Estimation of the RTID MVET Tax base: 2004

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Introduction

In September 2003, the King County Department of Transportation (KCDOT) engaged Conway Pederson Economics (CPE) to prepare a forecast of proposed transportation tax revenues within the three-county central Puget Sound region. The proposed taxes were authorized by the creation of the Regional Transportation Investment District (RTID)[1] and include, among other candidate tax instruments, a 0.3% motor vehicle excise tax (MVET). CPE engaged ECONorthwest as a subcontractor at KCDOT's request. ECONorthwest was engaged to estimate the current (2004) value of the tax base to assist CPE in benchmarking the beginning year of its MVET revenue forecast.

Summary of Methodology

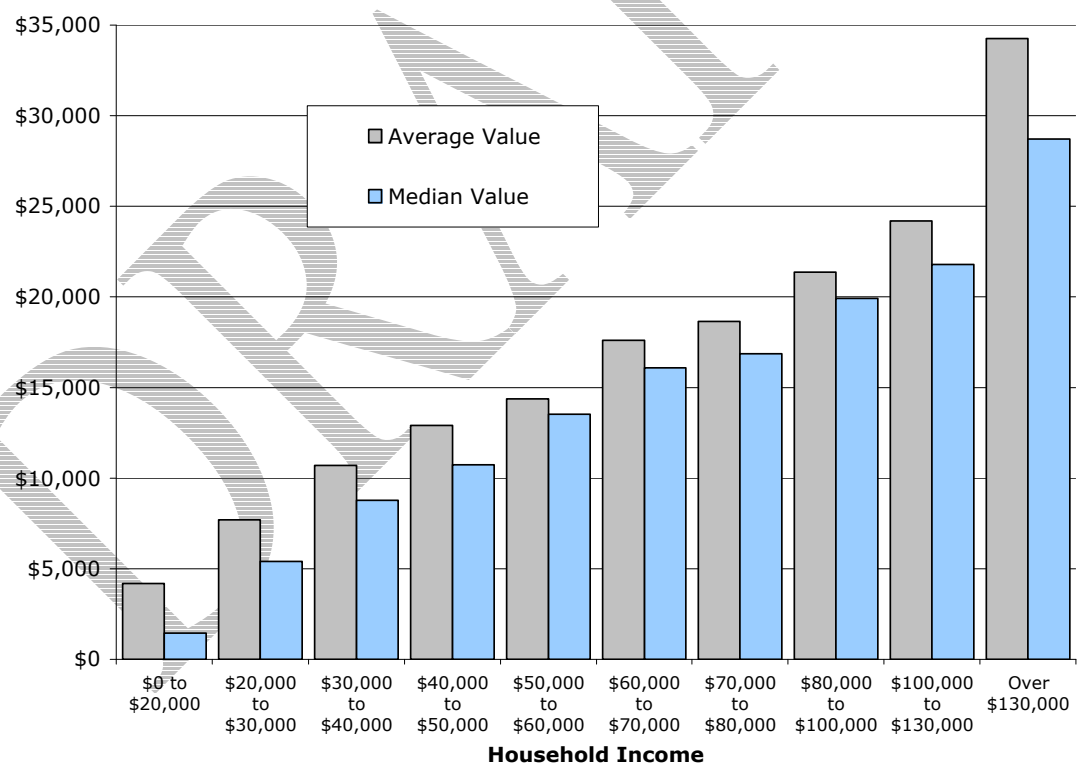
ECONorthwest applied multiple, different methodologies to the task of estimating the 2004 RTID MVET base. A variety of data sources were identified. The Washington Department of Licensing (DOL) vehicle registration database provides information on a detailed, registered vehicle level. The DOL maintains records on the Manufacturer's Suggested Retail Price (MSRP) and the assessed value of every vehicle registered in the State of Washington. From this data, it is possible to estimate the current value of the vehicle fleet by any desired geography. Calculating the effective value of the MVET base requires adjustments for any differences in registrations and the billing notices likely to be sent by DOL based on those registrations. ECONorthwest's intention was to use the DOL data to estimate the potential MVET base for Sound Transit and to compare this estimate to the tax base implied by actual collections by the Sound Transit district. Sound Transit already relies on the MVET instrument, so the relationship between its nominal and implied actual base can be used to make adjustments to the base for RTID as well. Unfortunately, data from the DOL are not available at this time although it may be available in the future. ECONorthwest employed instead several alternative methods for estimating the RTID tax base. These methods are presented below.

[1] See Chapter 56 of *Laws of 2002*.

Method 1 — Projection from Estimated Average Household Income, Vehicle Value Data and CPI Growth

Method 1 is based on the relationship between household income and vehicle value implied by data in the SimTax[2] model developed by the Washington State Tax Structure Study (the "Gates Commission") in 2002. The SimTax model is a micro-simulation model based on survey data collected by the Federal Reserve Bank. Data on vehicle ownership, vehicle type, and age was translated into appropriate MVET values. The relationship for the Western United States data in the SimTax model is displayed in Figure 1. As one would expect, as household income increases, the value of the household's vehicle fleets also increases. This Western United States relationship was assumed for the three-county RTID region.

Figure 1: Household Income and Household Fleet Values



Source: Gates Commission, SimTax Model, 2002

The methodology we followed for the *Method 1* estimates is as follows:

[2] http://dor.wa.gov/content/WAtaxstudy/Tax_Design.htm

1. The number of households in 2004 by income category was estimated by adjusting the 2000 Census household count by income class using 2004 household estimates.[3] This was done for each county.
2. Household vehicle values associated with each income class were adjusted to 2004 dollars by multiplying the Global Insights 2003 CPI-U forecast by each county's vehicle inflation factor. [4] Vehicle inflation factors for King, Pierce, and Snohomish counties are 1.5, 2.16, and 1.96, respectively.
3. The 2004 household vehicle values (from 2) were multiplied by the 2004 number of households (from 1) to obtain estimates of the vehicle fleet for each income category. These estimates were then summed to obtain the MVET base for each county.

Although this methodology is based on the primary determinant of vehicle fleet value—the number and wealth of households—it does not consider the value of fleet or other commercial vehicles. We assume, therefore, that this estimate is bias downward by an unknown factor.

Method 2 — Projection from Historical MVET Base Values Using a Regression Model and Demographic Forecasts

In 1999 Washington voters passed initiative I-695 and the State legislature subsequently eliminated the state's motor vehicle excise tax. Historical data on MVET collections for King, Pierce, and Snohomish counties were readily available to determine the tax base for the state MVET. Using each county's vehicle base for the period 1980 to 1998 (the last year for which reliable MVET data exists – in 1999 MVET collections declines precipitiously) we project the vehicle base to 2004 using an econometric model of non-commercial vehicle value growth developed by ECONorthwest in 2003.[5] The vehicle value growth model relies on growth in the number of households, persons per household, and household income, as well as each county's estimated vehicle inflation factor. Historical personal income data (through 2001) were obtained from the Bureau of Economic Analysis

[3] The number of households per county was estimated as follows: resident population projections for 2004 were obtained from Washington State Growth Management Act, 2002 (intermediate series); estimates of persons per household for each county were obtained by trending county-level 2000 Census estimates by the PSRC 2002 persons per household estimates. Resident population was divided by persons per household to obtain *number of households*.

[4] Pozdena, R. J. and T. L. Helvoigt. The Tax Base of the Seattle Monorail Project, December 2003. A report prepared for the Seattle Monorail Project by ECONorthwest.

[5] For more information on the vehicle value growth model please see Pozdena and Helvoigt, 2003.

and were projected forward to 2004. Data on growth in households and persons per household were obtained from the Washington Office of Financial Management.

Method 3 — Extrapolation from a Model Based on 2003 Zip Code Level Data

Using 2003 zip code level data obtained from DOL on the number and value of vehicles by vehicle type and vehicle age, we estimated the value of the vehicle fleet for each county of the RTID. The county-level estimates were then multiplied by 0.86 to adjust for overestimation of the value of the vehicle base, related to DOL data.[6] It is important to note that the vehicle types used in *Method 3* are consistent with the former statewide MVET and the current Monorail MVET, but are only an approximation of the vehicle-type delineation relevant to RTID. Although we feel that these are the best estimates possible with the existing high-resolution data, it should be noted that the vehicle types included in the analysis only approximate the vehicle types that actually will be subject to the RTID motor vehicle excise tax. The difference largely stems from the fact that the RTID tax is assessed differently (or not at all) depending on vehicle weight (greater than or less than 6,000 lbs.). The data used in *Method 3* does not include information on vehicle weight. At this time it is not possible to determine the extent (if any) of the vehicle type error in our estimate.

Method 4 — Extrapolated Based on Sound Transit Vehicle Base and the Proportion of County Population Currently Located in a Sound Transit District.

Using data on Sound Transit MVET collections for 2003, we calculated the value of the vehicle base for each of the Sound Transit counties.[7] These values were then divided by the ratio of each county's population that is located within the Sound Transit district. This gives us estimates of the value of the vehicle base at the county level for 2003. An obvious assumption in this approach is that the demographic and economic factors that influence vehicle purchasing and holding behavior are similar between those living within the boundaries of the Sound Transit district and those who do not. Finally, the 2003 estimates were projected to 2004 using the Global Insights inflation (CPI-U) forecast for 2004 and the

[6] That is, Monorails pre-bills and actual collections proved to be 86% of the vehicle base estimated from DOL data. We assumed this same degree of over-estimation of the RTID base by the DOL data.
[7] MVET base is calculated by dividing MVET collections by the tax rate (0.003).

respective vehicle inflation factor for each county. The estimated value of the MVET fleet from Method 4 deviates by approximately $3 billion dollars (13%) from methods 1 and 3.

Method 5 —Historical Relationship Between the Value of Sound Transit's MVET Base and the Value of the State MVET Base.

1998 was both the last full, reliable year of the State's MVET and the second full year of the Sound Transit MVET. Using data on revenues collected from each of these taxes and their respective tax rates, we calculate the value of the respective vehicle bases—at the county level. We then take the ratio of the value of the county-level Sound Transit MVET base to the value of the county-level State MVET base. This gives us a measure of total value of the Sound Transit vehicle base, relative to the value of the entire county's vehicle base.[8] We assume that this ratio remains constant between 1998 and 2003. Again using Sound Transit MVET revenue, but now in 2003, we estimate the value of each county's portion of the Sound Transit MVET base. We divided this by the 1998 ratio to give us an estimate of the value of the MVET for each entire county for 2003. Finally, the vehicles to be taxed by the RTID are less encompassing than the vehicles taxed by the State's MVET. Therefore, we need to adjust downward our estimate of the value of the RTID vehicle base. Based on conversations with Gary Prince, we settled on 10% as a "best guess" for the downward adjustment factor.

We project vehicle value base to 2004 using the Global Insights inflation forecast (CPI-U) for 2004 and each county's respective vehicle inflation factor. The estimated value of the taxable fleet from Method 5 is consistent with estimates derived in Methods 2 and 4 and deviate by approximately $3 billion dollars (13%) from methods 1 and 3.

Summary of Findings

Table 1 presents our five estimate of the value of the 2004 RTID vehicle base. The estimates can obviously be lumped into two groups—those at $22 billion and those at $25 billion. Considering all five estimates, the average of the estimated values is $23.4 billion, with a standard deviation of $1.6 billion. The minimum and maximum estimates across all methods range from $22 billion to $25 billion (about a 14% difference).

[8] These ratios are as follows: King County = 89%; Pierce County = 84%; Snohomish County = 62.5%

Table 1: Estimated RTID Tax Base, 2004 (thousands of dollars)

Estimation Methodology	King County	Pierce County	Snohomish County	Total Region
Individual Method Results				
Method 1: (Income-based)	$13,243,076	$4,519,317	$4,500,762	$22,263,155
Method 2: (Growth Model)	$15,342,637	$4,813,063	$4,724,848	$24,880,548
Method 3: (DOL Data)	$13,112,001	$4,684,632	$4,208,964	$22,005,597
Method 4: (Population-based from Sound Transit data)	$14,601,540	$5,655,278	$4,880,934	$25,137,752
Method 5: (Historic MVET from Sound Transit data)	$13,441,608	$4,790,237	$4,468,926	$22,700,771
Summary Results, All Methods				
Average	$13,948,172	$4,892,505	$4,556,887	$23,397,565
Standard Deviation	$977,800	$441,892	$257,466	$1,494,780
Min of Methods	$13,112,001	$4,519,317	$4,208,964	$22,005,597
Max of Methods	$15,342,637	$5,655,278	$4,880,934	$25,137,752

Source: ECONorthwest calculations from various data sources.