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16. Abstract

The original purpose of Project 0-6395-TI was to assess the usefulness and viability of the Joint Analysis Using Combined Knowledge (J.A.C.K.) model as a planning and forecasting tool. What originally was named the J.A.C.K. model was substantially revised, expanded and renamed the Texas Revenue Estimator and Needs Determination System (T.R.E.N.D.S.) model. The T.R.E.N.D.S. model is designed to provide transportation planners, policy makers and the public with a tool to forecast revenues and expenses for the Texas Department of Transportation (TxDOT) for the period 2010 through 2035 based on a user-defined level of transportation investment. The user, through interactive windows, can control a number of variables related to assumptions regarding statewide transportation needs, population growth rates, fuel efficiency, federal reimbursement rates, inflation rates, taxes, fees and other elements. The output is a set of tables and graphs showing a forecast of revenues, expenditures and fund balances for each year of the analysis period based on the user-defined assumptions. The version of the model developed under this project is a beta-test version to solicit comments from metropolitan planning organizations (MPOs) across the state.

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DEVELOPMENT OF THE TEXAS REVENUE ESTIMATOR AND NEEDS DETERMINATION SYSTEM (T.R.E.N.D.S.) MODEL

by

David Ellis
Research Scientist
Texas Transportation Institute

Report 0-6395-TI-1
Project 0-6395-TI
Project Title: Modeling Revenue for Use in Developing Reasonable Expectations of Revenue for Long Range Plan Development

Performed in cooperation with the
Texas Department of Transportation
and the
Federal Highway Administration

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TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas 77843-3135

DISCLAIMER

This research was performed in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation.

ACKNOWLEDGMENTS

The project team thanks the TxDOT and FHWA for support of this project. They also extend thanks to the TxDOT project director, and members of the review committee.

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The original purpose of Project 0-6395-TI was to assess the usefulness and viability of the Joint Analysis Using Combined Knowledge (J.A.C.K.) model as a planning and forecasting tool. The research was divided into three phases:

1. assessing the accuracy and validity of the model and proposing fundamental improvements as necessary;

2. investigating potential improvements to an expanded, more comprehensive J.A.C.K. model; and

3. producing a report on the research findings and submitting an improved model.

During the course of the research, the project direction changed significantly to focus entirely on model revision and development. As a result, what originally was named the J.A.C.K. model was substantially revised, expanded and renamed the Transportation Revenue Estimator and Needs Determination System (T.R.E.N.D.S.) model.

The T.R.E.N.D.S. model is designed to provide transportation planners, policy makers and the public with a tool to forecast revenues and expenses for the Texas Department of Transportation (TxDOT) for the period 2010 through 2035 based on a user-defined level of transportation investment. The user, through interactive windows, can control a number of variables related to assumptions regarding statewide transportation needs, population growth rates, fuel efficiency, federal reimbursement rates, inflation rates, taxes, fees and other elements. The output is a set of tables and graphs showing a forecast of revenues, expenditures and fund balances for each year of the analysis period based on the user-defined assumptions.

The version of the model developed under this project is a beta-test version to solicit comments from metropolitan planning organizations (MPOs) across the state. A final version of the model that incorporates suggested changes will be released in the summer of 2009 under a modification to the original Project 0-6395-TI contract. Additionally, the model is being expanded to include local option revenue alternatives for use by each of the state's 25 MPOs.

As a part of the maintenance of the model in future years, T.R.E.N.D.S. will be updated on a monthly basis to include the latest cash forecasts and letting schedules from TxDOT. This effort will be accomplished under a subsequent contract. In addition, as updates regarding population forecasts, inflation rates, fuel efficiency, and other variables become available, they will be incorporated into the model.

A copy of the Excel®-based model is contained on a CD accompanying this report. A description of the tabs and worksheets is shown in Appendix 1.

The beta-test version of the web-based model is available at: http://trends-tti.tamu.edu/. The temporary user name is trends-tester. The temporary password is c4PVM26g. (Note: The password is case-sensitive.)

DESIGN OF THE MODEL

Revenue Component

The revenue component of the T.R.E.N.D.S. model is driven by the relationship between historical population and fuel efficiency for the purpose of projecting gasoline and diesel fuel revenues and between population and historical vehicle registration fees revenues to project future vehicle registration fees revenues. Federal reimbursements are projected based on historical relationships between federal fuel tax rates, fuel efficiency, gallons of fuel consumed, and the rate of return of federal funds back to Texas.

Population Assumptions

The model employs four alternative population projection scenarios, titled the 1.0 Scenario, the 0.5 Scenario, the 04 Scenario and the 07 Scenario:

- The 1.0 Scenario assumes that net population migration rates in future years are equal to those experienced in Texas from 1990 to 2000.
- The 0.5 Scenario assumes net population migration rates in the future equal one-half the rates experienced from 1990 to 2000.
- The 04 Scenario assumes net migration rates in the future are consistent with rates estimated for the period 2000 to 2004.
- The 07 Scenario assumes net migration rates are consistent with those estimated for the period 2000 to 2007.

Under these alternative assumptions, the 1.0 Scenario produces the largest population, the 0.5 Scenario produces the smallest future population and the 04 Scenario produces a population that is roughly a mid-range between the 1.0 and 0.5 Scenarios. The 07 Scenario produces a population estimate slightly larger than the 04 Scenario, reflecting migration rates slightly higher than anticipated in the 04 Scenario. The alternative projections of future Texas population were secured from the Texas State Data Center website at the following web address: http://txsdc.utsa.edu/.

Details of the results of the alternative population forecasts for Texas used in the model are presented in the Alternative Migration Scenarios table.

Alternative Migration Scenarios				
YEAR	0.5 Scenario	04 Scenario	07 Scenario	1.0 Scenario
2008	23,614,468	24,178,180	24,383,647	24,902,639
2009	23,971,476	24,637,254	24,873,773	25,473,256
2010	24,330,612	25,105,646	25,373,947	26,058,565
2011	24,692,184	25,583,249	25,883,999	26,659,084
2012	25,056,035	26,070,099	26,403,743	27,275,196
2013	25,421,611	26,565,655	26,932,619	27,906,499
2014	25,788,872	27,069,526	27,470,110	28,553,097
2015	26,156,715	27,581,188	28,015,550	29,213,801
2016	26,525,347	28,100,315	28,568,732	29,889,143
2017	26,894,510	28,626,868	29,129,530	30,578,924
2018	27,264,177	29,160,863	29,697,950	31,283,092
2019	27,634,735	29,702,803	30,274,269	32,002,432
2020	28,005,788	30,252,539	30,858,449	32,736,693
2021	28,379,252	30,812,396	31,452,815	33,488,562
2022	28,755,425	31,382,834	32,057,766	34,258,696
2023	29,133,913	31,963,803	32,673,327	35,047,393
2024	29,514,739	32,555,481	33,299,749	35,855,249
2025	29,897,443	33,158,042	33,936,986	36,682,163
2026	30,281,749	33,771,203	34,584,918	37,528,722
2027	30,667,562	34,395,189	35,243,768	38,395,221
2028	31,054,431	35,029,972	35,913,396	39,281,924
2029	31,442,217	35,675,768	36,593,880	40,189,363
2030	31,830,589	36,332,880	37,285,486	41,117,624
2031	32,220,722	37,002,633	37,989,546	42,068,727
2032	32,611,793	37,684,240	38,705,621	43,042,653
2033	33,003,541	38,377,918	39,433,732	44,039,653
2034	33,396,336	39,084,191	40,174,225	45,060,720
2035	33,789,668	39,802,939	40,927,000	46,105,933

As new population projections are produced by the Texas State Data Center, they will be incorporated into the model.

Fuel Economy Projections

Projections of fuel economy are also key to the projection of future revenues. For this analysis, TxDOT contracted with Cambridge Systematics in late 2006 to forecast future levels of fuel efficiency for personal and commercial vehicles. The Cambridge Systematics analysis included several different scenarios regarding the adoption of alternative fuel vehicles. This analysis was then adjusted to account for the proportional contribution to total vehicle miles traveled of each vehicle type. From this analysis, low, medium and high fuel efficiency scenarios were produced. These alternative fuel efficiency scenarios are presented in the Alternative Fuel Efficiency Scenarios table.

Alternative Fuel Efficiency Scenarios						
	Low-MPG Scenario		High-MPG Scenario		Average-MPG Scenario	
Year	Personal Vehicles	Commercial Vehicles	Personal Vehicles	Commercial Vehicles	Personal Vehicles	Commercial Vehicles
2006	18.3657	6.0057	18.3657	6.0057	18.3657	6.0057
2007	19.0761	6.0183	19.0857	6.0192	19.0809	6.0188
2008	19.8017	6.0322	19.8412	6.0357	19.8215	6.0340
2009	20.5429	6.0476	20.6534	6.0570	20.5981	6.0523
2010	21.3000	6.0647	21.5627	6.0864	21.4313	6.0755
2011	22.0687	6.0882	22.5354	6.1338	22.3021	6.1110
2012	22.4190	6.1089	23.1374	6.1749	22.7782	6.1419
2013	22.7793	6.1311	23.7531	6.2203	23.2662	6.1757
2014	23.1505	6.1548	24.4243	6.2706	23.7874	6.2127
2015	23.5334	6.1802	25.1604	6.3264	24.3469	6.2533
2016	23.9288	6.2075	25.9733	6.3885	24.9510	6.2980
2017	24.3378	6.2368	26.8773	6.4579	25.6076	6.3474
2018	24.7616	6.2684	27.8910	6.5356	26.3263	6.4020
2019	25.2014	6.3026	29.0376	6.6230	27.1195	6.4628
2020	25.6587	6.3395	30.3475	6.7216	28.0031	6.5306
2021	26.1351	6.3796	31.8604	6.8334	28.9977	6.6065
2022	26.6324	6.4230	33.6301	6.9605	30.1313	6.6918
2023	27.1529	6.4704	35.7302	7.1059	31.4415	6.7882
2024	27.6988	6.5220	38.2651	7.2732	32.9819	6.8976
2025	28.2728	6.5784	41.3873	7.4667	34.8300	7.0225
2026	28.8782	6.6401	44.9660	7.6704	36.9221	7.1553
2027	29.5184	6.7079	49.1075	7.8851	39.3129	7.2965
2028	30.1977	6.7825	53.9533	8.1117	42.0755	7.4471
2029	30.9207	6.8648	59.6970	8.3513	45.3088	7.6080
2030	31.6932	6.9559	66.6102	8.6049	49.1517	7.7804
2031	32.0659	6.9889	70.5898	8.7097	51.3279	7.8493
2032	32.4429	7.0222	74.8073	8.8158	53.6251	7.9190
2033	32.8245	7.0555	79.2767	8.9232	56.0506	7.9894
2034	33.2104	7.0891	84.0132	9.0319	58.6118	8.0605
3035	33.6010	7.1228	89.0326	9.1419	61.3168	8.1324

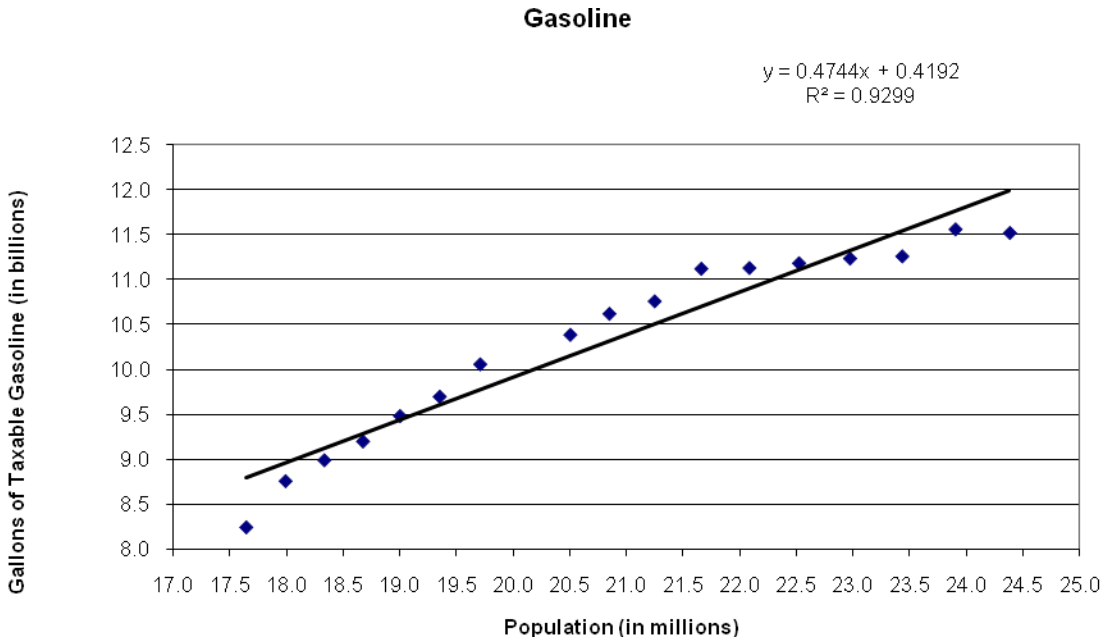
Fuel Tax Revenue Projections

Fuel tax revenues projections (for both gasoline and diesel fuel) were developed based on the historical relationship between population and fuel consumption, adjusted by forecasted increases in fuel efficiency.

In order to determine the relationship between gasoline consumption and population, historical values of the two variables were examined and an equation was developed that most accurately describes that relationship. Historical data from 1992 through 2008 were used to develop the equation. Those data are presented in the Historical Gasoline Consumption table.

Historical Gasoline Consumption		
Year	Gallons of Gasoline	Population
1992	8,238,980,000	17,650,479
1993	8,754,915,000	17,996,764
1994	8,988,265,000	18,338,319
1995	9,198,305,000	18,679,706
1996	9,480,730,000	19,006,240
1997	9,697,130,000	19,355,427
1998	10,058,265,000	19,712,389
1999	10,387,675,000	20,507,100
2000	10,622,310,000	20,851,820
2001	10,761,515,000	21,250,706
2002	11,124,805,000	21,662,156
2003	11,133,245,000	22,086,390
2004	11,186,255,000	22,523,650
2005	11,239,270,000	22,973,810
2006	11,263,450,000	23,433,853
2007	11,564,385,000	23,903,779
2008	11,524,525,000	24,383,647

A plot of these data yields the following best-fit line with historical gallons of gasoline consumed on the *Y* axis and historical population on the *X* axis.



The equation for the line shown above is as follows:

$y = .4744x - .4192$

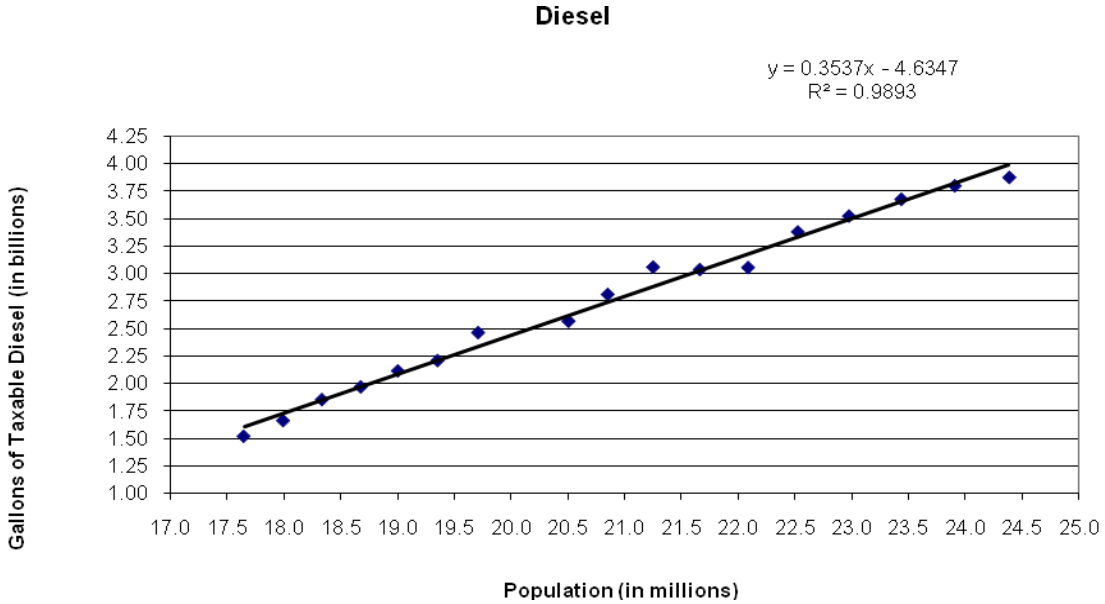
Where: y = gallons of taxable gasoline sold
x = projected population

$R^2 = .9299$

In order to determine the relationship between diesel fuel consumption and population, historical values of the two variables were examined and an equation was developed that most accurately describes that relationship. Historical data from 1992 through 2008 were used to develop the equation. Those data are presented in the Historical Diesel Fuel Consumption table.

Historical Diesel Fuel Consumption		
Year	Gallons of Diesel	Population
1992	1,515,590,000	17,650,479
1993	1,658,535,000	17,996,764
1994	1,849,605,000	18,338,319
1995	1,965,325,000	18,679,706
1996	2,111,125,000	19,006,240
1997	2,205,445,000	19,355,427
1998	2,459,975,000	19,712,389
1999	2,564,020,000	20,507,100
2000	2,807,800,000	20,851,820
2001	3,056,775,000	21,250,706
2002	3,033,940,000	21,662,156
2003	3,052,780,000	22,086,390
2004	3,377,195,000	22,523,650
2005	3,521,610,000	22,973,810
2006	3,673,795,000	23,433,853
2007	3,796,775,000	23,903,779
2008	3,873,105,000	24,383,647

A plot of these data yields the following best-fit line with historical gallons of diesel fuel consumed on the *Y* axis and historical population on the *X* axis.



The equation for the line shown above is as follows:

$y = .3537x - 4.6347$

Where: y = gallons of taxable diesel fuel sold
x = projected population

$R^2 = .9893$

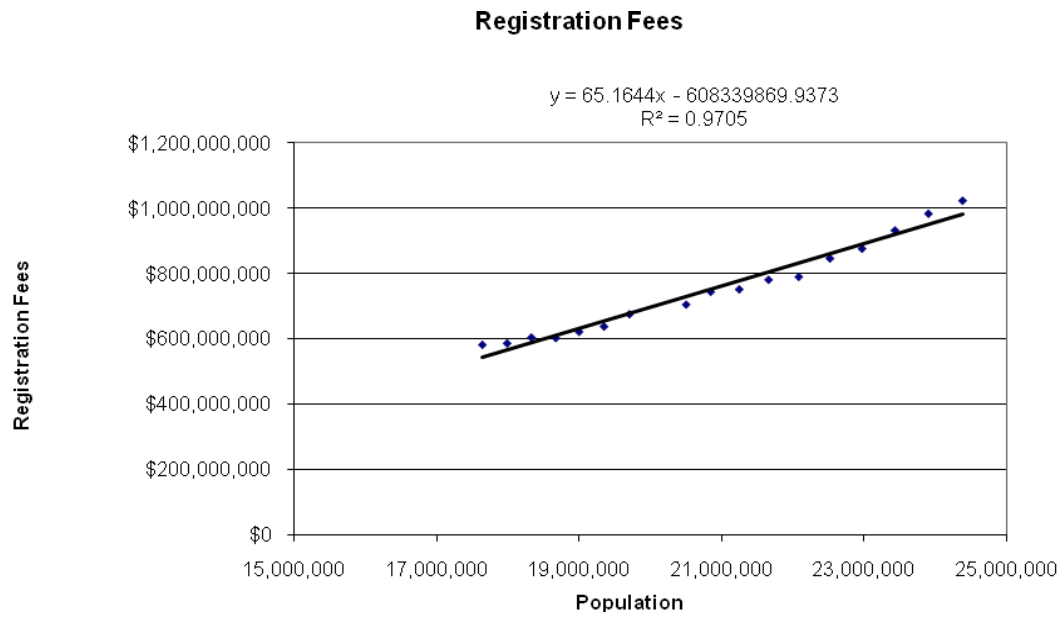
Vehicle Registration Fee Projections

A similar procedure was followed to determine the relationship between vehicle registration fees and population. Historical values of the two variables were examined and an equation was developed that most accurately describes that relationship. Historical data from 1992 through 2008 were used to develop the equation. Those data are presented in the Historical Vehicle Registration Fee Revenue table.

Historical Vehicle Registration Fee Revenue

Year	Registration Fees	Population
1992	$581,710,000	17,650,479
1993	$586,068,536	17,996,764
1994	$604,195,927	18,338,319
1995	$602,369,620	18,679,706
1996	$621,586,174	19,006,240
1997	$637,673,921	19,355,427
1998	$675,658,776	19,712,389
1999	$705,111,741	20,507,100
2000	$744,564,667	20,851,820
2001	$751,970,872	21,250,706
2002	$781,119,865	21,662,156
2003	$790,338,024	22,086,390
2004	$846,810,377	22,523,650
2005	$876,802,300	22,973,810
2006	$932,713,282	23,433,853
2007	$984,246,908	23,903,779
2008	$1,024,078,782	24,383,647

A plot of these data yields the following best-fit line with historical vehicle registration fee revenues on the *Y* axis and historical population on the *X* axis.



The equation for the line shown above is as follows:

$$y = 65.1644x - 608{,}339{,}869.9373$$

Where: y = vehicle registration fee revenue
x = projected population

$R^2 = .9705$

Backcast of Projection Equations

The equations developed to project the three major sources of state transportation revenue and were then tested against known results. In this instance, the equations for gasoline and diesel fuel revenues and the equation for vehicle registration fee revenues were employed using estimated population for the state for the years 1992 through 2008 to determine projected revenues for those years. The Predicted vs. Actual tables on the following pages shows the results from that test. In sum, all three equations yielded projected results with less than a 3 percent absolute mean value of error and a standard deviation of less than 4 percent when compared to actual results.

PREDICTED VS. ACTUAL STATE GASOLINE TAX REVENUE						
Fiscal Year	Actual Taxable Gallons of Gasoline	Predicted Taxable Gallons of Gasoline	Percent Difference	Actual Gasoline Tax Revenues	Predicted Gasoline Tax Revenues	Difference in Actual vs. Predicted Revenues
1992	8,238,980,000	8,792,587,238	6.72%	$1,647,796,000	$1,758,517,448	$110,721,448
1993	8,754,915,000	8,956,864,842	2.31%	$1,750,983,000	$1,791,372,968	$40,389,968
1994	8,988,265,000	9,118,898,534	1.45%	$1,797,653,000	$1,823,779,707	$26,126,707
1995	9,198,305,000	9,280,852,526	0.90%	$1,839,661,000	$1,856,170,505	$16,509,505
1996	9,480,730,000	9,435,760,256	-0.47%	$1,896,146,000	$1,887,152,051	-$8,993,949
1997	9,697,130,000	9,601,414,569	-0.99%	$1,939,426,000	$1,920,282,914	-$19,143,086
1998	10,058,265,000	9,770,757,342	-2.86%	$2,011,653,000	$1,954,151,468	-$57,501,532
1999	10,387,675,000	9,928,140,490	-4.42%	$2,077,535,000	$1,985,628,098	-$91,906,902
2000	10,622,310,000	10,311,303,408	-2.93%	$2,124,462,000	$2,062,260,682	-$62,201,318
2001	10,761,515,000	10,527,071,914	-2.18%	$2,152,303,000	$2,105,414,383	-$46,888,617
2002	11,124,805,000	10,749,890,952	-3.37%	$2,224,961,000	$2,149,978,190	-$74,982,810
2003	11,133,245,000	10,979,759,574	-1.38%	$2,226,649,000	$2,195,951,915	-$30,697,085
2004	11,186,255,000	11,217,089,086	0.28%	$2,237,251,000	$2,243,417,817	$6,166,817
2005	11,260,100,000	11,461,622,361	1.79%	$2,252,020,000	$2,292,324,472	$40,304,472
2006	11,263,450,000	11,712,390,675	3.99%	$2,252,690,000	$2,342,478,135	$89,788,135
Total Difference	152,155,945,000	151,844,403,766	-0.20%	$30,431,189,000	$30,368,880,753	-$62,308,247
Average Difference	9,509,746,563	9,490,275,235	-0.20%	$1,901,949,313	$1,898,055,047	-$3,894,265
Absolute Value of Mean Error			2.19%			$42,569,397
Standard Deviation			3.02%			$59,247,820

PREDICTED VS. ACTUAL STATE DIESEL TAX REVENUE						
Fiscal Year	Actual Taxable Gallons of Diesel	Predicted Taxable Gallons of Diesel	Percent Difference	Actual Diesel Tax Revenues	Predicted Diesel Tax Revenues	Difference in Actual vs. Predicted Revenues
1992	1,515,590,000	1,608,274,422	6.12%	$303,118,000	$321,654,884	$18,536,884
1993	1,658,535,000	1,730,755,427	4.35%	$331,707,000	$346,151,085	$14,444,085
1994	1,849,605,000	1,851,563,430	0.11%	$369,921,000	$370,312,686	$391,686
1995	1,965,325,000	1,972,312,012	0.36%	$393,065,000	$394,462,402	$1,397,402
1996	2,111,125,000	2,087,807,088	-1.10%	$422,225,000	$417,561,418	-$4,663,582
1997	2,205,445,000	2,211,314,530	0.27%	$441,089,000	$442,262,906	$1,173,906
1998	2,459,975,000	2,337,571,989	-4.98%	$491,995,000	$467,514,398	-$24,480,602
1999	2,564,020,000	2,454,912,672	-4.26%	$512,804,000	$490,982,534	-$21,821,466
2000	2,807,800,000	2,740,588,734	-2.39%	$561,560,000	$548,117,747	-$13,442,253
2001	3,056,775,000	2,901,459,983	-5.08%	$611,355,000	$580,291,997	-$31,063,003
2002	3,033,940,000	3,067,587,921	1.11%	$606,788,000	$613,517,584	$6,729,584
2003	3,052,780,000	3,238,971,841	6.10%	$610,556,000	$647,794,368	$37,238,368
2004	3,377,195,000	3,415,918,401	1.15%	$675,439,000	$683,183,680	$7,744,680
2005	3,396,915,000	3,598,235,896	5.93%	$679,383,000	$719,647,179	$40,264,179
2006	3,673,795,000	3,785,202,070	3.03%	$734,759,000	$757,040,414	$22,281,414
Total Difference	38,728,820,000	39,002,476,416	0.71%	$7,745,764,000	$7,800,495,283	$54,731,283
Average Difference	2,420,551,250	2,437,654,776	0.71%	$484,110,250	$487,530,955	$3,420,705
Absolute Value of Mean Error			2.68%			$12,873,912
Standard Deviation			3.86%			$21,058,574

PREDICTED VS. ACTUAL REGISTRATION FEE REVENUE				
Fiscal Year	Actual Vehicle Registration Fee Revenues	Predicted Vehicle Registration Fee Revenues	Percent Difference	Difference in Actual vs. Predicted Revenues
1992	571,710,000	545,286,243	-4.62%	-26,423,757
1993	586,068,536	566,885,423	-3.27%	-19,183,113
1994	604,195,927	588,189,575	-2.65%	-16,006,352
1995	602,369,620	609,483,247	1.18%	7,113,627
1996	621,586,174	629,850,479	1.33%	8,264,305
1997	637,673,921	651,630,669	2.19%	13,956,748
1998	675,658,776	673,895,817	-0.26%	-1,762,959
1999	705,111,741	694,588,516	-1.49%	-10,523,225
2000	744,564,667	744,966,686	0.05%	402,019
2001	751,970,872	773,335,878	2.84%	21,365,006
2002	781,119,865	802,632,073	2.75%	21,512,208
2003	790,338,024	832,855,145	5.38%	42,517,121
2004	846,810,377	864,059,173	2.04%	17,248,796
2005	876,802,300	896,210,350	2.21%	19,408,050
2006	932,713,282	929,181,309	-0.38%	-3,531,973
Total Difference	10,728,694,082	10,803,050,584	0.69%	74,356,502
Average Difference	670,543,380	675,190,662	0.69%	4,957,100
Absolute Value of Mean Error			2.55%	18,368,642
Standard Deviation			2.67%	18,507,008

Expense Component

The expenses accounted for in the model for the period 2009 through 2019 are developed from TxDOT data sources as indicated in each of the items below. Beyond 2019, the model user can set the annual rate of increase in the expense item. Details of each expense category are as follows:

Category Expenses

CATEGORY 1 Preservation: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. For years FY2020-FY2035, the values are hard-coded based from TxDOT input.

CATEGORY 1 Routine: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. For the period FY2020-FY2035, the values are zero in this column and all CATEGORY 1 Routine expenditures are included in CATEGORY 1 Preservation.

CATEGORY 2 TMA Corridor Projects: This category currently contains no values and is a place-holder only.

CATEGORY 3 Non-TMA Corridor Projects: This category currently contains no values and is a place-holder only.

CATEGORY 4 Statewide Connectivity Corridor Projects: This category currently contains no values and is a place-holder only.

CATEGORY 5 CMAQ: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 6 Bridge Maintenance: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 7 STP-MM: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 8 Federal Safety: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT.

Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 9 Federal Enhancement: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 10 Congressional Earmarks & TPWD: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 11 District Discretionary: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. Values for years FY2020-FY2035 result from user input to determine the annual rate of increase.

CATEGORY 12 Strategic Priority: Values for years FY2009-FY2019 are derived from the estimates of total lettings for FY2008-FY2019 produced by TxDOT. No expenditures are contemplated beyond 2019 and all values thereafter are zero.

Bridge and Maintenance Expenses

2030 Needs Report: Bridges: These data were derived from the 2030 Needs Assessment.

(90 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 90 Percent “Good or Better” option is chosen as the desired maintenance level. Values were derived as a part of the 2030 Needs Assessment.

(87 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 87 Percent “Good or Better” option is chosen as the desired maintenance level. Values were derived as a part of the 2030 Needs Assessment.

(80 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 80 Percent “Good or Better” option is chosen as the desired maintenance level. Values were derived as a part of the 2030 Needs Assessment.

Research: Values for the period FY2009-FY2019 are derived from the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Engineering: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

ROW: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Toll Equity: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. No expenditures are contemplated beyond FY2019.

Pass Through Tolls: Values for the period FY2009-FY2019 are derived from row the January 2009 special fund/transfer report produced by TxDOT. No expenditures are contemplated beyond FY2020.

Aviation/Motor Vehicles: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Maintenance: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Contract Routine Maintenance: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Ferry: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

GIWW/Public Transportation: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Traffic and Travel: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Vehicle Registration: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

ATPA: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Administrative/Support Cost: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

SWCAP: Values for the period FY2009-FY2019 are derived from row the January 2009 special fund/transfer report produced by TxDOT. No expenditures are contemplated beyond FY2020.

Short Term Borrowing: Values for the period FY2009-FY2019 are derived from row the January 2009 special fund/transfer report produced by TxDOT. No expenditures are contemplated beyond FY2020.

Prop 14 Debt Service: Values for the period FY2009-FY2019 are derived from row the January 2009 special fund/transfer report produced by TxDOT. Debt service expenditures for FY2020-FY2035 result from user input.

Payments to Other Agencies: Values for the period FY2009-FY2019 are derived from row the January 2009 special fund/transfer report produced by TxDOT.

Retirement/Comptroller: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

Inflation/Add'l Programs: Values for the period FY2009-FY2019 are derived from row the January 2009 cash forecast produced by TxDOT. Values for FY2020-FY2035 result from user input to determine the annual rate of increase.

TxDOT Maintenance Estimates and Total Non-Letting Expenditures: This column represents the sum of Columns AL through BF.

Input Page

As originally developed, the model was envisioned as a Microsoft Excel-based program. Toward that end, the model contained a tab within the Excel spreadsheet where the user has the option of changing up to 84 different variables regarding revenue, expense, fuel efficiency and other options. These variables were linked to appropriate tabs in the spreadsheet and automatically changed calculation values and produced output pages based on the variables chosen.

The Excel-based input page is shown on the following three pages.

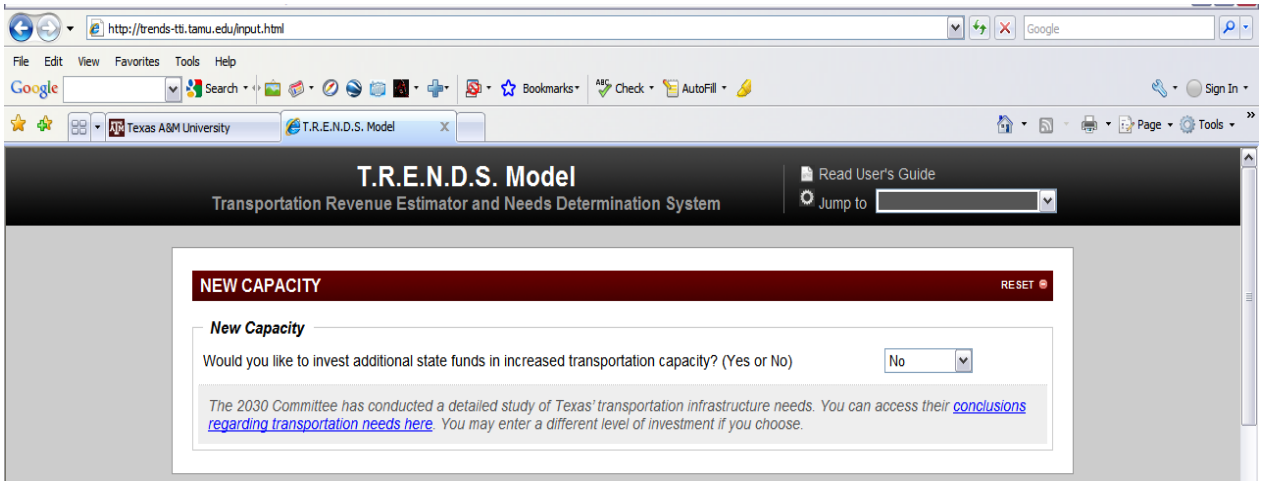
VARIABLES	
STATE MOTOR FUEL TAX VARIABLES	
Current State Gasoline Tax Rate:	$0.20
If You Would Like to Increase the State Gasoline Tax, Enter the Amount of the Increase:	$0.00
Enter the Year the Gasoline Tax Increase Takes Effect:	2010
If You Would Like to Increase the State Gasoline Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Gasoline Tax Increase Takes Effect:	2020
Current State Diesel Tax Rate:	$0.20
If You Would Like to Increase the State Diesel Fuel Tax, Enter the Amount of the Increase:	$0.00
Year the Diesel Fuel Tax Increase Takes Effect:	2010
If You Would Like to Increase the State Diesel Fuel Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Diesel Fuel Tax Increase Takes Effect:	2030
Do You Want to Index the State Gasoline Tax to the Rate of Inflation in the Highway Cost Index (Enter Yes or No):	No
Do You Want to Index the State Gasoline Tax to the Rate of Inflation in the Consumer Price Index (Enter Yes or No):	No
If Yes, What Year Do You Want the Index to Start:	2010
Net Percent of State Fuel Tax Dedicated to Transportation:	74.0%
Net Percent of State Fuel Tax **Increase** Dedicated to Transportation:	74.0%
STATE VMT TAX VARIABLES	
Enter VMT Fee Per Mile for Personal Vehicles (cents per mile):	$0.000
Enter VMT Fee Per Mile for Commercial Vehicles (cents per mile):	$0.000
Enter year to begin collecting VMT fee on Personal Vehicles:	2020
Enter year to begin collecting VMT fee on Commercial Vehicles:	2020
If You Would Like to End the State Gasoline Tax, Enter the Last Year to Collect the Tax:	2035
If You Would Like to End the State Diesel Fuel Tax, Enter Last Year to Collect State Diesel Fuel Tax:	2035
FEDERAL MOTOR FUEL TAX VARIABLES	
Current Federal Gasoline Tax Rate:	$0.184
If You Would Like to Increase the Federal Gasoline Tax, Enter the Amount of the Increase:	$0.000
Enter the Year the Federal Gasoline Tax Increase Takes Effect:	2020
If You Would Like to Increase the Federal Gasoline Tax Again, Enter the Amount of the Increase:	$0.000
Enter the Year the Second Federal Gasoline Tax Increase Takes Effect:	2030
Current Federal Diesel Tax Rate:	$0.244
If You Would Like to Increase the Federal Diesel Fuel Tax, Enter the Amount of the Increase:	$0.000
Enter the Year the Federal Diesel Fuel Tax Increase Takes Effect:	2020
If You Would Like to Increase the Federal Diesel Fuel Tax Again, Enter the Amount of the Increase:	$0.000
Enter the Year the Second Federal Diesel Fuel Tax Increase Takes Effect:	2030
Total Federal Reimbursements as a Percent of Federal Fuel Tax Revenue:	85.0%

MISCELLANEOUS REVENUES	
Annual Increase in Lubricant Sales Tax Revenues	3.0%
Annual Increase in Miscellaneous Revenues	1.0%
Annual Increase in Other Agency Revenue	1.0%
VEHICLE REGISTRATION FEE VARIABLES	
If You Would Like to Increase Vehicle Registration Fees, Enter the Percent Increase:	0.0%
Enter the Year the Vehicle Registration Fee Increase Takes Effect:	2015
If You Would Like to Increase Vehicle Registration Fees Again, Enter the Percent Increase:	0.0%
Enter the Year the Second Vehicle Registration Fees Increase Takes Effect:	2020
Annual Percent Increase (2016-2030) in Vehicle Registration Fee Adjustment from Comptroller:	0.0%
MAINTENANCE VARIABLES	
Use TxDOT Maintenance Numbers (Enter Yes or No):	Yes
Use *2030 Committee* Maintenance Estimate for 90 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Use *2030 Committee* Maintenance Estimate for 87 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Use *2030 Committee* Maintenance Estimate for 80 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Percent Annual Increase in Category 6 Bridge Maintenance (2020-2035):	5.0%
Maintenance Catch Up 2020-2022 in Billions of $:	$0.00
EXPENSE VARIABLES	
Annual Percent Increase in Category 5 CMAQ Expenses: (2020-2035):	0.0%
Percent Annual Increase in Category 7 STP Metro Mobility and Maintenance Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 8 Federal Safety Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 9 Federal Enhancement Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 10 Congressional Earmarks & TPWD Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 11 District Discretionary Funding (2020-2035):	0.0%
Annual Percent Increase in Non-Letting Expenses (2020-2035):	5.0%
Annual Percent Increase in Right of Way Expenses (2020-2035):	5.0%
Annual Percent Increase in Maintenance Expenses (2020-2035):	5.0%
Annual Percent Increase in Ferry Operations Expenses (2020-2035):	5.0%
Annual Percent Increase in GIWW Operations and Transit Expenses (2020-2035):	5.0%
Annual Percent Increase in Travel/Traffic Expenses (2020-2035):	5.0%
Annual Percent Increase in Vehicle Registration Expenses (2020-2035):	5.0%
Annual Percent Increase in ATPA Expenses (2020-2035):	5.0%
Annual Percent Increase in Cost of Other Agencies Funded by TxDOT (2020-2035):	5.0%
Percent Increase in Contributions from TxDOT to Comptroller and Retirement (2020-2035):	5.0%
Percent of "Diversions" to Be Eliminated:	0.0%
Year that "Diversions" are Eliminated:	2009

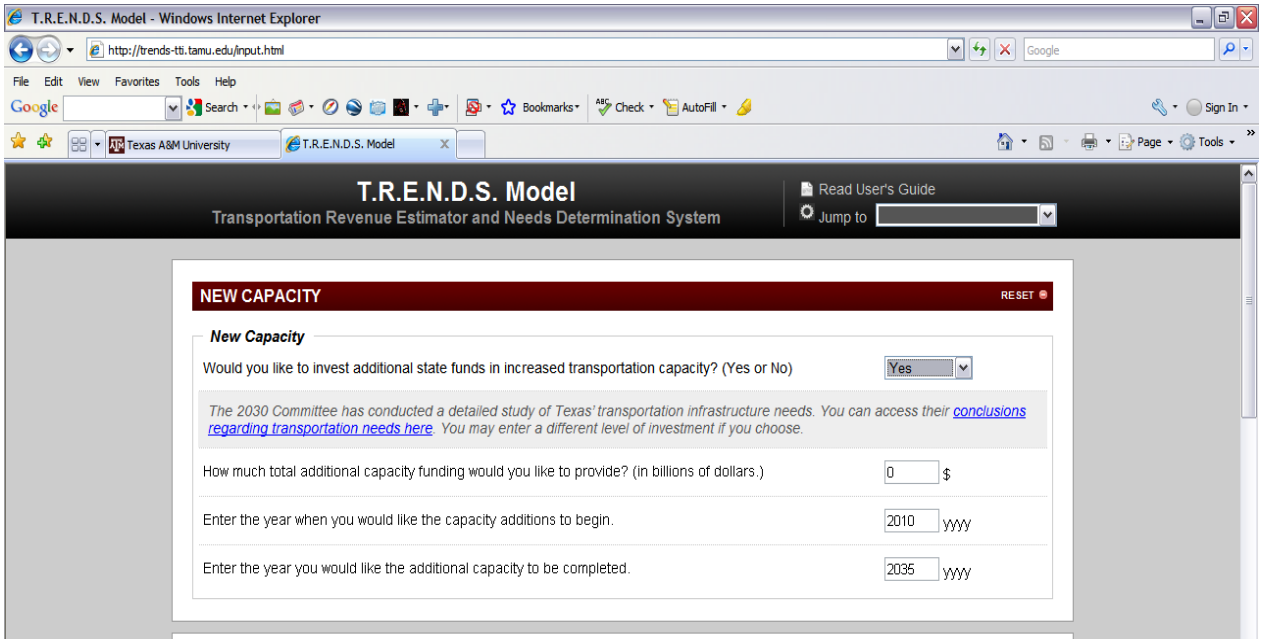
FUEL EFFICIENCY VARIABLES	
Percent of Diesel Consumed by Commercial Vehicles:	97.0%
Percent of Gasoline Consumed by Personal Vehicles:	98.0%
Commercial Truck Fuel Efficiency Assumption (enter "low", "high" or "average"):	low
Personal Vehicle Fuel Efficiency Assumption (enter "low", "high" or "average"):	low
BOND FINANCE VARIABLES	
Enter Proposition 12 Bond Amount in Billions of $:	$0
Enter Number of Years to Receive Proposition 12 Bond Proceeds:	3
Enter First Year to Receive Proposition 12 Bond Proceeds:	2009
Enter Discount Rate for Net Percent Value (in percent):	5.0%
Enter Proposition 14 Bond Proceeds in Billions of $	$3.00
Enter Number of Years to Receive Proposition 14 Bond Proceeds:	3
Enter First Year to Receive Proposition 14 Bond Proceeds:	2009
Enter Year to Start Proposition 14 Bond Payback:	2010
Enter Number of Years to Pay Back Proposition 14 Bonds:	20
Estimated Annual Debt Service on Proposition 14 Bonds (2020-2026) in millions:	$240.0
Estimated Annual Debt Service on Proposition 14 Bonds (2027) in millions:	$105.0
NEW CAPICITY DOLLARS	
Enter the Amount to Be Spent on New Capacity (in Billions of Inflation-Adjusted):	$0.0
Enter Year to Begin Spending New Capacity Dollars:	2020
Enter Year to End Spending New Capacity Dollars:	2030

As noted earlier, a decision was made to convert the T.R.E.N.D.S. to a web-based model. As a result, a new series of input pages were created for the model-user to enter a wide assortment to variables choices.

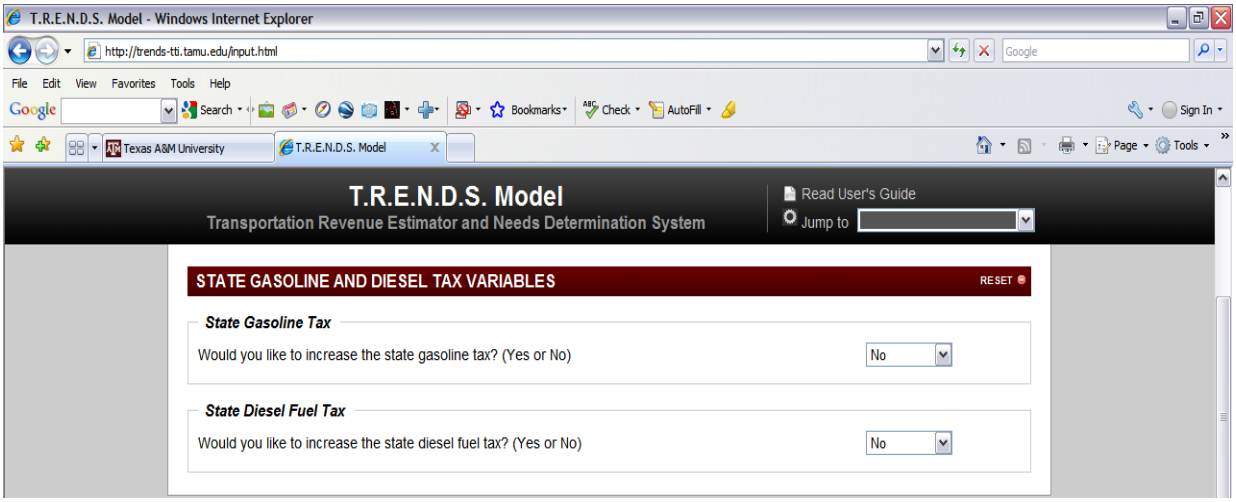
As show below, the user is asked a series of questions regarding alternative assumptions to be used in the model calculations. For example, the first window shown below asks about new capacity. The default answer is "No."



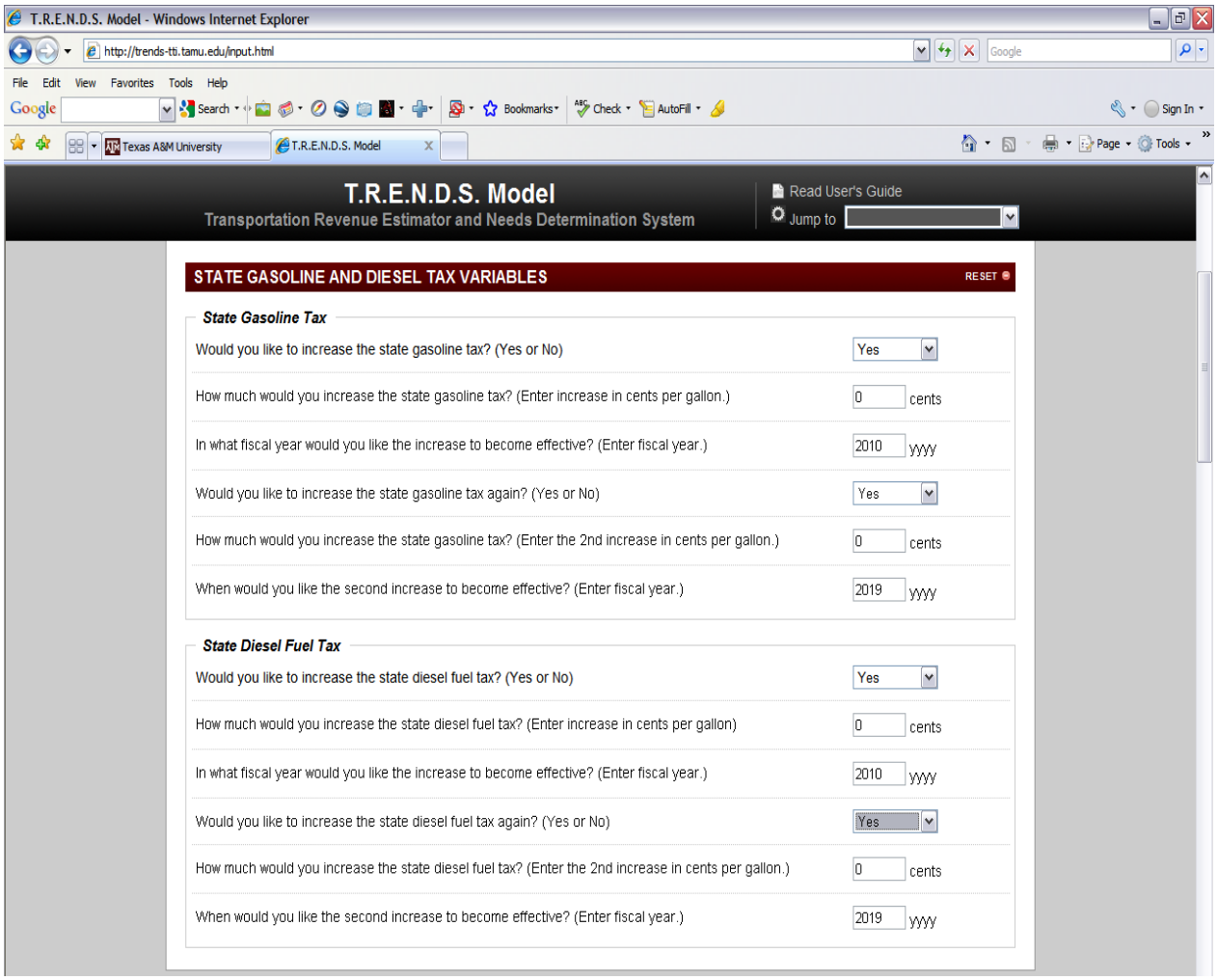
If the user changes the capacity answer from "No" to "Yes," a series of other options appears as shown below.



The next series of questions relates to state gasoline and diesel fuel tax options. Again, the default answer to the questions is "No."

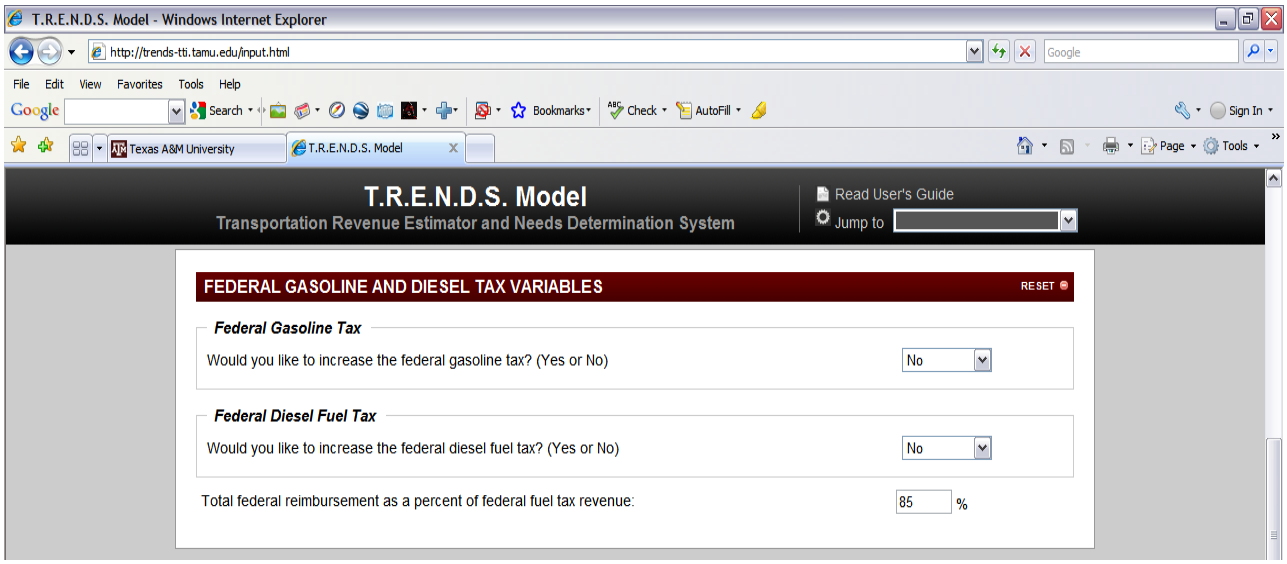


If the user wishes to assess the revenue impact of increasing the gasoline or diesel fuel tax, another series of questions regarding rates and effective dates appears.

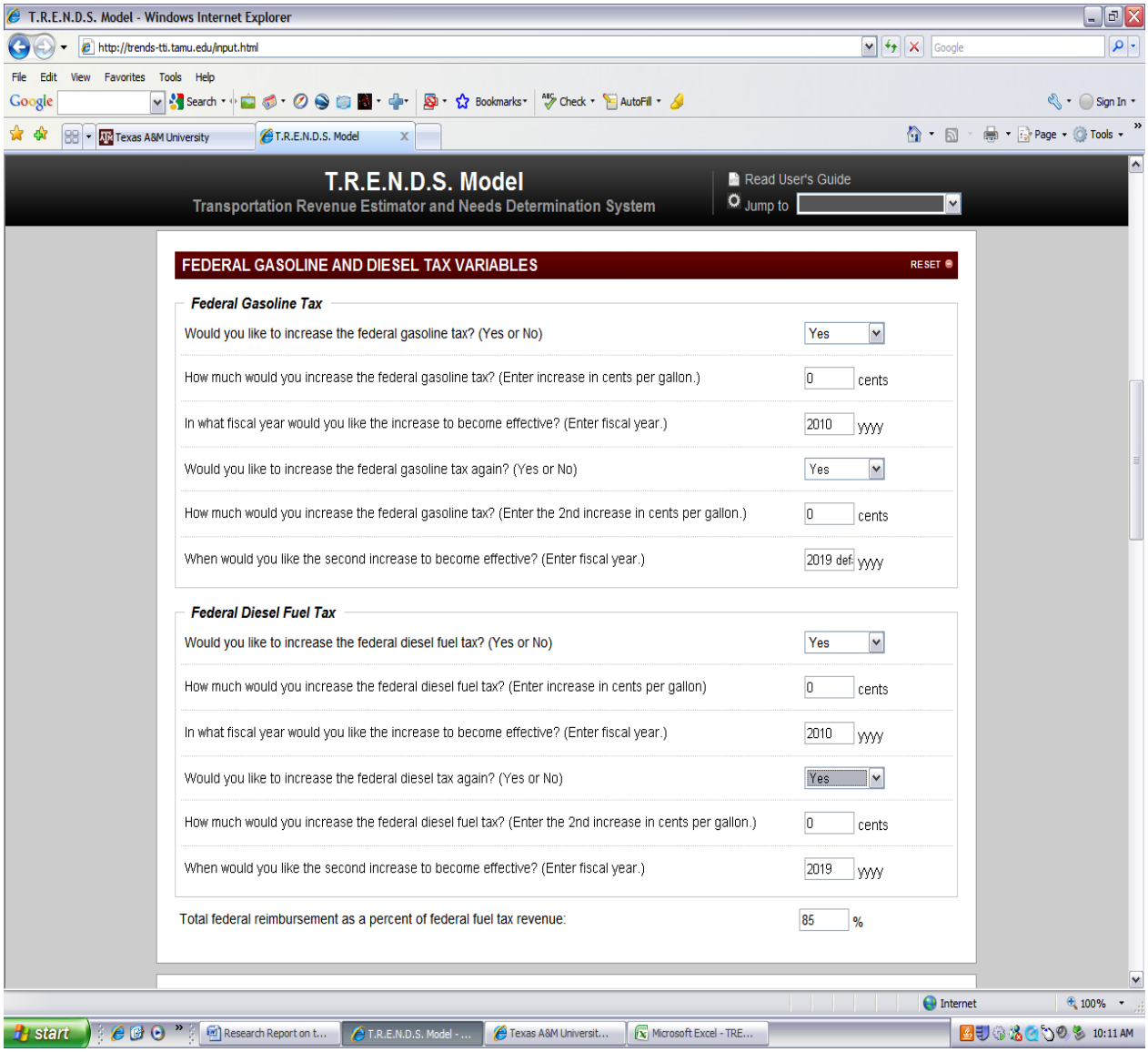


A similar process is followed regarding the federal gasoline and fuel tax rate in order for the user to assess the effect a tax increase for Texas at the federal level. As a part of this calculation, the user is allowed to change the baseline assumption regarding the rate of reimbursement to the State on federal revenues collected in Texas. (Note: The default rate of return used in the model is 85 percent. In other words, 85 percent of the federal fuel tax revenue collected in Texas is returned to the State. The rate of return represents the average return to Texas over the past 10 years and will be updated on an annual basis based on the latest available data.)

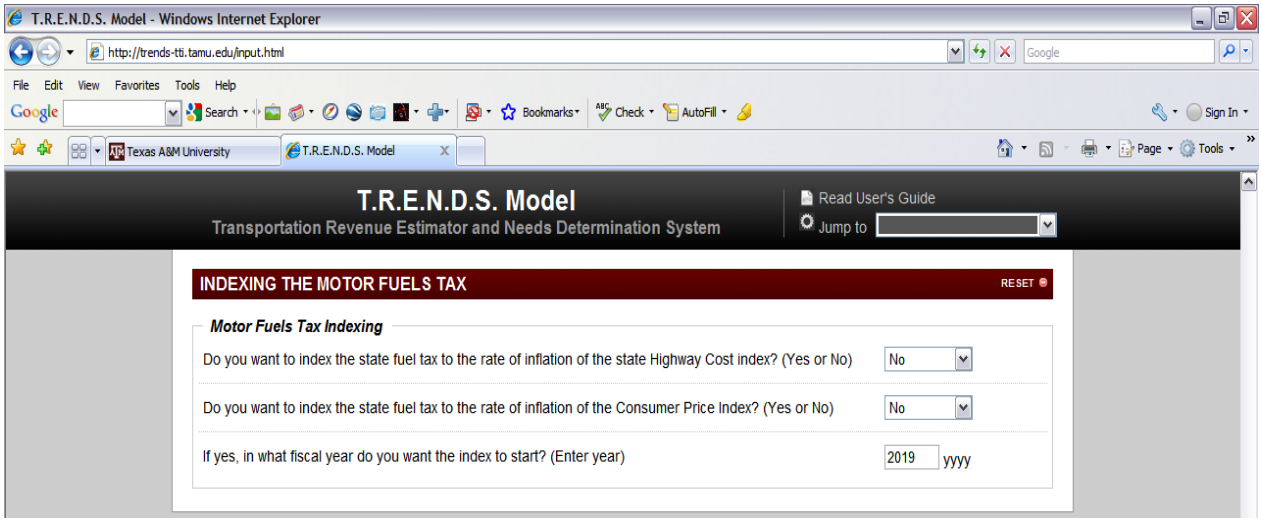
The screen below shows the default values.



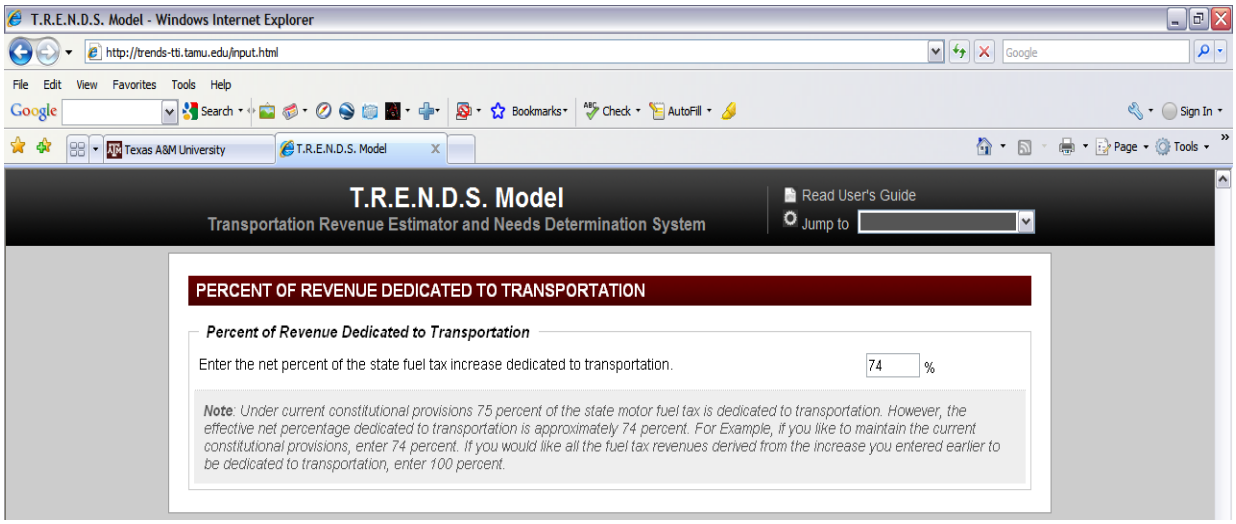
The following screen shows the additional options presented regarding tax rates and effective dates if the default values are not chosen.



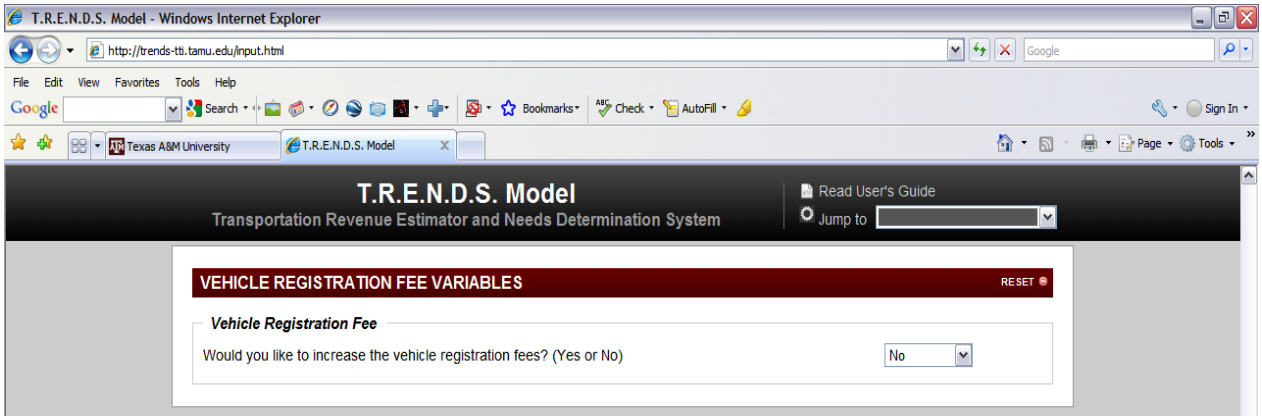
The T.R.E.N.D.S. model-user is also given the option to index the state gasoline and diesel fuel tax to either the state Highway Cost Index or the Consumer Price Index. The default values for both are “No.” If “Yes” is chosen for one of the options, the user must enter a year when the indexing is to begin.



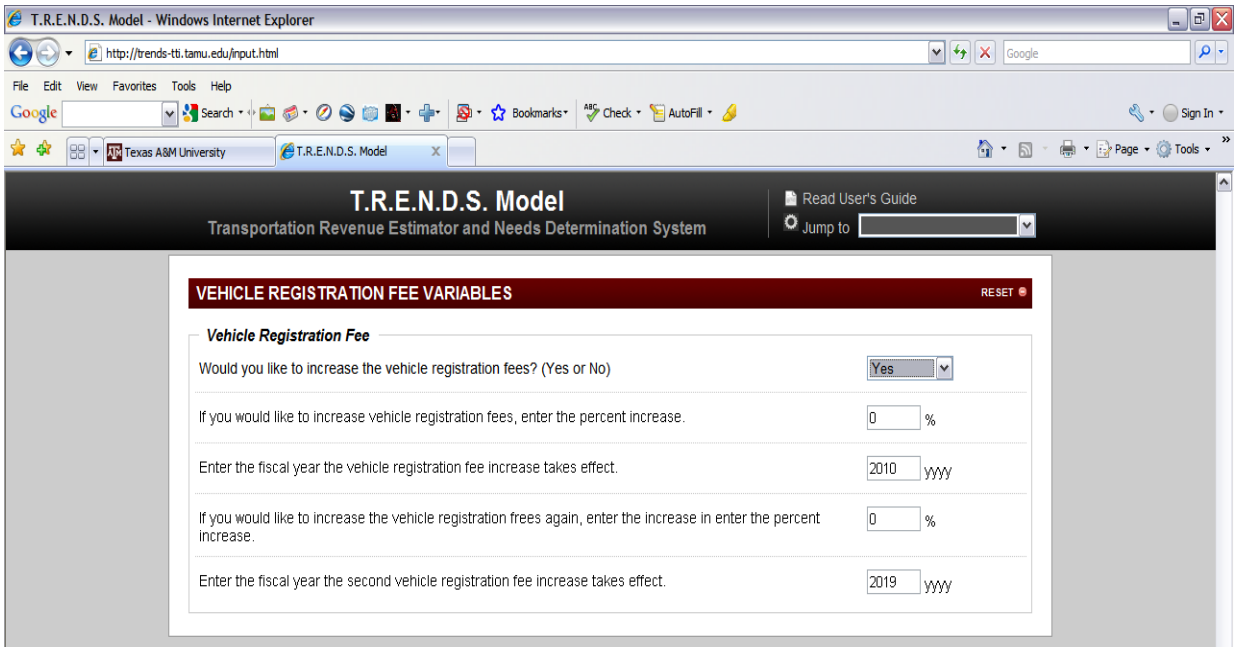
The user can also change the percentage of the fuel tax that is allocated to transportation. Currently, the Texas Constitution dedicates 75 percent of fuel tax revenues to transportation and 25 percent to public education. In this window, the user is given the option of changing allocation percentage of NEW revenues derived from the fuel tax.



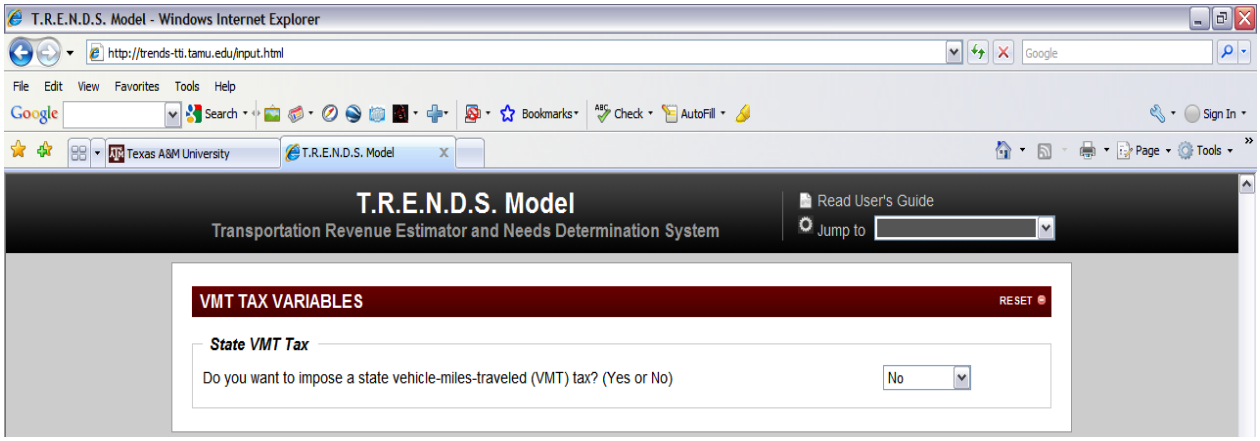
As noted earlier, the user is also provided with options to increase vehicle registration fees. Again, the default answer is “No” as shown below.



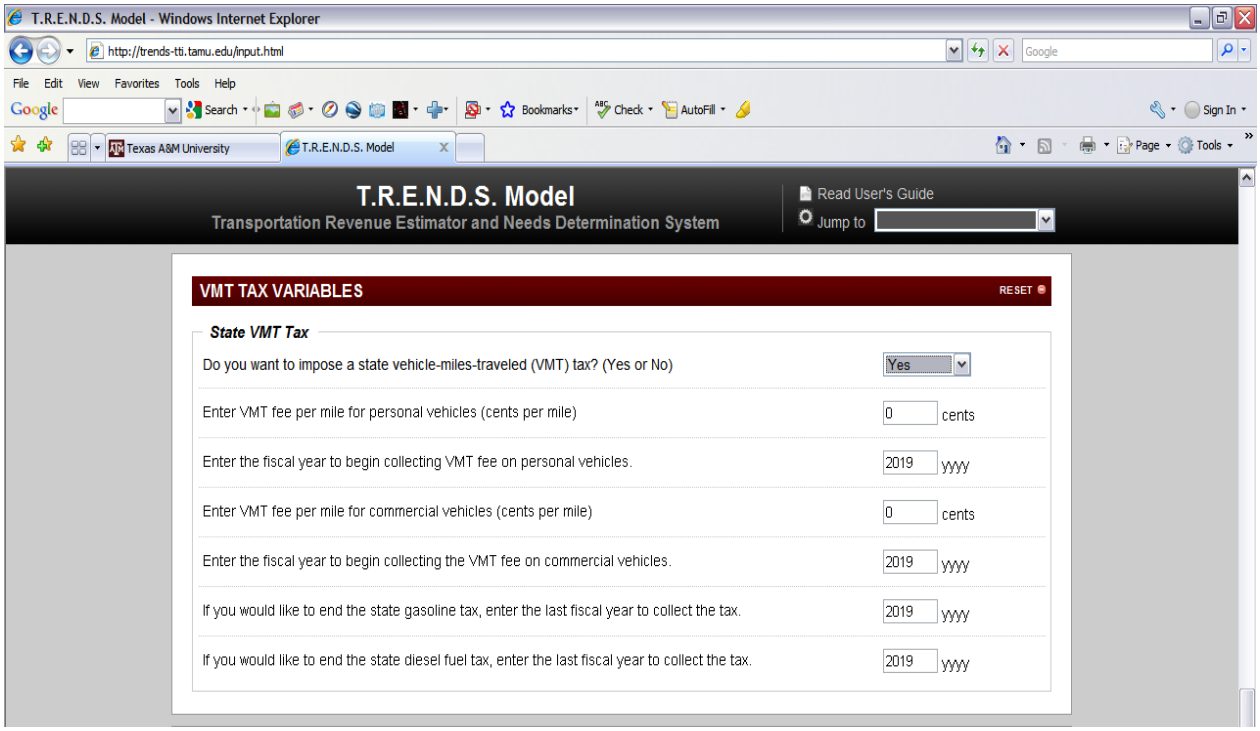
If the user wishes to increase vehicle registration fees, a series of additional choices regarding the rate and effective date appear.



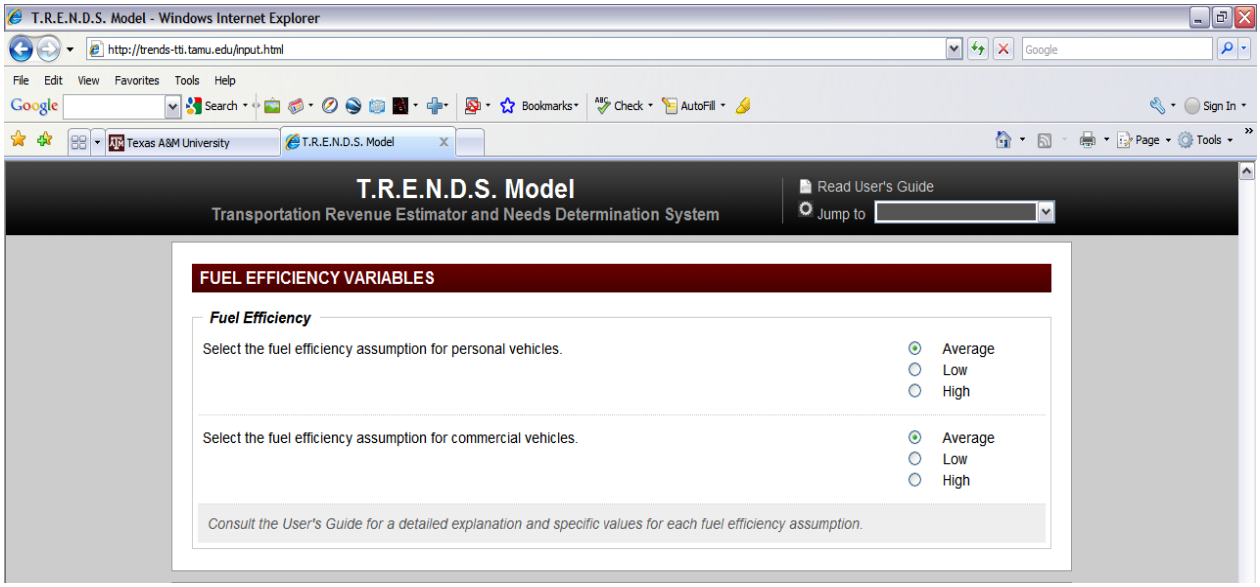
Unique to this model is the ability to assess the revenue impact of a state vehicle-miles-traveled (VMT) tax. Again, the default answer is “No” as seen below.



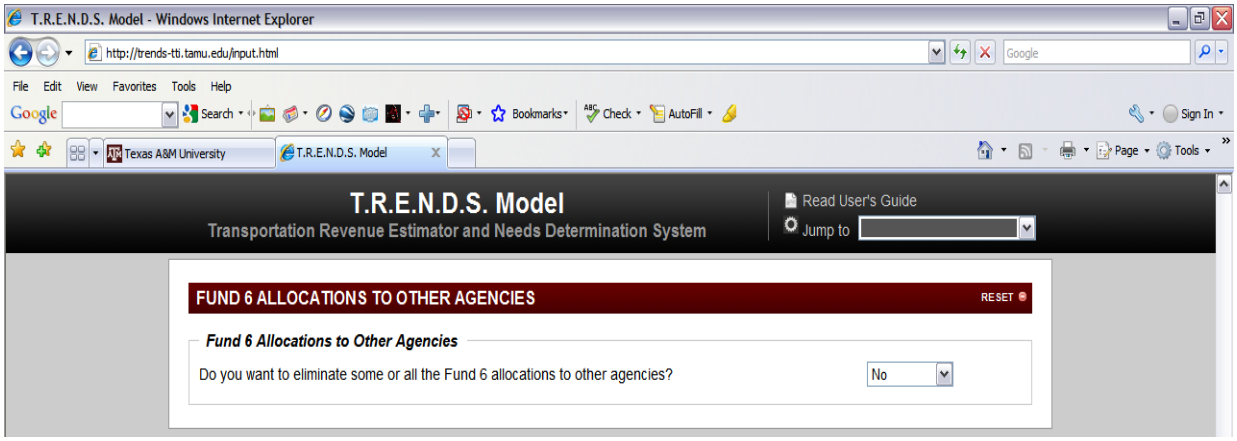
If the user wishes to assess the effects of a VMT tax, a series of additional questions appear regarding rate and implementation date.



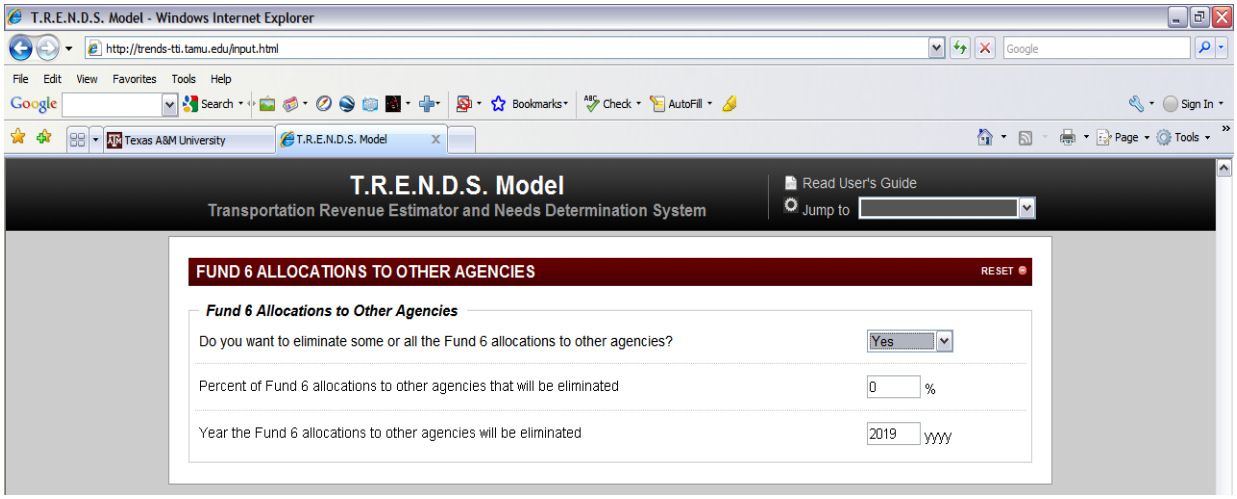
Additionally, the user can also select among three assumptions regarding fuel efficiency. These alternatives correspond to the table shown on page 4 of this report.



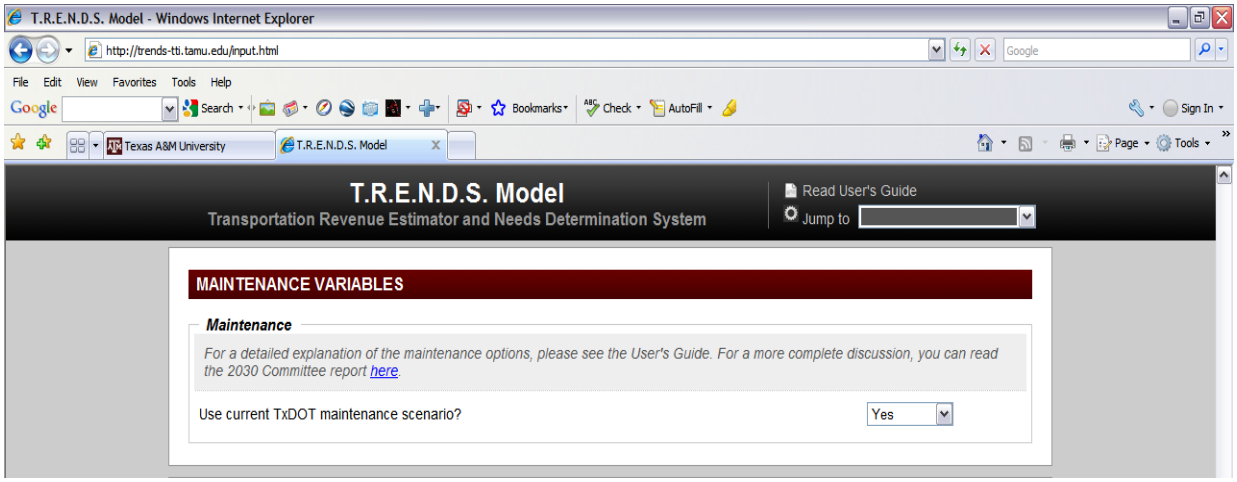
Another user-controlled variable is the amount of Fund 6 revenue that is ultimately allocated to other agencies. The default answer to the question is set to "No" reflecting no elimination of Fund 6 diversions.



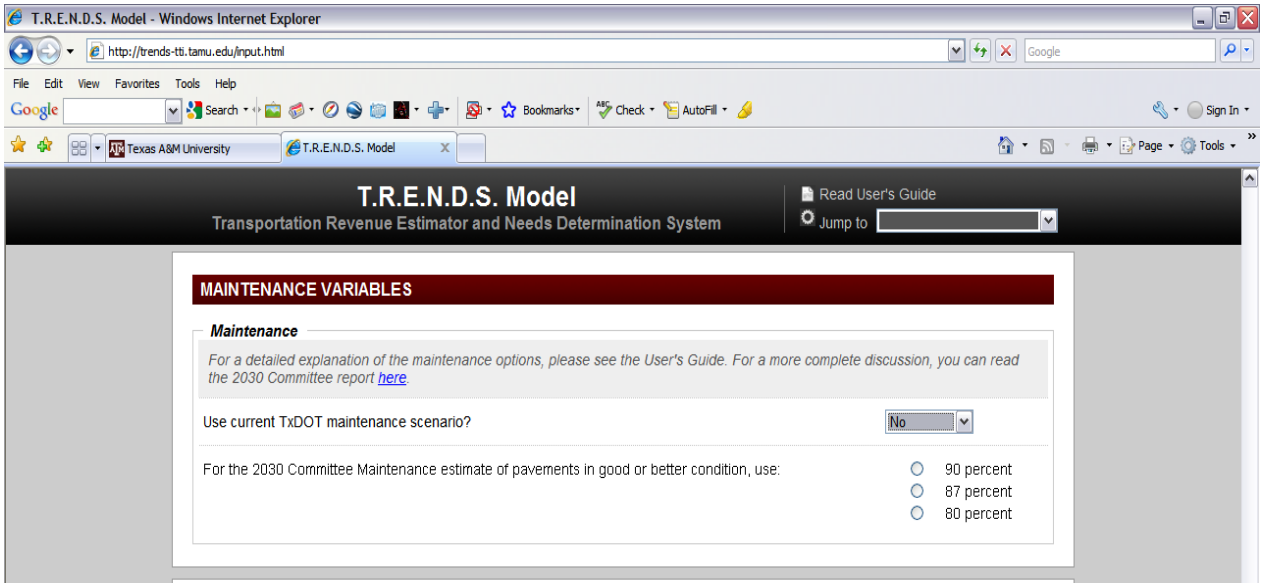
If users enters "Yes" in answer to the question, then they are asked to enter the percentage of Fund 6 diversions to be eliminated as well as the effective year.



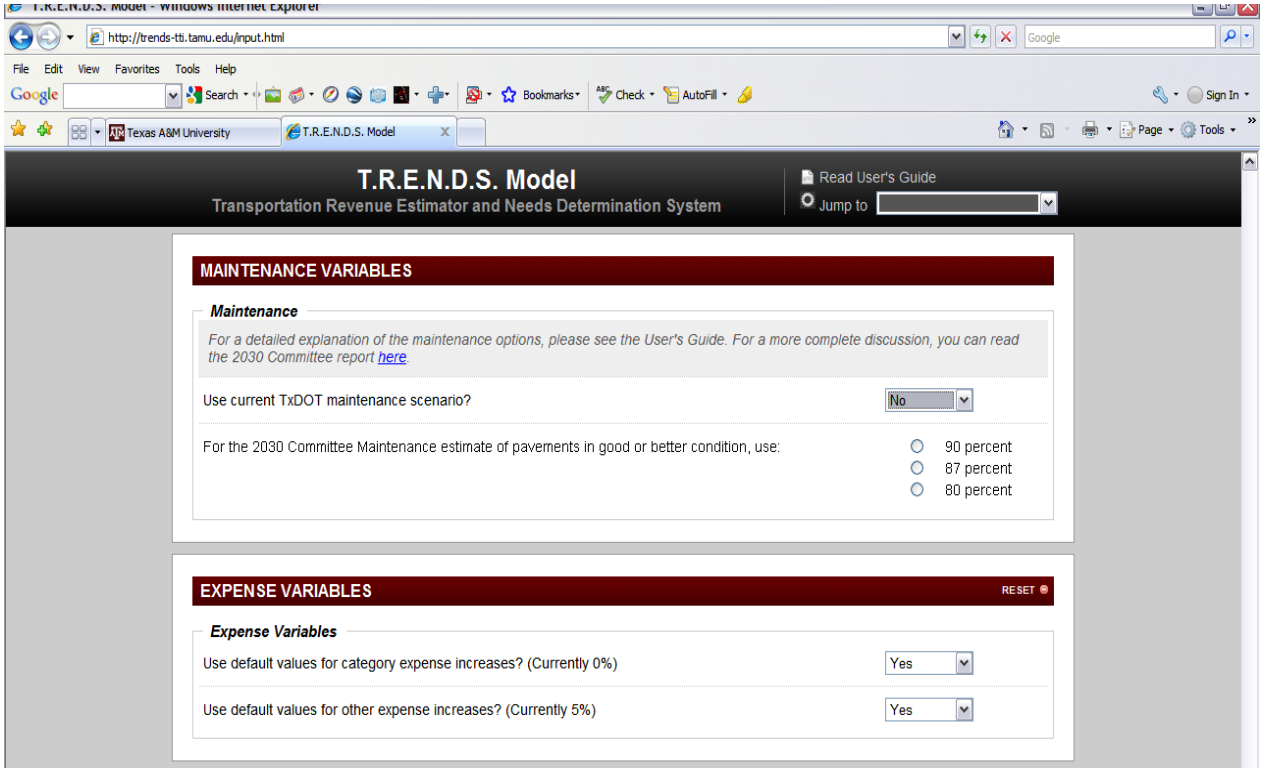
The next window relates to maintenance expenditures. The default values for maintenance expenditures are shown below and represent those expenditures currently budgeted by TxDOT in the 2009 through 2019 plan.



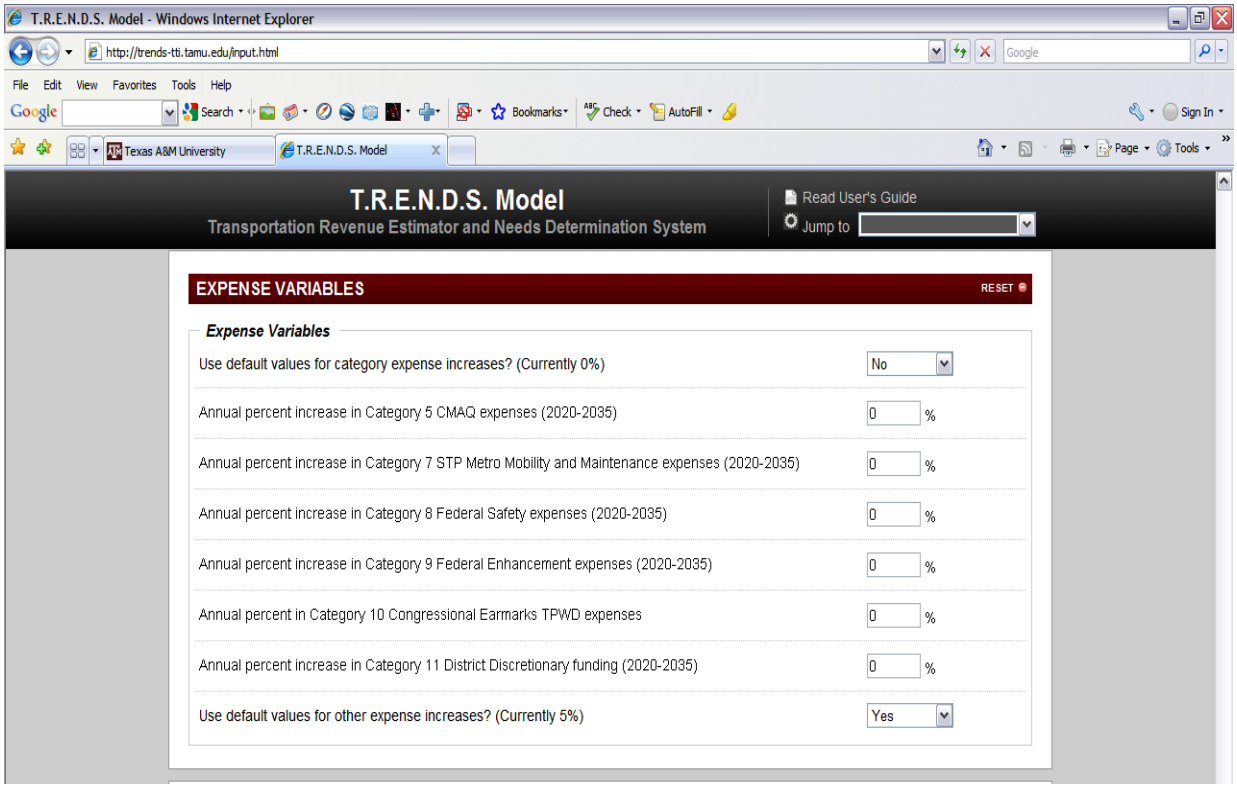
However, the user has the option choosing among three other maintenance scenarios. These scenarios were developed by 2030 Committee in 2008. They relate to the costs associated with maintaining 90 percent, 87 percent, or 80 percent of Texas roadways in "good or better" condition. A detailed description of these alternatives is contained in the 2030 Committee Report and the user is provided with a link to the appropriate section of that report for further explanation and reference.

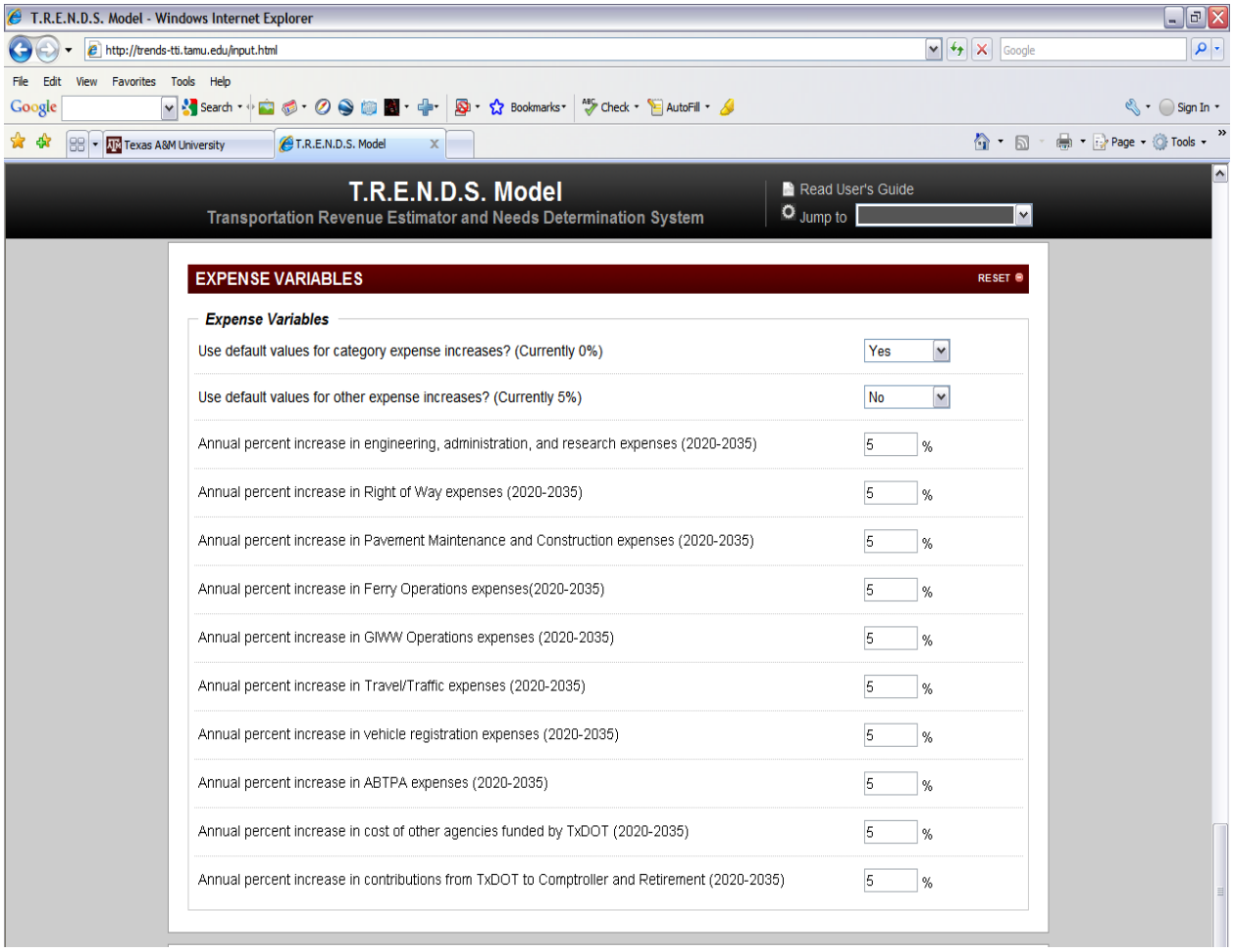


Below the “Maintenance Variables” window is a window providing options for changing expense variables contained in the model. Again, the user can accept or reject the default values.

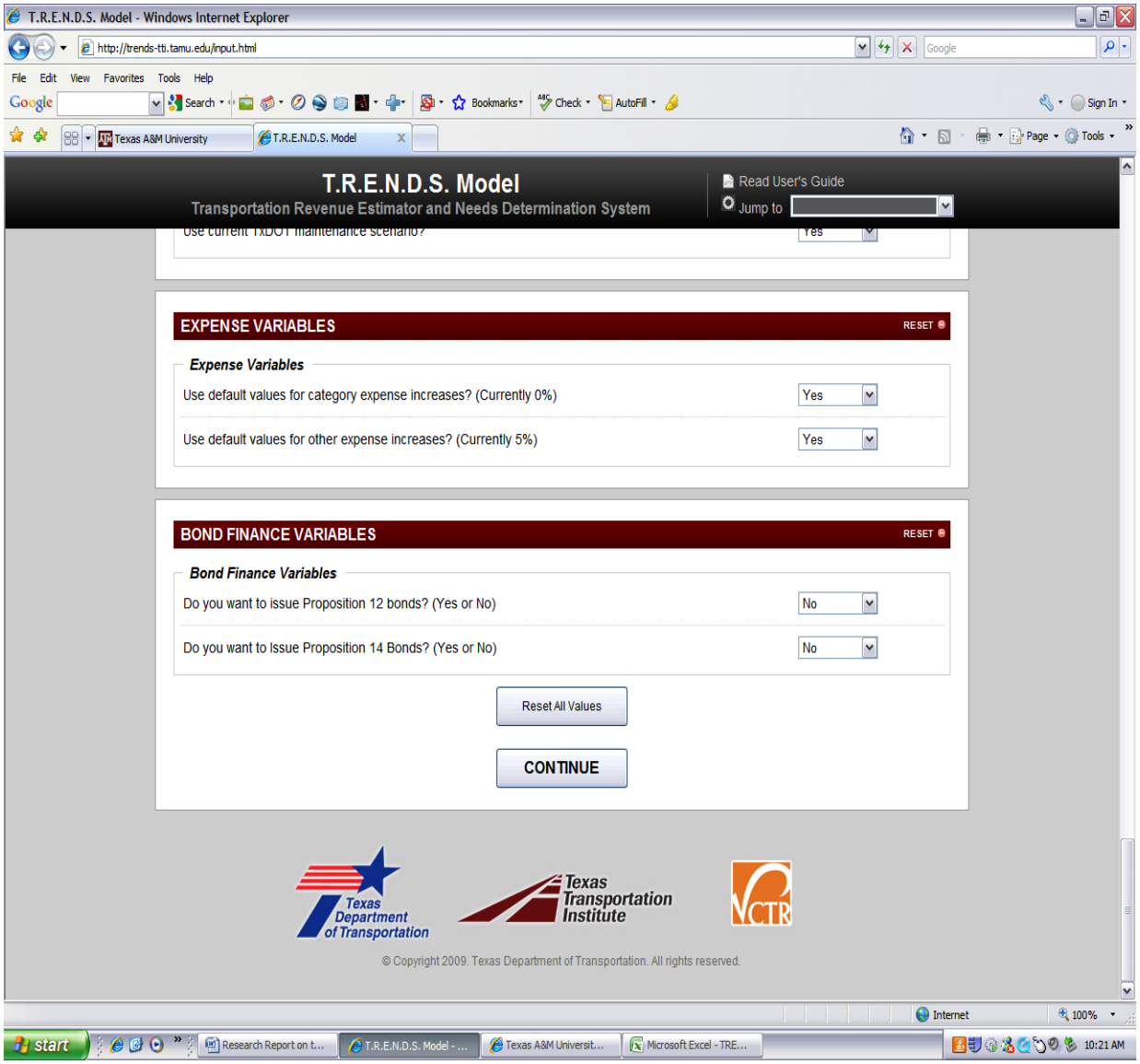


Rejecting the default values presents a series of cost escalation decisions as shown below.

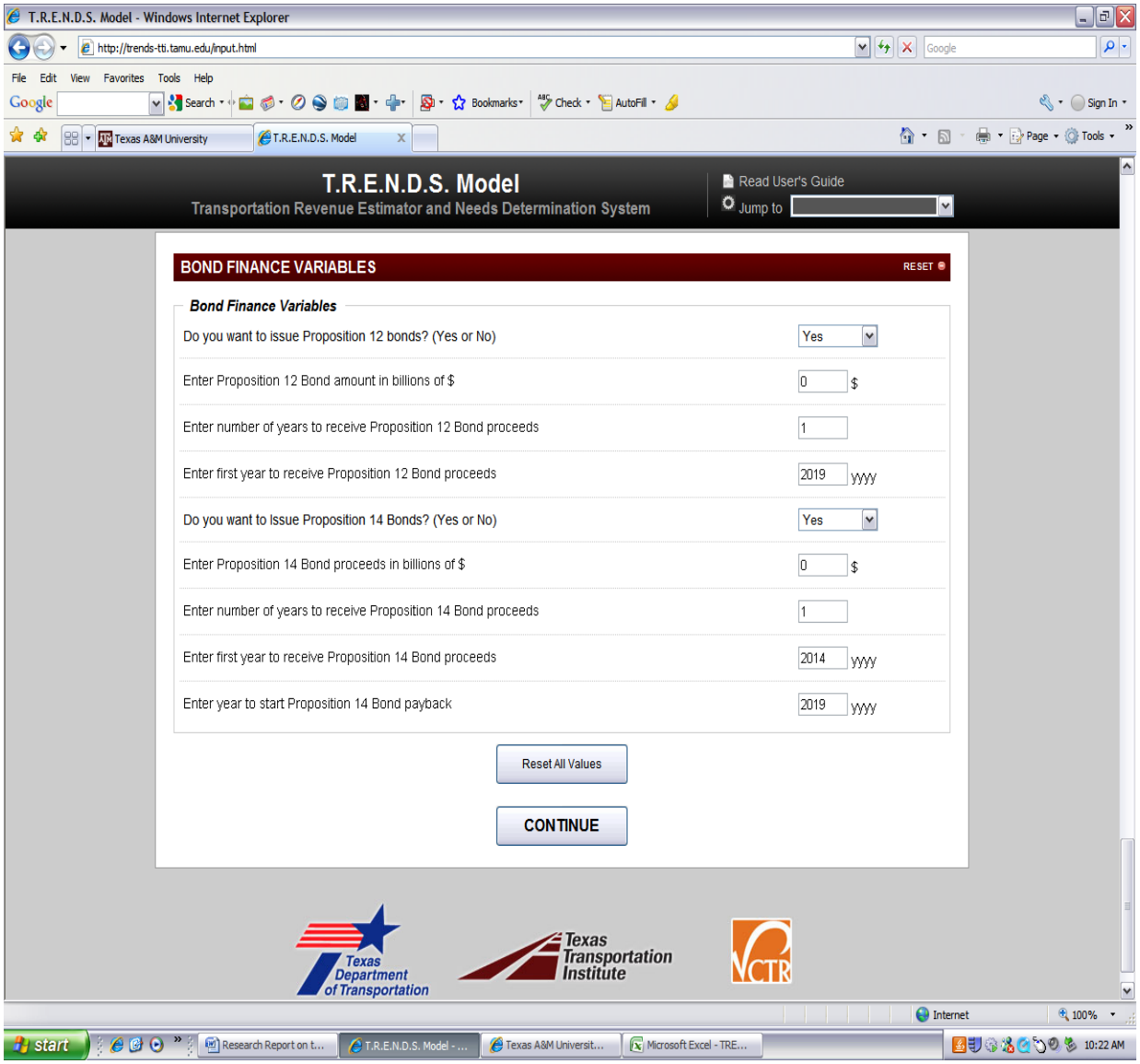

T.R.E.N.D.S. Model - Windows Internet Explorer
http://trends-tti.tamu.edu/input.html
File Edit View Favorites Tools Help
Texas A&M University
T.R.E.N.D.S. Model
T.R.E.N.D.S. Model
Transportation Revenue Estimator and Needs Determination System
Read User's Guide
Jump to
EXPENSE VARIABLES
RESET
Expense Variables
Use default values for category expense increases? (Currently 0%)
No
Annual percent increase in Category 5 CMAQ expenses (2020-2035)
0 %
Annual percent increase in Category 7 STP Metro Mobility and Maintenance expenses (2020-2035)
0 %
Annual percent increase in Category 8 Federal Safety expenses (2020-2035)
0 %
Annual percent increase in Category 9 Federal Enhancement expenses (2020-2035)
0 %
Annual percent in Category 10 Congressional Earmarks TPWD expenses
0 %
Annual percent increase in Category 11 District Discretionary funding (2020-2035)
0 %
Use default values for other expense increases? (Currently 5%)
Yes



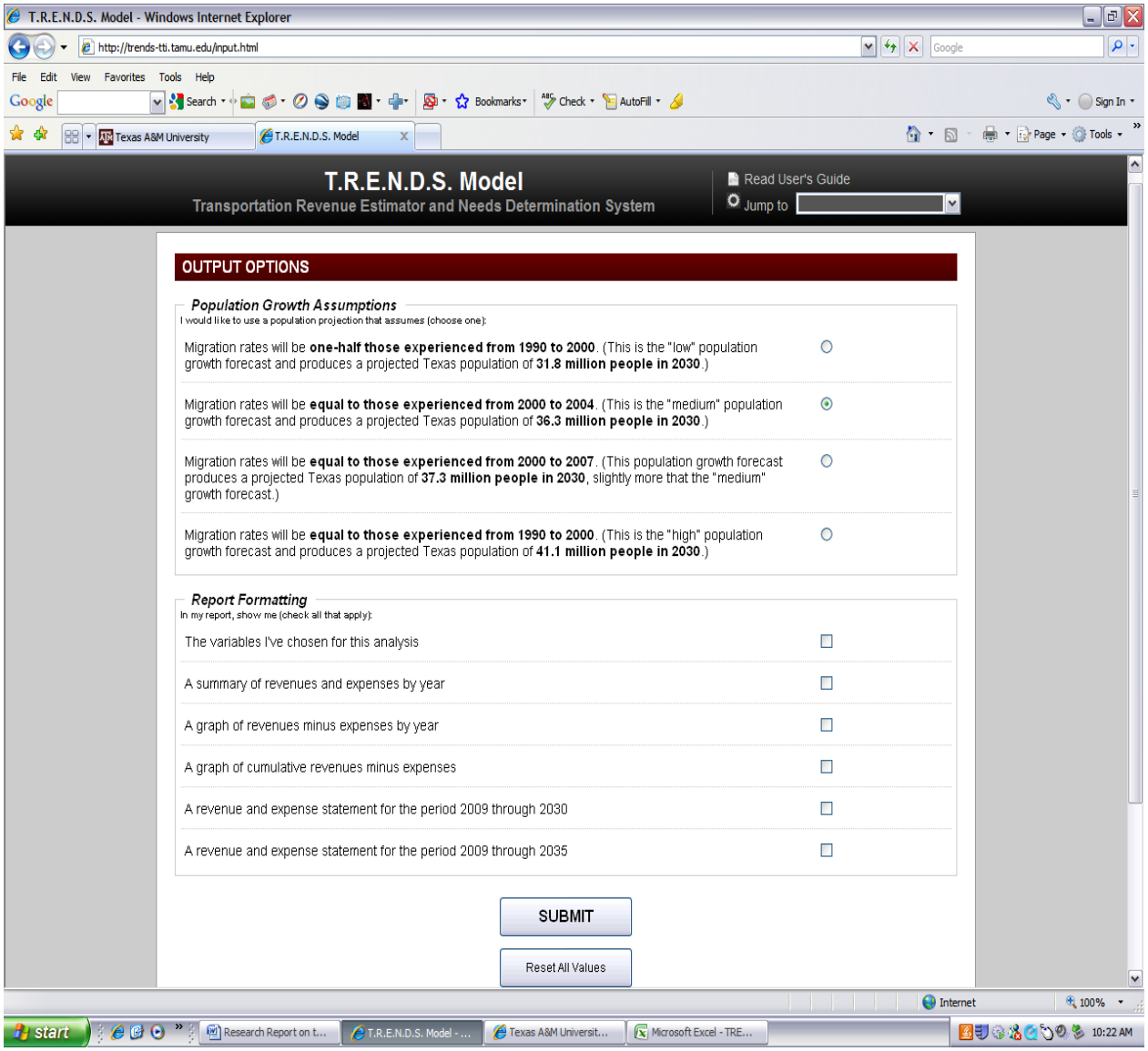
Finally, the user is asked about issuing additional Proposition 12 or Proposition 14 bonds. Once again, the default answer is “No.”



If the user chooses to issues additional bonds, further information regarding assumptions concerning the amount of the bond issue, distribution of proceeds, and repayment schedule is presented.



After the questions regarding bond finance are addressed, the user can continue to the next page or reset all entered values to their default values. If the user chooses to continue to the next page, two output options are presented. As shown below, first the user must select among the four alternative population projection scenarios. Second, the user must select among six report options.



Once those two decisions are made, the user clicks the “SUBMIT” button and is presented with the requested reports.

Output

The output component of the model produces five reports. The first report, shown on the following page, is simply a summary of the user-selected values. The other four reports incorporate the user input regarding mobility needs, revenues and expenses.

Output Summary	
TRENDS MODEL Version 1.0	
VARIABLES	
STATE MOTOR FUEL TAX VARIABLES	
Current State Gasoline Tax Rate:	$0.20
If You Would Like to Increase the State Gasoline Tax, Enter the Amount of the Increase:	$0.00
Enter the Year the Gasoline Tax Increase Takes Effect:	2010
If You Would Like to Increase the State Gasoline Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Gasoline Tax Increase Takes Effect:	2020
Current State Diesel Tax Rate:	$0.20
If You Would Like to Increase the State Diesel Fuel Tax, Enter the Amount of the Increase:	$0.00
Year the Diesel Fuel Tax Increase Takes Effect:	2010
If You Would Like to Increase the State Diesel Fuel Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Diesel Fuel Tax Increase Takes Effect:	2030
Do You Want to Index the State Gasoline Tax to the Rate of Inflation in the Highway Cost Index (Enter Yes or No):	No
Do You Want to Index the State Gasoline Tax to the Rate of Inflation in the Consumer Price Index (Enter Yes or No):	No
If Yes, What Year Do You Want the Index to Start:	2010
Net Percent of State Fuel Tax Dedicated to Transportation:	74.0%
Net Percent of State Fuel Tax **Increase** Dedicated to Transportation:	74.0%
STATE VMT TAX VARIABLES	
Enter VMT Fee Per Mile for Personal Vehicles (cents per mile):	$0.0000
Enter VMT Fee Per Mile for Commercial Vehicles (cents per mile):	$0.0000
Enter year to begin collecting VMT fee on Personal Vehicles:	2020
Enter year to begin collecting VMT fee on Commercial Vehicles:	2020
If You Would Like to End the State Gasoline Tax, Enter the Last Year to Collect the Tax:	2035
If You Would Like to End the State Diesel Fuel Tax, Enter Last Year to Collect State Diesel Fuel Tax:	2035
FEDERAL MOTOR FUEL TAX VARIABLES	
Current Federal Gasoline Tax Rate:	$0.184
If You Would Like to Increase the Federal Gasoline Tax, Enter the Amount of the Increase:	$0.00
Enter the Year the Federal Gasoline Tax Increase Takes Effect:	2020
If You Would Like to Increase the Federal Gasoline Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Federal Gasoline Tax Increase Takes Effect:	2030
Current Federal Diesel Tax Rate:	$0.244
If You Would Like to Increase the Federal Diesel Fuel Tax, Enter the Amount of the Increase:	$0.00
Enter the Year the Federal Diesel Fuel Tax Increase Takes Effect:	2020
If You Would Like to Increase the Federal Diesel Fuel Tax Again, Enter the Amount of the Increase:	$0.00
Enter the Year the Second Federal Diesel Fuel Tax Increase Takes Effect:	2030
Total Federal Reimbursements as a Percent of Federal Fuel Tax Revenue:	85.0%
MISCELLANEOUS REVENUES	
Annual Increase in Lubricant Sales Tax Revenues	3.0%
Annual Increase in Miscellaneous Revenues	1.0%
Annual Increase in Other Agency Revenue	1.0%
VEHICLE REGISTRATION FEE VARIABLES	
If You Would Like to Increase Vehicle Registration Fees, Enter the Percent Increase:	0.0%
Enter the Year the Vehicle Registration Fee Increase Takes Effect:	2015
If You Would Like to Increase Vehicle Registration Fees Again, Enter the Percent Increase:	0.0%
Enter the Year the Second Vehicle Registration Fees Increase Takes Effect:	2020
Annual Percent Increase (2016-2030) in Vehicle Registration Fee Adjustment from Comptroller:	0.0%
MAINTENANCE VARIABLES	
Use TxDOT Maintenance Numbers (Enter Yes or No):	Yes
Use *2030 Committee* Maintenance Estimate for 90 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Use *2030 Committee* Maintenance Estimate for 87 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Use *2030 Committee* Maintenance Estimate for 80 Percent of Pavements in Good or Better Condition (Enter Yes or No):	No
Percent Annual Increase in Category 6 Bridge Maintenance (2020-2035):	5.0%
Maintenance Catch Up 2020-2022 in Billions of $:	$0.0

(Summary of variables continued from previous page.)

EXPENSE VARIABLES	
Annual Percent Increase in Category 5 CMAQ Expenses: (2020-2035):	0.0%
Percent Annual Increase in Category 7 STP Metro Mobility and Maintenance Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 8 Federal Safety Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 9 Federal Enhancement Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 10 Congressional Earmarks & TPWD Expenses (2020-2035):	0.0%
Annual Percent Increase in Category 11 District Discretionary Funding (2020-2035):	0.0%
Annual Percent Increase in Non-Letting Expenses (2020-2035):	5.0%
Annual Percent Increase in Right of Way Expenses (2020-2035):	5.0%
Annual Percent Increase in Maintenance Expenses (2020-2035):	5.0%
Annual Percent Increase in Ferry Operations Expenses (2020-2035):	5.0%
Annual Percent Increase in GIWW Operations and Transit Expenses (2020-2035):	5.0%
Annual Percent Increase in Travel/Traffic Expenses (2020-2035):	5.0%
Annual Percent Increase in Vehicle Registration Expenses (2020-2035):	5.0%
Annual Percent Increase in ATPA Expenses (2020-2035):	5.0%
Annual Percent Increase in Cost of Other Agencies Funded by TxDOT (2020-2035):	5.0%
Percent Increase in Contributions from TxDOT to Comptroller and Retirement (2020-2035):	5.0%
Percent of "Diversions" to Be Eliminated:	0.0%
Year that "Diversions" are Eliminated:	2009
FUEL EFFICIENCY VARIABLES	
Percent of Diesel Consumed by Commercial Vehicles:	97.0%
Percent of Gasoline Consumed by Personal Vehicles:	98.0%
Commercial Truck Fuel Efficiency Assumption (enter "low", "high" or "average"):	low
Personal Vehicle Fuel Efficiency Assumption (enter "low", "high" or "average"):	low
NEW CAPICITY DOLLARS	
Enter the Amount to Be Spent on New Capacity (in Billions of Inflation-Adjusted):	$0.0
Enter Year to Begin Spending New Capacity Dollars:	2020
Enter Year to End Spending New Capacity Dollars:	2030

The following report shows total revenues, maintenance and operating expenses and expenditures on new capacity for each year from 2009 to 2010 as well as providing annual and cumulative balances of funds.

PROJECTED REVENUE AND EXPENDITURES					
Fiscal Year	Total Revenues	Maintenace and Operating Expenditures	New Capacity Expenditures	Annual Balance of Funds	Cummulative Balance
2009	$8,607,796,764	$7,799,497,326	$0	$808,299,437	$808,299,437
2010	$7,203,875,462	$6,877,267,077	$0	$326,608,385	$1,134,907,822
2011	$7,225,203,334	$6,360,284,260	$0	$864,919,073	$1,999,826,896
2012	$6,309,840,699	$6,468,419,988	$0	-$158,579,289	$1,841,247,606
2013	$6,389,152,963	$6,788,593,878	$0	-$399,440,915	$1,441,806,692
2014	$6,468,362,055	$6,984,860,231	$0	-$516,498,175	$925,308,516
2015	$6,547,439,703	$7,161,613,808	$0	-$614,174,105	$311,134,411
2016	$6,626,076,668	$7,477,106,182	$0	-$851,029,513	-$539,895,102
2017	$6,682,089,648	$7,682,694,886	$0	-$1,000,605,239	-$1,540,500,341
2018	$6,735,935,657	$7,908,534,796	$0	-$1,172,599,139	-$2,713,099,480
2019	$6,787,583,003	$8,096,357,606	$0	-$1,308,774,602	-$4,021,874,083
2020	$6,836,502,089	$9,723,499,079	$0	-$2,886,996,990	-$6,908,871,072
2021	$6,883,251,172	$10,124,196,821	$0	-$3,240,945,649	-$10,149,816,721
2022	$6,927,635,884	$10,574,729,648	$0	-$3,647,093,763	-$13,796,910,485
2023	$6,969,332,203	$11,046,389,100	$0	-$4,077,056,897	-$17,873,967,381
2024	$7,008,058,274	$11,536,059,390	$0	-$4,528,001,116	-$22,401,968,497
2025	$7,043,393,373	$12,057,607,453	$0	-$5,014,214,080	-$27,416,182,578
2026	$7,074,954,788	$12,605,232,920	$0	-$5,530,278,133	-$32,946,460,710
2027	$7,102,342,713	$13,045,239,661	$0	-$5,942,896,947	-$38,889,357,658
2028	$7,125,039,496	$13,543,996,738	$0	-$6,418,957,242	-$45,308,314,900
2029	$7,142,633,036	$14,177,941,669	$0	-$7,035,308,633	-$52,343,623,533
2030	$7,154,557,110	$14,603,583,847	$0	-$7,449,026,737	-$59,792,650,270
2031	$7,220,574,742	$15,302,508,134	$0	-$8,081,933,392	-$67,874,583,662
2032	$7,286,165,899	$16,036,378,635	$0	-$8,750,212,735	-$76,624,796,397
2033	$7,351,326,806	$16,806,942,661	$0	-$9,455,615,855	-$86,080,412,252
2034	$7,416,130,017	$17,616,034,888	$0	-$10,199,904,871	-$96,280,317,123
2035	$7,480,491,068	$18,465,581,727	$0	-$10,985,090,659	-$107,265,407,781
TOTAL NEW CAPACITY EXPENDITURES:			$0		

The following two graphs simply plot the annual and cumulative balance of funds shown on the previous tables.

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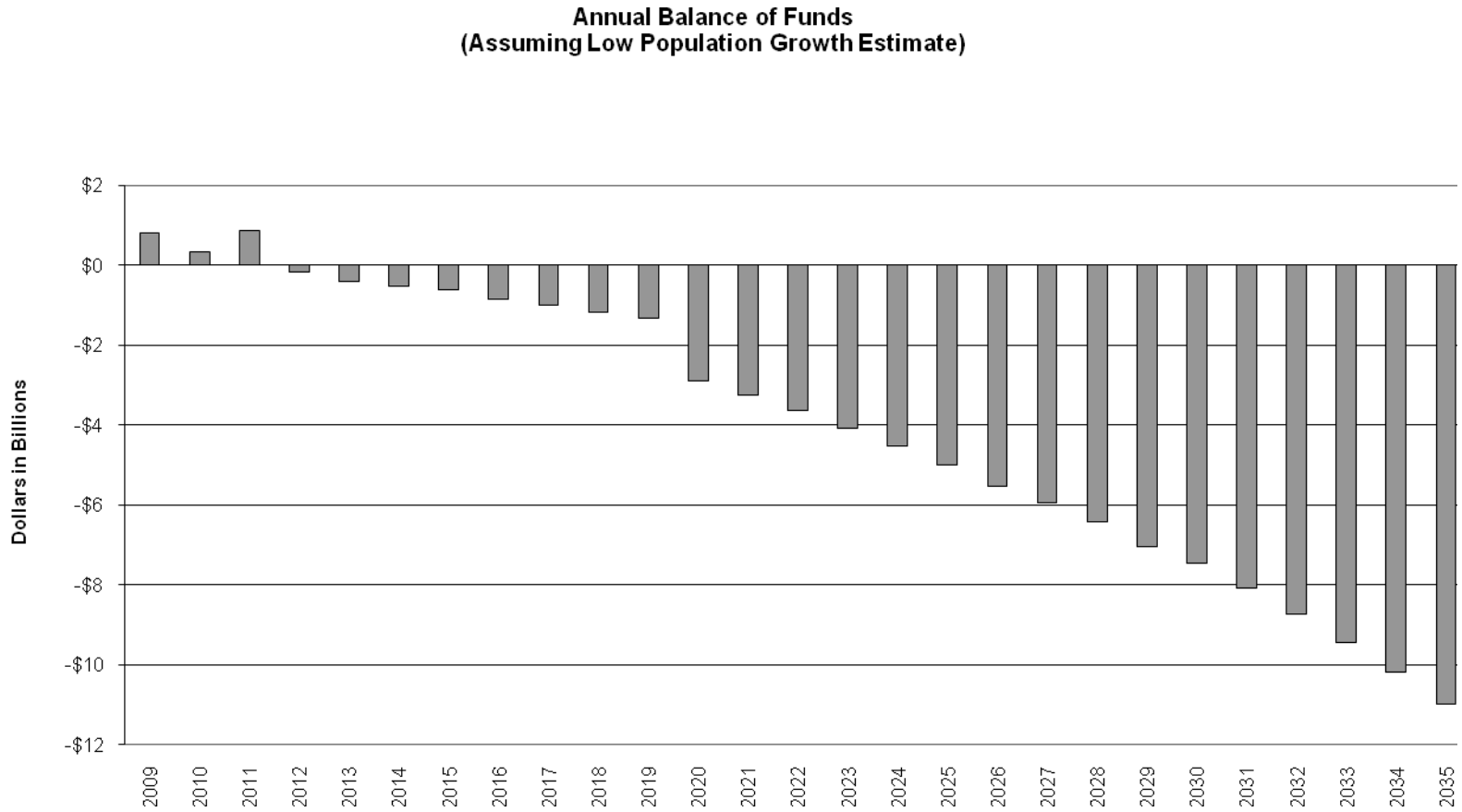
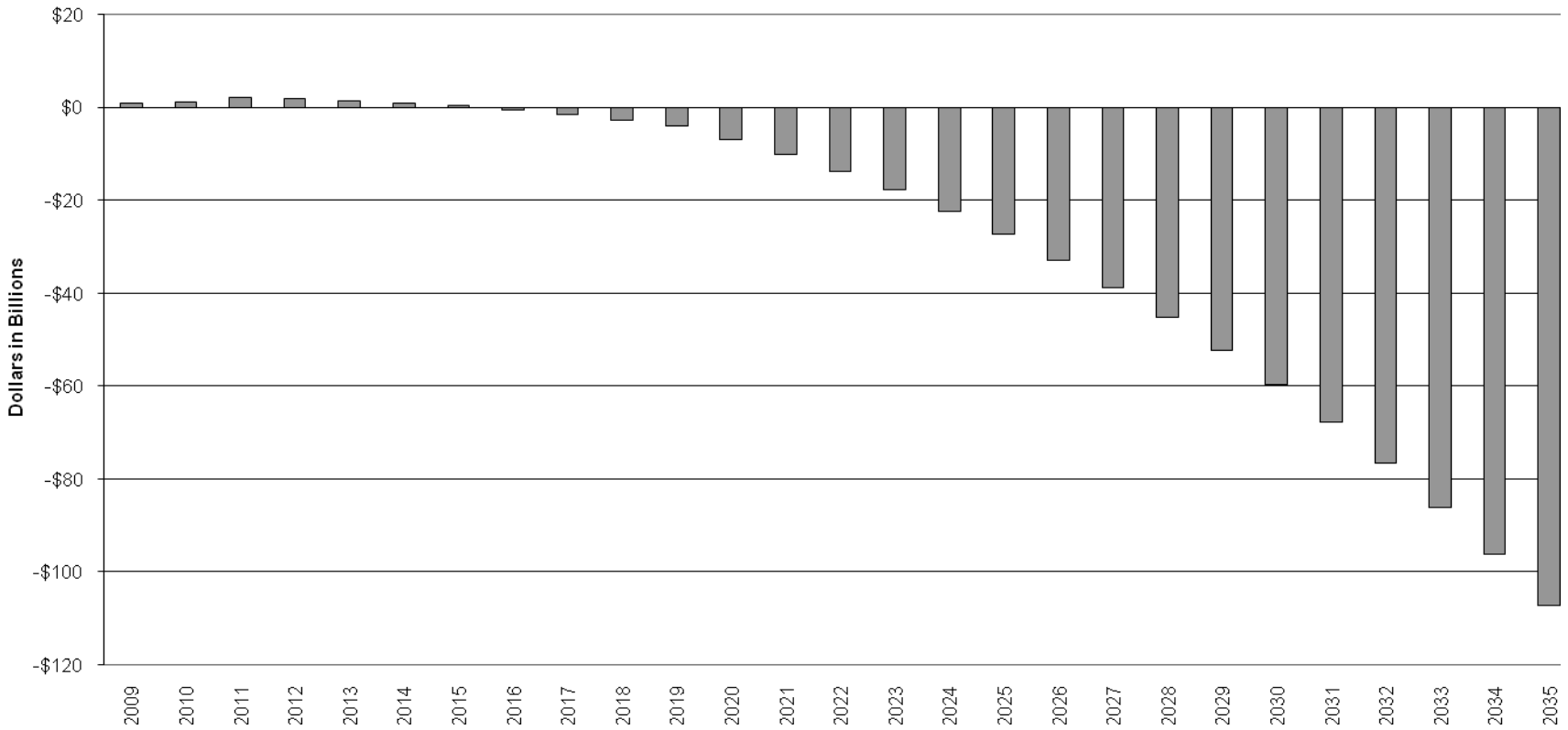

Annual Balance of Funds
(Assuming Low Population Growth Estimate)
Dollars in Billions
$2
$0
-$2
-$4
-$6
-$8
-$10
-$12
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035

Cummulative Balance of Funds
(Assuming Population Low Population Growth Estimate)



The final output, shown below, is an annual statement of revenues and expenses by category along with an annual balance. Shown here is the summary sheet indicating total revenues and expenditures by category for the period 2009 through 2030.

SUMMARY: FY2009 THROUGH FY2030
(dollars expressed in millions)

ASSUMES POPULATION MIGRATION RATES EQUAL TO THOSE EXPERIENCED FROM 2000 TO 2007

Revenues			
	State Revenues:		
	Fuel Taxes	$55,224.2	
	Vehicle Registration Fees	$34,118.8	
	Vehicle Mile Traveled Tax	$0.0	
	Bond Proceeds	$3,000.0	
	Mobility Funds	$1,185.4	
	Miscellaneous	$10,914.1	
	SUBTOTAL, STATE REVENUES	$104,442.3	
	Federal Reimbursements:		
	Fuel Tax	$50,977.0	
	Right of Way	$4,765.5	
	P.E.	$837.6	
	C.E. and Other	$5,474.9	
	Public Transportation/Traffic	$1,905.3	
	Aviation	$954.9	
	SUBTOTAL, FEDERAL REIMBURSEMENTS	$64,915.1	
	TOTAL REVENUES		**$169,357.5**
Expenses			
	Category 1 Preservation	$49,961.5	
	Category 1 Preservation Catch-up	$0.0	
	Category 1 Routine	$8,758.2	
	Category 2 TMA Corridor Projects	$3,778.2	
	Category 3 Non-TMA Corridor Projects	$0.0	
	Category 4 State Connectivity Corridor Projects	$0.0	
	Category 5 CMAQ	$3,227.3	
	Category 6 Bridge Maintenance	$6,465.7	
	Category 7 STP - Metro Mobility	$4,576.4	
	Category 8 Federal Safety	$2,817.8	
	Category 9 Federal Enhancement	$1,295.0	
	Category 10 Congressional Earmarks and TPWD	$999.9	
	Category 11 District Discretionary	$1,369.4	
	Category 12 Strategic Priority	$734.9	
	SUBTOTAL, CATAGORIES	$83,984.5	
	PLAN IT	$20,379.8	
	BUILD IT	$3,962.8	
	MAINTAIN IT	$41,551.5	
	USE IT	$5,150.7	
	MANAGE IT	$6,542.3	
	SUBTOTAL, FUNCTIONS	$77,587.1	
	Debt Service	$9,445.1	
	Payments to Other Agencies	$30,411.9	
	Payments on Existing Projects	$2,121.8	
	Retirement/Comptroller	$9,093.3	
	SUBTOTAL, OTHER	$51,072.1	
	NEW CAPACITY	$0.0	
	TOTAL EXPENSES		**$212,643.7**
	BALANCE		**-$43,286.2**

COMMUNICATIONS AND DISSEMINATION OF INFORMATION

Throughout the development of the T.R.E.N.D.S. model, both TxDOT and TTI personnel have worked closely with representatives from TxDOT management as well as representatives of the state's 25 metropolitan planning organizations in order to ensure the model would meet the needs of both constituencies as well as, ultimately, the general public. The decision to move the model from a spreadsheet-based to web-based model was driven by the consideration to make the model available to as many people as possible. Further, the decision to expand the model to include all 25 MPO regions as sub-models to the statewide T.R.E.N.D.S. model was driven by issues raised by representatives of the MPOs.

In addition to the TxDOT/TEMPO working group, the Texas Transportation Commission has been kept informed through several presentations at Commission hearings. A copy of the latest presentation from June 2009 is attached as Appendix 2 to this report. This presentation was developed by the TxDOT/TEMPO working group in conjunction with those who developed and refined the T.R.E.N.D.S. model.

Because the web-based model is still in development, specific communication tools for the general public have not been developed. Once the model is complete a user's guide will be developed along with communications tools and a media advisory announcing the completion and availability of the model will be distributed.

APPENDIX 1

A copy of the Excel-based version of the T.R.E.N.D.S. model accompanies this report on CD.

Below is a description of the various tabs and spreadsheets contained in the Excel version of the model.

TABS:

Input Page and Summary Sheet: The tab contains cells for each of the user-controlled variables as well as the summary tables that result from the model calculations.

Income & Expense – 1.0 Scenario: This tab contains a summary of all of the revenue and expense projections for TxDOT in which the revenue calculations are driven by a projection of the future Texas population assuming a 1.0 population migration scenario.

Income & Expense – 0.5 Scenario: This tab contains a summary of all of the revenue and expense projections for the TxDOT in which the revenue calculations are driven by a projection of the future Texas population assuming a 0.5 population migration scenario.

Income & Expense – 04 Scenario: This tab contains a summary of all of the revenue and expense projections for TxDOT in which the revenue calculations are driven by a projection of the future Texas population assuming the 04 population migration scenario.

Income & Expense – 07 Scenario: This tab contains a summary of all of the revenue and expense projections for TxDOT in which the revenue calculations are driven by a projection of the future Texas population assuming a 07 population migration scenario.

Gasoline Tax Worksheet – 1.0: This tab contains all of the calculations that produce a forecast of both state and federal gasoline tax revenue for Texas under the 1.0 migration scenario.

Diesel Tax Worksheet – 1.0: This tab contains all of the calculations that produce a forecast of both state and federal diesel fuel tax revenue for Texas under the 1.0 migration scenario.

Gasoline Tax Worksheet – 0.5: This tab contains all of the calculations that produce a forecast of both state and federal gasoline tax revenue for Texas under the 0.5 migration scenario.

Diesel Tax Worksheet – 0.5: This tab contains all of the calculations that produce a forecast of both state and federal diesel fuel tax revenue for Texas under the 0.5 migration scenario.

Gasoline Tax Worksheet – 04: This tab contains all of the calculations that produce a forecast of both state and federal gasoline tax revenue for Texas under the 04 migration scenario.

Diesel Tax Worksheet – 04: This tab contains all of the calculations that produce a forecast of both state and federal diesel fuel tax revenue for Texas under the 04 migration scenario.

Gasoline Tax Worksheet – 07: This tab contains all of the calculations that produce a forecast of both state and federal gasoline tax revenue for Texas under the 07 migration scenario.

Diesel Tax Worksheet – 07: This tab contains all of the calculations that produce a forecast of both state and federal diesel fuel tax revenue for Texas under the 07 migration scenario.

Registration Fee Worksheet: This tab contains all of the calculations that produce alternative forecasts for vehicle registration fee revenue for all four alternative population projections.

Gasoline Regression Table: This table presents historical Texas population and gallons of taxable gasoline sold in Texas for the period 1992 to 2007. From these data, a regression equation was produced that allows future gallons of taxable gasoline consumed to be forecast from the projected population.

Diesel Regression Table: This table presents historical Texas population and gallons of taxable diesel fuel sold in Texas for the period 1992 to 2007. From these data, a regression equation was produced that allows future gallons of taxable diesel fuel consumed to be forecast from the projected population.

Registration Fee Table: This table presents historical Texas population and Texas vehicle registration fee revenue for the period 1992 to 2007. From these data, a regression equation was produced that allows future registration fee revenues to be forecast from the projected population.

Gasoline Regression Chart: The tab shows results of the regression analysis for population and taxable gallons gasoline consumed.

Diesel Fuel Regression Chart: The tab shows results of the regression analysis for population and taxable gallons gasoline consumed.

Registration Fee Chart: The tab shows results of the regression analysis for population and vehicle regression fees.

Predicted vs. Actual: This tab uses historical Texas population and employs the Gasoline, Diesel Fuel and Registration Fee equations to assess the resulting projected fuel consumption (in the case of gasoline and diesel fuel) and fee revenues compared to known results. While the details of the analysis are available on the tab, in summary, all three equations yielded projected results with less than a 3 percent absolute mean value of error when compared to actual results.

Fuel Economy: Projection of fuel economy, along with projections of the future population are key to projection future revenues. For this analysis, TxDOT contracted with Cambridge Systematics in late 2006 to forecast future levels of fuel efficiency for personal and commercial vehicles. The Cambridge Systematics analysis included alternative assumptions regarding the adoption of alternative fuel vehicles. This analysis, presented in the Fuel Economy tab, was then adjusted to account for the proportional contribution to total vehicle miles traveled of each vehicle type. Low, medium and high fuel efficiency scenarios were produced.

Pavement Needs: As a part of the 2030 Committee assessment of Texas transportation needs, maintenance expenditure requirements were estimated for the period 2009 through 2035 by the Center for Transportation Research (CTR) at The University of Texas at Austin. Three alternative needs assessments were calculated – one that maintains 90 percent of Texas roadways in “Good or Better” condition, one that maintains 87 percent of Texas roadways in “Good or Better” condition and one that maintains 80 percent of Texas roadways in “Good or Better” condition. These data are presented on this tab. CTR made its calculations in 2008 dollars. This tab converts the required expenditures into nominal dollars (the T.R.E.N.D.S. model uses nominal dollars as a basis for calculation).

Revenue Fee Adjustment: Beginning in FY2008, vehicle registration fees will be returned from the general fund to TxDOT. The amount to be returned in FY2008 was $96 million and will increase by $32 million each year until 2015. After FY2015, it is assumed the fee revenue will increase by 1.5 percent per year. (This 1.5 percent per year increase assumption can be changed by the user.)

Sept 2008 Forecast: This tab contains the revenue and expense forecast for TxDOT for the period FY2008-FY2019 issued in September 2008. It is retained here for reference purposes only and was replaced by the January 2009 forecast.

Feb 2008 Forecast: This tab contains the revenue and expense forecast for TxDOT for the period FY2008-FY2019 issued in February 2008. It is retained here for reference purposes only and was replaced by the September 2008 forecast.

Jan 2009 Forecast: This tab contains the revenue and expense forecast for TxDOT for the period FY2008-FY2019 issued in January 2009. Various elements of this forecast are incorporated into the model and are addressed elsewhere is this report.

Total Letting FY 2008 – 2019: This tab contains forecasts of letting amounts for period FY2008-FY 2019.

The tabs described so far in this report represent fundamental inputs to the calculation process. Described next in detail will be the tabs (and inside each tab, the columns) where these inputs are aggregated and the calculations are performed.

Income and Expense Tabs

There are four income expense tabs, labeled Income & Expense – 1.0 Scenario, Income & Expense – 0.5 Scenario, Income & Expense – 04 Scenario, and Income & Expense – 07 Scenario that match each of the population projection scenarios. Each of tabs is identical in layout so only one description will be provided. Each tab, however, produces a different result as a function the alternative population assumptions. What follows is a description of function of each column. Columns B through N are revenue columns. Columns P through BF plus column BI, BN and BO are expense columns. Columns BG, BH, BJ through BM and BP through BS are total columns.

Column B – Gasoline Tax: This column brings in data for the appropriate year that was calculated in corresponding cell in Columns J and L from the Gasoline Tax Worksheet.

Column C – Diesel Tax: This column brings in data for the appropriate year that was calculated in corresponding cell in Columns J and L from the Diesel Tax Worksheet.

Column D – Registration Fee: This column brings in data for the appropriate year that was calculated in corresponding cell from the Registration Fee Worksheet.

Column E – VMT Tax Revenue: This column brings in data for the appropriate year that was calculated in corresponding cell from columns P and Q from the Gasoline Tax Worksheet and Diesel Tax Worksheet.

Column F – Lubricant Sales Tax Revenue: This column brings in data for the appropriate year from the Jan 2009 Forecast tab row 13.

Column G – Fund 927 Reimbursements: This column brings in data for the appropriate year from the Jan 2009 Forecast tab row 19.

Column H – Depository Interest: This column brings in data for the appropriate year from the Jan 2009 Forecast tab row 21.

Column I – Misc Revenue: This column brings in data for the appropriate year from the Jan 2009 Forecast tab row 20.

Column J – Other Agency Revenue: This column brings in data for the appropriate year from the Jan 2009 Forecast tab row 24.

Column K – Mobility Funds: This cell is hard-coded based on the known Mobility Fund transfers.

Column L – Prop 12 Bonds: This column is a function of inputs from the Input Page and Summary Sheet.

Column M – Prop 14 Bonds: The initial (FY2009) value is hard-coded based on action taken by the Texas Transportation Commission. Values for subsequent years are a function of inputs from the Input Page and Summary Sheet.

Column N – Fuel Tax Reimbursements: This column brings in data from Column O of the Gasoline Tax Worksheet and Diesel Tax Worksheet.

Column O – ROW Reimbursements: Values in this column for FY2009-FY 2019 are calculated from the Historical Revenues Tab 16-year average of ROW reimbursements as a percentage of total federal reimbursements.

Column P – PE Reimbursements: Values in this column for FY2009-FY 2019 are calculated from the Historical Revenues Tab 16-year average of PE reimbursements as a percentage of total federal reimbursements.

Column Q – CE and Other Reimbursements: Values in this column for FY2009-FY 2019 are calculated from the Historical Revenues Tab 16-year average of CE and other reimbursements as a percentage of total federal reimbursements.

Column R – Public Trans/Traffic: Values in this column for FY2009-FY 2019 are calculated from the Historical Revenues Tab 16-year average of Pubic Trans/Traffic reimbursements as a percentage of total federal reimbursements.

Column S – Aviation: Values in this column for FY2009-FY 2019 are calculated from the Historical Revenues Tab 16-year average of Aviation reimbursements as a percentage of total federal reimbursements.

Column T – State: This column totals all revenue from state sources.

Column U – Federal: This column totals all revenue from federal sources.

Column V – Grand Total: This column totals all revenues.

Column W – Spacer row. Intentionally left blank.

Column X – CAT 1 Preservation: For the period FY2009-FY2019, values are derived from the Total Letting FY2008-2019 tab. For years FY2020-2035, the values are hard-coded based from TxDOT input.

Column Y – CAT Preservation Catch-up: For FY2020-FY2022, the values are result from cell H34 on the Input Page and Summary Sheet. All other years are zero.

Column Z – CAT 1 Routine: Values for years FY2009-FY2019 are derived from corresponding columns in rows 12, 13 and 14 of the Total Letting FY2008-2019 tab. For the period FY2020-2035, the values are zero in this column and all CAT 1 Routine expenditures are included in Column P – CAT 1 Preservation.

Column AA – CAT 2 TMA Corridor Projects: This column contains no values and is a place-holder only.

Column AB – CAT 3 Non-TMA Corridor Projects: This column contains no values and is a place-holder only.

Column AC – CAT $ Statewide Connectivity Corridor Projects: This column contains no values and is a place-holder only.

Column AD – CAT 5 CMAQ: Values for years FY2009-FY2019 are derived from corresponding columns in rows 35, 36 and 37 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H36 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AE – CAT 6 Bridge Maintenance: Values for years FY2009-FY2019 are derived from corresponding columns in row 39 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H33 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AF – CAT 7 STP-MM: Values for years FY2009-FY2019 are derived from corresponding columns in row 43 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H37 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AG – CAT 8 Federal Safety: Values for years FY2009-FY2019 are derived from corresponding columns in rows 45, 46 and 47 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H38 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AH – CAT 9 Federal Enhancement: Values for years FY2009-FY2019 are derived from corresponding columns in rows 51 and 52 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H39 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AI – CAT 10 Congressional Earmarks & TPWD: Values for years FY2009-FY2019 are derived from corresponding columns in rows 54, 55, 56, and 57 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H40 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AJ – CAT 11 District Discretionary: Values for years FY2009-FY2019 are derived from corresponding columns in rows 59, 60 and 61 of the Total Letting FY2008-2019 tab. Values for FY2020-FY2035 result from User input in cell H41 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AK – CAT 12 Strategic Priority: Values for years FY2009-FY2019 are derived from corresponding columns in rows 64, 65 and 66 of the Total Letting FY2008-2019 tab. No expenditures are contemplated beyond 2019 and all value thereafter are zero.

Column AL – 2030 Needs Report: 90 Percent Good or Better: These data are derived from the column G in the Pavement Needs tab.

Column AM – 2030 Needs Report: 87 Percent Good or Better: These data are derived from the column H in the Pavement Needs tab.

Column AN – 2030 Needs Report: 80 Percent Good or Better: These data are derived from the column I in the Pavement Needs tab.

Column AO – 2030 Needs Report: Bridges: These data are derived from the column K in the Pavement Needs tab.

Column AP: (90 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 90 Percent “Good or Better” option is taken with respect to maintenance level. The selection of the alternative maintenance level option is made on the Input Page and Summary Sheet, cells H29 through H32. (As noted on the Input Page and Summary Sheet, only one of the cells in H29 through H32 may be toggled ‘Yes’.)

Column AQ: (90 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 90 Percent “Good or Better” option is taken with respect to maintenance level. The selection of the alternative maintenance level option is made on the Input Page and Summary Sheet, cells H29 through H32. (As noted

on the Input Page and Summary Sheet, only one of the cells in H29 through H32 may be toggled 'Yes'.)

Column AR: (80 Percent G or B) Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds if the 80 Percent "Good or Better" option is taken with respect to maintenance level. The selection of the alternative maintenance level option is made on the Input Page and Summary Sheet, cells H29 through H32. (As noted on the Input Page and Summary Sheet, only one of the cells in H29 through H32 may be toggled 'Yes'.)

Column AS: TxDOT Estimates Total Maintenance, Preservation Needs and Mandated Funds: This is the total maintenance and preservation needs plus mandated funds using the existing TxDOT planned maintenance option with respect to maintenance level. The selection of the alternative maintenance level option is made on the Input Page and Summary Sheet, cells H29 through H32. (As noted on the Input Page and Summary Sheet, only one of the cells in H29 through H32 may be toggled 'Yes'.)

Column AT – Research: Values for the period FY2009-FY2019 are derived from row 27 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H42 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AU – Engineering: Values for the period FY2009-FY2019 are derived from row 33 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H42 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AV – ROW: Values for the period FY2009-FY2019 are derived from row 34 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H43 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AW – Toll Equity: Values for the period FY2009-FY2019 are derived from row 48 of the Jan 2009 Forecast tab. No expenditures are contemplated beyond FY2019.

Column AX – Pass Through Tolls: Values for the period FY2009-FY2019 are derived from row 139 of the Fund Transfers-SPC PRV tab. Expenditures in the cell for FY2020 are hard-coded as per TxDOT. No expenditures are contemplated beyond FY2020.

Column AY – Aviation/Motor Vehicles: Values for the period FY2009-FY2019 are derived from row 42 of the Jan 2009 Forecast tab. Values for FY2020-FY2035

result from User input in cell H42 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column AX – Maintenance: Values for the period FY2009-FY2019 are derived from row 28 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H44 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BA – Contract Routine Maintenance: Values for the period FY2009-FY2019 are derived from row 29 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H44 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BB – Ferry: Values for the period FY2009-FY2019 are derived from row 30 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H45 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BC – GIWW/Public Transportation: Values for the period FY2009-FY2019 are derived from row 40 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H46 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BD – Traffic and Travel: Values for the period FY2009-FY2019 are derived from row 37 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H47on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BE – Vehicle Registration: Values for the period FY2009-FY2019 are derived from row 38 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H48 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BF – ATPA: Values for the period FY2009-FY2019 are derived from row 39 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H49 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BG – Administrative/Support Cost: Values for the period FY2009-FY2019 are derived from row 26 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H42 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BH – SWCAP: Values for the period FY2009-FY2019 are derived from row 137 of the Fund Transfers-SPC PRV tab. No expenditures are contemplated beyond FY2019.

Column BI – Short Term Borrowing: Values for the period FY2009-FY2019 are derived from row 138 of the Fund Transfers-SPC PRV tab. No expenditures are contemplated beyond FY2019.

Column BJ – Prop 14 Debt Service: Values for the period FY2009-FY2019 are derived from row 140 and 141 of the Fund Transfers-SPC PRV tab. Debt service expenditures for FY2020-2026 result from User input in cell H69 on the Input Page and Summary Sheet. The debt service expenditure for FY2027 results from User input in cell H70 on the Input Page and Summary Sheet.

Column BK – Payments to Other Agencies: Values for the period FY2009-FY2019 are derived from row 142 of the Fund Transfers-SPC PRV tab and from rows 43, 45 and 46 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H50 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BL – Amount of Payments to be Eliminated: Values in this column are derived by the corresponding row in Column BC multiplied by the User-entered percentage reduction in cell H52 on the Input Page and Summary Sheet to be effective in the year chosen in cell H53 on the Input Page and Summary Sheet.

Column BM – Retirement/Comptroller: Values for the period FY2009-FY2019 are derived from row 44 of the Jan 2009 Forecast tab. Values for FY2020-FY2035 result from User input in cell H51 on the Input Page and Summary Sheet to determine the annual rate of increase.

Column BN – Inflation/Add'l Programs: Values for the period FY2009-FY2019 are derived from row 47 of the Jan 2009 Forecast tab. For FY2020-FY2035 inflation in calculated by individual cost item on the Input Page and Summary Sheet as a User-entered item.

Column BO – TxDOT Maintenance Estimates and Total Non-Letting Expenditures: This column represents the sum of Columns AL through BF.

Column BP – Total Non-Letting Expenditures Not Including Cols AZ and BA: This column represents the same calculation as Column BG, less TxDOT Maintenance and Contract Routine Maintenance (Columns AZ and BA).

Column BQ – Total Maintenance and Overhead Expenses Using TxDOT Maintenance Estimates: This column represents the sum of Columns BO and AS.

Column BR – Total Maintenance and Over Expenses Using 90% G or B Maintenance Estimates: This column represents Column BP plus necessary maintenance funds if the 90 Percent "Good or Better" option is chosen (Column

AP) multiplied by an inflation allocation. Said another way, it removes TxDOT maintenance costs and substitutes maintenance costs associated with the 90 percent "Good or Better" option.

Column BS – Total Maintenance and Over Expenses Using 87% G or B Maintenance Estimates: This column represents Column BP plus necessary maintenance funds if the 87 Percent "Good or Better" option is chosen (Column AQ) multiplied by an inflation allocation. Said another way, it removes TxDOT maintenance costs and substitutes maintenance costs associated with the 87 percent "Good or Better" option.

Column BM - Total Maintenance and Over Expenses Using 80% G or B Maintenance Estimates: This column represents Column BP plus necessary maintenance funds if the 80 Percent "Good or Better" option is chosen (Column AR) multiplied by an inflation allocation. Said another way, it removes TxDOT maintenance costs and substitutes maintenance costs associated with the 80 percent "Good or Better" option.

Column BN – Payments for Existing Projects: Values for the period FY2009-FY2019 are derived from row 64 of the Jan 2009 Forecast tab.

Column BV – Additional Prop 14 Bond Repayment: This column represents Proposition 14 bond repayments derived from entries in cell H64, H67 and H68 on the User Input and Summary Page.

Column BW through Column BZ: These columns represent total revenues less total expenses based on the alternative maintenance assumption discussed previously (existing TxDOT maintenance commitments, 90 percent of roadways in "Good or Better" condition, 87 percent of roadways in "Good or Better" condition, or 80 percent of roadways in "Good or Better" condition).

Column CA – This column represents the average investment per year in new mobility needs and is driven from input entered by the user.

Gasoline and Diesel Tax Worksheets

Like the Income and Expense tabs, there are four sets of Gasoline and Diesel Tax tabs – a tab for gasoline and diesel fuel tax calculations for each of the four population projection scenarios. Also included within each of the worksheets are columns where VMT tax revenues are calculated should that option be chosen on the Input Page and Summary sheet. Since the six worksheets are identical in their calculations (only differing based on fuel type or population forecast scenario) only one description is provided. Below are descriptions of each of the columns and the calculations performed.

Column B – Historical Gasoline (or Diesel) Tax Revenues: The values in this column represent historical fuel tax revenues and are used for comparison purposes only.

Column C – Current State Gas (or Diesel) Tax Rate: The current fuel tax rate derived from cell H3 on the Input Page and Summary Sheet.

Column D – Future State Gas (or Diesel) Tax Rate: The future fuel tax rate derived from cells H4 and H7 on the Input Page and Summary Sheet.

Column E – Current Federal Gas (or Diesel) Tax Rate: The current fuel tax rate derived from cell H19 on the Input Page and Summary Sheet.

Column F – Future Federal Gas (or Diesel) Tax Rate: The current fuel tax rate derived from cell H20 on the Input Page and Summary Sheet.

Column G – Baseline Gasoline (or Diesel) Tax Rate: The fuel efficiency-adjusted gallons of fuel (from Column W) multiplied by the existing state fuel tax rate.

Column H – Incremental Increase in Gasoline (or Diesel) Tax Revenues: The amount of incremental revenue derived from the future (increased) fuel tax rate.

Column I – Total Gasoline (or Diesel) Tax Revenues: The total of Columns G and H (baseline plus incremental fuel tax revenues).

Column J – Highway Allocation of Baseline Gasoline (or Diesel) Tax Revenue: The amount of fuel tax revenue allocated to highway construction, maintenance and operations. This amount may be set by the User at cell H11 on the Input Page and Summary Sheet. Current law provides that ¾ of fuel tax revenue is dedicated to transportation with ¼ dedicated to public education. However, as a practical matter, approximately one percent is consumed through payment of collection and other costs to the Comptroller.

Column K – Education Allocation of Baseline Gasoline (or Diesel) Tax Revenue: Total fuel tax revenue multiplied by 25 percent.

Column L – Highway Allocation of Incremental Gasoline (or Diesel) Tax Revenue: The incremental fuel tax revenue raised as shown in Column H multiplied by the amount of the incremental tax revenue allocated to transportation as enter by the User in cell H12 on the Input Page and Summary Sheet.

Column M – Education Allocation of Incremental Gasoline (or Diesel) Tax Revenue: Column H minus Column L.

Column N – Baseline Federal Gasoline (or Diesel) Tax Revenue: Current federal fuel tax rate (Column E) multiplied by the number of gallons of fuel consumed

(Column W) multiplied by the rate of return on federal fuel tax revenues from cell H23 on the Input Page and Summary Sheet.

Column O – Future Federal Gasoline (or Diesel) Tax Revenue: Future federal fuel tax rate (Column F) multiplied by the number of gallons of fuel consumed (Column W) multiplied by the rate of return on federal fuel tax revenues from cell H23 on the Input Page and Summary Sheet.

Column P – VMT Revenue from Personal Vehicles: Personal vehicle VMT (Column U) multiplied by VMT fee rate for personal vehicles from cell H14 on the Input Page and Summary Sheet.

Column Q – VMT Fee Revenue from Commercial Vehicles: Commercial vehicle VMT (Column V) multiplied by VMT fee rate for personal vehicles from cell H15 on the Input Page and Summary Sheet.

Column R – Taxable Gallons of Gasoline (or Diesel): This data is the result of the population/taxable gallons of gasoline (or diesel) regression equation described earlier and shown in the Gasoline (or Diesel Fuel) Regression tab. The equation is applied to the population variable shown in Column Z.

Column S – Derived VMT: This data results from multiplying the taxable gallons of fuel (Column R) by the average fuel efficiency (Column X).

Column T – Commercial Vehicle VMT: Commercial vehicle VMT is the remainder from subtracting personal VMT from total VMT.

Column U – Personal Vehicle VMT: Personal vehicle VMT is calculated by multiplying total VMT (Column S) and cell H56 on the Input Page and Summary Sheet.

Column V – Personal Diesel Vehicle VMT: This data is derived by multiplying total VMT (Column S) by cell H55 on the Input Page and Summary Sheet.

Column W – Fuel Efficiency-Adjusted Gallons of Fuel: This data is derived by dividing total VMT (Column S) plus VMT from diesel-powered personal vehicles (Column V) by fuel efficiency (Column X).

Column X – Average MPG: Average VMT is derived from the User-chosen fuel efficiency scenario in cell H57 on the Input Page and Summary Sheet.

Column Y – Annual MPG Increase: This data is a calculated value for testing reasonableness and is not included in any other calculations.

Column Z – Projected Population: The projected population corresponding to the migration scenario represented by the tab.

Column AA – Percent Population Increase: This data is a calculated value for testing reasonableness and is not included in any other calculations.

Column AB – Percent Gallons Increase: This data is a calculated value for testing reasonableness and is not included in any other calculations.

DATA INPUT AND SUMMARY PAGE

The Data Input and Summary Page contains all of the User-controlled variables as well as presents summary tables the result from all of the calculations contained in the model. Following is a description by row of all of the variables that can be controlled by the User.

Row 3: Enter the current state gasoline tax rate in cents per gallon ($0.20).

Row 4: If you would like to increase the state gasoline tax, enter the amount of the increase in cents per gallon.

Row 5: Enter the year the increase is to take effect.

Row 6: If you would like to increase the gasoline tax again, enter the amount of the second increase.

Row 7: Enter the year the second increase in the gasoline tax is to take effect.

Row 8: Enter the current state diesel fuel tax rate in cents per gallon ($0.20).

Row 9: If you would like to increase the state diesel tax, enter the amount of the increase in cents per gallon.

Row 10: Enter the year the increase is to take effect.

Row 11: If you would like to increase the diesel tax again, enter the amount of the second increase.

Row 12: Enter the year the second increase in the diesel tax is to take effect.

Row 13: If you would like to index the state fuel tax to the Highway Cost Index enter Yes, if not, enter No.

Row 14: If you would like to index the state fuel tax to the Consumer Price Index enter Yes, if not, enter No.

Row 15: If you would like to index the fuel tax, enter the year indexing is to begin.

Row 16: Enter the net percent of the state fuel tax that is dedicated to transportation. It is recommended that the value be kept at 74 percent (3/4 of the state gasoline tax dedicated to transportation, less approximately one percent in collection fees retained by the Comptroller.)

Row 17: Enter the net percent of the incremental increase in the fuel tax to be dedicated to transportation. For example, the current gasoline tax is 20 cents per gallon, of which approximately 15 cents is dedicated to transportation. If the tax were increased to 25 cents and the value if this cell is set to 100 percent, the entire 5 cent increase would be dedicated to transportation.

Row 18: Title row.

Row 19: If you wish to impose a fee on vehicle miles traveled for personal vehicles, enter the amount to be paid per mile here. If you do not wish to impose such a tax, leave the value set to $0.00.

Row 20: If you wish to impose a fee on vehicle miles traveled for commercial vehicles, enter the amount to be paid per mile here. If you do not wish to impose such a tax, leave the value set to $0.00.

Row 21: Enter the year you wish to begin collected a fee on vehicle miles traveled on personal vehicles.

Row 22: Enter the year you wish to begin collected a fee on vehicle miles traveled on commercial vehicles.

Row 23: Enter the last year the state gasoline tax is to be collected. (For example, if you wish to impose a VMT tax starting in 2020 **in place** of the gasoline tax, enter 2019 here.)

Row 24: Enter the last year the state diesel fuel tax is to be collected. (For example, if you wish to impose a VMT tax starting in 2020 **in place** of the diesel tax, enter 2019 here.)

Row 25: Title row.

Row 26: Enter the current federal gasoline tax rate in cents per gallon. This value is currently set 18.4 cents per gallon. You should not have to change this value.

Row 27: If you would like to see the effect of an increase in the federal gasoline tax rate, enter the amount of the increase here in cents per gallon.

Row 28: Enter the year the increase is to take effect.

Row 29: If you would like to see the effect of a second increase the federal gasoline tax rate, enter the amount of the second increase here in cents per gallon.

Row 30: Enter the year the second increase is to take effect.

Row 31: Enter the current federal diesel fuel tax rate. This value is currently set 20.4 cents per gallon. You should not have to change this value.

Row 32: If you would like to see the effect of an increase in the federal diesel tax rate, enter the amount of the increase here in cents per gallon.

Row 33: Enter the year the increase is to take effect.

Row 34: If you would like to see the effect of a second increase the federal diesel tax rate, enter the amount of the second increase here in cents per gallon.

Row 34: Enter the year the second increase is to take effect.

Row 36: Enter the amount that is returned to Texas that is ultimately available to TxDOT. Currently the effective rate of return is approximately 85 percent.

Row 37: Title row.

Row 38: Enter the assumed rate of increase in Lubricant Sales Tax revenues.

Row 39: Enter the assumed rate of increase in miscellaneous revenues.

Row 40: Enter the assumed rate of increase in other agency revenues.

Row 41: Title row.

Row 42: If you would like to increase vehicle registration fees, enter the percent increase here.

Row 43: Enter the year the vehicle registration fee increase will take effect.

Row 44: If you would like to increase the vehicle registration fee again, enter the percent increase here.

Row 45: Enter the year the second vehicle registration fee increase will take effect.

Row 46: Enter the annual percent increase in the vehicle registration fee adjustment from the Comptroller.

Row 47: Title row.

Rows 48 through 51: In these cells, the User selects the desired roadway maintenance option described in Column A of this sheet. Only one value can be selected as “Yes”. The other values must be “No.”

Row 52: Enter the percent of annual increase in Category 6 bridge maintenance.

Row 53: If maintenance “catch-up” work is to be performed, in 2020 through 2022, enter the amount in billions of dollars.

Row 54: Title row.

Rows 55 through 70: Enter the assumed inflation rate in the various categories of expenditures shown.

Row 71: Enter the percent of “diversions” to be eliminated. (Currently, TxDOT funds several other agencies from the highway fund. If you would like to eliminate the transfer of these funds, enter the percent to be eliminated.)

Row 72: Enter the year the “diversions” are to be reduced or eliminated.

Row 73: Title row.

Row 74: Enter the amount of diesel fuel consumed by commercial vehicles. The remainder (the amount less than 100 percent) will be allocated to personal vehicles when computing personal vehicle VMT. Currently it is estimated that this value is approximately 97 percent.

Row 75: Enter the amount of gasoline that is consumed by personal vehicles. The remainder (the amount less than 100 percent) will be allocated to commercial vehicles when computing commercial vehicle VMT. Currently it is estimated that this value is approximately 98 percent.

Row 76: Enter your assumption regarding commercial truck fuel efficiency. Enter “low”, “high” or average.

Row 77: Enter your assumption regarding personal vehicle fuel efficiency. Enter “low”, “high” or average.

Row 78: Title row.

Row 79: If you would like to issue Proposition 12 bonds, enter the amount in billion of dollars.

Row 80: Enter the number of years over which the proceeds will be distributed.

Row 81: Enter the year you wish to receive to first Proposition 12 bond proceeds.

Row 82: Enter the discount rate for net present value calculations.

Row 83: If you would like to issue Proposition 14 bonds, enter the amount in billion of dollars.

Row 84: Enter the number of years over which the proceeds will be distributed.

Row 85: Enter the year you wish to receive to first Proposition 14 bond proceeds.

Row 86: Enter the year when wish to begin paying back the bonds.

Row 87: Enter the number of years over which you wish to pay back the bonds.

Row 88: This is the current estimated annual debt service for the period 2020 through 2026 on Proposition 14 bonds that have already been issued. (Debt service for the period 2009 though 2019 is included in the Jan 2009 Cash Forecast.) If you wish to issue other bonds, be sure to include this current value in addition to future payments associated with other bond issues.

Row 89: This is the current estimated annual debt service for 2027 on the bonds that have already been issued. If you wish to issue other bonds, be sure to include this current value in addition to future payments associated with other bond issues.

Row 90: Title row.

Row 91: Enter the amount to be spent on new capacity in billions of dollars.

Row 92: Enter the year to begin spending the new capacity dollars.

Row 93: Enter the year to end spending the new capacity dollars.

APPENDIX 2

FUNDING THE FUTURE
A Forecast of Transportation Finance

A Report to the
Texas Transportation Commission

TEMPO/TxDOT Financial Forecasting Workgroup
May 28, 2009

FUNDING THE FUTURE CONTRIBUTORS

TEMPO/TxDOT Workgroup

Brian Barth, TxDOT, Fort Worth District
Andrew A. Canon., Hidalgo County MPO
Christopher Evilia, Waco MPO
Jeanne M. Geiger, San Antonio, Bexar County MPO
Ron Hagquist, TxDOT, Government and Public Affairs Division
Dan Kessler, North Central Texas Council of Governments, Dallas-Fort Worth MPO
Ashby Johnson, Houston-Galveston Area Council, Houston-Galveston MPO
Randy Redmond, TxDOT, Beaumont District
Jessica Castiglione, TxDOT, San Antonio District

Research and Development Assistance

Texas Transportation Institute Dr. David Ellis, Dr. Bill Stockton, Dr. Tim Lomax

Center for Transportation Research Rob Harrison, Dr. Khali Persad, Lisa Loftus-Otway, Seokho Chi, Patricia Franco, Prakash Singh, Alejandra Cruz-Ross

University Of Texas School of Engineering Transportation Systems Management Graduate Course, Dr. Michael Walton, Professor

Students: Lu Gao, Andrew Karl, Eleni Pappas, Daniel Pachy, Melissa Thompson, Dan Seedah, Beatriz Rutzen, Hui Wu, Yao Yu, Sruthi Peddibhotla, Migdalia Carrion, Tadahisa Muramatsu

WORKGROUP CHARGE

"To develop a transportation revenue forecasting model, a range of reasonable model input assumptions, and to utilize this model to develop estimates of future available funding for capacity improvements."

TRENDS MODEL

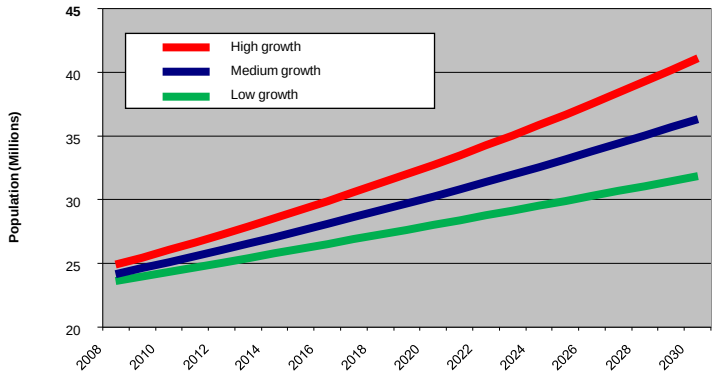
Transportation
Revenue
Estimator and
Needs
Determination
System

Allows for rapid, multiple-scenario development based on user input assumptions.

Web based:
http://Trends-tti.tamu.edu

TRENDS MODEL
Captures Population Growth Impacts and Provides Flexibility for Evaluating Scenarios

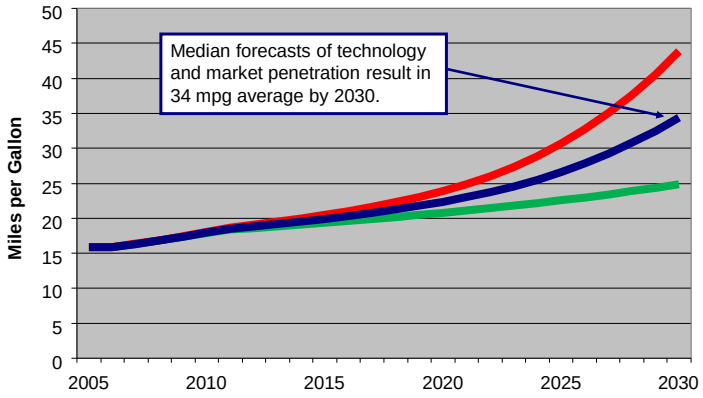
Texas Population Growth



Source: Texas State Data Center

TRENDS MODEL
Captures Fuel Efficiency Impacts and Provides Flexibility for Evaluating Scenarios

Fuel Efficiency Scenarios



Source: Cambridge Systematics/TTI

TRENDS MODEL
Provides for Input of Variables by Category

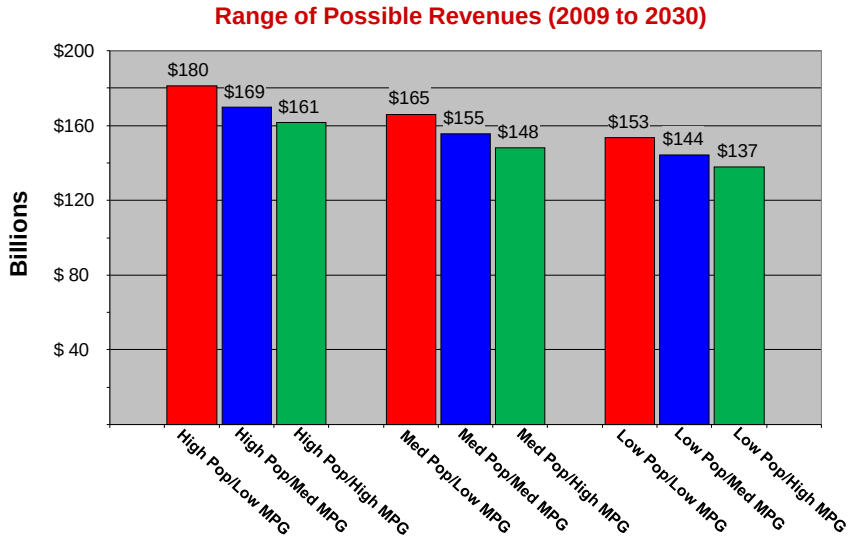
User-specified Policy Variables

Population Growth
Fuel Efficiency
Percent of Revenue to Transportation (Diversions)
Federal Rate of Return to Texas
Level of Funding Dedicated To System Maintenance

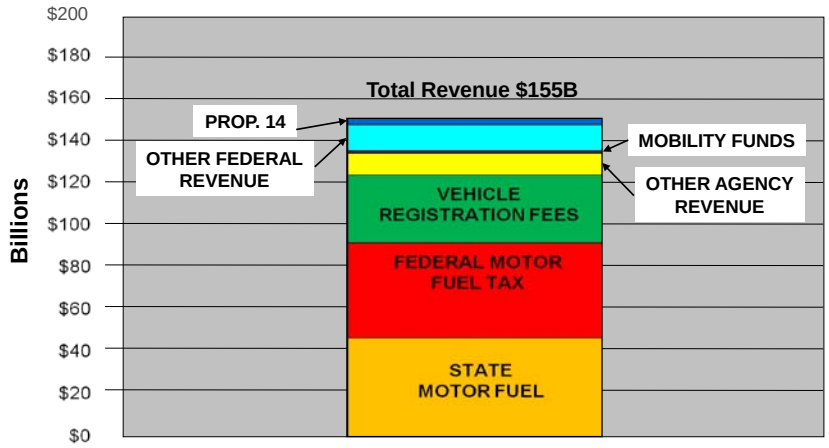
User-specified Revenue Variables

State Gasoline and Diesel Taxes
Federal Gasoline and Diesel Taxes
Indexing State and Federal Motor Fuels Tax
Vehicle Registration Fees
Vehicle Miles of Travel (Distance-based) Tax
Levels of Bond Financing

FUNDING THE FUTURE
Provides a Range of Revenue Estimates Through Combined Scenarios

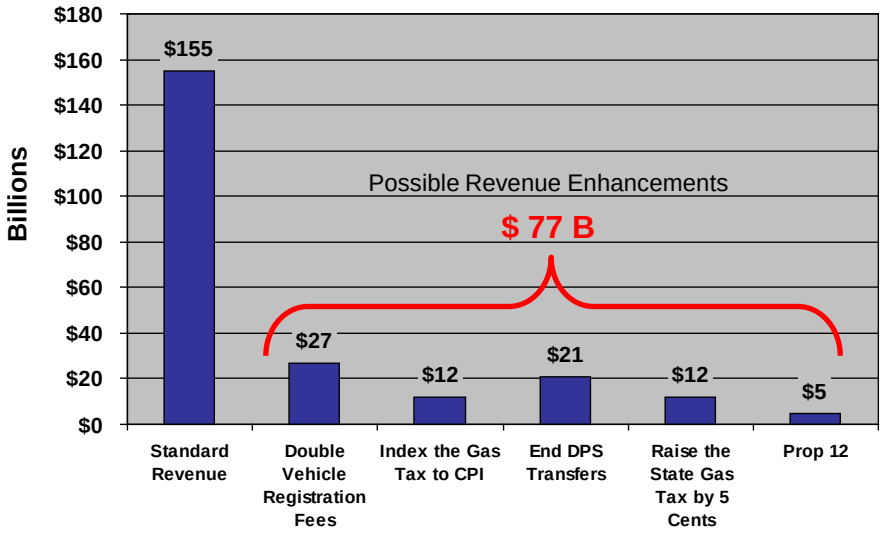


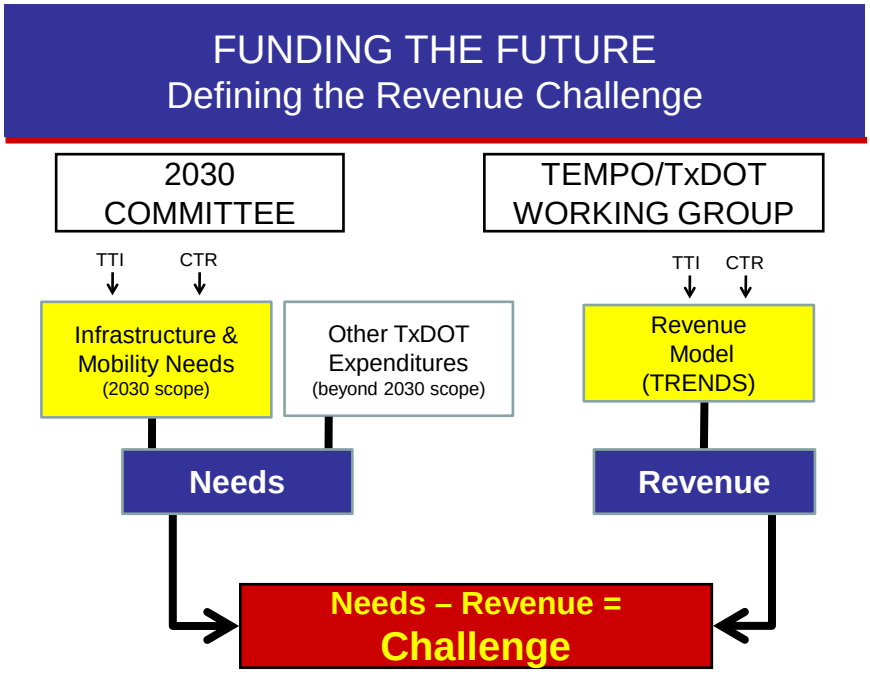
FUNDING THE FUTURE
Provides a Baseline Revenue Forecast

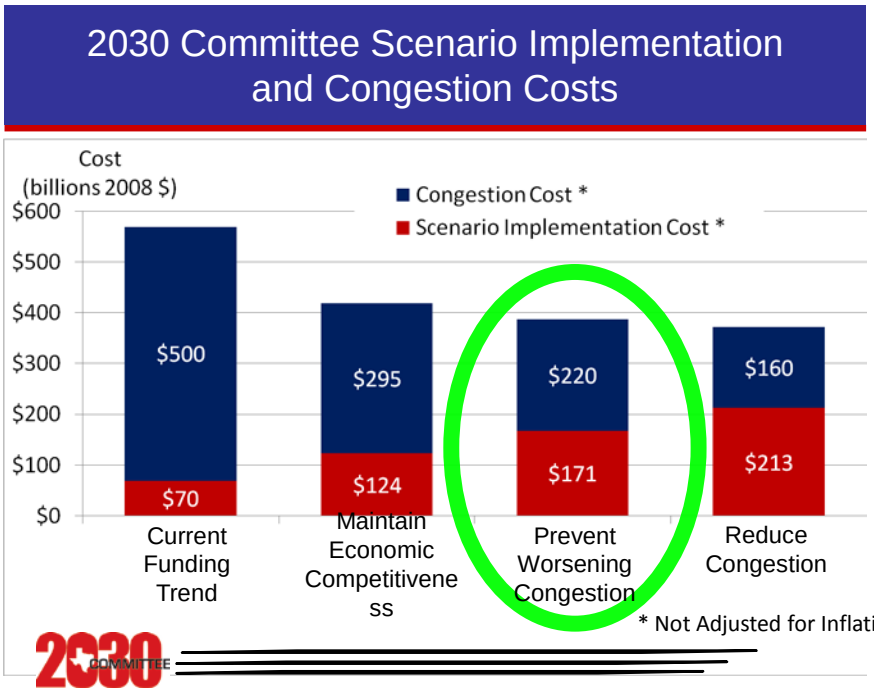


Baseline revenue forecast in nominal dollars, 2009 to 2030

FUNDING THE FUTURE
Provides Funding Estimates from Possible Revenue Enhancements




FUNDING THE FUTURE
Defining the Revenue Challenge
2030 COMMITTEE
TEMPO/TxDOT WORKING GROUP
TTI
CTR
TTI
CTR
Infrastructure & Mobility Needs (2030 scope)
Other TxDOT Expenditures (beyond 2030 scope)
Revenue Model (TRENDS)
Needs
Revenue
Needs – Revenue = Challenge


2030 Committee Scenario Implementation and Congestion Costs
Cost (billions 2008 $)
Congestion Cost *
Scenario Implementation Cost *
$600
$500
$400
$300
$200
$100
$0
$500
$70
$295
$124
$220
$171
$160
$213
Current Funding Trend
Maintain Economic Competitiveness
Prevent Worsening Congestion
Reduce Congestion
* Not Adjusted for Inflation

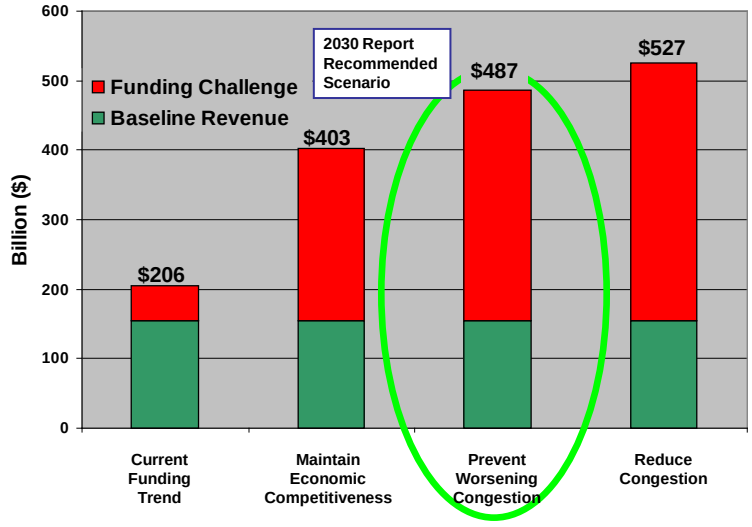
Translating 2030 Report
Adjusting for Inflation and State Share of Needs

2030 Total Investment Needs (2009-2030)	Constant 2008 Dollars (billions)	Inflation Adjusted (billions)	State Share (billions)
Pavements	$ 89	$138	$138
Bridges	$ 36	$ 55	$55
Urban Mobility *	$171	$266	$165
Rural Mobility & Safety	$ 19	$ 29	$ 29
Total	**$315**	**$488**	**$387**

2030 COMMITTEE

* Historically, 2/3 of mobility is State investment

FUNDING THE FUTURE
Needed Revenue Challenge
2030 Committee Investment Scenarios



Total revenue needs increased by $100B to include anticipated TxDOT encumbrances.

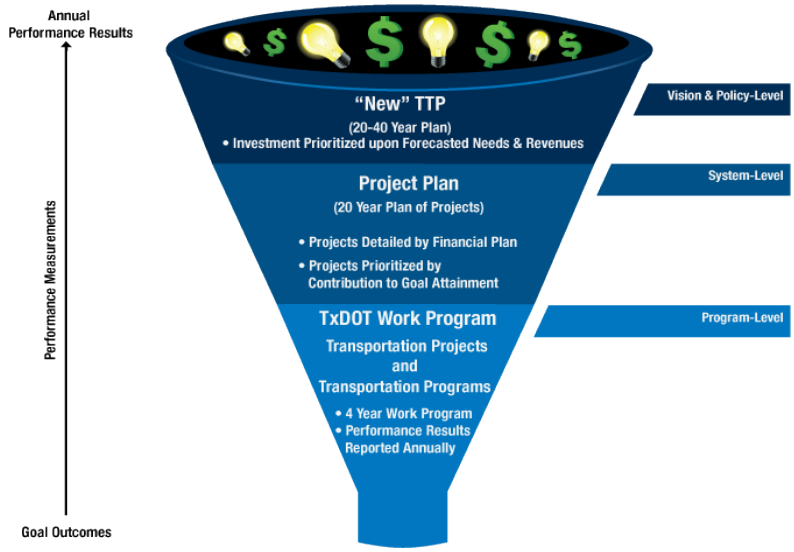
FUNDING THE FUTURE
TEMPO / TxDOT Next Steps

- Provide TRENDS model to MPOs
- Use the TRENDS model to develop the base-line forecast with statewide consensus for the creation of 2035 MTPs, TTP, UTP, TIP
- Update/Monitor TRENDS model for:
  - Latest revenue forecasts from TxDOT CFO
  - State and Federal legislation
  - Population Growth and Fuel Efficiency
- Develop local option TRENDS model for 25 metro areas

FUNDING THE FUTURE
TxDOT Next Steps

- Approve “Baseline” Revenue Forecast for TTP Development – Sept/Oct 2009
- Set Performance Goals for all Investment Strategies
- Allocate “Investment” Levels for all Strategies
  - System Preservation including Bridges
  - Congestion Management
  - Other

FUNDING FUNNEL



Tentative Development Schedule

- May 09 TRENDS Adopted
- Jun 09 TRENDS Reviewed SAO
- Jul 09 Public Outreach: Goals and Measures
- Sept 09 TCC Adopts Certified Forecast
- Oct 09 Public Hearing: Allocations to Goals
- Oct-Nov 09 "New" TTP Development
- Nov 09 Public Hearing: Draft TTP
- Jan 10 TTC Adopts "New" TTP