COVID-19 IMPACT ON ENERGY CONSUMPTION AND EMISSIONS

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CEEPC
May 27, 2020

Agenda Item 3

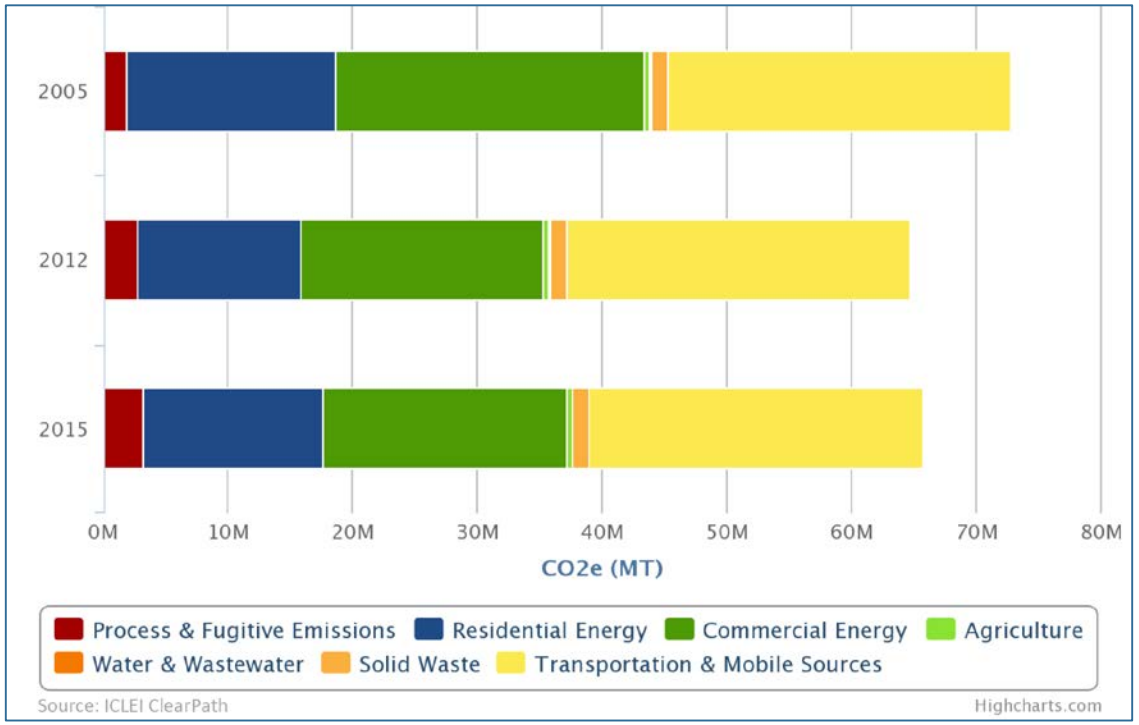
Metropolitan Washington
Council of Governments

COVID-10, ENERGY USE & EMISSIONS

- Reduced operation of businesses, institutions, and governments since early March
- Students being taught online
- Business sectors closed or severely cut back; employees teleworking where possible
- Significant reduction in traffic in the region

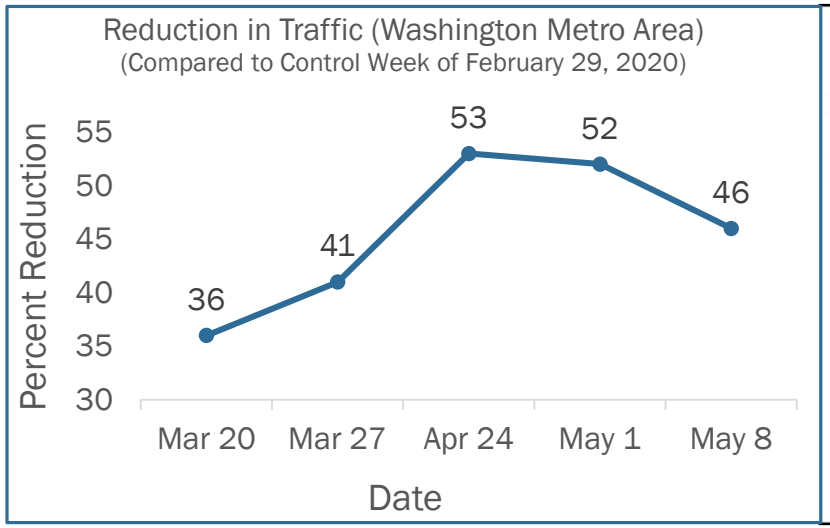
GREENHOUSE GAS EMISSIONS

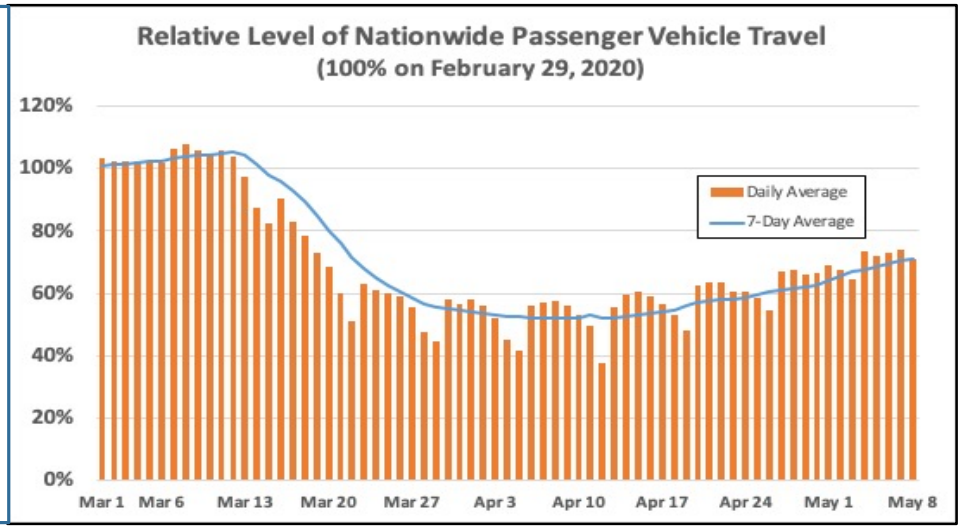
- 2015 Regional Greenhouse Gas Inventory
  - Energy consumption (residential and commercial)
    - 37% electricity, 15% other
  - Transportation
    - 34% on-road; 7% off-road/aviation/rail



ON-ROAD TRANSPORTATION

- On-Road Sector





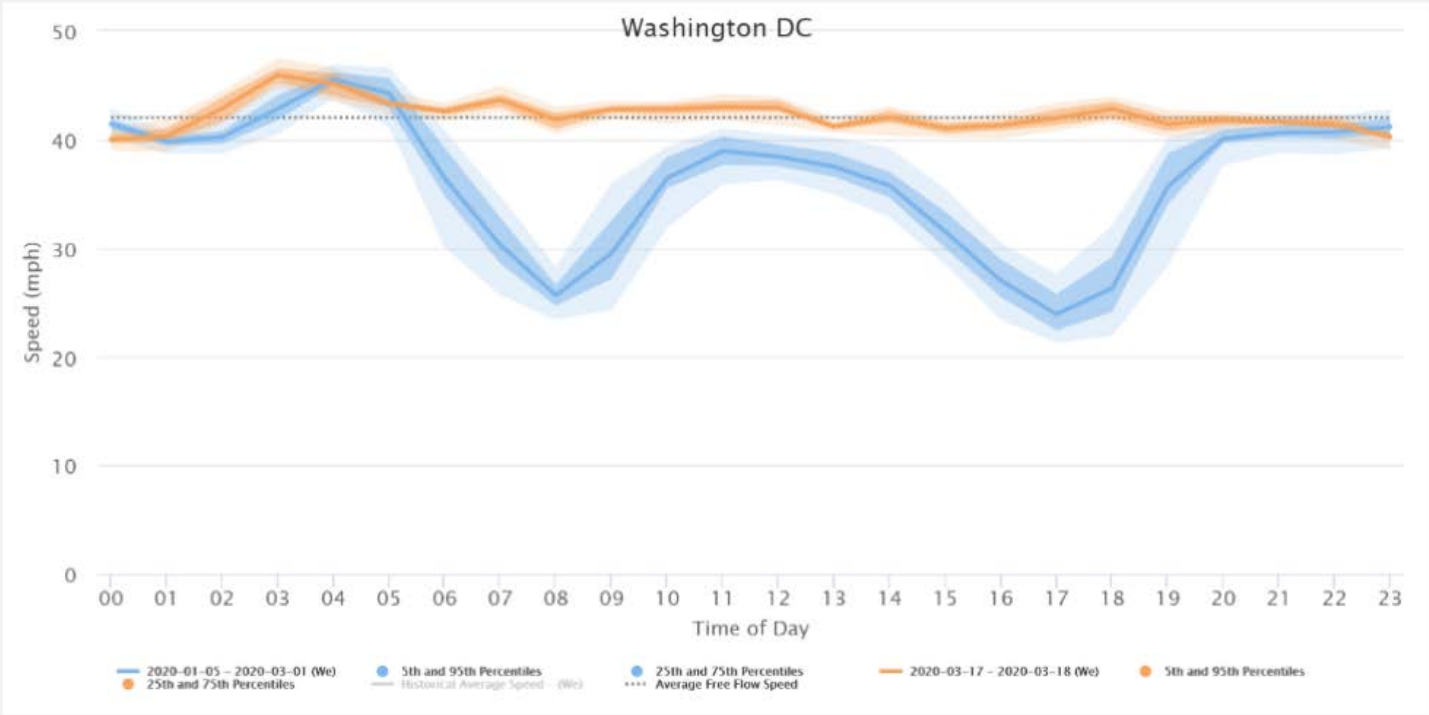
Sources:

- Washington metro area chart is based on data extracted from INRIX U.S. National Traffic Volume Synopsis Issues #1(Table 1), #2(Table3), #6, #7, and #8
- Nationwide travel chart - [INRIX U.S. National Traffic Volume Synopsis Issue #8 (May 2 – May 8, 2020)]

ON-ROAD TRANSPORTATION

Washington DC

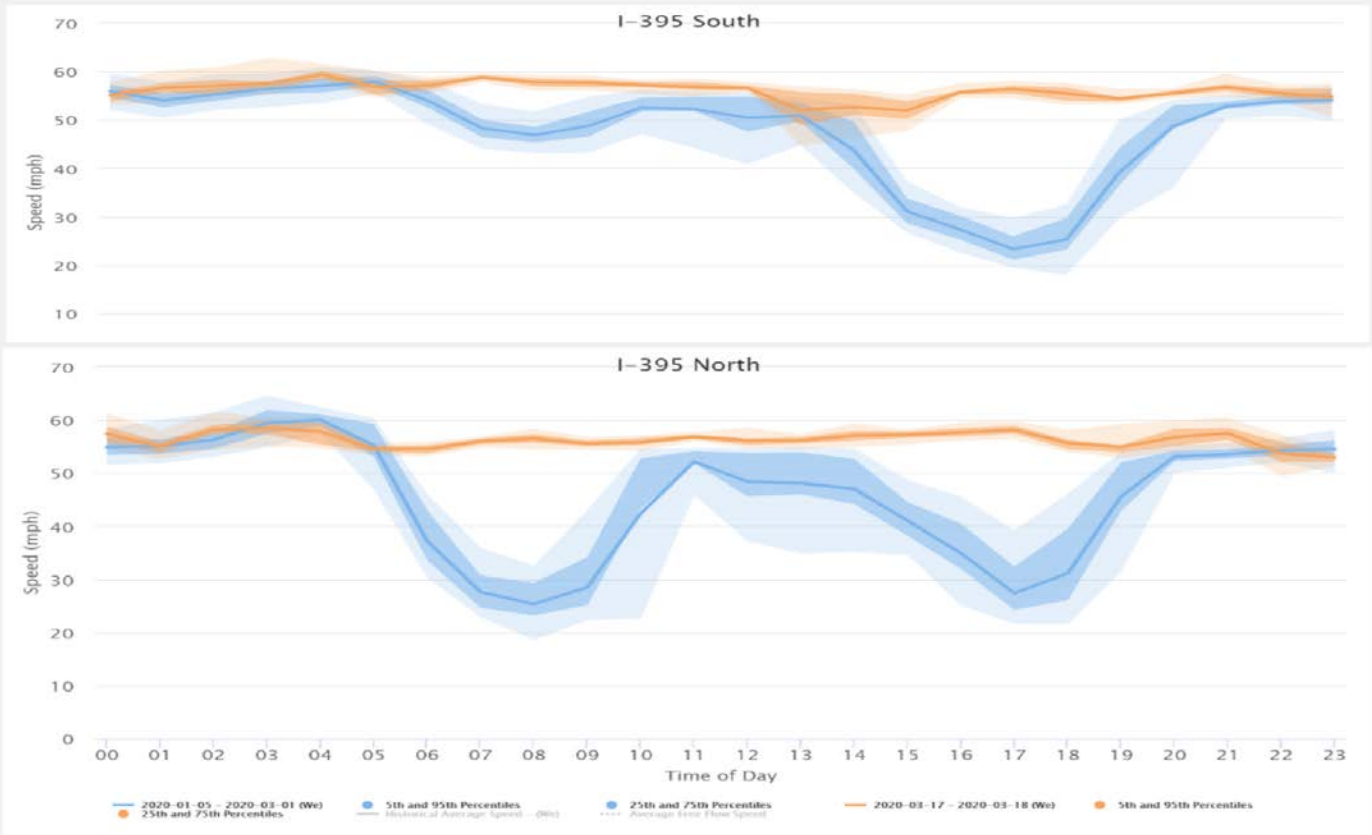
Similar to Boston, Washington DC is achieved free-flow travel speeds for all hours of Wednesday. For morning drivers, this equates to speed increases of up to 16 MPH faster than average and 17 MPH faster for the morning and afternoon rush hours, respectively.



- Source: INRIX

ON-ROAD TRANSPORTATION

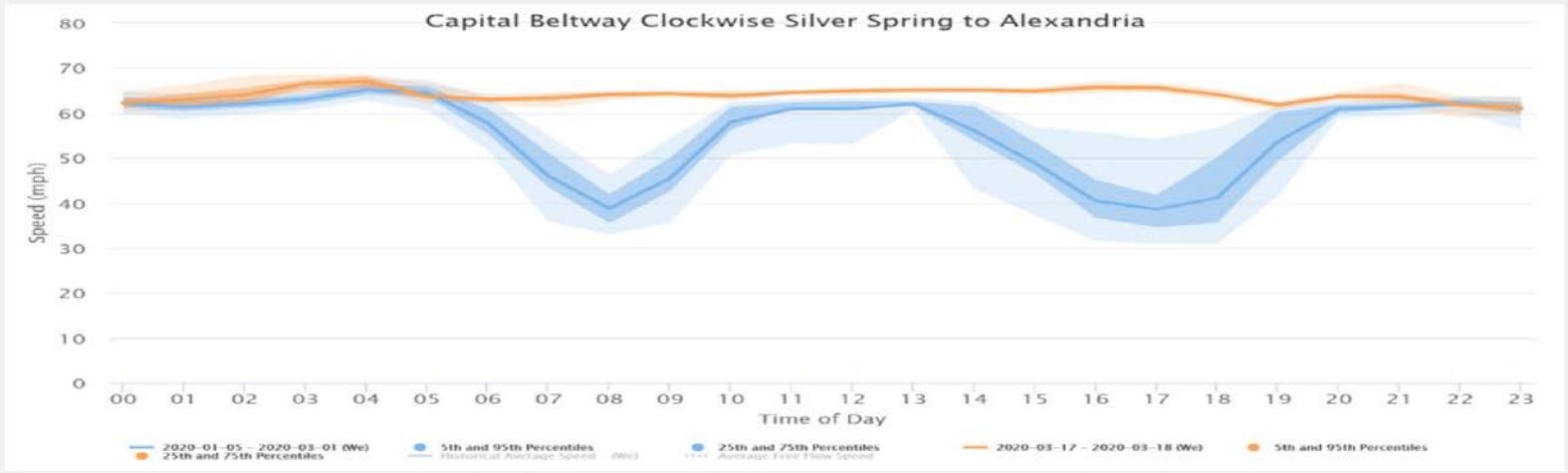
Extending the analysis of travel speeds to major corridors in Washington DC, travelers on I-395 did not experience congestion conditions for an hour traveling northbound or southbound. Southbound travelers saw morning speed increases of 11 MPH and afternoon increases of 23 MPH. Northbound drivers saw a remarkable increase of up to 21 MPH on average for both morning and afternoon.

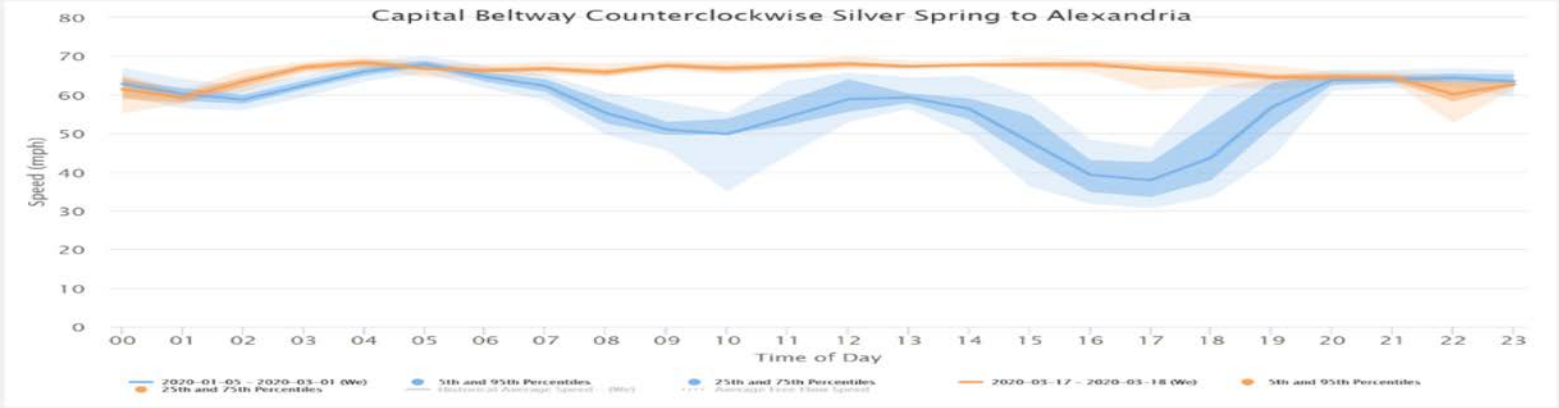


- Source: INRIX

ON-ROAD TRANSPORTATION

The infamous Beltway also recorded congestion free conditions going both clockwise and counterclockwise between Silver Spring and Alexandria. The morning and afternoon running clockwise saw speed increases of 23 and 27 MPH, while counterclockwise saw increases of 17 and 28 MPH.





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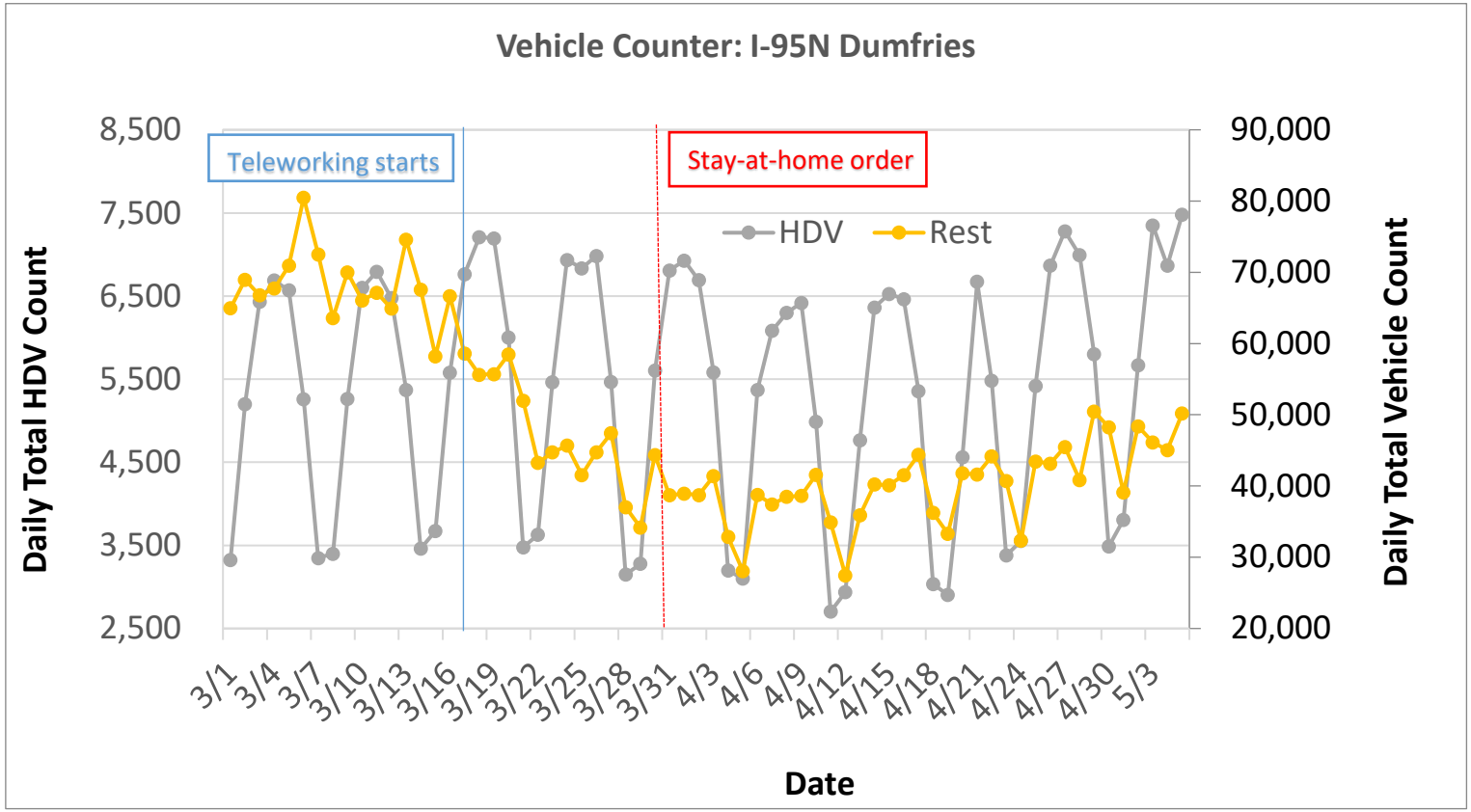
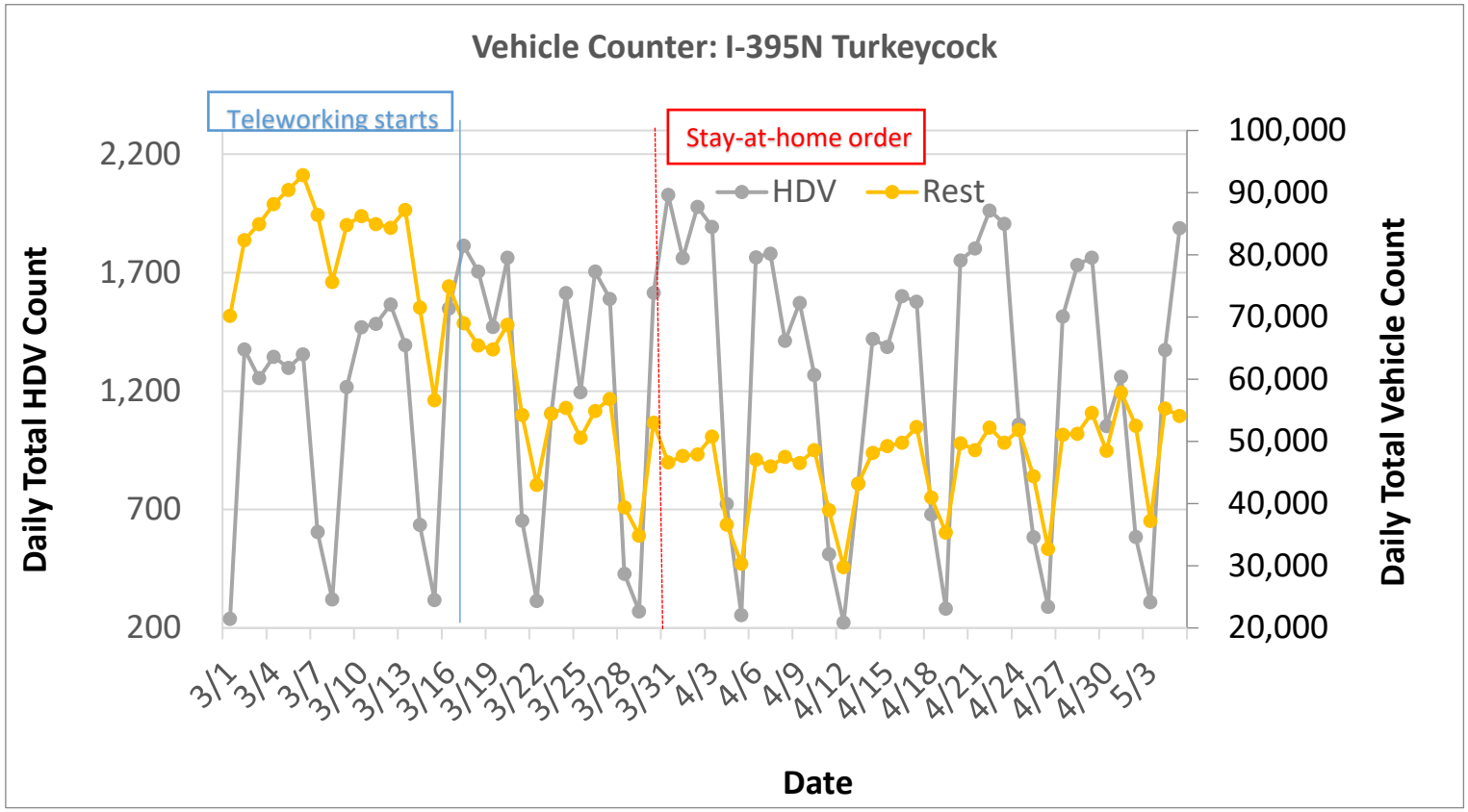
ON-ROAD TRANSPORTATION



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

ON-ROAD TRANSPORTATION



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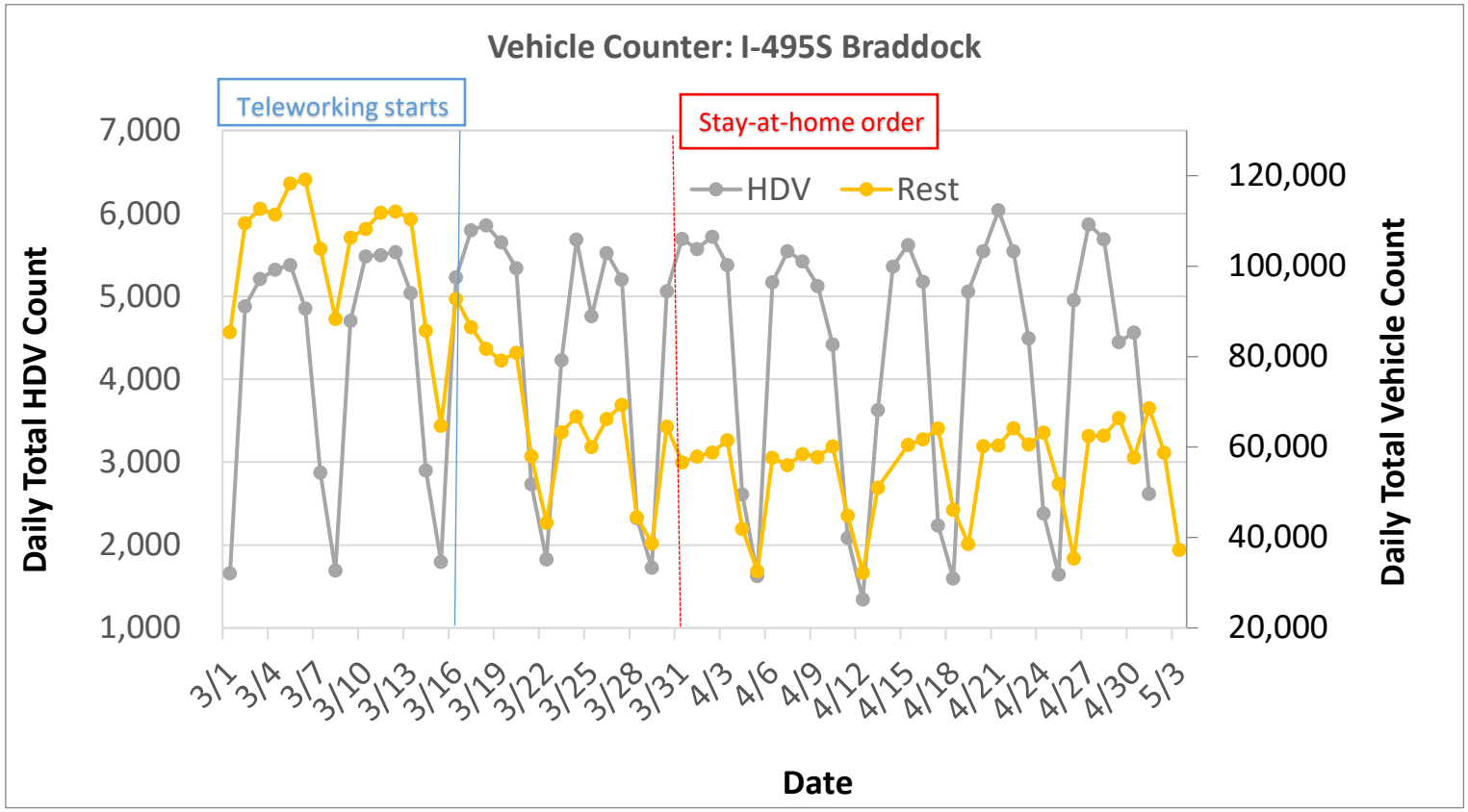
ON-ROAD TRANSPORTATION



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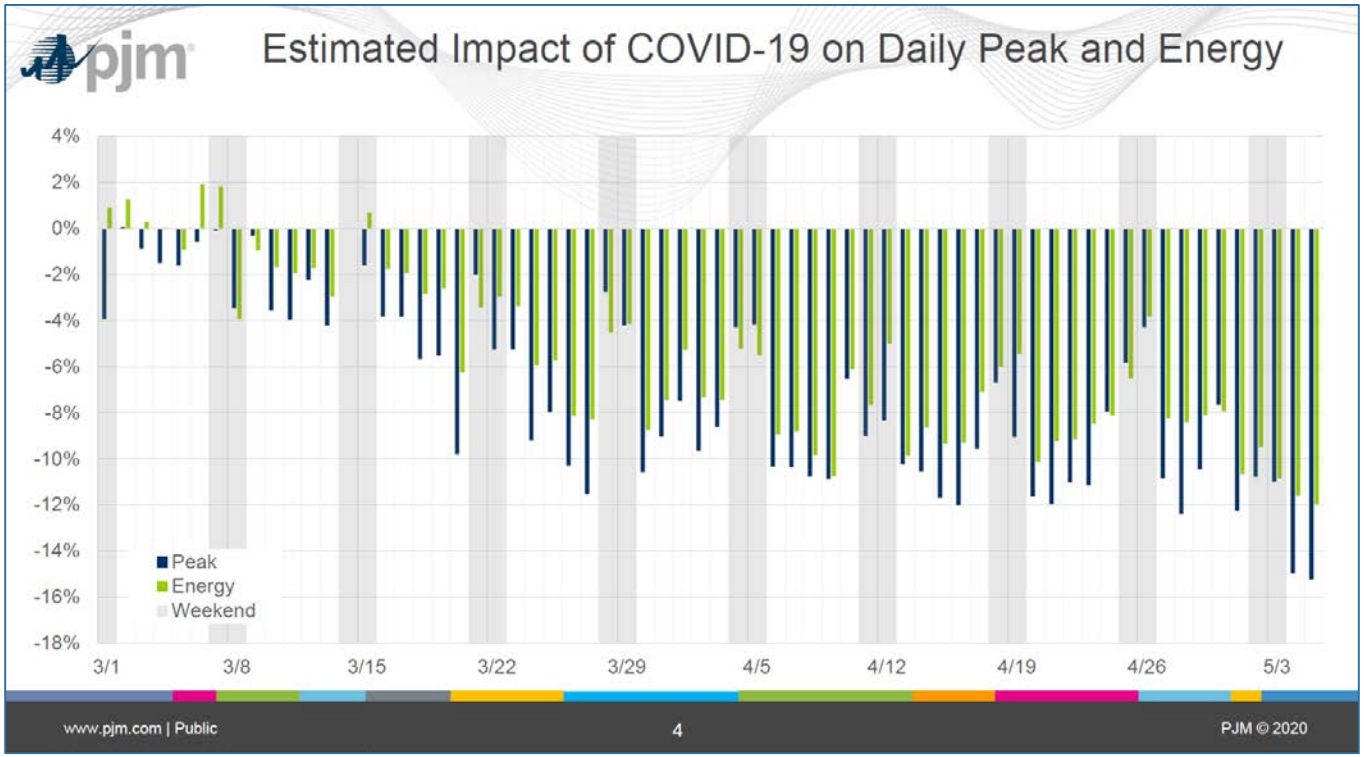
ONROAD TRANSPORTATION

- Assume 40% average weekly reduction in traffic volume in the metropolitan Washington region
- Assume March 20 - June 19 – 25% of the year
- 2020 BAU on-road sector emissions = 20,515,631 $MtCO_2e$
- Reduction = 20,515,631 $MtCO_2e$ x 40% x 25%
- Reduction = 2,051,963 $MtCO_2e$

BAU emissions from COG BAU projections revised May 2020

ELECTRICITY

- PJM Electric generation March 25 to May 4
  - Weekday peak 10% less than anticipated
  - Average energy 7.9% less than anticipated



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

ELECTRICITY

- Assume 7.5% average daily reduction in electricity use in the PJM
- Assume March 20 - June 19 – 25% of the year
- 2020 BAU electric sector emissions = 23,174,811 $MtCO_2e$
- Reduction = 23,174,811 $MtCO_2e$ x 7.5% x 25%
- Reduction = 434,572 $MtCO_2e$

BAU emissions from COG BAU projections revised May 2020

COMMERCIAL AVIATION

Source: Flightradar24.com, Latest News, May 12, 2020

COMMERCIAL AVIATION

- 7-day average number of commercial flights (worldwide)
  - March 7 = 103,987; May 11 = 32,198
  - Assume percent drop = 69%
- Assume March 20 - June 19 – 25% of the year
- 2020 BAU aircraft sector emissions = 2,193,230 $MtCO_2e$
- Reduction = 2,193,230 $MtCO_2e$ x 69% x 25%
- Reduction = 378,332 $MtCO_2e$

BAU emissions from COG BAU projections revised May 2020

OTHER SECTORS

- Assume no change in sectors
  - Stationary building fuel combustion
  - Rail transportation
  - Off-road vehicles
  - Water and wastewater
  - Agriculture
  - Solid waste
  - Process and fugitive emissions

IMPACT ON GREENHOUSE GAS EMISSIONS

- Transportation + Electric Generation + Aviation
  - Reduction = 2,051,963 + 434,572 + 378,332 = 2,864,876 $MtCO_2e$
  - Assume 2020 BAU total emissions = 63,275,113 $MtCO_2e$
  - Annual Reductions of BAU GHG emissions = 4.5%

BAU emissions from COG BAU projections revised May 2020

- Nature Climate Change 5/19/20 – 4% reduction estimate if pre-pandemic conditions return by mid-June

https://www.nature.com/articles/s41558-020-0797-x

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