



Technical Report
NREL/TP-5600-51564
April 2011

National FCEV Learning Demonstration

Spring 2011
Composite Data Products

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National Renewable Energy Laboratory

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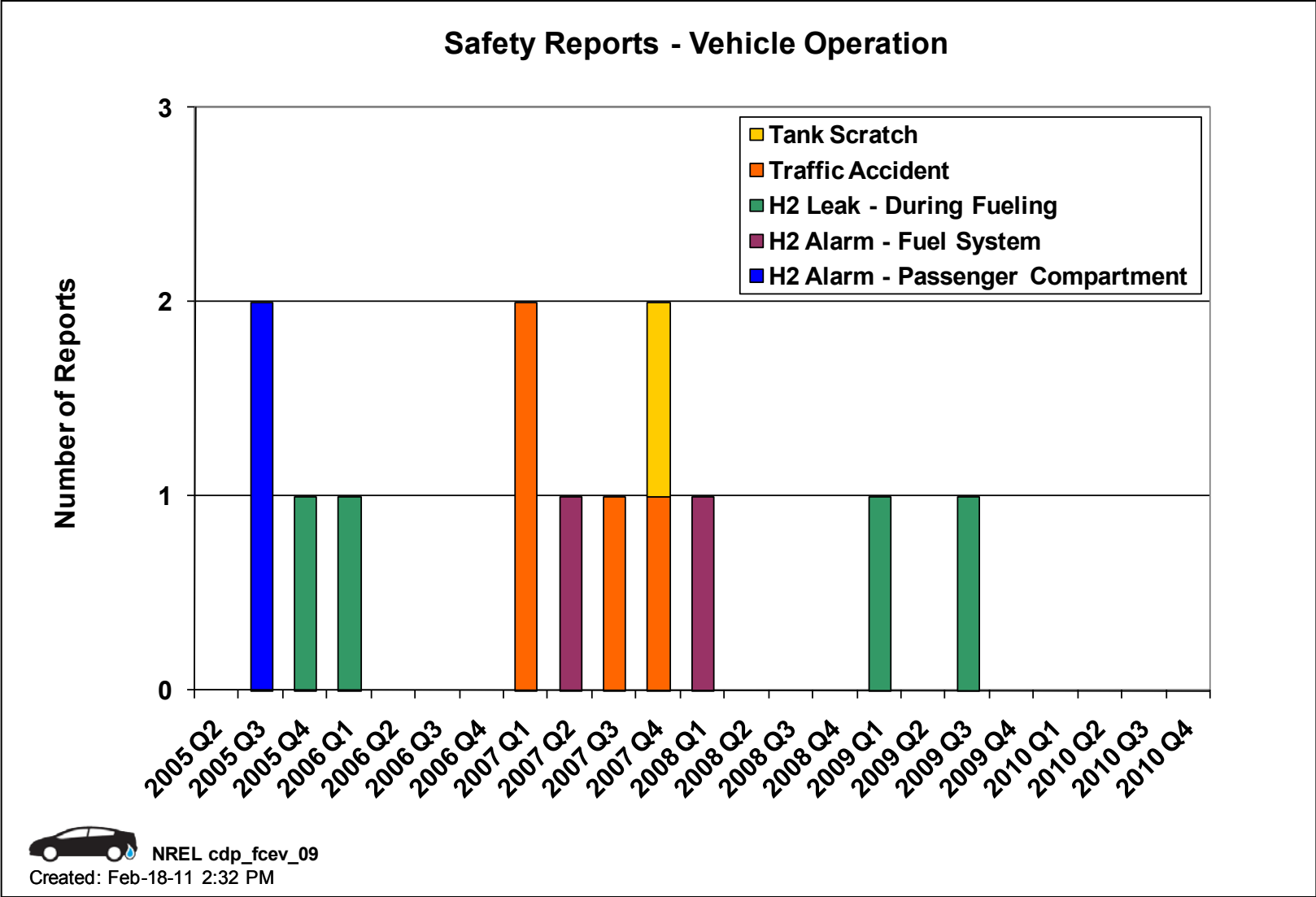
Spring 2011 Composite Data Products: National FCEV Learning Demonstration



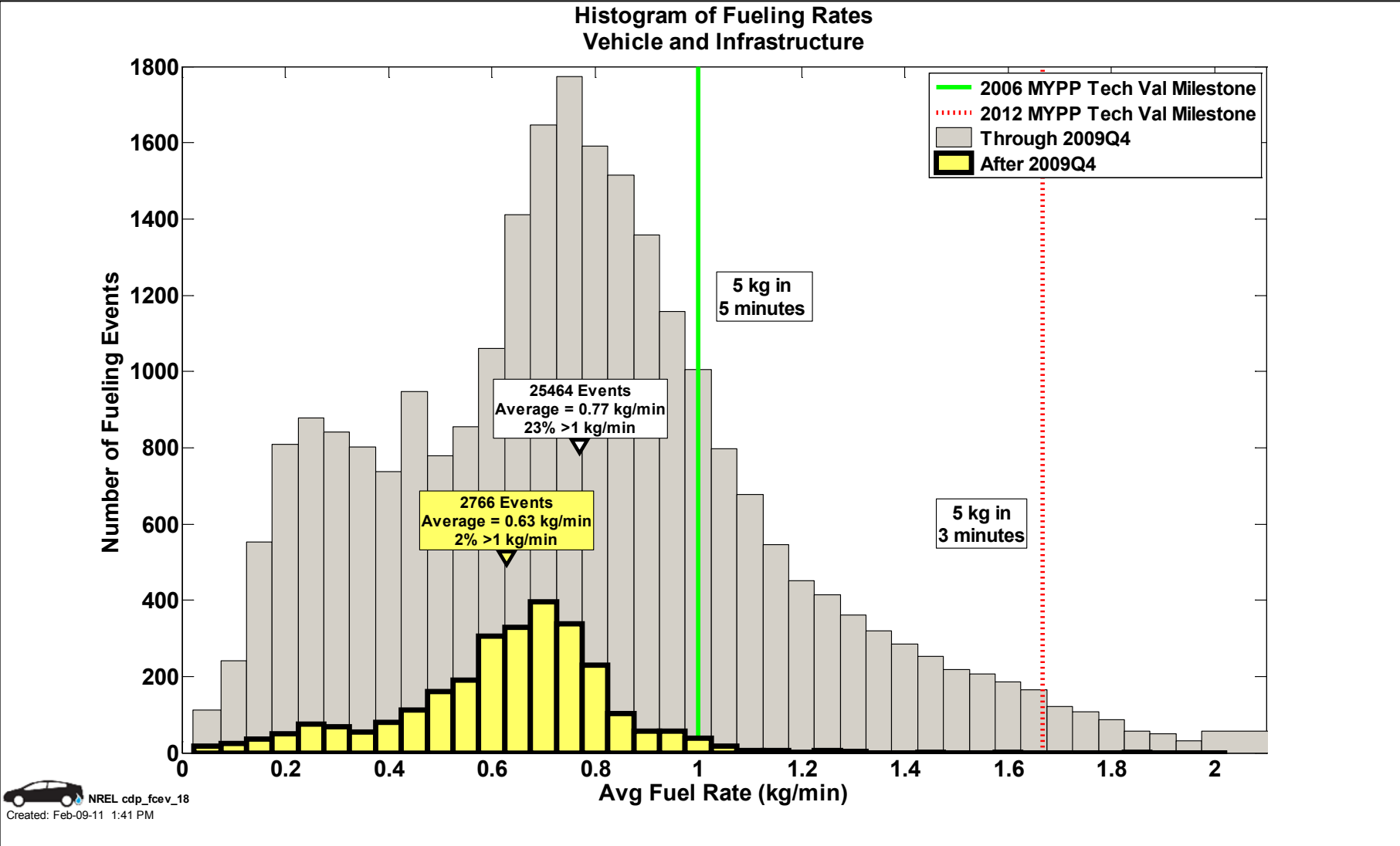
March 29, 2011

**Keith Wipke, Sam Sprik,
Jennifer Kurtz, Todd
Ramsden**

CDP#9: Safety Reports – Vehicles

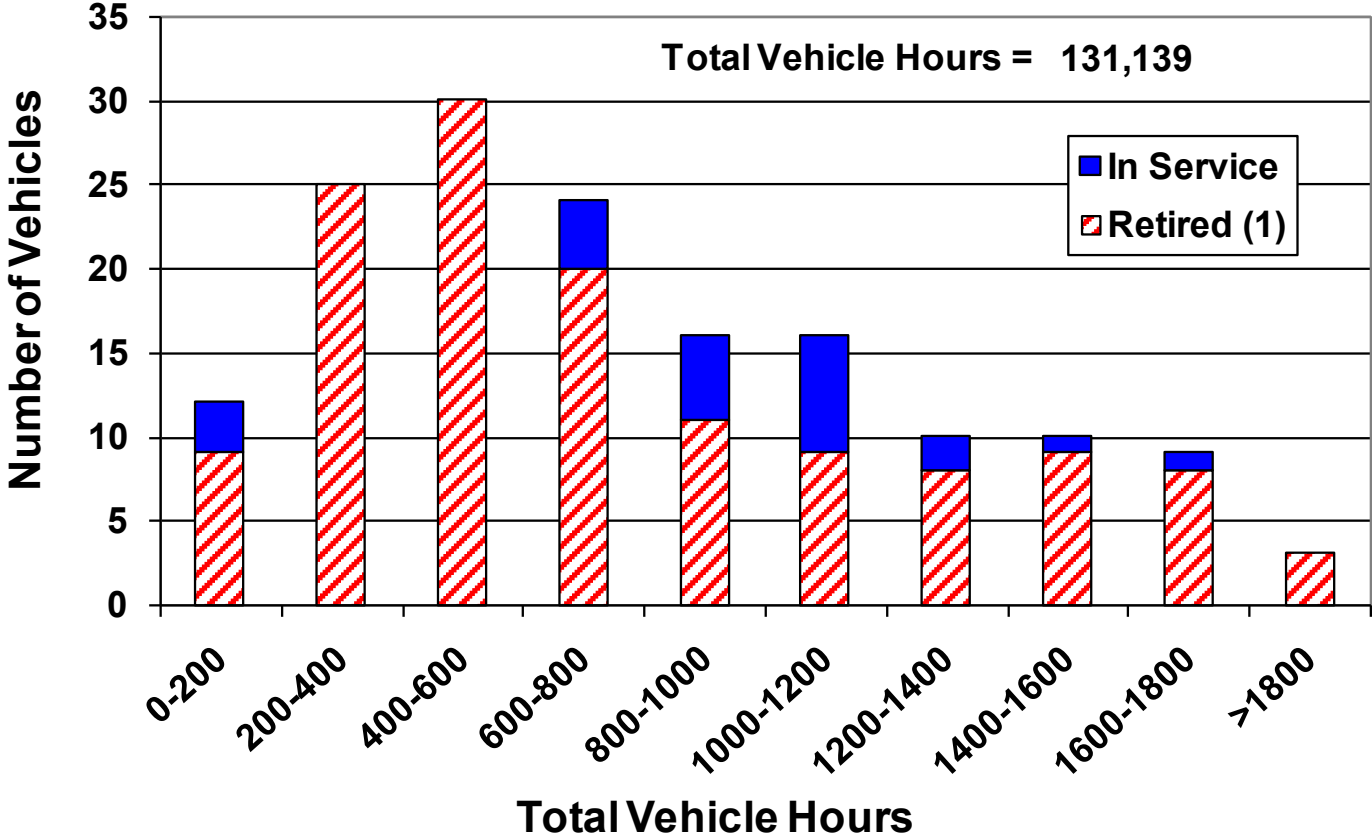


CDP#18: Refueling Rates



CDP#22: Vehicle Operating Hours

Vehicle Hours: All OEMs, Gen 1 and Gen 2
Through 2010 Q4

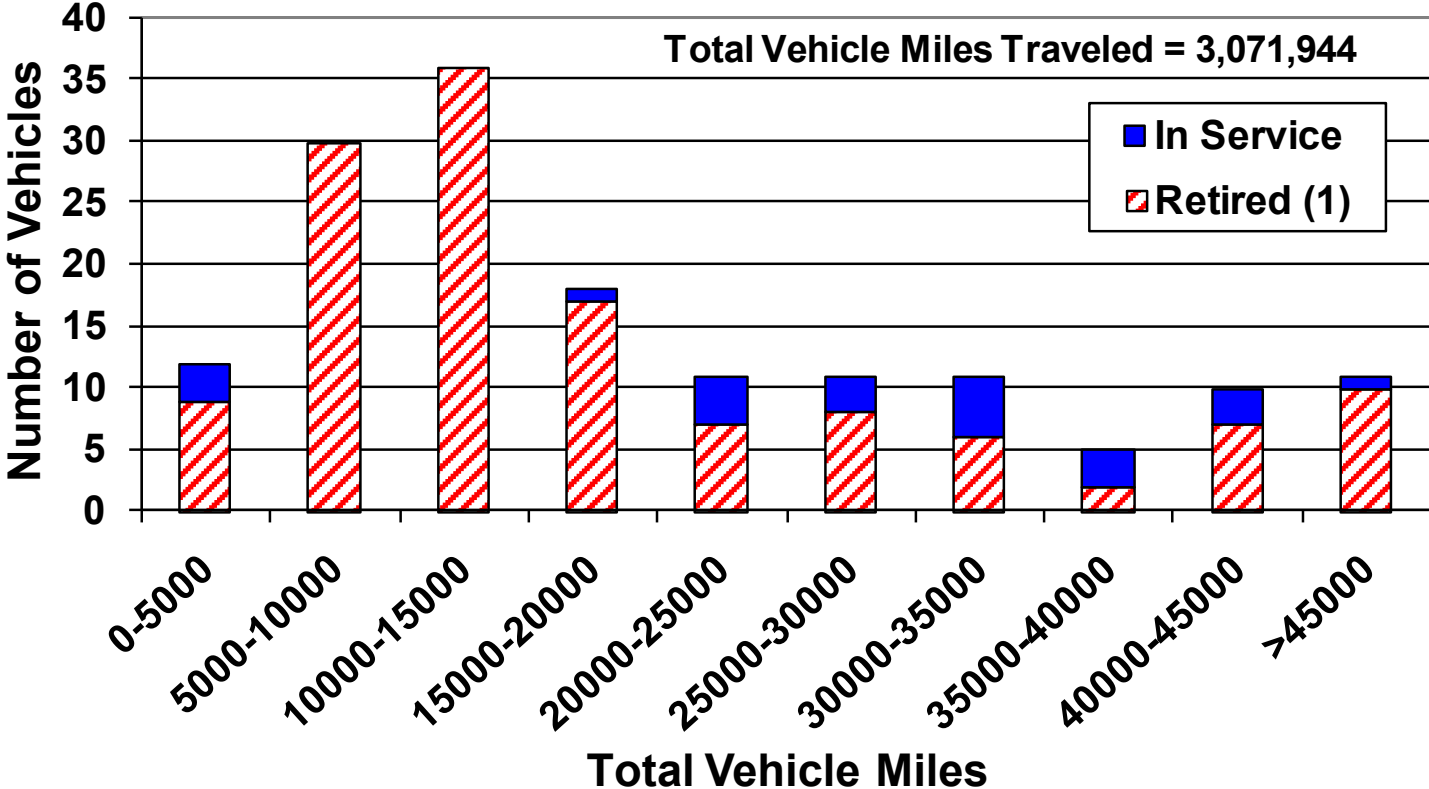


NREL cdp_fcvev_22
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(1) Retired vehicles have left DOE fleet and are no longer providing data to NREL
Some project teams concluded in Fall/Winter 2009

CDP#23: Vehicles vs. Miles Traveled

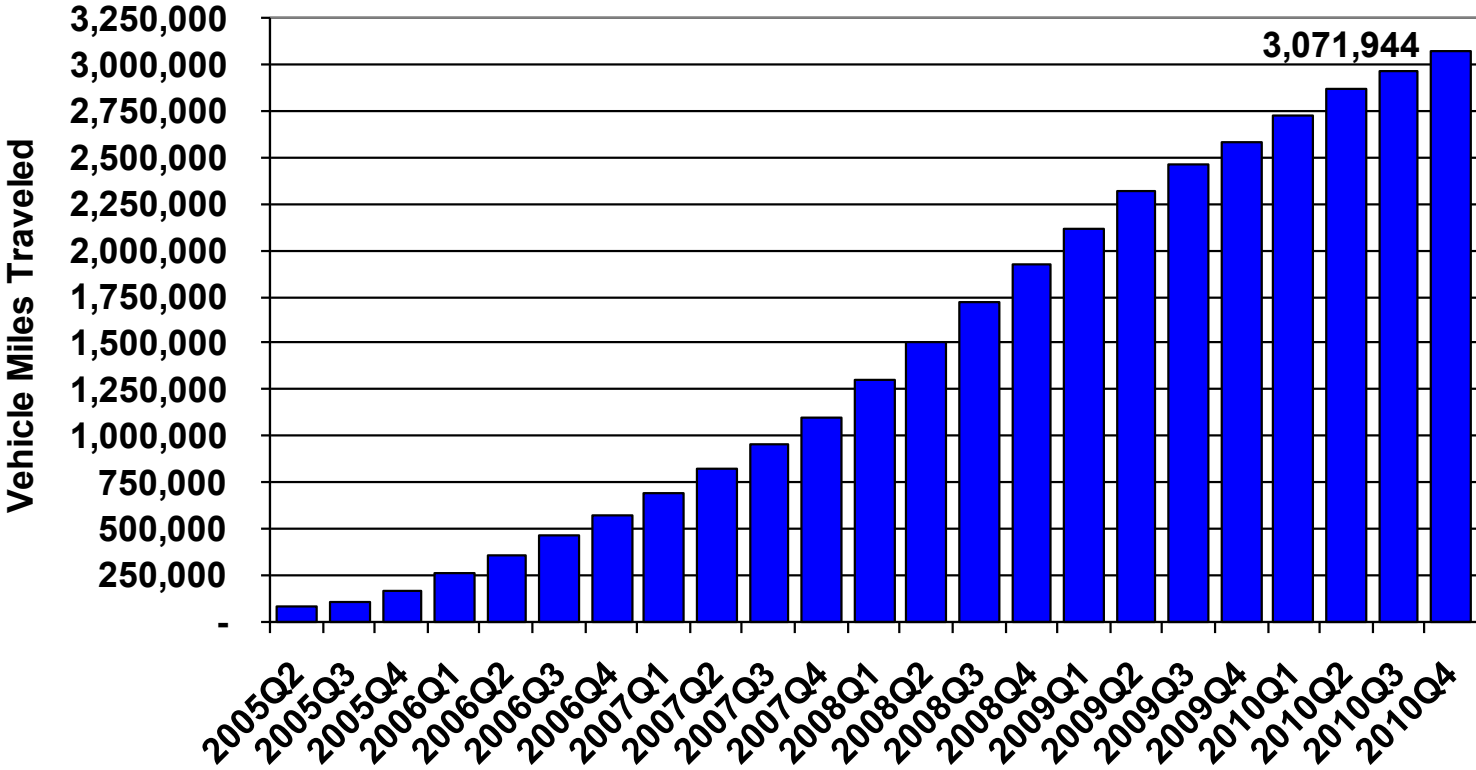
Vehicle Miles: All OEMs, Gen 1 and 2
Through 2010 Q4



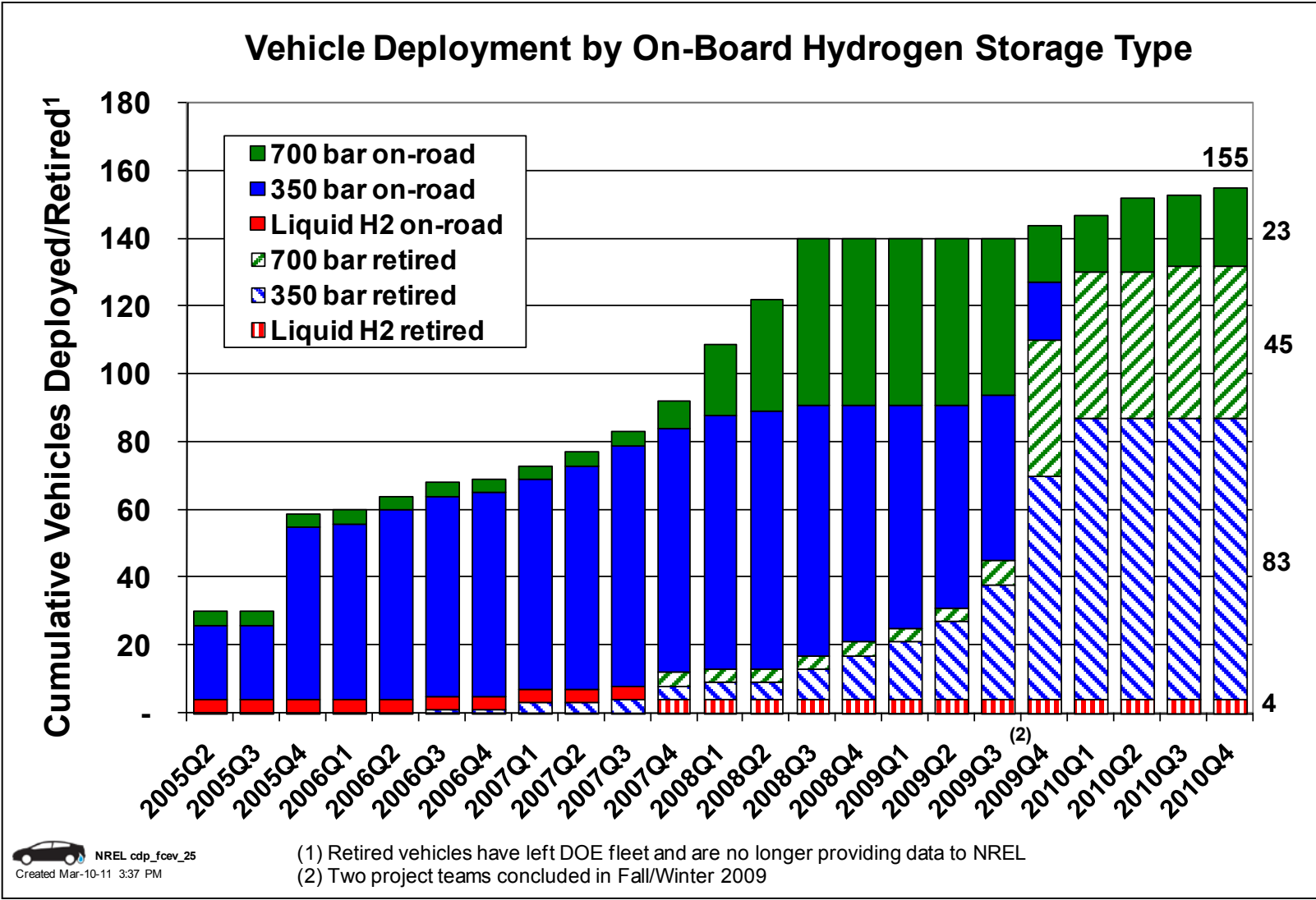
(1) Retired vehicles have left DOE fleet and are no longer providing data to NREL
Some project teams concluded in Fall/Winter 2009

CDP#24: Cumulative Vehicle Miles Traveled

Cumulative Vehicle Miles: All OEMs, Gen 1 and Gen 2
Through 2010 Q4

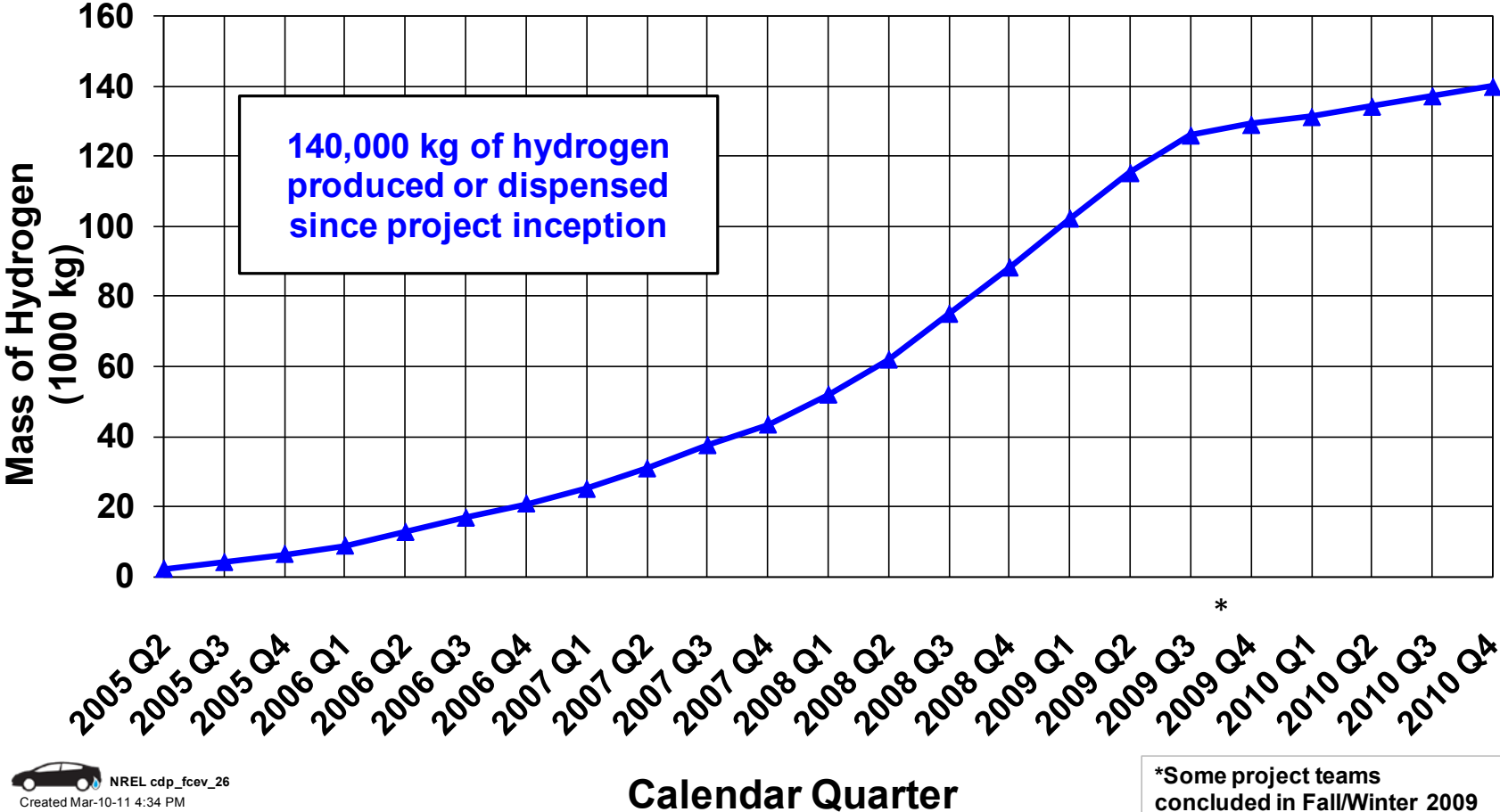


CDP#25: Vehicle H2 Storage Technologies



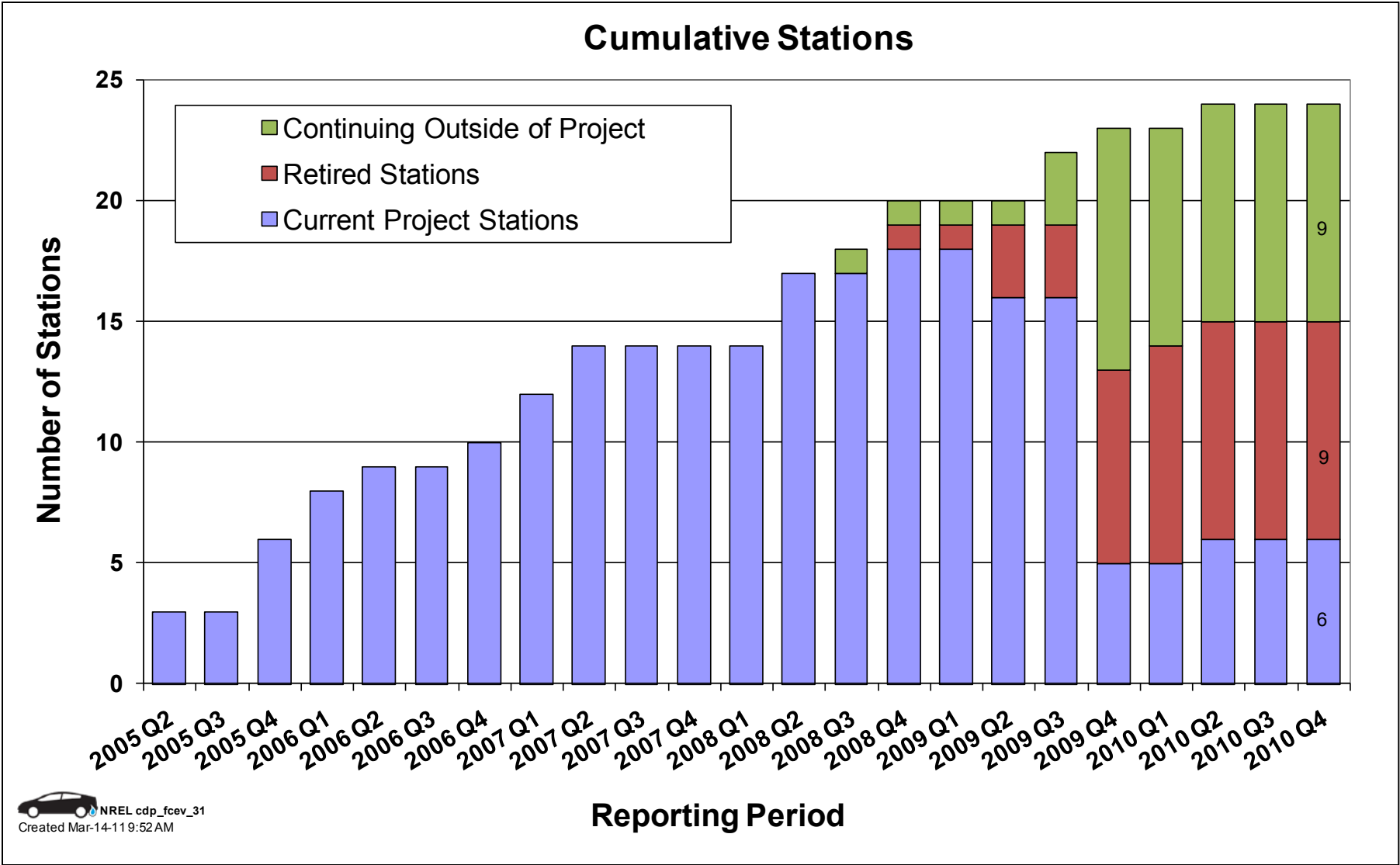
CDP#26: Cumulative H2 Produced or Dispensed

Cumulative Hydrogen Produced or Dispensed Through 2010 Q4



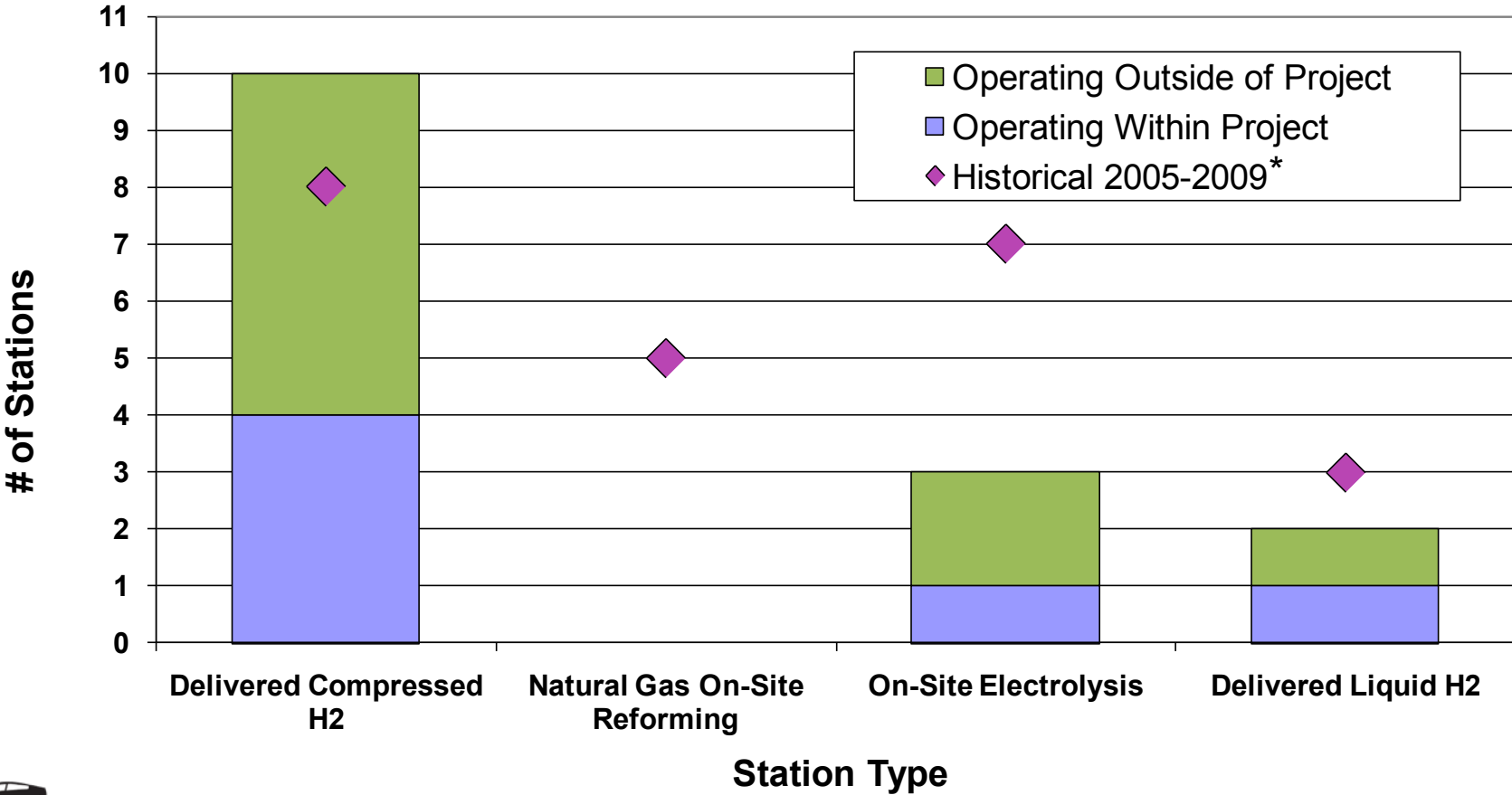
*Some project teams concluded in Fall/Winter 2009

CDP#31: Number of Online Stations



CDP#32: Infrastructure Hydrogen Production Methods

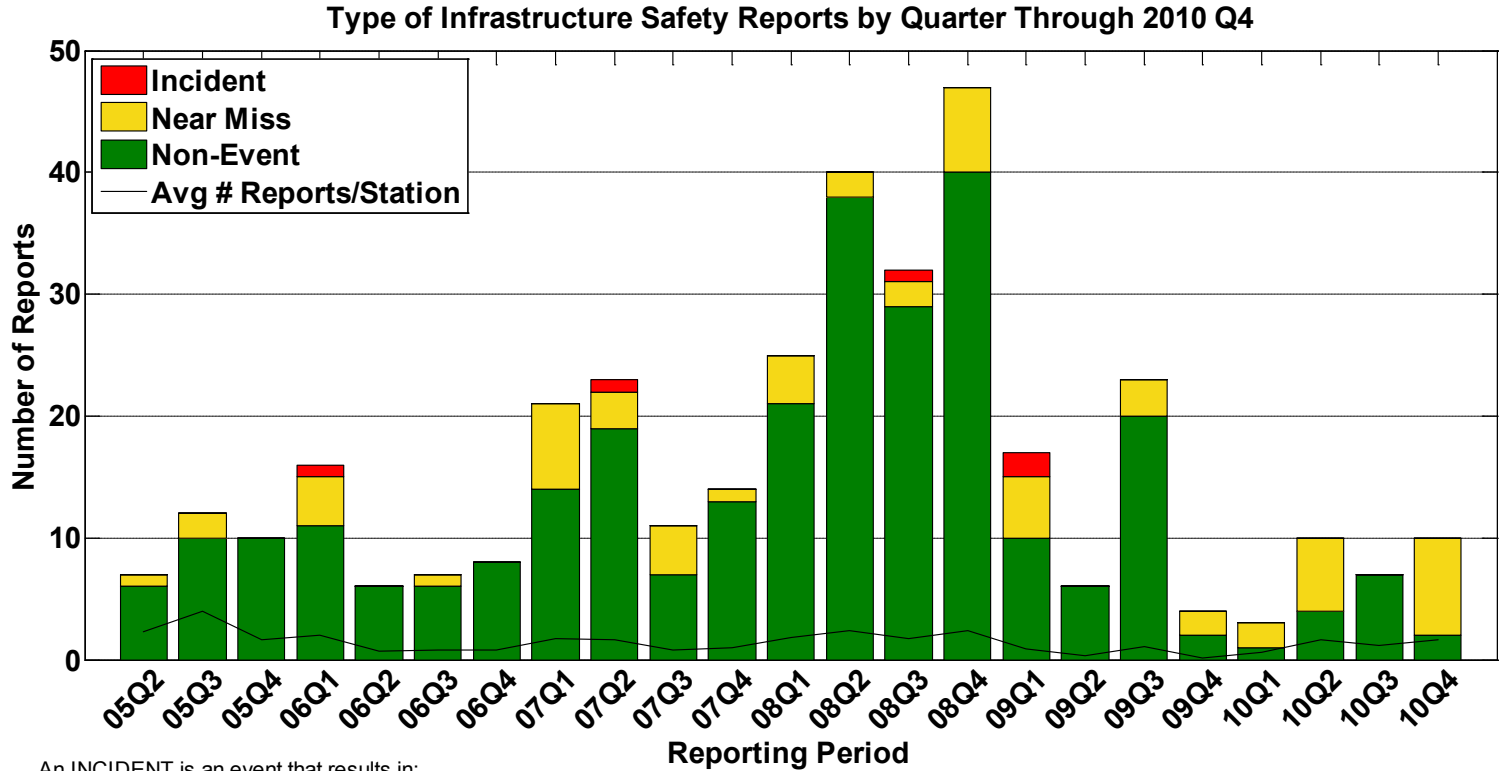
Learning Demonstration Hydrogen Stations By Type



 NREL cdp_fcdev_32
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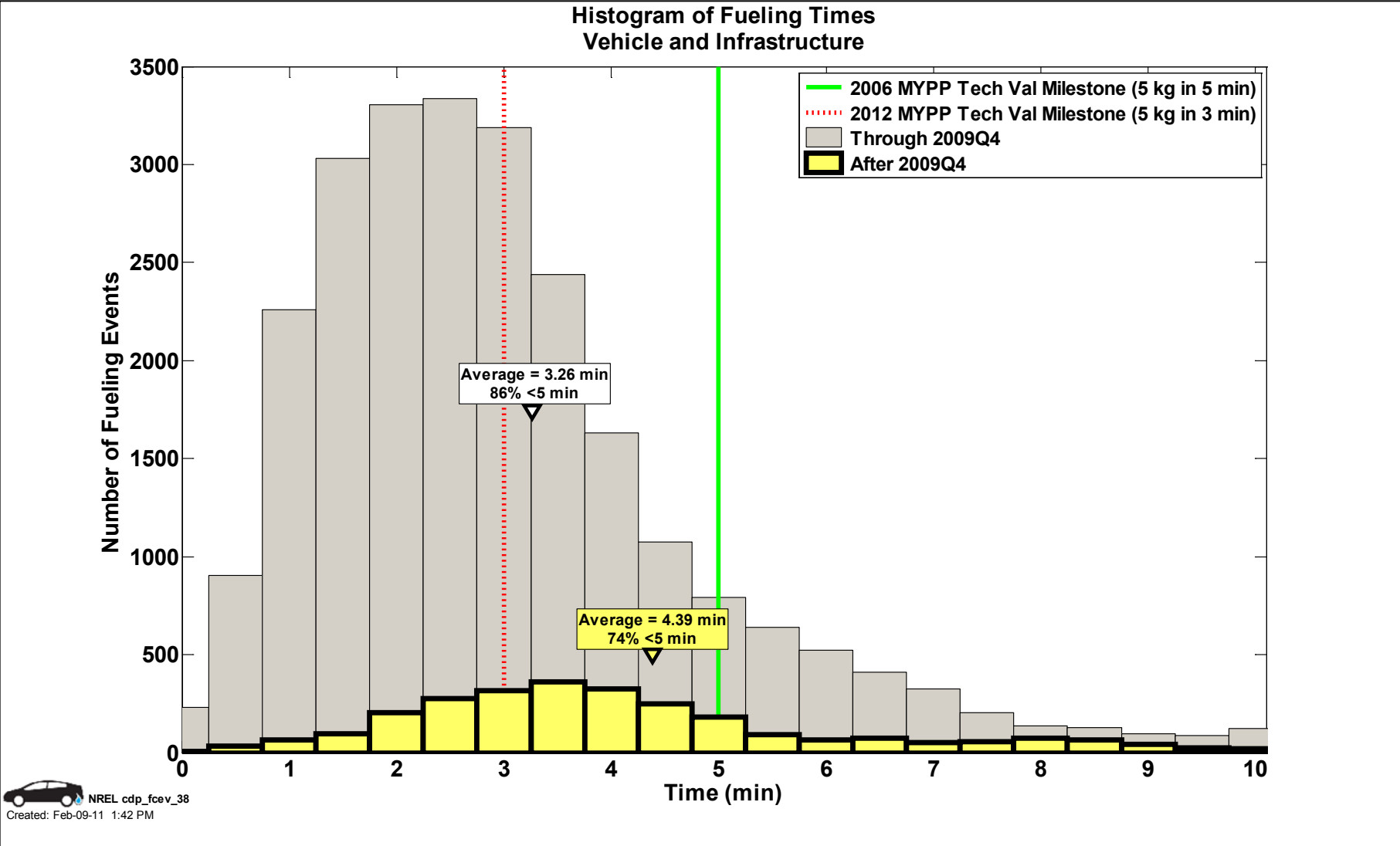
*Some project teams concluded Fall/Winter 2009. Markers show the cumulative stations operated during the 2005-2009 period

CDP#36: Type of Infrastructure Safety Report By Quarter

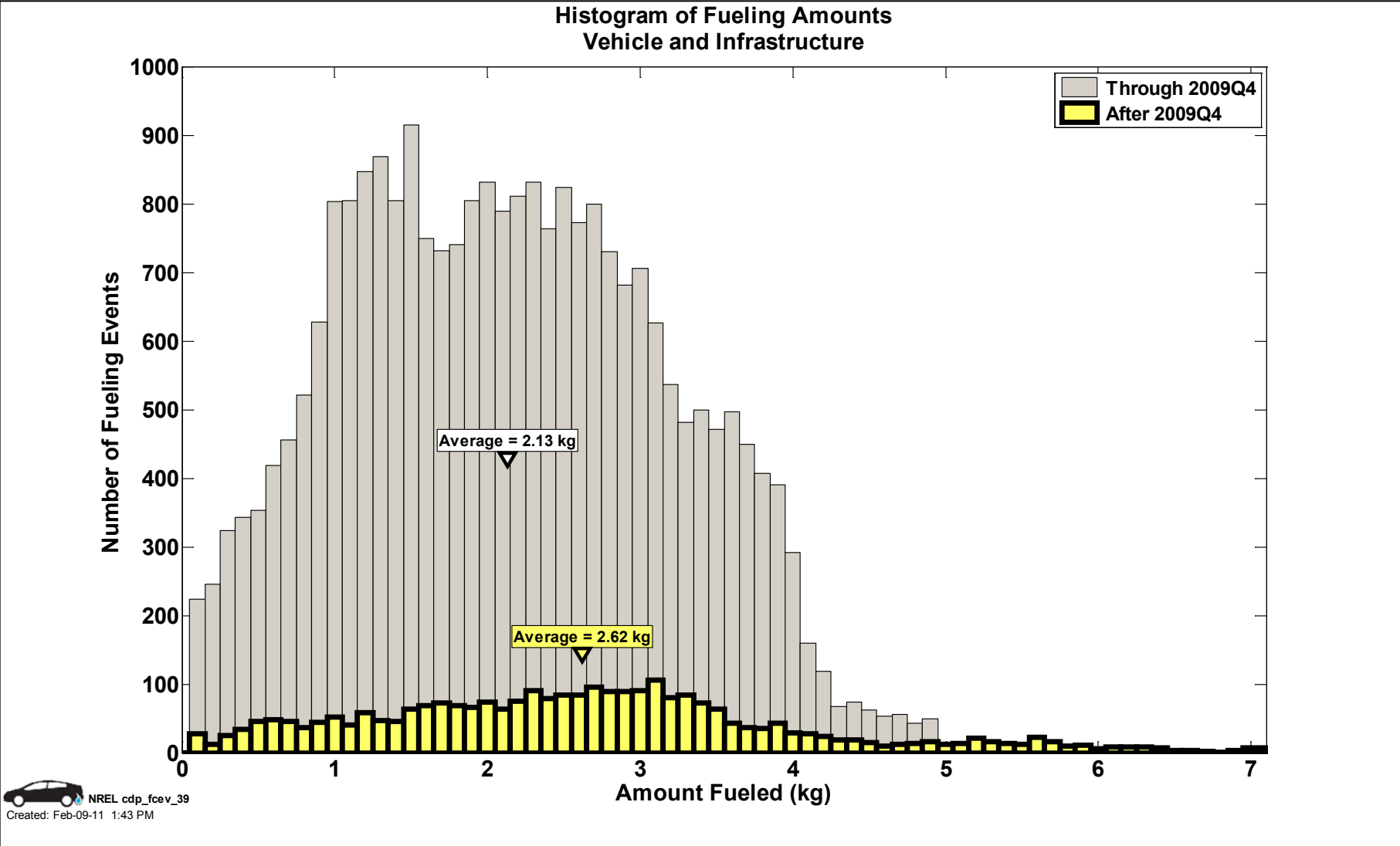


- An INCIDENT is an event that results in:
- a lost time accident and/or injury to personnel
 - damage/unplanned downtime for project equipment, facilities or property
 - impact to the public or environment
 - any hydrogen release that unintentionally ignites or is sufficient to sustain a flame if ignited
 - release of any volatile, hydrogen containing compound (other than the hydrocarbons used as common fuels)
- A NEAR-MISS is:
- an event that under slightly different circumstances could have become an incident
 - unplanned H2 release insufficient to sustain a flame

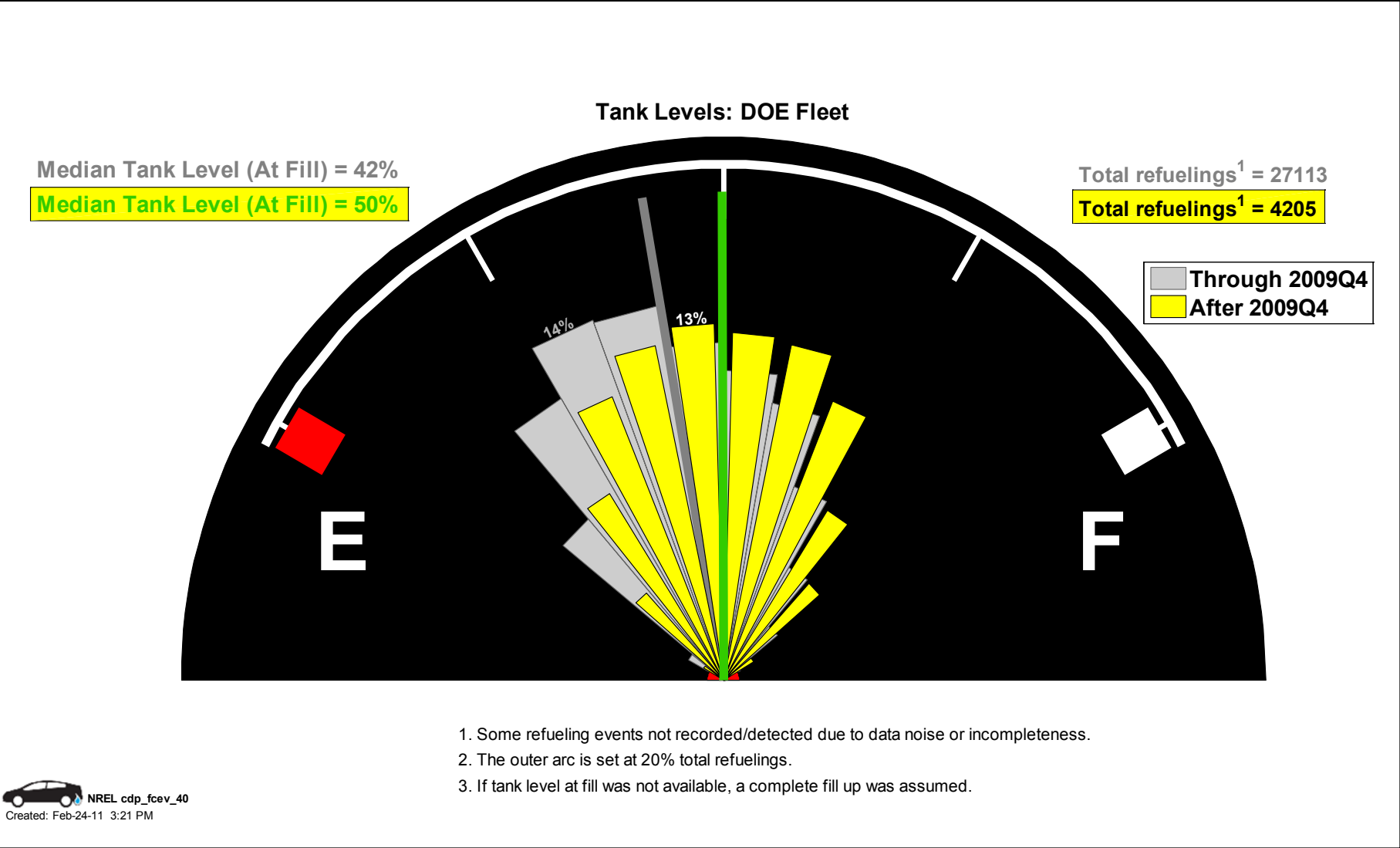
CDP#38: Refueling Times



CDP#39: Refueling Amounts



CDP#40: H2 Tank Level at Refueling



CDP#42: Refueling by Time of Day

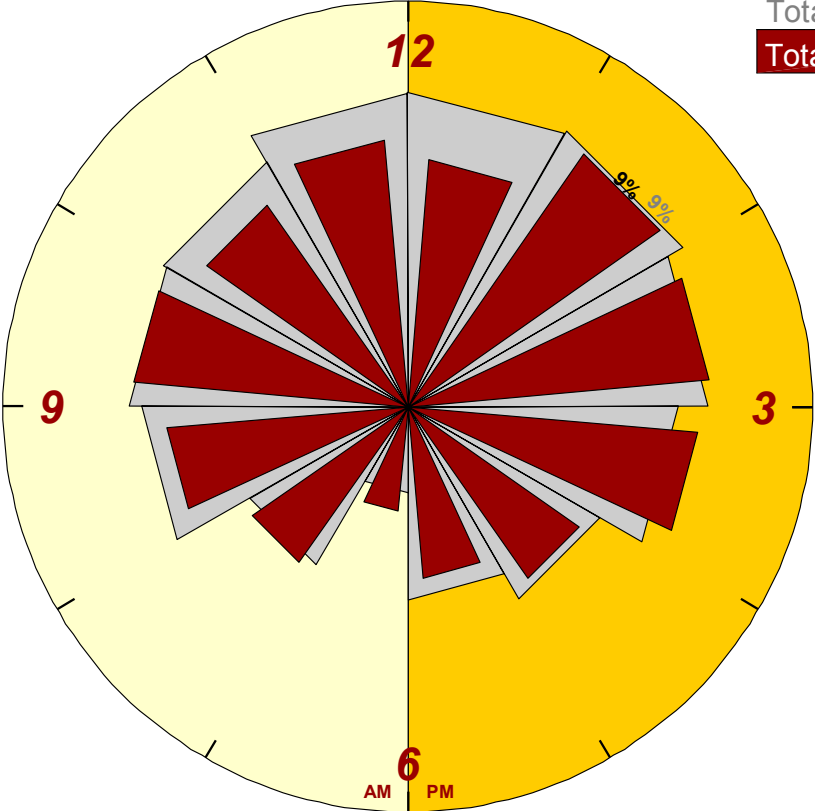
Refueling by Time of Day

% of fills b/t 6 AM & 6 PM: 89.7%

% of fills b/t 6 AM & 6 PM: 84.6%

Total Fill³ Events = 22657

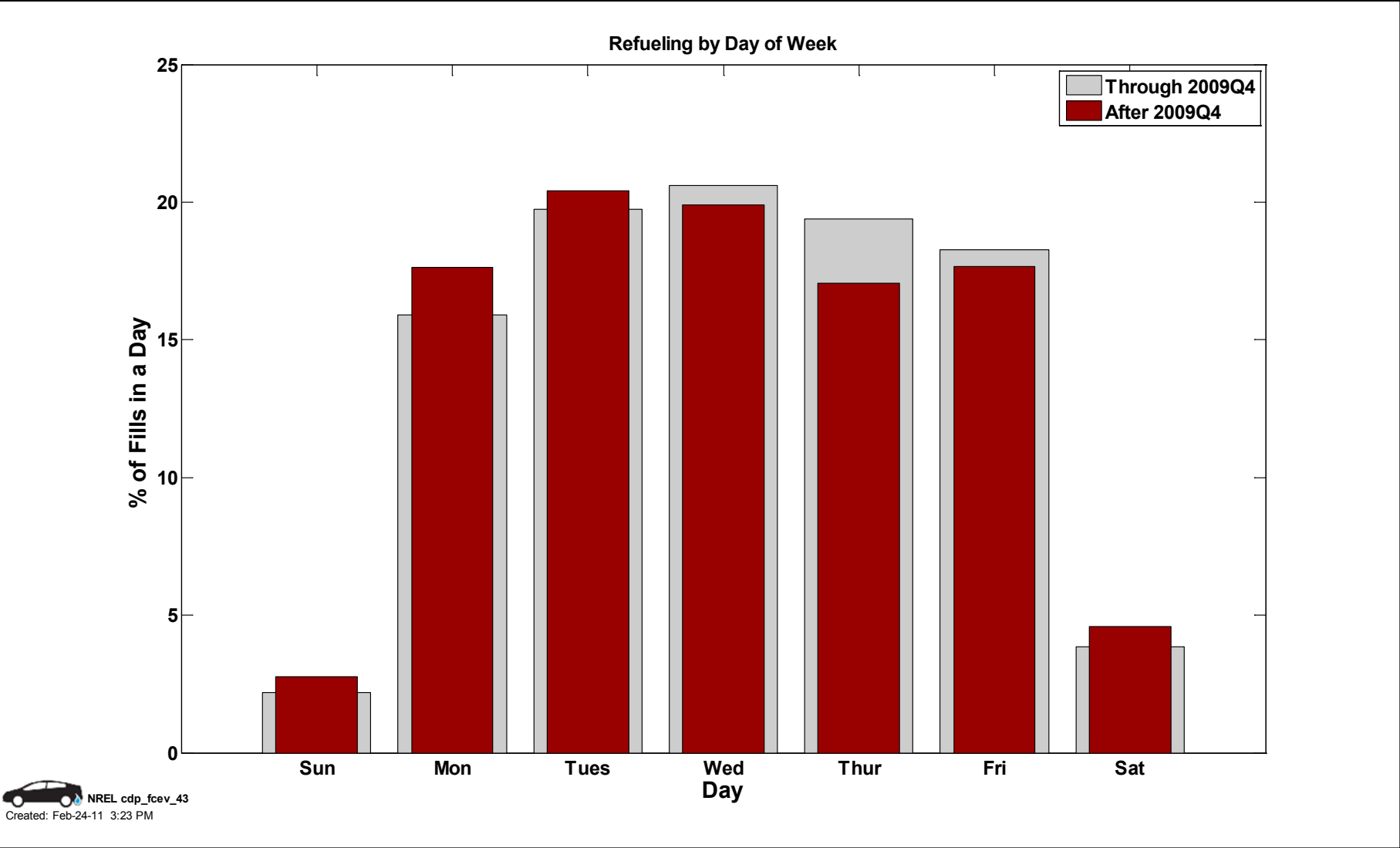
Total Fill³ Events = 4216



Through 2009Q4
After 2009Q4

- 1. Fills between 6 AM & 6 PM
- 2. The outer arc is set at 12 % total Fill.
- 3. Some events not recorded/detected due to data noise or incompleteness.

CDP#43: Refueling by Day of Week



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CDP#44: Driving Start Time – Day

Driving by Time of Day

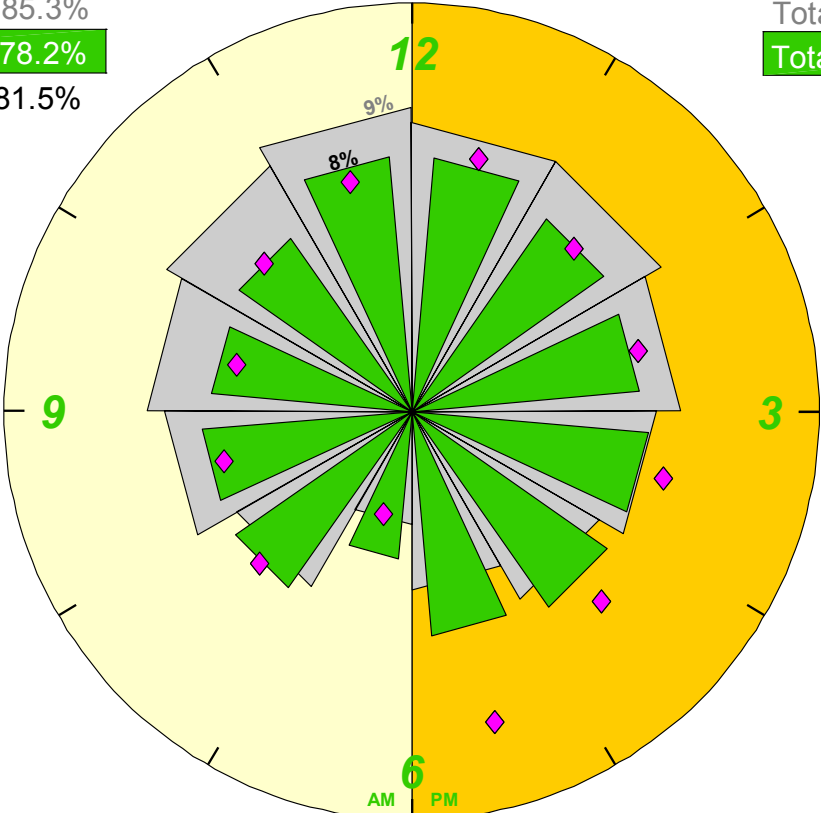
% of driving trips b/t 6 AM & 6 PM: 85.3%

% of driving trips b/t 6 AM & 6 PM: 78.2%

% of NHTS trips b/t 6 AM & 6 PM: 81.5%

Total Driving³ Events = 295222

Total Drive³ Events = 18213

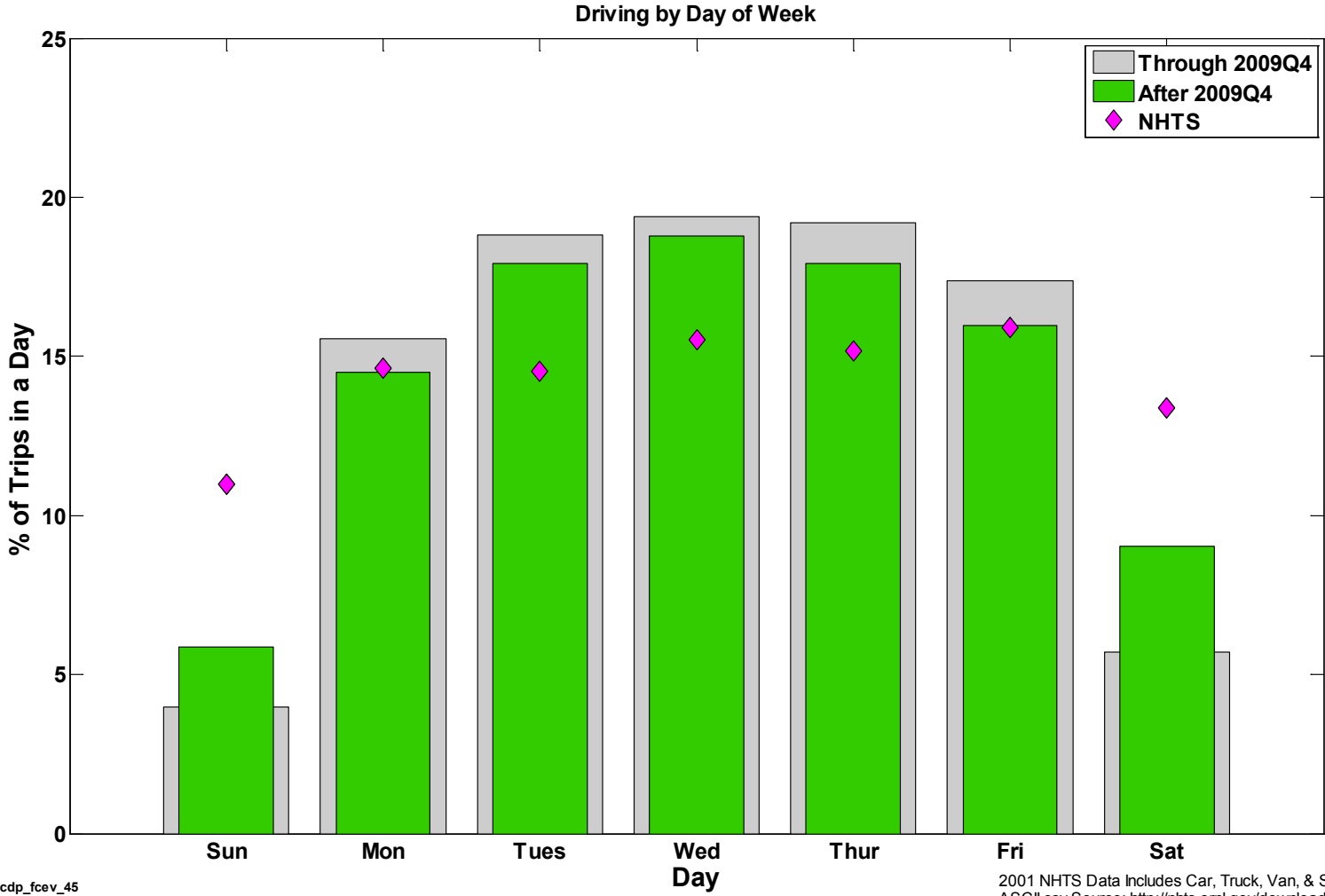


Through 2009Q4
 After 2009Q4
 NHTS

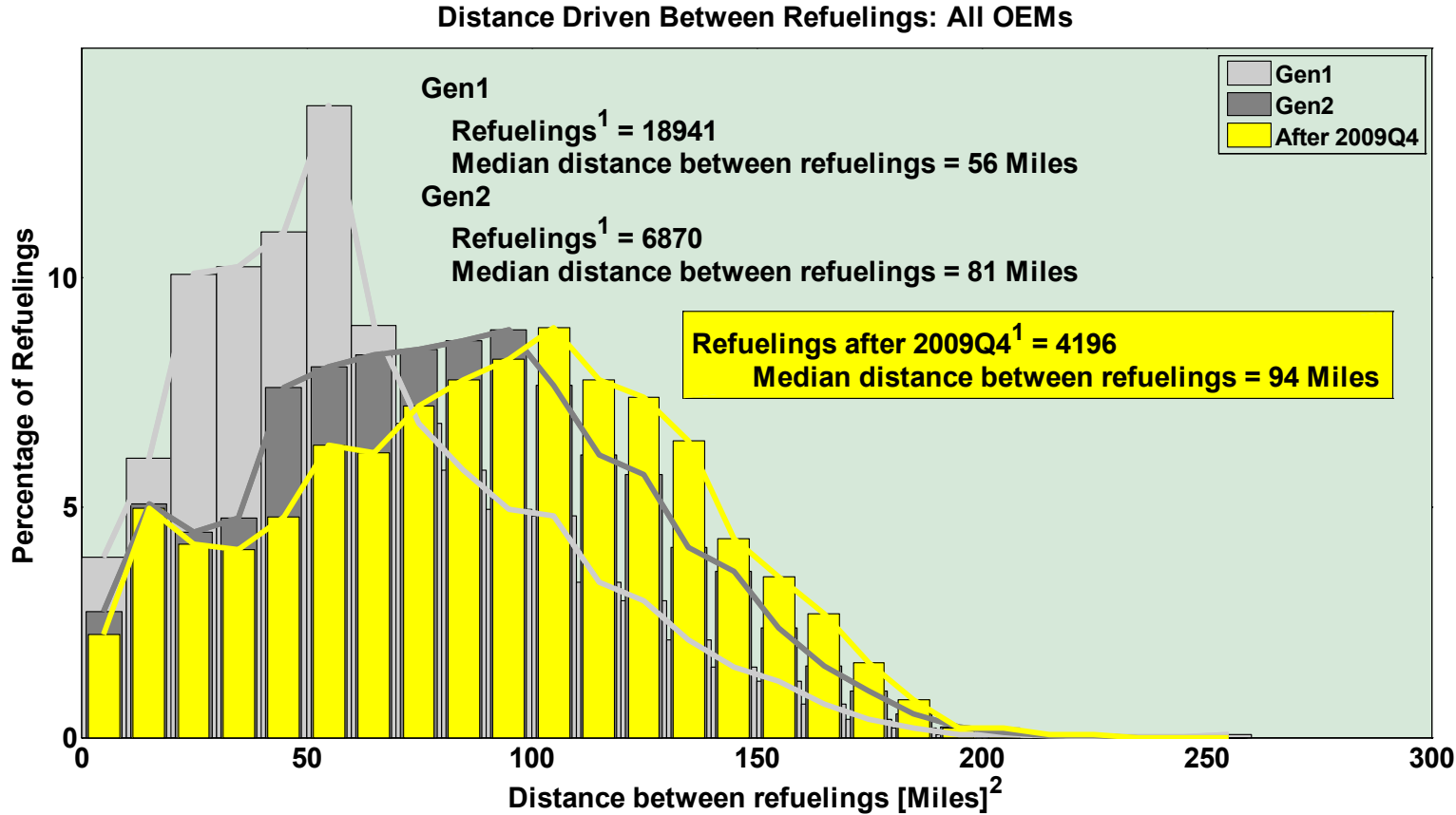
1. Driving trips between 6 AM & 6 PM
2. The outer arc is set at 12 % total Driving.
3. Some events not recorded/detected due to data noise or incompleteness.

2001 NHTS Data Includes Car, Truck, Van, & SUV day trips
 ASCII.csv Source: <http://nhts.ornl.gov/download.shtml#2001>

CDP#45: Driving by Day of Week

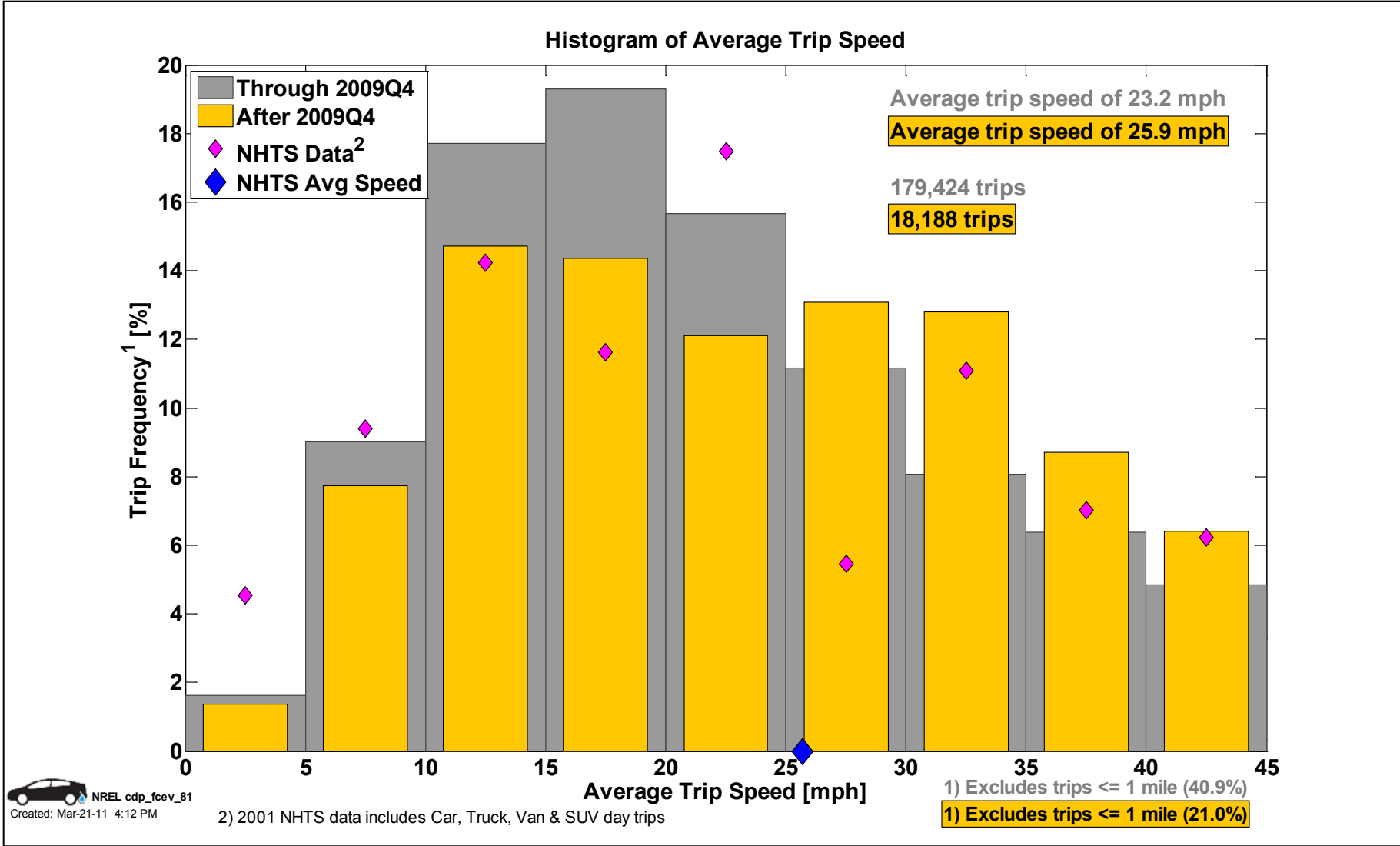


CDP#80: Miles Between Refuelings

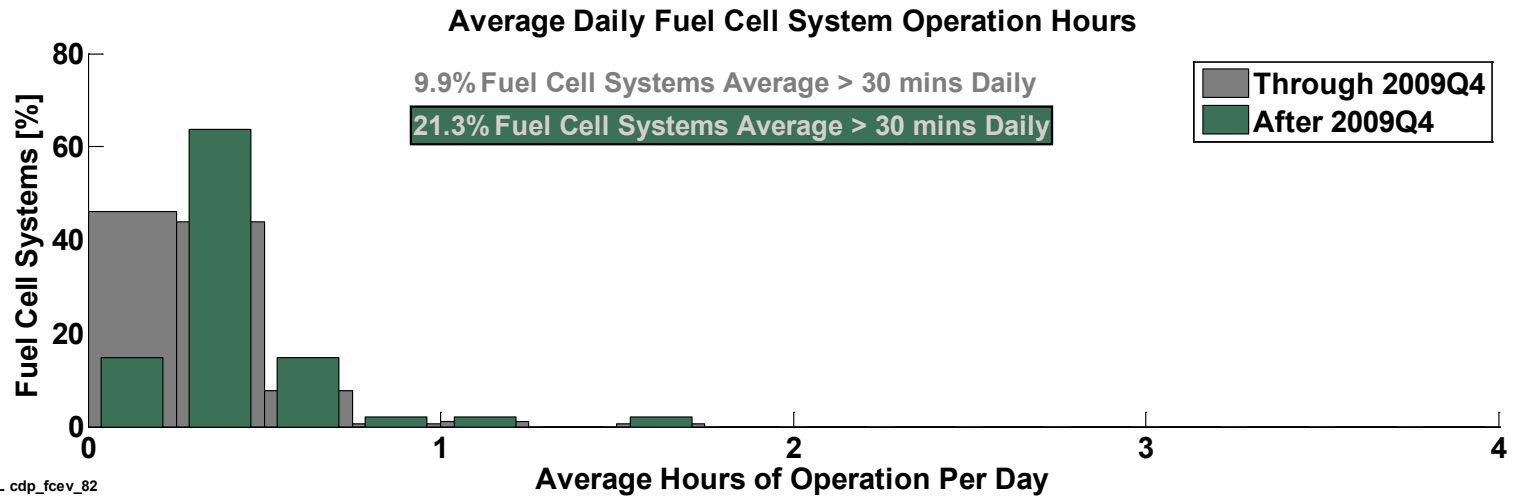
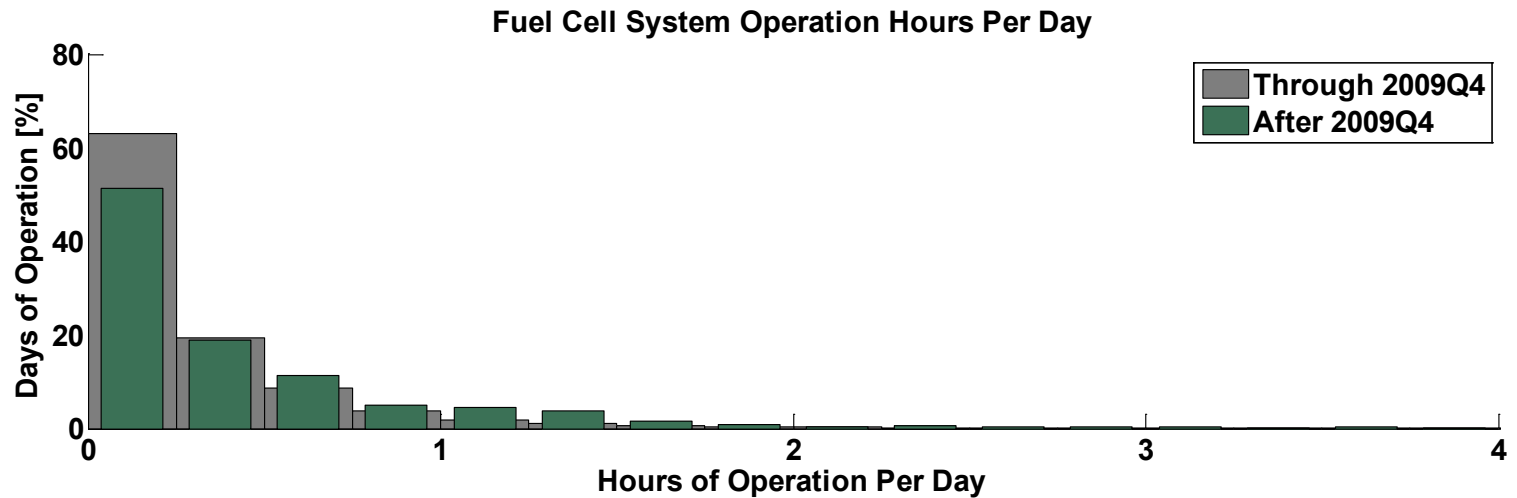


1. Some refueling events are not detected/reported due to data noise or incompleteness.
 2. Distance driven between refuelings is indicative of driver behavior and does not represent the full range of the vehicle.

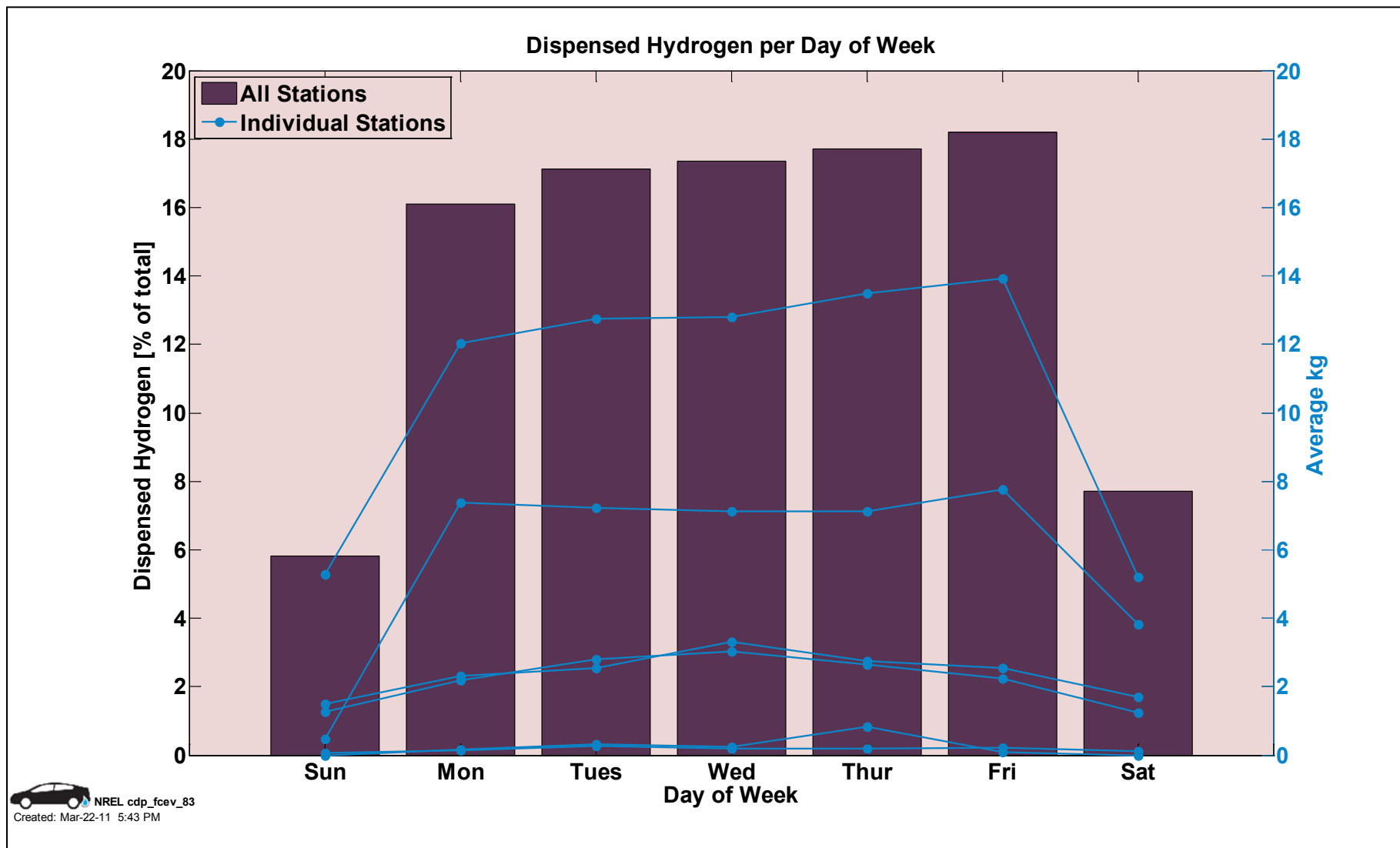
CDP#81: Average Trip Speed



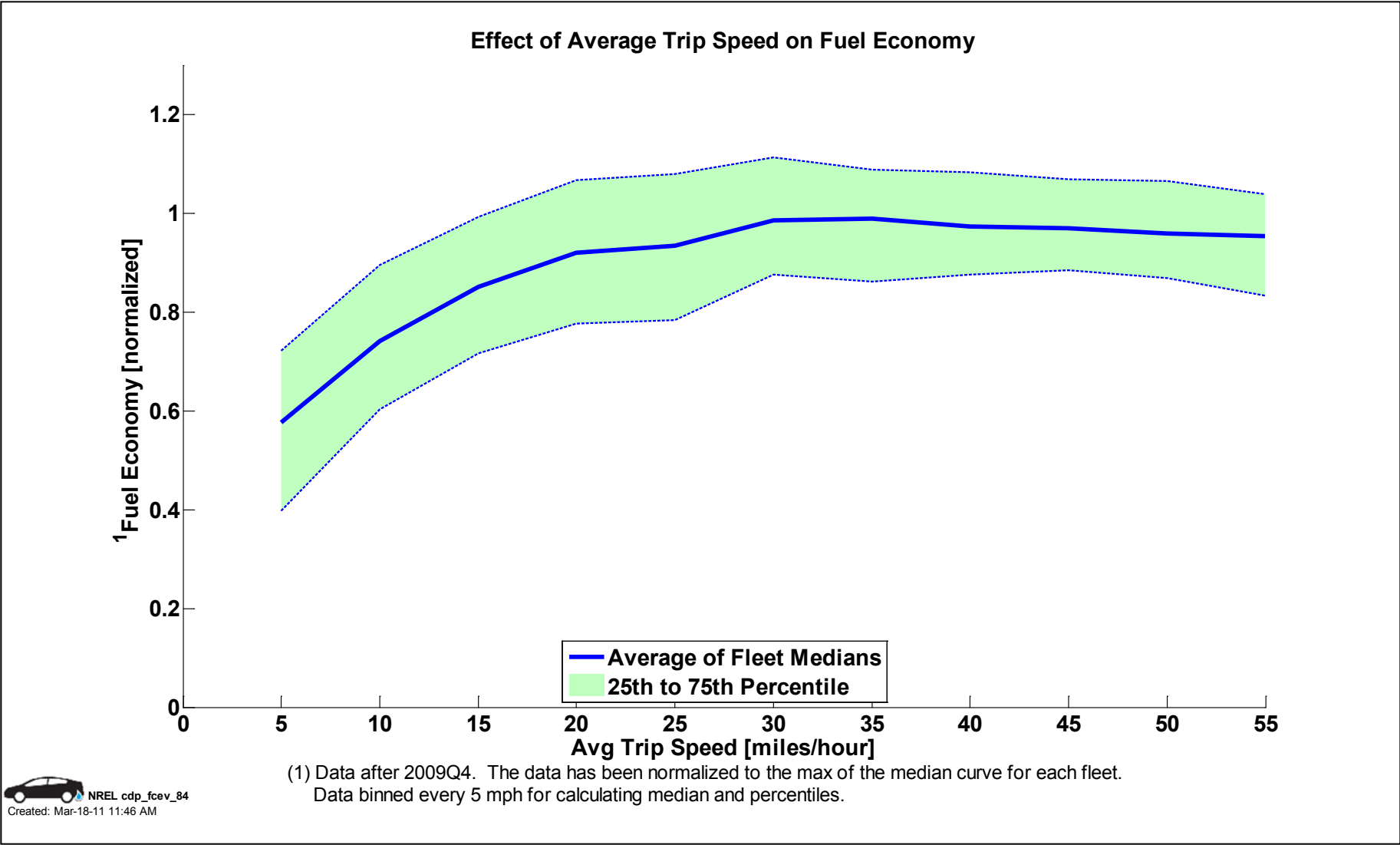
CDP#82: Daily FC Operation Hours in Automotive Application



CDP#83: Hydrogen Dispensed by Day of Week



CDP#84: Effect of Average Trip Speed on Fuel Economy



CDP#85: Effect of Trip Length on Fuel Economy

