

2008 OZONE MAINTENANCE PLAN UPDATE

New Motor Vehicle Emissions Budgets

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Background

- EPA released a new mobile emissions model, MOVES3, which is now required for use in transportation conformity and State Implementation Plan (SIP) development
- Using the same inputs, MOVES3 results in significant increases in estimated NO_x (over 50% in some analysis years) compared to MOVES2014, which was used to develop mobile inventories in the 2008 ozone maintenance plan
- To be consistent, one should use the same tool for estimating emissions and setting emissions budgets, unless two tools produce identical results, which is clearly not the case based on our tests regarding NO_x.



2008 Ozone Maintenance Plan

From the 2008 Ozone Maintenance Plan (2017):

“The MVEBs will be re-evaluated if there is a roll-back of federal emissions control programs and/or changes to USEPA’s emissions estimation model that result in significant changes in emissions inventories or to accommodate transportation planning issues when the Constrained Long-Range Plan horizon year is extended beyond 2040.”



Preliminary MOVES3 Sensitivity Tests

MOVES3 vs MOVES2014: Estimated NOx (tons/day)

| Year | MOVES2014B | MOVES3.0.3 | MOVES3.0.3 versus MOVES2014B |
|------|------------|------------|------------------------------|
| 2021 | 66.824 | 67.442 | 1% |
| 2023 | 54.016 | 56.382 | 4% |
| 2025 | 42.566 | 46.377 | 9% |
| 2030 | 27.536 | 34.666 | 26% |
| 2040 | 19.140 | 29.183 | 52% |
| 2045 | 19.131 | 29.434 | 54% |



Updating Motor Vehicle Emissions Budgets

Motor Vehicle Emissions Budgets

§93.101 – Definition:

“Motor vehicle emissions budget is that portion of the total allowable emissions defined in ...the maintenance plan for a certain dateallocated to highway and transit vehicle use and emissions”

§93.118(e)(4) – Criteria & Procedures:

- iv. *“The motor vehicle emissions budget(s), when considered together with all other emissions sources, is consistent with applicable requirements for....maintenance;*
- v. *The motor vehicle emissions budget(s) is consistent with and clearly related to the emissions inventory in the submitted maintenance plan.”*

Source: Transportation Conformity Regulations, April 2012



Updating Motor Vehicle Emissions Budgets

Motor Vehicle Emissions Safety Margins

§93.101 – Definition:

“Safety margin means the amount by which total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for ...maintenance”

Source: Transportation Conformity Regulations, April 2012

There is widespread use of safety margins in maintenance plans



MVEB Safety Margins: Uncertainties*

- ✓ Changes to EPA Emissions Model (MOVES)
 - In addition to significant increases in estimated NOx between MOVES2014 and MOVES3, there was more than 100% change in NOx in the 2040 analysis year when we moved from EPA Mobile model to MOVES
 - MOVES3 model, released in 2020, which we are required to use, is already out of date, as it is based on the SAFE Vehicles Rule, superseded with more stringent emissions and CAFE standards in 2021
- ✓ Vehicle Fleet Changes
 - Vehicle registration data updated approx. every 3 years: next 2023 or 2024
 - Ageing vehicle fleet and trend towards larger vehicles
 - Inability to explicitly account for likely higher percentage of EVs and cleaner vehicles in forecast years, beyond what is already embedded in the MOVES model
- ✓ Updates to Cooperative Forecasts - economic growth

*Uncertainties = elements out of TPB control that can lead to mobile budget exceedances



2008 Ozone Maintenance Plan Update: Key Tools and Assumptions

- Tools:
 - MOVES3.0.4 Model
 - Gen2/Version 2.4 Travel Demand Model
- Input Assumptions:
 - Land Activity: Round 9.2 Cooperative
 - Transportation Networks: 2022 Update to Visualize 2045



Updated NOx and VOC Inventories for 2008 Ozone Maintenance Plan Update

Using the updated assumptions, updated NOx and VOC inventories and corresponding safety margins are provided below:

Nitrogen Oxides (NOx)

tons/day

| | Inventory | Safety Margin | New MVEBs |
|------|-----------|---------------|-----------|
| 2025 | 46.5 | 9.3 | 55.8 |
| 2030 | 34.3 | 6.9 | 41.2 |

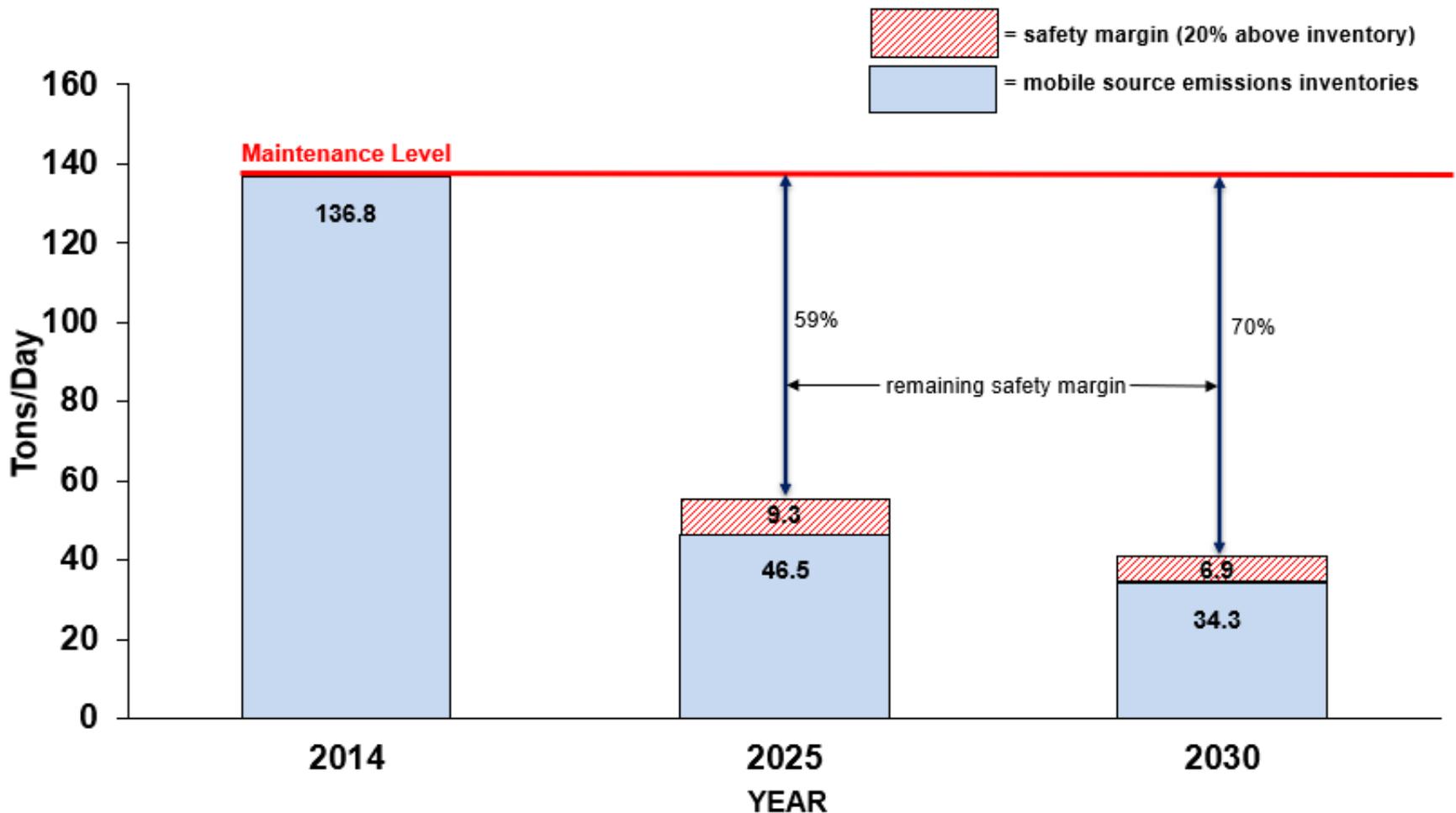
Volatile Organic Compounds (VOCs)

tons/day

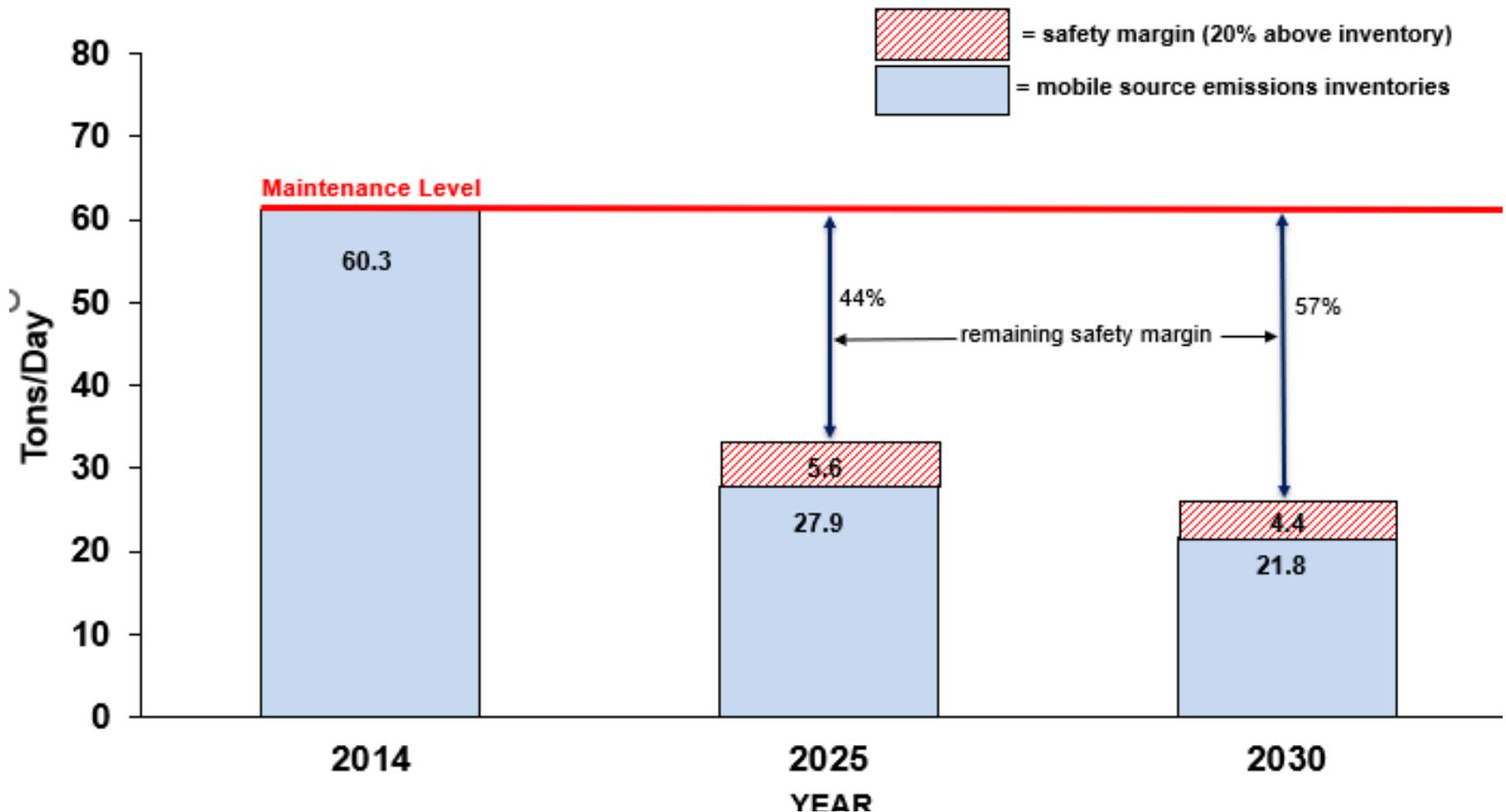
| | Inventory | Safety Margin | New MVEBs |
|------|-----------|---------------|-----------|
| 2025 | 27.9 | 5.6 | 33.5 |
| 2030 | 21.8 | 4.4 | 26.2 |



Updated 2008 Ozone Maintenance Plan: 20% Safety Margins for NOx



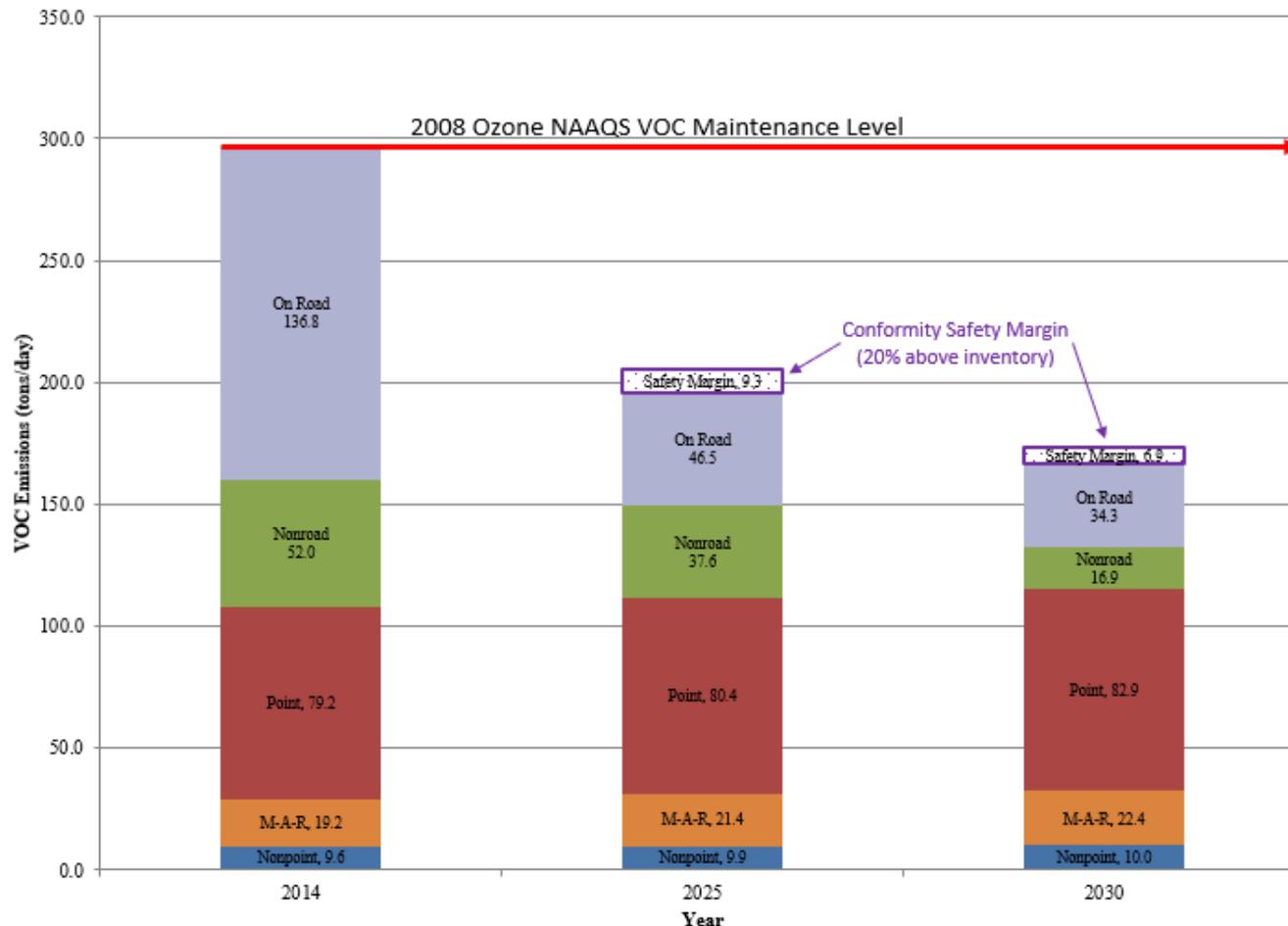
Updated 2008 Ozone Maintenance Plan: 20% Safety Margins for VOC



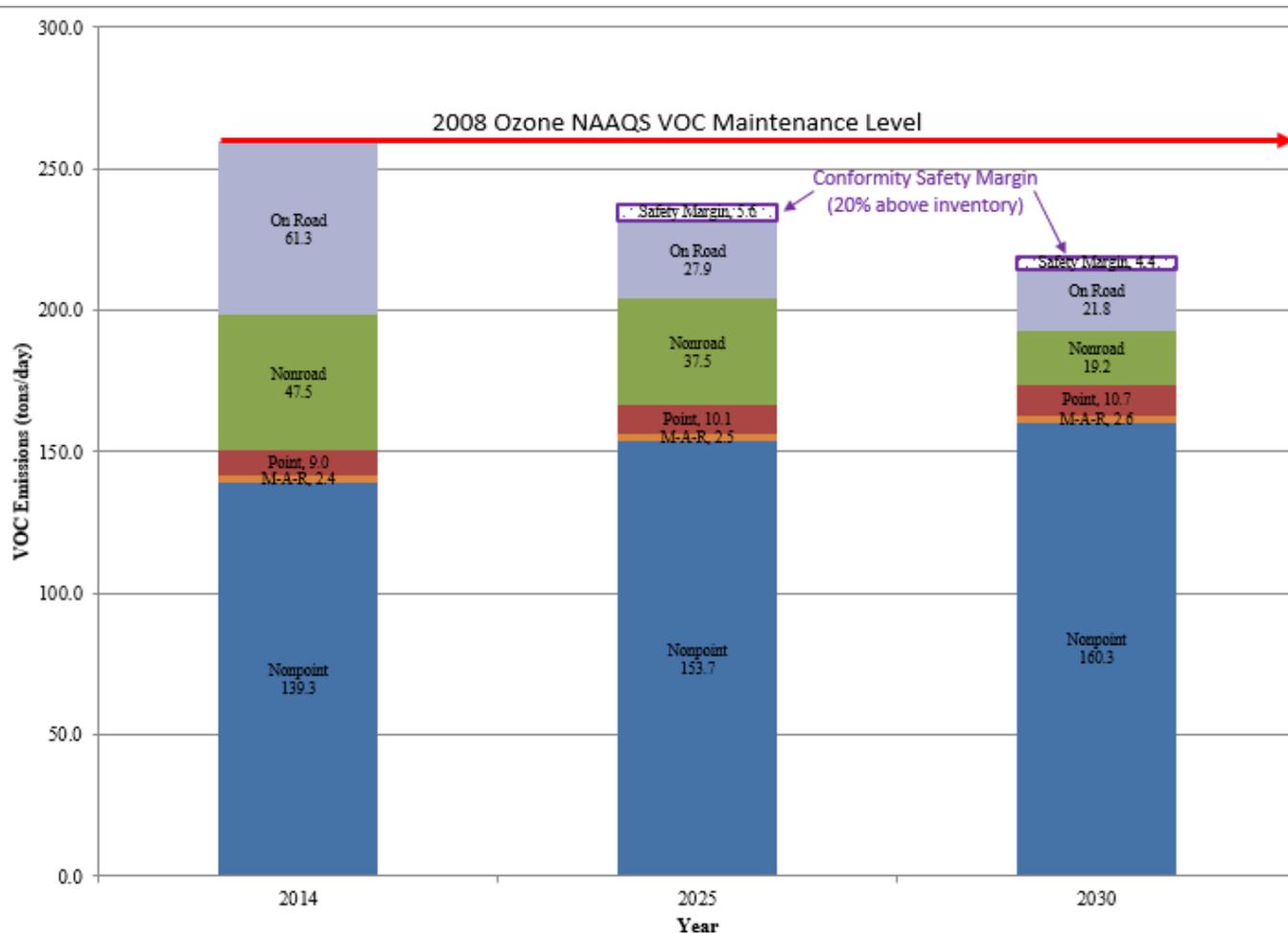
SOURCE: 2025 and 2030 inventories were re-estimated using MOVES3.04 for the 2023 update of the 2008 ozone maintenance plan. The 2014 inventory is from the original 2008 ozone maintenance plan (December 20, 2017).



Updated 2008 Ozone Maintenance Plan: NOx with 20% Safety Margins



Updated 2008 Ozone Maintenance Plan: VOC with 20% Safety Margins



2023 Schedule

| | |
|---------------|--|
| March | TPB Transmits Mobile Emissions Inventories to MWAQC |
| March - April | MWAQC Develops New Motor Vehicle Emissions Budgets (MVEBs) |
| March- April | MWAQC Prepares 2008 Ozone Maintenance Plan (MP) Update Document |
| May | MWAQC Releases 2008 Ozone MP Update with New MVEBs For Comment |
| June-August | Public Hearings and Comment Period |
| September | MWAQC Approves Final 2008 Ozone MP Update with New MVEBs |
| October | State Air Agencies Submit 2008 Ozone MP Update to EPA |
| ??? | EPA Approves Updated 2008 Ozone MP or Finds MVEBs Adequate for Use in Conformity |



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