

METRORAIL SAFETRACK SURGES 1 TO 14B

Impact on Regional Highway Network Preliminary Observations using vehicle probe datasets

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Background

- This is a follow-on to previous work that has been done to measure impact of the SafeTrack maintenance surges
- From the WMATA Web site:

SafeTrack is an accelerated track work plan to address safety recommendations and rehabilitate the Metrorail system to improve safety and reliability. Through SafeTrack, Metro will complete approximately three years' worth of work into approximately one year. The plan significantly expands maintenance time on weeknights, weekends and midday hours and includes 16 "Safety Surges" - long duration track outages for major projects in key parts of the system.



Background (continued)

- Surge 1 started on June 4, 2016 and surges have continued since then, with all lines impacted
- Only one longer pause between surges – December 21, 2016 though February 11, 2017
- A combination of single-tracking and total shut-downs on all lines
- Completed Surges (as of mid-May 2017) are detailed on the following page



Surge Number	Start Date	End Date	Week-days	Line	Line	Line	From	To	Type of Impact
1	June 4, 2016	June 16, 2016	9	Orange	Silver	-	East Falls Church	Ballston	Single Tracking
2	June 18, 2016	July 3, 2016	10	Orange	Blue	Silver	Eastern Market	Minnesota Avenue/Benning Road	Closure
3	July 5, 2016	July 11, 2016	5	Yellow	Blue	-	National Airport	Braddock Road	Closure
4	July 12, 2016	July 18, 2016	5	Yellow	Blue	-	National Airport	Pentagon City	Closure
5	July 20, 2016	July 31, 2016	8	Orange	Silver	-	East Falls Church	Ballston	Single Tracking
6	August 1, 2016	August 7, 2016	5	Red	-	-	Takoma	Silver Spring	Single Tracking
7	August 9, 2016	August 21, 2016	9	Red	-	-	Twinbrook	Shady Grove	Single Tracking
8	August 27, 2016	September 11, 2016	9	Yellow	Blue	-	Franconia-Springfield	Van Dorn Street	Single Tracking
9	September 15, 2016	October 26, 2016	29	Orange	-	-	West Falls Church	Vienna	Single Tracking
10	October 29, 2016	November 22, 2016	16	Red	-	-	NoMa-Gallaudet	Fort Totten	Closure
11	November 28, 2016	December 20, 2016	17	Orange	Silver	-	East Falls Church	West Falls Church	Single Tracking
12	February 11, 2017	February 28, 2017	11	Blue	-	-	Rosslyn	Pentagon	Closure
13	March 4, 2017	April 12, 2017	28	Blue	Yellow	-	Braddock Road	Huntington/Van Dorn	Single Tracking
14A	April 15, 2017	April 29, 2017	10	Green	Yellow	-	Greenbelt	Prince George's Plaza	Closure
14B	April 30, 2017	May 14, 2017	10	Green	Yellow	-	Greenbelt	College Park	Closure



Methodology

- INRIX vehicle probe data downloaded from Center for Advanced Transportation Technology Laboratory (CATT Lab) at the University of Maryland
- Hours examined were 7AM-8AM and 5PM-6PM – weekdays only (no weekends, no federal holidays)
- Impact on highway system analyzed in four groups:
 - Interstate system;
 - National Highway System (non-Interstate);
 - Highways with significant transit bus service; and
 - All highways in the region for which vehicle probe data are available



Methodology (continued)

- Metrics used were:
 - Regionwide Travel Time Index (TTI); and
 - Regionwide Planning Time Index (PTI)
 - Change in TTI and PTI as compared with same period a year earlier (impact of growth in highway traffic **not** considered)
 - Cost of congestion (used congestion cost model developed by the CATT Lab with default settings)



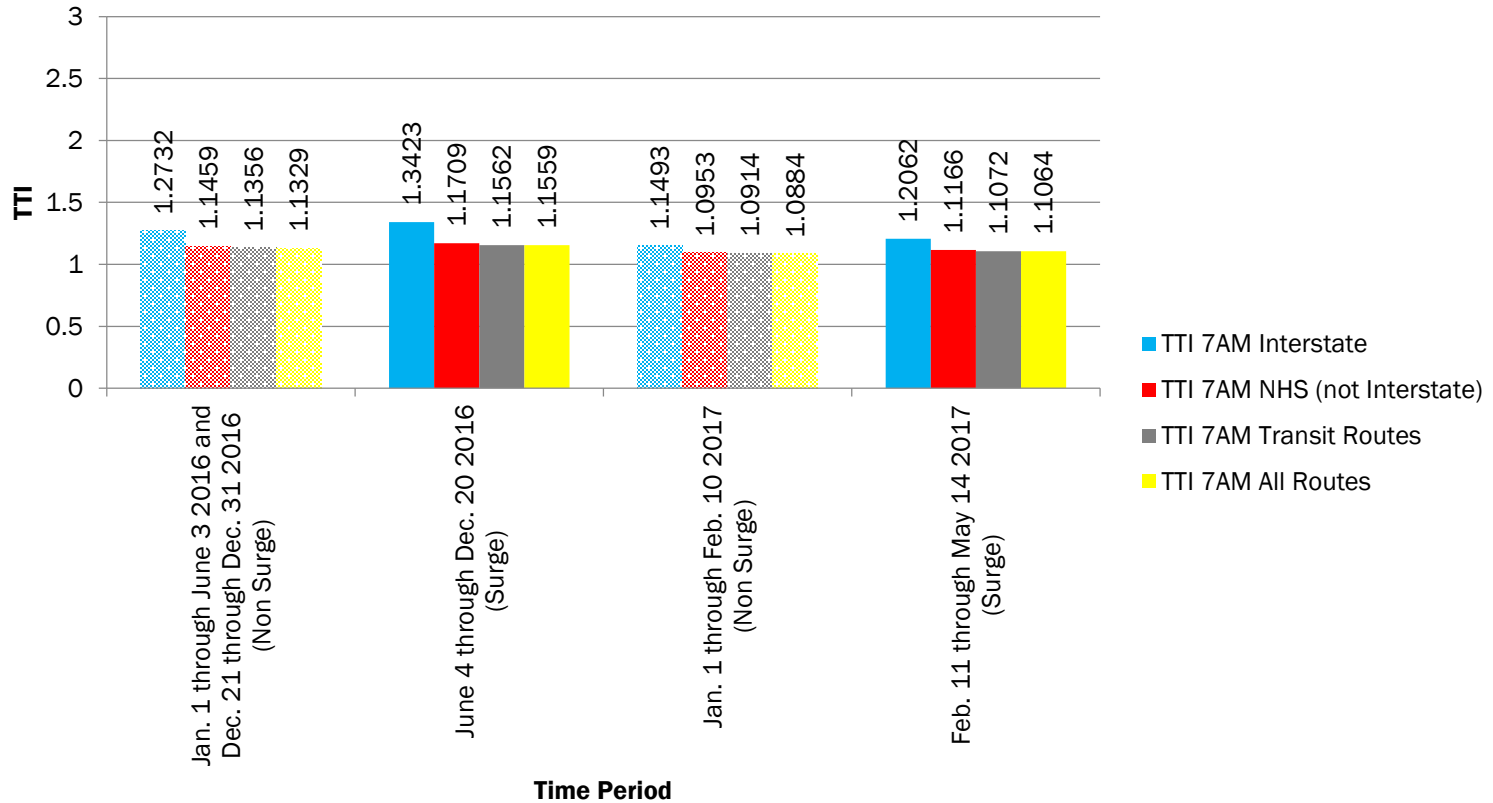
Aggregation of TTI and PTI

- Calendar year 2016: January 1, to start of Surge 1 (June 4) and between end of Surge 11 (December 21) to December 31.
- Calendar year 2017: January 1 to start of Surge 12 (February 10) and from Surge 1 to end of Surge 14B (May 14).

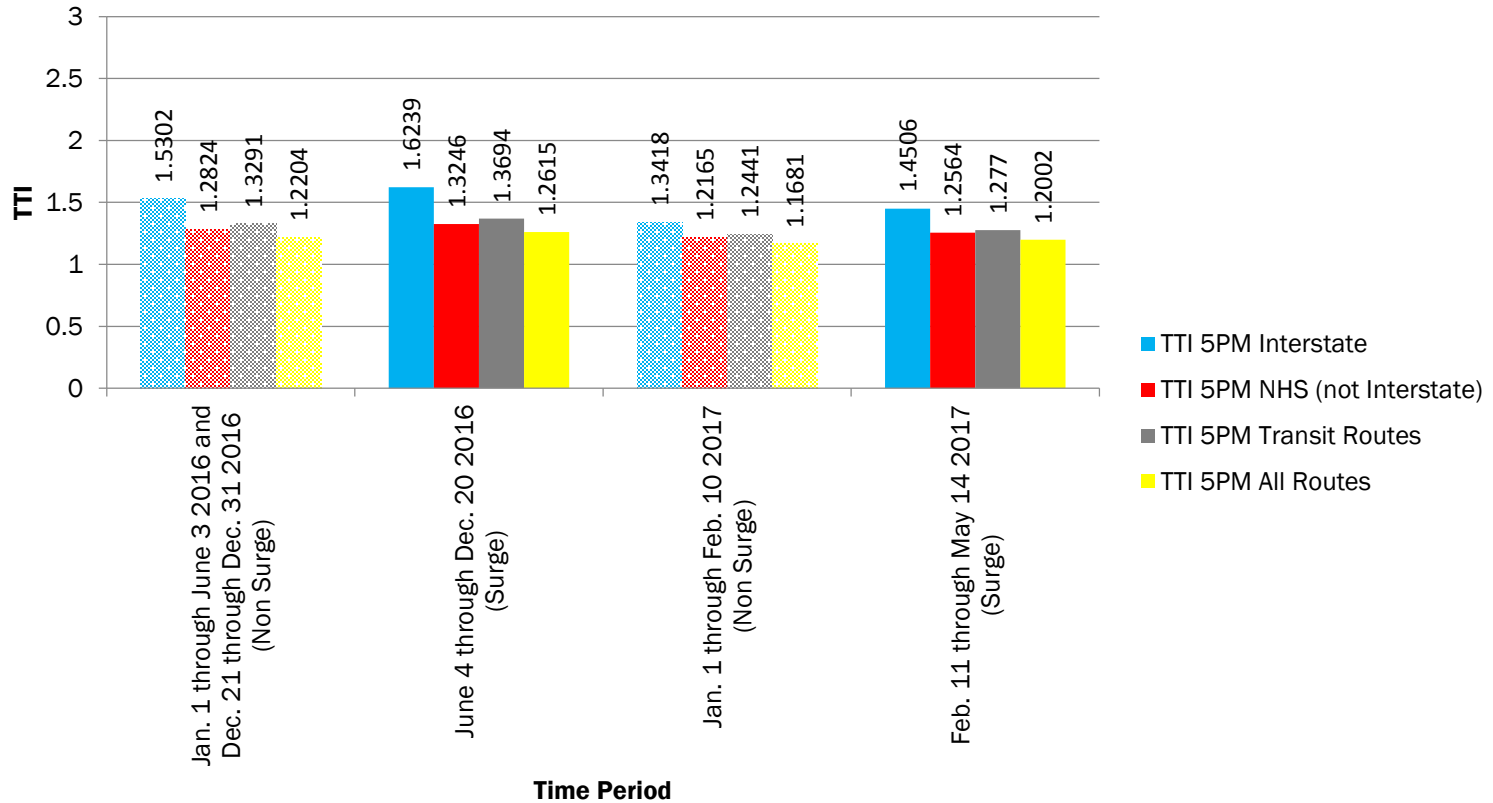
Travel Time Index and Planning Time Index during the periods leading up to the surges and during the surges.



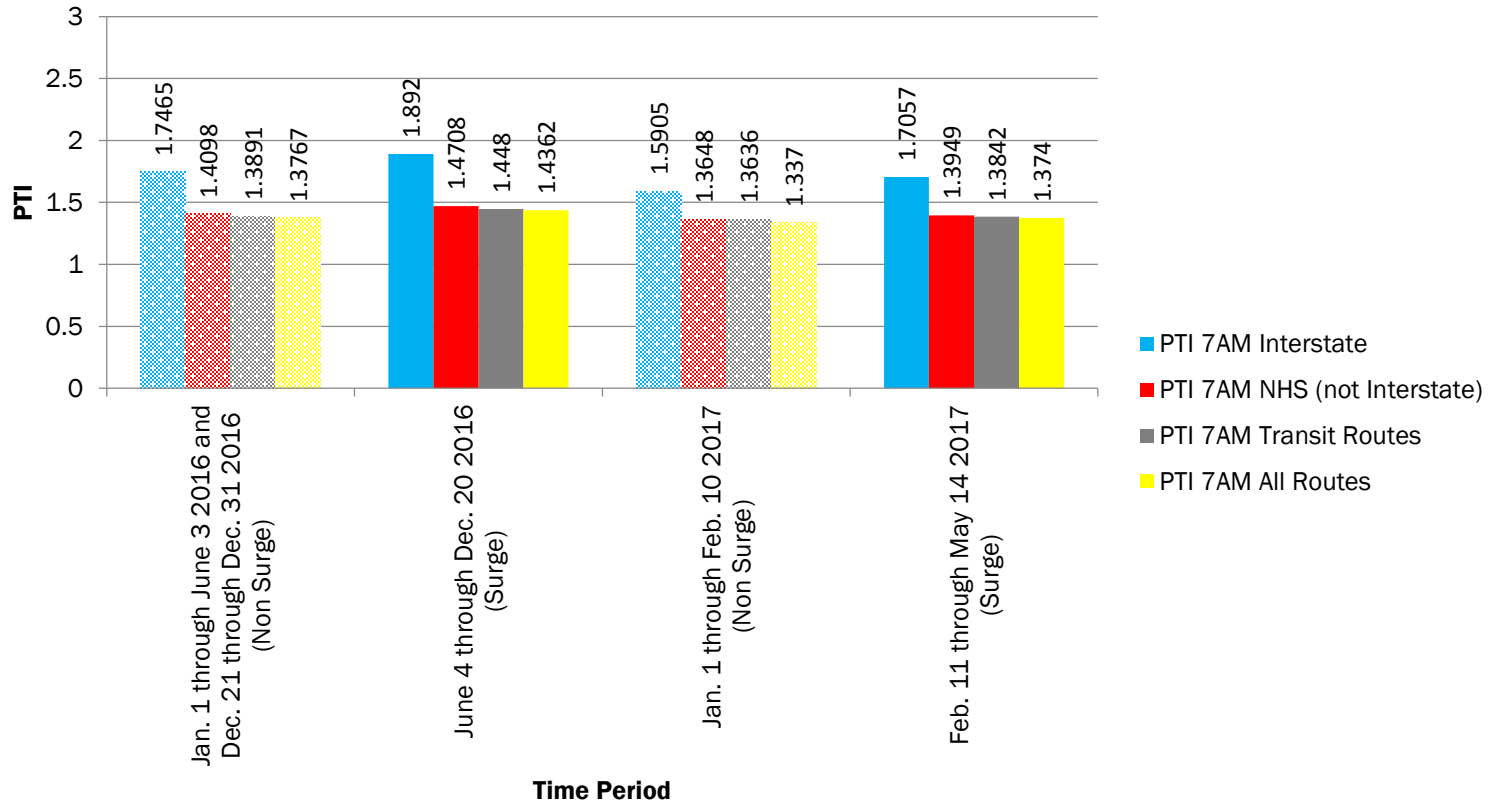
Regional Travel Time Index (7 AM hour) Comparison Metrorail Safe Track Surges (Non-Surge and Surge 2016-2017) Weekdays Only, Federal Holidays Excluded



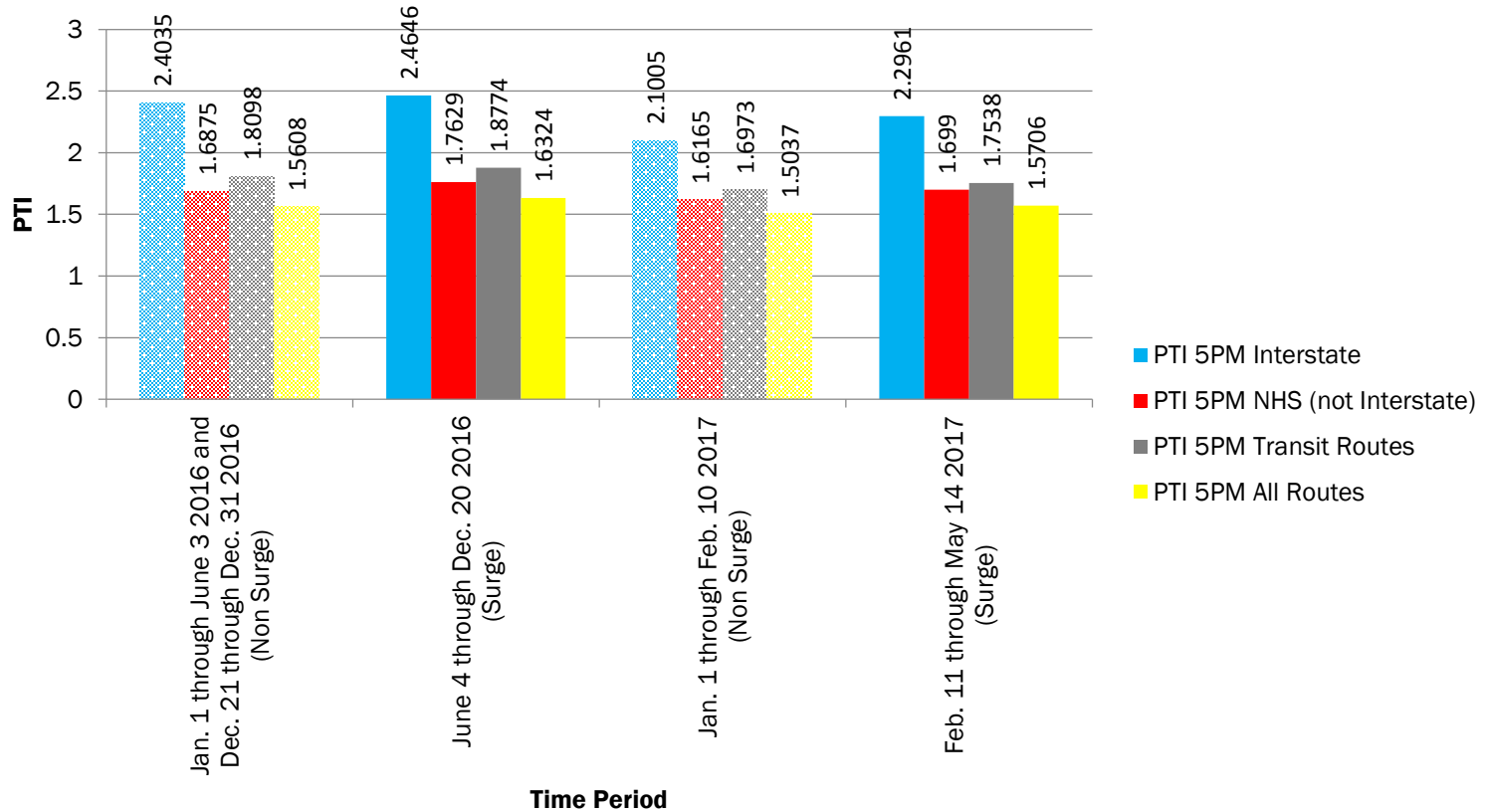
Regional Travel Time Index (5 PM hour) Comparison Metrorail Safe Track Surges (Non-Surge and Surge 2016-2017) Weekdays Only, Federal Holidays Excluded



Regional Planning Time Index (7 AM hour) Comparison Metrorail Safe Track Surges (Non-Surge and Surge 2016-2017) Weekdays Only, Federal Holidays Excluded



Regional Planning Time Index (5 PM hour) Comparison Metrorail Safe Track Surges (Non-Surge and Surge 2016-2017) Weekdays Only, Federal Holidays Excluded

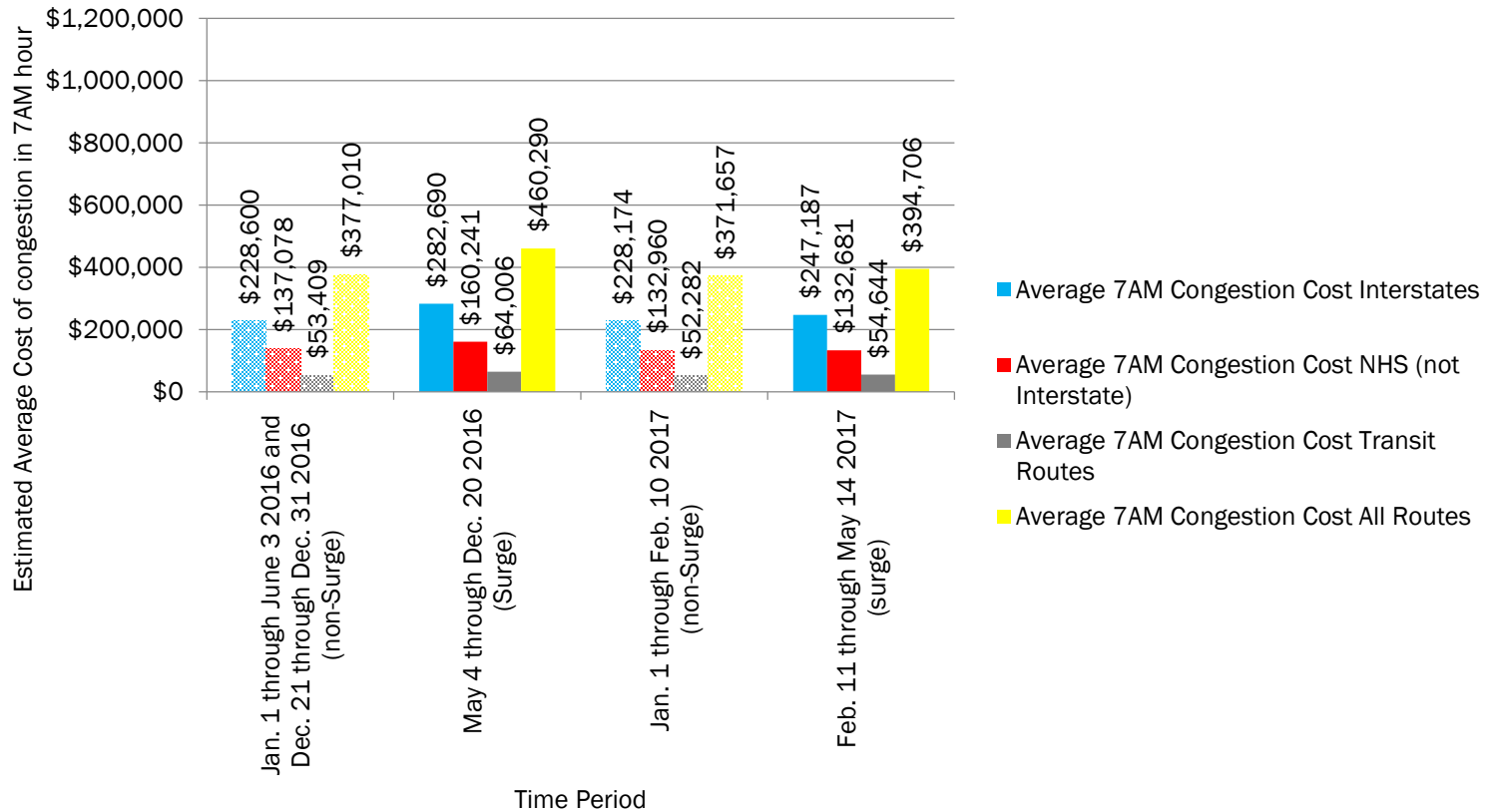


Costs of congestion before and during surges

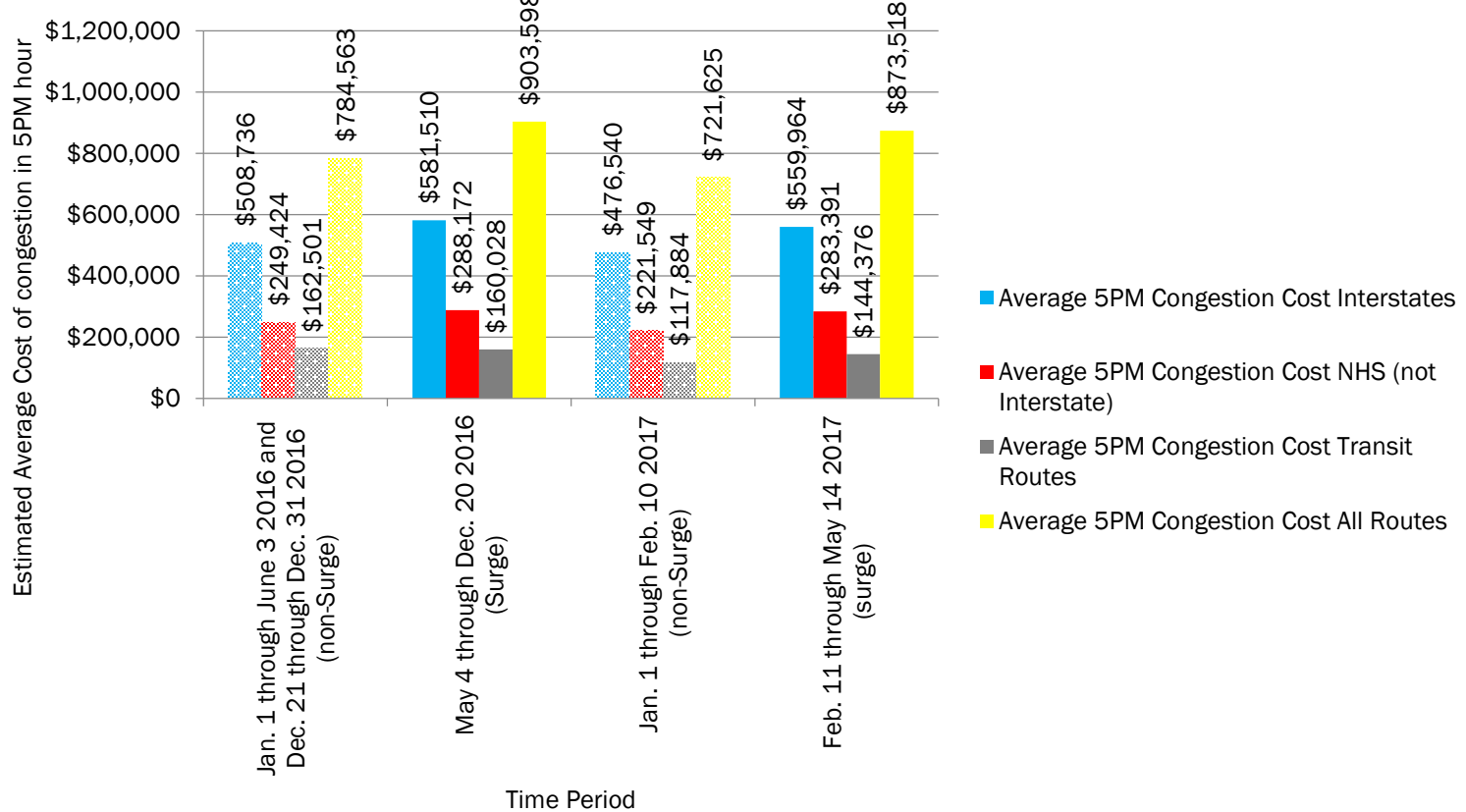
Costs estimated using the Cost of Congestion tool developed and maintained by the CATT Lab as part of the Probe Data Analytics Suite



Regional Estimated Cost of Congestion (Weekdays 7 AM hour) Comparison During Metrorail Safe Track Surges (Non-Surge and Surge periods)



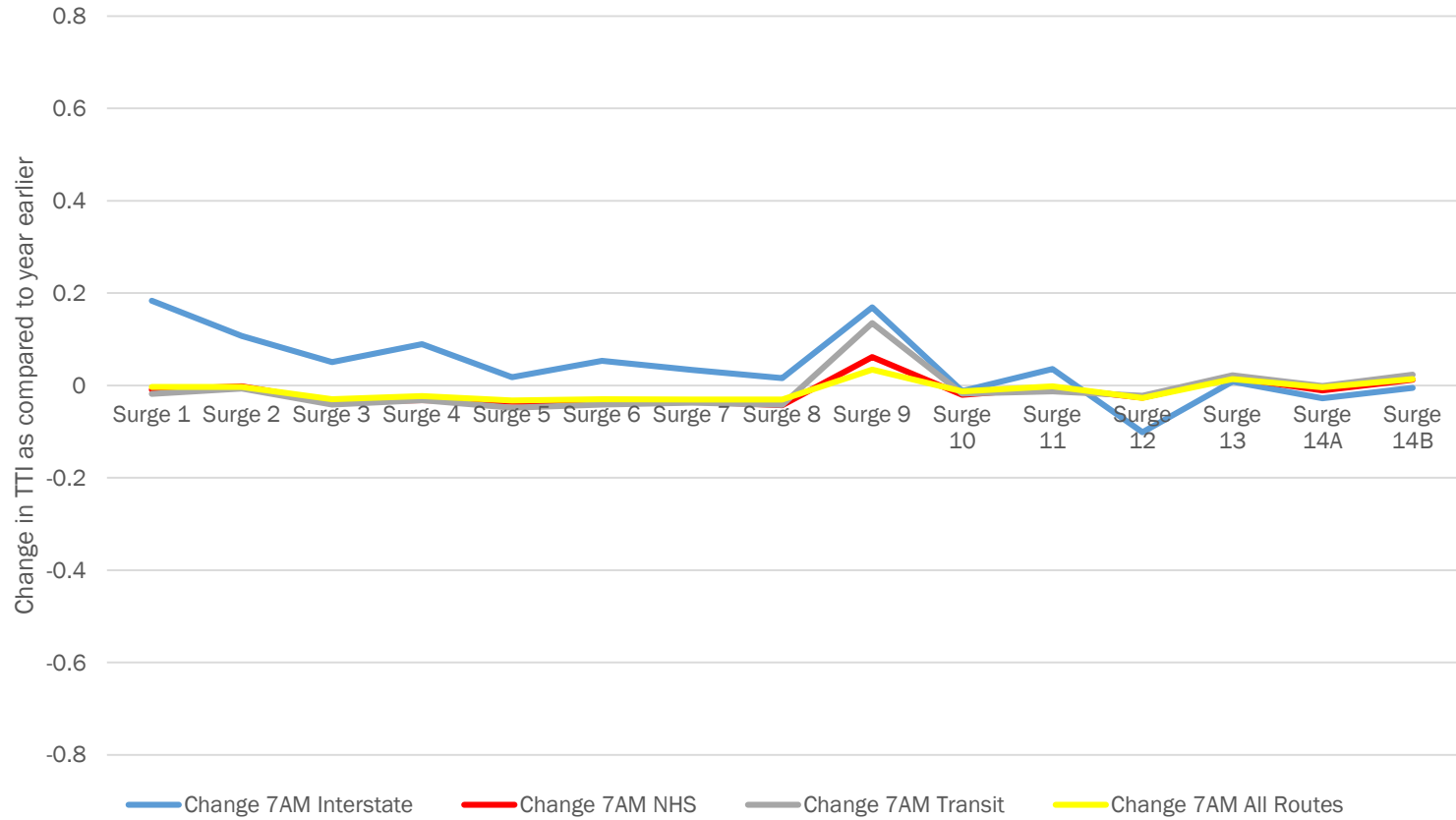
Regional Estimated Cost of Congestion (Weekdays 5 PM hour) Comparison During Metrorail Safe Track Surges (Non-Surge and Surge periods)



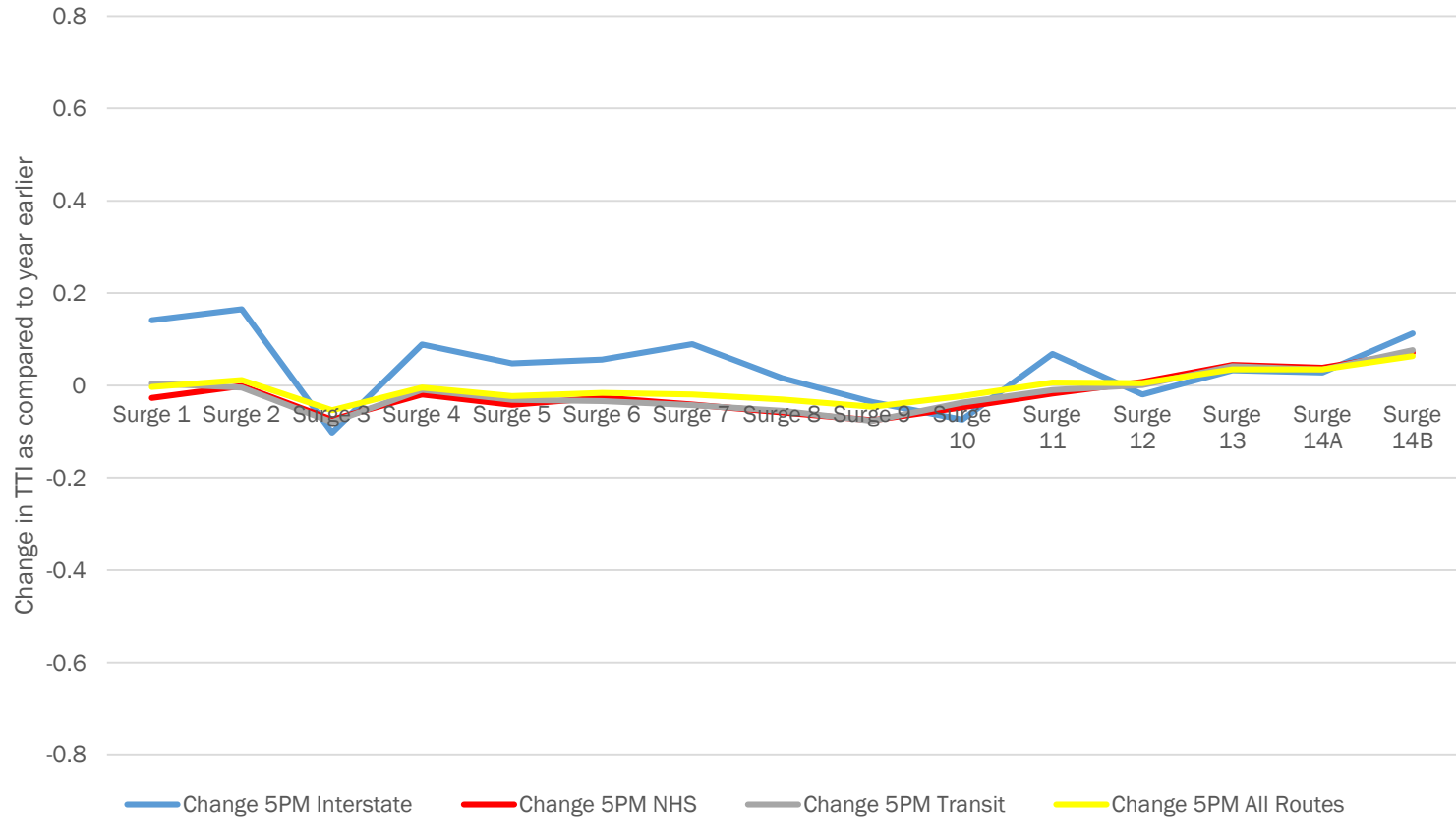
Changes in Travel Time Index and Planning Time Index during the surges, as compared to previous year.



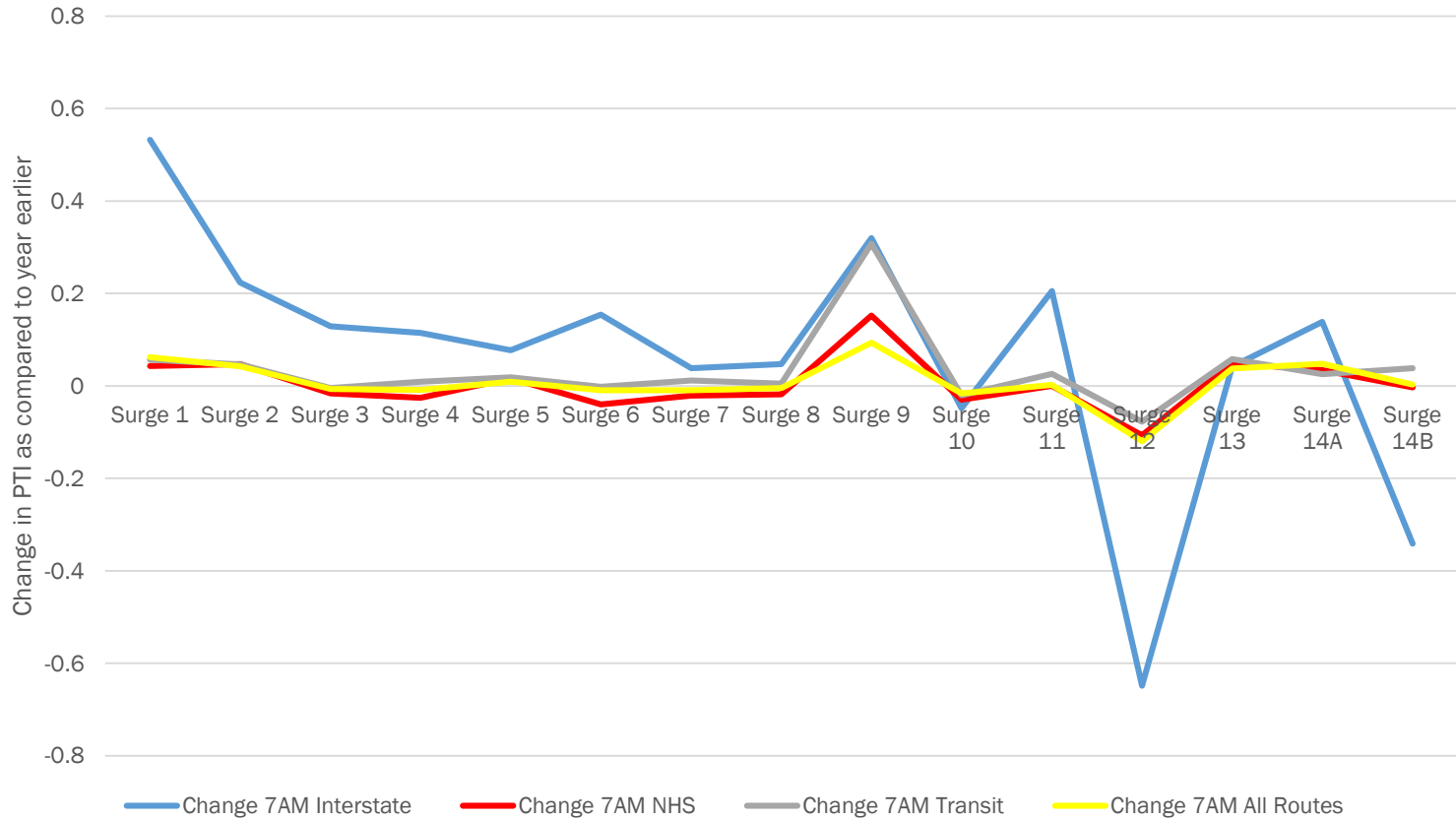
Change in Regional Travel Time Index (from 1 year earlier) during Surges - 7AM hour June 2016 through May 2017



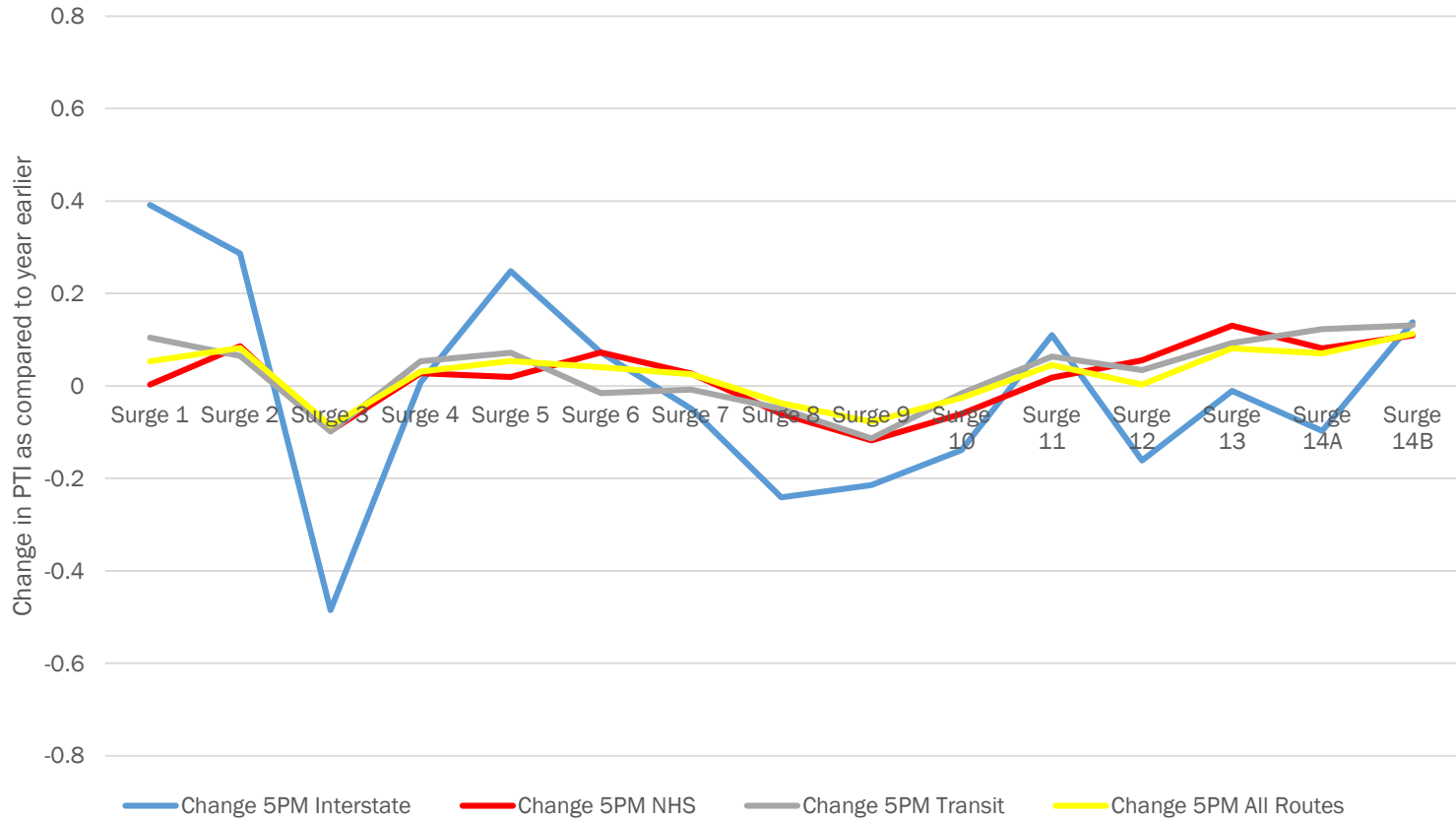
Change in Regional Travel Time Index (from 1 year earlier) during Surges - 5PM hour June 2016 through May 2017



Change in Regional Planning Time Index (from 1 year earlier) during Surges - 7AM hour June 2016 through May 2017



Change in Regional Planning Time Index (from 1 year earlier) during Surges - 5PM hour June 2016 through May 2017



Conclusions

- Did highway traffic get worse during the SafeTrack surges?

Yes, as measured by Travel Time Index and Planning Time Index at the regional level - overall, and especially in the 7AM hour of Surge 1 (9 workdays) and Surge 9 (29 workdays) – but in some surge periods, TTI and PTI actually improved somewhat when compared to same time period in the previous year

But overall increases in regional highway traffic (not related to SafeTrack) may also be a cause of increased TTI and PTI

- Changes in traffic during the SafeTrack surges were significant, but not worse than other factors such as weather and crashes
- Impacts appear to be more pronounced in the 7AM hour than in the 5PM hour



Conclusions (continued)

- System is resilient in spite of the SafeTrack surge-related single-tracking and total shutdowns
- When surges are aggregated, the change in TTI and PTI was not that large (when compared to non-surge period) but it was consistently higher during the surges – in some cases very slightly higher. Estimated costs associated with congestion also increased during the surge periods.
- PTI will nearly always change more than TTI, and higher PTI implies greater variability in road speeds



Next steps

- Complete this analysis for the remaining surges once WMATA announces that the Safe Track work is completed
- Make a similar presentation to the TPB Travel Forecasting Subcommittee (TFS) and other groups as requested
- Follow-up on comments received from SPOTS, TFS and others



Questions and comments?

- Comments and questions from the group

- Thank you

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