3DATX-Africa Abuja Demonstration Project

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Overview

Trial objective: Test approximately 100 on-road passenger cars on a first-come first-served basis according to a standard programme to ensure accurate vehicle emissions testing and data integrity.

➢ Outcome: 103 vehicles tested in 5 days

# Test protocol followed by each vehicle

Phase	Objectives
1. Zeroing	Zero the parSYNC® FLEX instrument
2. Measure filtered air	Pre-verification of zero
3. Measure ambient air	Pre-check ambient conditions
4. Measure vehicle exhaust at idle	Verify test vehicle emissions without load
5. Measure vehicle exhaust while driving	Verify test vehicle emissions under load: The vehicle is driven around a standard and repeatable route under safe conditions
6. Measure vehicle exhaust at idle	Reverify test vehicle emissions without load
7. Measure ambient air	Post-check ambient conditions
8. Measure filtered air	Post-verification of zero

➢Test procedure performed in approx. 10 minutes at road-side.

➢Drive section took on average 366 ± 23 s to complete, had a mean speed of 34 ± 2 km/h and maximum speed of 73 ± 2 km/h *(calculated from 25 tests).*
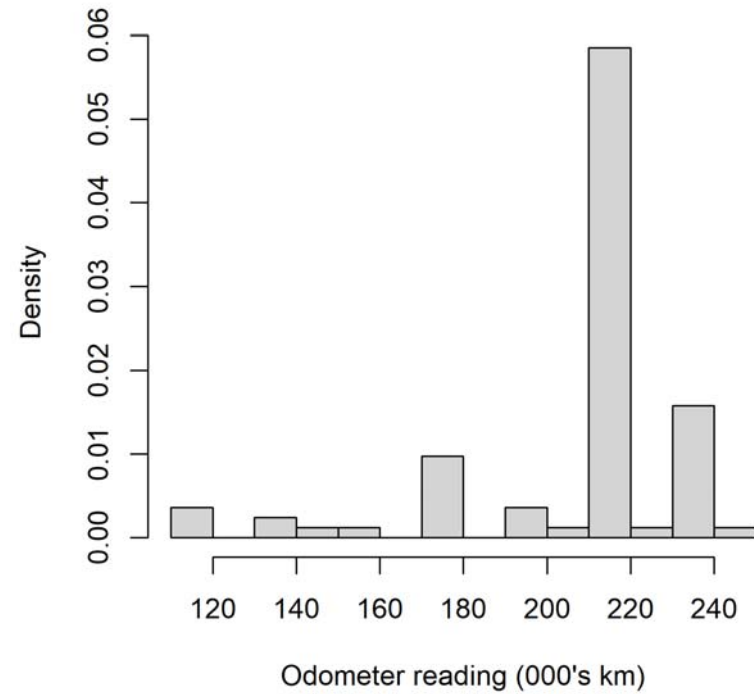
Fleet characteristics

Histogram of Model Years
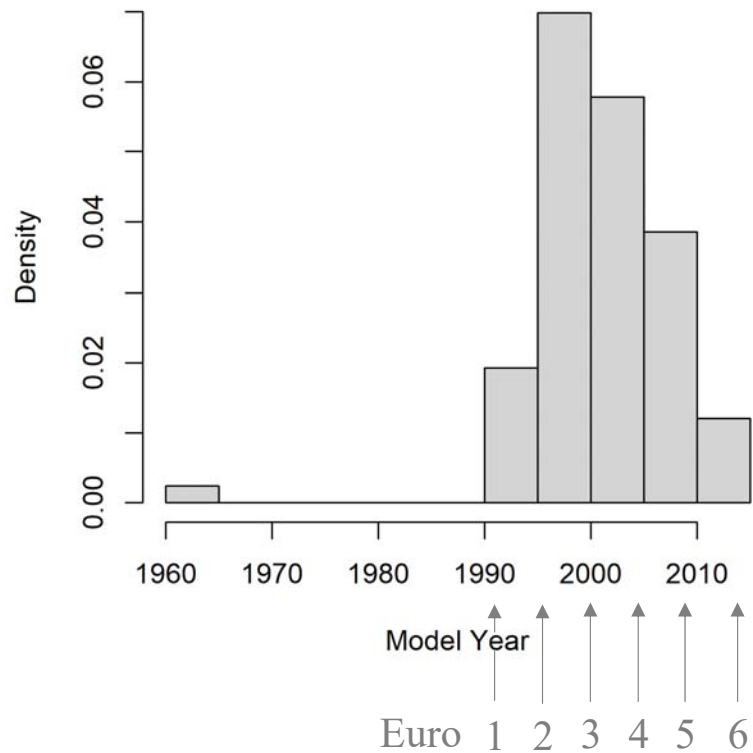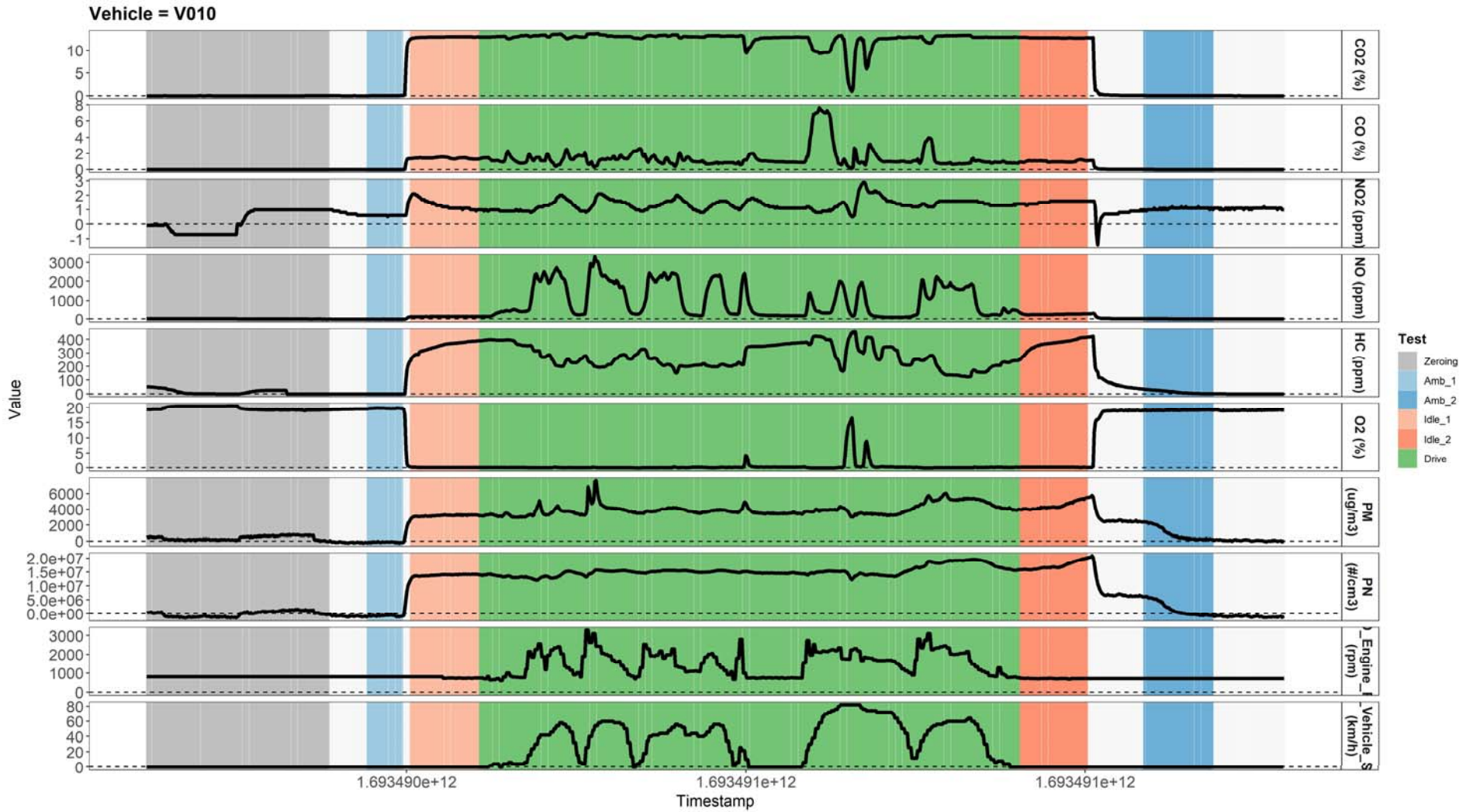
Histogram of Odometer Reading
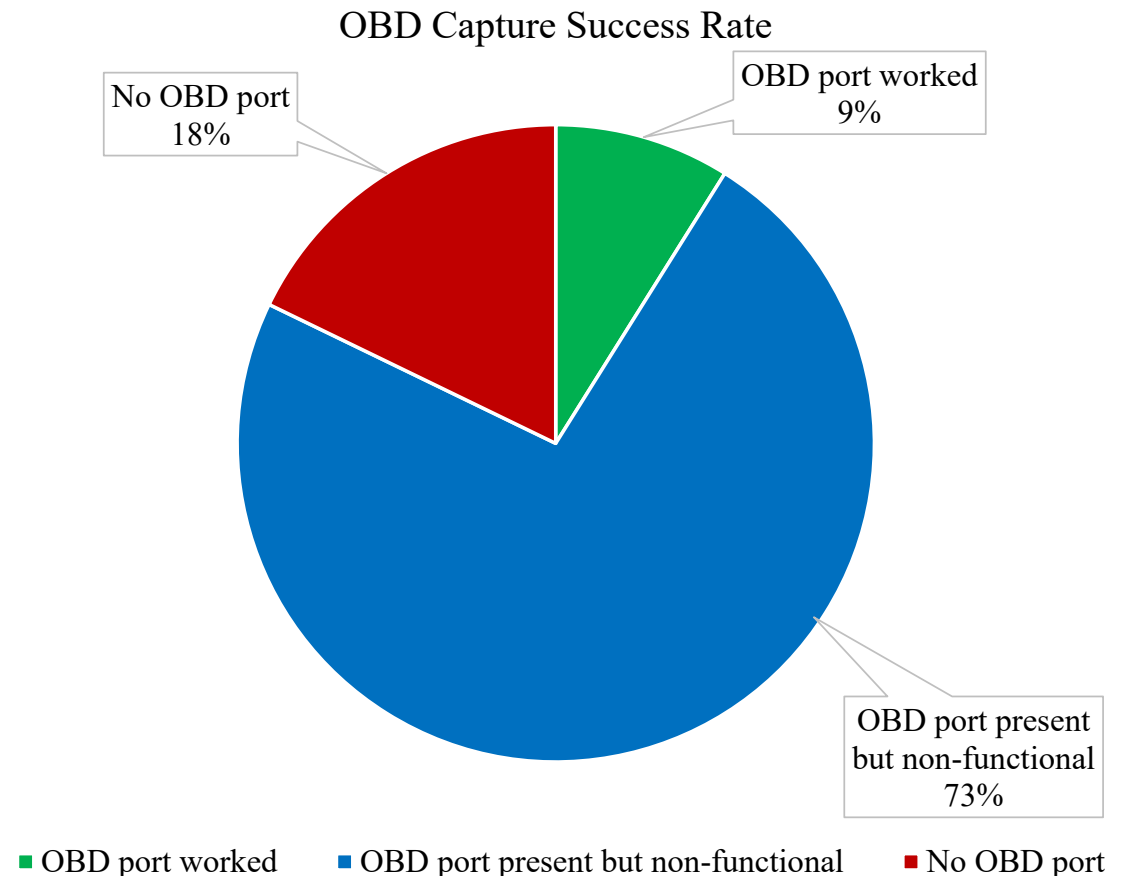
(data from first 83 tests)
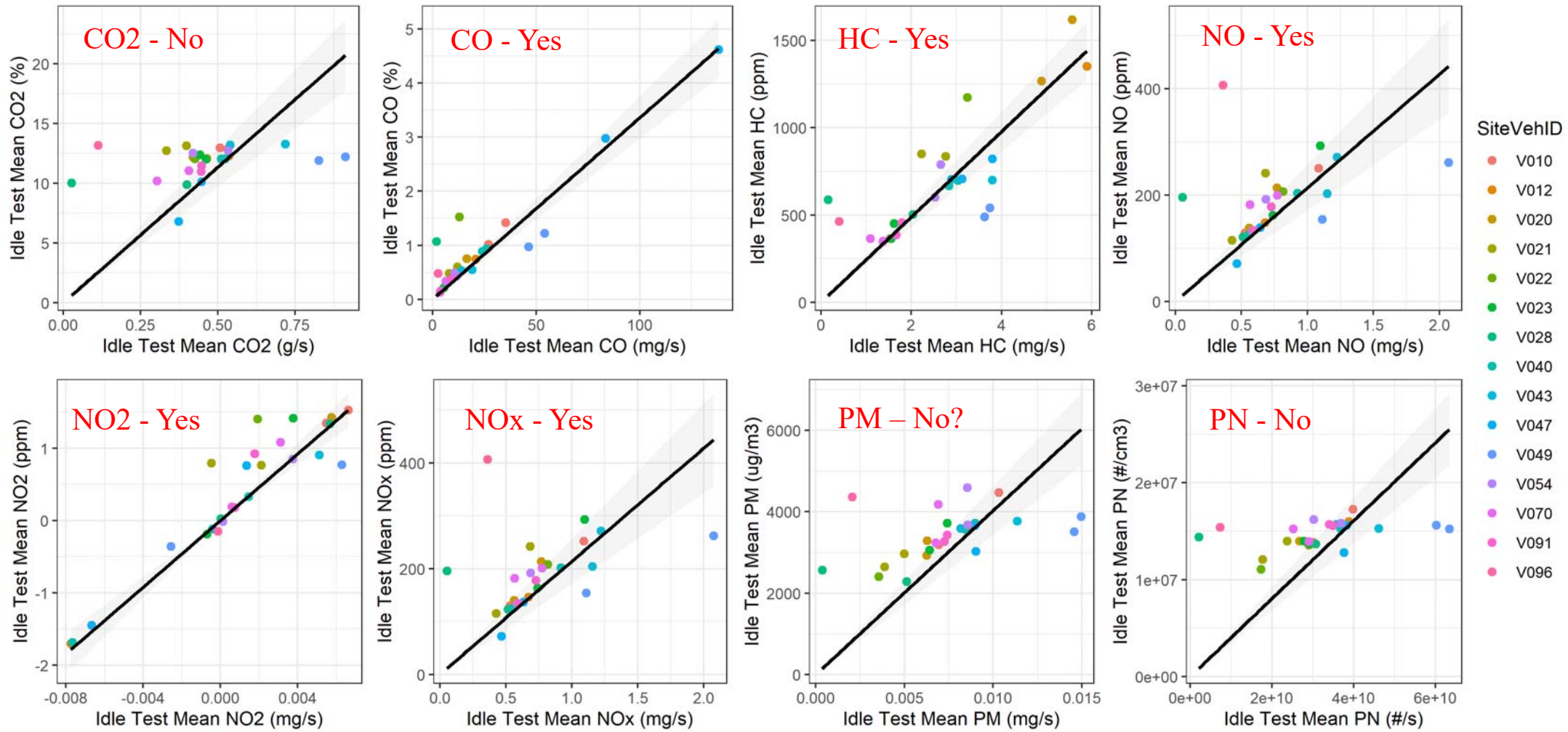
Test Example

Vehicle = V010

OBD acquisition success rate

- OBD info is scarce,
- Sufficient in only around 10% of vehicle tests from the demonstration trial
- Majority of tests will have pollutant concentrations only
- With the use of parSYNC's SCOTTY GPS system, vehicle speed will still be available for all tests

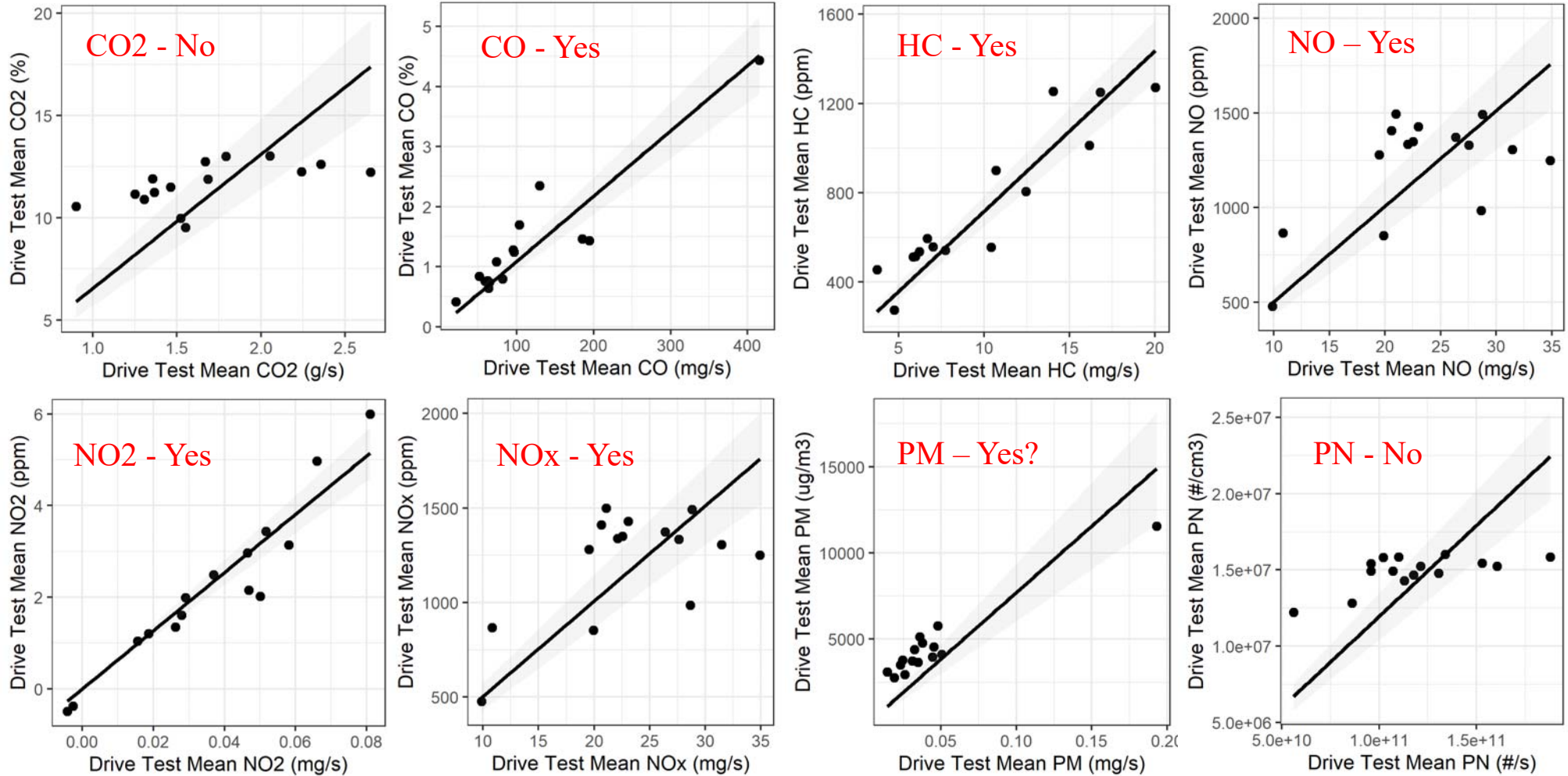**OBD Capture Success Rate**

Legend: OBD port worked | OBD port present but non-functional | No OBD port

- No OBD port 18%
- OBD port worked 9%
- OBD port present but non-functional 73%

Is concentration sufficient for emissions on idle test?

Is concentration sufficient for emissions on drive test?

Plan for data processing program

Import
- Import parSYNC data to program
- Input vehicle information to program
- Program + user perform QA/QC checks (check data availability, correct bagging, etc.)

Calculate
- Calculate mass emissions (where possible)
- Calculate dynamic properties of drive section (VSP, RPA, $va_{pos}[95]$ etc.)
- Calculate overall emission results for the test, flag values above pre-defined thresholds

Assimilate
- Pass/fail check and report delivered on-screen at end of test
- New results added into database
- Any overall fleet values recalculated (average results, feedback to pass/fail thresholds etc.)

Next steps

➢Write the data processing program

➢Add pass/fail check and report at end of test

➢Start Phase II of trial – Ramp-up of DCP Franchises

➢Implement the data processing program on Phase II

➢Build up results database

Thank you for listening

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