Metropolitan Washington Council of Governments
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MEMORANDUM
May 7, 2004

To: TPB Technical Committee

From: Robert E. Griffiths, Technical Services Director, COG/TPB

Subject: Travel Model Employment Data Adjustment Factors

At the April 2, 2004 TPB Technical Committee meeting staff presented an analysis comparing recently released 2000 Census Transportation Planning Package (CTPP 2000) at-place worker tabulations with Cooperative Forecasting Round 6.4 Base Year Estimates for 2000 by jurisdiction. This analysis showed systematic jurisdictional differences in Round 6.4 base year employment estimates relative to the independently derived CTPP 2000 estimates. The primary reason for these systematic differences was that jurisdictions in the Baltimore region and several other Maryland jurisdictions use BEA-based employment data to develop their base year employment estimates and jurisdictions in the Washington region mostly used ESA-202 and decennial Census data to develop their base year employment estimates.

The systematic jurisdictional differences in base year 2000 employment estimates identified in this analysis were on the order of 20% or more. Staff explained that these differences arose primarily from the different data sources used and the way in which these different data sources defined and measured employment. Because these systematic differences could significantly skew the pattern of trip origins and destinations generated by the travel demand forecasting models used by the TPB, staff recommended that a technical adjustment be made to the employment data when running these transportation models. The members of the Technical Committee agreed that a technical adjustment to account for these systematic differences was needed, but asked staff to come back at the next meeting with a specific recommendation on how this technical adjustment should be made.

In last few weeks staff has refined the analysis and comparison of CTPP 2000 derived at-place employment estimates with Cooperative Forecasting Round 6.4 Base Year Estimates for 2000 and extended this analysis to all jurisdictions in the TPB modeled region. The refinement of this analysis included the use of jurisdiction-specific multiple-job holding rates derived from COG/TPB Household travel surveys and the addition of a number of jobs held per multiple job holder factor. (Tables 1 and 2). Based on this analysis, staff recommends that the CTPP-derived Travel Model Employment Data Adjustment Factors shown in Table 2 be used in running the regional travel demand forecasting model to account for systematic differences in the way employment is defined by the data sources used by different jurisdictions in developing their employment estimates and forecasts. This recommendation is made for the following reasons:

- The CTPP 2000 data provides a consistent, unbiased data source across all jurisdictions in DC, MD, VA, and WV.

- The CTPP 2000-derived employment data provides estimates of at-place employment for a common reference point in time (the week before the Census) and ensures an inherent consistency between base year population, household, worker and job estimates. All other employment data sources are subject to at least some level of double counting.

- The CTPP 2000-derived employment data, with the multiple job holding adjustment, provides a good estimate of self-employment and at home employment that is not available from wage and salary employment statistics, but is not subject to the potential overstatement of the number self-employed proprietors for a specific reference point that is inherent in the BEA methodology.

- On average, the CTPP 2000-derived employment estimates are slightly higher than the 2000 base year estimates based on the ESA-202 data and decennial census data, but lower than those based on the BEA methodology.

- Montgomery's County 1997 Census Update Survey validates COG/TPB Household Travel Surveys estimate of the multiple job holding rate and the CPS-derived estimate of jobs per multiple job holder.

- Use of CTPP-derived base year employment estimates for travel model validation and simulation is accepted practice at most large MPOs in regions with a population of 1 million or more.

- Use of the CTPP-derived employment data adjustment factors may reduce and lessen the need for K-factors in the TPB's Version 2.1D travel demand forecasting model.

It is recommend that the CTPP-derived Travel Model Employment Data Adjustment Factors be applied as scalars across all transportation analysis zones (TAZs), employment types and forecast years within a jurisdiction when running the regional travel demand model. This recommendation is made because the technical adjustment factors to be incorporated into the TPB's travel modeling procedures are to account for differences in the way employment is defined and measured by the different data sources used by various jurisdictions. TPB staff will work with COG's Cooperative Forecasting Subcommittee and the Planning Directors' Technical Advisory Committee during the next year to examine ways in which these technical adjustment factors may be refined and applied differentially by TAZ and employment type within a jurisdiction.

Table 1 05-06-2004

Estimated At-Place Employment from 2000 Census Transporatation Planning Package

JURISDICTION	Workers by Place of Work CTPP 2000	Worker Absenteeism Adjustment	Multiple Job Holding Rate	Jobs per Multiple Job Holder	Estimated 2000 At Place Employment from CTPP
District of Columbia	671,700	1.6%	8.3%	2.08	743,600
Montgomery County	420,900	1.6%	10.1%	2.08	474,300
Prince George's County	295,300	1.6%	11.8%	2.08	338,300
Arlington County	163,600	1.6%	9.1%	2.08	182,600
City of Aleaxandria	81,400	1.6%	7.4%	2.08	89,300
Fairfax County/Fairfax City/Falls Church	546,600	1.6%	10.0%	2.08	615,300
Loudoun County	79,200	1.6%	11.5%	2.08	90,500
Prince William County/ Manassas/Manassas Park	106,300	1.6%	10.1%	2.08	119,800
Frederick County	84,700	1.6%	11.0%	2.08	96,300
Anne Arundel County	225,100	1.6%	10.0%	2.08	253,400
Howard County	120,000	1.6%	10.0%	2.08	135,100
Charles County	36,200	1.6%	13.0%	2.08	41,900
Carol County	48,700	1.6%	10.0%	2.08	54,800
Calvert County	19,700	1.6%	13.0%	2.08	22,800
St. Mary's County	40,177	1.6%	13.0%	2.08	46,600
King George County	9,900	1.6%	10.0%	2.08	11,100
City of Fredericksburg	19,800	1.6%	10.0%	2.08	22,300
Stafford County	27,100	1.6%	10.0%	2.08	30,500
Spotsylvania County	26,526	1.6%	10.0%	2.08	29,900
Fauquier County	18,700	1.6%	10.0%	2.08	21,100
Clarke County	5,265	1.6%	10.0%	2.08	5,900
Jefferson County	14,172	1.6%	10.0%	2.08	16,000
Model Region Total	2,996,377	1.6%	10.4%	2.08	3,441,400

Note: Multiple job-holding rates for Washington MSA jurisdiction are from the 1994 COG/TPB Household Travel Survey. A region-wide average multiple job-holding rate of 10% assumed for all expanded cordon jurisdictions, except St. Mary's County in South Maryland where a 13% rate was assumed based on the 13% multiple-job holding rate observed for Charles and Calvert Counties.

Table 2

05-05-2004

Recommended Travel Model Adjustment Factors

JURISDICTION	CTPP Estimated Employment 2000	Round 6.4 Total Employment 2000	Travel Model Employment Data Adjustment Factors
District of Columbia	743,600	678,000	1.10
Montgomery County	474,300	479,800	0.99
Prince George's County	338,300	327,500	1.03
Arlington County	182,600	188,400	0.97
City of Aleaxandria	89,300	91,300	0.98
Fairfax County/Fairfax City/Falls Church	615,300	573,000	1.07
Loudoun County	90,500	87,000	1.04
Prince William County/ Manassas/Manassas Park	119,800	114,200	1.05
Frederick County	96,300	99,700	0.97
Anne Arundel County	253,400	297,000	0.85
Howard County	135,100	160,000	0.84
Charles County	41,900	50,100	0.84
Carol County	54,800	68,300	0.80
Calvert County	22,800	25,900	0.88
St. Mary's County	46,600	49,600	0.94
King George County	11,100	9,200	1.21
City of Fredericksburg	22,300	19,000	1.17
Stafford County	30,500	25,300	1.21
Spotsylvania County	29,900	24,000	1.25
Fauquier County	21,100	17,200	1.23
Clarke County	5,900	4,400	1.34
Jefferson County	16,000	12,800	1.25
Regional Total	3,441,400	3,401,700	