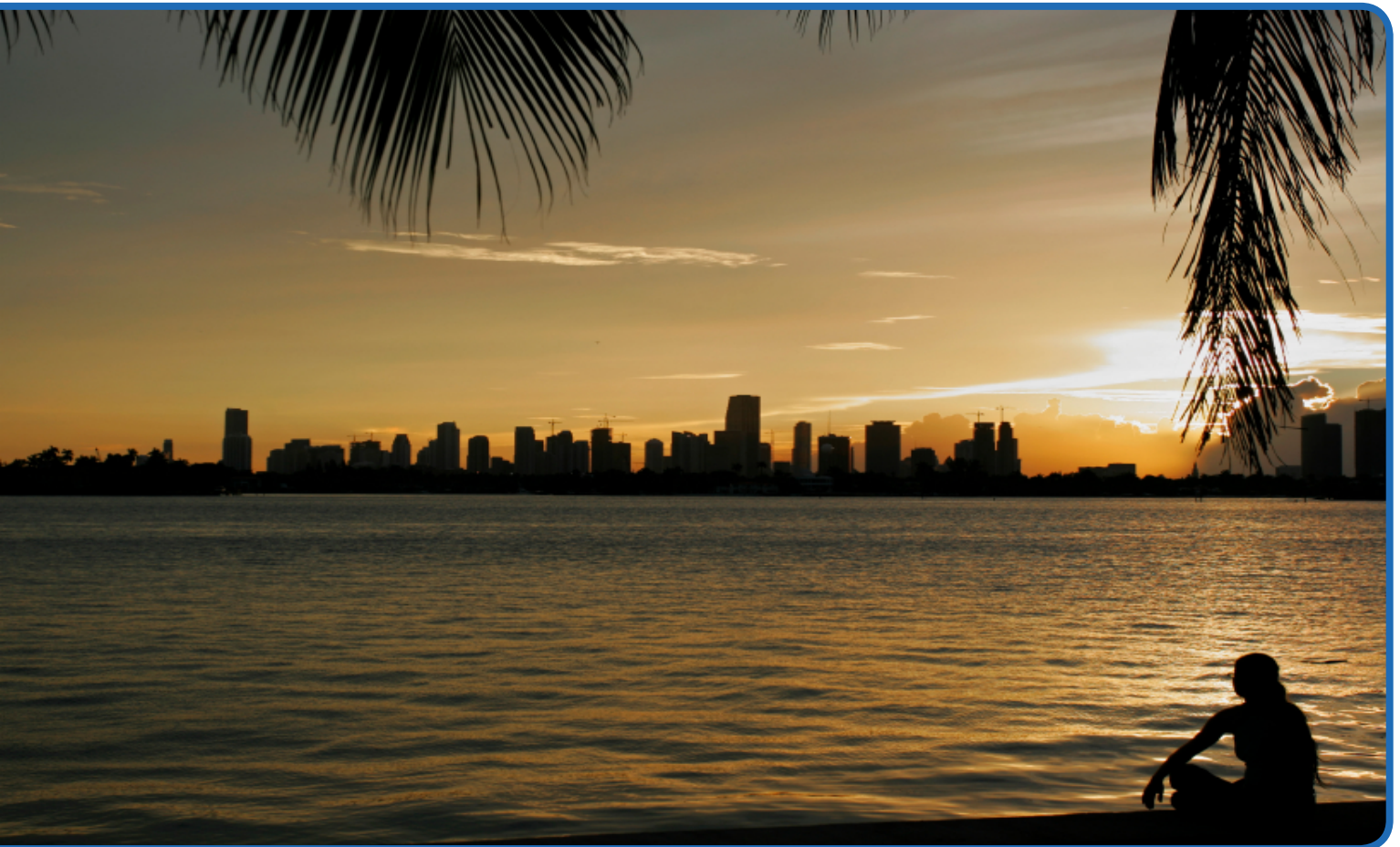




METROPOLITAN PLANNING ORGANIZATION  
FOR THE MIAMI URBANIZED AREA

# STATE OF THE COUNTY [1997 - 2006] REPORT

NOVEMBER 2008



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## 1. Introduction

Changes over the last 10 years in the performance of the Miami-Dade County transportation system can be summarized and analyzed in terms of three categories of variables. The first, demand variables, are characterized by the demand on the transportation system and include population, employment, and other subsets of those two primary variables. The second category consists of supply variables, which are defined by the supply of transportation infrastructure and services. Supply variables include highway lane miles and transit revenue miles. The third and final category of variables can be characterized by performance measures that are a function of the supply and demand variables. The concept is similar to that of the economic principles of supply and demand and their combined impact on the performance of financial systems. Two examples of transportation system performance measures are highway vehicle miles traveled and transit ridership (boardings).

The following analysis provides an assessment of the trends over the last ten years in some of Miami-Dade County's supply, demand, and performance variables.

## 2. Demand Variables

Demand on the transportation system is typically defined by socioeconomic variables such as population and employment, and also travel behavior variables such as number of trips and mode of travel. **Table 1** includes these variables and their trends in Miami-Dade County over the last 10 years. Miami-Dade County's population grew at an annualized rate of 1.4% from 1997 to 2006, while employment grew by a rate of 1.0% from 1997 to 2005. Conversely, the daily vehicle miles traveled on Miami-Dade County state highways (VMT) increased by 3.6% annually over the same period. **Figures 1** and **2** depict those population, employment and VMT growth trends. The contrast in the growth of the demand on the highway system (represented by VMT) relative to the population growth indicates an upward trend in the magnitude of travel on a per capita basis. This is evident in the 2.6% annual growth in work trips made by automobile by Miami-Dade County residents, which is almost double the annual growth in population. The impact of the growth in the number of work trips is reduced somewhat by an annual increase of 1.9% in the average auto occupancy for work trips made by automobile and an annual increase of 4.2% in the transit mode share for work trips. **Figure 3** depicts the work trips by auto and auto occupancy trends and **Figure 4** depicts the work trips by auto and transit mode share trends.

Table 1: Annualized Growth Rates for Demand Variables

Variable	Time period	Annualized Growth Rate
Population	1997 - 2006	1.4%
Employment	1997 - 2005	1.0%
Vehicle Miles of Travel	1997 - 2007	3.6%
Work Trips by Auto	2000 - 2006	2.6%
Work Trip Auto Occupancy	2000 - 2006	1.9%
Work Trip Transit Mode Share	2000 - 2006	4.2%

Figure 1: Population and Daily Vehicle Miles Traveled (VMT) 1997-2007

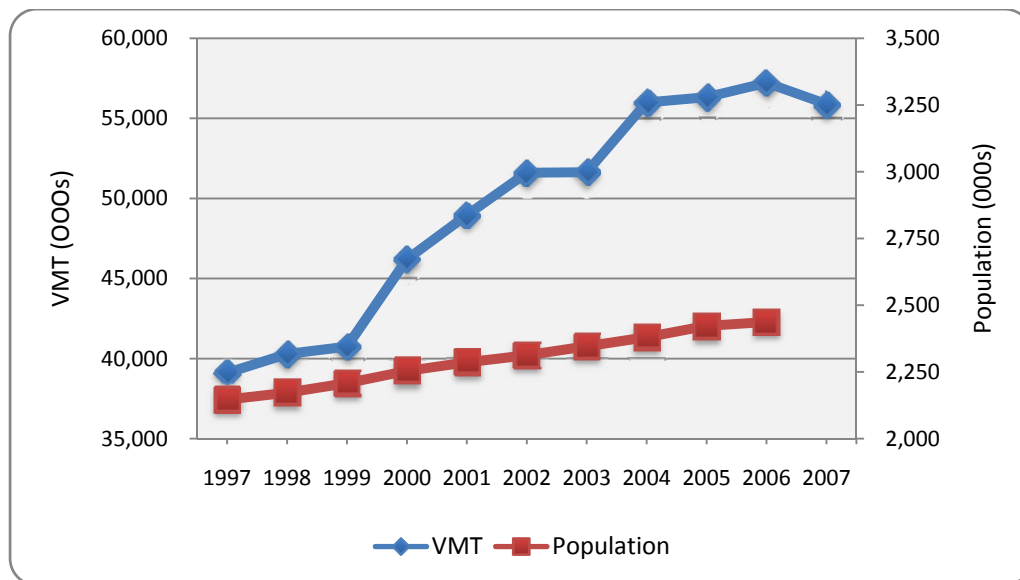


Figure 2: Employment and Daily Vehicle Miles Traveled (VMT) 1997-2007

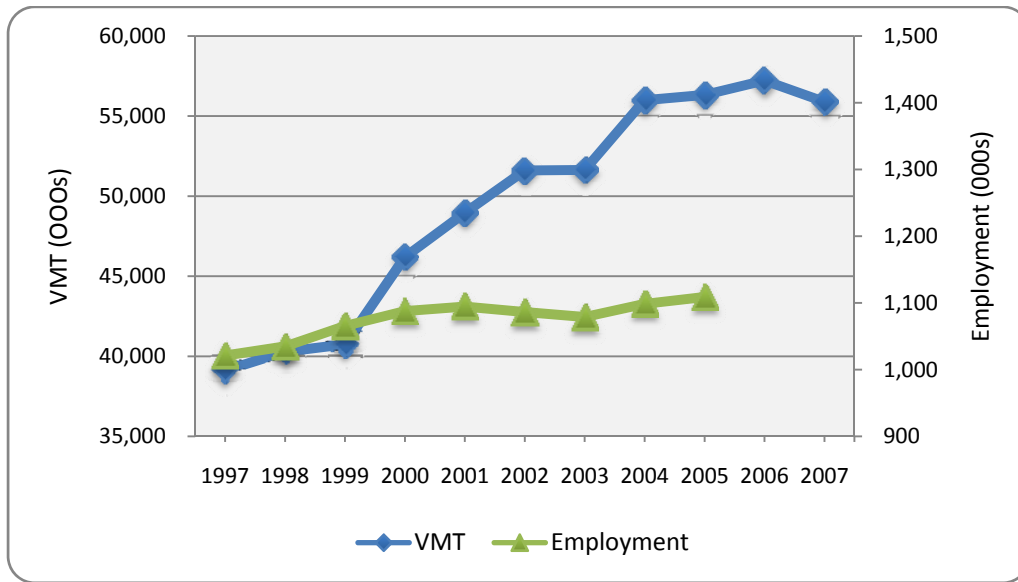


Figure 3: Work Trips by Auto and Work Trip Auto Occupancy

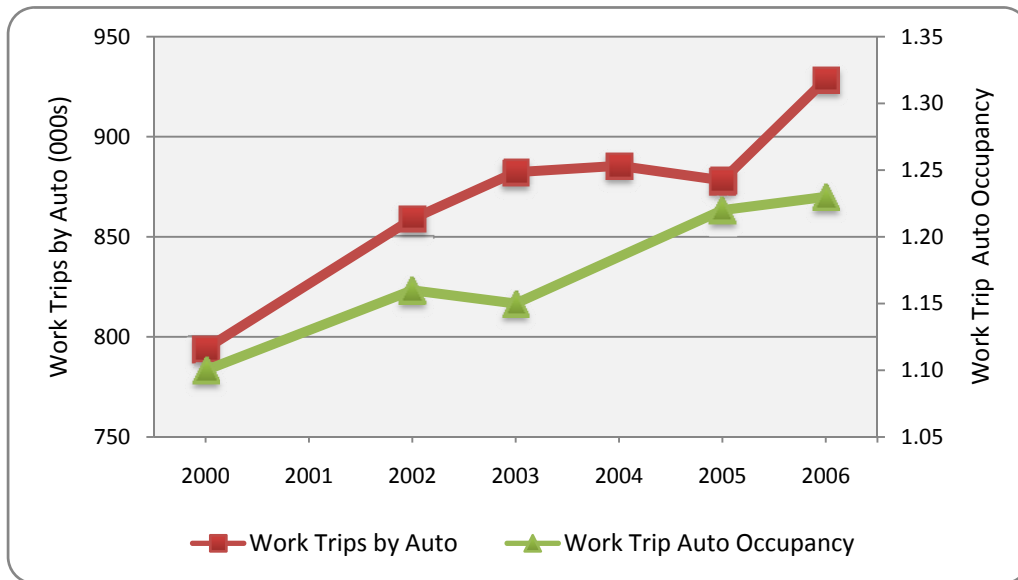
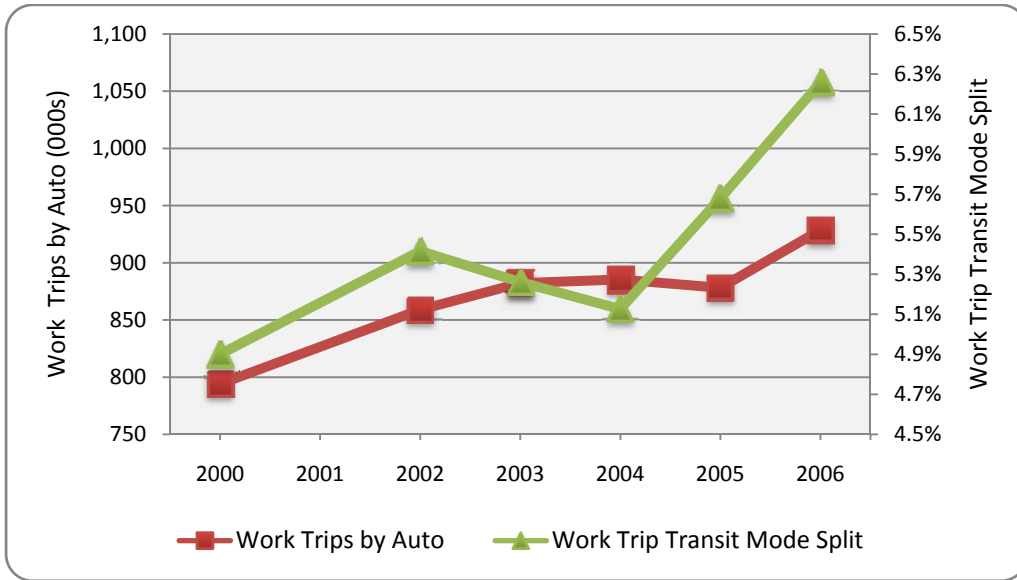


Figure 4: Work Trips by Auto and Work Trip Transit Mode Share



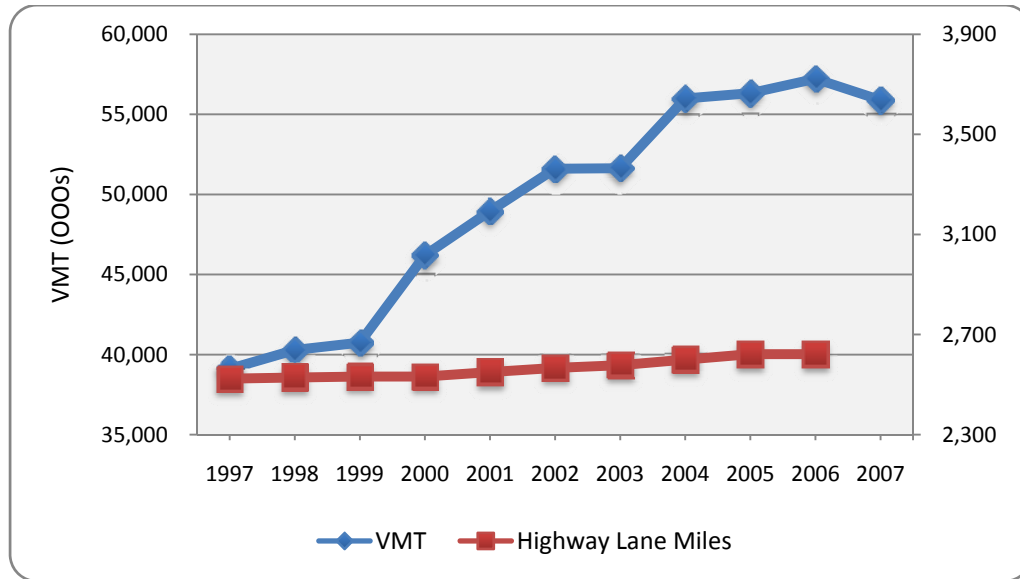
### 3. Supply and Performance Variables

The Miami-Dade County transportation system consists of highway and transit infrastructure and service, representing the supply of transportation services. The highway infrastructure grew at a much slower pace than the demand from 1997-2007. **Table 2** includes data on the trends in highway lane miles (State Highways only) and VMT during this period. The annual growth in VMT is nine times greater than the growth in the highway system, indicating a shortage in the supply of highway infrastructure, relative to the demand. **Figure 5** depicts the State Highway Lane miles and VMT growth trends, showing a gross imbalance between the two over the ten year time period. The consequently high level of congestion on the State Highway System in Miami-Dade County has consistently hovered at a level of service “D”, on a scale from “A” to “F”.

**Table 2: Annualized Growth Rates for Highway Supply and Performance Variables**

Variable	Time period	Annualized Growth Rate
State Highway Lane Miles	1997 - 2006	0.4%
Vehicle Miles of Travel	1997 - 2007	3.6%

**Figure 5: State Highway Lane Miles and Daily Vehicle Miles of Travel (VMT) 1997-2007**



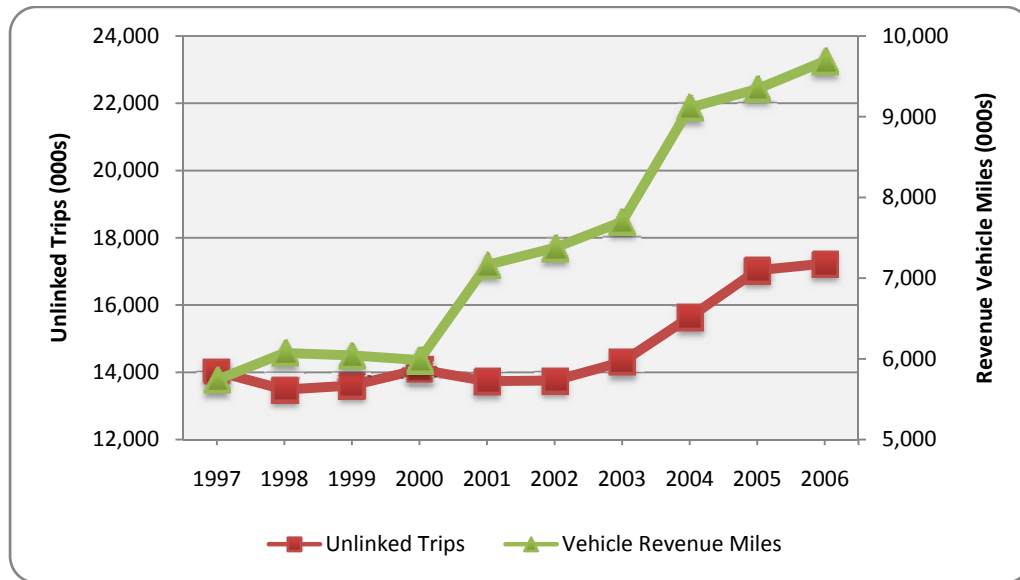
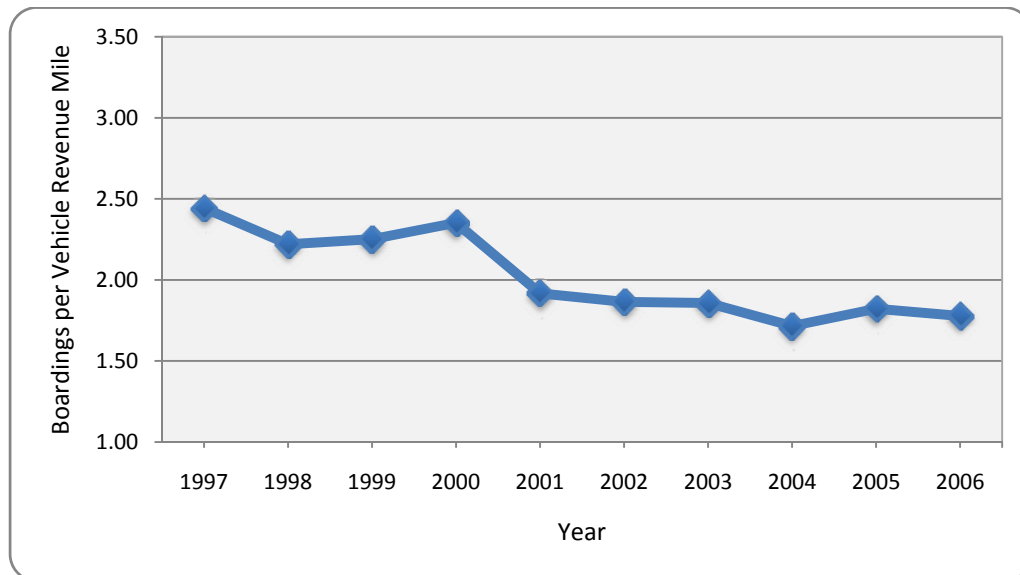
The supply of transit service has, depending on the transit mode, in some cases outpaced the demand on the transit system. Transit services can be measured in terms of vehicle revenue miles, defined as the total miles traveled each year by transit vehicles while in revenue service. In the case of Metromover, revenue service after 2002 does not truly generate revenue, but is still referred to as revenue service. The performance of the transit system can be measured in terms of efficiency by relating the supply of transit services to the demand on the system. The Metrorail, Metromover, Metrobus, and Tri-rail systems in Miami-Dade County are discussed individually below, with analysis of the supply, demand, and efficiency of each system.

Metrorail’s annual vehicle revenue miles grew at a rate of 6.0% per year between 1997 and 2006, while Metrorail ridership grew at a relatively low rate of 2.3% annually. **Figure 6** depicts the Metrorail vehicle revenue miles and ridership trends, indicating the unbalanced growth in demand at roughly one third of the growth in supply. **Figure 7** depicts a graph of the relative efficiency of Metrorail service, which fell from 2.4 passengers per revenue mile in 1997 to 1.8 in 2006. Metrorail’s efficiency declined by 3.5% annually over the 10-year period.

**Table 3: Annualized Growth Rates for Metrorail Supply and Performance Variables**

Variable	Time period	Annualized Growth Rate
<b>Metrorail Annual Rev. Miles</b>	1997 - 2006	6.0%
<b>Metrorail Annual Boardings</b>	1997 - 2006	2.3%
<b>Metrorail Boardings per Rev. Mile</b>	1997 - 2006	-3.5%



**Figure 6: Metrorail Annual Vehicle Revenue Miles and Boardings 1997-2006****Figure 7: Metrorail Boardings per Vehicle Revenue Mile 1997-2006**

Metromover's annual vehicle revenue miles declined at a rate of 0.2% per year between 1997 and 2006, while Metromover ridership grew at an annual rate of 8.0%. **Figure 8** depicts the Metromover vehicle revenue miles and ridership trends, indicating a spike in demand after 2002. This trend can be attributed, in part, to the establishment of free Metromover service at that time. **Figure 9** depicts a graph of the relative efficiency of Metromover service, which increased from 4.3 passengers per revenue mile in 1997 to 8.7 in 2006. Metromover's efficiency rose 8.2% annually over the 10-year period.

Table 4: Annualized Growth Rates for Metromover Supply and Performance Variables

Variable	Time period	Annualized Growth Rate
Metromover Annual Rev. Miles	1997 - 2006	-0.2%
Metromover Annual Boardings	1997 - 2006	8.0%
Metromover Boardings per Rev. Mile	1997 - 2006	8.2%

Figure 8: Metromover Annual Vehicle Revenue Miles and Boardings 1997-2006

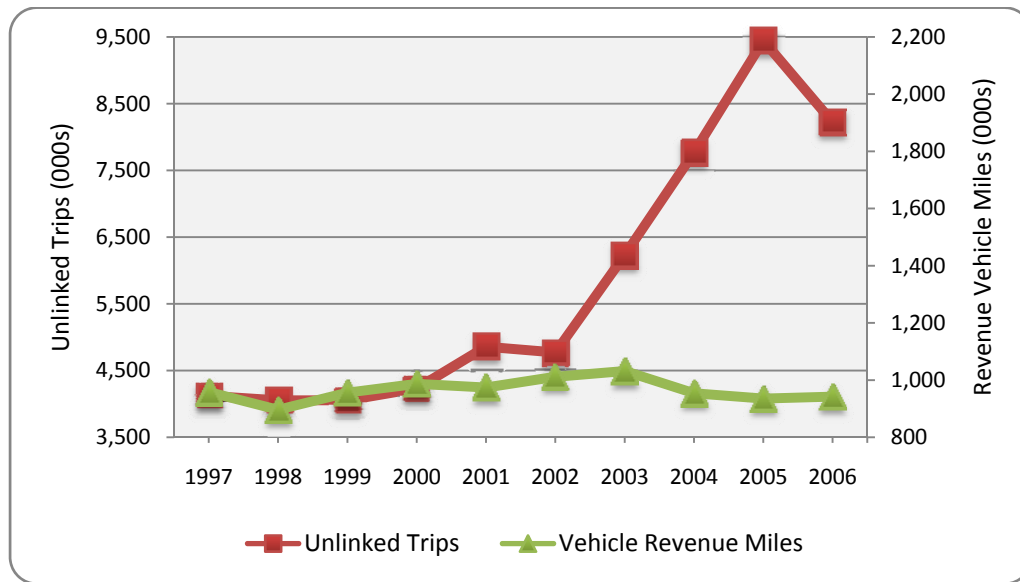
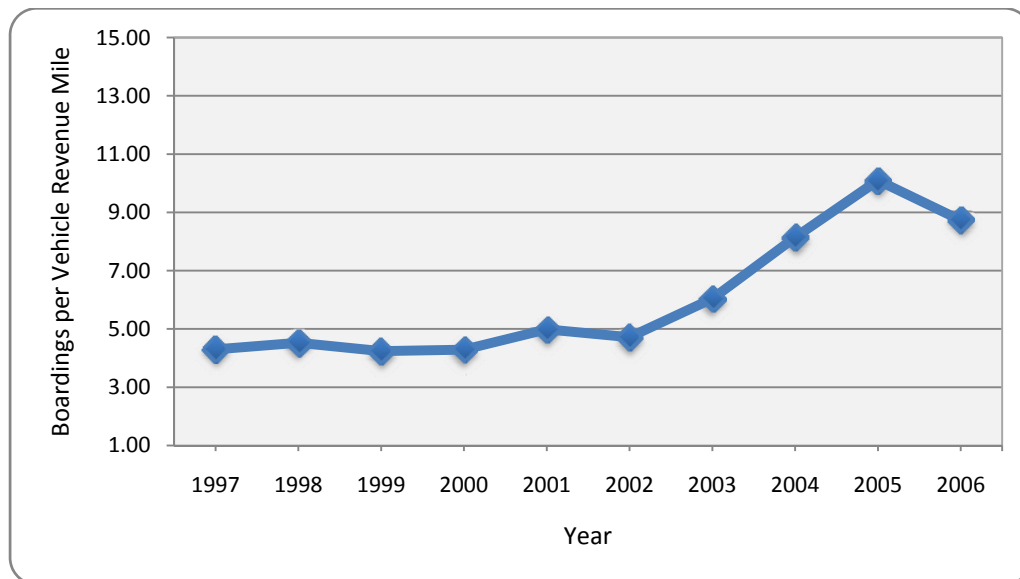


Figure 9: Metromover Boardings per Vehicle Revenue Mile 1997-2006



Metrobus’ annual vehicle revenue miles grew at a rate of 5.0% per year between 1997 and 2006, while Metrobus ridership grew at a rate of 3.1%. **Figure 10** depicts the Metrobus vehicle revenue miles and ridership trends, indicating a surge in bus service after 2003, a direct result of the adoption of the People’s Transportation Plan and related bus route improvements. The ridership also began rising rather sharply at that time, albeit not quite at the pace of the bus service growth. This imbalance is depicted in **Figure 11**, which shows the relative efficiency of Metrobus service, which fell from 2.6 passengers per revenue mile in 1997 to 2.35 in 2003. Efficiency rose in the subsequent year, but ultimately fell to 2.2 in 2006. The efficiency over the entire period dropped by 1.8% annually.

**Table 5: Annualized Growth Rates for Metrobus Supply and Performance Variables**

Variable	Time period	Annualized Growth Rate
<b>Metrobus Annual Rev. Miles</b>	1997 - 2006	5.0%
<b>Metrobus Annual Boardings</b>	1997 - 2006	3.1%
<b>Metrobus Boardings per Rev. Mile</b>	1997 - 2006	-1.8%

Figure 10: Metrobus Annual Vehicle Revenue Miles and Boardings 1997-2006

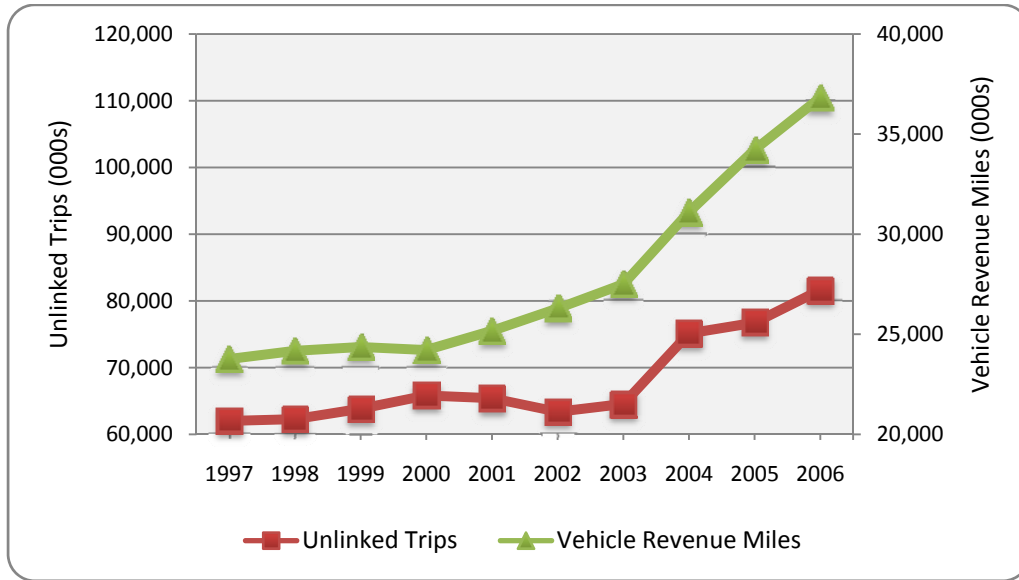
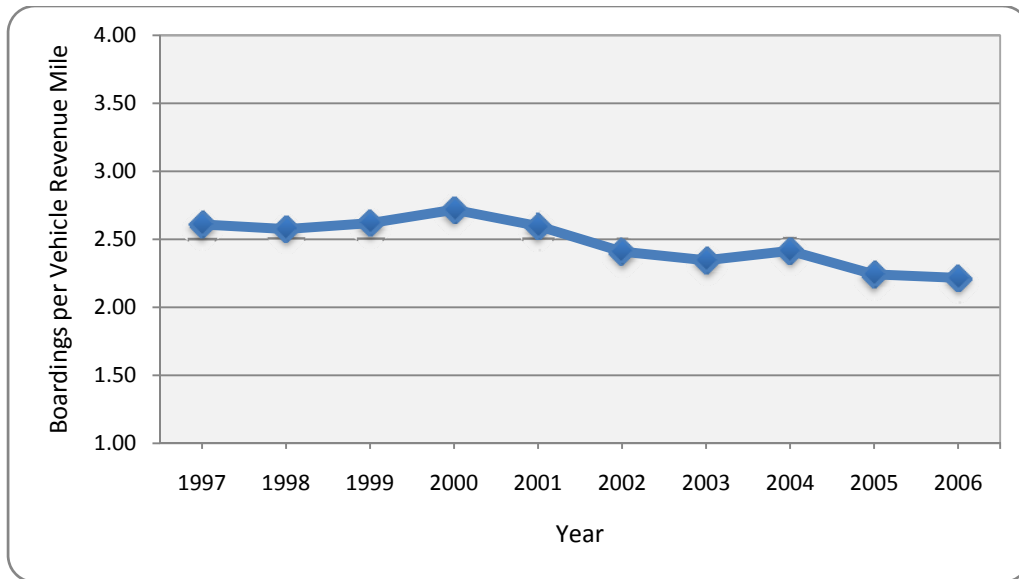


Figure 11: Metrobus Boardings per Vehicle Revenue Mile 1997-2006



Tri-rail’s annual vehicle revenue miles grew at a of 1.6% per year between 1999 and 2006, while boardings grew by 3.0% annually over the same period. **Figure 12** depicts the Tri-rail vehicle revenue miles and riderhip trends, indicating a relatively higher growth in the demand, at twice the annual growth of increased service. These data do not reflect the completion of the double-tracking project, which dramatically increased service and ridership in 2008. **Figure 13** depicts a graph of the relative efficiency of Tri-rail service, which rose from 1.2 passengers per revenue mile in 1999 to 1.3 in 2006. Tri-rail’s efficiency increased by 1.1% annually over the seven year period.

**Table 6: Annualized Growth Rates for Tri-rail Supply and Performance Variables**

Variable	Time period	Annualized Growth Rate
<b>Tri-rail Annual Rev. Miles</b>	1999 - 2006	1.6%
<b>Tri-rail Annual Boardings</b>	1999 - 2006	3.0%
<b>Tri-rail Boardings per Rev. Mile</b>	1999 - 2006	1.1%

Figure 12: Tri-rail Annual Vehicle Revenue Miles and Boardings 1997-2006

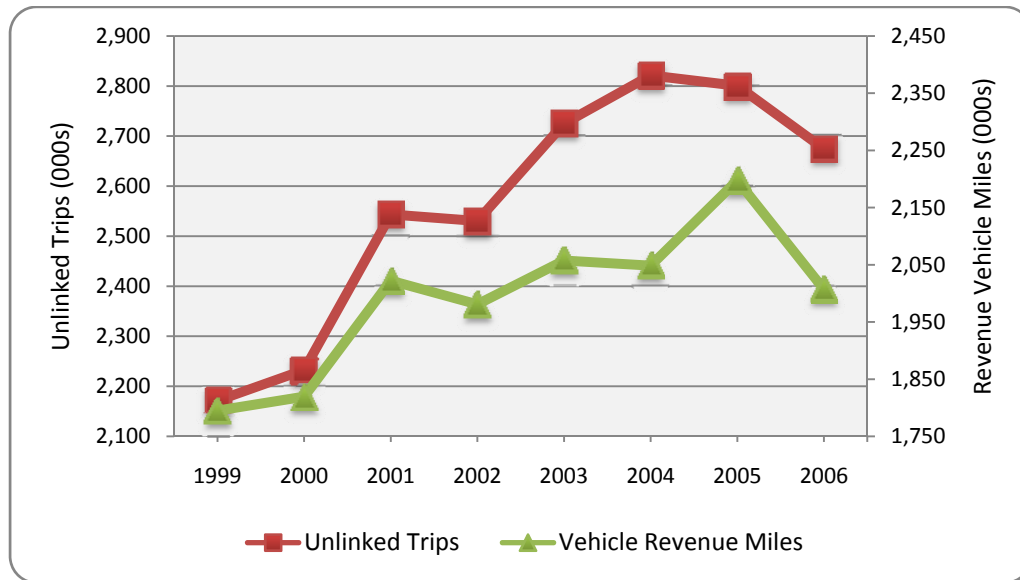
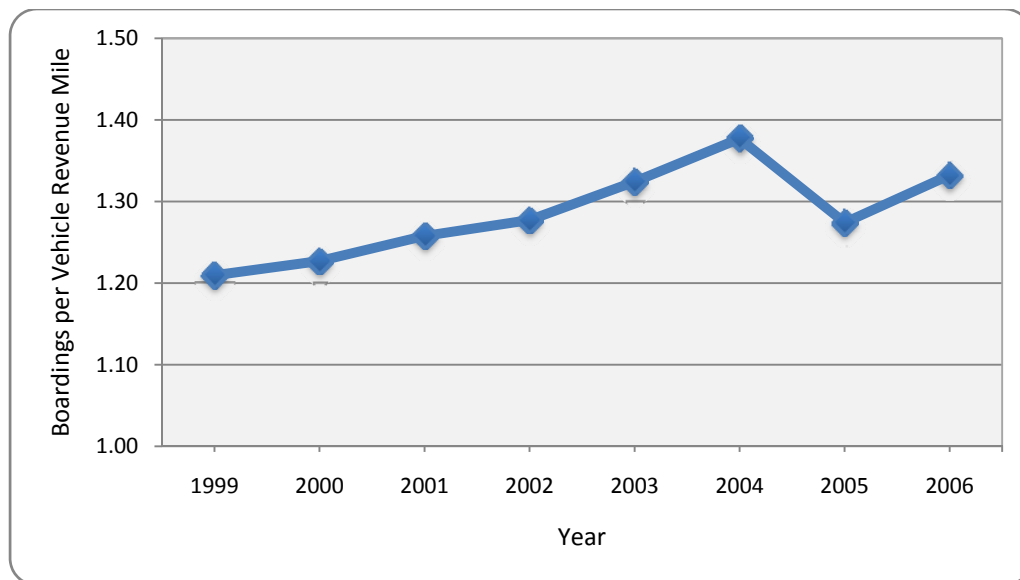


Figure 13: Tri-rail Boardings per Vehicle Revenue Mile 1997-2006



## 4. Summary

The data on supply, demand, and performance measure variables for Miami-Dade was collected from various sources. The trends in the growth rates of the variables were summarized and analyzed. The average growth in demand on the system from 1997 to 2007, defined by population and employment growth, is about 1.2% annually. The growth in the supply of transportation infrastructure has been much slower, ranging from 0.4% on the highway system to 6.0% on the transit system. The performance of the highway system has consistently registered at a level of service “D”, while the performance of the transit system, measured as a ratio of ridership to revenue miles, has varied by mode. The efficiency of Metrorail and Metrobus has declined overall since 1997, while Metromover and Tri-rail have experienced overall gains in efficiency. **Table 7** summarizes the demand, supply and performance variables analyzed in this report.

**Table 7: Annualized Growth Rates for Performance Measure Variables**

	Variable	Time period	Annualized Growth Rate
<b>Demand</b>	Population	1997- 2006	1.4%
	Employment	1997- 2005	1.0%
	Vehicle Miles of Travel	1997- 2007	3.6%
	Work Trips by Auto	2000- 2006	2.6%
	Work Trip Auto Occupancy	2000- 2006	1.9%
	Work Trip Transit Mode Share	2000- 2006	4.2%
	Metrorail Annual Boardings	1997- 2006	2.3%
	Metromover Annual Boardings	1997- 2006	8.0%
	Metrobus Annual Boardings	1997- 2006	3.1%
	Tri-rail Annual Boardings	1999- 2006	3.0%
<b>Supply</b>	State Highway Lane Miles	1997- 2006	0.4%
	Metrorail Annual Rev. Miles	1997- 2006	6.0%
	Metromover Annual Rev. Miles	1997- 2006	-0.2%
	Metrobus Annual Rev. Miles	1997- 2006	5.0%
	Tri-rail Annual Rev. Miles	1999- 2006	1.6%
<b>Perf. Measure</b>	Highway Level of Service	1997- 2006	“D”
	Metrorail Boardings per Rev. Mile	1997- 2006	-3.5%
	Metromover Boardings per Rev. Mile	1997- 2006	8.2%
	Metrobus Boardings per Rev. Mile	1997- 2006	-1.8%
	Tri-rail Boardings per Rev. Mile	1999- 2006	1.1%

# MIAMI-DADE METROPOLITAN PLANNING ORGANIZATION

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