

# MOVES3 VS MOVES2014

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## New Mobile Emissions Budgets

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TPB Technical Committee  
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Agenda Item #5



National Capital Region  
**Transportation Planning Board**

# TPB Long Range Transportation Plan (LRTP)

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## 2024 LRTP Update

- TPB resolution to update projects in new 2024 LRTP to better advance TPB's enhanced policy priorities.
- Update needed to take advantage of funding in the Infrastructure Investment and Jobs Act (IIJA).
- Update needed to provide federally required 20-year horizon--current 2045 out-year must be updated to 2050.

Scheduled for TPB Adoption in 2024



# Motor Vehicle Emissions Budgets

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The region needs two new sets of MVEBs:

- Updated MVEBs for the 2008 ozone standard Maintenance Plan.
- New MVEBs to meet the 2015 ozone standard requirements.

New MVEBs for 2015 ozone standard requirements will not override the need for new MVEBs associated with the 2008 ozone maintenance plan.



# Motor Vehicle Emissions Budgets

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- 2024 LRTP update will need an air quality conformity analysis.
- New MVEBs set using the new MOVES3 model will have to be used as part of this analysis.
- Approved updated MVEBs for the 2008 ozone maintenance plan will be needed by the end of 2023 for use in the air quality conformity analysis of the 2024 LRTP update.



# MOVES3- Release

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## MOtor Vehicle Emissions Simulator (MOVES)

- EPA's latest emissions model, MOVES3, was officially released in the Federal Register<sup>1</sup> on January 7, 2021.
- EPA provided a 2-year grace period before MOVES3 must be used for conformity analyses. The grace period ends on January 9, 2023.

<sup>1</sup>Federal Register Vol 86, No. 4/ Thursday January 7, 2021 "Official Release of the MOVES3 Motor Vehicle Emissions Model for SIPs and Transportation Conformity <https://www.govinfo.gov/content/pkg/FR-2021-01-07/pdf/2021-00023.pdf>



# MOVES3 – EPA Notes Possible NOx Increases in Urban Areas

Regarding the potential increases in NOx emissions in urban areas, in the MOVES3 documentation, EPA notes that “as shown in Figure 6-5, urban counties with congested roads and little *hotelling* activity in MOVES2014b may see higher total NOx with MOVES3 than with MOVES2014b.”

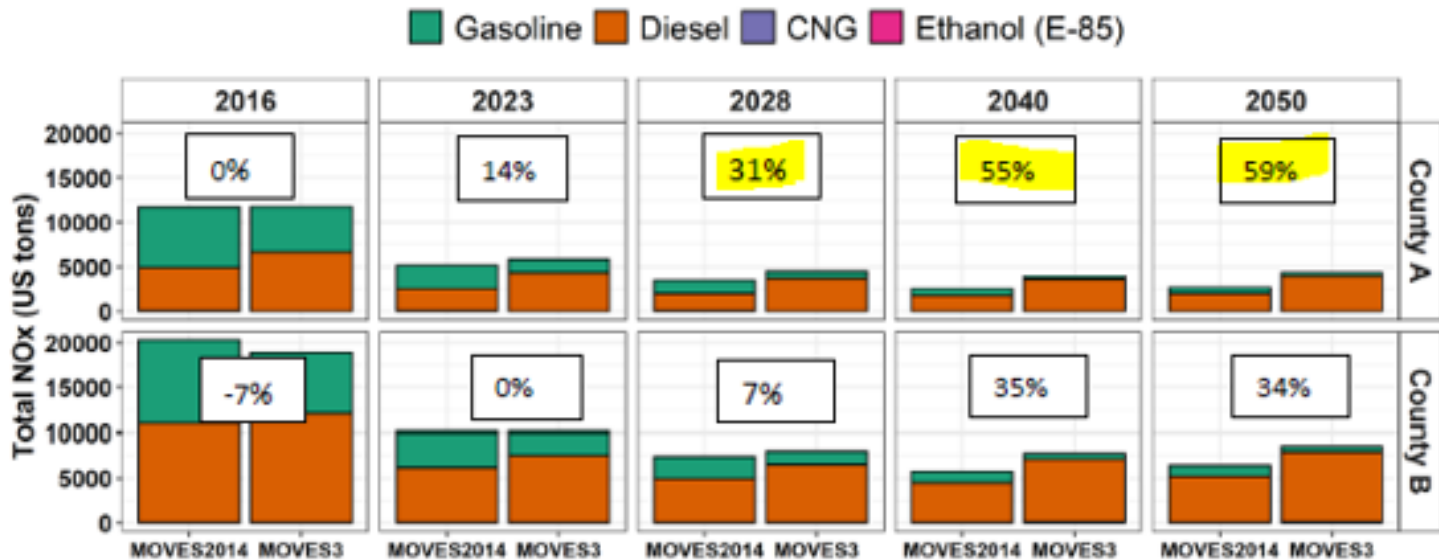


Figure 6-5—Onroad NO<sub>x</sub> from two sample urban counties in MOVES3 as compared to MOVES2014b

Source: Overview of EPA's Motor Vehicle Emission Simulator (MOVES3); March 2021



# MOVES3 – Preliminary Sensitivity Tests

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- TPB staff ran preliminary sensitivity tests for MOVES3 using MOVES2014b inputs from the 2022 Update to Visualize 2045 air quality conformity analysis.
- MOVES3 and MOVES2014b runs used the same inputs (where possible).
- TPB staff found that using the new MOVES3 model resulted in Nitrogen Oxides (NO<sub>x</sub>) emissions increases of more than 50%.



# MOVES3 – Preliminary Sensitivity Tests

## MOVES3 vs MOVES2014: VOC (tons/day)

Year	MOVES2014B	MOVES3.0.3	MOVES3.0.3 versus MOVES2014B
2021	42.341	35.046	-17%
2023	37.741	31.402	-17%
2025	34.165	28.099	-18%
2030	25.633	22.145	-14%
2040	19.559	18.017	-8%
2045	19.074	17.774	-7%





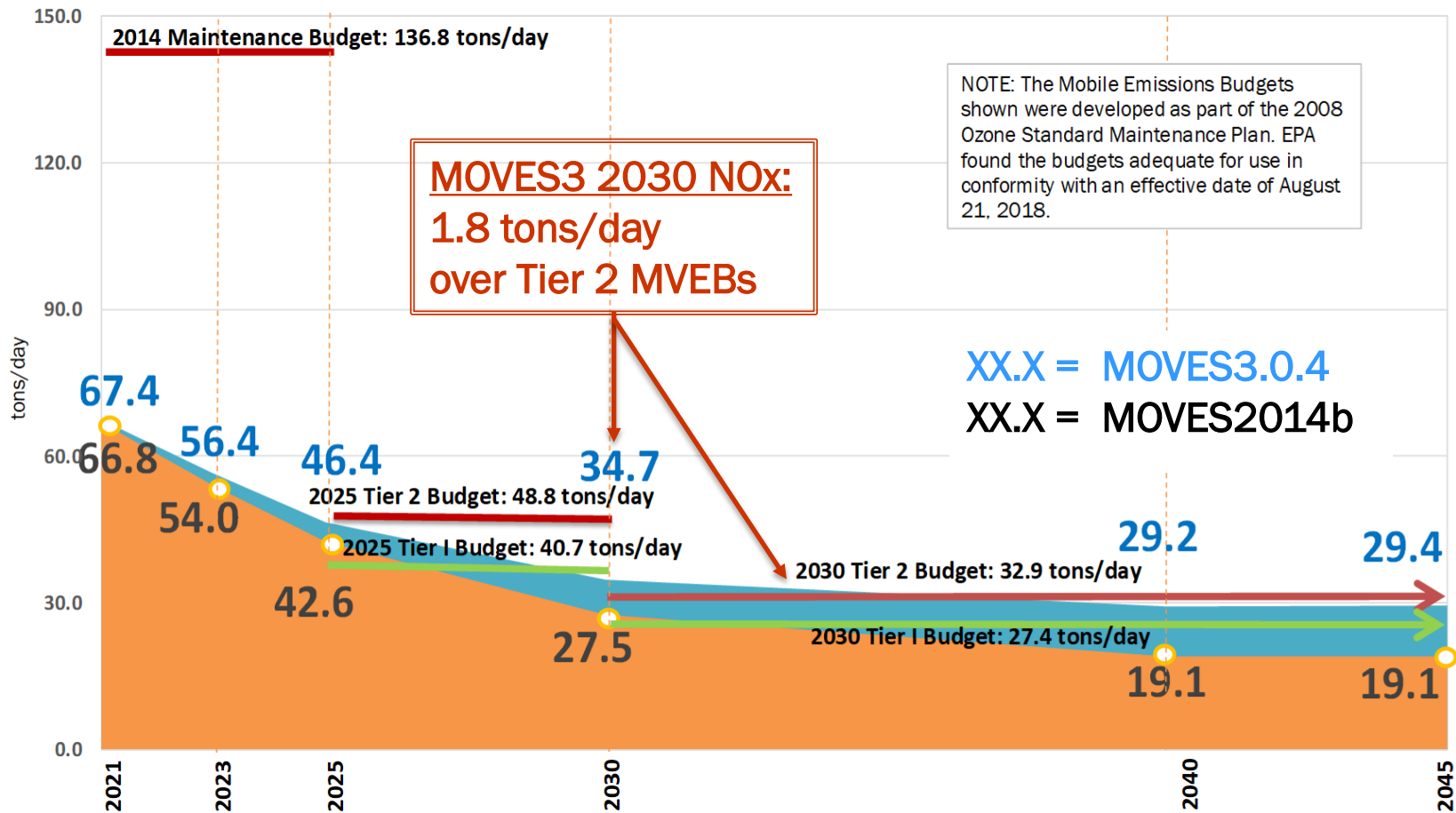
# MOVES3 – Preliminary Sensitivity Tests

## MOVES3 vs MOVES2014: NO<sub>x</sub> (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%

# MOVES3- NOx emissions vs MVEBs

Ozone Season NOx: MOVES2014b Vs. MOVES3.0.4



NOx emissions from 2022 Update to Visualize 2045



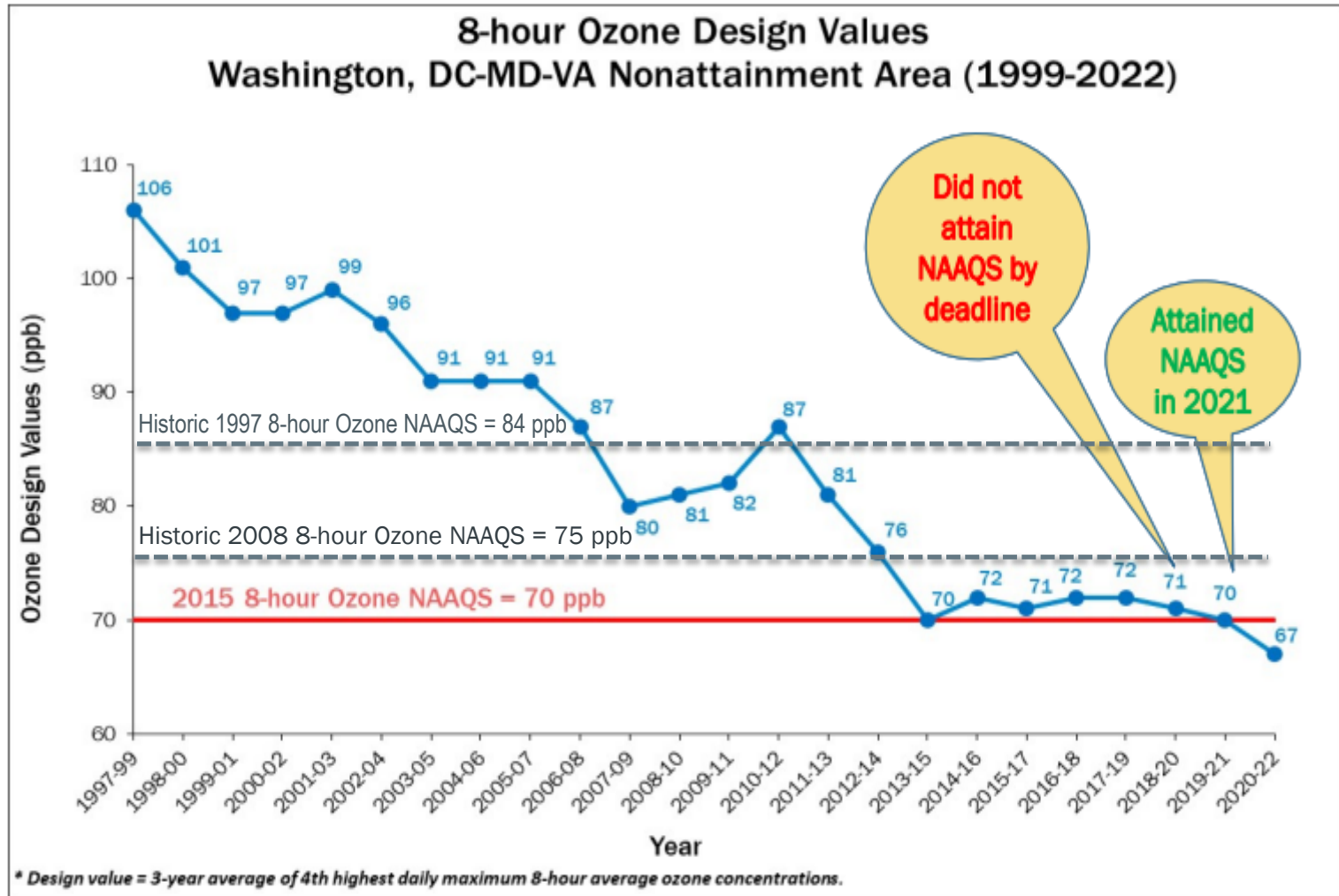
# MOVES3- Other Urban Areas

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- TPB staff reached out to other metropolitan planning organizations representing urban areas to see if they have experienced a significant NO<sub>x</sub> increase when using MOVES3 relative to MOVES2014b.
- Several other metropolitan areas around the country have seen significant NO<sub>x</sub> increases. Atlanta Regional Commission and North Central Texas COG (Dallas) shared specific results:
  - Atlanta >80% increase in NO<sub>x</sub> in 2050
  - Dallas 40% increase in NO<sub>x</sub> in 2045



# Observed Ozone Levels Over Time vs NAAQS



NOTE: 2022 data (current to Sept 16, 2022) is draft and incomplete.



# Ozone NAAQS

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Regional Conformity Analysis must currently address two ozone National Ambient Air Quality Standards (NAAQS):

- 2008 (historic) ozone standard (75 ppb)
- 2015 (current) ozone standard (70 ppb)



# Motor Vehicle Emissions Budgets

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- Current Motor Vehicle Emission Budgets (MVEBs) (from 2008 ozone standard maintenance plan) were developed using MOVES2014.
- Future LRTP conformity analysis mobile inventories must be developed using MOVES3 but will be compared to those MVEBs developed using MOVES2014.
- The region needs updated MVEBs developed using the new MOVES3 model so that conformity and the MVEBs are consistent.



# Next Steps:

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- MWAQC is working with EPA to determine requirements associated with updating the current MVEBs in the 2008 ozone standard maintenance plan.
- TPB staff will develop mobile inventories for the 2008 ozone maintenance plan analysis years.
  
- MWAQC plans to develop a 2015 ozone standard maintenance plan.
- TPB staff will develop mobile inventories for a 2015 ozone standard maintenance plan.



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