
Trends and Conditions Report – 2010

TRANSPORTATION SYSTEM: Walking and Bicycling Facilities and Travel June 2010

This “Trends and Conditions” report was prepared jointly by the Office of Policy Planning of the Florida Department of Transportation and the Center for Urban Transportation Research at the University of South Florida. It is part of a continuing process to support the needs of decision makers, transportation professionals and the interested public.

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Transportation System: Walking and Bicycling Facilities and Travel

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Bicyclist and Pedestrian Travel

While data show that travel by motorized vehicles is by far the dominant transportation mode in terms of both number of trips and person miles of travel, both pedestrian and bicycling modes have important roles in overall mobility. Walking, in particular, is an integral activity in virtually all travel, either as a complete trip or by providing the means of access and egress to other modes for all trips. These modes are more modest in terms of their share of all travel and less dependent on expensive infrastructure. There is a growing awareness of the importance of walking and bicycle travel in supplying a sustainable transportation system that provides mobility for all persons.

By their nature, walking and bicycling are less resource intensive than driving or transit. Bicycle lanes, paved shoulders and sidewalks are commonly included in the design and construction of roadway projects. Most bicycle facilities (paved shoulders or bike lanes) have minimal additional costs (historically about 2%) or no additional cost since the facility is required for other reasons. Exclusive bicycling and walking trails and facilities are both more limited and more expensive.

There is a growing awareness of the importance of travel by walking and bicycling.

The nature of the bicycle and pedestrian modes allows them to consume no combustion fuels, produce no pollutants, and utilize less space for operation and vehicle storage than other modes. Bicycle and pedestrian travel also requires personal exertion and, hence, have an opportunity to improve personal well being. They are less insular modes than motorized vehicle travel and can support social interaction between travelers. However, cyclists and pedestrians, as well as motorcyclists, do not have a “protective shell” around them and have a smaller visual profile. Therefore, travelers are more likely to suffer a serious injury or death in the event of a crash with a motor vehicle.

The improvement of bicyclist and pedestrian safety is an important commitment in Florida. Over the last decade, the state has consistently ranked at or near the top of national rankings in bicyclist and pedestrian fatality rates¹ (relative to population). In 2008, Florida experienced a slight decline in bicyclist fatalities from the previous year (118 vs. 121) and a modest decline in pedestrian fatalities (502 vs. 530). Further information about Florida’s safety trends related to the bicycle and pedestrian modes are explored in the *Transportation Safety* report of this Trends and Conditions Reports series.

¹ Alliance for Biking & Walking, *Bicycling and Walking in the United States 2010: Benchmarking Report*, January 2010. Page 14.
<http://peoplepoweredmovement.org/site/images/uploads/2010%20Benchmarking%20FINAL%20DRAFT%201.25.09-Web.pdf>

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According to the 2009 National Household Travel Survey (NHTS), nearly 11 percent of the trips in Florida were made by walking or bicycling while the majority (85%) of the trips were by motor vehicle². Both walking and bicycling trip shares at the state and national levels increased from 2001 to 2008 (Table 1). The percent of trips made by walking in Florida increased from 6.9% in 2001 to 9.4% in 2008. A slight increase in bicycling was also found from 1.2% in 2001 to 1.3% in 2008. As average bicycling and walking trips are shorter than vehicle trips, the share of total miles of travel by these modes is lower.

Table 1– Mode Share of Person Trips, 2001 and 2008

	FL 2001	US 2001	FL 2008	US 2008
Car	54.7%	49.2%	46.1%	44.3%
Van, SUV, Truck	33.3%	36.5%	38.5%	38.2%
RV, Motorcycle	0.5%	0.1%	0.5%	0.3%
Public Transportation	1.0%	1.6%	1.3%	2.2%
Walk	6.9%	8.7%	9.4%	11.0%
Bicycle	1.2%	0.8%	1.3%	1.0%
Other	2.4%	3.1%	2.8%	3.0%
Total	100%	100%	100%	100%

Source: NHTS, 2001, 2009

Tables 2 and 3 provide data on characteristics of bicycle and pedestrian travel. As these tables portray, these modes are predominately used for short trips for social or recreational purposes. The bicycle and pedestrian per capita trip rates for Florida's major four metropolitan areas (Table 2)

Table 2 – Per Capita Bicycle and Pedestrian Daily Trip Rates, 2008

Core Based Statistical Area ³	Pedestrian Trip Rate	Bicycle Trip Rate
Jacksonville	0.25	0.03
Miami	0.35	0.04
Orlando	0.32	0.06
Tampa	0.37	0.04

Source: CUTR analysis of 2009 National Household Travel Survey

averaged 0.05 and 0.32 trips per day, respectively. National multi-decade trends indicate declines in these modes for functional transportation, particularly work trip making. NHTS reported an increase in cycling and pedestrian activity for social/recreational purposes – often walking a dog or walking or biking for exercise. Walking remains a critical mode of travel for those population segments that may not have auto or public transit options for some trips. Low income, elderly and young people often walk for access to employment, shopping and school.

² NHTS 2009 refers to the National Household Travel Survey conducted from April 2008 through April 2009. We refer to it as 2008 data in this report and source it as 2009 NHTS.

³ Core based Statistical Area (CBSA) is a new method of defining urban geography that the Census is moving toward. It is similar to Metropolitan Statistical Areas.

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Table 3 – Trip Purpose and Trip Length, 2008

Trip Purpose	Average Pedestrian Trip Length (miles)	Percent of Total Walking trips	Average Bicycle Trip Length (miles)	Percent of Total Bike Trips
Home to Work	0.52	2.6%	3.30	5.5%
Work Related	0.60	0.9%	1.57	2.5%
Shopping	0.51	9.8%	1.75	9.3%
Family/Personal	0.44	23.7%	1.21	6.6%
School /Church	0.56	4.7%	2.43	8.5%
Medical/Dental	0.52	0.8%	1.29	0.4%
Vacation	0.63	2.5%	3.57	1.4%
Visit Friends or Relatives	0.55	9.3%	0.95	18.5%
Social/Recreation	0.84	44.5%	2.16	47.1%
Other	0.93	1.1%	0.63	0.3%
All	0.65	100%	1.93	100.0%

Source: CUTR analysis of 2009 National Household Travel Survey

In Florida, bicycle accommodations on transit buses are widely available and popular. The ability of bicyclists to use transit extends the potential range of travel for this group by allowing them to take advantage of transit for line haul portions of their travel. Because bicycle speeds are two to three times faster than walking, bicyclists can access transit from greater distances within a given amount of time. In general, the use of bike-on-bus provisions has been increasing in recent years. Table 4 provides the ridership of transit passengers that use this program in several of the major public transportation agencies around the state.

Table 4 – Florida Monthly Bikes on Bus and Percent of Total Transit Boarding

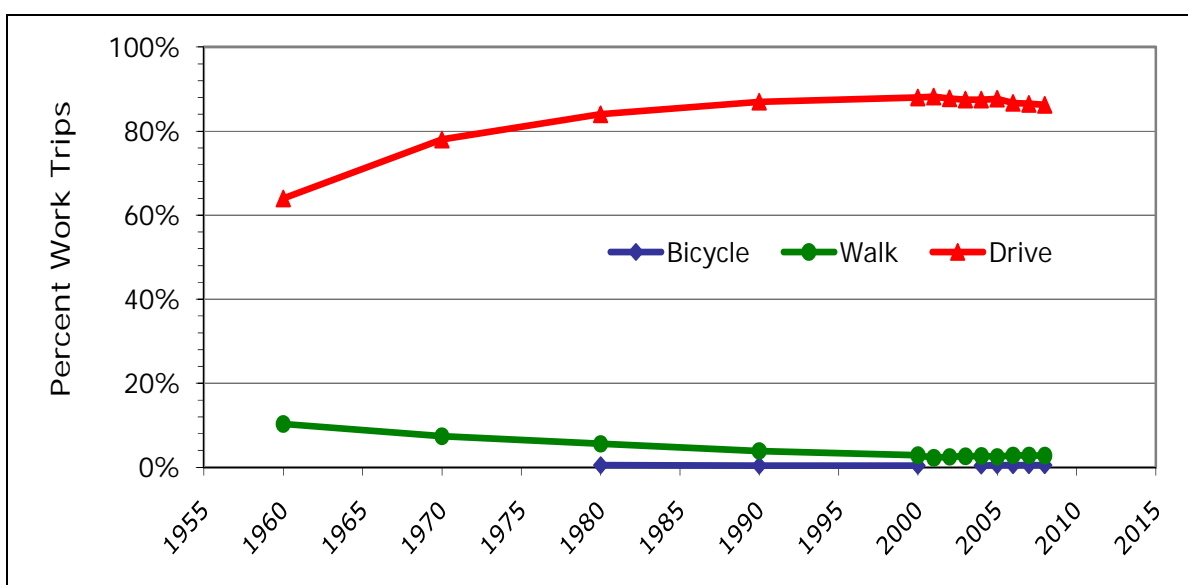
Agency		2004	2005	2006	2007	2008
Broward county Transit, Fort Lauderdale	Bicycles	30,000	31,300	31,696	32,584	30,560
	% of total	0.94%	0.95%	0.96%	0.94%	0.95%
Pinellas Suncoast Transit Authority, St. Petersburg	Bicycles	13,850	15,320	19,499	28,461	33,007
	% of total	1.71%	1.80%	2.10%	2.99%	3.14%
Hillsborough Area Regional Transit, Tampa	Bicycles	7,751	10,191	17,086	20,730	20,663
	% of total	0.95%	1.11%	1.72%	2.04%	1.90%
Space Coast, Brevard	Bicycles	4,000	4,000	5,480	6,967	8,081
	% of total	6.14%	5.72%	7.20%	8.19%	7.93%
StarMetro, Tallahassee	Bicycles	900	1,200	1,367	1,524	2,227
	% of total	0.02%	0.03%	0.03%	0.04%	0.05%

Source: Agency reporting of Bikes on buses and National Transit Database (NTD) ridership reports.

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Nationwide, the mode share of journey-to-work trips by walking and bicycling had been decreasing since the 1960's until the past decade when this trend appears to have turned. Figure 1 presents the national trend of the share of work trips by these modes, using the Census Bureau's Journey to Work data. In 2000, bicycling accounted for 0.4% of the work trip and walking comprised of 2.9%. Subsequent American Community Survey (ACS) results suggested further declines, but the 2008 ACS revealed that both walking and bicycling shares grew to 2.8% and 0.5%, back to the 2000 Census level. The 2009 National Household Travel Survey (NHTS) data confirm the more recent growth in the use of these modes.

Figure 1 – U.S. Mode Share Journey to Work, 1960 - 2008



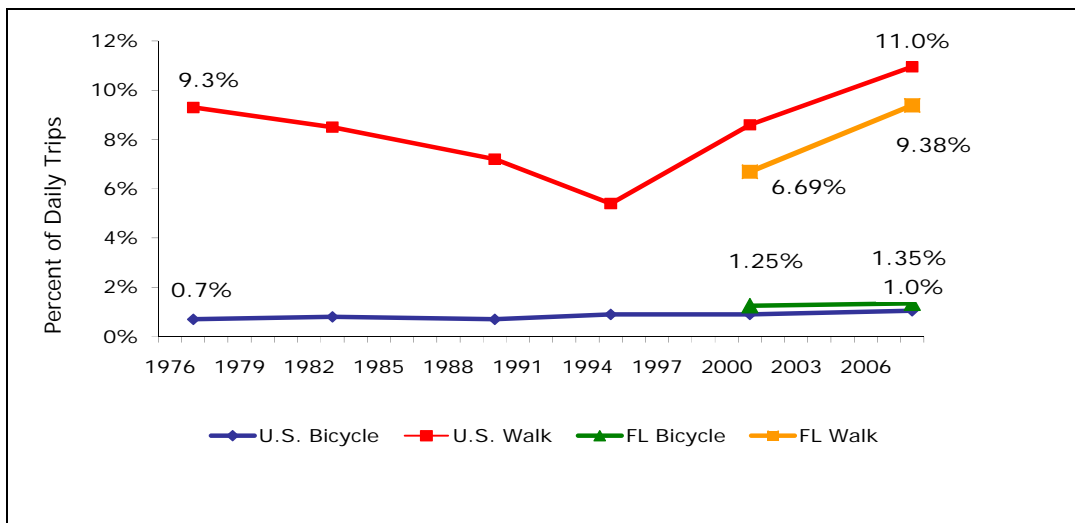
Source: U.S. Census Bureau, US Decennial Census, Supplemental Survey: Journey to Work, Census 1960 to 2000, American Community Survey 2001-2008.

While Figure 1 presents the national mode share for work trips, Figure 2 on the following page compares Florida's and national shares of daily walking and bicycling. Over time, bicycle trips have remained less than 1% of all daily travel nationally. It was 1.35% in Florida in 2008. The walk share, however, constituted almost 11% nationally and 9.38% of daily trip making in Florida.

It is important to note that the sampling methodology of the NHTS after 1995 was altered in order to capture previously unreported walking trips. This change partially explains the large jump in the walk mode share and a corresponding decline in personal motor vehicle mode share (Figure 2).

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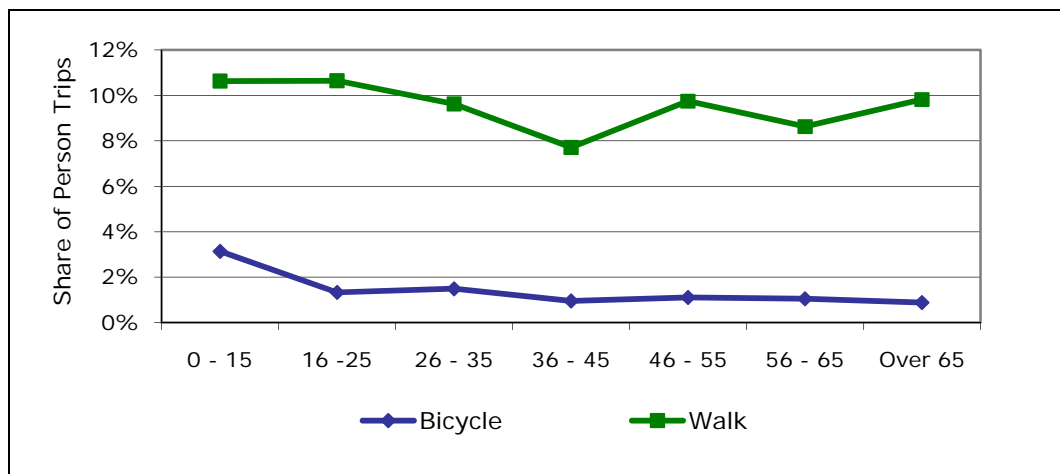
Figure 2 – U.S and Florida Bicycling and Walking Shares for Daily Travel, 1977 - 2008



Source: Federal Highway Administration, NPTS/NHTS series.

Figure 3 shows the share of person trips by age group. Persons under age 16 have the greatest share of trips by walking or bicycling as compared with other age groups. This age group is not eligible for driver licenses and, therefore, must rely on others for auto travel or use other modes such as walking, bicycling and transit. Also persons over age 65 have a relatively high share of person trips by walking. As discussed in the *Travel Demand: Population Growth and Characteristics* report of this series, this age group is expected to grow significantly over the next several decades. As a result, the total number of walking trips is expected to increase.

Figure 3 – Florida Share of Person Trips by Age Group, 2008



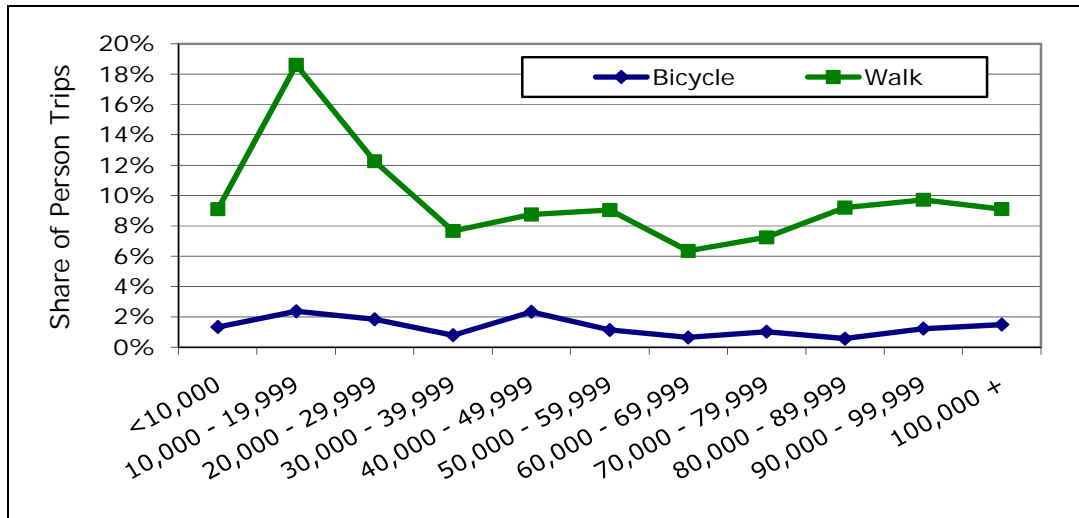
Source: 2009 NHTS

Household income could also be a factor influencing mode choices. As Figure 4 shows, households with income levels between \$10,000 and \$29,999 have the highest share of person

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trips by walking. Walking is more common at both ends of the income distribution than in the middle. However, bicycling doesn't appear to be affected by household incomes.

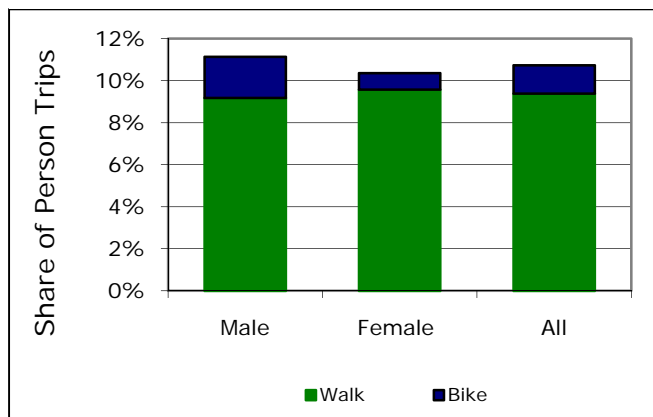
Figure 4 – Florida Share of Person Trips by Annual Household Income, 2008



Source: 2009 NHTS

According to NHTS data for Florida, women walk for a greater share of person trips than men. However, men are more likely to bike, as illustrated in Figure 5.

Figure 5 – Florida Share of Person Trips by Gender, 2008



Source: 2009 NHTS

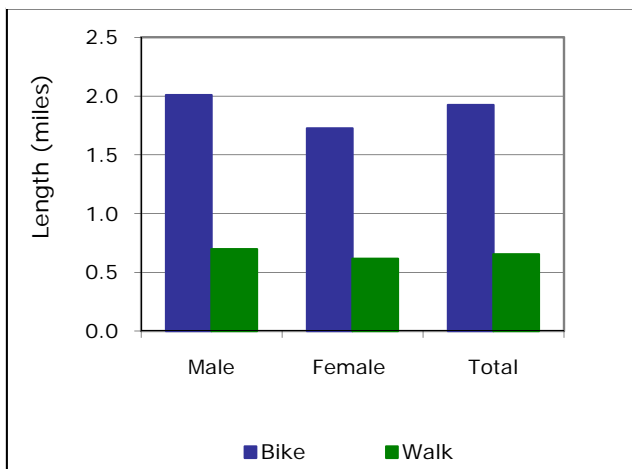
In Florida, women walk for a greater share of person trips than men; but men are more likely to bike.

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In 2001, the average trip length by bicycle in Florida was 1.72 miles, while walking trips averaged 0.73 miles. In 2008, the average bicycle trip increased to 1.92 miles and the average walking trip declined to 0.65 miles. Women typically take shorter bicycle and walking trips than men (Figure 6).

On average, bicycle trips are more than twice as long as walking trips.

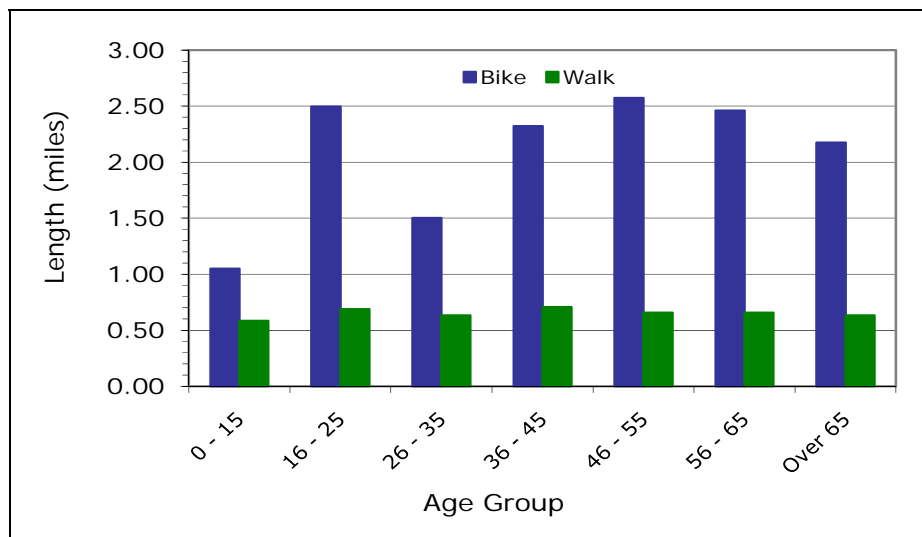
Figure 6 – Florida Average Length of Person Trips by Gender, 2008



Source: 2009 NHTS

Figure 7 presents the average lengths of bicycle and walking trips by age group. The data shows that trip lengths remain quite stable for the walk mode regardless of age. The average trip length of bicycle trips fluctuates across age groups. This fluctuation may coincide with life cycle changes and physical activity levels of persons in various age groups. For example, persons under age 15 may have restrictions on the length of trips by non-motorized modes established by parents.

Figure 7 – Florida Average Length of Trips by Age Group, 2008

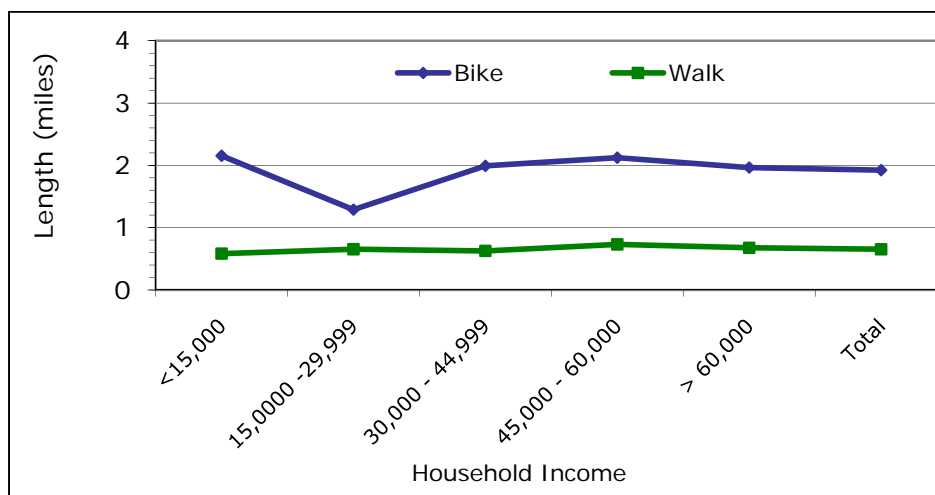


Source: NHTS 2009

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Figure 8 provides the average trip length for non-motorized modes by annual household income. With the exception of bicycle trip length which dips for the \$15,000-\$29,999 income group, income has little effect on trip length. For all groups, walking trips on average are less than a mile. Bicycle trip lengths range between approximately 1.25 and 2.0 miles. On average, bicycle trips are more than twice as long as walking trips.

Figure 8 – Florida Average Length of Trips by Income, 2008



Source: NHTS 2009

Another factor influencing bicycle travel is the availability of a bicycle (Table 5). In 2002, roughly 42% of households in Jacksonville, Miami, Orlando and Tampa did not own a bicycle. The percent of households with bicycles increased at a rate of 1% per year, from 55.6% in 1998 to 58.2% in 2002. More current data are not available.

Table 5 – Distribution of Bicycles per Household, 1998 and 2002

Bicycles per Household	1998	2002
0	44.4%	41.8%
1	17.9%	18.0%
2	18.2%	19.5%
3	10.5%	10.7%
4+	9.0%	10.0%
Total	100.0%	100.0%

Source: CUTR and NuStats, *Bicycle and Pedestrian Travel: Exploration of Collision Exposure in Florida, 2002*

Note: The survey sample for this report was taken from four Florida metropolitan areas and cannot be used to generalize the entire state.

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Infrastructure for Walking and Bicycling

The extent of bicycling and walking is affected, at least partially, by the infrastructure that supports these means of travel. The Florida Department of Transportation (FDOT) produces the *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)*. The *Florida Greenbook* requires consideration of pedestrians and bicyclists during planning, design, construction and capital improvement projects as well as transit projects. Provisions for bicycle facilities include “all rural arterial and collector sections within one mile of an urbanized area should be given consideration for the construction of 4 to 5 foot paved shoulders, and all urban arterial and collector sections should be given consideration for either undesignated 4 foot lanes or marked bike lanes.”

There is limited information on the amount and condition of infrastructure that supports walking and bicycling. Dispersed ownership of this infrastructure among multiple public jurisdictions and the private sector (private ownership of some sidewalks and paths of bicycles), various definitions for facility types and the lack of requirements for reporting such data have limited its availability. The FDOT is now collecting more specific data on pedestrian and bicycle facilities in the Roadway Characteristics Index (RCI).

Table 6 presents a summary of the RCI data for the State Highway System (SHS). Definitions and context information include:

- Designated Bike Lanes are stripe-separated portions of the roadway that have pavement markings and/or signs indicating the preferential use of bicycles.
- Undesignated Bike Lanes refer to the portions of stripe-separated paved shoulders (exclusive of the gutter width) with no signs or markings for preferential bicycle use. They apply only to curbed roadways, and must be at least four feet in width.
- Paved Shoulders should be at least 4 feet wide to accommodate bicycle travel and be separated from the roadway.
- According to the RCI Field Handbook, collection of bike lane data is only required for “All non-limited access Urban State Highways (including bridge segments) up to one mile outside the designated urban boundary” (Beyond that distance, FDOT design policy has no requirement for bike lanes to be designated on paved shoulders).
- RCI sidewalk inventory is incomplete at this time. The total mileage of sidewalks reported is likely an underestimate.
- “Non-Urban” in the table refers to those non-limited access state highways that are at least one mile outside the designated urban boundary.
- Shared Use Paths are facilities on exclusive rights-of-way and with minimal cross flow by motor vehicles. They are shared by pedestrians and bicyclists as well as other users.

As one would expect, much of the pedestrian infrastructure is within the urban portions of the system. Most state highways in non-urban areas have paved shoulders (which cyclists typically

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use in preference to the traffic lanes). Total SHS urban non-limited centerline mileage is 4,827 miles and total non-urban mileage is 5,024 miles.

Table 6 – Summary of Bicycles and Pedestrian Facilities on the State Highway System

	Centerline Mileage with Bicyclist or Pedestrian Facilities								
	Location	District							Total
		1	2	3	4	5	6	7	
Designated Bike Lanes	Urban	60.1	100.6	85.1	243.9	72.9	12.3	24.7	598.8
	Non-Urban	1.9	51.1	29.9	0.0	3.1	0.0	0.0	85.0
Undesignated Bike Lanes	Urban	367.4	22.4	35.6	232.3	494.7	1.9	90.1	1244.3
	Non-Urban	521.3	2.6	22.2	24.1	113.6	0.0	12.7	696.5
Paved Shoulders	Urban	26.3	77.1	20.5	55.7	54.7	42.9	20.7	297.9
	Non-Urban	0.9	24.5	16.6	6.2	9.1	0.0	0.0	57.2
Shared Use Paths	Urban	5.8	7.0	11.4	13.8	6.5	36.4	14.1	95.0
	Non-Urban	0.9	14.9	7.6	0.1	0.0	7.0	2.4	32.9
Sidewalks	Urban	303.8	337.1	256.4	535.6	168.5	329.8	355.3	2286.5
	Non-Urban	14.4	77.3	54.1	4.4	2.1	0.1	3.2	155.5

Source: FDOT, 2010. *Roadway Characteristics Inventory*

Walking (including hiking and jogging) and bicycling travel also occur on outdoor recreation facilities across the state. While not always considered “transportation” infrastructure, they do serve recreational travel where the travel itself is part of the recreation. The Florida Department of Environmental Protection (FDEP) maintains an online inventory of all recreational facilities in Florida. Table 7 presents the length of the trails by type and jurisdictions in Florida. The table also compares the 2007 facility totals with the 2005 totals. All categories grew over 2005.

Table 7 – Outdoor Recreation Facilities by Jurisdictions in Florida, 2007 Data

Jurisdictions	Bike Trails (paved)	Bike Trails (unpaved)	Hiking Trails	Jogging Trails
Federal	99.5 mi	140.4 mi	839.4 mi	85.4 mi
State	331.0 mi	1,495.1 mi	3,037.7 mi	171.7 mi
County	433.6 mi	487.7 mi	860.7 mi	499.5 mi
Municipal	480.2 mi	207.3 mi	388.2 mi	496.6 mi
Non-Government	80.5 mi	52.7 mi	297.8 mi	72.3 mi
Total 2007	1,424.8 mi	2,435.9 mi	5,423.8 mi	1,324.6 mi
Total 2005	1,335.4 mi	2,350.8 mi	4,445.8 mi	1,228.0 mi

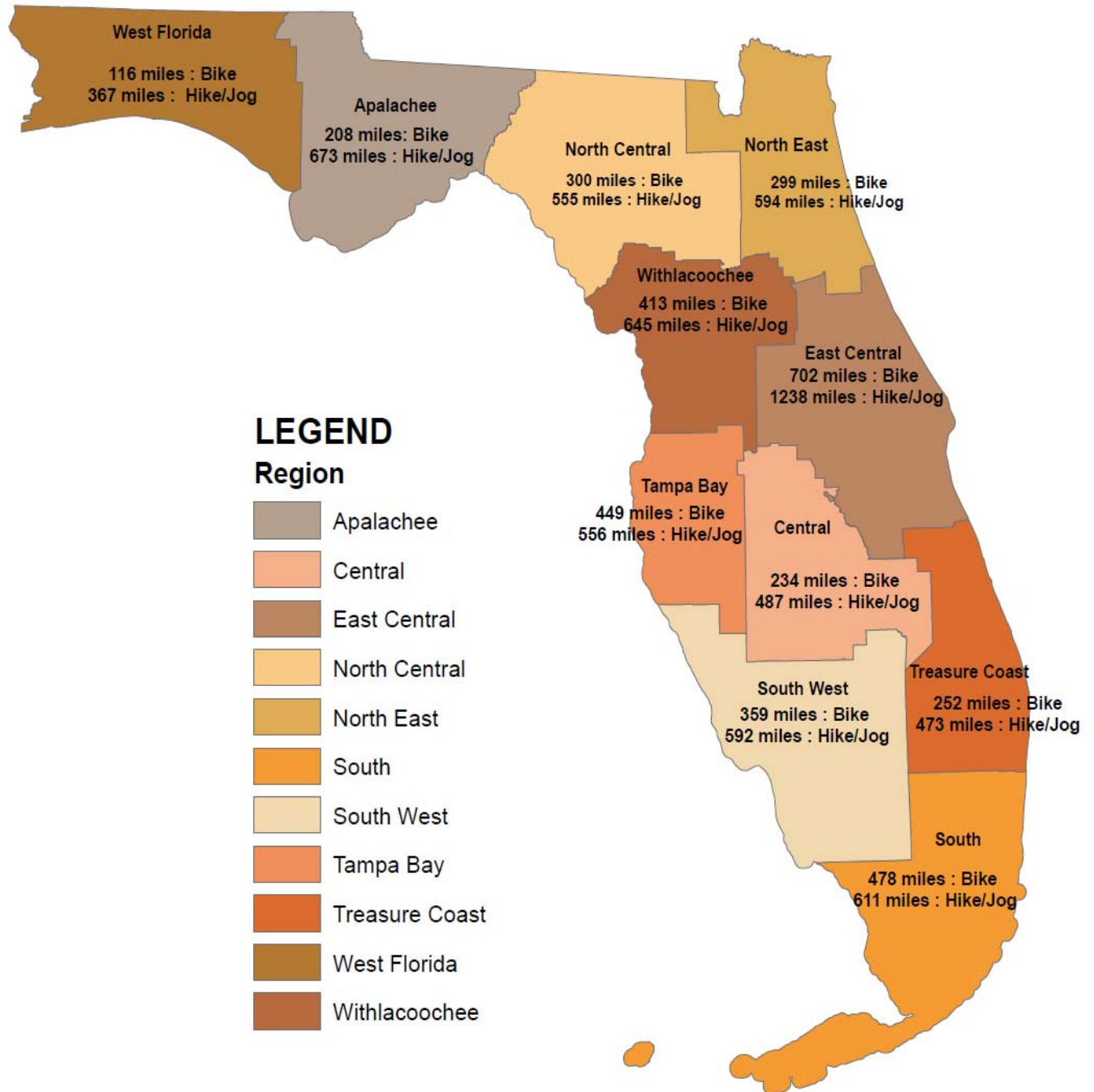
Source: Florida Department of Environmental Protection (FDEP), Division of Parks and Recreation, *Outdoor Recreation in Florida - 2008*

The map in Figure 9 illustrates mileages of bicycle trails and hiking and jogging trails by FDEP park district as of 2007. East Central Florida has the largest share of paved bicycle and hiking/jogging paths by length. Totals include off-roadway single-use and multi-use paths

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(Multi-use facilities allow both walking and bicycling). Most paved bicycle paths in Florida are for shared use. The demand and corresponding needs for outdoor recreation resources are expected to continue to grow in the future.

Figure 9 – Florida Miles of Bicycle and Hiking/Jogging Trails by Park District, 2007



Source: FDEP, Division of Parks and Recreation, *Outdoor Recreation in Florida - 2008*

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Conclusions

Interest in bicycle and pedestrian travel has been growing and efforts are being made to improve the data available to support planning, programming and policy decision-making at the federal, state and local levels. Improved information will allow transportation professionals and decision makers to better serve users of the system. While there is still room for improvement in data availability at the state level on bicycling and walking infrastructure and use, detailed data are available on safety for both bicyclists and pedestrians (see the *Impact of Transportation: Transportation Safety* report of this series). Florida was recognized in 2010 by the League of American Bicyclists with an Honorable Mention in their bicycle friendly state awards program, giving Florida high scores for programs and policies (3rd), infrastructure (9th), and evaluation (i.e., monitoring its own performance, 10th)⁴.

Part of the growing interest in bicycle and pedestrian travel is motivated by health and environmental considerations.

The interest in bicycle and pedestrian travel is motivated by a host of considerations. These modes provide the opportunity to reduce motor vehicle travel and contribute to the subsequent benefits of lessened energy consumption, decreased air pollution and lowered congestion. They can also play a significant role in supporting personal health through physical activity. Deterrents to walking or bicycling that people cite include roadways with high-speed, high-volume motorized traffic and lack of adequate bike lanes, paved shoulders, sidewalks, shared use paths, intersection treatments and crosswalks. Dispersed activity patterns, weather exposure and the tendency to chain multiple trips also discourage bicycle use⁵.

The increasing interest in affordable, efficient and environmentally sustainable travel supports improvements in the quality and safety of our walking and bicycling facilities. Increasingly, livability and quality-of-life evaluations take into consideration non-motorized access and accommodations. Access to transit, the Safe Routes to School Program and other initiatives also consider pedestrian and bicyclist access.

Florida Department of Transportation (FDOT) Level of Service measures that include bicycle and pedestrian activities are among the steps being implemented to support more informed planning for these modes. The Bicycle and Pedestrian Partnership Council, initiated in 2010 to make policy recommendations to FDOT and transportation partners throughout Florida on the state's walking, bicycling and trail facilities, exemplifies the renewed attention to bicycle and pedestrian mobility. Increased attention from all levels of government is positioning bicycle and pedestrian facilities to receive additional priority in future mobility planning.

⁴ http://www.bikeleague.org/programs/bicyclefriendlyamerica/pdfs/bfs_ranking_awards2010.pdf

⁵ For more on impediments to Bicycling see: FHWA NATIONAL BICYCLING & WALKING STUDY Case Study No. 1 Reasons Why Bicycling And Walking Are Not Being Used More Extensively As Travel Modes. Publication No. FHWA-PD-92-041.

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