

# OZONE SEASON SUMMARY 2020

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MWAQC-Technical Advisory Committee  
June 9, 2020

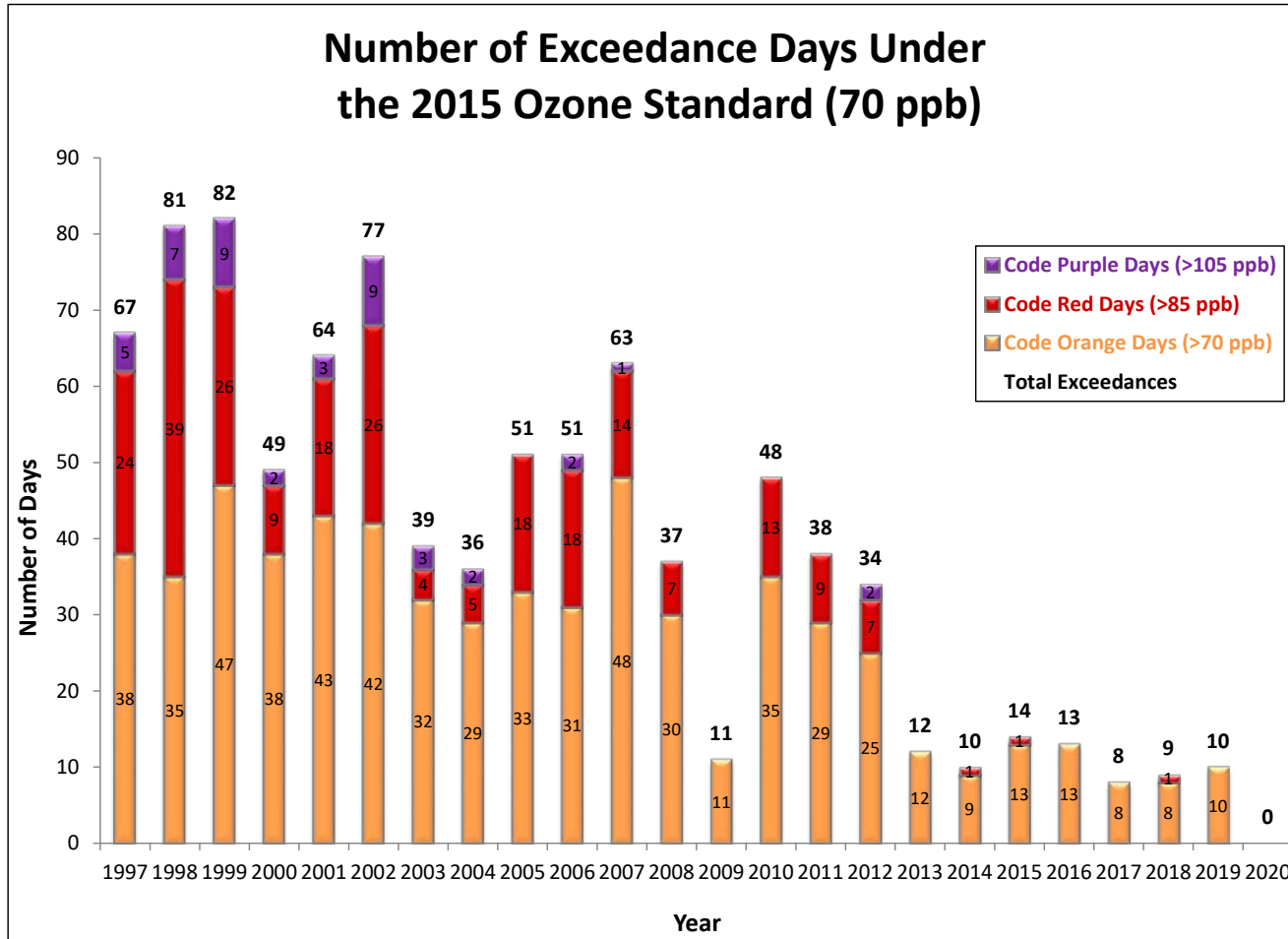
# Peak 8-Hour Average Ozone Levels (ppb)

March 2020							April 2020							May 2020						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01	02	03	04	05	06	07	29	30	31	01	02	03	04	26	27	28	29	30	01	02
44	52	40	44	42	39	43				40	48	50	36						39	49
08	09	10	11	12	13	14	05	06	07	08	09	10	11	03	04	05	06	07	08	09
47	52	43	36	42	46	45	46	52	45	51	51	43	49	49	48	40	37	52	50	39
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
40	48	40	42	39	41	39	50	45	47	48	49	51	47	49	39	46	56	47	57	52
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
44	38	39	38	41	48	43	50	45	48	49	41	34	47	42	43	47	46	43	33	47
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
38	49	40					38	40	40	51	46			35	42	49	36	26	39	52
														31						
														43						

2 Code Yellow Days, Rest All Code Green Days

Analysis is based on draft and incomplete data as of June 2, 2020.

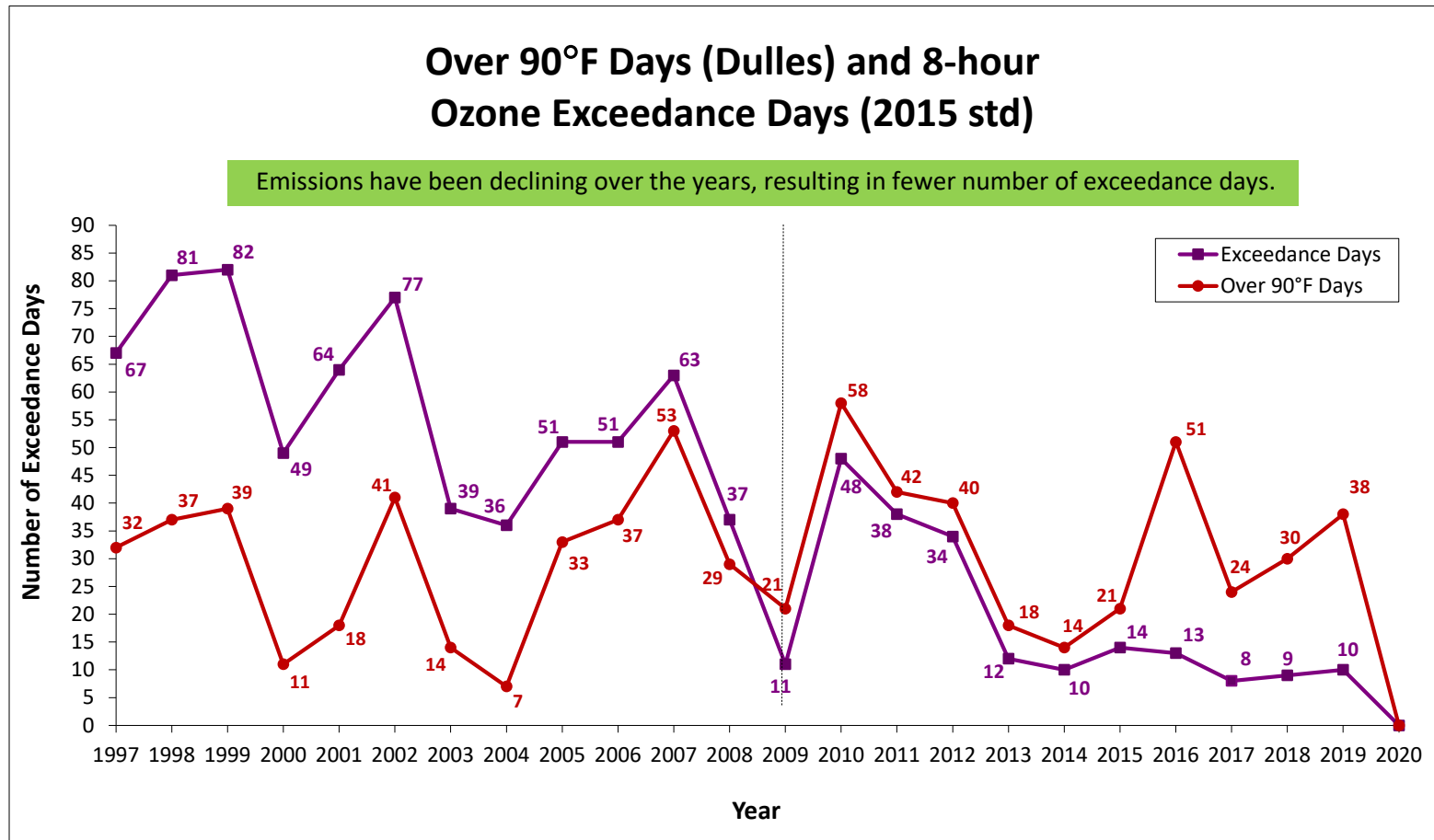
# Ozone Exceedance Trend



Analysis is based on draft and incomplete data as of June 2, 2020.

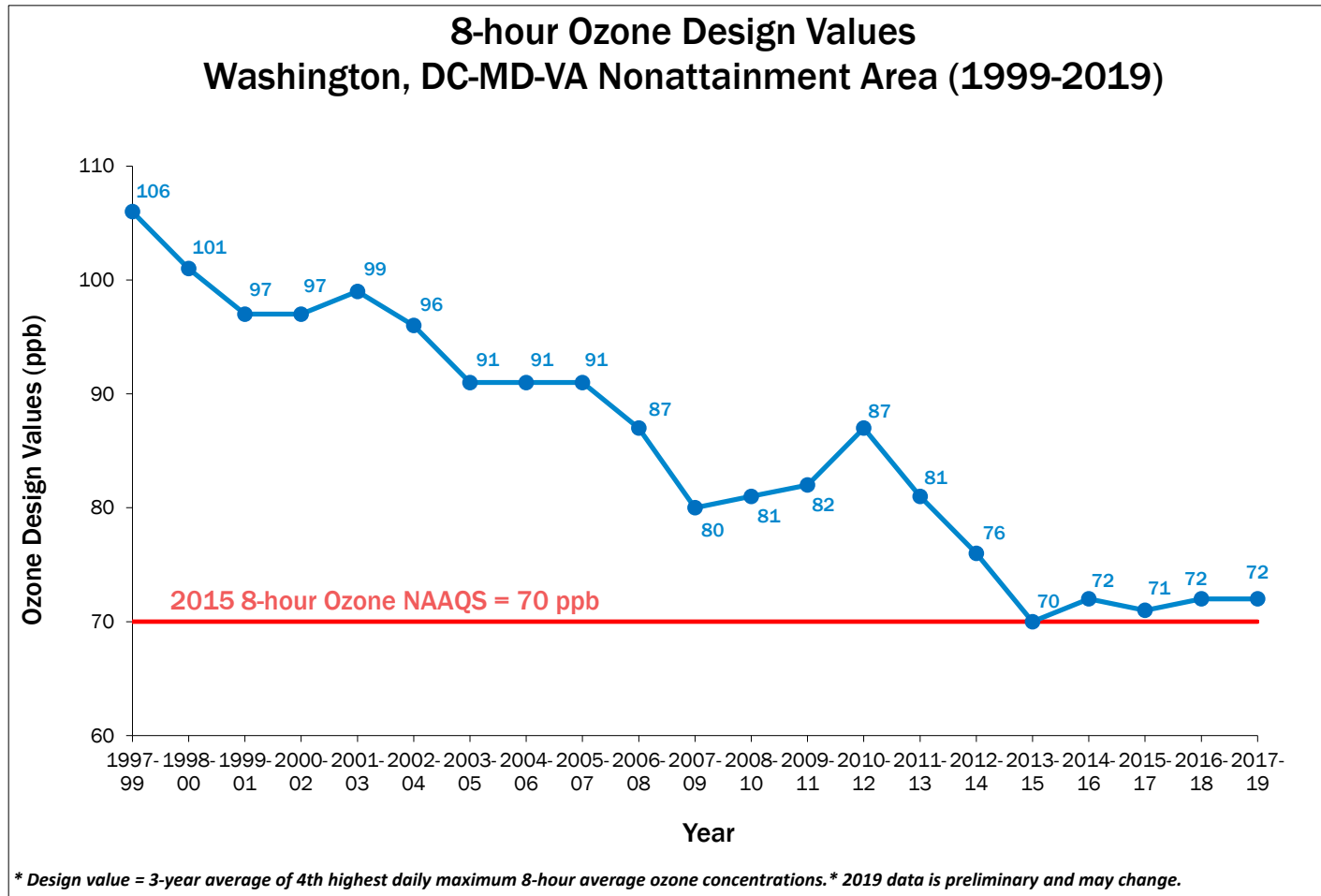


# Ozone & Temperature Trend



Analysis is based on draft and incomplete data as of June 2, 2020.

# Ozone Design Value Trend



# Why Fewer Exceedance Days Now ?

## Emission Control Programs

Federal	State	Local
Acid Rain Program (1996/2000)	Vehicle Inspection & Maintenance Programs	Renewable Energy Programs Regional Wind Power Purchase Program Clean Energy Rewards Program Renewable Portfolio Standards
Tier 2 (LD Vehicle) Rule (2004)	Maryland Healthy Air Act (2009/2012)	Energy Efficiency Programs LED Traffic Signal Retrofit program Building Energy Efficiency Programs
HD Diesel vehicle Rule (2004/2007)	Virginia CSAPR Rule	VRE Idling Reduction
NOX SIP Call (2004)	Ozone Transport Commission Rules	LOW VOC Paint
CAIR/CSAPR/CSAPR Update (2009/2015/2017)		Gas Can Replacement



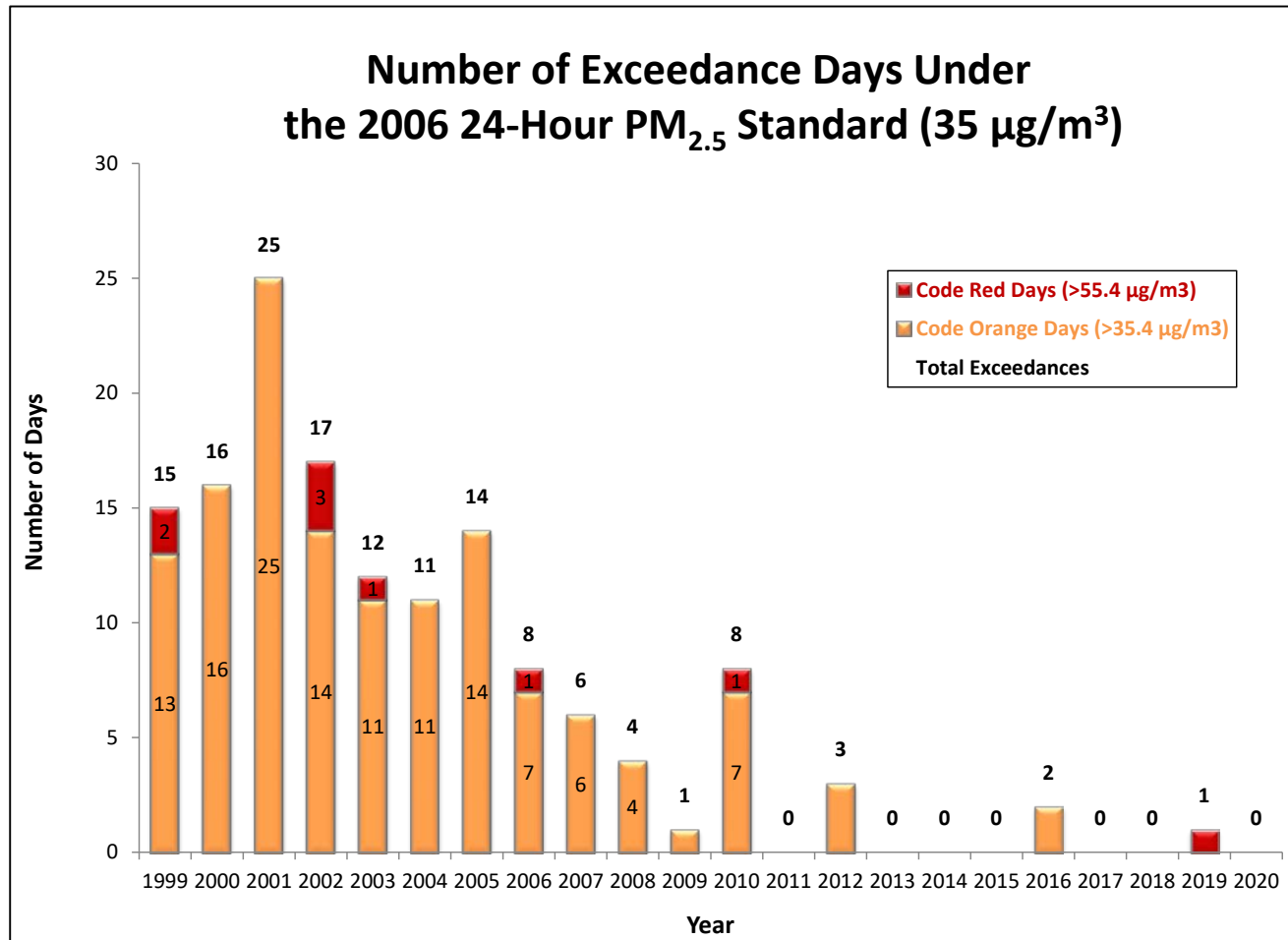
# 24-Hour Average PM2.5 Levels ( $\mu\text{g}/\text{m}^3$ )

March 2020							April 2020							May 2020						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01	02	03	04	05	06	07	29	30	31	01	02	03	04	26	27	28	29	30	01	02
6.2	10.9	9.4	3.4	7.7	9.3	4.0				6.6	4.2	3.1	3.1						3.5	5.6
08	09	10	11	12	13	14	05	06	07	08	09	10	11	03	04	05	06	07	08	09
7.6	8.0	7.9	7.7	10.3	6.9	4.7	6.2	6.9	10.9	6.5	7.4	4.2	7.8	8.9	4.4	5.2	4.6	5.3	6.6	4.3
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
8.1	6.7	7.7	8.4	13.1	10.6	5.2	10.0	3.9	5.3	6.8	7.9	9.5	8.5	5.1	11.7	9.3	11.1	10.3	10.4	8.5
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
6.8	5.0	6.7	6.0	10.9	6.9	8.8	8.6	10.2	6.9	5.1	7.1	3.9	7.0	9.8	6.6	7.0	6.7	9.1	6.5	10.1
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
9.4	6.5	4.3					4.0	3.1	6.0	8.3	5.1			8.0	7.4	8.6	6.7	6.8	10.7	5.1
														31						
														8.1						

1 Code Yellow Day, Rest All Code Green Days

Analysis is based on draft and incomplete data as of June 2, 2020.

# PM2.5 Exceedance Trend

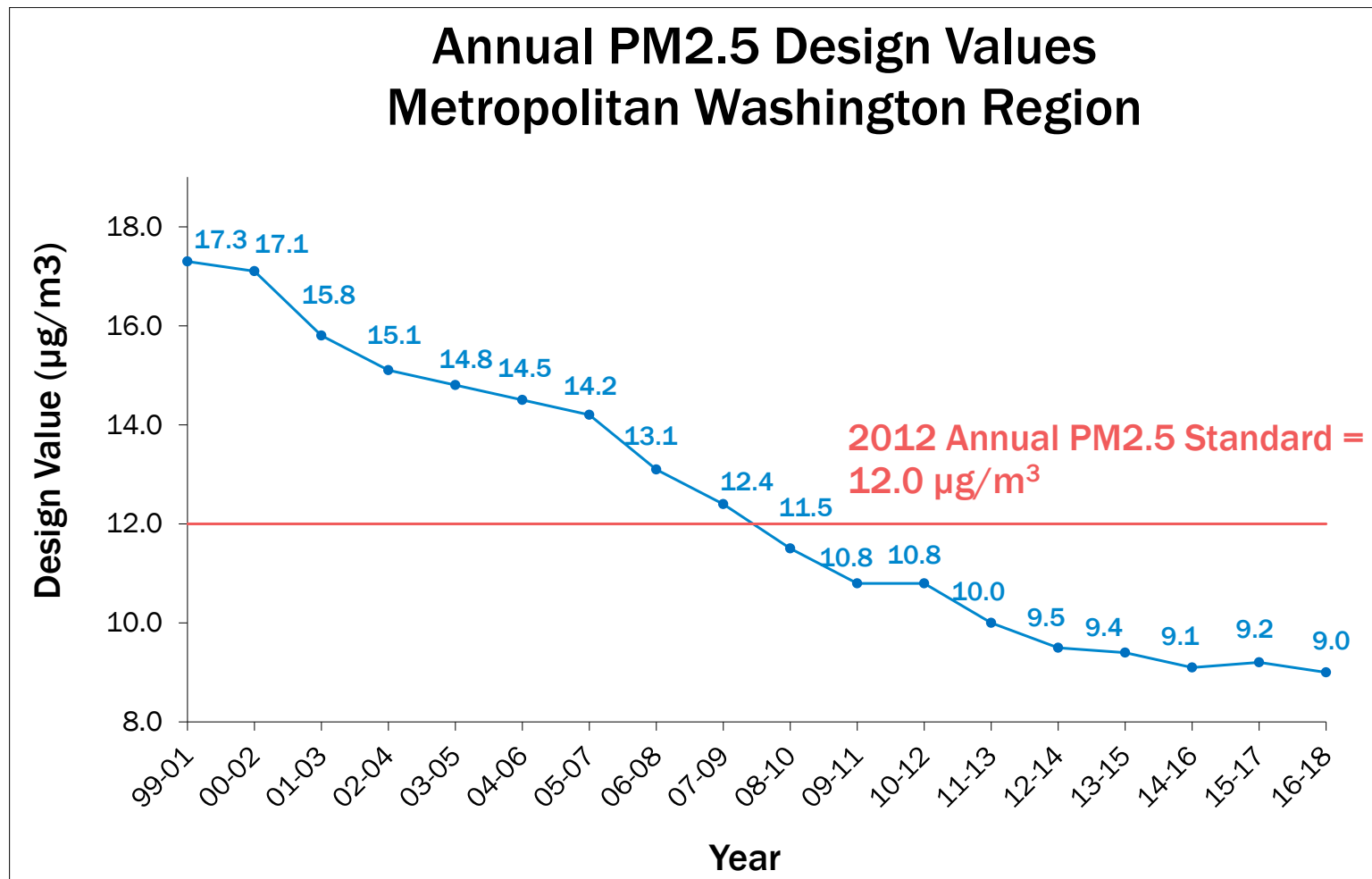


Analysis is based on draft and incomplete data as of June 2, 2020.

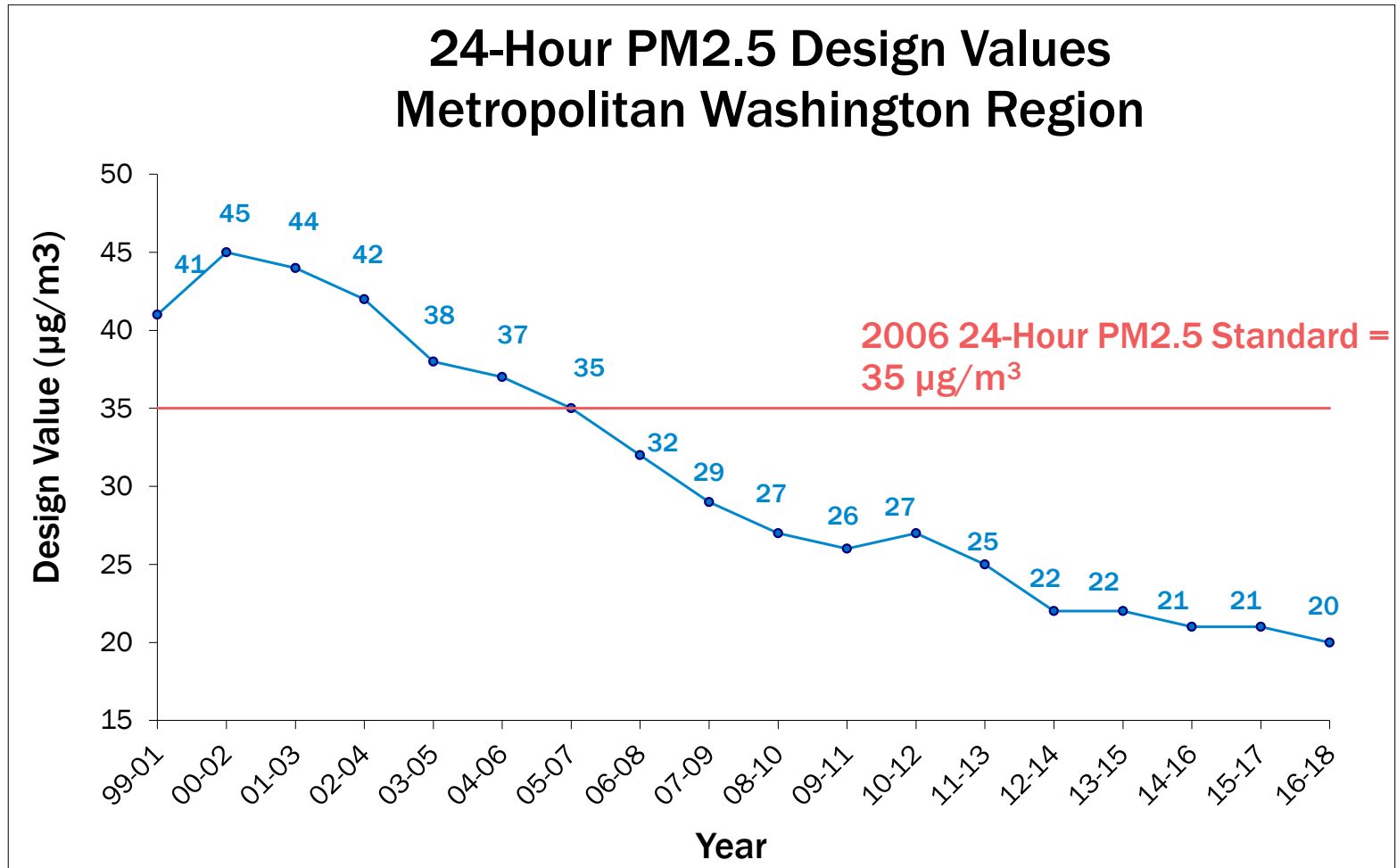




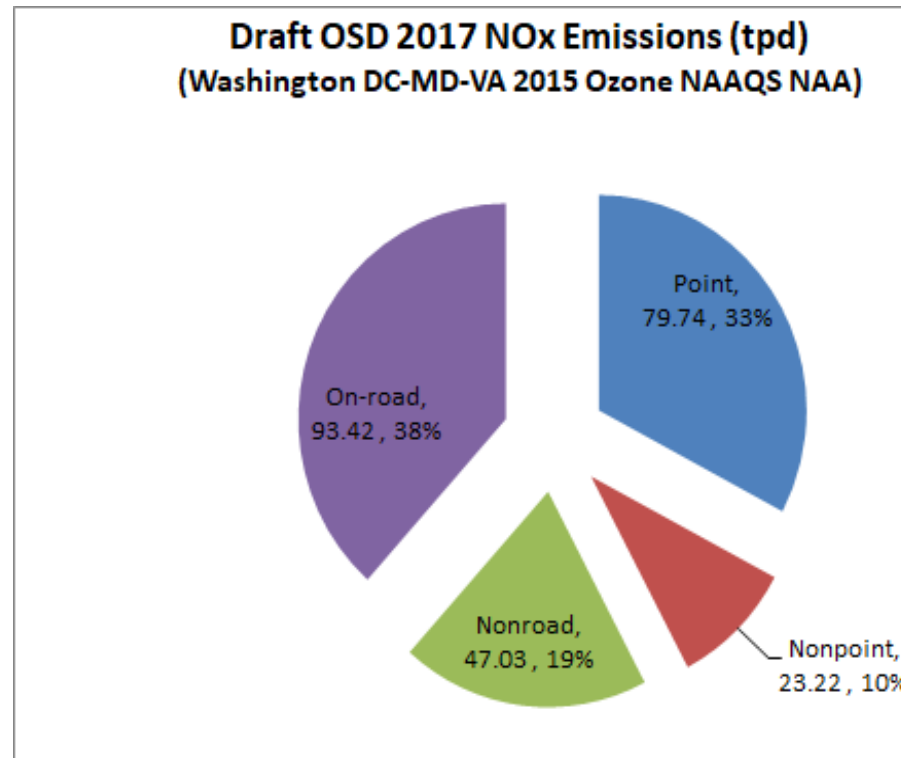
# Annual PM2.5 Design Value Trend



# 24-Hour PM2.5 Design Value Trend



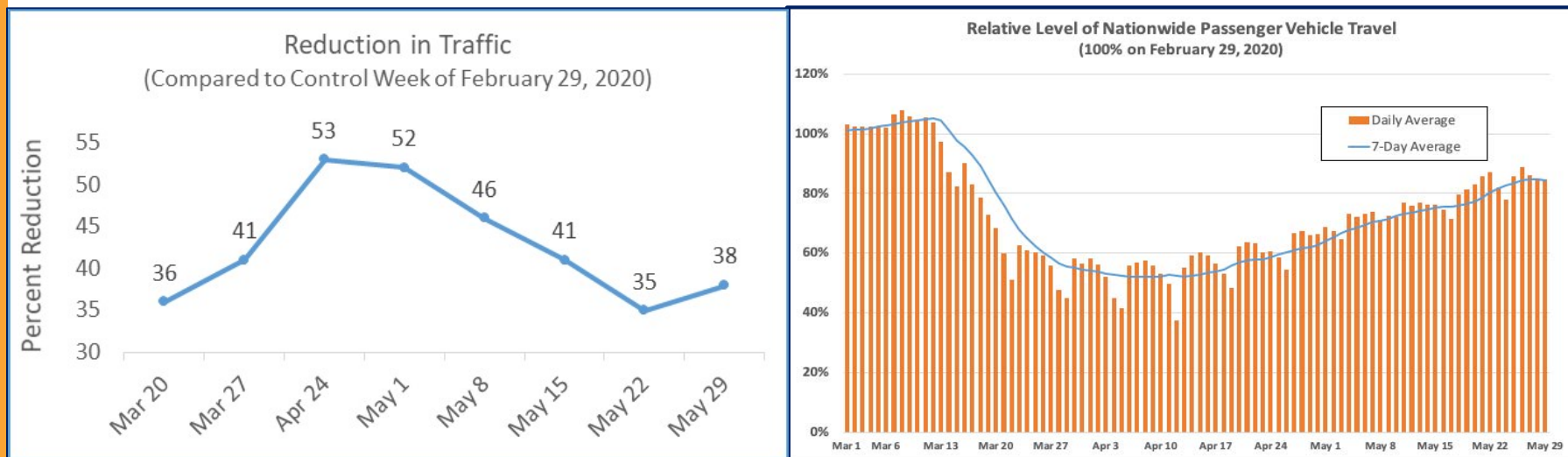
# Emission by Source



- Since COVID-19 has affected operation of all sources, emissions have been affected accordingly.



# IMPACT ON ON-ROAD SECTOR

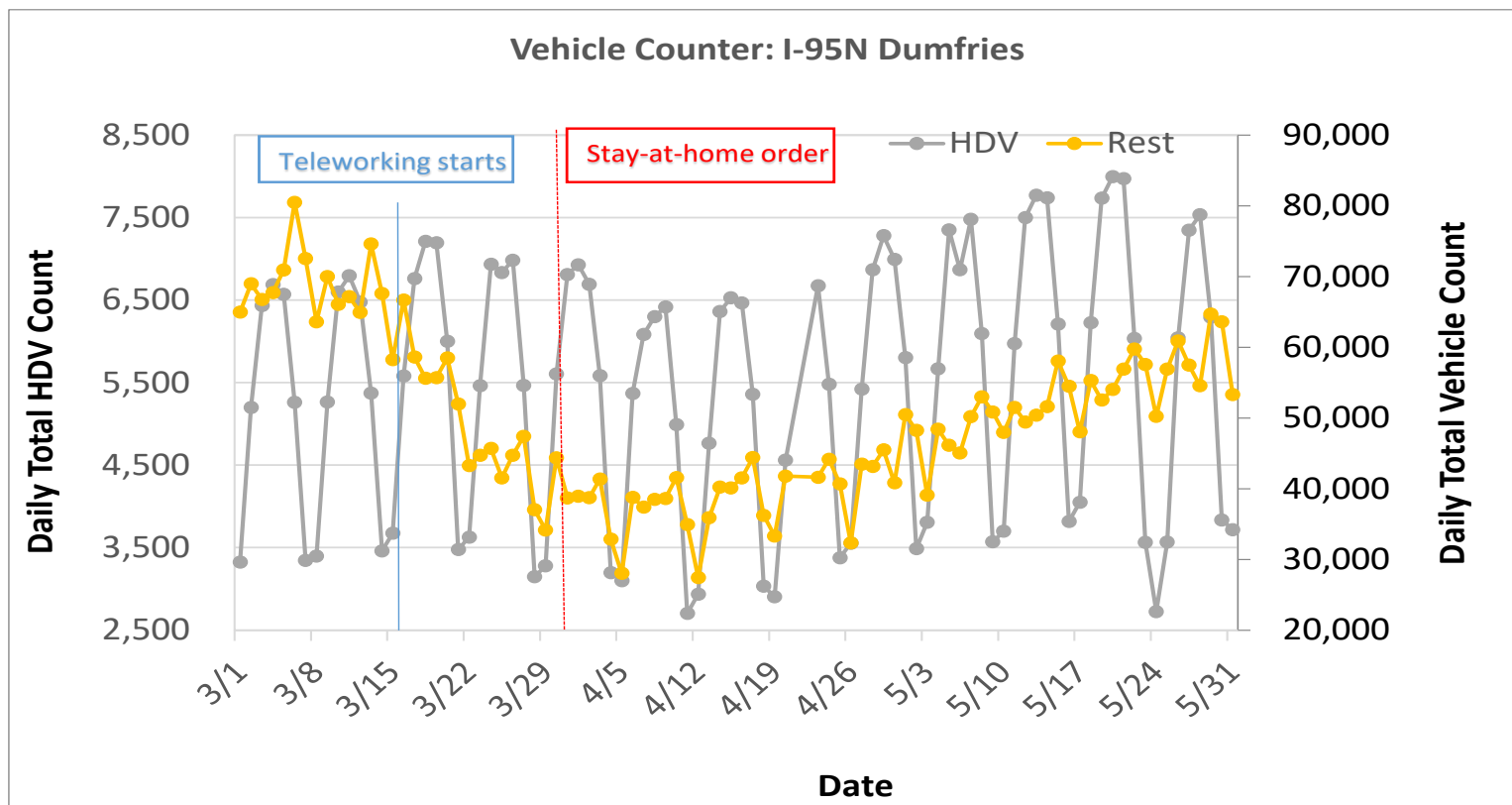


## Sources:

- A. Washington metro area chart is based on data extracted from INRIX U.S. National Traffic Volume Synopsis Issues #1(Table 1), #2(Table3), #6-#11
- B. Nationwide travel chart - [INRIX U.S. National Traffic Volume Synopsis Issue #8 \(May 2 – May 8, 2020\)](#)



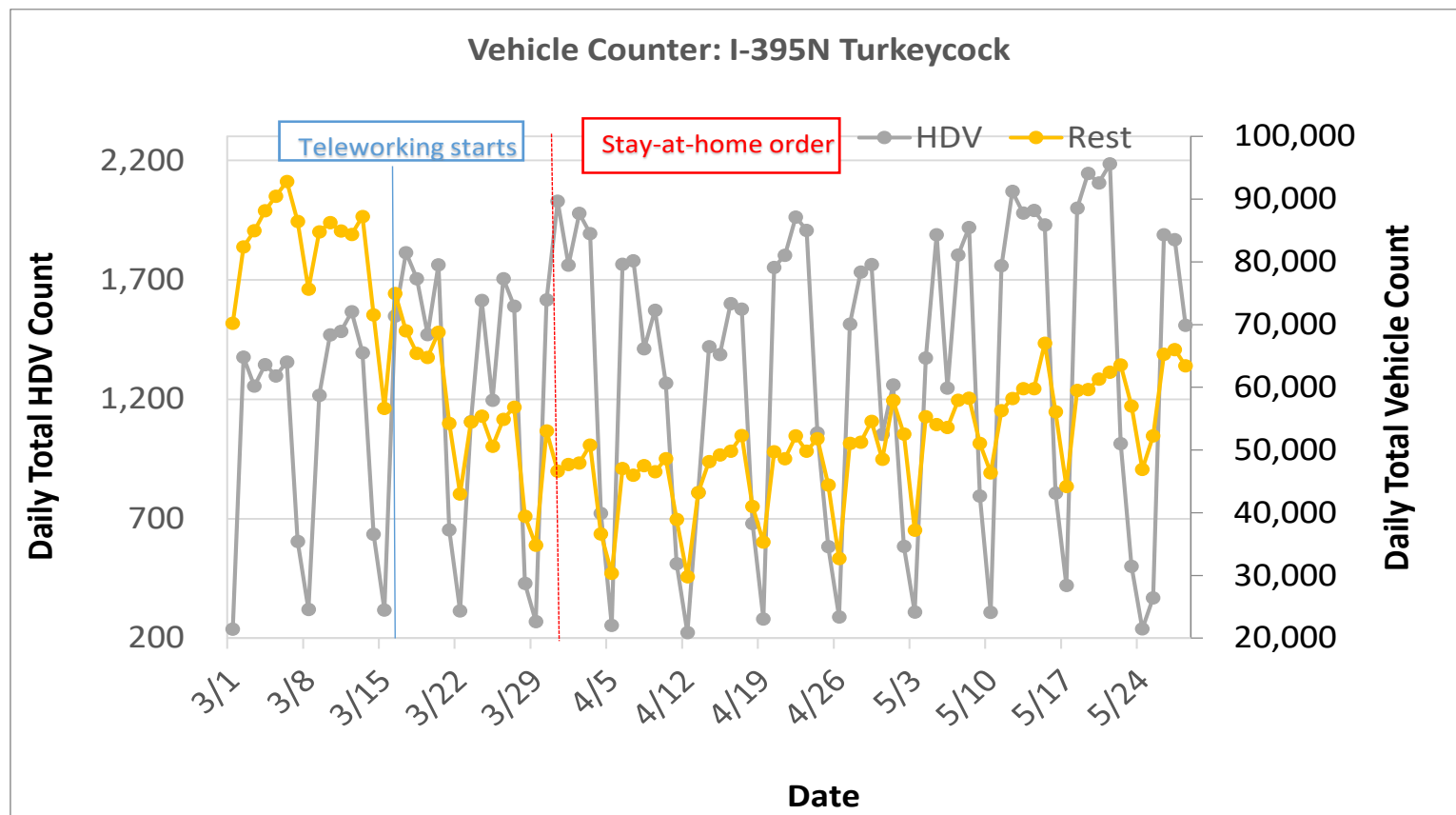
# IMPACT ON ON-ROAD SECTOR



- Both heavy-duty and other vehicle traffic seem to be increasing after a decrease during the early to mid April. Source: VDOT

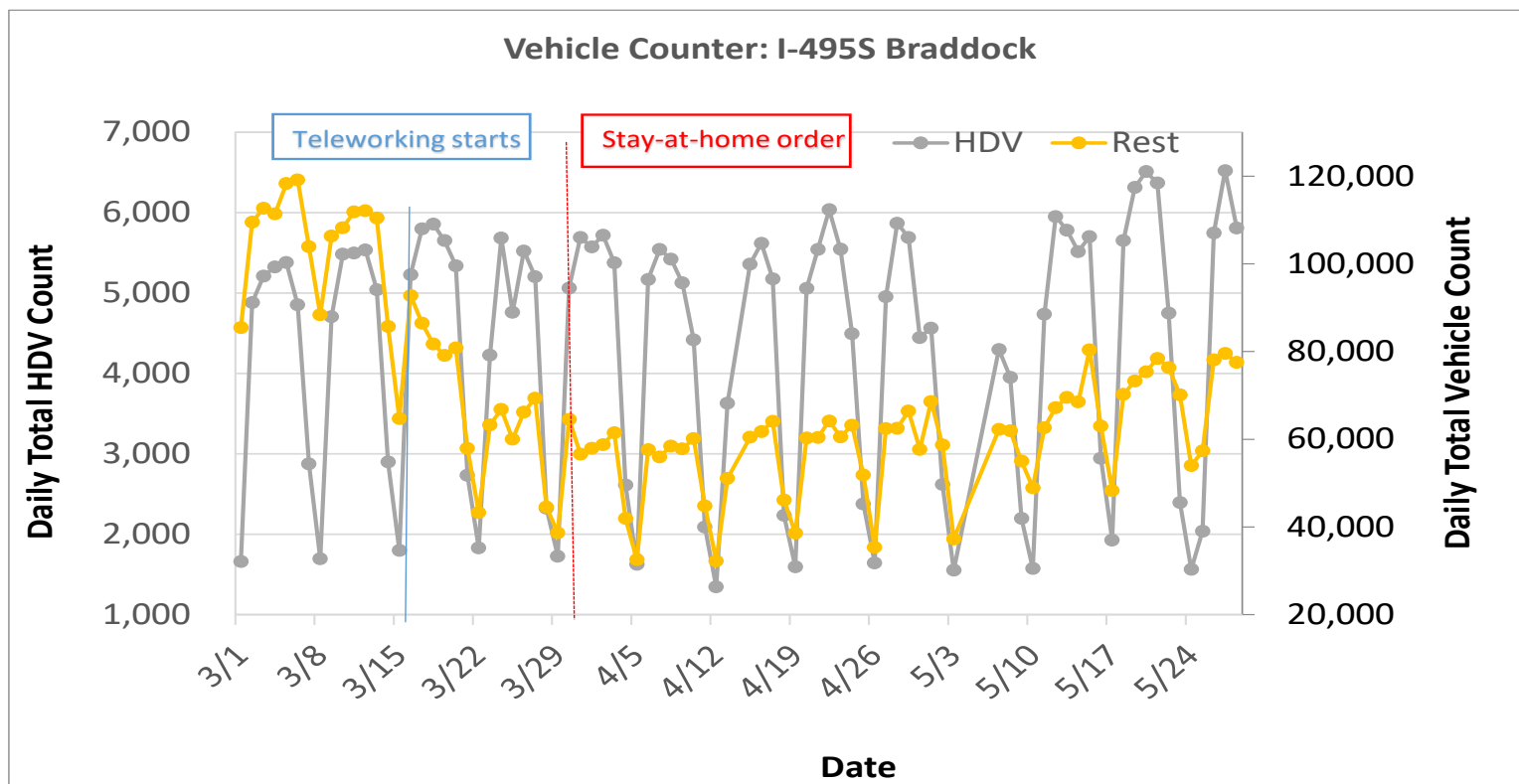


# IMPACT ON ON-ROAD SECTOR



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# IMPACT ON ON-ROAD SECTOR

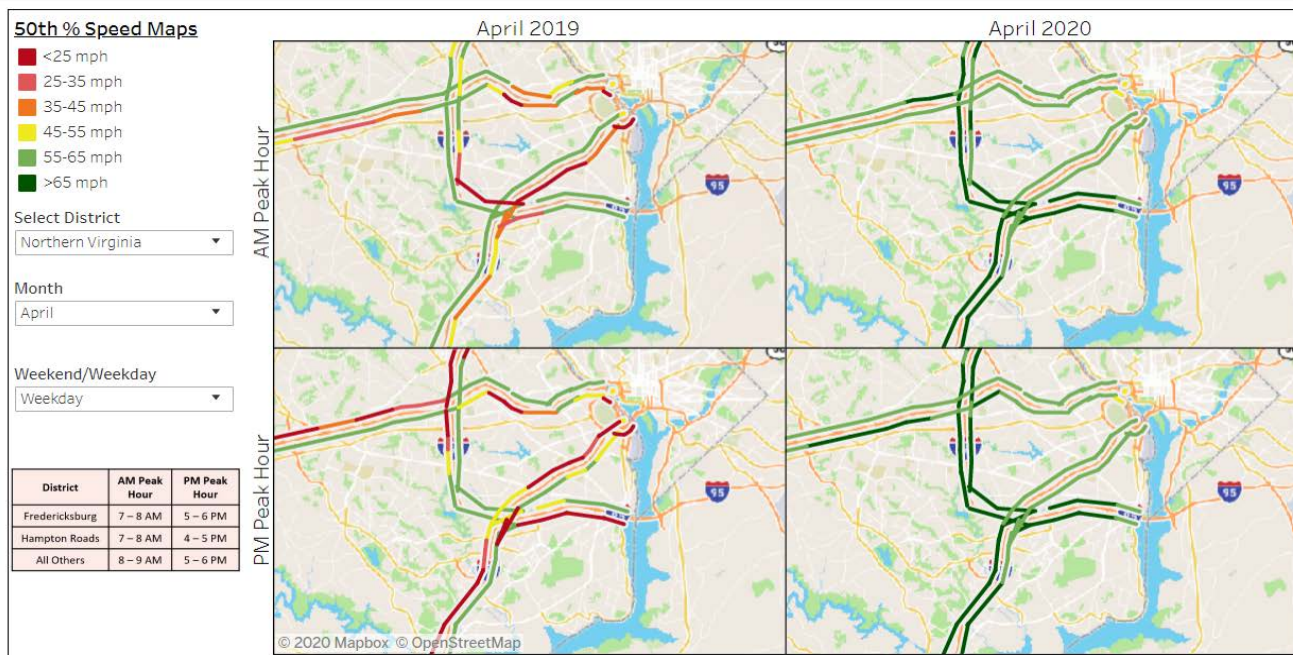


- Both heavy-duty and other vehicle traffic seem to be increasing after a decrease during the early to mid April. Source: VDOT

# IMPACT ON ON-ROAD SECTOR

## Daily Volume for Northern Virginia - Wednesday

	03/18/20	03/25/20	04/01/20	04/08/20	04/15/20	04/22/20	04/29/20	05/06/20	05/13/20	05/20/20
Observed Volume	1,249K	926K	883K	888K	887K	968K	1,023K	984K	1,110K	1,170K
% Change from 2019	-29.0%	-47.4%	-50.9%	-50.7%	-49.2%	-45.5%	-43.2%	-45.7%	-38.8%	-35.5%
# of Links Reporting	55	55	55	55	53	53	55	55	55	55



- Traffic count shows downward trend in northern Virginia. Much less congestion now. Source: VDOT





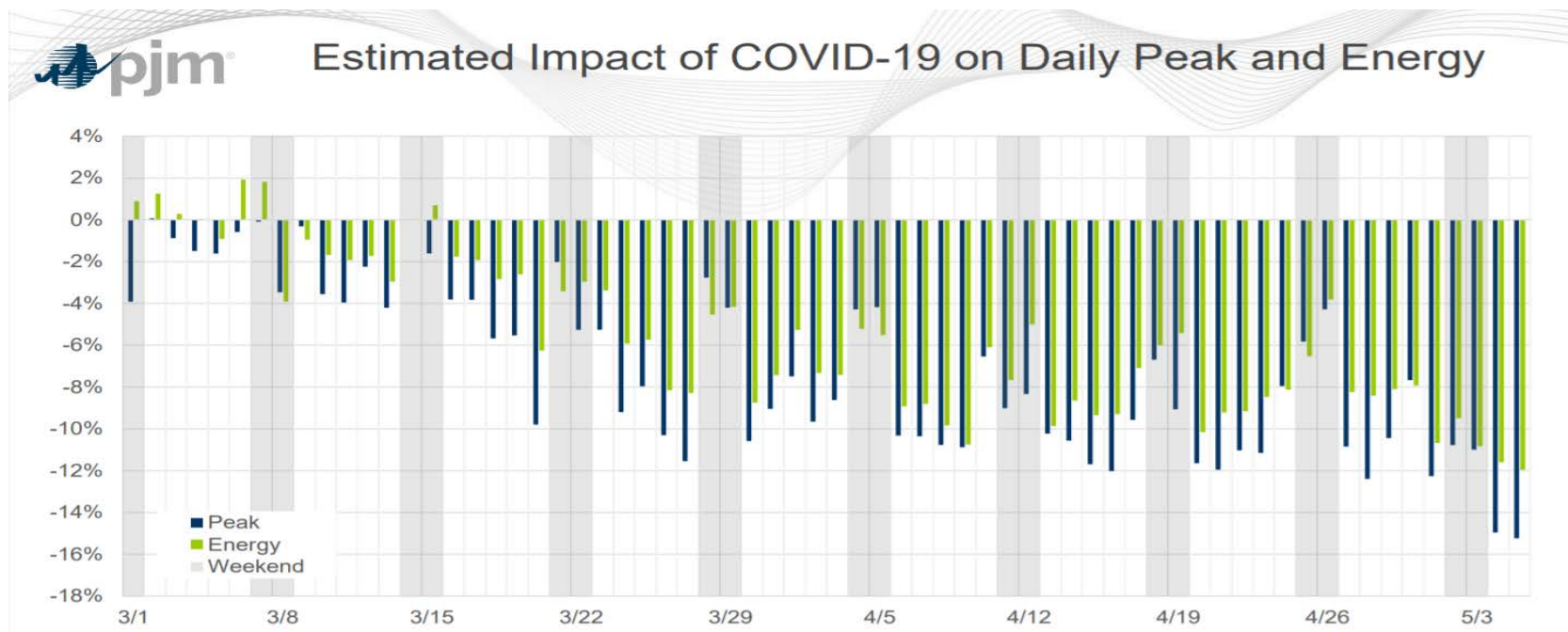
# IMPACT ON NONPOINT & NONROAD SECTORS

- Emissions can be expected to decline similar to other sectors as activities related to nonroad sources (e.g., construction, commercial, industrial, aircraft, railroad, etc) and nonpoint sources (dry cleaners, restaurants, portable fuel containers, auto repair facilities, etc) have also declined.



# IMPACT ON POINT SECTOR

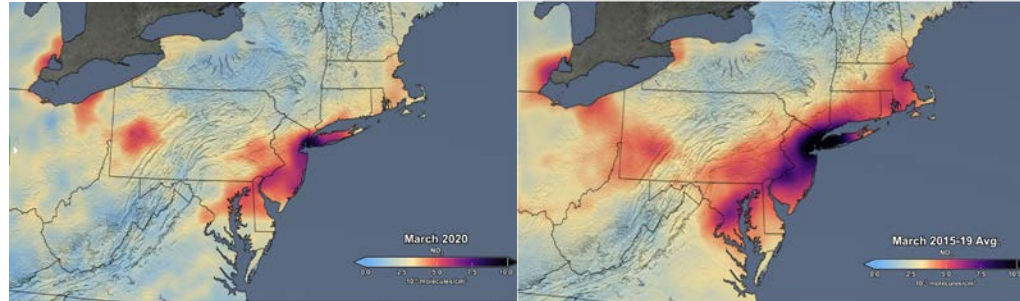
- There has also been impact on the energy consumption in the region due to office and business closures and people teleworking/staying at home.
- Electricity consumption data, in general shows downward trend (lower emissions).



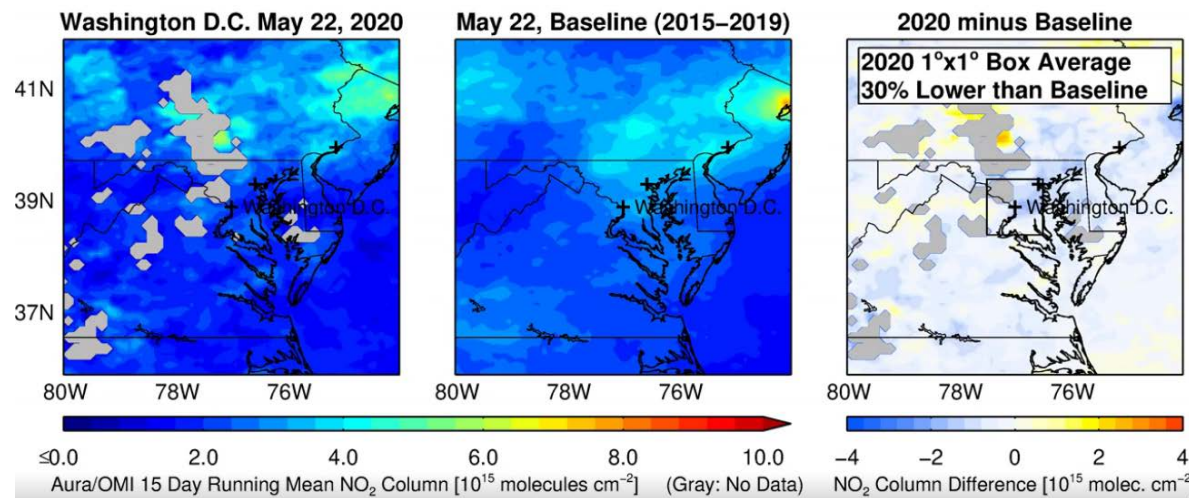
- Source: PJM Report “Update of COVID-19 Load Impacts”, May 12, 2020



# SATELLITE NO2 DATA TREND



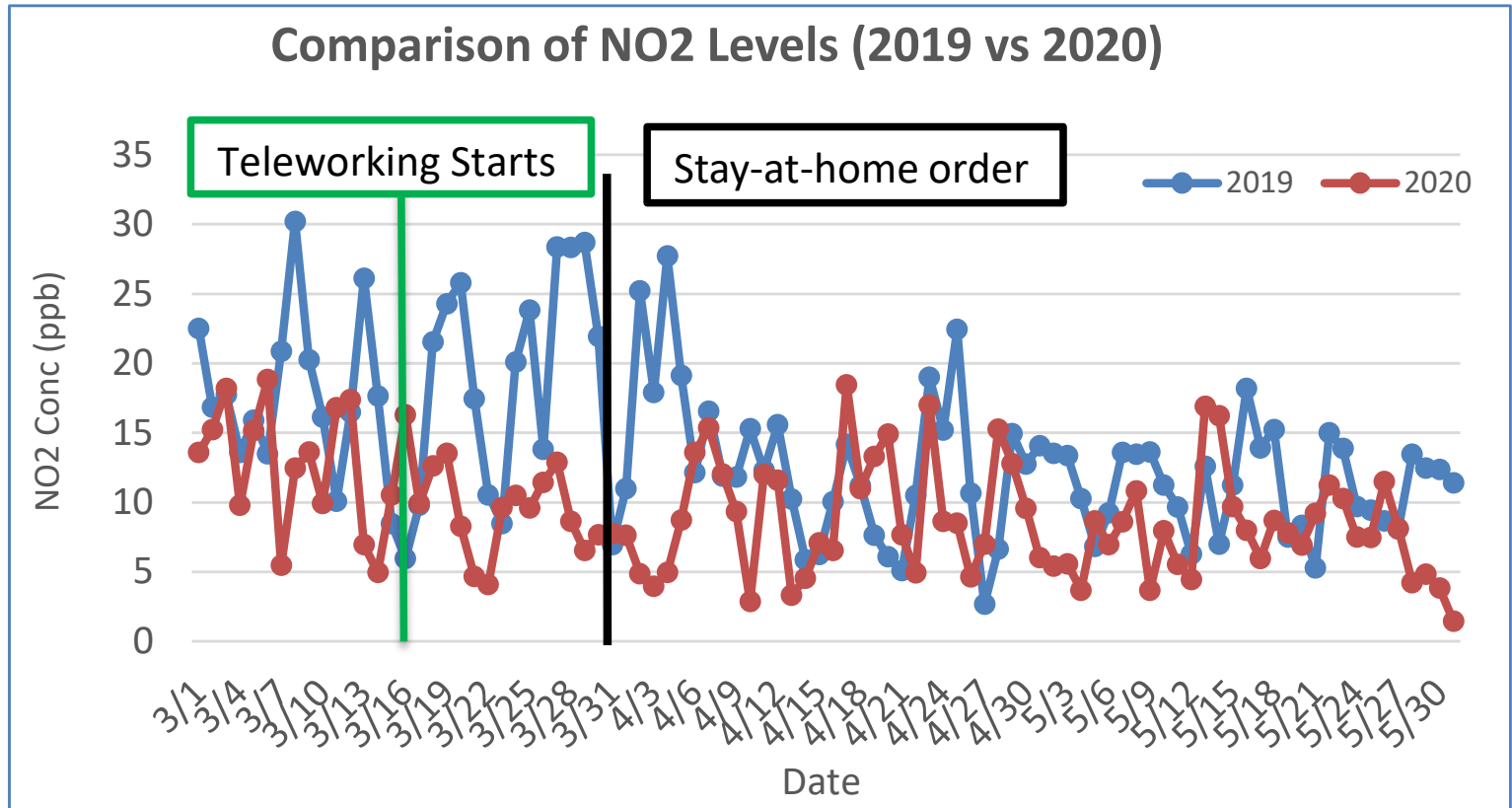
<https://earthdata.nasa.gov/learn/articles/feature-articles/health-and-air-quality-articles/find-no2-data>



[https://so2.gsfc.nasa.gov/no2/pix/mp4s/Washington\\_DC.html](https://so2.gsfc.nasa.gov/no2/pix/mp4s/Washington_DC.html)

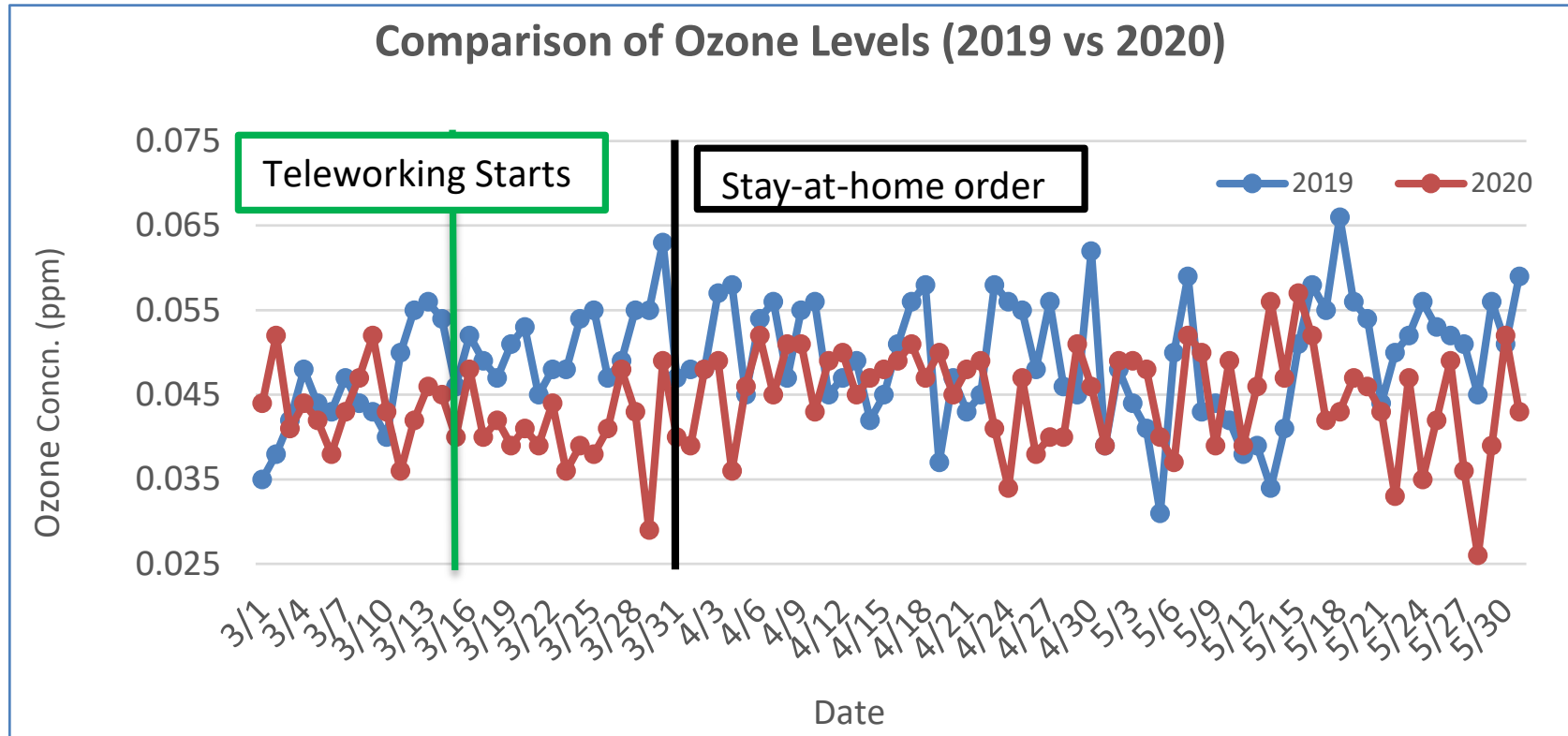
- Lower NO<sub>2</sub> levels in March/May 2020 compared to March/May 2015-2019 averages.
- NASA cautions that “Further analysis is required to rigorously quantify the amount of the change in NO<sub>2</sub> levels associated with changes in pollutant emissions versus natural variations in weather.”

# COVID-19 & NO2 LEVELS



- Draft 2020 ozone levels mostly lower compared to 2019 both before and after lockdown.

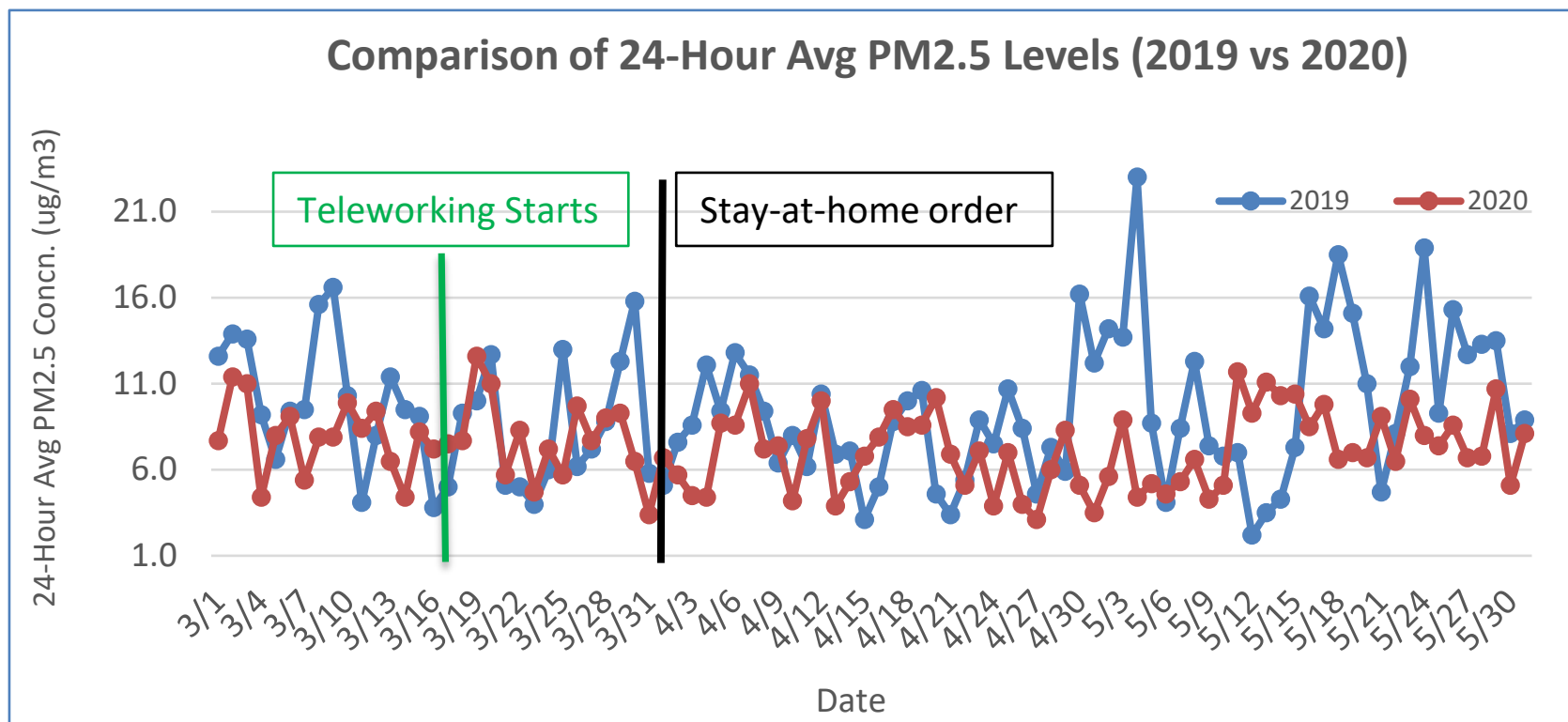
# COVID-19 & OZONE LEVELS



- Draft 2020 ozone levels mostly lower compared to 2019 both before and after lockdown.



# COVID-19 & PM2.5 LEVELS



- Draft 2020 PM2.5 levels generally lower.

# WEATHER & AIR QUALITY

- Weather plays an important role in determining air quality besides emission.
- March 2020 – Warmer and drier than March 2019 and normal.
- April 2020 – Colder and much wetter than April 2019 and normal.
- May 2020 – Much Colder and drier than May 2019 and normal. Cloudier than May 2019. Coolest since 2008 and driest since 2007.

Source: <https://w2.weather.gov/climate/index.php?wfo=lwx>



# CONCLUSIONS

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- NO<sub>2</sub>, ozone and PM<sub>2.5</sub> levels generally seemed lower after COVID-19 related restrictions were implemented in the Washington region.
- Reduction in emissions due to lower traffic and fuel/ electricity consumption coupled with unfavorable weather (cool & cloudy) contributed towards lower pollutant levels.
- Air quality impact of COVID-19 related restrictions is expected to be more visible in summer, if those restrictions get extended to those months and weather becomes warmer, drier, and less cloudy.