

Southwest Region University Transportation Center

Exploring Sustainable Transportation for Texas Southern University

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16. Abstract Texas Southern University is a commuter campus with students, faculty, and staff traveling from the Greater Houston area to the university. Over the past few years, the TSU campus has made marked improvements to move towards a "greener" more sustainable campus with less impervious coverage. Despite this commitment, the campus still has not addressed how the university will decrease its carbon footprint and change the way people arrive at the campus. Adopting a multi-faceted approach to commuting where faculty, staff, and students have the sustainable commuting options: i.e. rideshare, transit, drive, and bicycle, as viable alternatives to get to the university. The literature and practices currently in use show these strategies are already working well at other campuses and could prove success at TSU as well.					
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**EXPLORING SUSTAINABLE TRANSPORTATION FOR
TEXAS SOUTHERN UNIVERSITY**

by

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Sponsored by
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EXECUTIVE SUMMARY

Across the United States, universities must balance the rising costs of parking, decreasing land to expand, and the increasing demand for academic facilities/buildings. To this end, campuses looked for ways to decrease the space needed for parking. This action resulted in more green space, increased demand for bicycling, walking, carpooling, and transit. The action also caused the universities to become more environmentally aware. For example, after implementing different programs, i.e. Zipcar, bicycle rental, Yale noted changes in commuting behavior between 2007 and 2011. By 2011, mode shifts occurred. The number of persons driving alone to campus decreased to 36%, while the share of transit riders increased to 24%, walkers increased to 24% and bicycling increased to 8%.

In Part I of this study involved a literature review and on campus focused discussion. The Center for Transportation Training and Research (CTTR) staff held a focused discussion to determine the interest in such a program on Texas Southern University's (TSU's) campus. During the meeting, attendees examined three modes: bicycling, transit, and vanpool. The results are presented in a Strengths, Weaknesses, Opportunities, and Threats (SWOTs) analysis in Figure 1. The attendees expressed interest in the campus pursuing sustainable transportation. Overwhelmingly, the attendees felt all modes of transportation would be successful at Texas Southern University.

During Part II of this study, CTTR staff examined the possibility of implementing some of these alternatives at TSU. Several key points emerged. First, with the proposed improvements to METRO's bus system and the addition of a rail line, TSU will have greater and faster access to various destinations throughout the city. Hopefully, these changes will mean that more faculty, staff and students use public transportation. Next, connectivity with the new rail would be more viable with the addition of a B-cycle station; however, the lack of funding will not allow for a station directly on the campus. In the future, researchers and university officials should continue to revisit this option or at least the possibility of a station just outside of the campus. Vanpools and carpools present viable possibilities for staff and faculty, especially for those living in the suburban areas of the greater Houston area. Because carpools and vanpools are relatively inexpensive, university officials should continue to investigate the next steps to establishing a carpool option. Finally, carsharing remains a vibrant and growing business. TSU students could benefit from a program that allowed them access to a shared vehicle without the issues of car maintenance, insurance, and expensive payments.

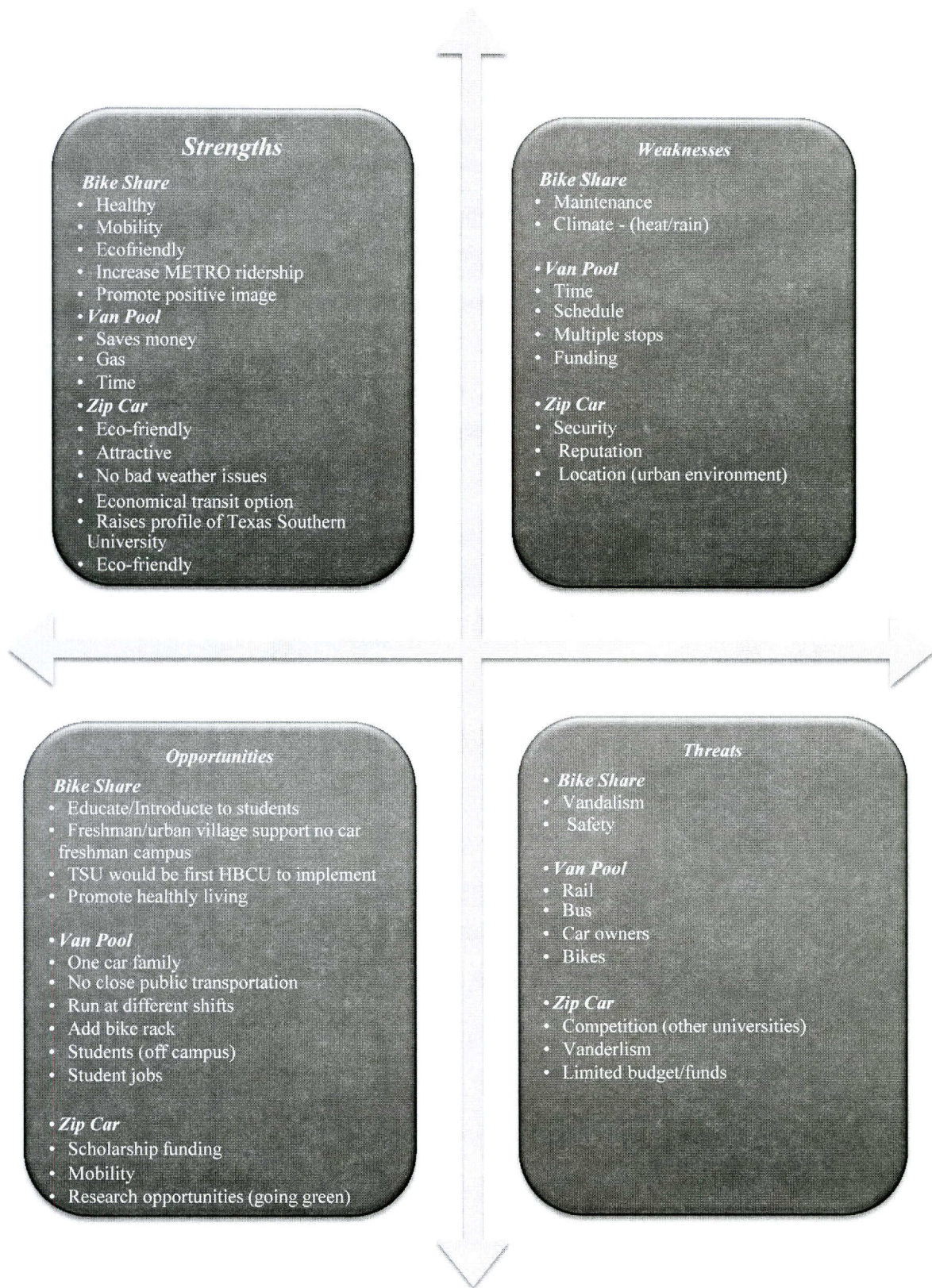


Figure 1 : Summarization of SWOT Analysis

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INTRODUCTION AND BACKGROUND

Commuting to a college or university campus can be cumbersome and expensive. In most cases, driving a car proves to be the fastest method of commuting, but proves expensive and tiring when faced with the increasing cost of parking on campus and rush hour traffic. Riding transit is also an option, if it is available and if the hours of operation meet the needs of the commuter. Walking and bicycling prove viable and safe but only when dedicated bike lanes or pedestrian paths and sidewalks are in place.

Over the years, several college/university campuses faced balancing the growing demand for parking spaces and the increased need to build new facilities. Added to these challenges comes the need for a greener campus and the aspiration to reduce the carbon footprint of commuting university faculty, staff, and students. To address these needs, many college/university campuses looked for sustainable transportation solutions.

Yale University campus officials examined the various commuting modes used to get to campus, i.e. walk, bike, carpool, transit, or drive alone. In 2007, 44% of its commuters drove alone and only 19% used transit. Yale officials wanted to reduce the number of commuters arriving to campus driving alone and increase the share in other modes. A master plan was implemented in 2010 that supported the fundamentals of sustainable transportation. One of the results included saving \$11.5 million, the cost of a 500 parking space structure, and instead opting to fund “non-car” transportation incentive programs or services.

PROBLEM STATEMENT

Over the past ten years, Texas Southern University's campus parking and overall mobility has changed. In 2006, the university operated shuttle bus suspended service around the perimeter of campus. As the university continues to grow, metered parking was eliminated and new academic buildings were erected. To centralize parking, two garages opened on the east (Tierwester and Cleburne Avenue) and west (Blodgett and Ennis Street) sides of campus. Various improvements and the desire for a "greener" campus resulted in replacing pavement with green spaces. Parking spaces, near buildings and surface lots, were drastically reduced or eliminated and replaced with grass and shrubs. In addition, student housing moved from the center of campus on the "Tiger Walk" and relocated several blocks away as new apartment style housing. These cumulative changes resulted in fewer places to park for faculty, staff, and students.

As enrollment continues to increase, parking during peak hours means many commuters spend valuable time searching for a place to park. Additionally, faculty and staff have experienced annual increases in parking fees. Faced with these challenges, the Center for Transportation, Training, and Research (CTTR) staff investigated potential solutions. After reviewing Yale University's and other universities progressive approaches to reducing the carbon footprint, CTTR researchers were interested in knowing if mode sharing changes would also occur among TSU commuters if similar strategies were implemented.

RESEARCH GOALS AND OBJECTIVES

To address answer this question, CTTR staff first determined interest in exploring sustainable transportation options. Staff conducted a focused discussion with the following research goals and objectives:

- To determine overall feeling regarding sustainable transportation.
- To understand what the university gains from implementing sustainable transportation policies.
- To identify the potential negative impacts from implementing sustainable transportation policies
- To discuss what techniques or strategies should be supported.

LITERATURE REVIEW

Initiating a plan of action for Texas Southern University requires a working knowledge of the various sustainable transportation strategies and options available. To that end, researchers reviewed literature and best practices currently in place. The following discussion details the sustainable transportation strategies and plans adopted by selected universities around the United States.

Yale's Plan

Two factors in Transportation Planning that Yale University considered in determining the ideal mode of transportation are as follows:

1. Land use
2. Distance

The Yale University campus is situated in the heart of New Haven, Connecticut, where it intermixes with campus and downtown. University officials found that there are a variety of transportation choices available to accommodate faculty, staff, and students and correct identified deficiency in the campus transportation system. The modes of transportation used are as follows: walk, bike, carpool or transit versus driving. Shown in the two figures below is how the ratio changed over a time span between 2007 and 2011.

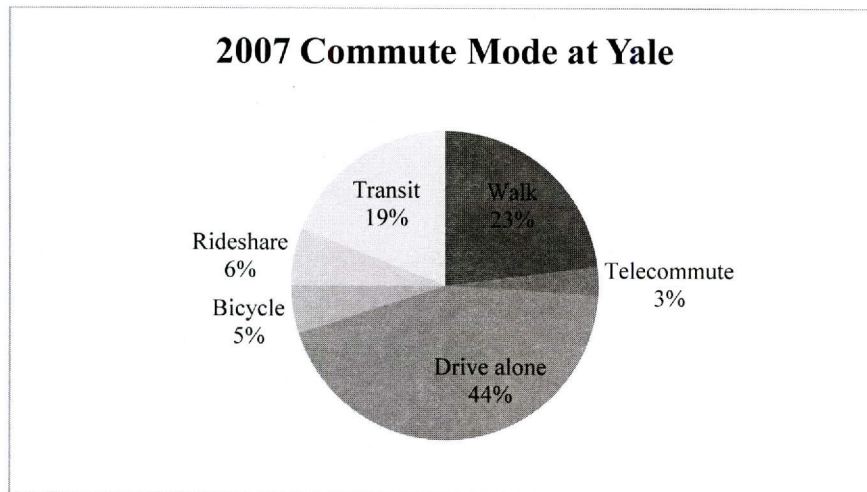


Figure 2: 2007 Commute Mode at Yale

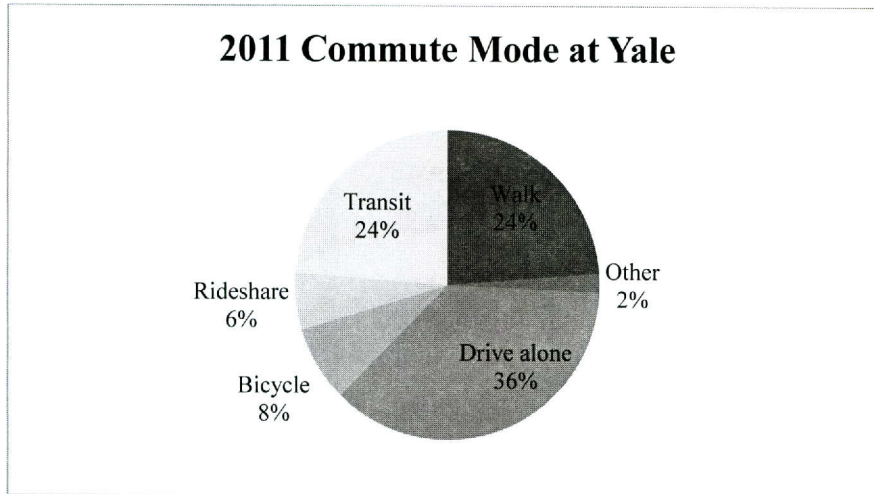


Figure 3: 2011 Commute Mode at Yale

A master plan was implemented in 2010 to broaden sustainability on the campus of Yale University. Before this was implemented, however, University officials identified existing and anticipated mobility needs of its constituents and designed a plan that would define suitable options to support the fundamentals of sustainable transportation. The initial steps to implementing the sustainable transportation plan were adapted from Global Development Research Center on the environment and economy which are as follows:

1. Access
2. Health and safety
3. Individual responsibility
4. Integrated planning/land and resource use
5. Pollution prevention
6. Fuller cost accounting (long-term costs, economic viability)

With this information in hand, Yale University officials determined the best practices and strategies specifically designed to advance the plans implementation. For example, campus officials considered the “cost of building 500 future parking spaces at a savings of \$11.5 million would in turn fund non-car transportation incentive programs or services” (Parker H. et al, 2012, p.80.). Such incentive programs would be predicated on the ease of access for “non-car” options and an adherence to the sustainable transportation plan. Furthermore, the strategies used to develop the incentive programs involved costs, and the projected impacts. The following illustrates the programs generated by Yale University officials:

1. Safe sidewalk and crosswalk infrastructure and maintenance planned along with the city of New Haven;
2. Connecting on campus-sponsored Yale Shuttle to external transit systems improving reliability;
3. Limiting placing of additional car parking spaces;
4. Integration of sustainable transportation into the Yale University Framework for Campus Planning for decision making; and

5. Determining the placement of local “transportation hubs” (Parker H. et al, 2012, p.9) and the development of a liaison with local working groups in the appropriate city departments when projects impact cyclists, pedestrians, transit riders and also taking into consideration safety and comfort into account.

Community transportation found on the Yale University campus has positively impacted the transportation behavior in the following manner:

- Free campus shuttle system noted for its day and night shuttle trips were implemented in 2010-2011;
- Zipcar program (35 cars, 3,200 members);
- Enhanced bicycle access;
- Discounted parking permits for carpoolers;
- Staff-run commuter counseling program; and
- Establish a “Bike-Share” program.

Stanford’s Transportation Management Program

The intent of officials at Stanford University was to pursue a campus expansion while simultaneously managing vehicular commutes on campus and surrounding campus trips. The impetus for trip management was found in the high vehicular traffic entering and exiting campus during morning and evening peak periods. Sixteen access points were implemented on campus to help with traffic management. However, despite their biggest challenge of accommodating a population of “11,000 employees and 15,000 students” (Parker H. et al, 2012, p.10). Stanford University officials also considered the following to assist with improving the campus’s transport systems:

1. Clean air cash (program whereby commuters are paid to carpool);
2. Free shuttle service (15 route system);
3. Free parking permits for carpoolers;
4. Reserved parking for carpools/vanpools;
5. Emergency ride home program (full and part-time transport users);
6. Freshman emergency ride home program (those adhering to freshmen no cars policy); and
7. Infrastructure to serve the bicycling community.

However, even with Stanford University officials supporting these strategically sustainable transportation activities, they also initiated a rewards program for faculty, staff, and students who choose not to drive. The cost of parking permits range from \$300 to \$768, so this would be a significant costs savings for those who opt to give up parking permits. Having these alternative modes of transportation on campus allowed for increased mode options for the commuter. Also, the implementation of additional routes connects the existing campus shuttle to the regional bus and rail services of the Santa Clara County Rail transit system.

Stanford University officials also implemented a bicycle program that attracted an estimated 13,000 cyclists daily (Parker H. et al, 2012, p.10), and this program provided 18,000 bike rack

spaces, lockers, storage rentals and showers. Implementing these different aspects of the bicycle program make the system more attractive to commuters. The results from the implementation of various transportation innovations on the Stanford University campus was done to manage transportation demand. In so doing, the number of trips during the peak hours in the evening decreased by 100 trips and by 500 trips in the morning. Also, another major impact made on the campus from 2002 to 2011 was the employee-drive alone program. This initiative resulted in a significant decrease in drive alone commuters from 72 to 46% between 2002 and 2011 (see Figures 3 and 4).

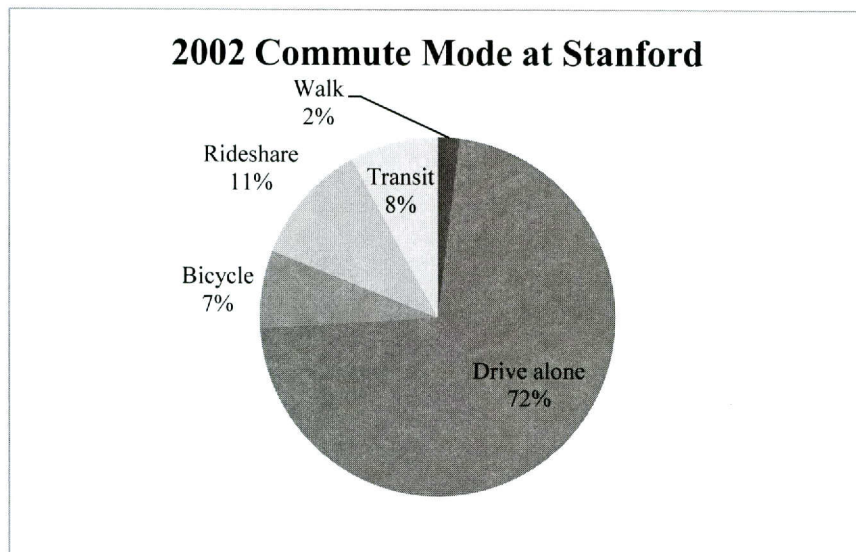


Figure 4: 2002 Commute Mode at Stanford

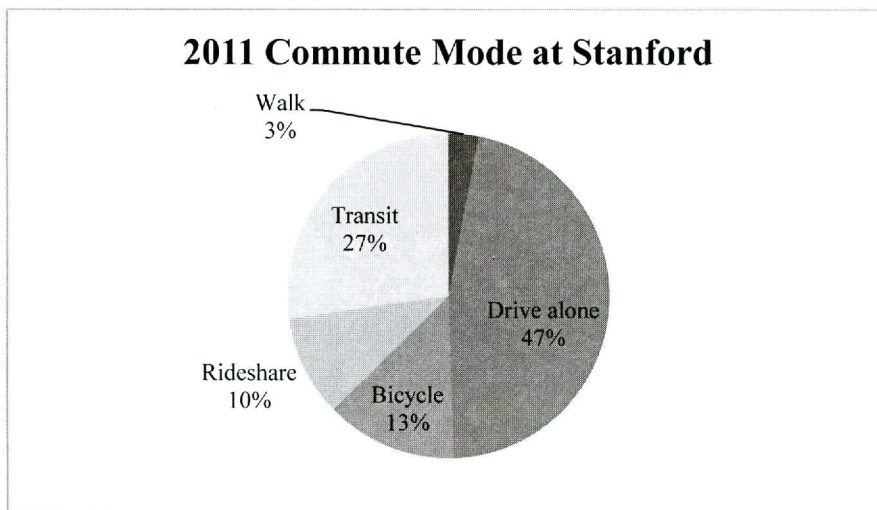


Figure 5: 2011 Commute Mode at Stanford

But in order to have such results, Stanford University officials believed that the culture at the institution and available local transportation options may affect on campus transport, user behavior, lack of land for expansion, limited funds and overburdened transportation systems.

Harvard's Demand Management Program

Harvard University currently boasts of a high-capacity public transit system serving the institution. The demand management program proves effective in the supply management aspect of their transportation innovations on the campus. One of the incentives implemented by Harvard University officials to decrease vehicle numbers on campus involved providing discounted monthly passes for Massachusetts Bay Transportation Authority (MBTA). This was considered a good start for the institution and it was anticipated that future transportation plans would include a reduction of available parking spaces, thus taking full advantage of MBTA's subway, bus, rail, and ferry transportation options.

Texas A & M University's Campus Master Transportation Plan

The Campus Transportation Master Plan at Texas A & M University considers certain mobility aspects in order to satisfy their sustainability plan. The University's sustainability plan included traffic management, safety and security, accessibility, sustainability, mobility, planning goals, motor vehicle, pedestrian, bicycle, transit, parking and other facilities inclusive of campus lighting, emergency lights/ telephones, and signage. Also, included is the best practices analysis that campus officials implemented the academic community. They take into consideration different phases in this analysis matrix based on collaborative transportation planning, pedestrian and bicycling, transit, motor vehicle traffic, and parking. The figure and tables both show master transportation and best practices per Texas A&M University campus rules and regulations.

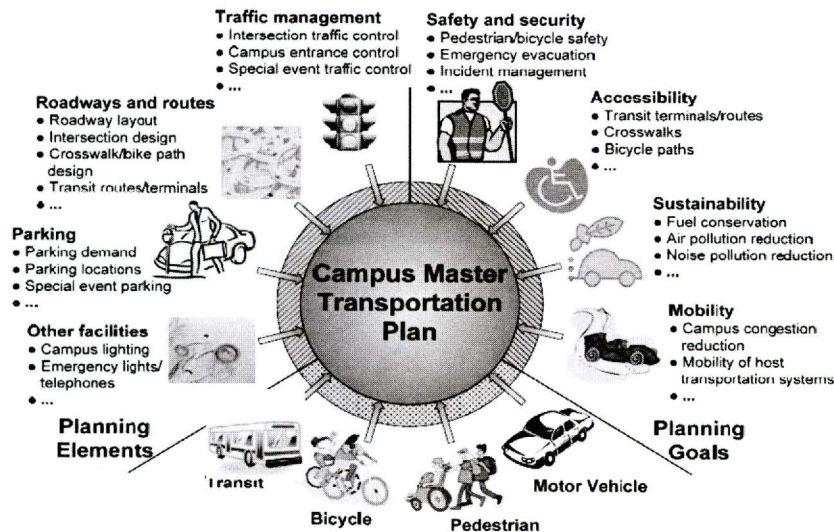


Figure 6: Campus Master Transportation Plan

Table 1: Campus Transportation Master Plan

Least Advance	Moderately Advanced	Most Advanced
Collaborative Transportation Planning		
<ul style="list-style-type: none"> •Limited or no coordinations with LPAs and other stakeholders 	<ul style="list-style-type: none"> •Coordination with some LPAs and stakeholders on a limited number of planning topics (e.g. transit and or congestion management) 	<ul style="list-style-type: none"> •Extensive coordination with all affected LPAs (e.g. city, county, and state Department of Transportation) and stakeholders on most or all transportation topics including transit, parking, pedestrian and bicycle, congestion management, and environmental impact.
Pedestrian and Bicycle		
<ul style="list-style-type: none"> •Minimum provisions for pedestrian mobility and accessibility- narrow sidewalks, inconvenient pedestrian crossings, lack of sidewalk connectivity, etc. •Limited or poorly maintained bicycle routes; limited bicycle facilities. •No pedestrian and bicycle incentives. •No pedestrian and bicycle safety. •No coordination with LPAs on pedestrian and bicycle. 	<ul style="list-style-type: none"> •Network for basic pedestrian mobility and accessibility needs; a limited number of shades paths, seating areas, grade separated crossings etc. •Some bicycle routes; basic bicycle facilities (e.g. racks, shaded parking spaces etc.) •Limited pedestrian and bicycle incentives. •Basic pedestrian and bicycle safety measures (e.g. routine traffic control, dedicated routes, etc.) •Some collaborative planning for limited connectivity, but barriers on or around campus exist. 	<ul style="list-style-type: none"> •Extensive pedestrian network with enjoyable walking environment connecting to all major campus buildings, transit stations, and other popular pedestrian destinations. •Extensive bicycle network with large numbers of exclusive bicycle paths, shaded bicycle parking, bicycle lockers, clothes lockers, showers, maintenance centers, etc. Side walking programs, pedestrian transporters (e.g. HTs, APMs, and PRTs), bicycle sharing programs, bicycle purchase incentives, etc. •Pedestrian and bicycle safety education programs; use of advances technologies (e.g. GIS and ITS) for safety improvement; and safety equipment (e.g. helmets, flashers and safety vests) sharing programs. •Collaborative planning on pedestrian and bicycle safety and network with maximum accessibility and connectivity on and around campus.
Transit		
<ul style="list-style-type: none"> •No or limited transit services and routes on campus; no pedestrian-friendly facilities at stations. •No ridership incentives. •No collaborative transit planning with local transit providers. 	<ul style="list-style-type: none"> •Regular transit services provided by both university and local providers; limits facilities (e.g. shelters, seating and lighting) at transit stops. •Basic ridership incentives such as fare discount for students. •Basic collaborative planning routes, stops, and fare price. 	<ul style="list-style-type: none"> •Adequate transit services on or around campus; convenient facilities (e.g. shelters, seating, lighting, emergency phone system, drinking fountains, etc.) at most transit stops; use of transit malls and hubs. • Multiple ridership incentives such as little or no cost for students and employees, extended services during after hours, ready accessibility to transit stations, park and ride facilities, class schedules in coordination with transit availability, and ITS for transit vehicle location and schedule information. •Well coordinated planning on transit services on or off campus for maximum connectivity and consistence service.

Table 1: Campus Transportation Master Plan cont'd

Least Advance	Moderately Advanced	Most Advanced
Parking		
<ul style="list-style-type: none"> •Poorly managed and enforced parking facilities; no or very limited visitor parking. •No regular parking inventory and/or studies; discrepancies exist between parking capacity and permits issued. •No parking management in surrounding neighborhoods 	<ul style="list-style-type: none"> •Fairly designed parking facilities; regular parking enforcement, limited traffic signs for location parking; some visitor parking spaces. •Limited parking inventory studies; moderate discrepancy between parking capacity and permits issued. •Limited involvement in managing student parking within surrounding neighborhoods 	<ul style="list-style-type: none"> •Well designed and managed campus facilities; off-campus facilities with reliable shuttle service and safety measures; advanced parking management and information tools (e.g. APMs, DMS and internet); convenient and clearly guided visitor parking. •Regular parking inventory studies; clear understanding of parking availability and demand; up-to date parking management strategies. •Extensive collaboration and involvement in parking management within surrounding neighborhoods using mechanism such as establishing collaboratively managed parking districts.
Motor Vehicle Traffic		
<ul style="list-style-type: none"> •No or implicit policy statements discouraging use of personal vehicles in campus plan. •Limited traffic control at few entrances. •Vehicle traffic restriction primarily by parking availability. •No particular incentives for careless commuting 	<ul style="list-style-type: none"> •Statements include in campus plans emphasizing the importance of pedestrian, bicycle, and transit modes on campus. •Traffic control at major campus entrances. •Parking management skills used for vehicular traffic reduction, such as preferential parking for carpoolers/vanpoolers and infrequent drivers. •Basic incentives for commuting by bicycles or transit as previously noted. 	<ul style="list-style-type: none"> •Policy statements included in campus plans and explicitly rank pedestrian, bicycle and transit as high-priority modes of travel on campus while personal vehicles are the least preferred. •Traffic control at all major campus entrances as well as other strategic locations; campus roads with heavy pedestrian traffic closed to motor vehicles; sufficient auto accessibility for emergency events. •Flexible working schedule and location with consideration of parking availability and avoiding peak hours; use of telecommunication technologies. •Guaranteed emergency ride home programs for people who commute by alternative modes; systematic incentive programs to encourage all alternative modes; other innovative incentives such as campus access fees with rebate for use of alternative modes.

University of Wyoming's Transit System

The University of Wyoming established a transit system that serves the campus and the surrounding community. The objective was to reduce the demand for parking while simultaneously connecting the university campus with residential locations, key community and university destinations. This system includes three shuttle routes which include the union express, classroom shuttle and campus shuttle. The shuttle services are exclusively limited to the campus areas and not the adjacent residential areas and certain areas within the City of Laramie.

Additionally, the university provides a free paratransit service provided by TransPark. This service is available to provide transportation between the University of Wyoming campus, work, appointments, meetings, social, and recreational facilities. The boundaries of the paratransit services are limited to the Laramie city limits and adjacent areas within two miles of the city limits.

In 2001, the Safe Ride program was developed by the Associated Students of the University of Wyoming (ASUW). This program is a free public transportation system with the goal of providing safe and reliable transportation within the Laramie city limits. The fixed route includes 22 bus stops and the flexible routes provide door-to-door services.

It was noted over a three semester period that overall ridership was consistent at approximately 2,000 passengers per day. During the 2006-2007 academic year, the ASUW estimates that 26,000 people used the Safe Ride services. The University of Wyoming transport program is made up of transit services focus on the shuttle service on campus and the Safe Ride's van. This university currently houses 9,982 students, (2,053 live on campus), and 2,445 faculty/staff members which is about the same number that Texas Southern University.

University of Washington District's (UWD) Transportation Demand Management

Officials at the University of Washington District made a commitment to reduce the vehicle demand to the campus and to a thorough set of Transportation Demand Management (TDM) programs and policies. The intent of the proposed TDM programs and policies was not solely limited to the reduction transportation demand on campus, but was anticipated that they would organize, market, and monitor the different TDM strategies they implemented to ensure cost effectiveness and efficiency. The following are some of their TDM recommendations:

1. Establish a single point of contact for managing and monitoring TDM programs and policies;
2. Assemble yearly monitoring reports, which collect performance data on the TDM strategies and make recommendations for additions and deletions from the plan based on the relative success of the performance measures;
3. Promote TDM measures through improved marketing activities
4. Incorporate new TDM measures to encourage use of non-automobile based services.

Specific new TDM measures for consideration include:

- **Parking Pricing:** whereby if the parking garage is over 90% full, the rates can be raised, but when the garage is less than 75% full, the rates are lowered.
- **Carpooling:** A ride matching and sharing service could be used to allow for students, faculty and staff to offer and accept rides. Employees could also use an online service (such as Zimride) to find potential carpool partners.
- **Carsharing:** maintain Zipcar availability and investigate placing reserved Zipcar spots in the Underground Parking Garage.
- **Transit Benefits:** investigate offering enrolment in the SmartBenefits program, which allows for up to \$230 a month of pre-tax salary to be used for transit fares, to University employees.
- **Bicycling:** provide information about bicycle riding in the District, bike routes between campus and major destinations, and locations on campus for bike parking and storage. Quality bike parking should be incorporated into new buildings,

notably the student center (both on street along Connecticut Avenue and within the center), and at all new residence halls. UDC should investigate the addition of bicycle commuter benefits.

California State University's Sustainable Transportation Network

California State University introduced a major sustainable transportation network to their campus. This network includes alternative forms of mobility like bike and transit facilities. However, cycling is restricted to those bikeways located within the campus core. University officials also categorized bikeways facilities into the following three categories: set up for bicycling into three as follows:

- Class I (Bike Path) – Provides a completely separate right-of-way for the exclusive use of bicyclists and pedestrians.
- Class II (Bike Lane) – Provides a striped lane for one-way bike travel on a roadway.
- Class III (Bike Route) – Provides for shared use with vehicle traffic within a roadway.

It is required by California state law that cyclists register their bicycles and renew that registration every three years. The California State University Police Department provides bicycle registration service for an initial registration fee of \$10 and a renewal fee of \$5. In the last year officials calculated that total registration increased more than 50 percent. It was also noted that this increase did not significantly have an impact on bicycle parking utilization. However, such bicycle registration does not actually determine the use of bicycles on campus. Lastly, campus officials also established bicycling resources whereby the Associated Students' Adventure Outings provide an on-campus bike services (i.e. repair station) under canopied areas known as bike carts.



Figure 7: Bicycle trail and signage



Figure 8: Bicycle with a canopy

Also, in partnership with the California State University, Associated Students' Adventure Outings is the Chico Velo Cycling Club organized local rides and cycling events. There were minimal fees associated with membership and participation. However, the fees were used to fund a Roadside Assistance Program card where students can have access to a onetime free taxi ride home from any paved road in Butte County in the event of a physical or mechanical emergency. Likewise, free transit services were available to all campus faculty, staff, and students with a Wildcat Identification Card.

North Carolina State University's

At this university there were numerous transportation options available to the university community, including the following:

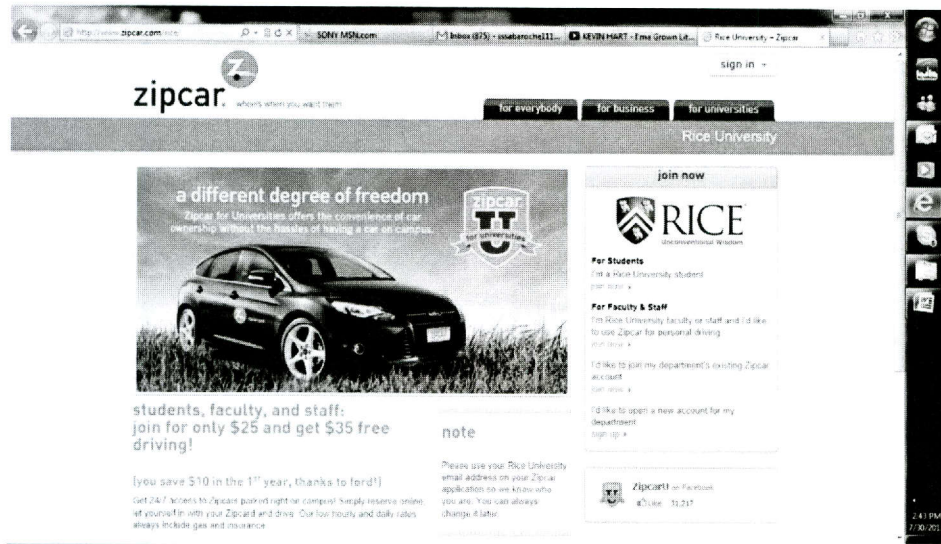
1. Carpoolers
2. Walkers
3. Transit
4. Bike riders

These commuters were offered incentives to assist with decreasing traffic on campus. The incentives include the emergency ride home service and up to 12 free daily parking permits annually. These incentives were directed towards those individuals who were registered to use some form of alternative mode of transportation (bus, carpool, bicycle, and walk). This was done especially for those individuals who must drive his/her personal vehicle. Similar benefits are offered to employees who participate in the Triangle Transit Authority's Vanpool program. The benefits are as follows:

- Carpool: 12 free parking permits
- 24 daily permits for only \$2 each
- Vanpool: 24 free parking permits
- Vans park for free
- Transit/ Bike/ Walk: 12 free parking permits
- 36 daily permits for only \$2 each
- Bicycling Enhancements

Rice University's Zipcar program

The idea of a car share program in Texas seemed hard to sell compared to New York or Washington, D. C., where car ownership costs prove expensive compared to those same costs in Texas. Zipcar is similar to the traditional car rental business but is underpinned by a broader mission: to get Americans to change the way they think about owning and driving cars. Looking at transportation at colleges, Zipcar began partnering views a college campus as an ideal situation for a car sharing program. In Houston, Rice University participates in the Zipcar program. Rice students pay \$35 for a yearlong membership. Reserving a car is \$7 an hour or \$60 for an entire day rental. At present there are two vehicles a Volvo S40 and a Toyota Pruis. Also, other areas being considered for inclusion in the Zipcar program are the Texas Medical Center, downtown and the University of Houston, as well as Austin and other cities in Texas.



Source: <http://www.zipcar.com/rice/>

Figure 9: Zipcar at Rice University,

Bike-sharing Implemented in Downtown Houston

EPA Climate Showcase grant funded a bike-sharing program operated by the nonprofit organization Houston Bike Share. Eighteen bikes were used in the program but that number will increase to about 200 bikes at the end of the year. Houston’s Mayor, Annise Parker, launched the public Bike-Share program on May 2, 2012, to decrease motor traffic in the city’s downtown region.

The program is based on member-participation where they would have unlimited access to the shared bikes. With a paid membership, the first 90 minutes of bike rental are free. Ride time after the first 90 minutes is just \$2 for each additional half hour with a maximum charge of \$55 a full day. A one day membership can be purchased at a B-cycle station for just \$5. Weekly memberships are \$15 and annual memberships are \$50, which is under 20 cents per day. All memberships start at the time of your first bike use, not the day and time you purchased the membership.

METHODOLOGY

To adequately investigate adopting sustainable transportation, CTTR staff determined the study must be undertaken in two parts. This study represents Part I which seeks to begin the dialogue and gain support on campus for sustainable transportation. To accomplish the research goal and objectives, this study was conducted using the tasks below.

Review literature and best practices in sustainable transportation - The PIO and Graduate assistants reviewed current literature regarding sustainable transportation. Next, CTTR developed a list of peer campuses and examined these campuses and their policies regarding sustainable transportation.

Host a focused discussion group meeting - This task involved coordinating meeting logistics, which included determining who should attend the meeting, developing themes for discussion, and determining the best time and location to hold the meeting. Additional tasks included gathering materials needed for the meeting: background literature and other meeting essentials. The PI and Graduate assistant developed a Powerpoint presentation to introduce the topic to attendees. To gather information, attendees answered five questions. (See Appendix A, B and C). The PI served as the facilitator and the Graduate assistant served as recorder.

Document findings from focused discussion group meeting - This task included gathering comments made from the meeting. These comments were captured by mode of transportation: vanpool, bicycle, and transit. Based on the comments, CTTR staff would determine the interest and feasibility of pursuing sustainable transportation for the TSU campus.

FINDINGS

On August 22, 2012, CTTR staff hosted a focused discussion group meeting. Co-hosts of the meeting were TSU campus organizations: Institute of Transportation Engineering and the Urban Planning Student Planning Organization. Meeting attendees were placed into the following groups to discuss sustainable transportation ideas: Bike-Sharing, Vanpool, and Zipcar. Below are the outcomes by topic.

Bike-Sharing

Currently, there is no bike-sharing program implemented on the Texas Southern University campus. During the focus group meeting, participants expressed a desire to implement a program. The participants wanted to administer a commuter survey to the student body, faculty, and staff to obtain their interest in bike sharing as an alternative mode of transportation in and around campus. The participants also felt a bike share program would promote connectivity to METRO-Houston Light Rail Transit (Southeast corridor).

The bike share program would also move students faster around campus from dorm to campus or building to building. It will also be another introductory mode of transport to the university. In addition to these beneficial factors, biking would bring connectivity to bike trail initiative and encourage exercise and promote healthy living among students.

In order to make bike-sharing program more attractive to the Texas Southern community it was determined that showing them threw monetary incentives, savings and obtain funding. In addition, students could earn monetary rewards towards books, football games, bowling and cafeteria on campus.

In order to make the Bike-sharing program accessible on campus, key staff and students must be involved to get the program going. Persons to consider are those within the transportation, administration and urban planning community within Texas Southern community. Also outsourcing services, i.e. bicycle companies, to supply bikes and run the program, Texas Southern University, would be beneficial. Additional agencies to work with include Geared Up, (a biking program established by a Texas Southern Graduate Student to encourage biking in the community), Houston METRO, and neighboring schools like University of Houston and Rice University. The focus group examined various factors and determined positives reasons for the implementing a Bike-sharing program at Texas Southern University. The SWOT analysis is shown below in Figure 10.

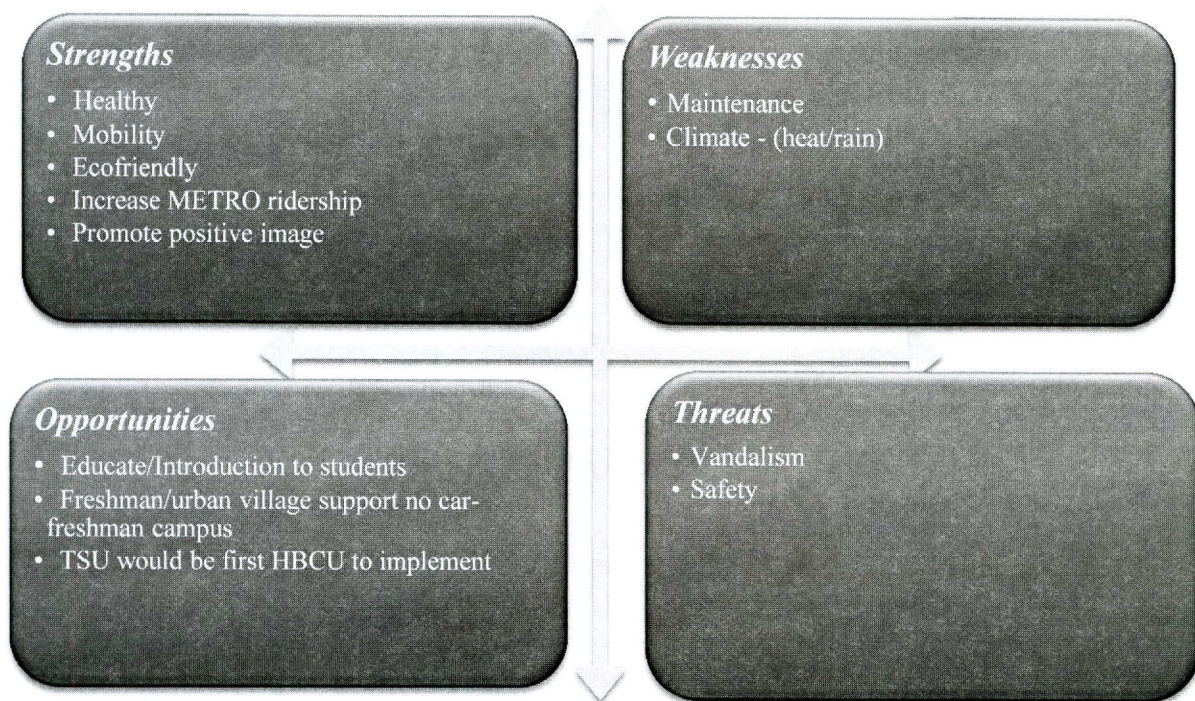


Figure 10: SWOT Analysis - Bike Sharing

Vanpool

Participants also examined the idea of establishing vanpools as a way to commute to Texas Southern University. The participants felt vanpools would have a positive impact on the campus. The participants indicated that commuters (faculty, staff and students) could organize and access the vanpool services at different locations throughout the region.

A vanpool service on campus would be beneficial because gas costs would decrease, parking fees would be decreased, and money would be saved; also a vanpool could reduce stress and it is eco-friendly. Vanpoolers could use their time in-route to do work or sleep, while someone else drives the vehicle.

The Texas Southern University community would be interested in such a program for the various reasons listed below:

- Subsidies that will help get the program started
- Advertising the program will increase its use and promote the eco-friendly lifestyle
- Offer incentives to use vanpool to get to campus

In order for this option to be adopted as an alternative mode of choice, it would be advisable for university officials to include the campus' parking personnel in the implementation process. If an outside consultant establishes the vanpool routes and schedules, university officials should consider management and subsidy assistance from the local transit authority, Houston METRO. To facilitate the discussion, a SWOT analysis was done to further determine the positive and negative effects of implementing the vanpool program. It is shown below in Figure 11.

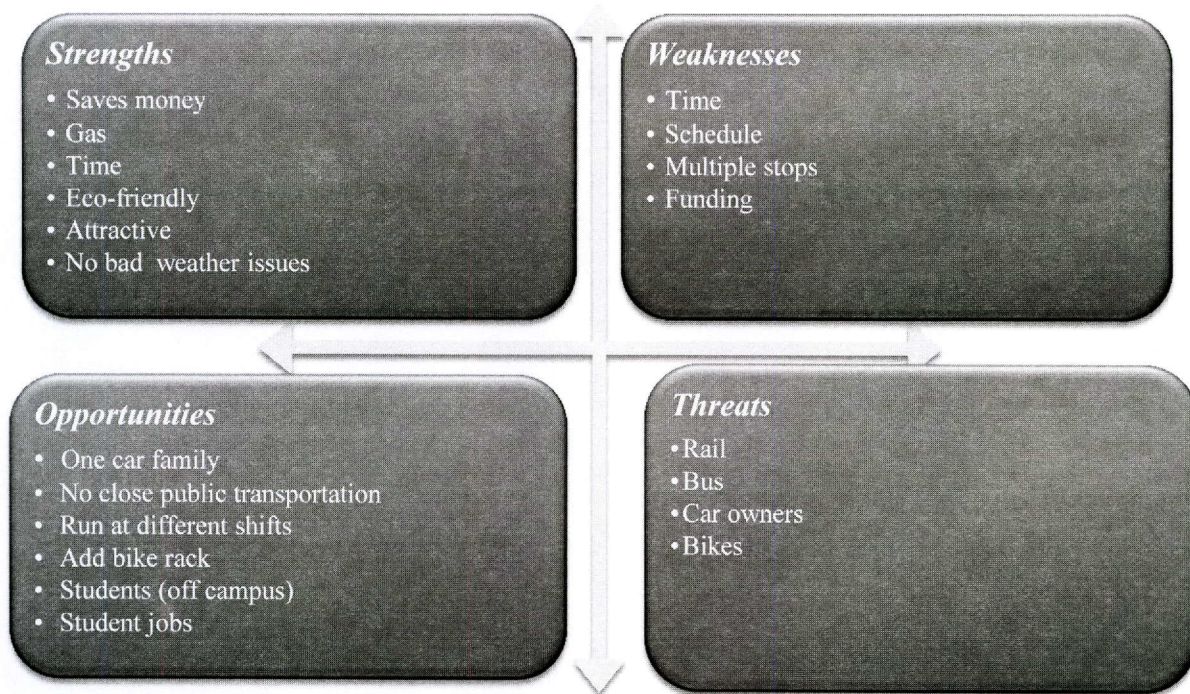


Figure 11: SWOT Analysis - Vanpool

Zipcar

When envisioning Zipcar services on the Texas Southern University campus, one concern came up whereby who will purchase or invest in such a transportation system. It was clearly noted that students can use them. It can also be attractive to faculty and staff to utilize the Zipcar especially if it is near a Houston METRO transit center. This mode of transportation will be beneficial to the campus community for various reasons:

- Economical reasons
- Eco-friendly (possibility of obtaining Eco-credit – going green)
- Helps relieve parking responsibility
- Accessibility on campus

The Texas Southern community would be interested in participating in a Zipcar program because it will be beneficial to students and staff without transportation especially, those from out of state or international students. A major factor in implementing such a program is that would definitely raise the profile of the university.

Various people and organizations were considered to be involved in bringing Zipcar to the campus. On campus support for such a program would be getting administration, student organization and staff council involved. Other assistance to be considered by outsourcing is the alumni community and corporate donors.

Lastly, in the study a SWOT analysis was done to determine the strength and weaknesses of implementing such a program is shown in Figure 12 below.

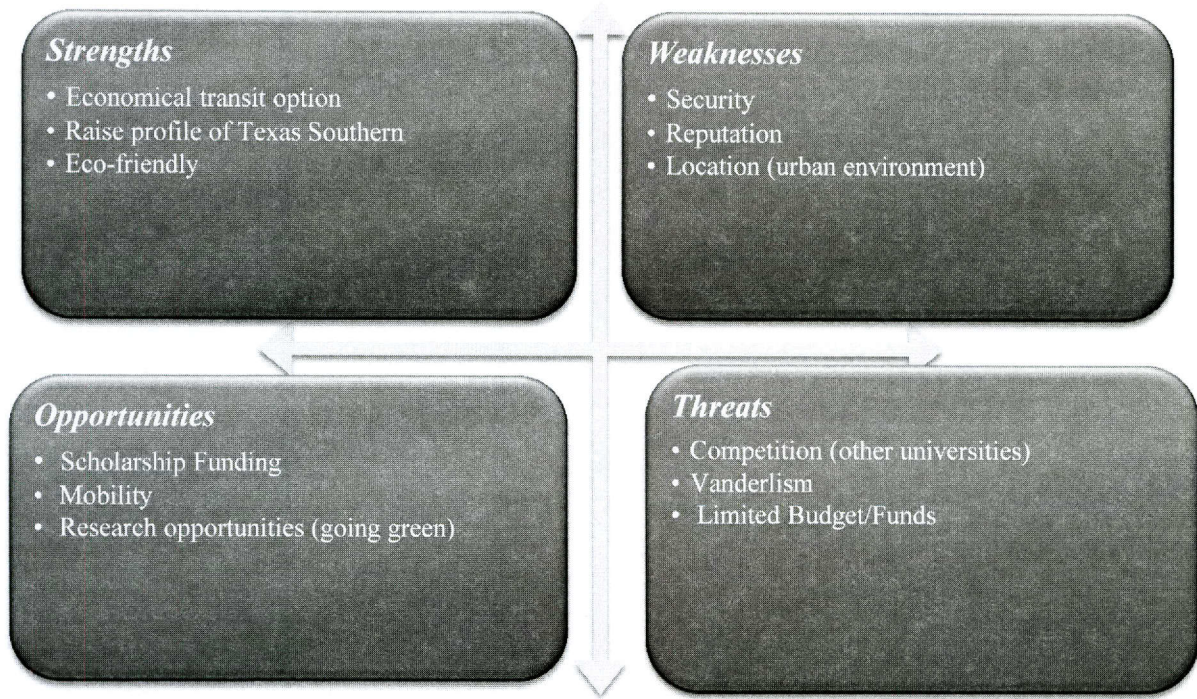


Figure 12: SWOT Analysis - Zipcar

NEXT STEPS

The next step involves initiating Part II of the study. During Part II, CTTR staff will undertake the following tasks. First, approach Texas Southern University Administration to gain support for the plan. This includes presenting an outline of why sustainable transportation should be pursued on campus. Second, develop and administer online survey for faculty, staff and students. This survey will gather commuting information and determine the travel patterns/behaviors of all persons traveling to campus. Third, develop a comprehensive sustainable transportation plan with various modes of transportation for the Texas Southern University community. Using information from Parker et al., (2009), the following basic concepts will be considered:

1. Identify goals to accomplish in the transportation plan.
2. Identify short and long term goals.
3. Utilize survey and social media to collect data from users.
4. Make various optional transport ideas to be utilized
5. Determine costs for such a transportation plan.
6. Revisit goals to determine whether they are set or need to be reset.

Transportation innovative ideas considered in the plan could include but are not limited to:

- Zimride
- Bike Sharing
- Transit
- Carsharing/pooling
- Zipcar

Finally, CTTR will seek funding to support a demonstration utilizing one of the three methods discussed. The determination of which mode to demonstrate will be based on the interest in the mode of transportation, costs, and goals.

EXAMINING POTENTIAL CAMPUS SOLUTIONS FOR TEXAS SOUTHERN UNIVERSITY

Introduction and Background

An efficient transportation system can potentially yield positive returns for the community that it serves. University campuses pose a unique transportation challenge with a daily fluctuating population of students, faculty and staff, unique campus designs, and issues of parking. Sustainability as a concept is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on the Environment 1987, p. 41). Sustainable transportation promotes modes and infrastructure features on campuses that reduces emissions and waste, affordable, expand mode options, and can bolster healthier lifestyles (Jeon and Amekudzi, 2005). Alternative campus commuting offers multifaceted effects that are local in practice with potentially global implications.

Brick and mortar institutions of higher learning have a variety of activity throughout the year, and require unique transportation protocols. Stanford University’s transportation director explained how their alternative transportation options were implemented for growth management and to decrease the number of trips coming to campus during peak hour traffic (Hamilton, 2013). Since 2002, they have conducted an annual commute and mode survey to measure satisfaction with transportation options (Hamilton, 2013). They also studied proximity to mass transit options, with the school being close to the Palo Alto, CA Caltrans station (Hamilton, 2013).

Transportation is being transformed by the onset of new technologies that are creating new norms in movement throughout urban environments (U.S. PIRG, 2013). Novel transportation services are allowing people to lessen their driving, especially among younger Americans who tend to be first adopters of these technologies (U.S. PIRG, 2013). This is exhibited with “the rapid spread of mobile, Internet-connected technologies, [and] the emergence of social networking” coinciding with a recent decline in decreased driving among the American young (U.S. PIRG, 2013; Schwartz, 2013). Some revealing statistics that showcase this orientation toward driving less are vehicle miles traveled, which decreased by 23%, while bicycle trips increased by 24%. Public transportation increased by 40% among 16 to 34-year-olds between 2001 and 2009 (U.S. PIRG, 2012). The reasons for the decline may reflect the desire to safely and comfortably use mobile devices, concern for environmental impacts related to driving, and access to bikesharing and carsharing programs (U.S. PIRG, 2012).

Purpose of Study

Texas Southern University (TSU) continues to grow and expand the campus. The recently opened Leonard H. Spearman Technology Building and the six year old Science Building represent examples of this growth. Furthermore, the beginning of construction for a seven-story, 215,000 square foot residential complex with 800-beds illustrates the continued enhancement of the school.

Currently, 9,700 students and 1,400 faculty and staff travel to campus every week using cars, shuttles, and the Houston Metropolitan Transit Authority (METRO). Those arriving by car utilize two large parking garages located on opposite ends on campus. The 2006 completion of two large parking garages provide 45% of the 4,200 parking spaces across campus (Davis, 2013). Car commuters also use various lots concentrated by the Student Center, Hannah Hall, Recreational Center, and a few other locations throughout campus.

Student, faculty, and staff can also use public transportation provided by the Houston Metropolitan Transit Authority (METRO). Seven METRO bus routes operate near or are within a quarter mile walking distance from campus. In Fall 2014, TSU's campus will have a new option in transportation with the opening of a METRO light rail station on the Southeast/Purple Line. This station will be a five minute walk from the eastern edge of campus. The station will serve neighboring University of Houston, including its new dormitories, and redesigned stadium.

Once on campus, TSU operates a small shuttle system, with multi-seat electric golf carts, that moves students and staff along the half mile long Tiger Walk promenade. Students, faculty and staff also walk, skateboard, and rollerblade around campus.

The purpose of this study is to further examine how students, faculty and staff commute to campus. The study also seeks to see if alternative modes of commuting to and from campus prove viable options. Furthermore, this study could serve as the background research for students, faculty, staff, but especially administrators to examine and see the advantages of possibly bringing these sustainable concepts to fruition on campus.

Literature Review

Carpools/Vanpools

Carpools and vanpools are rides coordinated either formally by an organization, or informally by the participants themselves. Some of the advantages of carpool, usually 2 – 4 people, include using of High Occupancy Vehicle (HOV) lanes, splitting rides with those that live in your vicinity, and sharing the cost of parking permits and gas (University of Houston, 2013; University of Michigan, 2013; GoTriangle, n.d.). Vanpools involve parties of seven to fifteen riders that commute daily with a passenger van. Vanpools, typically more formal than carpools, have with a designated driver and monthly fees, (University of Houston, 2013; University of Michigan, 2013). The convenience of vanpool is that you only pay for gas, have less stops, ride on HOV lanes, and can use the service on a part or full time basis (University of Houston, 2013; Washington Policy Center, 2010). Campuses and wider communities benefit from carpools and vanpools as they reduce pollution and help ease congestion (University of Michigan, 2013).

Several universities offer faculty, staff and students opportunities to sign-up online for carpools or vanpools. The University of Houston and the University of Michigan created web-based programs which allow riders to purchase mutual permits and anonymously search and select other van/carpoolers that live close to them (University of Houston 2, n.d.; University of Michigan 2, n.d.). Both universities site environmental benefits and parking mitigation as important effects of vanpool and carpools (University of Houston 2, n.d.; University of Michigan

2, n.d.). Furthermore, the universities note that alleviating commuting stress and offering more time to read, relax, and socialize as program benefits (University of Houston 2, n.d.; University of Michigan 2, n.d.). The University of Houston continues to develop both modes within their transportation toolbox (University of Houston 3, 2013). They are currently coordinating with METRO to establish vanpool plan that would serve the Woodlands/Spring area to the north and Southwest Houston/Sugarland area (University of Houston 3, 2013).

Rice University provides an employee carpool program where two or more Rice employees can share the payment of a single premium lot or garage decal (Morgan, 2014). It requires that employees or students carpool 60% of the time to continue to keep their carpool status (Morgan, 2014). The carpool will acquire one proximity card and a shared hangtag that must be displayed on the rear-view mirror (Morgan, 2014). When not carpooling, members have to park in areas not designated for single drivers (Morgan, 2014).

The Ohio State University partnered with their local regional planning organization to facilitate a vanpool program (The Ohio State University, 2010). At Stanford University, the transportation director stated that 8,000 members participated in the commuting club (Hamilton, 2013). Also, Stanford incentivizes this program with a Clean Air Cash that disperses \$1.5 million a year to students, staff, and faculty that carpool or vanpool (Hamilton, 2013). Stanford also uses Zimride, a rideshare service, that institutions can implement for its employees to carpool using its email and social media linked software (Zimride, n.d.). However, the database was not as robust as it could be (Hamilton, 2013).

Carshare

The concept of carsharing involves renting a car for a brief duration, usually by the hour from a designated location. Essentially, a student, faculty, or staff purchases a membership with a carsharing company (Zipcar, 2013). The convenience of using a carshare service, like Zipcar, the leader in the industry, is that gas and insurance are covered (Chaput, 2013). Over 100 colleges have established carsharing services on their campuses (Zipcar, 2013). Carshare vehicles are available at a variety of locations, reduce money spent on car payments and insurance, make a variety of cars available, and offer inexpensive memberships (Chaput, 2013). Stanford University started a partnership with the Zipcar in the 2007-08 school year with two cars, and now has expanded to 60 cars on campus (Hamilton, 2013). As a result the university has significantly reduced demand for parking spaces, allowing more property to be utilized for other purposes (Hamilton, 2013).

Since 2008, Rice University has been the only institution of higher learning in the Houston area with Zipcar. Communication with the university's transportation administrators revealed that Rice has six (6) different car models parked next to one another. Roughly one fourth of the student body holds a Zipcar membership (Gbordzoe, 2014). Furthermore, at Rice, most of the trips were for shopping or entertainment related activities, with occasional trips outside of the City of Houston (Gbordzoe, 2014). Zipcar does yearly promotions where student organizations compete for "riding credit" (Gbordzoe, 2014). The feedback from the city student body has been overwhelmingly positive (Gbordzoe, 2014). Although, Rice has a Zipcar program, only students are allowed access to those vehicles (Gbordzoe, 2014). In 2014, Zipcar expanded their presence

in Houston with a downtown office (Ryan, 2014). Likewise, it launched 25 cars in the downtown, Midtown, and Greenway Plaza areas, with more cars anticipated (Ryan, 2014).

Bikeshare

Bikesharing offers an alternative transportation method that is efficient and malleable for the user, with stations scattered across a city. Bikeshare users pay membership and usage fees that can be daily rates, weeklong, and yearlong memberships (U.S. PIRG, 2013; Houston B-cycle, 2014). The Washington, DC Capital Bikeshare, launched in 2010, has 35,000 yearly members with about 4.1 million cumulative miles pedaled (U.S. PIRG, 2013). The number of bike sharing systems has grown to 34 cities, with over 35,000 bikes total around the country (Schmitt, 2013).

In 2013, Houston B-cycle began in the city, and now has around 30 stations with hundreds of bikes to rent. Only one station is in the Third Ward area, with the majority downtown, Midtown, and a couple in East of Downtown (EaDo), The Medical Center (TMC), and the Heights (Houston B-cycle 2, 2013). The 24 hour system is accessible through the use of credit cards, and any emergency or maintenance issues can be quickly communicated to the company (Houston B-cycle, 2013). Correspondence with the director of the program expressed his opinion that it has been a success and will continue to steadily grow (Rub, 2013).

There are a diverse number of mechanisms that colleges have established to facilitate and encourage a campus bicycling program. A larger public appeal to biking is matched by colleges trying to remain competitive, utilizing a bicycle program as a recruiting tool on dense and active campuses (Tang, 2010). Some schools have in-person check-out systems, while others use high-tech automated programs (Tang, 2010). A few schools mandate membership, others a rental fee, and some may be completely free to students (Tang, 2010). Rutgers University manages a 150 bicycle rental program, with stations across the campus that are affordable and accessible through an online system (Rutgers University, 2010). Stanford University has 18,000 bike racks and about 13,000 bike tracks on its campus (Hamilton, 2013). Stanford operates a foldable bicycle program, which can be stored in smaller spaces, that is subsidized by weekly rental payments (Hamilton, 2013).

Two major criticisms arise when examining bikeshare programs. First, in other cities, one lingering issue involves the lack of participation among lower-income residents. Generally, bikeshare programs require the user to possess a credit card; unfortunately, this may preclude lower-income persons from participating if they do not have credit cards (Schmitt, 2012). Second, some bikeshare programs experience problems with theft. However, the addition of geo-location technology on the bikes makes it possible to mitigate thefts and coordinate the system more efficiently (U.S. PIRG, 2013; Houston B-cycle, 2013).

CAMPUS COMMUTE INFORMATION/RECOMMENDATION

The research into alternative commuting methods for student, faculty, and staff has provided a blueprint for Texas Southern University. The recommendations are based on the three options for a carshare, carpool/vanpool, and bikeshare/bicycle program on campus. It will showcase some of the pro-active steps the research has done to have some of these options materialize. Essentially, the authors have conducted some extensive preliminary groundwork, so administrators can have a guidepost to further advance these ideas.

Carshare

The carshare program that could likely best serve the TSU is Zipcar. It is well established on several dozen campuses, and TSU will likely benefit as well. After contacting the university liaison of Zipcar, the researchers obtained information about TSU's attributes that would make it a good fit for the company. The authors contacted the university's lead parking system and maintenance personnel about aspects of carsharing, and received pertinent feedback. Next, the research team shared the demographic and geographic profile of TSU with Zipcar. The Zipcar spokesperson determined that the school was approved to have two (2) cars on campus to start a program here. The entire system would be free to TSU and would only require two (2) parking spaces, most likely in a garage. The maintenance of the cars is conducted by a contractor of Zipcar. The company seemed enthusiastic about getting a program on campus started and sent paper work over to be completed by school administrators. This is where the relationship between Zipcar and TSU has remained, and only requires university personnel to approve and initiate the program.

Carpools/Vanpools

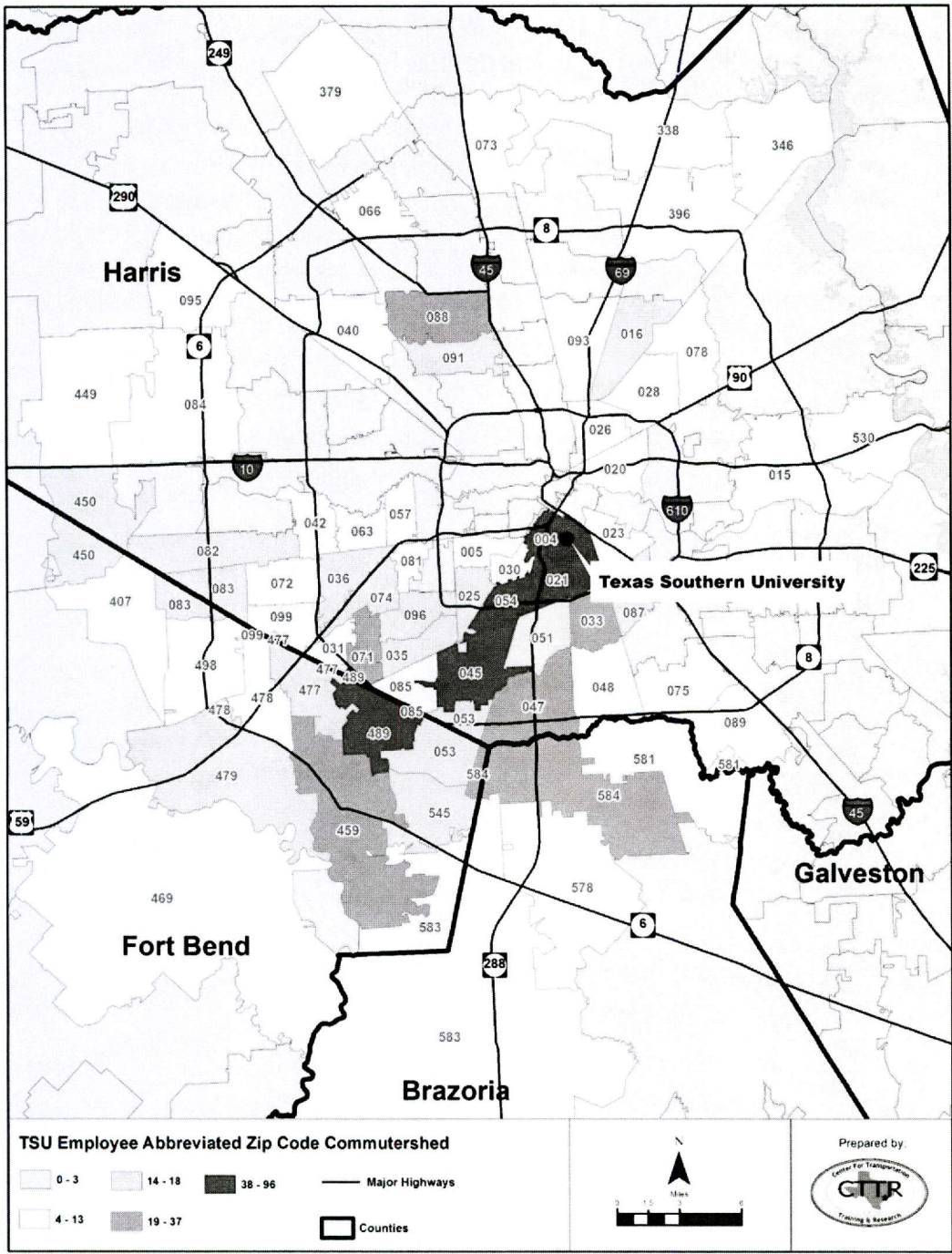
The implementation of a carpool/vanpool program was examined with the idea of establishing a system on TSU's campus. The authors suggested that initially a vanpool program be exclusive for the use of TSU faculty and staff. An online system could be enabled that allows seamless contact between riders and passengers. This software could be designed as a smartphone application by computer science faculty and students or a professional provider. As other schools have shown, the system that would protect the users' anonymity while showcasing people that live in the same vicinity. The authors contacted various appropriate TSU personnel while looking into this possibility, who provided valuable insight on circumstances regarding implementation of a carshare program (Bunch, 2013; Kirk, 2013). An employee commutershed map was created for TSU, exhibiting the zip codes where most of the faculty and staff live, shown in Figure 13. The blue numbers are the last three digits of the zip codes where most employees reside. Zip codes in red represent the highest volume of employees.

The recommendation is that carpooling or vanpooling could occur in some of the outlying zip codes. Seemingly, both carpool and vanpool pickup and drop off schedules and locations could be determined by the drivers and passengers themselves, with minimal external oversight.

Bikeshare

Preliminary discussions with state Senator Rodney Ellis' office, a TSU alum and supporter of cycling infrastructure, showed his ambition to bring Houston B-Cycle to campus (Schleifer, 2013; Brown, 2014). Senator Ellis' office also searched for funding. The research team

communicated with the director of Houston B-cycle to explain this study and how a bikeshare service could be integrated on or near campus. The director was enthusiastic about placing the bikeshare on or near TSU's campus. However, the cost to bring a typical 11-bike station exceeded \$25,000; Houston B-cycle would contribute 60% of the cost, and the rest of the amount would have to come from other sources (Rub, 2013). Subsequently, three graduate researchers (2 Urban Planning and Environmental Policy doctoral students and 1 Transportation Planning and Management graduate student) searched for grant money to help pay for the balance. This led to these students, submitting a proposal to the 2013 Ford HBCU Community Challenge.



Source: Texas Southern University, Office of Institutional Compliance, 2013

Figure 13: Texas Southern University Employee Zip Code Commutershed

This sustainability competition would award \$25,000 to the winning team; unfortunately, the project team was not awarded by the Ford HBCU College Challenge program. Nonetheless, correspond with the Houston B-cycle and state Senator Ellis' office continues regarding adding a bikeshare station adjacent to campus.

While conducting this research, TSU Student Services implemented an on campus bicycle program in spring 2013. An assortment of bikes was made available for students to utilize on and off campus. The approach for accessing the bicycles including signing up and retrieving a bicycle from one of the garages (Saunders, 2013). Although participation in the program is low, the research team supports the strides being made to provide students with transportation options on and around campus.

Public Transportation and walking

Public transportation is still a viable alternative for many students, faculty, and staff. The 2014 completion of the Robertson Stadium/UH/TSU light station on the Southeast/Purple Line will only enhance the ability of the people use and enjoy this mode to and from campus. The school should consider steps to make the university community aware of this new transportation feature, thereby creating connectivity between the campus and the rest of the city.

CONCLUSION

Balancing growth on campus and finding sustainable mobility options proves important as TSU moves forward in the next decade. As the university adds more academic programs and enrollment increases, university officials will need to make decisions regarding parking, green living, and mobility. What follows summarizes potential options for persons commuting to TSU.

With the proposed improvements to METRO's bus system and the addition of a rail line, TSU will have greater and faster access to various destinations throughout the city. Hopefully, these changes will mean that more faculty, staff and students use public transportation. Connectivity with the new rail would be more viable with the addition of a B-cycle station; however, the lack of funding will not allow for a station directly on the campus. In the future, researchers and university officials should continue to revisit this option or at least the possibility of a station just outside of the campus. Vanpools and carpools present viable possibilities for staff and faculty, especially for those living in the suburban areas of the greater Houston area. Because carpools and vanpools are relatively inexpensive, university officials should continue to investigate the next steps to establishing a carpool option. Finally, carsharing remains a vibrant and growing business. TSU students could benefit from a program that allowed them access to a shared vehicle without the issues of car maintenance, insurance, and expensive payments.

The above study provided insights on the various means for students, faculty and staff to commute to campus. While some of the options were free, others required substantial investment. The research team hopes that those options that are easiest to implement be given the most consideration. If one or several of these alternative transportation concepts are pursued, TSU will become a more efficient and sustainable organization in Houston and Texas.

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APPENDIX A

BICYCLE

1. How do you envision Bike-Sharing working on TSU's campus?
 - Promotion of new bike trail (awareness campaign)
 - Need a commuter survey (faculty, staff and students)
 - Connect with METRO
 - Paying for

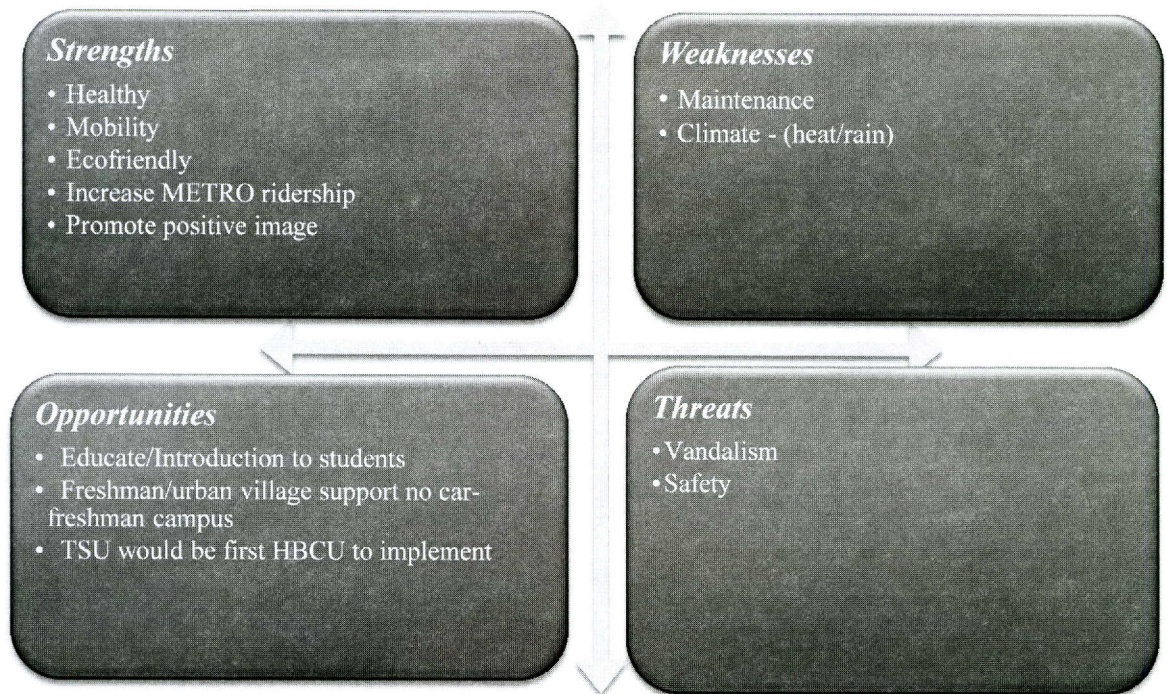
2. List three reasons why this mode of transportation will be beneficial to campus:
 - Move students faster around campus (dorm to campus)
 - Introduction to another mode of transit
 - Connectivity to bike/trail initiative
 - Health

3. What will make the TSU community interested in participating in a Bike-Sharing program?
 - Incentive (money)
 - Save (money)
 - Receive/Earn (money) towards books, football games, bowling, cafeteria

4. Who else on campus should be involved in bringing Bike-Sharing to campus?
 - Transportation
 - Administration
 - Urban Planning

5. Who off campus should be involved in bringing Bike-Sharing to campus?
 - Bike company
 - Geared Up
 - METRO
 - UH and Rice

6. Please list the Strength, Weakness, Opportunity, Threats (SWOT Analysis) associated with implementing a Bike-Sharing Program on campus.

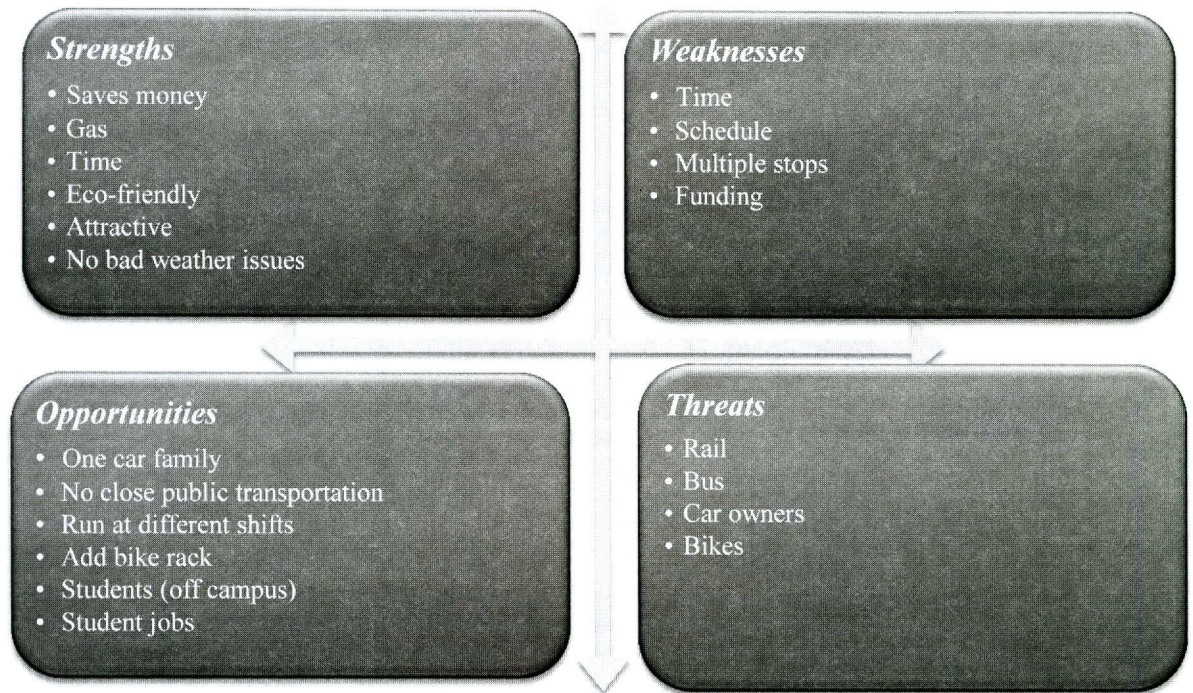


APPENDIX B

VANPOOL

1. How do you envision Vanpool working on TSU's campus?
 - Commuting from different locations
2. List three reasons why this mode of transportation will be beneficial to campus.
 - Gas saver
 - Eco-friendly
 - Parking saver
 - Money Saver
 - Can work or sleep while someone else drives
3. What will make the TSU community interested in participating in a Vanpool program?
 - Subsidies that will help
 - Advertise
 - Offer incentives
 - Locations
4. Who else on campus should be involved in bringing Vanpool to campus?
 - Inform parking department
 - Posting
5. Who off campus should be involved in bringing Vanpool to campus?
 - METRO
 - Anyone that can subsidize the van.

6. Please list the Strength, Weakness, Opportunity, Threats (SWOT Analysis) associated with implementing a Vanpool Program on campus.



APPENDIX C

ZIPCAR

1. How do you envision ZipCar working on TSU's campus?
 - Understanding who will purchase/invest zipcar
 - Students can use them
 - Faculty/staff/students use zipcar location near METRO Transit center
2. List three reasons why this mode of transportation will be beneficial to campus.
 - Economical/Eco-friendly (possibility of Eco-credit –going green)
 - Helps relieve parking responsibility
 - Accessibility on campus
3. What will make the TSU community interested in participating in a ZipCar program?
 - Benefit students/staff without transportation (out of state, international)
 - Raises profile of the university
4. Who else on campus should be involved in bringing ZipCar to campus?
 - Administration
 - Student organization
 - Staff council
5. Who off campus should be involved in bringing ZipCar to campus?
 - Alumni community
 - Corporate donors

6. Please list the Strength, Weakness, Opportunity, Threats (SWOT Analysis) associated with implementing a ZipCar Program on campus.

