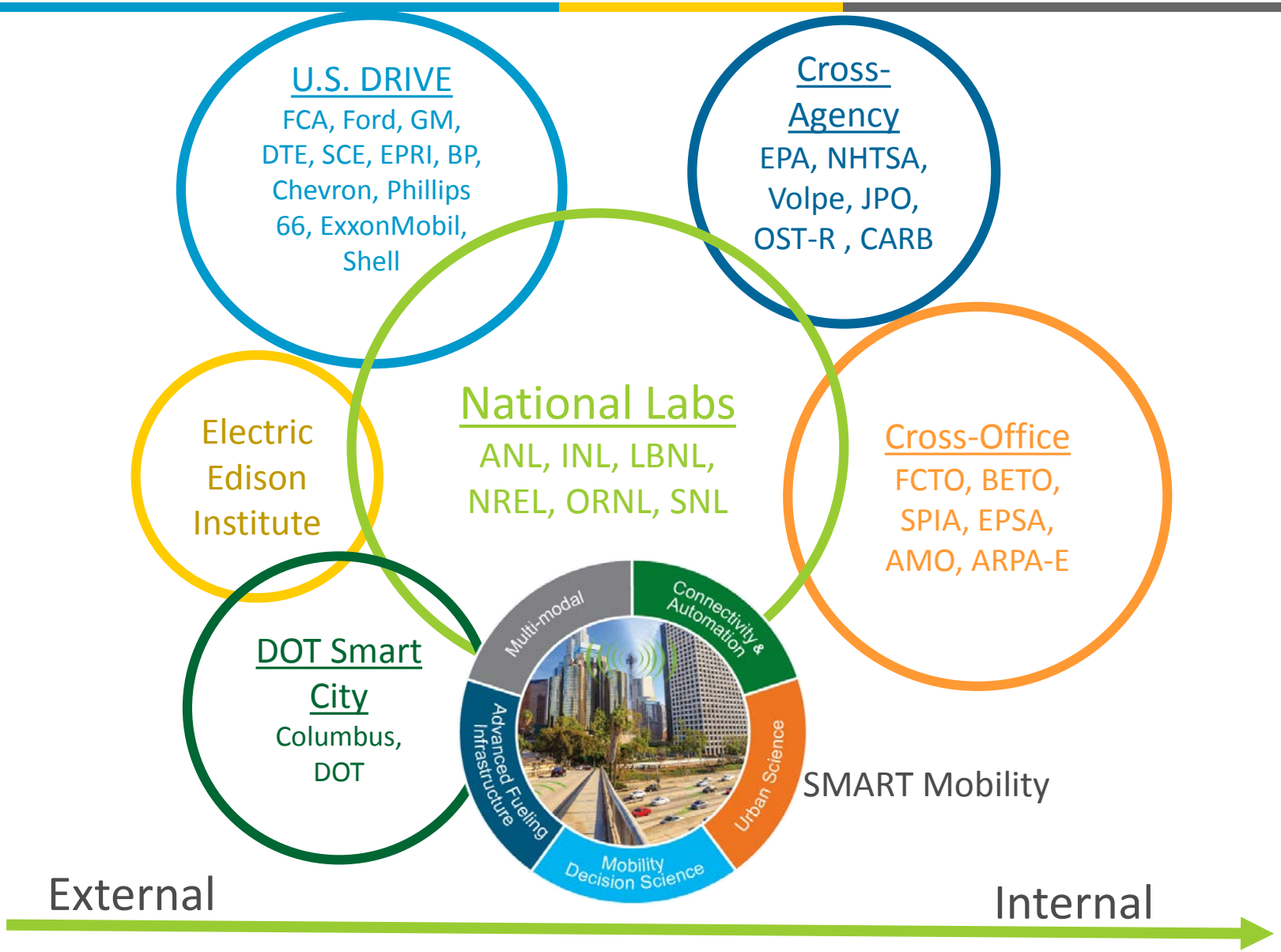
Analysis Projects Leveraged Across Partnerships



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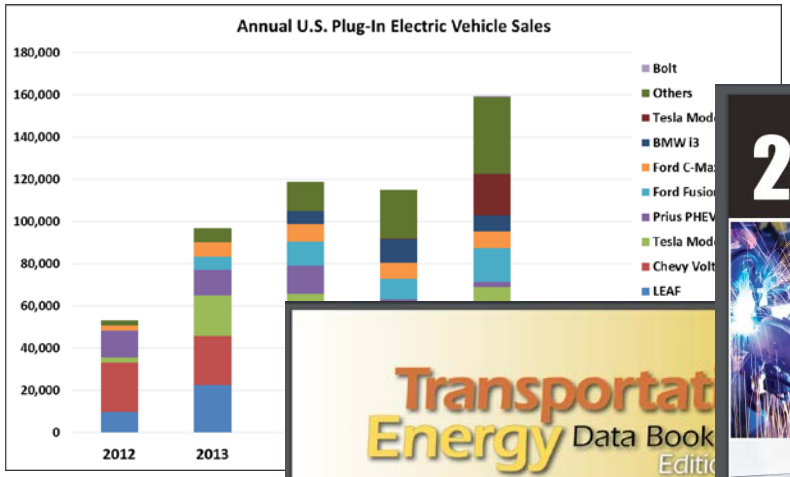
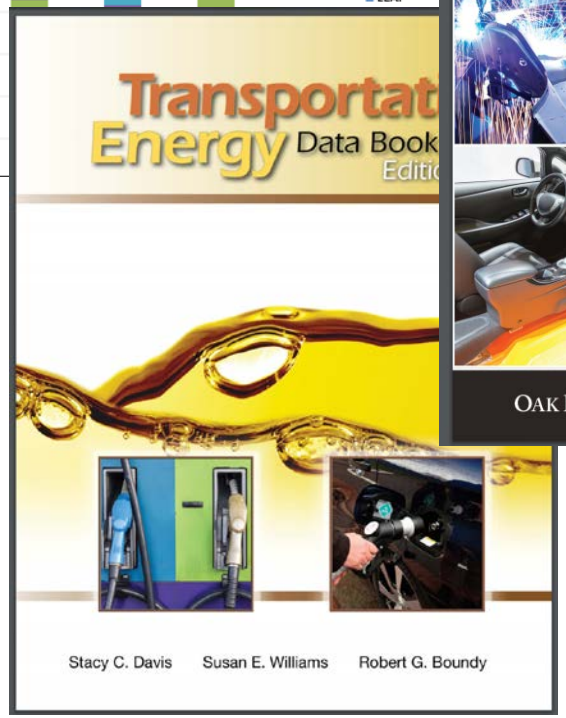
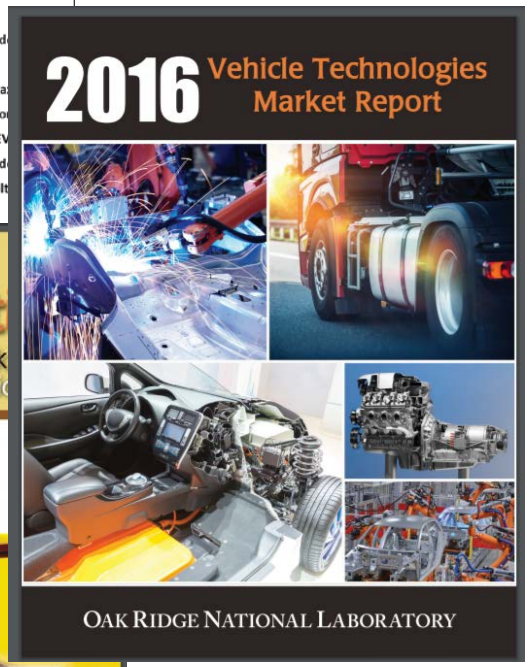
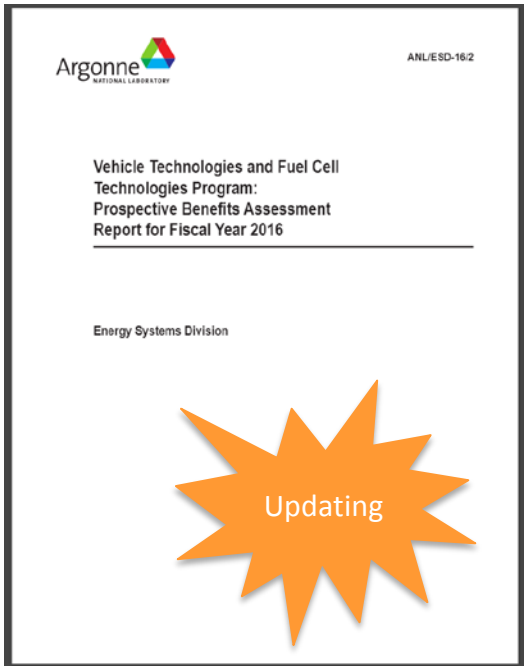
Provides insight into transportation and energy use for broad range of stakeholders









Accomplishments– New Beginnings

Portfolio is ever-evolving with the rapidly changing transportation environment

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SMARTMOBILITY

Systems and Modeling for Accelerated Research in Transportation

Now with CAVs

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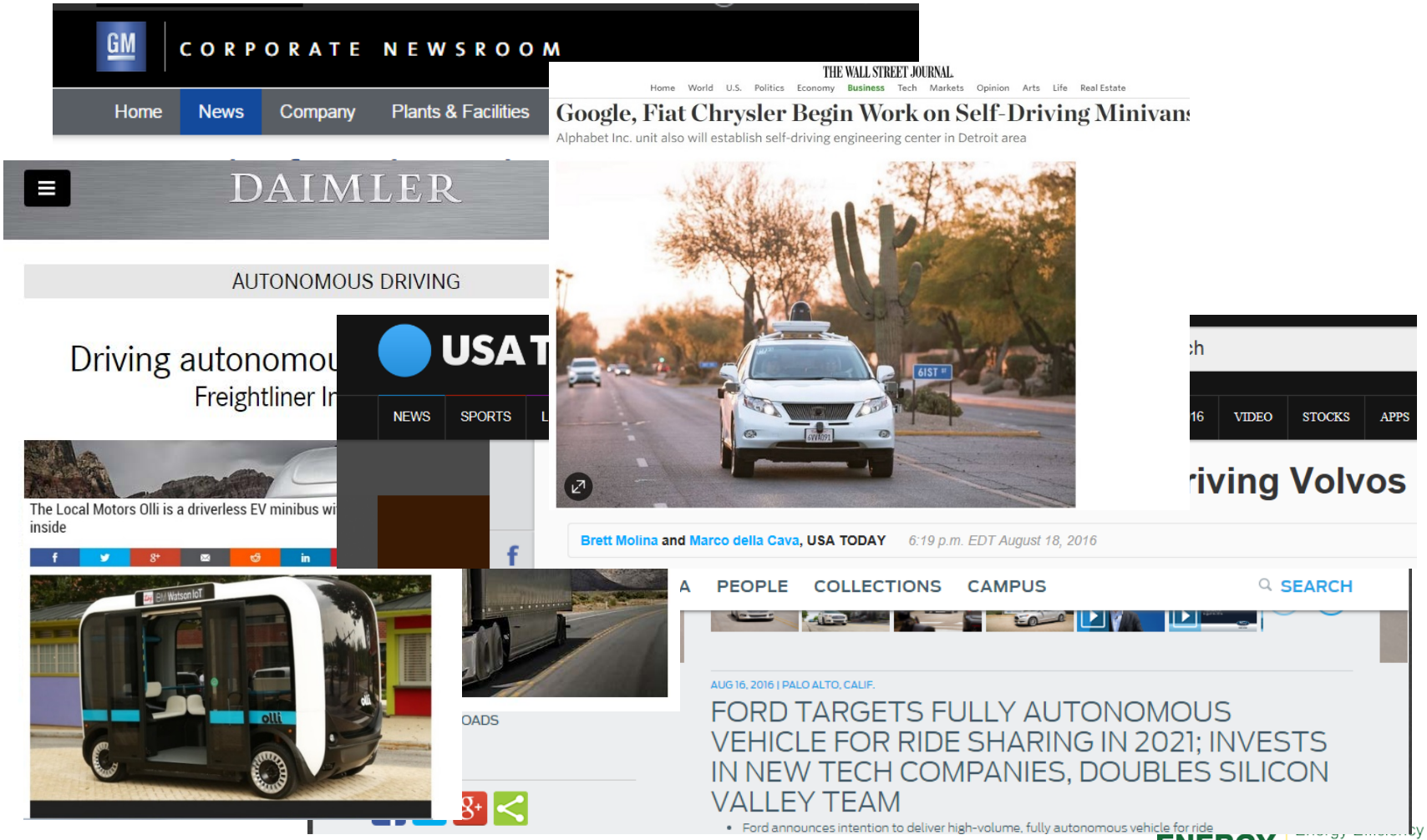
Adapting current models and tools to accurately estimate transportation energy use



Lessons Learned and Impacts of Analysis Projects

FY17 Funding Supported over 50 Publications

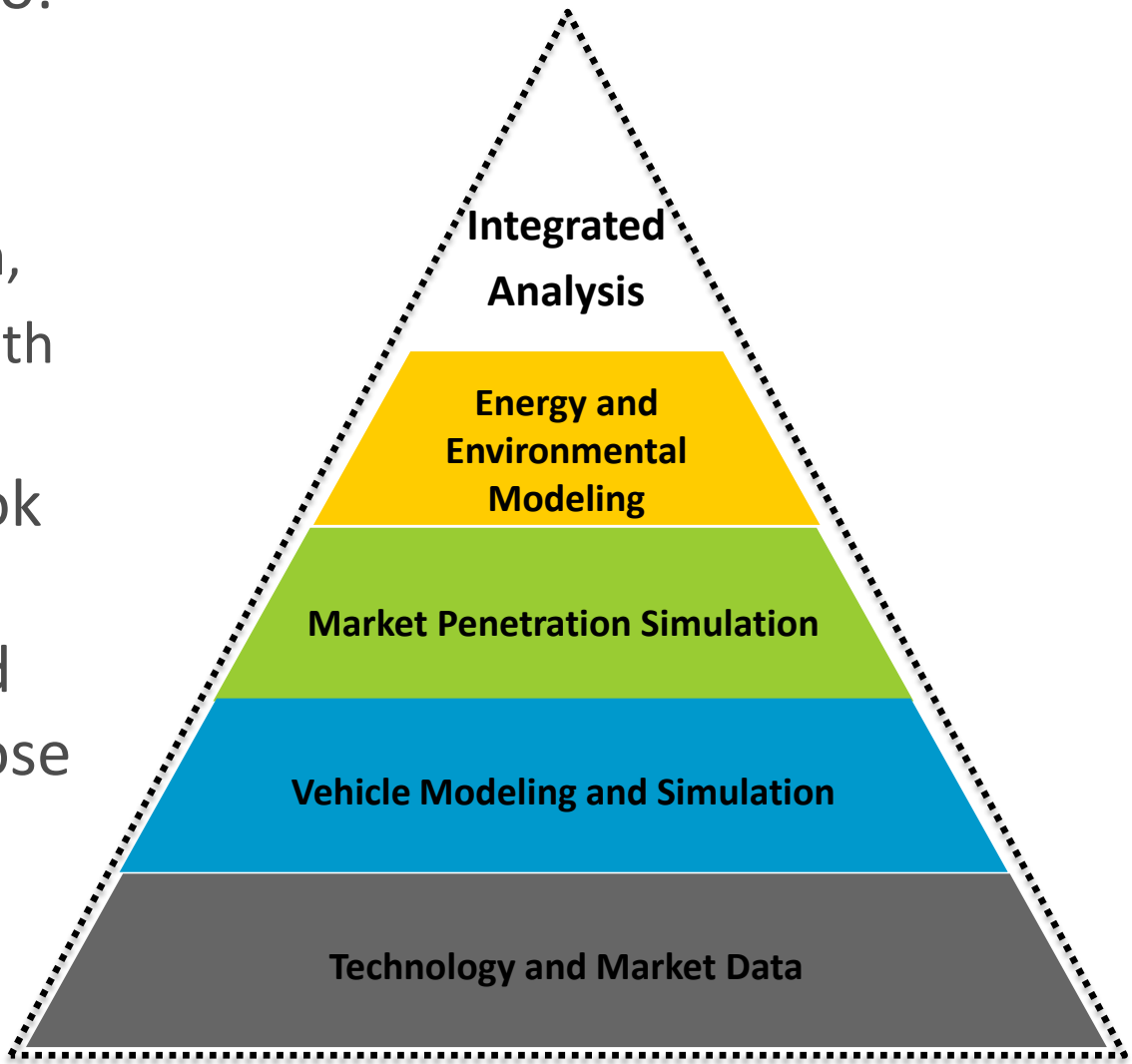
FY 17 Select Impacts (not comprehensive)	Presentation/Poster
Transportation Energy Data Book; VTO Market Report; EV Sales Tracking; Consumer Preference on EVs and CAVs	VAN016 (poster)
Household travel modeling; GREET lifecycle water consumption additions; Mode shift freight energy analysis	VAN017 (poster)
VTO Benefits Analysis: Energy impacts of VTO targets	VAN018 (poster)
Away-from-home EV charging assessment impact on EV sales; Vehicle choice modeling sensitivity analysis	VAN019 (oral)
Foundational energy implications of CAVs; Develop common assumptions to model and compare CAVs impacts	VAN020 (oral)
Modeling updates to vehicle choice model MA3T Adding mobility choices and connected and automated vehicles	VAN021 (oral)
Model CAVs over drivetrain cycles; CAVs traffic flow modeling	VAN022 (oral)
Simulate vehicles with VTO target success; Publish vehicle resizing results	VAN023 (poster)
Published cost and specification information on DC Fast Charging sites for EVs [sponsored by Clean Cities]	VAN024 (oral)
Provided information to Smart Columbus on infrastructure siting	VAN025 (oral)

Analysis Sessions are on Thursday afternoon and evening

Conclusion

- What R&D to invest in to:
  - improve efficiency,
  - save consumers money,
  - create economic growth,
  - and protect human health

- What will the future look like if we meet all our subprogram targets and how do we invest in those today to achieve that future?



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