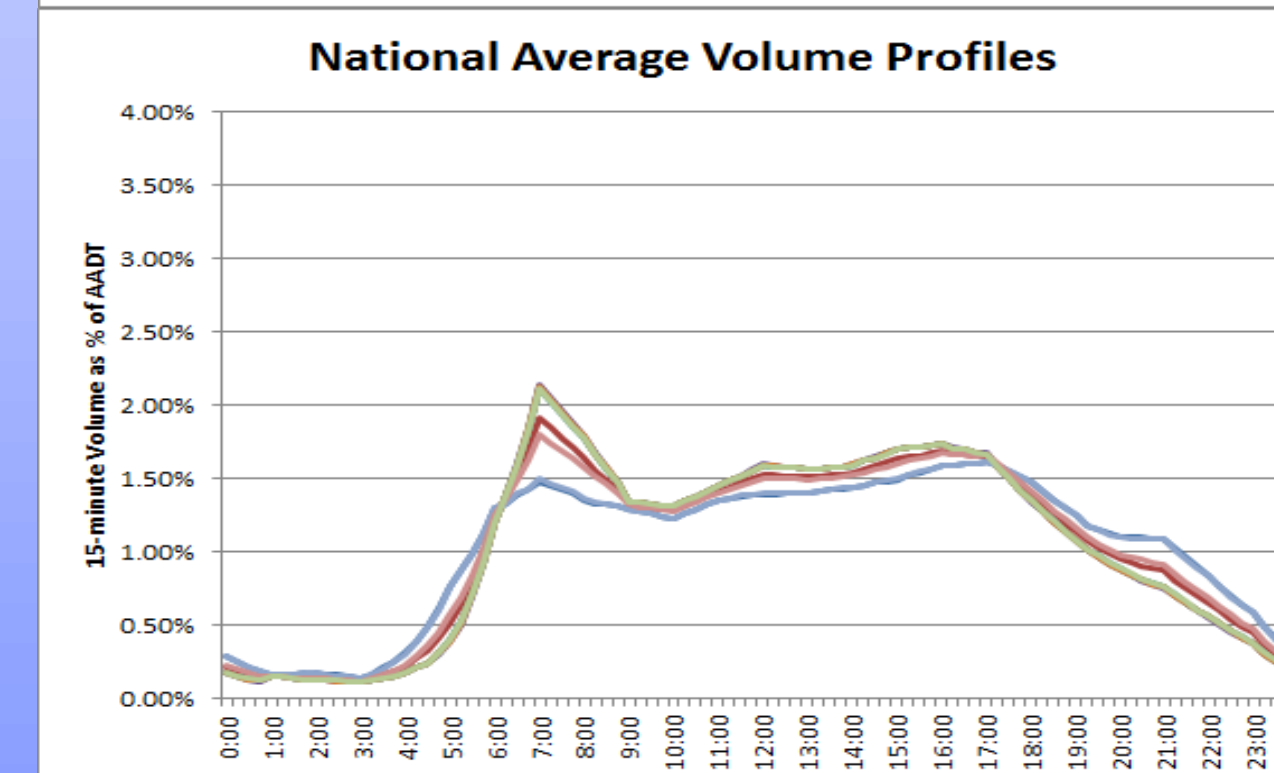
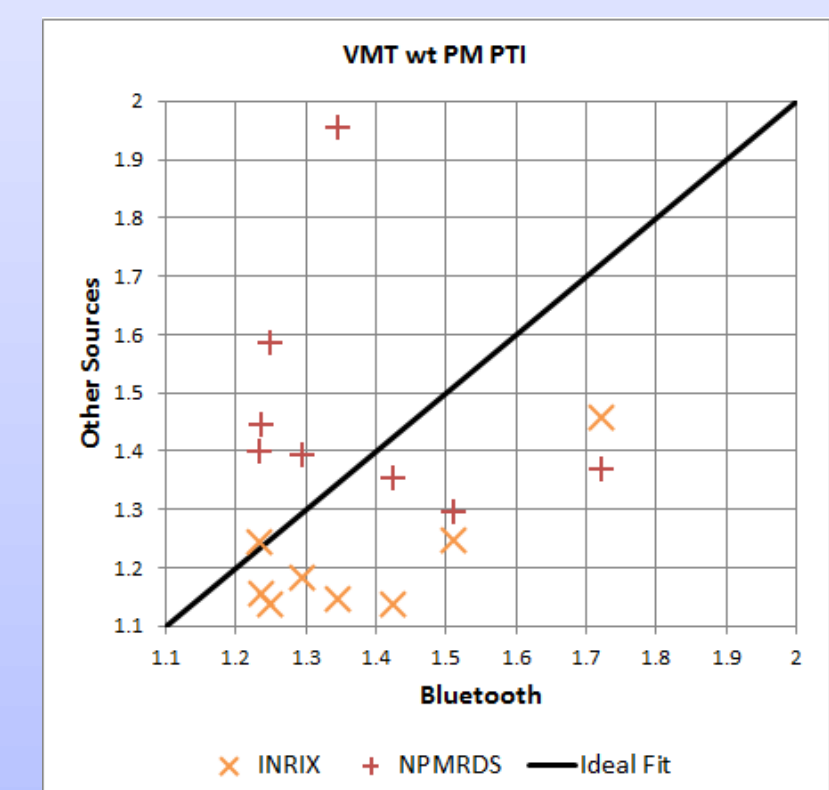
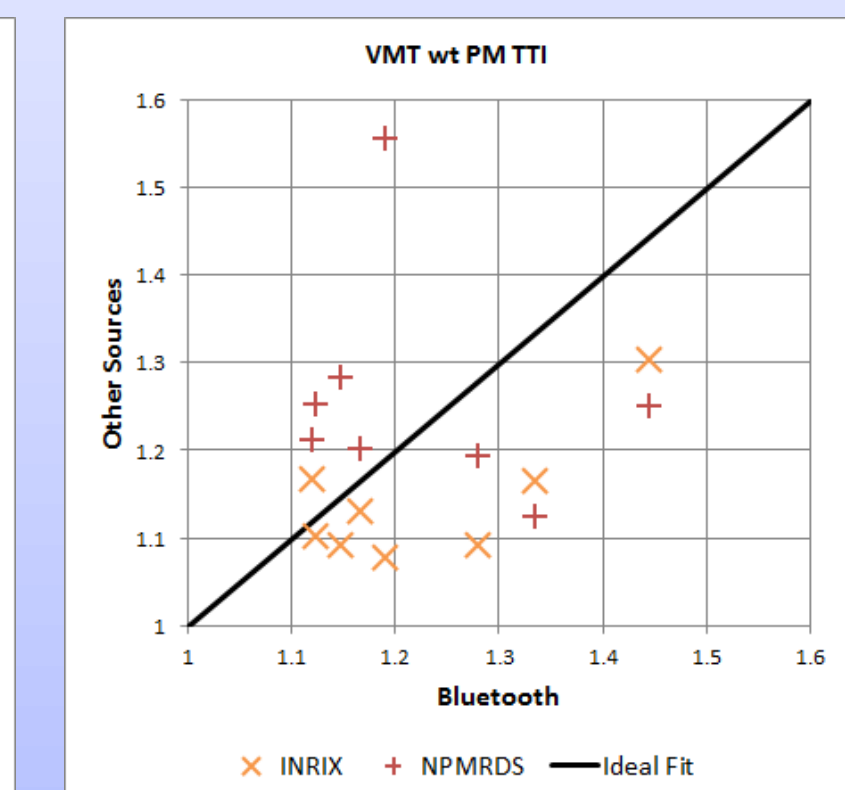
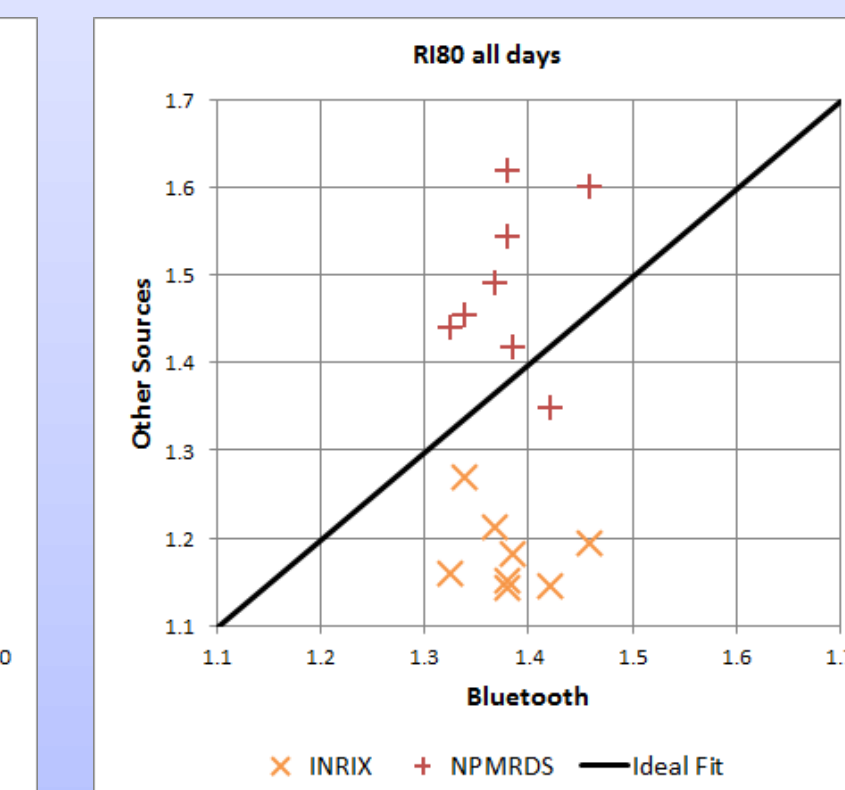
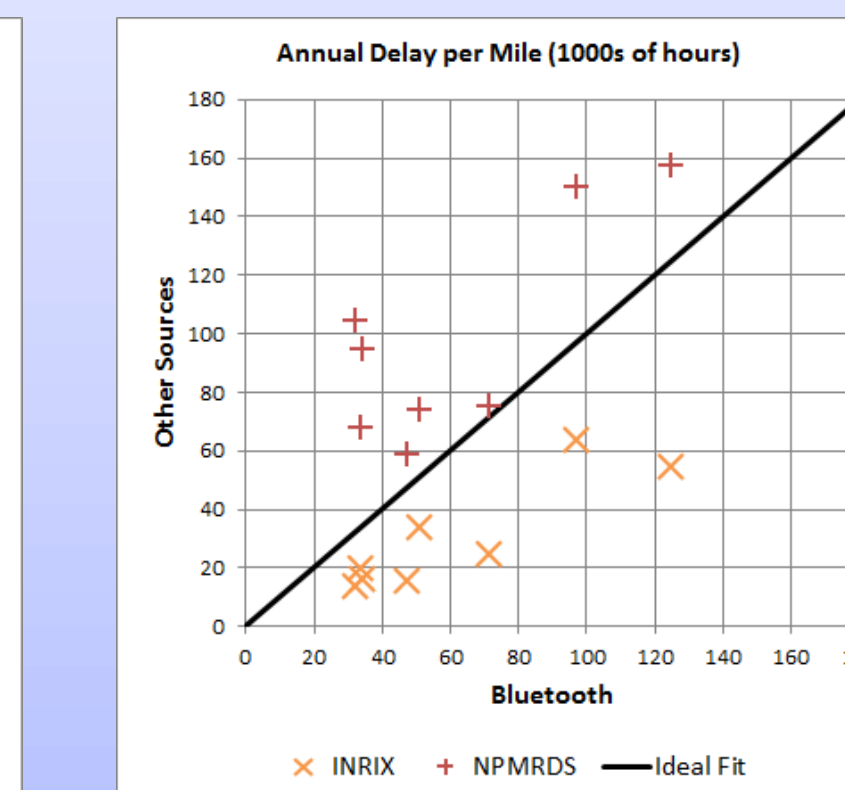
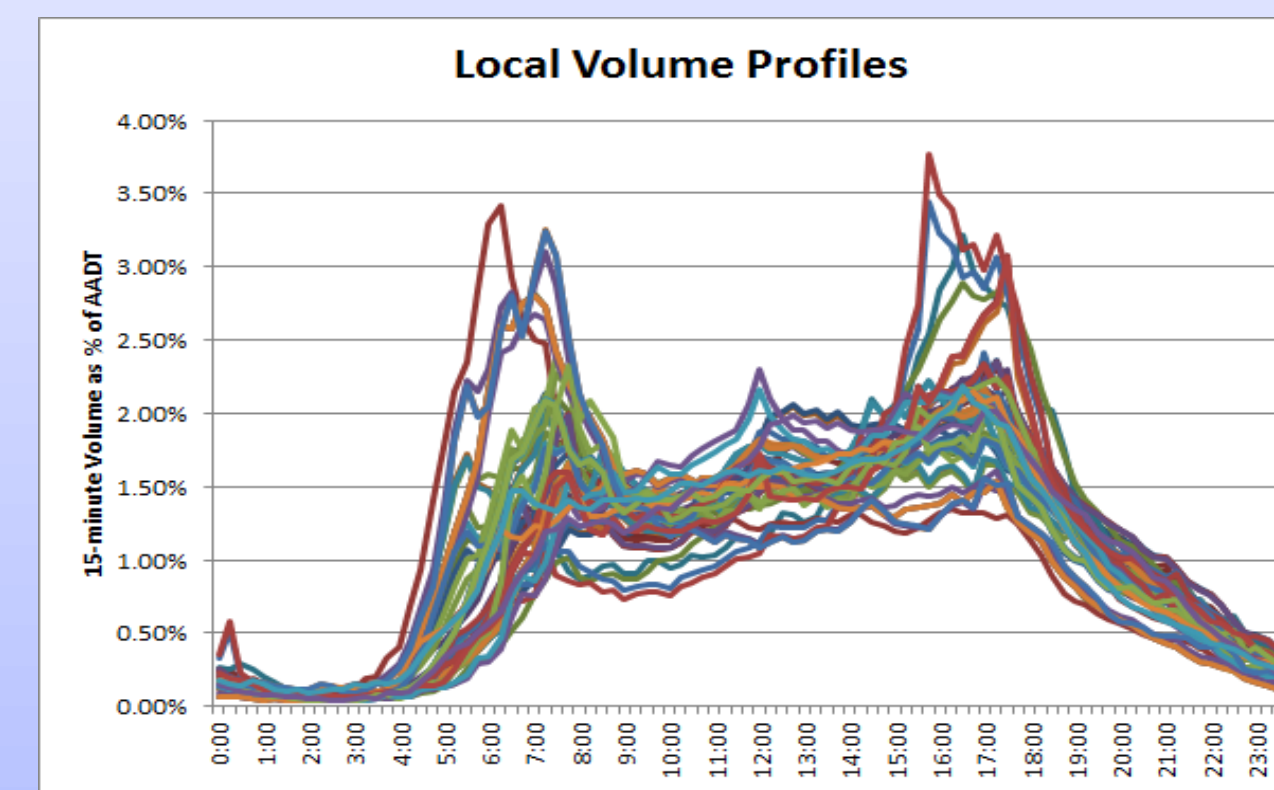
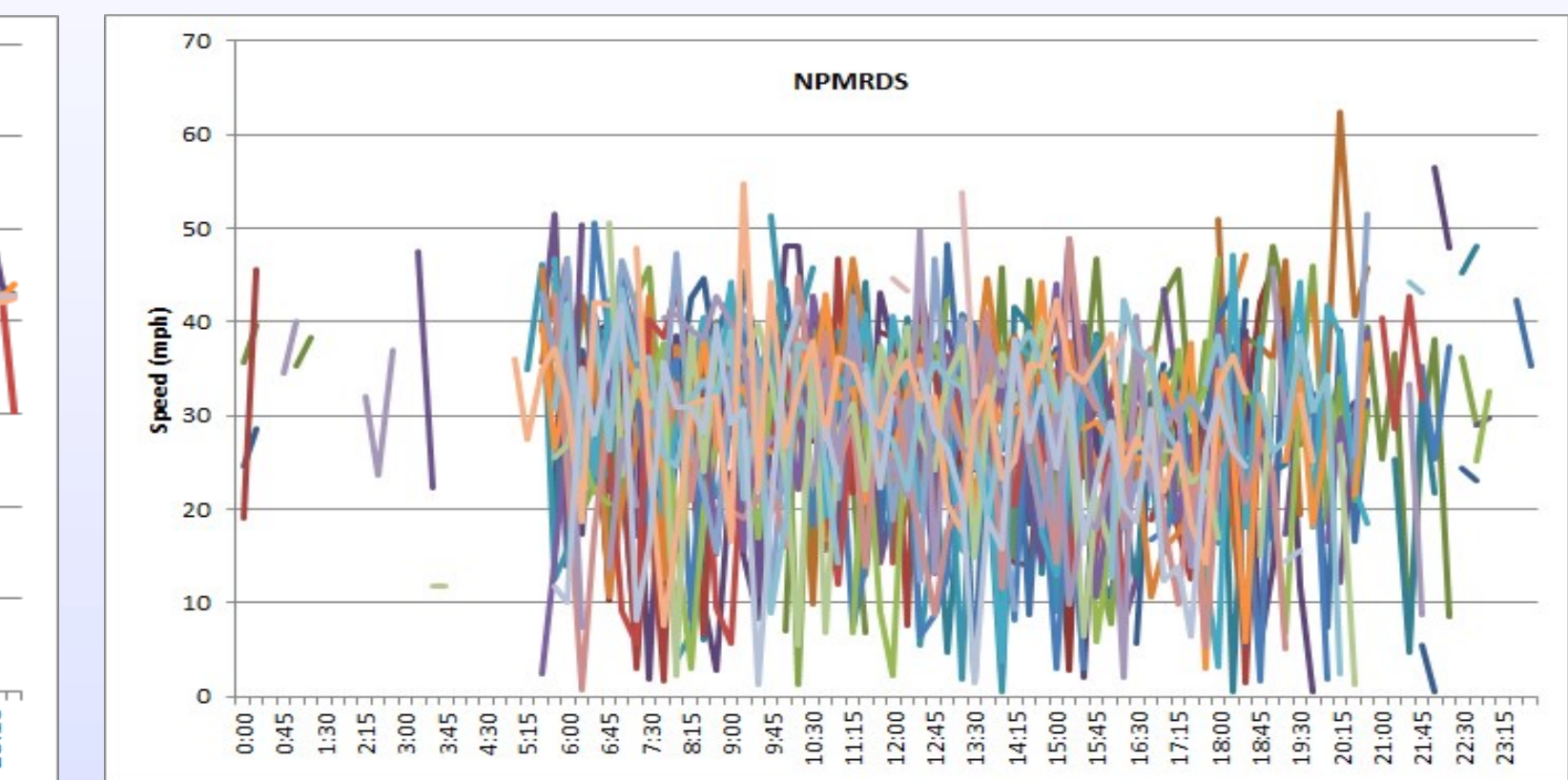
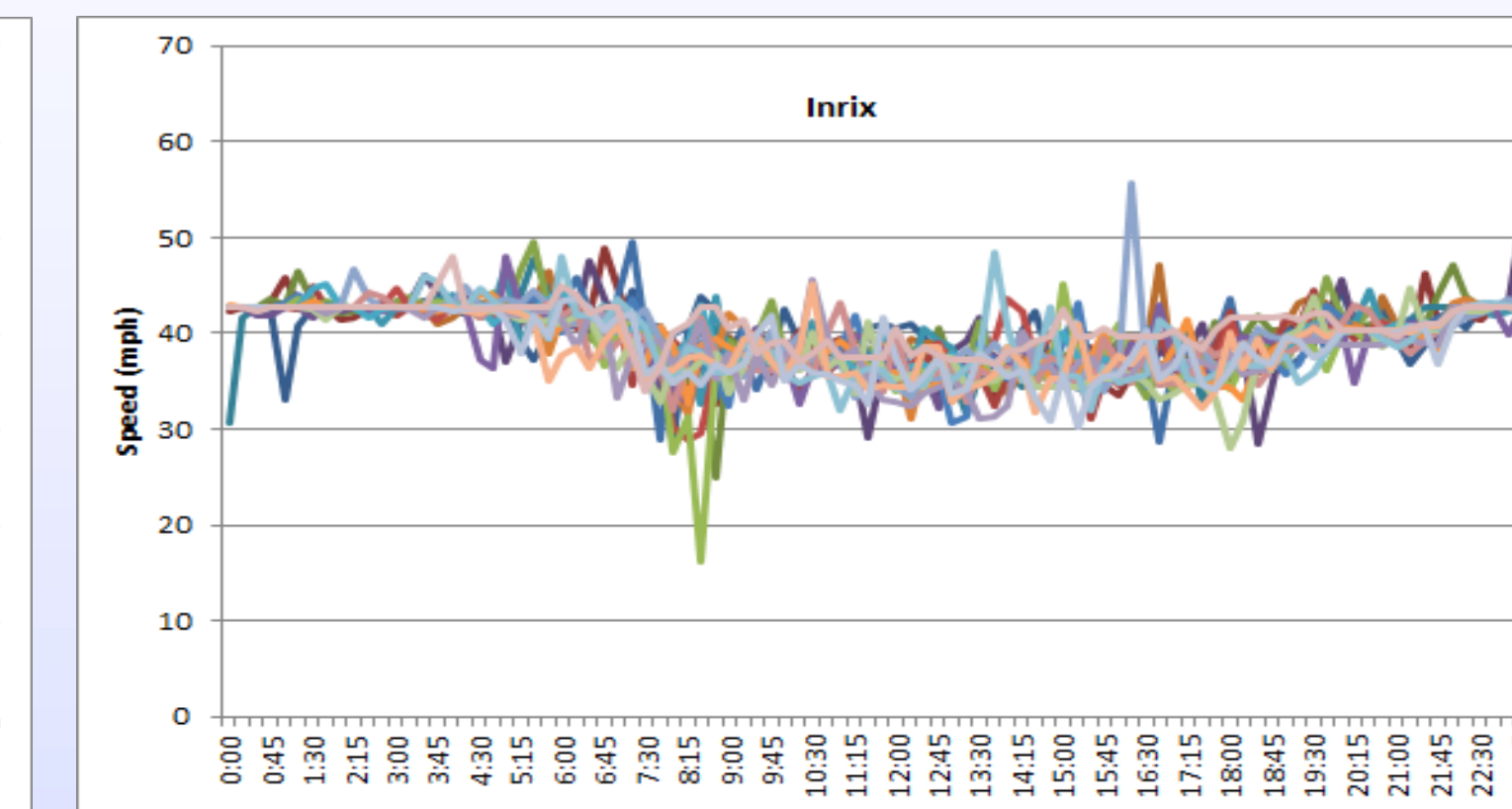
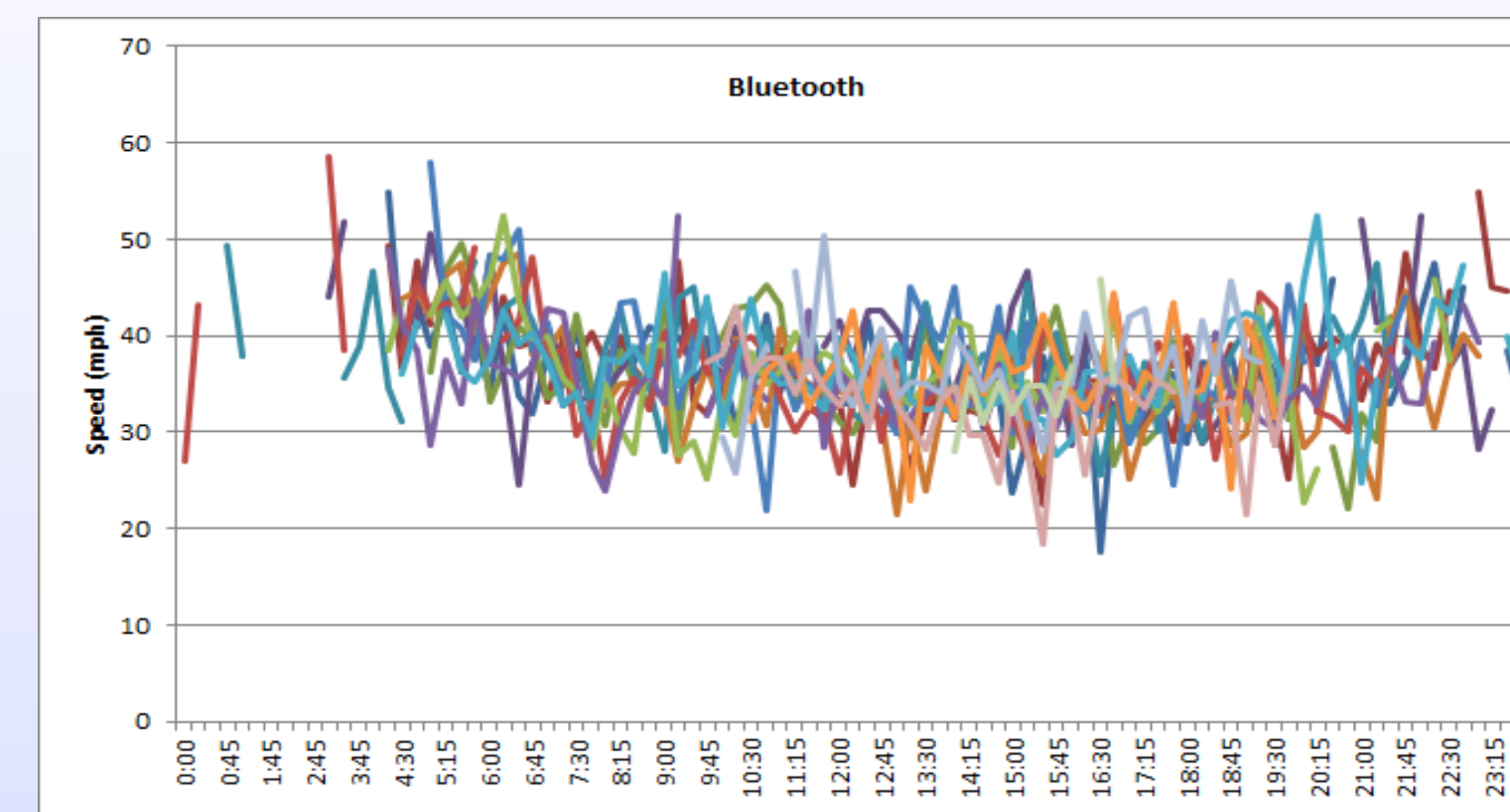
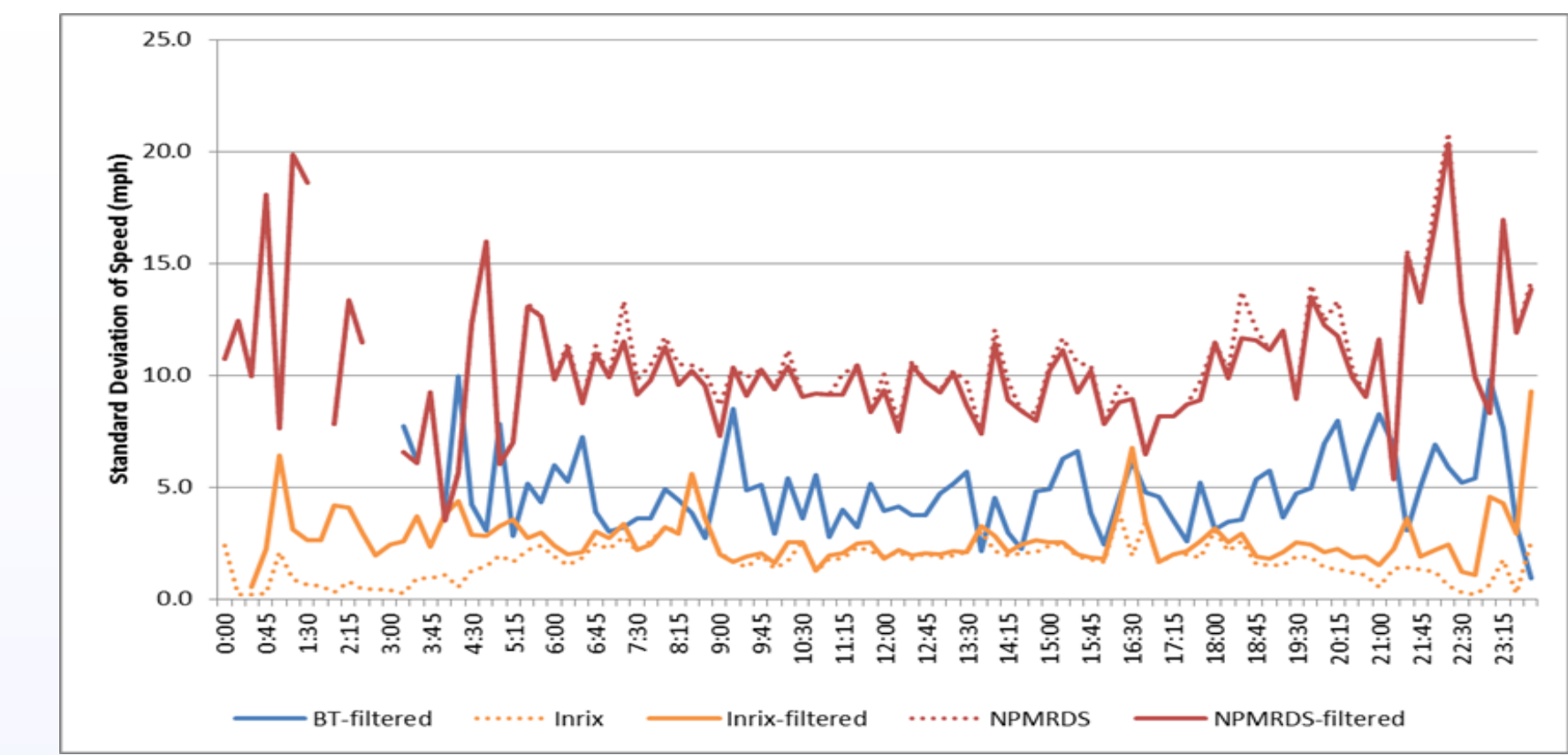
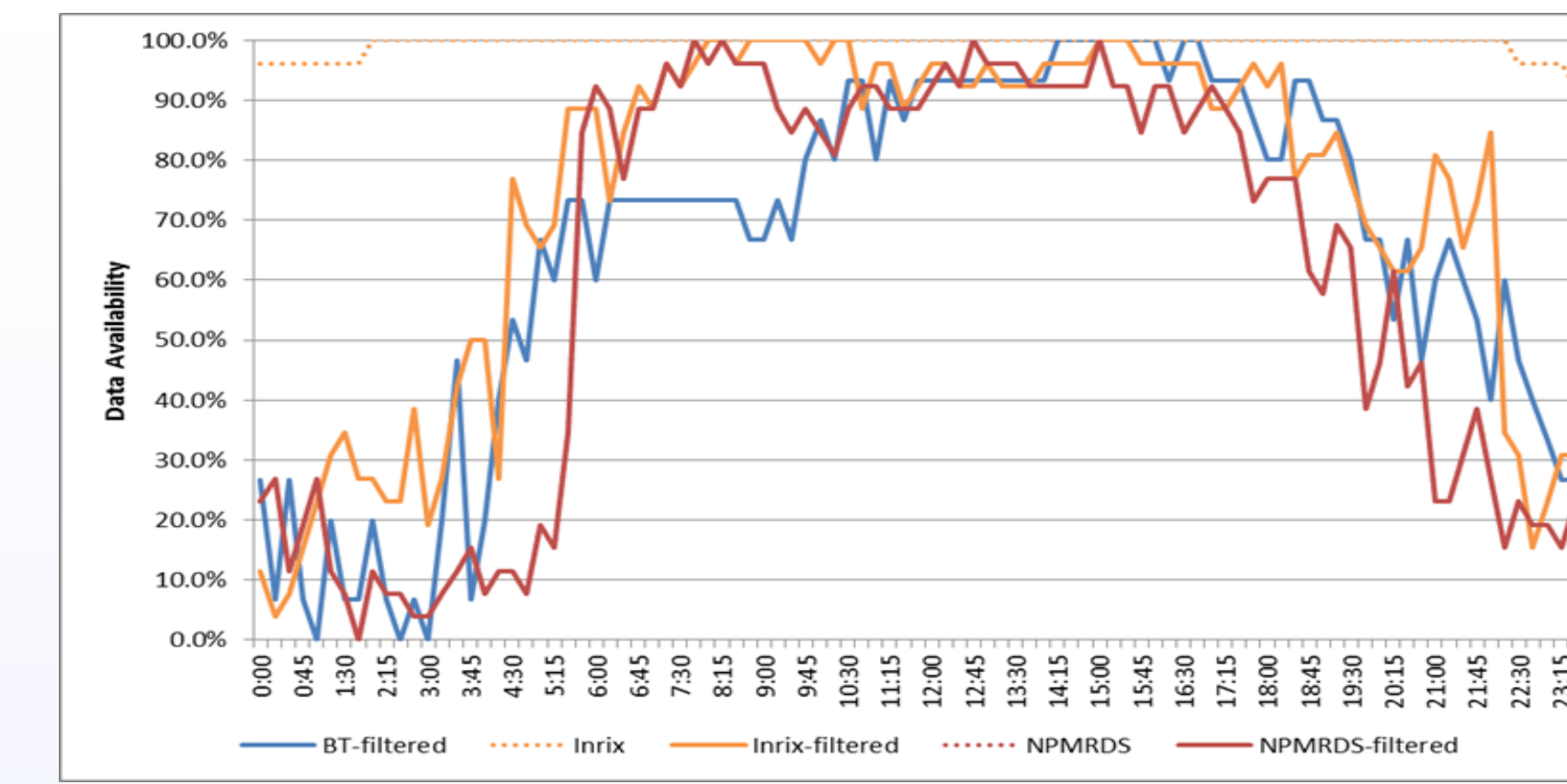
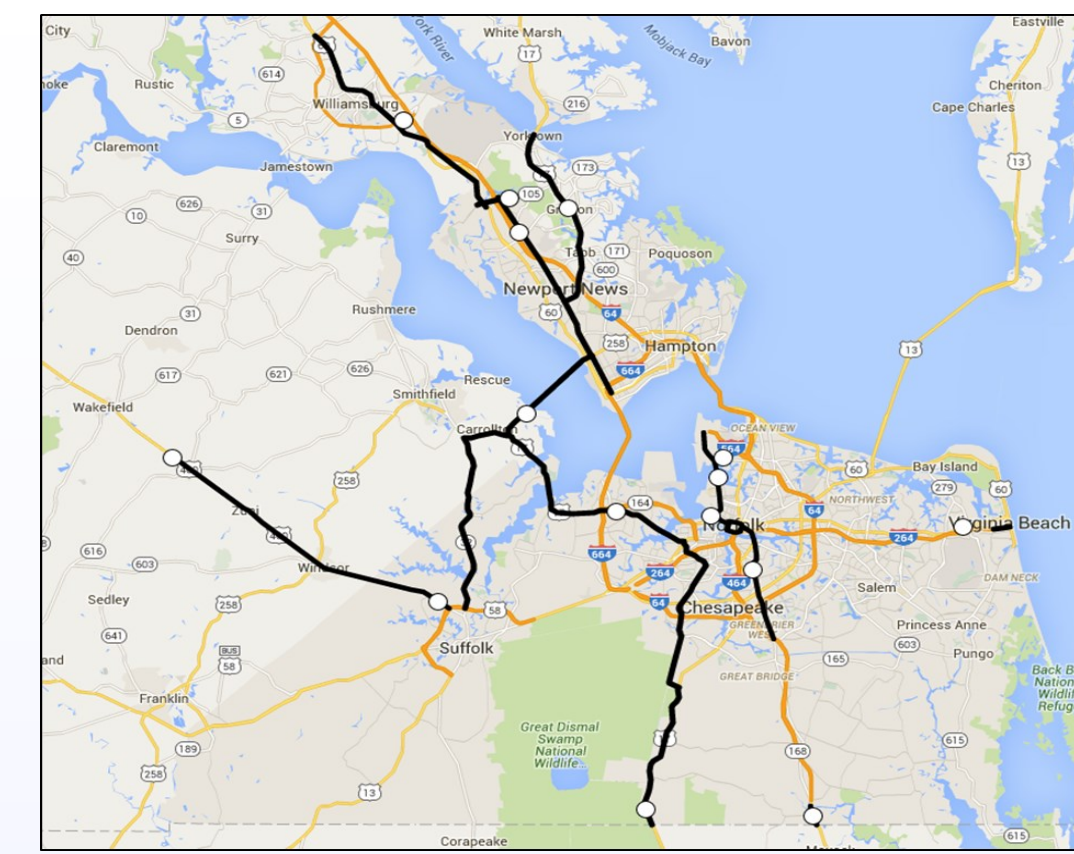
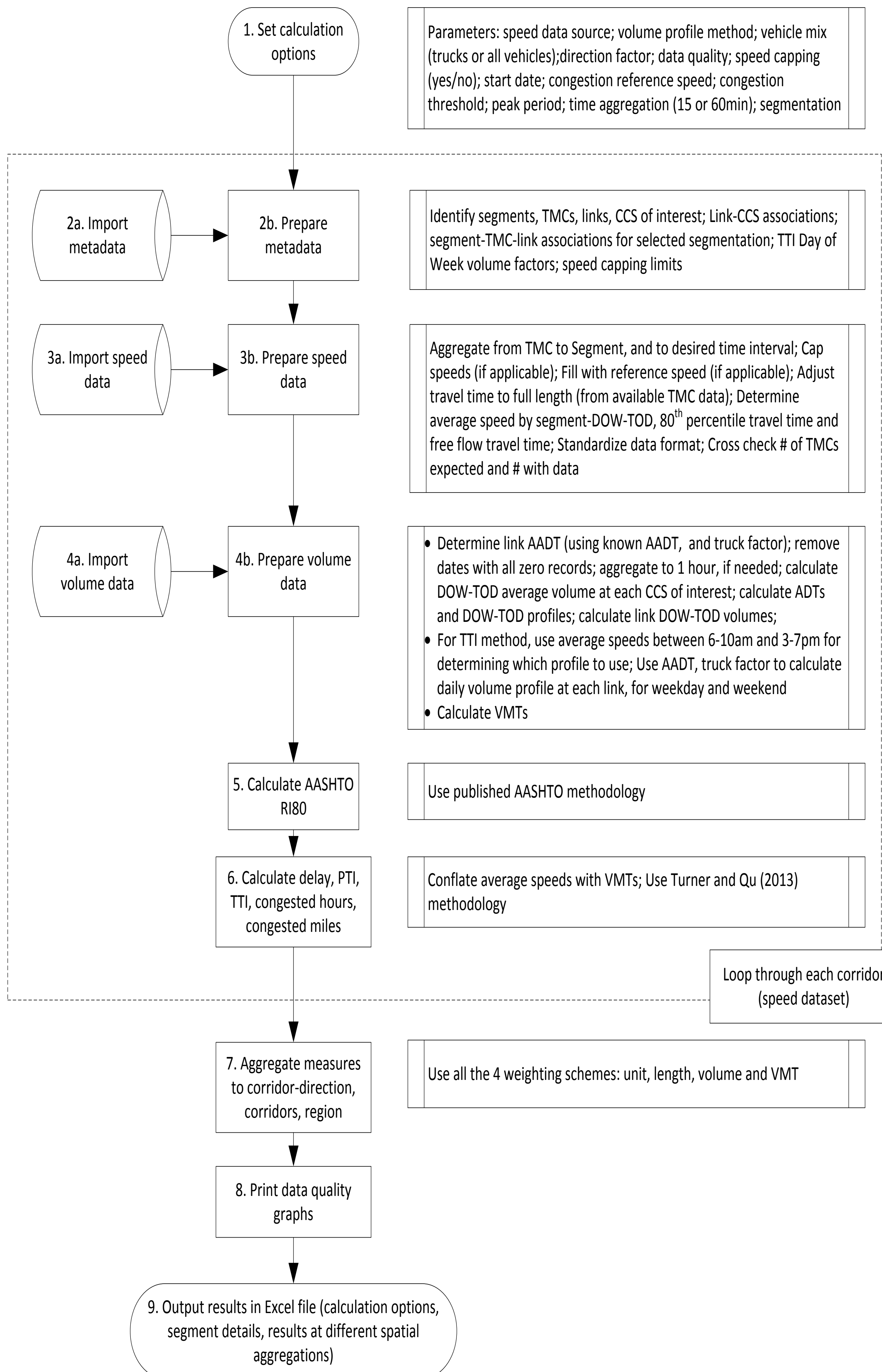


Factors Affecting Calculation of Arterial System Performance Measures: Case Study from Virginia

Ramkumar Venkatanarayana, Ph.D.

Introduction and Methodology

Calculating system performance measures involves several parameters, options and factors, such as time aggregation, segmentation, weighting schemes. This study investigated their impacts, using a 288-mile NHS arterial network in Southeast Virginia. Measures studied: Delay per mile, AASHTO Reliability Index (RI80), TTI, PTI, Congested miles and hours.



| | LTS as Congestion Reference | | | | PSL as Congestion Reference | | | |
|-------------------|-----------------------------|--------------|----------------|--------------|-----------------------------|---------------|---------------|---------------|
| | Delay per Mile | AASHTO RI | TTI | PTI | Delay per Mile | AASHTO RI | TTI | PTI |
| INRIX (both) | 49-53% lower | 12-14% lower | 1.5-6.5% lower | 6-12% lower | 56% lower | 23-24% lower | 12-18% lower | 17-23% lower |
| NPMRDS | 155% higher | 6-8% higher | 13-20% higher | 4-18% higher | 125% higher | 25-27% higher | 35-44% higher | 23-41% higher |
| NPMRDS (filtered) | 49% higher | 8-10% higher | 3-9% higher | 5-16% higher | 68% higher | 25-27% higher | 20-27% higher | 22-35% higher |

Key Results

- NPMRDS variability is high, and needs filtering.
- All indices are highly correlated and robust. None of the studied parameters and options impacted the indices more than 3%.
- Volume profile methodologies and peak period definitions impact the peak period VMTs.
- Volume profiles and large spatial segments impacted delays by more than 10%.
- Truck definitions (Class 5/6 and above), temporal aggregation, small spatial segmentation changes hardly impacted delay (except a 12% decrease in NPMRDS delay for temporal aggregation).

Key Recommendations

- Use local volume profiles for delays, TMCs as segments, 1-hour aggregation.
- Monitor congested miles and hours together.
- Try length, volume, VMT weights; different peak period definitions; and both Posted Speed Limits and Daytime Light Traffic Speed as references.
- Need more ground truth evaluation, experience. Punitive targets are not beneficial now.

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