

Travel Behavior of Students Reaching Their Origin and Destination at the University of Florida

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Abstract - The primary objective of this research is to investigate the travel behavior of students reaching their origin and destination at the University of Florida. University of Florida is located in the city of Gainesville, Florida with a population of over two hundred thousand people. There are more than fifty thousand students at the University of Florida studying undergraduate and graduate work. A study using large- scale travel surveys were conducted throughout the University of Florida campus. The travel behaviors of students from the surveys were analyzed, primarily of students that used a motorized vehicle for means of transportation for short distances (less than or equal to 3 miles). Taking the age of university students into consideration (18 to 24 years), the distances were appropriately converted into steps to appraise the potential physical activity benefits of making these short trips by foot instead of a motorized mode of transportation.

After analyzing the travel behavior of the students, primarily of those that used motorized vehicles, estimation and analysis were done on the health benefits students would have by trading their motorized vehicles for a non-motorized mode of travel such as walking to make their short trips. For this purpose, results show that 91% of the student body at the University of Florida uses the Regional Transit System for their transportation to their on campus destinations, while 82% of the population walks or bikes to campus and 33% drive their motorized vehicles. This paper will discuss how to get the last 33% of the students to adapt a sustainable way to travel to campus and its benefits both to them individually and university as a whole. This shift in the mode of transportation for University of Florida students could help them meet the required physical activity an individual needs for a healthy lifestyle, while also helping to save energy, reduce pollution, and decrease traffic congestion on Gainesville roads, especially during rush hours [2].

Keywords: Behavior of Students, Origin, Destination

INTRODUCTION

As the population grows throughout the world, congestion and air pollution also increases. Diminishing resources has made our current transportation practices impossible to sustain in the future [2]. Therefore, transportation professionals have been forced to lower motorized transportation and even consider non- motorized means of transportation for the public in the near future. On the same note, the obesity levels in the United States have been overwhelmingly been increasing due to current transportation lifestyle adapted by the public [4]. As a consequence, a combined solution for these two issues is to promote non-motorized transportation and to increase pedestrian and bicycle modes of transportation, at least for short distances.

Non- motorized transportation up until today has never been a designing factor for transportation engineers [9]. Rather, sidewalks and bicycle lanes have been built where primary roads are necessary. Although recently, transportation officials are starting to work with health officials to promote means for travel (at least for short distances), there is no detailed data collected that links the health and transportation habits of an individual [7]. Furthermore, no research has been conducted on the travel behavior of university students reaching their destinations.

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As a result, it was the primary objective of this research to examine and collect detailed data regarding the transportation trends of University of Florida students to their on campus destinations. Other objectives were to improve the transportation modeling system of the city of Gainesville to accommodate non- motorized means of travel along with the primary roads, contribution to ongoing research and studies on the relationship of transportation habits and health, and provide the University of Florida with essential travel patterns of students for better transportation at the campus. This research and study was done on the University of Florida campus, located in Gainesville, Florida. The data was collected through research surveys randomly distributed throughout the campus. In addition, a detailed inspection was done on the non- motorized facilities close to campus making sure that there are ways for students to adapt a non- motorized means of travel to their on campus destinations.

METHODOLOGY

Survey

From October 10, 2011 to October 14, 2011, 300 one page surveys were distributed in three locations to randomly selected students. These surveys were given in front of the Turlington Plaza, in front of the Shands Parking Garage, and Lake Alice Field. These locations were chosen because they are on different parts of the campus and so all kinds of students with all different majors could be included in the study, creating a better understanding of the university transportation trends as a whole.

The survey itself contained two demographical questions, a general exercise question, and two questions that specifically identified the means of transportation of students to their on campus destinations and to what extent they used those means. Along with each survey, a cover letter was attached describing the reasons for this research and how it may be helpful to the university and its transportation planners.

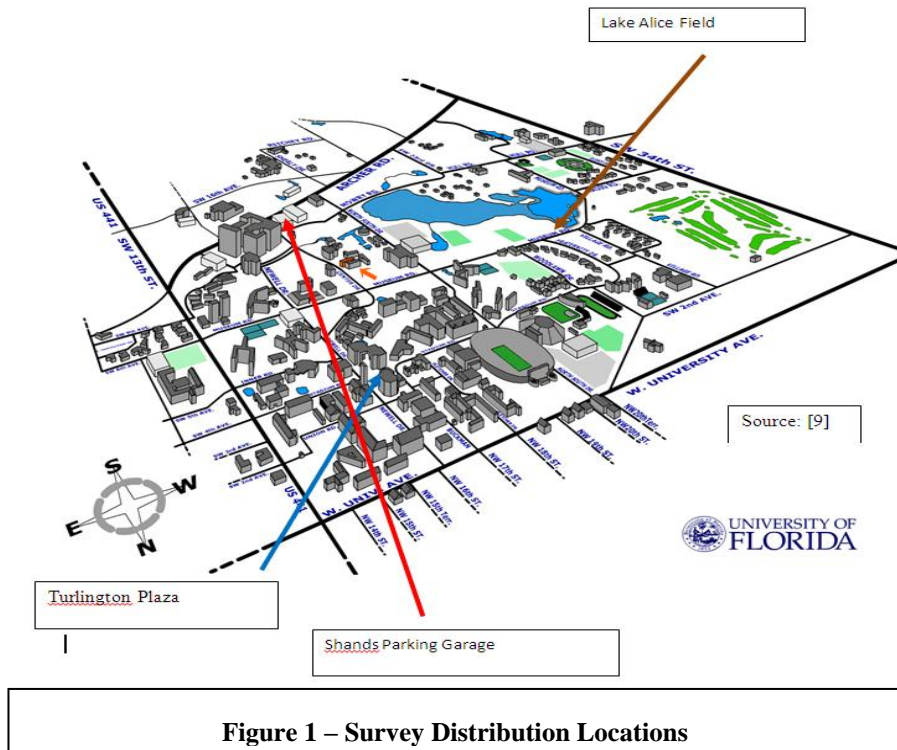


Figure 1 – Survey Distribution Locations

The data collected from the completed surveys was maintained in a Microsoft Excel spreadsheet for further data analysis in terms of means of transportation, demographics, and the amount of exercise for University of Florida students. First, the age and the amount of exercise the students did were analyzed. Secondly, comparisons were made regarding the amount of exercise students do and what means of transportation they use (motorized or non-motorized) to get to their destinations on campus. Finally, recommendations were made as to how to accommodate the use of non- motorized transportation at the University of Florida not only to reduce traffic congestion and air pollution, but also to meet the recommended two and a half hours of exercise to sustain a healthy lifestyle.

Non- Motorized Facilities Inspection

In order to make sure that non- motorized travel can be implemented at the University of Florida without much lack of convenience for on campus travel, the University of Florida was analyzed for its non- motorized facilities. The following factors were looked at:

- Whether there is a sidewalk available for walking
- Whether there is a bike lane for convenient bike travel
- Whether there are convenient bike stands so the students can lock up their bikes after reaching their desired destination

The following roads were analyzed for these factors:

- Gale Lemerand Drive
- Center Drive
- Newell Drive
- Stadium Road
- Museum Road
- Mowry Drive

NON – MOTORIZED FACILITIES INSPECTION

Table 1 presents the sidewalks, bike lanes, and bike racks availability for major road network at the University of Florida mostly used by students.

Table 1 – Non- Motorized Facilities Inspection Data for the Chosen Roads

	Gale Lemerand	Center	Newell	Stadium	Museum	Mowry
Sidewalks Available	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Partially
Bike Lane	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Partially
Bike Racks	Yes	Yes	Yes	Yes	Yes	Partially

Gale Lemerand Drive

- There are sidewalks going in both directions available for safe walking
- There are bike lanes available in both directions for bicycle riders
- There are bike stands available next to all major buildings (lecture halls, library, and labs)

Center Drive

- There are sidewalks going in both directions available for safe walking
- There are bike lanes available in both directions for bicycle riders
- There are bike stands available next to all major buildings (lecture halls, library, food courts, and labs)

Newell Drive

- There are sidewalks going in both directions available for safe walking, especially since a part of the road is closed for motorized vehicles during the day.
- There are bike lanes available in both directions for bicycle riders
- There are bike stands available next to all major buildings (lecture halls, library, food courts, and labs)

Stadium road

- There are sidewalks going in both directions available for safe walking, especially since a part of the road is closed for motorized vehicles during the day.
- There are bike lanes available in both directions for bicycle riders
- There are bike stands available next to all major buildings (lecture halls, library, food courts, and labs)

Museum Road

- There are sidewalks going in both directions available for safe walking
- There are bike lanes available in both directions for bicycle riders
- There are bike stands available next to all major buildings (lecture halls, library, and labs)

Mowry Drive

- There are sidewalks going in both directions available for safe walking, but only on some parts of the road.
- There are bike lanes available in both directions for bicycle riders, but only on some parts of the road.
- There are bike stands available next to all major buildings (lecture halls, library, and labs)

RESULTS

Survey Results

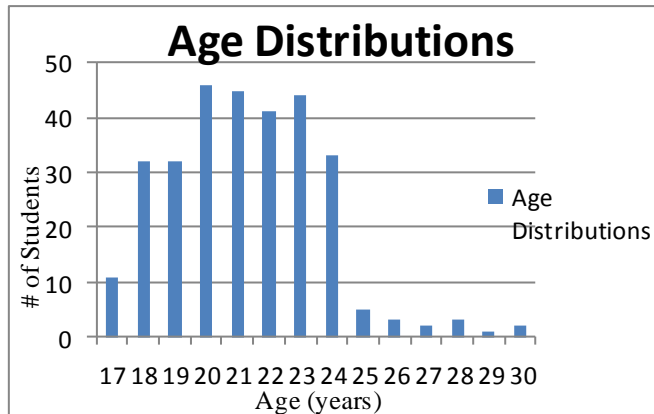


Figure 2 – Age Distributions of the Students that Took Part in the Study

Since the surveys were handed out in person, all 300 surveys were completed that were handed out. In addition, it was assured that all student age groups were represented in this research closely to equally to avoid large errors due to demographics (See Figure 1). Of the 300 students that participated in the study, 71% reported to be living in Gainesville within 3 miles of the University of Florida; meanwhile 22% live in dormitories located on campus. Of the students that live off campus, only 26% of them have a bicycle available to them, while 60% of these same students own a car. As far as transportation to campus for off campus students, 33% of them drive, 73% walk, 90% ride a bus, and 15% ride a bike to any on campus destinations. Getting from an off campus location to campus from a bus seems understandable, but 26% of the students reported of using the bus

service or their personal car to get from one on campus destination to another. Of this 26%, 76% of them said they get between 0- 2 hours of exercise a week, which is below the suggested exercise requirement for a healthy lifestyle (2.5 hours) [4].

If the students reported that they drove to any on campus destinations, they were then asked to answer the reasons for doing so. The primary reasons appeared to be convenience, distance, and the fact that these students make multiple trips during the day. The reasons for these multiple trips during the day were due to large time gaps between classes and trips for eating. Although the university has several options for eating on campus, many students still prefer eating off campus, which could be the cause of long food lines on campus and cheaper food choices off campus.

As far as bikers are concerned, of the 15% who do use bicycles as their mode of transportation to on campus destinations, only 21% of them are females. Primary reasons for this could be that females think that biking may be unsafe and there may be security issues later in the day. Although the University of Florida campus is well monitored by the on campus police department, better lighting of the university in the evening and night may increase the number of female bicycle riders and walkers

Bike Ownership of all Students

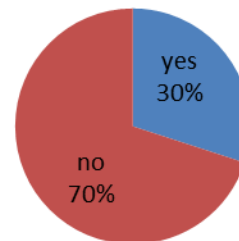


Figure 3 – Students Bike Ownership

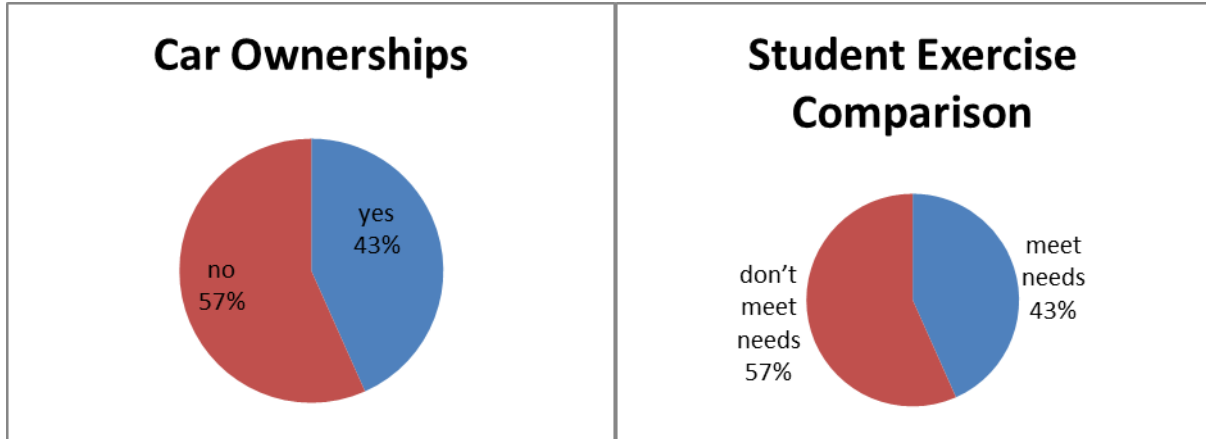


Figure 4 – Off Campus UF Students that Own Cars

Figure 5–Students Getting at least 2.5hr Exercise/ Week

For exercise, only 28% of the students that drive to on campus destinations get the recommended amount of exercise. Also, of the 26% of the students that bus ride from one on campus destination to another, only 24% of them receive more than 2 hours of exercise every week. This means that 76% of these students are not meeting their recommended exercise goals, which will potentially lead to health issues for them later down the years, adding to the United States’ already uncontrollable obesity concerns [4].

Of the 33% of the students that said they drive to on campus destinations, also reported that they would consider an alternate mode of transportation if the University of Florida increases its parking decal prices. Although the university already has prices close to \$100 for parking on campus during the day, increasing the prices a bit more can get many current drivers to ride the bus, bike, or walk to their desired on- campus destinations. If the students reported that they use the bus service to get from one on campus destination to another, they were also asked what would alter their decision for using these on campus buses. The main factor that will get these students to walk from one place on campus to another is charging for travel rather than allowing free bus transportation with a Gator 1 Identification Card.

These results are relevant to engineering and education because it covers knowledge of transportation engineering aspects. Specifically, the requirements for safe and sustainable transportation facilities such as a sidewalk for pedestrians, bike lanes, and the need to add streetlights are all imperative for the University of Florida. The paper and results stress that the university needs a multi-model transportation system such as transit, bike riding, and walking in order to get students into a healthier shape and to decrease traffic congestion on the roads.

CONCLUSIONS

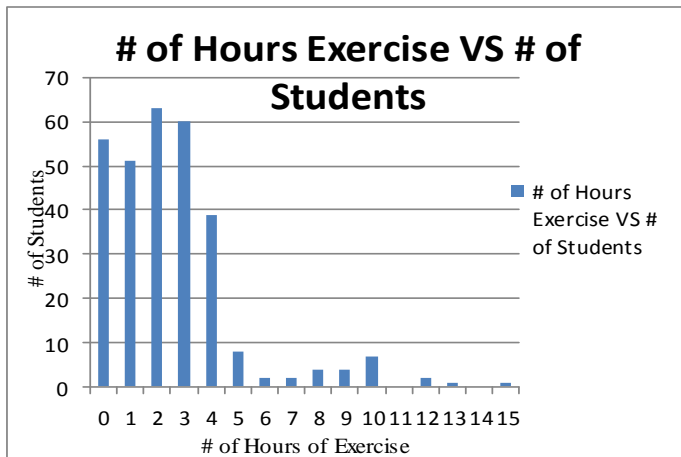


Figure 6 – The Number of Hours Students Exercise that Took Part in the Survey

As examined through all the survey data, out of the 300 students that took part in the research, 99 drive, 219 walk, 270 use the bus, and 62 ride their bicycles to their desired on campus destinations. 7% of the students reported on living more than 3 miles from the University of Florida campus. All these students either ride their car to campus or use the Regional Transit System of Gainesville. The transportation trends of these students to get on campus are unlikely to change since they travel a fair distance to get onto campus. Therefore, this research must then focus on students that live in dormitories and no more than 3 miles from the university campus.

Out of the 213 students that live within 3 miles, 198 of them use the bus to get to an on campus destination. Although this trend is much more feasible for Gainesville than having these 198 students traveling in individual cars increasing air pollution and congestion, a non- motorized means of travel is a better option. The University of Florida already has a very good transportation infrastructure for walking and bicycle riding. These non- motorized modes of travel should be more encouraged in order to encourage students to attain the 2.5 hours of recommended exercise for a healthy lifestyle [3].

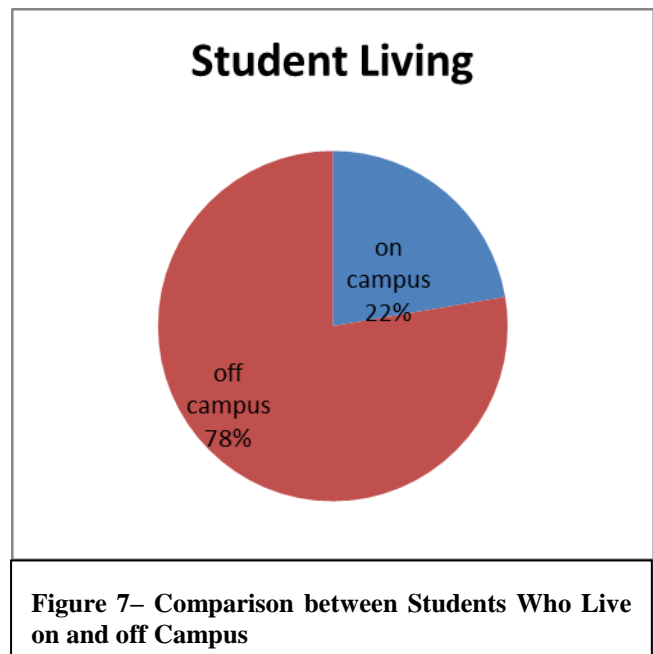
78 of the 300 respondents also reported that they use the on campus bus system and/or their personal cars to get from one on campus destination to another. As the obesity rates rise in the United States, the University of Florida should encourage its students to live a healthier lifestyle through their transportation choices [1]. Providing a bus service to campus destinations free of charge for all university students is keeping 26% of the students from walking or biking even from one part of campus to another. It is clearly showing that these same students are not meeting their exercise requirements as well. In fact, 76% of them reported on exercising less than 2 hours a week. On the other hand, if these students adapt to bicycle riding, not only do they get the exercise, but their heart health and cardio vascular fitness also stays in check [5].

It is apparent through the non- motorized facilities inspection that the University of Florida has adequate infrastructure for students that want to adapt a non-motorized means of travel with sidewalks, bicycle lanes, and bicycle racks available at every major on campus road. Although the on campus facilities are taken care of, some off campus facilities such as bicycle racks are not available to students that stay within 3 miles of campus. The main concern should be those 78 people that only use the bus or car to get to their on campus destinations. Public officials are targeting these kinds of people and encouraging them to use non- motorized means of travel and get off motorized vehicles [2]. The University of Florida should encourage the same practices for the health well-being of its students.

A very similar study was done at University of California in Davis by Susan L. Handy and her students with a goal to promote low cost, low polluting, and health promoting mode of transportation. In her paper, she describes that bicycle riding was promoted at the university by featuring only extensive bicycle paths to the newer renovated areas of campus. With the city’s help and University of California in Davis’ desire to accommodate bike riding, Davis has “over 50 miles of on street bike lanes and over 50 miles of off street bike paths in an area of less than ten square miles” [10]. The results of this infrastructure are very admirable. 47 percent of the undergraduates and 55 percent of the graduates there bike to campus [10]. Results such as this should motivate the University of Florida to take further steps into promoting bike riding and walking.

RECOMMENDATIONS

Based on the conclusions mentioned and the feedback given on the surveys given by the respondents, it is clear that in order to improve the University of Florida’s transportation trends to benefit its students and their health, students that use the Regional Transit System in order to get to on campus destinations must be encouraged to use a non- motorized mode of travel. More importantly, this survey’s focus is on the students that use a motorized vehicle (in this case car and/or bus) to travel from one on campus destination to another, which is a higher number of students than those that reported to live on campus as can be seen in Figure 7. It should be the primary objective of the university to make these students walk or bike to their on campus destinations. The following recommendations are made for the University of Florida to implement a healthier and sustainable means of travel for students:



- Additional bicycles racks should be built within 3 miles of the university off campus to benefit and promote student bicycle travel
- Increase car decal fees
- Encourage students to walk and bike for a healthier student lifestyle and its benefits through campus advertising
- Mowry Drive should be stripped to include bicycle paths and sidewalks on both directions on all parts of the road on campus. This will encourage and promote walking and bicycle riding
- Additional streetlights should be installed on campus roads as well as roads connecting to these campus roads. As analyzed in the survey results, more females will be encouraged to walk and bike on campus if the streets are well lit. This will also help the police department on campus monitor the campus better.
- Redesign existing parking facilities for student recreational activities to promote walking and biking.
- The college of Health and Human Performance should develop a program that encourages walking and biking.

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BIOGRAPHICAL INFORMATION

Vaibhav Nayar

Vaibhav Nayar is an undergraduate senior pursuing a double major in Civil and Environmental Engineering. He plans to continue his higher education towards receiving Masters and PhD degrees. He had an internship with AECOM in the summer of 2011 working along with a group of professional engineers whose primary objective was to redesign a water treatment facility to output more finished water than it currently does.

Vaibhav Nayar is a member of three professional organizations at the University of Florida, including the American Society of Civil Engineers, the National Society of Environmental Engineers, and the National Society of Asian Engineers. He is also currently the treasurer for the student chapter of the Florida Water Environmental Association.

Dr. Fazil T. Najafi

Dr. Najafi is a professor of Civil and Coastal Engineering at the University of Florida who earned his BSAE, MS, and PhD degrees in Civil Engineering from Virginia Polytechnic Institute and State University. He has more than 35 years of experience with government, industry, and education. He has more than 300 research papers published and presented to international, national and local organizations.

Dr. Najafi is a member of many professional committees and several professional societies. His areas of specialization include transportation planning and management, legal aspects, construction contract administration, and public works.

