OAK RIDGE National Laboratory

Project ID # van016

Transportation Data Program

Stacy C. Davis, ORNL, *Principal Investigator*

2020 U.S. DOE Vehicle Technologies Office (VTO) Annual Merit Review Meeting

June 1-4, 2020

ORNL is managed by UT-Battelle, LLC for the US Department of Energy

Overview

Timeline

- Project start date: October 2019
- Project end date: September 2022
- Percent complete: 28%

Barriers

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

Budget

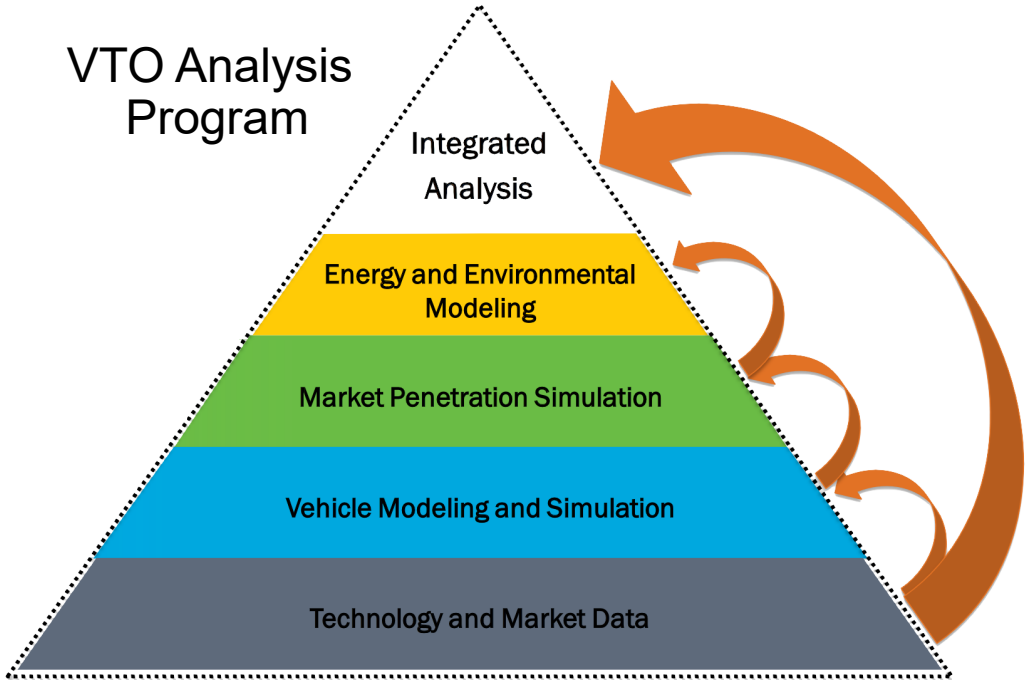
- Total project funding
  - FY20: $400K
  - FY21: $400k
  - FY22: $400K
  - Total: $1.2M

Partners

- Argonne National Lab
- National Renewable Energy Lab

Relevance

The objective of the Transportation Data Program is to provide consistent, quality data and information on the transportation sector for VTO researchers and other transportation analysts' use.



The Transportation Data Program disseminates data in:

- National Security
- Economic Growth
- Affordability for Business and Consumers
- Reliability/Resiliency

- Transportation analysts, and VTO staff require current and historical data to affect good decisions for the future.
- Data provide the foundation of the Analysis Program in the pursuit of moving people and goods using the most secure, energy-efficient, and cost-effective technologies.

Milestones

Quarter	Milestone Description	Milestones for the Transportation Data Program FY20
Quarter 1	Fact of the Week prepared weekly for posting on the Vehicle Technologies website	Complete
Quarter 2	Draft report comparing transportation energy use including and excluding upstream energy use	Complete
Quarter 3	Update tables on the Transportation Energy Data Book website to Edition 38.1	Complete
Quarter 4	Draft of the next Transportation Energy Data Book delivered to VTO	On track
Quarter 4	Go/no-go milestone Determine if VTO research efforts require continued transportation data program support	On track

Approach – Data Book

Since 1975

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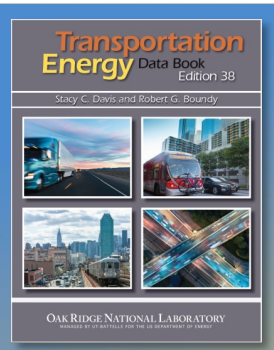
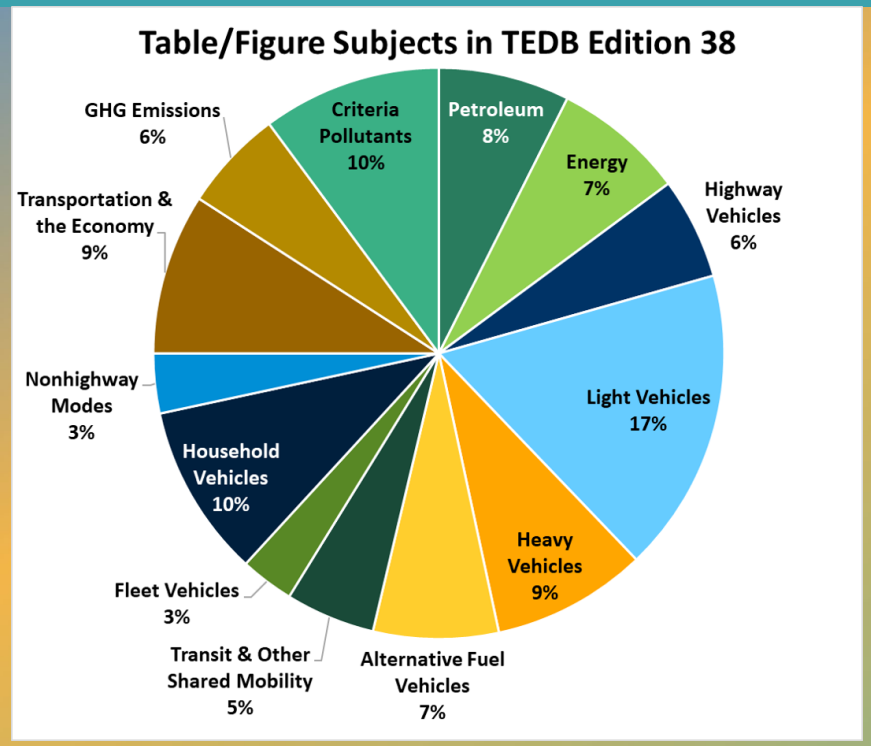


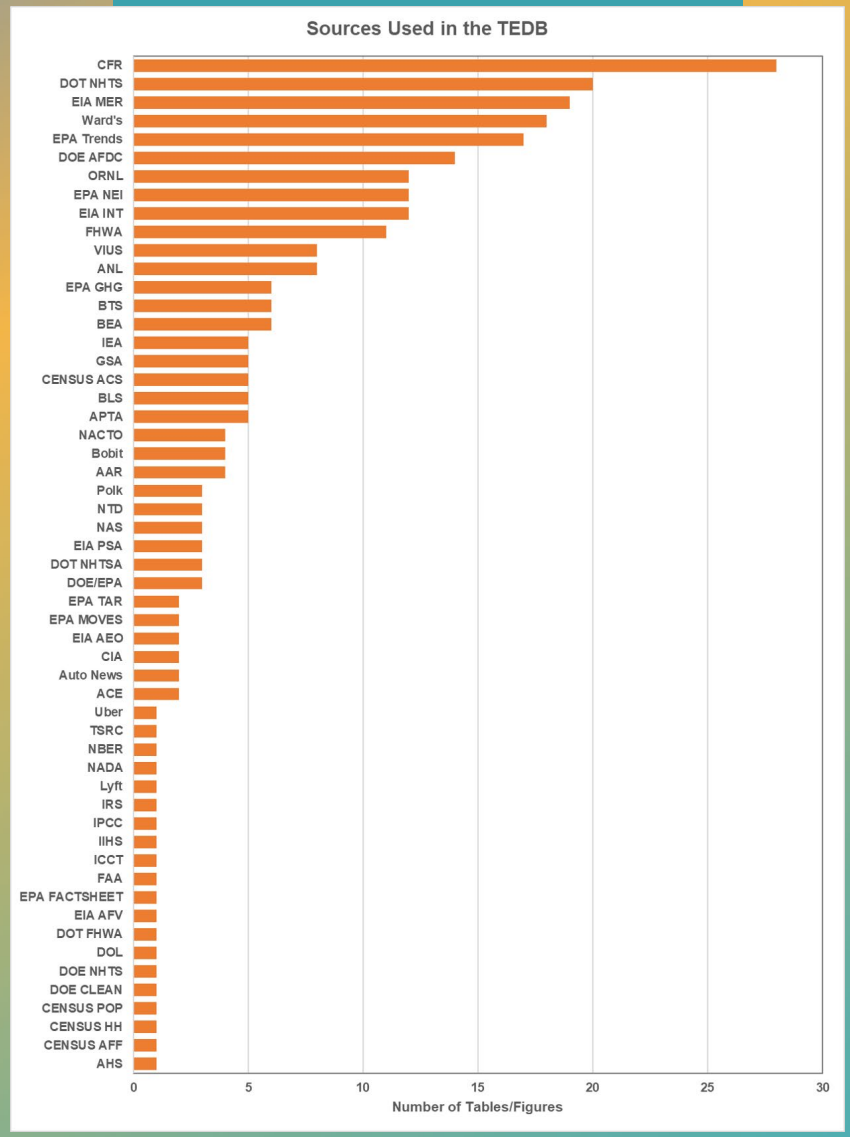
On-line report
https://tedb.ornl.gov

PDF & Excel formats

Thirteen Chapters, 226 Tables and 70 Figures



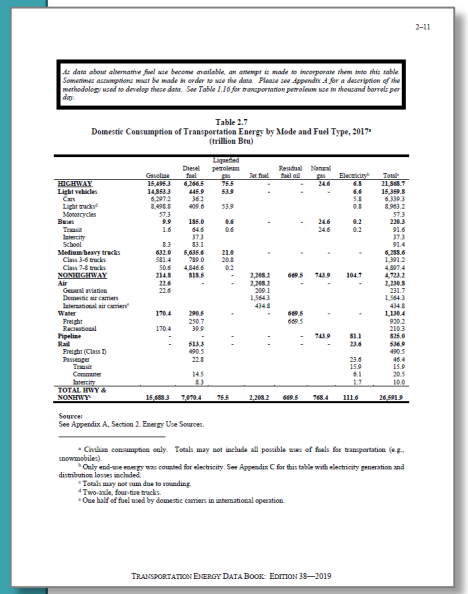
About 50 different sources



Approach – Data Book

Unique "Big Energy Table"

- Energy use in Btu by mode and fuel type
- **Appendix** A holds sources and assumptions
- About 20 sources
- Added electricity use to light vehicles two years ago (documented estimates)



2–11

As data about alternative fuel use become available, an attempt is made to incorporate them into this table. Sometimes assumptions must be made in order to use the data. Please see Appendix A for a description of the methodology used to develop these data. See Table 1.16 for transportation petroleum use in thousand barrels per day.

Table 2.7
Domestic Consumption of Transportation Energy by Mode and Fuel Type, 2017[a]
(trillion Btu)

	Gasoline	Diesel fuel	Liquefied petroleum gas	Jet fuel	Residual fuel oil	Natural gas	Electricity[b]	Total[c]
HIGHWAY	**15,498.3**	**6,366.5**	**75.5**	-	-	**24.6**	**6.8**	**21,968.7**
Light vehicles	**14,853.3**	**445.9**	**53.9**	-	-	-	**6.6**	**15,359.8**
Cars	6,297.2	36.2					5.8	6,339.3
Light trucks[d]	8,498.8	409.6	53.9				0.8	8,963.2
Motorcycles	57.3							57.3
Buses	**0.9**	**185.0**	**0.6**	-	-	**24.6**	**0.2**	**220.3**
Transit	1.6	64.6	0.6			24.6	0.2	91.6
Intercity		37.3						37.3
School	8.3	83.1						91.4
Medium-heavy trucks	**632.0**	**5,635.6**	**21.0**	-	-	-	-	**6,288.6**
Class 3-6 trucks	581.4	789.0	20.8					1,391.2
Class 7-8 trucks	50.6	4,846.6	0.2					4,897.4
NONHIGHWAY	**214.8**	**818.5**	-	**2,208.2**	**669.5**	**743.9**	**104.7**	**4,723.2**
Air	**22.6**	-	-	**2,208.2**	-	-	-	**2,230.8**
General aviation	22.6			209.1				231.7
Domestic air carriers				1,564.3				1,564.3
International air carriers[e]				434.8				434.8
Water	**170.4**	**290.6**	-	-	**669.5**	-	-	**1,130.4**
Freight		250.7			669.5			920.2
Recreational	170.4	39.9						210.3
Pipeline	-	-	-	-	-	**743.9**	**81.1**	**825.0**
Rail	-	**513.3**	-	-	-	-	**23.6**	**536.9**
Freight (Class I)		490.5						490.5
Passenger		22.8					23.6	46.4
Transit							15.9	15.9
Commuter		14.5					6.1	20.5
Intercity		8.3					1.7	10.0
TOTAL HWY & NONHWY	**15,688.3**	**7,070.4**	**75.5**	**2,208.2**	**669.5**	**768.4**	**111.6**	**26,691.9**

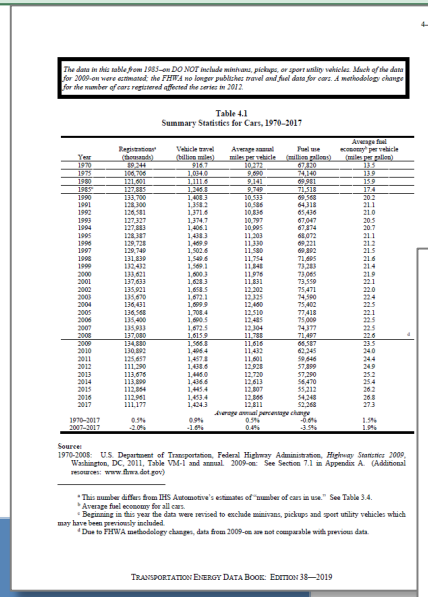
Sources:
See Appendix A, Section 2. Energy Use Sources.

[a] Civilian consumption only. Totals may not include all possible uses of fuels for transportation (e.g., snowmobiles).
[b] Only end-use energy was counted for electricity. See Appendix C for this table with electricity generation and distribution losses included.
[c] Totals may not sum due to rounding.
[d] Two-axle, four-tire trucks.
[e] One half of fuel used by domestic carriers in international operation.

TRANSPORTATION ENERGY DATA BOOK: EDITION 38—2019

Value-Added:

- Combine data to present unique data series. FHWA data require opening 25 individual reports to get the whole series.
- Present data from different tables/reports to show a unique perspective.



4–3

The data in this table from 1985–on DO NOT include minivans, pickups, or sport utility vehicles: Much of the data for 2009-on were estimated; the FHWA no longer publishes travel and fuel data for cars. A methodology change for the number of cars registered affected the series in 2012.

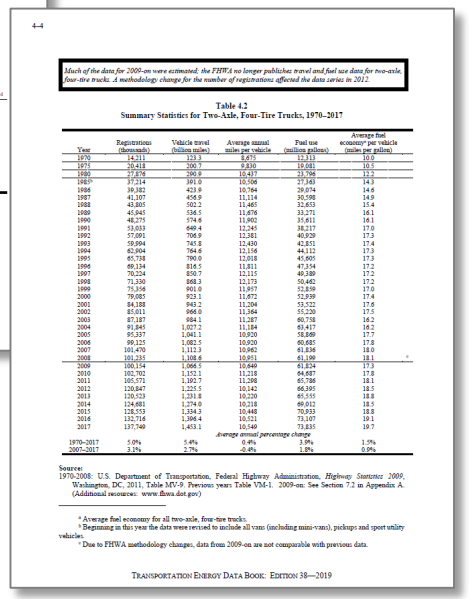
Table 4.1
Summary Statistics for Cars, 1970–2017

Year	Registrations[a] (thousands)	Vehicle travel (billion miles)	Average annual miles per vehicle	Fuel use (million gallons)	Average fuel economy[b] per vehicle (miles per gallon)
1970	89,244	916.3	10,272	67,820	13.5
1975	106,706	1,034.0	9,690	74,140	13.9
1980	121,601	1,111.6	9,141	69,981	15.9
1985[c]	127,885	1,245.8	9,740	71,518	17.4
1990	133,700	1,408.3	10,533	69,568	20.2
1991	128,300	1,358.2	10,586	64,318	21.1
1992	126,581	1,371.6	10,836	65,436	21.0
1993	127,227	1,374.7	10,797	67,047	20.5
1994	127,883	1,406.1	10,995	67,874	20.7
1995	128,387	1,438.3	11,203	68,072	21.1
1996	128,728	1,469.9	11,330	69,221	21.2
1997	129,749	1,502.6	11,580	69,892	21.5
1998	131,839	1,549.6	11,754	71,695	21.6
1999	132,432	1,589.1	11,848	73,283	21.4
2000	133,621	1,600.3	11,978	73,065	21.9
2001	137,633	1,628.3	11,831	73,559	22.1
2002	135,921	1,658.5	12,202	75,471	22.0
2003	135,670	1,672.1	12,325	74,580	22.4
2004	136,431	1,699.9	12,460	75,402	22.5
2005	136,588	1,708.4	12,510	77,418	22.1
2006	135,400	1,690.5	12,485	75,009	22.5
2007	135,033	1,672.5	12,304	74,377	22.5
2008	137,080	1,615.9	11,788	71,497	22.6
2009	134,880	1,566.8	11,616	66,587	23.5
2010	130,892	1,496.4	11,432	62,245	24.0
2011	125,657	1,457.8	11,601	59,646	24.4
2012	111,390	1,438.6	12,928	57,899	24.9
2013	113,676	1,446.0	12,720	57,390	25.2
2014	113,899	1,436.6	12,613	56,470	25.4
2015	112,864	1,445.4	12,807	55,212	26.2
2016	112,961	1,453.4	12,866	54,248	26.8
2017	111,177	1,424.3	12,811	52,248	27.3
Average annual percentage change					
1970–2017	0.5%	0.9%	0.5%	-0.6%	1.5%
2007–2017	-2.0%	-1.6%	0.4%	-3.5%	1.9%

Sources:
1970-2008: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2009*, Washington, DC, 2011, Table VM-1 and annual. 2009-on: See Section 7.1 in Appendix A. (Additional resources: www.fhwa.dot.gov)

[a] This number differs from IHS Automotive's estimates of "number of cars in use." See Table 3.4.
[b] Average fuel economy for all cars.
[c] Beginning in this year the data were revised to exclude minivans, pickups and sport utility vehicles which may have been previously included.
[d] Due to FHWA methodology changes, data from 2009-on are not comparable with previous data.

TRANSPORTATION ENERGY DATA BOOK: EDITION 38—2019



4–4

Much of the data for 2009-on were estimated; the FHWA no longer publishes travel and fuel use data for two-axle, four-tire trucks. A methodology change for the number of registrations affected the data series in 2012.

Table 4.2
Summary Statistics for Two-Axle, Four-Tire Trucks, 1970–2017

Year	Registrations (thousands)	Vehicle travel (billion miles)	Average annual miles per vehicle	Fuel use (million gallons)	Average fuel economy[a] per vehicle (miles per gallon)
1970	14,211	133.3	8,675	13,133	10.0
1971	26,418	200.7	9,830	19,081	10.5
1980	37,876	390.9	10,437	33,796	13.2
1985[b]	37,214	391.0	10,506	27,343	14.3
1986	39,382	423.9	10,764	29,074	14.6
1987	41,107	456.9	11,114	30,598	14.9
1988	43,805	502.2	11,465	32,653	15.4
1989	45,945	536.5	11,676	33,271	16.1
1990	48,275	574.6	11,902	35,611	16.1
1991	53,033	649.4	12,245	38,217	17.0
1992	57,091	706.9	12,381	40,929	17.3
1993	59,994	745.8	12,430	42,851	17.4
1994	62,904	784.6	12,156	44,112	17.3
1995	65,758	790.0	12,018	45,605	17.3
1996	69,134	816.5	11,811	47,354	17.2
1997	70,224	850.7	12,115	49,389	17.2
1998	71,330	868.3	12,173	50,462	17.2
1999	75,356	901.0	11,957	52,859	17.0
2000	79,085	923.1	11,672	52,939	17.4
2001	84,188	948.2	11,264	53,523	17.8
2002	85,011	966.0	11,364	55,220	17.5
2003	87,187	984.1	11,287	60,758	16.2
2004	91,845	1,027.2	11,184	63,417	16.2
2005	95,337	1,041.1	10,920	58,869	17.7
2006	99,125	1,082.5	10,920	60,685	17.8
2007	101,470	1,112.3	10,962	61,836	18.0
2008	101,235	1,108.6	10,951	61,190	18.1
2009	100,154	1,066.5	10,649	61,824	17.3
2010	102,702	1,152.1	11,218	64,687	17.8
2011	105,571	1,192.7	11,298	65,786	18.1
2012	120,647	1,225.5	10,142	66,389	18.5
2013	120,523	1,231.8	10,220	65,555	18.8
2014	124,681	1,274.0	10,218	69,012	18.5
2015	128,553	1,284.3	10,448	70,933	18.8
2016	132,716	1,306.4	10,521	73,107	19.1
2017	137,749	1,453.1	10,549	73,835	19.7
Average annual percentage change					
1970–2017	5.0%	5.4%	0.4%	3.9%	1.5%
2007–2017	3.1%	2.7%	-0.4%	1.8%	0.9%

Sources:
1970-2008: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2009*, Washington, DC, 2011, Table MV-9. Previous years Table VM-1. 2009-on: See Section 7.2 in Appendix A. (Additional resources: www.fhwa.dot.gov)

[a] Average fuel economy for all two-axle, four-tire trucks.
[b] Beginning in this year the data were revised to include all vans (including mini-vans), pickups and sport utility vehicles.
[c] Due to FHWA methodology changes, data from 2009-on are not comparable with previous data.

TRANSPORTATION ENERGY DATA BOOK: EDITION 38—2019

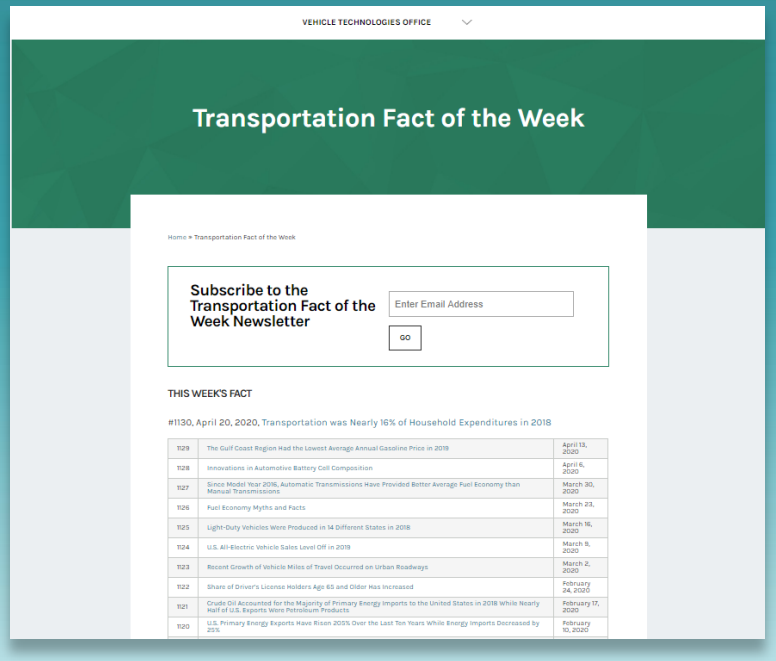
Car and Light Truck Population Data

- FHWA discontinued this is 2009
- ORNL/ANL develop estimates each year to continue the series

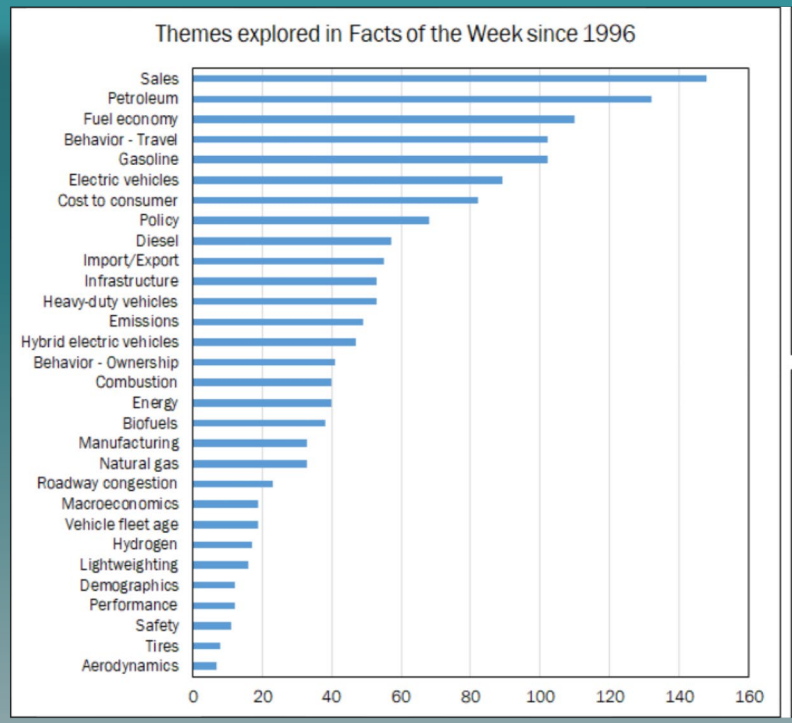
Approach – Fact of the Week (FOTW)

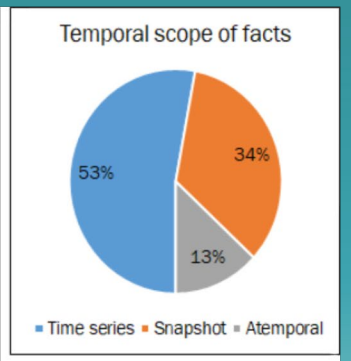
Since 2001

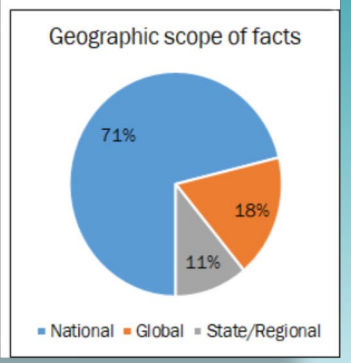
- Facts consist of a graphic, explanatory text, source, and an Excel file.
- Facts are posted on the VTO website every Monday.
- Facts are emailed to a subscription list of over 25,100 every Monday.



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







Approach – Data Book & Fact of the Week

Barrier Addressed: Provides consistency to improve analyses of the transportation sector which contribute to policies, programs, and technologies. Provides a wealth of data and information which reduces the burden on VTO analysts to compile the data individually.

The Data Book is mostly tabular historical data, especially good for modeling use. The Fact of the Week is widely varied on topic and source.

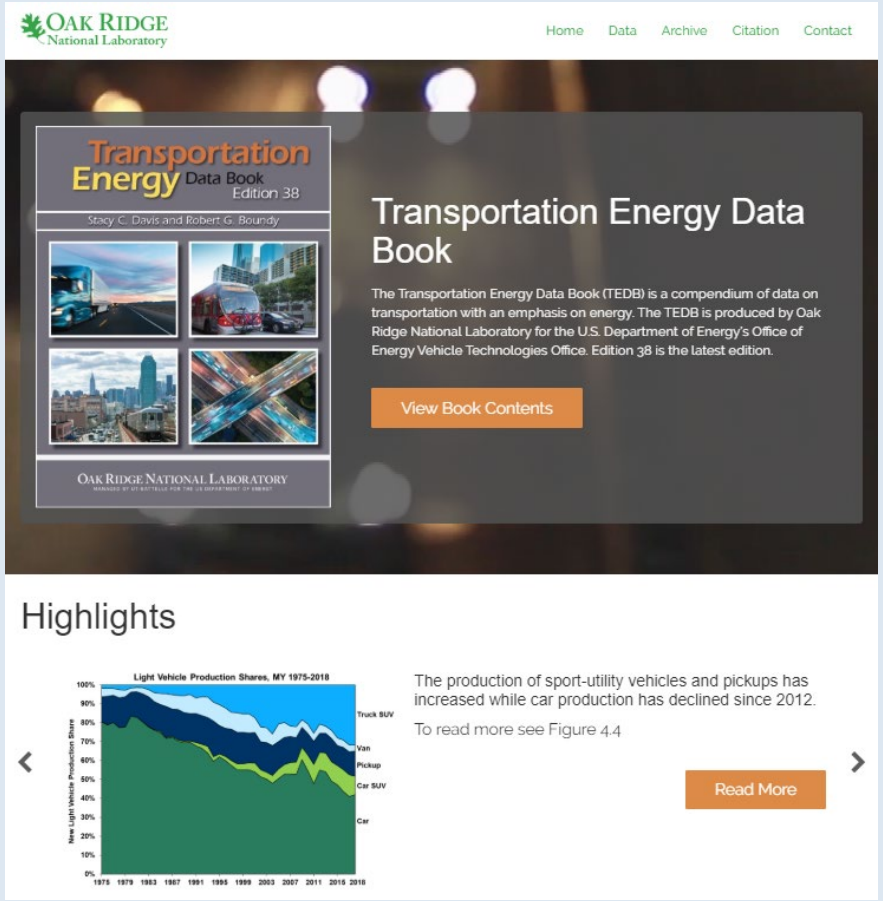
Discovery	Due Diligence	DOE Approval	Publication
• Content review • Source identification • Data collection	• Convert units • Perform calculations • Confirm revisions • Analyze data • Study definitions • Assemble notes • Create graphs & tables • Write text	• VTO approval • EERE approval • Draft finalized	• Post Fact on VTO site • Program Fact email • Update TEDB Website • Respond to inquiries • Request user feedback

Primary mechanism: Publish data and information in PDF, Excel, and HTML on VTO and ORNL websites for VTO researchers and others to access.

Technical Accomplishments and Progress for the Data Book

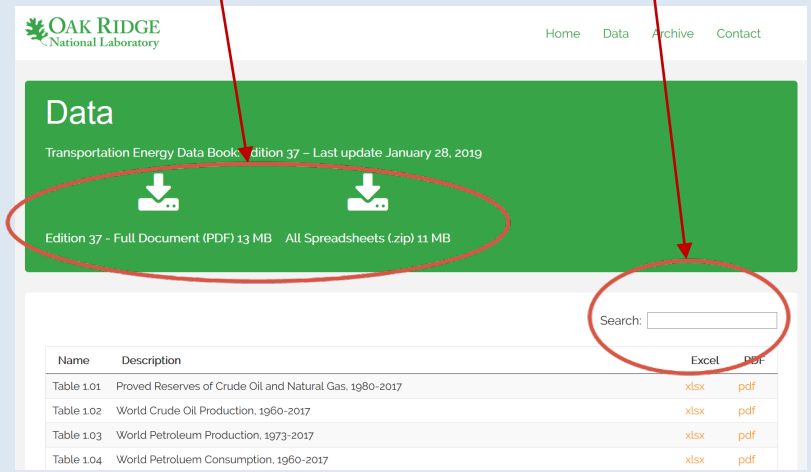
Current Website Debuted in 2019

- Newly redesigned website with search capability
- New URL https://tedb.ornl.gov
- Rotating highlights from the report are on the homepage



On the Data page, download full PDF or spreadsheets

Search by topic for Excel or PDF of specific tables/figures

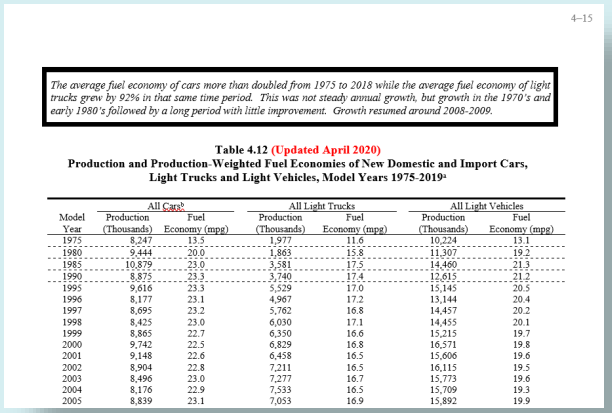


Feedback encouraged at bottom of the homepage

Technical Accomplishments and Progress for the Data Book

Data Book updates twice a year

Edition 38 published January 2020
Edition 38.1 published April 2020
Edition 38.2 will be published in August 2020
Edition 39 draft due at end of FY 2020



4–15

The average fuel economy of cars more than doubled from 1975 to 2018 while the average fuel economy of light trucks grew by 92% in that same time period. This was not steady annual growth, but growth in the 1970's and early 1980's followed by a long period with little improvement. Growth resumed around 2008-2009.

Table 4.12 (Updated April 2020)
Production and Production-Weighted Fuel Economies of New Domestic and Import Cars, Light Trucks and Light Vehicles, Model Years 1975-2019[a]

Model Year	All Cars[b] Production (Thousands)	All Cars[b] Fuel Economy (mpg)	All Light Trucks Production (Thousands)	All Light Trucks Fuel Economy (mpg)	All Light Vehicles Production (Thousands)	All Light Vehicles Fuel Economy (mpg)
1975	8,247	13.5	1,977	11.6	10,224	13.1
1980	9,444	20.0	1,863	15.8	11,307	19.2
1985	10,879	23.0	3,581	17.5	14,460	21.3
1990	8,875	23.3	3,740	17.4	12,615	21.2
1995	9,616	23.3	5,529	17.0	15,145	20.5
1996	8,177	23.1	4,967	17.2	13,144	20.4
1997	8,695	23.2	5,762	16.8	14,457	20.2
1998	8,425	23.0	6,030	17.1	14,455	20.1
1999	8,865	22.7	6,350	16.6	15,215	19.7
2000	9,742	22.5	6,829	16.8	16,571	19.8
2001	9,148	22.6	6,458	16.5	15,606	19.6
2002	8,904	22.8	7,211	16.5	16,115	19.5
2003	8,496	23.0	7,277	16.7	15,773	19.6
2004	8,176	22.9	7,533	16.5	15,709	19.3
2005	8,839	23.1	7,053	16.9	15,892	19.9

Website links to other parts of the Transportation Data Program

Transportation Fact of the Week

View

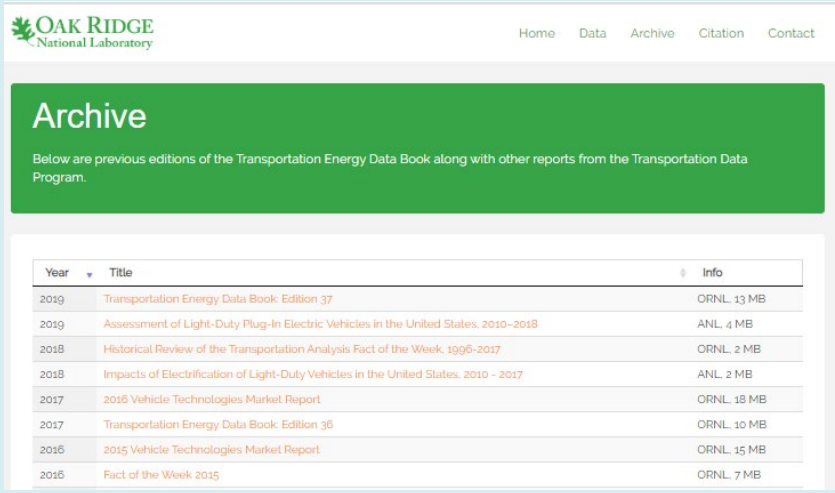
E-Drive Monthly Sales

View

Older editions are still accessible

https://tedb.ornl.gov/archives

As well as older reports from the Transportation Data Program



OAK RIDGE National Laboratory

Home Data Archive Citation Contact

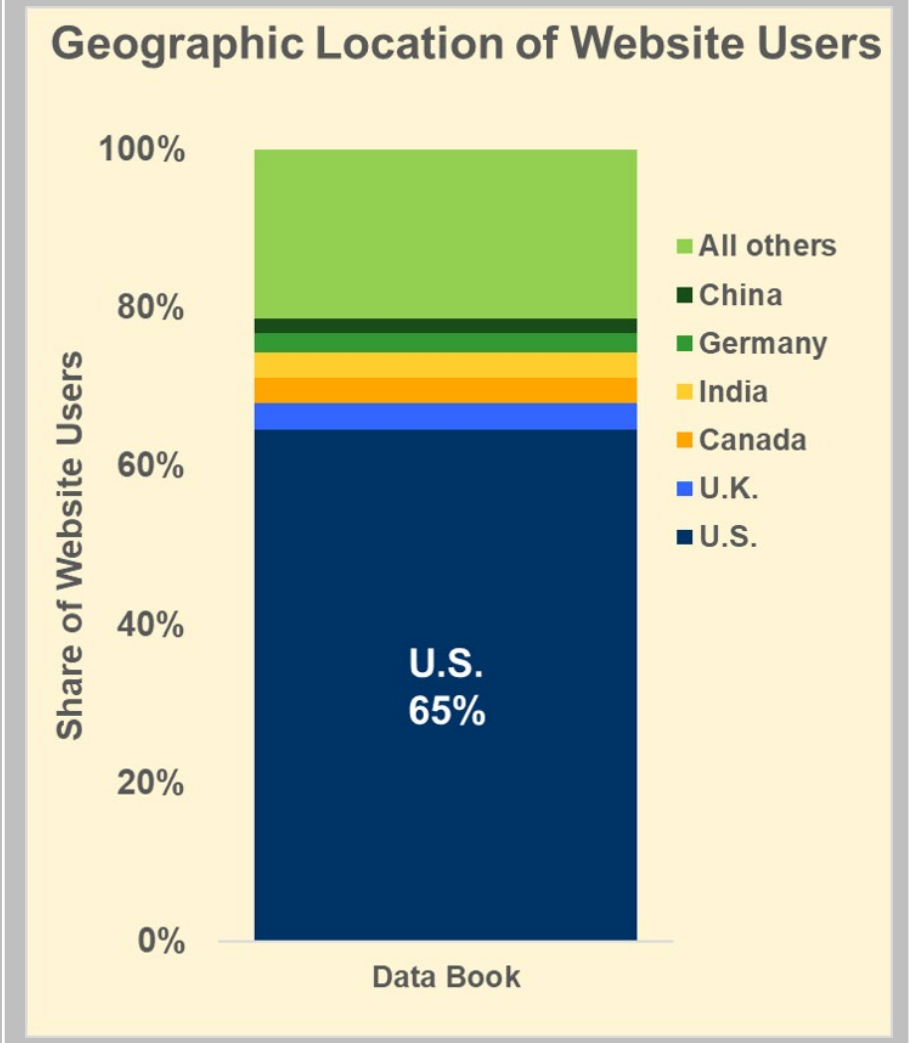
Archive

Below are previous editions of the Transportation Energy Data Book along with other reports from the Transportation Data Program.

Year	Title	Info
2019	Transportation Energy Data Book: Edition 37	ORNL, 13 MB
2019	Assessment of Light-Duty Plug-In Electric Vehicles in the United States, 2010–2018	ANL, 4 MB
2018	Historical Review of the Transportation Analysis Fact of the Week, 1996-2017	ORNL, 2 MB
2018	Impacts of Electrification of Light-Duty Vehicles in the United States, 2010 - 2017	ANL, 2 MB
2017	2016 Vehicle Technologies Market Report	ORNL, 18 MB
2017	Transportation Energy Data Book: Edition 36	ORNL, 10 MB
2016	2015 Vehicle Technologies Market Report	ORNL, 15 MB
2016	Fact of the Week 2015	ORNL, 7 MB

Technical Accomplishments and Progress for the Data Book

Page Views, Downloads, Citations					
Month-Year	Page Views	PDF Downloads	XLS Downloads	Total Views	Unique Users
FY 2019 Total	75,527	7,853	10,115	93,495	Not available
Oct 2019	7,277	1,101	676	9,054	2,994
Nov 2019	6,486	1,023	476	7,985	2,759
Dec 2019	5,290	769	647	6,706	2,273
Jan 2020	1,581	1,087	1,614	4,282	1,641
Feb 2020	4,627	857	396	5,880	1,599
Mar 2020	6,849	1,545	1,001	9,395	1,859
Google Scholar Citations as of April 22, 2020					
About 3,230					



Technical Accomplishments and Progress for the Data Book

Edition 38: Added a new chapter to the Data Book called
Transit and Other Shared Mobility

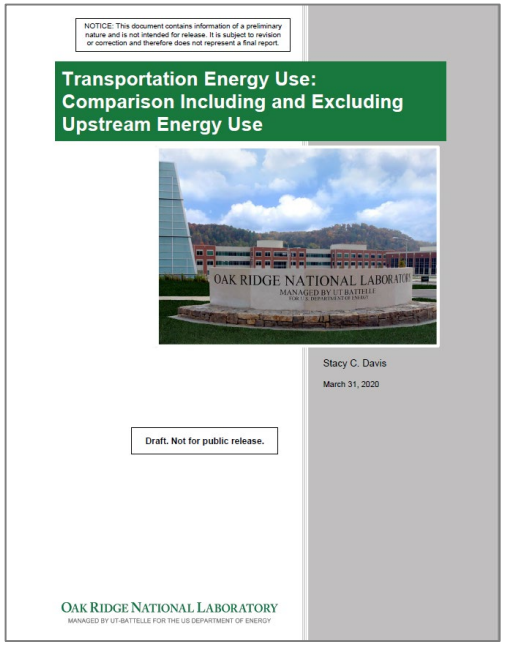
- Moved existing transit tables to this chapter
- Added tables on scooters, bikes, carsharing, and ride hailing

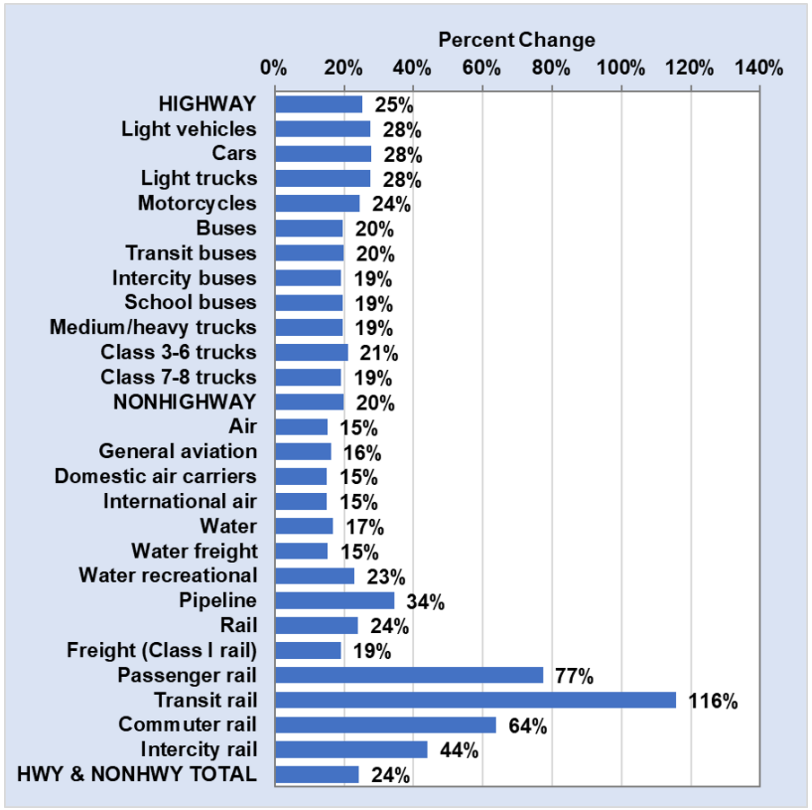
Edition 38: Added a new appendix to the Data Book called
Energy Tables Including Electricity Generation and Distribution

- The appendix includes a second copy of all energy tables and figures from the body of the report but taking into account electricity generation and distribution (upstream energy).

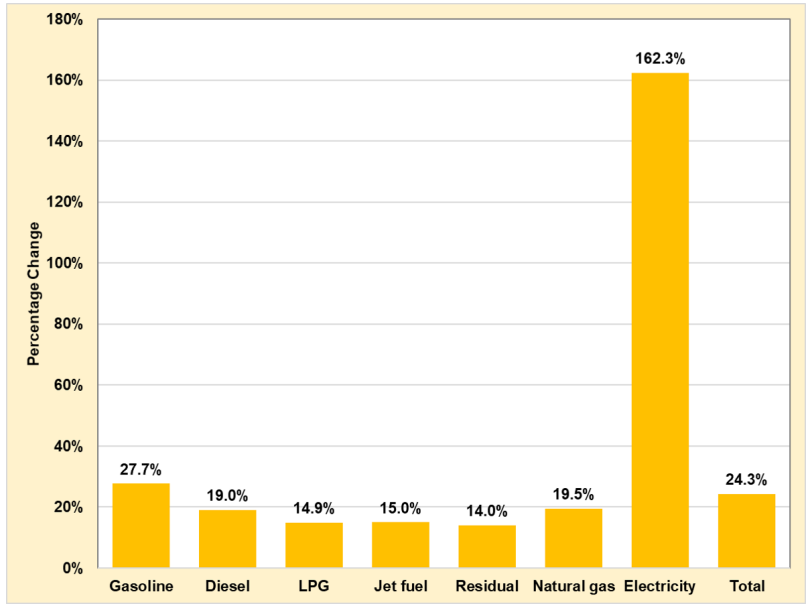
Technical Accomplishments and Progress for the Data Book

Draft report delivered March 31, 2020 on transportation energy including and excluding upstream energy.





Percent change of vehicle energy use to energy use including upstream energy by mode, 2017.



Percent change of vehicle energy use to energy use including upstream energy by fuel type, 2017.

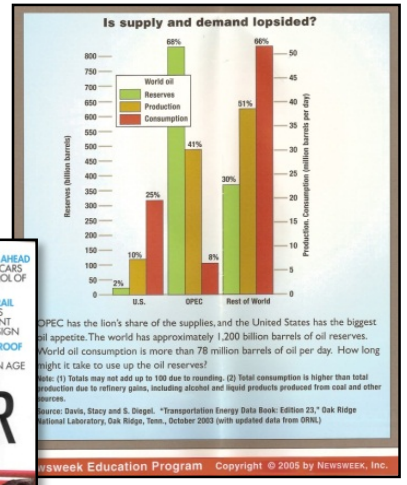
As the highway sector transitions towards heavier use of electricity, the differences between including and excluding upstream energy will become more pronounced.

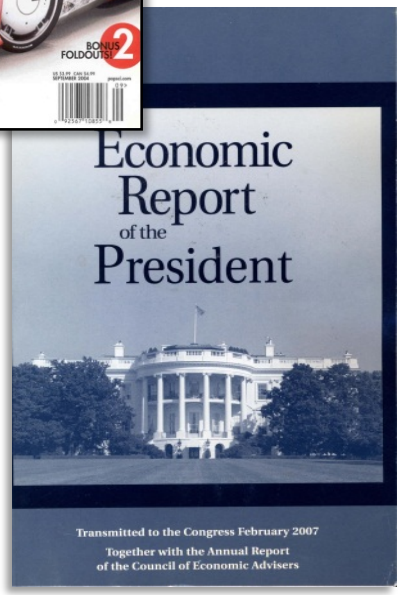
Technical Accomplishments and Progress for the Data Book

Data collected in the Transportation Data Program provides input data to other VTO programs and other agency's models, such as:

MA3T
GREET
ADOPT
Parachoice
Benefits analysis
DOE eGallon Initiative
DOE Advanced Technology Manufacturing Loans Program
National Science Foundation website
EPA MOVES
EIA NEMS

In the past, our data have been cited in Popular Science, Newsweek Education Program, and the Economic Report of the President



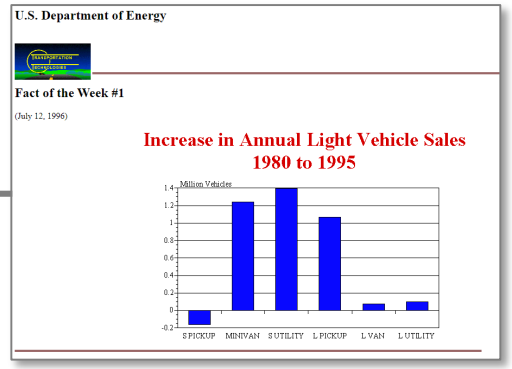


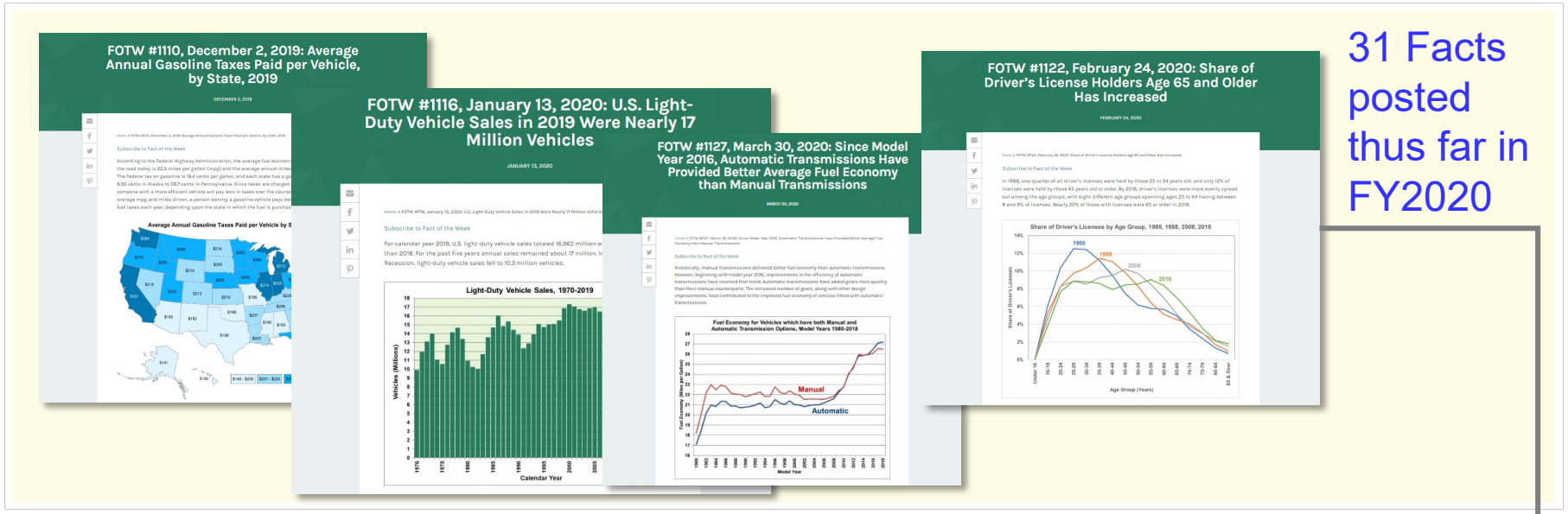
The Transportation Energy Data Book is used by Congressional staff, auto manufacturers, state governments, universities (professors & students), libraries, federal agencies, and more.

Technical Accomplishments and Progress for the Fact of the Week

http://energy.gov/eere/vehicles/transportation-fact-week

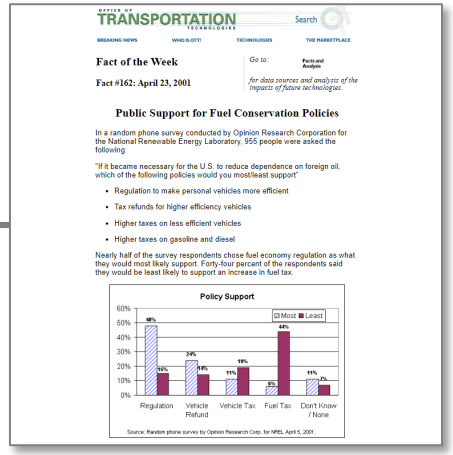
Fact #1: July 12, 1996



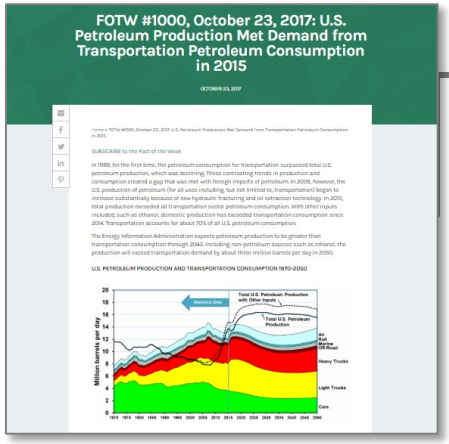


31 Facts posted thus far in FY2020

1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020



First ORNL-written Fact #162: April 23, 2001



Fact #1000: October 23, 2017

OAK RIDGE National Laboratory | NATIONAL TRANSPORTATION RESEARCH CENTER

Technical Accomplishments and Progress for the Fact of the Week

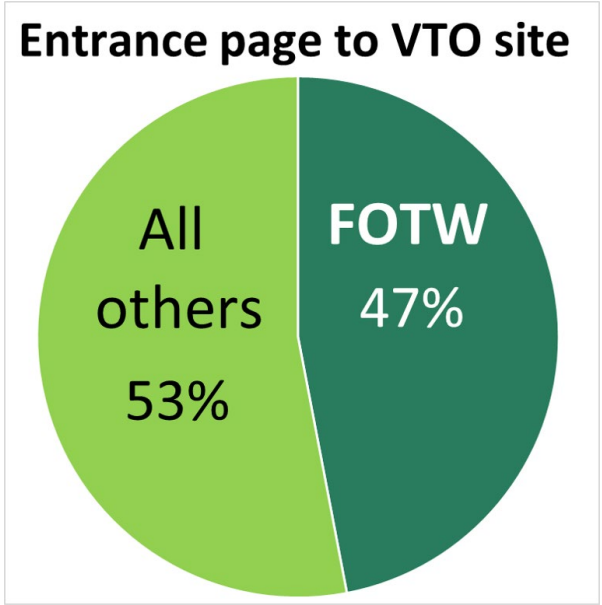
As of April 2020, there were > 25,100 subscribers to the Fact of the Week email distribution each Monday

Anyone with an email can subscribe

- Fact of the Week content accounted for 220,256 pageviews, or 35% of all VTO site pageviews during FY2019.
- About 47% of VTO site visits entered into the site through the Fact of the Week
- In the most visited VTO website pages:

  Fact 915, Average Historical Annual Gasoline Pump Price from 1929-2015

  Fact 861, Idle Fuel Consumption of Selected Gasoline and Diesel Vehicles

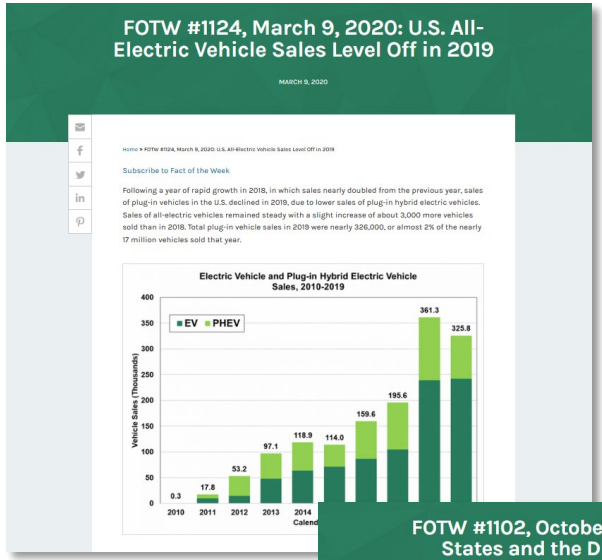


Collaboration & Coordination

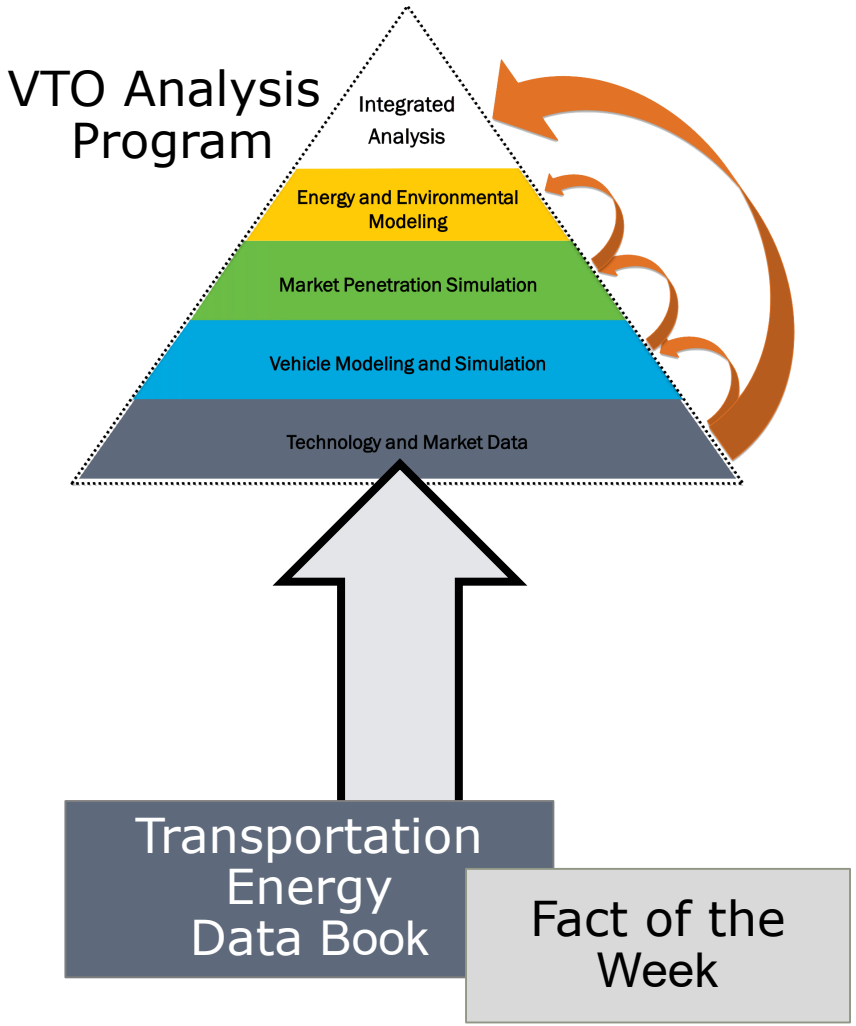
ORNL works with others to meet the data needs of the VTO Transportation Analysis Program

- 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 EVs;
  - NREL staff to make sure our data are congruent with the Alternative Fuel Data Center.
- Work with other Labs supporting VTO, such as the multi-Lab team on the Total Cost of Vehicle Ownership.
- Work with other Labs to showcase their work via the Fact of the Week and the Data Book.

Examples of Facts posted that use ANL, NREL data as a source



Proposed Future Research



Future plans are to continue the two components of the Transportation Data Program to support the VTO Analysis Program in the next fiscal year.

All future work will be updated to the latest possible data/information available and will include new material on emerging topics of interest.

Feedback from data users will be used to continually improve upon data, data sources, and data serving (websites).

ORNL will answer ad hoc data requests from VTO staff and Analysis Program team members.

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
- Reports on special topics, such as upstream energy use

Methods

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

Results

- Data Book website page views averaged 7,217 per month in FY20
- Google Scholar citations are 3,230 as of April 22, 2020
- Fact of Week email currently has over 25,100 subscribers

Milestones

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

Acknowledgements

Jacob Ward & Madhur Boloor
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US Department of Energy

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Formerly of the Office of Vehicle Technologies
US Department of Energy

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Reviewer-Only Slides

Critical Assumptions and Issues

- Government agencies or companies from which ORNL collects data are improving their data collection and data processing methodologies. But those improvements can cause incompatibility with previous years' data and cause a significant disruption to a historical time series of data.
  - The only course of action we have is to alert the users of these changes and give as much detail as possible about the changes. (Example: The Federal Highway Administration's change of Table VM-1 affected many tables in the *Transportation Energy Data Book*.)
- The Vehicle Inventory and Use Survey (VIUS), which was conducted every 5 years from 1967-2002, was discontinued after 2002. It included detailed data on the characteristics of the nation's truck population and truck activity.
  - There are currently no other sources of data that can give us similar information, thus data from the 2002 VIUS continues to be published in the *Transportation Energy Data Book*, with notes that it is the latest available data of its kind.
  - The Department of Transportation is in the planning stages of conducting a new study with information similar to the VIUS. We anticipate several years before these data will be made available.
- Government agencies with tight budgets are discontinuing some data collection and distribution (e.g., EIA international prices), and private companies are making their data more expensive and/or putting tighter restrictions on their use (e.g., IHS-Polk).

Publications – TEDB

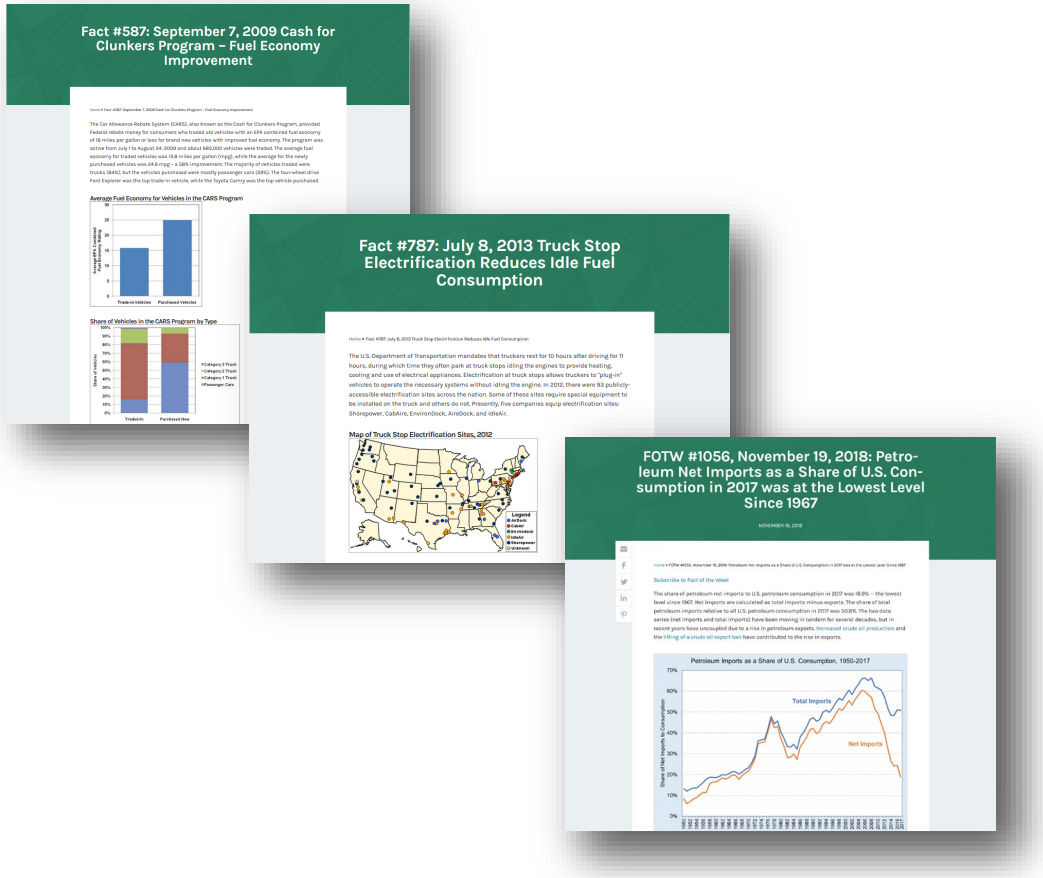
Edition 38: https://tedb.ornl.gov

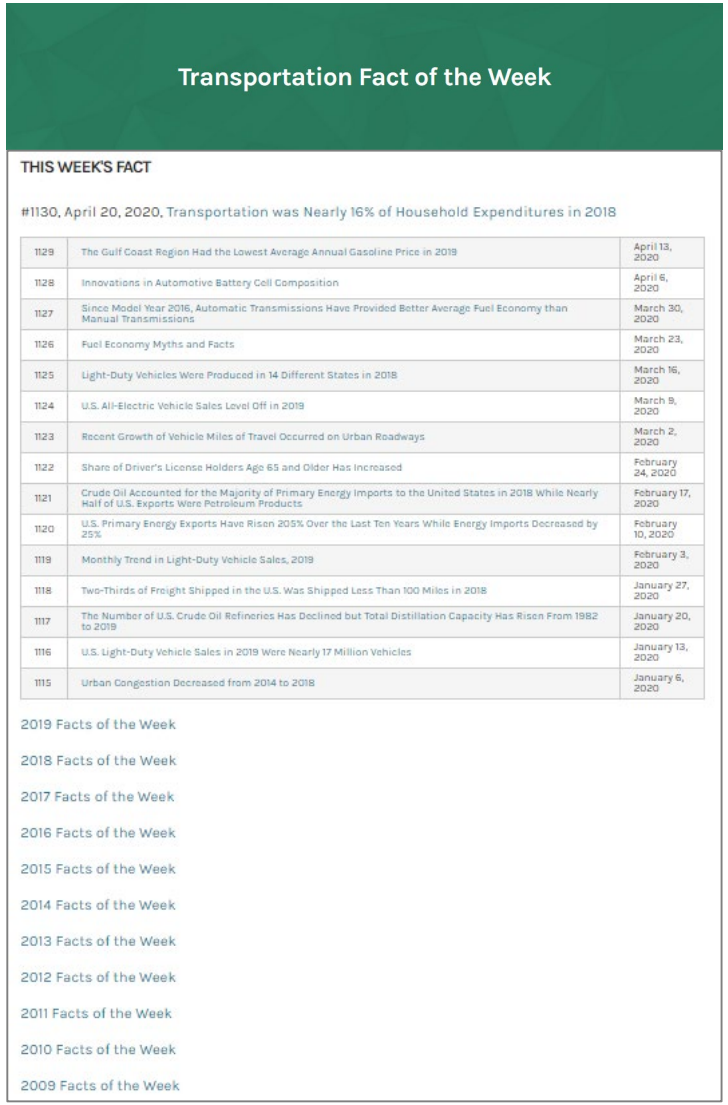
Editions 12-37 of the *Transportation Energy Data Book* can be found on our website:

https://tedb.ornl.gov/archive

Publications - Fact of the Week

From 2009-2020,
all Facts of the Week
are on the VTO website:
http://energy.gov/eere/vehicles/transportation-fact-week





Additional Data Book Web Statistics

Most popular Excel files downloaded

Rank	Excel Files	Description
1	**Table 4.1**	**Summary Statistics for Cars, 1970–2017**
2	Table 3.11	U.S. Average Vehicle Age, 1970–2018
3	Table 3.4	U.S. Cars and Trucks in Use, 1970–2017
4	Table 3.5	New Retail Vehicle Sales, 1970–2018
5	**Table 2.7**	**Domestic Consumption of Transportation Energy by Mode and Fuel Type, 2017**
6	Table 2.8	Transportation Energy Use by Mode, 2016–2017
7	Table 3.8	Shares of Highway Vehicle-Miles Traveled by Vehicle Type, 1970–2017
8	Table 3.2	Car Registrations for Selected Countries, 1960–2017
9	**Table 5.2**	**Summary Statistics for Class 7-8 Combination Trucks, 1970–2017**
10	Table 3.13	Survival Rates for Cars and Light Trucks by Vehicle Age
11	Table 3.3	Truck and Bus Registrations for Selected Countries, 1960–2017
12	**Table 4.3**	**Summary Statistics for Light Vehicles, 1970–2017**
13	Table 11.8	Refiner Sales Prices for Aviation Gasoline and Jet Fuel, 1978–2018
14	Table 6.2	Hybrid and Plug-In Vehicle Sales, 1999–2018
15	Table 3.6	Vehicles per Thousand People in Selected Countries/Regions, 2007 and 2017
16	Table 3.12	Annual Mileage for Cars and Light Trucks by Vehicle Age
17	**Table 5.1**	**Summary Statistics for Class 3-8 Single-Unit Trucks, 1970–2017**
18	Table 2.3	Distribution of Transportation Energy Consumption by Source, 1950–2018
19	Figure 4.3	Fuel Use versus Fuel Economy
20	Table 2.16	Energy Intensities of Freight Modes, 1970–2017