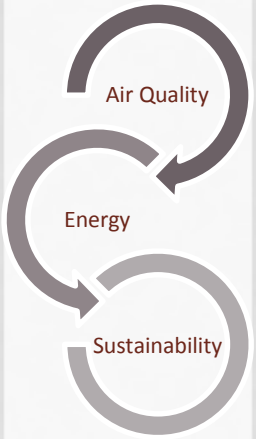
DIVISION OF AIR QUALITY

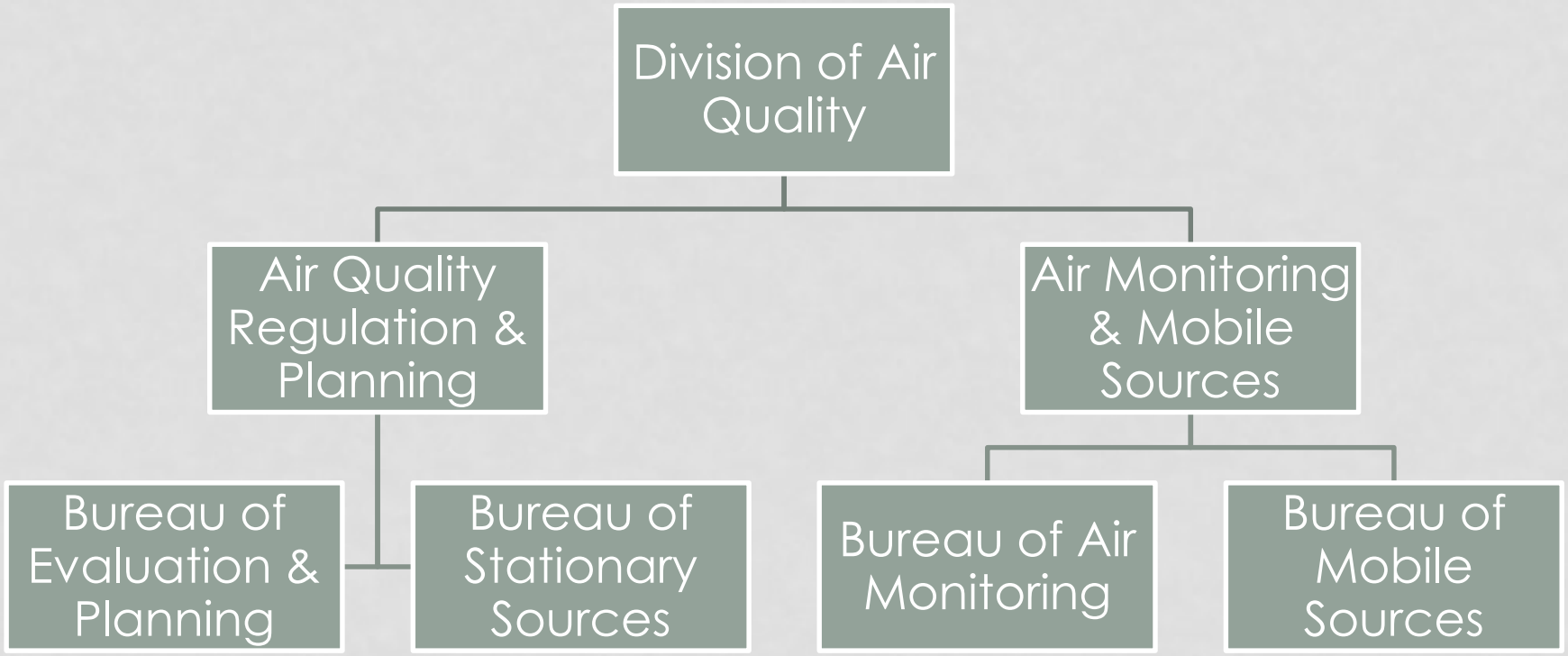
AIR QUALITY, ENERGY, AND SUSTAINABILITY

EVALUATION & PLANNING

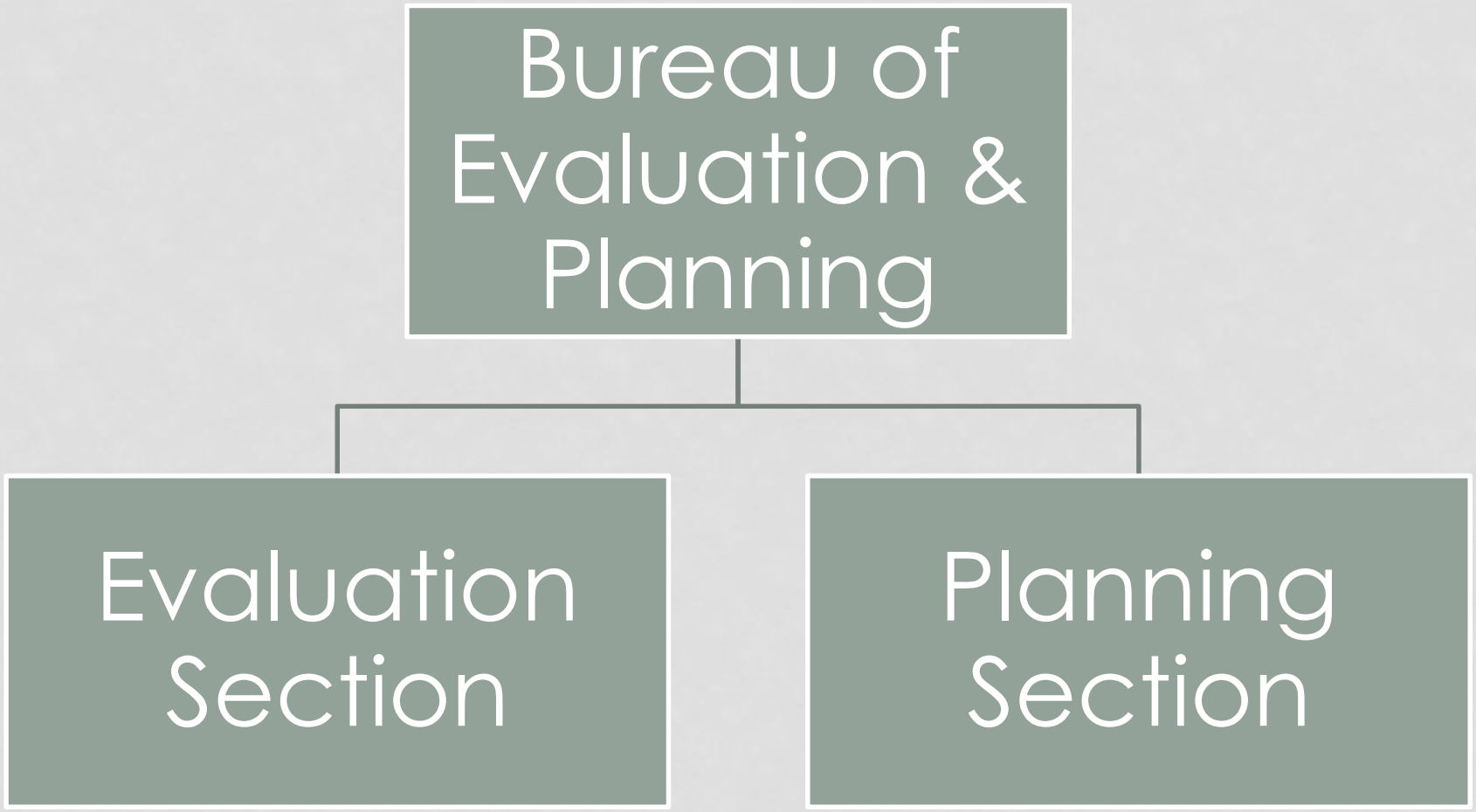
A&WMA 15TH ANNUAL REGULATORY UPDATE CONFERENCE NOVEMBER 18, 2016



DIVISION OF AIR QUALITY



BUREAU OF EVALUATION & PLANNING



GOAL

PROTECT PUBLIC HEALTH

EVALUATION

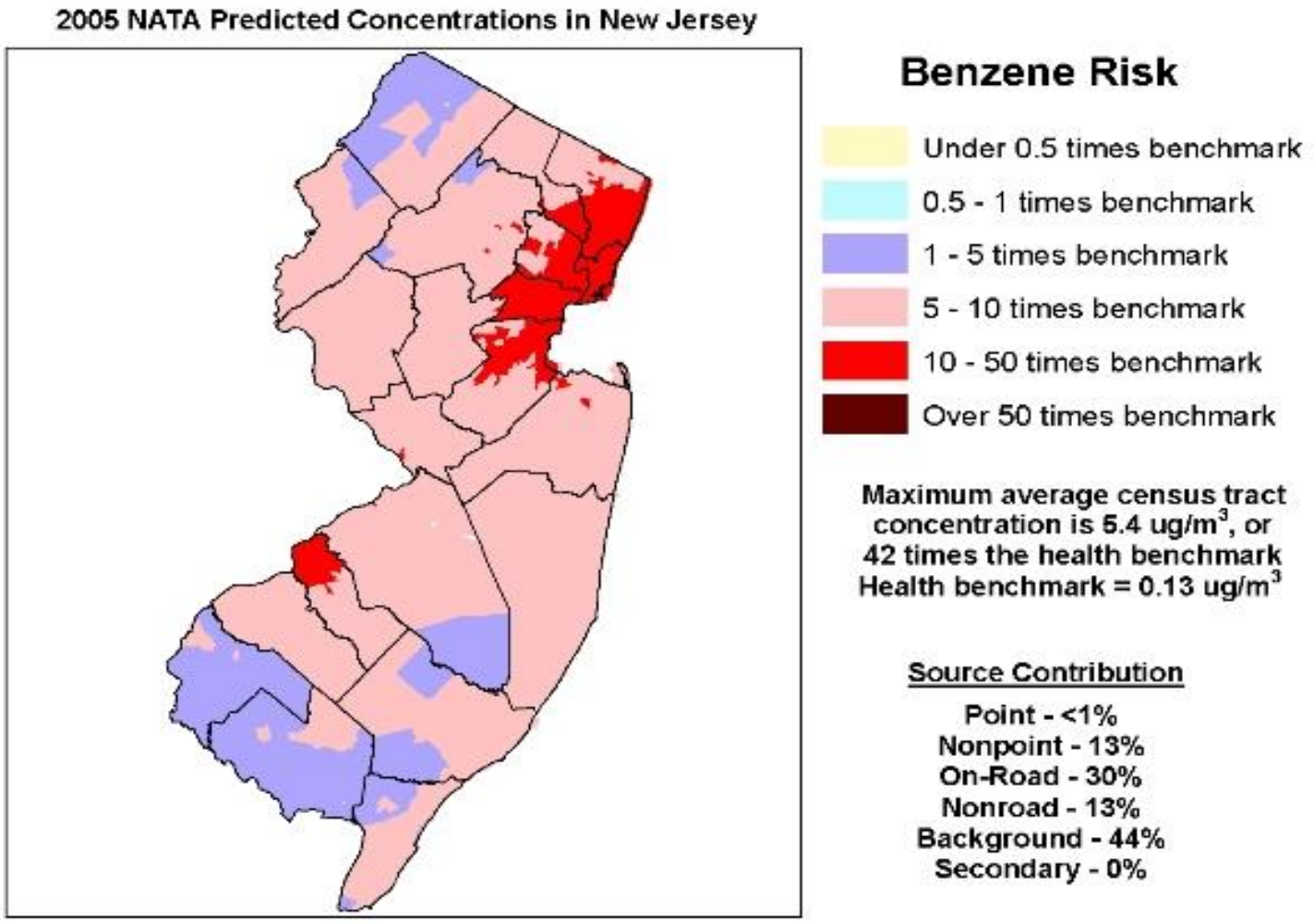
- Air toxics
- Risk assessment
- Point source modeling
- Air quality forecasting
- Emission statements
- Regulations

AIR TOXICS OF GREATEST CONCERN IN NEW JERSEY

2005 CHEMICALS OF CONCERN IN NEW JERSEY

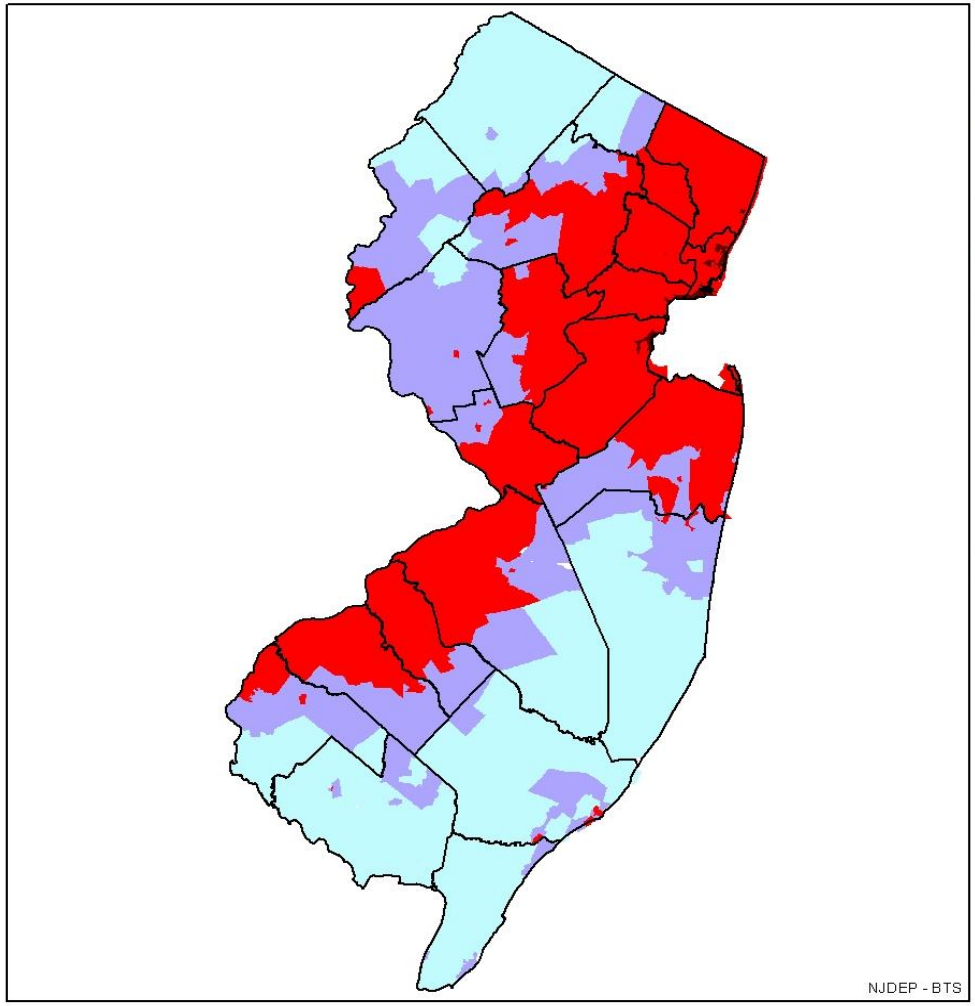
Pollutant	Number/Name of Counties Above Health Benchmarks	Primary Emissions Source
Acetaldehyde	21	Background/Secondary
Acrolein	21	Background, Nonpoint
Arsenic Compounds	19	Background/Secondary
Benzene	21	Background, Mobile
1,3-Butadiene	21	Background, Mobile
Cadmium Compounds	1 (Warren)	Nonpoint, Background
Carbon Tetrachloride	21	Background
Chloroform	21	Nonpoint, Background
Chromium VI	20	Background, Point
Cobalt Compounds	7	Point
1,4-Dichlorobenzene	8	Nonpoint, Background
1,3-Dichloropropene	1 (Hudson)	Nonpoint
Diesel Particulate Matter	21	Mobile
Ethylbenzene	6	Mobile, Nonpoint
Ethylene Oxide	6	Background, Nonpoint
Formaldehyde	21	Background/Secondary
Methyl Chloride	21	Background
Naphthalene	20	Nonpoint, Mobile
Nickel Compounds	1	Nonpoint, Point
PAH/POM	18	Nonpoint
Perchloroethylene	8	Nonpoint, Background
1,1,2-Trichloroethane	1 (Salem)	Nonpoint

NJ AIR TOXICS MAPS



NJDEP LOOKS AT RISK THAT EPA DOES NOT

2005 Estimated Diesel Particulate Risk in New Jersey from Mobile Sources



Diesel Particulate Risk

- Under 10 times benchmark
- 10 - 50 times benchmark
- 50 - 100 times benchmark
- 100 - 1000 times benchmark
- 1000 - 2400 times benchmark

Maximum average census tract concentration is 7.9 ug/m^3, or 2379 times the health benchmark
Health Benchmark = 0.0033 ug/m^3

Source Contribution

On-Road - 47%
Nonroad - 53%

Based on 2005 NATA concentrations and California cancer risk factor.

STATEWIDE

New Jersey Statewide Average 2005 NATA Modeled Air Concentrations Compared to Health Benchmarks								
Pollutant	Modeled Air Concentration (ug/m^3)	Health Benchmark (ug/m^3)	Risk Ratio	% Contribution by Source Category				
				Point Sources	Nonpoint Sources	Onroad Mobile	Nonroad Mobile	Background& Secondary
Acetaldehyde	1.9	0.45	**4.3**	<1%	4%	6%	3%	87%*
Acrolein	0.062	*0.020*	***3.1***	<1%	22%	14%	9%	55%*
Arsenic Compounds	0.0005	0.00023	**2.3**	3%	13%	5%	5%	74%
Benzene	1.3	0.13	**10**	<1%	13%	30%	13%	44%
1,3-Butadiene	0.095	0.033	**2.9**	<1%	<1%	40%	17%	43%
Cadmium Compounds	0.00011	0.00024	0.5	12%	44%	0%	1%	43%
Carbon Tetrachloride	0.61	0.067	**9.1**	0%	<1%	0%	0%	100%
Chloroform	0.13	0.043	**3.1**	<1%	54%	0%	0%	46%
Chromium (hexavalent form)	0.00024	0.000083	**2.9**	29%	10%	4%	1%	56%
Cobalt Compounds	0.000093	0.00011	0.8	93%	7%	0%	0%	0%
1,4-Dichlorobenzene	0.12	0.091	**1.3**	<1%	58%	0%	0%	42%
1,3-Dichloropropene	0.14	0.25	0.5	0%	100%	0%	0%	0%
Diesel Particulate Matter	1.1	0.0033	**327**	0%	0%	47%	53%	0%
Ethylbenzene	0.34	0.40	0.9	1%	30%	45%	24%	0%
Ethylene Oxide	0.011	0.011	**1**	12%	18%	0%	0%	70%
Formaldehyde	2.2	0.077	**28**	<1%	3%	9%	6%	82%*
Methyl Chloride	1.2	0.56	**2.2**	<1%	1%	0%	0%	99%
Naphthalene	0.13	0.029	**4.6**	1%	48%	26%	4%	21%
Nickel Compounds	0.0012	0.029	0.6	36%	37%	2%	10%	15%
PAH/POM	0.012	0.0072**	**1.6**	1%	79%	8%	12%	0%
Perchloroethylene	0.25	0.17	**1.4**	<1%	61%	0%	0%	39%
1,1,2-Trichloroethane	0.0066	0.063	0.1	<1%	100%	0%	0%	0%

- Chemicals with risk ratios greater than or equal to 1 are in **bold**.
- Risk Ratios based on noncarcinogenic effects are in *italics*.
- The symbol ug/m^3 is micrograms per cubic meter, the amount (in micrograms) of a chemical in a cubic meter of air. This is also known as a concentration.
- For diesel particulate matter, onroad and nonroad concentrations include a model-estimated background concentration.
- *Acetaldehyde, acrolein and formaldehyde concentration estimates include secondary formation, which is the process by which chemicals in the air are transformed into other chemicals.
- **PAH/POM is "polycyclic aromatic hydrocarbons/polycyclic organic matter." These define a broad class of compounds. The chemicals making up this class were broken up into 8 groups based on toxicity, and each group was assigned a cancer-weighted toxicity estimate. 0.0072 ug/m^3 is the health benchmark average across the 8 groups.

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Risk Screening Tools

Estimating Risk from Air Toxics

The NJDEP Air Quality Permitting Program uses risk assessment to evaluate potential effects on public health from facilities seeking permits to emit air toxics. An overview of the risk assessment process can be found in Technical Manual 1003, which also includes details on preparing a risk assessment. However, many permit applications can be evaluated using a risk screening worksheet. Information on risk assessment for various types of emissions can be found below.

- Technical Manual 1003: Guidance on Preparing a Risk Assessment Protocol for Air Contaminant Emissions
- Procedures to Conduct Risk Assessments to Determine the Incremental Health Risks from New or Modified Equipment

Risk Screening Tools for Air Quality Permits		
Description	**Format**	**Updated**
Cancer Risk Screening Worksheet for Nonroad Diesel Engines	MS Excel	7/15
Development of the Risk Screening Worksheet for Nonroad Diesel Engines	Adobe Pdf	7/15
Revisions to the NJDEP/DAQ Risk Screening Worksheet	Adobe Pdf	2/16
NJDEP Division of Air Quality Risk Screening Worksheet for Long-Term Carcinogenic and Noncarcinogenic Effects and Short-Term Effects	MS Excel	2/16
Methodology and Assumptions Used to Generate the Revised Level-1 Air Impact Values	Adobe Pdf	4/07
Risk Screening Policy and Second-Level Risk Screening	Adobe Pdf	6/07
Toxicity Values for Inhalation Exposure	Adobe Pdf	2/16
Risk Screening for PAH/POM	Adobe Pdf	1/13

Clean Air NJ

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What's Your Air Quality Today?
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Outreach Materials
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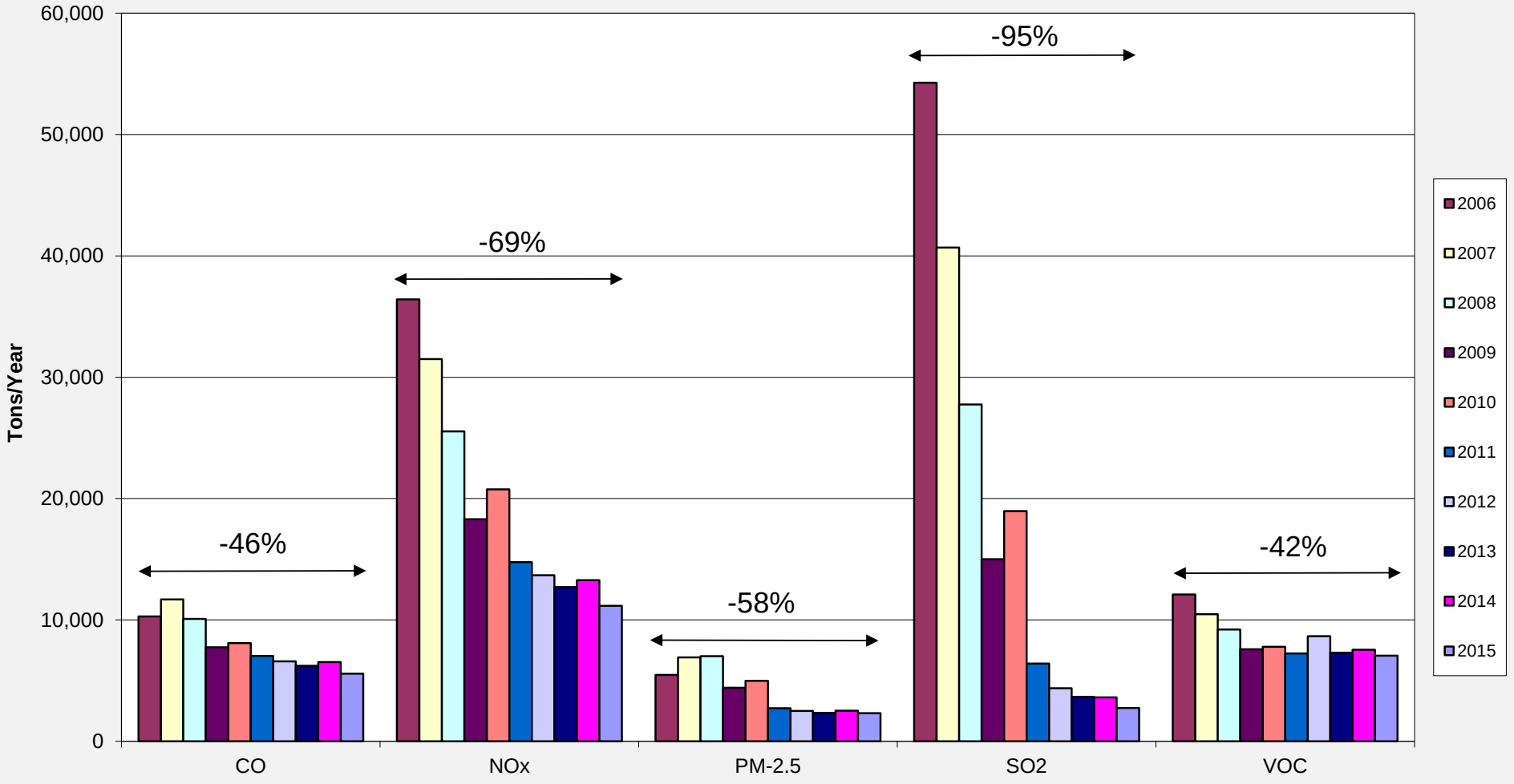
E-mail List
Upcoming Events
Contact Us

What's Your Air Quality Today?

The USEPA developed the Air Quality Index (AQI) to report daily air quality to the public. The AQI tells you how clean your local air is, and what associated health effects might be a concern in your area. Think of the AQI as a yardstick that runs from 0 to 300. The higher the AQI value, the greater the level of air pollution and the greater the health concern. To make it even easier, USEPA color coded the AQI so you can tell at a glance when you need to take precautions. Since an AQI value of 100 generally corresponds to the national ambient air quality standard for smog, AQI values below 100 are considered safe (green or yellow). When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher (orange and red). New Jersey's level has never exceeded an AQI of 200 – the purple color on the chart – and has rarely been over 150 – the red color on the chart.

AQI Values (Ozone Conc. Range)	Air Quality Descriptors	Who Should Be Concerned and What Should They Do About It:
0 – 50 (0-54 ppb)	Good	**No health impacts are expected when air quality is in this range.**
51 – 100 (55-70 ppb)	Moderate	**Unusually sensitive people should consider limiting prolonged outdoor exertion.**
101 – 150 (71-85 ppb)	Unhealthy for Sensitive Groups	**Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.**

Ten Year Trend on Emissions Reported to the Emission Statement Program



PLANNING

- State implementation Plan (SIP)
- Emissions inventory
- Control strategies
- Regional air quality modeling
- Mobile budgets & conformity
- Regulations

Existing NAAQS and New Jersey Status

Pollutant	Primary Standards			Monitoring Data Status (Multi-State NAAs)	Designation/SIP Status
	Level	Date	Averaging Time		
Ozone	0.12 ppm	1979	1-hour	Attaining	Standard revoked/CDDs Final
	85 ppb	1997	8-hour		Nonattainment/CDDs Final
	75 ppb	2008	8-hour	Not Attaining (other states)	Nonattainment
	70 ppb	2015	8-hour	Not Attaining	Not Yet Designated
Regional Haze	Visibility	1999	NA	2018 Goal Achieved	Progress Report Submitted June 2016
PM2.5	15.0 µg/m3	1997	Annual	Attaining	Attainment
	35 µg/m3	2006	24-hour		
	12 µg/m3	2012	Annual		Unclassifiable-Attainment
PM10	150 µg/m3	1987	24-hour	Attaining	Attainment
SO2	0.03 ppm	1971	Annual	Attaining	Attainment
	0.14 ppm	1971	24-hour		
	75 ppb	2010	1-hour		Unclassifiable-Attainment is Anticipated
NO2	53 ppb	1971	Annual	Attaining	Attainment
	100 ppb and New monitor	2010	1-hour	Likely to Attain	Unclassifiable-Attainment
Lead	1.5 µg/m3	1978	Quarterly Average	Attaining	Attainment
	0.15 µg/m3	2008	Rolling 3-Month Average		Unclassifiable-Attainment
CO	9 ppm	1971	8-hour	Attaining	Attainment/Last Maintenance Plan Approved
	35 ppm	1971	1-hour		
	New monitor	2011			No New Requirements

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New Jersey's Anticipated NAAQS and Regional Haze Milestones

Pollutant	Standard	NAAQS Promulgation Date	Designations Effective	110(a) SIPs Due	Attainment Demonstration SIP Due	Attainment Date
Promulgated						
Ozone	75 ppb 8 hour	Mar-08	Jul-12	Complete	Moderate with Bump Up: Jan-17	Moderate: Jul-18
Ozone	70 ppb 8 hour	Oct-15	Dec-17	Oct-18	Dec-20-21	Marginal: 2020 Moderate: 2023 Serious: 2026
Regional Haze	Visibility	Jul-99	NA	Progress Report Complete	Jul-2018	2064
PM2.5	12 µg/m3 annual	Dec-12	Apr-15	Complete	NA	NA
PM2.5	35 µg/m3 daily	Oct-06	Dec-09	Complete	NA	NA
SO2 Primary	75 ppb 1 hour	Jun-10	Sep-16	Complete	NA	NA
NO2 Primary	100 ppb 1 hour	Jan-10	Feb-12	Complete	NA	NA
NO2/SO2 Secondary	No change	Mar-2012	NA	NA	NA	NA
Lead	0.15 µg/m3	Oct-08	Dec-11	Complete	NA	NA
CO	No change, new monitoring	Aug-11	NA	NA	NA	NA

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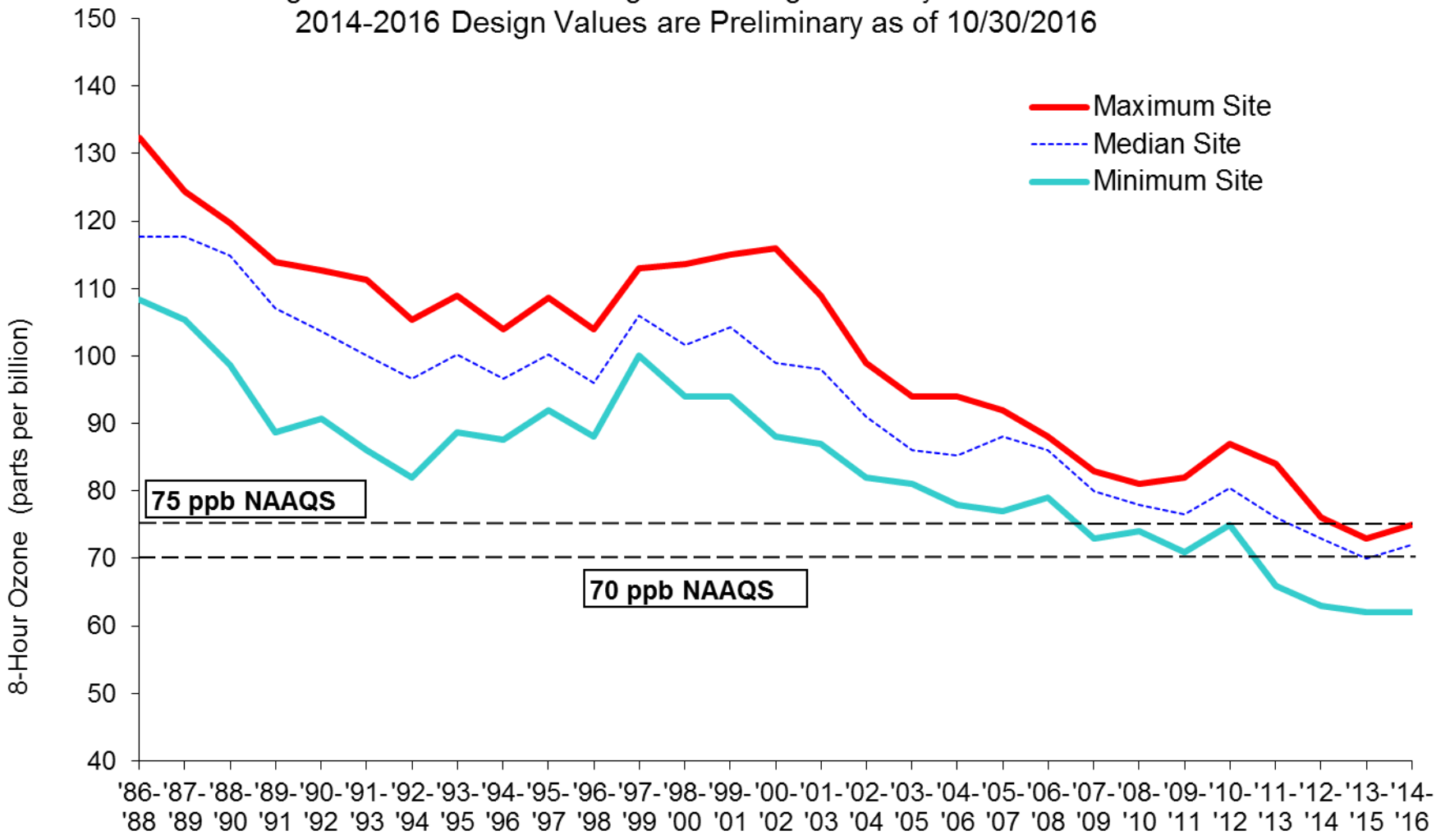
New Jersey 8-Hour Ozone Air Quality 1986 - 2016

Design Values - 3 Year Average of 4th Highest Daily 8-Hour Maximum

2014-2016 Design Values are Preliminary as of 10/30/2016



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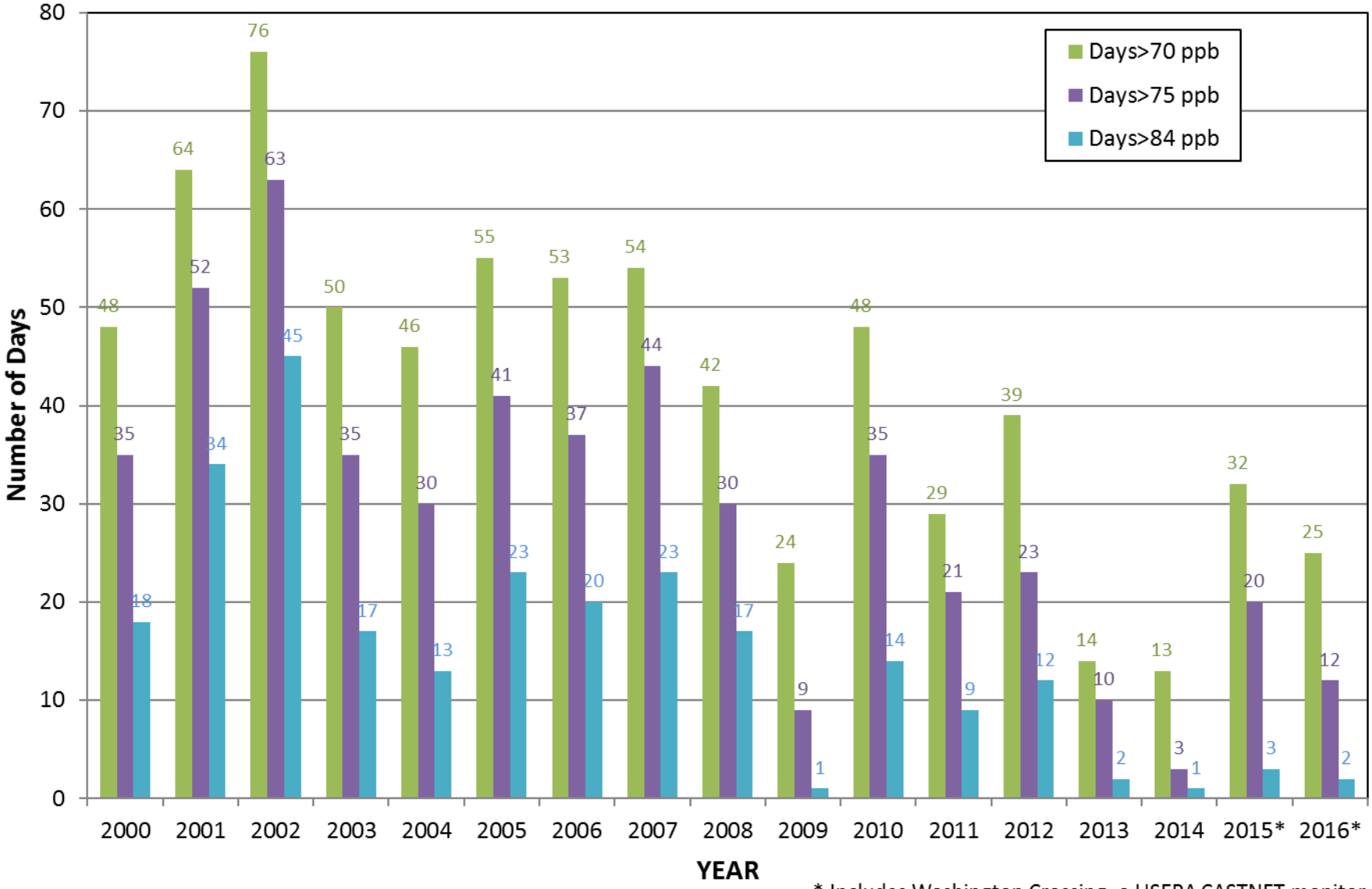
New Jersey Ozone Exceedance Days 2000-2016

2016 Values are Preliminary as of 10/31/2016

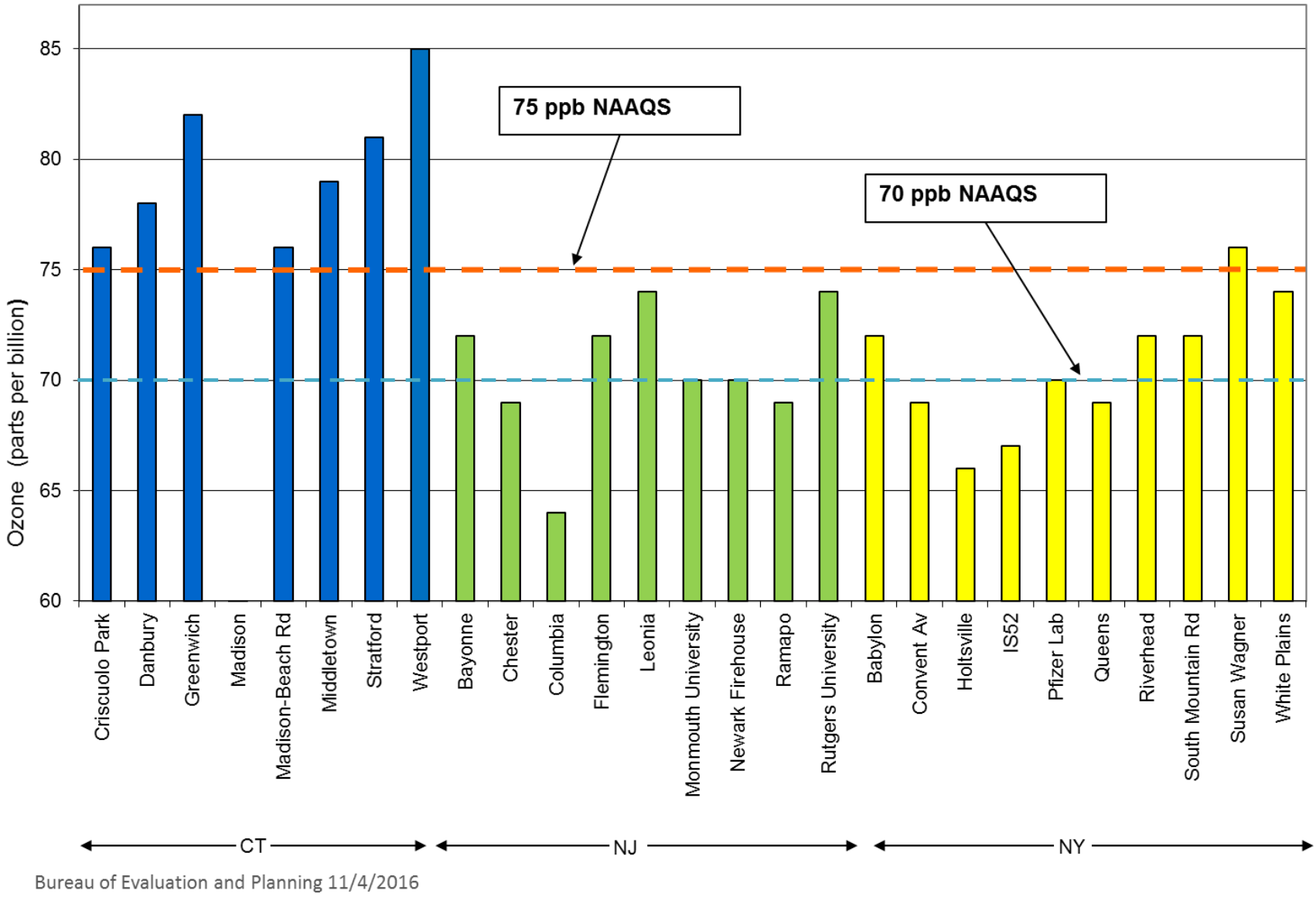


* Includes Washington Crossing, a USEPA CASTNET monitor.

Preliminary 8-hour Ozone Design Values 2014-2016

Northern New Jersey-CT-NY Nonattainment Area

2014-2016 Design Values are Preliminary as of 10/30/2016



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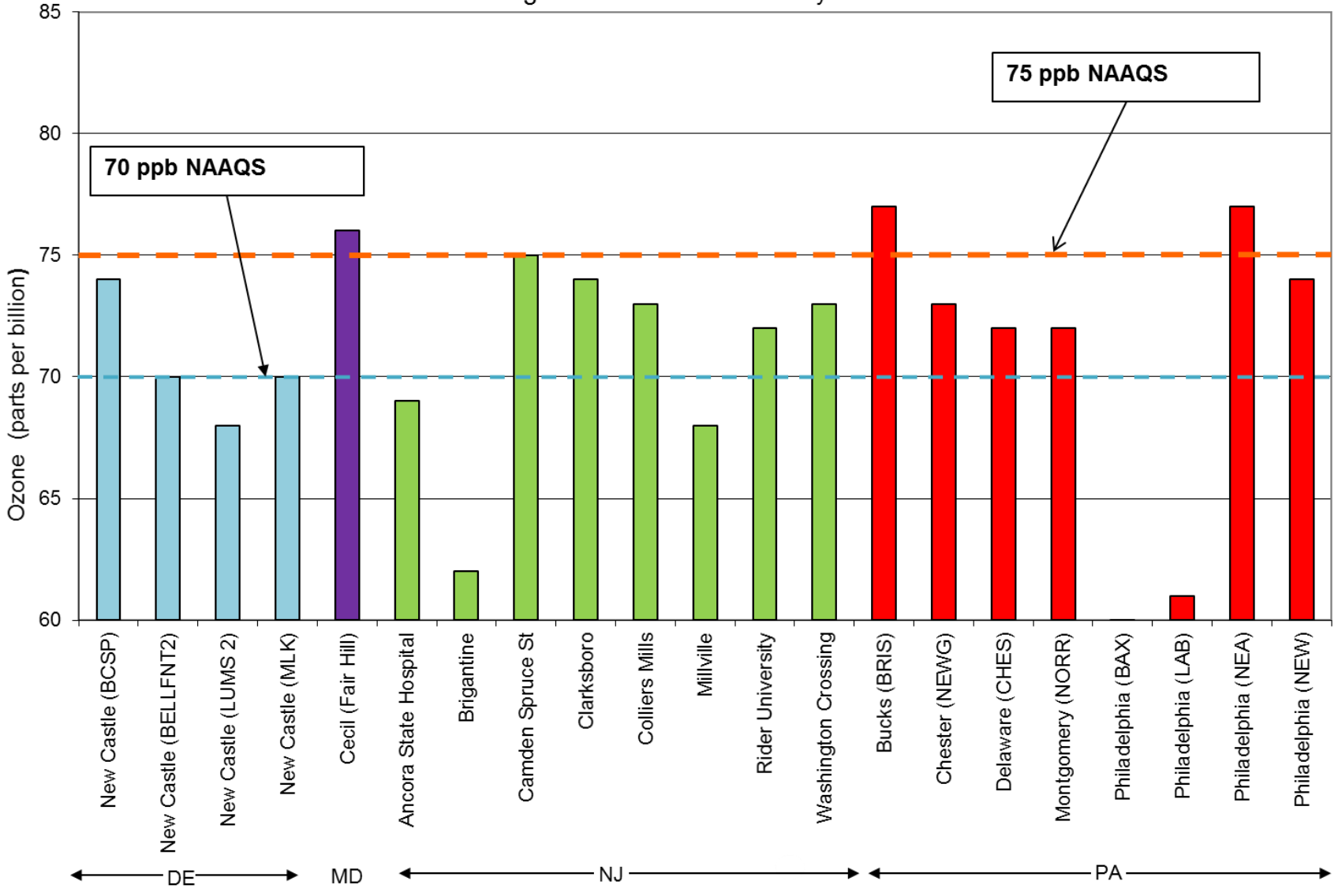
Preliminary 8-hour Ozone Design Values 2014-2016

Southern New Jersey-DE-MD-PA Nonattainment Area

2014-2016 Design Values are Preliminary as of 10/30/2016



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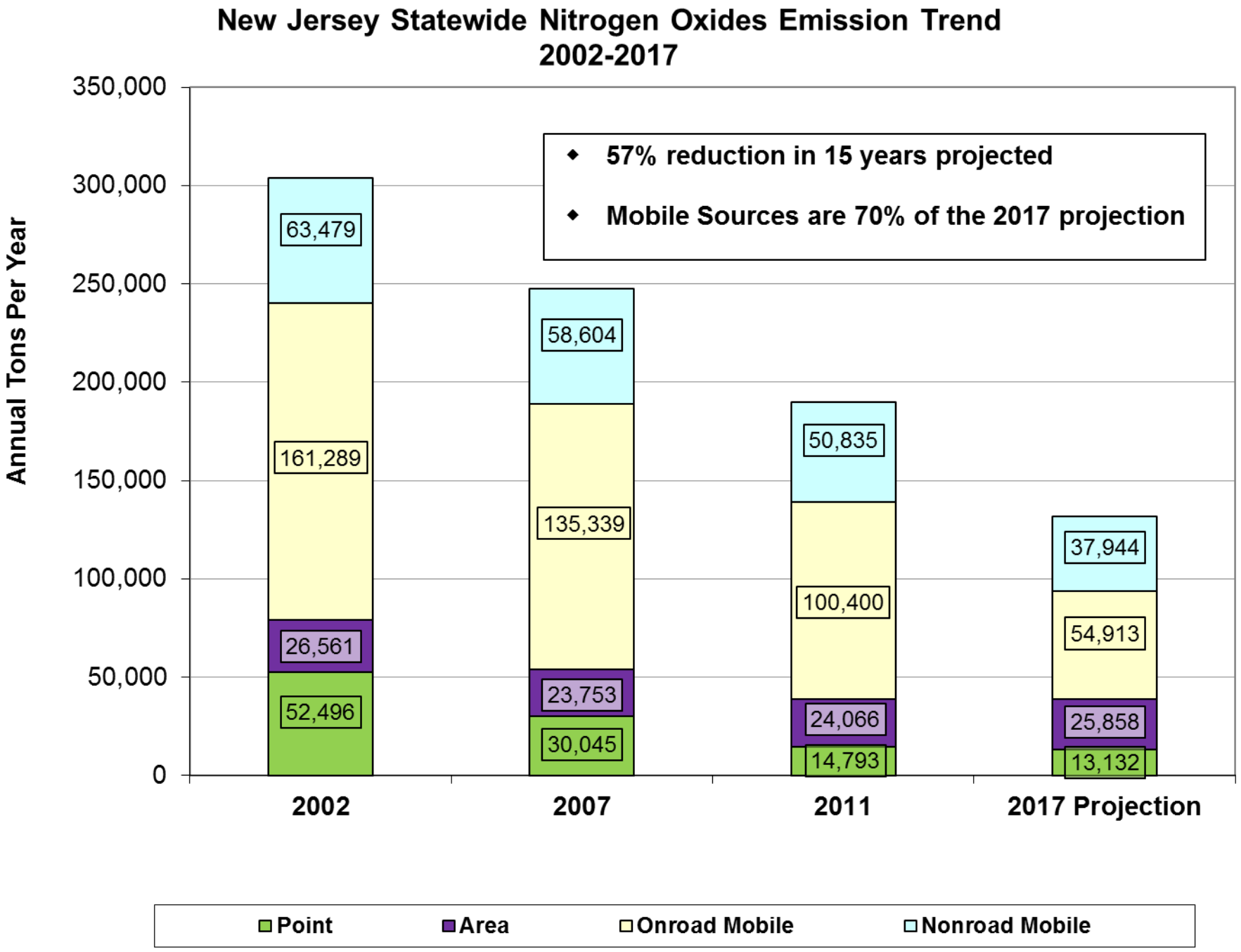
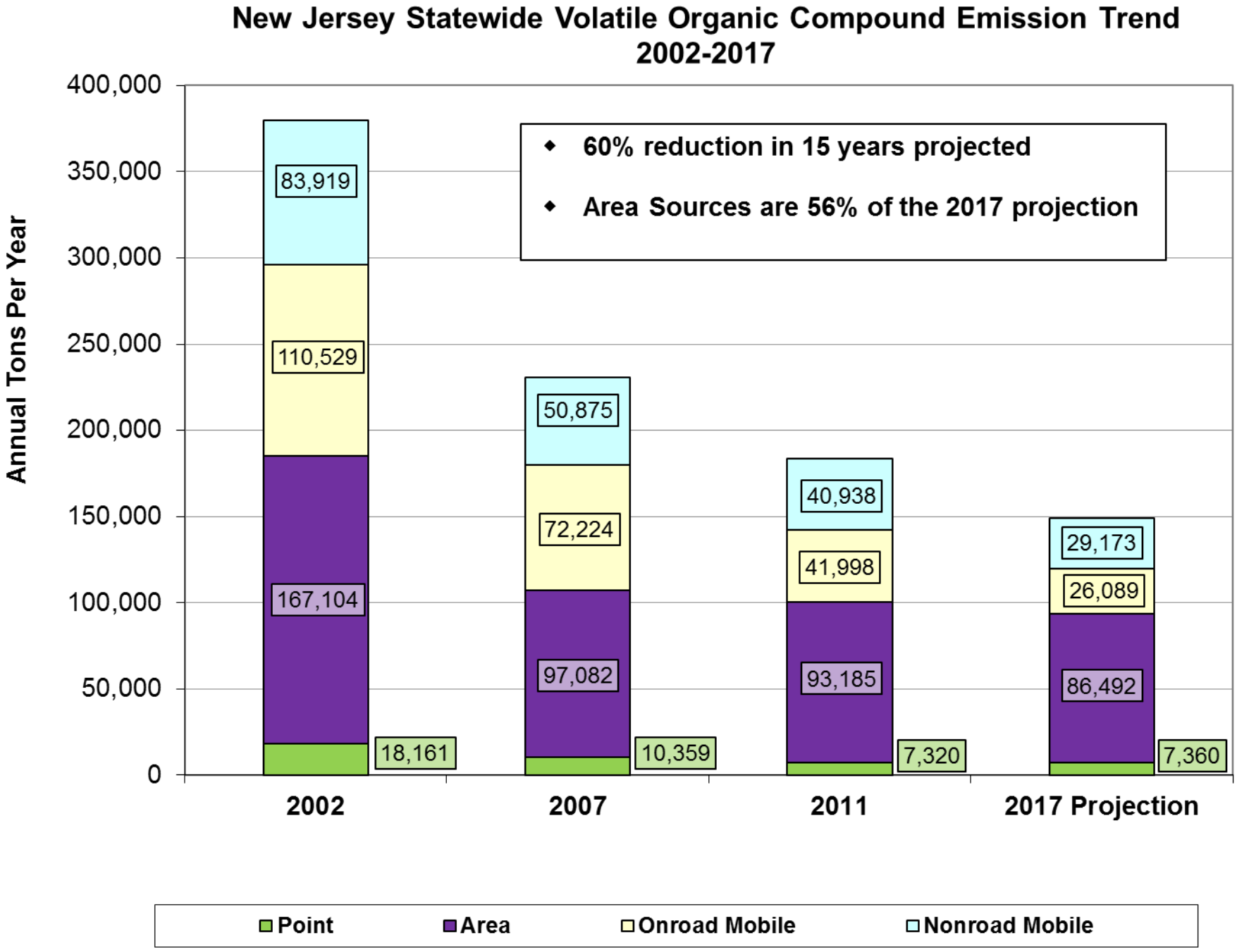

New Jersey Statewide Nitrogen Oxides Emission Trend
2002-2017
Annual Tons Per Year
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
57% reduction in 15 years projected
Mobile Sources are 70% of the 2017 projection
63,479
161,289
26,561
52,496
58,604
135,339
23,753
30,045
50,835
100,400
24,066
14,793
37,944
54,913
25,858
13,132
2002
2007
2011
2017 Projection
Point
Area
Onroad Mobile
Nonroad Mobile


New Jersey Statewide Volatile Organic Compound Emission Trend
2002-2017
Annual Tons Per Year
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
60% reduction in 15 years projected
Area Sources are 56% of the 2017 projection
83,919
110,529
167,104
18,161
50,875
72,224
97,082
10,359
40,938
41,998
93,185
7,320
29,173
26,089
86,492
7,360
2002
2007
2011
2017 Projection
Point
Area
Onroad Mobile
Nonroad Mobile

OTC REGIONAL CONTROL STRATEGIES

NOx Sources	VOC Sources
Model Rules 1. Power Plants–Oil and Gas-fired Boilers* 2. Power Plants–High Electric Demand Day (HEDD) Turbines* 3. Power Plants–Stationary Engines 4. New Small Gas Heating Boilers 5. Non-Road Diesel Idling* 6. Aftermarket Catalytic Converters	**Model Rules** 1. Large VOC Stationary Storage Tanks* 2. Autobody Refinishing 3. Consumer Products 4. Architectural/Industrial Coatings 5. Solvent Cleaning (Industrial/Commercial) 6. Paint Thinners (Consumer)
Categories Under Review 7. Power Plants–Coal-fired Boilers 8. Distributed and Emergency Generators (Demand Response) 9. Industrial/Commercial /Institutional (ICI) Boilers	**Categories Under Review** 7. Gasoline Station Vapor Recovery

*Existing NJ Rule Equivalent to Model Already Adopted

NJDEP'S EFFORT WITHIN OTC

- Equivalent RACT for all states
- EPA has to resolve transport
- Things to consider for the attainment of 70 ppb ozone NAAQS
  - RACT
  - RACM
  - OTC measures