New York ISO
Independent System Operator

# Impacts and Trends of COVID-19 on NYISO Load

## Analysis through 12/31/2021


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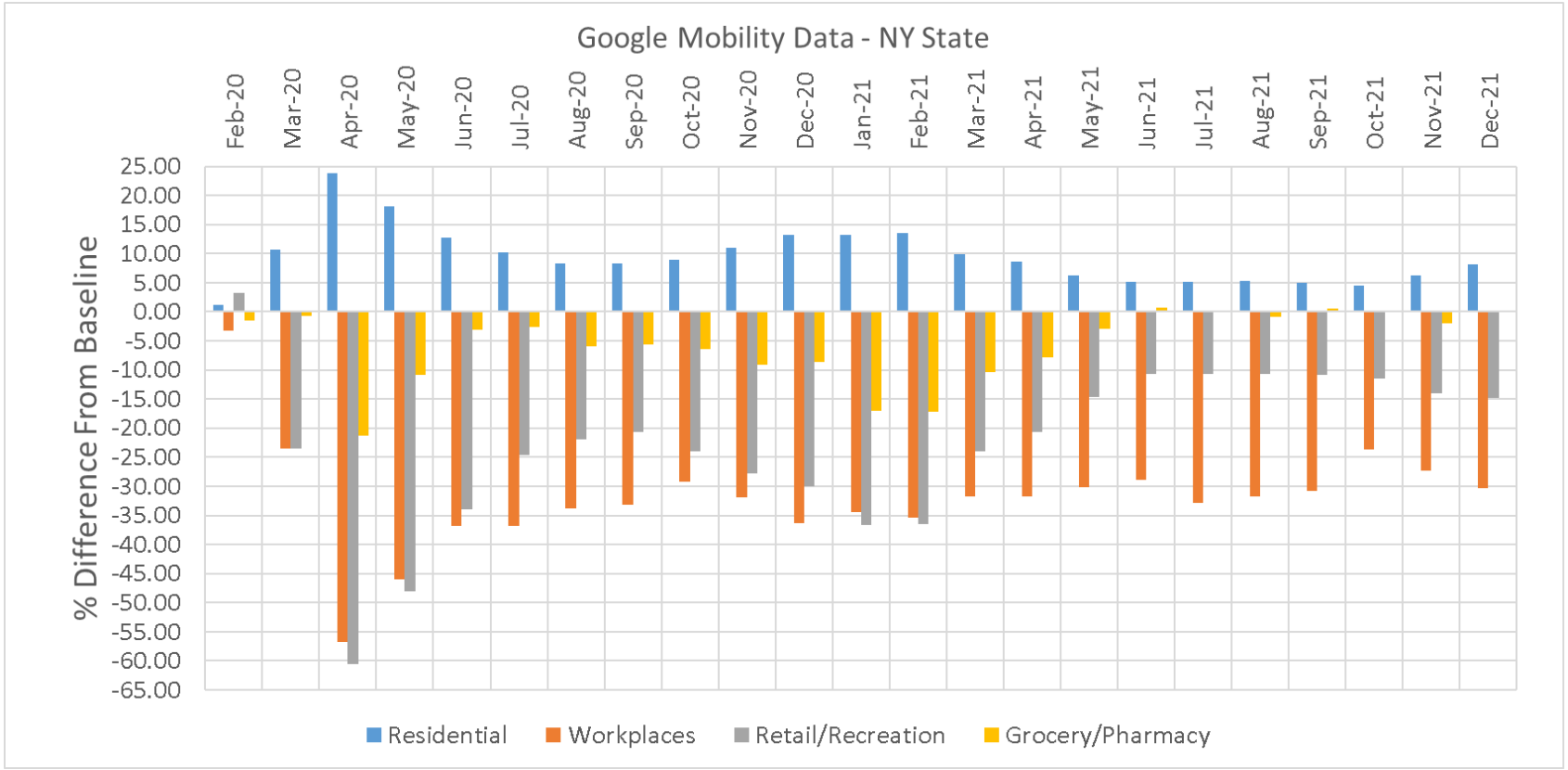
Demand Forecasting & Analysis


**Load Forecasting Task Force**

February 4, 2022; Teleconference

# New York Insights – Google Mobility




Source: Google LLC "Google COVID-19 Community Mobility Reports". https://www.google.com/covid19/mobility/ (Accessed 1/7/2022)

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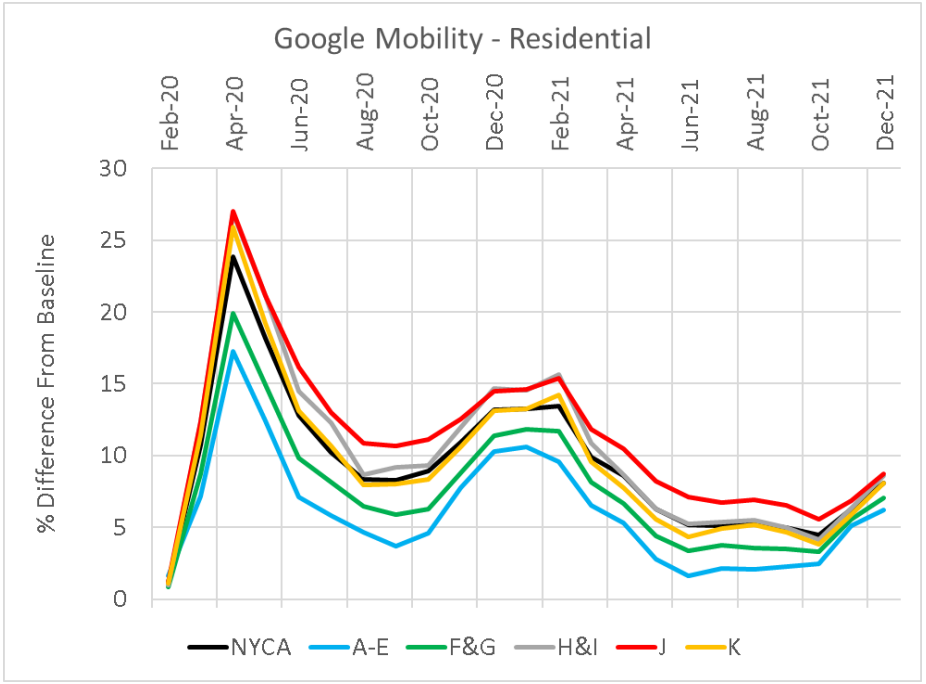
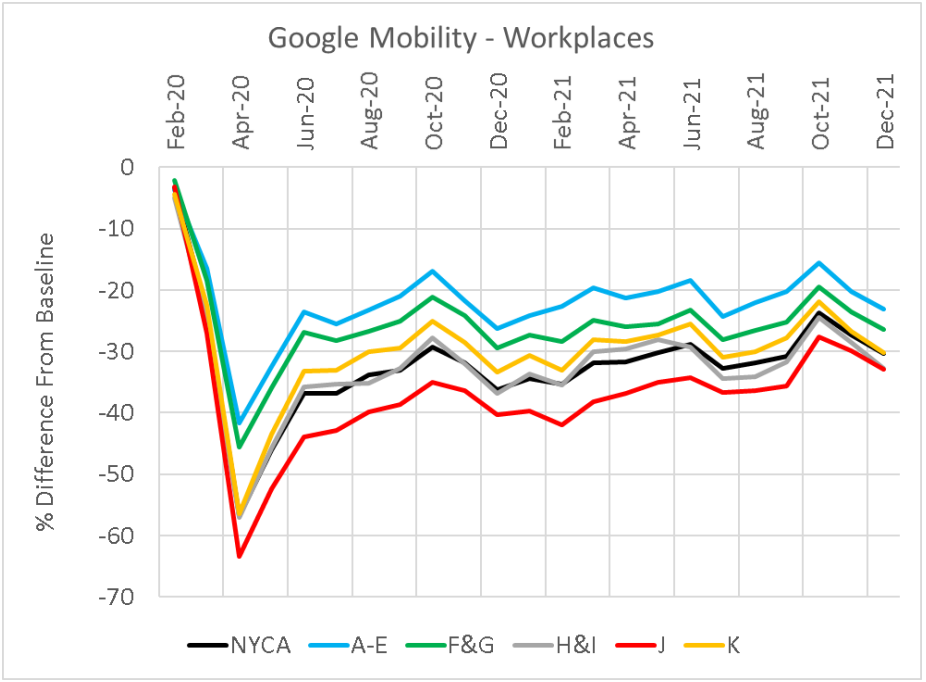
# Regional Insights – Google Mobility

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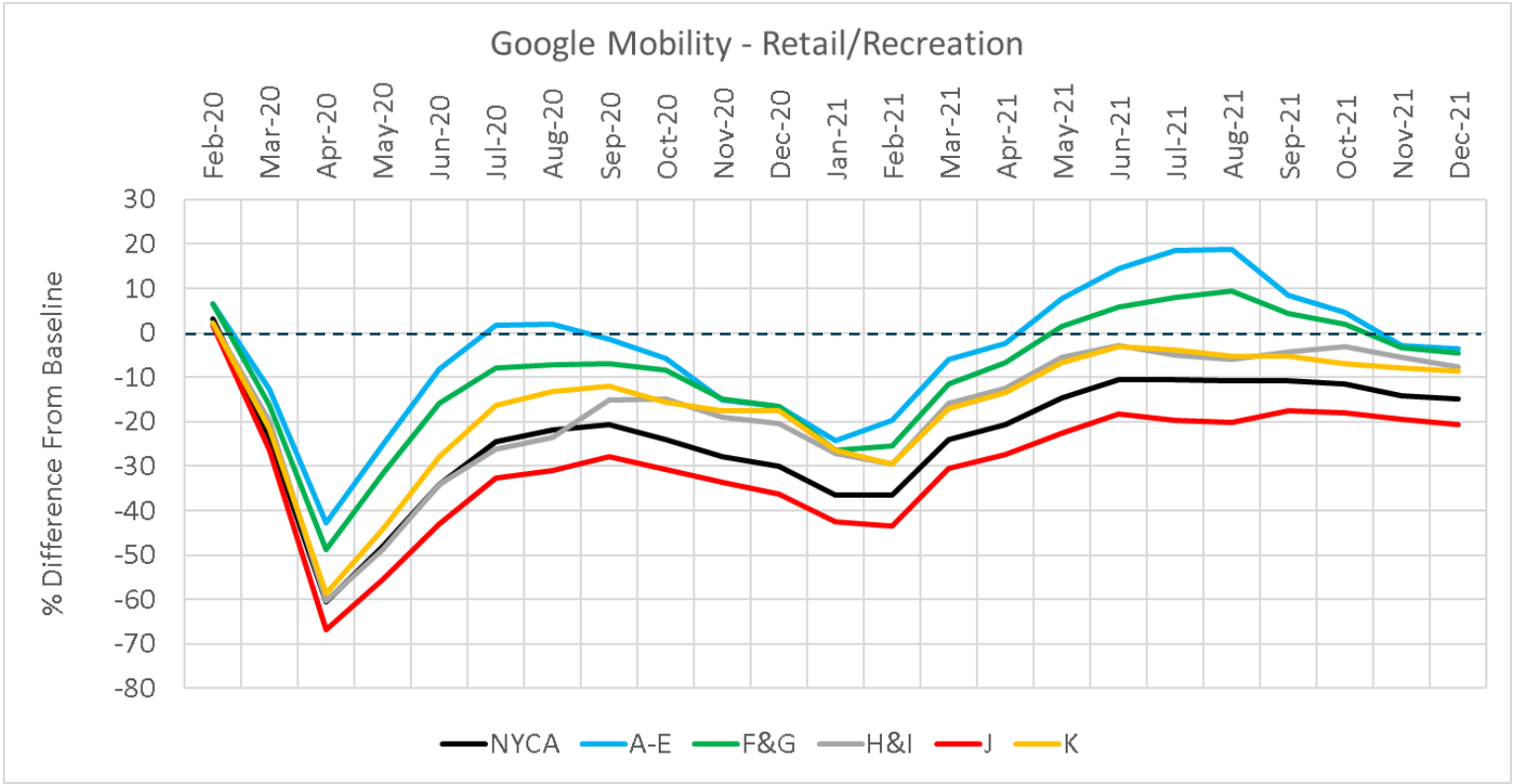
# Regional Insights – Google Mobility




Source: Google LLC "Google COVID-19 Community Mobility Reports". https://www.google.com/covid19/mobility/ (Accessed 1/7/2022)

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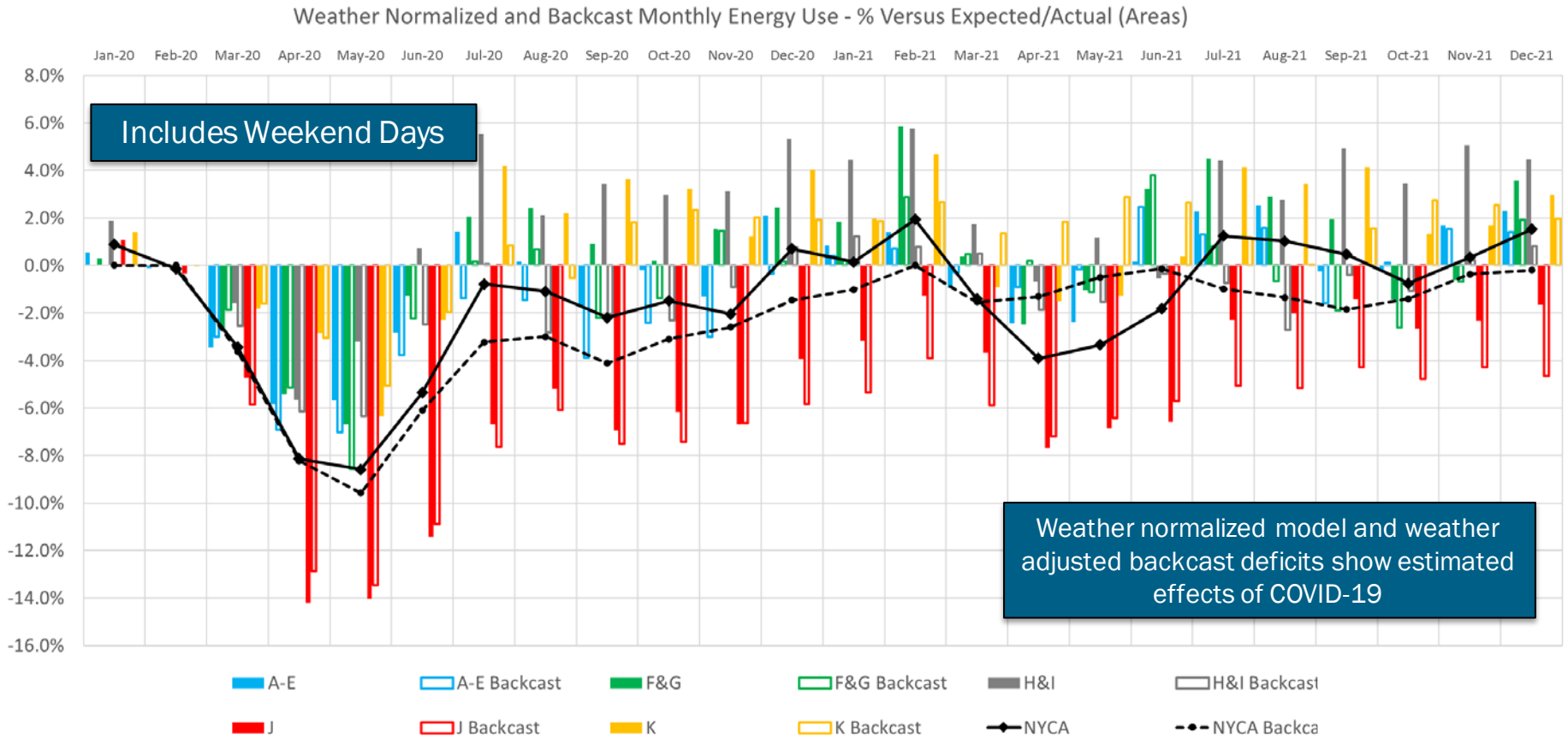
# Impacts on Daily Energy by Month



# Model Explanation - Impacts on Daily Energy by Month

## Weather Normalized Difference
(Solid Bars in Previous Chart)

- Equals: Weather Normalized Load – Expected Load
- Weather Normalized Load is calculated via Zonal models regressing daily energy against daily weather variables and binaries. These models estimate what the load would have been on a given date under normal weather conditions
- These models are fit through the most recent 12 months of data, and have recent weather response signals.
- Expected Load is the pre-COVID baseline annual load forecast, shared out on a daily basis using the 10-year history of daily weather-normalized energy
- This difference reflects non-weather driven changes in load levels, including economic, virus, and other impacts. The comparison is weather neutral as normal weather is used on both sides of the comparison

## Weather Adjusted Backcast Difference

(Hollow bars in Previous Chart)

- Equals: Actual Load - Backcast Load
- Backcast Load is the load generated by the Zonal hourly day-ahead models using actual weather, where the model estimation period ends in February 2020. Thus, these backcasts estimate what the load would have been on a given day under pre-COVID conditions
- These models were fit through February 2020, so they do not contain the most recent weather response signals
- This difference reflects non-weather driven changes in load levels, including economic, virus, and other impacts. The comparison is weather neutral as actual weather is used on both sides of the comparison

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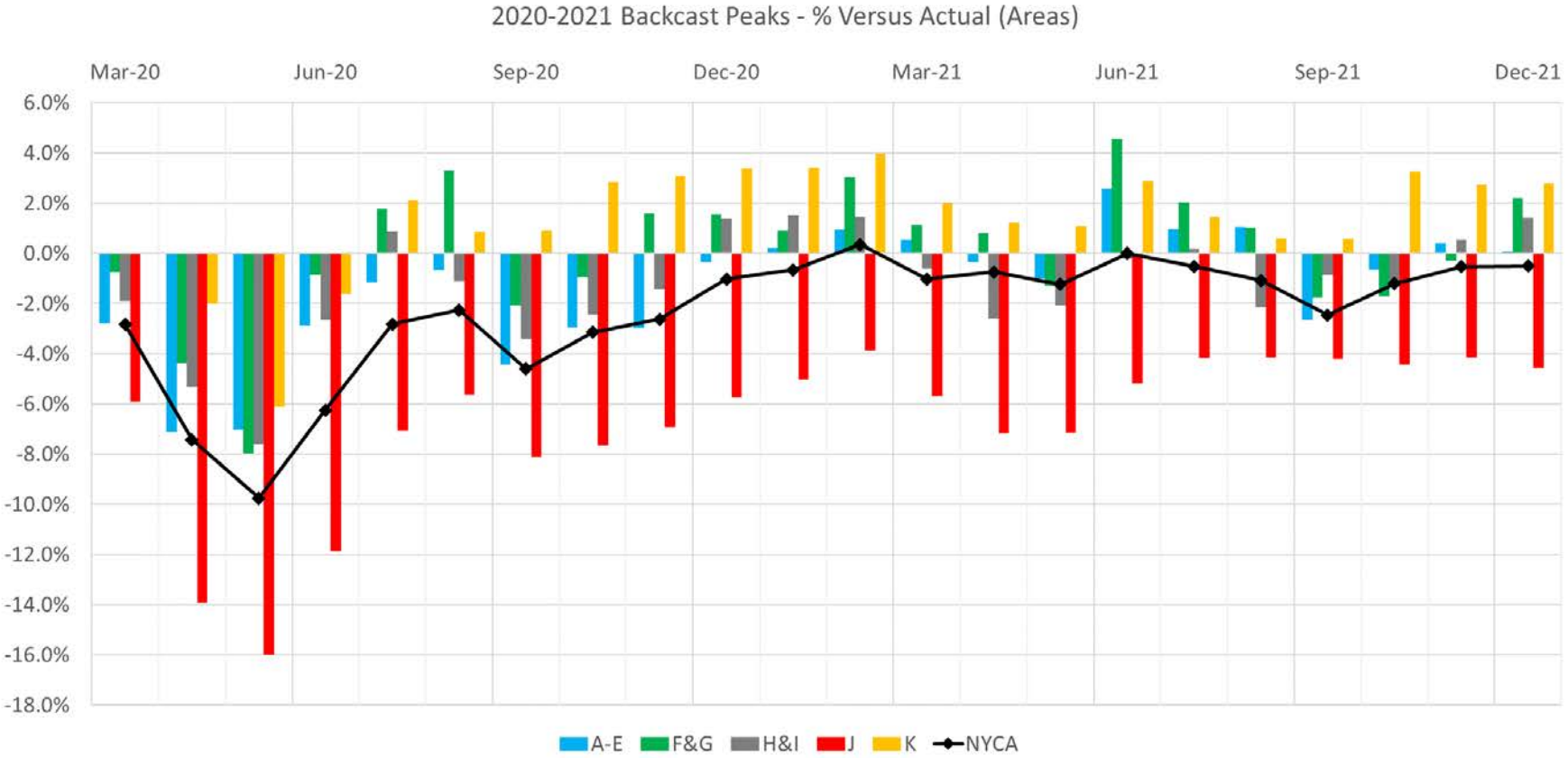
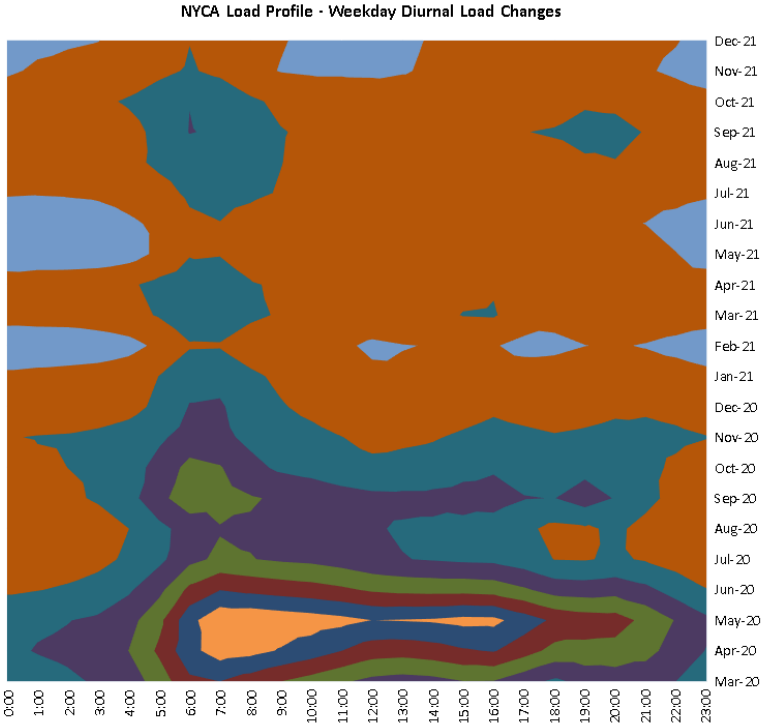
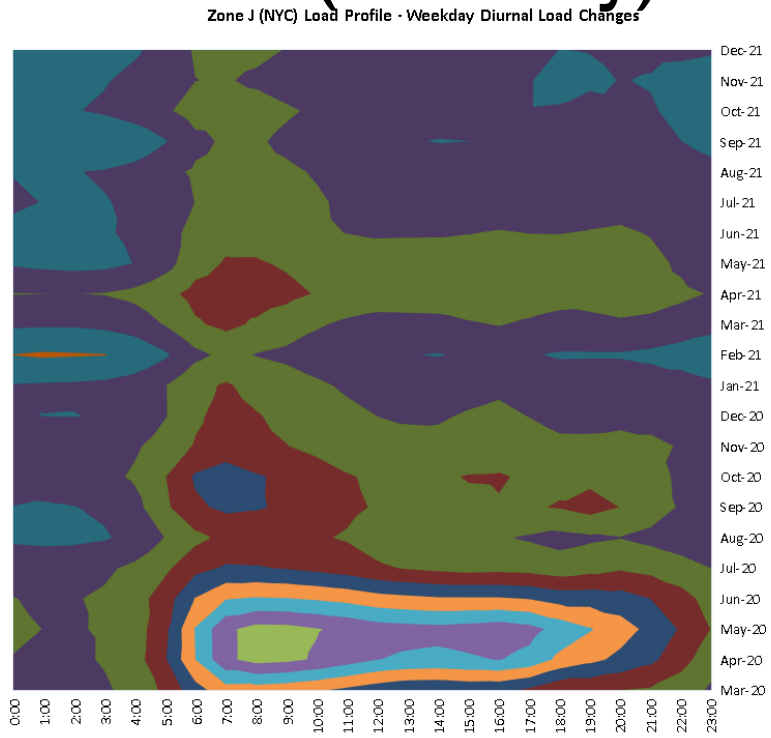
# Regional Impacts on Peak Demand



# Impacts on Hourly Load Patterns (Monthly)

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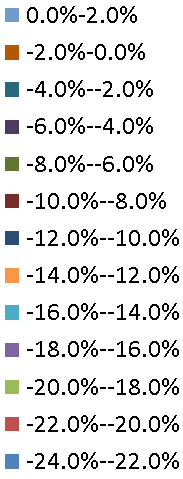
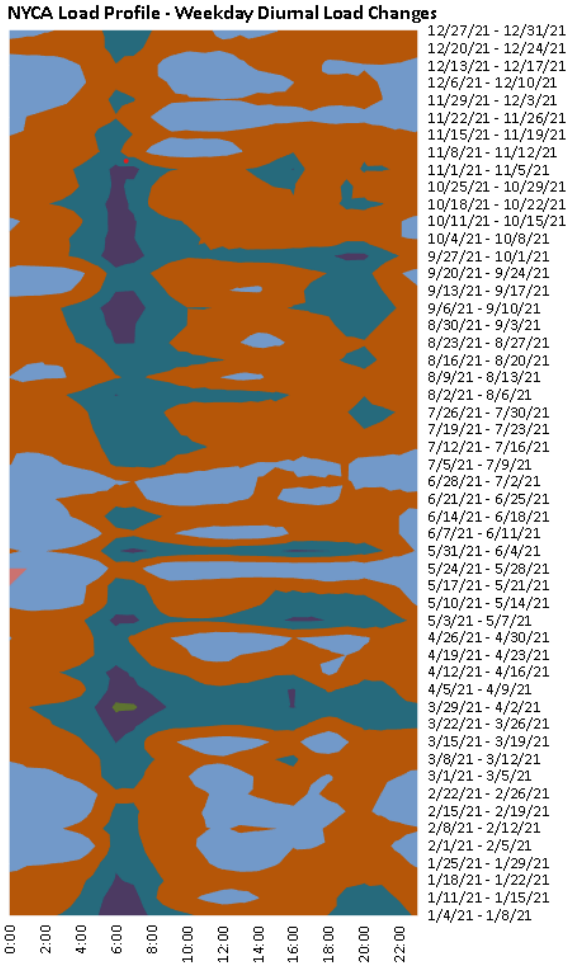
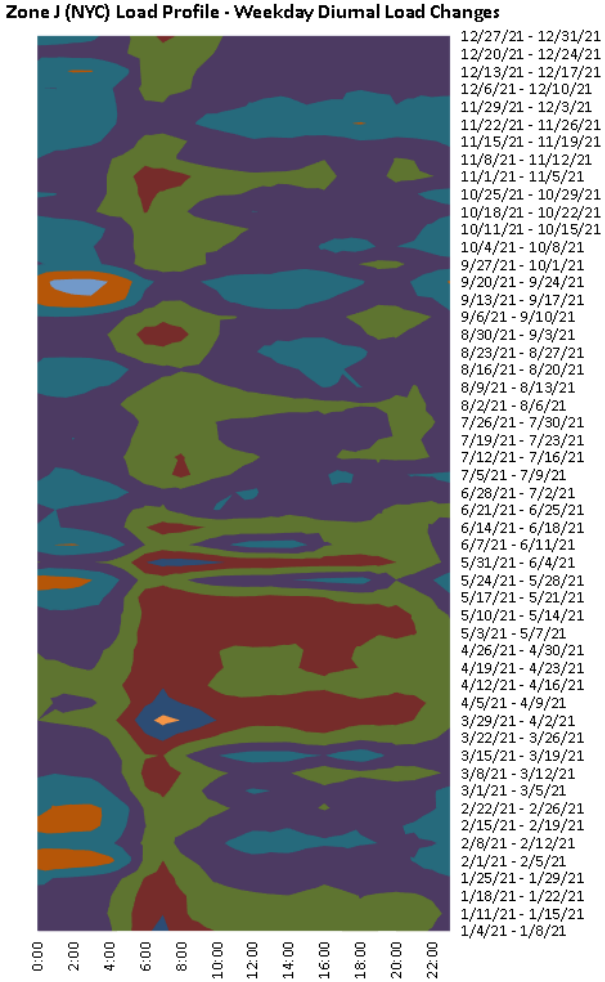
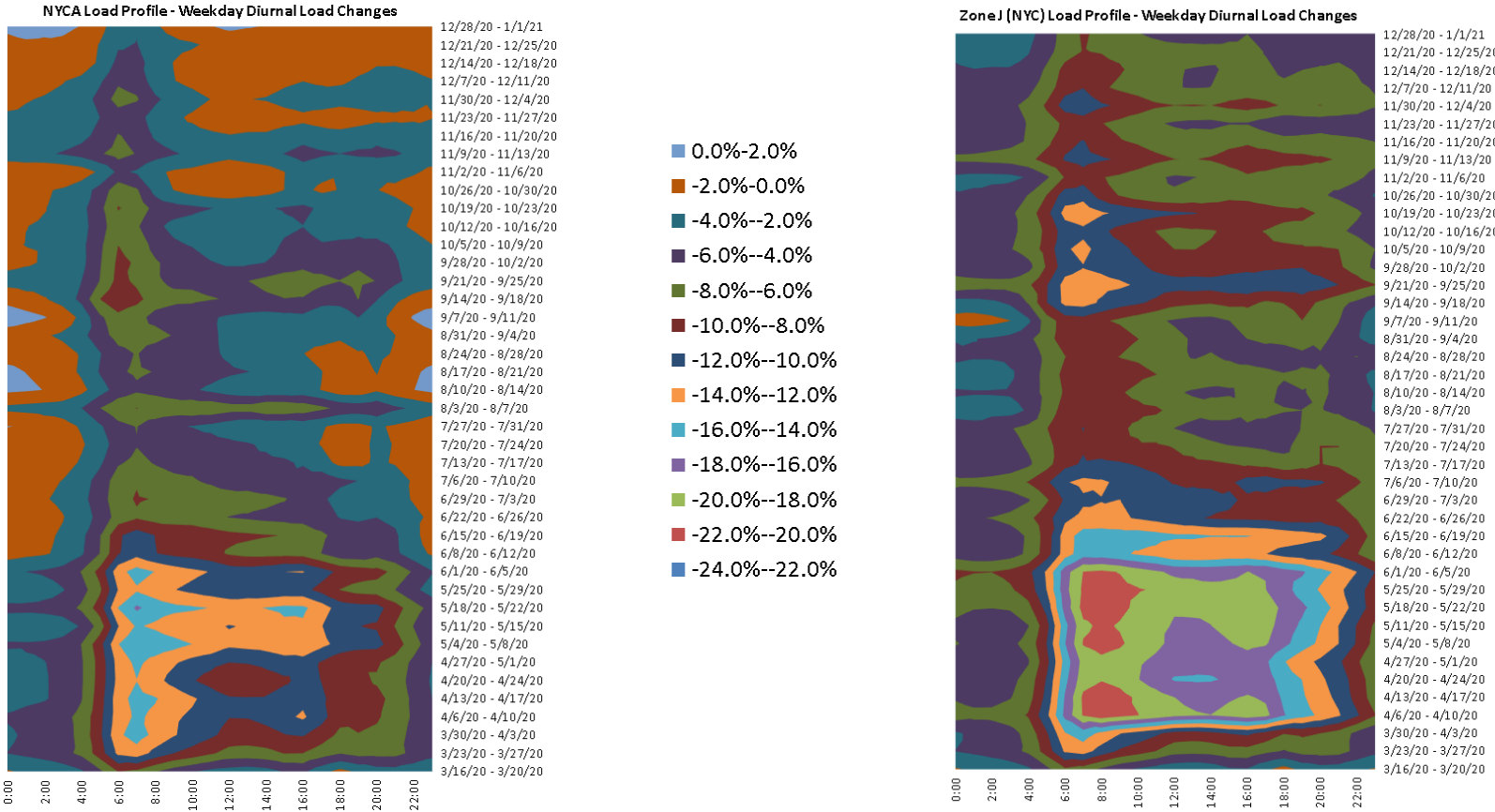
# Impacts on Hourly Load Patterns by Week (2021)



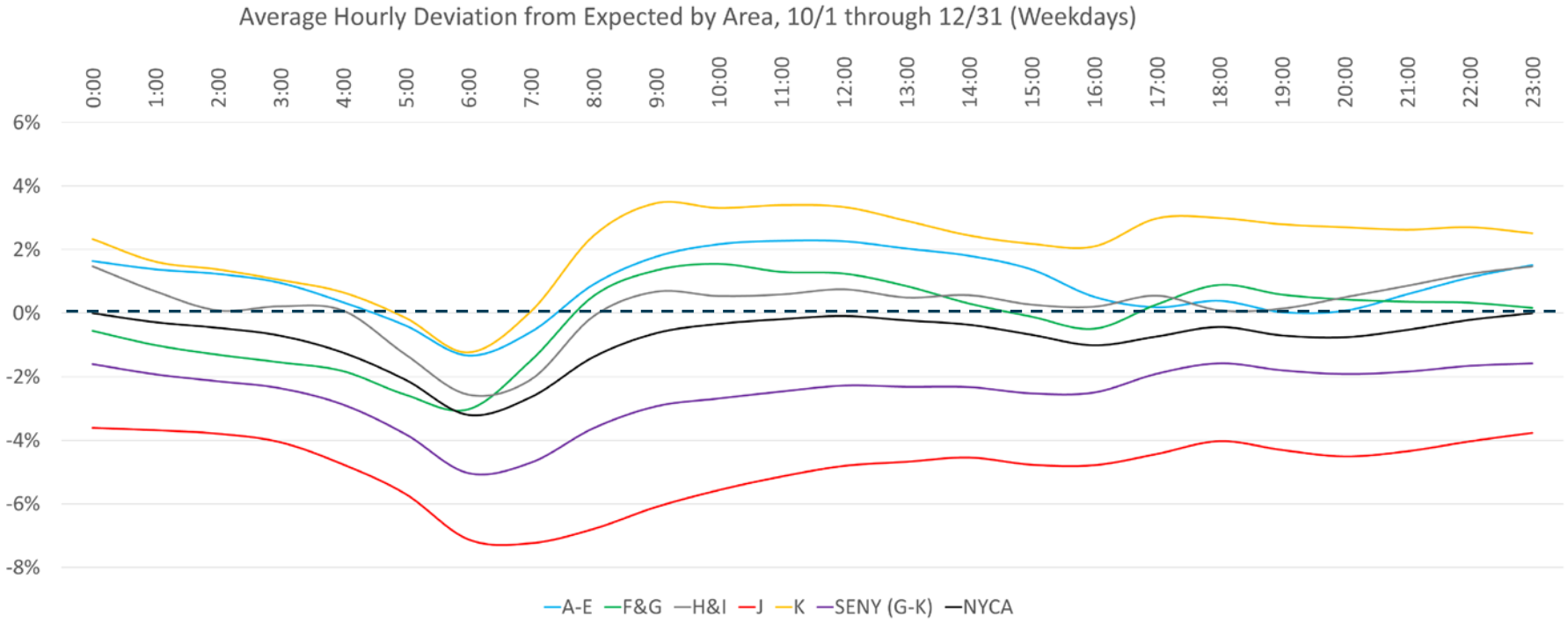



# Impacts on Hourly Load Patterns by Week (2020)



# Impacts on Hourly Load Patterns (Area)



# COVID-19 Tracking Summary & Next Steps

- Demand patterns across the New York Control Area (NYCA) have largely stabilized over the past several months. When factoring in longer term (i.e., greater than 1-year) trends, the COVID-19 impact analysis reveal the following:
  - NYC (Zone J) remains notably below the pre-COVID baseline load values
  - All other regions of the NYCA have returned to near expected load levels
  - Morning energy ramp up remains slightly delayed across the NYCA
- NYISO continues to fine-tune its load forecasting models in real-time to continuously improve load forecast accuracy for the day-ahead and real-time markets and for reliable operation of the bulk power system.

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# COVID-19 Tracking Summary & Next Steps - continued

- **Identifying COVID-19 specific impacts to regional and system loads becomes less clear as time progresses due to other underlying economic/demographic (e.g. population movement) and end-use trends (e.g., energy efficiency gains).**
  - The NYISO will replace its prior periodic COVID-19 load impact reports with ongoing evaluations of significant shifts in load patterns.
  - Significant load impacts due to COVID-19 and other factors will continue to be reported to stakeholders through the LFTF.

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# Questions/Discussion

# Impacts on Hourly Load Patterns (Area)

| Hour | A-E | F&G | H&I | J | K | SENY (G-K) | NYCA |
|---|---|---|---|---|---|---|---|
| 0:00 | 2% | -1% | 1% | -4% | 2% | -2% | 0% |
| 1:00 | 1% | -1% | 1% | -4% | 2% | -2% | 0% |
| 2:00 | 1% | -1% | 0% | -4% | 1% | -2% | 0% |
| 3:00 | 1% | -2% | 0% | -4% | 1% | -2% | -1% |
| 4:00 | 0% | -2% | 0% | -5% | 1% | -3% | -1% |
| 5:00 | 0% | -3% | -1% | -6% | 0% | -4% | -2% |
| 6:00 | -1% | -3% | -3% | -7% | -1% | -5% | -3% |
| 7:00 | -1% | -1% | -2% | -7% | 0% | -5% | -3% |
| 8:00 | 1% | 1% | 0% | -7% | 2% | -4% | -1% |
| 9:00 | 2% | 1% | 1% | -6% | 3% | -3% | -1% |
| 10:00 | 2% | 2% | 1% | -6% | 3% | -3% | 0% |
| 11:00 | 2% | 1% | 1% | -5% | 3% | -2% | 0% |
| 12:00 | 2% | 1% | 1% | -5% | 3% | -2% | 0% |
| 13:00 | 2% | 1% | 0% | -5% | 3% | -2% | 0% |
| 14:00 | 2% | 0% | 1% | -5% | 2% | -2% | 0% |
| 15:00 | 1% | 0% | 0% | -5% | 2% | -3% | -1% |
| 16:00 | 1% | 0% | 0% | -5% | 2% | -3% | -1% |
| 17:00 | 0% | 0% | 1% | -4% | 3% | -2% | -1% |
| 18:00 | 0% | 1% | 0% | -4% | 3% | -2% | 0% |
| 19:00 | 0% | 1% | 0% | -4% | 3% | -2% | -1% |
| 20:00 | 0% | 0% | 0% | -5% | 3% | -2% | -1% |
| 21:00 | 1% | 0% | 1% | -4% | 3% | -2% | -1% |
| 22:00 | 1% | 0% | 1% | -4% | 3% | -2% | 0% |
| 23:00 | 2% | 0% | 1% | -4% | 3% | -2% | 0% |

Average Hourly Load Deficit By Area 10/1 - 12/31 (Weekdays)

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# Impacts on Hourly Load Patterns (Zone)

| Hour | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0:00 | 3% | 3% | 0% | -1% | 3% | 0% | -1% | -4% | 5% | -4% | 2% |
| 1:00 | 3% | 3% | 0% | -3% | 3% | 0% | -2% | -6% | 4% | -4% | 2% |
| 2:00 | 3% | 2% | 0% | -3% | 3% | -1% | -2% | -6% | 3% | -4% | 1% |
| 3:00 | 3% | 2% | 0% | -3% | 3% | -1% | -2% | -7% | 4% | -4% | 1% |
| 4:00 | 2% | 2% | -1% | -4% | 2% | -1% | -3% | -7% | 4% | -5% | 1% |
| 5:00 | 1% | 0% | -1% | -3% | 0% | -2% | -3% | -8% | 3% | -6% | 0% |
| 6:00 | 0% | -1% | -2% | -3% | -1% | -2% | -4% | -11% | 2% | -7% | -1% |
| 7:00 | 1% | 0% | -1% | -5% | 0% | -1% | -3% | -7% | 1% | -7% | 0% |
| 8:00 | 2% | 1% | 1% | -4% | 3% | 2% | -1% | -5% | 2% | -7% | 2% |
| 9:00 | 3% | 2% | 1% | -3% | 5% | 3% | 0% | -3% | 2% | -6% | 3% |
| 10:00 | 4% | 2% | 1% | -1% | 5% | 3% | 0% | -2% | 2% | -6% | 3% |
| 11:00 | 4% | 2% | 0% | -1% | 5% | 3% | -1% | -2% | 2% | -5% | 3% |
| 12:00 | 4% | 2% | 0% | 0% | 5% | 3% | -1% | -1% | 2% | -5% | 3% |
| 13:00 | 4% | 2% | 0% | -1% | 4% | 2% | -1% | -1% | 1% | -5% | 3% |
| 14:00 | 4% | 2% | 0% | -1% | 4% | 2% | -2% | -1% | 2% | -5% | 2% |
| 15:00 | 3% | 2% | 0% | -2% | 3% | 1% | -2% | -2% | 1% | -5% | 2% |
| 16:00 | 2% | 2% | 0% | -5% | 2% | 0% | -2% | -2% | 1% | -5% | 2% |
| 17:00 | 1% | 2% | -1% | -5% | 2% | 1% | -1% | -3% | 2% | -4% | 3% |
| 18:00 | 2% | 2% | -1% | -4% | 2% | 2% | 0% | -5% | 3% | -4% | 3% |
| 19:00 | 1% | 2% | -1% | -6% | 2% | 1% | 0% | -5% | 3% | -4% | 3% |
| 20:00 | 1% | 2% | -1% | -6% | 2% | 1% | 0% | -5% | 4% | -5% | 3% |
| 21:00 | 1% | 2% | -1% | -3% | 2% | 1% | 0% | -5% | 4% | -4% | 3% |
| 22:00 | 2% | 3% | -1% | 0% | 3% | 1% | -1% | -4% | 4% | -4% | 3% |
| 23:00 | 2% | 3% | 0% | 1% | 3% | 1% | -1% | -4% | 5% | -4% | 3% |

Average Hourly Load Deficit by Zone, 10/1 - 12/31 (Weekdays)

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# Our Mission & Vision

## Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

## Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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