# Trends and Conditions
# Special Report – July 2009

## Congestion in Florida
### Findings from the *Urban Mobility Report 2009*

This special report of the FDOT Trends and Conditions series highlights the costs and challenges of congestion in seven urban areas in Florida and across the nation. It is based on the Texas Transportation Institute's (TTI) *Urban Mobility Report 2009*. The following summarizes the results for 2007 and select prior years:

- ***High congestion costs nationally*** – $87.2 billion for 439 urban areas in the U.S. in 2007: 4.2 billion more hours in travel time and 2.8 billion more gallons of fuel consumed.

- ***High congestion costs in Florida*** – $5.90 billion for seven selected urban areas in Florida in 2007: 292 million more hours in travel time and 198 million more gallons of fuel consumed.

- ***Slight decline in congestion from 2006 to 2007*** – both nationally and in Florida due to higher fuel prices and a slowing economy, but well ahead of the levels ten years ago.

- ***Congestion in Florida cities*** – Orlando ranked 1st in Florida and 6th nationally with 53 hours of delay per traveler in 2007. Miami and Tampa-St. Petersburg tied for second in Florida and 11th nationally with 47 hours of delay per traveler. In terms of a travel time index (the ratio of congested to free flow travel time), Miami ranked 1st in Florida and 5th nationally with a value of 1.37.

- ***Increased use of major highways*** – The average limited access lane in Florida's seven selected urban areas carried 17,340 vehicles daily. The number was 19,490 in Miami, the highest in the state, and 10,430 in Pensacola, the lowest of the seven areas.

- ***Expected decline in congestion in 2008 and 2009*** – Reduced travel due to the fuel price spike in 2008 and the depressed economy is resulting in lower congestion. However, congestion is anticipated to increase again with a resumption of economic growth.

- ***Congestion cost savings*** – Operational improvements and public transit in Florida reduce congestion costs by $725 million, $461 million through operational treatments and $264 million through public transportation.

Traffic Congestion on any road network is characterized by slower speeds, longer trip time and increased queuing. This condition generally persists when traffic demand exceeds the capacity of the road or road network, a result of the growth of demand outpacing infrastructure additions and improved operational treatments. Congestion is generally measured in the form of delay per traveler (or peak period traveler). It is often calculated as the time difference between the average speed and the free flow speed on a roadway segment for all vehicle occupants. The TTI report suggests congestion is a problem in all the major urban areas and has been getting worse up until 2007.

Table 1 shows the key mobility measures for seven urban areas selected for study in Florida. When key mobility measures such as annual delay per traveler, travel time index (the ratio of travel time in the peak period to the travel time at free-flow conditions) and wasted fuel per traveler were considered, Orlando and Miami ranked the highest in Florida and were in the top ten list in the nation (Table 1). In the Florida urban areas studied, 86% of travel delay and 87% of total excess fuel consumed were shared by three urban areas -- Miami, Orlando and Tampa-St. Petersburg (Table 2). Miami ranked number 1 in Florida in terms of total travel delay, congestion and excess fuel consumption in 2007. Tampa-St. Petersburg and Orlando came in the 2nd and 3rd, respectively.

**Table 1 Key Mobility Measures for 2007**

| Urban Area | Population Group | Annual Delay per Traveler | | | Travel Time Index | | | Wasted Fuel per Traveler | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hours | Rank in Florida | Rank in U.S. | Value | Rank in Florida | Rank in U.S. | Gallons | Rank in Florida | Rank in U.S. |
| **Florida** | | | | | | | | | | |
| Orlando FL | Large | 53 | 1 | 6 | 1.30 | 3 | 17 | 35 | 1 | 9 |
| Miami FL | Very Large | 47 | 2 | 11 | 1.37 | 1 | 5 | 33 | 2 | 12 |
| Tampa-St. Petersburg FL | Large | 47 | 2 | 11 | 1.31 | 2 | 14 | 30 | 3 | 15 |
| Jacksonville FL | Large | 39 | 4 | 24 | 1.23 | 4 | 32 | 27 | 4 | 23 |
| Cape Coral FL | Small | 29 | 5 | 41 | 1.17 | 6 | 43 | 17 | 5 | 46 |
| Pensacola FL-AL | Small | 28 | 6 | 44 | 1.13 | 7 | 52 | 16 | 6 | 50 |
| Sarasota-Bradenton FL | Medium | 25 | 7 | 51 | 1.19 | 5 | 37 | 15 | 7 | 52 |
| **Weighted Mean** | | **44.53** | * | | | | | **30** | * | |
| **Group Means for U.S. (By Population Group)** | | | | | | | | | | |
| Very Large Average | | 51 | | | 1.37 | | | 35 | | |
| Large Average | | 35 | | | 1.23 | | | 24 | | |
| Medium Average | | 23 | | | 1.14 | | | 15 | | |
| Small Average | | 19 | | | 1.1 | | | 11 | | |

*Source:* Data from the *Urban Mobility Report 2009*
Note: the Miami urban area includes the urban areas of Miami-Dade, Broward and West Palm Beach counties.

**Table 2 Components of Congestion Problems, 2007 Florida Urban Area Totals**

| Urban Area | Population Group | Travel Delay | | | Excess Fuel Consumed | | | Congestion Cost | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hours (1000s) | Rank | Rank in U.S. | Gallons (1000s) | Rank | Rank in U.S. | $ Million | Rankin Florida | Rank in U.S. |
| **Florida** | | | | | | | | | | |
| Miami FL | Very Large | 145,608 | 1 | 4 | 101,727 | 1 | 4 | 2955 | 1 | 5 |
| Tampa-St. Petersburg FL | Large | 61,018 | 2 | 17 | 39,612 | 2 | 18 | 1205 | 2 | 18 |
| Orlando FL | Large | 41,791 | 3 | 22 | 27,842 | 3 | 23 | 850 | 3 | 22 |
| Jacksonville FL | Large | 22,491 | 4 | 33 | 15,711 | 4 | 32 | 457 | 4 | 33 |
| Sarasota-Bradenton FL | Medium | 9,030 | 5 | 58 | 5,418 | 5 | 58 | 176 | 5 | 58 |
| Cape Coral FL | Small | 7,451 | 6 | 60 | 4,347 | 6 | 62 | 152 | 6 | 60 |
| Pensacola FL-AL | Small | 5,469 | 7 | 71 | 3,122 | 7 | 72 | 106 | 7 | 71 |
| **Weighted Mean** | | | | **18.45** | * | | **18.78** | * | | **19.12** |
| **Group Means for U.S. (By Population Group)** | | | | | | | | | | |
| Very Large Average | | 166,900 | | | 115,654 | | | 3,549 | | |
| Large Average | | 31,778 | | | 22,024 | | | 661 | | |
| Medium Average | | 9,002 | | | 5,879 | | | 186 | | |
| Small Average | | 3,444 | | | 2,090 | | | 71 | | |

*Source:* Data from the *Urban Mobility Report 2009*
* Mean is weighted based on peak period travelers

**Table 3 Congestion Impacts for 439 U.S. Urban Areas**

| | 1982 | 1997 | 2006 | 2007 |
|---|---|---|---|---|
| **Individual Traveler Congestion** | | | | |
| Annual Delay per peak traveler (Hours) | 14 | 32 | 37 | 36 |
| Travel Time Index* | 1.09 | 1.20 | 1.25 | 1.25 |
| Wasted Fuel per peak traveler (gallons)* | 9 | 21 | 25 | 24 |
| Congestion Cost (constant 2005 dollars) | $290 | $621 | $758 | $757 |
| **Total Congestion** | | | | |
| Travel Delay (billion hours) | 0.79 | 2.72 | 4.20 | 4.16 |
| Wasted Fuel (billion gallons) | 0.50 | 1.82 | 2.85 | 2.81 |
| Congestion Cost (billions of 2005 dollars) | $16.70 | $53.60 | $87.10 | $87.20 |
| **Effect of Some Solutions** | | | | |
| Travel Delay saved by | | | | |
| Operational Treatments (million hours) | 7 | 116 | 307 | 308 |
| Public Transportation (million hours) | 290 | 455 | 622 | 646 |
| Congestion Costs saved by | | | | |
| Operational Treatments (billions of 2005 dollars) | $0.02 | $2.3 | $6.4 | $6.5 |
| Public Transportation (billions of 2005 dollars) | $6.3 | $9.3 | $13.1 | $13.7 |

*Source: Urban Mobility Report 2009*
Travel Time Index (TTI) – The ratio of travel time in the peak period to travel time at free-flow conditions. A Travel Time Index of 1.35 indicates a 20-minute free-flow trip takes 27 minutes in the peak.
Delay per Peak Traveler – The extra time spent traveling at congested speeds rather than free-flow speeds divided by the number of persons making a trip during the peak period.
Wasted Fuel – Extra fuel consumed during congested travel.
Vehicle-miles – Total of all vehicle travel (10 vehicles traveling 9 miles is 90 vehicle-miles).
Expansion Needed – Either lane-miles or annual riders to keep pace with travel growth (and maintain congestion).

In 2007, slight decreases in annual delay per peak traveler, wasted fuel per peak traveler and congestion cost per peak traveler were observed by one hour, one gallon and one dollar, respectively (Table 3). Total annual delay and wasted fuel also saw a decline, but total congestion cost still grew by $100 million from 2006.

Annual delay per traveler during peak hours more than doubled from 1982 to 2006, indicating that congestion was getting worse. However, 2007 saw a slight moderation in delay hours. During the same period, wasted fuel per traveler during peak hours tripled from 9 gallons in 1982 to 24 gallons in 2007. Meanwhile, the travel time index climbed from 1.09 to 1.25. This means that a 30-minute free-flow trip took 32.7 minutes in the peak in 1982 but 37.5 minutes in 2007 (Figures 1-3).

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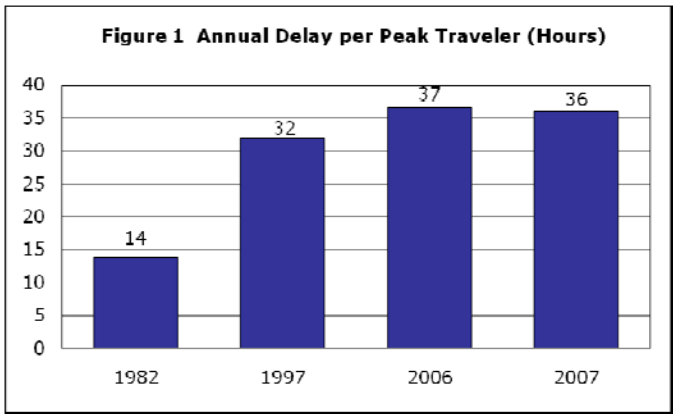
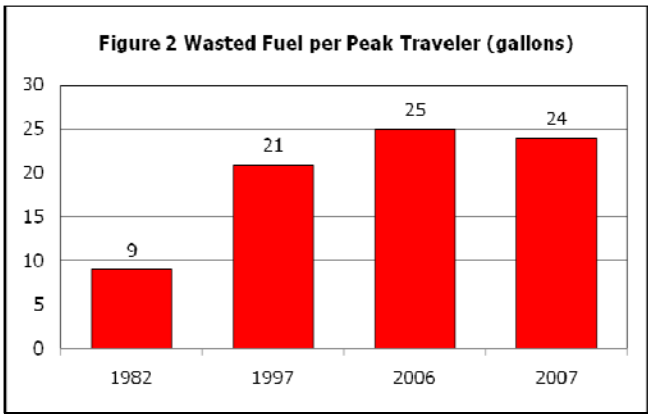
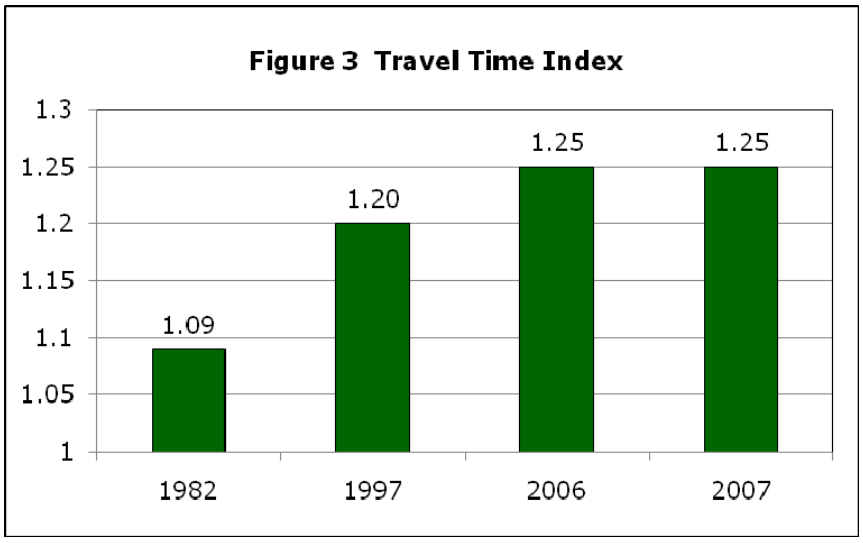



*Source:* Data from the *Urban Mobility Report 2009*
***Note:*** *Use caution in interpreting trends as the unequal time between data points distorts the shape of the trends.*

## Effects of Mobility Improvement/Solutions to Congestion Problems in Florida

The effects of the improvement solutions listed in Table 3 are presented in the following table for Florida. Through operational treatment, a total of over 23 million hours of travel time was saved in 2007 which equaled nearly $461 million savings in cost. Public transportation systems saved nearly 14 million hours of travel time which was approximately $264 million in cost savings.

**Table 4 2007 Effect of Mobility Improvements in Florida**

| Urban Area | Population Group | Operational Treatment Savings | | | | Public Transportation Savings | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Delay Reduction (1000 Hours) | Rank in Florida | Rank in U.S. | Cost Savings ($ Million) | Delay Reduction (1000 Hours) | Rank in Florida | Rank in U.S. | Cost Savings ($ Million) |
| **Florida** | | | | | | | | | |
| Miami FL | Very Large | 13,443 | 1 | 5 | 269.2 | 10,026 | 1 | 10 | 191.1 |
| Tampa-St. Petersburg FL | Large | 4,378 | 2 | 18 | 86.5 | 1,250 | 3 | 32 | 24.3 |
| Orlando FL | Large | 2,613 | 3 | 24 | 53.0 | 1,572 | 2 | 27 | 31.7 |
| Jacksonville FL | Large | 1,475 | 4 | 27 | 30.1 | 511 | 4 | 43 | 10.4 |
| Sarasota-Bradenton FL | Medium | 564 | 5 | 45 | 10.9 | 135 | 6 | 73 | 2.6 |
| Cape Coral FL | Small | 456 | 6 | 53 | 9.3 | 137 | 5 | 72 | 2.8 |
| Pensacola FL-AL | Small | 114 | 7 | 71 | 2.2 | 57 | 7 | 84 | 1.2 |
| **Group means for U.S. (By Population Group)** | | | | | | | | | |
| Very Large Average | | 15,413 | | | 324.6 | 39,784 | | | 848.2 |
| Large Average | | 2,149 | | | 44.6 | 2,029 | | | 42.3 |
| Medium Average | | 354 | | | 7.4 | 414 | | | 8.4 |
| Small Average | | 110 | | | 2.3 | 95 | | | 2 |

*Source:* Data from the *Urban Mobility Report 2009*

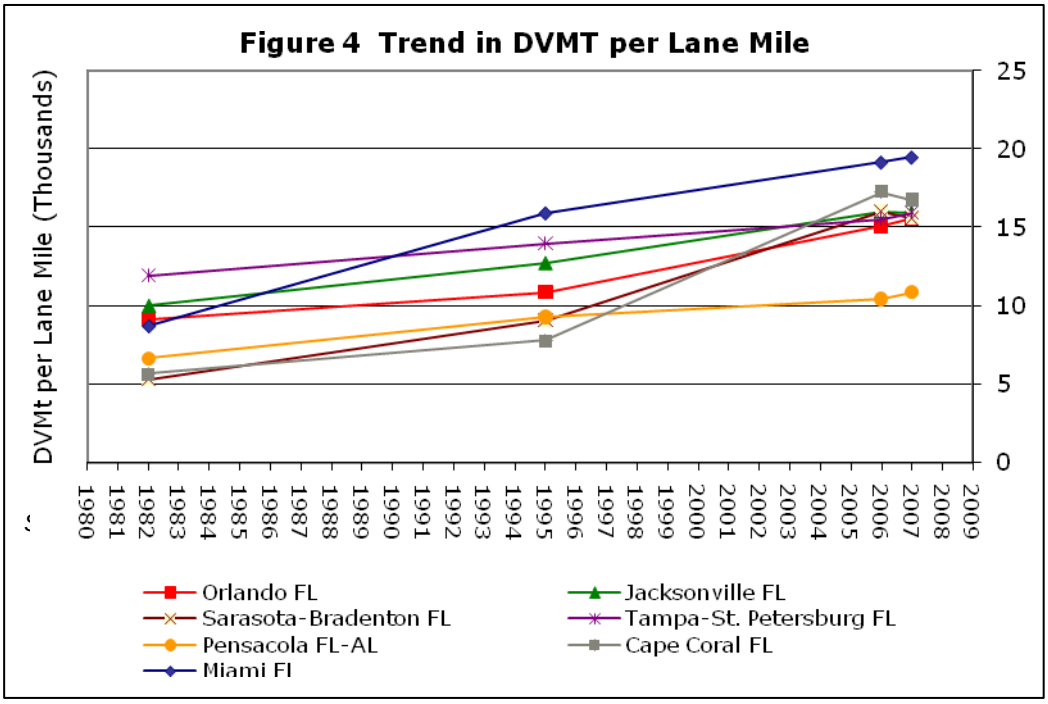
**Table 5 Trend in DVMT per Lane Mile, 1982 to 2007**

| Urban Area | DVMT per Lane Mile (1,000) | | | | Rank in Florida (2007) |
|---|---|---|---|---|---|
| | 1982 | 1995 | 2006 | 2007 | |
| Miami FL | 8.70 | 15.92 | 19.17 | 19.49 | 1 |
| Orlando FL | 9.17 | 10.87 | 15.09 | 15.56 | 6 |
| Jacksonville FL | 10.00 | 12.73 | 16.03 | 15.97 | 3 |
| Sarasota-Bradenton FL | 5.33 | 9.09 | 16.03 | 15.61 | 5 |
| Tampa-St. Petersburg FL | 11.94 | 13.97 | 15.35 | 15.53 | 4 |
| Pensacola FL-AL | 6.67 | 9.30 | 10.18 | 10.43 | 7 |
| Cape Coral FL | 5.67 | 7.78 | 17.27 | 16.77 | 2 |
| **Weighted Mean*** | **9.22** | **13.85** | **17.15** | **17.34** | |

* Mean is weighted based on "Peak Period Traveler"

*Source:* Data from the *Urban Mobility Report 2009*

Table 5 and Figure 4 indicate the intensiveness of use of the limited access lanes in Florida urban areas. From 1982 to 2007, there was an average increase of 89% in daily vehicle miles traveled (DVMT) per lane mile. Tampa-St. Petersburg witnessed the smallest increase of 33% whereas Cape Coral experienced the fastest growth of 196%.




*Source:* Data from the *Urban Mobility Report 2009*

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This special report was prepared by CUTR. For more information, contact Steve Polzin at 813-974-9849. Visit http://mobility.tamu.edu/ums/report/ to access TTI's report, *Urban Mobility Report 2009*.

Notes:

1. The Urban Mobility Report 2009 uses what FHWA defines as "Urbanized Areas." All Urbanized Areas (population 50,000 or more) are also Urban Areas.

2. The Florida urbanized areas in the report are the 6 largest ones (in population), plus Pensacola (which is #9). Numbers 7 and 8 are Palm Bay-Melbourne and Port St. Lucie.

3. There are 28 urbanized areas in Florida and 46 small urban areas (population 5,000-50,000).

4. The seven urbanized areas in the report have a total population of 11,717,150, or 75% of the 15,726,421 total population of the 28 urbanized areas in Florida. (as of April 1, 2008).