


Real Time Data for Operations in Utah

Variable Message Signs, Dashboards, and Congestion.

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Presentation Outline

1. Introduction
 2. UDOT Data Sources
 3. VMS Using Probe Data
 4. Cottonwood Canyon's Dashboard
 5. Traffic Performance and Metrics
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Rikki Sonnen – PE, PTOE



UDOT

 *Keeping Utah Moving*

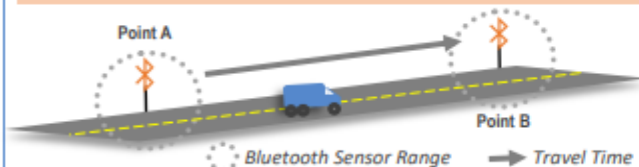
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UDOT Data Sources

BLUETOOTH

- Requirements:**
- ▶ Sensors in the field
 - ▶ Data must be purchased from third party
 - ▶ Bluetooth/Wi-Fi must be activated
- Benefits:**
- ▶ Higher penetration rate
 - ▶ Can be installed for specific projects
 - ▶ Collects travel time & origin-destination
- Description:**
- ▶ Data is collected at Point A and Point B only
- Limitations:**
- ▶ Cannot measure volume
 - ▶ Travel time updates lag behind real-time
 - ▶ Parallel corridors are hard to differentiate (I-15 and frontage roads)



PROBE

- Requirements:**
- ▶ Vehicle navigation system or app activated
 - ▶ Data must be purchased from third party
- Benefits:**
- ▶ Does not require field equipment
 - ▶ Collects speed and travel times
- Description:**
- ▶ Data is collected at multiple points along vehicle path
- Limitations:**
- ▶ Lower penetration rate
 - ▶ Cannot measure volume or determine origin/destination
 - ▶ Travel times are unreliable for low volume roads and mountainous geography



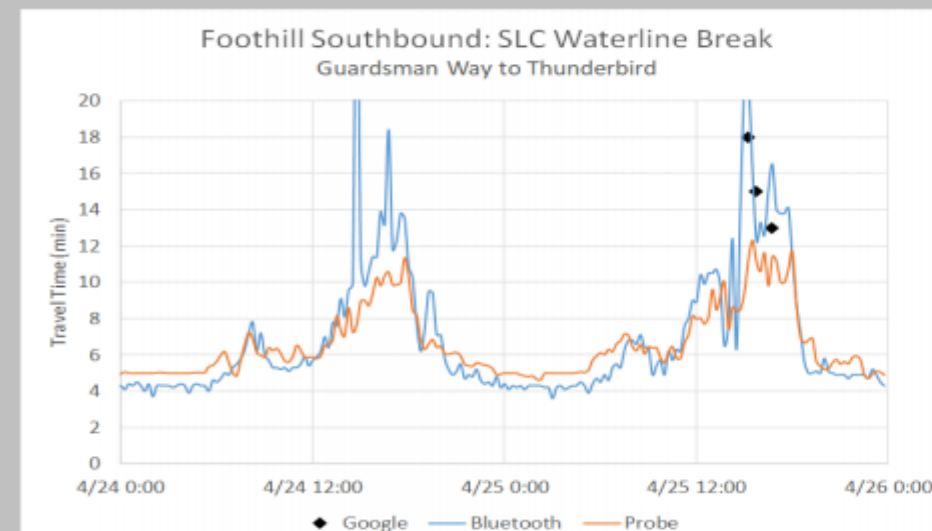
POINT

- Requirements:**
- ▶ Radar, loop or tube equipment in the field
- Benefits:**
- ▶ Collects volumes and speed
 - ▶ Data does not need to be purchased from third party
- Description:**
- ▶ Data is collected at equipment location
 - ▶ Available on major highways in urbanized areas
- Limitations:**
- ▶ Can only collect data at equipment locations
 - ▶ Can not collect travel times or origin-destination



Example of Google, Bluetooth, and Probe data for the same route

- ⇒ Probe travel time may be less reliable with fewer samples
- ⇒ Bluetooth may collect data for adjacent routes



Applications	Bluetooth	Probe	Point
Advocate for Funding		●	●
Evaluate Project Improvements		●	●
Manage Traffic During Construction	●	●	
Describe Events and Incidents		●	
Traffic Forecasting (Video Recording)		●	●
Identify Choke Points		●	●
Identify Construction Windows			●
Origin/Destination	●		
Provide Alerts During Construction	●	○	
Executive Speed Reports		●	●
Historical Data for Corridors		●	●
Special/Short Term Deployment	●		
VMS Display Travel Times	●	○	

Bluetooth Probe Point In Development



2019 HERE Data Validation Study performed by RSG: 95% of routes studied were not significantly different from Google data.

Sample Size Comparison

- Bluetooth 20-40% of vehicles
- Point 100% of vehicles
- Probe 2-15% of vehicles

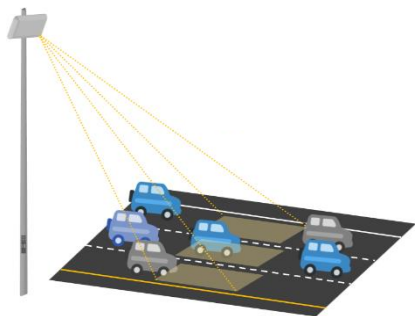
Date Modified:
May 10, 2019

Presentation Outline

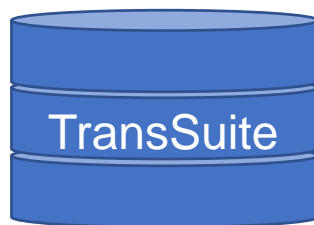
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Variable Message Board Travel Times

Point Detection Travel Times (Current Process):



Roadside units are deployed every half a mile (collect speed and volume)

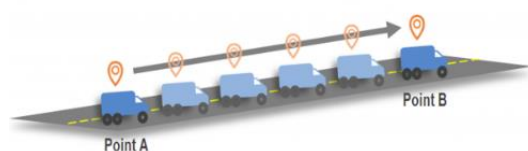


Speed data is sent to TOC TransSuite ATMS system and travel times are calculated

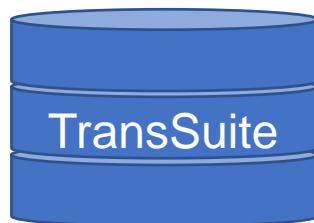


TransSuite is configured to send messages to the VMS boards to display travel times

Probe Data Travel Times (New Process):



UDOT purchases probe data on all roads collector and higher (collect speed and travel time)



Speed data is sent to TOC TransSuite ATMS system and travel times are calculated



TransSuite is configured to send messages to the VMS boards to display travel times

Note: UDOT will continue to use point data (where available) and expand travel times to locations where point data is not available

using probe data.

<https://youdot.utah.gov/news/vms-travel-times-using-probe-data/>

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Cottonwood Canyon Dashboard

Draft - Big Cottonwood Canyon

Current Date and Time

2020-12-08 14:35

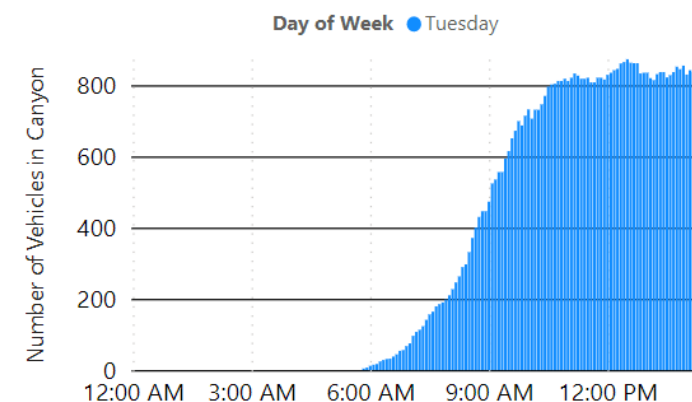
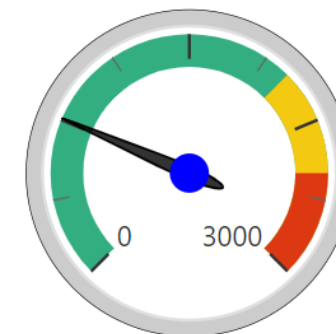
Tuesday



Big Cottonwood Canyon | Current Travel Times

Route Name	Max of Distance (miles)	Current Travel Time (min)	Free Flow Travel Time (min)
9000 S to BCC Park and Ride	6.0	10	8
6200 S to BCC Silver Fork	12.5	18	17
6200 S to BCC Park and Ride	1.5	2	2
9000 S to BCC Silver Fork	17.0	26	24

Big Cottonwood Canyon | Current Volume

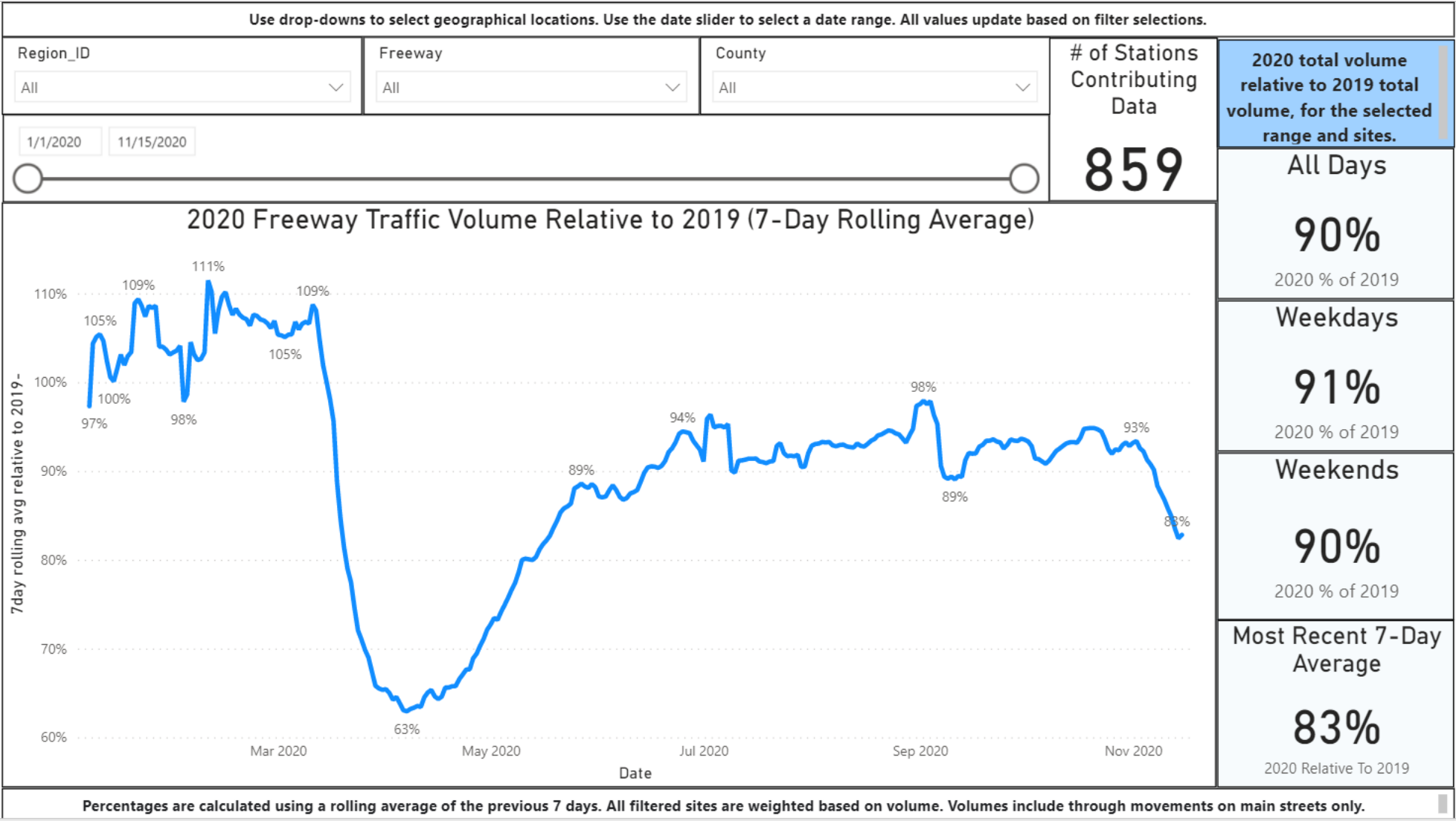


Disclaimer | Data is refreshed one time per half hour. Users may need to reload browsers to see most up to date information. For the most up to date alerts visit @UDOTCottonwoods on Twitter.com or <https://cottonwoodcanyons.udot.utah.gov/>

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UDOT Traffic Trends and Metrics

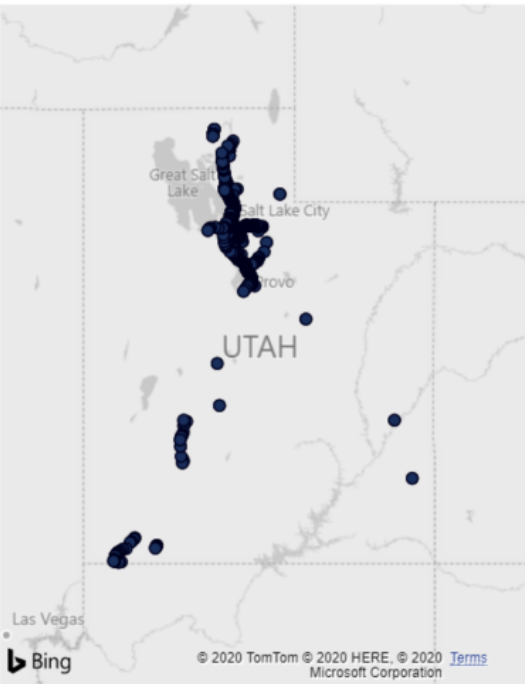


UDOT Traffic Trends and Metrics

DRAFT

Historic Traffic Volume Trends | Highways and Freeways

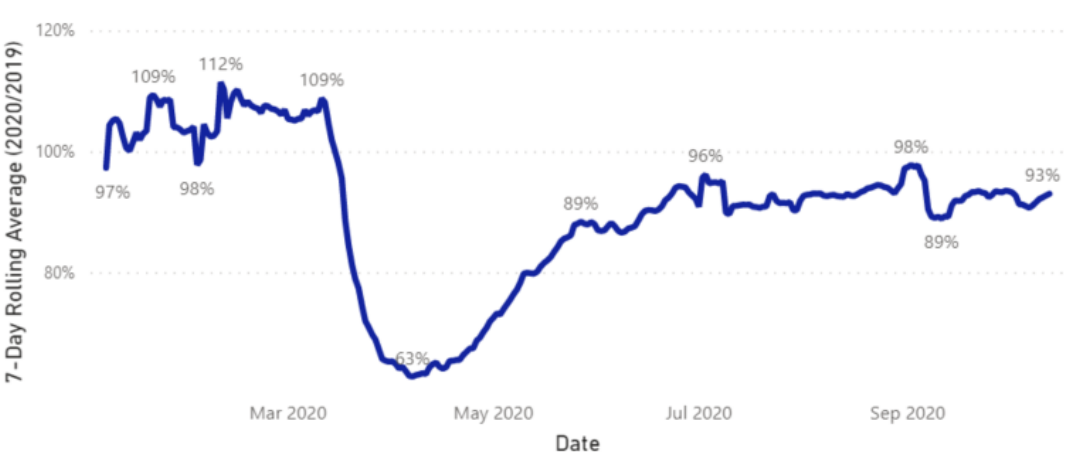
Number of Stations | 767



Metrics | 2020-2021 Relative to 2019 7-Day Rolling Average

Region	1	2	3	4	Total
Year-to-Date	91%	89%	92%	104%	90%
Weekdays	92%	89%	92%	105%	91%
Weekends	89%	88%	92%	102%	90%
Most Recent 7 Days	95%	92%	93%	107%	93%
Selected Month	June	88%	93%	109%	90%

Selected State Route Traffic Volume Relative to 2019 | 7-Day Rolling Average*



Region

All

County

All

Freeway

All

1/1/2020

10/13/2020

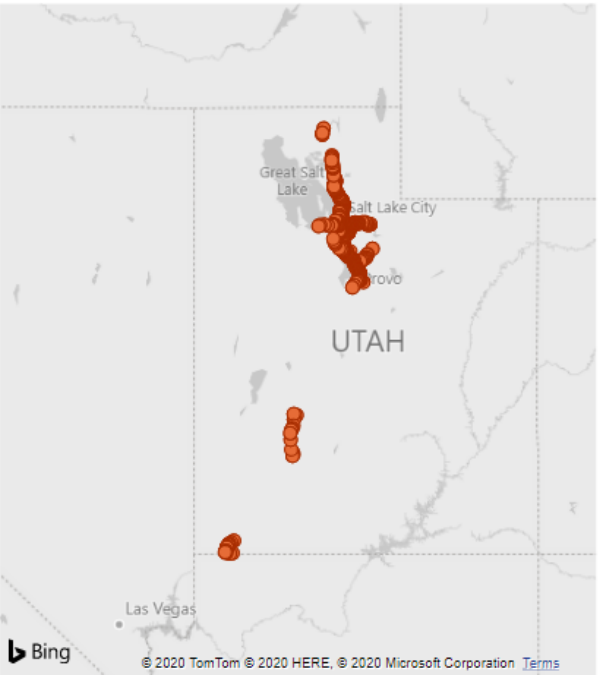
Year-to-Date | Total of all days in 2020 compared to all days in 2019 to the current date. **Selected Month** | Average of 2020 volume divided by 2019 volume for selected month. **7-Day Rolling Average** percentages are calculated using a rolling average of the previous 7 days. All filtered sites are weighted based on volume. Volumes include mainline general purpose lanes only.

UDOT Traffic Trends and Metrics – Proposed 2021

DRAFT

2020-2021 Traffic Volume Trends | Highways and Freeways

Number of Stations | 765



Metrics | 2020-2021 Relative to 2019 7-Day Rolling Average

2020

All Days	Weekdays	Weekends	Most Recent 7-Day Average
105%	105%	106%	110%

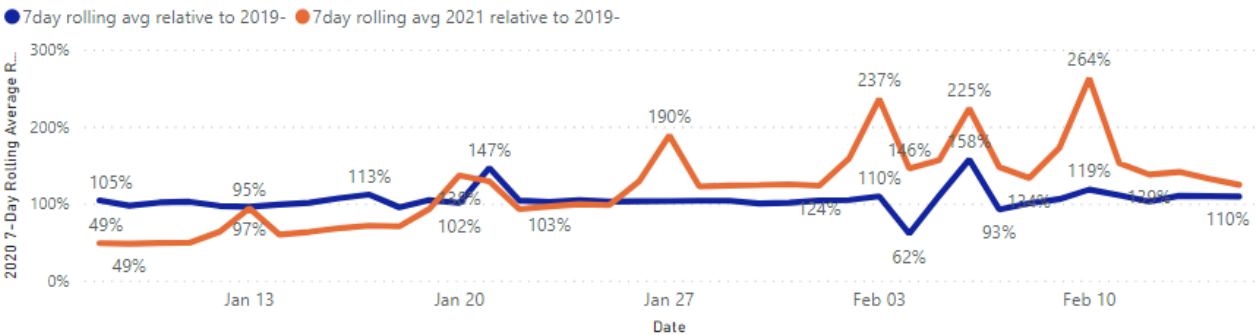
2021

All Days	Weekdays	Weekends	Most Recent 7-Day Average
Manufactured data to test the functionality			
105%	105%	106%	110%

20-21 Selected State Route Traffic Volume Relative to 2019 | 7-Day Rolling Average

Region: All County: All Route: All 1/1/2021 2/12/2021

Multiple Stations Selected



Year-to-Date | Total of all days in 2020 or 2021 compared to all days in 2019 to the current date. **Selected Month** | Average of 2020 or 2021 volume divided by 2019 volume for selected month. **7-Day Rolling Average** percentages are calculated using a rolling average of the previous 7 days. All filtered sites are weighted based on volume. Volumes include mainline general purpose lanes only.

UDOT Traffic Trends and Metrics

Location Name

EB I-80 at Kimball Junction

NB I-15 at 8000 S

NB I-15 at Clearfield

NB I-15 at Ogden

NB I-15 at Point of the Mou...

NB I-215 at Wasatch

SB I-15 at 8000 S

SB I-15 at Clearfield

SB I-15 at Ogden

SB I-15 at Point of the Mou...

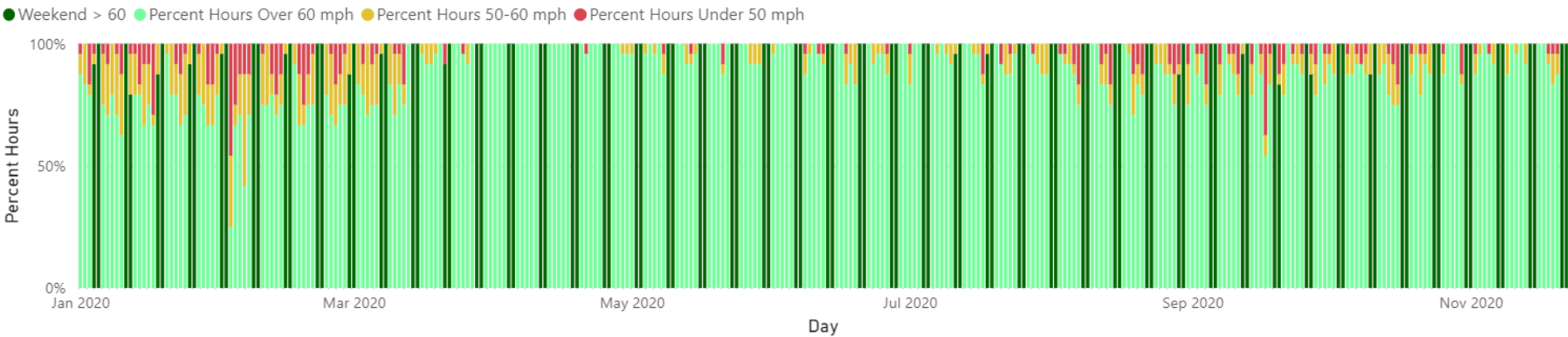
SB I-215 at Wasatch

WB I-80 at Kimball Junction

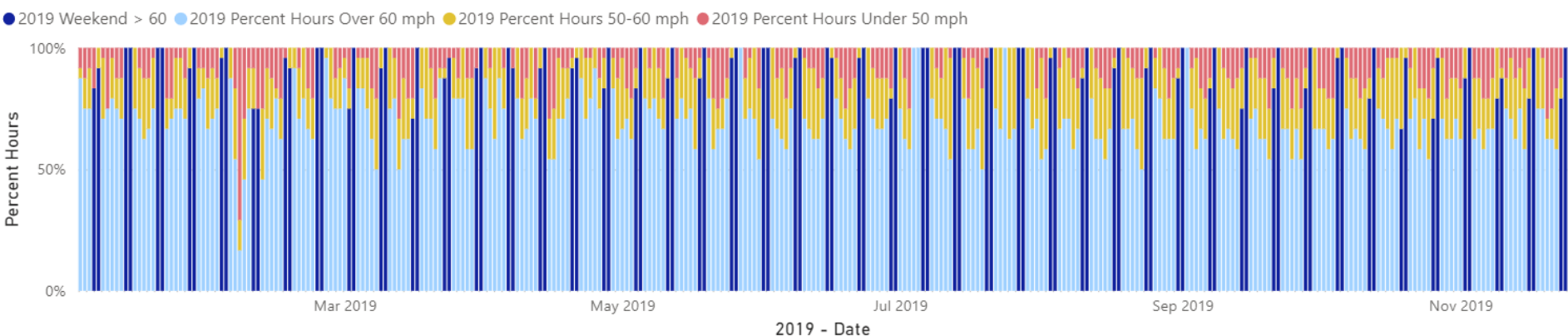
1/1/2020

11/22/2020

2020 Average Daily Speed



2019 Average Daily Speed





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