

TRUCK SPEEDS USING BLUETOOTH TECHNOLOGY

FIRST LOOK AT RESULTS

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Travel Forecasting Subcommittee
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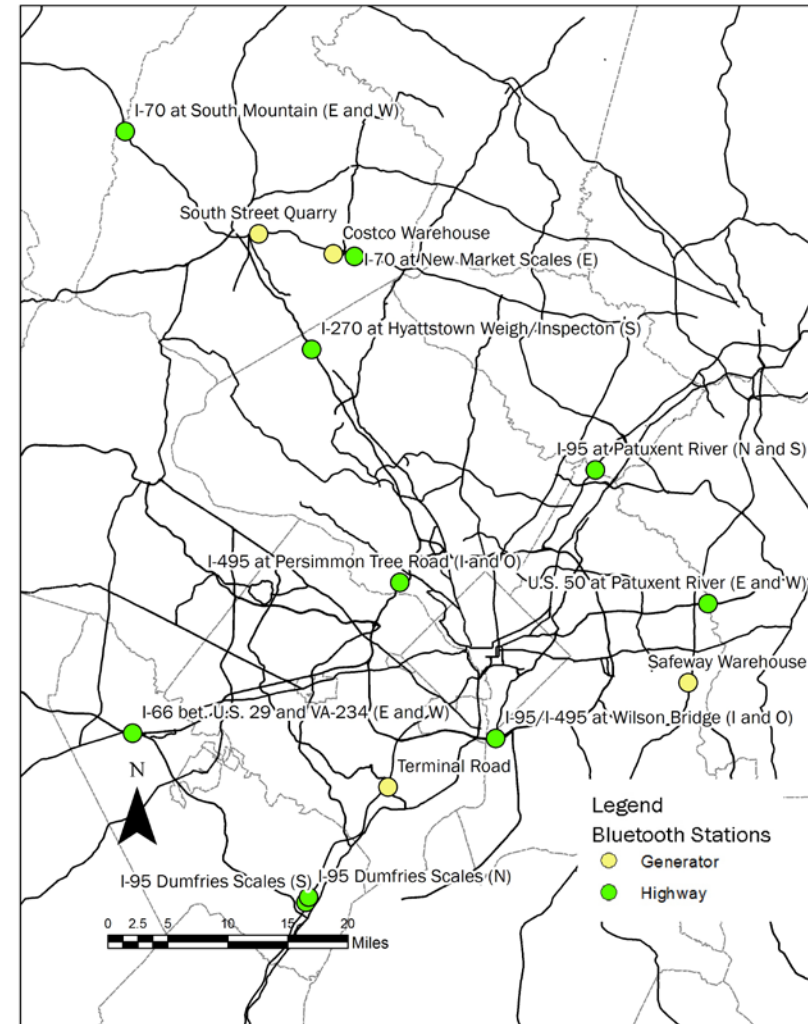
Background

- Intended as a “proof of concept” low-budget effort
- An earlier version of this presentation was given to the Systems Performance, Operations and Technology (SPOTS) Subcommittee (formerly MOITS)
- It will be reviewed by the Freight Subcommittee at a future meeting
- Consultant (RSG) lead on data collection
 - Deployed about 13 Bluetooth detectors around the region and left them out for a week
 - Some monitoring stations (with large volumes of truck traffic) were given two detectors
 - Devices were then taken down and brought to the office
- A network between stations was developed to determine miles between stations - care was taken to use legal truck routes only



Bluetooth Monitoring Stations

- Most detectors were roadside (green dots), four were at truck trip generators (yellow dots)
- Detectors linked to RSG's office by cellular devices to assure data capture
- Initial screening by RSG, then TPB staff added screening and analysis
 - Records with clearly invalid average speeds (greater than 75 mph or less than 5 mph (peak commute periods) or 15 mph (other times) were removed



Data Cleaning and Analysis Procedures

- Illogical station pairs eliminated
- If an O-D pair had less than 5 records in a time period, then they were deleted
- Based on overnight speeds, free-flow speed was assumed to be about 58 MPH for all TTI and PTI calculations (computed after invalid and low-sample size records were deleted) Weekdays only
- Time periods: Overnight (12 Midnight to 6 AM); AM peak (6 AM to 9 AM); Midday (9 AM to 3 PM); PM peak (3 PM to 7 PM); Evening (7 PM to Midnight)



Resulting Data

- Truck traffic only – RSG identified trucks and marked records as such – we used truck weigh/inspection station exit points to our advantage (where available) after getting approval from weigh station managers
- About 24,000 truck trip records resulted
- This effort did not follow the trucks between monitoring stations, and it is possible that some of the trucks made stops for a break or a business appointment along the way, even after extreme outliers were removed

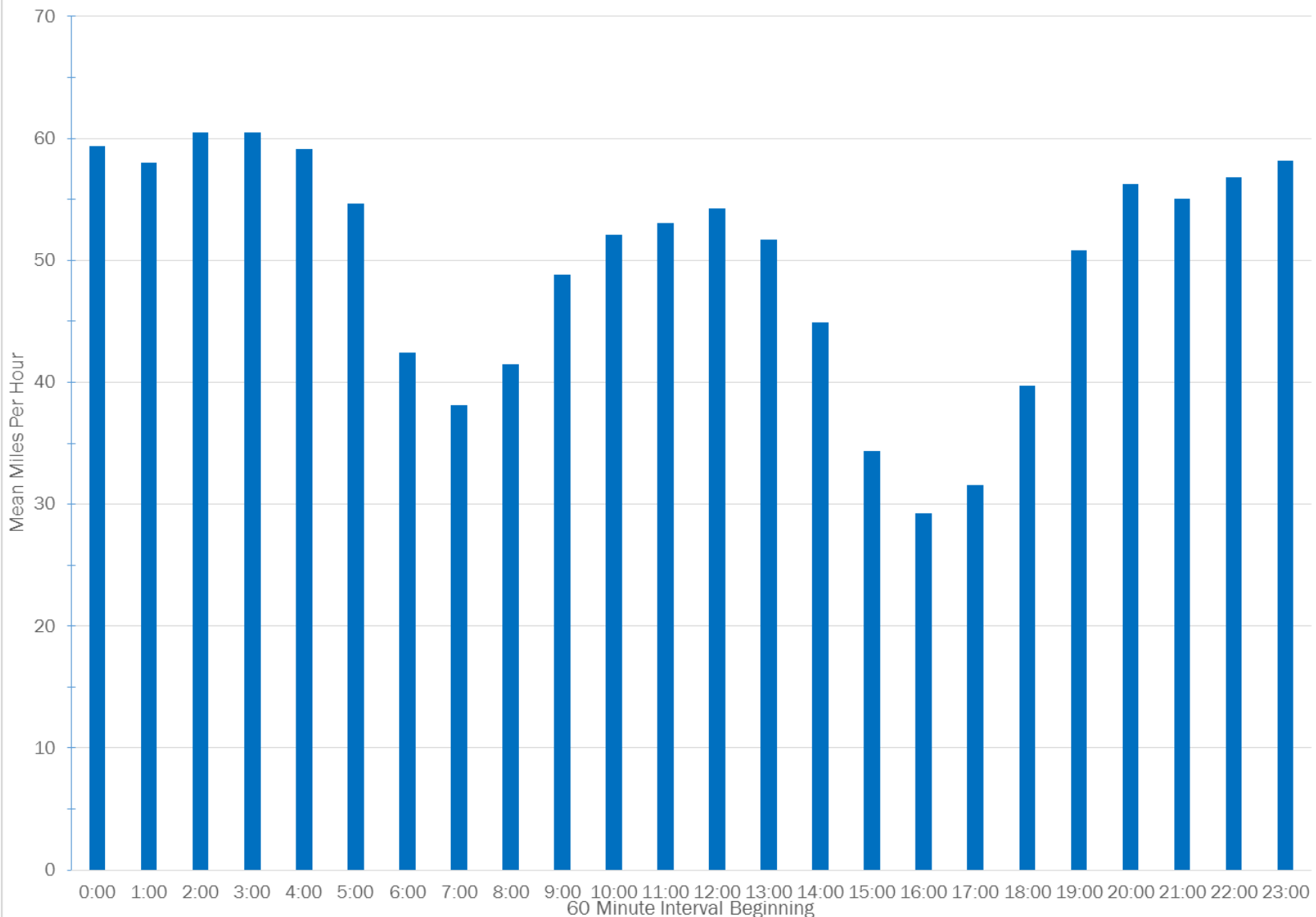


RESULTS: OBSERVED TRUCK SPEEDS AND TRAVEL TIMES

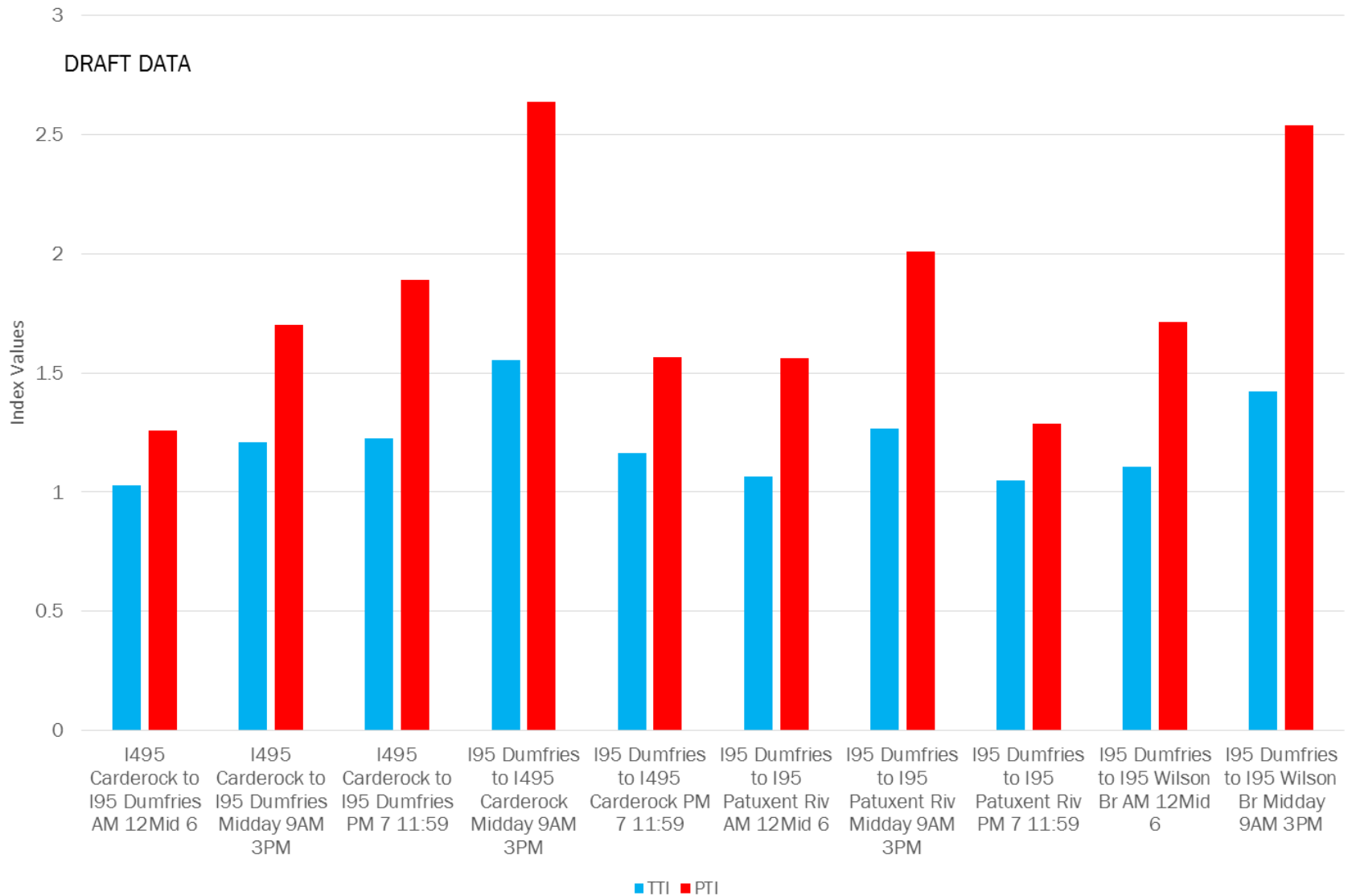


DRAFT DATA

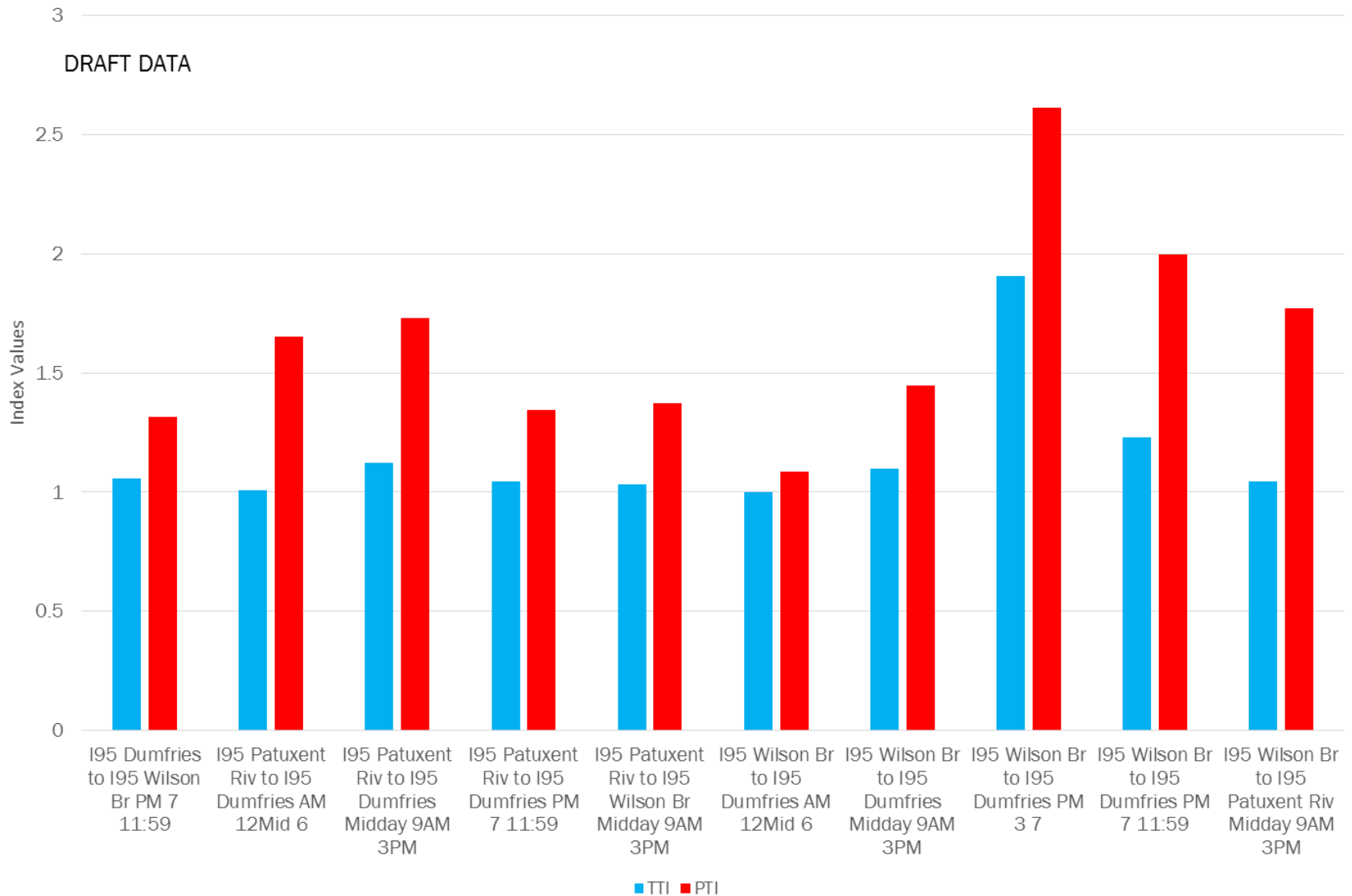
Weekday Region-wide Arithmetic Mean Truck Speeds by Hour



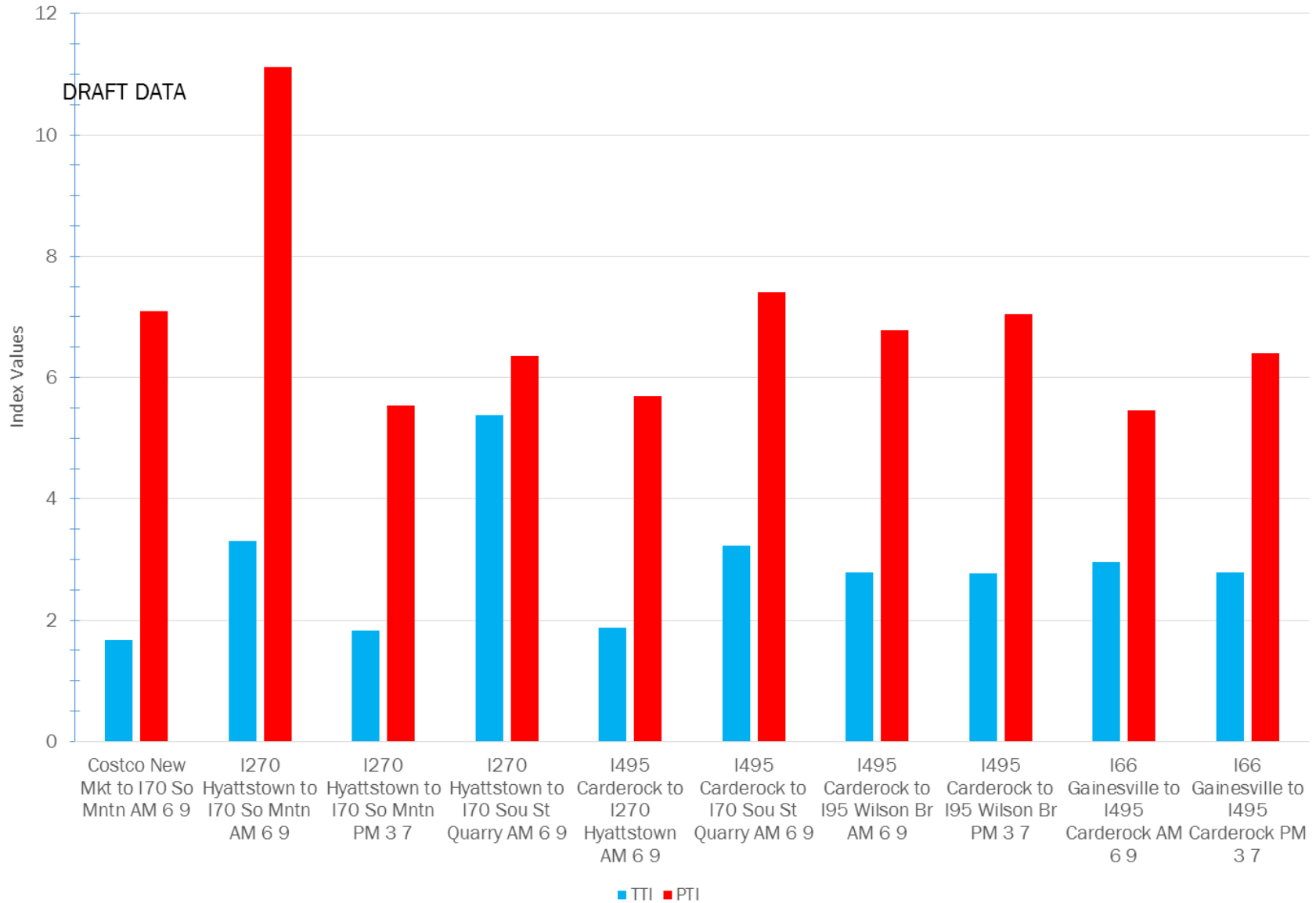
Truck Travel Time Index and Planning Time Index for routes with the highest number of input records (1 of 2)



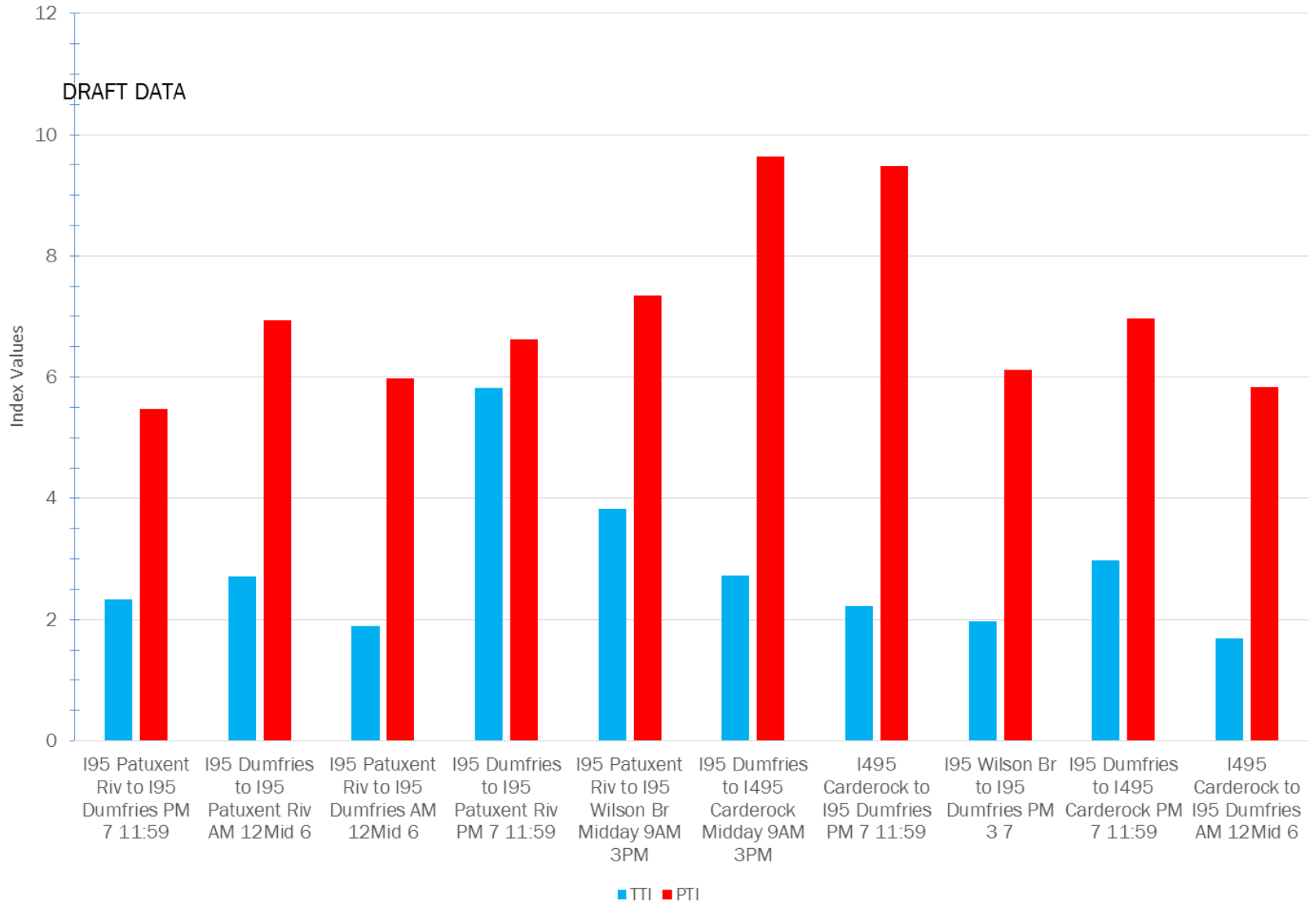
Truck Travel Time Index and Planning Time Index for routes with the highest number of input records (2 of 2)



Truck Travel Time Index and Planning Time Index 20 Highest PTI values (1 of 2)



Truck Travel Time Index and Planning Time Index 20 Highest PTI values (2 of 2)



Conclusions

- Truck speeds, travel time index and planning time index vary by time of day, much like other highway traffic
- This is an approach appears to be a viable and relatively low-cost way to assess the speeds of truck traffic in the region, and it may inform the truck models development process
- Project could be repeated on a larger scale, perhaps in cooperation with neighboring regions, though it is possible that truck-only vehicle probe data will be even less expensive and easier to obtain in the future



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