Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 041-AH**

Comprehensive Environmental Building Site Design Using GIS Mapping

Category: H. Proposals seeking $200,000 or less in funding

Sub-Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 195,000

Proposed Project Time Period for the Funding Requested: June 30, 2021 (2 yrs)

Summary:

This proposal seeks to enhance the environmental performance of building sites, by creating a web application that streamlines compliance with the B3 Guidelines, and helps complete the Environmental Assessment Worksheet.

Name: Garrett Mosiman

Sponsoring Organization: U of MN

Title: Senior Research Fellow

Department: College of Design / Center for Sustainable Building Research

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

This image shows a mockup of the proposed mapping application, including a site boundary and simulated output information.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE: Comprehensive Environmental Building Site Design Using GIS Mapping

I. PROJECT STATEMENT

The goal of this proposal is to develop a web-based application that enables building owners and developers to optimize building site selection and development for the mutual benefit of the owner, the environment, and the citizens of Minnesota. The application will allow designers, project owners and potential property developers to quickly understand the context of their site in plant, animal, human, soil, and water networks, while eliminating the need to manually navigate a challenging array of data sources.

B3 Guidelines are required for GO-Bond funded projects in Minnesota and were developed at the University of Minnesota in coordination with design professionals and state agency staff. Guideline categories include: Site & Water, Energy & Atmosphere, Indoor Environmental Quality, and Materials & Waste. The B3 Guidelines were adopted in 2004, and are updated on a rotating basis. The Site & Water guidelines were revised in 2018.

The criteria used to guide development will be derived from the B3 Site & Water Guidelines. These guidelines list a set of performance-based metrics for projects site and water resources, including the avoidance of high-value sites, provision of habitat for threatened and endangered species if they are found in nearby areas, the enhancement of pollinator habitat, and providing connection to native plant and animal communities. The tool will facilitate compliance with five guidelines and 21 sub-guidelines. It will be designed for use for site evaluation for non-B3 projects as well, including assistance in data gathering necessary for the Minnesota Environmental Quality Board's Environmental Assessment Worksheet (EAW). The final phase of the project includes the presentation of this application to relevant professionals and to increase its visibility and use in the marketplace.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: *Develop logic and specifications for the tool based on interpretation of B3 Guidelines and the State Environmental Assessment Worksheet*
Description: Minnesota B3 Site & Water guidelines and the EAW will be used as guides to develop algorithms and specifications to implement in the mapping program. This will lay out the steps necessary to convert a disparate array of existing data into specific, site-level steps that a project developer can take to support the environmental potential of the site. For example, under B3 Guidelines, projects are required to have 75% of plant species be native to the surrounding area. The proposed tool will evaluate and integrate multiple GIS layers that characterize ecological communities to supply the user with a representative plant list.
ENRTF BUDGET: $ 50,000

Activity 2: *Compile current geospatial data sets from disparate sources and unify the formatting for use in the application*
Description: Based on the data requirements identified in Activity 1, sets of geospatial (GIS) data will be compiled and prepared for use in the application. Data required for this tool are housed in various agencies and formats, such as County Biological Surveys, DNR data sets, FEMA flood plain maps, and ESRI GIS layers. This task will gather these data and prepare them in a unified format for use in the tool.
ENRTF BUDGET: $ 40,000

Activity 3: *Develop and deploy mapping application, publicize its release*
Description: A web-based mapping application will be developed. This application will provide guidance for specific proposed building sites. Users will define a site by drawing its border outline on a map. This will trigger

the application to test the site against all criteria identified in Activity 1. If the site meets the basic suitability criteria, then data about the surrounding plant, animal, and hydrological communities will be polled to give project-specific advice to the developer regarding appropriate site development. This activity will include presentations to the design community and members of the public to encourage its use.
ENRTF BUDGET: $ 105,000

Outcome	Completion Date
1. Complete set of logic arguments that codify relevant B3 Site guidelines compiled in a pdf document	*December 2019*
2. Complete set of geospatial data that meets the data requirements defined in Activity 1, including references allowing future updates	*July 2020*
3. Complete, functional, and user-friendly web based mapping application deployed to users and publicized to all B3 users and other interested parties	*December 2020*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Garrett Mosiman	**Senior Research Fellow**	**Center for Sustainable Building Research**	**Project Manager, Coordination with U Spatial, software development**
Len Kne	**Associate Director**	**U Spatial, University of Minnesota office of the Vice President for Research**	**Supervising the development of GIS-based mapping software**

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Gordon Christofferson	**Project Operations Manager**	**Minnesota Department of Administration, Real Estate and Construction Services**	**B3 program support**

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

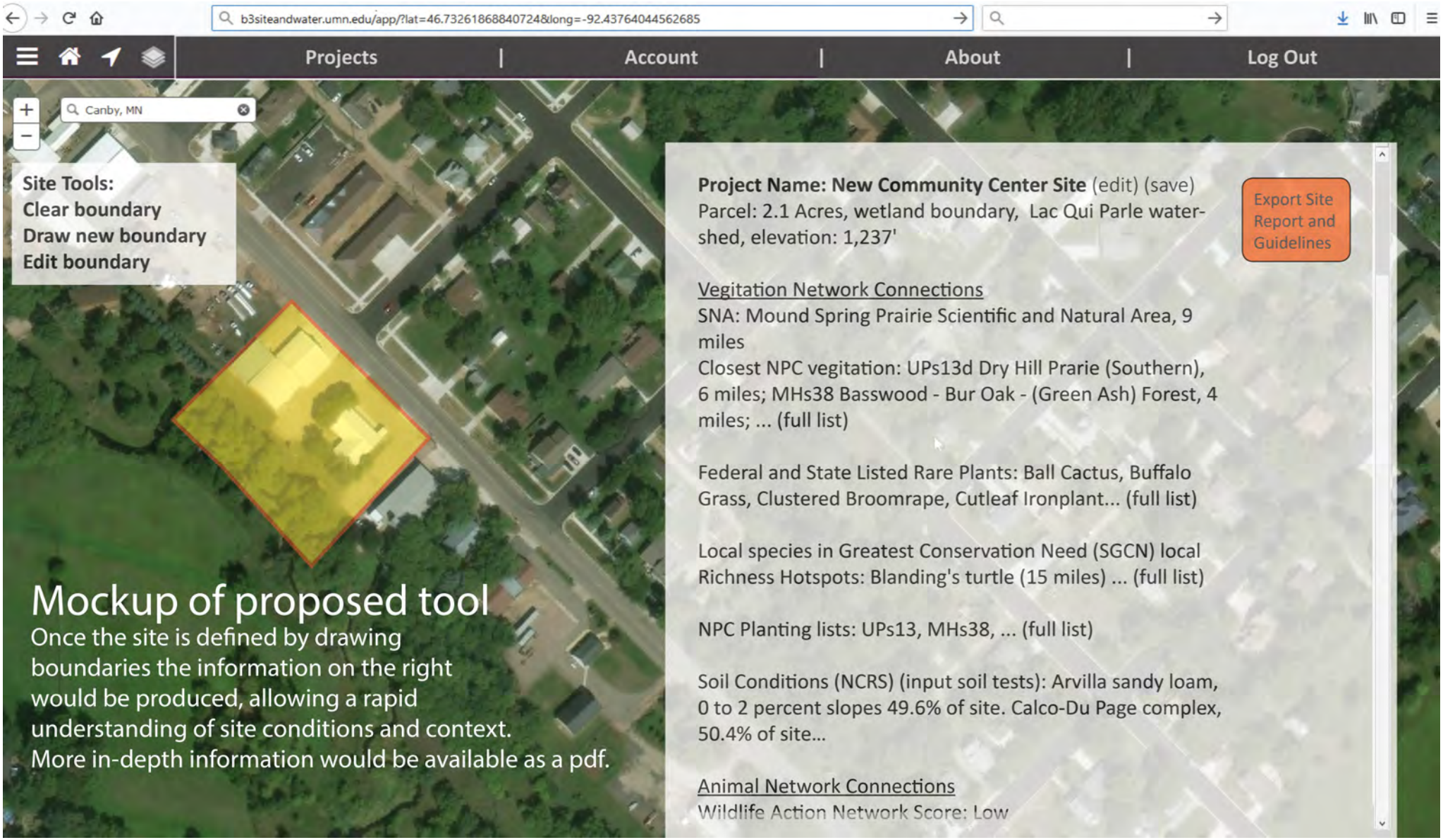
Ongoing maintenance and hosting of the application will be funded by an annual allocation from the B3 Guidelines budget.

V. TIME LINE REQUIREMENTS:

There are no specific time line requirements for this project.

2019 Proposal Budget Spreadsheet		
Project Title: Comprehensive environmental building site design using GIS mapping		
IV. TOTAL ENRTF REQUEST BUDGET: $195,000		
BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**	
Personnel: Time for CSBR and U-Spatial		
Garrett Mosiman, Senior Research Fellow (24% for 1.5 years) $29,963 salary, $10,037 fringe benefits	$ 40,000	
Patrick Smith, Research Fellow (24% for 1.5 years) $26,217 salary, $8,783 fringe benefits	$ 35,000	
Research Fellow, (TBD% for 1.5 years) $18,727 salary, $6,273 fringe benefits	$ 25,000	
Len Kne (6% for 1.5 years) $7,491 salary, $2,509 fringe benefits	$ 10,000	
Software Developer (TBD% for 1.5 years) $44,944 salary + 15,056 fringe benefits	$ 60,000	
Undergraduat Students - GIS	$ 25,000	
Professional/Technical/Service Contracts:		
Equipment/Tools/Supplies:	NA	
Acquisition (Fee Title or Permanent Easements):	NA	
Travel:	NA	
Additional Budget Items:	NA	
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 195,000	
V. OTHER FUNDS (This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)		
SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period:	NA	
Other State $ To Be Applied To Project During Project Period:	NA	
In-kind Services To Be Applied To Project During Project Period:		
Richard Graves, CSBR Director (3% for 1.5 years), $7,491 salary + $2,509 fringe benefits	$ 10,000	
Past and Current ENRTF Appropriation:	NA	
Other Funding History:	NA	

Comprehensive Environmental Building Site Design Using GIS Mapping



VI. ADDITIONAL PROPOSAL COMPONENTS:

F. Project Manager Qualifications and Organization Description

Project Manager: Garrett Mosiman, LEED-AP, Sr. Research Fellow

Experience and Expertise – Training, and Green Operations and Maintenance
Scale – Single Family Homes (renovation and new construction)

Garrett holds a bachelor's degree in architecture from Rice University, and a M.S. in Architecture, Sustainable Design Track from the University of Minnesota. He is also a LEED Accredited Professional. Prior to returning to school in 2006, Garrett worked for ten years as a carpenter, model builder, project manager and architectural designer in Texas and Minnesota. He has dual areas of expertise: building enclosure design and analysis, and commercial building energy efficient operations. In recent work in the enclosure field, Garrett has worked alongside the Cold Climate Housing Center on the NorthernSTAR Building America Partnership, a program in residential energy efficiency and building science funded by the Department of Energy. Garrett's work at CSBR concentrates on energy efficient upgrades to existing home enclosures. In the second area of expertise, Garrett spearheads an effort under the Minnesota B3 / SB2030 program to deploy Energy Efficient Operations Manuals for commercial and other large buildings. These manuals focus on simple, low-cost tasks designed to specifically identify hidden energy waste in significant energy-consuming devices and systems.

Organization Description:

The Center for Sustainable Building Research (CSBR) leads research, education and design efforts to create a thriving future. We are a unit within the College of Design (CDES) at the University of Minnesota. Our work is founded on an ecological view of humanity and ecosystems as one unified community, and focused on living system design to discover solutions to enable designers, developers and makers of buildings and products to build the capacity, commitment and caring to regenerate the health of all living communities.

The Center for Sustainable Building Research was established in 1997 as the Building Research Group in what was then the College of Architecture and Landscape Architecture. Its founding project, The Minnesota Sustainable Design Guide preceded USGBC LEED and was the forerunner to the current Minnesota State guidelines B3 and Sustainable Buildings 2030 programs. The project set the standard and outlined the ambitious nature of the center's commitment to creating a sustainable future through innovative thinking and engagement with the building industry.