

**Testimony of Michael Thomas Benjamin
Chief of the Air Quality Planning and Science Division
California Air Resources Board
Before the Senate Committee on Environment and Public Works
Hearing on COVID-19 and Remote Working, July 29, 2020**

I am Michael Thomas Benjamin, Chief of the Air Quality Planning and Science Division at the California Air Resources Board. Chairman Barrasso, Ranking Member Carper, members of the Committee, thank you for inviting me to testify today on lessons learned from COVID-19 regarding the potential for remote working to improve air quality and climate change.

The COVID-19 pandemic has had a devastating effect on California's people and economy. To date, more than 450,000 Californians have contracted the virus and 8500 people have died. At the same time, the state is confronting a \$54 billion budget deficit and has seen more than 6.5 million unemployment claims since mid-March. To address the public health emergency, on March 19, Governor Newsom issued an Executive Order directing all Californians to stay at home except under limited circumstances.

Recognizing the potential long-term benefits of telework, Governor Newsom has launched an economic recovery task force that has prioritized, alongside addressing climate, air quality and equity, exploring a statewide telework strategy. He has directed 75 percent of the 235,000 state employees work from home, at least part-time, for the foreseeable future.

The demand for travel has significantly changed in response to the Governor's Executive Order, as well as other factors. Between mid-March and late April of 2020, statewide vehicle miles traveled dropped by approximately 75 percent relative to January. This reduced travel has had observable impacts on overall emissions from vehicles as well as air quality.

In the first six weeks of the stay-at-home order, reductions in passenger vehicle usage resulted in a 15 to 30 percent reduction in smog-forming pollutants and a 50 percent reduction in fine particulate and greenhouse gas emissions statewide. California's network of more than 250 air quality monitors detected a reduction in statewide ambient concentrations of nitrogen dioxide, carbon monoxide, and fine particulate of approximately 35 percent. At the same time, average concentrations of ground-level ozone decreased by a statewide average of about 12 percent compared to the same time period in 2015 to 2019. This is good news for air quality and public health especially given recent research from Harvard demonstrating a link between fine particulate exposure, which disproportionately impacts communities of color, and increased COVID-19 deaths.

More recently, as stay-at-home orders have been relaxed in California, vehicle miles traveled have begun to rebound. As of late June, Californians were driving about 35 percent fewer miles than in January. With this continued reduction in travel, emissions of smog-forming pollutants from passenger vehicles are still down 5 to 15 percent relative to January while emissions of fine particulate and greenhouse gases are 25 percent lower. These ongoing reductions in tailpipe emissions are reflected in lower measured concentrations of air pollutants across much of California.

While reduced travel and increased teleworking have had some benefits for air quality and climate, they have also resulted in negative impacts on transit and shared modes of

transportation that will likely make it difficult to maintain emission reductions as the country recovers from the pandemic and more people return to work. Local transit agencies reported that ridership dropped as low as 10 percent of normal after stay-at-home orders, and is slow to recover as travel increases. Other shared mobility services, such as pooled rides and car sharing, have been reduced or discontinued, further limiting affordable options for essential trips. The immediate observed decreases in public transit use and shared/pooled services have led to an increase in personal vehicle use, when travel does occur, and could lead to a preference for personal vehicle use longer-term, reversing observed gains in air quality and congestion.

This is of particular concern because according to a recent University of Chicago study, only about 37 percent of U.S. jobs can be performed at home. Furthermore, for many essential workers, public transit is often the only transportation option. Surveys have shown that currently more than 90 percent of riders are using transit to commute to work, with more than 20 percent employed in health care services and almost 20 percent in food preparation.

Looking beyond COVID-19, it is hard to predict what travel will look like or how many employees will continue to telework. Although California's experience with COVID-19 highlights the potential environmental benefits of expanded teleworking, I would note that many jobs, particularly low-wage jobs, are not conducive to telework and many of those workers do not have access to a car. Our economy depends on these people getting to work. In order to take advantage of the air quality and economic benefits of telework, we need to continue investing in a range of affordable and clean transportation options, including walking, biking, and transit that will enable all workers to get where they need to go while continuing to decrease air pollution and greenhouse gas emissions. As we recover from COVID-19, we also know that people will begin to drive more and when they do, let's ensure those vehicles are zero emissions so that we can continue to enjoy the benefits of cleaner air.

That concludes my testimony. I would be happy to answer any questions.

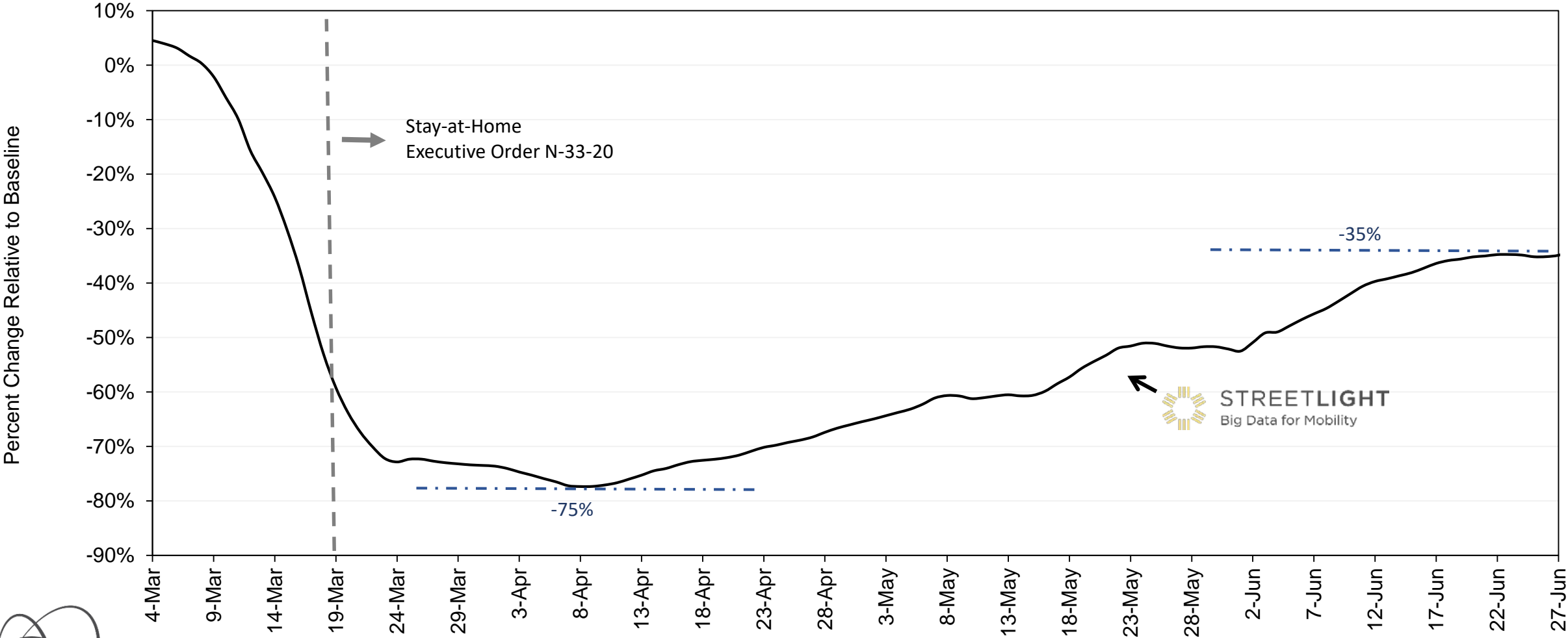


COVID-19 Impacts on Passenger Vehicle Travel, Emissions, and Air Quality in California

Dr. Michael Benjamin
Air Quality Planning and Science Division
California Air Resources Board

Trend in Statewide Vehicle Miles Traveled

Change Relative to January 2020 Baseline, 7-Day Moving Average

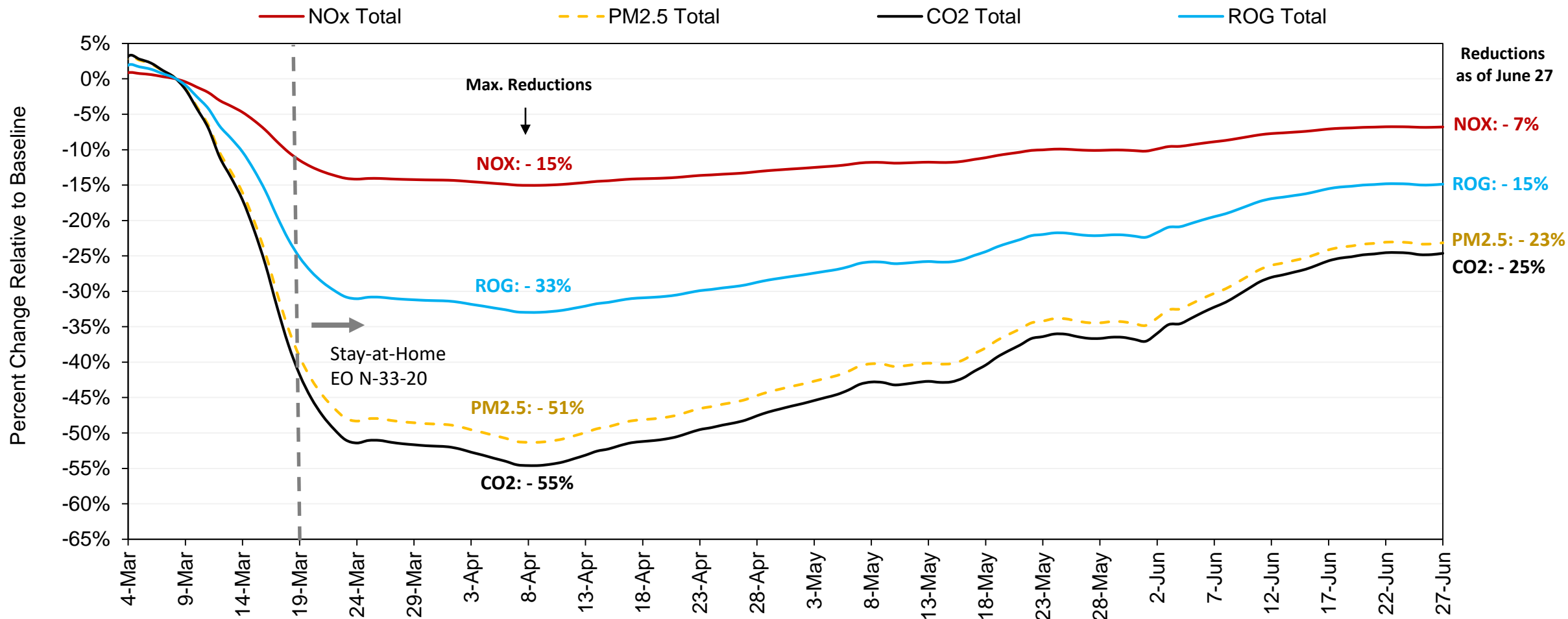


Data Source: Streetlight



Trends in Statewide Light Duty Vehicle Emissions

Changes Relative to January 2020 Baseline



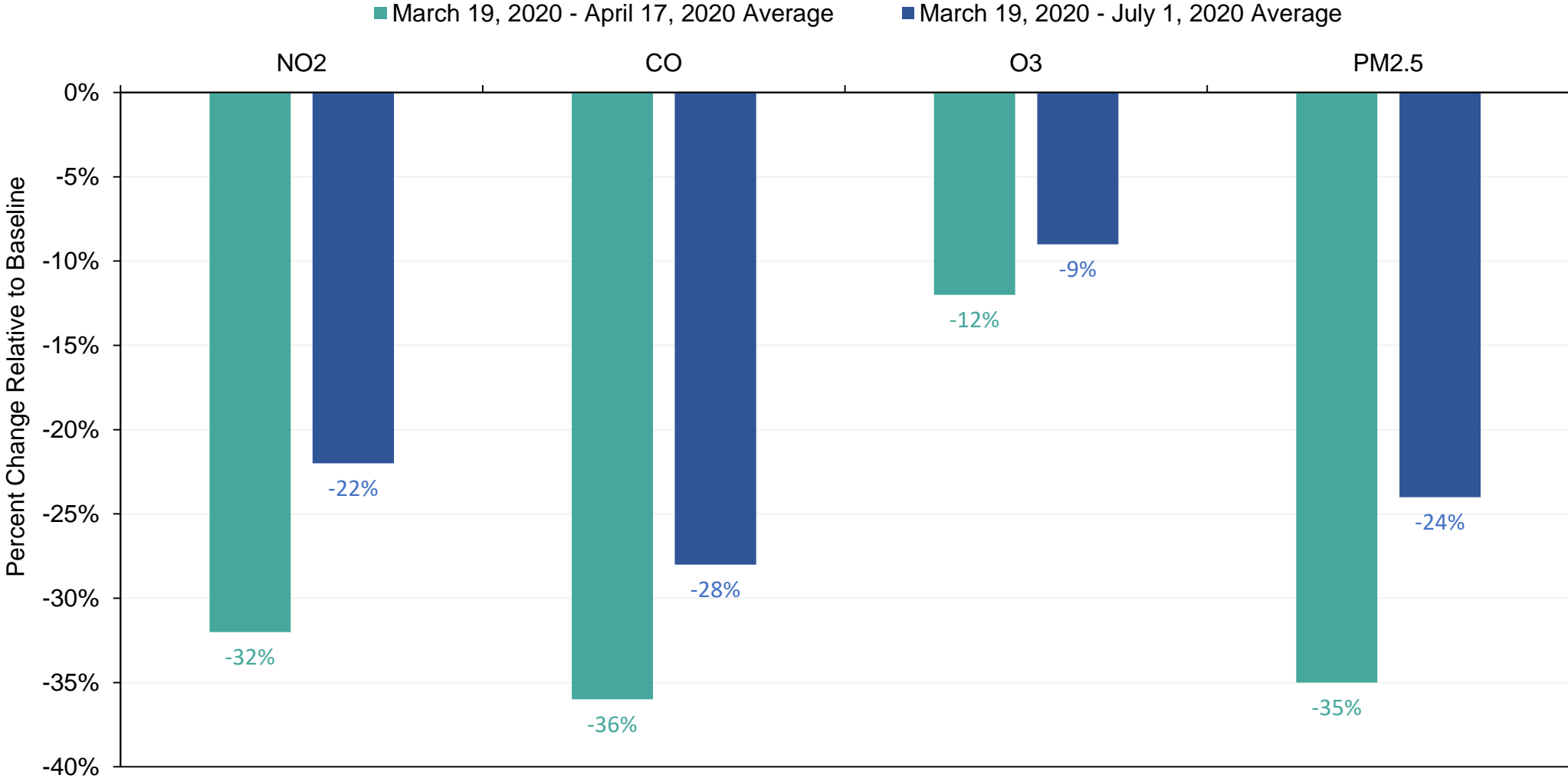
Data Source: CARB's EMFAC2017 on-road mobile source emissions inventory model and Streetlight

Assumptions: Streetlight represent trends of light-duty activity



Statewide Observed Air Quality Impacts

Reduction in Ambient Concentrations Relative to 2015-2019 Baseline



Data Source: CARB and local air district ambient air monitoring network



Data Sources

- Caltrans PeMS
- Streetlight
- CARB's EMFAC2017 Model
- CARB and district air monitoring

Passenger Vehicle VMT Trends

- Reduced up to 75% in total VMT in early April
- As of late June, total VMT is about 35% below baseline activity

Emissions Changes

- Generally, CO2 reductions track observed overall VMT reductions
- Up to 55% CO2 reduction and up to 15% NOx reduction at statewide level from light-duty vehicles under stay at home orders

Air Quality Changes

- The time period with maximum average observed pollution reductions coincide with observed maximum overall VMT reductions.

Summary