

PM2.5 Maintenance Plan Update



MWAQC
February 24, 2016

Background

- EPA set standards for fine particles (PM_{2.5}) in 1997 at
 - 15.0 ug/m³ (annual) – changed to 12.0 ug/m³ (2012)
 - 65 ug/m³ (24 hour average) – changed to 35 ug/m³ (2006)
- EPA designated the Washington, DC-MD-VA region as “nonattainment” for the annual PM_{2.5} standard in 2005
- Washington region submitted PM_{2.5} SIP (Attainment Plan) in 2008
- After attaining PM_{2.5} standard, Washington region submitted a request to redesignate the region to attainment and a demonstration to maintain the compliance with standard in 2013 (PM_{2.5} Redesignation Request & Maintenance Plan)

Elements of Original of PM2.5 Redesignation Request & Maintenance Plan

- **Air Quality Data**
 - Air quality (fine particles or PM2.5) data to show compliance with the 1997 PM2.5 standard
- **Emissions Inventories (Point, Area, Nonroad, and On-road Sources)**
 - **Redesignation Request:**
 - SIP Base Year 2002 & Attainment Year 2007 demonstrating a decline in emissions between the two years
 - **Maintenance Plan:**
 - Attainment Year 2007, Intermediate Year 2017, Final Maintenance Year 2025
 - Demonstrate compliance ten years into future by showing lower emissions in 2017 and 2025 compared to 2007
- **Motor Vehicle Emissions Budgets (MVEBs)**
 - Mobile emissions ceilings for transportation conformity purposes
- **Contingency Measures**
 - In case region exceeds PM2.5 standard in future, these measures would be implemented
- **State Compromise (Appendix D)**
 - Voluntary agreement between DOEE, MDE, and VDEQ to further address PM2.5 and ozone

Why Update PM2.5 Maintenance Plan?

- **State Compromise (Appendix D)**
 - Commits to updating the PM2.5 Maintenance Plan
 - Agreement between states:
 - To evaluate and submit updated annual PM2.5 & NOx MVEBs for 2017 and 2025 by the end of 2015, and
 - To re-evaluate these MVEBs in 2018 to accommodate transportation planning issues when transportation conformity milestone year is extended beyond 2040
 - Agreement is voluntary, not a federal requirement
- **Revision of MVEBs Requires Plan Update**
 - EPA requires that emissions from the other three sectors (point, area, and nonroad) also be updated or that a justification for not updating those sectors be included while submitting revised MVEBs

Elements of the Updated PM2.5 Maintenance Plan

1. State Implementation Plan Overview

2. Revisions to the MEVBs

- On-road emissions & MVEBs revised with MOVES2014
- Follows a two-tier (Tier 1 & Tier 2) approach

3. Revisions to the Maintenance Demonstration

- Revisions to the 2007 Attainment Year Inventory
- Revisions to the 2017 and 2025 Projection Inventories
- Inventory and Emissions Trend Analysis
- Air Quality

4. Conclusion

- **Appendix A – Methodology to Develop On-Road Mobile Emission and Motor Vehicle Emissions Budgets**
- **Appendix B – Input, RunSpec, and Output files for ON-Road Mobile Emissions by source Classification Code**
- **Appendix C - Updated State Compromise**
 - Reflects revised MOVES2014 based MVEBs and removal of items that are complete

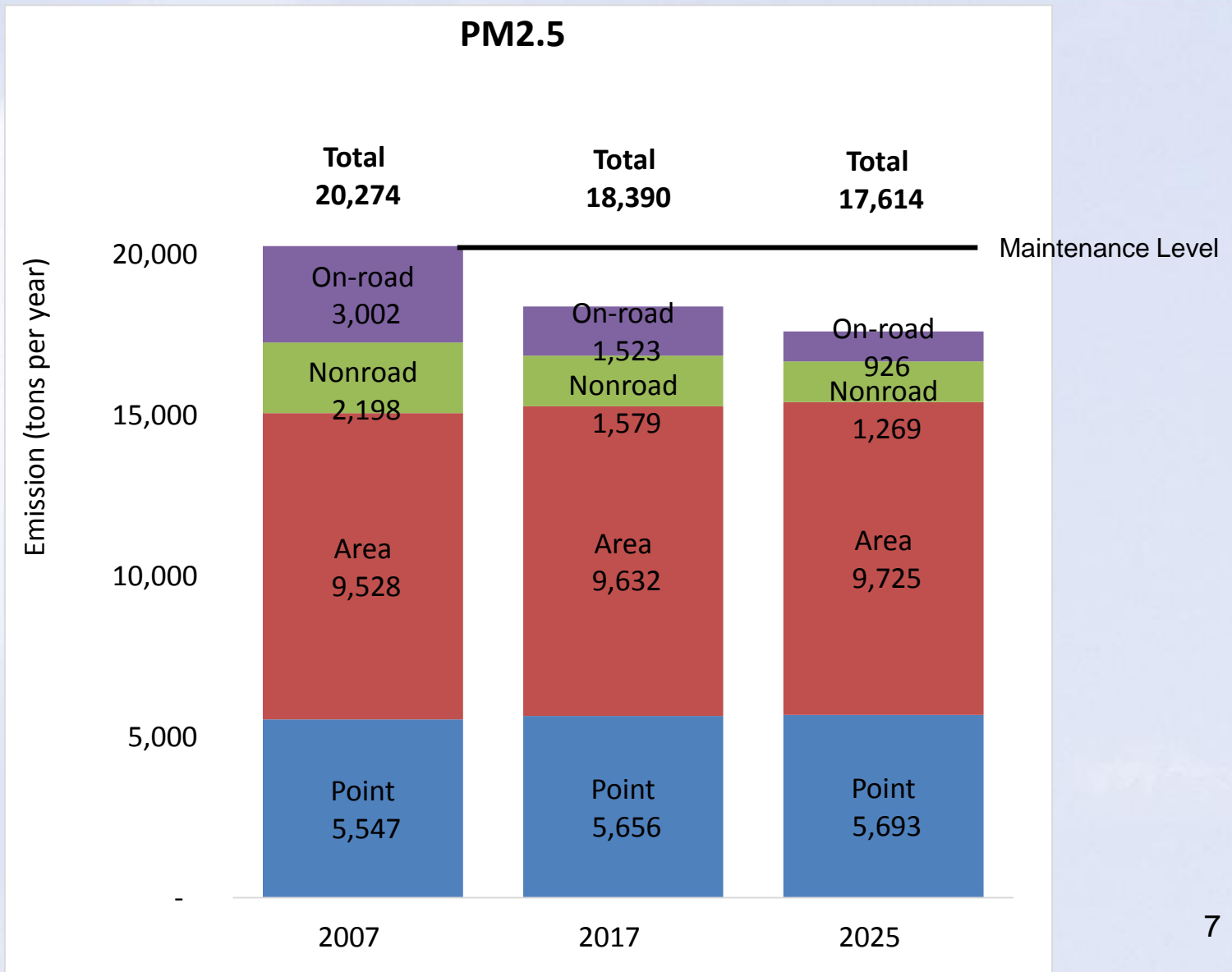
Updates in Emissions Inventories

PM2.5 Maintenance Plan

- **Electric Generating Units (Point Source)**
 - DC & VA emissions – No updates
 - MD emissions: No change, but includes a description of new power plant NO_x regulations recently adopted
- **Non-EGU (Point), Area & Nonroad Mobile Sources**
 - No updates
 - Growth & control assumptions used to project future emissions either did not change or changed mostly in favor of lower emissions
- **Onroad Mobile Source**
 - Emissions revised with EPA's MOVES2014 model
 - Uses latest model inputs available

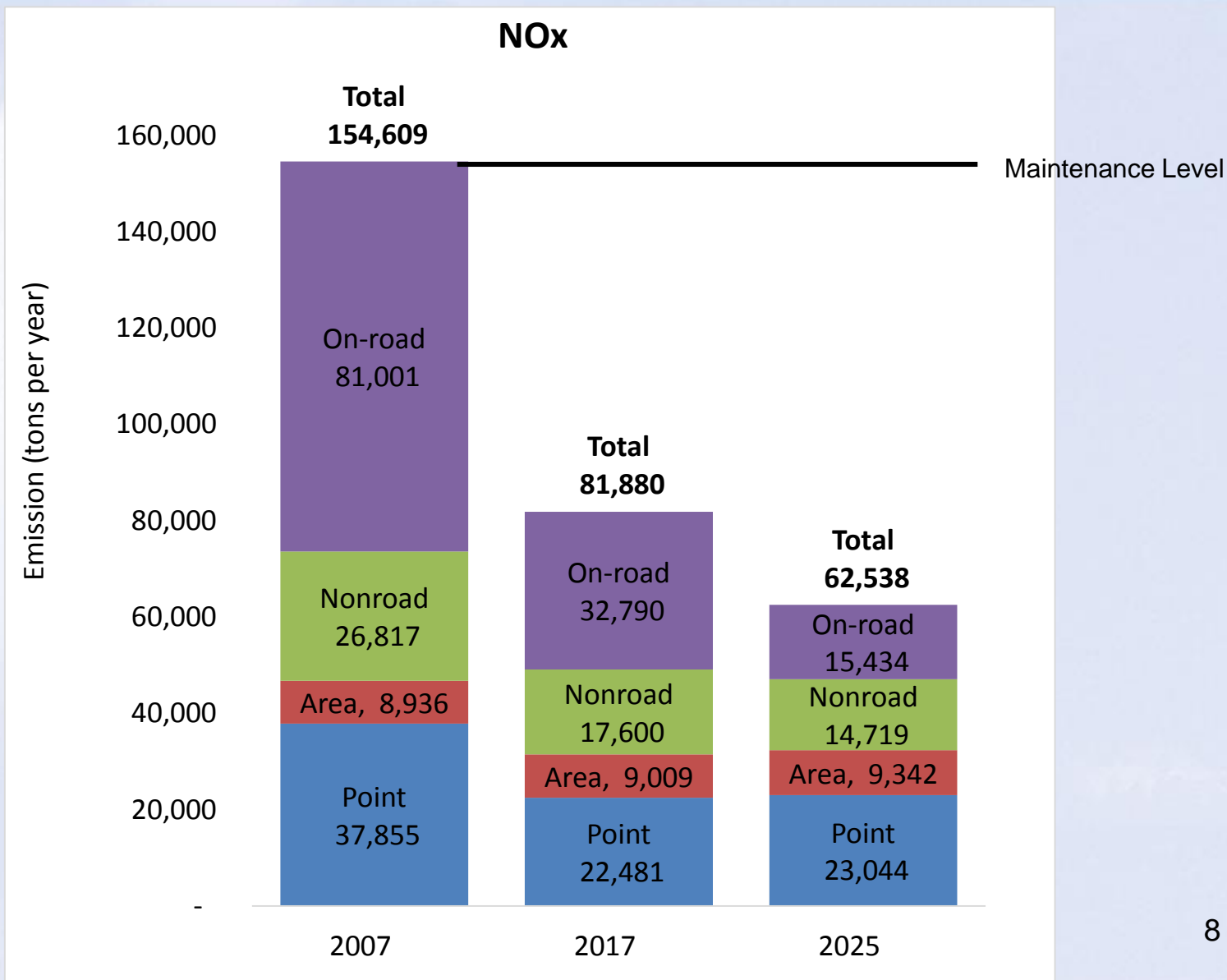
Updated PM2.5 Maintenance Plan

Direct PM2.5 Emissions Continue to be Lower in the Future



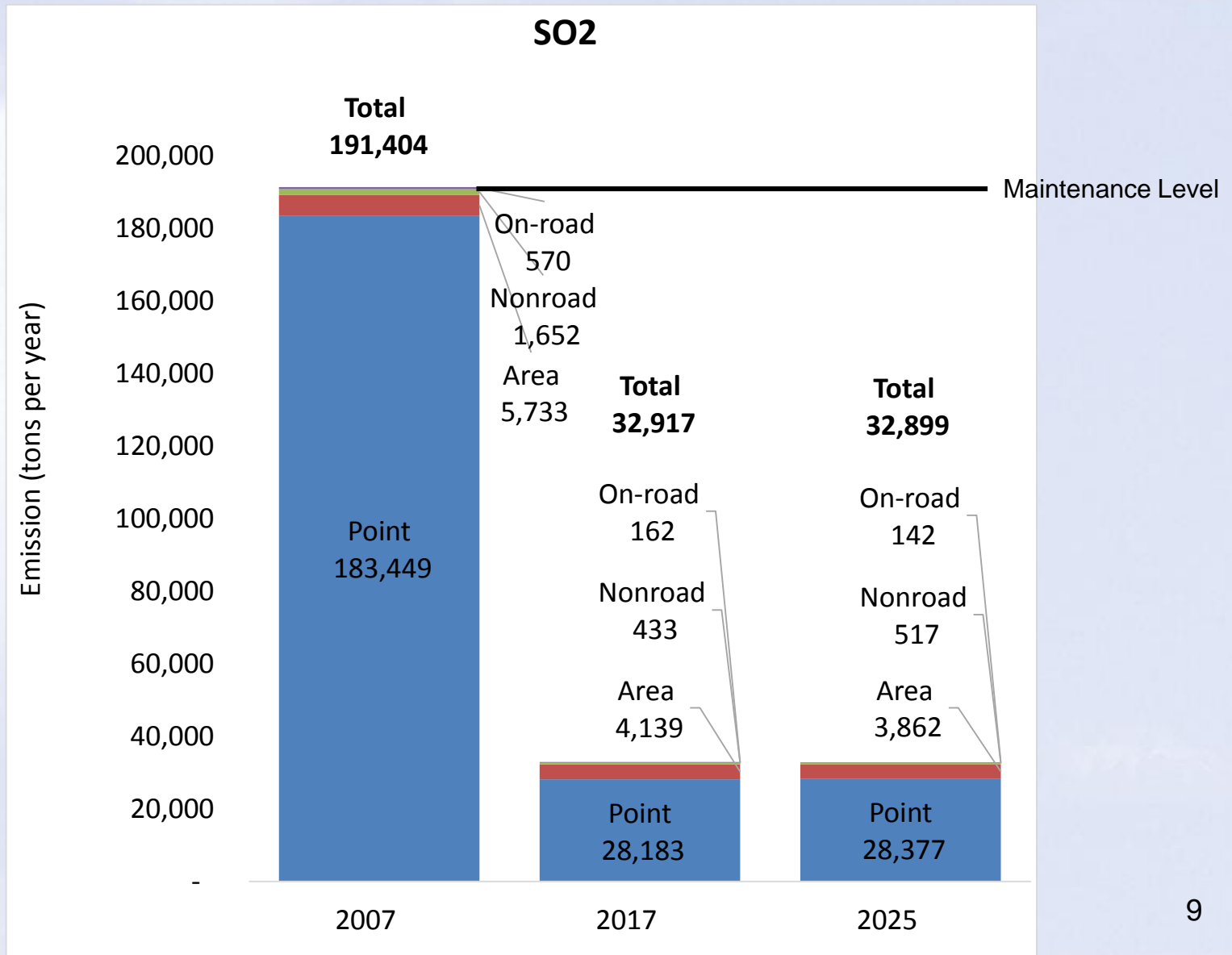
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NOx Emissions Continue to be Lower in the Future



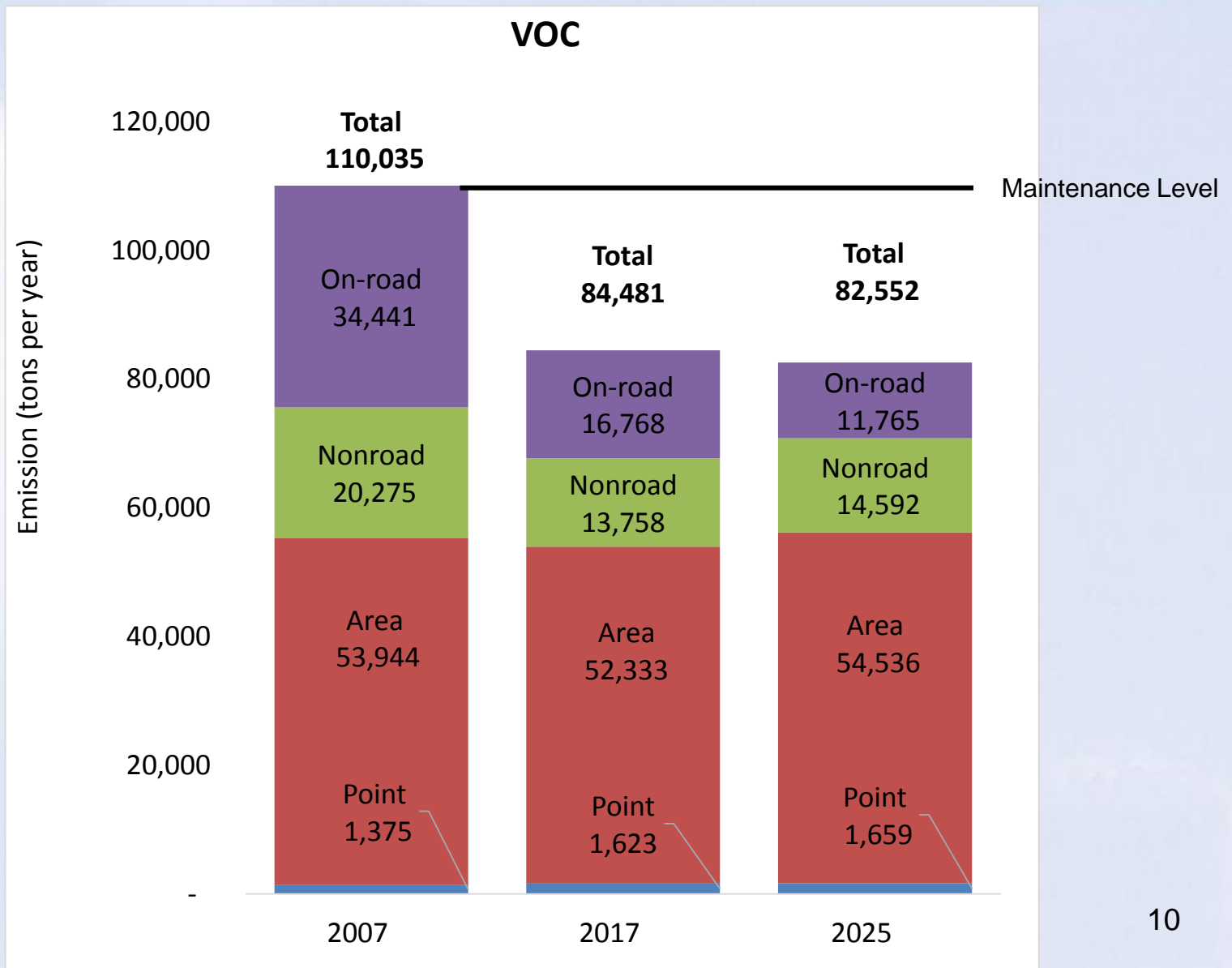
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Sulfur Dioxide Emissions Continue to be Lower in the Future



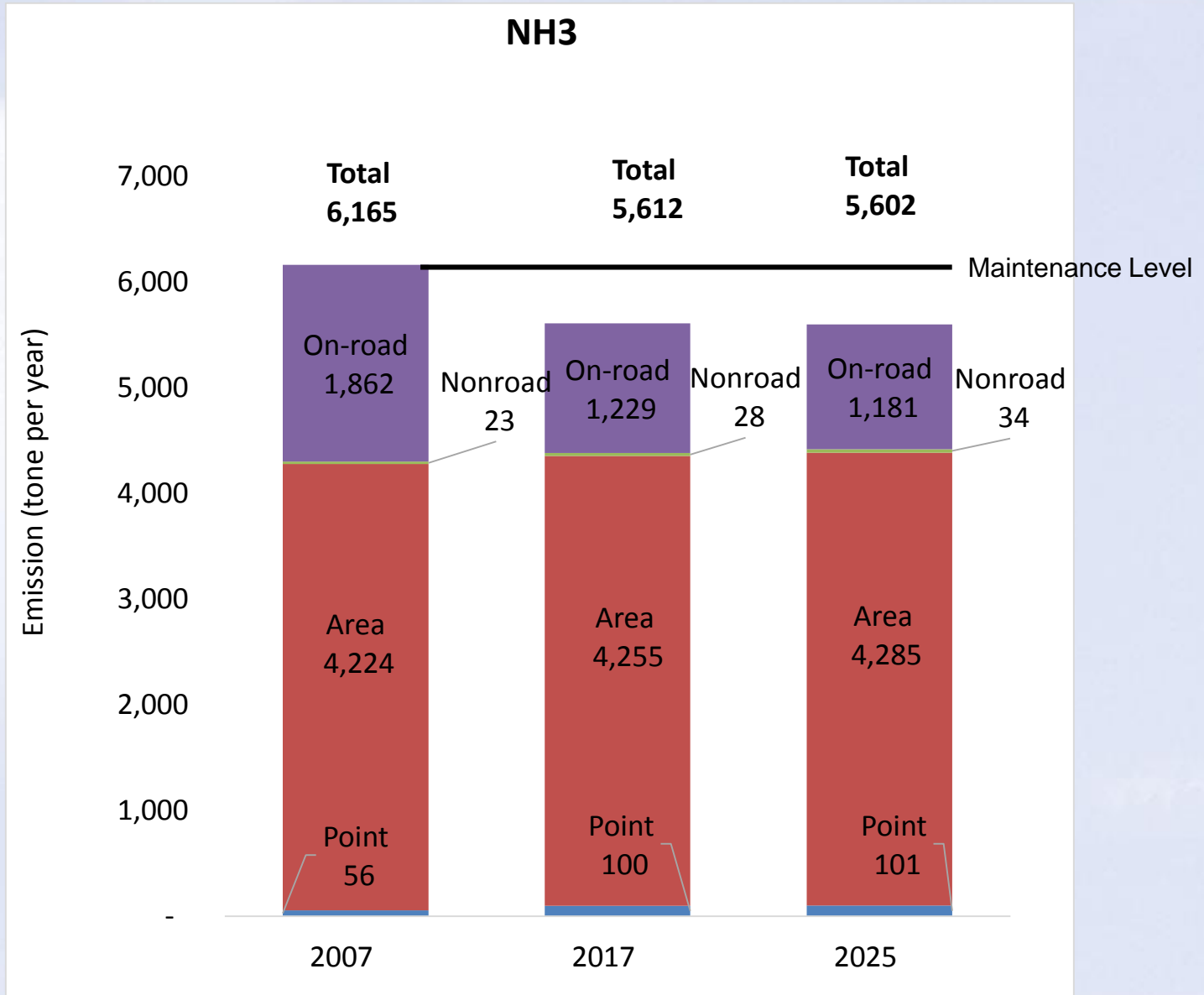
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Volatile Organic Compound Emissions Continue to be Lower in the Future

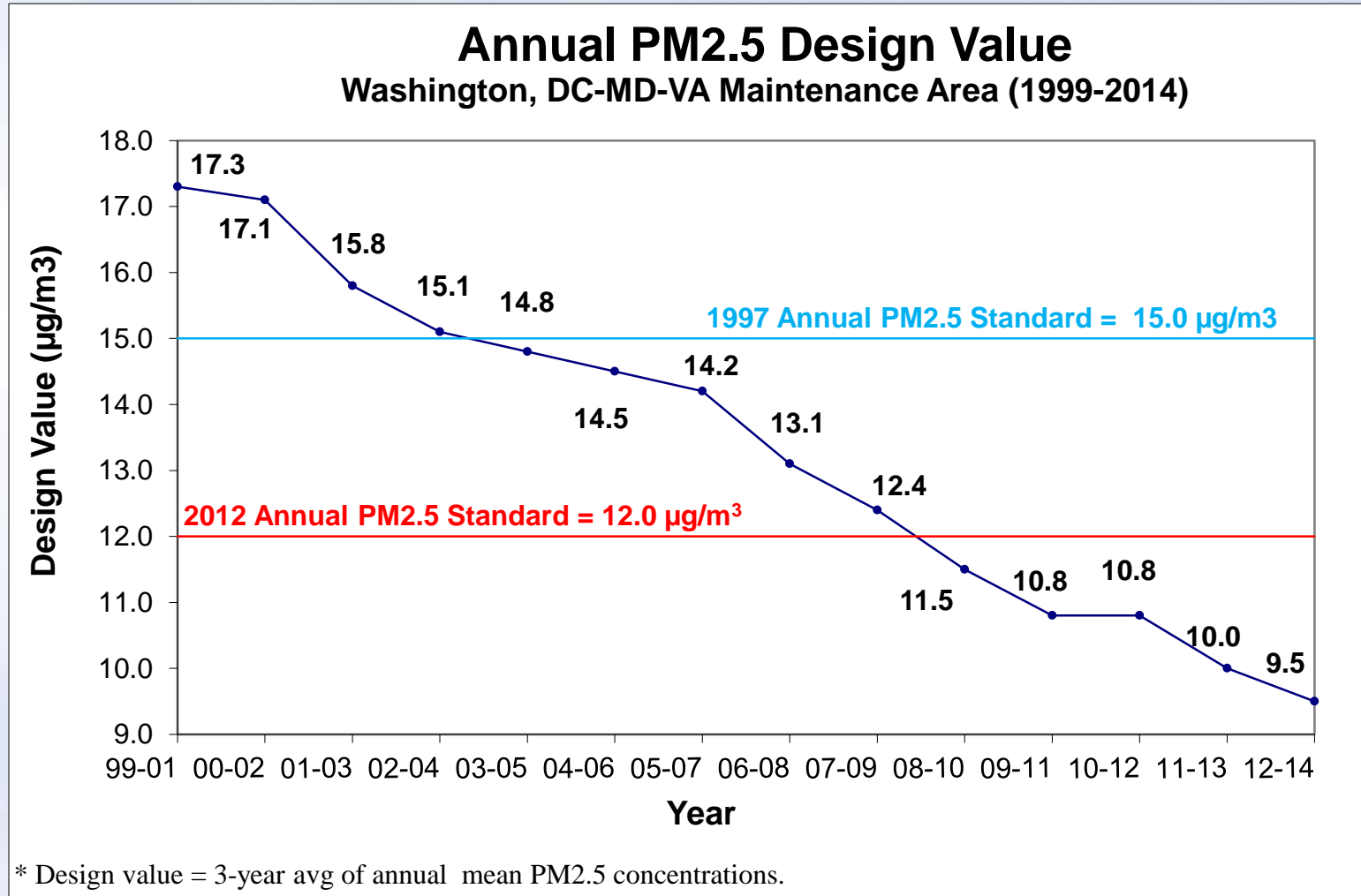


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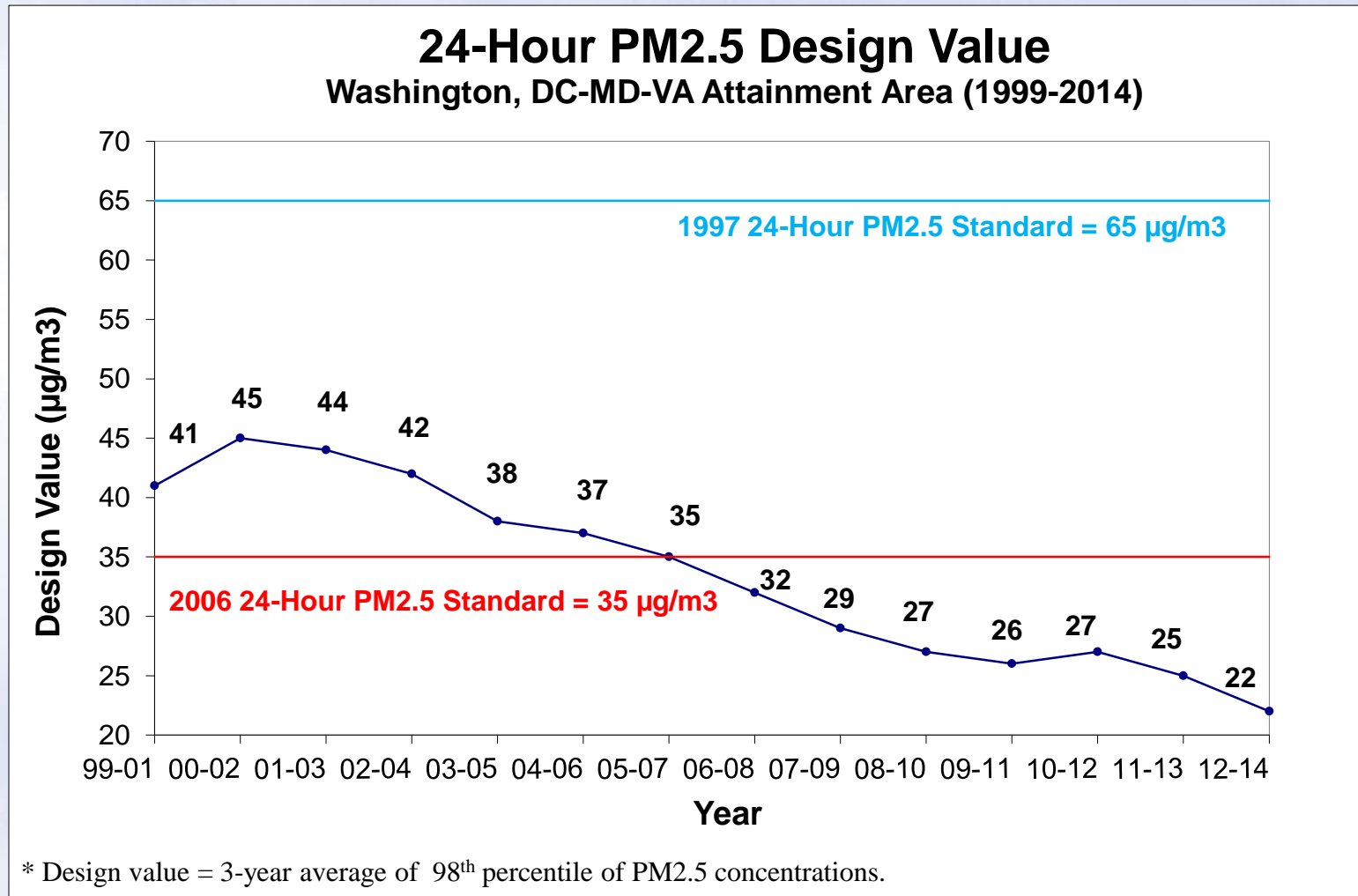
Ammonia Emissions Continue to be Lower in the Future



Updated Data – Trend in Ambient PM2.5 Levels Washington DC-MD-VA PM2.5 Maintenance Area



Updated Data – Trend in Ambient PM2.5 Levels Washington DC-MD-VA PM2.5 Maintenance Area



PM2.5 Maintenance Plan Updates

MVEBs & State Compromise

- **Updated Motor Vehicle Emissions Budgets (MVEBs)**
 - On-road emissions revised with EPA's MOVES2014 model
 - Updated MVEBs based on MOVES2014 model
 - Follows a two-tier (Tier 1 & Tier 2) approach
 - Use of Tier 2 addressed through the CLRP Interagency Consultation Process
- **Updated State Compromise Document (Now called Appendix C)**
 - Updates made to reflect revised MOVES2014 based MVEBs and to remove items that are no longer relevant

Original vs. Updated PM2.5 Maintenance Plan MOVES2014 Model Inputs & Technical Assumptions

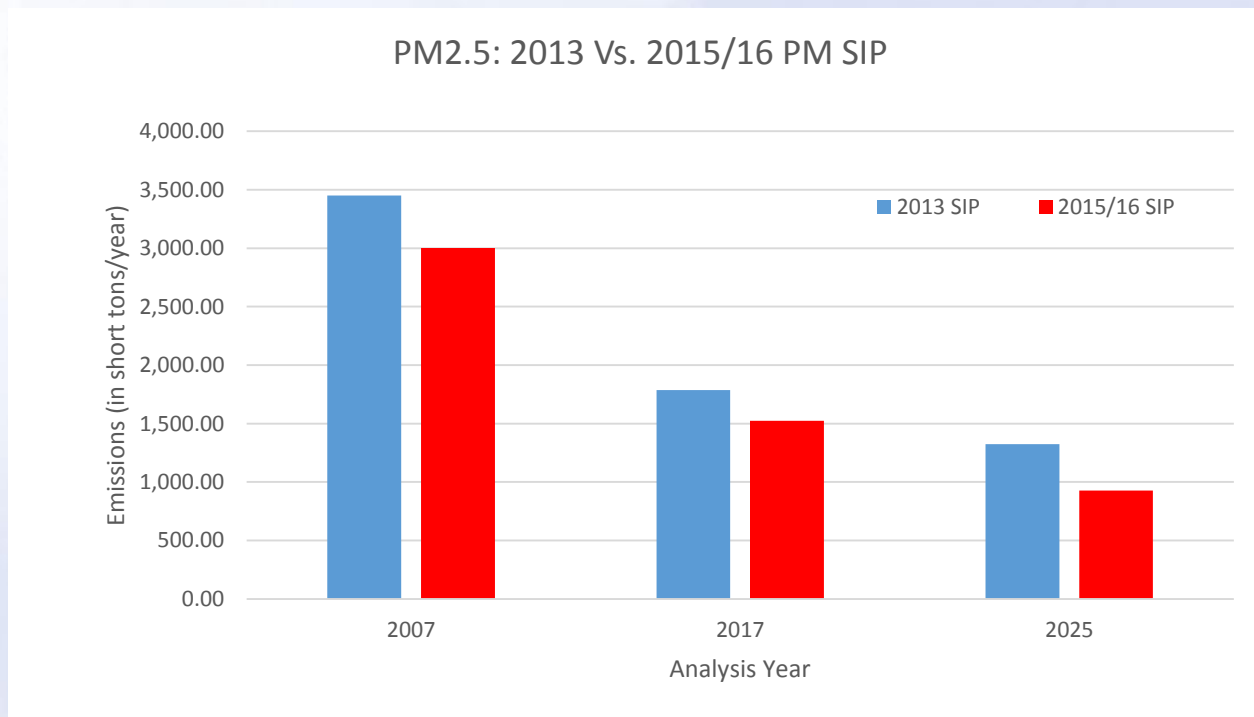
	Original PM2.5 Inventory	Updated PM2.5 Inventory
CLRP	2011	2015
Land Activity	8.0a	8.4
Travel Demand Model	Version 2.3.36	Version 2.3.57a
Emissions Model	MOVES2010a	MOVES2014
Vehicle Registration Data	2008 VIN/2011 VIN	2008 VIN/2014 VIN
Fuel Program	No Tier 3	Tier 3
PM2.5 Study Area	TPB Modeled Area (10 jurisdictions)	TPB Modeled Area (10 jurisdictions)
Years Analyzed	2002, 2007, 2017, 2025 and 2040	2007, 2017 and 2025

Original vs. Updated PM2.5 Maintenance Plan

On-road Mobile Source Emissions

Direct PM2.5

Analysis Year	2013 SIP	2015/16 SIP	Δ	% Δ
2007	3,451.62	3,001.67	-449.95	-13%
2017	1,786.94	1,522.67	-264.27	-15%
2025	1,322.29	926.48	-395.81	-30%



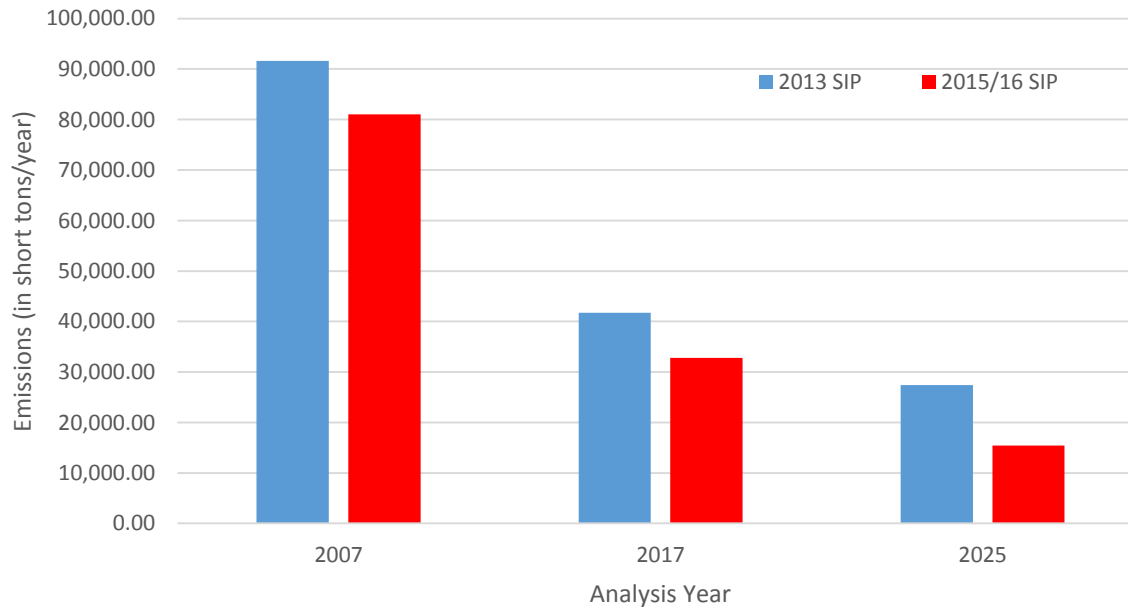
Original vs. Updated PM2.5 Maintenance Plan

On-road Mobile Source Emissions

NOx

Analysis Year	2013 SIP	2015/16 SIP	Δ	% Δ
2007	91,638.63	81,000.64	-10,637.99	-12%
2017	41,708.88	32,790.05	-8,918.82	-21%
2025	27,399.65	15,433.72	-11,965.93	-44%

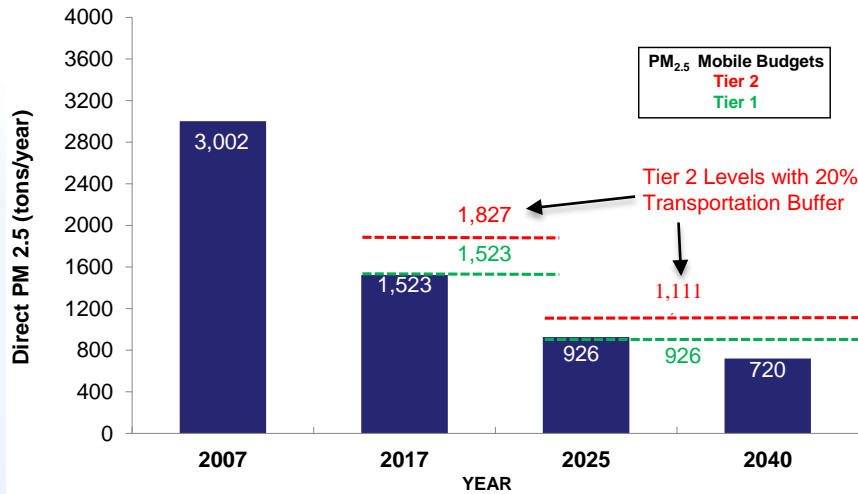
Precursor NOX: 2013 Vs. 2015/16 PM SIP



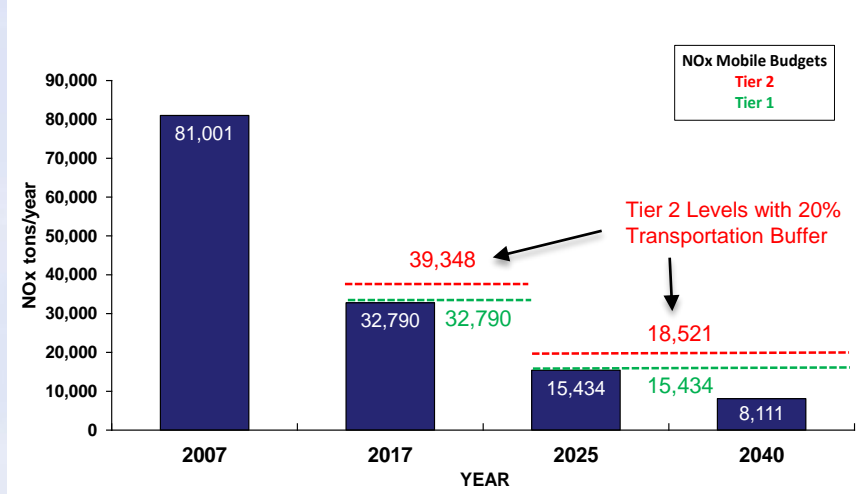
Updated PM2.5 Maintenance Plan

Motor Vehicle Emissions Budgets (Two Tier Approach)

Mobile PM2.5 Emissions & Two-Tier Budgets



Mobile NOx Emissions & Two-Tier Budgets



Maintenance Plan Update Schedule

December 18, 2015	Emissions Inventory Subcommittee Call: Review Inventories for all Sectors and Discuss Updated Mobile Budgets
January 8, 2016	TPB-Technical Committee: Inventory and Updated Mobile Budget Presentation
January 12, 2016	MWAQC-TAC: Inventory and Updated Mobile Budget Presentation
January 20, 2016	TPB: Inventory and Updated Mobile Budget Presentation
February 9, 2016	MWAQC-TAC: Draft Maintenance Plan Approval for MWAQC Consideration
February 24, 2016	MWAQC: Maintenance Plan Approval for Public Comment and Hearing
March-April, 2016	Public Comment and Hearing
May 25, 2016	MWAQC: Final Approval for Submittal to EPA
June, 2016	States Submit Updated Maintenance Plan to EPA