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DRAFT

Memorandum

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To: TPB Technical Committee

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Subject: Variation in Average Annual Weekday vs. Average Annual Traffic, and Seasonal Traffic: Recommendations for Travel Demand Model and Air Quality Post-Processor

I. INTRODUCTION

The regional travel demand model used for COG/TPB travel forecasting produces average weekday travel demand numbers. These forecasts are validated against observed traffic in the District of Columbia, Maryland, and Virginia. The observed data produced by these jurisdictions include average annual weekday traffic (AAWDT) in DC and average annual daily traffic (AADT) in Maryland. Virginia now reports both average annual daily and average annual weekday traffic. In the air quality analysis, ozone is modeled during the summer season, carbon monoxide is modeled during the winter season, and particulate matter is a year-round pollutant.

The purpose of this memorandum is to examine current observed traffic data to identify the relationships between AADT and AAWDT, as well as seasonal variations in traffic, and to present recommendations regarding factors for the development of weekday and seasonally adjusted traffic estimates for the travel demand model and air quality post-processor, respectively.

II. BACKGROUND

Since the travel demand model addresses annual average weekday conditions (a 5 day average) and observed travel is often reported on an average daily basis (a 7 day average), some conversion from AADT to AAWDT has been required in order to validate the model, i.e., to compare how well the model simulates observed travel. In the past a factor of 1.11 has been used in order to accomplish this conversion. In subsequent air quality studies which required the use of seasonal adjustments, this factor was reviewed and endorsed as being appropriate for representing weekday travel during ozone season.

III. ANALYSIS

A. Approach

In our current analysis staff has undertaken to quantify traffic data throughout the region to determine a weekday adjustment for the travel demand model, i.e., a factor to convert AADT to AAWDT, and another set of adjustments to be employed in the air quality 'post-processor', i.e., factors to produce spring, summer, fall and winter travel estimates.

TPB staff looked into available traffic count data and trends reports from Virginia, Maryland and the District of Columbia. The Maryland State Highway Administration (MD SHA) and the Virginia Department of Transportation (VDOT) collect traffic data from permanent count stations automatic traffic recorder (ATR) equipment placed at various locations on different facilities. MD SHA and VDOT also publish traffic trend reports; these reports are available in user friendly format on MD SHA and VDOT websites. The District of Columbia data included only 7-day counts.

A review of available data from the above sources indicated that the Maryland data files were the most comprehensive. Because of this, and since only Maryland travel estimates required both weekday and seasonal adjustments, the Maryland files provided the best resource for this analysis. While Virginia and District of Columbia data were also analyzed and provided corroboration of results, for simplicity only the Maryland statistics are included in this memo.

B. AADT to AAWDT Relationship

Staff identified eight permanent count stations within the MSA in Maryland with 365 days of data, which provide a basis for the analysis. The table below shows the facilities represented by various functional classes and their locations.

Table -1 MD ATR Station Locations

COUNTY	STATION ID	STATION DESCRIPTION	FUNCTIONAL CLASS
Frederick	P0003	MD 17 North of US 40 Alt.	Rural major collector
	P0030	US 15 North of MD 355	Urban OPA freeway/expressway
	P0068	US 15 North of Basford Rd	Rural other principal arterial
Montgomery	P0040	IS 495 at Persimmon Tree Rd	Urban Interstate
	P0060	IS 270 South of Middlebrook Rd	Urban Interstate
Prince George's	P0006	MD 4 North of Patuxent River Bridge	Urban OPA freeway/expressway
	P0061	US 50 West of MD 202	Urban Interstate
	P0049	IS 95 at Temple Hill Rd	Urban Interstate

In order to come up with a regional adjustment factor based upon data from all of the locations, staff estimated the average daily traffic at all sites by day of the week (weighted by the AADT volume at each location), prepared 5 day and 7 day averages,

and then computed the weekly to weekday adjustment factor for the dataset as a whole. As shown in Table 2, the average of weekday traffic (AAWDT) for all locations is 1.05 of the AADT.

C. Seasonal Variation

In order to come up with estimates of seasonal variation, staff analyzed the same Maryland ATR station locations in Table 1, organizing the counts by date and computing averages for the four discrete seasons: spring, summer, fall and winter. Staff then computed adjustment factors which, when applied to the travel demand model output volumes, would yield traffic estimates for each season. These results are shown in Table 3.

IV. RECOMMENDATIONS

Based upon the results shown in Tables 2 and 3, staff proposes the following weekday and seasonal adjustments. Values have been rounded up from the raw calculated figures so as not to understate traffic volumes or mobile source emissions.

A. Travel Demand Model Validation

Since the District of Columbia and Virginia report traffic volumes as AAWDT, there is no need to adjust the observed traffic volumes in those two jurisdictions. However, in Maryland, since the data are still reported as AADT, staff proposes to apply a factor of 1.05 to all links to get AAWDT.

B. Post-processor (Air Quality) Application - Seasonal Variation

Regional factors for all four seasons are documented below for use in preparation of seasonal or annual traffic and emissions estimates.

1. Ozone season - Apply a regional factor of 1.05 to all links, AM, PM, & off-peak periods, in the District of Columbia, Maryland and Virginia to convert AAWDT to ozone season average weekday traffic.

2. Winter season - Apply a regional factor of 0.97 to all links to convert AAWDT to winter average weekday traffic.

3. Spring season – Apply a factor of 1.02 to all links to convert AAWDT to produce spring average weekday traffic.

4. Fall season – No factor is necessary as fall traffic equals AAWDT.

Table - 2

MD Weighted Average for MD ATR Stations: P0003, P0030, P0068, P0040, P0060, P0006, P0049, P0061, P005

	SUN	MON	TUE	WED	THU	FRI	SAT	Avg -7 Days	Avg-Weekday (5-days)	Weekday/7-days
Weighted Average	109324	133546	137277	138386	140434	147095	125501	133081	139348	1.05

Table - 3

Seasonal Adjustment

Season	Post-Processor Seasonal Adjustment Factors
SPRING (March-May)	1.02
SUMMER (June-Aug.)	1.05
FALL (Sept. - Nov.)	1.00
WINTER (Dec - Feb)	0.97