Environment and Natural Resources Trust Fund
2016 Request for Proposals (RFP)

Project Title: **ENRTF ID:**   033-A

Measuring Access to Natural Resources and Recreation

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 261,049

Proposed Project Time Period for the Funding Requested: 2 years, July 2016 to June 2018

Summary:

This project will measure access to Minnesotas natural resources and recreation opportunities. The resulting data, maps, and reports will prodive a detailed understanding of how access varies geographically and demographically.

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Sponsoring Organization: U of MN

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

A map of access to jobs by transit in the Twin Cities metropolitan area. Accessiblity is highest in downtown Minneapolis, with other peaks located in downtown Saint Paul and in areas with frequent transit service.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%

PROJECT TITLE: Measuring Access to Natural Resources and Recreation

I. PROJECT STATEMENT

This project will measure access to natural resources and recreation opportunities in Minnesota. These are regarded as one of Minnesota's greatest features, but residents can only enjoy those that they can reach. For every Census block in the state, this project will calculate access metrics based on travel times to nearby parks, lakes and rivers, forests, trails, and other natural resources and recreation opportunities by walking, biking, driving, and transit. The resulting data, maps, and reports will provide a detailed understanding of how access to these resources varies geographically throughout the state, as well as how access varied across different demographic groups.

The data produced by this project will cover the entire state at a geographic resolution at least as detailed as the Census block level, and reports will summarize access for all municipalities and counties. These will enable the identification of "deserts" where access to natural resources and recreation are unusually low, and can guide the allocation of resources to maintain or improve access in an equitable way.

To achieve these goals, the project team will first collect existing GIS datasets describing the location, type, and other properties of natural resources and recreation opportunities from municipal, county, and state data sources. These will be merged into a single GIS database for consistent analysis. Next, accessibility and connectivity evaluation tools developed at the University of Minnesota will be used to measure access to natural resources and recreation opportunities by a variety of transportation modes. The data produced in this step will be made publicly available to enable additional research and analysis by others. Finally, the project team will publish reports summarizing and analyzing patterns of access for individual municipalities and counties, as well as for selected demographic groups.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Compile GIS database   **Budget: $97,893**
The project team will identify and collect existing datasets from municipal, county, and state organizations that identify, locate, and describe natural resources and recreation opportunities throughout Minnesota. These will be merged into a single GIS database for use in subsequent activities.

Outcome	Completion Date
1. Compile list of identified existing GIS datasets	Oct 31, 2016
2. Gather identified datasets from host organizations	Jan 31, 2017
3. Merge gathered datasets into single GIS database	Mar 31, 2017

Activity 2: Calculate access metrics   **Budget: $97,893**
Using detailed pedestrian, bike, road, and transit networks, the project team will calculate travel times from each Census block to natural resources and recreation opportunities throughout the state. Travel times will be calculated for walking, biking, driving, and transit. The travel times will be aggregated into accessibility metrics that indicate the amount, types, and variety of natural resources and recreation opportunities that can be reached from each Census block. This data will be made publicly available to enable additional research and analysis.

Outcome	Completion Date
1. Calculate accessibility metrics	Aug 31, 2017
2. Compile accessibility datasets	Dec 31, 2017

Activity 3: Prepare access reports   **Budget: $65,263**
The project team will analyze the accessibility data and metrics produces in Activity 2 and will prepare a series of reports summarizing patterns of access to natural resources and recreation opportunities across the state, by a

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variety of transportation modes. These reports will provide summaries for individual municipalities and counties, as well as for demographic groups. The reports will be published by the University of Minnesota.

Outcome	Completion Date
1. Publish statewide access report	Feb 28, 2018
2. Publish county access report	Apr 30, 2018
3. Publish municipal access report	Jun 30, 2018

III. PROJECT STRATEGY

A. Project Team/Partners

This project will be implemented by faculty and staff of the University of Minnesota's Department of Civil, Environmental, and Geo-Engineering. These personnel will receive funds:

- Andrew Owen is a Senior Research Fellow and will serve as the project's principal investigator. Owen will direct the activities of the project's research assistants to ensure the completion of each project task. He will ensure that the research team have access to adequate facilities and equipment, and will provide administrative oversight of the project, including the preparation of progress and final reports.
- David Levinson is a Professor and will provide strategic guidance for the project based on his professional and research experience calculating and using accessibility metrics. He will monitor the project's overall progress and advise in the selection of data sources, tools, and methodology.
- Additionally, Owen and Levinson will be assisted by Graduate and Undergraduate Research Assistants to be selected from students enrolled in the University of Minnesota's Civil Engineering and/or Urban and Regional Planning graduate programs.

B. Project Impact and Long-Term Strategy

The University of Minnesota's Accessibility Observatory is dedicated to robust measurement of access to a variety of valuable destinations. Recently, the Observatory has developed software tools that make this possible at a very detailed level, and is beginning a national evaluation of access to jobs by driving and transit. This project will complement those existing efforts by further demonstrating the value of the Observatory's tools, and may encourage other states to work with the Observatory to measure access to natural resources and recreation.

The data and reports created by this project may be valuable in selecting and prioritizing natural resource and recreation investments and maintenance resources. By understanding what parts of the state currently have high or low access to these opportunities, it will be possible to allocate future resources to improve geographic and demographic equity.

It may be valuable to update the project results as the state's natural resources and recreation opportunities evolve over time. A regularly-updated dataset would illustrate how access to these resources and opportunities has changed in response to conservation efforts, facility investments, transportation investments, and changes in residential and land use patterns. The project team will seek future funding opportunities for these updates, including LCCMR proposals in future years. After completing the data collection and processing investments made in this project, future updates will be possible with lower effort and cost.

C. Timeline Requirements

This projects is designed to be implemented over 24 consecutive months. The anticipated schedule and duration for the activities described in section II is:
- Activity 1 (Compile GIS database): 9 months, July 1 2016 – March 31, 2017
- Activity 2 (Calculate access metrics): 9 months, April 1, 2017 – December 31, 2017
- Activity 3 (Prepare access reports): 6 months, January 1, 2018 – June 30, 2018

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2016 Detailed Project Budget

Project Title: Measuring Access to Natural Resources and Recreation

IV. TOTAL ENRTF REQUEST BUDGET: 2 years

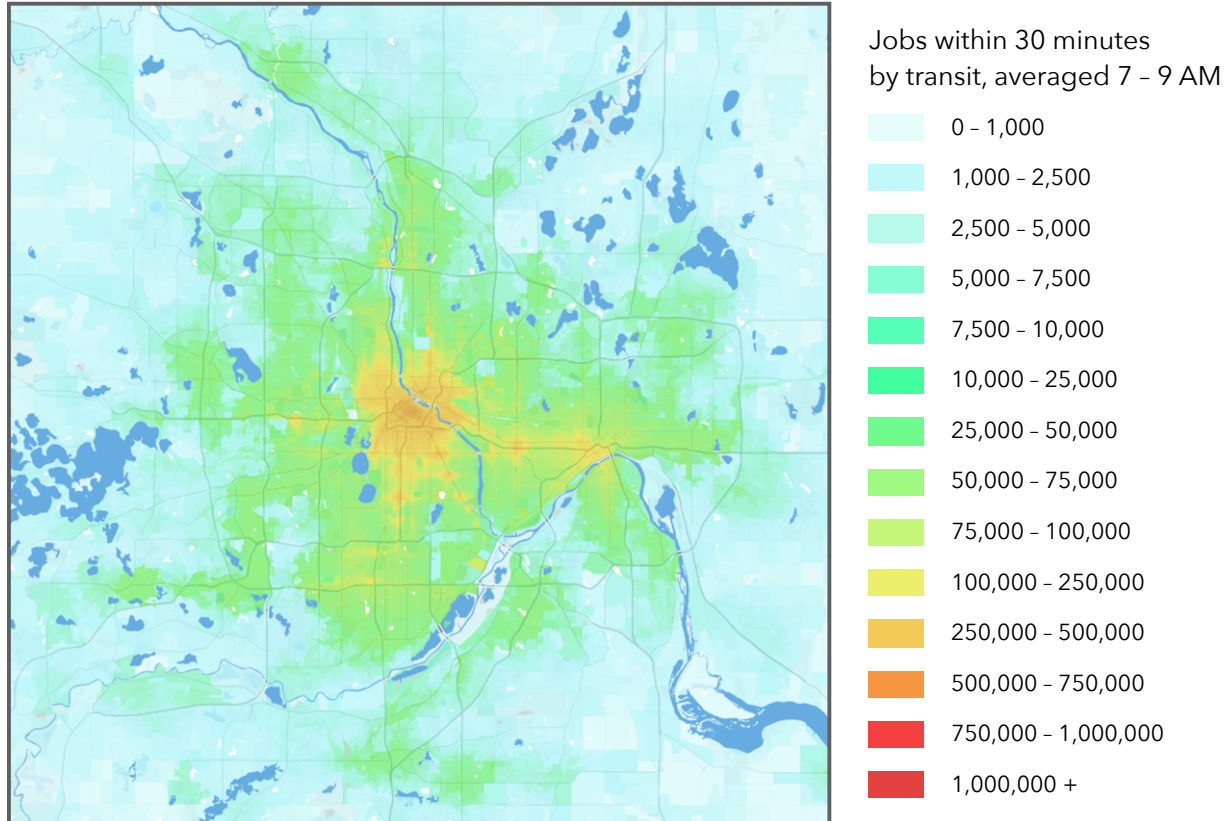| BUDGET ITEM	AMOUNT
Personnel:	
Andrew Owen, Senior Research Fellow/Project Manager (75% salary, 25% benefits); 25% FTE years 1 and 2. Project management, reporting, data analysis.	$ 49,646
David Levinson, Professor (75% salary, 25% benefits); 50% effort during summer, years 1 and 2. Project oversight, advise on data and methodology.	$ 55,478
2 Graduate Research Assistants (62% salary, 38% benefits); combined 75% FTE, years 1 and 2. Data collection and analysis, accessibility calculation, report preparation.	$ 137,094
Undergraduate Research Assistant (100% salary); 25% FTE years 1 and 2. Data collection and processing.	$ 16,831
Professional/Technical/Service Contracts:	
Cloud computing services for data storage and computation. Amazon Web Services or similar.	$ 2,000
Equipment/Tools/Supplies:	
N/A	$ -
Acquisition (Fee Title or Permanent Easements):	
N/A	$ -
Travel:	
N/A	$ -
Additional Budget Items:	
N/A	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 261,049

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: N/A	$ -	
Other State $ To Be Applied To Project During Project Period: N/A	$ -	
In-kind Services To Be Applied To Project During Project Period: N/A	$ -	
Funding History: N/A	$ -	
Remaining $ From Current ENRTF Appropriation: N/A	$ -	

Mapping Access to Destinations

Minneapolis
Minneapolis-St. Paul-Bloomington, MN-WI

Jobs within 30 minutes by transit, averaged 7 – 9 AM

- 0 – 1,000
- 1,000 – 2,500
- 2,500 – 5,000
- 5,000 – 7,500
- 7,500 – 10,000
- 10,000 – 25,000
- 25,000 – 50,000
- 50,000 – 75,000
- 75,000 – 100,000
- 100,000 – 250,000
- 250,000 – 500,000
- 500,000 – 750,000
- 750,000 – 1,000,000
- 1,000,000 +

Map of **access to jobs by transit** in the Twin Cities metropolitan area. Each of approximately 60,000 census blocks is colored based on the number of jobs that can be reached from that location by transit. This project will create similar maps and data for the entire state illustrating access to parks, lakes and rivers, forests, trails, and other natural resources and recreation opportunities, by walking, biking, driving, and transit.

Project Manager Qualifications and Organization Description

Andrew Owen is a Senior Research Fellow in the University of Minnesota's Department of Civil, Environmental, and Geo-Engineering. He holds master's degrees in Civil Engineering and Urban and Regional Planning from the University of Minnesota. Owen's work focuses on building and applying systems for collecting, calculating, analyzing, and communicating data about the connections that transportation systems create between people and destinations. He directs the Accessibility Observatory and leads its team of research assistants.

In *Annual Accessibility Metric for the Twin Cities Metropolitan Area*[1], Owen developed procedures and software tools for use by MnDOT in measuring access to jobs in the Twin Cities. Owen worked with MnDOT to develop the National Accessibility Evaluation pooled fund project[2] which will provide job (and other destinations) access data to states and metropolitan areas across the county. In 2014, Owen led the Observatory's *Access Across America: Transit 2014*[3] project which evaluated job access by transit in 46 US metropolitan areas.

The **Accessibility Observatory** at the University of Minnesota is focused on the research and application of accessibility-based transportation system evaluation. The Observatory is guided by a threefold mission:

1. To advance the field of transportation system evaluation through research of new data sources and methods for accessibility evaluation
2. To develop standards and tools to facilitate the use and communication of accessibility-based metrics in transportation planning, engineering, and evaluation
3. To apply our tools and expertise in support of continual improvements in the planning, design, engineering, and analysis of transportation projects

Accessibility measures the **ease of reaching valued destinations.** By incorporating data about both transportation and land use, accessibility provides a unified view of how well a transportation system fulfills the goal of creating connections between users and their destinations. Accessibility evaluation has applications in a variety of areas:

- **Performance Management**
  Accessibility evaluation can directly measure a fundamental goal of transportation: connecting people to useful destinations.

- **Scenario Evaluation and Analysis**
  Transportation planning organizations can use accessibility evaluation to help select between project alternatives and to prioritize investments.

- **Transportation and Land Use Research**
  Accessibility calculations can provide a valuable data source for transportation and land use research.

- **Transportation Equity**
  Detailed accessibility evaluation can help reveal how the costs and benefits of transportation investments are distributed over space and society.

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[1] http://access.umn.edu/research/previous/destinations/

[2] http://pooledfund.org/Details/Solicitation/1387

[3] http://access.umn.edu/research/america/transit2014/