Rec 2/17/14

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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.shtml 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 and Rose Carter	
Department/Office Campus Recreation Department	Phone # (Office) Josh (615) 904-8484 Rose (615) 484-7941
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2. Project Categories (Select One)

Select the category that best describes the project.

X	Energy Conservation/Efficiency		Sustainable Design
	Alternative Fuels		Other
	Renewable Energy		

3. Project Information

a. Please provide a brief descriptive title for the project.
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.**
c. List the source of project cost estimates.
d. Provide a brief explanation in response to question regarding previous funding.

3a. Project Title

Advancing MTSU's Progression Towards Becoming a Bicycle Friendly University

3b. Project Cost Estimate

$19,295.00

3c. Source of Estimate

Bicycle Pavilion:
First, we contacted Arthur Reed at MTSU's Campus Planning Department who directed us to Tolar Manufacturing for the construction bid for the proposed bicycle pavilion and to Terri Carlton for the estimate for the concrete services required to erect the bicycle pavilion.

Bicycles and Bicycle Gear:
Murfreesboro Outdoor and Bicycle (MOAB) provided estimates for the Trek 7.1 multispeed bicycles, locks, repair stand, and bicycle commuter safety lights

Bus Wrap Signage:
Ron Malone with MTSU Events and Transportation Services provided us with the estimated cost for the bicycle publicity/bicycle safety bus wrap sign

3d. If previous funding from this source was awarded, explain how this request differs?

The current request for funds differs from previous requests in three ways: 1) We have additional evidence of success of Middle Tennessee Bicycle Friendly University (MT-BFU) programs and services. 2) These successes can be quantified by the increased demand for services that supersedes our current inventory, and which requires additional facilities to meet the needs of the MTSU community. 3) In compliance with the Tennessee Department of Transportation Bicycle Traffic Laws and the safety of MTSU motorist and cyclists, all MTSU rental bicycles must be outfitted with lighting equipment for safe use at night.

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

(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 purpose of this project is to continue MTSU's progression towards becoming a nationally recognized bicycle friendly university by the prestigious League of American Bicyclists (LAB), and responsibly increase bicycle ridership on campus. The goals of this project are to increase the programs, facilities, and services offered to MTSU students, faculty and staff so that we can minimize the use petro-energy resources for commuting on campus.

With this project, our aims to increase bicycle safety on campus through the following measures: 1) install an additional covered bicycle parking pavilion with two bicycle educational signs near the Alumni Memorial Gym (AMG) so that we can accommodate the bicycles that can be safely stored on campus in a designated, and desirable, bicycle parking facility, 2) increase the bicycle rental fleet size by five additional bicycles to better meet the rental demand, 3) increase bicycle storage safety by purchasing additional bicycle locks that can be rented to MTSU Bicyclists, 4) increase the number of bicycles that can be serviced in the campus bicycle shop by purchasing an additional double headed work station rack, 5) increase the visibility of the MT-BFU educational outreach and other program services through MTSU Raider Express publicity wrap, 6) and increase bicyclists' visibility at night by offering rental bicycle lighting kits on the bicycle rental fleet. By offering safe and desirable alternatives to driving an automobile on campus, we can in time reduce the automobile congestion on campus and the consumption of non-renewable petro-energy.

4b. Scope: Benefit Statement

As with the four previously installed bicycle storage pavilions on campus, the location of the proposed AMG bicycle pavilion will be stationed in locations that encourage the bicyclists' use of the buses/automobile roadways rather than congested pedestrian sidewalk paths. The 15 bicycle capacity covered shelter provide increased protection from the weather, and its carefully planned placement near will entice bicyclists to abide by MTSU's future bicycle parking policy (e.g. use of designated bicycle racks for storing bicycles on campus). This increase in covered bicycle parking will also help promote the use of planned bicycle routes. Installation of bicycle pavilions as well as other bicycle friendly facilities and services along with MT-BFU's (re)education initiative will help change the culture of bicycle use on campus.

The evidence of the MT-BFU success was collected through the following measures: number of bicycle rentals, number of bicycle repairs completed by the on campus bicycle shop technicians, number of bicycle rental memberships purchased during 2013, and number of educational opportunities offered.

Bicycle Rentals:
During the Fall 2013 semester, MTSU's fleet of 33 bicycles averaged 33 rentals per week which is equivalent to each rental bicycle being rented seven times per week, the entire fleet was use all seven days a week, and no bicycles in the Campus Recreation bicycle shop being stored. Additionally, we have waiting list records to show the number of students, faculty and staff cyclists that were waiting for rental bicycles to be returned. These records show that during the entire Fall semester, every week had a waiting list of at least 10 cyclists. During the Spring 2013 semester, the first semester of the bike program, we had over 300 rentals, which commonly exceeded our supply.

Bicycle Repairs:
During Fall 2013, the number of bicycle repairs completed by on campus bicycle shop technicians more than tripled from the previous semester. In Fall, a total of 131 non-rental bicycles were repaired. The demand for these services was so great that an additional technician was required on Fridays to accommodate the additional workload. In the Spring 2013 semester we repaired over 40 non-rental bicycles.

Memberships Purchased:
Forty seven bicycle rental memberships were purchased during Fall 2013. A total of $1,342.00 in membership sales was raised by the MT-BFU bicycle rental services program.

Educational Opportunities:
Our bicycle safety and leadership clinics have been an extremely successful means of outreach and (re)education. 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. 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.

Lastly, 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 bicycle, maps of the MTSU Campus Bicycle route, offered more bicycle safety workshops, and continuing with our increased of bicycle shop services all in the effort of increasing bicycle safety.

4. Project Description (continued)

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

Bicycle Pavilion:
The proposed installation site for the new bicycle pavilion and additional bicycle safety signs is near the Alumni Memorial Gym (AMG).

Bicycles and Bicycle Gear:
The requested five new bicycles, bicycle repair stand, the 40 bicycle commuter safety lights (will be added to each rental bicycle), and five new bicycle locks will be added to the existing bicycle rental fleet which are stored in the Outdoor Equipment Rental (OER) located inside the Campus Recreation Building when not in use.

Bus Wrap Signage:
The promotional bus wrap-sign will be added to one of MTSU's on campus buses. Which will not only greatly improve the publicity of the MT-BFU program services, but it will also include Tennessee Department of Transportation (TDOT) bicycle traffic laws which will improve our educational outreach goal by increasing the public (both motorists and cyclists) education on their respective bicycle safety responsibilities.

4d. Participants and Roles

To ensure that bicycle use continues to increase responsibly, the MT-BFU will meet with the leaders of MTSU departments across campus (e.g. Campus Planning, Events and Transportation Services, Educational Leadership, etc.) to discuss prospective bicycle facility demands, needs, expectations, as well as desired programs prior to initiating new MT-BFU services. These can include (re)education initiatives, improvements on bicycle rack placement on campus, campus bicycle traffic/route planning, and corroboration with campus police to improve automobile driver and bicyclist comprehension of proper road-sharing laws, and proper sidewalk use by bicyclist. The overall goal for the participants of the MT-BFU is safety and responsibly the maximum rewards of effective bicycling for transportation so that we may reap the benefits associated with energy conservation, as well as benefit from the reduction in campus pollution.

4e. Student participation and/or student benefit

Rental Service:
Students may rent bicycles after signing a safety wavier for 24 hours. After the 24 hour period, the student may requests the same bicycle again for an additional 24 hours as long as there is no waiting list for the bicycle. An alternative offered to students, faculty, and staff to increase the rental period exists. Bicycle renters may purchase a rental membership for $15.00 which is good for a semester that entitles the student to unlimited bicycle rentals for five consecutive days at a time. At the end of the fifth day, the student must return the bicycle, and may rent the bicycle again for five days as long as there is no waiting list.

With the bicycle rental service, students are not forced to purchase a bicycle if they wish to commute by bike. Additionally, rental bicycles are maintenance by highly skilled technicians between each rental, and if something requires maintenance during a rental period, bicycle shop technicians will service both rental and non-rental bicycles of any active student, faculty, and/or staff member.

Students can rent bicycle supplies such as locks, helmets, and we would like to include visibility (i.e. bicycle mountable safety lighting) equipment for the bicyclists traveling at night.

Bicycle Pavilion:
Students should properly store bicycles on campus in a provided bicycle racks. However, the traditional bicycle racks do not offer students shelter from the elements. Covered bicycle parking racks

limit the effects of weather damage and are more aesthetically pleasing than traditional bicycle racks.

Educational Outreach:
Students may also sign-up for educational workshops such as bicycle maintenance and proper ridership. 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.

4f. Future Operating and/or Maintenance Requirements

MTSU Campus Recreation Department will continue to take responsibility for operations and maintenance requirements associated with all MT-BFU programs, facilities, and services.

Programs:
Educational opportunities (e.g. bicycle servicing educational classes, bicycle fitting, and bicycle safety classes) will continually be offered to students, faculty, and staff.

Facilities:
Bicycle pavilions, on campus bicycle shop, bicycle safety signs will be assessed annually and scheduled/required maintenance will be provided as needed.

Services:
Bicycle repair and maintenance services offered to students, faculty, and staff through the on campus bicycle shop will continue. Student employees' wages will continue to be provided through the MTSU Campus Recreation budget.

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

The projects included in this grant proposal are essential to the success of the safe bicycle program at MTSU (i.e. MT-BFU).

During Fall 2013 which was the first semester of the MT-BFU, the program received notoriety on Channel 4 news, the Daily News Journal, and was featured on MTSU's webpage. In 2013, the MT-BFU program caught the attention of Nashville Mayor Karl Dean and his Bicycle, Pedestrian, and Commuter council.

The MT-BFU program was presented at the 2013 Tennessee Intramural and Recreational Sports Association (TIRSA) conference

where colleagues from Tennessee Universities were quoted stating that the MT-BFU program will quickly become the best practices model for other Tennessee universities.

We are creating the infrastructure capable of deterred the use of automobiles for short distance driving among the MTSU community. Approximately 30% of Americans commute fewer than five miles to work, which would take fewer than 20 minutes to commute on bicycle at a pace comfortable for most sedentary adults (Gotschi et al., 2008). If a person bicycled five miles to work four days per week, s/he would avoid 2,000 miles of driving per year which is the equivalent to 100 gallons of gas, 2,000 pounds of carbon dioxide, and a 5% reduction of her/his carbon footprint. Likewise, if s/he bicycled to complete her/his errands an additional reduction of 500 gallons of gas, 10,000 pounds of carbon dioxide, and an additional 10% reduction in her/his carbon footprint (Gotschi et al., 2008). These estimates do not include other dangerous pollutants/greenhouse gases generated by gasoline consumption, nor do these estimates take into consideration the following: The first 10 minutes after starting an automobile creates a disproportionately high concentration of greenhouse gases/pollutants than any time after the first 10 minutes of the automobile's operation (related to cold-start of the engine), and in-city traffic greatly increases idling time because of the greater proportion of intersections per mile of road which significantly increases the production of greenhouse gases/pollution, and is also associated with greater number of rapid accelerations and breaks per mile than highway, interstate, and rural traffic locations which also greatly increases the amount of gasoline consumed thusly increasing the emissions (United States Environmental Protection Agency [EPA], 2010).

In addition to reduced fuel and emissions, this individual will reap all of the health benefits associated with habitually maintaining the minimum physical activity required to improve her/his overall health including but not limited to the following: risk reduction in developing/progressing cardiovascular disease and metabolic syndrome, development/progression of type II diabetes, as well as stress reduction.

As we continue to realize the success of the MT-BFU program, we will be gaining the momentum required to change the societal views on short distance transportation. That is to say - when MTSU commuters consistently choose walking or bicycling for short distance (three miles and under) transportation over automobiles, we will see the following: Improved quality of life, increased property value of realty around MTSU's campus, reduction in traffic

stress, improved air quality which will in turn ease the burden of chronic respiratory disorders for individuals residing near MTSU, reduce traffic noise, and will make travel safer for everyone especially for pedestrians and bicyclists (Gotsci et al., 2008).

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.)

Please see section 4g for estimated annual energy saving.

5b. Annual Energy COST Savings ($)

End-User Gasoline Savings:
The average price per gallon of gasoline in the United States during 2013 was $3.50 (United States Department of Energy, 2014). The estimated fuel savings associated with commuting five miles to work four days per week is 100 gallons of gasoline. This would result in an annual savings for the end-user (i.e. MTSU student, faculty, and/or staff commuting by bicycle) of approximately $350 per year. This estimate does not include other automobile operating/maintenance costs.

The cost for cleaning up one pound of carbon dioxide:
The Union of Concerned Scientists (2014) report that per gallon of gasoline 24 pounds of carbon dioxide is released into the earth's atmosphere. Unlike the estimates reported by Gotschi et al. (2008), this estimate includes the carbon emissions associated with the creation and transportation of each gallon of gasoline. Using the Union of Concerned Scientists (2014) estimate as the upper bound and the Gotschi et al. (2008) study as the lower bound (range = 2,400 - 2,000 pounds of carbon dioxide) related to the reduction gasoline

consumption (by 100 gallons per year) for transportation to work four days per week five miles per day by bicycle would require 0.744 to 0.892 acres of forested land to sequester carbon dioxide emissions (EPA, 2013). Krieger (2001) estimated the economic value of the 520 million acres or Unites States forests to be equal to 63.6 billion dollars. This means, each acre of United States forested land is approximately worth $122.31 in 2001; adjusted for inflation, the cost per acre of forest would equal $160.98 (United States Inflation Calculator, 2014). Therefore, each person would need to purchase approximately one acre of forest for every 100 gallons of gasoline was consumed adding an additional carbon clean-up cost of approximately $160.00. This estimate does not take into account the cost the purchasing de-forested land and converting into forested land, which can range in cost from $500 to $3,000 per acre (Gorte, 2009).

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

The costs associated with MT-BFU program operations are offset by the revenue raised through the on campus bicycle rental program, which is considered net cost savings. Without the support of previously awarded grant funds generously provided by the MTSU Clean Energy Initiative Program, this on campus bicycle rental program would not be possible.

During 2013, MTSU's bicycle rental program raised $1,342.00. It should be noted: 2013 was the very first year of the on campus bicycle rental program. We expect greater publicity resulting from the MT-BFU program services which will increase the demand of bicycle rentals and result in greater annual earnings from the rental program.

In the interim, any additional funds required for annual operations are provided by the MTSU Campus Recreation budget; for the 2013-2014 fiscal year, $2,100.00 was budgeted for bicycle repair shop student technicians wages and materials.

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

The materials included in this grant proposal will not be receiving additional funds through matching grants nor through supplementary funding sources.