Data Gaps in the Nonroad Sector

Mobile Sources Technical Review Subcommittee Meeting
April 2, 2019

David Choi, Office of Transportation and Air Quality
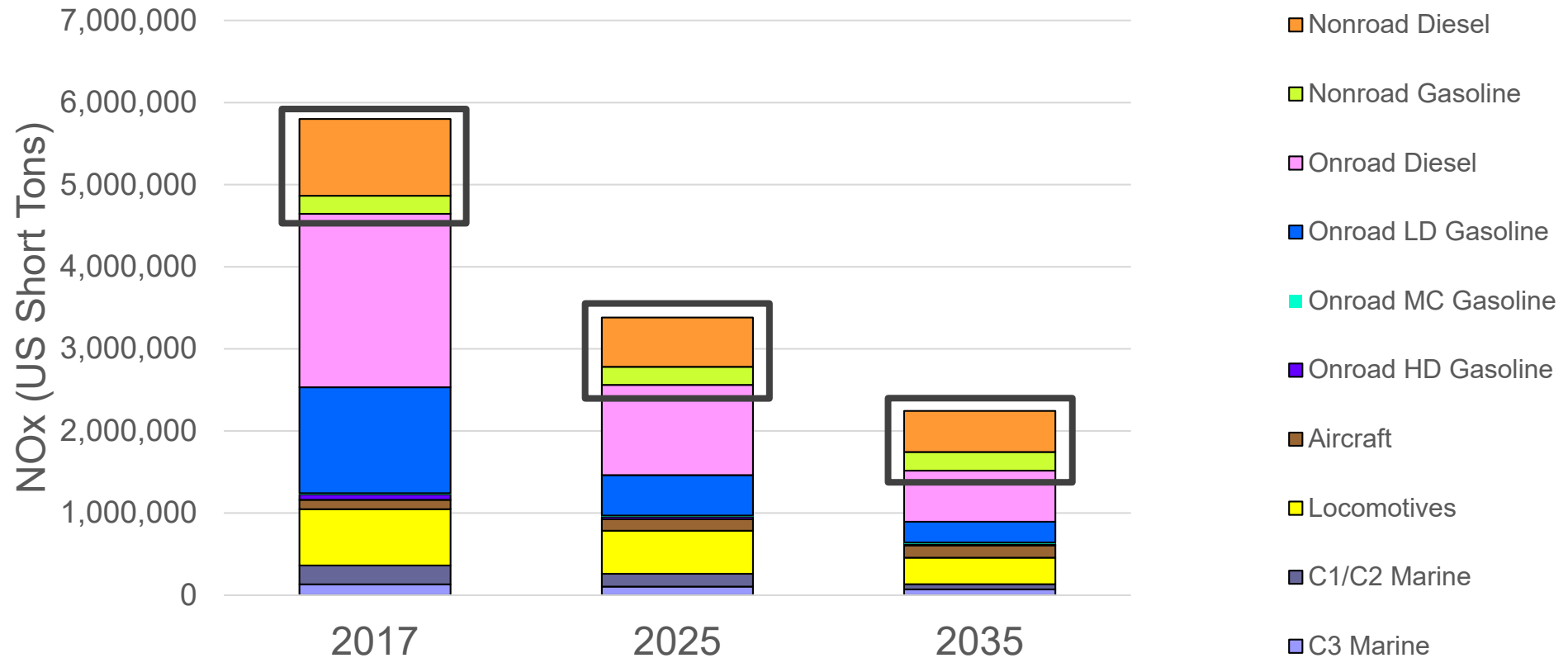U.S. Environmental Protection Agency

Recap of MSTRS Meeting on May 22, 2018

- Key emissions data and modeling uses
  - Compliance activities
  - Inform regulations and future actions
  - Emission models and inventories

- Example of new data approaches
  - Telematics data for onroad vehicles
  - Marine vessel AIS

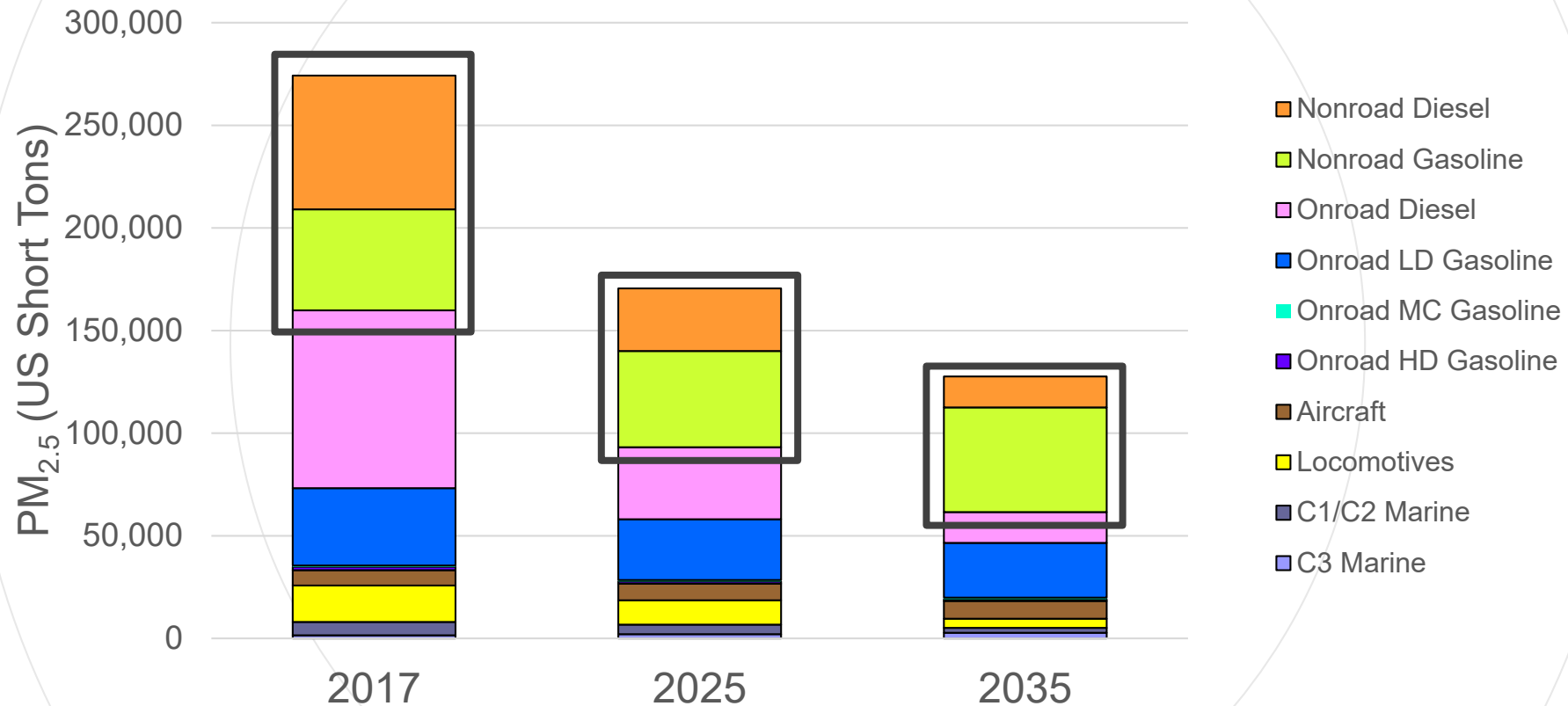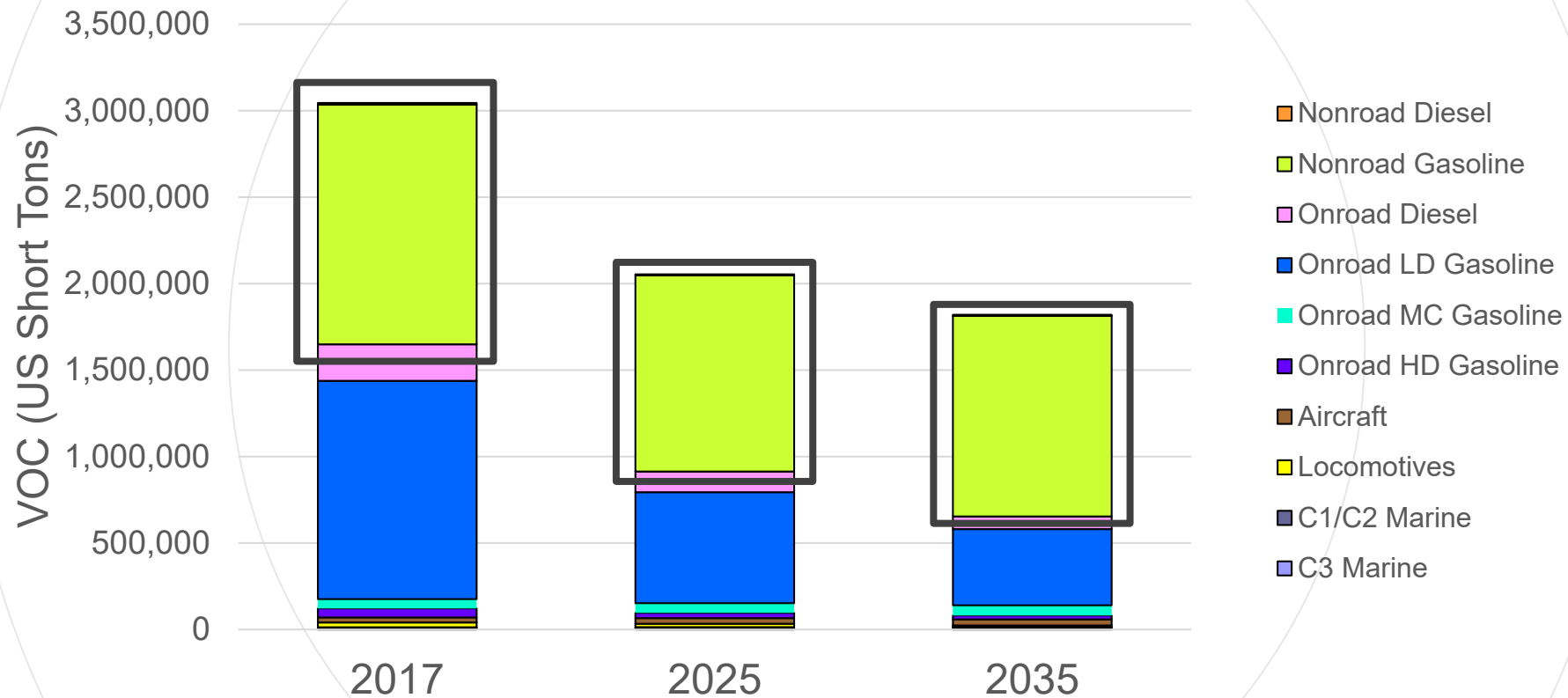- **Data challenges with nonroad sector**

NOx from Mobile Sources

❖ Nonroad becomes increasingly important over time

Source: MOVES2014b/NEI2011v6.2

PM$_{2.5}$ from Mobile Sources

❖ Nonroad gasoline becomes the largest contributor in the future

VOC from Mobile Sources

Legend:
- Nonroad Diesel
- Nonroad Gasoline
- Onroad Diesel
- Onroad LD Gasoline
- Onroad MC Gasoline
- Onroad HD Gasoline
- Aircraft
- Locomotives
- C1/C2 Marine
- C3 Marine

❖ Nonroad gasoline becomes the largest source of VOC in the future

Source: MOVES2014b/NEI2011v6.2

EPA's Efforts to Improve the NONROAD Model

o <u>Motivation</u>: to better characterize the emissions impacts of nonroad sector on air quality

o Released MOVES2014b in summer 2018 that updated engine population growth rates, Tier 4 emission rates/speciation profiles, and diesel fuel sulfur levels

o Develop a new NONROAD model based on real-world data in the next 2+ years
   o Prototypes being developed now
   o Actively collaborating with other agencies, industry, and academia to improve the data and science in the model

<u>Nonroad PM2.5 Inventory</u>
<u>2016 Modeling Platform</u>

Tons/year

186	
166	
145	
124	
103	
83	
62	
41	
20	
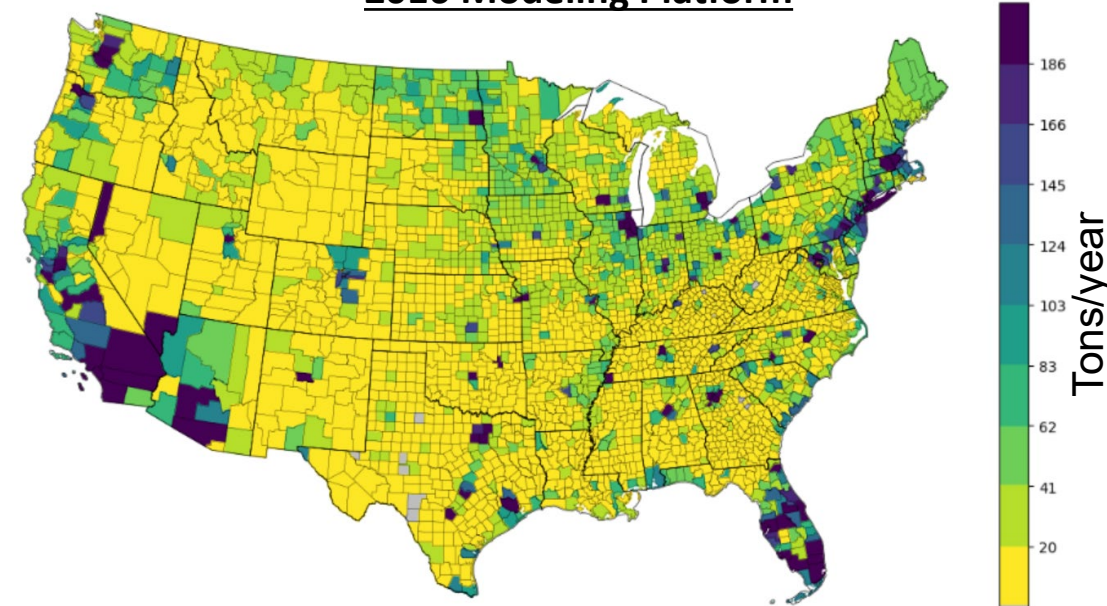
Nonroad Data – Challenges and Opportunities

- Challenges
  - Limited availability of equipment population, activity, and emissions data
  - Large diversity of equipment types and usage patterns both within and between equipment categories
- Opportunities
  - Increased use of on-board telematics, Portable Activity Measurement Systems (PAMS), and fleet management software to collect real-world activity data
  - Broader application of Portable Emissions Measurement Systems (PEMS)/micro-PEMS to measure emissions and engine load during real-world operations
  - Use of surveys and surrogate data to develop engine population estimates and growth projections
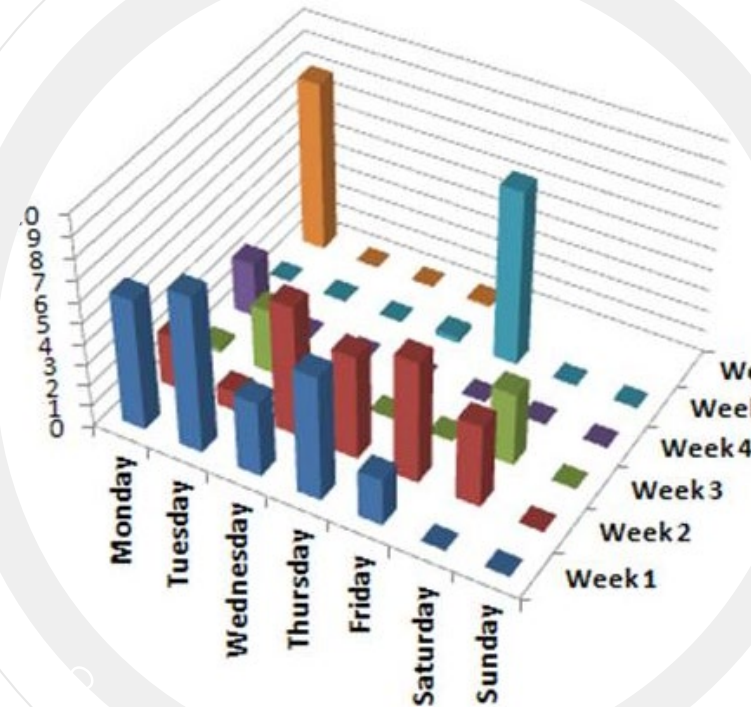
Hours of Operation by a Dozer measured by PAMS