FAST: FY 2018 Federal Fleet Data Call

Looking at Data Quality

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Topics

• FY 2018 fleet dataset

• Data Quality
  – Where are the rough spots?
  – What can we do about them?

• Looking forward
  – Watching quality
  – New ways of viewing fleet data
FY 2018 FEDERAL FLEET DATASET
FY 2018 Data Call

• Initial close 12/17/2018

• Final close 03/20/2019

• Milestones:
  – All reporting agencies provided VLD
  – New structured review process
FY 2018 Fleet Data Overview

Federal Vehicle Inventory
Inventory by Fiscal Year and Vehicle Class

Source: FAST, final data as of 2019-03-21

FedFleet 2019
FY 2018 Fleet Data Overview

Federal Vehicle Acquisitions
FY 2018 Acquisitions by Vehicle Class

- HD Vehicles: 2,953
- Buses: 587
- Ambulances: 47
- MD Vehicles: 14,397
- LD Trucks 4x4: 13,579
- LD Trucks 4x2: 10,240
- Sedans/St Wgns: 12,689
- LSEVs: 77

Source: FAST, final data as of 2019-03-21
FY 2018 Fleet Data Overview

Federal Vehicle Acquisitions
FY 2018 Acquisitions by Vehicle Fuel Type/Configuration

- CNG DE: 6
- DSL DE: 6,871
- DSL HY: 23
- DSL/CNG BI: 2
- ELE DE: 194
- GAS DE: 27,881
- GAS HY: 4,814
- GAS/CNG BI: 4
- GAS/E85 FF: 15,252
- GAS/ELE PH: 302
- GAS/LPG BI: 1

Source: FAST, final data as of 2019-03-21
FY 2018 Fleet Data Overview

Federal Vehicle Disposals
FY 2018 Disposals by Vehicle Fuel Type/Configuration

- CNG DE: 15
- DSL DE: 6,512
- DSL HY: 0
- DSL/ELE PH: 1
- ELE DE: 388
- GAS DE: 3,061
- GAS HY: 36
- GAS/CNG BI: 36
- GAS/E85 FF: 19,994
- GAS/ELE PH: 19
- GAS/LPG BI: 13
- LPG DE: 2

# of vehicles

Source: FAST, final data as of 2019-03-21

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FY 2018 Fleet Data Overview

Federal Vehicle Miles
Miles by Fiscal Year

Source: FAST, final data as of 2019-03-21
FY 2018 Fleet Data Overview

Federal Vehicle Miles
FY 2018 Miles by Vehicle Class

<table>
<thead>
<tr>
<th>Vehicle Class</th>
<th>Miles (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD Vehicles</td>
<td>231,918,702</td>
</tr>
<tr>
<td>Buses</td>
<td>60,146,240</td>
</tr>
<tr>
<td>Ambulances</td>
<td>3,616,238</td>
</tr>
<tr>
<td>MD Vehicles</td>
<td>733,134,512</td>
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<tr>
<td>LD Trucks 4x4</td>
<td>1,053,123,279</td>
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<tr>
<td>LD Trucks 4x2</td>
<td>1,749,415,637</td>
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<tr>
<td>Sedans/St Wgns</td>
<td>806,549,414</td>
</tr>
<tr>
<td>LSEVs</td>
<td>2,800,237</td>
</tr>
</tbody>
</table>

Source: FAST, final data as of 2019-03-21

FedFleet 2019
FY 2018 Fleet Data Overview

Federal Vehicle Fuel Consumption
Fuel Consumption by Fiscal Year and Fuel Type

Source: FAST, final data as of 2019-03-21

FedFleet 2019
FY 2018 Fleet Data Overview

Federal Vehicle Fuel Consumption
% Fuel Consumption by Fiscal Year and Fuel Type

Fiscal Year

Source: FAST, final data as of 2019-03-21
DATA QUALITY
Data Quality

• Lots of interest in vehicle-level data

• How good is it?
  – “It’s complicated...”
New Review Process

- FAST team reviewed agency submissions
- Written feedback to agencies
- Responses collected from agencies
- Short window for data improvement
- Summarized in dashboard
3 Questions

• What are the problems?
• How do we find them?
• What do we do about them?
# Problem Areas

<table>
<thead>
<tr>
<th></th>
<th>1. Inventory Consistency / Completeness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Overall Fleet</td>
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<tr>
<td></td>
<td>b) Foreign Vehicles</td>
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<td>c) Domestic Vehicles</td>
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<td>d) LEV Vehicles</td>
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<td>e) FL Vehicles</td>
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<td></td>
<td>f) Armored Vehicles</td>
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<td>2. Disposal Consistency / Completeness</td>
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<td>3. Mileage Consistency</td>
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<td>a) Overall Fleet</td>
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<td>b) Foreign Vehicles</td>
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<td>c) Domestic Vehicles</td>
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<td>d) LEV Vehicles</td>
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<td>e) FL Vehicles</td>
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<td>f) Armored Vehicles</td>
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<td>4. Fuel Consumption Consistency</td>
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<tr>
<td></td>
<td>a) Overall Fleet</td>
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<tr>
<td></td>
<td>b) Foreign Vehicles</td>
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<td>c) Domestic Vehicles</td>
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<tr>
<td></td>
<td>d) LEV Vehicles</td>
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<tr>
<td></td>
<td>e) FL Vehicles</td>
</tr>
<tr>
<td></td>
<td>f) Armored Vehicles</td>
</tr>
<tr>
<td></td>
<td>g) Petrolanes as % of Total</td>
</tr>
<tr>
<td></td>
<td>h) Petroleum Fuels</td>
</tr>
<tr>
<td></td>
<td>i) Alternative Fuels</td>
</tr>
<tr>
<td></td>
<td>5. Cost Consistency</td>
</tr>
<tr>
<td></td>
<td>6. Fuel Efficiency/Validity</td>
</tr>
<tr>
<td></td>
<td>7. Year-to-Year Reporting Consistency</td>
</tr>
<tr>
<td></td>
<td>a) Acquisition Dates: Current Year</td>
</tr>
<tr>
<td></td>
<td>b) Acquisition Dates: Prior Years</td>
</tr>
<tr>
<td></td>
<td>c) Disposal Dates: Prior Year</td>
</tr>
<tr>
<td></td>
<td>d) Disposal Dates: Missing from Current Year?</td>
</tr>
<tr>
<td></td>
<td>e) Changes to Static Attributes (B/AL=1.5)</td>
</tr>
<tr>
<td></td>
<td>8. Use of &quot;Placeholder&quot; Values</td>
</tr>
</tbody>
</table>

**FedFleet 2019**
1) Year-to-Year Consistency

• Inconsistent vehicle ID’s from prior year

• Missing vehicles?
  – Reported prior year, missing this year
  – Missing in prior year, reported this year

• Unexpected changes to vehicles reported in both years
1) Year-to-Year Consistency

**VLD Validation Flags**
FY 2018 Submissions: Year-to-Year Consistency Flags

<table>
<thead>
<tr>
<th>Validation Rule</th>
<th># of flags</th>
</tr>
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<tbody>
<tr>
<td>A-1.5</td>
<td>156,630</td>
</tr>
<tr>
<td>A-4.4</td>
<td>18,454</td>
</tr>
<tr>
<td>A-5.4</td>
<td>704</td>
</tr>
<tr>
<td>A-6.3</td>
<td>629</td>
</tr>
<tr>
<td>A-9.3</td>
<td>209</td>
</tr>
<tr>
<td>F-2.2</td>
<td>40,248</td>
</tr>
<tr>
<td>F-2.3</td>
<td>204</td>
</tr>
<tr>
<td>F-4.5</td>
<td>6,552</td>
</tr>
<tr>
<td>F-4.6</td>
<td>32,367</td>
</tr>
<tr>
<td>F-5.4</td>
<td>17,356</td>
</tr>
<tr>
<td>F-5.5</td>
<td>26,506</td>
</tr>
<tr>
<td>OC-1.5</td>
<td>3,785</td>
</tr>
<tr>
<td>OC-1.6</td>
<td>21,737</td>
</tr>
<tr>
<td>OC-10.4</td>
<td>446</td>
</tr>
<tr>
<td>OC-11.6</td>
<td>85,511</td>
</tr>
<tr>
<td>OC-12.7</td>
<td>42</td>
</tr>
<tr>
<td>OC-12.8</td>
<td>2,828</td>
</tr>
<tr>
<td>OC-6.5</td>
<td>7,807</td>
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<td>OC-6.6</td>
<td>62,225</td>
</tr>
<tr>
<td>OC-7.5</td>
<td>52</td>
</tr>
<tr>
<td>OC-8.4</td>
<td>175</td>
</tr>
<tr>
<td>OC-9.4</td>
<td>329</td>
</tr>
<tr>
<td>OW-1.3</td>
<td>36</td>
</tr>
<tr>
<td>OW-1.4</td>
<td>126,879</td>
</tr>
</tbody>
</table>

Source: FAST, final data as of 2019-03-21

_FedFleet 2019_
1) Year-to-Year Consistency

VLD Validation Flags
FY 2018 Submissions: Year-to-Year Consistency Flags

Rule ID
- A-1.5
- A-4.4
- A-5.4
- A-6.3
- A-9.3
- F-2.2
- F-2.3
- F-4.5
- F-4.6
- F-5.4
- F-5.5
- OC-1.5
- OC-1.6
- OC-10.4
- OC-11.6
- OC-12.7
- OC-12.8
- OC-6.5
- OC-6.6
- OC-7.5
- OC-8.4
- OC-9.4
- OW-1.3
- OW-1.4
- OW-4.4
- S-3.6

Source: FAST, final data as of 2019-03-21
1) Year-to-Year Consistency

• Why should we care?
  – We can’t tell how (in)complete the dataset is
  – Some validation checks can’t be run
  – Missing vehicles = missing costs, fuel, miles
  – Impacts on compliance determination
2) Fuel Consumption Data

• Inconsistent fuel type reported for vehicle

• Invalid fuel volume
  – Frequent use of “placeholder” for fuel volume
  – Invalid (high) fuel efficiency
  – Under-reporting of consumption
    • ... and possibly fuel cost
2) Fuel Consumption Data

VLD Validation Flags
FY 2018 Submissions: Fuel Consumption Flags

Validation Rule
A-1.5
A-4.4
A-5.4
A-6.3
A-9.3
F-2.2
F-2.3
F-4.5
F-4.6
F-5.4
F-5.5
OC-1.5
OC-1.6
OC-10.4
OC-11.6
OC-12.7
OC-12.8
OC-6.5
OC-6.6
OC-7.5
OC-8.4
OC-9.4
OW-1.3
OW-1.4
OW-4.4
S-3.6

# of flags

Source: FAST, final data as of 2019-03-21
2) Fuel Consumption Data

• Why should we care?
  – Fuel consumption (type and volume) is of interest to lots of stakeholders
  – Fuel efficiency is questionable for many agencies
  – Impacts on compliance determination, performance evaluation
How do we investigate?

• Flagging detail generated during reporting

• FAST query tool: “VLD Validation Flags”

• FAST’s “Vehicle Flagging Rules Summary”

• Post-data call review summary

• FAST technical team
### Vehicle Flagging Rules Summary

**Organization Overall Score:** 96%

<table>
<thead>
<tr>
<th>Vehicle Class &amp; Quantity</th>
<th>Vehicle Attributes</th>
<th>Ownership Characteristics</th>
<th>Special Characteristics</th>
<th>Operational &amp; Cost Data</th>
<th>Fuel Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSEVs</td>
<td>80%</td>
<td>100%</td>
<td>100%</td>
<td>91%</td>
<td>98%</td>
<td>88%</td>
</tr>
<tr>
<td>Sedans/St. Wgms</td>
<td>98%</td>
<td>82%</td>
<td>100%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Ambulances</td>
<td>97%</td>
<td>82%</td>
<td>100%</td>
<td>98%</td>
<td>96%</td>
<td>94%</td>
</tr>
<tr>
<td>Buses</td>
<td>98%</td>
<td>92%</td>
<td>100%</td>
<td>93%</td>
<td>90%</td>
<td>93%</td>
</tr>
<tr>
<td>LD 4x2</td>
<td>97%</td>
<td>79%</td>
<td>100%</td>
<td>91%</td>
<td>98%</td>
<td>96%</td>
</tr>
<tr>
<td>LD 4x4</td>
<td>98%</td>
<td>84%</td>
<td>100%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>MD</td>
<td>98%</td>
<td>81%</td>
<td>100%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>HD</td>
<td>98%</td>
<td>92%</td>
<td>100%</td>
<td>93%</td>
<td>93%</td>
<td>93%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>97%</td>
<td>82%</td>
<td>100%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vehicle Type &amp; Quantity</th>
<th>Business Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OW-1.3</td>
</tr>
<tr>
<td>LD SUV 4x2</td>
<td>100%</td>
</tr>
<tr>
<td>LD Minivan 4x2 (Passenger)</td>
<td>100%</td>
</tr>
<tr>
<td>LD Minivan 4x2 (Cargo)</td>
<td>100%</td>
</tr>
<tr>
<td>LD Van 4x2 (Passenger)</td>
<td>100%</td>
</tr>
<tr>
<td>LD Van 4x2 (Cargo)</td>
<td>100%</td>
</tr>
<tr>
<td>LD Pickup 4x2</td>
<td>100%</td>
</tr>
<tr>
<td>LD Other 4x2</td>
<td>0</td>
</tr>
</tbody>
</table>
LOOKING FORWARD...
New Review Process

• FY 2018 “baseline” to evaluate changes in quality in future years

• Responses from agencies on how they plan to address problem areas
New Ways to Look at Fleet Data
New Ways to Look at Fleet Data
New Ways to Look at Fleet Data

FedFleet 2019
DISCUSSION
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