



Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-214

Proposal Title: Emergency Location Markers for Minnesota's Trails, Parks & Landings.

Project Manager Information

Name: Brian Huberty

Organization: SharedGeo

Office Telephone: (651) 285-5015

Email: bhuberty@sharedgeo.org

Project Basic Information

Project Summary: Accelerate the installation of Emergency Location Markers-ELM throughout the state, county and tribal land recreation areas to help the public find and relay their emergency location accurately in remote areas.

Funds Requested: \$130,000

Proposed Project Completion: 2023-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Environmental Education (C)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Numerous backcountry Search and Rescue incidents over the years have highlighted that the public has difficulty in remote areas communicating location quickly and accurately to first responders. In addition to cell phones still having limited triangulation capability in remote areas, there are multiple (thus confusing) latitude/longitude formats. This project will accelerate use of a Department of Homeland Security and National Search and Rescue Committee (NSARC) emergency location communication standard - U.S. National Grid (USNG) - by helping state, county and tribal land and recreational management organizations place USNG Emergency Location Markers (ELM) at strategic locations such as boat ramps, trail junctions, and campgrounds. Installation of USNG Emergency Location Markers has already been implemented in a variety of recreational locations across the country such as NASA's Cape Canaveral, Kennesaw Mountain Battlefield National Park, many locations in the State of Iowa, and here in Minnesota with Cook, Dakota and Lake counties. Here are YouTube Videos describing some of these ELM installs: 1) Cook County, MN - <https://youtu.be/wg7DOAXphk0>; 2) Lake County, MN - <https://youtu.be/mvw3u2M9JZ0>; 3) Cobb County, Georgia - <https://youtu.be/BHHsp7zqnz0>

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

SharedGeo will provide the training to local land managers and local first responders using materials already developed by SharedGeo at the www.usngcenter.org website. Land managers and first responders will then identify optimal locations to place ELM markers. SharedGeo will then have ELM signs made and shipped to the land managers for installation. An in-kind labor program is proposed to seek proposals from around the state for installing signs. ENRTF funds will be used by SharedGeo for training, purchasing and shipping signs. It will then be up to the local land managers for installation and maintenance.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

Our state's natural resources will be better conserved by the recreating public where they can feel safe to relay accurate locations to first responders as they are out on Minnesota's public lands and waters. This will help land, forest, wildlife and water managers, conservation officers, firefighters and law enforcement personnel respond more quickly to situations. In addition, damages to our natural resource infrastructure - trails, boat landings, bridges, etc. - can be more easily located and reported for repair.

Activities and Milestones

Activity 1: U.S. National Grid and Emergency Locator Markers Training

Activity Budget: \$105,000

Activity Description:

On-site regional training one day workshops (3-6) with additional on-line webinars (5-10). This would include working with first responders, recreational user groups, and managers for parks, forests, trails, and aquatic environments to review the USNG ELM system and identify key, strategic locations for Emergency Location Marker placement.

Activity Milestones:

Description	Completion Date
Present on-site and virtual workshops around the state	2022-01-31
Request for funding from land and water managers	2022-04-30
Select proposed projects	2022-05-31

Activity 2: US National Grid Emergency Location Marker manufacturing and shipping

Activity Budget: \$25,000

Activity Description:

By August 31, 2022, all ELM signs will have been manufactured and shipped to the partners for installation by June 30, 2023. The amount budgeted is for an estimated 1000 signs @ \$25/sign.

Activity Milestones:

Description	Completion Date
Place and ship sign orders	2022-08-31
Complete follow up orders for bad or damaged signs by March of 2023	2023-03-31
Installation of ELMs complete	2023-06-30

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Recreational User Groups	Non-profit Recreational User Groups across Minnesota	Various outdoor associations such as snowmobile, bicycle, hiking, hunting, and watercraft groups receive training on the ELM system. Where appropriate, they will place and maintain ELM signs at strategic locations in coordination with the representative land owners.	No
Emergency Services Sector: conservation officers, law enforcement, EMS, firefighters	First responders	Receive Training on the USNG and how ELM System works.	No
Tribal Lands Departments	Minnesota Tribes	Receive training on the ELM system. Place and maintain Emergency ELM signs at strategic tribal recreation, land and waterway locations.	No
Parks & Trails, Forestry, Ecology and Waters, Fish & Wildlife Divisions	Minnesota Department of Natural Resources	Receive training on the ELM system. Place and maintain Emergency ELM signs at strategic state trails, parks, forests, waterways and other locations.	No
Minnesota County Lands and Parks Departments	Minnesota Counties	Receive training on the ELM system. Place and maintain Emergency ELM signs at strategic county park and land locations	No

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

Dakota, Lake and Cook Counties have already implemented USNG ELM starting nearly a decade ago. It is envisioned the ENRTF grant will help accelerate adoption and expansion to the rest of the state once an initial installation is established. It is envisioned recreational user groups will take over through federal trails programs and county resources.

Project Manager and Organization Qualifications

Project Manager Name: Brian Huberty

Job Title: US National Grid Emergency Location Marker Project Manager

Provide description of the project manager's qualifications to manage the proposed project.

The project manager was given the first USNG briefing by Capt. Tom Terry in the late 1990's.

Started using GPS in 1990! Managed GPS PLGR access and use for USDA NRCS for the Midwest Region

Provides Remote Sensing Support to the MGAC Emergency Planning Committee:

<http://www.mngeo.state.mn.us/committee/emprep/>

Started and managed the \$3.5 million dollar binational Great Lakes Restoration Initiative - Remote Sensing projects

The project manager has extensive wilderness navigation experience using only maps, aerial photos and a compass. This was gained as an inventory forester for the MN DNR in the 1980's .

Organization: SharedGeo

Organization Description:

SharedGeo was founded as a 501 c3 non-profit in September 2008 as a way to advance the use of mapping technologies and share geographic data in support of environmental disaster response and relief operations in the United States. Since 2008, SharedGeo has expanded its geospatial support roles in a wide variety of applications including: producing higher accuracy COVID-19 maps for the U.S. (<https://www.sharedgeo.org/COVID-19/>) establishing the U.S. National Grid Center (<https://usngcenter.org/>), and the Great Lakes Restoration Initiative for the U.S. Fish & Wildlife Service (<https://www.sharedgeo.org/portfolio-item/glri/>).

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Brian Huberty		Project Manager & Instructor			20%	0.5		\$30,000
Dr. Nancy Read		Administrator			20%	0.2		\$7,000
Steve Swazee		Instructor			20%	0.5		\$30,000
Bob Basques		Instructor			20%	0.5		\$30,000
							Sub Total	\$97,000
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Tools and Supplies	1000 Emergency Location Marker Signs \$25/sign delivered, \$25000 total	Manufacture and shipping of ELM signs					\$25,000
							Sub Total	\$25,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	USNG ELM Workshops	Workshops for explaining, locating and installing Emergency Location Marker signs					\$8,000

							Sub Total	\$8,000
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
							Sub Total	-
							Grand Total	\$130,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Existing State, County and Tribal sign infrastructure installation and repair programs.	State, County and Tribal land managers will contribute their time and tools to install ELM signs at their designated locations. This may be done as part of their on-going sign installation and repair programs.	Secured	\$50,000
			State Sub Total	\$50,000
Non-State				
			Non State Sub Total	-
			Funds Total	\$50,000

Attachments

Required Attachments

Visual Component

File: [7680fe0c-557.pdf](#)

Alternate Text for Visual Component

The USNG ELM poster from the 2019 MN GIS/LIS Conference

Financial Capacity

File: [605321f5-f5f.pdf](#)

Board Resolution or Letter

Title	File
SharedGeo Board of Directors Approval Letter	1349d0ea-b73.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

No

Does the organization have a fiscal agent for this project?

No



U.S. National Grid Speeds Emergency Response

Emergency Location Marker (ELM) Trail System

Steve Swazee and Nancy Read, SharedGeo



What

Problem

- 34% of U.S. response calls go to a location without a street address – recreational trails are a leading category
- Trails with location signs typically employ an approach which is unique to that park or trail system
- Locally unique marking systems have **NO VALUE** to responders unless those locations are **READILY AVAILABLE** in dispatch and response systems

Solution

- Develop a standardized Emergency Location Marker (ELM) which can be used anywhere in the nation in a variety of scenarios
- Align the marking system with established federal and state cartographic and signage standards
- Ensure the format leverages GPS instead of requiring constant updating of Computer Aided Dispatch systems
- Use a consistent approach which over time will become instantly recognizable by the public
- Involve multiple stakeholders during development to ensure a “Best Practices” outcome



Responder “Star of Life” symbol avoids Red Cross proprietary issue

15T - UTM Grid Zone; 4x6 degrees

VK - USNG/MGRS 100 KM Square

8 USNG digits called into a 911 response center provide 33’ accuracy within an area of approximately 3,861 square miles.

Federal standard - Traffic Control Blue

Design Development Partners

- MGAC Emergency Preparedness Committee
- Minnesota Department of Transportation
- Minnesota Department of Natural Resources
- Lake County Minnesota focus group (law, trail riders, etc.)
- National focus group of responders and geospatial experts

Why



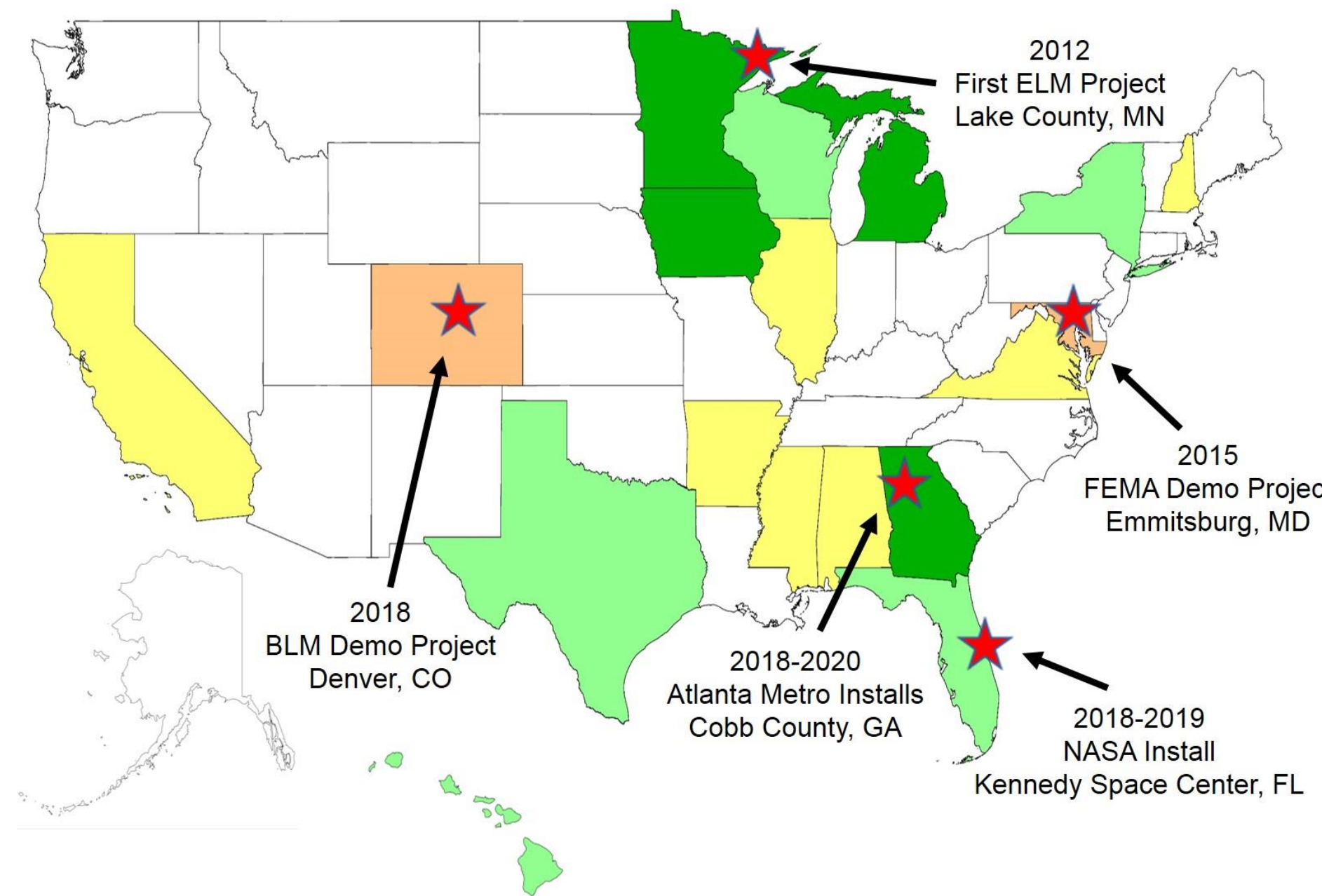
U.S. National Grid?

- USNG is the U.S. portion of the Military Grid Reference System (MGRS) – a well-established worldwide metric coordinate standard used by NATO and the U.S. Armed Forces since the late 1940’s
- In November 2011, the seven federal agencies which comprise the National Search and Rescue Committee, designated USNG as the standard for ALL ground based Search and Rescue (SAR) operations in the U.S.
- In October 2015, FEMA designated USNG as its primary coordinate system and encouraged all partner organizations to do the same – USNG effectively became the nation’s “Emergency Response Language of Location”

But What About...

- **Latitude/Longitude?**
 - It’s base 60 math and nonstandard sized trapezoids are not conducive to responders understanding local location relationships
 - 13 digits are needed to get the same precision as an 8 digit USNG coordinate
 - Format confusion has sent responses to the wrong location with deadly results (DD.MM.SS, DD.MM.mm, or DD.dddd)
- **Cell Phone Location Reporting?**
 - There are many instances where tower triangulation doesn’t work
 - In spring 2018, numerous major news organizations reported on significant location inaccuracies inherent in cell phones and the substantial problems caused for 911 centers
- **Next Gen 9-1-1 (NG911) Systems?**
 - Nationwide adoption of NG911 has been slow and spotty, and likely many rural areas where recreational trails are located remain decades away from implementing
 - USNG interoperability is a federal mandated data design standard of NG911 systems.
 - USNG and associated ELMs are meant to augment and not replace other sanctioned emergency response location reporting approaches such street addresses

One Minnesota ELM Trail System Becomes Many



USNG Emergency Location Marker Projects

- Four or more major installs
- One to three major installs
- Demonstration projects
- ELM Interest / USNG Inquiries

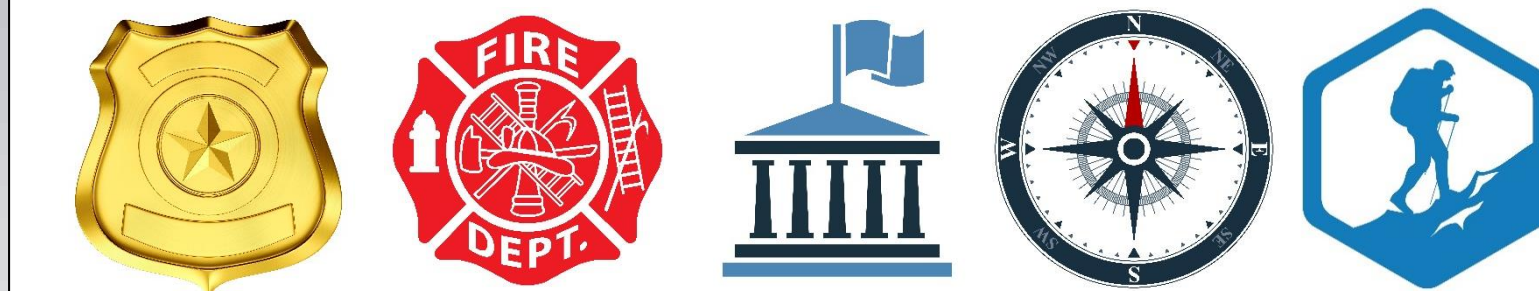
As of September 2019



SharedGeo is a 501(c)3 nonprofit with a mission to help government, nonprofit, education and corporate entities use mapping technologies and share geographic data for the public good.

How

A Truly Collaborative Geospatial Project Which Saves Lives!



1. Build your team

- Emergency Manager
- Responders (Law, Fire, EMS, SAR)
- 911 Call Center (PSAP)
- County/city administration
- GIS support
- Federal, state, local and private land owners
- Trail user groups

2. Plan system

- Average system density factors
 - » Rural = 1 ELM per mile
 - » Urban = 1 ELM per ¼ mile
- Average ELM delivered budgeting factors
 - » Standard ELM - \$30/ea
 - » Info signs - \$35/ea (see next panel)
 - » Carsonite vertical style - \$40/ea (see next panel)
- Posts and hardware (use existing posts or need new?)

3. Obtain funding

- Federal and state trail safety/improvement programs
- Corporate safety grants
- Trail user group fund raisers
- Local government funding

4. Accurately record planned ELM locations

- Trail heads
- Road crossings
- Known accident locations
- Trail junctions
- Camping areas or rest stops

5. Order ELMs, info signs and hardware

6. Conduct responder and call center training

7. Install signs and practice responses

8. Publicize effort to ensure public knows how to use

More

ELM Sizes and Styles

- Originally released in three sizes (6x9, 9x12, 12x12) on .063 aluminum to conform to various trail marking regulations, additional versions and supplemental signs now include:



Vertical Style ELMs

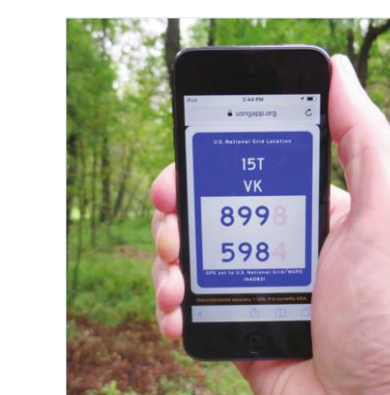


ELM Information Signs

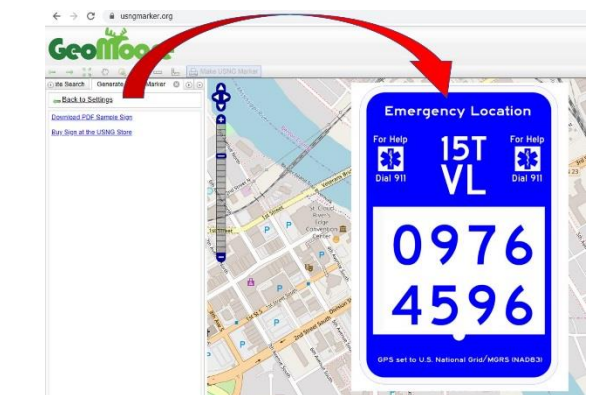


3x5" Custom ELM Stickers

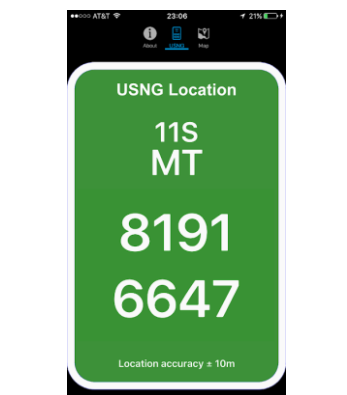
ELM Apps



SharedGeo's usngapp.org



Make an ELM Online usngmarker.org



Esri's MyUSNG

ELM Quick Notes

- “*ELMs cut our trail response times by 90%*”, Pete Walsh, Finland, MN Fire Chief
- St. Paul, MN installed ELMs in Lilydale Regional Park after responders were unable to quickly locate a deadly accident in 2013
- The ELM project in Cobb County, GA was cited as a reason the county won the state’s top IT Award in 2019
- ELMs are an invited presentation of The National Alliance of Public Safety GIS (NAPSG) Inspire Conference, Galveston, TX, November 12-14, 2019
- ELM YouTube videos: “emergency location marker cobb”

USNG Learning Center: www.usngcenter.org

