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MTSU Clean Energy Initiative Project Funding Request

There are five (5) sections of the request to complete before submitting. See <http://www.mtsu.edu/sga/cleanenergy.html> for funding guidelines. Save completed form and email to cee@mtsu.edu or mail to MTSU Box 57.

| 1. General Information | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Name of Person Submitting Request Josh Stone | |
| Department/Office Campus Recreation | Phone # (Office) 904-8484 |
| MTSU Box # 556 | Phone # (Cell) 615-498-7831 |
| E-mail josh.stone@mtsu.edu | Submittal Date |
| 2. Project Categories (Select One) | |
| Select the category that best describes the project. | |
| <input checked="" type="checkbox"/> Energy Conservation/Efficiency | <input type="checkbox"/> Sustainable Design |
| <input type="checkbox"/> Alternative Fuels | <input type="checkbox"/> Other |
| <input type="checkbox"/> Renewable Energy | |
| 3. Project Information | |
| <p>a. Please provide a brief descriptive title for the project.</p> <p>b. The project cost estimate is the expected cost of the project to be considered by the committee for approval, which may differ from the total project cost in the case of matching funding opportunities. Any funding request is a 'not-to-exceed' amount. Any proposed expenditure above the requested amount will require a resubmission.</p> <p>c. List the source of project cost estimates.</p> <p>d. Provide a brief explanation in response to question regarding previous funding.</p> | |
| 3a. Project Title: <i>MTSU's Progression Towards Becoming A Bicycle Friendly University (MT-BFU)</i> | |
| 3b. Project Cost Estimate: <i>\$33,068</i> | |
| 3c. Source of Estimate: <i>Budget of previously funded project as well as a new quote from MOAB Bicycle Shop</i> | |
| 3d. If previous funding from this source was awarded, explain how this request differs. <i>The two main improvements this request has over the previous request are: 1. We have evidence of success of the MT-BFU on campus, and 2. We can focus our efforts on the sustainability of MT-BFU which will impact petro-energy consumption and reduce air pollution on campus.</i> <i>In the previous request, we were speculative about the success of a bike program at MTSU, and we had to extrapolate evidence of successful bike</i> | |

programs offered on and around other university campuses. We had well defined measures of a successfully implemented bike plan through the League of American Bicyclists (LAB) Bicycle Friendly University (BFU) Certification (LAB, 2012). Please see Attachment "____" for LAB BFU Certification Criteria. However, we could not directly infer the successes of a BFU such as, the criterion, Stanford University could be replicated on our campus. Despite the differences in climate, community needs, and on/off campus infrastructure, our estimations of MTSU's readiness for a comprehensive bike plan (MT-BFU) were correctly identified!

4. Project Description

(Completed in as much detail as possible.)

- a. The scope of the work to be accomplished is a detailed description of project activities.
- b. The benefit statement describes the advantages of the project as relates to the selected project category.
- c. The location of the project includes the name of the building, department, and/or specific location of where the project will be conducted on campus.
- d. List any departments you anticipate to be involved. Were any departments consulted in preparation of this request? Who? A listing may be attached to this form when submitted.
- e. Provide specific information on anticipated student involvement or benefit.
- f. Provide information for anticipated future operating and/or maintenance requirements occurring as a result of the proposed project.
- g. Provide any additional comments or information that may be pertinent to approval of the project funding request.

4a. Scope: Work to be accomplished

The goal of this project is to have responsibly planned growth of bicycle use on campus so that we can impact the number of people who use petro-energy resources when commuting on campus. The continued effort of the MT-BFU is to continued progression of MTSU's status as a LAB Certified Bicycle Friendly University.

*With this project, we want to **increase the number of bicycles that can be safely stored on campus** in designated bicycle parking facilities and we want to **increase the bicycle rental fleet size to better meet the current demand**. We want to encourage students and campus staff to ride and store their bikes on campus, thus reducing the automobile congestion on campus while also reducing the consumption of petro-energy.*

The location of these bicycle shelters will be on the perimeter of campus and will be stationed in locations that support bicyclists' use of the paths of buses/automobile traffic on campus. The shelters provide the incentive of increased protection from weather and will entice bicyclist to use the planned on campus bike path, rather than using the congested pedestrian walkways. These new shelters will be used in conjunction with the (re)education initiative to encourage bicyclists to

ride on the planned bicycle route while also increasing the capacity of covered bicycle storage on campus by 15 bike parking spots under each new shelter resulting in total of 30 new covered parking spots. This increase in covered bicycle parking offered on the campus will promote the use of our planned bike route.

Secondly, we will be increasing our bicycle rental fleet by 35% from 15 bikes to 23 bikes. This is a modest growth model and the request of eight additional single speed commuter bikes would allow us to meet our rental demands without stressing the current infrastructure. The current fleet of 15 rental bikes, were rented a total of 300 times or approximately 20 times each during the fall semester. Assuming the pattern of use is stable, eight more bikes would allow us to support an additional 160 rentals for a total increase of 50% of service rendered to the students and campus staff.

Last semester, the first semester of the bike program, we had over 300 rentals from 30+ students, which commonly exceeded our supply. We proposed the purchase of a different model rental bike than the ones we previously purchased. The model bicycle recommended by MOAB Bicycle Shop is a speed bike made by Trek. This model will be easier for our on campus bike technicians to maintain.

Finally, we will be increasing our educational campaign to make bicycling even safer on campus. This includes kiosks with information on how to properly lock your bike, maps of the MTSU Campus Bicycle route, bicycle safety workshops, and continuing with our bike shop which helps keep everyone's bike able to be ridden

4b. Scope: Benefit Statement

This current request contains evidence to indicate the extent to which success the MT-BFU has been successful, and hopes to appeal for additional funding that will be used to increase the impacts and sustainability of the MT-BFU through the calculated expansion of bike usage on campus that can be accomplished safely through a well implemented master plan that will use evidenced based methods of measurement to ensure continued smart, planned growth of safe bicycle use on campus.

4. Project Description (continued)

4c. Location of Project (Building, etc.)

Bikes will be housed at the Campus Recreation bike shop. The first bike shelter will be located adjacent to the library closest to the white tag parking area. The second shelter will be located adjacent to the road near Peck Hall.

4d. Participants and Roles

To ensure that bicycle use continues to increase responsibly on campus, the MT-BFU will coordinate with the educational leadership through continued (re)education initiatives, work with campus planning to improve bike usage on campus, and corroborate with campus police to improve automobile driver and bicyclist comprehension of proper road-sharing laws and proper bicycling etiquette whilst traveling on pedestrian walkways so that we can sustain the MT-BFU and thusly reap the maximum rewards of effective energy conservation as well as benefit from the reduction in campus pollution.

4e. Student participation and/or student benefit

Student participation has been recorded from one semester. Through the records kept by the on campus bike rental staff, we can show that students and staff are using the bike rental service. In fact, the demand for rental bikes have exceeded current fleet capacity. Furthermore, we repaired 40+ bikes, and held numerous successful bicycle safety workshops and leadership clinics. These programs serve not only offer students new services and educational opportunities, but it also provides a foundation for a more green campus.

When interviewed Randy Weiler for the MTSU News paper, Dr. Phil Oliver agreed that the MT-BFU offers an opportunity to "...make our campus 'greener' and more navigable". Students in Dr. Oliver's philosophy classes even discuss the MT-BFU in his environmental ethics class. Thus, the reach of the MT-BFU plan has had a broader impact than we could have predicted last year. Students have benefitted from both from the services offered by the MT-BFU plan, but they have also experience this extremely successful means of outreach and interconnectedness of bicyclists that have made blended several different peoples, departments, levels of education and allowed them to bond over a common interest(s).

Currently we offer the following MT-BFU educational outreach projects: Freshman Leadership Courses on bicycle safety and transportation laws. As part of the general education course work physical education electives existing through the campus recreational facility, pedestrian/bicycling etiquette workshops and presentations are offered to students. At the annual Healthy Campus Day, the MT-BFU Outreach showcased the campus bike shop workers who were available to answer common bicycling questions, presented and promote the rental commuter bikes for students and campus staff to test. Furthermore, the campus bike shop staff demonstrated how to maintain safe bikes. Lastly, bicycle safety flyers were circulated in the campus parking maps that are distributed when campus parking passes are issued.

4f. Future Operating and/or Maintenance Requirements

Future operating and maintenance requirements are assumed by Campus Recreation. All maintenance of bicycles and bike shop employment is included in the Campus Recreation budget. In addition, Campus Recreation will ensure that all shelters are kept up and all kiosks at the shelters are kept up to date.

4g. Additional Comments or Information Pertinent to the Proposed Project

This project is essential into the completion of a successful and safe bicycle program at MTSU. In its first semester, the program has already received notoriety through Channel 4 news, the Daily News Journal, and on the front Web Page of MTSU. The program is also becoming a model to all other Tennessee Universities, has been presented on at the Tennessee Intramural and Recreational Sports Association conference, and has received attention through Mayor Dean's Bicycle, Pedestrian, and Commuter council. We have already successfully deterred students from driving short distances to school, which has significant environmental impact. In addition, we are becoming successful in changing the culture that has long used autos as their main source of short mileage commuting.

5. Project Performance Information

Provide information if applicable.

- a. Provide information on estimated annual energy savings stated in units such as kW, kWh, Btu, gallons, etc.
- b. Provide information on estimated annual energy cost savings in monetary terms.
- c. Provide information on any annual operating or other cost savings in monetary terms. Be specific.
- d. Provide information about any matching or supplementary funding opportunities that are available. Identify all sources and explain.

5a. Estimated Annual Energy Savings (Estimated in kW, kWh, Btu, etc.)

MTSU is a large campus that is spread over 515 acres of land. When converted, campus extends over 4.2 million square feet (www.mtsu.edu/TBRmeeting/fact_sheet.php, 2012). On our campus has several on-going construction projects as well as a student/staff population that commute to campus can result in acute changes in air quality. These are environmentally challenging because they increase the concentration of chemicals in the air as well as ground water sources. In an epidemiologic study, researchers have concluded that air pollution can increase in areas where there is a flux of new pollutants.

Harmful health effects of air pollution have been connected to acute morbidity and mortality when pollution particulate matter acutely concentrate from 30 to 150 micrograms/M³ (National Institute of Health, 1996). National Aeronautics and Space Administration (NASA) reported that the main contributor to increased particulate matter is automobile travel (NASA, 2010). In a study by Grabow and colleagues (2012), the researchers used census data to calculate the impact of air quality by removing the effect of short automobile trips. The results were astonishing! Hourly air quality improvements **reduced health care costs of 4.94 billion dollars per year**. If people substituted half of all short trip could exceed 8 billion dollars of health care related to air quality and improved physical fitness profiles.

5b. Annual Energy COST Savings (\$)

An Expedited Internal Review Board (IRB) Form is currently under review. A research project to determine how effective the MT-BFU is in reducing related costs (i.e. travel, maintenance, sick days, etc...).

5c. Annual Operating or Other Cost Savings. Specify. (\$)

The MT-BFU fee for bike rental/use will offset the annual operating costs not covered in this funding request.

5d. Matching or Supplementary Funding (Identify and Explain)

N/A

2nd semester budget

| | Quantity | Cost | Total |
|---------------------------------------------|----------|-------------|-------------|
| Additional commuter bikes for rent | 8 | \$350.00 | \$2,900.00 |
| Locks for bike | 8 | \$18.00 | \$144.00 |
| Rear baskets | 8 | \$24.00 | \$192.00 |
| Rack for baskets | 8 | \$24.00 | \$192.00 |
| | | | |
| | | | |
| Kiosk signs at pavillions | 4 | \$220.00 | \$840.00 |
| Bicycle pavillions | 2 | \$10,400.00 | \$20,800.00 |
| Concrete pads and installation for shelters | 2 | \$2,800.00 | \$5,600.00 |
| | | | |
| | | | |
| Research and measurement | | | \$3,300.00 |

TOTAL**\$33,968.00**

Middle Tennessee State University's Progression Toward Being a Bicycle Friendly University (MT-BFU)

Prepared for: Green Energy Committee

Prepared by: Rose Carter

February 22, 2013

Proposal number:

Objective

The Middle Tennessee State University (MTSU) Bike Friendly University (MT-BFU) is a multifaceted program. The purpose of the MT-BFU is to establish bicycling as a safe and supported means of transportation on campus for student, faculty, and staff. With proper implementation, MTSU will qualify as a Bicycle Friendly University (BFU) through the League of American Bicyclists (LAB), which is an honorable designation that recognizes universities that embrace bicycling as a means of transportation for their respective communities (League of American Bicyclists, 2012). Please see Attachment A for the progress of MTSU in meeting the LAB BFU guidelines.

The Middle Tennessee State University Bike Friendly University (MT-BFU) program was recently launched Fall Semester, 2012. The purpose of the MT-BFU is to establish bicycling as a safe and supported means of transportation on campus for student, faculty, and staff. Currently campus is under substantial infrastructural renovation to the structure of campus buildings, sidewalks on the periphery of campus, thoroughfares around campus, and in some parking lots. In May 2012 MTSU Campus Planning posted the following campus projects were, and are currently still, underway: Science Building, Student Services Building and Parking Garage, Parking and Transportation (resurfacing), Deere and Nicks Hall Housing Renovation, and Campus Lighting Upgrade. All of these projects will take several years fully complete.

Safe means of pedestrian, bicycling, and automobile traffic and parking has become more inconsistent. The available parking is farther from the center of campus. MTSU Parking Services Website reported in May 2012 that their objective includes provisions of safe, adequate, and attractive parking should be "...no more than 10-15 minutes walk or drive to the core of campus." The increases in road, sidewalks, and parking lot closures traffic on campus has become more dangerous and less efficient causing delays with travel time. Therefore, MTSU is not meeting the goals set by MTSU Parking Services. However, the campus traffic conundrum could be improved even after the campus construction comes to a close by providing additional incentives to park at lots further from campus. By creating a more bicycle friendly university, MTSU will be decrease it's carbon footprint, while simultaneously encouraging a more physically active lifestyle in a safe environment. By increased number of bicycling commuters on campus, MTSU will lessen the burden of automobile traffic congestion that tends to plague campus. Through establishing new, safe bike routes and offering campus-wide courses on bicycle safety, MTSU can decrease the burden of pedestrian-bike congestion while also decreasing the frequency of bicycle/automobile related accidents on campus.

Solution

Currently the MT-BFU plan has two open-air bicycle shelters planned for parking bikes on campus. The goal is to divert traffic in areas surrounding highly sought-after parking lots that see the highest volumes of traffic. To ensure that MT-BFU can have an impact on traffic in these highly populated areas, additional bicycle friendly infrastructure measures are need. Currently, two covered bicycle shelters are funded. However, two shelters are too sparse for MTSU's campus size. Further, MTSU's growth has an impact on parking, road, and other sidewalk closures due to campus construction (see ATTACHMENT B). The proposed additions are as follows: two additional open-air, solar lighted bicycle shelters, additional bicycling safety signage along pathways and at the new shelters, as well as increasing education for bicycle safety classes, and research currently bicycling campus users to determine where high bicycling traffic areas are, and if there areas have distinctly marked bicycle friendly on campus paths. These proposed additions would also MT-BFU closer to meeting the League of American Bicyclists (LAB) qualification.

MTSU stands to benefit in reductions in automobile traffic in high traffic areas on campus, furthering the goals of the funded MT-BFU program to meet the qualifications of LAB, and increase the campus' support of alternative energy programs and infrastructure by adding more bicycling friendly.

Education/Encouragement Beyond the signs designated for the pavilions, monthly bicycling educational clinics by Middle Tennessee Outdoor Pursuits (MTOP), as well as bicycle rules insert into every campus

transportation handbook will be provided to students, faculty and staff. MTOP clinics will focus on bicycle safety, proper bicycle maintenance, as well as cyclists' awareness (i.e. proper clothing for the weather, hydration and energy food consumption). Further, part of the MTSU general education requirements physical education classes are offered in bicycling (beginner, intermediate levels). With every bicycle rental from MTOP, MT-BFU Bike Staff Form to include a Pledge of abiding by bicycle safety rules, as well as a Helmet Pledge. These types of pledges have been shown at Stanford University as an effective means of bike-user awareness and increase the cyclist's commitment to bicycle safety. Future plans are to incorporate credit/non-credit classes to educate motorists and bicyclists to provide a more comprehensive bicycle safety and education program. Lastly, campus law enforcement officers are already routinely educated about bicycling safety regulations and are agreeable to the tentative MT-BFU plan.

Education/Encouragement Beyond the signs designated for the pavilions, monthly bicycling educational clinics by Middle Tennessee Outdoor Pursuits (MTOP), as well as bicycle rules insert into every campus transportation handbook will be provided to students, faculty and staff. MTOP clinics will focus on bicycle safety, proper bicycle maintenance, as well as cyclists' awareness (i.e. proper clothing for the weather, hydration and energy food consumption). Further, part of the MTSU general education requirements physical education classes are offered in bicycling (beginner, intermediate levels). With every bicycle rental from MTOP, MT-BFU Bike Staff Form to include a Pledge of abiding by bicycle safety rules, as well as a Helmet Pledge. These types of pledges have been shown at Stanford University as an effective means of bike-user awareness and increase the cyclist's commitment to bicycle safety. Future plans are to incorporate credit/non-credit classes to educate motorists and bicyclists to provide a more comprehensive bicycle safety and education program. Lastly, campus law enforcement officers are already routinely educated about bicycling safety regulations and are agreeable to the tentative MT-BFU plan.

Green Energy and BFU Research

Both dimensions of the MT-BFU lower climate emissions and improve carbon footprint having a greater affect on the environmental. Approximately 19 pounds of carbon are released from every gallon of gasoline consumed by an automobile (Department of Land, Building & Real Estate Stanford University Parking & Transportation Services). Stanford University, which has a platinum status BFU by the LAB, is the best bicycle program to model. Stanford University's automobile single-commuter (per car) rate dropped 24% from 2002 to 2010. This change came because of a large-scale effort to increase bike commute rate; the rate for bicycle commuters increased 21.7% (Department of Land, Building & Real Estate Stanford University Parking & Transportation). As part of the MT-BFU comprehensive approach for a sustainable bicycle community on campus, an ongoing research based approach to analyzing the data produced by the MT-BFU.

The following is the areas of measuring the effectiveness of the plan by tabulating the following:

- Measure how many students and staff are buying rental card for \$15, which allows for rentals for a one week period at any time for during a semester.
- Quantify the number of students and staff that renew rentals over consecutive weeks (based upon bike availability).
- Determine how many participants sign the MT-BFU Pledge to follow all rules and regulations based on bike safety on campus
- Helmet commitment, and the number of participants who take advantage of renting helmets through MTOP.
- Follow up with how many renters said that they used a helmet and bike lock during rental period to determine the effectiveness of the MT-BFU Helmet Pledge.
- Determine the dissemination offering of gear, education proper use safety to include protective gear, bike routes for commuting on and near campus with designated bike racks, pavilions addressed, vehicle (road) and MT-BFU pedestrian (walkways) safety, bike maintenance weatherizing, emergency maintenance, as well as rider gear safety for weather.

A second goal of MT-BFU Research is focused on improving of flow of bike traffic on campus and focused educational outreach promote. Currently pedestrian, automobile, and bicycle traffic are not well defined. By quantifying bicycle traffic by location to determine routes most frequently traveled each day. Since class schedules widely vary from student to student as well as between days of the week, a consecutive 14 days of data collection are needed to establish reliability of route detection. Systematic measurement collected by Land, Air, Sea Global Positioning System (GPS) will be attached to the rented bikes and current bike owners who commute by bike on campus. This proposed study to research current bicycle paths on campus would provide valuable information in targeted educational measures aiding in the detecting current non-adherence

to bike safety rules to establish future best practices. Further, the data can be used to determine the placement of safer, better positioned bike routes around campus for future campus planning.

Currently, MTOP and Kinesmetrics Department in Health and Human Performance have collaborated to develop the MT-BFU efficacy research studies. Together the departments have 8 GPS needed to carry out this study. Due to the seasonal fluctuations and varied class schedules, data collection for this study with only 8 GPS devices would likely be influenced by weather and schedule related biases. To produce valid and reliable measurements, the project would need to have approximately 20 GPS units (12 x \$250 = \$3,000). With the data collected from GPS, the researchers can use geo spacial maps using Google Earth and in the future software ArcGIS 3D (1 x \$2,500) to produce 3 dimensional maps of bike routes as well as determine what effect topography has on participants bike transit on campus. With both Google Earth and ArcGIS 3D software, a large amount of computer memory is used to produce visual and map rendering. There are currently no computers with enough unused memory that can be devoted for higher visual graphic operations. Proposed budget includes a laptop (1 x \$1,500) to be used with GPS data. The rational for its inclusion is with increased power and higher resolution, the researchers will report to MTOP and MTSU better details, and thus better information about characteristics of the paths most traveled by cyclists on campus.

A comprehensive approach is required to make a sustainable and fortuitous MT-BFU plan. Contacts and connections have been made with on-campus departmental personal who can make affectively implement policy in Transportation Services, Campus Police, Campus Planning, etc.

References

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- Department of Land, Building & Real Estate Stanford University Parking & Transportation Services. Alternative Transportation: Bicycling at Stanford. Retrieved from <http://transportation.stanford.edu/Directions.shtml>
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- Middle Tennessee State University Parking Services. (2012). Parking services. Retrieved September 7, 2012, from <http://www.mtsu.edu/parking/>

ATTACHMENTS

ATTACHMENT A: LAB BFU

Creating a Bicycle Friendly University at MTSU

Engineering

1. Does your campus have a comprehensive, connected, and well-maintained bicycling networks?
Currently no paths for bicycle traffic exists. Better paths with covered pavilions will help connect campus to satellite parking with both campus as well as other parking locations on campus.
2. Is bike parking readily available throughout the campus? There are several bike racks, but many of them are ill placed would and would be better to redirect bike traffic away from heavily populated pedestrian walkways. Adding covered bike parking options would encourage students to divert bike traffic away from areas such as the sidewalk in front of the Business and Aerospace Building through Todd Hall.
3. Is the university easily accessible by bike? Outside of campus, where the majority of student housing is located is not easily accessible. Automobile traffic is high and the roads do not contain shoulders nor do they have bike lanes. Once bicyclists are on campus, pedestrian traffic and ignorance of bike laws often results in unsafe riding conditions.

Education

1. Does the college or university offer bicycling education classes for students and staff? Not at all.
This could be covered with a 1hr credit course on bike safety or even by MTOP hosting various bike safety classes. Another great idea is to offer or mandate a bike safety seminar to each incoming freshmen class.
2. Are there classes for campus motorists on how to share the road with cyclists? No, but there should be.

Encouragement

1. Does your college or university have an up to date bike map? No
2. Are there incentives offered for students and staff that commute by bike? No, but there is great room for incentive programs. Reduced parking passes, late start on the workday, etc.
3. Is there an active bicycle advocacy group at the college or university? Yes and it is growing. Next year we even propose registering with Student Organizations.
4. Is there on campus bike center for rentals and repairs? Yes

Enforcement

1. Do campus safety/law enforcement officers receive training on the rights and responsibilities of all road users? Yes
2. Does your campus have law enforcement or other public safety officers on bikes? Yes
3. Is there a program on to campus to prevent bike theft? Yes
4. Is there an institutional plan or program to reduce bicyclist crashes? No
5. Does your college or university have a current comprehensive bicycle plan? No
6. Does your college have a bicycle program manager? No

ATTACHMENT B: MT-BFU Budget

| Items | Quantity | Cost | Total |
|--------------------------|----------|-------------|-------------|
| Bicycle pavilions | 2 | \$14,000.00 | \$28,000.00 |
| Rules of bicycling signs | 2 | \$105.00 | \$210.00 |
| Bicycle road map signs | 2 | \$105.00 | \$210.00 |
| Proper locking sign | 2 | \$105.00 | \$210.00 |
| Research Measurement | 1 | \$2,863.00 | \$2,863.00 |
| Research Education | 1 | \$2,863.00 | \$2,863.00 |
| | | | |
| TOTAL | | | \$34,356.00 |