Item #7

Status Report: Ongoing review of O-D cellular data for the TPB modeled area

Presentation to the Travel Forecasting Subcommittee
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airsage
The power of where and when

Recap:

- TPB staff has been analyzing Origin-Destination (O-D) flows derived from mobile phones and other cellular devices:
  - Provided at the 3,722 TAZ level
  - Aggregate, but segmented by purpose & resident status
  - Weekday movements obtained during April 2014

- Purpose: To update the non-resident forecasting procedures in the TPB's travel forecasting model
  - External/through trips
  - Internal non-resident trips (visitors, non-resident students, business travelers, non-resident commuters)

Data product features:

- Provided by AirSage (AS)
- Reflects “data mining” of two major wireless communications providers
- Trip O-Ds, purposes and resident categories are *inferred* using proprietary analytics:
  - statistical analysis of space/time positions of the device during the study period

Key concerns and lessons learned

- Mode & trip linking aspects of O-Ds are *unknown*
- O-D data correlates better with land activity at *higher* levels of aggregation
- AS trips match modeled trips in total, but *not* by purpose
- AS Extl. & through trips do not agree with counts*:*
  - O-Ds crossing the external cordon do not agree with counts, particularly in the Baltimore area
  - O-D crossings from I-70 west are excessively low
- Internal non-resident O-Ds appear reasonable

Current developments:

- Staff has asked AS to reformulate the O-D data using reconfigured external travel sheds
  - External sheds have been aggregated before
- New dataset was transmitted on Jan. 19
- Improvement is noted

- **Updated external shed areas are shown as dashed lines**
- **Previous sheds shown as light solid lines**

- In comparison with the previous are area sheds, the updated sheds are:

  1. More aggregated (particularly in the Baltimore area)
  2. County oriented in comparison with the previous are sheds
  3. In some cases, more expansive

Overview of AS dataset differences

(Previous/August dataset vs. the updated/January dataset)

Unweighted trip observations:

- The aggregated external sheds result in fewer extl. & thu O-D records ☺
- Internal (I-I) trip records increase marginally 😐

Weighted trip observations:

- Overall total is about the same while shifting occurs between trip movements
- Substantial increase in external trips (mostly prevalent in the Baltimore external) ☺

UNWEIGHTED Trips by SubClass and Movement Type

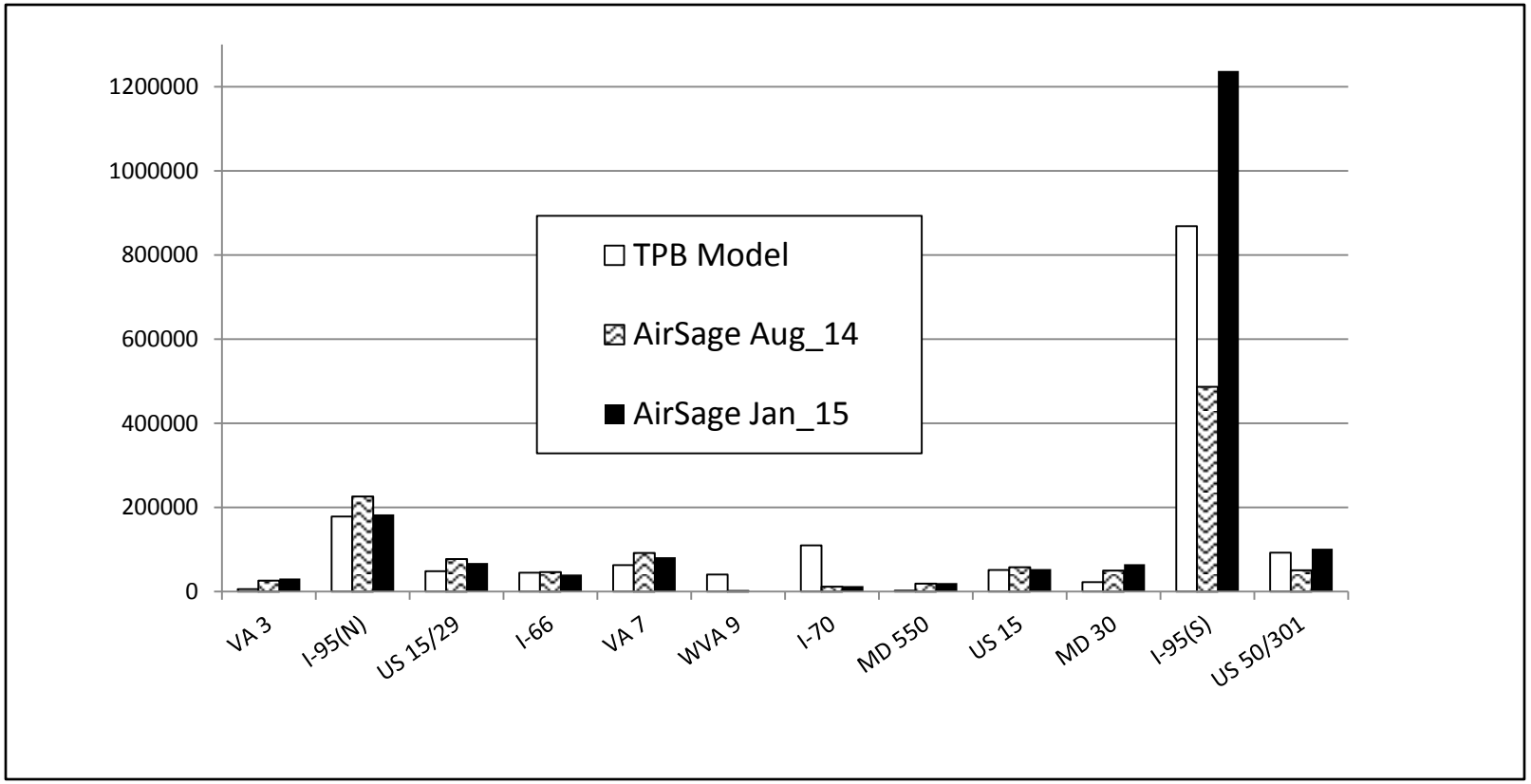
Dataset	II	IE	EI	EE	ALL
August	5,065,013	100,210	97,779	11,001	5,274,003
January	5,098,585	86,955	83,995	4,556	5,274,091
Diff. (J-A)	33,572	-13,255	-13,784	-6,445	88
Pct.Diff	0.7%	-13.2%	-14.1%	-58.6%	0.0%

WEIGHTED Trips by SubClass and Movement Type

Dataset	II	IE	EI	EE	ALL
August	20,357,675	526,466	534,813	42,216	21,461,170
January	19,844,743	907,024	913,143	38,685	21,703,594
Diff. (J-A)	-512,932	380,558	378,330	-3,531	242,424
Pct.Diff	-2.5%	72.3%	70.7%	-8.4%	1.1%

2014 trip crossings at external cordon

TPB model versus AirSage datasets



Conclusions

- We have learned that the design of external travel shed areas substantially affects AS trip movements
- The aggregated external sheds appear to produce improved matches with ground counts, particularly in the Baltimore area
- Staff notes a persistent underestimation of external crossings at external stations near WVA
- A more detailed look at changes between datasets by resident status and trip purpose is needed
- Work is planned to continue