OAK RIDGE National Laboratory | NATIONAL TRANSPORTATION RESEARCH CENTER

Transportation Data Program

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Oak Ridge National Laboratory

VTO Annual Merit Review

June 21, 2022

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This presentation does not contain any proprietary, confidential, or otherwise restricted information.

Overview

Timeline

Project start date: October 2019
Project end date: September 2022
Percent complete: 92%

Barriers

Multi-Year Program Plan 2011 – 2015
Section 2.6 Outreach, Deployment and Analysis A, B, C
Section 3.2 Program Analysis

Budget

FY20: $400K
FY21: $400K
FY22: $400K

Partners

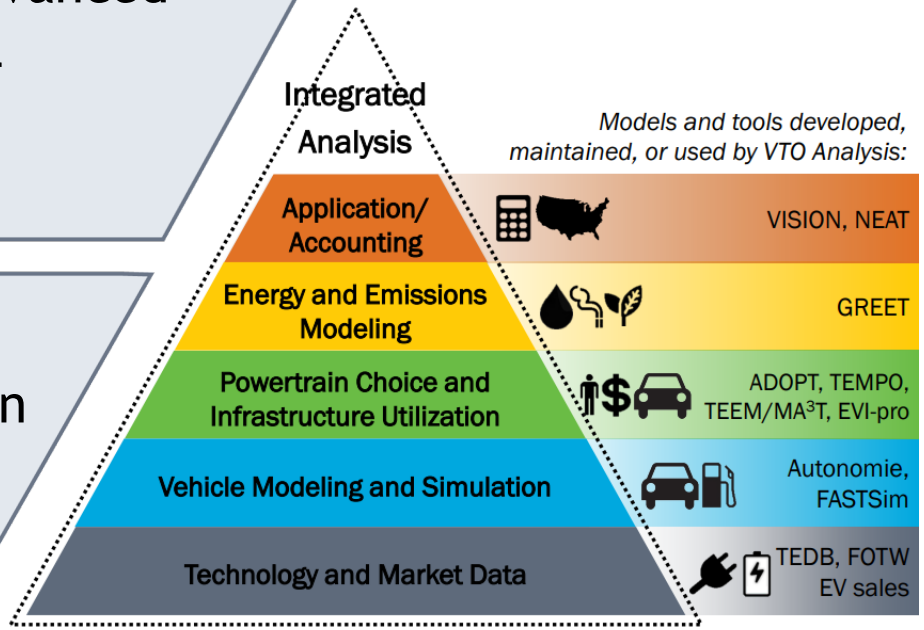
Argonne National Laboratory
National Renewable Energy Laboratory
The University of Tennessee

Relevance

Data provide the foundation of the Analysis program's vision to:

"Develop and manage a portfolio of **data-driven**, advanced transportation technology analysis to answer critical questions and create insights about energy use and other relevant metrics." -- Jake Ward's 2021 AMR presentation

The objective of the Transportation Data Program is to provide consistent, quality data and information on the transportation sector. This reduces the burden on VTO analysts to compile data individually and improves consistency within the program and beyond.



The data produced in this program are available free of restriction online to all communities, including underserved populations.

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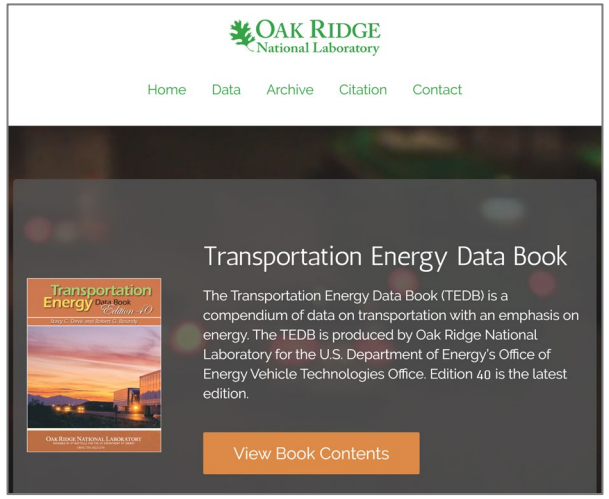
Approach

Publish data and information online in PDF, Excel, and HTML on VTO and ORNL websites for VTO researchers and others to access

Transportation Energy Data Book

- An annual report with 13 chapters, 2 appendices and a glossary.
- Data are served in PDF and Excel.
- Following initial report release, the report is updated with more current data twice in each cycle.
- The website has a search feature to quickly locate data and archives of older editions.

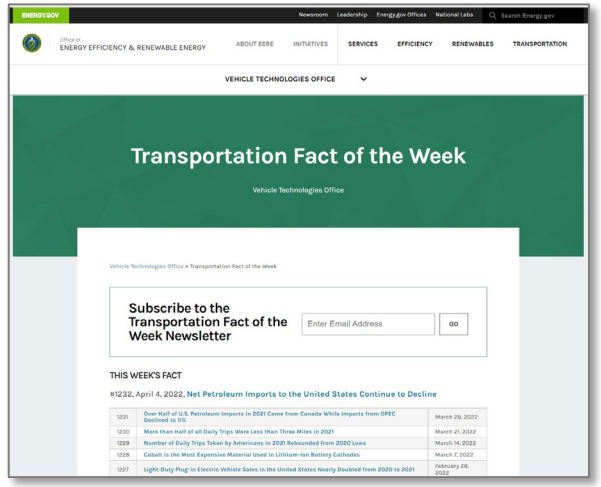
https://tedb.ornl.gov



Transportation Fact of the Week

- Facts consist of a graphic, explanatory text, source, and an Excel file.
- Facts are posted to the VTO website every Monday morning.
- Facts are emailed to a subscription list every Monday afternoon.

https://www.energy.gov/eere/vehicles/transportation-fact-week



Approach (continued)

Discovery

- Content review
- Source identification
- Data collection

Due Diligence

- Units converted
- Calculations performed
- Revisions confirmed
- Data analyzed
- Definitions studied
- Notes assembled
- Tables & graphs created
- Text written

DOE Approval

- VTO approval
- EERE approval
- Draft finalized

Publication

- Fact posted on VTO website
- Fact email programmed
- TEDB website updated
- Inquiry responses provided
- User feedback requested

Value Added

- ✓ Combine data to present unique data series
- ✓ Present data from different tables/reports to show a unique perspective.
- ✓ Unique "Big Energy Table" – Energy use in Btu by mode and fuel type is a combination of 20 different sources, documented in Appendix A

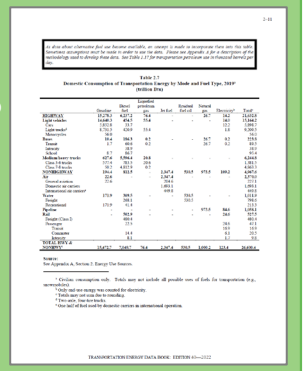


Table 2-7
Domestic Consumption of Transportation Energy by Mode and Fuel Type, 2019*
(trillion Btu)

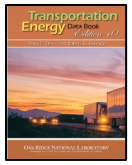
	Gasoline	Diesel fuel	Gasoline gasoline	Jet fuel	Residual fuel oil	Natural gas	Electricity[a]	Total
HIGHWAY	15,276.3	4,217.2	90.4	.	.	24.7	19.7	19,628.3
Light vehicles	14,640.5	454.7	75.4	.	.	.	18.7	15,189.2
Cars	7,922.9	7.3	.	.	.	.	12.2	7,942.5
Light trucks[b]	6,717.6	447.4	75.4	.	.	.	6.5	7,246.7
Motorcycles	70.0	.	.	.	.	.	.	70.0
Buses	19.4	196.9	0.7	.	.	24.7	0.2	242.0
Transit	1.7	196.9	0.7	.	.	24.7	0.2	224.2
Intercity	.	0.0	.	.	.	.	.	0.0
School	.	17.8	.	.	.	.	.	17.8
Heavy-duty trucks	617.4	3,594.4	14.0	.	.	.	.	4,225.8
Class 3-6 trucks	77.4	351.1	13.6	.	.	.	.	442.1
Class 7-8 trucks	540.0	3,243.3	0.7	.	.	.	.	3,783.7
NONHIGHWAY	70.7	913.9	.	2,347.4	910.5	973.5	109.2	5,325.2
Air	21.6	.	.	2,347.4	.	.	.	2,369.0
General aviation	21.6	.	.	39.6	.	.	.	61.1
Domestic carriers	.	.	.	1,307.8	.	.	.	1,307.8
International air carriers[c]	.	.	.	999.9	.	.	.	999.9
Water	17.9	309.5	.	.	910.5	.	.	1,238.0
Domestic	.	309.5	.	.	910.5	.	.	1,220.4
International	17.9	0.0	.	.	.	.	.	17.9
Pipeline	.	.	.	.	.	973.5	84.0	1,056.8
Rail	.	562.9	.	.	.	.	24.0	586.9
Freight Class I	.	499.9	.	.	.	.	.	499.9
Passenger	.	17.1	.	.	.	.	24.0	41.1
Transit	.	.	.	.	.	.	0.0	0.0
Commuter	.	44.4	.	.	.	.	0.1	44.5
Intercity	.	0.1	.	.	.	.	0.1	0.2
TOTAL BTU A ACCORDING	15,347.1	5,131.1	90.4	2,347.4	910.5	1,000.2	128.9	25,000.6

Notes:
See Appendix A, Section 2: Energy Use Sources.

Key:
- Circular consumption cells. Totals may not include all possible uses of fuels for transportation (e.g., incineration).
- Only and not energy was created for electricity.
- Totals may not sum due to rounding.
- Two axial. Not two tracks.
- Our fuel of fuel used by domestic carriers in international operation.

TRANSPORTATION ENERGY DATA BOOK: EDITION 40—2022

Technical Accomplishments – Data Book

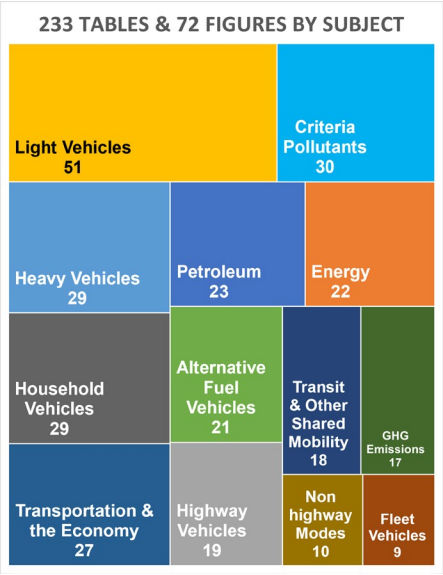


May 2022: Website and rotating highlights were updated to Edition 40

August 2022: Tables & rotating highlights will be updated

June 2022: Tables and rotating highlights were updated

Sept 2022: Draft PDF of Edition 41 will be delivered to DOE



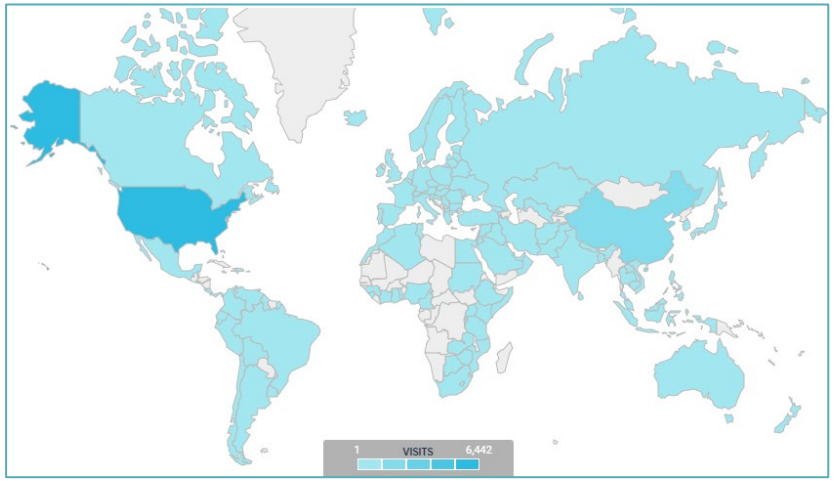
In FY22, ORNL partnered with the University of Tennessee to produce light-duty vehicle scrappage rates to replace older data in the Data Book

- Developed rates for cars, SUVs and vans, and pickups
- Wrote draft methodology report in April 2022
- Citing UT's report, data will be included in Edition 41

Website Statistics for tedb.ornl.gov

Date	Visits	Pageviews
FY 2021 total	21,304	48,372
Oct-21	1,982	4,030
Nov-21	2,084	4,973
Dec-21	1,605	3,008
Jan-22	1,982	3,988
Feb-22	1,884	4,090
Mar-22	2,167	4,620

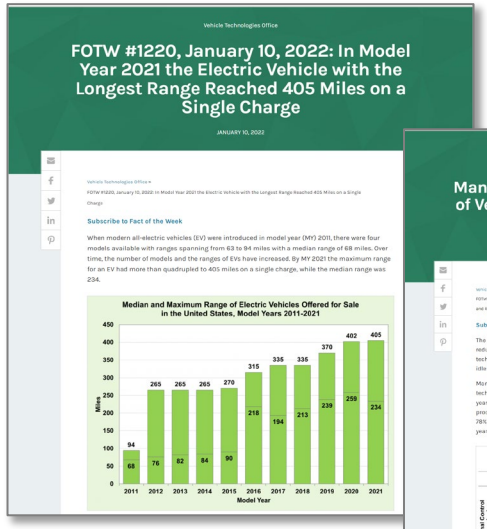
Website Traffic by Country
First six months of FY 2022

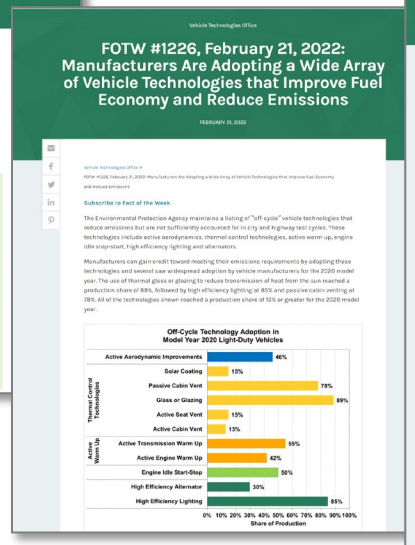


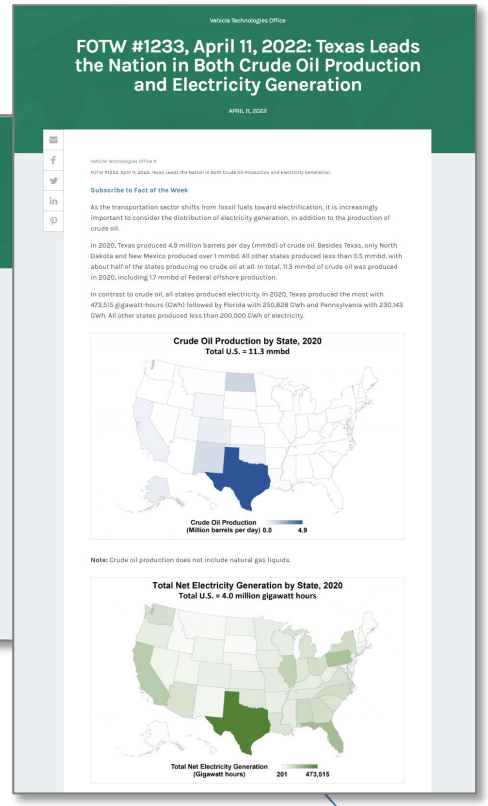
Top External Referring Domains
en.Wikipedia.org
www.researchgate.net
www.bts.gov
afdc.energy.gov
www.eia.gov

Technical Accomplishments – Fact of the Week

- A Fact of the Week has been posted each week of FY2022.
- More than 22,000 subscribe to get the Fact of the Week email each Monday
- Fact of the Week content accounted for 415,231 pageviews, or 52% of all VTO site pageviews during the first half of 2022.
- 60% of VTO site visits entered through a Fact of the Week landing page.
- The Fact of the Week is frequently cited online by Clean Cities Coalitions, universities, media outlets, state & local governments, & electric vehicle forums.







1996 — 2001 — 2017 — 2022

July 12, 1996
FOTW #1
Increase in Annual Light Vehicle Sales, 1980-1995

April 23, 2001
First Fact written by ORNL
FOTW #162 Public Support for Fuel Conservation Policies
The data were from an NREL study

October 23, 2017
FOTW #1000
Petroleum Production Met Demand from Transportation Petroleum Consumption in 2015

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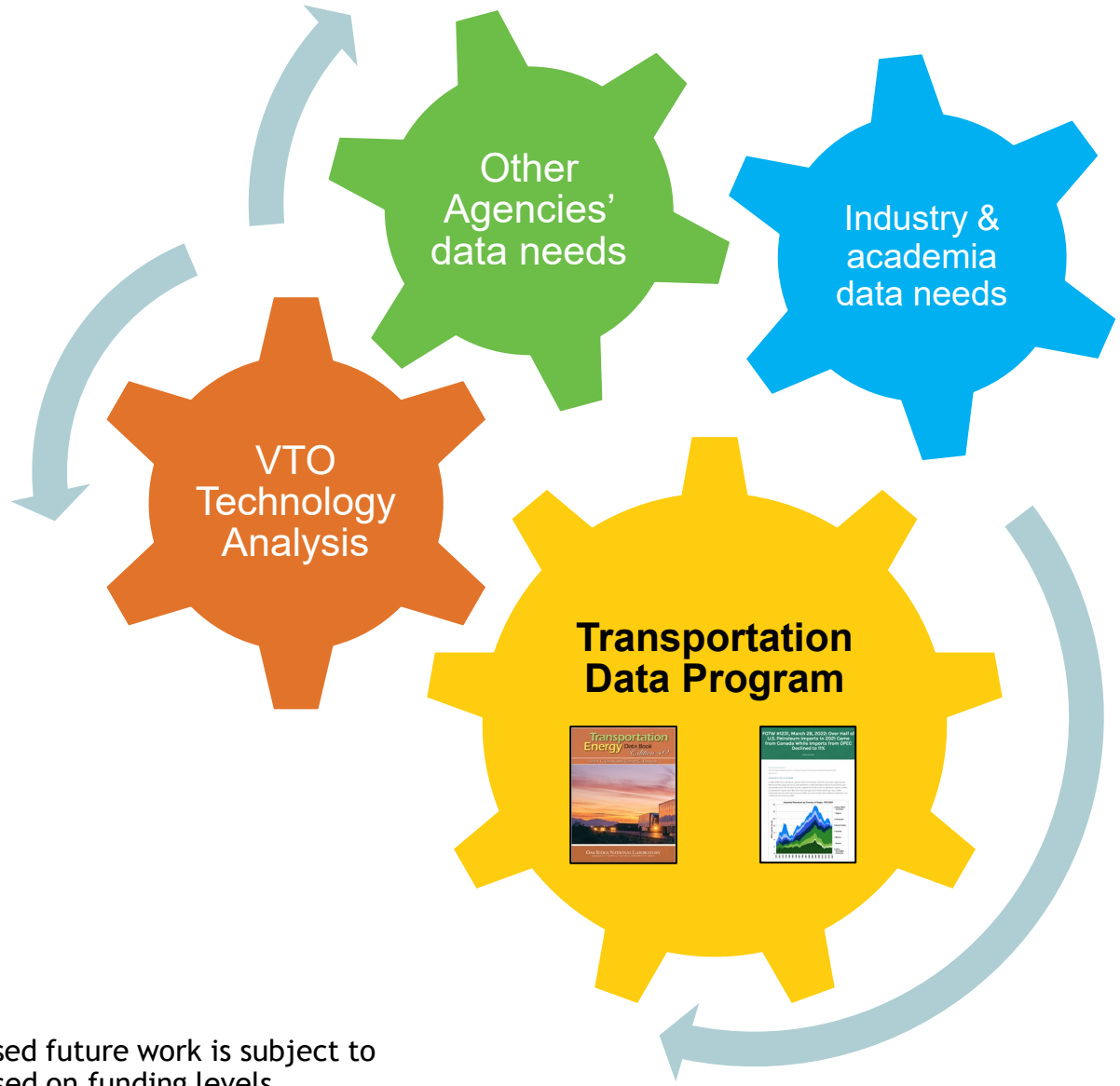
Collaboration and Coordination

ORNL works with others to meet the data needs of the VTO Transportation Analysis Program

- Work with many public & private entities in the data collection process
- Work closely with:
  - VTO staff who approve each Fact of the Week
  - ANL staff who program and post the Fact of the Week on the VTO website
  - ANL staff who work with data on electric vehicles
  - NREL staff to make sure our data are congruent with the Alternative Fuel Data Center
- Work with several Labs to showcase their work via the Fact of the Week and the Data Book
- Worked with DOT, Bureau of Transportation Statistics to finalize the questionnaire of the 2021 Vehicle Inventory and Use Survey

Proposed Future Research

- Future research will continue the two components of the Transportation Data Program in order to serve VTO technology analysis and other data needs
- Processes will be streamlined
- New data will be added, if available, especially data on:
  - ❖ Underserved populations
  - ❖ Off-highway vehicle fuel use
  - ❖ Med/Hvy truck scrappage rates



Any proposed future work is subject to change based on funding levels

Summary

Objectives

- Provide consistent, quality data on the transportation sector for VTO researchers and other transportation analysts' use

Outcomes

- Annual Transportation Energy Data Book with two interim updates
- Weekly Fact of the Week website posting & email distribution

Methods

- Data discovery, due diligence, approval, & publication in collaboration with government, private sector, academia, & other laboratories

Results

- Data Book website page views averaged 4,152 per month in FY21
- Google Scholar citations are 3,910 as of April 1, 2022
- The Fact of the Week email currently has over 22,000 subscribers

Milestones

- This project has weekly, monthly, and annual milestones delivered on-time and within budget

Thank you!

Stacy Davis

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