STOCKTON UNIVERSITY

2020 Initiatives Proposal Form

Thank you for your interest in submitting a proposal to the 2020 Initiatives process.

Please complete this form, save it to your hard drive, and then email a copy to: 2020@stockton.edu. Please copy your Dean/Director on the email. You will then be contacted by the appropriate 2020 Initiative Team representative/LEGS facilitators.

Proposals will be evaluated based on general criteria including the following:

- University-wide impact
- Clearly addressing one of the four LEGS themes from the 2020 strategic plan
- Specific budget details provided
- Realistic outcomes identified
- Assessment measures specified

Please consider the following questions as helpful prompts:

University-wide Objective(s)

- Does your proposal clearly address an issue relevant to your selected "primary strategic (LEGS) theme"?
- What specifically do you wish to accomplish with your project?
- How will Stockton, as a whole, benefit?

Expected Results

- How will you know if your project is a success?
- What are your anticipated outcomes and specific measurements for success?
- Does your proposal clearly indicate the person(s) or department(s) that will assume responsibility for the various work tasks?
- What is your project's "finish line"?

General Application Information	
Your Name	Alice Gitchell
Your Email	alice.gitchell@stockton.edu
Title of Project	Renewable energy FLEXIBILITY initiatives
Project Leader	Michael Ferraro/Alice Gitchell
LEGS Initiative Team Coach	Tait Chirenje
Project Partner(s)	Facilities Planning & Construction, SUST program
Duration / Time Frame of Project	FY18

Proposal Category (choose one: one-time or ongoing)			
One-Time Event or Activity		**Ongoing Event or Activity**	
☐	(A) $5,000 or less	☐	(C) $5,000 or less
☑	(B) More than $5,000	☐	(D) More than $5,000

Strategic Theme (choose one)	
☐	**Learning**
☐	**Engagement**
☐	**Global Perspectives**
✔	**Sustainability**

Strategic Objectives: choose one primary (P) in main theme and up to three secondary (S) In any themes			
Learning			
S	Deliver high value-added learning experiences and promote scholarly activity (S1)	-	Reward scholarly applications (ER2)
-	Promote liberal arts ideal to develop lifelong learners (S2)	-	Establish additional revenue sources (RS1-L)
-	Strengthen internal processes to support learning (IP1-L)	-	Reduce expenses (RS2-L)
-	Develop faculty and staff skills to support learning (ER1-L)	-	Align resources to support strategic plan (RS3-L)
Engagement			
-	Establish Stockton as an integral part of the identity of students, faculty, staff, alumni, and community members (S3)	-	Foster an interactive environment among students, faculty, staff, and community (ER3)
-	Prepare students for active citizenship role (S4)	-	Increase opportunities for interactions between internal and external communities (ER4)
-	Create mutually reinforcing intellectual and co-curricular experiences (S5)	-	Establish additional revenue sources (RS1-E)
-	Strengthen internal processes to support engagement (IP1-E)	-	Reduce expenses (RS2-E)
-	Develop faculty and staff skills to support engagement (ER1-E)	-	Align resources to support the strategic plan (RS3-E)
Global Perspectives			
-	Develop a globally diverse Stockton community (S6)	-	Strengthen opportunities for global interaction among members of the Stockton community (ER5)
-	Enhance capacity to participate globally (S7)	-	Establish additional revenue sources (RS1-G)
-	Strengthen internal processes to support global education (IP1-G)	-	Reduce expenses (RS2-G)
-	Integrate global program efforts among multiple units of the university (IP2)	-	Align resources to support the strategic plan (RS3-G)
-	Develop faculty and staff skills to support global education (ER1-G)		
Sustainability			
P	Increase sustainable infrastructure (S8)	-	Develop and implement sustainability programs (IP5)
-	Enhance sustainability education and research (S9)	-	Develop faculty and staff skills to support sustainability (ER1-S)
S	Increase recognition as a model of sustainability (S10)	-	Reward sustainable practices (ER6)
-	Partner to promote global sustainability (S11)	-	Establish additional revenue sources (RS1-S)
-	Strengthen internal process to support sustainability (IP1-S)	-	Reduce expenses (RS2-S)
-	Prioritize sustainability in plan operations and residential life (IP3)	-	Align resources to support the strategic plan (RS3-S)
-	Promote sustainability across the curriculum (IP4)	S	Seek efficiencies through sustainable practices (RS4)

The tables below allow for summaries of about 350 words. Additional information can be included as an attachment.

Narrative Summary of Project

Stockton University makes extensive use of renewable solar electricity, but only through the campus electrical grid. The next step is to make solar electricity more accessible, visible, user friendly and FLEXIBLE. Systems have been selected for campus use with the expectation that they will be systematically evaluated in order to make decisions about future needs.

1. Solar powered outdoor work station/picnic table with battery storage for use at night and during grid power failures. Supplier is CarrierClass Green Infrastructure, ConnecTable HUB model. Solar array consists of 4 panels, total 1 KW generating capacity, powering 8 USB ports and 4 120V electrical outlets. It will be capable of charging about 150 mobile devices per day.

2. Solar/wind HYBRID exterior light pole with battery storage, suitable for 3 days grid independent use. Wind turbine is a vertical axis stainless steel rotor of 6 blades, each 28" long and 5" wide.

Please see attachment for further details.

Assessment Plan: What are your anticipated outcomes and specific measurements for success?

1. Increased awareness of renewable energy on campus.
a. Generate related web content and track "hits". Publicize on academic program web pages (Environmental Studies and Sustainability).
b. Hold inaugural event/ribbon cutting, possibly in conjunction with another sustainability related event.
c. Generate press release and track pick up.

2. Equip installations with data loggers to measure use and efficiency and adjust operation accordingly.

3. Involve students and faculty in data analysis and publicize their results. Include calculation of grid energy replaced by on-site generation and use it to project impact of further penetration of these technologies. Goal is to involve students from one course per semester and for students to prepare either a poster for the annual NAMS Student Research Poster Session or for the University's annual Day of Scholarship.

Budget Summary					
	Item	**FY2017** July 1, 2016 – June 30, 2017	**FY2018** July 1, 2017 – June 30, 2018	**FY2019** July 1, 2018 – June 30, 2019	**Notes/Comments** (stipends, supplies, hospitality, etc.)
1.	solar/wind hybrid light pole		$ 8,000.00		
2.	solar charging station picnic tabl		$ 15,000.00		
3.					
4.					
5.					
6.					
7.					
	Total				

First-Year Funding Questions		
Will you need funds for immediate use to begin your project?	(●) **Yes**	( ) **No**
If so, how much?	$ 23,000.00	
Date when funds will be needed	07/01/2017	

CC: Dean/Director

Att. 1

ConnecTable HUB

Estimate

	Per Table	QTY	Sales Price
ConnecTable HUB Electronic Device Charging Station Base Price	$ 12,950.00	1	$ 12,950.00
Includes:			
French Gray smooth concrete finish			
4 Solar Panels			
2 Recycled Plastic Lumber Concrete Benches			
Bronze steel color			
Additional Bench Options:	**Per Bench**		
Concrete Lobby Bench with Ipe seat	$ 750.00	0	$ -
Concrete Plaza Bench	$ 700.00	0	$ -
Custom Concrete Plaza Bench	$ 700.00	0	$ -
Sales Price before Tax and Shipping			$ 12,950.00
Sales Tax	0.000%		$ -
Shipping (see terms below)	$ 895.00	1	$ 895.00
Total*			$ 13,845.00

Quote Includes:
- Fully commissioned solar table charging stations.
- Site assessment.
- Shipping (see terms below).

Does not include:
- Forklift rental (if unavailable at the site), unless specified in the contract and paid for by client.
- Construction of site or concrete pad or other surface material for table site.
- Removal or disposal of other outdoor equipment, furniture or other items placed at location that would impede placement.
- Disposal of ConnecTable crating or packing materials.

Table Siting
A site assessment will be conducted to determine the best placement of tables, prior to ordering. This will be conducted by a trained CCGI solar specialist in conjunction with your own personnel. There is no charge for CCGI to conduct the site assessment to determine the optimal placement of your ConnecTable(s).

Project Timeline
Manufacturing: Estimated at 16 weeks upon receipt of deposit.
Delivery: Approximately 1 week for domestic shipments.
Installation: Unless otherwise noted, the ConnecTable(s) will be shipped fully assembled, requiring only a minor adjustment to the angle of the canopy. With a forklift, operator, and a crew of 3-4 on site (including forklift operator & assistant), the ConnecTable can be installed in less than two hours. The installation of multiple ConnecTables can exceed 2 tables/day assuming no delays or complications with table site, transport, and placement. Installation Support Services are available at an extra cost.

Terms
- A deposit of 50% of the total price is due upon production confirmation and is required to secure a final production date. Final balance is due upon installation acceptance. Acceptance is assumed 7 days after delivery unless otherwise notified in writing. Payment due net 10 days from receipt of invoice.
- Pricing for CCGI products and services are valid for 30 days from the date of this proposal.
- Unless otherwise noted, the shipping price quoted in this proposal will be accurate for a period of 30 days. At the end of the 30 day period, all shipment costs will require requoting to ensure accuracy. Final shipping price is determined within two weeks of delivery, and if it has increased by >20% the entire increased amount must be paid by the customer.
- All shipping prices are for non-guaranteed, LTL (less than truckload) rates and include limited access and lift-gate service fees where applicable.

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Spec Sheet
ConnecTable Hub
Product Specification Sheet
Overview

- Highest solar power capacity of any charging station
- True off grid solar power design that delivers dependable year round charging power even in worst case conditions
- Charges 75-150 mobile devices per day (typical use)
- Supports tablets, laptops, cameras, other electronic devices
- Optimized system design includes high quality UL listed solar power components for safe and trouble-free performance
- Architectural design, and a fully engineered commercial grade structure
- Attractive, non-glare LED table top lighting system for nighttime use
- Hardened for public use. Low maintenance. 20 year expected service life
- ADA compliant design, Seats four (4) comfortably

Charging Specifications

- Solar Array Capacity: 530 Watts DC
- Autonomy (days): 3.0
- Depth of Discharge : 50%
- Four (4) GFCI traditional electrical receptacles & Eight (8) USB charging ports
- Battery: 225 Amp-Hour Sealed Gel Valve Regulated Lead Acid (VRLA)
- Battery Bank Voltage: 12.0 Volts DC
- Daily Energy Production 2,106 Wh.1
- Interior: Morningstar SureSine300 (Island/Off-Grid)
- Charge Controller: Morningstar TS-MPPT-45 (Maximum Power Point Tracking)
- Battery Replacement Cycle: Five (5) years/1000 cycles (typical)
- All electrical and structural steel components bonded to NEC-compliant earth grounding electrode (ground rod)

Structural Specifications

- Steel Structure: 100% Powder Coated Structural Steel
    - ASTM A-500 Grade B Structural Steel – Horizontal Tube, Vertical Tube, and Solar Canopy Supporting Tube; Thickness: 3/16"
- Smooth Concrete Table & Benches, Perforated Steel
- Wind Speed Rating: 90 MPH Self-Ballasted (no surface attachment required)
- Durable industrial strength construction with easy to clean surfaces
- Seats four (4) comfortably with a minimum 24" centerline distance between parallel seats
- Dimensions :

- Canopy Height: 8'5" (high side)
- Canopy Head Clearance Height: 6'8" (low side)
- Bench Seat: l' 6 1/2" W" x 4'6" L
- Table Top: 3'7" W x 4'6" L
- Overall Footprint: 10'9 3/16" W x 4'6" L (including solar canopy)
- Bench & Table Footprint: 7'0" W x 4'6" L (Extended 4 panel canopy 10'10" W x 6'6" L)
- Total Weight: 1,580 lbs. (including electrical components and concrete ballast block)

Security

- Robust ballast mount system minimizes movement
- Additional "anti-vandal" surface attachment options
- Robust, heavy gauge steel components, inherently vandal-proof
- Tamper-resistant hardware and fasteners

Monitoring

- User Monitoring/Meter: MidNite Solar Battery Capacity Meter
- Includes RM2 meter systems for current and historical parameters
- Optional upgrade to include prewired charge controller, internal USB/serial port access cable available
- Optional upgrade for charge controller with comprehensive system monitoring and control via Ethernet port and manufacturers web portal
- Customized external Ethernet port available

Add-On's & Customization

- Wide range of steel powder coat colors
- User logos or advertiser/sponsor branding
- Wi-Fi access and security cameras.5
- Tablet video screens.5
- Expanded shade canopy

Warranty

- One (1) year warranty on installation
- Twenty Five (25) year warranty on solar panel power output
- Individual component warranties

Savings

- Volume discounts available
- ConnecTable qualifies for a 30% Federal Business Energy Investment Tax Credit (ITC) for tax paying individuals 2.3

- ConnecTable qualifies for Federal MACR'.s accelerated depreciation for a tax paying business entity.4
- Financing available

ConnecTable Hub is a product of Carrier Class Green Infrastructure

[1] PV Array Daily Energy Production with average irradience for Philadelphia, PA in June.

[2] Consultation with a tax advisor recommended.

[3] http://www.dsireusa.org/incentives/incentive.cfm?Incenti ve_Code=US02F

[4] http://www.dsireusa.org/incentives/incentive.cfm ?Incentive_Code=US06F

[5] Additional fixed power loads requires 2nd battery; additional loads can limit device charging power availability

601 Davisville Rd., Suite 210, Willow Grove, PA 19090 Phone 267-419-8496 • Fax: 215-565-2746
info@theconnectable.com • www.theconnectable.com

A++3

Our Story

At the ConnecTable, we aim to achieve global connectivity through the implementation of off-grid, solar charging technology that fosters a beautiful, sustainable world.

To achieve this, we provide businesses with premium, innovative, outdoor solar charging solutions. Our combination of durable, high-performance products and superior customer service results in a "carrier class" experience: top-of-the-line, in every way.

Recharge and reconnect with the ConnecTable Hub.

What Our Customers Say

"The solar tables at UCR provide a clean and renewable source of energy for charging the multitude of mobile devices on campus while offering much needed shade."
–University of California, Riverside

"The ConnecTable will showcase our commitment to sustainability ...and is a good learning and engagement tool for students."
–University of Alabama at Birmingham

Make a Green Statement

ConnecTable™ HUB

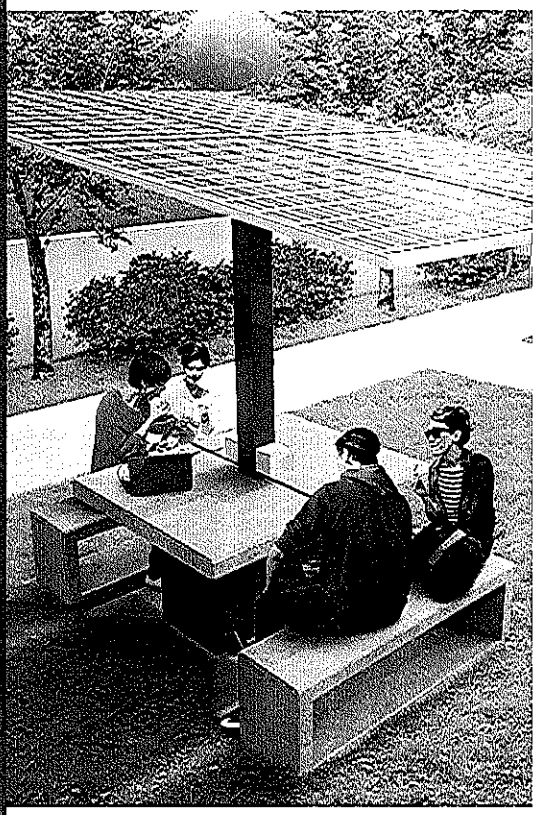
- Universities
- Corporate Campuses
- Malls
- Parks
- Campgrounds
- Resorts
- Theme Parks

Contact Us For A Free Quote!

601 Davisville Road, Suite 210 Willow Grove, PA 19090
267.419.8496
info@theconnectable.com
theconnectable.com

CarrierClass Green Infrastructure

Connecting Outdoors Never Felt So Good



ConnecTable™ HUB

Why the ConnecTable Hub?

Let's face it, human beings were never intended to spend all day in a room filled with fluorescent lights and computer screens. Countless articles and research have documented the dangers of sitting indoors for extended periods of time, and have also explained the health benefits and increased productivity that connecting with nature provides.

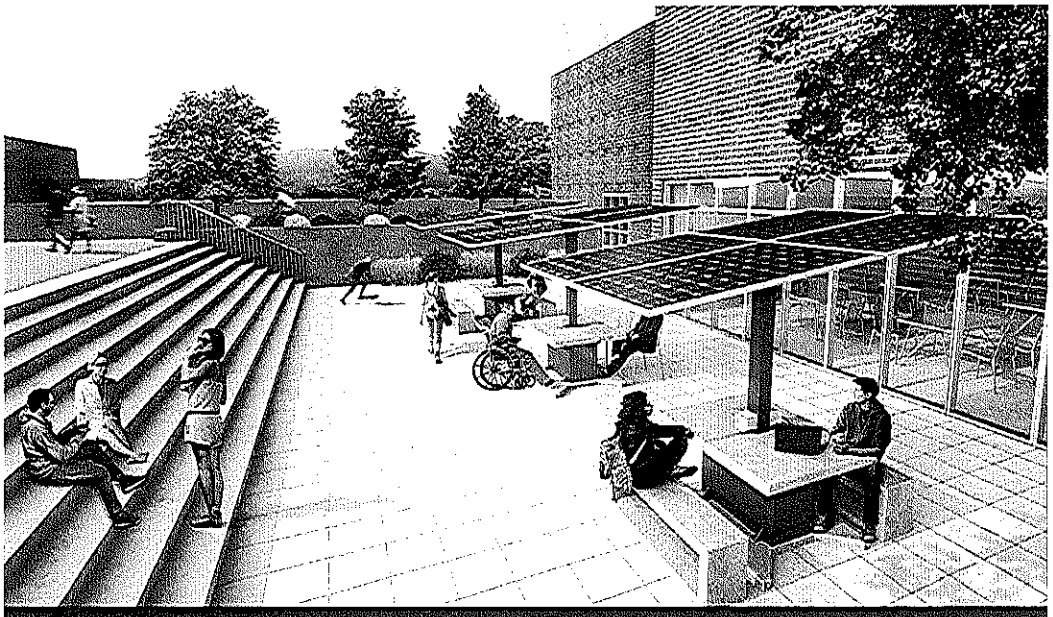
While open, outdoor spaces continue to dwindle due to residential development and construction, there is an active movement to find accessible, social, technologically-enabled, welcoming places to work within urban and suburban areas.

The ConnecTable Hub Is The Ideal Solution

A Creative Solution to Reconnect With Nature

With the ConnecTable Hub, users can charge devices outdoors while working, studying, grabbing lunch or taking a break, using the sustainable power of the sun.

- Recharge your devices using off-grid, solar technology
- Connect to WiFi
- Protect devices from sun glare and heat with shade panels
- Create a gathering space for meetings or classes
- Relax & reconnect with nature



The Ultimate 'Green' Outdoor Workstation

Sleek, Modern Design

- Minimalistic design aesthetic integrates seamlessly with any space
- Customized steel powder coating complements the look of any landscape
- Seats 4-8 comfortably, with the ability to add additional benches
- Integrated LED lighting for night time enjoyment
- ADA compliant

Safety & Durability

- NEC compliant
- P.E. stamped electrical design
- 90mph wind-rated, self-ballasted base structure
- Powder coated or enameled steel surfaces are highly stain resistant and weather protected

Unparalleled Performance

- The most powerful solar charging station on the market, with a 3/1 solar harvest to output power ratio & 1kW robust solar array
- Charges up to 75-150 mobile devices per day
- (4) 120V AC and (8) USB ports support tablets, laptops, smartphones, cameras and other portable devices
- Delivers dependable, off-grid charging power in all seasons and weather conditions, with three days autonomy

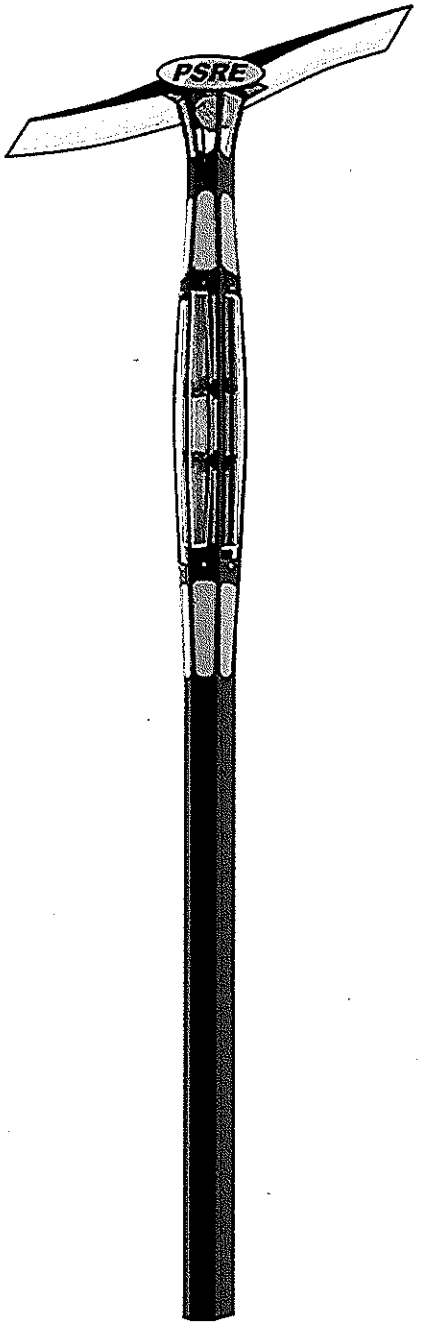
Incredible Value

- Cost-competitive with all major suppliers, while providing superior performance
- Qualifies for a 30% Federal Business Investment Tax Credit (ITC) & Federal MACRs accelerated depreciation

Att 4

PSRE HYBRID OUTDOOR AREA LIGHTING SYSTEM

Hybrid Outdoor Area Lighting Systems are an (off-grid) self-contained Light Pole that typically consists of Two Renewable Energy Sources (Wind / Solar), LED Light Array, Dual Charge Controller and Rechargeable Deep Cycle Storage Batteries (Lead Acid/Lithium).



PSRE Designed and Developed our Renewable Energy Lighting Systems to blend harmoniously into the local environment. This was achieved by applying innovative cutting edge engineered solutions. We integrated the Pole, LED Array, Solar Panel and Turbine in a way that is technically sound and aesthetically attractive.

PSRE custom designs and manufactures our product to offer the specific area lighting solution (Technical and Decorative) for the location where the product will be installed.

Features:

System Monitoring:

Local (at pole) access to digital display for system parameters/performance monitoring (real-time/archived data).

Remote access (via internet) to system parameters/performance monitoring (real-time/archived data).

Pole:

Each hexagon shaped 6063 aluminum pole is foundry extruded from a PSRE custom designed die.

- The Pole height is 18' with a diameter of 5" OD (flat to flat) and wall thickness of 1/8".
- The exterior of the pole will be custom powder coated.

Wind Turbine:

The Vertical Axis Wind Turbine (VAWT) is designed and manufactured by PSRE.

- The 6 poly carbonate blades (clear or tinted) are 38" in length by approx. 5" in width.
- The blades are mounted to two spindles that are machined from dense PVC.
- All mounting hardware is stainless steel.
- The copper (powder coated) turbine shaft is 40" in length by 1" in diameter.

Solar Panel Frame:

The Solar Panel Frame is designed and manufactured by PSRE.

- The decorative frame is machined from dense PVC.
- All mounting hardware is stainless steel.

Specifications:

Flexible Solar Panel:

- Cell Type - Mono Crystalline
- Output Voltage – 12vdc
- Peak Power output 140w
- Efficiency is approx. 23%
- The panel dimensions are approx. 43" x 31".

Led Array:

The LED Array is pyramid shaped which is uniquely suitable for the PSRE light fixture.

- Light Angle – 360%
- Life Span – 50,000hrs
- Power - 30w
- Lumens – 4,000lm
- Voltage – 12vdc

Turbine Generator:

The Generator is Disc type.

- The output power is 75w max ac 3 phase
- The nominal rated power is 50w.
- Max wind speed is 100mph.
- The working wind speed is 9-50mph

Charge Controller:

The charge controller is Hybrid (Wind/Solar).

- Full function digital display.
- The output is 12vdc.

Battery Storage:

The batteries are Lifep04 lithium deep cycle.

- The output is 12vdc.
- There are 2 - 30ah batteries for a total capacity of 60ah.

Cost Estimate: Cost per pole: $7,000.00

Manufacturer Warranty: 2 years Parts and Labor

Payment and Product Availability Terms:

Payment in Full is required upon receipt of Purchase Order.

Availability Date: Within 90 days of receipt of Purchase Order.

ATTACHMENT: Narrative summary of Renewable Energy FLEXIBILITY Initiatives project.

Stockton University presently makes extensive use of renewable solar electricity, but it's only delivered through the campus electrical grid for immediate (instantaneous) use. The campus grid is fully integrated with the regional electrical transmission and distribution system operated by Atlantic City Electric, our local utility. The next step in modeling and demonstrating progress towards a sustainable, reduced carbon future is to make renewable electricity more accessible, visible, user friendly and FLEXIBLE. To increase flexibility and independence, energy storage through use of batteries allows for use of renewable electricity outside the rather brief daily period when photovoltaic electricity is generated. Additionally, the University will undertake a first, small, grid independent wind generation project.

Equipment and accessories have been selected for campus use with the expectation that they will be systematically evaluated in order to make decisions about future needs.

The following equipment has been selected:

1. **Solar powered outdoor workstation**/picnic table with battery storage. Seats 4 to 6 people. This installation will generate electricity for battery storage. The selected product (ConnecTable "Hub" model) utilizes a 1 KW solar photovoltaic array (4 panels) and offers eight USB ports and 4 electrical outlets. Estimated life is 20 years, by which time solar panels will still produce about 80% of original output. Structure is self ballasted to withstand wind up to 90 miles per hour. Estimated charging capability is about 150 mobile devices per day (cell phone, laptops, tablets, E-readers, cameras, etc.) As a grid independent generating station, the table will be available for charging and lighted with LED lamps at night when the regional electrical grid is down. This is a major step because all our other solar capacity shuts down (for safety reasons) when the grid goes down during regional emergencies. Approximately three days of autonomous operation can be expected. The selected supplier (CarrierClass Green Infrastructure) operates out of Willow Grove, PA. Two benches made of concrete and recycled lumber are included in the price, as is shipping ($895.00) and installation. Work station is ADA compliant.

   LOCATION: Several good possibilities exist. Because of construction, placement near the new Quad classroom building will not be possible until sometime in 2018. Temporary placement on the patio beside the Food Court will be highly visible.

2. **Solar/wind HYBRID exterior area lighting system** pole with battery storage. Local or remote access system included for performance/parameter monitoring (real time or archived data). Pole is 18' with 5" OD. Wind generator is vertical axis stainless steel rotor of 6 blades, 28" in length and 5" wide attached to a disc type generator rated at 50w, designed for use in conditions up to 100 mph wind. The solar panel is a flexible crystalline unit 43" by 31" mounted in a PVC frame. Peak power output is 140 watts. Light is LED array of 4,000 lm output. The selected supplier (Pollution Solutions Renewable Energy) in incorporated in New Jersey. Batteries (2) are lithium deep cycle with a total capacity of 60 ah and an output of 12 volts DC.

   LOCATION: This pole will be placed near the new Quad classroom building, near the entrance to the Sustainability Laboratory.

Apart from being an attractive recruiting tool that meets one of our pillars, this project creates opportunities for both faculty and students. It will involve both students and faculty in data analysis and data publication/information dissemination. The focus will include calculation of grid energy replaced by on-site generation and use it to project impact of further penetration of these technologies. The project proposers are working with faculty to involve students from one course per semester and for students to prepare either a poster for the annual NAMS Student Research Poster Session or for the University's annual Day of Scholarship. The visibility of these

Alice Gitchell, Office of Facilities and Construction, March 28, 2017

Additional attachments

1. Outdoor workstation HUB estimate
2. Outdoor workstation HUB product specification
3. Outdoor workstation HUB pamphlet
4. PSRE hybrid outdoor area lighting system features, specifications and cost estimate

2020 PROPOSAL

Megan DiMarcantonio, Kevin Carr, Tyler Furrow, Gage Furrow

STOCKTON UNIVERSITY Spring 2017

Maps of the trails behind Lake Fred located on Stockton University campus are not officially available to the Stockton community. This project will make this information available to students, and has the benefit of also potentially attracting the surrounding local community. The goal is to create a head trail map at the beginning of the walking trails, as well as create informational plaques about the native flora and fauna across the newly marked trails. The grant would cover the funds needed to create the plaques, such as wood and building costs **(See appendix A)**. This is needed because many students are not aware of how unique the pine barrens are. Many people also get confused while walking around unsure of where trails will lead them. The trail map would provide the necessary knowledge to properly navigate the wooded sections campus, and the plaques would teach students and visitors about their surroundings while hiking Stockton's trails.

Stockton is known as New Jersey's Green University. The woodland surrounding campus is actively used by the student body, faculty, and Galloway residents. There are several miles of trails that wind their way through Stockton's many habitat types. The problem with these trails is that they are unmarked. While exploring the woods it can be easy to lose one's way especially if it is in the later hours of the day when no one is around. The first benefit of this project is that it would create a safer environment on campus by providing clear and understandable trail makers so that anyone using the campus trails can easily navigate our unique campus. The second benefit this project provides would be helping to educate non-environmental majors about the diversity, fragility, and importance of Stockton's local environment and by extension, the greater Pine Barrens environment. This educational aspect will also be beneficial to non-Stockton students using the campus grounds as a whole. This would also provide a degree of publicity for the university, through the beauty and accessibility of its campus. Having marked hiking trails with informational stands is a great way to attract people to the campus. If families are walking the grounds with their children regardless of age, it would be in the long run free advertising for the University's Environmental, Sustainability, and Biology programs. This also has the added benefit of expanding on-lookers general knowledge.

The project goals are as follows:

- Create a safer more navigable campus
- Educate Stockton Students, and Visitors of the Campus
- Create passive advertising for Stockton University

Human dimension surveys were conducted on campus asking both students and faculty members what exactly they know about the wildlife present. Out of the total sixty surveys, fifty-eight of the recipients were students, and two were teachers. **See appendix B.** The purpose of this survey was to understand how much people outside of NAMS know about the pine barrens. The surveys were separated by people who live on campus and people who do not. The students living on campus are the ones who walk

the trails the most, and around 27% of the surveys showed that the students wanted educational plaques across the campus. They mostly wanted to learn about the different species located on campus and to know about the different unique areas located on campus, such as the cedar swamp, vernal ponds, burned areas, and the student farm.

Using GPS technology while walking along the trails, coordinates were taken down and uploaded into GIS ArcMap. An aerial photo was taken of the campus and retrieved from the Stockton University website. The GPS coordinates were then layered on top of the base-map in order to create an accurate trail map. **See appendix C**. The first draft of this map is attached, but to ensure accuracy, this procedure will be repeated at least three times. This is to make sure the GPS was correct as well as to determine the exact distance of each trail. To preserve Stockton's wild spaces, only obvious trails were recorded for the proposed map, as to avoid unnecessary harassment of flora and fauna.

Data on wildlife species present on campus was sourced from Dr. Tredick's camera traps, taken over the last two years. This provides information on what species are present, where, and daily as well as seasonal activity habits.-Threatened and endangered species will not be pointed out, in order to avoid interference which might affect their recovery. Further information is being sourced from ongoing Stockton projects such as Dr. Zimmerman's forest management plan. Independently, we will use NJDEP as a data source for the different types of soils present.

The research and mapping should be done by the beginning of the fall 2017 semester. The construction will start during the fall semester, and if we, the students, are permitted to build the sign it should be completed before 2018. The schedule will be broken down as follows: June, July, and August will be focused on trail mapping, and flora, fauna research for the pinelands. September and October will be designated for building the head trail map and the plaques. November will be finalizing all the maps and information. It will be printed on the plotter and inserted into newly built signs. By December this project will be completed.

The budget for this project is $500. **See Appendix D.**

After this project is finished, the same surveys will be conducted to see if the student body has benefited from this project. Lake Pam side of campus will not be mapped which will leave room for future research from other students.

Appendices

A: Blueprints

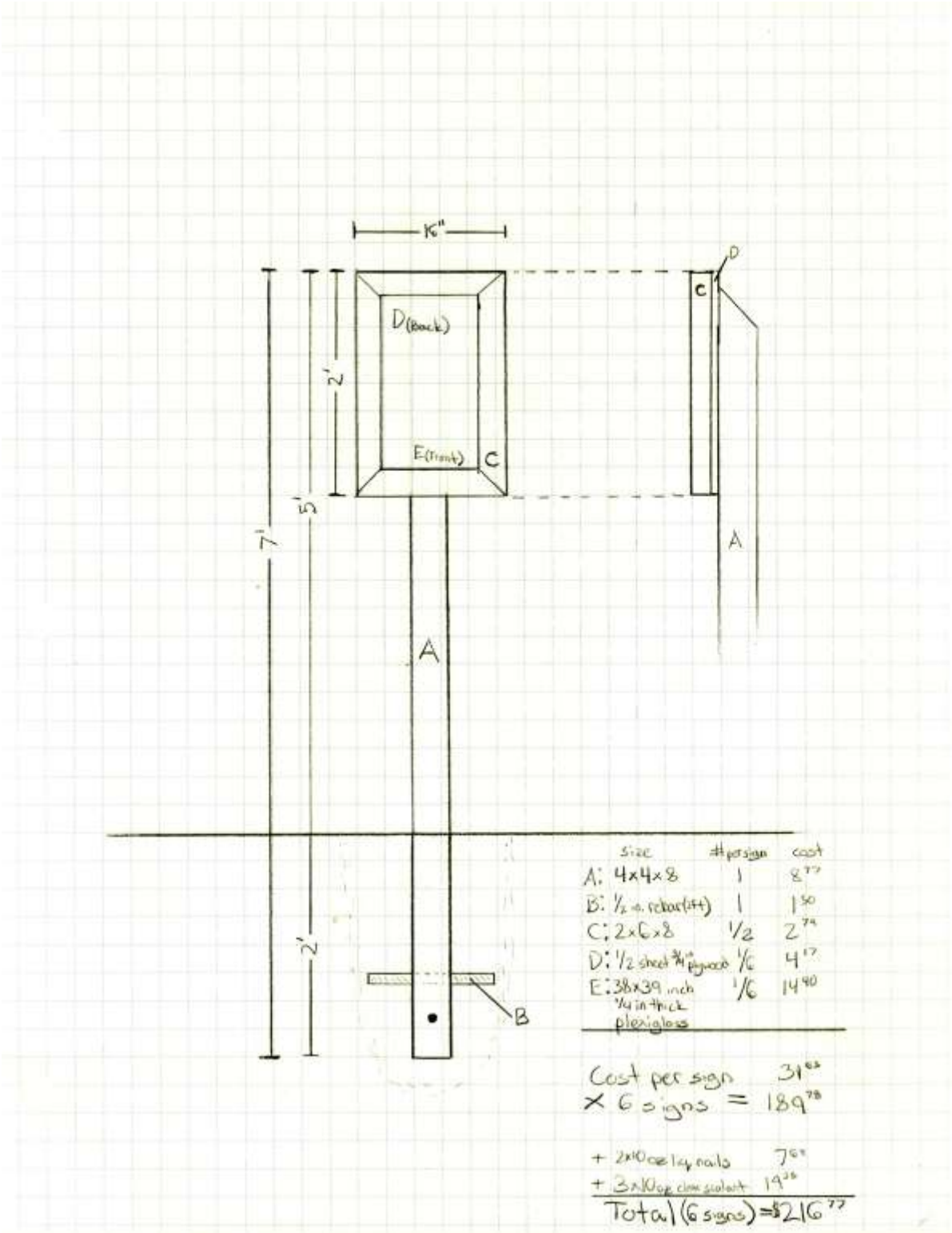


Figure 1: smaller educational plaques that will be located across trails

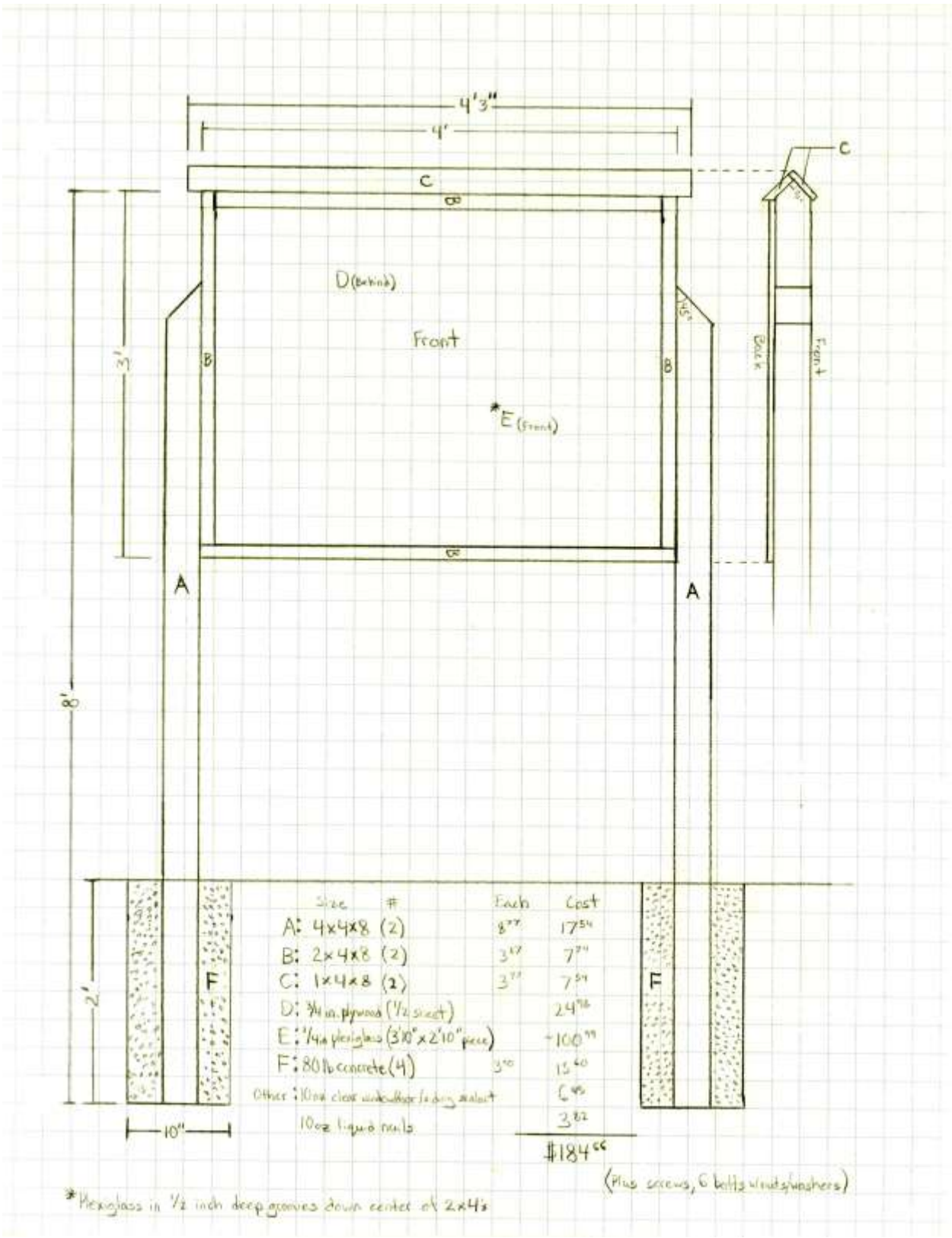


Figure 2: Blueprint design for head trail map

B: survey

1. To what extent do you feel educated about wildlife present on Stockton University campus?
   - □ Not at all
   - □ Very little
   - □ Moderate amount
   - □ Substantial amount
   - □ Everything

2. Are you aware of any Stockton University classes that are related to wildlife?
   - □ Yes
   - □ No

   If yes, please specify_____

3. To what extent would you be interested in learning about the wildlife on campus?
   - □ Highly interested
   - □ Moderately Interested
   - □ Not interested

4. If Stockton University had a club that was devoted to different aspects of wildlife, how likely would you be to join?
   - □ Very likely
   - □ Not sure
   - □ Not likely

5. What would be your preferred mode of learning about the native species present?
   - □ Taking a class
   - □ Having a human tour guide
   - □ Having a printed guide
   - □ Educational plaques located at interesting points along the trails

6. How likely are you to share newly are acquired knowledge about wildlife with others? ***(Circle one)*** *(1= unlikely. 5= highly likely*).

   1 2 3 4 5

7. What following information would you want to learn about ***(check all that apply)***

- ☐ Mammal Species
- ☐ Bird Species
- ☐ Fish Species
- ☐ Habitat Use
- ☐ Diet preferences
- ☐ Conservation plans
- ☐ Diseases
- ☐ Insect species
- ☐ Reptile Species
- ☐ Threatened and Endangered species
- ☐ Management practices
- ☐ Breeding patterns
- ☐ Migration patterns (if any)

8. Are you familiar with any of these areas on campus? (***check all that apply)***
   - ☐ Cedar Swamp
   - ☐ Vernal Ponds
   - ☐ Student Farm
   - ☐ Burned Areas
   - ☐ Lake Pam
   - ☐ Lake Fred
   - ☐ Greenhouses
   - ☐ The Clear-Cut

9. Are you aware if any hunting/fishing is permitted on campus?
   - ☐ Yes, both are allowed
   - ☐ Only fishing is allowed
   - ☐ Only hunting is allowed
   - ☐ Neither are permitted

10. How likely is this statement to be true?
    Trapping and euthanizing wildlife species is always bad
    - ☐ Confident this is false
    - ☐ This may be false
    - ☐ Not sure
    - ☐ This may be true
    - ☐ Confident this is true

11. How often do you visit your local parks/trails?
    - ☐ Every day
    - ☐ Once a week
    - ☐ Once every other week
    - ☐ Once a month
    - ☐ Once every 3 months
    - ☐ Once every 6 months
    - ☐ Less than once a year

12. What is your major?

    _____

13. How many years have you attended Stockton university?
    - ☐ Less than 1 year
    - ☐ 1 year
    - ☐ 2 years
    - ☐ 3 years

- □ 4 years
- □ 5+ years

14. Do you live on campus? (***circle one)***

Yes No

C: map

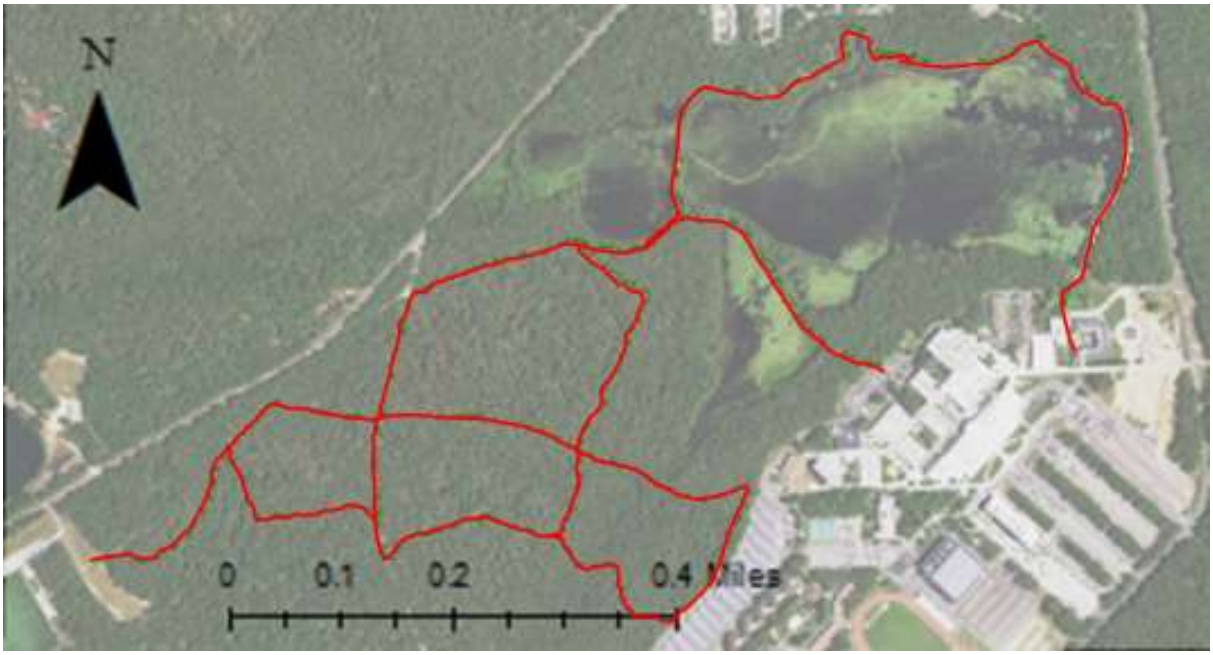


Figure 3: First attempt at mapping trails using gps and arcmap

D: budget costs.

1/2 sheet of 3/4 in plywood	$4		
38X39 in 1/4 in plexliglass	$14.40		
cost per sign	**$31.63**		
6 signs	6		
2X10 liquid nails	$ 7.64		
3X10ox clear sealant	$ 14.35		
Total (for all 6 signs):	**$216.77**		
Large Trail Map Sign:			
4x4x8 (2)	$17.54		
2x4x8 (2)	$7.74		
1x4x8 (2)	$7.54		
3/4 in thick plywood	$24.98		
1/4 in plexiglass (3'10"x2'10")	$100.99		
80 lb. concrete (4)	$15.60		
10oz clear window/door sealant)	$6.45		
10oz liquid nails	$3.82		
Total:	**$184.66**		
			*If construction is not permitted link to buy sign below:
Grand Total: $ 450.00			Sign≈$600-$1000

Small Trail Map Signs:

Plexiglass (3'10"x2'10")	$100
4x4x8 (6)	$52.68
3/4 in thick plywood	$50
Nuts and bolts	$10
2x4x8 (6)	$23.22
Total:	**$236**

Large Trail Map Sign:

4x4x8 (2)	$17.54
2x4x8 (2)	$7.74
1x4x8 (2)	$7.54
3/4 in thick plywood	$24.98
1/4 in plexiglass (3'10"x2'10")	$100.99
80 lb. concrete (4)	$15.60
10oz clear window/door sealant)	$6.45
10oz liquid nails	$3.82
Total:	**$184.66**

Grand Total: $500.00

*If construction is not permitted link to buy sign below:
Sign≈$600-$1000