



U.S. General Services Administration

# FedFleet



2020

Federal Automotive Statistical Tool (FAST)  
Continuing the Focus on Data Quality

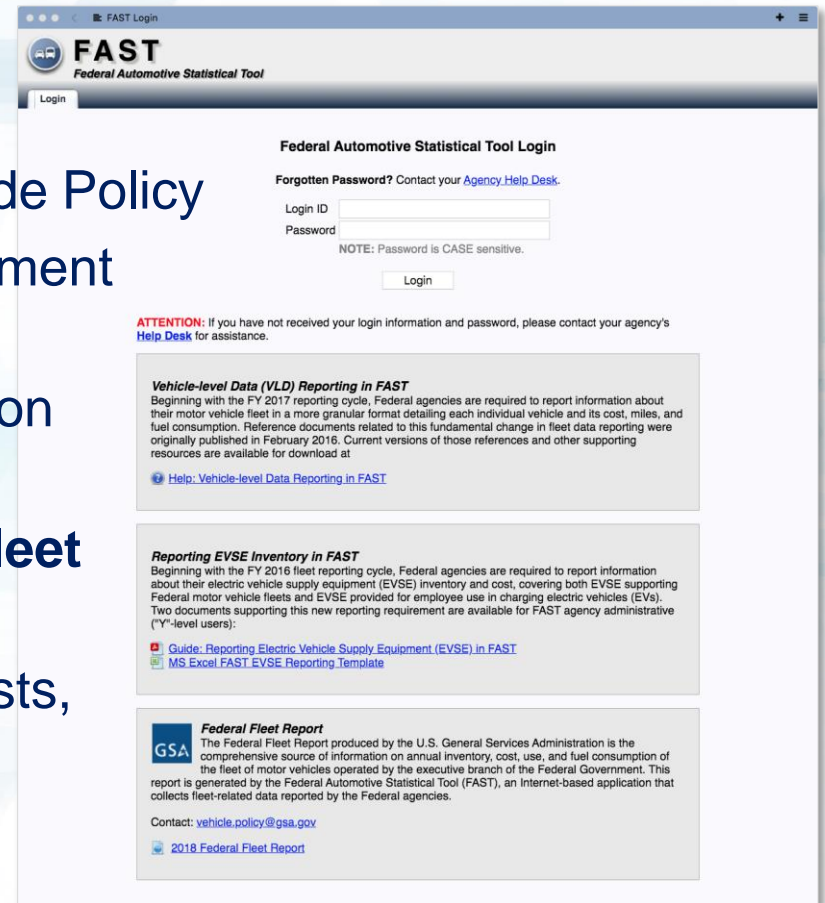
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INL/CON-20-57196:001

- Overview of FAST and how vehicle fleet data is reviewed
- Preliminary review of FY 2019 fleet dataset
  - How does it compare to prior year?
  - Where do we see trouble spots?
- Recommendations
- Discussion

# What is FAST?

- **Collaborative project funded and managed by**
  - GSA's Office of Government-wide Policy
  - DOE's Federal Energy Management Program
  - Energy Information Administration
- **Collects multiple federal vehicle fleet datasets**
  - Vehicles & operational data (costs, miles, fuel)
  - Fleet budget data
  - Fueling infrastructure data



# FAST: Why do we care about data quality?

- **Based on how the data is used:**
  - Regulatory & EO compliance determination
  - Required publications
  - Policy evaluation and development
  - Information resource for analysis
- **Based on increased interest in Federal vehicle fleet**
  - ... inside and outside the government
  - ... particularly since the transition to per-vehicle reporting



# FAST: Why do we care about data quality?

- **Implications of questionable data quality**
  - Inaccurate compliance determination
  - Decreased confidence in compliance determination
  - Decreased confidence in dataset for other uses
    - Policy development and evaluation
    - Information resource for analysis
- **Presumably this is the data agencies are using to manage their fleets**
- **Knowing where the potential quality concerns are is a key part of improving the quality**



# How is fleet data reviewed?

- **As the data is reported:**
  - Data must pass validation as it is loaded
    - 150+ “blocking” checks for basic validity
  - Data also screened for reasonability
    - 25+ “flagging” checks
  - Checks are documented in FAST’s “Vehicle-Level Data Business Rules Reference”



# How is fleet data reviewed?

- After it has been loaded in FAST:
  - Pre-defined reports
  - User-defined ad hoc queries



**Data Quality & Consistency Report**

The Data Quality & Consistency Report presents a set of overview trends and supporting tables for Department of Energy (and any subordinate fleet element) within the FAST reporting years 2014 through 2019. These trends and supporting tables are intended to help ensure the overall consistency and quality of the data for the corresponding fleet element(s), both across different data acquisition vehicles, fuel, costs, and mileage for fiscal year 2019.

**Contents**

1. Historical Data Trends
  - a. Vehicle Inventory
  - b. Vehicle Acquisition and Disposal
  - c. Fuel Consumption
  - d. Vehicle Miles Traveled (VMT) and Fuel Consumption as Percentage of Total Covered Consumption
  - e. Data Mile Traveled
  - f. Actual Fuel Consumption
  - g. Vehicle Fuel Consumption as Percentage of Total Fleet Indicators
  - h. Additional Note to the Department of Energy Fleet Indicators
  - i. Alternative Fuel Vehicle Inventory
  - j. Alternative Fuel Vehicle Inventory
  - k. Alternative Fuel Vehicle Inventory
  - l. Alternative Fuel Consumption
  - m. EPA 2012 Section 151 - Department of Vehicle Availability
2. Data Consistency Tables
  - a. F2019 Vehicle Inventory vs. Fuel Consumption
  - b. F2019 Vehicle Inventory vs. Mile Traveled
  - c. F2019 Vehicle Inventory vs. Fuel Consumption
  - d. F2019 Vehicle Inventory vs. Operating Costs/Hours vs. Fuel Consumption
  - e. EPA 2012 Section 151 - Department of Vehicle Availability
3. Fleet Operations History

**1. Historical Data Trends**

**1a. Vehicle Inventory**

Vehicle Inventory

Vehicle Type	2014	2015	2016	2017	2018	2019
Sedans/St Wgns	930	949	944	947	947	792
LSEVs	83	0	0	0	0	1
Ambulances	62	64	64	59	44	44
LD Trucks 4x2	3,861	3,740	3,557	3,457	3,396	3,396
LD Trucks 4x4	3,657	3,151	3,267	3,436	3,366	3,366
MD Vehicles	4,154	4,288	4,255	4,285	4,139	4,139
MD Vehicles	2,014	2,016	2,016	2,016	2,016	2,016
<b>Total</b>	<b>14,682</b>	<b>14,297</b>	<b>14,891</b>	<b>14,649</b>	<b>14,632</b>	

**Organization Overall Score: 96%**

Vehicle Class & Quantity	Business Rule Section				Operational & Cost Data	Fuel Data	Total
	Vehicle Attributes	Ownership Characteristics	Characteristics	Special			
LSEVs	1	80%	100%	100%	91%	83%	88%
Sedans/St Wgns	966	98%	92%	100%	99%	95%	96%
Ambulances	45	97%	92%	100%	99%	95%	94%
Busess	190	95%	92%	100%	95%	92%	93%
LD 4x2	3669	97%	79%	100%	98%	96%	96%
LD 4x4	3639	98%	84%	100%	98%	96%	96%
MD	4421	98%	81%	100%	99%	96%	96%
HD	2589	98%	82%	100%	95%	93%	93%
<b>Total</b>	<b>15820</b>	<b>97%</b>	<b>82%</b>	<b>100%</b>	<b>98%</b>	<b>96%</b>	<b>96%</b>

**Vehicles Falling Flag Rule**

**OW-1-4 - Acquisition Date:** Vehicles with acquisition dates in previous report years should also be present in previous year's submission (with exception for agency in first year of VLD reporting)

#	Fleet	Vehicle ID	Model Year	Make	Model	Details	Form
1			2017	CHEVROLET	EQUINOX	Acquisition Date: 2017-03-23	
2			2014	FORD	EXPLORER	Acquisition Date: 2014-04-14	
3			2014	JEEP	PATRIOT	Acquisition Date: 2014-07-01	
4			2014	JEEP	PATRIOT	Acquisition Date: 2014-07-02	
5			2015	JEEP	CHEROKEE	Acquisition Date: 2015-08-25	
6			2013	FORD	ESCAPE	Acquisition Date: 2013-06-19	

# How is fleet data reviewed?

- **When agency designates submission as complete:**
  - FAST team reviews agency submission
  - FAST team provides written summary of noted items
  - Agency responds to review summary
  - FAST re-opened for corrections identified by agency
  - FAST team assembles review results and agency responses into dashboard





# How is fleet data reviewed?

- **FAST team review looks at two levels**
  - Macro: high-level consistency
    - Unexpected shifts in fleet size or makeup?
    - Inconsistent shifts in costs, miles, fuel?
  - Micro: vehicle-level consistency and trouble spots
    - Year-to-year consistency
    - Fuel efficiency (e.g., mileage or fuel)
    - Use of “placeholders” for vehicle information
- **DOE review looks primarily at compliance**
  - Identifies issues impacting compliance



# Preliminary review of FY 2019 fleet data

- **Data call officially closed 2019-12-16**
  - 44 of 50 expected agencies completed on time
  - 4 additional agencies complete before 2020-01-01
  - 2 small agencies incomplete (~60 vehicles)
- **Preliminary review summaries provided to on-time agencies shortly after completion**
  - First three agencies had summaries by 2019-11-15
- **Significant improvements:**
  - Agencies are reporting sooner
  - Agencies are receiving feedback sooner





# Preliminary review of FY 2019 fleet data

FAST Team Data Review Areas / Items									
<b>1. Inventory Consistency / Completeness</b>									
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles				
<b>2. Disposal Consistency / Completeness</b>									
<b>3. Mileage Consistency</b>									
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles				
<b>4. Fuel Consumption Consistency</b>									
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles	g) Petroleum as % of Total	h) Petroleum Fuels	i) Alternative Fuels	
<b>5. Cost Consistency</b>									
<b>6. Fuel Efficiency Validity</b>									
<b>7. Year-to-Year Reporting Consistency</b>									
a) Acquisition Dates: Current Year	b) Acquisition Dates: Prior Year	c) Disposal Dates: Prior Year	d) Disposal Dates: Missing from Current Year?	e) Disposal Dates: Missing from Current Year?	f) Changes to Static Attributes (BIA 1.1.5)				
<b>8. Use of "Placeholder" Values</b>									

FY 2018

FAST Team Data Review Areas											
Macro-level Metrics						Vehicle-level Metrics					
<b>1. Inventory Consistency / Completeness</b>											
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles	g) SSA Lease Vehicles	h) Commercial Lease Vehicles	i) Agency Owned Vehicles	j) Light Duty Vehicles	k) Medium Duty Vehicles	l) Heavy Duty Vehicles
<b>2. Disposal Consistency / Completeness</b>											
<b>3. Mileage Consistency</b>											
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles	g) SSA Lease Vehicles	h) Commercial Lease Vehicles	i) Agency Owned Vehicles	j) Light Duty Vehicles	k) Medium Duty Vehicles	l) Heavy Duty Vehicles
<b>4. Fuel Consumption Consistency</b>											
a) Overall Fleet	b) Foreign Vehicles	c) Domestic Vehicles	d) LE Vehicles	e) EV Vehicles	f) Armored Vehicles	g) SSA Lease Vehicles	h) Commercial Lease Vehicles	i) Agency Owned Vehicles	j) Light Duty Vehicles	k) Medium Duty Vehicles	l) Heavy Duty Vehicles
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<b>8. Use of "Placeholder" Values</b>											

FY 2019

**FedFleet**



2020

# Preliminary review of FY 2019 fleet data

- **Where do we see trouble spots?**
  - **M1 & M7: Year-to-year consistency of vehicle reporting**
    - Missing / inconsistent reporting of vehicles
    - Changes in “static” vehicle attributes
  - **M6: Fuel and mileage at the vehicle level**
  - **M8: Use of “placeholder” values for vehicle attributes**
    - Particularly for vehicle fuel and mileage



# Preliminary review of FY 2019 fleet data

- **Trouble spots: Year-to-year consistency of vehicle reporting**
  - Measure 1(a): overall inventory (example)
    - *Total inventory discrepancies: 15,389 vehicles*
  - Measure 7(a): Current-year acquisitions also reported in prior year (flag OW-1.3)
    - *Total: 2,681 vehicles*
  - Measure 7(b): Vehicles in current-year inventory missing from prior year (based on acquisition date; flag OW-1.4)
    - *Total: 23,800 vehicles*

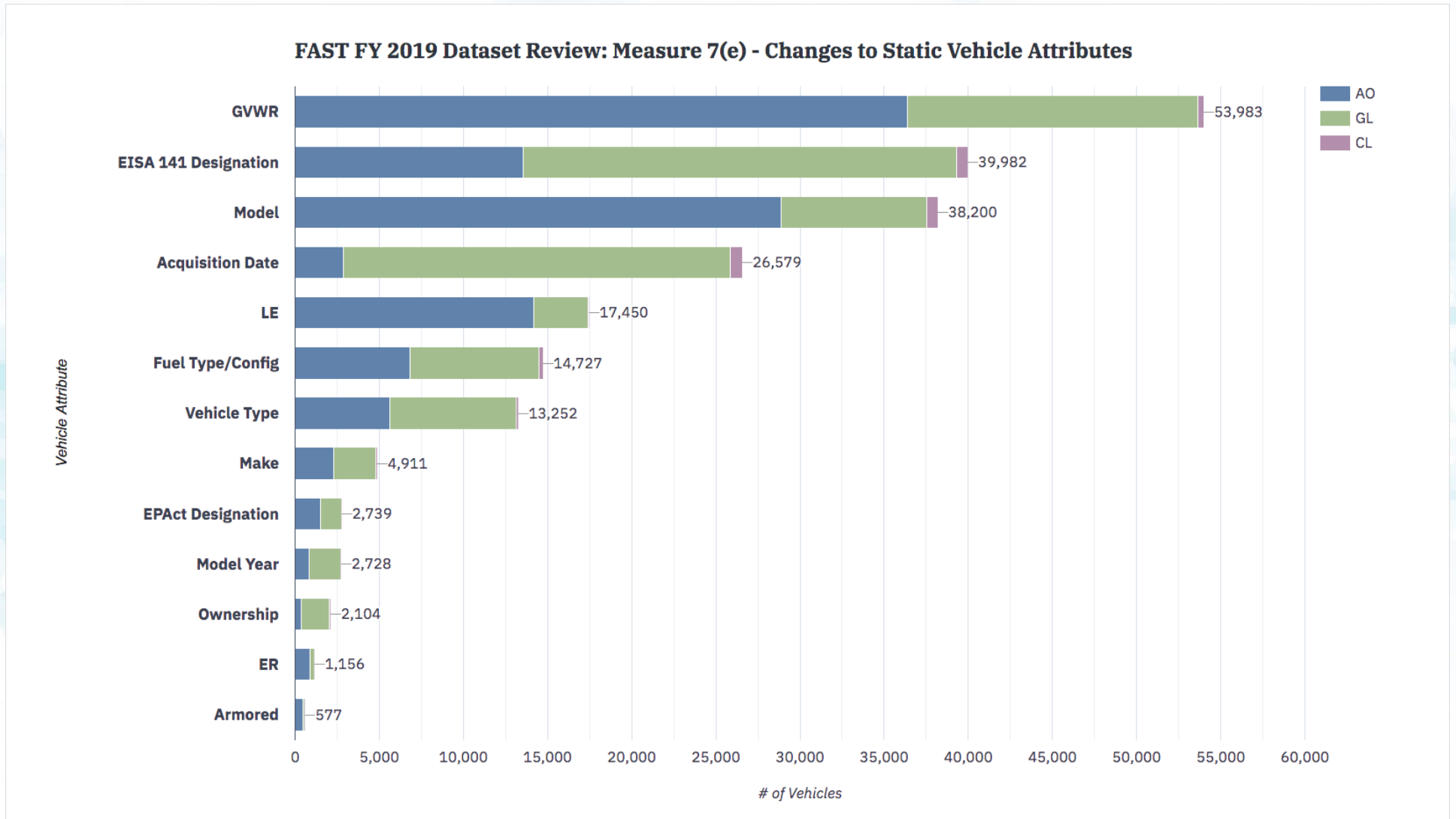


# Preliminary review of FY 2019 fleet data

- **Trouble spots: Year-to-year consistency of vehicle reporting (continued)**
  - Measure 7(c): Prior-year disposals also present in current year (flag OW 4.4)
    - *Total: 1,104 vehicles*
  - Measure 7(d): Vehicles in prior year inventory missing from current year:
    - *Total: 18,743 vehicles*
  - Measure 7(e): Vehicles with year-to-year changes to “static” attributes (flag A-1.5)
    - *Total: 114,680 vehicles*



# Preliminary review of FY 2019 fleet data





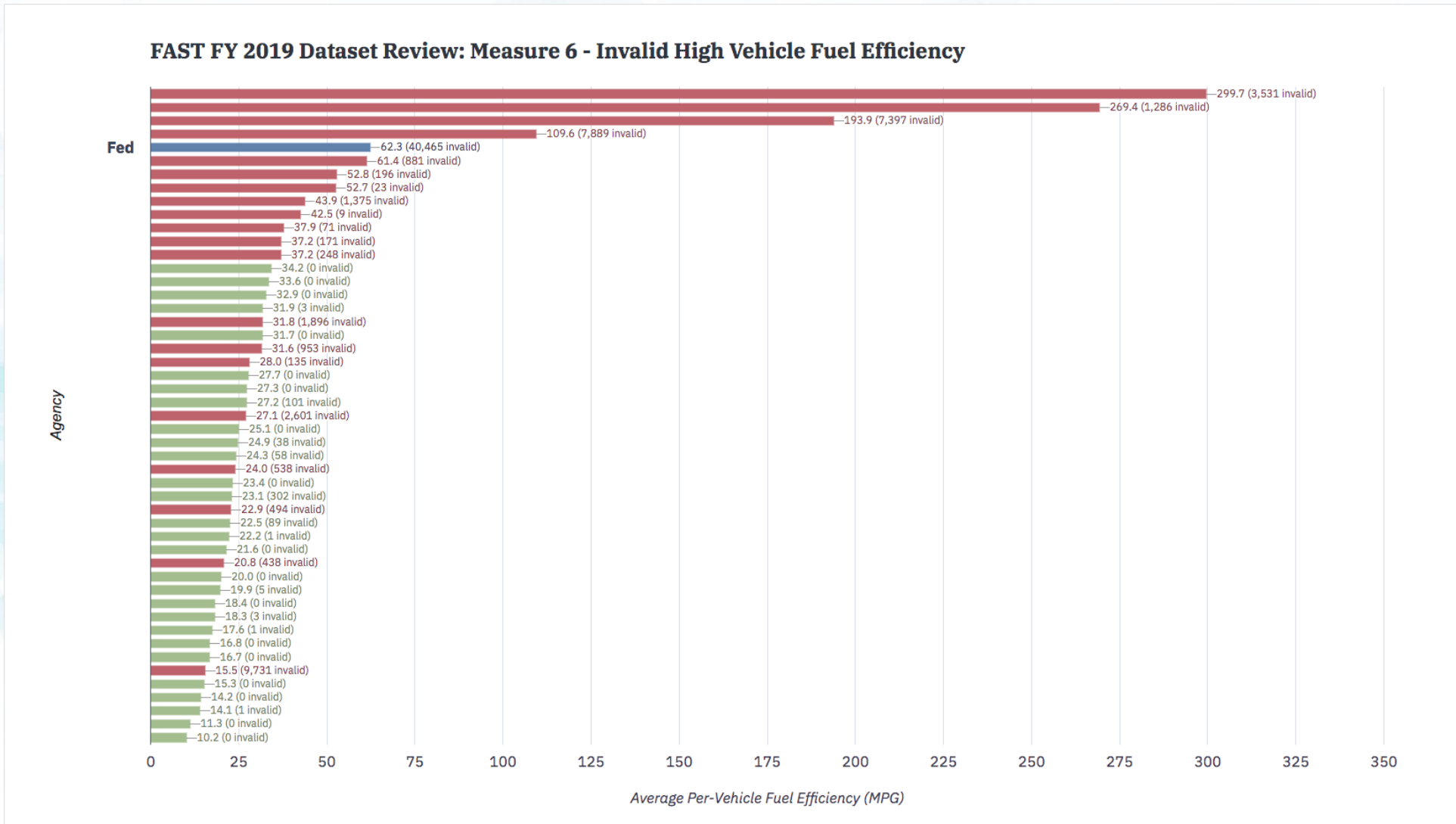
# Preliminary review of FY 2019 fleet data

- **Trouble spots: Fuel and mileage at the vehicle level**
  - Measure 6: vehicles with invalid high fuel efficiency (flag F-4.6)
    - Further limited to vehicles w/miles > 1,000
    - *Total: 40,465 of 581,798 vehicles*
    - *5 agencies with > 10% of vehicles flagged*
    - Invalid data skews agency and federal per-vehicle average fuel efficiency



# Preliminary review of FY 2019 fleet data

**FAST FY 2019 Dataset Review: Measure 6 - Invalid High Vehicle Fuel Efficiency**



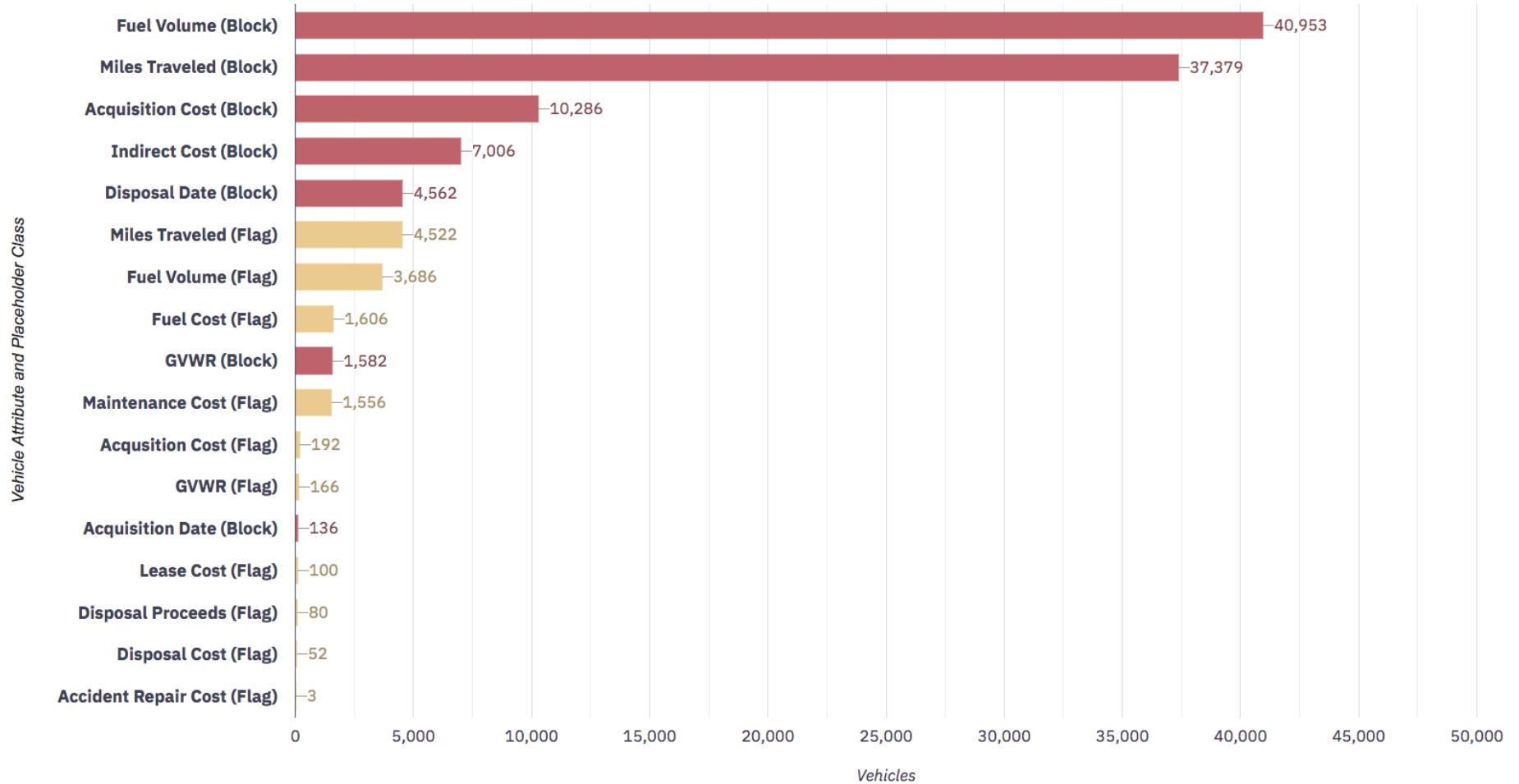
# Preliminary review of FY 2019 fleet data

- **Trouble spots: Placeholder values**
  - Placeholder: vehicle attribute which exactly matches business rule thresholds for blocking or flagging data
  - Raises question about “real” data
  - *72,030 vehicles (of 698,441) reported with one or more placeholder attributes*
  - *101,904 blocking placeholders*
  - *11,963 flagging placeholders*



# Preliminary review of FY 2019 fleet data

FAST FY 2019 Dataset Review: Measure 8 - Use of Placeholder Attributes



# Recommendations

- **Maintain perspective:**
  - Understanding where the problems are is A Good Thing™
  - Improving quality is a (potentially lengthy) process
- **Continue the focus on timely reporting**
- **Use available tools to identify, investigate problem areas**
  - Flags during data loading process
  - Available reports
  - Results from reviews (and supporting detail)
- **Look for coming changes on the data collection side**





# Discussion



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