

The Gateway Cities  
**Air Quality Action Plan**

# I-710 Construction Staging and Phasing Concept

## Emissions Analysis Preview

Technical Roundtable  
August 10, 2011

---



Made possible with support from



# Objective

Estimate emissions for a reasonable concept of construction staging and phasing of the I-710 corridor improvements (2018 – 2034)

- Daily and monthly emissions at location of activity
- Criteria and MSAT air pollutants
- GHG (on-site tailpipe only)
- Fleet changes every year

# Methodology

Based on GCCOGs staging and phasing construction report for the I-710 to determine:

- location (segment) and duration (phases) of construction activity
- type of construction activity (%road, %bridge)

Enhanced version of Roadway Construction Model (SMAQMD)

- Emission factors extended to 2035
- Include mobile source air toxic and all GHG's
- Assign equipment by construction activity

## Methodology (continued)

On-road activity (e.g., watering trucks)

- CARB EMFAC2007 model – LA county fleet

Off-road activity

- Current CARB OFFROAD2007 - statewide fleet
- Update with new CARB model (August 2011)
  - equipment population post recessions
  - updated average load factors
  - updated growth projections in new fleet
- MSAT speciated from VOC and PM via CARB speciation database

## Other Assumptions

- Average of 20 working days per month
- Construction phases are sequential within segment
- Construction schedule follows late finish
- LACMTA “Green” Construction Policy not included in analysis

# Findings

## Average and Peak Daily Emissions

Pollutant	Average Daily Emissions at a Segment <sup>a</sup> (lbs/day)	Peak Daily Emissions for Any One Segment (lbs/day)	SCAQMD Construction Thresholds (lb/day)	Segment with Peak Daily Emissions	Exceeds Thresholds?
ROG	2.15	24.7	75	4	No
CO	14.3	180	550	4	No
NOx	14.3	152	100	6	Yes
PM10	26.7	491	150	6	Yes
PM2.5	5.97	106	55	6	Yes
DPM	1.16	12.7	n/a	4	n/a
ACETALDEHYDE	0.155	1.55	n/a	6	n/a
ACROLEIN	0.016	0.384	n/a	4	n/a
BENZENE	0.041	0.429	n/a	6	n/a
BUTADIENE	0.004	0.042	n/a	6	n/a
FORMALDEHYDE	0.296	3.09	n/a	6	n/a

<sup>a</sup> Non-weighted average of average daily emissions across each segment, not average of total daily emissions.

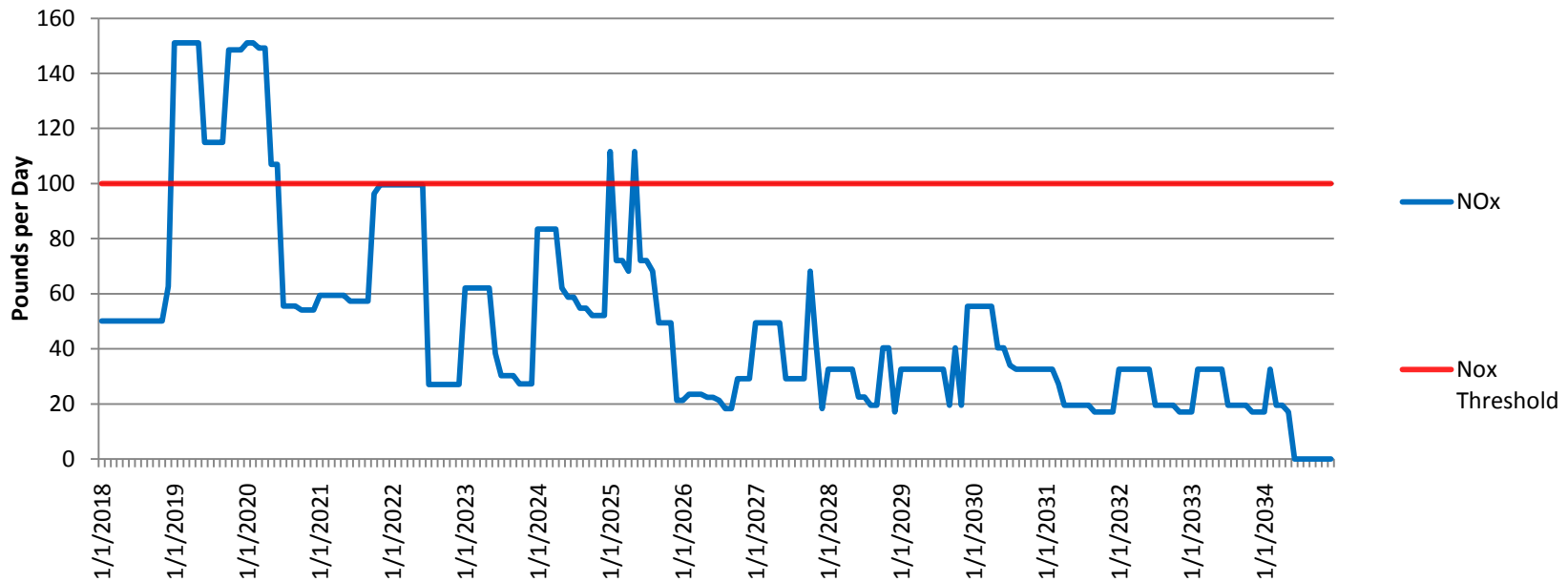
- SCAQMD construction same regardless of size of facility
- GHG: Peak year CO<sub>2e</sub> 2,680 MT/yr vs. industrial facility threshold 10,000 MT of CO<sub>2e</sub>/yr

Note: Rows shown in yellow are sized-based constituents, all others are chemical compounds.

# Findings cont.

## Peak NO<sub>x</sub> Emissions (lbs/day)

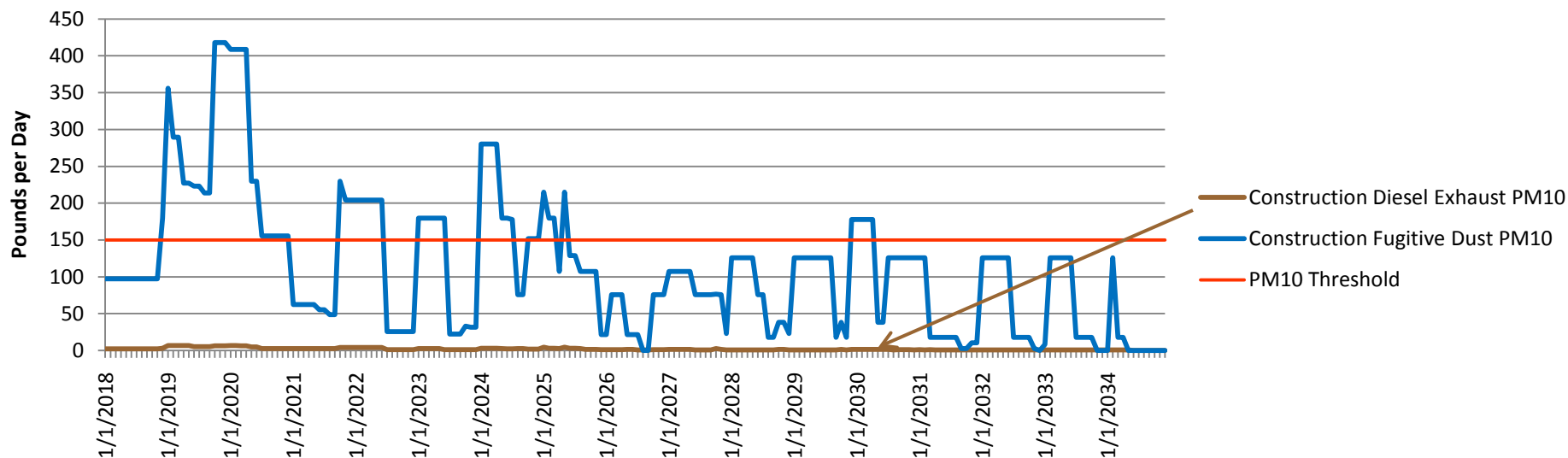
Peak NO<sub>x</sub> Daily Emissions for Any One Segment



# Findings cont.

## Peak PM<sub>10</sub> Emissions (lbs/day)

Peak PM<sub>10</sub> Daily Emissions for Any One Segment



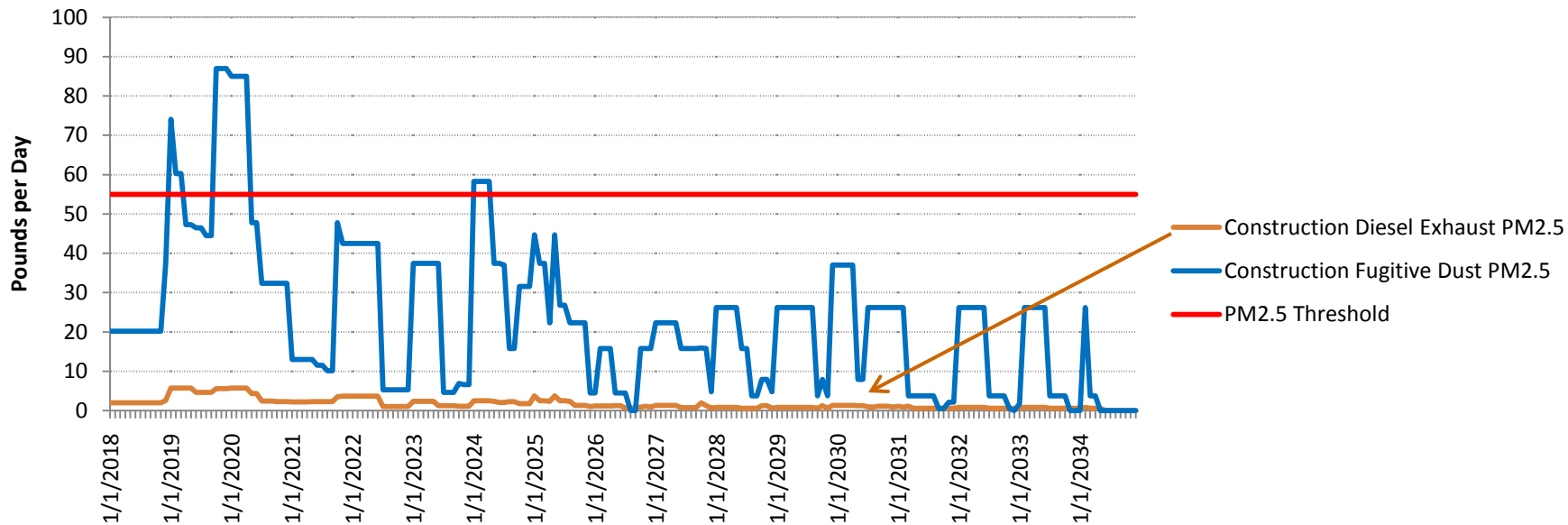
Most PM<sub>10</sub> generated from construction fugitive dust



# Findings cont.

## Peak PM<sub>2.5</sub> Emissions (lbs/day)

Peak PM<sub>2.5</sub> Daily Emissions for Any One Segment



Most PM<sub>2.5</sub> generated from construction fugitive dust

## Findings cont.

- As shown in previous slides,  $PM_{2.5}$  and  $PM_{10}$  from diesel emissions (associated with construction equipment exhaust) do not exceed the AQMD thresholds of significance.
- Exceedances are generated primarily by fugitive dust from construction activities.

# Findings cont.

Segment	Total Months of Construction (per Segment)	Total Months the Emissions Threshold is Exceeded				
		CO	ROG	NOx	PM10	PM2.5
1	123	none	none	none	none	none
2	108	none	none	none	none	none
3	131	none	none	none	<b>13</b>	none
4	108	none	none	14	<b>11</b>	none
5	118	none	none	none	<b>15</b>	none
6	132	none	none	18	<b>24</b>	<b>10</b>
7	60	none	none	none	none	none

Note: Bold values indicate exceedances are due primarily from fugitive dust

# Conclusions

## **NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>**

- Only segments 3-7 show exceedance of significance threshold, but only 10-20% of the construction period
- Analysis is developed for each segment and changes at the local scale (geometry, interchanges) will not impact the emission findings

## **Robust analysis is useful for air quality modeling**

- Detailed info for specific times and locations

## **Next Steps**

- Update with revised CARB OFFROAD model information
- Health risk of the toxics addressed in HRA

# Recommendations

## Emission reductions for PM<sub>10</sub> and PM<sub>2.5</sub> fugitive dust

- Smaller disturbance areas
- More frequent water (> 50% efficiency)
- Use of surfactants

## Emission reductions for NOx

- Detailed info for specific times and locations
- Newer equipment (lower emitting) 2019-2020 for segment 4 & 6
- Modify construction duration to manage emissions