FAST and Asset-Level Data Reporting

Lessons Learned and Insights

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We'll cover…

- FY 2017 fleet data call overview and status
- Asset-level data reporting: what we've learned
- Fleet insights: new ways we can look at the fleet
- Looking forward…
- Discussion / Q&A

FY 2017 Fleet Data Call Overview

- 39 of 49 reporting Federal agencies submitting per-vehicle data
- Remaining 10 agencies submitted aggregated fleet data
  - 1 large agency fleet
  - 2 medium agency fleets
  - 7 small agency fleets
- 90% of Federal fleet covered in new data shape
  - Approximately 650,000 vehicles and their data
- Dataset not yet final
  - Several agencies still working on initial submission
  - DOE feedback to agencies may result in updates

ALD: Lessons Learned - Validation

- Flagging business rules will all be evaluated
  - Thresholds / ranges evaluated to make sure they are actually flagging outliers
    - Flagging too much?
    - Not flagging things they should?
  - Tune how / when rules are applied:
    - Some rules apply only to vehicles in fleet entire year?
    - Some rules may need to be more specific: ranges based on vehicle type rather than class?
  - Elevate flagging rules to block clearly invalid data?
- A few areas where we will look to revise blocking rules
- We (all) need additional ways of exploring flagged data in FAST

ALD: Lessons Learned - Process

- Simpler approaches worked better
  - Simpler reporting hierarchy
  - Fewer people involved in data cleaning, issue resolution, and submission
- Effort associated with data cleanup was significant
  - Starting earlier made a big difference
  - Evaluation of both data and processes was important
- Approach this year will help determine ease vs. pain next year
  - Factoring of data corrections into MIS data (and processes)
  - Process and tool changes to minimize pain points

ALD: Lessons Learned – Data Issues

- Use of license plate # for vehicle identifier
  - Not permanent and immutable!
- Groups of “identical” vehicles
  - Example: 13 vehicles in a fleet that are identical in all regards except vehicle identifier (VIN)
  - Vehicles with the same vehicle ID (e.g., VIN) reported in multiple agencies, none of which show as disposal?
- Consistency of cost reporting
- Consistency of EPAct exemption designations
- Issues with vehicle mileage and fuel consumption
  - Reporting annual miles vs. odometer reading?
  - Fuel units matter!
  - Tracking electricity consumption in vehicles?

ALD: Insights

- Caveat: partial and preliminary dataset
- Looking at “the fuel coding issue”
- Very diverse fleet (we knew that)
  - … now we can quantify “how diverse?”
- Some examples of new ways of looking at the fleet

ALD: Insights – Inconsistent Fuel Data

- Long-recognized “fuel coding issue”
  - Inconsistent fuel types based on vehicle fuel type/configuration
  - Example: DSL fuel consumed in GAS/ELE PH vehicle
- Largely swallowed up in older aggregated reporting method
- Problem with coding at the pump?
  - … or in data handling within purchasing systems?
  - … or in data entry?
  - … or in fleet MISs?
  - … something else?
- FAST management team decided to accept and flag inconsistent fuel consumption
  - Challenge for DOE/GSA/EIA: use of invalid data?
  - Work with agencies to better understand scope and cause of issues

ALD: Insights – Inconsistent Fuel Data

- Data from 37 agencies
  - 556,500 vehicles
  - 853,500 fuel entries
  - 298M GGE fuel
- At the Federal level:
  - 21 of 37 agencies have vehicles with inconsistent fuel consumption
  - 39,700 vehicles (7.1% of all vehicles)
  - 42,539 fuel records (5.0% of all fuel records)
  - 3.6M GGE (1.2% of all fuel volume)
- At the agency level
  - 0.1% - 15.6% of vehicles with inconsistent fuel
  - 0.1% - 10.0% of fuel records
  - 0.0% - 9.3% of fuel volume

Source: FAST (https://fastweb.inl.gov), preliminary dataset 2018-01-26

ALD: Insights – A Diverse Fleet

- 31 different vehicle types
  - Vehicle counts/type range from 1 to over 160,000
- 150 different combinations of vehicle type + fuel type/configuration
- 170 different vehicle makes
  - 1 to over 235,000 vehicles/make
- Vehicle location:
  - 5% foreign
  - 7% domestic and location withheld
  - 25% domestic by ZIP code (over 7,100 different ZIP codes)
  - 63% domestic by lat/long (over 22,100 distinct locations)

Source: FAST (https://fastweb.inl.gov), preliminary dataset 2018-01-26

ALD: Insights – A diverse fleet

Inventory Parameter	Min	Median	Mean	Max
Model Year	1938	2010	2006	2018
GVWR	500	5,200	7,451	100,000
Months in Service	1	88	136	772
Miles	0	5,042	6,654	136,907
Fuel Consumption (GGE)	0	382	534	44,006
Operating Cost ($)	10	4,076	5,039	177,785
Fuel Efficiency (miles/GGE)	0	12.9	176.6	185,400

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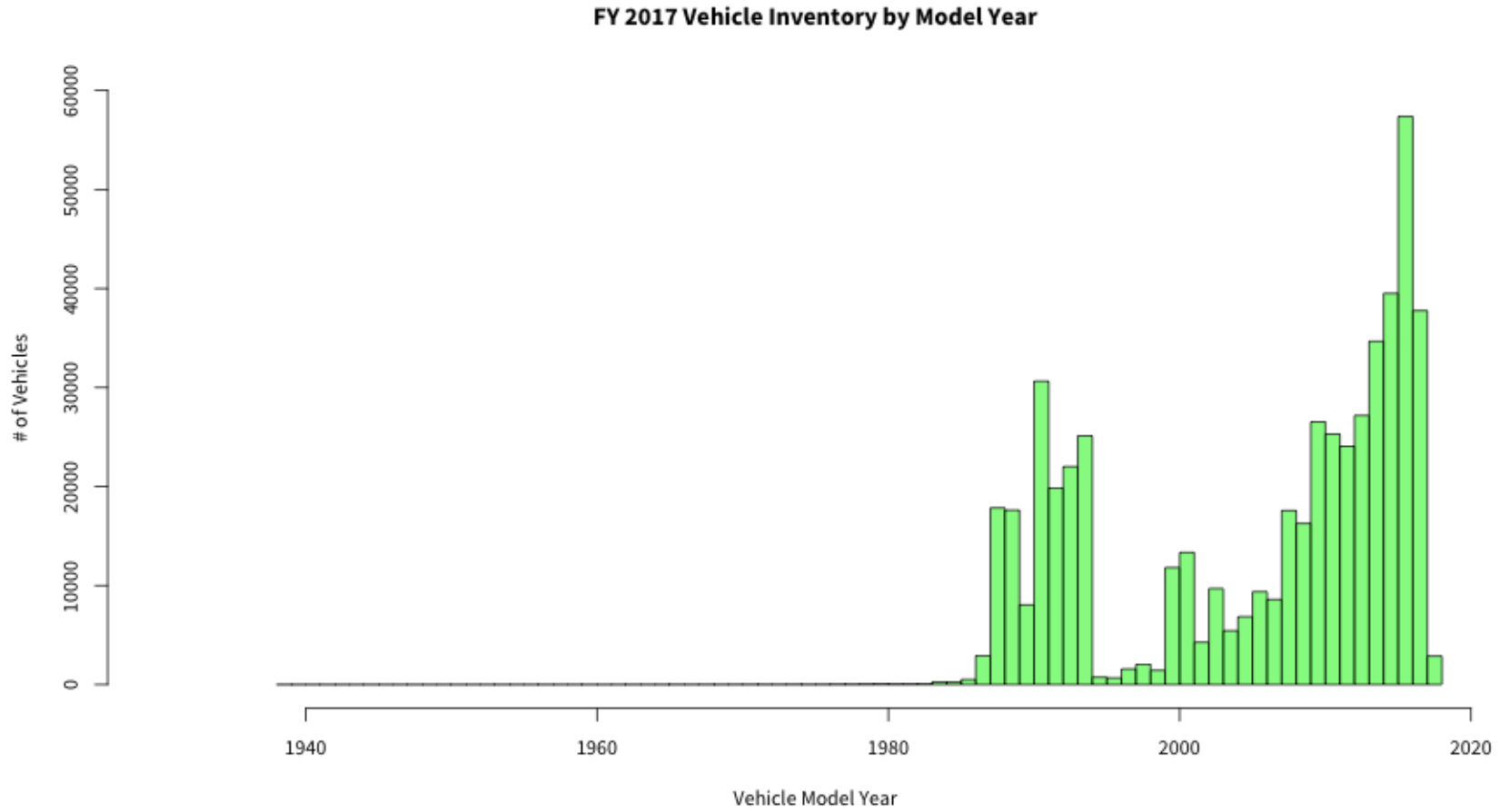
ALD: Insights – New ways to look at the fleet



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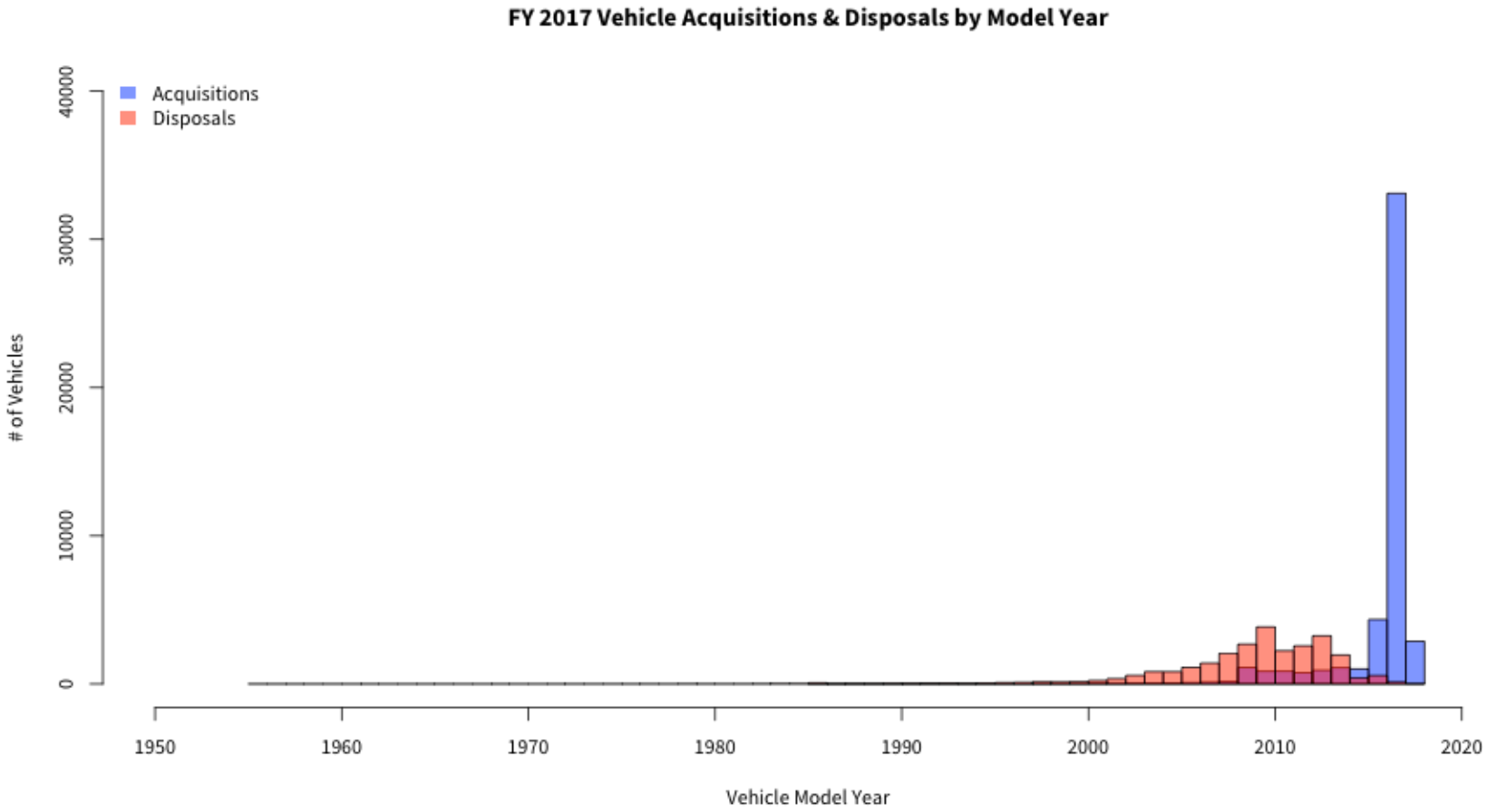

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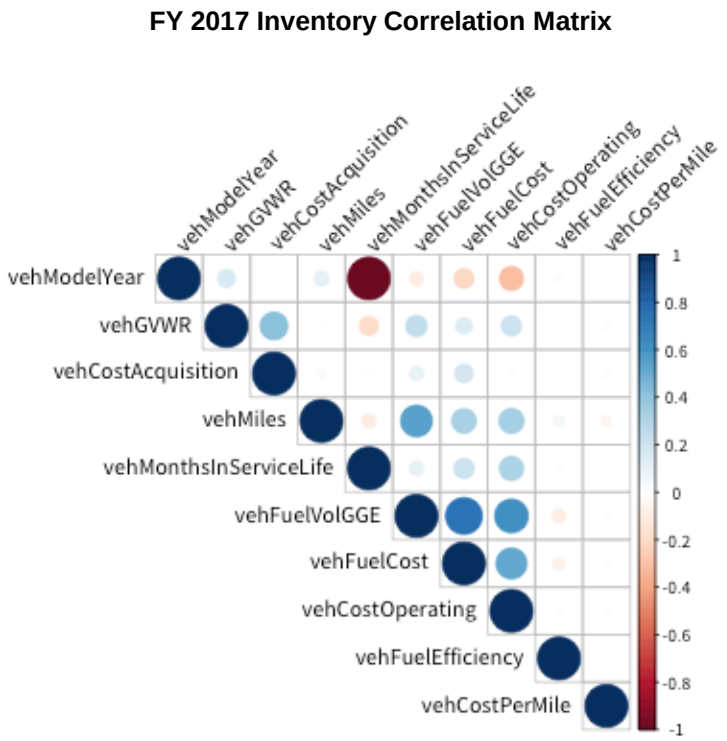


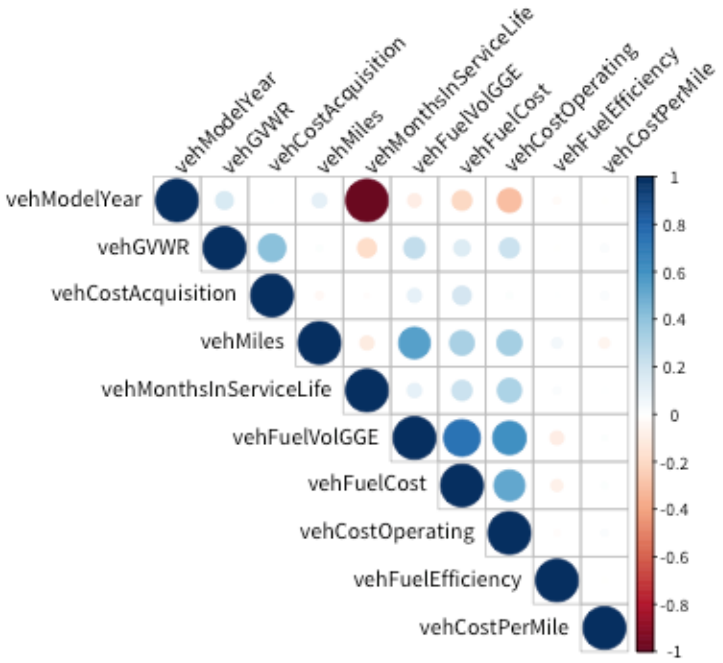
Correlation matrix: visualization of relationships between data elements

Dot size and color: magnitude of correlation

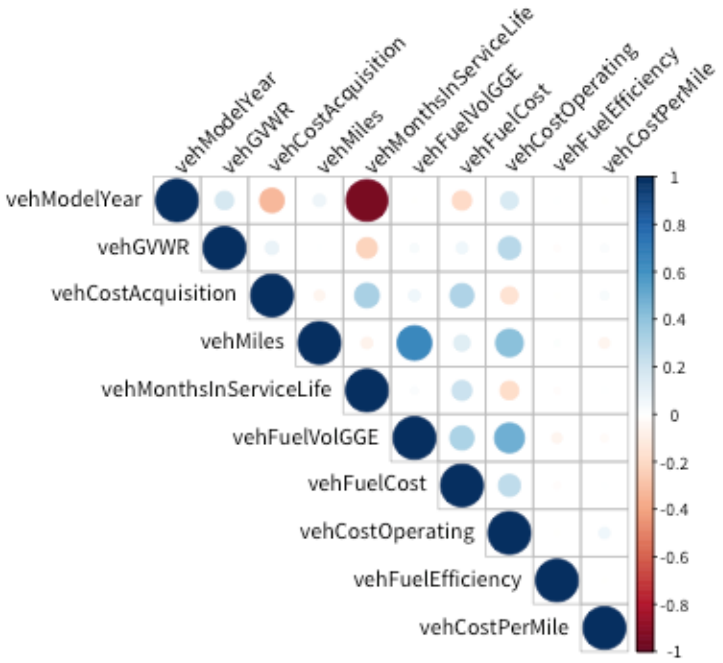
Source: FAST (https://fastweb.inl.gov), preliminary dataset 2018-01-26

ALD: Insights – New ways to look at the fleet

FY 2017 Inventory Correlation Matrix



FY 2017 Inventory - Sedans/St Wgns - Correlation Matrix



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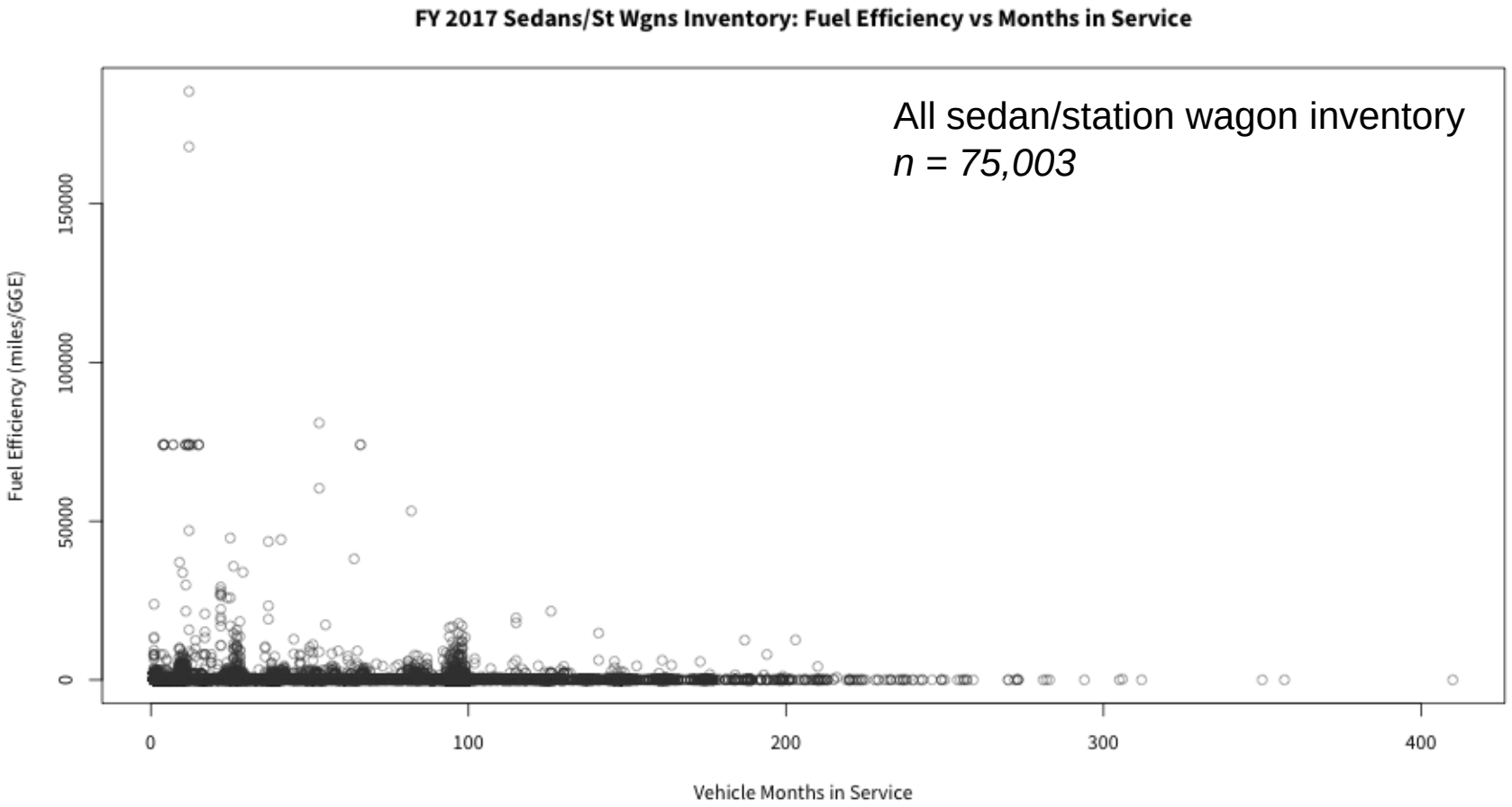

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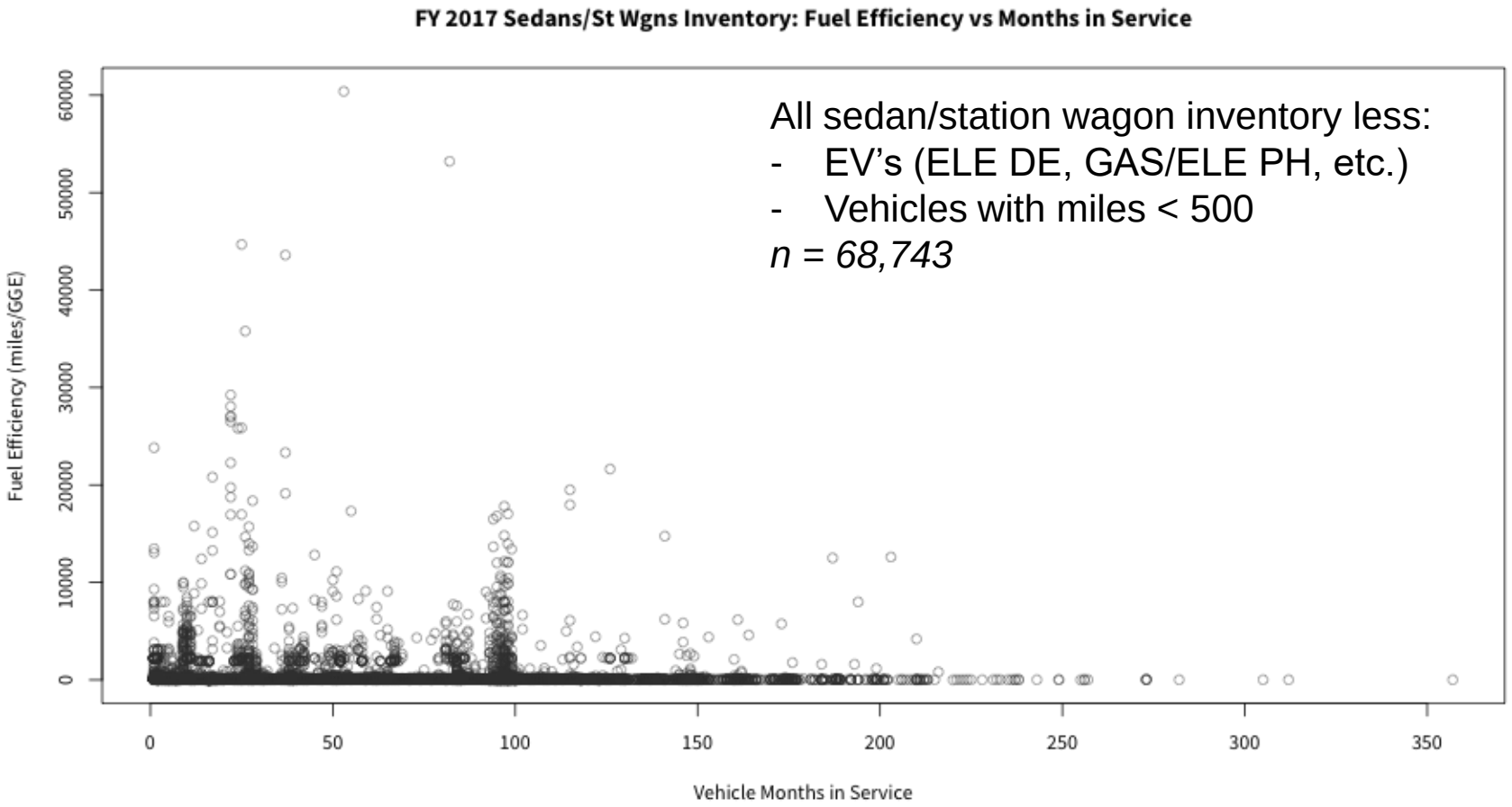

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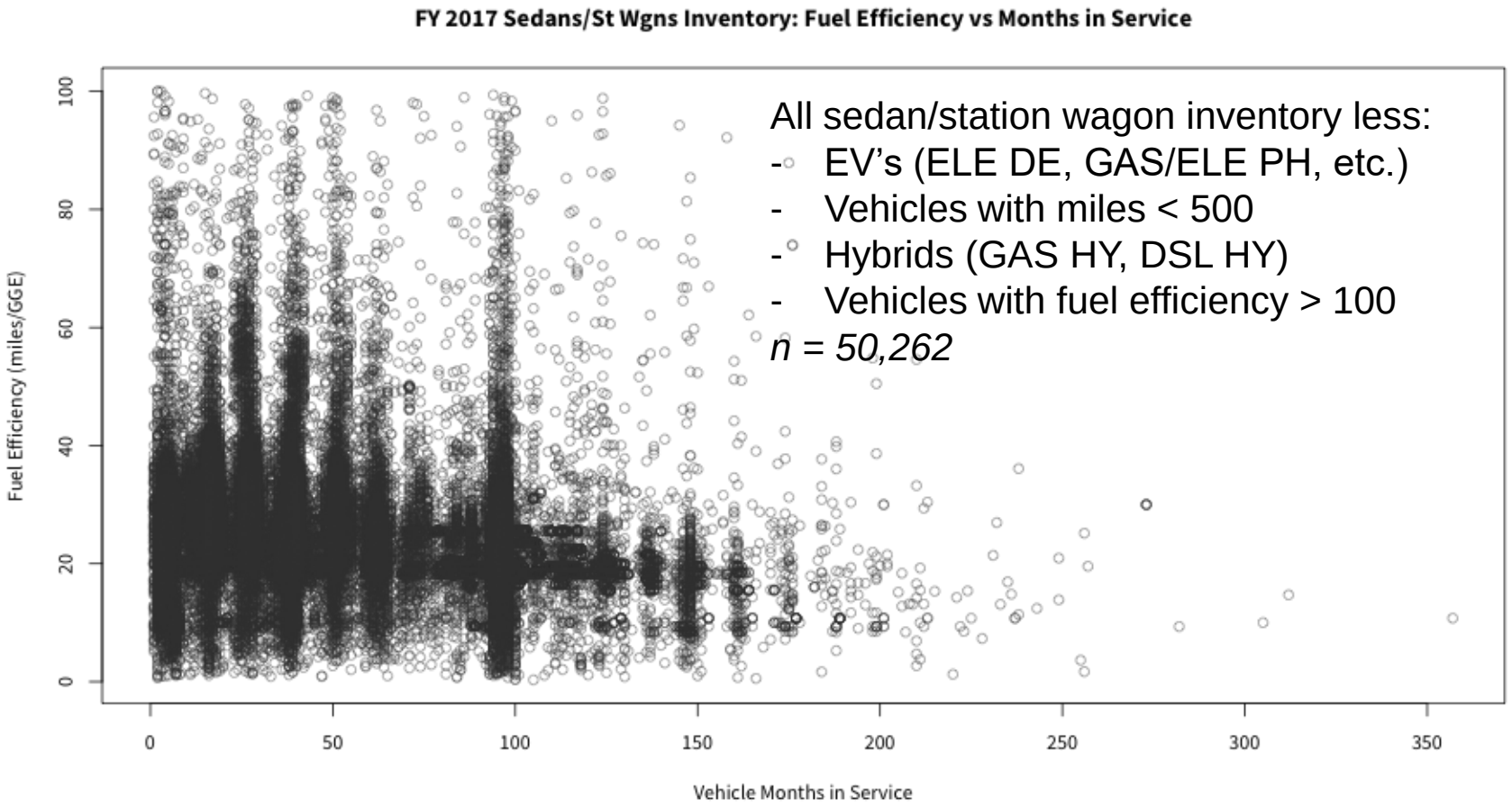

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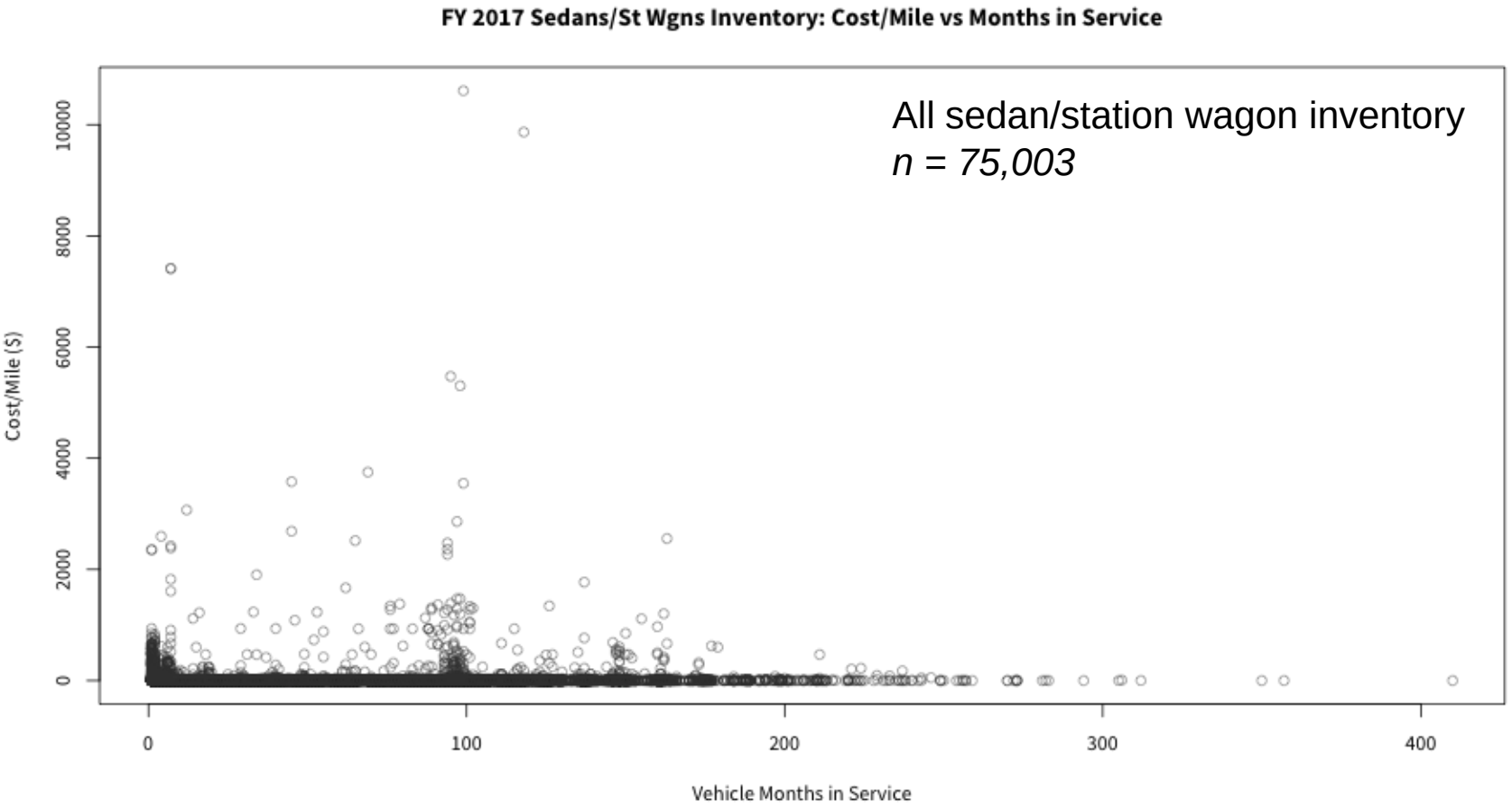

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Looking forward…

- Planned on the FAST side:
  - Review and tuning of business rules
  - Additional ways to look at the data and flags

- Recommendations for the agency side:
  - Make sure data corrections go back into fleet MIS(s)
  - Review what was flagged… and why
  - Review data-related processes that contribute(d) to missing, invalid, or questionable data
    - Find ways to address those as far upstream and early as possible?
    - Look for ways to highlight questionable data within fleet MIS(s) and review processes?

FAST Program Points of Contact

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