

**Department of Natural Resources and Environmental Control**

**Division of Air Quality**

**Technical Support Document**

**For the Proposed Changes to the Inspections and Maintenance Program**

**Regulation 1126 - Motor Vehicle Emissions Inspection Program**

**Regulation 1131 - Low Enhanced Inspection and Maintenance Program**

**September 29, 2022**



## Table of Contents

Section 1.0	Introduction .....	3
	Purpose .....	3
	Delaware’s Air Quality .....	3
	2015 8-hour Ozone NAAQS .....	7
	Ozone Pollution Trend .....	8
	PM Standards .....	17
Section 2.0	Program Overview .....	21
	Introduction .....	21
	Federal Program .....	22
	Performance Standards.....	26
Section 3.0	Delaware’s Inspection & Maintenance Program .....	29
	Background and Historical Context .....	29
	Program Description .....	32
	Legislation to exempt additional vehicles from the I/M program.....	33
Section 4.0	Non-interference with Delaware’s State Implementation Plan .....	34
Section 5.0	Performance Standard Analysis.....	44
	Performance Standard Evaluation .....	45
Section 6.0	Department Recommendations .....	49
	Proposed Changes to Regulation 1126 (Motor Vehicle Emissions Inspection Program) .....	49
	Regulation 1131 (Low Enhanced Emissions Inspection and Maintenance Program) .....	50
Section 7.0	Environmental & Health Benefits.....	50
Section 8.0	Public Engagement .....	54

## List of Table

Table 1. National Ambient Air Quality Standards (NAAQS) .....	5
Table 2. Inspection & Maintenance Program Performance Standards .....	28
Table 3. Delaware Inspection and Maintenance Facility Information .....	32
Table 4. Delaware’s Current I/M Program Parameters.....	33
Table 5. Emission Increases Attributed to HB-246 .....	34
Table 6. MOVES Modeling of the I/M program options.....	37
Table 7. Proposed Amendments for Establishing a Statewide Program.....	42
Table 8. Modeling for I/M Program Final Recommendations.....	43
Table 9. Non-Interference Demonstration - Overall Statewide Summary .....	44

Table 10. Basic I/M Performance Standard (Used for Sussex County).....	45
Table 11. Ozone Transport Region Low-Enhanced Performance Standard (Used for Kent and New Castle Counties) .....	45
Table 12. 2023 VMT by County and Performance Standard Used .....	47
Table 13. Options showing the emissions, grams/mile and emission differences vs the Relevant Performance Standard.....	48
Table 14: At Risk Group.....	52
Table 15. National Benefits of I/M .....	53
Table 16. Public Engagement Actions .....	54
Table 17: Department Survey and Responses Received.....	57

## List of Figures

Figure 1. Delaware’s Air Monitoring Network .....	6
Figure 2. Current 2015 Ozone NAAQS Designations.....	7
Figure 3 . Current 2015 Ozone NAAQS Designations in the Ozone Transport Region .....	7
Figure 4. Map of the Philadelphia Nonattainment Area Under the 2015 8-hour ozone NAAQS. ....	8
Figure 5: Ozone exceedance days by county from 1997 to 2021. ....	9
Figure 6: Ozone three-year average design values. ....	10
Figure 7. Delaware’s NOx and VOC emissions .....	11
Figure 9. Ozone Precursor Emissions – NOx by Source Category .....	12
Figure 8. Ozone Precursor Emissions – VOC by Source Category.....	12
Figure 10. NO2 Trends, 3-year Design Values: 98th Percentile .....	14
Figure 11. NO2 Trends, Annual Average.....	14
Figure 12. Delaware CO Trends Annual 2nd Maximum.....	16
Figure 13. Particulate Matter Annual Design Values .....	18
Figure 15. Course Particulate Matter Emissions by Source Category .....	18
Figure 14. Fine Particulate Matter Emissions by Source Category .....	18
Figure 16. US GHG Emissions by Economic Sector .....	20
Figure 17. Delaware Inspection and Maintenance Facilities .....	32
Figure 18. WILMAPCO – Vehicle movements between counties. (2017) .....	41
Figure 19. Delaware Sources of Air Pollution.....	51

## **Section 1.0 Introduction**

### **Purpose**

This technical support document presents the technical basis for the Department of Natural Resources & Environmental Control – Division of Air Quality’s (Department) proposed amendments to Delaware’s vehicle inspection and maintenance (I/M) programs implemented by 7 DE Admin. Code 1126 (Sussex County) and 1131 (Kent & New Castle Counties).

As a result of the passage by Delaware’s General Assembly of HB246 (2017) which expanded the model year exemption for vehicle safety and emissions testing from five to seven years, the Department finds it necessary to amend the I/M program and the State Implementation Plan (SIP) to address the vehicle exemption as well as offset the vehicle emission increases attributed to the exemption.

The proposed amendments to Delaware’s I/M Program include: establishing identical emission testing requirements for all three Delaware counties; expanding the model year exemption from five to seven years; expanding the vehicles covered by the program to include vehicles weighing 8,501 pounds to 14,000 pounds gross vehicle weight beginning with model year 2008; modifying the older vehicle testing requirements to include curb idle and gas cap tests; and phasing in an increased cost of repairs for receiving a program waiver in Sussex County and adding anti-tampering language.

### **Delaware’s Air Quality**

In 1970, Congress amended the Clean Air Act (CAA) of 1963<sup>1</sup> and authorized the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for criteria pollutants shown to threaten human health, welfare and the environment.

A “criteria” air pollutant is an air pollutant that has a National Ambient Air Quality Standard (NAAQS) established for it by the U.S. EPA. There are currently seven criteria pollutants: sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, particulate matter less than 10 microns in diameter (PM<sub>10</sub>), and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). Concentrations listed below are in either parts per million (ppm), parts per billion (ppb), or micrograms per meter cubed (g/m<sup>3</sup>).

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<sup>1</sup> Evolution of the Clean Air Act retrieved from <https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act>

Primary standards were set according to criteria designed to protect public health, including an adequate margin of safety to protect sensitive populations (e.g., children, asthmatics, and the elderly). Secondary standards were set according to criteria designed to protect public welfare (decreased visibility, damage to crops, vegetation, buildings, etc.).

**Table 1. National Ambient Air Quality Standards (NAAQS)**

Pollutant (Scientific Notation)	Primary / Secondary Standard	Averaging Time	Concentration	Form
Carbon Monoxide (CO)	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Lead (Pb)	Primary & Secondary	Rolling 3 month period	0.15 $\mu\text{g}/\text{m}^3$	Not to be exceeded
Nitrogen Dioxide (NO <sub>2</sub> )	Primary	1 hour	100 ppb	98 <sup>th</sup> percentile of 1- hour daily maximum concentrations, averaged over 3 years
	Primary & Secondary	1 year	53 ppb	Annual Mean
Ozone (O <sub>3</sub> )	Primary & Secondary	8 hours	0.070 ppm	Annual 4 <sup>th</sup> highest daily maximum 8- hour concentration, averaged over 3 years
Particle Pollution (PM)	Primary	1 year	12.0 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
	Secondary	1 year	15.0 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
	Primary & Secondary	24 hours	35 $\mu\text{g}/\text{m}^3$	98 <sup>th</sup> percentile, averaged over 3 years
	Primary & Secondary	24 hours	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO <sub>2</sub> )	Primary	1 hour	75 ppb	99 <sup>th</sup> percentile of 1- hour daily maximum concentrations, averaged over 3 years
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

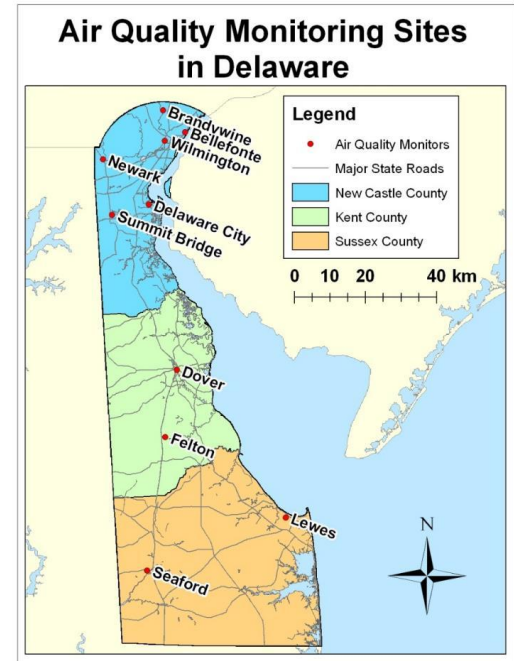
Once a NAAQS is established, states use the measured air pollution concentrations of these pollutants through their ambient air monitoring network to determine how high the pollution is in that area. Delaware's Division of Air Quality operates and maintains 11 monitoring stations throughout our state. See Figure 1.

Although monitoring takes place statewide, most of the stations are concentrated in the northern urban/industrial areas, which have the highest population and number of pollutant sources. Different stations also monitor different pollutants, depending on sources, population, and monitoring goals for the station.

If the monitors record air pollution above the NAAQS threshold, the governor informs the EPA that the county should be classified as not meeting the health-based standard. The EPA classifies that county as non-attainment for the pollutant.

Though, Delaware has made great strides in reducing air pollution in our state since the 1970's --Delaware's ambient air quality monitors in 2015 showed that only New Castle County did not record pollution concentrations below the Ozone standard. As a result, the state was designated non-attainment for ozone and required to identify control measures that will further reduce emissions from sources in Delaware. States must develop state implementation plans (SIPs) that explain the regulations and controls it will use to clean up the nonattainment areas. For all other criteria pollutants Delaware has demonstrated attainment of the federal standards.

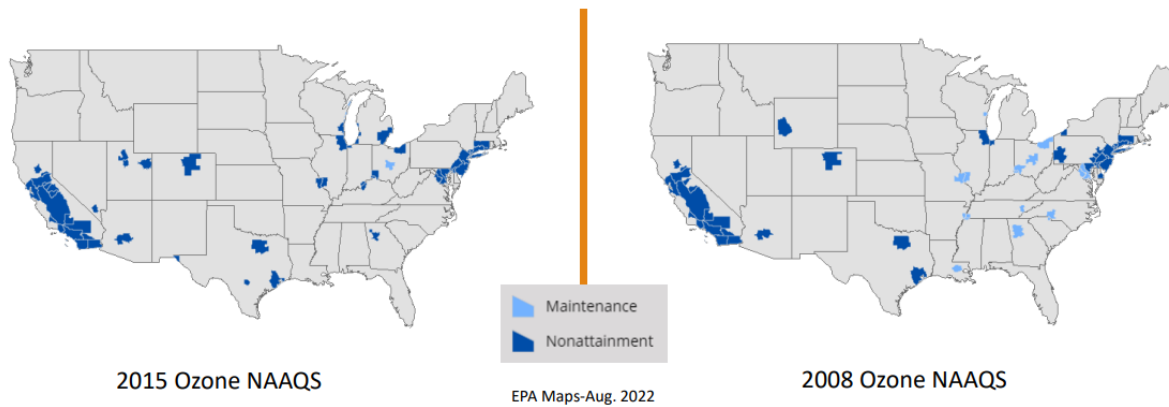
The control measures include requiring pollution control equipment on our power plants and other industrial sources, reducing certain chemicals in the consumer products we use to establishing standards for our vehicles to meet and for those vehicles to be inspected to show they meet the standards. Today, the largest source of ozone pollution in Delaware is from the cars and trucks (on-road) we drive. Transportation is also the nation's largest source of greenhouse gases, accounting for 27 percent of emissions.



**Figure 1. Delaware's Air Monitoring Network**

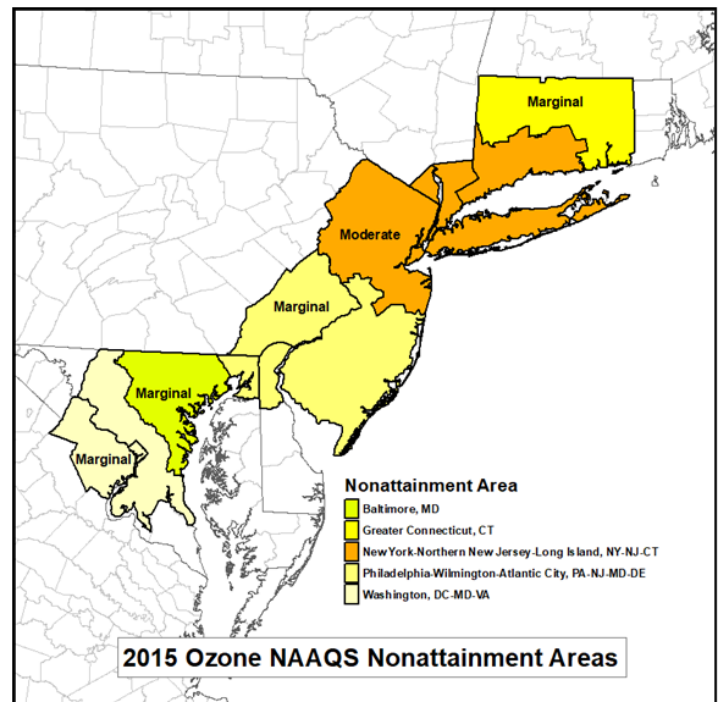
## 2015 8-hour Ozone NAAQS

On October 1, 2015, the EPA strengthened the primary and secondary National Ambient Air Quality Standards (NAAQS) for ground-level ozone from the 2008 NAAQS of 0.075 parts per million (ppm) over an 8-hour period to 0.070 ppm, which is equivalent to 70 ppb (US EPA 2015b) (Figure 1). The 2015 8-hour ozone NAAQS of 0.070 ppm is expected to provide better protections of public health and environment. In a final rule dated June 4, 2018 (83 FR 25776), the EPA designated 51 areas (Figure 1) in the country as nonattainment for the 2015 8-hour ozone NAAQS.



**Figure 2. Current 2015 Ozone NAAQS Designations**

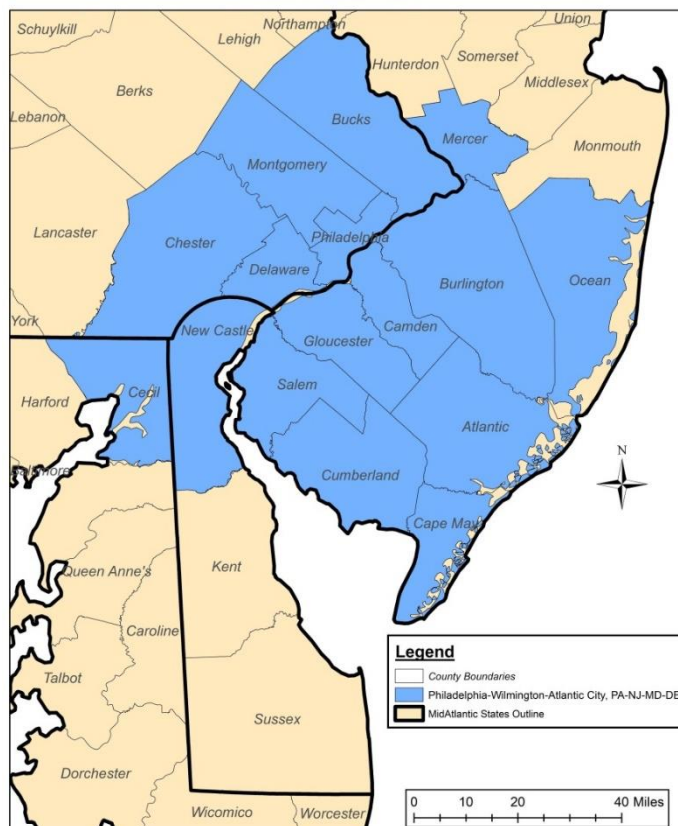
New Castle County of Delaware was designated nonattainment as a part of the Philadelphia-Wilmington-Atlantic City Marginal Nonattainment Area (NAA) under the 2015 8-hour ozone NAAQS. Since this marginal NAA is centered by the City of Philadelphia, it is often referred to as “the Philadelphia NAA.” In the same final rule, Kent and Sussex Counties were designated as attainment (83 FR 25776). The EPA made the designations of these three



**Figure 3 . Current 2015 Ozone NAAQS Designations in the Ozone Transport Region**



counties based on their 2014-2016 design values,<sup>2</sup> and the effective date of the designations was August 3, 2018. Figure 4 provides a visual of Delaware's three counties and New Castle County as part of the Philadelphia NAA.



**Figure 4. Map of the Philadelphia Nonattainment Area Under the 2015 8-hour ozone NAAQS.**

### Ozone Pollution Trend

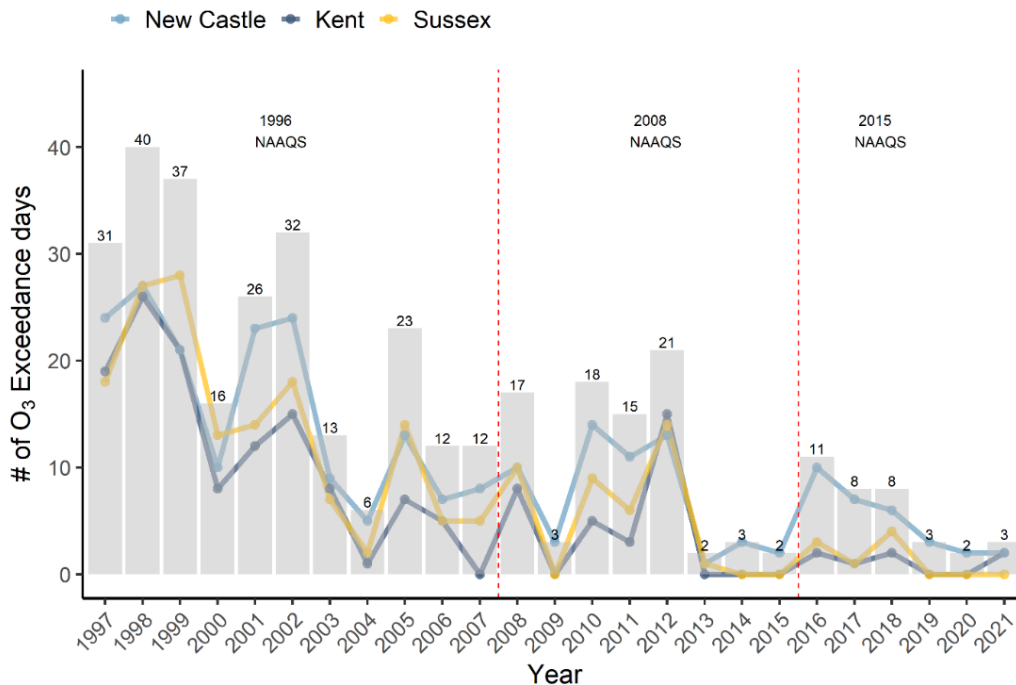
Trends in ozone concentrations can be difficult to discern because of meteorology. Hot, dry weather and stagnant air favor the formation of ozone, and the greatest number of exceedance days typically occur during the hottest and driest summers. Overall, Delaware ozone levels have shown a downward trend, with fewer exceedance days even as the standard has been lowered twice in the past two decades. In Figure 5, the total number of statewide exceedances is shown as a bar chart in gray based on the applicable standard. The lines for each county do not necessarily correspond with the statewide count because an exceedance in a particular county

<sup>2</sup> The air quality design value at a monitoring site is defined as the 3-year average annual fourth-highest daily maximum 8-hour average ozone concentration is also the air quality design value for the site. (40 CFR Part 50, Appendix I, Interpretation of the 8-Hour Primary and Secondary National Ambient Air Quality Standards for Ozone)

may not have occurred on the same day as another county. For example, if Sussex had two exceedances one each on a Monday & Tuesday, Kent had three each Wednesday to Friday, and New Castle had one on Friday, the statewide total would be 5 but Sussex = 2, Kent = 3, New Castle = 1.

### O<sub>3</sub> Yearly 8-hour NAAQS Exceedance Days

*Exceedance Days by County: 1997 to 2021*



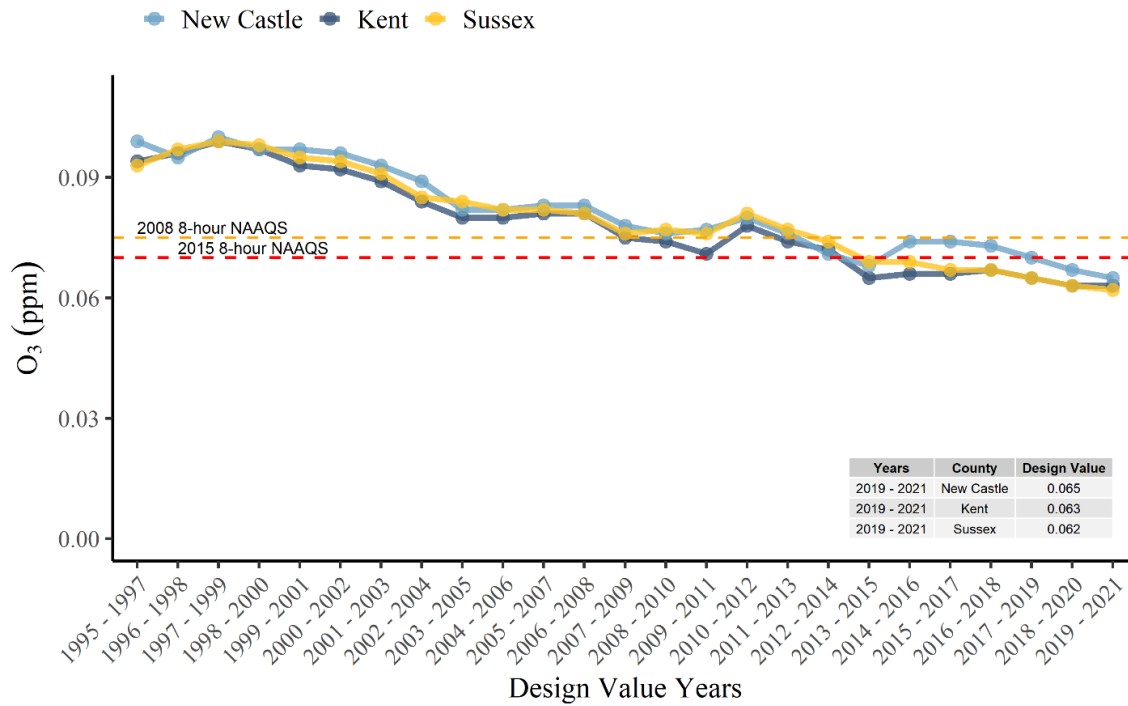
**Figure 5: Ozone exceedance days by county from 1997 to 2021.**

In air quality, design value is the static measure used to describe the air quality status of a specific location in relative to the level of the National Air Quality Standards (NAAQS). Figure 4 shows the “Ozone Design Value by County” for ozone from 1993 to 2021, The “Ozone Design Value by County” numbers in the chart on the following page are the annual fourth highest (4th Maximum) daily 8-hour concentration, averaged over three years, referred to as the Design Value. If the Design Value is less than or equal to the standard, the 8-hour standard is achieved or met. Based on the preliminary 2019 – 2021 data New Castle County meets the ozone 8-hour NAAQS at 0.065 ppm.

The U.S. EPA announced on November 16, 2017 that New Castle County has been declared nonattainment for Ozone. Effective August 3, 2018, EPA designated the Philadelphia Area, which consists of New Castle County in Delaware and counties in Maryland, New Jersey, and Pennsylvania, as marginal nonattainment for the 2015 ozone NAAQS.

### O<sub>3</sub> 4<sup>th</sup> Maximum 8-hour Average Design Values

3-Year Average Design Value Periods: 1997 to 2021



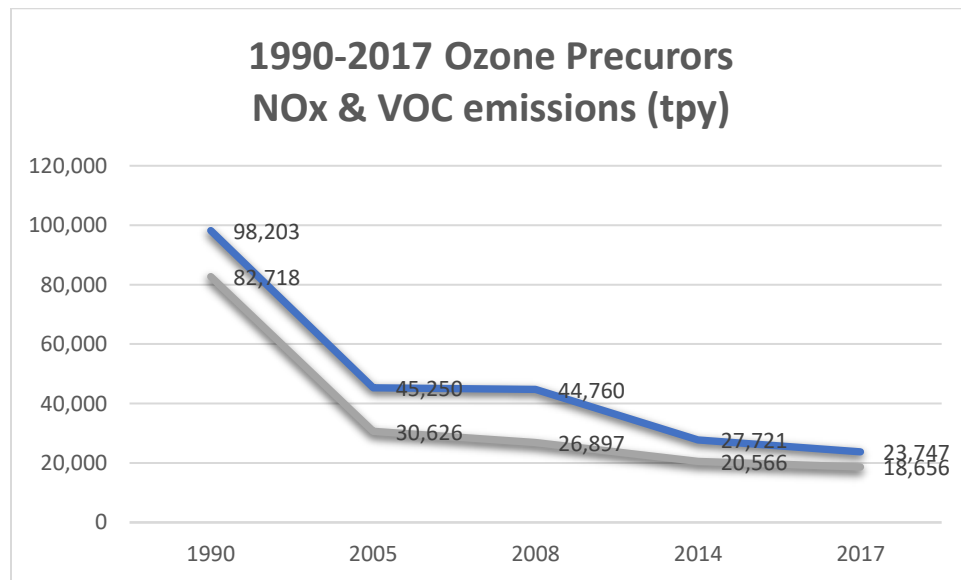
**Figure 6: Ozone three-year average design values.**

## Ozone

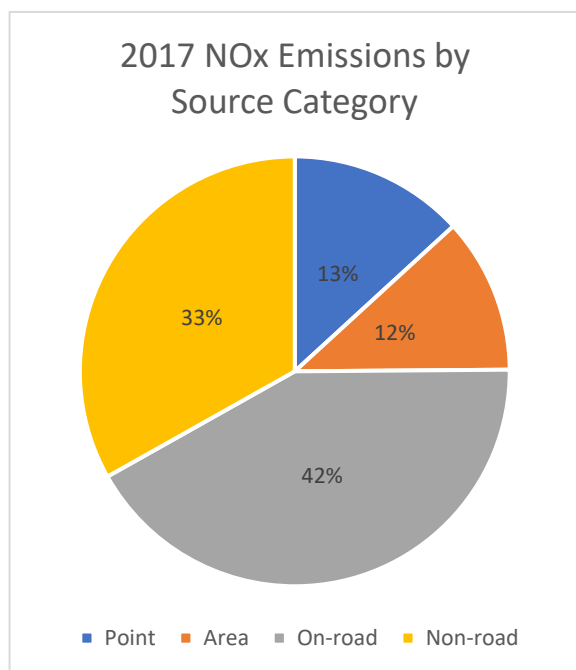
Ozone is a colorless gas composed of three oxygen atoms. Ground level ozone is not emitted directly into the air but is created by chemical reactions between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC). This happens when pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight.

It is the prime ingredient of what is commonly called “smog.” When inhaled, ozone can cause acute respiratory problems, aggravate asthma, cause inflammation of lung tissue, and even temporarily decrease the lung capacity of healthy adults. Repeated exposure may permanently scar lung tissue.

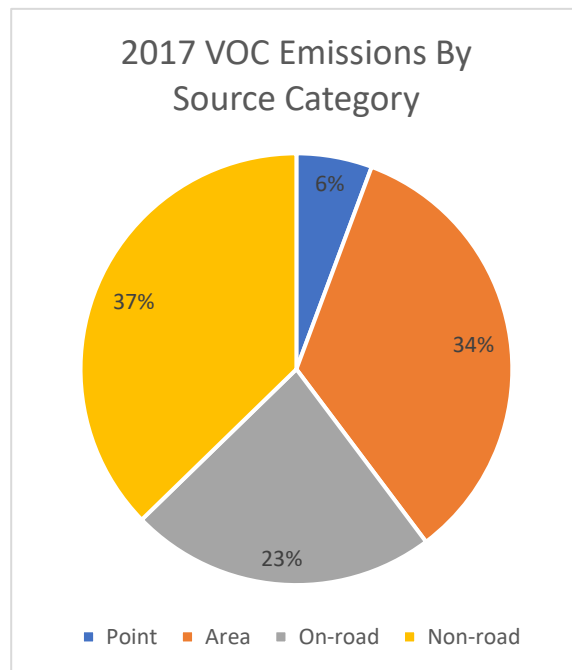
Ozone is most likely to reach unhealthy levels on hot sunny days in urban environments, but can still reach high levels during colder months. Ozone can also be transported long distances by wind, so even rural areas can experience high ozone levels.



*Figure 7. Delaware's NO<sub>x</sub> and VOC emissions*



*Figure 8. Ozone Precursor Emissions – NO<sub>x</sub> by Source Category*



*Figure 9. Ozone Precursor Emissions – VOC by Source Category*

## Nitrogen Dioxide

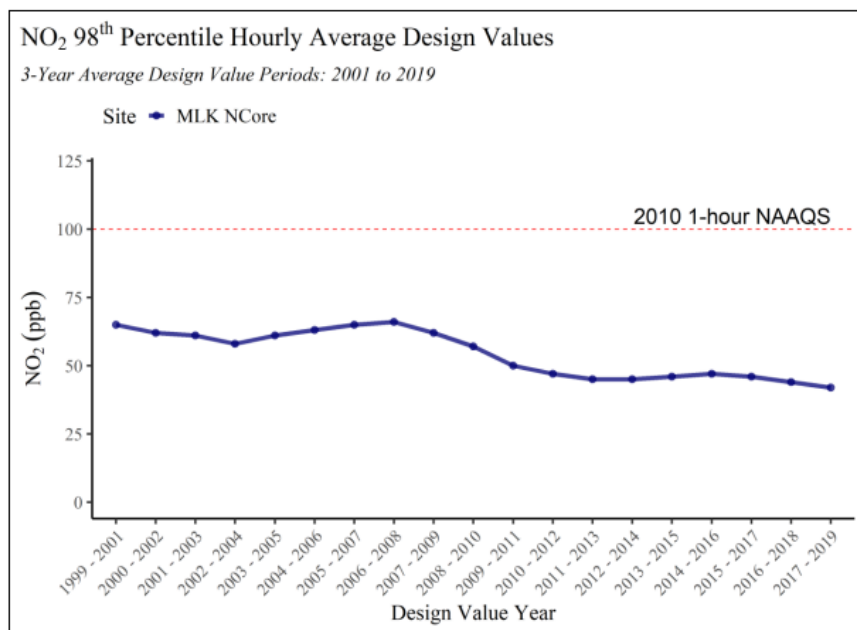
Nitrogen dioxide (NO<sub>2</sub>) is a reddish-brown toxic gas that is part of a group of gases containing nitrogen and oxygen called oxides of nitrogen or NO<sub>x</sub>. Nitrogen dioxide irritates the lungs and upper respiratory system and lowers resistance to respiratory infections. It can be fatal in high concentrations. Nitrogen dioxide is also known to damage vegetation by stunting growth and reducing seed production. It acts to reduce visibility. Reactions between nitrogen dioxide and other compounds in the atmosphere can form nitric acid, which contributes to the acid rain problem.

Oxides of nitrogen can also have a significant impact on fine particulate matter concentrations, most notably in the western areas of the United States. One of the most important features of NO<sub>x</sub> is their ability to react with volatile organic compounds (VOCs) to form ozone. Air quality computer models have shown that control of NO<sub>x</sub> is necessary in many areas of the United States to reach attainment of the ozone standard.

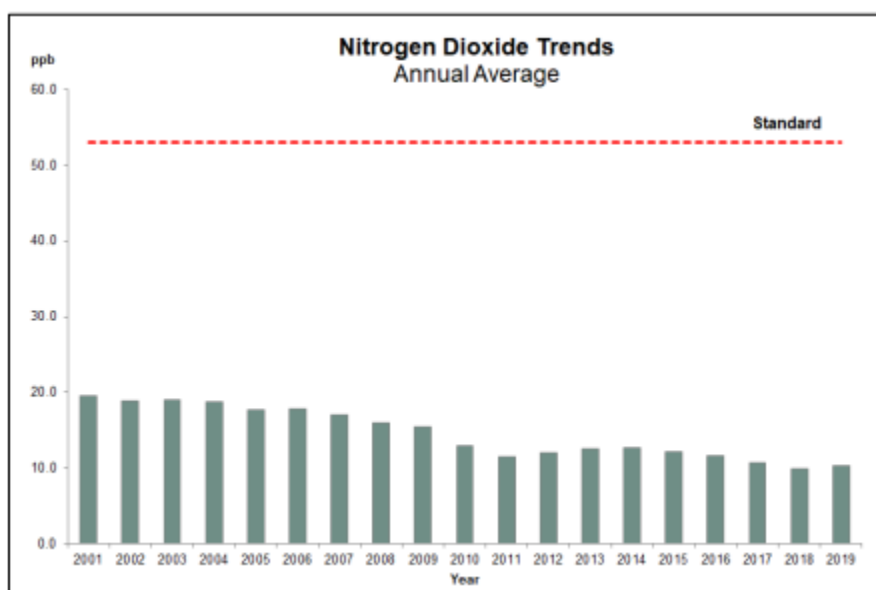
Atmospheric deposition of oxides of nitrogen has recently been estimated to be a significant source of nitrogen to bodies of water such as the Chesapeake Bay and Delaware's Inland Bays. Nitrogen acts as a nutrient and contributes to excess nutrient loading and algal blooms in estuary systems.

Oxides of nitrogen are produced during high temperature burning of fuels. Sources of NO<sub>x</sub> include motor vehicles and stationary sources that burn fossil fuels such as power plants and industrial boilers

Nitrogen dioxide levels in Delaware have remained well below the NAAQS since monitoring began. In 2019, levels continued to remain well below the standard with a slight downward trend in the Design Value. Figures 10 and 11 depict the current levels of NO<sub>2</sub> pollution experienced in Delaware.



**Figure 10. NO<sub>2</sub> Trends, 3-year Design Values: 98th Percentile**



**Figure 11. NO<sub>2</sub> Trends, Annual Average**

## Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless, poisonous gas produced by incomplete combustion of fossil fuels. It reduces the blood's ability to carry oxygen. Exposure can cause fatigue, headache, and impaired judgment and reflexes at moderate concentrations; at high levels unconsciousness and death can result. People with heart disease, angina, emphysema and other lung or cardiovascular diseases are most susceptible.

### Standards Primary NAAQS:

- 8-hour average = 9 ppm (10 µg/m<sup>3</sup>) (Not to be exceeded more than once per year)
- 1-hour average = 35 ppm (40 µg/m<sup>3</sup>) (Not to be exceeded more than once per year)

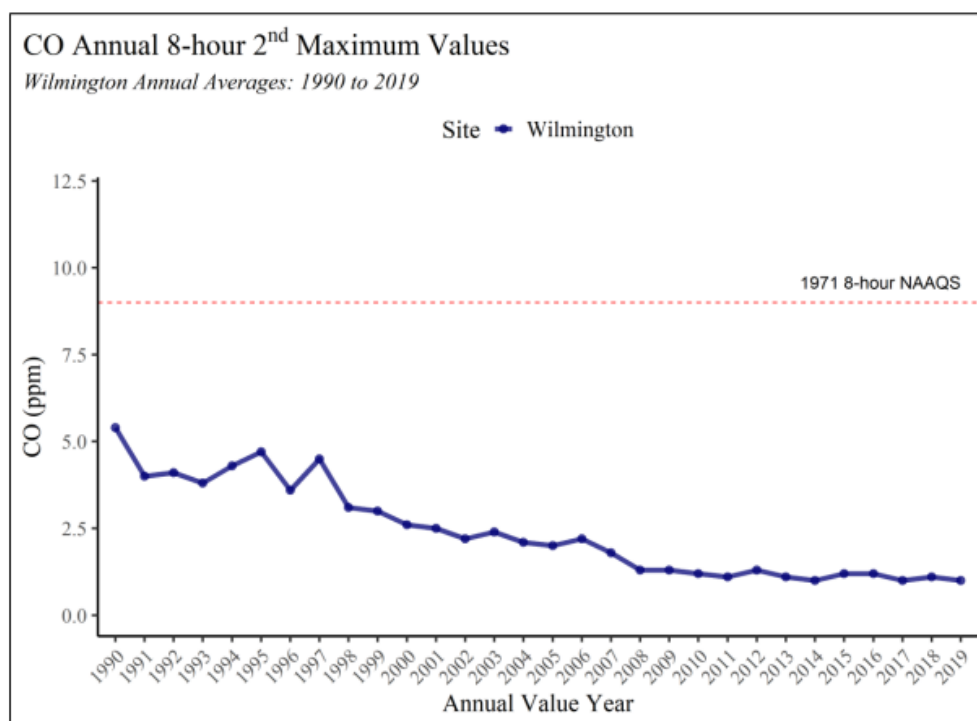
### Sources

Carbon monoxide is formed when carbon in fuel is not completely burned. The U.S. EPA estimates that approximately 60% of all CO emissions are from motor vehicle exhaust. Other sources include incinerators, wood stoves, furnaces, and some industrial processes. Concentrations are highest along heavily traveled highways and decrease significantly with increasing distance from traffic. Therefore, CO monitors are usually located close to roadways or in urban areas.

Mobile sources cause most of the ambient CO detected by Delaware's monitoring network.

There has been a slight downward trend in CO concentrations since monitoring began in the 1970's, and no violations of the ambient standards have occurred since 1977. Improvements are largely due to cleaner burning engines in cars and tighter automobile emission standards. Relatively stable low year-to-year concentrations continued in 2019.





**Figure 12. Delaware CO Trends Annual 2nd Maximum**

## Particulate Matter

Tiny airborne particles found in haze, smoke and airborne dust, and known as “particulate matter” and usually abbreviated as PM<sub>2.5</sub>, can occur year-round and can cause serious [health problems](#).

Fine particles (those smaller than 2.5 [microns](#)) penetrate more deeply into the lungs than coarse particles those between (2.5 and 10 microns). Health studies indicate a link between fine particle concentrations in outdoor air and certain health effects. These include premature death in people with heart or lung disease, nonfatal heart attacks, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

Particulate matter pollution can cause reduced visibility (haze) in parts of the United States, including many of our treasured national parks.

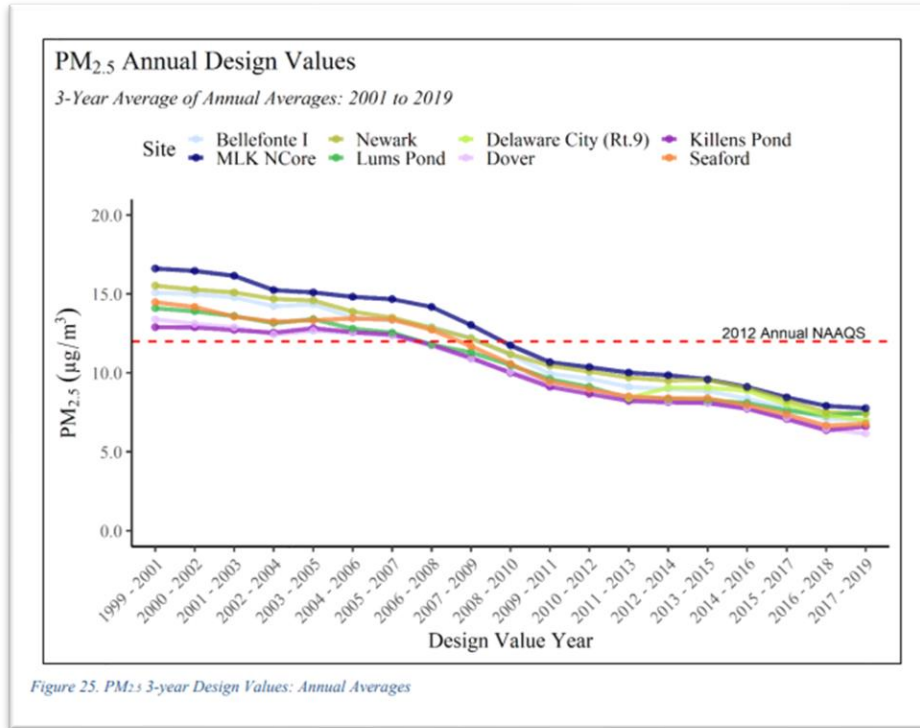
Particles can be carried over long distances by wind and settle on the ground or water. This can make lakes and streams acidic, change the nutrient balance in coastal waters and large river basins, deplete the nutrients in soil, damage sensitive forests and farm crops, and affect the diversity of ecosystems.

Particle pollution can also stain and damage stone and other materials, including culturally important objects such as statues and monuments.

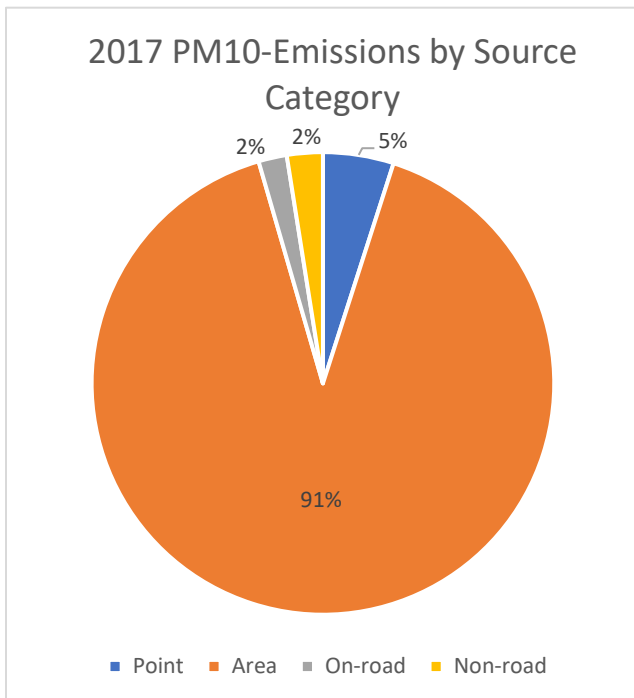
Fine particles are directly released from construction sites, unpaved roads, fields, smokestacks, or fires (area sources). Others form in the atmosphere by complicated reactions of chemicals such as sulfur dioxides and nitrogen oxides that are released from power plants, industries, and automobiles. These particles, known as secondary particles, make up most of the fine particulate in the country.

## PM Standards

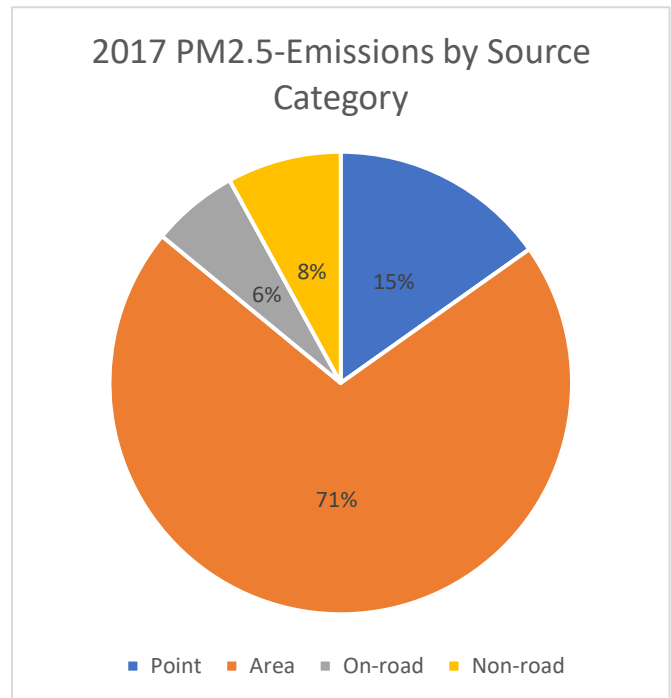
PM has primary and secondary standards for PM<sub>2.5</sub> (annual average standards with levels of 12.0 ug/m<sup>3</sup> and 15.0 ug/m<sup>3</sup>, respectively; 24-hour standards with 98<sup>th</sup> percentile forms and levels of 35 ug/m<sup>3</sup>) and PM<sub>10</sub> (24-hour standards with one-expected exceedance forms and levels of 150 ug/m<sup>3</sup>). As depicted by Figures 13-15 - Delaware’s fine particulate matter emissions are monitored below the current federal health based emission standards and attain the standards.



**Figure 13. Particulate Matter Annual Design Values**



**Figure 15. Course Particulate Matter Emissions by Source Category**



**Figure 14. Fine Particulate Matter Emissions by Source Category**

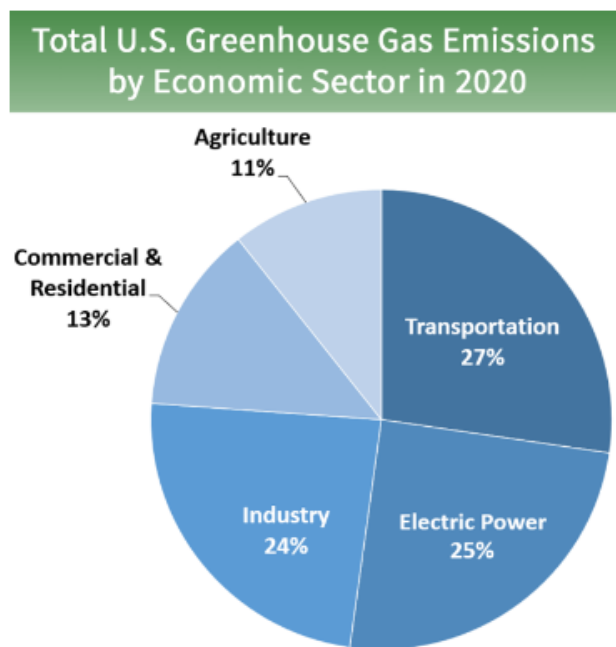
## Greenhouse Gas Emissions

Greenhouse gases trap heat and make the planet warmer. Human activities are responsible for almost all of the increase in greenhouse gases in the atmosphere over the last 150 years.<sup>1</sup> The largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation.

The primary sources of greenhouse gas emissions in the United States are:

- [Transportation](#) (27% of 2020 greenhouse gas emissions) – The transportation sector generates the largest share of greenhouse gas emissions. Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Over 90% of the fuel used for transportation is petroleum based, which includes primarily gasoline and diesel.<sup>2</sup>
- [Electricity production](#) (25% of 2020 greenhouse gas emissions) – Electric power generates the second largest share of greenhouse gas emissions. Approximately 60% of our electricity comes from burning fossil fuels, mostly coal and natural gas.<sup>3</sup>
- [Industry](#) (24% of 2020 greenhouse gas emissions) – Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy, as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials.
- [Commercial and Residential](#) (13% of 2020 greenhouse gas emissions) – Greenhouse gas emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of certain products that contain greenhouse gases, and the handling of waste.
- [Agriculture](#) (11% of 2020 greenhouse gas emissions) – Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.
- [Land Use and Forestry](#) (13% of 2020 greenhouse gas emissions) – Land areas can act as a sink (absorbing CO<sub>2</sub> from the atmosphere) or a source of greenhouse gas emissions. In the United States, since 1990, managed forests and other lands are a net sink, i.e., they have absorbed more CO<sub>2</sub> from the atmosphere than they emit.

<sup>1</sup>IPCC (2014). [Climate Change 2014: Mitigation of Climate Change \(PDF\)](#) (1454 pp, 50 MB). Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.



Total Emissions in 2020 = 5,981 [Million Metric Tons of CO<sub>2</sub> equivalent](#). Percentages may not add up to 100% due to independent rounding.

\* Land Use, Land-Use Change, and Forestry in the United States is a net sink and removes approximately 13% of these greenhouse gas emissions. This net sink is not shown in the above diagram. All emission estimates from the [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020](#).

**Figure 16. US GHG Emissions by Economic Sector**

Since 1990, gross U.S. greenhouse gas emissions<sup>3</sup> have decreased by 7%. From year to year, emissions can rise and fall due to changes in the economy, the price of fuel, and other factors. In 2020, U.S. greenhouse gas emissions decreased 11% compared to 2019 levels. The sharp decline in emissions was primarily from CO<sub>2</sub> emissions from fossil fuel combustion and was largely due to the coronavirus (COVID-19) pandemic-related reductions in travel and economic activity, including a 13% decrease in transportation emissions driven by less travel due to the COVID-19 pandemic. Electric power sector emissions decreased 10% due to a slight decrease in electricity demand from the COVID-19 pandemic and a continued shift from coal to less carbon-intensive natural gas and renewables. Note: All emission estimates from the [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020](#)

<sup>3</sup> [Sources of Greenhouse Gas Emissions | US EPA](#)

## **Section 2.0 Program Overview**

### **Introduction**

Motor vehicles are significant contributors of volatile organic compounds (VOC), carbon monoxide (CO) and nitrogen oxide (NOX) emissions. An important control measure to reduce these emissions is the implementation of a motor vehicle I/M program. Despite being subject to the most rigorous vehicle pollution control program in the world, cars and trucks still create toxic contaminants, about half of the ozone air pollution and nearly all of the carbon monoxide air pollution in United States cities. Of all highway vehicles, passenger cars and light-duty trucks emit most of the vehicle-related carbon monoxide and ozone-forming hydrocarbons. They also emit substantial amounts of nitrogen oxides and air toxics.

Although the U.S. has made progress in reducing emissions of these pollutants, total fleet emissions remain high. This is because the number of vehicle miles traveled on U.S. roads has doubled in the last 30 years to over 3 trillion miles per year<sup>4</sup>, offsetting much of the technological progress in vehicle emission control over the same three decades. Projections indicate that the steady growth in vehicle travel will continue.

Ongoing efforts to reduce emissions from individual vehicles are necessary to achieve and maintain our air quality goals. Today's cars are absolutely dependent on properly functioning emission controls to keep pollution levels low. Minor malfunctions in the emission control system can increase emissions significantly, and the average car on the road emits three to four times the new car standard.

Major malfunctions in the emission control system can cause emissions to skyrocket. As a result, 10 to 30 percent of cars are causing the majority of the vehicle-related pollution problem. Unfortunately, it is rarely obvious which cars fall into this category, as the emissions themselves may not be noticeable and emission control malfunctions do not necessarily affect vehicle drivability.

Effective I/M programs, however, can identify these problem cars and assure their repair. I/M programs ensure that cars are properly maintained during customer use. I/M produces emission reduction results soon after the program is put in place. The Clean Air Act as amended

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<sup>4</sup> Bureau of Transportation Statistics. 2020. Retrieved from <https://www.bts.gov/content/highway-profile> on 09/19/2022.

in 1990 (herein referred to as the Act) requires that most polluted areas adopt either “basic” or “enhanced” I/M programs, depending on the severity of the problem and the population of the area. The moderate ozone nonattainment areas, plus marginal ozone areas with existing or previously required I/M programs, fall under the “basic” I/M requirements.

### **Federal Program**

The Environmental Protection Agency (EPA) has had oversight and policy development responsibility for vehicle inspection and maintenance (I/M) programs since the passage of the Clean Air Act (Act) in 1970, which included I/M as an option for improving air quality. The first I/M program was implemented in New Jersey in 1974 and consisted of an annual idle test of 1968 and newer light-duty gasoline-powered vehicles conducted at a centralized facility. No tampering checks were performed and no repair waivers were allowed.

I/M was first mandated for areas with long term air quality problems beginning with the Clean Air Act Amendments of 1977. EPA issued its first guidance for such programs in 1978; the guidance addressed State Implementation Plan (SIP) elements such as minimum emission reduction requirements, administrative requirements, and implementation schedules. The original I/M guidance was quite broad and difficult to enforce, given EPA's lack of legal authority to establish minimum I/M implementation. The lack of regulatory authority - and the state-to-state inconsistency with regard to I/M program design that resulted from it -- was cited in audits of EPA's oversight of the I/M requirement conducted by both the Agency's own Inspector General, as well as the General Accounting Office.

In response to the above-cited deficiencies, the 1990 Amendments to the Clean Air Act (CAAA) signed into law on November 15, 1990 were much more prescriptive with regard to I/M requirements while also expanding I/M's role as an attainment strategy. The CAAA required EPA to develop Federally enforceable guidance<sup>5</sup> for two levels of I/M program: "basic" I/M for areas designated as moderate non-attainment, and "enhanced " I/M for serious and worse non-

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<sup>5</sup> USEPA - Vehicle Emissions Inspection and Maintenance (I/M): Policy and Technical Guidance. 2022. Retrieved from <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-inspection-and-maintenance-im-policy-and-technical> .

attainment areas, as well as for areas within an Ozone Transport Region (OTR), regardless of attainment status.

In response to the CAAA, EPA published its I/M rule<sup>6</sup> on November 5, 1992, which established the minimum procedural and administrative requirements to be met by basic and enhanced I/M programs. This rule also included a performance standard for basic I/M based upon the original New Jersey I/M program and a separate performance standard for enhanced I/M, based on the following program elements:

- Centralized, annual testing of MY 1968 and newer light-duty vehicles (LDVs) and light duty trucks (LDTs) rated up to 8,500 pounds GVWR.
- Tailpipe test: MY1968-1980 - idle; MY1981-1985 - two-speed idle; MY1986 and newer - IM240.
- Evaporative system test: MY1983 and newer - pressure; MY1986 and newer - purge test.
- Visual inspection: MY1984 and newer - catalyst and fuel inlet restrictor.

Enhanced programs are required in serious, severe, and extreme ozone nonattainment areas with urbanized populations of 200,000 or more; CO areas that exceed a 12.7 parts per million (ppm) design value 1 with urbanized populations of 100,000 or more in the Northeast Ozone Transport Region (OTR)<sup>7</sup>.

“Basic” and “enhanced” I/M programs both achieve their objective by identifying vehicles that have high emissions as a result of one or more malfunctions, and by requiring them to be repaired. An “enhanced” program covers more of the vehicles in operation, employs inspection methods that are better at finding high emitting vehicles, and has additional features to better assure that all vehicles are tested properly and effectively repaired.

EPA’s rules for I/M established a low and high enhanced standard. The high enhanced I/M program achieves a greater reduction in emissions (approximately 36%) and uses a highly technical test method. The low enhanced I/M performance standard provides flexibility for nonattainment areas that are required to implement enhanced I/M programs but which can meet

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<sup>6</sup> USEPA – Chronological List of Rulemakings. 2022. Retrieved from <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-inspection-and-maintenance-im-general-information#chronological>.

<sup>7</sup> The Act also established the OTR in the Northeastern United States which includes the States of Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, Pennsylvania, New York, New Jersey, Delaware, Maryland, and Northern Virginia and the District of Columbia.



the Act's emission reduction requirements for reasonable further progress (commonly referred to as 15% plans) and attainment from other sources without the stringency of the high enhanced I/M performance standard (60 FR 48029). All other provisions of the November 5, 1992 I/M rule, except as revised in 60 FR 48029 for extension of waivers and expenditure requirements, remain applicable to states available for low enhanced I/M. 40 CFR 51.35(g) provides that states may select the low enhanced performance standard if they have an approved SIP for 15%.

The CAAA, reflects a recognition of the problems encountered in identifying malfunctioning vehicles and contain several provisions aimed at reducing them. One of these is the requirement for incorporation and inspection of onboard diagnostic systems (OBD) in new vehicles. The amendments added paragraph (m) to section 202 of the Act, directing the EPA to promulgate regulations requiring the installation and inspection of OBD systems. Section 202(m)(1) of the Act requires OBD systems to monitor emission related components for malfunctions or deterioration which render vehicles incapable of complying with the emission standards established for such vehicles.

On February 19, 1993, EPA promulgated requirements for OBD systems (hereafter, OBD rules) on 1994 and later model year light duty vehicles and light duty trucks (58 FR 9468, February 19, 1993). These regulations (40 CFR 86.094–17) require all vehicle manufacturers to install equipment and establish operating parameters for the purpose of detecting malfunctions or deterioration in performance that would be expected to cause a vehicle to fail federal emission standards. Specifically, the on-board diagnostic system must be capable of identifying catalyst deterioration, engine misfire, oxygen sensor deterioration, and any other deterioration or malfunction within the powertrain which could cause emission increases greater than or exceeding the threshold levels established in § 86.094– 17.

A malfunction indicator light (MIL) located in the dashboard of the vehicle is required to be illuminated when the OBD system detects malfunctions. The purpose of the MIL is to inform



the vehicle operator of the need for service when the vehicle is operating under potentially high emitting conditions. Once illuminated to indicate a malfunction, the MIL must remain illuminated during all periods of engine operation until the trouble codes stored in the on-board computer are cleared by a service

technician or after repeated reevaluation by the OBD system fails to detect a reoccurrence of the problem.

The regulations allow the OBD system to extinguish the MIL after three subsequent driving cycles of similar operation in which a system fault does not reoccur. Similar operating conditions are defined as being within ten (10) percent of the load condition and 375 rpm with the same engine warm-up status which existed when the malfunction was first determined (40 CFR 86.094–17). Codes indicating the likely problem will be stored in the vehicle’s on-board computer for ready access by technicians, enabling proper diagnosis and repair.

Section 202(m)(4) of the Act requires that OBD system information be unrestricted and accessible to anyone via standardized connectors without requiring access codes or any device only available from the manufacturer. Further, the OBD system information must be usable without need for any unique decoding information or device. In accordance with this mandate, the OBD rules require codes to be standardized to follow the diagnostic trouble code definitions established in Society of Automotive Engineers (SAE) J2012, published in March 1992. EPA allows the computer-stored fault codes to be cleared after forty (40) engine warm-up cycles if the same fault is not reregistered. Anyone desiring more detailed information on the OBD system should refer to the OBD rules and the preamble promulgated on February 19, 1993, (58 FR 9468).

The Act also revised and strengthened EPA’s authority to prescribe vehicle inspection and maintenance (I/M) programs for ozone nonattainment areas. Section 182 of the Act requires EPA to review, revise, and republish I/ M program requirements, taking into consideration investigations and audits of I/M programs, and the I/M requirements established in the Act. One of these program requirements is inspection of vehicle OBD systems. The Act requires that OBD inspections be incorporated into all basic and enhanced I/M programs once vehicles with mandated OBD systems become part of the fleet. Section 182(c)(3)(vii) requires that I/M programs include “inspection of emission control diagnostic systems and the maintenance or repair of malfunctions or systems deterioration identified by or affecting such diagnostic systems.”

Sections 182(a)(2) and 202(m)(3) required states to amend I/M program implementation plans to incorporate the inspection of on-board diagnostic systems within two years after promulgation of regulations requiring such inspection.

EPA's initial rule implementing section 182's I/M requirements (the I/M rule) was promulgated on November 5, 1992. It established performance standards and other requirements for basic and enhanced vehicle I/M programs. Several sections of the I/M rule were reserved for OBD requirements, since the OBD rules had not yet been promulgated.

OBD systems will allow an inspector to scan for stored malfunction codes at the time of the periodic I/M test by simply attaching a computerized scan tool to the standardized plug provided on all OBD equipped vehicles. The presence of one or more emissions related codes in a vehicle's OBD system will indicate current or recent existence of a malfunction with the potential to cause high emissions. Furthermore, current emissions problems are also indicated if the MIL is commanded to be illuminated by the OBD system. Thus, EPA proposed that if the MIL is commanded to be illuminated and an emissions-related code is present, the vehicle shall fail the OBD inspection and be required to obtain the repairs indicated by the malfunction code. On-board diagnostic system inspections are intended to improve the accuracy of I/M programs, thus enhancing air quality benefits. The short emission tests used in I/M programs allow some vehicles that need repair to nevertheless "pass" the test. In addition, visual inspections of emission control devices can only determine presence and possibly proper connection but do not necessarily establish that the devices are functioning properly.

### **Performance Standards**

The I/M regulation also establishes requirements for the following: Network type and program evaluation; adequate tools and resources; test frequency and convenience; vehicle coverage; test procedures and standards; test equipment; quality control; waivers and compliance via diagnostic inspection; motorist compliance enforcement; motorist compliance enforcement program oversight; quality assurance; enforcement against contractors, stations and inspectors; data collection; data analysis and reporting; inspector training and licensing or certification; public information and consumer protection; improving repair effectiveness; compliance with recall notices; on-road testing; SIP revisions; and implementation deadlines.

The performance standard for the high enhanced I/M program is different from the low enhanced program in that the high enhanced performance standard is based on high-technology transient test, known as IM240, for new technology vehicles (i.e, those with closed-loop control and especially, fuel injected engines), including a transient loaded exhaust short test

incorporating hydrocarbons (HC), CO and NO<sub>x</sub> cut-points, and evaporative system integrity (pressure) test and an evaporative system performance (purge) test. The low enhanced performance standard, however, allows for idle testing in place of high-tech testing.

Note that the phrase “performance standard” used above was initially used in the CAA and is misleading in that it more accurately describes program design. Adhering to the “performance standard” does not guarantee an I/M program will meet a specific level of emissions reductions. Therefore, the performance standard is not what is required to be implemented, it is the bar against which a program is to be compared.

States new to I/M must demonstrate their program’s ability to meet the relevant performance standard when the program is first proposed as part of the I/M SIP. Existing I/M program areas which have not been redesignated to attainment must also do performance standard modeling [see Section 5 for additional information] whenever they revise their I/M SIP in a way that is likely to change the level of emission reductions achieved by the program.

The CAA also includes I/M requirements for metropolitan statistical areas (MSAs) within the OTR with populations of 100,000 or more, regardless of attainment status for ozone. It is not likely that any area in the OTR would be newly required to adopt an I/M program based upon classification under a new or subsequent ozone standard because the enhanced I/M requirement for the OTR is tied to population threshold only, and not to attainment status. It is possible, however, that an existing OTR I/M program might need to be upgraded if its status changed from attainment to serious or worse nonattainment for ozone.

Delaware has chosen to meet the performance standards for the Alternate Low Enhanced I/M program in Kent and New Castle Counties with a Basic Program in Sussex County.

**Table 2. Inspection & Maintenance Program Performance Standards**

<b>I/M Program Parameter</b>	<b>Basic I/M per 40 CFR 51.352</b>	<b>Alternate Low Enhanced I/M per 40 CFR 51.351 (g)</b>
Network Type	Centralized testing.	Centralized testing.
Start Date	For areas with existing I/M programs, 1983. For areas newly subject, 1994.	For areas with existing I/M programs, 1983. For areas newly subject, 1995.
Test Frequency	Annual testing.	Annual testing.
Model Year Coverage	Testing of 1968 and later model year vehicles.	Testing of 1968 and newer vehicles.
Vehicle Type Coverage	Light duty vehicles.	Light duty vehicles, and light duty trucks, rated up to 8,500 pounds GVWR.
Emission Test Type	Idle test.	Idle testing of all covered vehicles (as described in appendix B of subpart S).
Emission Standards	No weaker than specified in <a href="#">40 CFR part 85, subpart W</a> .	Those specified in <a href="#">40 CFR part 85, subpart W</a> .
Emission Control Device Inspection	None.	Visual inspection of the positive crankcase ventilation valve on all 1968 through 1971 model year vehicles, inclusive, and of the exhaust gas recirculation valve on all 1972 and newer model year vehicles.
Evaporative System Function Checks	—	None.
Stringency	A 20% emission test failure rate among pre-1981 model year vehicles.	A 20% emission test failure rate among pre-1981 model year vehicles.
Waiver Rate	A 0% waiver rate.	A 3% waiver rate, as a percentage of failed vehicles.
Compliance Rate	A 100% compliance rate.	A 96% compliance rate.
Evaluation Date	Basic I/M programs shall be shown to obtain the same or lower emission levels as the model inputs by 1997 for ozone nonattainment areas and 1996 for CO nonattainment areas; and, for serious or worse ozone nonattainment areas, on each applicable milestone and attainment deadline, thereafter.	Enhanced I/M program areas subject to the provisions of this <a href="#">paragraph (g)</a> shall be shown to obtain the same or lower emission levels as the model program described in this paragraph by January 1, 2002 to within $\pm 0.02$ gpm. Subject programs shall demonstrate through modeling the ability to maintain this level of emission reduction (or better) through their attainment deadline for the applicable NAAQS standard(s).

### **Section 3.0 Delaware's Inspection & Maintenance Program**

#### **Background and Historical Context**

In the Fall of 1977, following the passage of the Clean Air Act Amendments (CAAA) of 1977, the Department along with the New Castle County metropolitan planning organization (MPO) – WILMAPCO's Technical Coordinating Committee (TCC) began exploring the implications of the CAA for the region under Section 174 which required joint planning and coordination in the development of the state's implementation plan and the transportation control measures. Following numerous meetings and public workshops, the TCC recommended several transportation control measures that the Department included in the Delaware 1979 SIP. These measures include the establishment of an Inspection & Maintenance program, Ride-Share Pilot program, Coordinated Signalization Demonstration Project; Staggered and Flexible Work Hours; and Bicycle Measures.

The Department finalized its regulations of 7 DE Admin Code 1126 (known at the time as Regulation XXVI) in 1982 with a program implementation commencing on January 1, 1983. EPA approved the inclusion of this regulation in the SIP in 1983. The I/M program applied to vehicles registered in New Castle County and was administered by the Division of Motor Vehicles. At the behest of the Governor's Clean Air Task Force's recommendation, the I/M program was expanded to all three Delaware counties with a subsequent amendment to Regulation 26. In doing so, the emission reductions attributed to Sussex County vehicles participating in the I/M program could be used as a SIP strengthening measure for demonstrating the 15% rate of progress.

Delaware revised its I/M SIP to improve air quality and to meet requirements of the 1990 Clean Air Act Amendments (the Act) for an enhanced I/M program. The Act required states to make changes to improve existing I/M programs or to implement new ones for certain nonattainment areas. At the time, both Kent and New Castle counties, were part of the Philadelphia-Wilmington-Trenton severe ozone nonattainment area for the 1-hour standard. The DNREC submitted a revised SIP to EPA on February 17, 1995 that included enhancements to the I/M program. The intent of the revisions was to meet the requirements of the Act and the I/M rule.

The submittal consisted of Regulation Numbers 26 and 33 of the Delaware Regulations Governing the Control of Air Pollution. EPA identified numerous deficiencies of the February 17, 1995 submittal. On May 19, 1997, EPA granted Delaware a conditional approval of the program, contingent upon Delaware's commitment to submit a revised enhanced I/M SIP by June 18, 1998 correcting the deficiencies identified in EPA's conditional approval.

On June 16, 1998, Delaware submitted a new Regulation 31-Low Enhanced Inspection and Maintenance Program, for the purpose of addressing the program deficiencies. Regulation 31 replaced Regulation 26 for Kent and New Castle counties. Regulation 33 was rescinded and also replaced by Regulation 31. Regulation 31 required Kent and New Castle Counties to implement the Low-Enhanced I/M program or LEIM with Sussex County continuing with a Basic program. On-board Diagnostic (OBD) testing was added to Regulation 31 in 1996.

On June 15, 2010 Delaware's governor signed SB 215<sup>8</sup> as presented by the 145th Delaware General Assembly. SB 215 provided an exception to Title 21 vehicle registration requirements for vehicles being driven by Delaware Emission Education Program ("DEEP") certified emission repair technicians during drive cycle testing. SB 215 also added to Title 7 a new section 6709, Permits for operation of motor vehicles during testing. Section 6709 provides for this vehicle registration exception to be administered by DNREC through the establishment of a new permitting program.

The Department discovered while developing a permit program to implement the requirements of SB215, that the DEEP program which certified emission repair technicians was no longer available due to budgetary and administrative constraints at Delaware Technical and Community College in Stanton. As a result, the Department researched alternative third-party training and certification programs available for automotive repair technicians.

In consultation with the Delaware Automotive Repair Professionals Association, the Department has chosen to rely on the National Institute of Automotive Service Excellence (ASE) testing program for certifying automotive repair technicians. ASE is an independent, non-profit organization that has worked since 1972 to improve the quality of vehicle repair and service by

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<sup>8</sup> Delaware 145<sup>th</sup> General Assembly. 2010. An Act to Amend Titles 7 and 21 of the Delaware Code relating to motor vehicles. Retrieved from [Bill Detail - Delaware General Assembly](#) .

testing and certifying repair and service professionals. By selecting ASE certification, the Department provides car-owners with the ability to find Certified Technicians who have proven to be knowledgeable professionals in the emissions repair field. ASE certification expires every 5 years thereby requiring the technician to re-certify to maintain their permit.

To maintain certification as a certified emissions repair technician, each technician will be required to obtain ASE–L1 certification. Automotive repair technicians currently certified by the DEEP program will be grandfathered for a period not to exceed 5 years or less if they also hold a current ASE-L1 certification. Technicians with current ASE-L1 certification shall be issued a permit for the term of the current ASE-L1 certification. The estimated cost of obtaining the ASE-L1 certification is approximately \$60.<sup>9</sup>

The 2012 amendments to Regulation 1131 [Section 8.0 Certified Emission Repair Technicians] require automotive repair technicians to obtain a permit in order to be exempt from the requirements of 21 Del. C §2115. In addition, the Department chose to reformat and reorganize the regulation to provide an easier to understand document – extraneous text in the current regulation was removed and relocated to the Inspection & Maintenance Plan for Implementation (PFI is a document required by USEPA). The text that was removed and relocated to the PFI bore no requirements and had no impact on the regulated community but will enhance an individual and/or small business’ understanding of the regulation.

Today, the entire State is covered by the emission inspection program which tests approximately 273,000 vehicles each year. The inspections are performed by the State’s Division of Motor Vehicles. Delaware continues to administer two I/M areas with different requirements governed by 7 DE ADMIN. CODE 1126 (Sussex County) and 7 DE ADMIN. CODE 1131 (Kent/New Castle Counties). New Castle and Kent Counties are in the Low Enhanced I/M (LEIM) area, while Sussex County is in the Basic I/M area.

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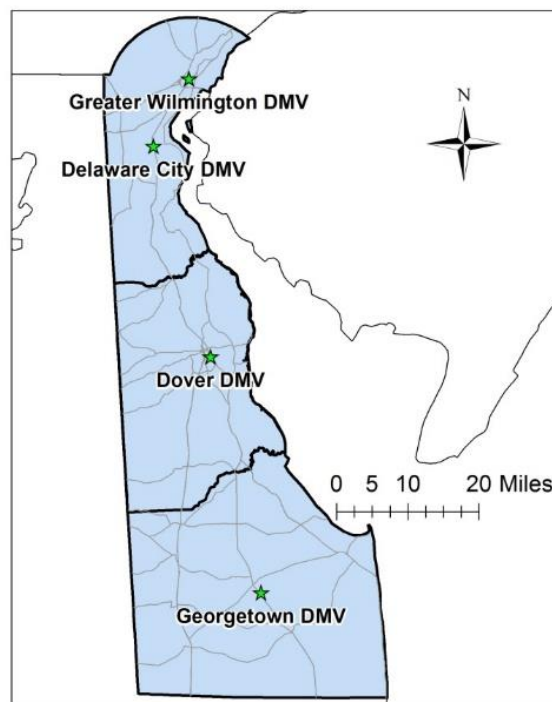
<sup>9</sup> Based upon ASE fees as of November 2, 2011 – see <http://ase.com/Tests/ASE-Certification-Tests/cbt/Dates,-Fees,---Test-Times.aspx>



## Program Description

The I/M Program in Delaware is a centralized system operated and administered by the Division of Motor Vehicles (DMV). The purpose of Delaware's emissions testing program is to identify vehicles that exceed tailpipe exhaust and evaporative emissions standards and prevent registration or renewals until vehicles meet emission standards.

The I/M Program is implemented at four testing facilities located in Wilmington, Delaware City, Dover, and Georgetown. The program utilizes **31** total inspection lanes, including spare lanes<sup>10</sup> and **51** DMV inspection associates as shown in Table 3. The inspection lanes are operated throughout the year - open daily (Monday, Tuesday, Thursday, and Friday from 8:00 am to 4:30 pm and Wednesday from noon to 8:00 pm) and are closed on State holidays. Figure 18 presents the geographical locations of each of the DMV inspection lanes in Delaware.



**Figure 17. Delaware Inspection and Maintenance Facilities**

**Table 3. Delaware Inspection and Maintenance Facility Information**

County	Location	DMV Inspection Lanes	DMV Inspection Associates <sup>11</sup>
New Castle	Delaware City	7 (no spares)	13
	Greater Wilmington	10 (no spares)	15
Kent	Dover	6 (w/ 2 spares)	10
Sussex	Georgetown	8 (w/ 1 spare)	13
	Toll Facilities <sup>12</sup>	n/a	n/a

<sup>10</sup> Meets the requirements of 40 CFR §51.366(b)(1)(i)

<sup>11</sup> Meets the requirements of 40 CFR §51.366(b)(5) - the number of inspectors licensed or certified to conduct testing.

<sup>12</sup> The DMV name for the automated diagnostics gathered from vehicles owned by the State of Delaware. It is run by ThingTech

Spare inspection lanes are used during busy periods or when one or more of the designated lanes is placed out of service due to an equipment problem. The spare lanes may also be used to re-check vehicles that have failed a previous inspection.

The I/M program inspection schedule is biennial, requiring vehicles to pass an emissions inspection every two years. The current regulations provide an exemption for vehicles less than 5 years old.<sup>13</sup> A vehicle must either pass inspection or be granted a waiver before its registration can be renewed.

**Table 4. Delaware's Current I/M Program Parameters.**

Gross Vehicle Weight	Residence County	Vehicle Model Year	Tailpipe Emissions	Evaporative Emissions
Up to 8,500 lbs	Kent / New Castle	1967 & Older	No test performed	No test performed
		1968-1974	Idle Test <sup>14</sup>	No test performed
		1975-1980	Idle Test	Gas Cap <sup>15</sup> /Fuel Tank Pressure <sup>16</sup>
		1981-1995	Two-speed Idle <sup>17</sup>	Gas Cap/Fuel Tank Pressure
		1996-2015	On-board Diagnostics (OBD II) <sup>18</sup>	
		2016-2022	NA – Model Year Exemption	
	Sussex	1967 & Older	No test performed	No test performed
		1968-2015	Idle Test	No test performed
		2016-2022	NA – Model Year Exemption	

### Legislation to exempt additional vehicles from the I/M program

On June 20, 2017, HB 246<sup>19</sup> was introduced to the General Assembly and was signed into law on September 21, 2017, by Governor Carney and codified in Title 21 § 2143. The bill increased the vehicle inspection exemption from five to seven years for all new vehicles, which

<sup>13</sup> Delaware State Code Title 21 § 2143 was amended on 9/21/2017 to change the exemption for new vehicles from 5 to 7 years

<sup>14</sup> Test performed while vehicle idles in Park or Neutral.

<sup>15</sup> A test conducted by pressurizing the gas cap for the purpose of identifying leaks in the gas cap.

<sup>16</sup> A test conducted by pressuring the evaporative system by way of the fuel tank's fill neck and sometimes referred to as the fill neck pressure (FP) test.

<sup>17</sup> Test performed while vehicle idles and at 2500 rpm.

<sup>18</sup> Test of exhaust-related systems and components performed by visual check of Malfunction Indicator Light (MIL) and scan of on-board (OBD) computer for system readiness, MIL status and stored trouble codes, on 1996 and newer OBD-equipped vehicles only.

<sup>19</sup> Delaware House Bill 246, An Act to Amend Title 21 of the Delaware Code Relating to Registration, Title, and Licenses of Motor Vehicles - <http://legis.delaware.gov/BillDetail?LegislationId=26006>

applied to vehicles purchased after January 1, 2012. It reduced the number of inspections by approximately 45,000 vehicles, allowing owners of vehicle with a current five-year expiration to renew their registration for an additional two years within 90 days of registration expiration.

Unfortunately, the vehicle exemption resulted in emissions increase in the program as demonstrated in Table 5, which demonstrates an increase of 19.2 tons per year in NO<sub>x</sub> and 15.3 tons per year in VOC for Kent and New Castle counties as well as an increase of 1.1 tons per year in VOC and no impact on NO<sub>x</sub> emissions in Sussex County. The legislative mandate resulting from the expansion of the new model year exemption requires the Department to amend 7 DE Admin. Code 1126 and 1131. In addition, the Department must develop additional control measures to address the increase in emissions.

**Table 5. Emission Increases Attributed to HB-246**

Modeled Year	Non-Attainment Area	Emission Increase (Tons / Year)	
		NO <sub>x</sub>	VOC
2021	Kent/New Castle Counties	+19.2	+15.3
	Sussex County	+0.0 <sup>20</sup>	+1.1

#### **Section 4.0 Non-interference with Delaware's State Implementation Plan**

The Department must submit a demonstration to the United States Environmental Protection Agency (EPA) for review and approval to revise Delaware's regulations pertaining to I/M in accordance with Section 110(l) of the CAA. Section 110(l) of the CAA prohibits EPA from approving any proposed State Implementation Plan (SIP) revision that would interfere with the attainment and maintenance of any of the NAAQS in effect at the time of the revision. Section 110(l) of the CAA states:

*“Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.”*

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<sup>20</sup> The existing Basic I/M program in Sussex County provides no additional NO<sub>x</sub> credits.

Section 110(l) applies to all requirements of the CAA and to all areas of the country, whether attainment, nonattainment, unclassifiable or maintenance<sup>21</sup> for one or more of the six criteria pollutants: ozone, particulate matter (PM), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO) and lead (Pb). As stated earlier, although the focus of this guidance is on how a State can demonstrate noninterference relative to attainment and maintenance of the NAAQS, section 110(l) is not limited in scope to those SIP revisions that only impact ambient air quality.

For SIP revisions that will or could potentially lead to a change in emissions or ambient concentrations of a pollutant or its precursors, the section 110(l) demonstration should address all pollutants whose emissions and/or ambient concentrations may change as a result of the SIP revision. For example, while an I/M program originally may have been adopted to address a CO problem, such program may also reduce NO<sub>x</sub> and/or volatile organic compound (VOC) emissions. Thus, removal or changes of the I/M program from the SIP may also cause an increase in NO<sub>x</sub> and VOC emissions, which may impact ozone and PM<sub>2.5</sub>. These NAAQS would need to be addressed in the 110(l) demonstration, as well as CO.

Some control measures may not be removed from a SIP even if doing so would not interfere with the Clean Air Act's air quality goals. These measures are often referred to as "mandatory" measures because the CAA requires that they be included in the SIP for an area based on the area's designation status and classification. For example, the CAA specifies that an area classified as moderate for ozone must implement a basic tailpipe I/M program.

The following "noninterference demonstration" is provided to show that expanding the model year exemption for new vehicles from the emissions testing requirement will not interfere with Delaware's attainment of any NAAQS.

Due to increase in pollution resulting from the legislative mandate (HB 246), the Division of Air Quality (Division) staff analyzed several scenarios to offset emissions increase. The Department worked with the Division of Motor Vehicle (DMV) to identify program options to solve the increases realized by the expansion of the vehicles exempt from receiving the vehicle

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<sup>21</sup> Section 110(l) applies to both maintenance plans under section 175A and those under section 110(a)(1) that may be required following promulgation of a new NAAQS.

emissions tests. In the course of those discussions, DMV further requested the Two-Speed Idle test be eliminated for older vehicles in Kent and New Castle Counties. In order account for the emission increases attributed to the legislation and the DMV requests, the Department modeled several scenarios using MOVES2014b<sup>22</sup> in order to establish a cohesive statewide emission I/M program and present Division recommendations to Department and the Department of Transportation senior leadership consideration.

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<sup>22</sup> United States Environmental Protection Agency, MOVES Versions in Limited Current (January 11,2022) Retrieved September 16, 2022 from <https://www.epa.gov/moves/moves-versions-limited-current-use#moves2014-general>.

**Table 6. MOVES Modeling of the I/M program options.**

				Emission Increases Relative to Current plan (5 year exemption) (Tons/Year)			
Modeled Year	Case	Action / Option	Non- Attainment Area	CO	NOx	VOC	Comments
2021	1	Baseline Case [5- year exemption]	Kent/ New Castle Counties	0.0	0.0	0.0	The existing I/M program.
			Sussex County	0.0	0.0	0.0	
			Sum	0.0	0.0	0.0	
2021	2	Impact of HB-246 [7- year exemption]	Kent/New Castle Counties	401.3	17.0	12.9	The impact of HB-246 which resulted in a jump in emissions.
			Sussex County	65.3	0.0	1.7	
			Sum	466.6	17.0	14.6	
2021	3	OBD 14,000 + SSI 8,500 7MY Exempt	Kent/New Castle Counties	340.8	11.1	16.3	OBD testing for vehicles weighing up to 14,000 lb, a single speed idle test for older light duty vehicles.
			Sussex County	-470.3	-95.6	-51.9	
			Sum	-129.5	-84.5	-35.6	
2021	4	OBD 14,000 + TSI 8,500 7MY Exempt	Kent/New Castle Counties	287.4	7.6	9.2	Case 3 with a two speed idle test.

				Emission Increases Relative to Current plan (5 year exemption) (Tons/Year)			
Modeled Year	Case	Action / Option	Non- Attainment Area	CO	NOx	VOC	Comments
			Sussex County	n/a	n/a	n/a	Not modeled for Sussex County as this would be a difficult to achieve.
			Sum	n/a	n/a	n/a	
2021	5	OBD Only, 8,500 lb	Kent/New Castle Counties	580.7	13.6	47.1	An OBD only plan for light duty vehicle resulted in a pollutants in Kent & New Castle Counties. There was no testing of pre-1996 vehicles.
			Sussex County	-313.0	-91.8	-29.6	The reduction in Sussex County was not sufficient to overcome the increase in Kent & New Castle Counties.
			Sum	267.7	-78.2	17.5	
2021	6	OBD Only, 14,000 lb	Kent/New Castle Counties	502.2	7.6	42.1	Including OBD testing for heavier vehicles (Model years 2008 and later had a modest

				Emission Increases Relative to Current plan (5 year exemption) (Tons/Year)			
Modeled Year	Case	Action / Option	Non- Attainment Area	CO	NOx	VOC	Comments
							improvement -- not enough emission reductions.
			Sussex County	-346.0	-94.6	-32.3	
			Sum	156.2	-87.0	9.8	
2021	7	OBD 14,000 + SSI 8,500 7MY Exempt + GasCap	Kent/New Castle Counties	287.4	7.6	9.2	The same as Case 3, but with a gas cap test.
			Sussex County	-457.0	-94.6	-52.8	
			Sum	-169.6	-87.0	-43.6	The emission reductions for all pollutants when both counties are totaled showed the best overall result (slightly better than for option 3. This was the option Selected

Following consultation with the staff at Region 3 Environmental Protection Agency (EPA), Region 3 staff agreed that the emission reductions attributed to an OBD testing program in Sussex County could be used to offset in part the emission increases attributed to the vehicle exemption. EPA guidance states:

*“EPA believes that if emissions reductions removed from the SIP are replaced with new control measures that achieve equivalent or greater emissions reductions, the SIP*



*revision will not interfere with the area's ability to continue to attain or maintain the affected NAAQS or other CAA requirements.<sup>23</sup>*

*...As discussed in EPA's Clean Air Interstate Rule proceedings,<sup>24</sup> PM<sub>2.5</sub> and ozone are the result of emissions from many sources over a multi-State region. Emissions of NO<sub>x</sub> and VOC (as ozone precursors) and emissions of NO<sub>x</sub> and SO<sub>2</sub> (as PM<sub>2.5</sub> precursors), are well quantified for many urban and regional sources. Furthermore, the transport of these emissions can also be quantified with a fair degree of certainty. Because both ozone and PM<sub>2.5</sub> formation occur as the result of emissions from many sources over a multi-State region, regional controls for these emissions can result in significant benefits. The Agency thus concludes that it is appropriate to allow ozone and PM<sub>2.5</sub> areas to obtain substitute emissions reductions from sources located outside the nonattainment or maintenance area boundary, provided the State can demonstrate that the substitute measure provides the same air quality benefit as that being replaced.*

*For example, under current EPA policy, an ozone area can obtain replacement measures located up to 100 and 200 kilometers from the nonattainment area for VOC and NO<sub>x</sub> reductions, respectively.<sup>25</sup> The distances in the guidance provide only a general policy presumption that, if used, would need to be supported by technical rationale showing that the result will produce equal or greater air quality benefit in the area and that the substitution will not interfere with any other area's ability to attain or maintain the NAAQS. The Agency intends to reassess whether the policy should be revised in light of concerns recently brought to our attention pertaining to its technical feasibility."*

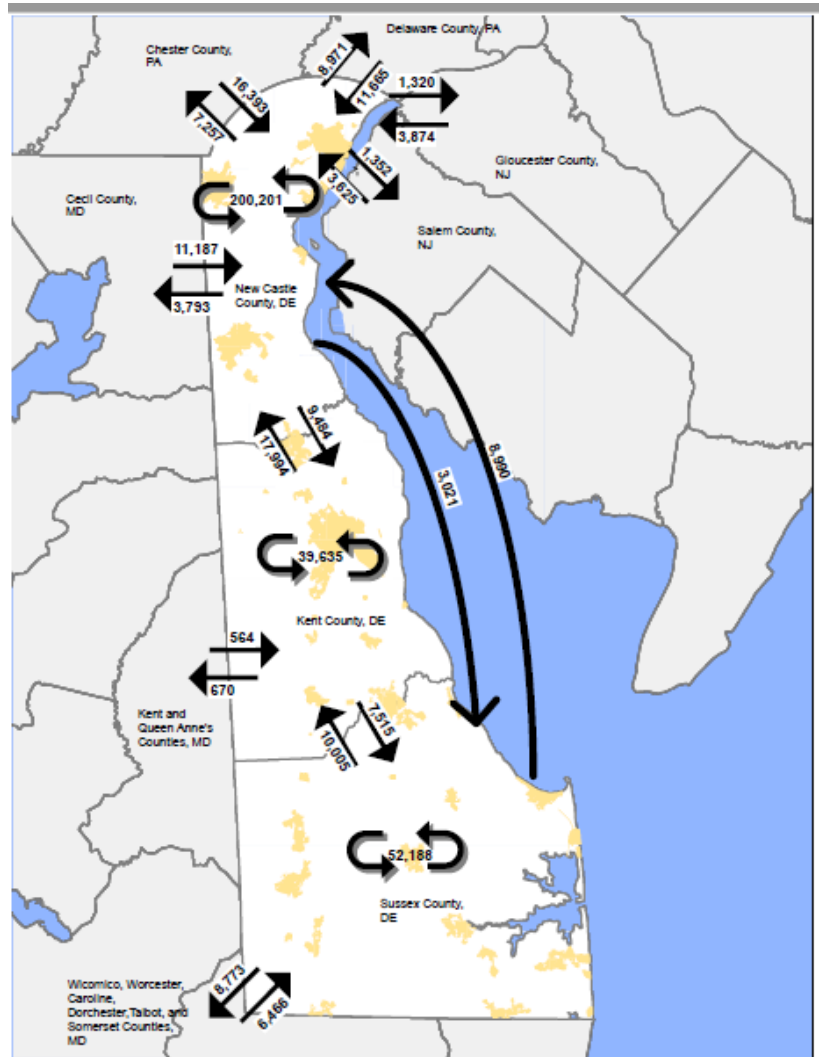
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<sup>23</sup> USEPA. Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model. EPA-420-B-14-006. January 2014.

<sup>24</sup> <http://www.epa.gov/cair/rule.html>

<sup>25</sup> "Guidance for Implementing the 1-Hour Ozone and Pre-Existing PM<sub>10</sub> NAAQS," December 29, 1997, <http://www.epa.gov/ttn/oarpg/t1/memoranda/iig.p>

Using vehicle emission reductions from Sussex County vehicles for increased emission in Kent and New Castle are further supported by the number of vehicles that travel each day between the three Delaware counties. Figure 19. This would be achieved by amending Sussex County's regulation 1126 to include - the addition of On-Board Diagnostic testing to 1996 and newer vehicles weighing 8,500 pounds up to 14,000 pounds in Sussex County and adding a gas cap test for evaporative emissions for vehicles 1995 and older.



**Figure 18. WILMAPCO – Vehicle movements between counties. (2017)**

Following discussions with senior leadership for the Department and the Department of Transportation, it was agreed to further to modify the program. The I/M program in Kent and New Castle counties amendments to Regulation 1131 would eliminate the two-speed idle exhaust test and tank pressure test while retaining the gas cap test and expand testing for 2008 and newer vehicles weighing 8,501 pounds up to 14,000 pounds as shown in Table 7.

***Table 7. Proposed Amendments for Establishing a Statewide Program***

County	Regulation	Vehicle Model Years Exempt	1995 and older vehicles		1996 and newer vehicles
Sussex	1126	First 7 model years	Curb Idle	Gas Cap	OBD
Kent	1131	First 7 model years	Curb Idle	Gas Cap	OBD
New Castle	1131	First 7 model years	Curb Idle	Gas Cap	OBD

Modeling was again performed using MOVES 2014b to assess the emissions attributed to the passage of Delaware’s legislative directive (HB246) and the proposed amendments to the existing I/M programs.

**Table 8. Modeling for I/M Program Final Recommendations**

Evaluation Year	County	Description		Differences: (Tons/Year) from the Baseline [5 MY Exemption]		PASS
				CO	NOx	Baseline
2023	Kent	Baseline - Current Program 5 Year Exemption		0.0	0.0	0.0
		Current Program 7 Year Exempt		-55.2	-3.2	-2.1
		Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt		-17.1	-0.3	-0.7
	New Castle	Baseline - Current Program 5 Year Exemption		0.0	0.0	0.0
		Current Program 7 Year Exempt		-224.5	-13.2	-7.6
		Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt		-184.0	-10.1	-7.8
	Combined Kent & New Castle	Baseline - Current Program 5 Year Exemption		0.0	0.0	0.0
		Current Program 7 Year Exempt		-279.7	-16.4	-9.7
		Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt		-201.0	-10.4	-8.5
	Sussex	Baseline - Current Program 5 Year Exemption		0.0	0.0	0.0
		Current Program 7 Year Exempt		-60.1	0.0	-1.4
		Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt		594.2	112.0	54.1

Table 9 shows that the overall impact of the proposed plan will be to reduce emissions from the baseline by 391.1 tons per year of CO, 101.6 tons per year of NOx and 45.6 tons per year of VOC's.

**Table 9. Non-Interference Demonstration - Overall Statewide Summary**

Evaluation Year	Counties	Description	Differences: (Tons/Year) from the Baseline [5 MY Exemption]		PASS
			CO	NOx	Baseline FAIL
2023	All 3 Counties	Baseline - Current Program 5 Year Exemption	0.0	0.0	0.0
		Current Program - 7 Year Exempt	-339.8	-16.4	-11.1
		Statewide OBD 14,500 + SSI 8,500 + GasCap + 7MY Exempt	393.1	101.6	45.6

## Section 5.0 Performance Standard Analysis

Historically, EPA’s approach to establishing minimum performance standards for basic and enhanced I/M has involved publishing a list of program parameters for each performance standard in the *Federal Register* as part of the larger I/M rule. These program parameters tend to be those that impact the amount of reductions a program is projected to achieve and include: test frequency, test type, test standards, vehicle model year and vehicle type coverage, compliance rate, waiver rate, etc.

To determine whether a state’s proposed program is projected to meet or exceed the relevant performance standard, the state needs to perform three modeling scenarios: a no-I/M case, the proposed program, and the applicable I/M performance standard. These modeling scenarios are to be performed using the most recently required mobile source emission factor model along with other locally variable parameters, such as the age distribution of the local in-use fleet, average ambient temperature, the distribution of vehicle miles travelled (VMT), average speed, etc.

The proposed program and performance standard scenarios are compared to the no-I/M case to determine the percent reduction produced by the proposed program and the applicable performance standard, respectively. If the proposed program is projected to achieve the same or greater percent reductions in hydrocarbons (HC), oxides of nitrogen (NOx), and/or carbon monoxide (CO) as would be achieved by the performance standard, then the proposed program is considered to have met the performance standard and is one step closer to being deemed approvable.

## Performance Standard Evaluation<sup>26</sup>

The Motor Vehicle Emissions Inspection program is designed and implemented to meet or exceed a minimum performance standard. The standard is expressed as emission levels in area-wide average grams per mile (gpm), achieved from highway mobile sources.

The Performance Standards were selected from the appropriate section of the Clean Air Act:

40 CFR §51.352 (a) - Basic I/M Performance Standard for Sussex County

40 CFR §51.351 (h) - Ozone Transport Region Low-Enhanced Performance Standard for Kent and New Castle

**Table 10. Basic I/M Performance Standard (Used for Sussex County)**

polProcessID	Stated	countyID	yearID	sourceTypeID	fuelTypeID	IMProgramID	inspectFreq.	TestStandardsID	begModelYearID	endModelYearID	useIMyn	complianceFactor
101	10	10005	2023	21	1	1100	1	11	1968	2022	Y	100.00
102	10	10005	2023	21	1	1100	1	11	1968	2022	Y	100.00
201	10	10005	2023	21	1	1100	1	11	1968	2022	Y	100.00
202	10	10005	2023	21	1	1100	1	11	1968	2022	Y	100.00

**Table 11. Ozone Transport Region Low-Enhanced Performance Standard (Used for Kent and New Castle Counties)**

polProcessID	Stated	countyID <sup>27</sup>	yearID	sourceTypeID	fuelTypeID	IMProgramID	inspectFreq	testStandards ID	begModelYear ID	endModelYearID	useIMyn	complianceFactor
101	10	10003	2023	21	1	111	1	11	1968	2000	y	93.120
101	10	10003	2023	31	1	111	1	11	1968	2000	y	87.533
101	10	10003	2023	32	1	111	1	11	1968	2000	y	81.946
102	10	10003	2023	21	1	111	1	11	1968	2000	y	93.120

<sup>26</sup> See detail in EPA-420-B-14-006 : Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model

<sup>27</sup> For Kent County, the table would be identical, except that in Kent Couty, the countyID is 10001

<i>polProcessID</i>	<i>Stated</i>	<i>countyID</i> <sup>27</sup>	<i>yearID</i>	<i>sourceTypeID</i>	<i>fuelTypeID</i>	<i>IMProgramID</i>	<i>inspectFreq</i>	<i>testStandards ID</i>	<i>begModelYear ID</i>	<i>endModelYearID</i>	<i>useIMyn</i>	<i>complianceFactor</i>
102	10	10003	2023	31	1	111	1	11	1968	2000	y	87.533
102	10	10003	2023	32	1	111	1	11	1968	2000	y	81.946
301	10	10003	2023	21	1	111	1	11	1968	2000	y	93.120
301	10	10003	2023	31	1	111	1	11	1968	2000	y	87.533
301	10	10003	2023	32	1	111	1	11	1968	2000	y	81.946
302	10	10003	2023	21	1	111	1	11	1968	2000	y	93.120
302	10	10003	2023	31	1	111	1	11	1968	2000	y	87.533
302	10	10003	2023	32	1	111	1	11	1968	2000	y	81.946
101	10	10003	2023	21	1	151	1	51	2001	2022	y	93.120
101	10	10003	2023	31	1	151	1	51	2001	2022	y	87.533
101	10	10003	2023	32	1	151	1	51	2001	2022	y	81.946
102	10	10003	2023	21	1	151	1	51	2001	2022	y	93.120
102	10	10003	2023	31	1	151	1	51	2001	2022	y	87.533
102	10	10003	2023	32	1	151	1	51	2001	2022	y	81.946
301	10	10003	2023	21	1	151	1	51	2001	2022	y	93.120
301	10	10003	2023	31	1	151	1	51	2001	2022	y	87.533
301	10	10003	2023	32	1	151	1	51	2001	2022	y	81.946
302	10	10003	2023	21	1	151	1	51	2001	2022	y	93.120
302	10	10003	2023	31	1	151	1	51	2001	2022	y	87.533
302	10	10003	2023	32	1	151	1	51	2001	2022	y	81.946
112	10	10003	2023	21	1	143	1	43	2001	2022	y	93.120
112	10	10003	2023	31	1	143	1	43	2001	2022	y	87.533
112	10	10003	2023	32	1	143	1	43	2001	2022	y	81.946

The Motor Vehicle Emissions Simulator (MOVES2014b) model was used to model the 2023 emissions inventories. Table 8 and 9 summarizes the 2023 results for CO, NOx, and VOC's covering Kent, New Castle and Sussex Counties.

The relevant performance standard for each county was run as Option B. This was used to evaluate the other options within each county. The total VMT for each county was used to convert the emissions of each pollutant to grams/mile. The only case where the option did not meet the performance standard was Option A (no I/M program) for Kent and New Castle Counties.

**Table 12. 2023 VMT by County and Performance Standard Used**

<b>Year</b>	<b>County</b>	<b>VMT</b>	<b>Performance Standard Used</b>
2023	Kent	1,871,944,955	40 CFR §51.351 (h) - Ozone Transport Region Low-Enhanced Performance Standard.
	New Castle	6,450,798,722	
	Sussex	2,755,333,009	40 CFR §51.352 (a) - Basic I/M Performance Standard.



**Table 13. Options showing the emissions, grams/mile and emission differences vs the Relevant Performance Standard**

Evaluation Year	County	Option	Option Description	Emissions (tons/year)			grams per mile			Emissions differences (g/mile) from the <b>Performance Standard</b>		
										Better than the Standard = <b>Approvable</b>		
										Within the leeway (0.02 g/mile) = <b>Approvable</b>		
										<b>Not Approvable</b>		
				CO	NOx	VOC	CO	NOx	VOC	NOx	VOC	Comment
2023	Kent	A	None	8,287.9	1,059.4	654.3	4.01647	0.51339	0.31707	-0.026	-0.030	Not Approvable
		B	Performance Standard	8,287.9	1,005.1	592.1	4.01647	0.48707	0.28693	0.000	0.000	Approvable
		C	Baseline - Current Program 5 Year Exemption	7,172.7	989.3	583.5	3.47606	0.47941	0.28276	0.008	0.004	Approvable
		F	Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt	7,189.8	989.6	584.2	3.48434	0.47958	0.28313	0.007	0.004	Approvable
	NewCastle	A	None	27,052.6	3,011.8	1,818.0	3.80445	0.42356	0.25567	-0.025	-0.025	Not Approvable
		B	Performance Standard	27,052.6	2,836.3	1,641.8	3.80445	0.39888	0.23088	0.000	0.000	Approvable
		C	Baseline - Current Program 5 Year Exemption	23,462.6	2,798.5	1,627.8	3.29958	0.39355	0.22892	0.005	0.002	Approvable
		F	Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt	23,646.6	2,808.6	1,635.6	3.32545	0.39497	0.23001	0.004	0.001	Approvable
	Sussex	A	None	13,347.9	1,628.8	1,036.9	4.39477	0.53628	0.34140	0.000	-0.006	Approvable
		B	Performance Standard	12,948.9	1,628.8	1,019.8	4.26338	0.53628	0.33577	0.000	0.000	Approvable
		C	Baseline - Current Program 5 Year Exemption	12,235.6	1,628.8	978.3	4.02854	0.53628	0.32211	0.000	0.014	Approvable
		F	Statewide OBD 14,500 + SSI 8,500 +GasCap 7MY Exempt	11,641.4	1,516.8	924.2	3.83290	0.49940	0.30430	0.037	0.031	Approvable

Sussex County has a different Performance Standard compared to that of Kent and New Castle Counties. Therefore, a combined county performance standard as such does not exist,

The proposed program (Option F) meets the performance standard for each of the counties. Therefore, the proposed plan is approvable in each county, subject to the CAA section 110I being satisfied.

## **Section 6.0 Department Recommendations**

The Division of Air Quality is proposing amendments to Regulations 1126 (Motor Vehicle Emissions Inspection Program) and 1131 (Low Enhanced Emissions Inspection and Maintenance Program) that will reduce mobile sources emissions and the associated health benefits as outlined in Section 7 Benefit of the Proposed Amendments on Health and the Environment, assist in the equitable distribution of emission reductions responsibilities between New Castle, Kent and Sussex Counties, provide for DMV's request to drop the two speed idle tailpipe test, and expand the inspection model year exemption from five to seven years.

### **Proposed Changes to Regulation 1126 (Motor Vehicle Emissions Inspection Program)**

Regulation 1126 will be amended to expand the program model year exemption from five to seven years to align with Delaware Code. The more stringent On-Board Diagnostic Test (OBD) for vehicles 1996 and newer for vehicle up to 8,500 pounds will replace the current curb idle tailpipe test on vehicles in the same vehicle weight range. On-board diagnostics means a system of vehicle component and condition monitors controlled by a central, on-board computer designed to signal the motorist when conditions exist which could lead to a vehicle's exceeding its certification standards by 1.5 times the standard. The amendment will also require vehicles that weigh 8,501 up to 14,000 pounds gross vehicle weight, beginning with model year 2008 to undergo an OBD test. In addition to the curb idle tailpipe test, vehicle model years 1995 and older will also be required to complete a gas cap pressure test.

A phased-in schedule to increase the cost of repairs to obtain an emission waiver in Sussex County is included. The pre-1981 model year repair cost remains unchanged at \$75.00. The 1981 and newer model year vehicles will be \$200 in years 2023-2024. The cost of repairs will increase to \$450 for years 2025-2026. The phase-in will achieve parity with New Castle and Kent counties in 2027. For those vehicles applying for a waiver, there is a requirement that the work is to be completed by a Certified Emission Repair Technician for 1981 and newer model years. Certified Emission Repair Technicians are certified and permitted by the state after they have applied and documented their training and completion of classes and tests to satisfy regulatory requirements. The regulation contains additional language to clarify and prevent tampering of emission controls.

### **Regulation 1131 (Low Enhanced Emissions Inspection and Maintenance Program)**

Regulation 1131 proposed amendments include the expansion of the program model year exemption from five to seven years to align with Delaware Code. The current regulation does require the OBD Test for vehicles 1996 and newer for vehicle up to 8,500 pounds. The amendment will add the OBD Test requirement for vehicles that weigh 8,501 up to 14,000 pounds gross vehicle weight, beginning with model year 2008. In addition, the current two speed idle tailpipe test will be discontinued and replaced by a curb idle tailpipe test, for vehicle model years 1981 through 1995. Tailpipe pipe test for vehicle model years 1968 through 1980 will remain unchanged. Vehicle model year 1975 through 1995 will also be required to complete a gas cap test. The pressure integrity test of the vehicle's evaporative canister and fuel system for vehicle 1975 through 1995 has been removed. No changes have been made to the waiver program in 1131. The regulation contains addition language to clarify and prevent tampering of emission controls.

### **Section 7.0 Environmental & Health Benefits**

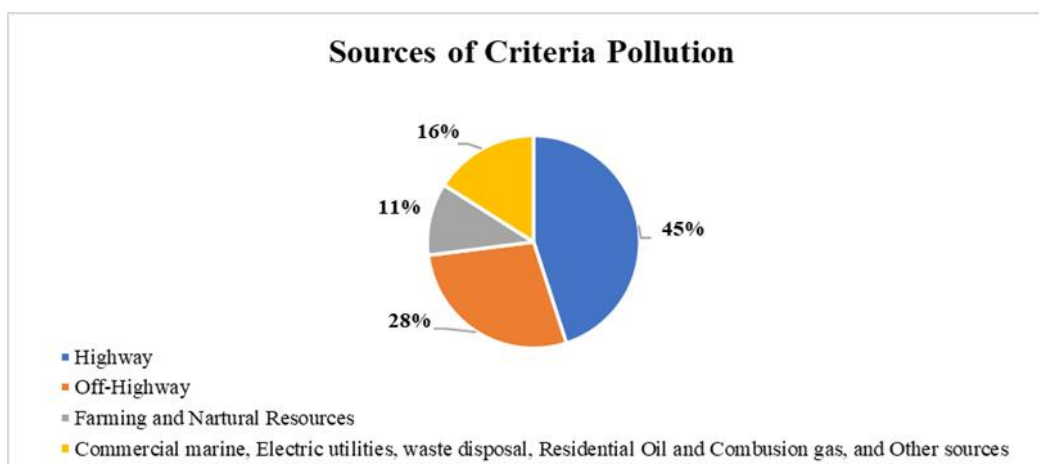
Delaware has been making excellent strive at reducing emissions from vehicles over the years due to its adoption and amendments in its IM programs. Due to the passage of House Bill 246 in 2017 which added additional two years for new vehicles exemption and continuous increase in vehicle miles traveled on highways in Delaware has offset much of the progress being made thus far. According to the Federal Highway Administration (FHWA), Office of Highway Policy Information reported that Vehicle Miles Traveled in Delaware has increased from 8.98 million in 2008<sup>28</sup> to 10.25 million miles traveled in 2019<sup>29</sup>. Our main source of air pollution reduction in Delaware derives from the emissions inspection and maintenance programs, hence the efforts to continuously improve our programs. Currently transportation is

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<sup>28</sup> FHWA, Highway Statistics Series 2008, (November 7, 2014) State Statistical Abstracts, Delaware. Retrieved September 16, 2022, from <https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/de.cfm>

<sup>29</sup> Federal Highway Administration, Highway Statistics Series 2019, (n.d.) State Statistical Abstracts, Delaware. Retrieved September 16, 2022, from [https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/2019/delaware\\_2019.pdf](https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/2019/delaware_2019.pdf)

responsible for 45 percent of pollution in Delaware as shown below in *Figure 19 – Sources of Criteria Pollution*.



***Figure 19. Delaware Sources of Air Pollution***

As vehicles continue to be one of the main sources of pollution. The health risks of air pollution are extremely serious. Poor air quality increases respiratory ailments like asthma and bronchitis, heightens the risk of life-threatening conditions like cancer, and burdens our health care system with substantial medical costs. Other possible impacts from PM<sub>2.5</sub> exposure that are being investigated include low birth weight and impacts to the brain. Particulate matter is singlehandedly responsible for up to 30,000 premature deaths each year<sup>30</sup>.

“The daily traffic volumes are expected to grow significantly throughout the state which is a result of increased in VMT. Sussex County’s proximity to the Atlantic Ocean brings a tremendous number of visitors from all over the mid-Atlantic region to the resort areas in Delaware such as Rehoboth and Bethany Beaches. Vacationers also travel through Sussex County to get to Maryland beaches. Weekends during the summer, and increasingly in the off-season, are known for their high traffic volumes along east-west through routes such as Routes 9, 404, 20, 24, 26, as well as north-south routes such as US 113 and SR 1”<sup>31</sup>.

Air pollution mainly affects those living in large urban areas, where road emissions contribute the most to the degradation of air quality. The health of susceptible and sensitive

<sup>30</sup> <https://www.ucsusa.org/resources/vehicles-air-pollution-human-health#:~:text=Passenger%20vehicles%20are%20a%20major,hydrocarbons%20emitted%20into%20our%20air.>

<sup>31</sup> Sussex County Comprehensive Plan: Mobility Element 2008  
<https://sussexcountyde.gov/sites/default/files/PDFs/MobilityElement.pdf>

individuals can be impacted even on low air pollution days. Short-term exposure to air pollutants is closely related to COPD (Chronic Obstructive Pulmonary Disease), cough, shortness of breath, wheezing, asthma, respiratory disease, and high rates of hospitalization. The long-term effects associated with air pollution are chronic asthma, pulmonary insufficiency, cardiovascular diseases, and cardiovascular mortality. Air pollution seems to have various malign health effects in early human life, such as respiratory, cardiovascular, mental, and perinatal disorders, leading to infant mortality or chronic disease in adult age<sup>32</sup>.

Table 14 covers data from 2018 to 2021 estimating vulnerable populations that currently live in areas where these impacts are projected to be the highest. The adoption and amendments of our regulations have helped successfully keep Delaware on path to a cleaner, healthier transportation and environmental future.

**Table 14: At Risk Group<sup>33</sup>**

County	Total Pop	Under 18	65 & over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	CV Disease	Preg.	Poverty Est.	People of Color
<u>Kent</u>	183,643	41,789	32,951	3,114	15,542	8,552	106	13,394	2,018	23,168	74,193
<u>New Castle</u>	561,531	119,200	92,855	8,882	48,620	25,956	325	40,073	6,289	55,026	250,437
<u>Sussex</u>	241,635	43,667	71,788	3,254	21,242	14,917	140	24,380	1,921	26,206	59,650
Total:	986,809	204,656	197,594	15,250	85,404	49,425	571	77,847	10,228	104,400	384,280

In the 1992 proposed rulemaking<sup>34</sup> for the federal I/M requirements – EPA stated the following benefits would be achieved by implementing the I/M program:

*“This rule will provide environmental and health benefits by decreasing in-use motor vehicle emissions of VOCs, CO, and NOx. In 1985, motor vehicles were responsible for 70 percent of the nation’s CO, 45 percent of the NO, and 34 percent of the VOCs. Ozone, the major component of smog, is produced by the photochemical reaction of VOC and NO, emissions. Motor vehicles are also a significant source of toxic air pollutants. Their contribution to toxics is decreased as hydrocarbon levels are lowered. All of these pollutants have significant adverse effects on human health and the environment.*

<sup>32</sup> Environmental and Health Impact of Air Pollution: A Review  
<https://www.frontiersin.org/articles/10.3389/fpubh.2020.00014/full#B6>

<sup>33</sup> American Lung Association of Delaware <https://www.lung.org/research/sota/city-rankings/states/delaware>

<sup>34</sup> USEPA. Retrieved from <https://www.govinfo.gov/content/pkg/FR-1992-07-13/pdf/FR-1992-07-13.pdf>

*Carbon monoxide interferes with the oxygen-carrying capacity of the blood. Exposure aggravates angina and other aspects of coronary heart disease and decreases exercise tolerance in persons with cardiovascular problems. Infants, fetuses, elderly persons, and individuals with respiratory diseases are also particularly susceptible to CO poisoning.*

*Nitrogen oxides, a family of gases including nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO), irritate the lungs, lower resistance to respiratory infections, and contribute to the development of emphysema, including nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO), irritate the lungs, lower resistance to respiratory infections, and contribute to the development of emphysema, bronchitis, and pneumonia. NO, contributes to ozone formation and can also react chemically in the air to form nitric acid.*

*HC emissions include VOC, which react with NO, to form ozone and other photochemical oxidants. Some VOCs, including benzene, formaldehyde, and 1,3-butadiene, are air toxics. They cause cancer and other adverse health effects, as well as toxic deposition in lakes and coastal waters.*

*As shown in the following table, when compared to the no-I/M case, current I/M programs obtain estimated total annual emission reductions of 116,000 tons of VOC and 1,566,000 tons of CO. Implementation of the (biennial high option) requirements of this proposed action would yield estimated annual emission reductions of 384,000 tons of VOC and 2,345,000 tons of CO from enhanced I/M programs, and 36,000 tons of VOC and 500,000 tons of CO from basic programs, as compared to the no I/M case. Enhanced I/M programs would also reduce NO<sub>x</sub> emissions. The transient test with NO<sub>x</sub> cut points designed to fail 10% to 20% of the vehicles would yield estimated NO<sub>x</sub> reductions of 9% relative to emission levels with no program in place.*

**Table 15. National Benefits of I/M**

[Annual tons of emission reductions in 2000 compared to the no-I/M case]

	VOC	CO
Reductions from continuing I/M unchanged:		
Centralized.....	55,540	775,228
Decentralized.....	<u>60,476</u>	<u>791,167</u>
Current total.....	116,016	1,566,395
Expected reductions from proposal:		
Enhanced areas.....	384,130	2,345,278
Basic areas: Centralized.....	23,289	326,290
Decentralized.....	<u>12,996</u>	<u>174,186</u>
Basic total.....	36,285	500,476
Total future benefit....	420,415	2,845,754

*Thus, enhanced I/M and improvements to existing and new I/M programs will result in national emission reductions substantially greater than current I/M programs.”*

## **Section 8.0 Public Engagement**

Public engagement is an integral part of Delaware’s regulatory development process. The Department follows an internal regulatory development process to ensure that, to the extent possible, everyone who is interested in a proposed action regarding a regulation is properly notified about it, that the department follows a predictable and open process in developing, adopting, amending, and/or repealing such regulations, and that all these processes conform to legal and programmatic requirements. The Department has provided several opportunities for the public to actively participate in the regulatory process and to provide meaningful input.

All regulatory changes begin with an internal Department Start Action Notice (SAN) which lists the type and purpose of the proposed change, the statutory basis for the action, affected stakeholders, schedules and more information. The Department introduced a SAN for 7 DE Admin. Code 1126 with SAN# 218-04 and 7 DE Admin. Code 1131 with SAN# 2018-05 on April 2, 2018. Both SAN documents were signed and approved by the Department Secretary and the General Assembly was notified that the Department was proposing regulatory amendments on April 12, 2018.

As part of the public review process, regulatory changes are published in the monthly Register of Regulations. All Department public notices are published in statewide newspapers and on the Department’s Administrative Law website. All public meetings and events of the agency, including Public Hearings, are published on the Department’s calendar of events. Meetings subject to the state open meetings law are also published on the state Public Meeting Calendar.

***Table 16. Public Engagement Actions***

Engagement Action	Date
SAN approved	April 2, 2018
Public Workshop	May 23, 2018
Public Workshop (Virtual)	May 25, 2022 10 am
Public Workshop (Virtual)	May 25, 2022 6 pm
Public Hearing	September 29, 2022

The Department initially held a public workshop to provide the public with outreach and education opportunities on the proposed changes to 7 DE Admin. Code 1126 and 7 DE Admin. Code 1131 which included the State Implementation Plan. The first public workshop was held on May 23, 2018 at 6:00 pm at the Delaware Technical and Community College, Georgetown campus. The workshop consisted of a presentation on the Department's proposed amendments. Department's proposed amendments included a model year exemption that expands the I/M program from five to seven years to align with Delaware Code, a change in testing that required all 1996 model year vehicles to receive the On-Board Diagnostic (OBD) test in all counties, a change to the older vehicle testing requirements to include curb idle for vehicles 1995 and older vehicles, a visual inspection of the catalytic converter for all 1975 and new vehicles in all counties, a change in testing requirements for vehicles between model year 1975-1980 to receive a gas cap test in all counties, and a phased-in schedule for the increase in the cost of repairs to obtain an emission waiver in Sussex County. The workshop was announced in advance of the meeting in the Cape Gazette and the Delaware State News and on DNREC's public meeting calendar on April 29, 2018. The workshop was attended by Delaware's vehicle owners, auto shops owners, the Division of Motor Vehicles, and others from the environmental community to discuss the proposed changes. No questions were received from this meeting and the department held the public comment period open.

Two virtual workshops were held on Wednesday, May 25, 2022 on the proposed draft amendments to the Inspection and Maintenance Program (I/M) via Webex webinar. The public workshops were announced in advance of the meeting in the Delaware State News and the News Journal on May 1, 2022. The first workshop was held at 10:00 am and the second was held at 6:00 pm. The Department provided a presentation of the proposed draft amendments to 7 DE Admin. Code 1126 and 7 DE Admin. Code 1131. The amendments included a model year exemption that expands the I/M program from five to seven years to align with Delaware Code, an increase for vehicles that weigh 8,501 up to 14,000 pounds gross vehicle weight beginning with model year 2008 for the On-Board Diagnostic (OBD) test in all counties, a change to the older vehicle testing requirements to include curb idle and gas cap tests for vehicles 1995 and older, a phased-in schedule for the increase in the cost of repairs to obtain an emission waiver in Sussex County; and language to prevent vehicle tampering.



Both meetings were attended by the Department, the Delaware Department of Transportation, the Division of Motor Vehicle staff and members of the public. The first workshop was attended by 13 people and the second was attended by 11 people. Questions were received and answered. Comments from the workshop were received until Wednesday, June 8, 2022. No comments were received during the comment period.

The Department did, however, conduct an interactive survey during both May 25, 2022 workshops to gain an understanding of the public's opinions on how the draft amendments were received. Of the people present, only 2 people voluntarily participated in the survey. The survey questions with the responses received are summarized in Table 17 - Department Survey and Responses Received. Both respondents were in agreement with the amendments presented except the phase-in schedule for the increase in the cost of repairs to obtain an emission waiver in Sussex County.

The Department further reviewed the phase-in schedule of the waiver repair costs for Sussex County vehicles. The waiver cost threshold for 1981 and newer vehicles registered in Sussex County will change from \$200 to \$450 for the 2023-2024 inspection cycle and reach parity with Kent and New Castle County for the 2025-2026 inspection cycle which allows Sussex County vehicles owners more time.

**Table 17: Department Survey and Responses Received**

	Responses Received	
	10 am Workshop	6 pm Workshop
Survey Question	Participants - 1	Participants – 1
Question 1 Do you support regulatory amendments to implement a consistent I/M program in all three counties to benefit air quality?	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>
Question 2 Do you support amending the I/M program to test vehicles up to 14,000 pounds?	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>
Question 3 Do you support amendments to OBD test vehicles in Sussex County?	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No - 0</li> </ul>
Question 4 Have you ever applied for an emissions waiver?	<ul style="list-style-type: none"> <li>• Yes – 0</li> <li>• No – 100%</li> </ul>	<ul style="list-style-type: none"> <li>• Yes – 0</li> <li>• No – 100%</li> </ul>
Question 5 Considering the complexity of newer vehicles, where do you believe vehicle repairs should be completed in order to qualify for an emissions waiver?	<ul style="list-style-type: none"> <li>• Repairs should be made at any auto repair shop – 0</li> <li>• Repairs should be made by a Certified Emission Repair Technician – 100%</li> <li>• Other - 0</li> </ul>	<ul style="list-style-type: none"> <li>• Repairs should be made at any auto repair shop - 0</li> <li>• Repairs should be made by a Certified Emission Repair Technician – 0</li> <li>• Other – 100%</li> </ul>
Question 6 Which proposed Waiver Option do you believe is the best approach? <ul style="list-style-type: none"> <li>• Option 1 - \$200 for 2023/2024; \$450 for 2025/2026; &amp; parity with Kent/New County by 2027</li> <li>• Option 2 - \$450 for 2023/2026; &amp; parity with Kent/New County by 2027</li> <li>• Option 3 - Parity with Kent/New County by 2027</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Option 1 – 0</li> <li>• Option 2 – 100%</li> <li>• Option 3 – 0</li> <li>• Other – 0</li> </ul>	<ul style="list-style-type: none"> <li>• Option 1 – 0</li> <li>• Option 2 – 0</li> <li>• Option 3 – 100%</li> <li>• Other – 0</li> </ul>
Question 7 Would you support a vehicle “buy-back” program (I.e. cash for clunkers)?	<ul style="list-style-type: none"> <li>• Yes - 100%</li> <li>• No – 0</li> </ul>	<ul style="list-style-type: none"> <li>• Yes – 0</li> <li>• No - 0</li> </ul> (No response

	Responses Received	
	10 am Workshop	6 pm Workshop
Survey Question	Participants - 1	Participants – 1
Question 8 Would you support “hardship” funding to cover the cost of repairs for low income vehicle owners?	<ul style="list-style-type: none"><li>• Yes - 100%</li><li>• No – 0</li></ul>	<ul style="list-style-type: none"><li>• Yes - 100%</li><li>• No – 0</li></ul>

After the workshop, the proposed draft regulations, the presentation slides, and both video recordings along with the supporting documents were posted on the Department’s regulatory development website: <https://dnrec.alpha.delaware.gov/air/permitting/under-development/>.

After finalizing the draft regulatory language, the Department scheduled a public hearing to be held on Thursday, September 29, 2022 to present the proposed regulatory language. The public hearing was advertised in the August 28, 2022 edition of both the Delaware State News and the News Journal. The meeting was also announced on the August 28, 2022 Public Meeting Calendar and on the Department’s Public Hearing webpage. The public comment period will remain open until October 14, 2022.

## References

- [1] Evolution of the Clean Air Act. <https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act>
- [2] The air quality design value at a monitoring site is defined as the 3-year average annual fourth-highest daily maximum 8-hour average ozone concentration is also the air quality design value for the site. (40 CFR Part 50, Appendix I, Interpretation of the 8-Hour Primary and Secondary National Ambient Air Quality Standards for Ozone)
- [3] Sources of Greenhouse Gas Emissions. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>
- [4] Bureau of Transportation Statistics. 2020. Retrieved from <https://www.bts.gov/content/highway-profile> on 09/19/2022.
- [5] USEPA - Vehicle Emissions Inspection and Maintenance (I/M): Policy and Technical Guidance. 2022. Retrieved from <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-inspection-and-maintenance-im-policy-and-technical>.
- [6] USEPA – Chronological List of Rulemakings. 2022. Retrieved from <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-inspection-and-maintenance-im-general-information#chronological>.
- [7] The Act also established the OTR in the Northeastern United States which includes the States of Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, Pennsylvania, New York, New Jersey, Delaware, Maryland, and Northern Virginia and the District of Columbia.
- [8] Delaware 145th General Assembly. 2010. An Act to Amend Titles 7 and 21 of the Delaware Code relating to motor vehicles. Retrieved from Bill Detail - Delaware General Assembly.
- [9] Based upon ASE fees as of November 2, 2011 – see <http://ase.com/Tests/ASE-Certification-Tests/cbt/Dates,-Fees,---Test-Times.aspx>
- [10] Meets the requirements of 40 CFR §51.366(b)(1)(i)
- [11] Meets the requirements of 40 CFR §51.366(b)(5) - the number of inspectors licensed or certified to conduct testing.
- [12] The DMV name for the automated diagnostics gathered from vehicles owned by the State of Delaware. It is run by ThingTech.
- [13] Delaware State Code Title 21 § 2143 was amended on 9/21/2017 to change the exemption for new vehicles from 5 to 7 years
- [14] Test performed while vehicle idles in Park or Neutral.
- [15] A test conducted by pressurizing the gas cap for the purpose of identifying leaks in the gas cap.
- [16] A test conducted by pressuring the evaporative system by way of the fuel tank's fill neck and sometimes referred to as the fill neck pressure (FP) test.
- [17] Test performed while vehicle idles and at 2500 rpm.

- [18] Test of exhaust-related systems and components performed by visual check of Malfunction Indicator Light (MIL) and scan of on-board (OBD) computer for system readiness, MIL status and stored trouble codes, on 1996 and newer OBD-equipped vehicles only.
- [19] Delaware House Bill 246, An Act to Amend Title 21 of the Delaware Code Relating to Registration, Title, and Licenses of Motor Vehicles - <http://legis.delaware.gov/BillDetail?LegislationId=26006>
- [20] The existing Basic I/M program in Sussex County provides no additional NOX credits.
- [21] Section 110(l) applies to both maintenance plans under section 175A and those under section 110(a)(1) that may be required following promulgation of a new NAAQS.
- [22] United States Environmental Protection Agency, MOVES Versions in Limited Current (January 11,2022) Retrieved September 16, 2022 from <https://www.epa.gov/moves/moves-versions-limited-current-use#moves2014-general>.
- [23] USEPA. Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model.
- [24] EPA-420-B-14-006. January 2014.<http://www.epa.gov/cair/rule.html>
- [25] “Guidance for Implementing the 1-Hour Ozone and Pre-Existing PM10 NAAQS,” December 29, 1997,<http://www.epa.gov/ttn/oarpg/t1/memoranda/iig.p>
- [26] See detail in EPA-420-B-14-006: Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model
- [27] For Kent County, the table would be identical, except that in Kent Couty, the countyID is 10001
- [28] FHWA, Highway Statistics Series 2008, (November 7, 2014) State Statistical Abstracts, Delaware. Retrieved September 16, 2022, from <https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/de.cfm>
- [29] Federal Highway Administration, Highway Statistics Series 2019, (n.d.) State Statistical Abstracts, Delaware. Retrieved September 16, 2022, from [https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/2019/delaware\\_2019.pdf](https://www.fhwa.dot.gov/policyinformation/statistics/abstracts/2019/delaware_2019.pdf)
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- [31] Sussex County Comprehensive Plan: Mobility Element 2008 <https://sussexcountyde.gov/sites/default/files/PDFs/MobilityElement.pdf>
- [32] Environmental and Health Impact of Air Pollution: A Review <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00014/full#B6>
- [33] American Lung Association of Delaware <https://www.lung.org/research/sota/city-rankings/states/delaware>
- [34] USEPA. Retrieved from <https://www.govinfo.gov/content/pkg/FR-1992-07-13/pdf/FR-1992-07-13.pdf>