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

- FY 2019 review dashboard

Legend

- **No significant issues noted**
- **Issue(s) noted; may be limited in scope or impact**
- **Issue(s) noted; significant in scope and/or impact**
- **Issue(s) noted; missing or highly suspect data**
- **Not evaluated**
Preliminary review of FY 2019 fleet data

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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*

Source: FAST (https://fastweb.inl.gov/), 2020-01-13
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*

Source: FAST (https://fastweb.inl.gov/), 2020-01-13
Preliminary review of FY 2019 fleet data

FAST FY 2019 Dataset Review: Measure 7(e) - Changes to Static Vehicle Attributes

# of Vehicles

- GVWR
- EISA 141 Designation
- Model
- Acquisition Date
- LE
- Fuel Type/Config
- Vehicle Type
- Make
- EPAct Designation
- Model Year
- Ownership
- ER
- Armored

Source: FAST (https://fastweb.inl.gov/), 2020-01-13
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

Source: FAST (https://fastweb.inl.gov/), 2020-01-13
Preliminary review of FY 2019 fleet data

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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

Source: FAST (https://fastweb.inl.gov/), 2020-01-13
Preliminary review of FY 2019 fleet data

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

- Fuel Volume (Block): -40,953
- Miles Traveled (Block): -37,379
- Acquisition Cost (Block): -10,286
- Indirect Cost (Block): -7,006
- Disposal Date (Block): -4,562
- Miles Traveled (Flag): -4,522
- Fuel Volume (Flag): -3,686
- Fuel Cost (Flag): -1,606
- GVWR (Block): -1,582
- Maintenance Cost (Flag): -1,556
- Acquisition Cost (Flag): -192
- GVWR (Flag): -166
- Acquisition Date (Block): -136
- Lease Cost (Flag): -100
- Disposal Proceeds (Flag): -80
- Disposal Cost (Flag): -52
- Accident Repair Cost (Flag): -3
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
# FAST Program Contacts

## GSA OGP
- James Vogelsinger  
  james.vogelsinger@gsa.gov  
- Patrick McConnell  
  patrick.mcconnell@gsa.gov

## DOE FEMP
- Kendall Kam  
  kendall.kam@ee.doe.gov  
- Jay Wrobell  
  jay.wrobell@ee.doe.gov

## EIA CES
- Cynthia Sirk  
  cynthia.sirk@eia.gov

## FAST System Team
- Ron Stewart  
  ron.stewart@inl.gov  
- Michelle Kirby  
  michelle.kirby@inl.gov  
- Tim Raczek  
  timothy.raczej@inl.gov  
- @FASTdevs on Twitter

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