

Chapter 3B: Emissions and Source Attribution

Introduction

The Community Emissions Reduction Plan (CERP) needs to identify air pollution challenges that each community faces, and define strategies to reduce the exposure burden from sources of criteria air pollutants (CAPs) and toxic air contaminants (TACs). Identifying air quality priorities for the CERP is accomplished through listening to the community's input and expertise, along with evaluating technical data on emission sources in the community. A rigorous accounting of

sources and their resulting emissions is needed to produce an accurate emissions inventory that will serve as a baseline reference from which emission reductions can be measured. This rigorous accounting of sources, their emissions and their contribution to the cumulative exposure burden is what the CARB guidelines identify as the source attribution analysis. Per the direction of CARB guidelines, source attribution is required to meet the following AB 617 statutory requirements:

California Health and Safety Code § 44391.2 (b) (2) directs CARB to provide “[a] methodology for assessing and identifying the contributing sources or categories of sources, including, but not limited to, stationary and mobile sources, and an estimate of their relative contribution to elevated exposure to air pollution in impacted communities...”

The CARB guidelines recommended five potential technical approaches for the source attribution analysis. The options presented are: developing an emissions inventory, air quality modeling, targeted air monitoring/back trajectory/pollution roses/inverse modeling, chemical mass balance and positive matrix factorization. Among these options, based on the availability of data and resources, this source attribution analysis employs the emissions inventory and air quality modeling analysis approaches to identify sources contributing to air pollution levels in the community, with an emphasis on identifying sources within the community (emissions inventory). More information on source attribution methods is included in the Source Attribution Methodology report¹. The most recent air quality modeling analysis was conducted as part of the Multiple Air Toxics Exposure Study (MATES IV) in 2015, which showed that Diesel Particulate Matter (DPM) was the air pollutant that contributed most to the air toxics cancer risk in the South

Chapter 3B Highlights

- Information about the sources of air pollution in this community is presented in a “source attribution” analysis
- Diesel particulate matter is currently the main air toxic pollutant in this community, and it comes mostly from on-road and off-road mobile sources
- In future years, diesel emissions decrease substantially due to CARB regulations, but continues to be the main driver of air toxics cancer risk in this community
- Other key air toxic pollutants in this community are 1,3-butadiene (mostly from the chemical industry) and hexavalent chromium (mostly from brake wear)

¹ Methodology for Source Attribution Analyses for the first year AB 617 Communities in the South Coast Air Basin (Technical Report), 2019. [add URL when available]

Coast Air Basin. While the San Bernardino, Muscoy (SBM) community had slightly lower cancer risk compared to the overall average (**Figure 3-5**), the SBM has some of the highest ozone levels in the Basin. A community-specific emissions inventory was developed for criteria air pollutants (CAPs) and TACs based on the most recent available datasets.

The SBM community contains some obvious sources of air pollution, including major freeways and major rail yards within the community that support the goods movement industry. The community also includes a wide range of industrial facilities, including asphalt, concrete and other mineral production processes, and 43 warehouses larger than 100,000 square feet, which attract heavy-duty truck traffic. The source attribution analysis highlights that in the year 2017, on-road and off-road mobile sources were the predominant sources of DPM, with the major contributors being heavy-heavy duty trucks, medium-heavy duty trucks, off-road diesel equipment, and trains. In this community, stationary and area sources contribute to the emissions of 1,3-butadiene, benzene and formaldehyde, with the chemical industry as the major source for 1,3-butadiene emissions, and fuel combustion in residential and commercial sectors as the major source of benzene and formaldehyde. The analysis presented in this chapter provides further details on the sources of NO_x, VOCs and PM_{2.5}. Projected emissions in future years show decreases in DPM emissions, although DPM continues to be the main contributor to cancer risk.

The community-level emissions and their sources are discussed in this report. The detailed methodology to develop these emissions is provided in the Source Attribution Methodology report. Base year emissions of CAPs and TACs are provided in section 2. Future year emissions of CAPs and TACs are discussed in section 3, and a summary is provided in section 4.

Base year emissions inventory and source attribution

Overall profiles of CAPs and TACs

A variety of sources contribute to the emissions of criteria pollutants in the San Bernardino and Muscoy community, with different sources emitting different air pollutant species (**Figure 1**). NO_x emissions are primarily from combustion sources. On-road mobile sources are the largest emitters of NO_x, with heavy-duty trucks being the largest contributor in this community. Off-road mobile sources, including trains and off-road equipment, are the second largest contributor to NO_x emissions. Area sources of NO_x are mainly from fuel combustion for space and water heating at commercial businesses and homes, whereas point sources of NO_x include fuel combustion at industrial facilities.

VOC emissions mostly come from area sources, specifically from consumer products and outdoor paints (architectural coatings), as well as vehicle exhaust. The largest contributors to PM_{2.5} emissions are area sources, such as commercial cooking, residential wood burning (residential fuel combustion), and paved road dust. PM is also emitted from mobile sources via vehicle exhaust and tire and brake wear. While paved road dust is also related to vehicles traveling on roads, it is considered as an area source rather than a mobile source. It is important to note that ambient PM_{2.5} concentrations in the community have decreased steadily in the past decades

due to the reductions of PM_{2.5} precursor emissions such as NO_x, SO_x, and VOC. Ambient PM_{2.5} can be either formed through chemical reactions of its precursor pollutants or be emitted directly from sources. In the South Coast Air Basin including in this community, the majority of ambient PM_{2.5} is from secondary chemical reactions in the atmosphere rather than directly emitted from local sources. Accordingly, although local PM_{2.5} emissions have decreased marginally over the past decade, the ambient PM_{2.5} concentrations have been improved substantially, and the South Coast Air Basin is close to attainment of the U.S. EPA's ambient air quality standards for PM_{2.5}.

TAC emissions from point sources were compiled from the emissions reported by facilities. TAC emissions from area, on-road, and off-road sources were calculated using chemical speciation profiles applied to PM or TOG emissions. Details on the chemical speciation profiles are provided in a separate Source Attribution Methodology report¹. In total, 22 air toxic pollutants were analyzed and included in this report. This list of air toxic pollutants is consistent with the list of TACs that facilities are required to report under the South Coast AQMD Annual Emissions Reporting (AER) program, except chlorofluorocarbons (CFCs) and ammonia were not included. CFCs do not have an associated cancer risk, whereas ammonia is included in the CAPs inventory because it is a PM precursor.

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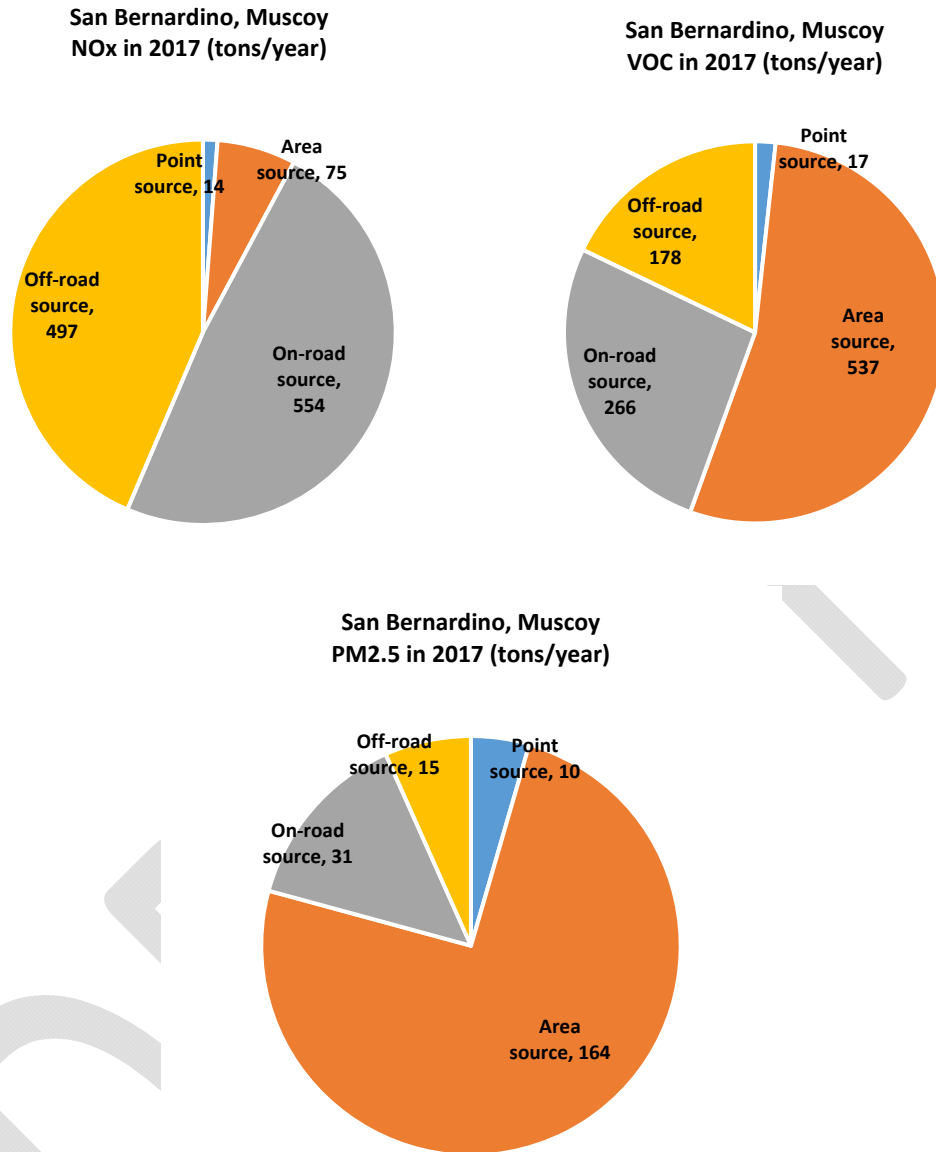


Figure 1. Contribution of major sources to NO_x emissions, VOC emissions, PM_{2.5} emissions in San Bernardino and Muscoy in 2017 (tons/year)

The contribution from point, area, on-road and off-road emission sources to TACs emissions in this community are presented in **Figure 2**. Note that the emissions in the figure are weighted based on the air toxics cancer risk (hereafter referred as “cancer risk”) of each TAC relative to DPM. For example, Cr6+ has a cancer risk that is approximately 464 times higher than that of DPM. Thus, Cr6+ emissions are multiplied by 464 to estimate the cancer-risk-weighted emissions of Cr6+. The units in the cancer-risk-weighted DPM-equivalent emissions are expressed in pounds per year (lbs/year). This weighting approach enables comparisons across the contribution of each

TAC to overall cancer risk using a consistent, toxicity-weighted scale. **Figure 2** shows that DPM is the biggest contributor to the overall cancer risk in the community, followed by 1,3-butadiene, hexavalent chromium, and benzene. **Figure 2** also shows the major source categories of these main TACs. Most of the DPM and Cr⁶⁺ is emitted from mobile sources. A detailed emission inventory by major source categories is provided in the Appendix.

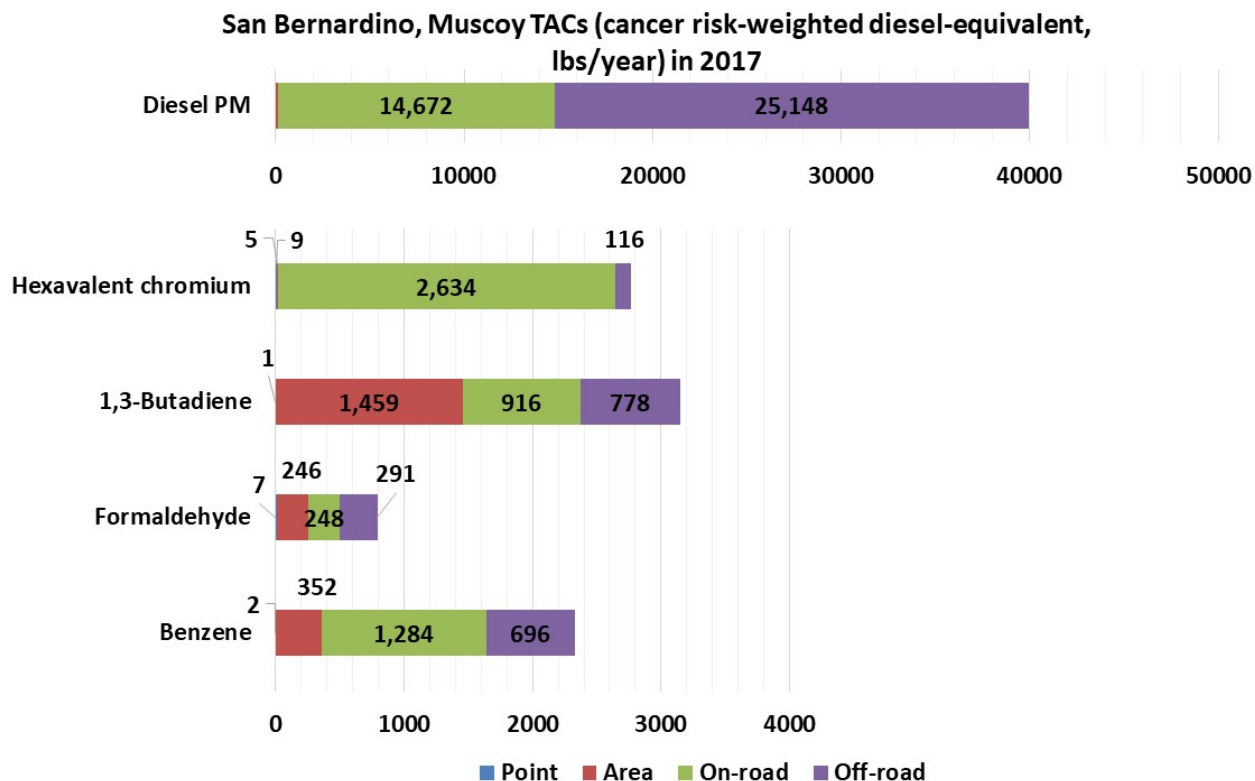


Figure 2. Contribution of major sources to toxic air contaminant emissions in the San Bernardino and Muscoy community in 2017 (shown in lbs/year, weighted by air toxics cancer risk). Note the different scale for DPM with respect to the other air toxics.

Stationary and area sources

Figure 3 provides a summary of the sources of VOC and PM2.5 emissions from stationary and area sources in the SBM community in 2017. The largest contribution to VOC emissions is solvent evaporation from consumer products. A wide range of industries also contribute significantly to the total VOC emissions from stationary sources, with degreasing and surface coating being the second largest source, and gas stations (petroleum marketing) also being a third significant source of VOC emissions.

Direct emissions of PM2.5 in the SBM community originate from a wide range of activities, including commercial cooking, residential and commercial fuel combustion, and paved road dust. In addition, emissions from various industries, including mineral processing and manufacturing, contribute to total PM2.5 emissions.

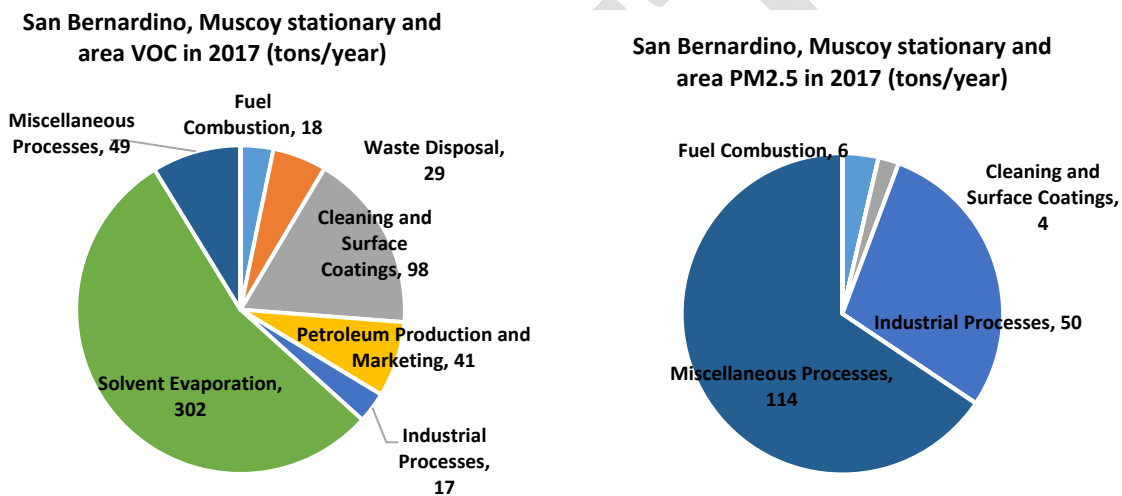


Figure 3. Source attribution of VOC emissions and PM2.5 emissions from stationary and area sources and area in the San Bernardino and Muscoy community for the year 2017

Figure 4 illustrates the emissions of the major TACs from stationary and area sources in the community. The emissions of each pollutant are weighted by their cancer risk relative to DPM. In this community, 1,3-butadiene is the most predominant air toxic from stationary and area sources. The major source for 1,3-butadiene emissions is industrial processes (**Figure 5**), mostly from chemical industries.

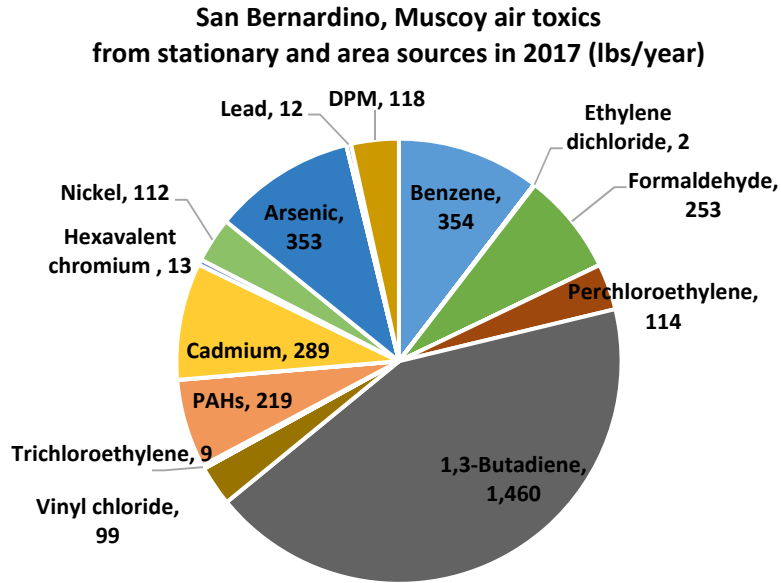


Figure 4. Toxic air contaminant emissions, weighted by cancer risk, from stationary sources in the San Bernardino and Muscoy community for the year 2017 (in lbs/year)

**San Bernardino, Muscoy 1,3-Butadiene
from stationary and area in 2017 (lbs/year)**

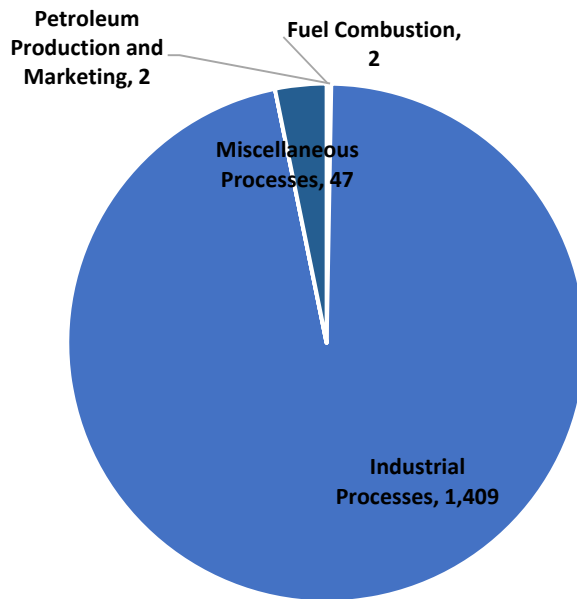


Figure 5. Source attribution of 1,3-butadiene emissions from stationary and area sources in the San Bernardino and Muscoy community for 2017 (shown in lbs/year, weighted by air toxics cancer risk)

On-road mobile sources

In this community, passenger vehicles and light- and medium-duty vehicles contribute to the majority of VOC and PM2.5 emissions (**Figure 6**). VOC emissions are mostly from gasoline vehicles², and, as a result, passenger cars are the main contributor to VOC emissions because of the large number of vehicles and miles traveled by these types of vehicles. PM2.5 emissions from on-road sources are from fuel combustion as well as from tire and brake wear. Light and medium duty vehicles are the main contributors to the total emissions of PM2.5, because these vehicles travel the most miles within the community. Even though heavy-duty trucks drive less than 10% of the total vehicle miles traveled in San Bernardino County, heavy-duty trucks contribute to more than 30% of the total PM2.5 emissions from on-road sources³.

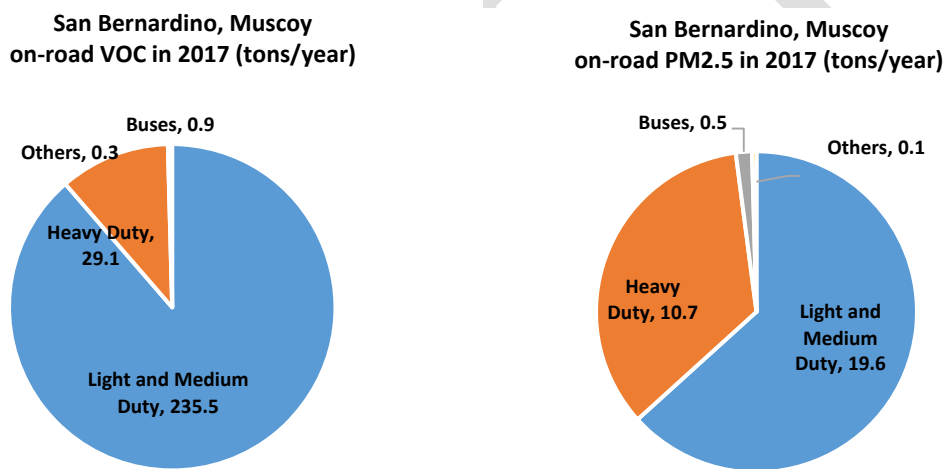


Figure 6. Source attribution of VOC emissions and PM2.5 emissions from on-road sources in the San Bernardino and Muscoy community for 2017

² These emissions are largely related to evaporative and running losses

³ Heavy-duty diesel vehicles tend to have higher PM exhaust and tire and brake wear emissions per mile driven compared to gasoline cars.

Toxic emissions from on-road sources are largely dominated by DPM (**Figure 7**). The largest contributor to DPM emissions is diesel-fueled heavy-duty trucks, so the largest impacts from on-road sources in the community are concentrated along the main goods movement corridors. The second largest contributor to cancer risk from on-road sources is hexavalent chromium, which is emitted from brake wear⁴ and, to a smaller extent, from fuel combustion.

Other TACs emitted from on-road sources include benzene, 1,3-butadiene and formaldehyde. The source of benzene is evaporative losses and the incomplete combustion of gasoline, whereas formaldehyde and 1,3-butadiene emissions are generated from fuel combustion.

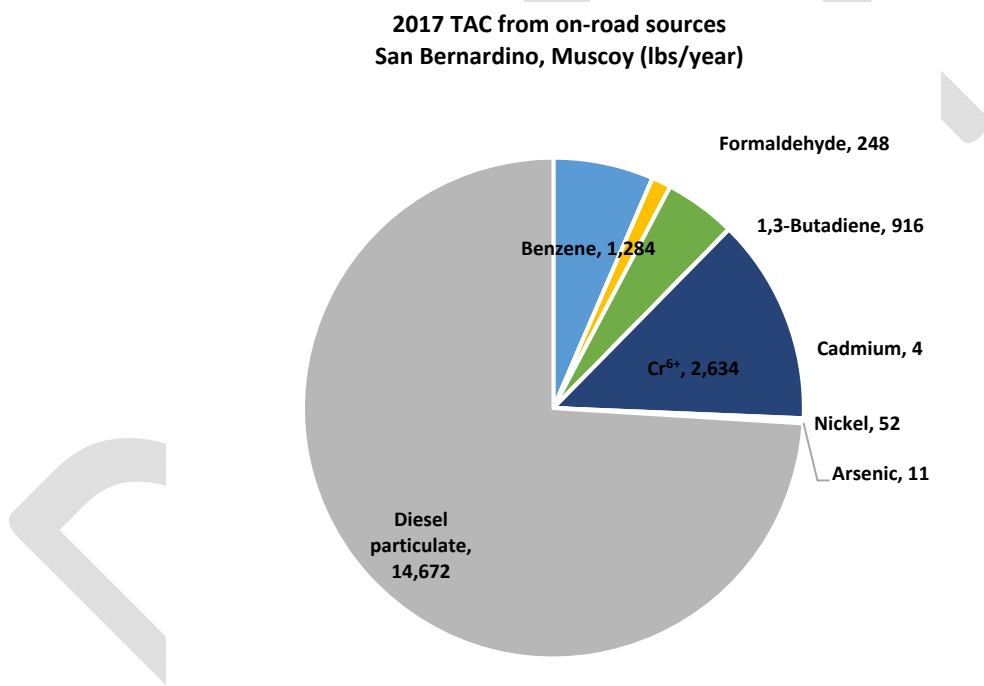


Figure 7. Distribution of air contaminant emissions from on-road sources in San Bernardino and Muscoy for 2017 (shown in lbs/year, weighted by air toxics cancer risk)

⁴ A small fraction of hexavalent chromium was considered to originate from vehicle brake wear. The emission factors were empirically adjusted for the MATES IV analysis. While this approach worked reasonably well for the MATES analysis, further evaluation may be required for adapting this adjustment to more recent data. For example, an adjustment may be required to reflect cleaner vehicle fuels compared to those in use during previous MATES.

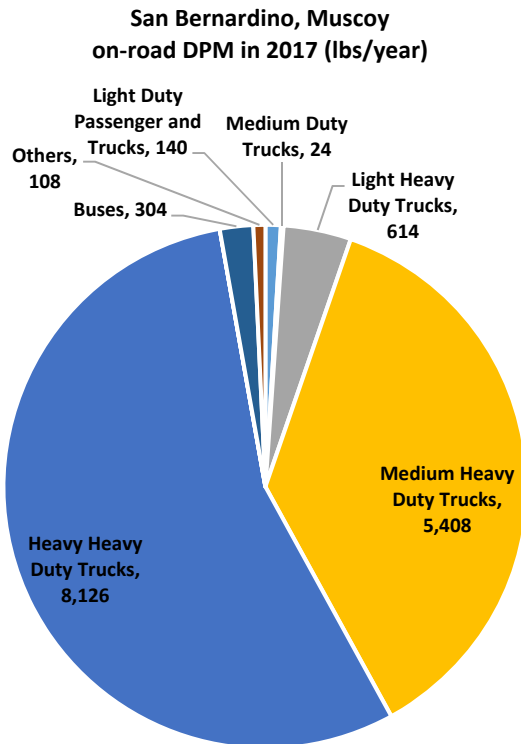


Figure 8. Source attribution of toxic air contaminant from on-road sources in the East Los Angeles, Boyle Heights and West Commerce community for the years 2017 (shown in lbs/year), weighted by air toxics cancer risk)

Off-road mobile sources

Figure 9 presents the major sources of VOC and PM2.5 emissions from off-road mobile sources. The largest contributor to total VOC from off-road mobile sources in the community is small off-road equipment. This category contains small off-road spark-ignition engines that include lawn and garden equipment, industrial and commercial utility equipment, golf carts, and specialty vehicles. Other significant sources of VOC include evaporative emissions from fuel storage and handling, recreational boats, recreational vehicles, and emissions from trains. Although there is no major waterway or waterbody in the SBM community, boats that are parked in the community still emit pollutants through fuel evaporation.

The largest off-road source contributing to PM2.5 emissions is off-road equipment, both small commercial and large industrial equipment. The second largest contribution to PM2.5 emissions from off-road sources in the community is trains. There is 1 intermodal railyard and 4 maintenance railyards within the community boundaries, and some of them are near residential areas.

Figure 10 presents the contribution of TAC emissions from off-road sources in the SBM community. DPM is the toxic air contaminant that contributes the most to total cancer risk in

the community from off-road mobile sources. The two main sources of DPM are trains and diesel off-road equipment (**Figure 11**).

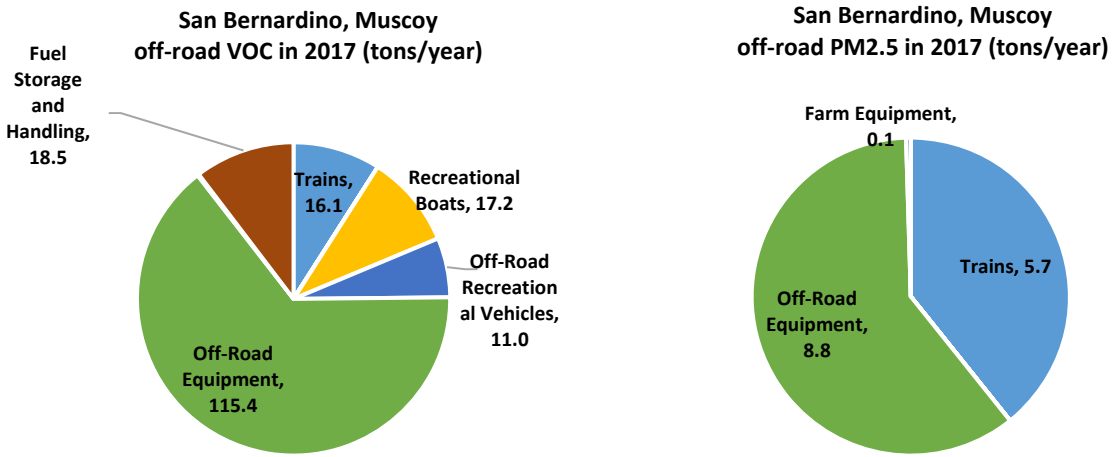


Figure 9. Source attribution of VOC emissions and PM2.5 emissions from off-road mobile sources in the San Bernardino and Muscoy community for the years 2017

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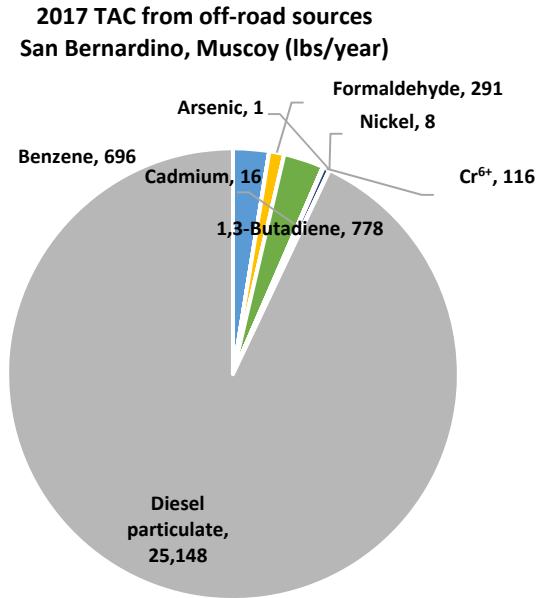


Figure 10. Contribution of toxic air contaminant from off-road mobile sources in the San Bernardino and Muscoy community for 2017 (shown in lbs/year, weighted by air toxics cancer risk)

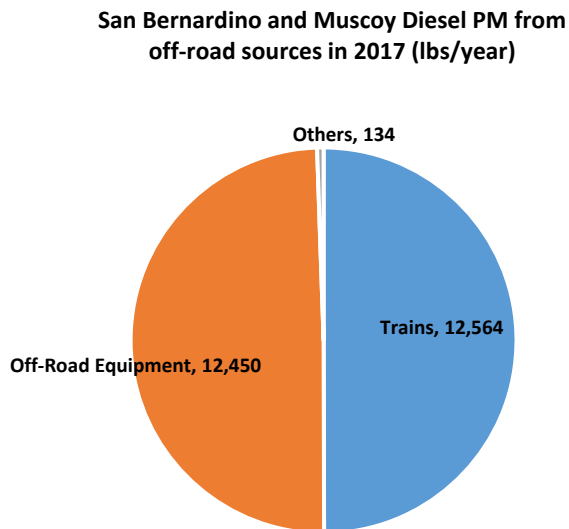


Figure 11. Source attribution of DPM from off-road mobile sources in the San Bernardino and Muscoy community for 2017 (shown in lbs/year, weighted by air toxics cancer risk)

Future year emissions inventory and source attribution

Trends of emission changes for CAPs and TACs

Future emissions of CAPs and TACs in the SBM community are projected using the best available information on population growth, economic growth and emission adjustments reflecting ongoing regulations that reduce specific air pollutants. Regulations reflected in these adjustments include South Coast AQMD regulations and CARB regulations.

Heavy-duty diesel vehicles in this community will be subject to the CARB truck and bus regulation, with implementation dates after 2017. Off-road diesel equipment is also subject to existing state regulations that will reduce DPM emissions from these sources. The South Coast AQMD is developing various regulations to reduce NO_x and VOC emissions since the adoption of the 2016 AQMP in March 2017. However, control factors for these future regulations and programs are still under development and not reflected in the current inventory. The current inventory for area and stationary sources reflects NO_x and VOC rules adopted as of December 2015 and TACs rules adopted as of December 2017. Future versions of the emission inventory will reflect the more recently adopted regulations.

Figure 12 presents the projected major CAPs emissions (NO_x, VOC and PM_{2.5}) in the SBM community in the two future milestone years 2024 and 2029, along with the base year 2017. The NO_x emissions in the community are expected to decrease substantially between the year 2017 (1,140 tons/year) to the year 2024 (726 tons/year), due to the existing regulations on mobile sources and the emission reduction commitments under the RECLAIM program. The NO_x emissions in 2029 are projected to continue decreasing (to 602 tons/year) despite the expected increase in industrial and mobile source activity. VOC emissions are expected to decrease by 11% between the years 2017 and 2029, mostly due to cleaner vehicle emissions. Unlike NO_x and VOC emissions, PM_{2.5} emissions increase by 2%, during the period from 2017 to 2029, due to increase in industrial and vehicle activity.

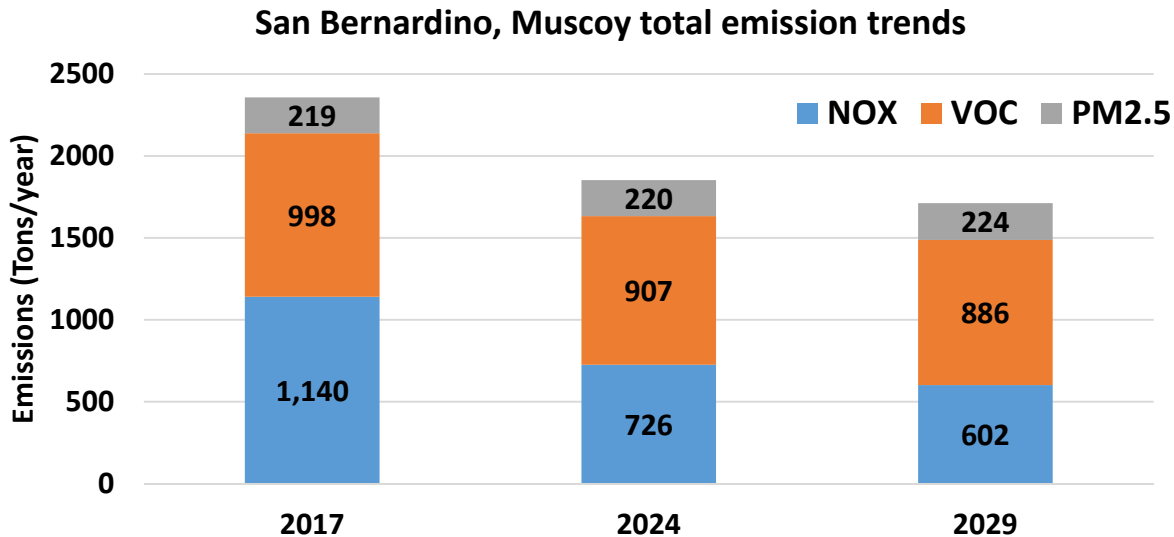


Figure 12. The community total emission trends for NOx, VOC & PM2.5 (tons/year) for the year of 2017, 2024 and 2029

Trends for TAC emissions are shown in **Figure 13**. DPM continues to dominate the TAC emissions inventory in future years, despite a significant reduction in DPM from heavy-duty trucks. DPM emissions decrease by 58% between 2017 (39,938 lbs/year) and 2024 (16,738 lbs/year), and continues to decline through 2029 (11,904 lbs/year). 1,3-butadiene is the second largest contributor to TAC, and these emissions remain relatively unchanged due to slight increases in industrial emissions offset by reductions in emissions from vehicles. The third largest contributor to TACs is hexavalent chromium, which increases slightly between 2017 and 2029, due to the increase in brake wear emissions and projected industrial activity growth. Benzene and formaldehyde emissions decrease throughout the 12-year period due to decreases in the emissions from vehicles, whereas emissions of metals such as cadmium, nickel, arsenic and lead, show a steady increasing trend due to projected industrial activity growth, and from paved road dust emission.

Figure 14 presents the cumulative TAC emissions by the major categories for the base and two future milestone years. The overall cancer-risk-weighted emissions decrease between 2017 and 2029. The decrease is more pronounced in the first 7 years due to the emission reductions in diesel heavy duty trucks and off-road equipment.

It is important to note that many of the South Coast AQMD regulations addressing toxic metal pollution emissions from industrial facilities (e.g. South Coast AQMD Rule 1407 and Rule 1469) include requirements that reduce fugitive emissions from these facilities. Fugitive emissions can often account for the vast majority of the toxic metal emissions from a facility. Unfortunately,

the methods available to create an emissions inventory are not able to reflect fugitive emissions from these facilities. Therefore, while the inventory may not show an overall decrease in toxic metal emissions, the regulations result in overall decreased emissions due to reductions in fugitive emissions.

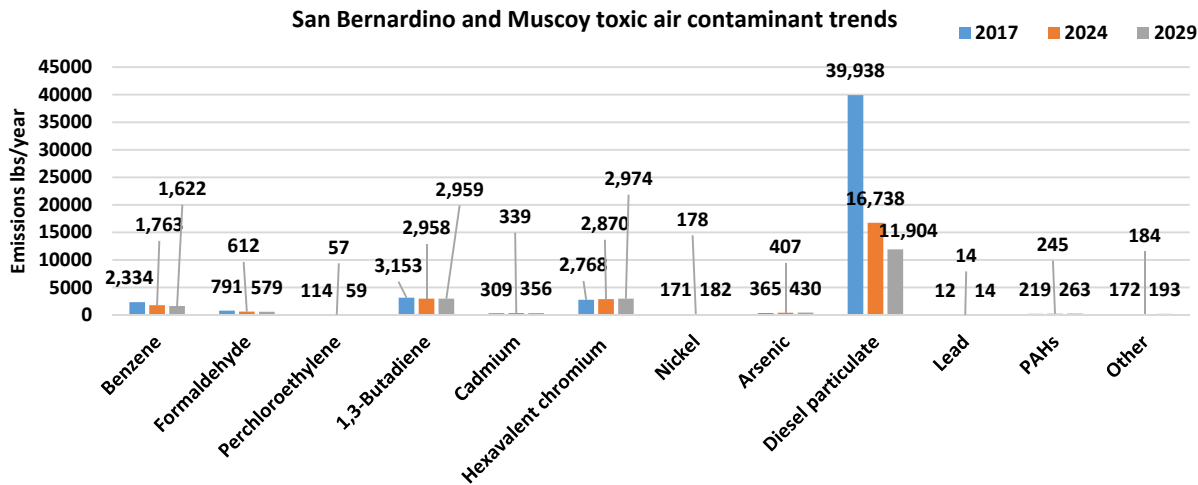


Figure 13. The community total emission trends for toxic air contaminants for the year of 2017, 2024 and 2029 (shown in lbs/year, weighted by air toxics cancer risk).

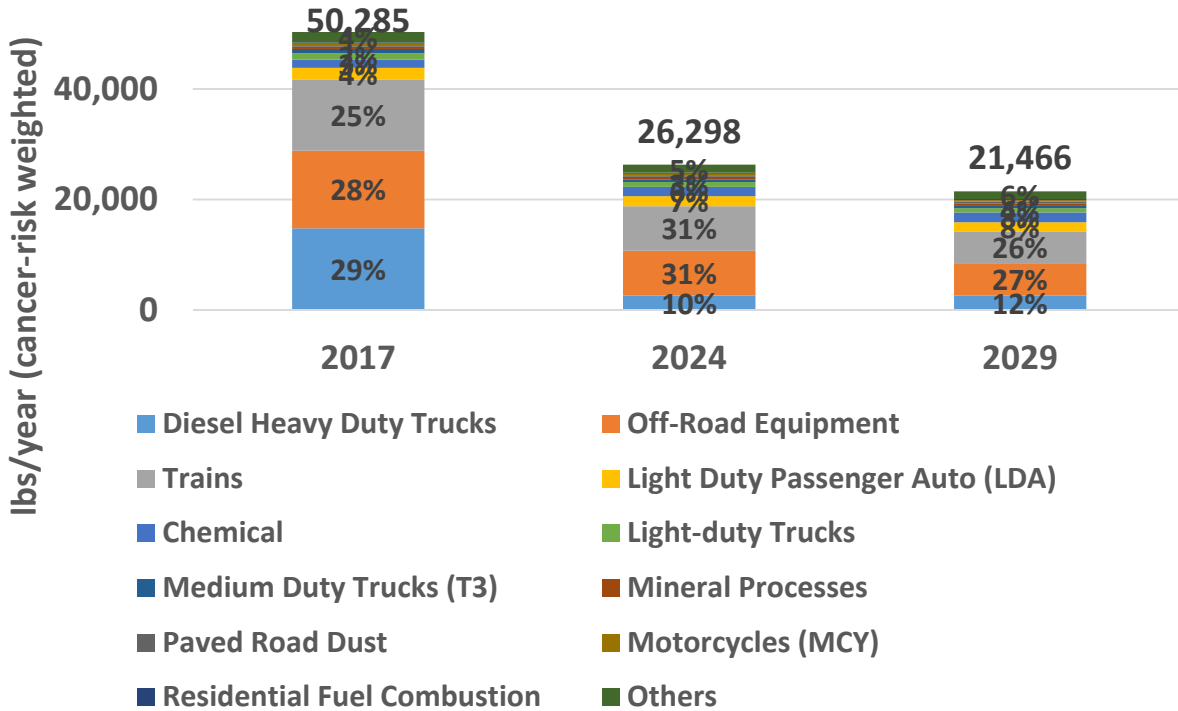


Figure 14. Toxic air contaminant emissions from all sources in the Wilmington, Carson, West Long Beach community, shown by major categories. Emissions are weighted based on their cancer risk relative to DPM.

Stationary and Area Sources

The trends in total emissions of NOx, VOC and PM2.5 from stationary and area sources in this community are shown in **Figure 15**. NOx emissions are expected to decline from 2017 to 2024, due to the emission reductions from RECLAIM facilities.⁵ VOC and PM2.5 emissions are expected to grow gradually due to the projected growth in population and economic and industrial activities.

1,3-Butadiene is the largest contributor to total toxic emissions from area and stationary sources (**Figure 16**), and its emission is expected to grow from 2017 to 2029 due to the projected industrial activity growth during the same period. The major source for 1,3-butadiene emissions is the chemical industry. Emissions of other TACs that are primarily emitted from industrial

⁵ NOx RECLAIM is an emission cap-and-trade program that includes larger stationary sources located in the Basin. The current regulation, Rule 2002 requires 12 tons per year of NOx emission reductions from 2016 to 2022. When the rule is fully implemented in 2022, no significant changes in NOx are expected except for a slight increase from 2024 to 2029 due to the growth in economic, industrial, and commercial activities. The 2016 AQMP includes a control measure to target an additional 5 tons per year of NOx reduction from the RECLAIM facilities by 2031. The impact of the additional “NOx shave” is not reflected in the community inventory since December 2015 was the cut off for stationary source regulations to reflect on the inventory. The rulemaking to achieve additional 5 TPD NOx is still ongoing and will be reflected on the inventory when it is finalized.

activities, i.e., formaldehyde, cadmium, arsenic, nickel, and lead, are also expected to increase due to industrial growth. Only DPM and perchloroethylene emissions are expected to decline due to on-going regulations.

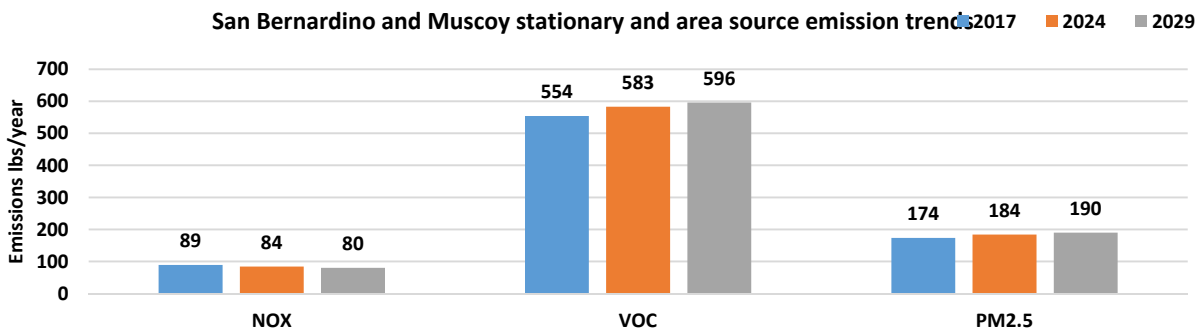


Figure 15. Trends in NOx, VOC and PM25 emissions from stationary and area sources in the San Bernardino and Muscoy community. Emissions are presented in pounds per year

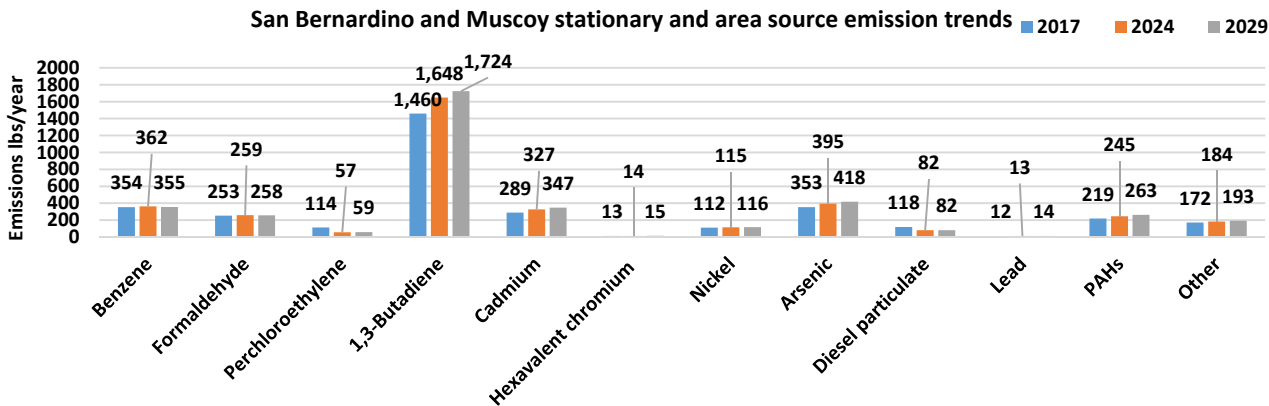


Figure 16. Trends in toxic air contaminant emissions from stationary and area sources in the San Bernardino, Muscoy community (shown in lbs/year, weighted by air toxics cancer risk).

On-road mobile sources

Trends for on-road emissions are presented in **Figure 17**. On-road emissions are expected to decline significantly between 2017 and 2024, due to the turnover of light-duty passenger vehicles

and heavy-duty trucks. NOx emissions will continue decreasing after 2024 but at a slower rate, because the effect of regulations will be partially offset by the increase in vehicle activity (**Table 1**).

VOC emissions are expected to decline for all vehicle types except for motorcycles, whose emissions grow steadily between 2017 and 2029. PM2.5 emissions are expected to decline for all vehicle types between 2017 and 2024. After 2024, the effect of vehicle regulations on light-, medium- and heavy-heavy duty trucks is offset by their activity growth. Emissions of PM2.5 from heavy-duty trucks are expected to increase slightly, offsetting passenger vehicle PM2.5 emission reductions. As a result, overall PM2.5 emissions from vehicles are expected to remain unchanged between 2024 and 2029.

Figure 18 presents the trends in emissions of TACs from on-road sources. DPM is the predominant TAC in 2017, followed by hexavalent chromium. However, DPM emissions decline drastically between 2017 and 2024, due to regulations on heavy-duty diesel trucks, and continue decreasing through 2029. Hexavalent chromium emissions are predominantly from brake wear, which is directly related to VMT, with a small contribution from fuel combustion. Because VMT from vehicles are expected to increase, emissions of hexavalent chromium are also expected to increase from this source. However, it is important to note that there is uncertainty in the amount of hexavalent chromium emissions associated with vehicular activities especially in brake wear. While the emission factors need further evaluation, the increase in VMT would still certainly contribute to the increase in vehicular emissions. Benzene emissions are projected to decline due to reductions in evaporative emissions from vehicles. Formaldehyde and 1,3-butadiene emissions are projected to decrease due to expected reductions in VOC emissions from vehicle exhaust.

Table 1. Trends in vehicle miles traveled (VMT) from on-road mobile sources in the San Bernardino and Muscoy community

Year	Vehicle Categories					Total
	Light and Medium Duty	Light Heavy Duty	Medium Heavy Duty	Heavy Heavy-Duty	Buses	
2017	2,793	66	43	82	7	2,991
2024	2,855	49	57	106	7	3,074
2029	2,914	43	59	114	7	3,137

Unit in 1000 miles

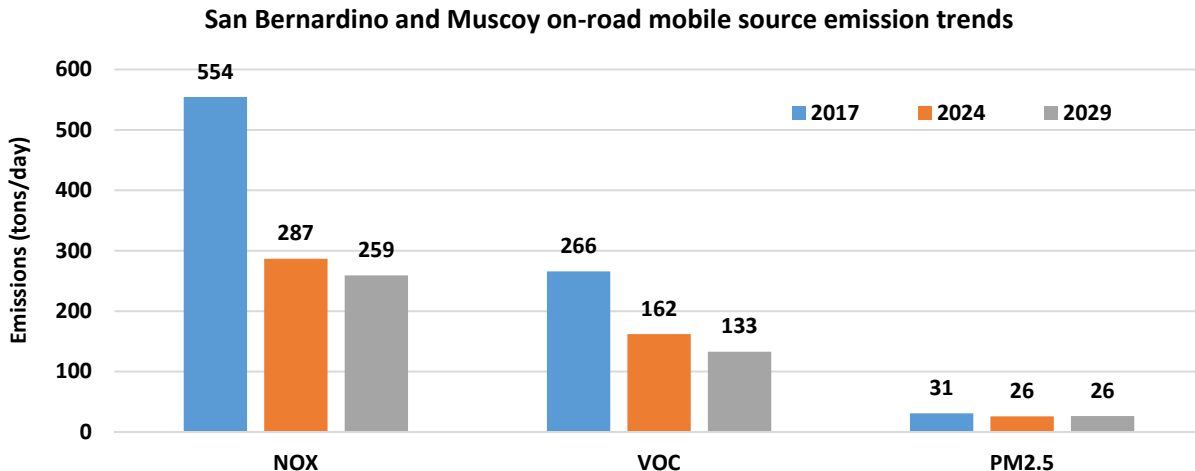


Figure 17. Trends in NOx, VOC and PM25 emissions from on-road mobile sources in the San Bernardino and Muscoy community. Emission values in tons per year.

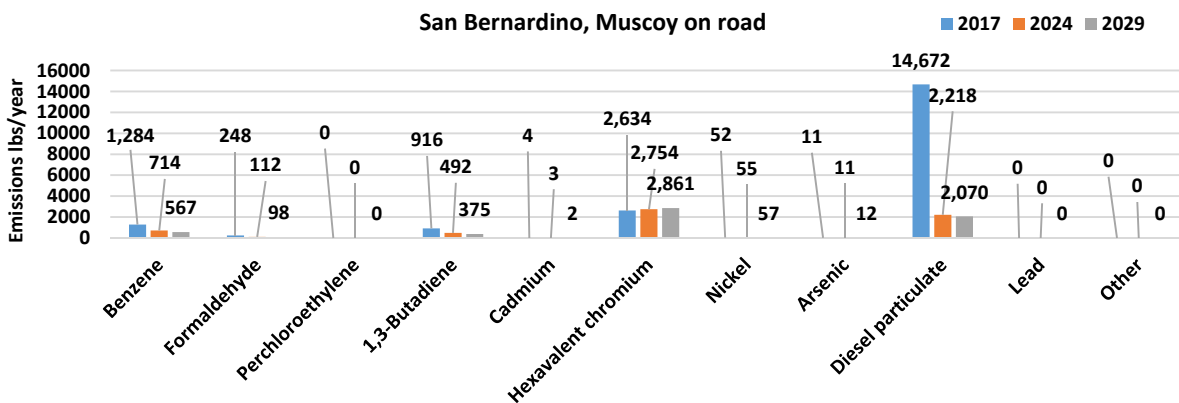


Figure 18. Trends in toxic air contaminant emissions from on-road sources in the San Bernardino, Muscoy community (shown in lbs/year, weighted by air toxics cancer risk)

Off-road mobile sources

Trends in emissions of NOx, VOC, and PM2.5 from off-road mobile sources in the SBM community are presented in **Figure 19**. All three pollutants are projected to decline steadily between 2017 and 2029. In general, emissions are expected to decline due to emission reductions from trains and industrial off-road equipment, due to turnover of older equipment to newer, cleaner

equipment. Reductions in evaporative emissions from fuel storage handling and recreational vehicles drive the overall VOC reductions in the community.

Trends in toxic air contaminant emissions are presented in **Figure 20**. Emissions from off-road mobile sources are still dominated by diesel emissions from trains and off-road equipment in 2024 and 2029. Off-road equipment regulations reduce the overall TACs in the community. While benzene and 1,3-butadiene decrease between 2017 and 2024, the projected increase in industrial activity through 2029 offsets the effect of regulations in the 2017-2024 period. The emissions of the rest of relevant TAC are projected to decline as a result of regulations.

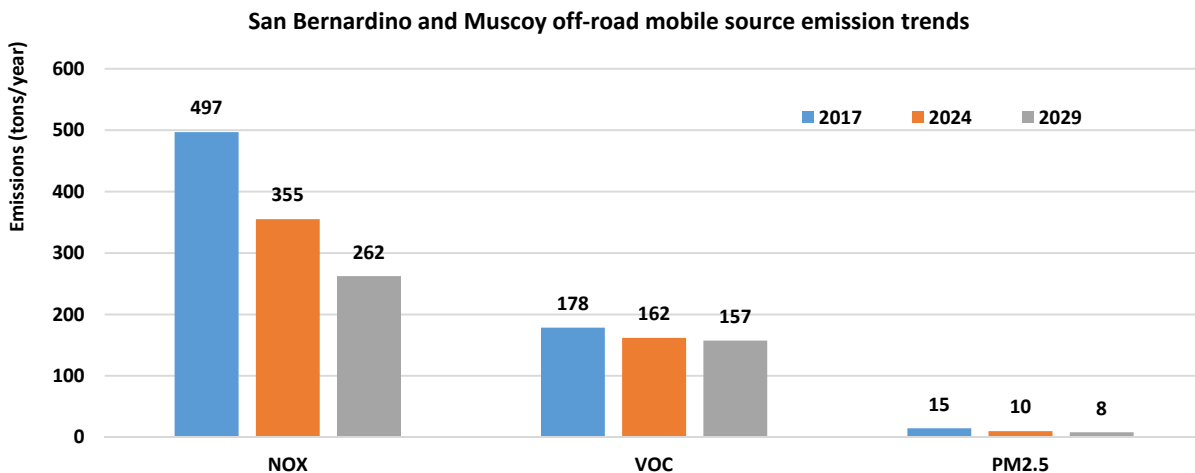


Figure 19. Trends in NOx, ROG and PM25 emissions from off-road mobile sources in the San Bernardino, Muscoy community. Emission values in tons per year.

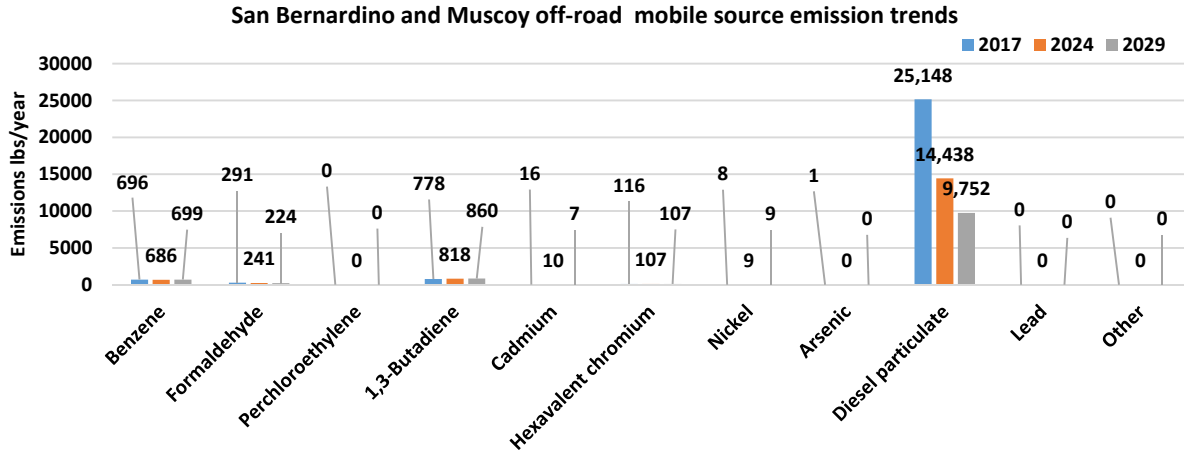


Figure 20. Trends in toxic air contaminant emissions from off-road mobile sources in San Bernardino and Muscoy (shown in lbs/year, weighted by air toxics cancer risk)

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Source Attribution Summary

The main sources of air pollution emissions in the SBM community are on-road traffic, trains, off-road equipment, and certain industrial activities.

NO_x emissions in this community are dominated by mobile sources – both on-road and off-road – which account for more than 90% of the total emissions. Heavy-duty truck traffic, trains, and off-road equipment are the largest sources for NO_x. Stationary and area sources contribute to less than 10% of NO_x emissions in this community, mostly from fuel combustion in the residential, commercial, and industrial sectors.

VOC emissions are dominated by area sources, with consumer products being the largest source. Passenger vehicles and off-road equipment, such as lawn mowers and small gasoline engines, are the largest contributors to VOC from on-road and off-road mobile sources, respectively. Three quarters of PM_{2.5} emissions are from miscellaneous area sources that include commercial cooking, residential fuel combustion, construction, and paved road dust.

TAC emissions in the SBM community are dominated by DPM from diesel fueled vehicles and equipment such as heavy-duty trucks, trains and heavy industrial off-road equipment. 1,3-butadiene is the second largest component of TACs based on cancer-risk-weighted emissions, and its major sources include chemical industry and on-road vehicles. Other significant TAC species include hexavalent chromium, predominantly from brake wear from on-road mobile sources.

Future NO_x emissions in the community are expected to decrease due to the regulations on mobile sources. VOC emissions are also expected to decline, albeit at a slower pace than NO_x. Emissions of DPM associated with heavy-duty trucks are also expected to decrease due to recent regulations, and CARB's in-use off-road diesel-fueled fleets regulation will also contribute to reducing DPM. Emissions of 1,3-butadiene from stationary and area sources are expected to increase slightly in the future years, due to increased industrial activity. However, in future years, DPM continues to be the main contributor to cancer risk in this community.