Air Quality Improvements During the March-April Covid-19 Lockdown

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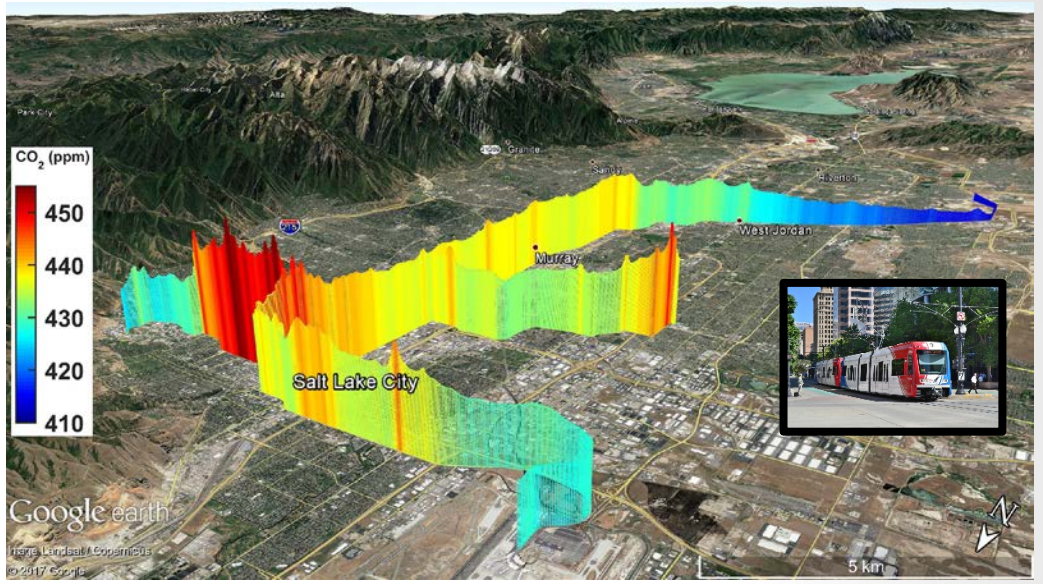
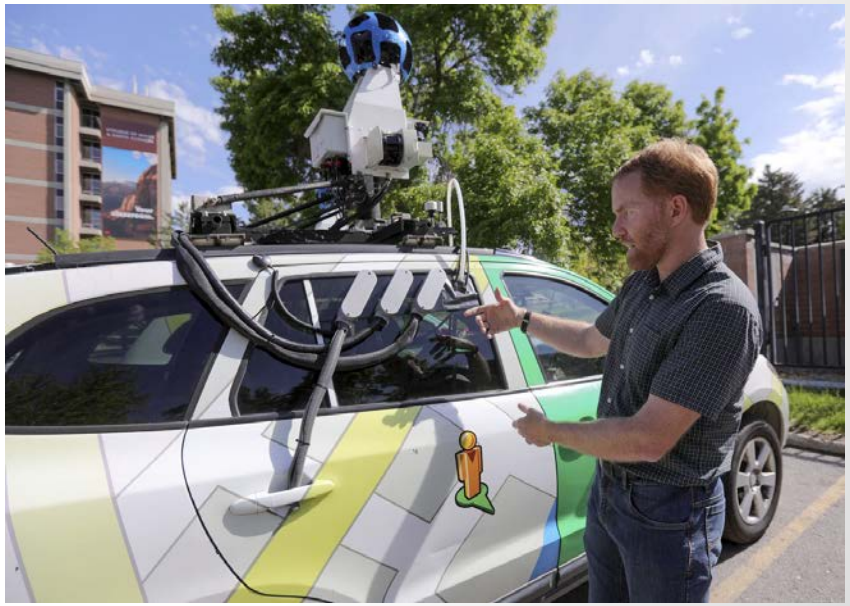




Economic Development and Workforce Services Interim Committee Meeting

June 15, 2020

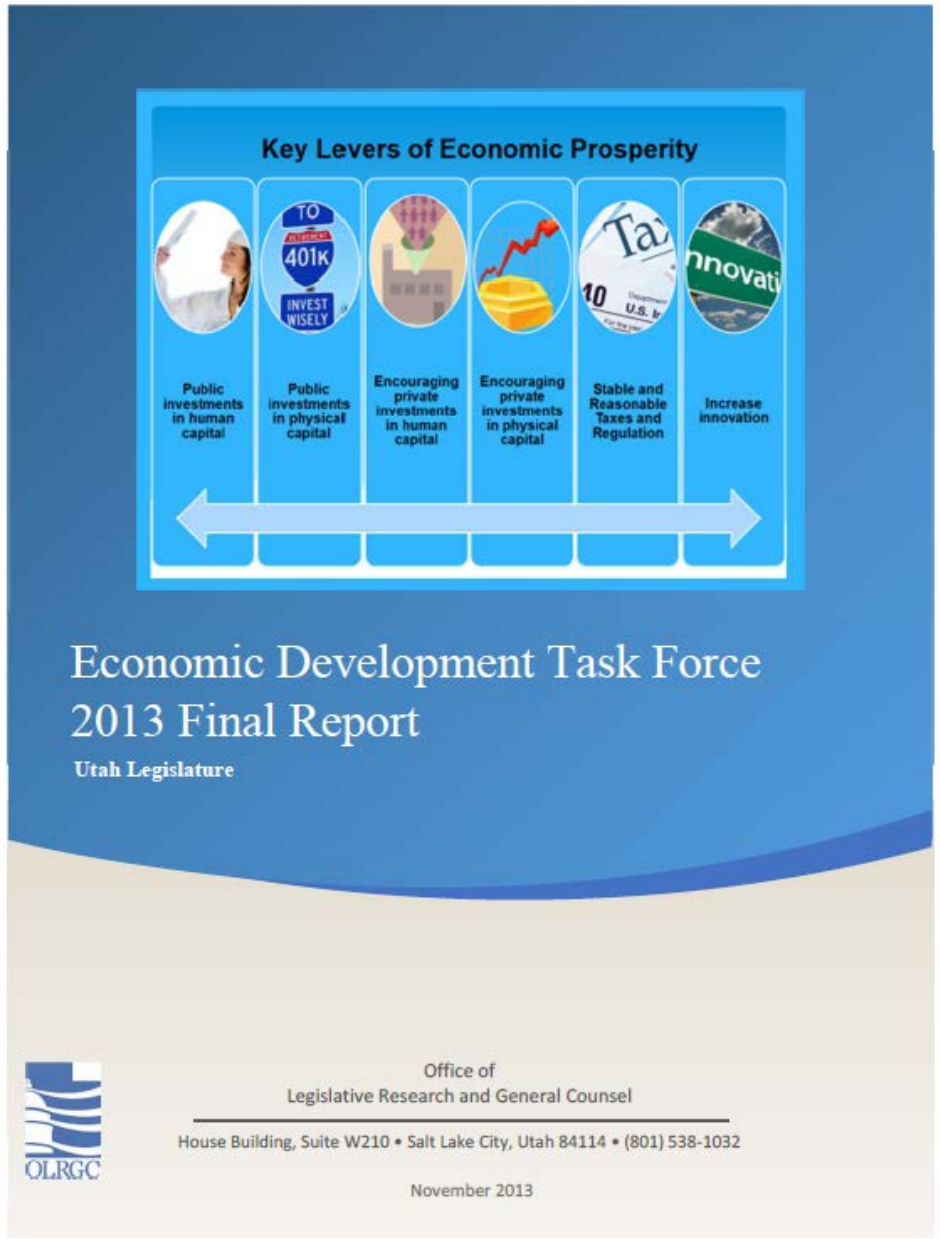
Salt Lake City, UT

This analysis is available online:
https://atmos.utah.edu/air-quality/covid-19_air_quality.php

Thank you!

- **Thank you for your continued efforts to sustain Utah's economy & for recognizing the economic impacts of poor air quality.**

- **A note about these extraordinary circumstances: A pandemic is a terrible way to improve air quality.**

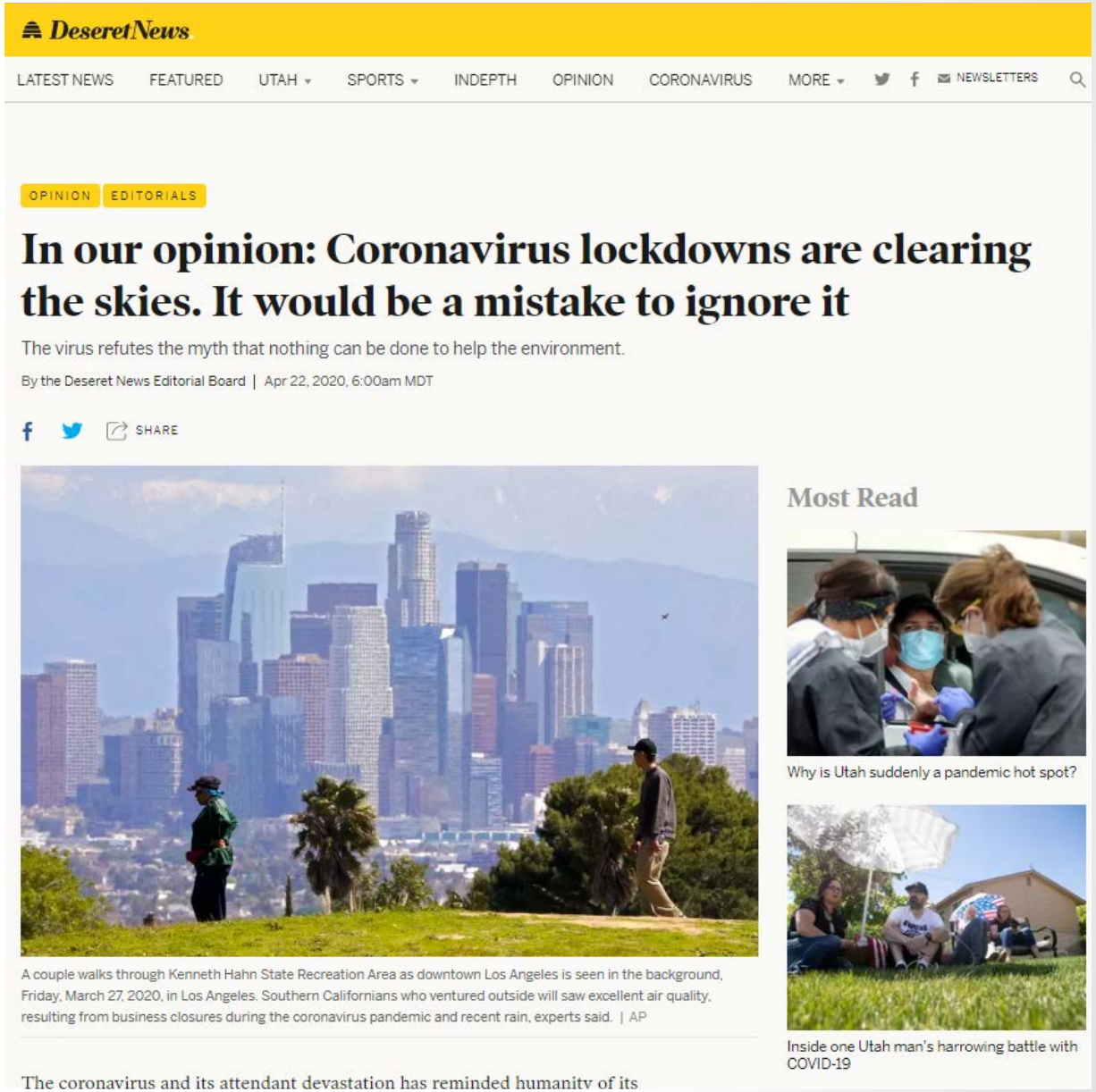


6. Air Quality

Policy Finding – Utah is a beautiful place in which to work and live because of its mountain and valley topography. However, this unique topography, coupled with temperature inversions during some months, contributes to poor air quality. Poor air quality is a threat to the state's economic development and continued growth. Poor air quality adversely affects corporate relocation efforts, employee retention and recruitment, and public health; places additional regulatory burdens on businesses; increases health care costs; and places Utah's federal highway funding at risk. Accordingly, improving air quality should be a priority for state and local government, Utah's businesses, and Utah's citizens.

Emissions reductions during the Covid-19 lockdown

- UDOT reported that traffic decreased by 40-50%
  - Cars decreased more than trucks
- Emissions from commercial buildings were lower, but this was partially offset by increases from residential buildings
  - It will take some time for this data to come out
- Improved air quality was apparent before any data analysis was done.
  - Can we see anything in the data?
- Note: This is a preliminary analysis



Deseret News

LATEST NEWS FEATURED UTAH SPORTS INDEPTH OPINION CORONAVIRUS MORE NEWSLETTERS

OPINION EDITORIALS

In our opinion: Coronavirus lockdowns are clearing the skies. It would be a mistake to ignore it

The virus refutes the myth that nothing can be done to help the environment.

By the Deseret News Editorial Board | Apr 22, 2020, 6:00am MDT

SHARE

A couple walks through Kenneth Hahn State Recreation Area as downtown Los Angeles is seen in the background, Friday, March 27, 2020, in Los Angeles. Southern Californians who ventured outside will saw excellent air quality, resulting from business closures during the coronavirus pandemic and recent rain, experts said. | AP

The coronavirus and its attendant devastation has reminded humanity of its

Most Read

Why is Utah suddenly a pandemic hot spot?

Inside one Utah man's harrowing battle with COVID-19

Air Quality in March is Usually "Good"

- The Wasatch Front has poor air quality in winter & summer
- During the spring, air quality is usually "Good" using the Air Quality Index (AQI)
- However, the "Good" AQI category represents a range of air pollutant concentrations
  - The AQI alone can't tell you how much the air quality improved
  - Some health impacts are observed even in "Good" AQI

Orange & Red exceed federal air quality standards

https://www.epa.gov/outdoor-air-quality-data/air-data-multiyear-tile-plot

Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: June 13, 2020
Note: The PM2.5 monitoring network was phased in between 1999 and 2001 in most areas. Earlier years in this plot do not include PM2.5 data.

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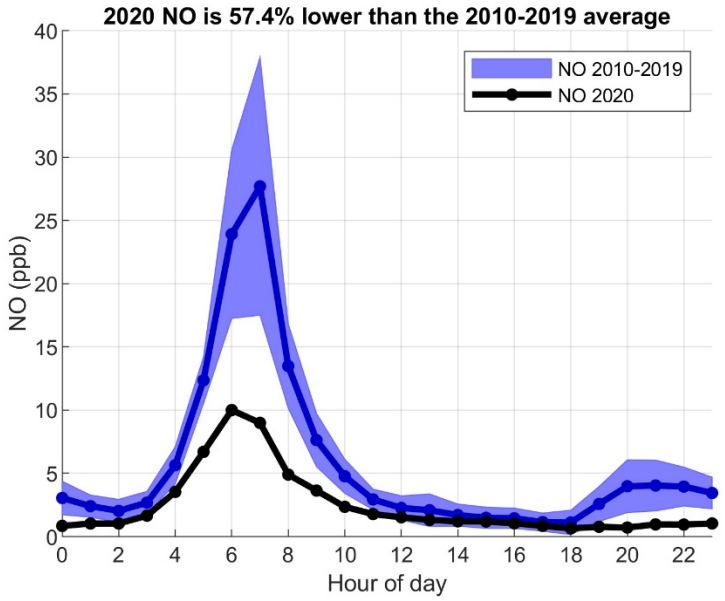
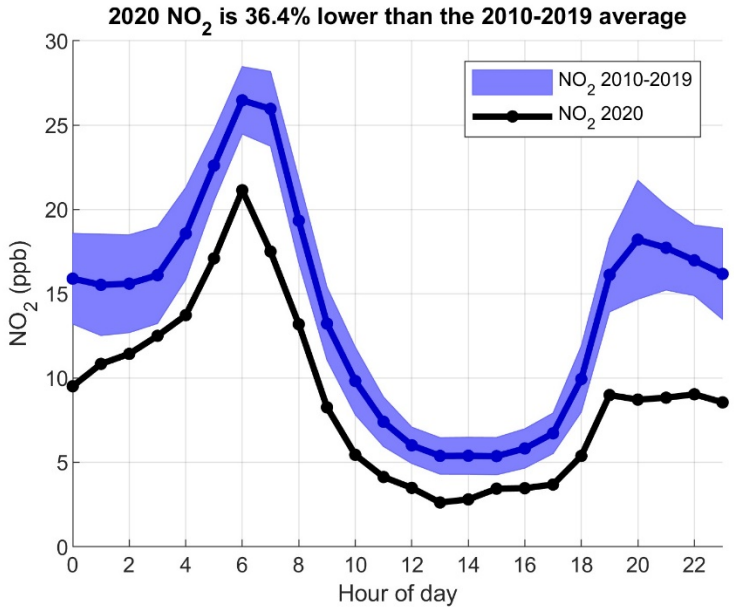
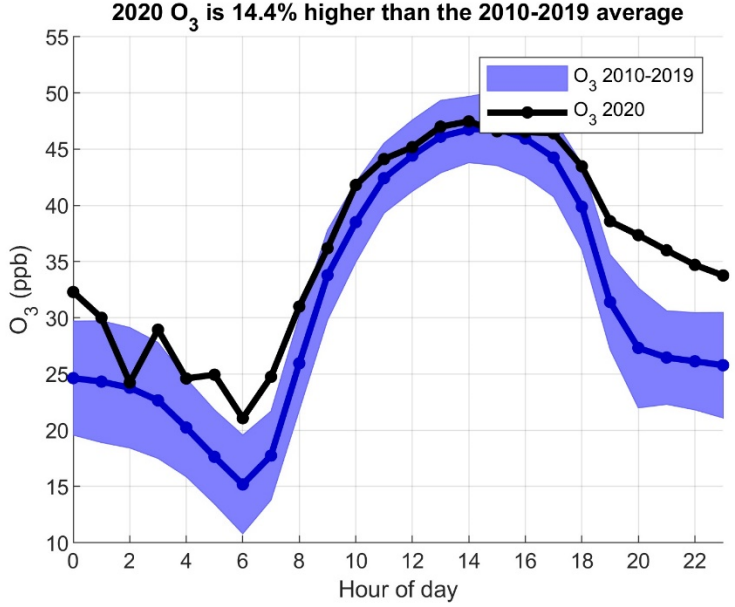
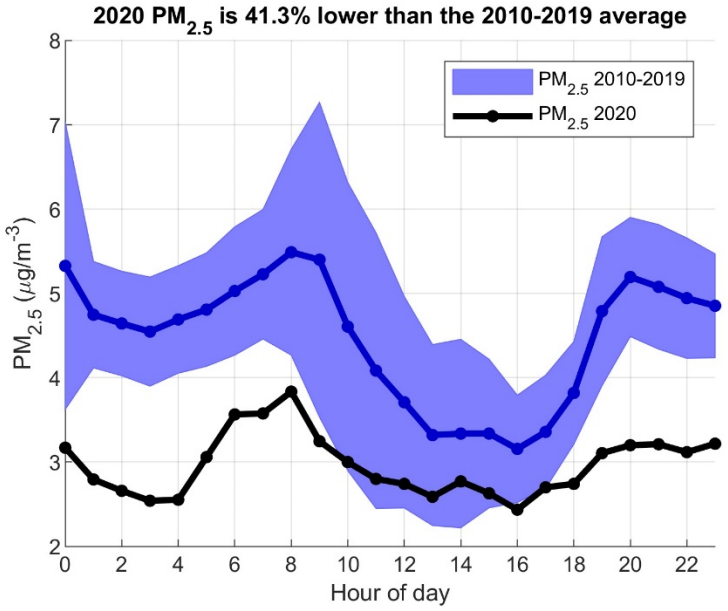
March 15-31 Air Quality at Utah DAQ Hawthorne Site

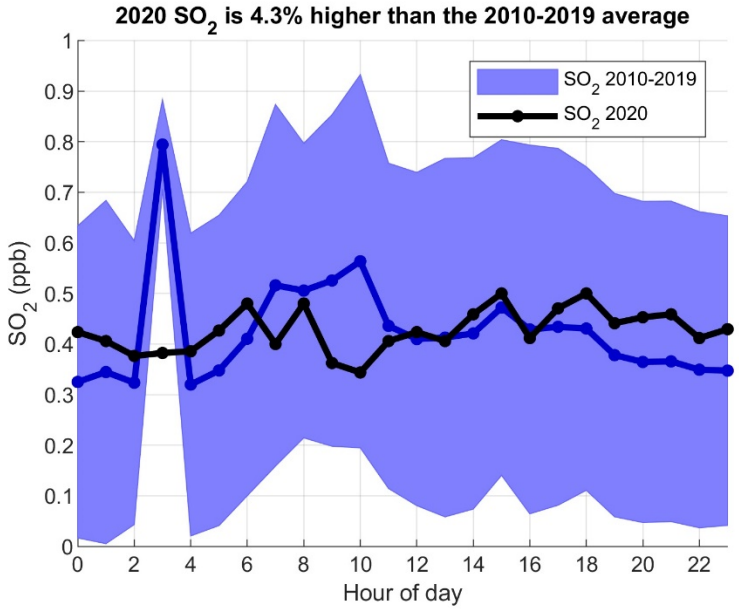
UTAH DEPARTMENT of ENVIRONMENTAL QUALITY AIR QUALITY











- Data is from DAQ
- Plots show the 24-hr profile
- Comparing late March 2020 to the prior 9 years

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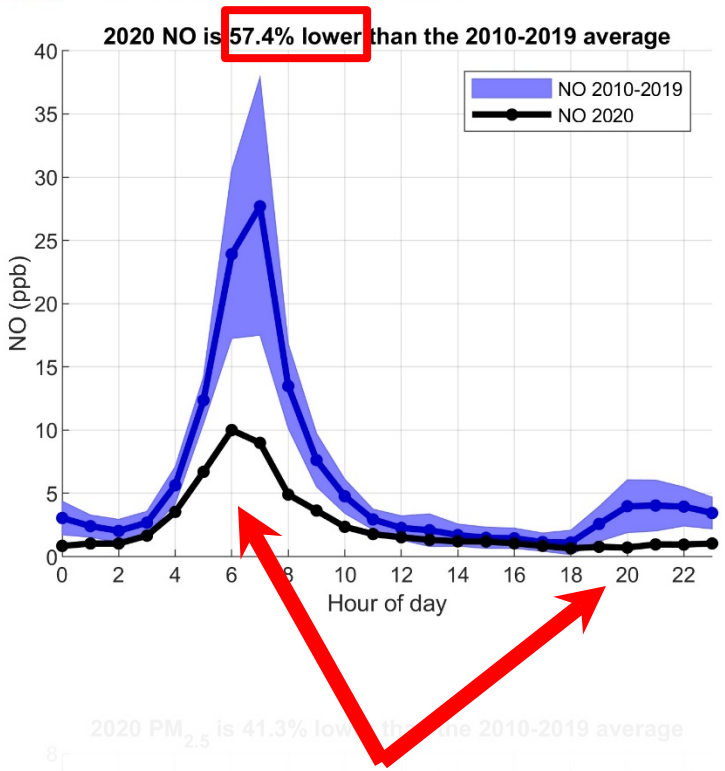

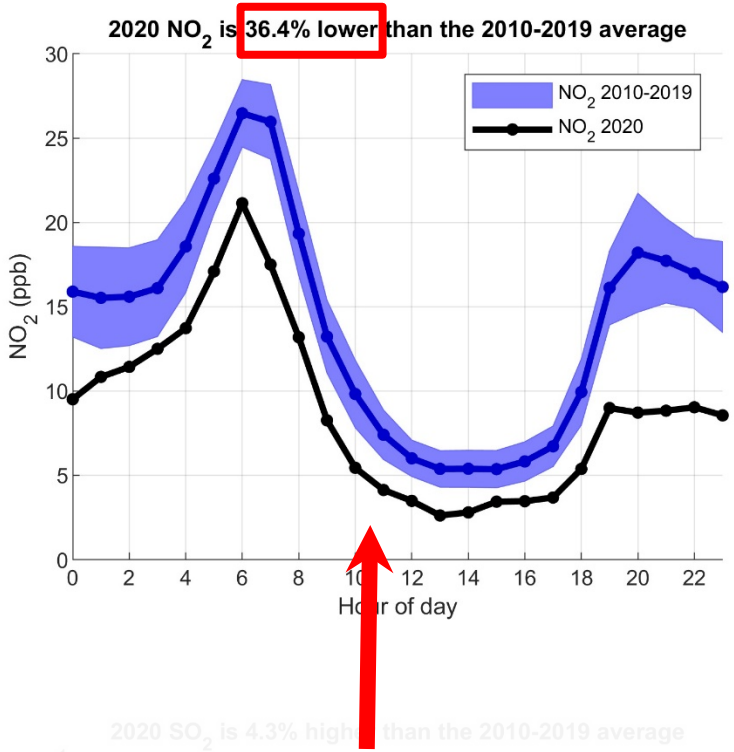

NO is lower, especially during rush hour. This is a fingerprint of reduced traffic emissions

NO_2 is lower throughout the day due to atmospheric chemistry

NO_x is 36-57% lower than normal

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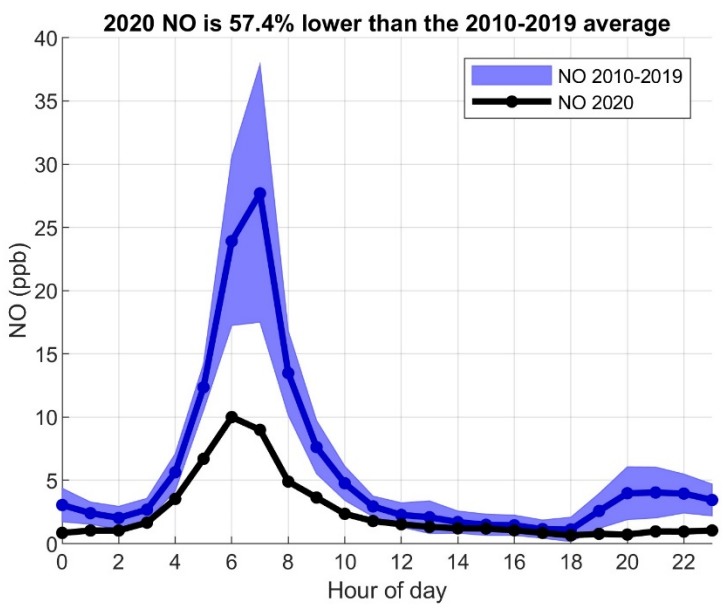

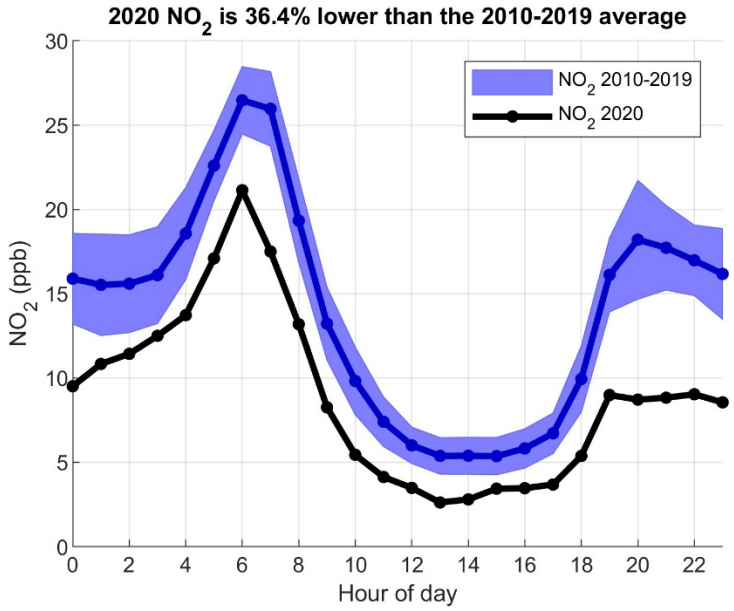

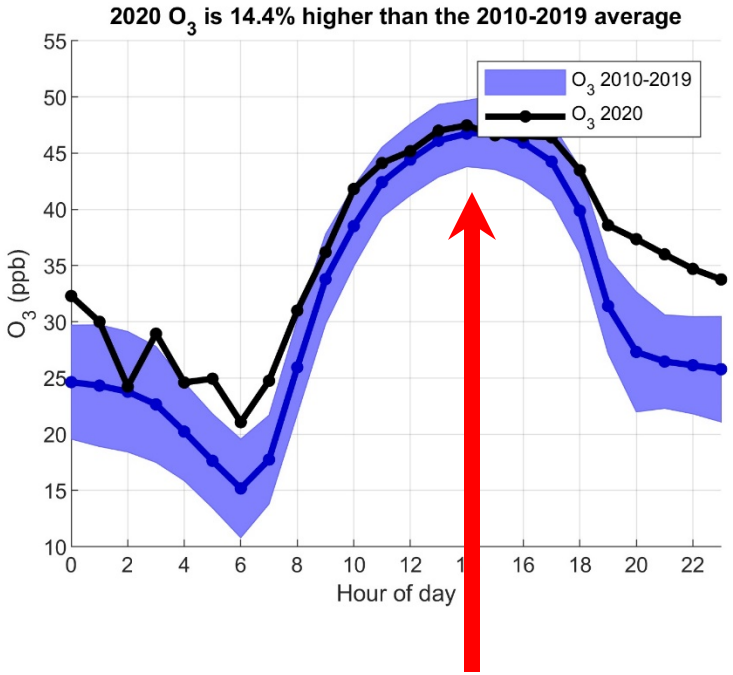

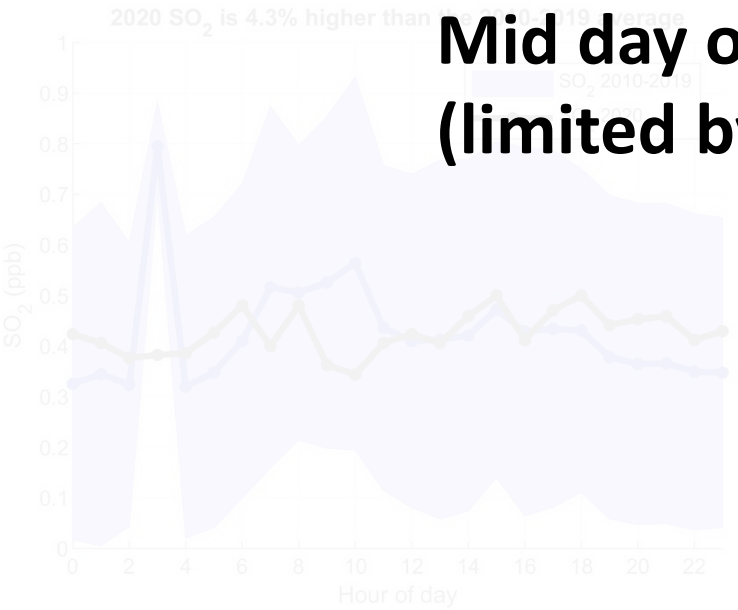

Mid day ozone is about average (limited by sunlight & temperature)…

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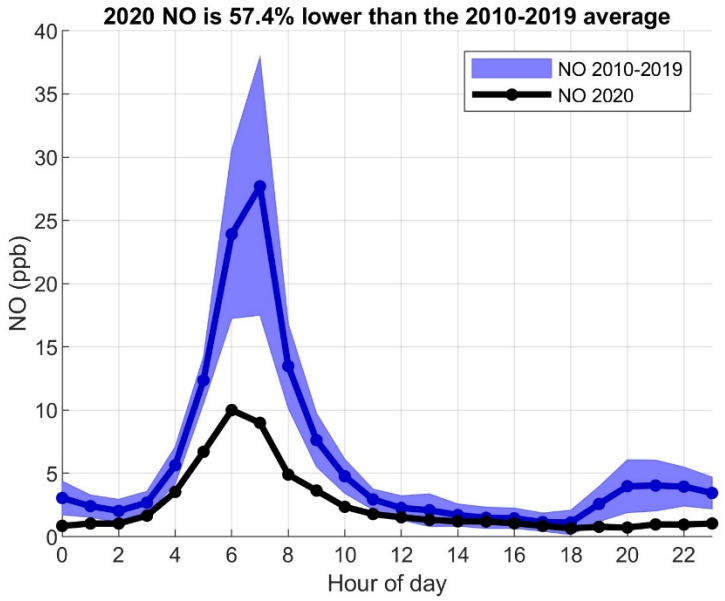
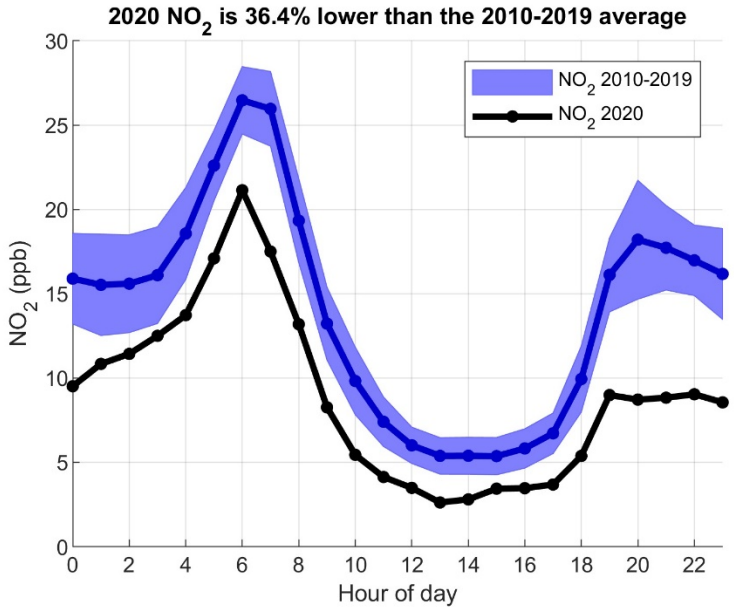
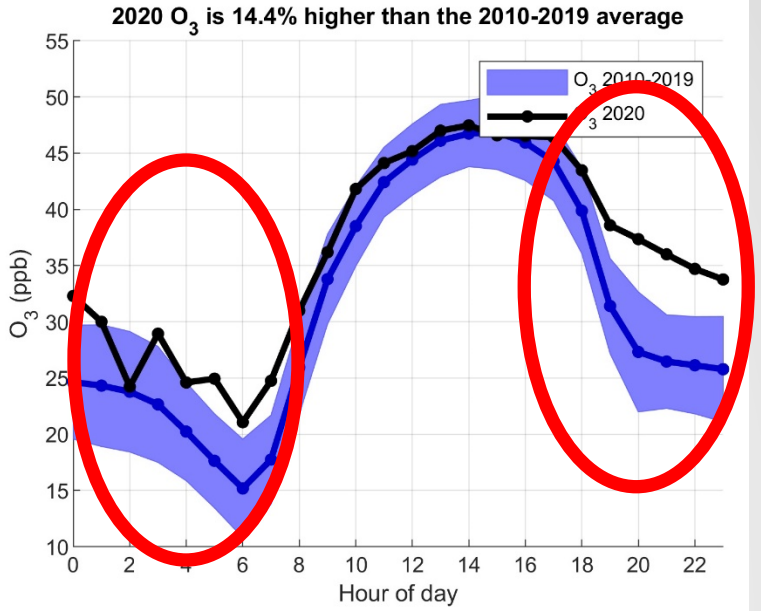
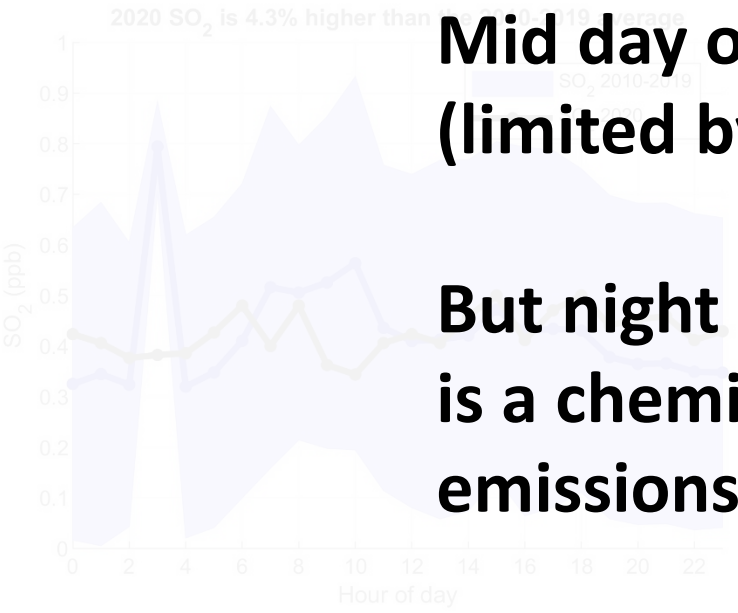








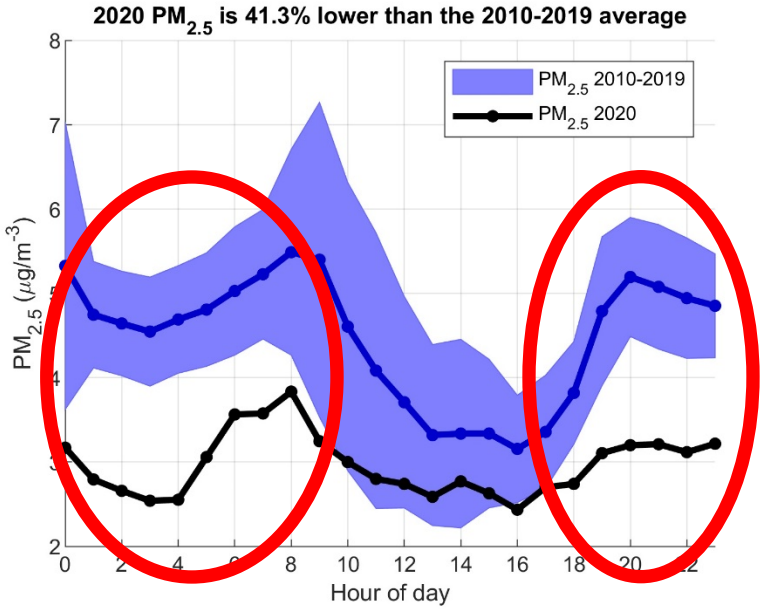
Mid day ozone is about average (limited by sunlight & temperature)…

But night time ozone is elevated. This is a chemical fingerprint of reduced emissions.

March 15-31 Air Quality at Utah DAQ Hawthorne Site

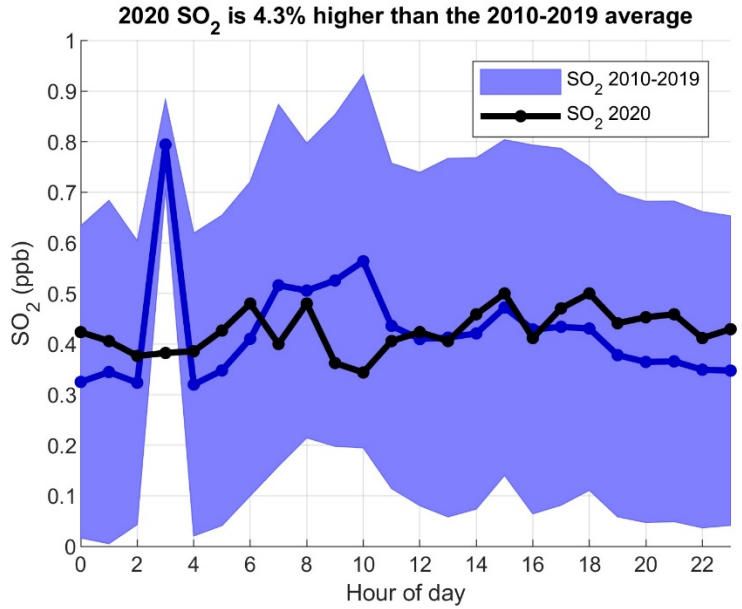
$PM_{2.5}$ is lower, especially at night.

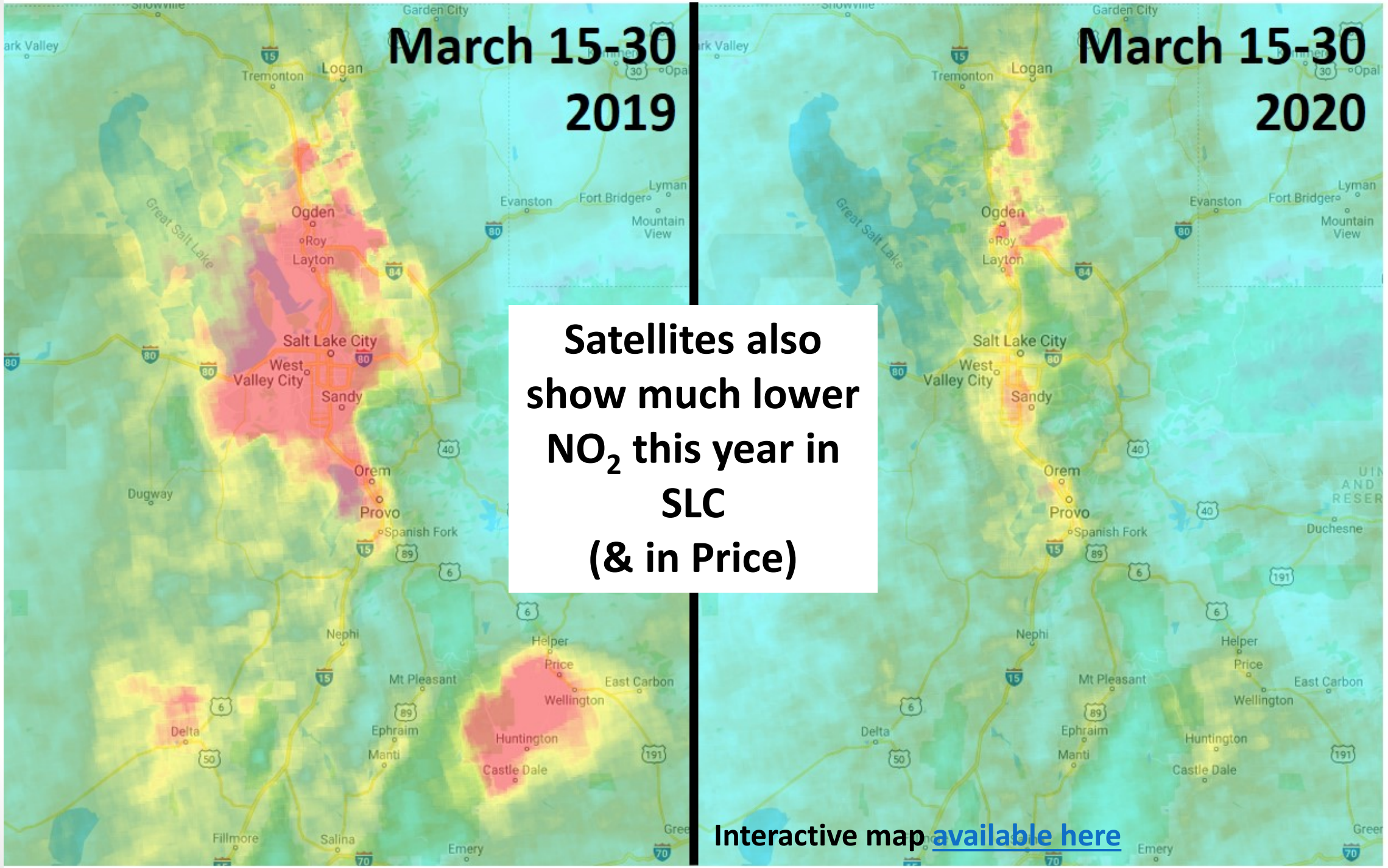
This may be an important scientific observation about the chemical reactions the create $PM_{2.5}$, but more work is needed



March 15-31 Air Quality at Utah DAQ Hawthorne Site

The Wasatch Front no longer has a SO_2 problem, and this year it's about average




March 15-30
2019
March 15-30
2020
Satellites also show much lower NO_2 this year in SLC (& in Price)
Interactive map available here
Garden City
Logan
Tremonton
Evanston
Fort Bridger
Lyman
Mountain View
Ogden
Roy
Layton
Great Salt Lake
Salt Lake City
West Valley City
Sandy
Orem
Provo
Spanish Fork
Dugway
Nephi
Mt Pleasant
Ephraim
Manti
Helper
Price
Wellington
East Carbon
Huntington
Castle Dale
Delta
Fillmore
Salina
Emery
Duchesne

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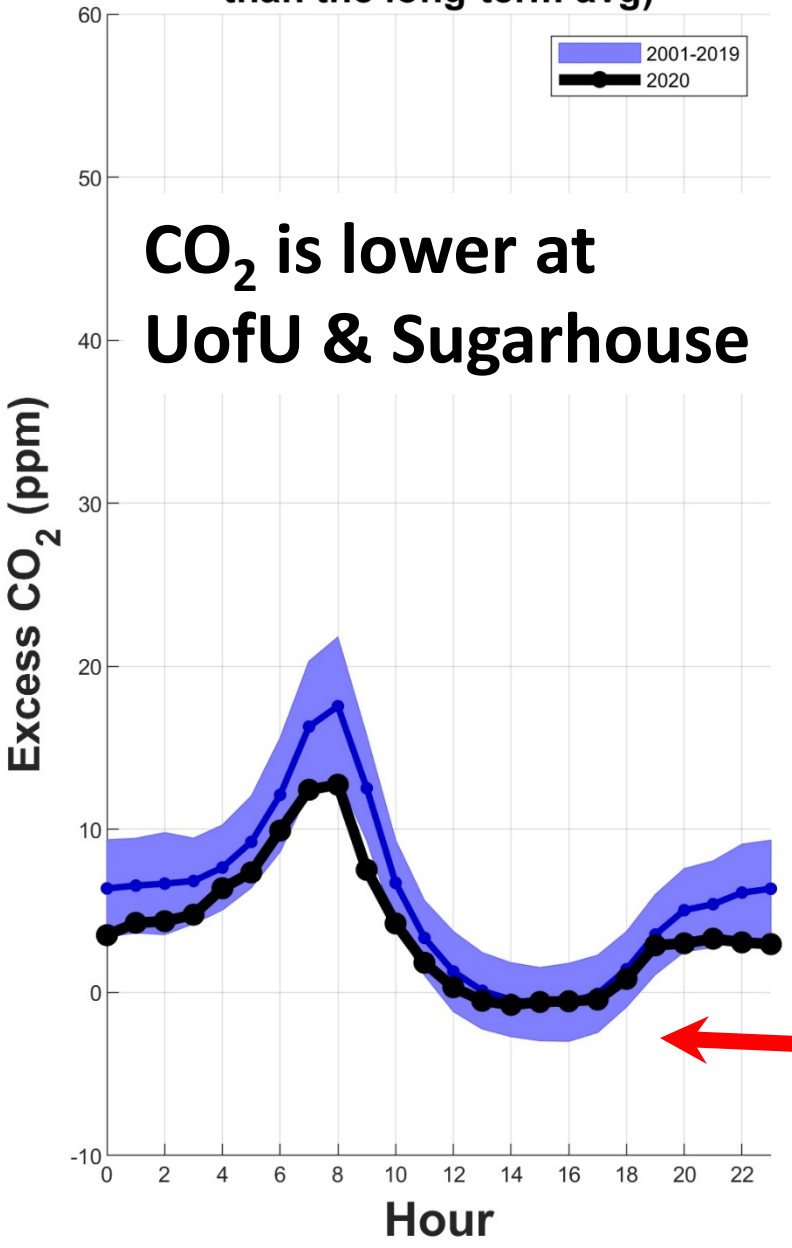
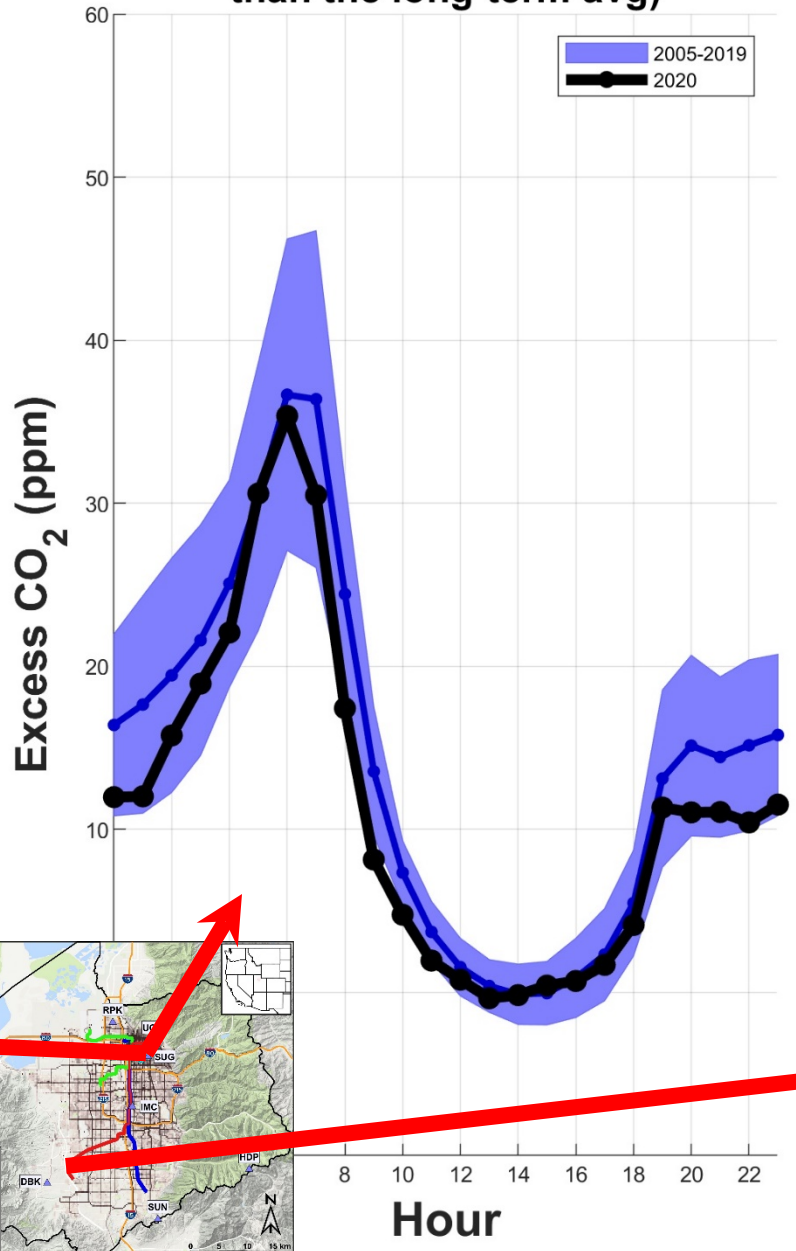
March 15 - April 11 Excess CO_2 at UUCON Sites

UOU (2020 is 33.3% lower than the long-term avg)

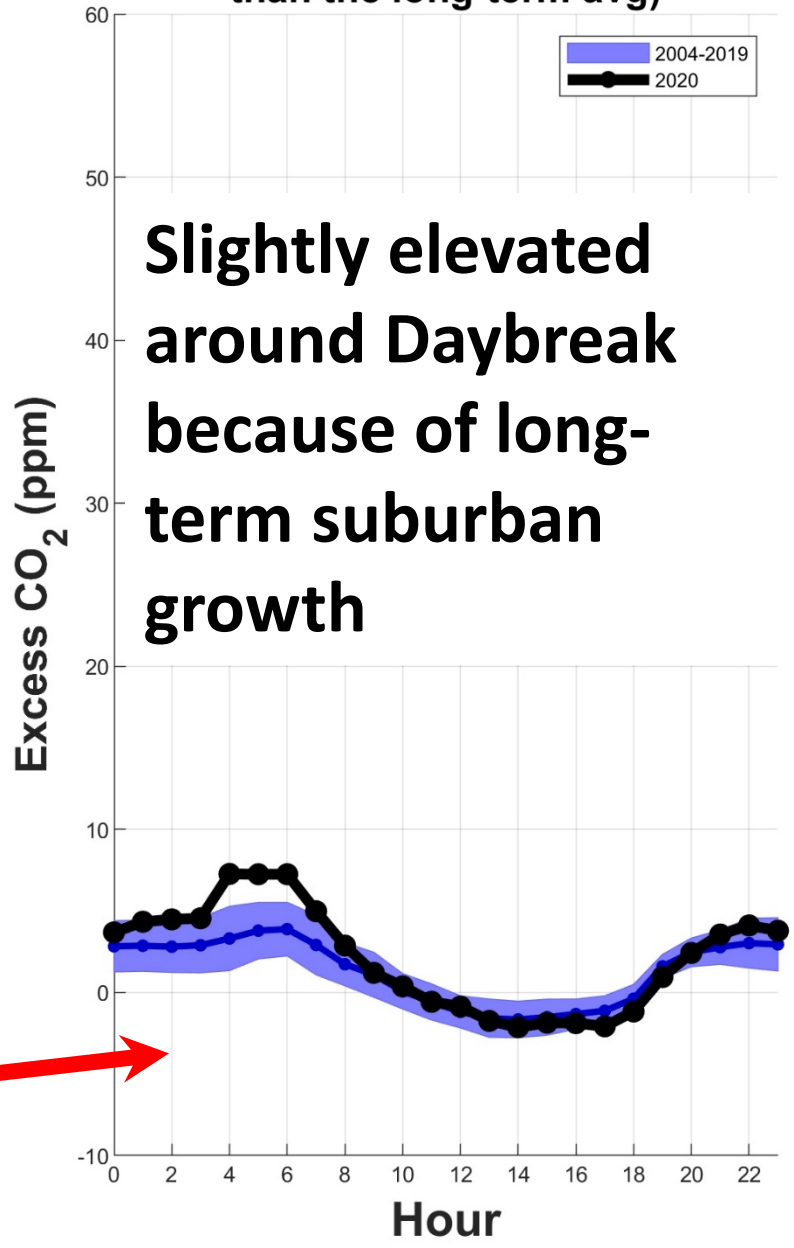


CO_2 is lower at UofU & Sugarhouse

SUG (2020 is 19.2% lower than the long-term avg)



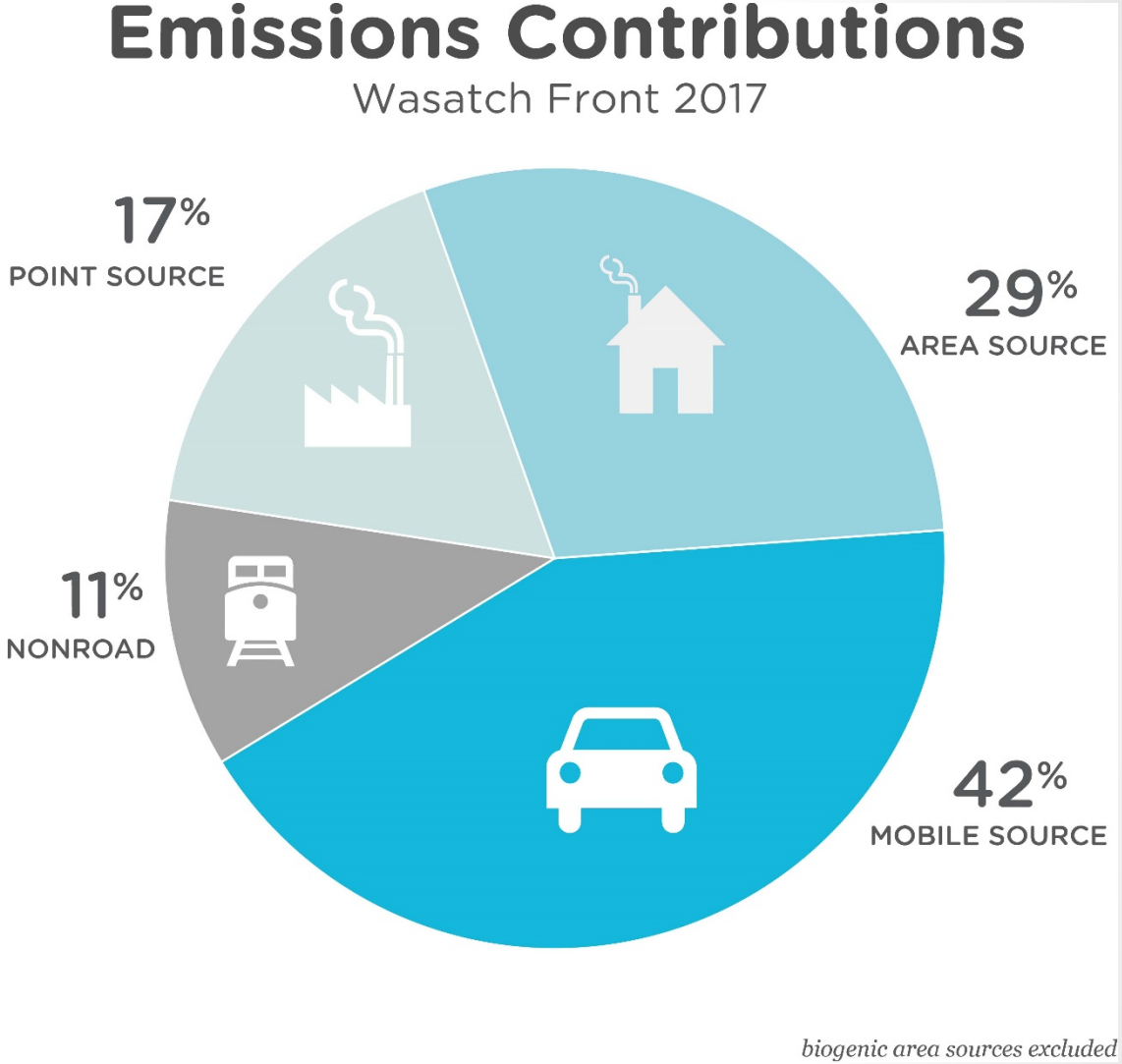
DBK (2020 is 60.3% higher than the long-term avg)



Slightly elevated around Daybreak because of long-term suburban growth

Summary

- Improvements in air quality came primarily from a ~40-50% reduction in traffic
  - Observed in air quality & GHG observations at the surface & from space
- We would see similar results if:
  - 40-50% of cars & trucks were electric or were telecommuting
  - Or reduced building emissions



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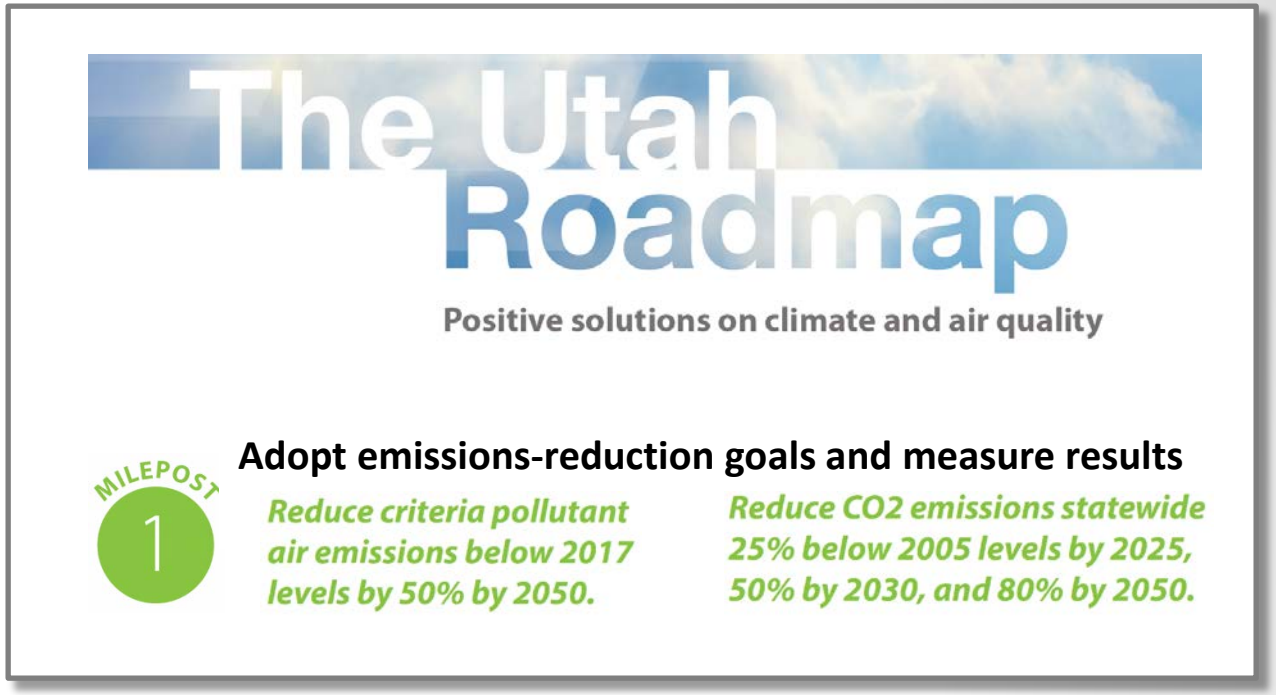
  - Observed in air quality & GHG observations at the surface & from space
- We would see similar results if:
  - 40-50% of cars & trucks were electric or were telecommuting
  - Or reduced building emissions
- Local air quality improved immediately after emissions were reduced
  - Local emissions affect our local air quality
  - Actions to reduce emissions have immediate health & economic co-benefits to our local community
- Much more research is coming.



For context…

- The NO_x reduction of 36-57% meets or exceeds Milepost 1 of the Utah Roadmap
  - Utah Roadmap goals are attainable & improvements would be noticeable
- ***Orienting policy towards solving these challenges will generate opportunities for economic growth & innovation as we recover from the pandemic***