

# OVERVIEW OF MODEL VALIDATION RESULTS

Expert Peer Panel Meeting  
September 23 & 24, 2004



# Model Enhancements

- New Base Year of 2000
- 2000 Demographic Data
- 2000 Transportation Analysis Zone (TAZ) Structure
- Transportation Networks in GIS
- Improvements to Model Code
- New Truck and Commercial Vehicle Model
- Equilibrium Assignment Methodology



# Model Enhancements (Continued)

- Network Speed and Capacity Updates
- Drive Access to Transit Trips in Assignment
- BWI Special Generator Update
- Addition of Home-Based Other (HBO), Home-Based School (HBSch), and Work-Based Other (WBO) to Distribution Feedback Loop
- Revised Barrier Penalties
- Mode Choice for I-X/X-I trips



# Trip Generation Results

Measure	1996 Model (MC96)	2000 Model (TR00)	Guideline/ Comment
Average Baltimore Region TAZ Size	2.52 sq miles	1.94 sq miles	
Intrazonal Trips	677,500	707,200	
Percent Intrazonal Trips	8.6%	8.2%	Percentage has decreased due to adding TAZs
Baltimore Region Person Trips	7,837,000	8,558,000	Motorized production trips
Model Region Person Trips	16,076,000	17,033,000	Motorized production trips
Baltimore Region Truck and Commercial Vehicle Trips	565,000	1,022,000	Vehicle Trips



# Trip Generation Results (Continued)

Measure		1996 Model (MC96)	2000 Model (TR00)	Guideline/ Comment
Truck and Commercial Vehicle Trip Percentage		7.2%	11.9%	
Person Trips/TAZ		7,729	7,435	Less than 10,000
Production/Attraction Ratio		0.96	0.92	0.90 to 1.10; Excludes WBO and OBO Trips
Person Trips/ HH	HBW	1.74	1.75	1.7 to 2.3 (Other studies, not statistical)
	HBNW	3.96	3.98	3.5 to 4.8
	NHB	2.10	2.13	1.7 to 2.9
	All non-truck trip types	7.57	7.85	National Average = 8.5
Non-truck Vehicle Trips Per Household		5.50	6.50	National Average = 6.9



# Trip Distribution Results

Measure		1996 Model (MC96)	2000 Model (TR00)	Guideline/ Comment	
Average Trip Length By Purpose (Minutes)	HBW	27.15	26.39	1993 HH Travel Survey	26.66
	HBSH	11.69	11.48		11.18
	HBO	12.07	12.24		13.54
	HBSch	10.25	10.22		12.15
	WBO	12.69	12.37		15.55
	OBO	12.16	12.37		12.67
	CV	N/A	15.74	N/A - Not in Household Travel Survey and 1996 Model	
	MT	16.55	16.91	N/A - Not in Household Travel Survey	
	HT	21.04	34.78		
	All Trips	15.41	15.74	Total is for Non-Truck/CV Purposes only; No survey data available for Truck or CV	



# Mode Choice Results

Measure		1996 Model (MC96)	2000 Model (TR00)	Guideline/ Comment	
Auto Occupancy	HBW	1.1	1.1	1993 Household Travel Survey: No carpooling assumed for Truck or Commercial Vehicle Trip Purposes	1.11
	HBSH	1.28	1.27		1.26
	HBO	1.41	1.39		1.42
	HBSch	1.84	1.76		1.78
	WBO	1.13	1.12		1.21
	OBO	1.31	1.31		1.32
Total Transit Trips (Linked)		205,600	232,400	Estimate for MTA and Local Bus $\approx$ 216,100	
MTA Total Transit Trips (Boardings)		378,300	403,500	2001 MTA Boardings $\approx$ 326,500	
Local Bus Total Transit Trips (Boardings)		3,600	3,100	Local Bus Total for Howard, Harford, and Anne Arundel Counties $\approx$ 4,300	
Transit Ridership Percentage (Non-Truck)		2.83%	3.08%		



# Trip Assignment Results

Measure	1996 Model (MC96)	2000 Model (TR00)	Guideline/Comment
HPMS Comparison to Simulated VMT (SHA Total – Local)	In Millions Model = 49.8 HPMS = 55.6	In Millions Model = 52.1 HPMS = 60.8	± 5% error on overall regional VMT Baltimore City HPMS VMT is overestimated
R <sup>2</sup> For Baltimore Region	0.87	0.94	R <sup>2</sup> should be higher than 0.88;
% RMSE For All Screenline Locations	43%	30%	
% RMSE For Truck Assignment	HT = 394% MT = 138%	HT = 36% MT = 32%	
% RMSE For Commercial Vehicle Assignment	N/A	CV = 23%	No CV in 1996 Model
% RMSE For Overall Vehicle Assignment	43%	37%	

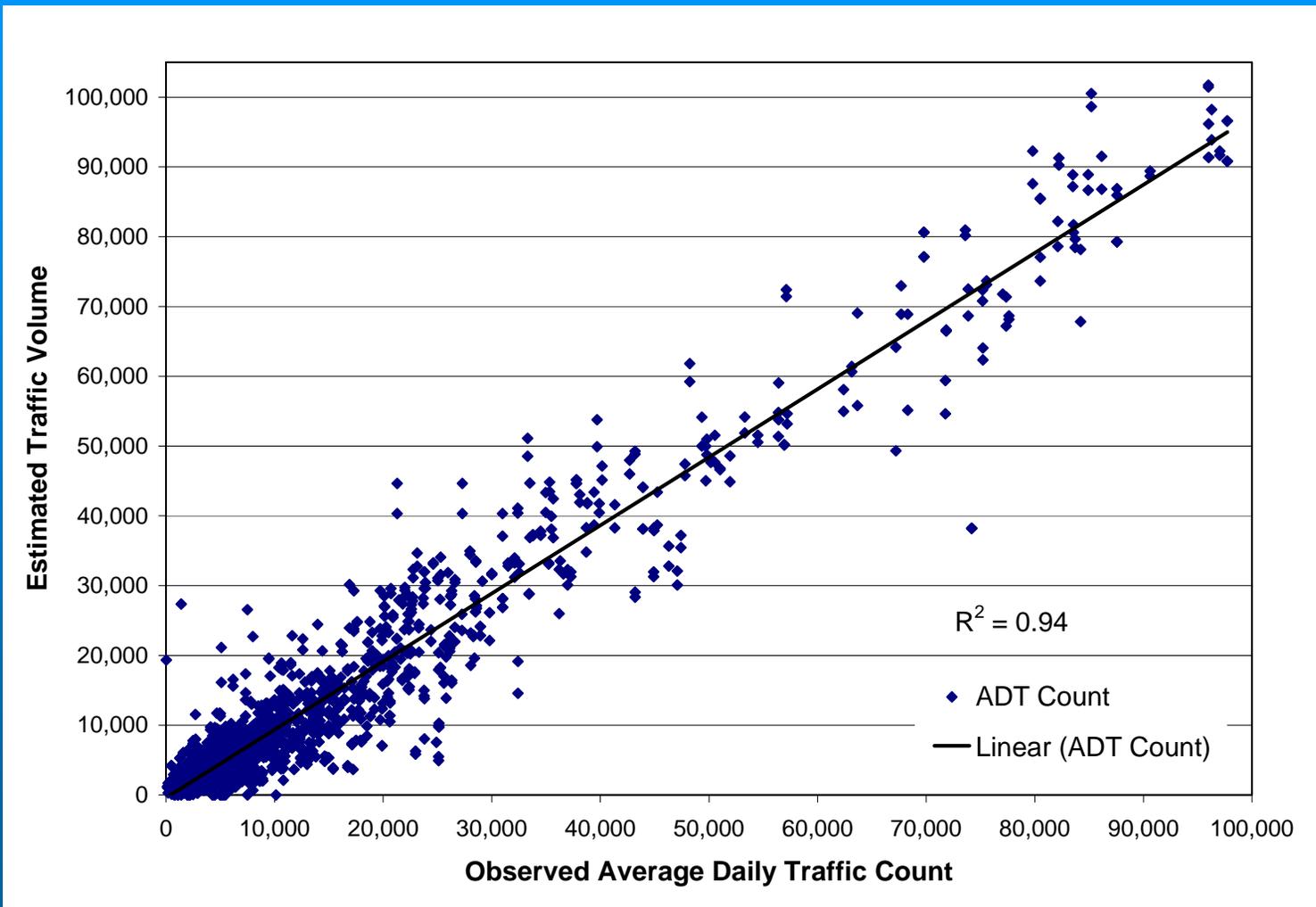


# Trip Assignment Results (Continued)

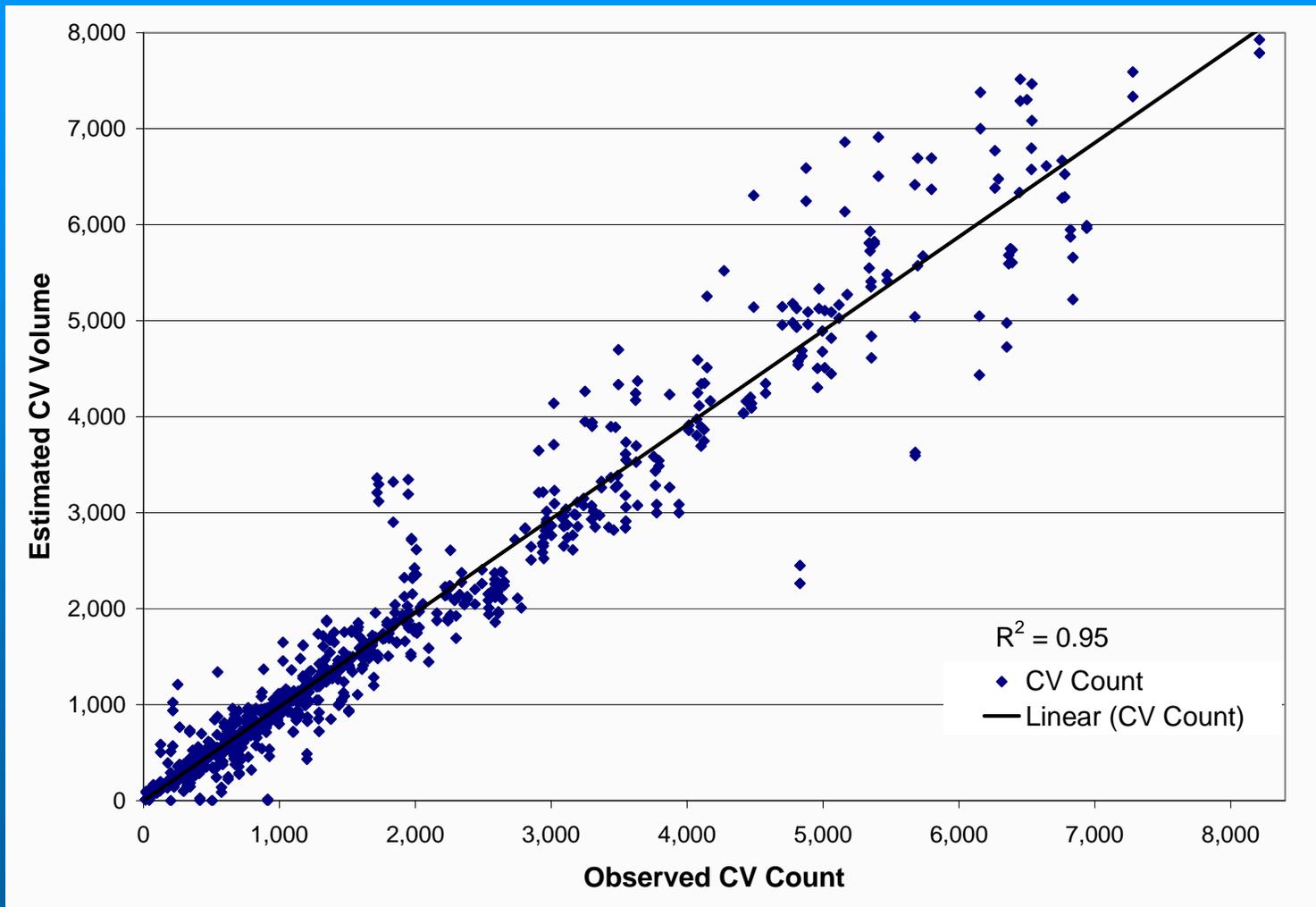
Facility Type	Screenline Total (in thousands)			All Count Total (in thousands)			Guide- line
	Model	Observed	% Error	Model	Observed	% Error	
Freeway	6,235	6,245	-0.20%	23,352	23,384	-0.10%	< 7 %
Principal Arterial	3,356	3,562	-5.80%	7,623	8,457	-9.90%	< 10 %
Minor Arterial	1,217	1,526	-20.30%	3,068	3,659	-16.10%	< 15 %
Collector	370	487	-24.10%	973	1,207	-19.40%	< 25 %
<b>Grand Total</b>	<b>11,177</b>	<b>11,820</b>	<b>-5.40%</b>	<b>35,016</b>	<b>36,707</b>	<b>-4.60%</b>	<b>&lt; 7 %</b>



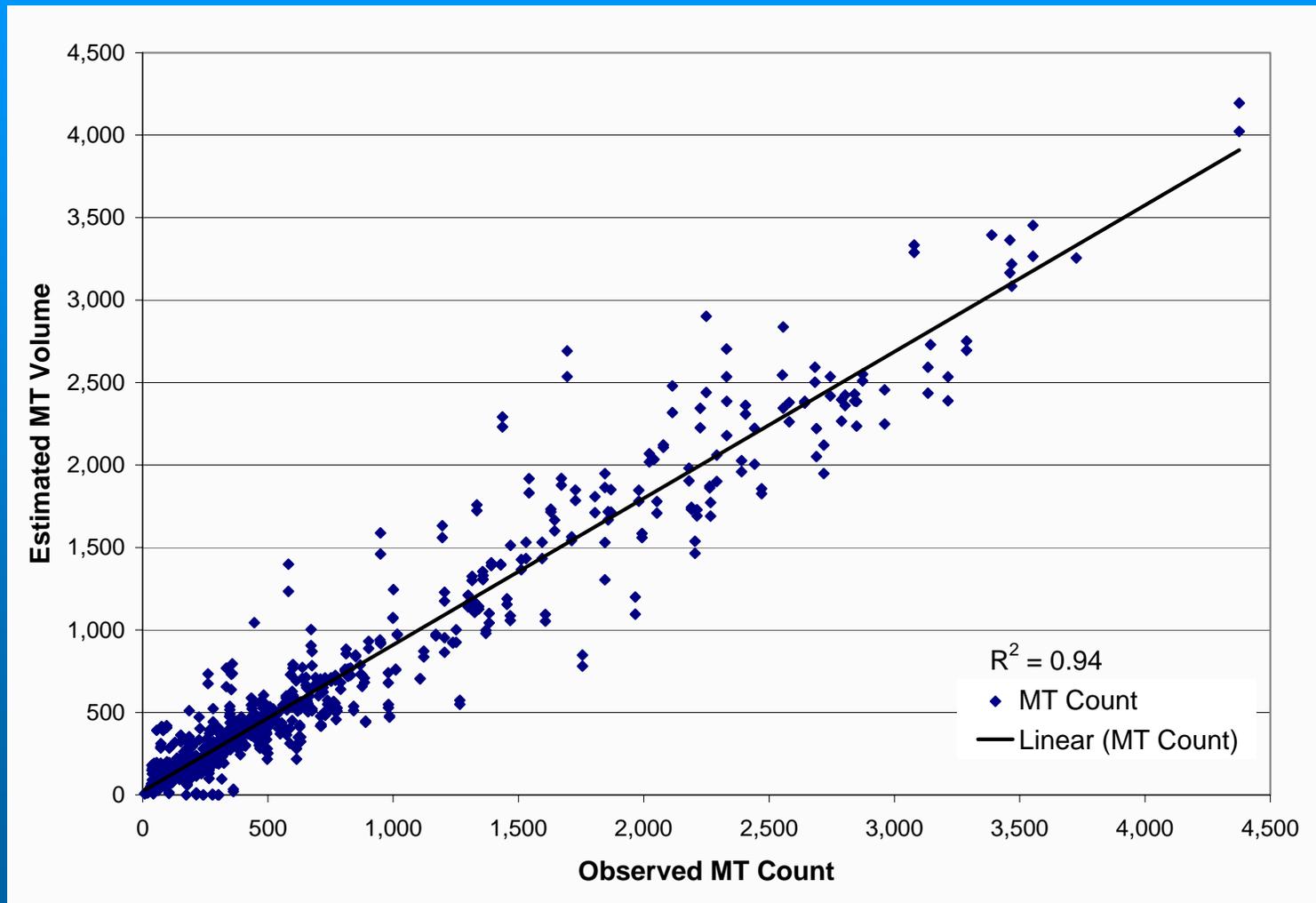
# Trip Assignment Scatter Plot— All Vehicles



# Trip Assignment Scatter Plot— Commercial Vehicles



# Trip Assignment Scatter Plot— Medium Trucks



# Trip Assignment Scatter Plot— Heavy Trucks

