

Durham  
Chapel Hill  
Carrboro



metropolitan  
Planning Organization

DURHAM-CHAPEL HILL-CARRBORO  
METROPOLITAN PLANNING ORGANIZATION

2030

# LONG RANGE TRANSPORTATION PLAN

[www.dhcmpo.org](http://www.dhcmpo.org)

## **Member Governments**

Town of Carrboro  
Town of Chapel Hill  
County of Chatham  
City of Durham  
County of Durham  
Town of Hillsborough  
NC Department of Transportation  
County of Orange

**April 13, 2005**





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## EXECUTIVE SUMMARY

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### INTRODUCTION

The 2030 Long-Range Transportation Plan (LRTP) is the guide for major transportation investments in the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC-MPO) area. The DCHC-MPO area covers the entire Durham County and the urbanized portions of Orange and Chatham Counties. The 2030 LRTP recommends major transportation projects, policies and strategies designed to maintain existing transportation systems and serve the region's future travel needs. The 2030 LRTP is also designed to support land use and air quality goals for the urban area, and was prepared in accordance with Federal requirements in order to obtain endorsements from the DCHC-MPO Transportation Advisory Committee (TAC), United States Department of Transportation (USDOT), and the United States Environmental Protection Agency (USEPA). These endorsements are pre-requisites for receiving Federal funds for the transportation improvement program defined in the 2030 LRTP.

### PLANNING PROCESS

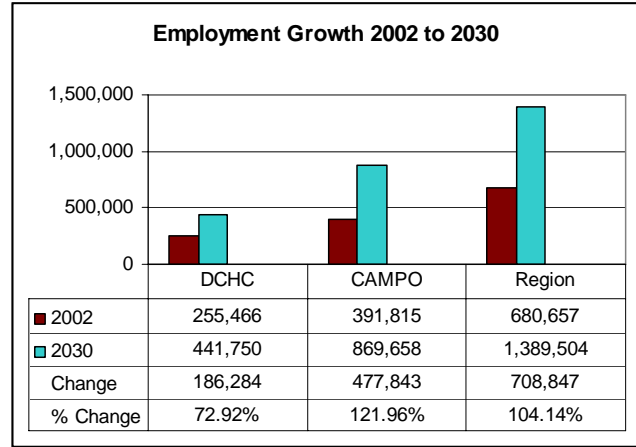
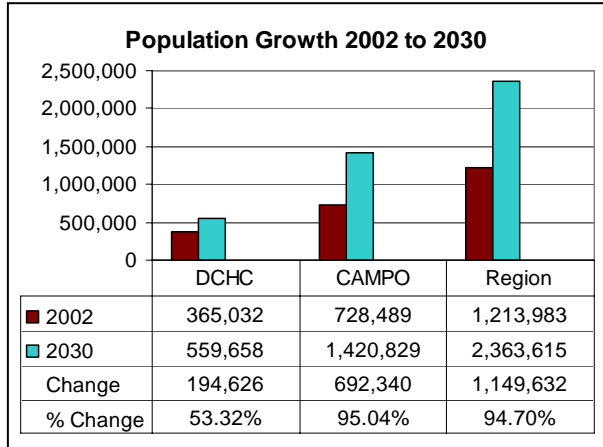
The planning process for development of the 2030 LRTP was a two-track process involving community inputs and technical analysis. The community involvement track included multiple open houses, newsletters and mailings to area residents. Also, several meetings were conducted with the DCHC-MPO TAC, the governing board of the DCHC-MPO which is comprised of elected and appointed officials, to reach consensus on project and funding priorities. The technical analysis track was managed by the DCHC-MPO Technical Coordinating Committee (TCC), which is comprised of staff from local governments. It included tasks such as gathering land use data updates from MPO jurisdictions; developing socio-economic data forecasts for the year 2030 in accordance to local land use plans, small area plans, corridor plans and regional jobs forecasts; conducting travel demand modeling and analysis using the Triangle Regional Model (TRM); and evaluating alternative transportation improvement options for highway, transit and non-motorized modes of travel based on cost, operations, safety, air quality and other performance measures. The preferred transportation plan, documented in this report, was selected by the DCHC-TAC based on mobility, system Level of Service (LOS) and economic development goals balanced against financial, environmental and social constraints.



### GROWTH PROJECTIONS

The population in the DCHC-MPO area is expected to increase by 53 percent between 2002 and 2030, growing from a baseline population of 365,302 to a forecast population of 559,658. This pace of growth in the DCHC-MPO is significantly slower than the projected pace of growth in the neighboring Capital Area Metropolitan Planning Organization (CAMPO) or the overall Triangle region.

The job forecast for the DCHC-MPO area indicate that 186,284 new jobs will be added, reflecting a 73 percent increase between 2002 and 2030. This employment growth rate is higher than the population growth rate, indicating that the DCHC-MPO area would continue to grow as an employment destination. A similar trend can be observed for the CAMPO area and the Triangle region.



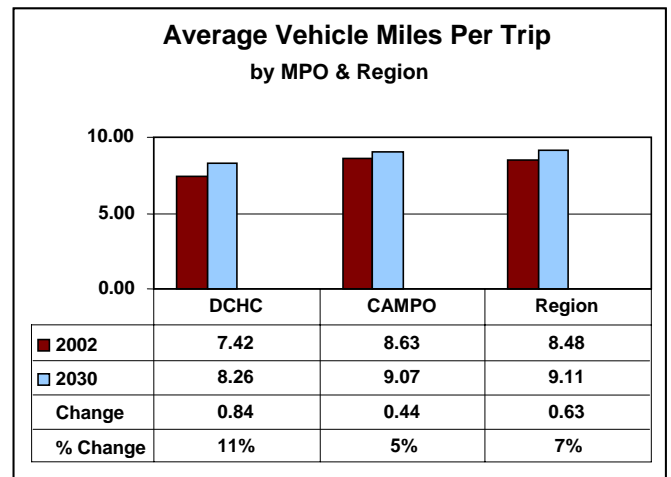
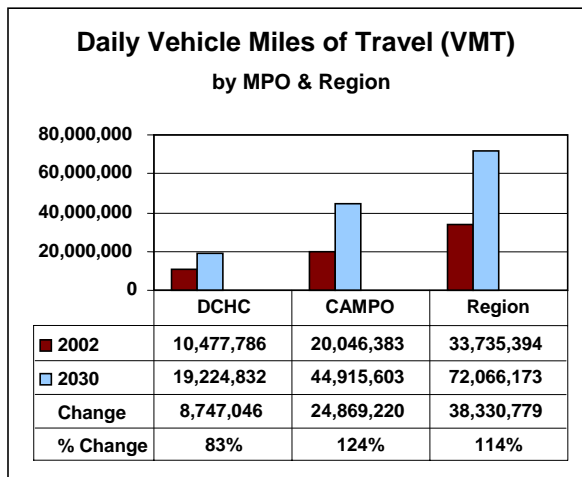
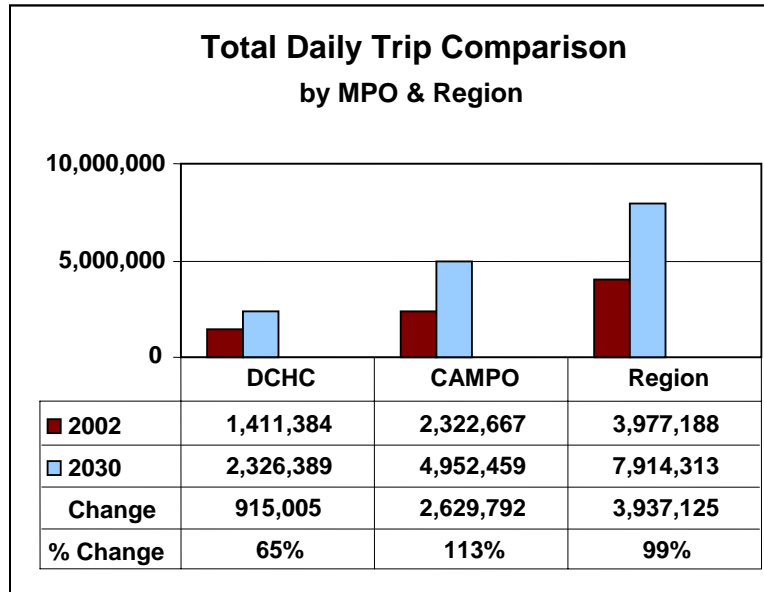
## TRAVEL FORECASTS

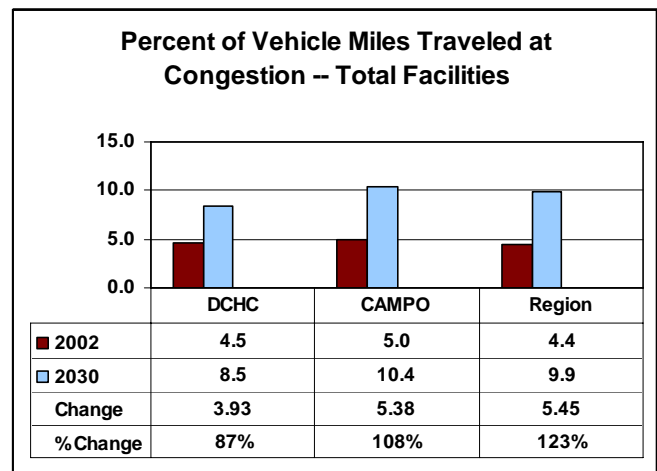
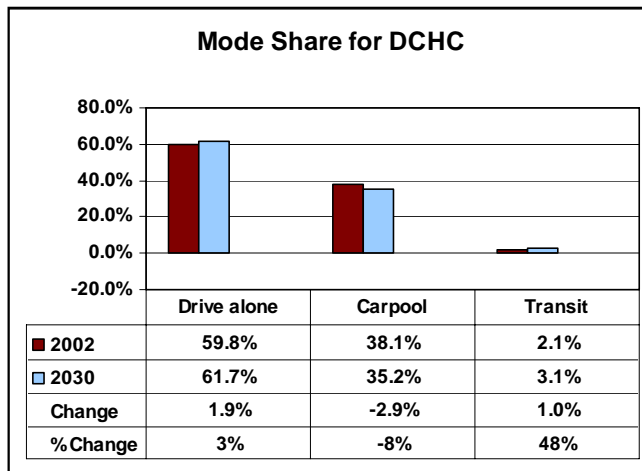
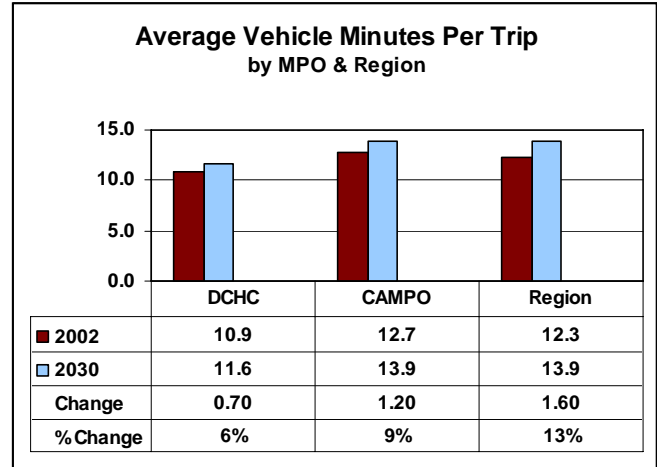
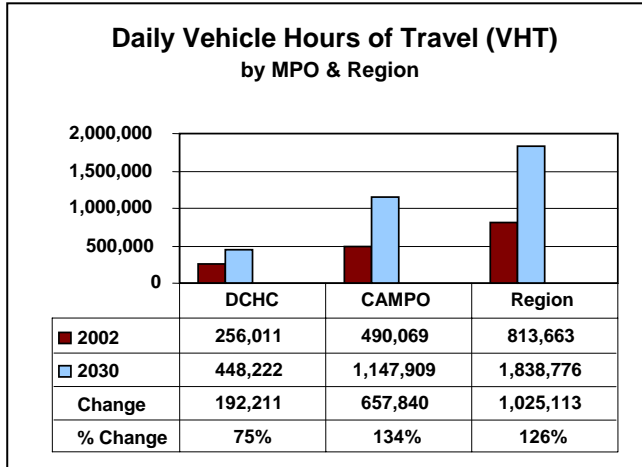
With growth in population and employment, it is expected that traffic will continue to grow as well. By the year 2030, regional travel demand forecasts indicate that total person trips will increase by 65 percent for the DCHC-MPO area, with higher per capita trips in 2030 (4.16 trips per person) than in 2002 (3.87 trips person). However, the person trip growth rate in the DCHC-MPO area is lower than the CAMPO's 113 percent growth and the Triangle region's 99 percent growth, but it is in line with relative demographic profiles of the areas.

The travel demand forecasts also reveal important insights on vehicle miles of travel (VMT) and vehicle hours of travel (VHT) in the DCHC-MPO, CAMPO, and the Triangle region. These areas show VMT and VHT growth rates that are greater than the projected increases in population, employment and person trips, indicating that people will not only make more trips, but they will travel greater distances and spend more time traveling, as well.

In terms of mode of travel, driving alone on automobiles will continue to be the most popular mode of transportation in the future until significant infrastructures are built to improve carpool and transit travel. The 2030 projections show that 3.1 percent of the trips will be transit, 35.2 percent will be carpool for commuting and other business and shopping trips, and 61.7 percent will be driving alone. This modal split reflects an increase for the transit in terms of percentage points, but a drop for the carpool share.

The highway deficiency analysis revealed that the level of traffic congestion would expand and intensify throughout the DCHC-MPO area in the future, especially on the principal roadways such as I-40, I-85, US 70, US 15-501, NC 147, and NC 54. The results show that congestion on the overall road network will almost double; going from 4.5 percent in 2002 to 8.5 percent congested VMT in 2030.







## **RECOMMENDED PLAN**

### **Highways**

The 2030 LRTP recommends a highway investment plan that will cost \$2.8 billion. The highway element of the Plan would serve automobile trips, as well as other modes such as bicycle and public bus transportation, and support strategies such as Intelligent Transportation Systems (ITS) and Transportation Demand Management (TDM). The main emphasis of the recommended highway plan is the preservation and maintenance of existing streets, roadways, and bridges. This vision is reflected in the fact that among the highway projects that are intended to increase road capacity, 68 percent of the projects, or 158 miles, are for increasing the capacity of existing highway alignments (usually by road widening), compared to 32 percent of the projects, or 76 miles, for new roads. The most important highway projects include:

- East End Connector, new and widened 6-lane freeway;
- US 70 upgrade to 6-lane freeway (Lynn Road to Wake County line);
- I-85 widening to 6 lanes (US 70 to Red Mill Road);
- Northern Durham Parkway (US 70 to Roxboro Road);
- Roxboro Road widening to 6 lanes (Duke Street to Goodwin Road);
- I-40 High Occupancy Vehicle (HOV) lanes (Durham/Wake County line to NC 86 in Orange County);
- NC 147 – Durham Freeway HOV (East End Connector to I-40); and,
- NC 147 – Triangle Parkway – new alignment.

### **Fixed Guideway and High Capacity Transit**

The proposed Fixed Guideway and High Capacity Transit investment totals \$1.1 billion and provides considerable support to MPO goals related to transit, multi-modal transportation, and the provision of alternatives to the automobile. Fixed Guideway refers to rail, bus rapid transit, and other types of transit services that operate on permanent routes that are often grade-separated facilities or special highway travel lanes. These routes serve corridors in which the land use, e.g., large employment centers and relatively dense residential areas, will generate a high number of trips, especially during the morning and afternoon weekday peaks. The 2030 LRTP identifies these projects as corridor systems, and thus the design details and exact alignments have not yet been determined.

The four major fixed guideway and high capacity transit projects include:

- TTA Rail – Phase I (Ninth Street in Durham to Government Center in downtown Raleigh);
- TTA Phase II Fixed Guideway (Ninth Street/Duke Medical Center and University in Durham to UNC Horace Williams development in Chapel Hill);
- High Capacity Transit (I-40 to Carrboro Plaza); and,
- High Capacity Transit (Eubanks Road to Southern Village).

### **Bus Transit (Public Transportation)**

The recommended bus transit plan totals \$2 billion and accelerates the currently increasing level of transit investment. Among the four public transit systems, i.e., Triangle Transit Authority (TTA), Durham Area Transit Authority (DATA), Chapel Hill Transit (CHT), and Orange Public Transportation (OPT), there are 258 proposed local and express bus routes. Many routes are new or include high level services such as special feeder routes to proposed fixed guideway systems, and express service between employment centers,

residential areas, and park-and-ride lots. Moreover, the frequency of bus service on the routes is to be increased.

### **Bicycle & Pedestrian**

In response to the increased popularity of bike and pedestrian travel, the MPO has set a goal to create “a pedestrian and bicycle system that provides an alternative means of transportation, allows greater access to public transit, and supports recreational opportunities.” On a regional level, the Transportation Advisory Committee has adopted a policy of inclusion for pedestrian and bicycle projects within the DCHC MPO boundary. As a result, all road projects in the ‘Highway Element’ of the LRTP are expected to provide appropriate accommodations for pedestrians and bicyclists, concurrent with roadway improvements. Missing links and gaps in the pedestrian networks will be constructed retroactively and subsidized with \$20,383,000 in MPO funding, priority being given to areas with heavy pedestrian traffic generators such as schools, parks and business districts. The 2030 LRTP lists 243 bicycle projects, totaling over \$112 million in cost. In addition to these policies and projects, the MPO plans to direct resources to education, enforcement and encouragement programs to support bicycle travel.

### **Other Travel Programs**

In addition to highway, transit, fixed guideway, bicycle and pedestrian projects, the 2030 LRTP recommends additional travel programs to provide adequate alternatives to single-occupancy vehicle (SOV) trips. These programs are:

- Travel Demand Management (TDM) – There is \$50 million planned for strategies and actions that reduce SOV trips, spread traffic volumes away from peak travel periods, and improve traffic flow;
- Intelligent Transportation Systems (ITS) – There is a set of diverse technologies, such as information processing, communications, control systems, and electronics that promises to make the existing transportation infrastructure more efficient and safer; and,
- Transportation System Management (TSM) – These are solutions that increase efficiency and safety by allowing the current transportation network to operate with less obstructions and increased capacity; the combined investment for ITS and TSM is \$57 million.

## **AIR QUALITY CONFORMITY ANALYSIS AND DETERMINATION REPORT**

The 2030 LRTP complies with the provisions of the Clean Air Act Amendments of 1990 and the Transportation Equity Act for the 21<sup>st</sup> Century of 1998. A conformity analysis has demonstrated that the transportation projects in the 2030 LRTP will impact the overall emission of pollutants in a manner that will eliminate or reduce violations of the national ambient air quality standards (NAAQS) in Durham County and Orange County.

## **FINANCIAL PLAN**

The Financial Plan provides a comparison of projected costs and revenues from 2005 through 2030. The purpose of the Financial Plan is to demonstrate that the DCHC MPO has the financial capacity to implement the 2030 LRTP and ultimately achieve air quality conformity.

### **Costs**

The estimated costs for the 26-year plan period (2005 through 2030) are \$6.1 billion, or approximately \$236 million per year. Public transportation comprises the majority of the total costs, 51%, demonstrating the MPO’s commitment to providing alternatives to the private automobile. Bus transit accounts for two-thirds of

the total public transportation costs. The highway component comprises the next largest cost, 46% of the total costs. Highway improvements account for three-fourths of the total highway costs, and highway maintenance and operation accounts for the remaining one-fourth of those costs. The other components comprise 2%, or less, of the total costs. All costs are in constant year 2005 dollars.

### **Revenues**

The 2030 LRTP forecast revenue sources to pay for the proposed projects, based on historical revenue data. The total future revenue was estimated at \$5.4 billion, of which the traditional highway funding sources provide 63 percent, or \$3.4 billion. The State Highway Trust Fund (HTF) source is to provide \$468 million, or the same amount as the estimated cost of the five HTF projects. It should be noted that not all highway source revenues need to be expended on highway projects. Federal transportation regulations permit so-called "flexing" for many funding sources, which allows highway revenue to fund non-highway transportation projects such as transit and transportation demand management projects.

The transit bus and fixed guideway sources are to provide 18% and 19% of the total revenue, respectively.

### **2030 LRTP Cost Summary**

<b>No.</b>	<b>Cost Components</b>	<b>Cost Estimate, in 2005 Millions of Dollars</b>
<b>1</b>	<b>Highway</b>	
1.1	Improvement	\$2,046.7
1.2	Maintenance	\$741.6
	<b>Total Highway Program</b>	<b>\$2,788.3</b>
<b>2</b>	<b>Public Transportation - Transit/Fixed Guideway/Rail</b>	
2.1	Bus Transit Cost	\$2,035.7
2.2	High Capacity Transit	\$102.2
2.3	Fixed Guideway (New Starts)	\$952.9
2.4	Rail Right-of-Way Corridor Protection	\$13.6
	<b>Total Public Transportation</b>	<b>\$3,104.4</b>
<b>3</b>	<b>Non Motorized Transportation</b>	
	Bicycle Facilities	\$112.4
	Sidewalks & Pedestrian Walkways	\$20.4
	<b>Total Non-Motorized Transportation</b>	<b>\$132.8</b>
<b>4</b>	<b>TDM</b>	<b>\$49.8</b>
<b>5</b>	<b>ITS/TSM</b>	<b>\$56.7</b>
<b>TOTAL 2030 LRTP Costs</b>		<b>\$6,132</b>

2030 LRTP Revenue Summary

	Funding Sources / Types	Revenue Estimate, in 2005 Millions of Dollars
<b>1</b>	<b>Highway / Enhancement</b>	
1.1	Federal /State (NHS, STP, NCDOT, etc.)	\$2,463.2
1.2	State Highway Trust Fund (loop projects)	\$468.1
1.3	Local (e.g., Capital Improvement Program)	\$348.7
1.4	Private	\$126.9
	<b>Total highway/enhancement revenue</b>	<b>\$3,406.9</b>
<b>2.1</b>	<b>Transit Bus</b>	
	<b>Capital</b>	
2.11	Federal FTA	\$324.6
2.12	State – NCDOT	\$20.3
2.13	Local	\$60.9
	<b>Total bus transit capital</b>	<b>\$405.8</b>
	<b>Operating &amp; Maintenance (O &amp; M)</b>	
2.14	Federal FTA	\$65.1
2.15	State – NCDOT	\$110.6
2.16	Local	\$255.5
2.17	Fare	\$131.6
	<b>Total bus transit operating &amp; maintenance</b>	<b>\$562.8</b>
	<b>Total bus transit revenue (capital, operating &amp; maintenance)</b>	<b>\$968.6</b>
<b>2.2</b>	<b>Fixed Guideway Transit (TTA Phase 1 and US 15-501)</b>	
	<b>Capital</b>	
2.21	Federal FTA	\$386.8
2.22	State – NCDOT	\$193.4
2.23	Local	\$193.4
	<b>Total fixed guideway transit capital</b>	<b>\$773.6</b>
	<b>Operating &amp; Maintenance (O &amp; M)</b>	
2.24	Federal FTA	\$47.1
2.25	State – NCDOT	\$37.1
2.26	Local	\$86.4
2.27	Fare	\$124.5
	<b>Total fixed guideway operating &amp; maintenance</b>	<b>\$295.1</b>
	<b>Total fixed guideway revenue</b>	<b>\$1,068.7</b>
	<b>Total Transportation Plan Revenue</b>	<b>\$5,444.2</b>

**Cost and Revenue Comparison and Non-Traditional Revenue**

Under current federal transportation legislation, long-range transportation plans must be fiscally constrained. In other words, revenues must closely match costs and there must be a well-founded expectation that proposed revenues will be realized.

Given the preceding total cost and revenue projections, costs will exceed revenues by almost \$558 million. In order to provide adequate funding to implement the 2030 LRTP projects, the plan identifies three sources of non-traditional revenue. Additional revenue sources might be made available within the timeframe of this long-range plan through new state legislation or local initiatives.

**Cost and Revenue Comparison and Non-Traditional Revenue Sources**

	<b>COST &amp; REVENUE COMPARISON</b>	<b>In 2005 Millions of Dollars</b>
1	Total Transportation Cost Estimates	\$6,132.0
2	a) Total historical revenues	\$5,444.3
	b) Total expected revenue increases based on changes to State and federal transportation legislation; \$13 million/year, 2021 to 2030	\$130
	<b>Shortfall</b>	<b>-\$557.7</b>
	<b>NON TRADITIONAL REVENUE SOURCES</b>	
	(Includes all Durham County and part of Orange County in MPO boundary)	
A	Motor (Gasoline) Fuel Tax - Five percent on non-taxed portion of gas retail cost (\$1.40 non-tax per gallon) Revenue period is 2008 to 2030, and uses ~1.4 percent annual growth	\$356.2
B	Vehicle Registration - \$10 from 2008 to 2009; \$15 from 2010 to 2019; \$20 from 2020 to 2030 Uses ~1.4 percent annual growth for vehicles	\$124.4
C	Triangle Parkway Toll Financing	\$84.0
	<b>Total Non Traditional Revenue Sources</b>	<b>\$564.6</b>
	<b>TOTAL REVENUE (traditional &amp; non-traditional)</b>	<b>\$6,138.9</b>
	<b>Difference -- Surplus</b>	<b>\$6.9</b>

