



CAMBRIDGE
SYSTEMATICS

Think  Forward

I-95 Express Toll Lanes Extension

Delay, Reliability, and Safety Review

presented to

Policy Committee

presented by

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I-95 Express Lane Extension

Context

Opened SB ramp – Oct. 31, 2017

Opened NB ramp – Nov. 1, 2017

Extended the I-95 Express Lanes about two miles beyond the original terminus (SB flyover ramp and NB ramp north of Exit 143)

1. A reversible single lane was built in the median of I-95, splitting into NB and SB merge ramps
2. SB Express Lanes traffic can continue past Exit 143 and merge into I-95 about one mile south of Exit 143
3. Northbound traffic can enter the express lanes earlier at a new left entrance south of Exit 143.
4. The existing left entrance north of Exit 143 remains.



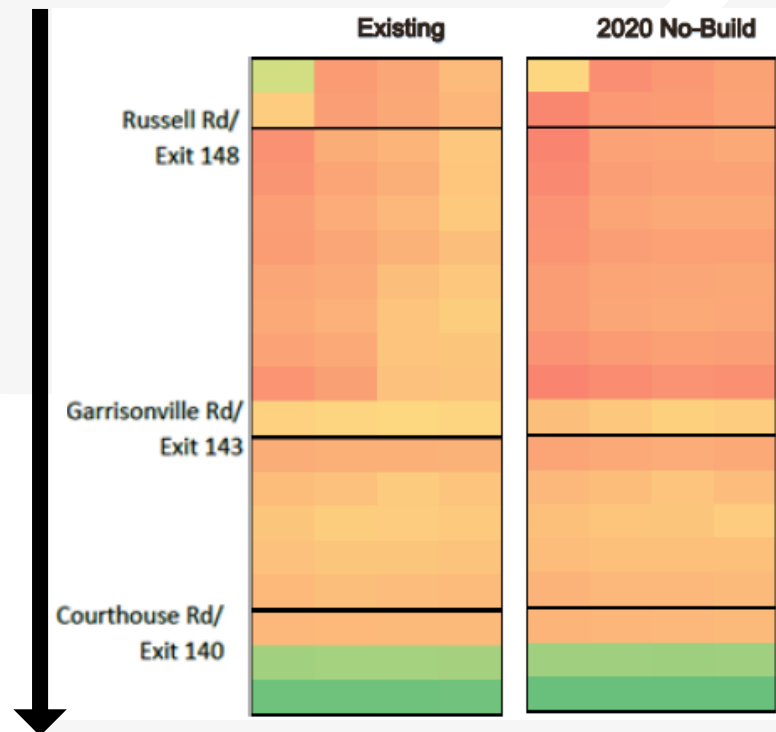
I-95 Express Lane Extension

Purpose & Need

The project aims to:

- Reduce delays for northbound general lanes during the a.m. peak
- Reduce delays for southbound express lanes and general lanes during the p.m. peak
- Increase capacity within the existing right-of-way

Southbound General Purpose Lane Congestion Profile

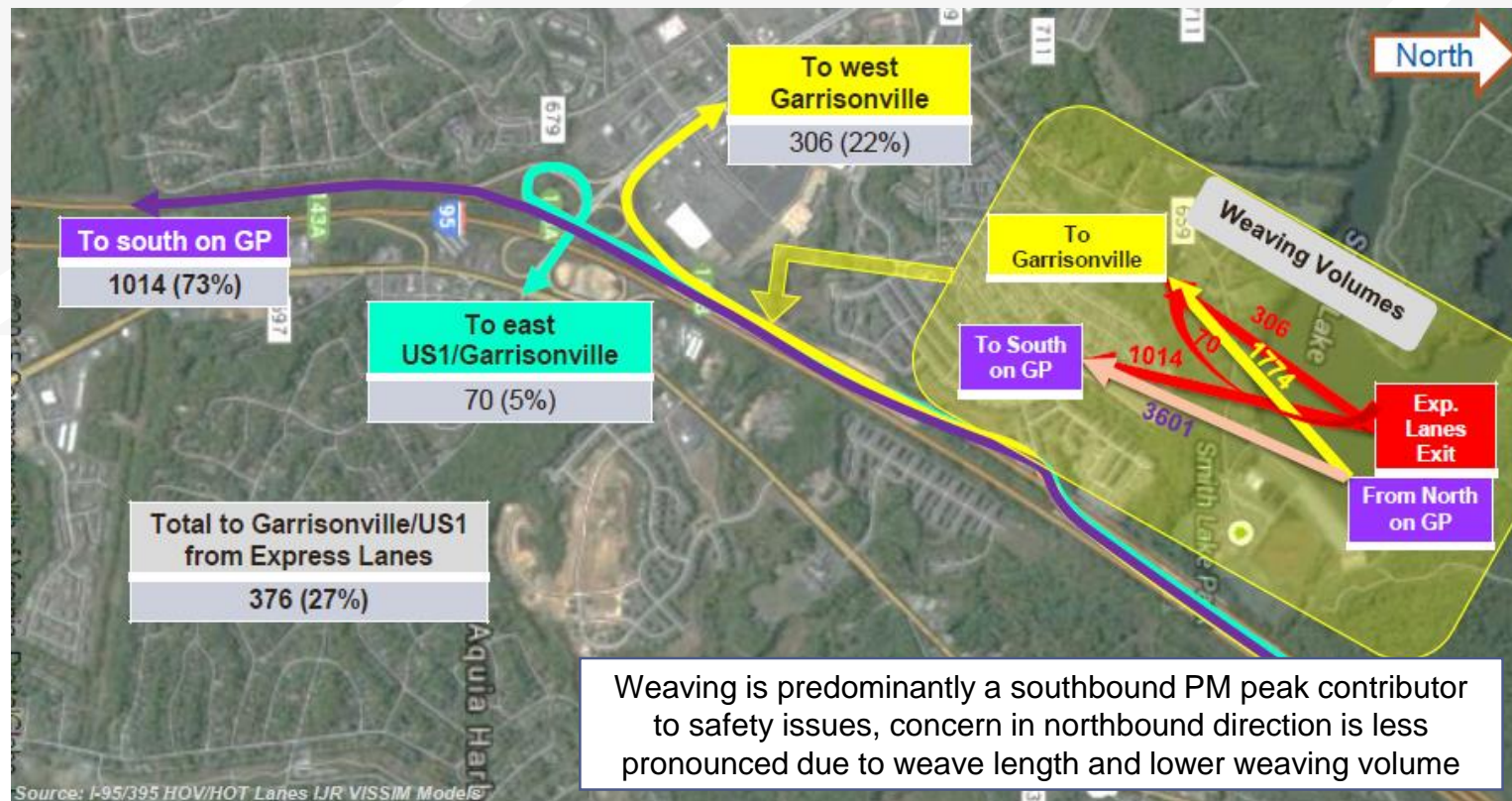


Source: Oct 19, 2015 VDOT Presentation to FAMPO Policy Committee

I-95 Express Lane Extension

Purpose & Need

- Improve safety by reducing vehicles weaving to enter and exit the express lanes north of Exit 143 on and off-ramps



Source: Oct 19, 2015 VDOT Presentation to FAMPO Policy Committee

I-95 Express Lane Extension

Analysis Questions

- ➔ Has the express lane extension...
 - ① **Reduced delay and improved travel time reliability on I-95 NB** between Exit 133 and existing express lane terminus north of Exit 150
 - ② **Reduced delay and improved travel time reliability on I-95 SB and the Express Lane SB** between Exit 150 and Exit 133
 - ③ **Addressed safety issues associated with existing weaving movements** in both directions north of Exit 143
- Note** – complete assessment of potential safety benefits requires at least a full year of crash data (analysis should be conducted in mid-2019)



I-95 Express Lane Extension

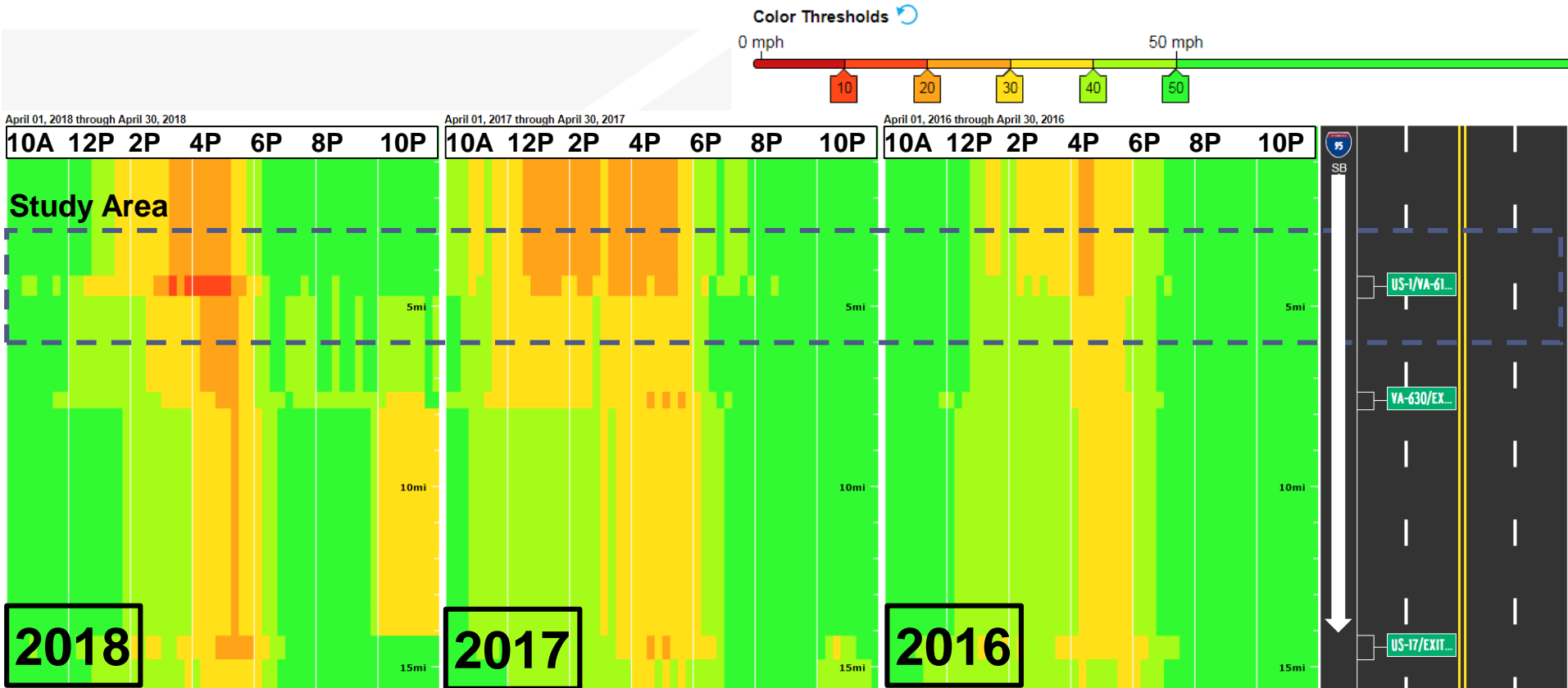
Analysis Approach

- 2016 / 2017 / 2018 travel time data (INRIX)
 - » Compared average April weekday conditions
 - » Focused on change in average speed and travel time by time of day to review intensity, duration, and extent of delay
 - » Reviewed reliability measures
- 2014 – 2016 safety data
 - » Reviewed crash characteristics prior to opening
 - » Awaiting full year of crash data to reach conclusions on potential safety benefits

I-95 Southbound Midday and PM Peak focus

I-95 Southbound Average Speed – Stafford County

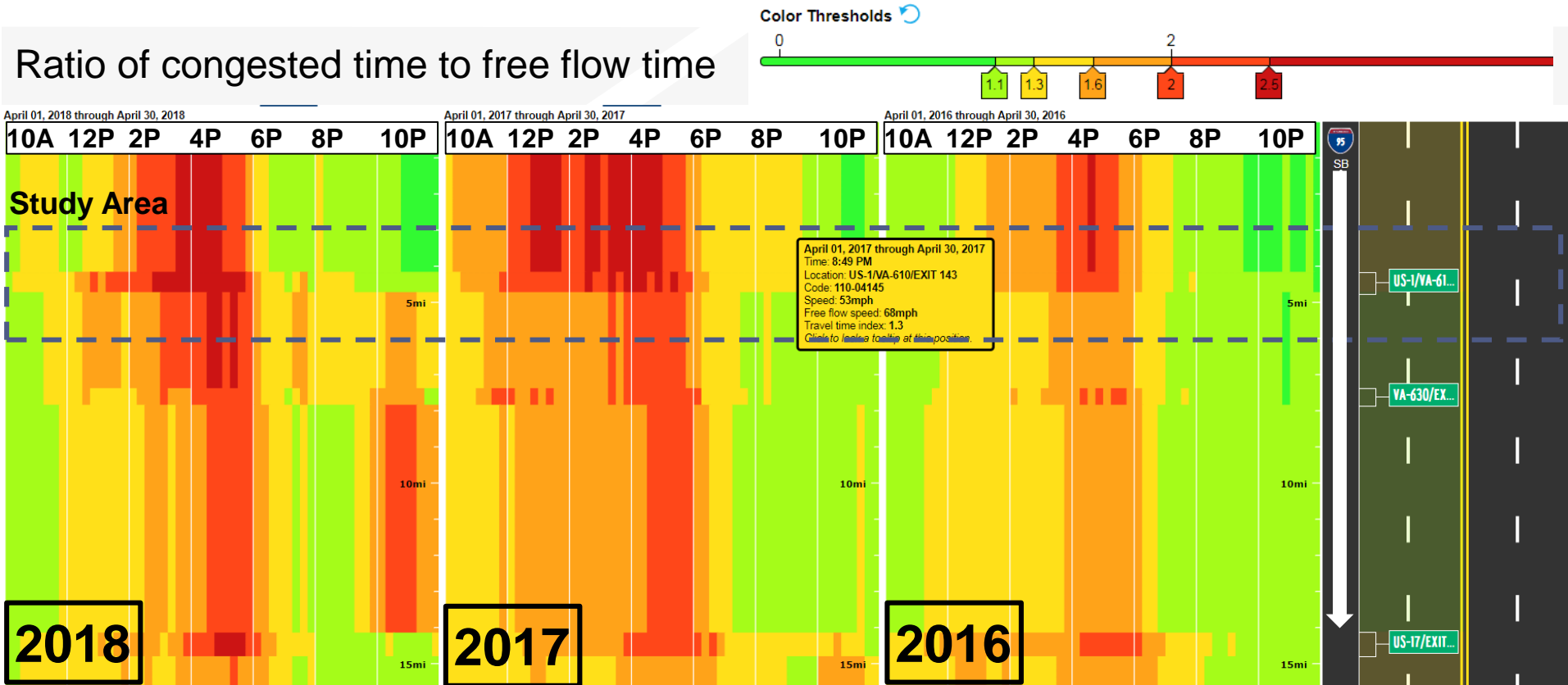
Source: RITIS, 2016-2018 INRIX Data



Generally only minor changes in average speed
Most noticeable improvements occurring in early afternoon

I-95 Southbound Travel Time Index – Stafford County

Source: RITIS, 2016-2018 INRIX Data

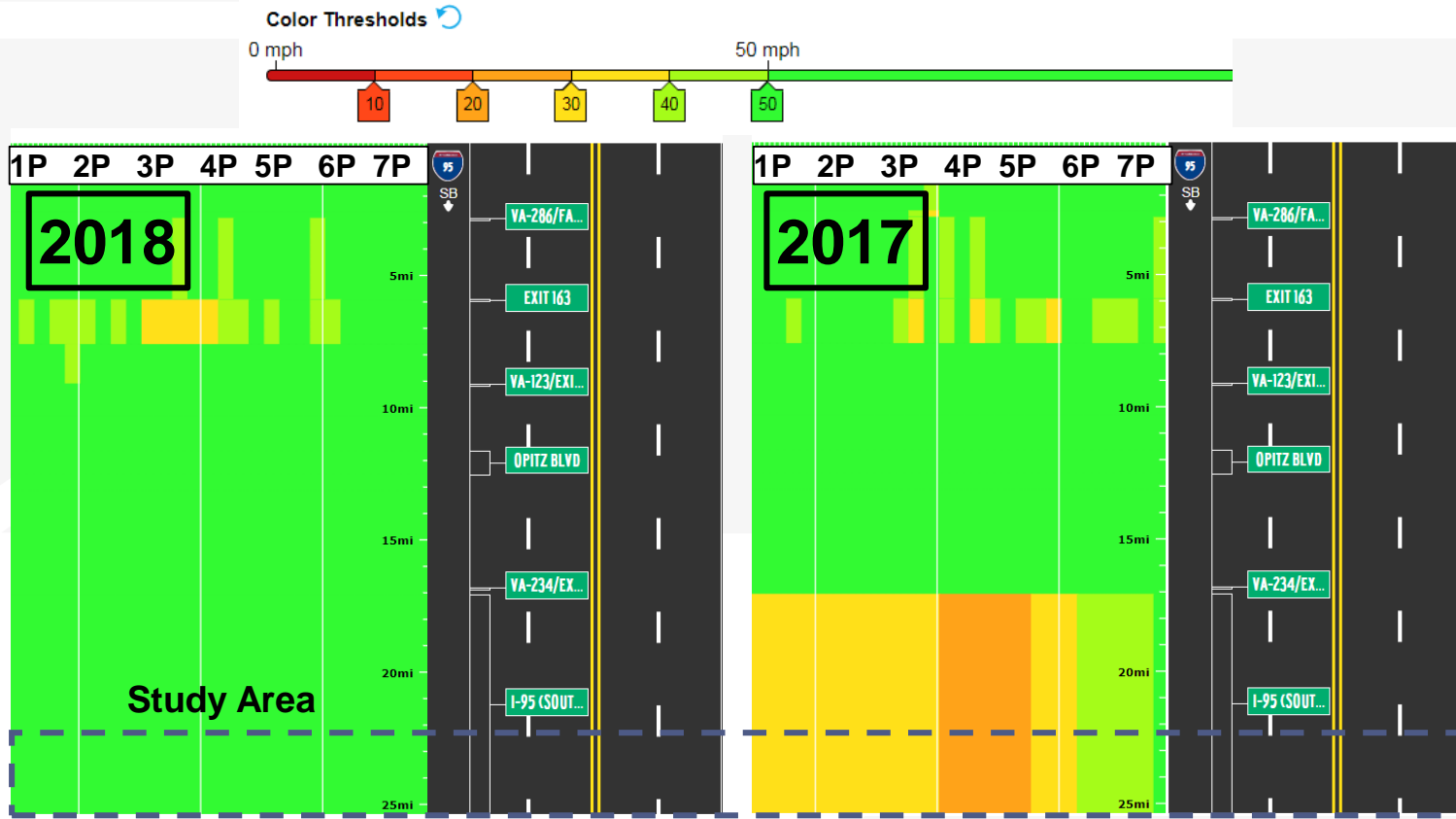


Slight improvement north of VA 610 in 2018

No real change south of VA 610 (some slight decrease in duration)

I-95 Express Lanes Southbound (Franconia to VA 610)

Source: RITIS, 2017-2018 INRIX Data

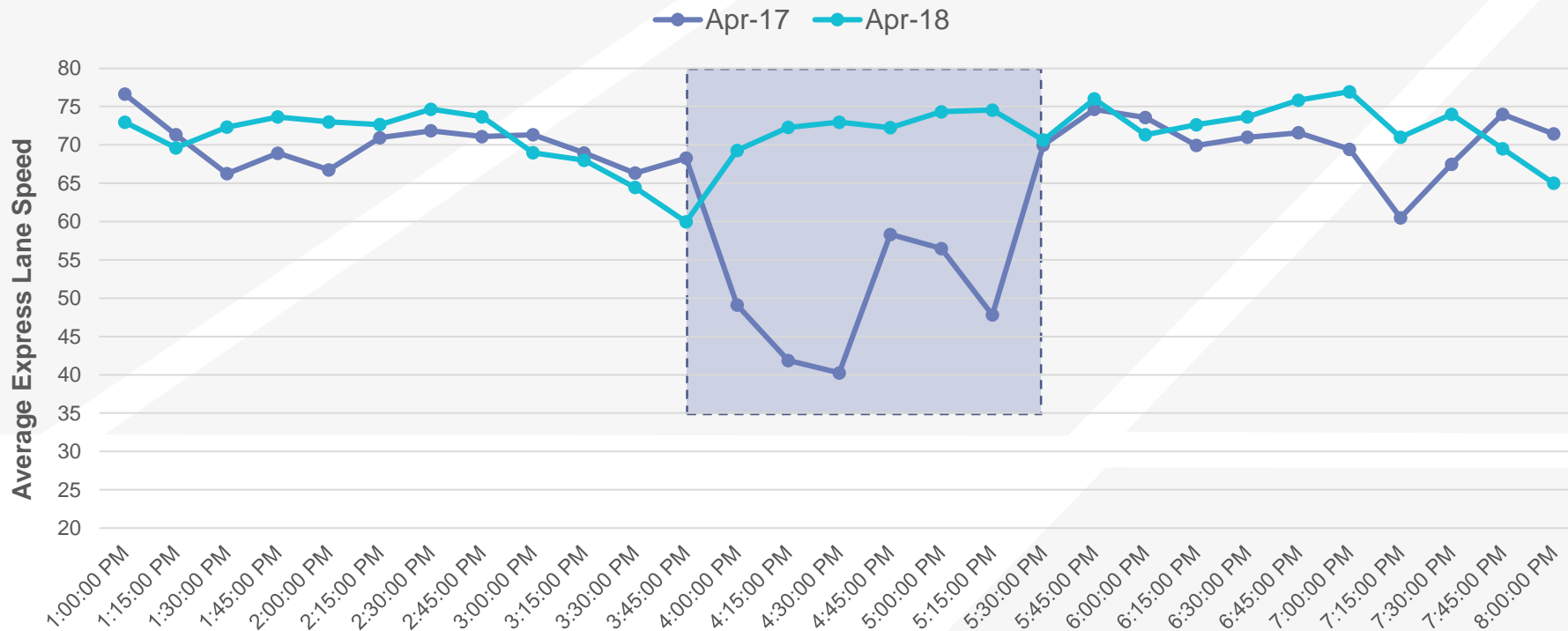


Note: 2016 speed data not available

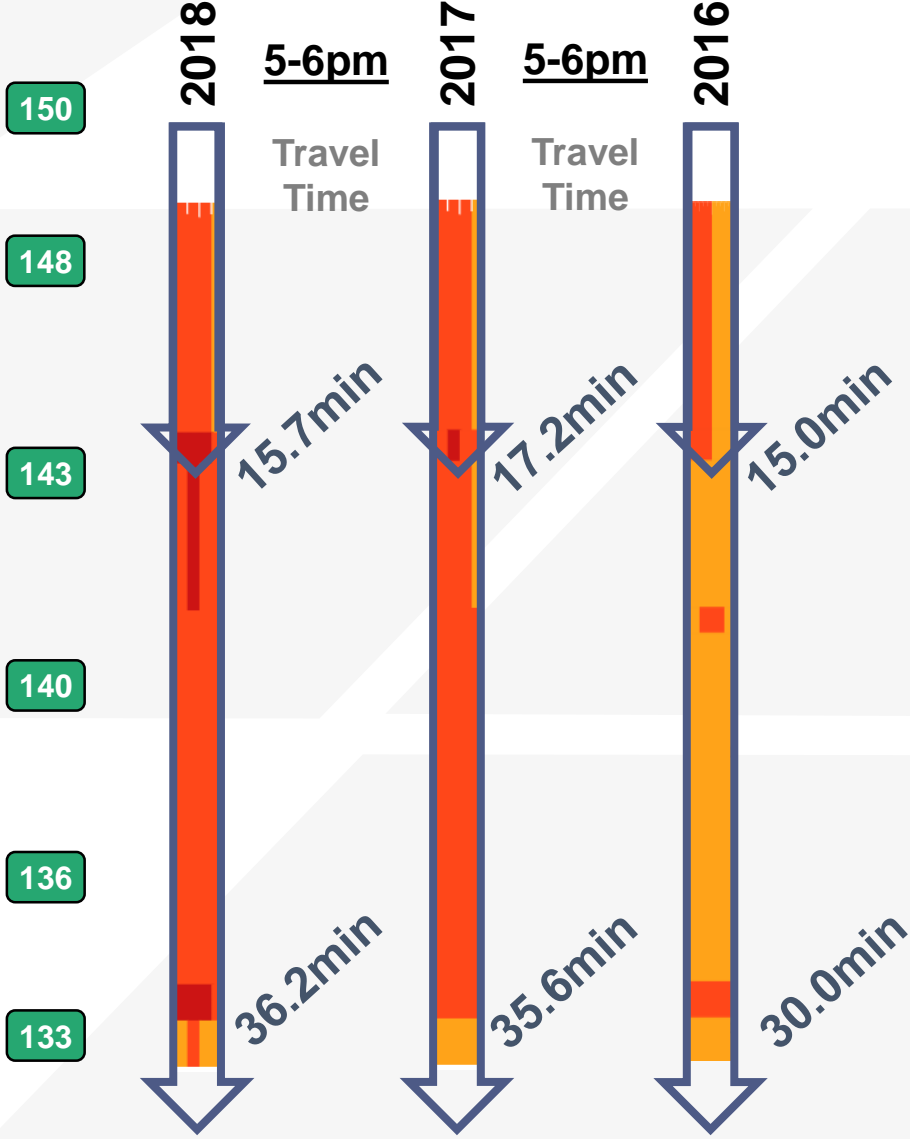
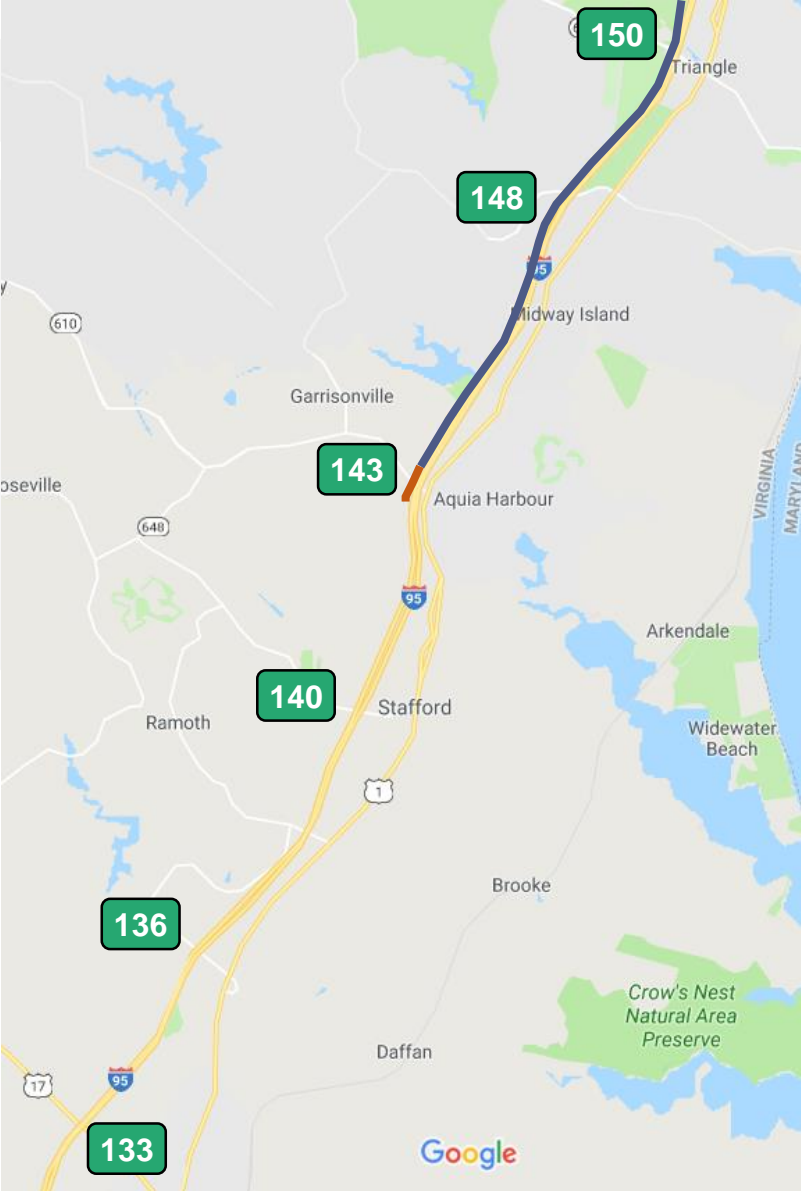
In the PM Peak, Express lane average speed south of VA 234 increases from around 30mph in 2017 to above 50mph in 2018

Express Lane Southbound Average Speed

VA 234 to VA 610



Average Travel Times



SB Findings – Delay

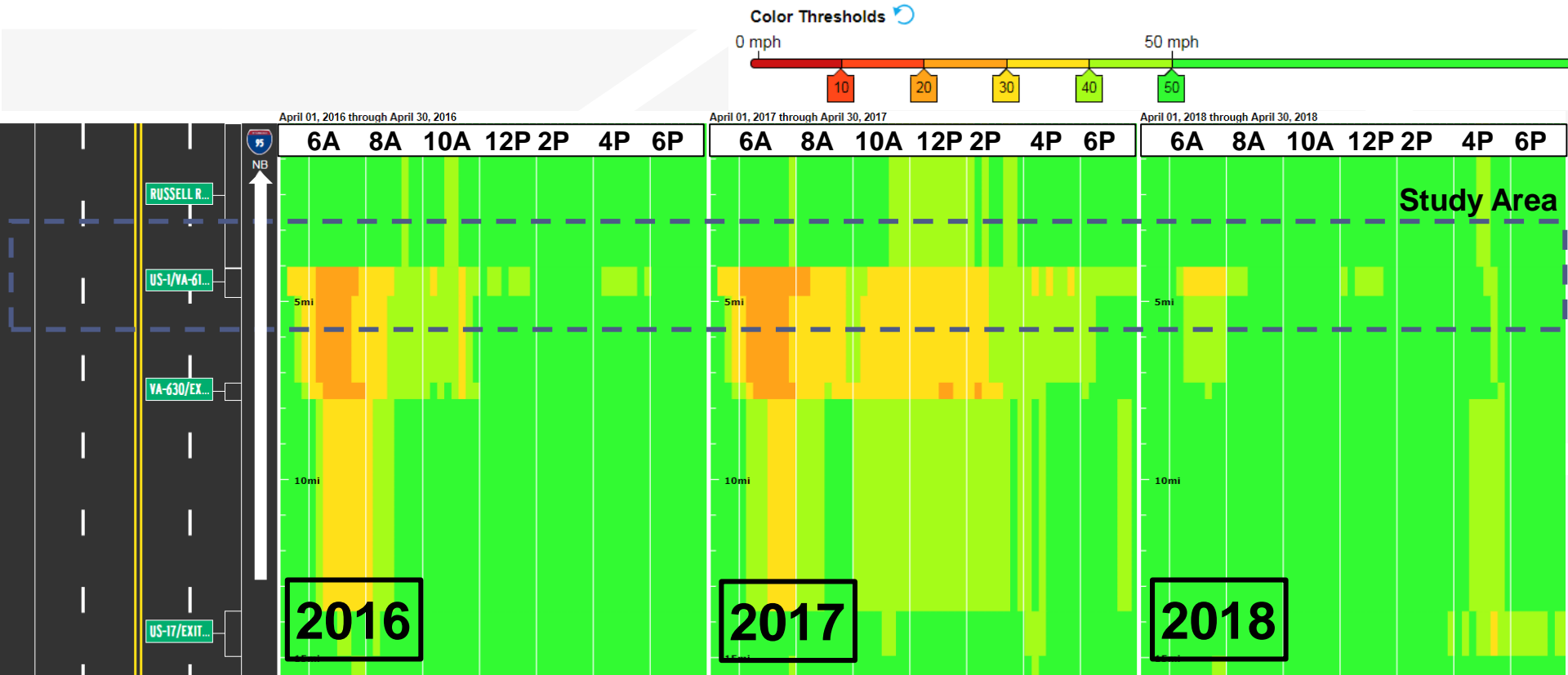
➤ Southbound (Midday – PM focus)

- » Marginal impact on operation of I-95 GP lanes
 - Apparent shorter duration, however no noticeable change in intensity, and potential slight increase in extent
- » Substantive decrease in duration, extent, and intensity of delay on the SB Express Lanes
 - However these travelers still face significant (and increasing) delay south of Exit 143
- » Decrease in travel time in the PM Peak from Exit 150 to 143
- » Overall no change in corridor travel time south of Exit 143

I-95 Northbound AM Peak focus

I-95 Northbound Average Speed (Stafford County)

Source: RITIS, 2016-2018 INRIX Data

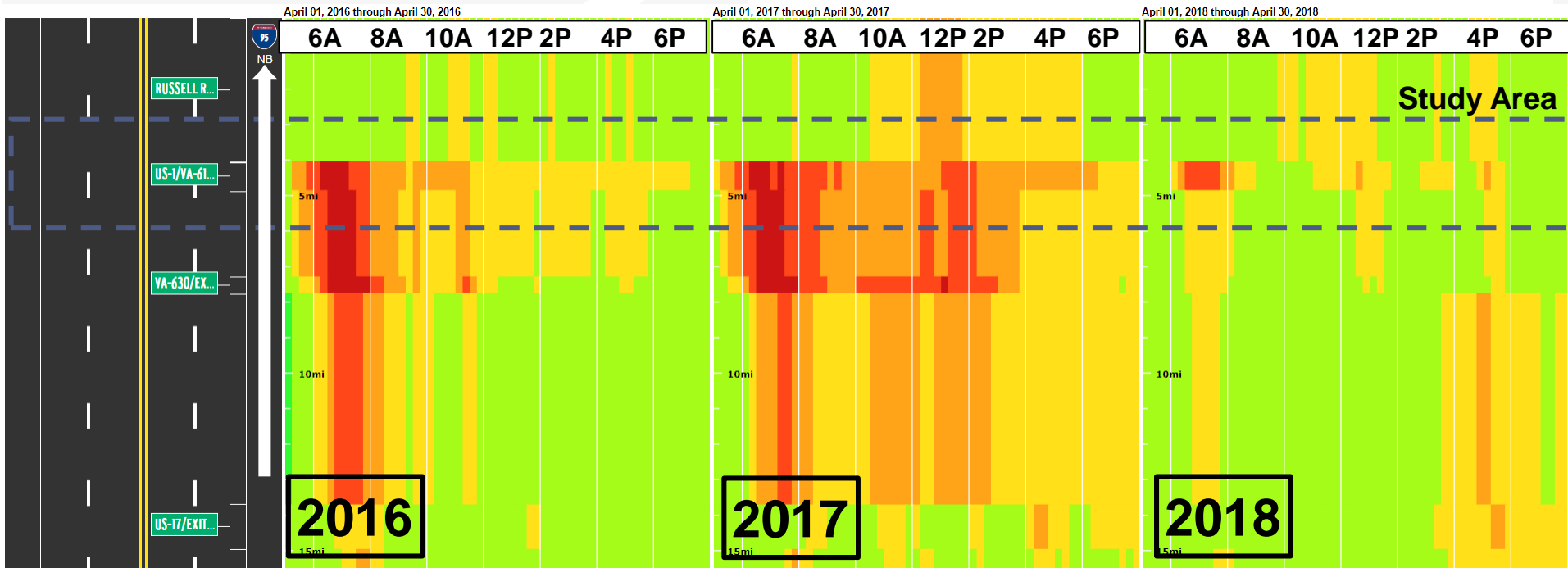
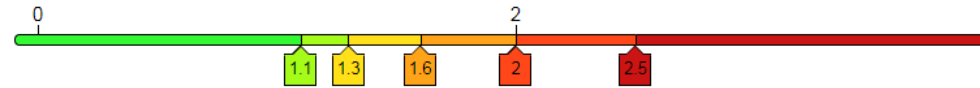


I-95 Northbound Travel Time Index – Stafford County

Source: RITIS, 2016-2018 INRIX Data

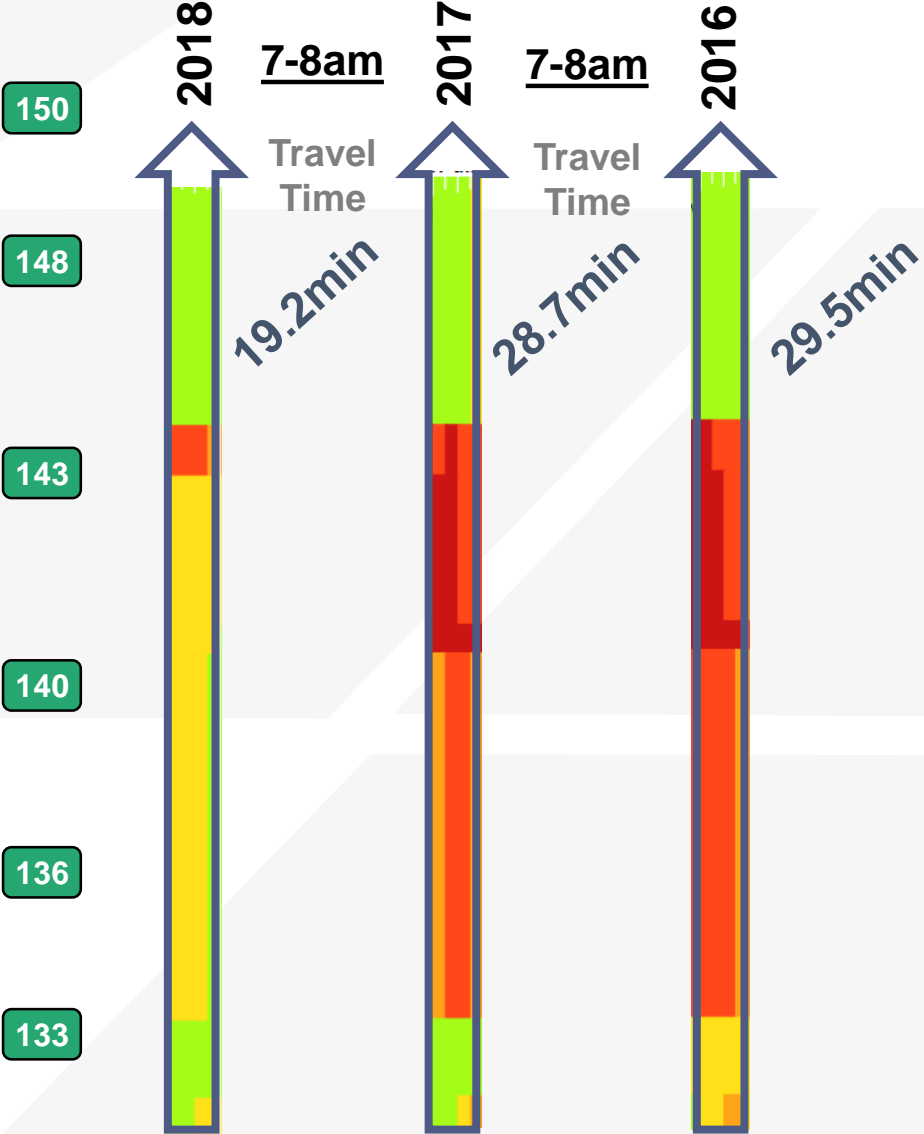
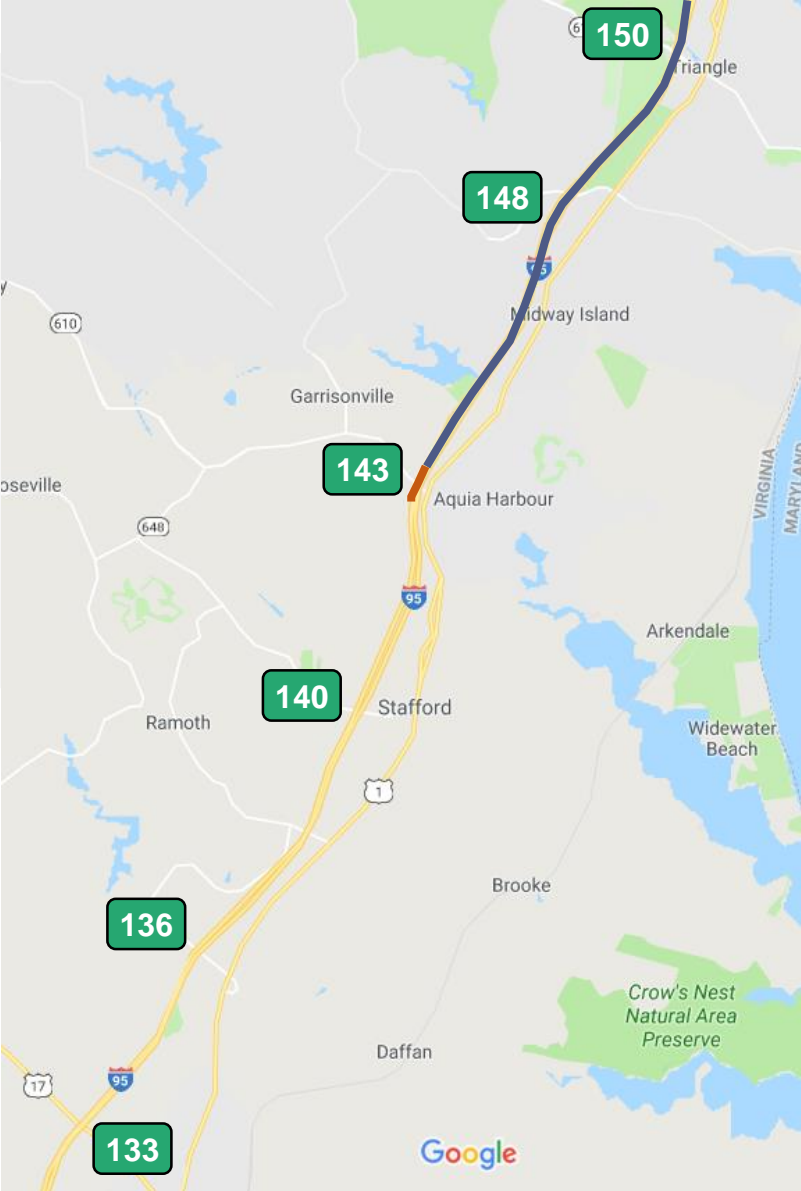
Ratio of congested time to free flow time

Color Thresholds



Noticeable improvement for all NB segments in Stafford, particularly in the AM peak

Average Travel Times



NB Findings – Delay

➤ Northbound (AM focus)

- » Decrease in duration, extent, and intensity of delay on I-95 throughout Stafford County
 - Includes changes in average speed, travel time index, and buffer index (reliability)
- » Slight improvement in Express Lanes (generally operating at free-flow at all times since 2016, excluding some construction impacts in 2017)

Conclusions

➔ Observed travel time benefits

- » **I-95 SB Express Lane users** during the PM Peak destined south of Exit 143 are **saving around 2 minutes** from Exit 148 to the new Express Lane terminus
- » **I-95 NB users (both general and express lane users)** during the AM Peak experience **a 33 percent reduction in travel time** (from Exit 133 to Exit 150, this equates to saving almost 9 minutes)

Conclusions

➤ Potential safety benefits

- » The removal of the SB weave section north of Exit 143 should reduce crashes (appx. 0.7 mile segment)
 - There will still be crashes resulting from stop and go traffic conditions
 - Express Lane users still will merge into I-95 South, but now from the left and with no concern of weaving traffic
- » The extended access point for NB express lane users south of Exit 143 removes the conflict between express lane users from I-95 and from Garrisonville Rd.
 - Express lane users from Garrisonville Rd. still need to cross I-95 to access the next express lane entry (but have over 1 ½ miles to do it)

