**PROJECT TITLE:**

Comprehensive Environmental Building Site Design Using GIS Mapping

**I. PROJECT STATEMENT**

Detailed information exists which is useful for ecologically appropriate site development, but it is dispersed among many separate data sources. Because compiling this information is challenging and time-intensive most building projects fail to benefit from these resources. The goal of this project is to develop a web‐based tool that would summarize this information and present it in a useful format for designers, owners and other relevant parties, allowing a rapid understanding of the context of a site in plant, animal, human, soil, and water networks while eliminating the need to manually navigate a challenging array of data sources. This improved understanding of a project site would enable better protection of Minnesota ecological resources by revealing site-specific opportunities. Additionally this tool would streamline compliance with existing environmental site design criteria, including the B3 Guidelines, and would provide information useful for completion of the Environmental Assessment Worksheet.

The criteria used to guide development will be derived from the updated B3 Site & Water Guidelines. These guidelines are required for General Obligation 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: Process Management, 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 recently revised in 2018. They include a set of performance‐based requirements for projects site and water resources, including the avoidance of high‐value sites, providing habitat for threatened and endangered species, the enhancement of pollinator habitat, and providing connection to native plant and animal communities. The current process of compliance with these guidelines requires designers to collect information from multiple data sources related to plant, animal, soil, and water networks in order to develop appropriate and impactful site design strategies.

While the tool will facilitate compliance with five guidelines and 21 sub‐guidelines it will be designed for use for in-depth and rapid site evaluation for non‐B3 projects as well, including reporting data useful for completion of the Minnesota Environmental Quality Board’s Environmental Assessment Worksheet (EAW), which is required for a significant number of land development projects in Minnesota.

The final phase of the project includes the presentation of this application to relevant professionals in order to increase its visibility and use in the marketplace as it will be made available free-of-charge to the public.

**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.

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| **Outcome** | **Completion Date** |
| Complete set of logic arguments that codify relevant B3 Site guidelines compiled in a  pdf document | December 2020 |

**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.

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| **Outcome** | **Completion Date** |
| Complete set of geospatial data that meets the data requirements defined in Activity 1,  including references allowing future updates | July 2021 |

**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.

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| **Outcome** | **Completion Date** |
| Complete, functional, and user‐friendly web based mapping application deployed to  users and publicized to all B3 users and other interested parties | December 2021 |

**ENRTF BUDGET: $ 105,000**

**III. PROJECT PARTNERS AND COLLABORATORS:**

**Partners receiving ENRTF funding:**

**Patrick Smith**, Senior Research Fellow, Center for Sustainable Building Research, Role: Project management coordination with U Spatial, and software development

**Len Kne**,Associate Director, U Spatial, University of Minnesota office of the Vice President for Research, Role: Supervising the development of GIS‐ based mapping software

**Partners NOT receiving ENRTF funding**

**Gordon Christofferson**, Project Operations Manager, Minnesota Department of Administration, Real Estate and Construction Services, Role: 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. SEE ADDITIONAL PROPOSAL COMPONENTS: A. Proposal Budget Spreadsheet, B. Visual Component, F. Project Manager Qualifications and Organization Description, Additional: Letter of Support**