Background

Approved by Regional Transportation Council and Used Congestion Mitigation and Air Quality Improvement Program Funding

Investigate a Heavy-Duty Diesel Vehicle (HDDV) Inspection and Maintenance (I/M) Program for the Dallas-Fort Worth (DFW) Region

Characterize Nitrogen Oxides ($\text{NO}_x$) Emissions from HDDVs Utilizing Various Technologies

Assess Data, Validity, and Implications for HDDV I/M or Screening Programs
Currently No Emissions Testing for Diesel Vehicles in Texas

Project Purpose

Light-Duty Vehicles \( \leq 8,500 \text{ lbs gross vehicle weight rating (GVWR)} \)
Medium-Duty Vehicles \( = 8,501 - 14,000 \text{ lbs GVWR} \)
Heavy-Duty Vehicles \( \geq 14,001 \text{ lbs GVWR} \)

2017 On-Road NOx Emissions Inventory
On-Road Emissions = 130.77 tons per day (tpd) NOx
Source: Texas Commission on Environmental Quality (TCEQ)
Partners

North Central Texas Council of Governments (NCTCOG)

Texas A&M Transportation Institute (TTI)

Texas Department of Public Safety (DPS)

Texas Department of Transportation (TxDOT)

University of Denver (DU)
OHMS Overview

Three Major Components:
Exhaust Collection
Vehicle Monitoring
Emissions Analysis

OHMS = On-Road Heavy-Duty Measurement System

Photo Source: TTI
Field Study Results

Fleet Analysis:

Model Year 2007 Trucks Peaked in 2012 and 2016

Tested Trucks MY Distributions

- 2012
- 2016

Percentage of Total

Model Year

1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
NOx Results by Truck Model Year

Field Study Results

HEAVY-DUTY DIESEL INSPECTION AND MAINTENANCE PILOT – PHASE 2

40 10 20 30 40 50 60

g NOx/kg CO2


95% Percentile Average
Potential Emissions Reductions in DFW Area

Classifying high-emitter (HE) as any truck higher than the 95\textsuperscript{th} percentile within a model year (MY)

7.3\% of vehicles accounted for 21\% of total NOx emissions

Potential reduction of 5.15 tons/day NOx if HE replaced with “average” vehicle from same MY

Classifying HE as any truck higher than the 95\textsuperscript{th} percentile of entire fleet

Potential reduction of up to 6.98 tons/day NOx possible depending on how the HE is replaced
Potential Applications

I/M Programs

- Clean Screening of Vehicles
- Identifying HE from a Fleet

Enforcement of Emissions Reduction Devices
Considerations and Next Steps

Further Research:
- Low exhaust stack configurations
- Light-duty vehicles
- Truck load weights
- Truck speeds

Implementation Considerations:
- Legislative process
- Funding
- Deployment locations and enforcement

Further Discussion:
- Host stakeholder conference/workshop
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