MONTANA
Department of Transportation
Research

BRINGING MONTANA'S HISTORY INTO THE FUTURE: MODERNIZING MDT'S INTERPRETIVE MARKER SYSTEM

FHWA/MT-25-003/10403-955

Final Report

October 2025

prepared for

THE STATE OF MONTANA DEPARTMENT OF TRANSPORTATION

in cooperation with

THE U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

October 2025

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TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. FHWA/MT-25-003/10403-955	**2. Government Accession No.**	**3. Recipient's Catalog No.**
4. Title and Subtitle Bringing Montana's History into the Future: Modernizing MDT's Interpretive Marker System	**5. Report Date** October 2025 **6. Performing Organization Code**	
7. Author(s) Natalie Villwock-Witte (0000-0002-6992-7141), Karalyn Clouser (0000-0002-5968-094X)	**8. Performing Organization Report No.**	
9. Performing Organization Name and Address Western Transportation Institute Montana State University 2327 University Way Bozeman, MT 59717	**10. Work Unit No.** **11. Contract or Grant No.** MDT Project Number – 10403-955	
12. Sponsoring Agency Name and Address Research Programs Montana Department of Transportation (SPR) 2701 Prospect Avenue PO Box 201001 Helena MT 59620-1001	**13. Type of Report and Period Covered** Final Report (May 2024-October 2025) **14. Sponsoring Agency Code** 5401	

15. Supplementary Notes:
Conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration. This report can be found at DOI: https://doi.org/10.21949/1529567

Recommended Citation:
Villwock-Witte, N., Clouser, K. (2025). Bringing Montana's History into the Future: Modernizing MDT's Interpretive Marker System (FHWA/MT-25-003/10403-955). Helena, MT: Montana Department of Transportation. https://doi.org/10.21949/1529567

16. Abstract

The Montana Department of Transportation currently administers 295 interpretive markers along the state's primary and secondary roads and in rest areas along interstates. Historically, travelers could stop to read the interpretive markers. Then, printable guidebooks were created, with some agencies still using these today. With contemporary technology, interactive online maps are becoming more commonplace, some which have a companion mobile application (app). This research reviewed twenty-three apps to identify some of the innovative content. It asked peer agencies that use apps about their experiences. Allowing offline use and ensuring that continued maintenance can be performed are key needs. The use of augmented reality is one of the most novel approaches that is still in its infancy. The research also reviewed twenty-eight online interactive maps to identify best practices. Enabling users to provide feedback via integrated forms and allowing for open and keyword-focused searches were two best practices. Many of the recommendations were related to avenues for sharing the data, including on a publicly accessible online interactive map. Several suggestions for improvements to the online interactive map were provided. There is also a need to plan for how the interpretive marker data is managed going forward.

17. Key Words Interactive markers, historic, geologic, mobile applications, apps, online interactive maps		**18. Distribution Statement** No restrictions.	
19. Security Classif. (of this report) Unclassified	**20. Security Classif. (of this page)** Unclassified	**21. No. of Pages** 146	**22. Price**

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Acknowledgments

The Western Transportation Institute (WTI) at Montana State University would like to thank the MDT Research Programs Manager Rebecca Ridenour and our Research Project Manager Alexandra Nelson for their oversight; and our Technical Panel, including: Jon Axline (Chair), Brian Andersen, Kira Axline, Mack Long, Jon Swartz, and Jeff Patten for their guidance and direction. The researchers would also like to acknowledge former Research Project Manager, Vaneza Callejas. Furthermore, the researchers would like to express their gratitude to the individuals who responded to the survey as well as those who were willing to participate in interviews (National Park Service, GuideOne Mobile, ExploreHere, and the Montana Department of Commerce). Finally, the researchers would also like to thank Dana May for technical editing and Neil Hetherington for creating some of the graphics found within, both are with WTI.

TABLE OF CONTENTS

List of Tables

List of Figures

STANDARD CONVERSION TABLE – ENGLISH TO METRIC				
Symbol	To convert from	Multiply by	To determine	Symbol
		LENGTH		
IN	inch	25.4	millimeters	mm
FT	feet	0.3048	meters	m
YD	yards	0.9144	meters	m
MI	miles	1.609344	kilometers	km
		AREA		
SI	square inches	645.16	square millimeters	mm^2
SF	square feet	0.09290304	square meters	m^2
SY	square yards	0.83612736	square meters	m^2
A	acres	0.4046856	hectares	ha
MI^2	square miles	2.59	square kilometers	km^2
		VOLUME		
CI	cubic inches	16.387064	cubic centimeters	cm^3
CF	cubic feet	0.0283168	cubic meters cubic	m^3
CY	cubic yards	0.764555	meters liters	m^3
GAL	gallons fluid	3.78541	liters	L
OZ	ounces	0.0295735	cubic meters	L
MBM	thousand feet board	2.35974		m^3
		MASS		
LB	pounds	0.4535924	kilograms	kg
TON	short tons (2000 lbs)	0.9071848	metric tons	t
		PRESSURE AND STRESS		
PSF	pounds per square foot	47.8803	pascals	Pa
PSI	pounds per square inch	6.89476	kilopascals	kPa
PSI	pounds per square inch	0.00689476	megapascals	Mpa
		DISCHARGE		
CFS	cubic feet per second	0.02831	cubic meters per second	$m^3/_s$
		VELOCITY		
FT/SEC	feet per second	0.3048	meters per second	m/s
		INTENSITY		
IN/HR	inch per hour	25.4	millimeters per hour	mm/hr
		FORCE		
LB	pound (force)	4.448222	newtons	N
		POWER		
HP	horsepower	746.0	watts	W
		TEMPERATURE		
˚F	degrees Fahrenheit	5 X (˚F – 32)/9	degrees Celsius	˚C
		DENSITY		
lb/ft^3	pounds per cubic foot	16.01846	kilograms per cubic meter	kg/m^3
		ACCELERATION		
g	freefall, standard	9.807	meters per second squared	m/s^2

TO CONVERT FROM METRIC TO ENGLISH, DIVIDE BY THE ABOVE CONVERSION FACTORS.

Acronym List

AI	Artificial Intelligence
Apps	Smartphone applications/mobile applications
AR	Augmented Reality
BLE	Bluetooth Low Energy
CPHDH	Cleveland State University's Center for Public History + Digital Humanities
CSV	Comma-Separated Values
DNR	Department of Natural Resources
DOT	Department of Transportation
ESRI	Environmental Systems Research Institute, Inc.
FHWA	Federal Highway Administration
FTC	Federal Trade Commission
GHS	Georgia Historical Society
GIS	Geographic Information System
GPS	Global Positioning System
HMdb	Historical Marker Database
KML	Keyhole Markup Language
MDT	Montana Department of Transportation
MHS	Montana Historical Society
NOAA	National Oceanic and Atmospheric Administration
NPR	National Public Radio
NPS	National Park Service
PDF	Portable Document Format
QR	Quick-Response
SEO	Search Engine Optimization
SHPO	State Historic Preservation Office
SOW	Scope of Work
SWHC	Spanish World Heritage Cities
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UX/UI	User experience/user interface
VR	Virtual Reality
WTI	Western Transportation Institute

Introduction

The Montana Department of Transportation (MDT) currently administers 295 historic and geological interpretive markers (Figure 1) along the state's primary and secondary roads and in rest areas along interstates. The markers have been an important part of the Montana transportation landscape since 1935. Traditionally, one would access the information by reading the sign itself, or a traveler may review the content in a booklet in cooperation with a static map about each sign's location. However, in modern times, there is a need to consider contemporary approaches to disseminating this information to Montanans and visitors to the state. One potential approach is to leverage interactive electronic maps on the MDT website. In addition, there may be other methods available to better disseminate the history and geology of Montana described in the interpretive markers. For example, smartphone applications (a.k.a. apps) have been a commonly used technological approach. An app could provide the text of the markers without the user stopping to read them. However, if this is the intent, the tool should not encourage unsafe or distracted driving. Therefore, there is a need to better understand how other states, and potentially federal agencies (e.g., the National Park Service) are trying to use more contemporary media for better dissemination of their history, geology, and culture.

Figure 1: Example of a Geologic Interpretive Marker in Billings, Montana.

The report begins with a Literature Review and Information Gathering. This is followed by the findings from the Survey of Other States and Federal Lands. Next, it presents a Review of Innovative Apps was conducted, followed by a Review of Online Interactive Maps. The report then details insights from Discussions with MDT Stakeholders. The report concludes with Conclusions, Recommendations, and Future Research.

Literature Review & Information Gathering

Interpretive markers provide information that enables the reader to connect to a place. However, ensuring that the information is disseminated to readers is becoming more challenging as vehicles can travel at faster speeds and people's lives have more and more activities crammed into a finite amount of time. Therefore, while the markers remain in place ready to share information, it is unclear if travelers receive that information. This literature review and gathering of information examines: 1) the purpose of interpretive markers, 2) the number of interpretive markers, 3) the history of interpretive markers, and 4) innovative methods for dissemination. Resources that focus on the content of interpretive markers, particularly those whose focus is history, were abundant but not sought for this effort. For example, in 2024, a podcast of the National Public Radio (NPR) (Sullivan & McMillan, 2024) highlighted the on-going conversation about who is and is not included as subjects in interpretive markers. The contemporary discussion of interpretive markers suggests that they remain relevant even in this modern age. The focus of this research is the *dissemination* of the markers. The discussion of the content displayed on markers should be left to historians and other experts in this field.

The Purpose of Interpretive Markers

Interpretive marker programs have been described as having four purposes: 1) convey pride of place, 2) support cultural tourism, 3) educate the public, and 4) preserve historic resources (Bluestone, 2011; Schultz & Kelly, 2007). An interpretive marker suggests that a "certain person or story matters," and has the "potential of increasing residents' pride of and attachment to the places in which they lived" (Bluestone, 2011; Marks, 2023). Interpretive markers are said to "promote history-related tourism and research" (Bluestone, 2011; Daniels, Meinkoth, & Loux, 2023). Some have touted the ease with which they can be used to educate the public, potentially serving as a starting point to encourage the reader to learn more (Bluestone, 2011; Lapshan & Voigt, 2017; Robinson & Galle, 2014). Yet, with often only a capacity for around a hundred words to be included on each marker, "…the history captured on the markers did little to get across the meaning or importance that places should hold for people" (Bluestone, 2011). Interpretive markers have also been suggested as bringing economic benefits (Bluestone, 2011), particularly related to the introduction of the automobile as it became more accessible to the broader public (Daniels, Meinkoth, & Loux, 2023).

Number of Interpretive Markers

The number of markers that each state reports varies widely from as few as 120 in Kansas to as many as 13,000 in Texas (Table 1) (Idaho Historical Society, n.d.; KJZZ Phoenix, 2024; Lapshan & Voigt, 2017; Maryland Department of Transportation, n.d.; Schultz & Kelly, 2007; South Carolina Department of Archives & History, 2019; State Historical Society of Iowa, n.d.).

Table 1. Estimated Number of Interpretive Markers

State	Estimated Number of Interpretive Markers
Arizona	2,000+
Colorado	220
Delaware	~630
Idaho	500
Illinois	400+
Indiana	425+
Iowa	3,500
Georgia	2,600
Kansas	120+
Kentucky	2,000+
Maryland	780
Michigan	1,700
Montana	295
Nevada	266
New Mexico	500+
New York	2,800
North Carolina	1,400
Ohio	1204
Pennsylvania	2,000+
South Carolina	1,700
Texas	13,000
Virginia	2,200
West Virginia	1,000
Wisconsin	470
Wyoming	400

History of Interpretive Markers

In 2007, a review of state-level historic marker programs concluded that thirty-four states had some type of program (Schultz & Kelly, 2007). While many suggest Virginia may have "the oldest" program, with roadside markers placed as early as 1927 (Marks, 2023; Daniels, Meinkoth, & Loux, 2023; Barni, 2018), South Carolina reported having a program since 1905, which would make it the oldest (Schultz & Kelly, 2007). Colorado has had one since 1907 (Schultz & Kelly, 2007), Missouri, since 1913 (Daniels, Meinkoth, & Loux, 2023), and Pennsylvania since 1914 (Robinson & Galle, 2014), with more recent programs like Michigan starting in 1955. However, what constitutes a formal definition of a historic marker program and whether it is consistent in how each program looked at various points in time could be debated.

From the onset, historical markers have been seen as bringing economic benefits (Bluestone, 2011; Daniels, Meinkoth, & Loux, 2023; Marks, 2023; Robinson & Galle, 2014). Virginia's highway marker program was intended to promote tourism and economic development, as suggested by the $50,000 seed funding provided by Virginia's state advertising fund (Bluestone, 2011). Early on, the interpretive markers of Virginia's program were installed only on the main road so they could

be seen by tourists (Bluestone, 2011). Later, "The association likely established a 700-mile historic circuit in order to guide tourists from eastern Virginia to more remote parts of the state using history as an attraction. The Conservation Commission continued this role of juxtaposing history and highways in the interest of economic development" (Bluestone, 2011). Most notably, historic markers did not require purchasing historic buildings or sites, often a costly endeavor (Bluestone, 2011). The belief of their economic influence continues today, although research does not suggest a direct connection or a specific dollar amount that may be associated with the presence of a historical marker (Marks, 2023; Daniels, Meinkoth, & Loux, 2023).

As recently as 2007, New Jersey asked a consultant to provide recommendations for what a statewide program would look like (Schultz & Kelly, 2007). While some markers exist and have been in place in New Jersey as early as the 1930s, there had never been "an organized state historical marker program." However, four counties within New Jersey had their own programs: Bergen, Middlesex, Morris, and Sussex.

Late in the 1920's, Virginians conveyed history via cast-metal signs installed along the state's primary highways (Bluestone, 2011). These signs were preferred to granite markers installed by historic societies elsewhere so that they were, "highly legible and designed to be read in part from a moving car." In fact, this style of marker is often viewed as "the iconic interpretive marker," typically constructed of aluminum and painted with raised lettering. Many historic marker programs have used such a design since the 1930's (Schultz & Kelly, 2007). The Walton East Branch Foundry cast the markers for New York. To replace a marker today, an aluminum cast is made and can cost about $500 each (Lord, Jr., 2024).

The physical condition of interpretive markers varies over time. In some cases, the wording has deteriorated. In others, like Virginia, the markers remain in place (Daniels, Meinkoth, & Loux, 2023). Some have been hit when vehicles leave the roadway or by snowplows (Marks, 2023; Barni, 2018). One state reported changing to a "honeycombed constructed post," reporting that they were hit fairly frequently by vehicles leaving the roadway (Schultz & Kelly, 2007).

Early speed limits of 25 miles per hour more easily allowed motorists to pull over and read the historical markers (Robinson & Galle, 2014), although some have suggested that markers were originally intended to be read as the vehicle was moving (Bluestone, 2011; Schultz & Kelly, 2007). As roads improved, vehicles were able to travel at faster speeds. By 1929, speed limits rose to 40 mph, and motorists were less likely to stop and read the markers (Robinson & Galle, 2014). Even so, some felt that the presence of interpretive markers could compel motorists to slow down (Barni, 2018).

Many of New York's interpretive markers were installed between 1926 and 1936, spurred by an interest in celebrating the 150th Anniversary of the American Revolution (Lord, Jr., 2024). In the 1960's, after formal legislation officially re-established a program, larger markers were installed moving forward to identify historic sites for educational purposes. Therefore, while the original purpose of the markers was commemorative, it shifted to an educational purpose. New York State does not manage a historical marker program; instead, local officials were given the responsibility. New York reports leveraging funding from the William G. Pomeroy Foundation to repair or install a marker.

Maryland has been installing historic markers since 1930 (Maryland Department of Transportation, n.d.). The Maryland Department of Transportation State Highway Administration "funds, installs, and maintains markers along state roads and property." Similar to New York, Maryland supported George Washington commemoration activities by installing markers along

state routes that Washington had traveled. Around 800 markers were installed, with around 780 markers remaining today. Applications are still being submitted.

Innovative Dissemination Methods

While acknowledging that "augmented reality, virtual tours and online programming" are more contemporary than the "old-school vibe" of historical markers, interpretive markers still possess "the power…to shape the public's ideas about history" (Marks, 2023). Some states have taken innovative approaches to disseminate the information on interpretive markers. In this section, the more traditional printed materials approach is highlighted, followed by web pages, tours, mobile apps, and augmented reality (AR). Technology can be a "powerful avenue for storytelling" (Cuseum, Inc., 2018). Audio guides, apps, and AR are some modern technological approaches that can be used to "bring preservation narrative into the digital age" (Cuseum, Inc., 2018).

Printed Materials

A previously popular approach for disseminating information about interpretive marker programs was the production of interpretive marker guides. In fact, until more recently, the provision of such guides, where a number may be associated with a marker and contain the relevant information, was seen as innovative.

The Virginia Conservation Commission "grappled with the incompatibilities between driving an automobile and reading historic markers," (Bluestone, 2011) suggesting that the idea of having people read markers while moving was short-lived (Schultz & Kelly, 2007). Furthermore, Virginia's Conservation Commission, "worried that the markers might prove a hazard if people stopped to read them while still on the roadway itself" (Bluestone, 2011); the Conservation Commission's concerns are well-founded, as modern traffic safety engineering practices remove fixed objects, like signs, from the shoulder where errant vehicles may travel when they leave the roadway. Consequently, as early as 1929, a guidebook associated with the markers in Virginia stated, "It is difficult to read anything when going at speed [25 to 40 mph], and so the commission decided to supplement the inscriptions on the markers with a book giving the inscriptions and keyed to the road markers by means of their numbers. Thus, the traveler supplied with this booklet has only to catch the number of a marker and to turn to that number in the booklet to find the inscription, which may be read without checking the speed of the car…it is possible to get a good idea of the topography of Virginia history with an absolute minimum of reading. And in a busy age, this is deemed to be a much-desired convenience" (Bluestone, 2011). It seems that even in the 1930s, life was at a fast pace. It was argued that by allowing motorists to pass by without stopping, "the commission's work made the awareness of history more pervasive even as the historical power of any particular places seemingly diminished" (Bluestone, 2011). This again speaks to an interest in ensuring that the educational content is delivered to the passerby, as previously discussed as a purpose of interpretive markers.

Delaware, as early as 1933 (Barni, 2018; Schultz & Kelly, 2007), produced a guidebook for their historic sites. The book contained a small map of the sites and inscriptions of each site. The aim of the guidebook was to attract visitors to the state, again harking back to an interest in promoting economic development via tourism.

The Idaho Transportation Department publishes the *Idaho Highway Historical Marker Guide,* which provides information on the over 500 state markers along Idaho's highways (Idaho Historical Society, n.d.). The intent of the guidebook is to allow travelers to plan interesting stops along their journey or to pass a marker without stopping and still read the text. The guidebook is

organized by highway number. For each marker, information is provided on the sign number, highway, milepost, marker title, and a short description.

Nevada State Historic Preservation Office (SHPO) offers a booklet entitled *A Guide to Nevada's Historical Markers* (Martin, 2021). This guidebook provides basic information on Nevada's roadside markers including the marker name, marker number, primary topic (i.e., mining, railroad), location coordinates, a short description, marker type (i.e., stone, on building) and a quick-response (QR) code which readers can use to find more information, again encouraging the viewer to learn more. The guide is organized by county, including a map of marker locations for each county and a list of markers.

South Carolina offers a similar booklet which lists the state's 1,700-plus historical markers by county (South Carolina Department of Archives & History, 2019). Each marker has its name, location description, a short description, and global positioning system (GPS) coordinates. The booklet also provides a list of marker names based on select subject matter (i.e., Colonial Era, American Revolution), as well as information on how to apply for a new historical marker.

The West Viginia Department of Arts, Culture and History updated its *Signs of the Times: West Virginia's Highway Historical Marker Program* guidebook in 2021 (West Virginia Office of the Governor, 2021). Published since 2002, the guide contains descriptions of the state's historic markers along highways organized by county.

While guidebooks were only recently offered by some states, other states have chosen to no longer produce theirs. The main motivation behind this change is often as soon as the guide is published, the information is "obsolete," as new markers are already being installed (Robinson & Galle, 2014; Schultz & Kelly, 2007). For example, in 2000, Pennsylvania stopped offering its guide, which had provided the text and locations of the state's historical markers (Robinson & Galle, 2014).

Web Pages

As access to the internet became more commonplace, it provided opportunities to use websites where a user can obtain information on interpretive markers in a format that can easily be updated when compared with a printed guidebook. Appendix A: Interactive Maps of Interpretive Markers presents a list of interactive maps that were identified through the literature search and information gathering.

Pennsylvania's database was provided via a website where a user could access the information from a variety of searches. In 2001, in an effort to better disseminate the information from the markers, the Pennsylvania's marker program partnered with WITF, a "trusted, valued supplier of programs and services that both satisfy and stimulate curiosity for residents in every community in the central Pennsylvania region" (WITF, n.d.). This collaboration highlighted the desire to educate the public based on the interpretive markers. A review of all statewide programs indicated that Pennsylvania's effort was "unique and extraordinary" (Schultz & Kelly, 2007). The collaboration between these two entities and others resulted in the development of the website, ExplorePAhistory.com. In addition to providing general information about the markers, the website also provides lesson plans that can be used by teachers that align with the state's teaching standards. WITF then went on to create the PA Markers app. The creation of the lesson plans and other associated tasks were said to have cost about $6 million (Schultz & Kelly, 2007).

Michigan has created its own "web-based tool" (Lapshan & Voigt, 2017) in an attempt to disseminate the information contained on their historic markers. Their website is described as "interactive," and they touted the fact that there was "no special app required." Information provided by the tool included the title, address of the marker, links that enable someone to learn more about the marker, driving directions in Google Maps, installation dates, an image, and marker text. The user is also able to download a portable document format (PDF) copy of the marker. Furthermore, the website provides a "contact form link" to notify administrators when a marker is missing. It essentially leverages crowdsourcing. In addition, the tool allows the user to filter the markers by county, theme, or time period. The map can be viewed in a road or topographical format. Information about state parks, campgrounds, and the state's network of rail trails can also be incorporated onto the map, allowing for someone using the tool to coordinate traveling to marker locations with places to stay and other destinations. The database can be downloaded in the Keyhole Markup Language (KML) or comma-separated values (CSV) file format.

The Virginia Department of Historic Resources was working with the Virginia Department of Transportation to develop a "more flexible ArcGIS app" (Daniels, Meinkoth, & Loux, 2023).

Recommendations for developing a marker program for New Jersey suggested that the website should be "dynamic and innovative;" they also recommended that an online geographic information system (GIS)-based database be "interactive" and "searchable" (Schultz & Kelly, 2007). Indiana, Kentucky, Michigan, North Carolina, and Pennsylvania were identified as states that had the most "comprehensive user-friendly websites" (Schultz & Kelly, 2007).

Other websites that may feature some markers, including Waymarking.com, Historical Marker Database (HMdb) (www.hmdb.org), and Markeroni.com (Robinson & Galle, 2014; Schultz & Kelly, 2007). Data from the HMdb was used as the source of interpretive maker data for the "Explore Here" application (app) (Guld, 2021).

Sterling Eureka and Laketown Historical Society leveraged a volunteer with geospatial analysis expertise to digitally map 373 historical markers within Polk County, Wisconsin (Anderson, 2024). Little information besides the location of the marker and a name for the feature was provided.

Tours

One more contemporary suggestion for the dissemination of interpretive marker information was "self-guided public tour opportunities" (Schultz & Kelly, 2007). Such an opportunity is believed to involve a self-guided audio tour or tour options where an agency may provide a suggested list of places to visit based on a locality or a historic topic of interest.

Mobile Apps

First introduced in 2007, mobile guide apps have a growing presence in the tourism industry and may have a role to play in interpretation as they can provide current multimedia content in a format that is accessible at your fingertips (Purcell, 2011). Apps can aim to educate and engage users, a stated purpose of interpretive markers. Apps are "an end-user software application designed for a mobile device operating system, which extends that device's capabilities," although a "standard, industry-wide definition of what is-and is not- an 'app' is difficult to pinpoint" (Purcell, 2011). A mobile app can pull data from an online database, like those mentioned in the previous section, or be more interactive (i.e., provide users with videos, photos, and other multimedia content, allow users to share information, or notify a user when they are near an interpretive marker). In addition, an app can provide options like both audio and visuals for people with disabilities, ensuring that

interpretive marker materials are accessible to all visitors. A significant drawback to apps occurs when there is limited or no cellular connection. Blaser (Blaser, 2015) described one method to address spotty cellular/internet reception. The app downloads all the information to the smartphone so that it can operate without a cellular connection. The challenge with this solution is that the download size of the app can become quite large.

The remainder of this section discusses research conducted by the University of Nebraska – Lincoln towards the development of an app for the Oregon National Historical Trail, the development of an app for the Fort Vancouver National Historical Site, the development of the Flyover County app, followed by the discussion of a variety of other examples where less was written about them in literature.

University of Nebraska - Lincoln NPS App Development

A project completed at the University of Nebraska – Lincoln explored modern methods for visitor interpretation in the National Park Service (NPS), to help prepare for the development of an interpretive mobile app for the Oregon National Historical Trail (Blaser, 2015). As a part of this effort, a market analysis was conducted where both official NPS and unofficial national park mobile apps identified in the following list were examined to understand available features and what types of information was provided:

- Black Hills & Badlands of South Dakota
- Canyon Country National Parks
- Chesapeake Explorer
- Chimani Yellowstone National Park
- Fort Vancouver Mobile
- Mount Rushmore Virtual Tour
- National Parks by National Geographic
- NPS Boston
- NPS Independence National Historical Park
- NPS National Mall and Memorial Parks
- NPS Yosemite
- Parkopolo
- Passport to Your National Parks
- Visit Harpers Ferry
- Yellowstone National Park – The Official Guide

The researchers found that the biggest difference between official and unofficial apps was that NPS official apps were free to use and did not have advertisements, whereas unofficial apps were generally ad-supported or had a paywall to unlock features. Information provided in these mobile apps included maps, driving directions, hours of operation, guided tours, nearby amenities, and interpretive site information. In addition to reviewing the mobile app features, customer ratings were reviewed to understand user opinions. App users liked in-depth information (e.g., hours of operation, wayfinding including maps and directions, admission costs, guided tours, current events, and current park alerts) over basic overview information. App users also wanted the ability to download maps so that they could be used offline.

The University of Nebraska – Lincoln researchers then distributed a survey through social media and outdoor-focused websites like the Wilderness Medicine Institute and John Day Fossil Beds National Monument to obtain feedback on what app features were most desired for an NPS tourism app. Survey respondents ranged from age 19 to 63 with an average age of 28 years old, suggesting a slightly youthful sample (Blaser, 2015). Just over 30% of respondents were female, 53.7% were male, and 14.9% did not provide their gender. Most respondents (74.1%) were Caucasian. Most respondents (89.45%) had never used an NPS mobile app and were unaware one existed or did not feel the need to use an app. Considering that 60% of Americans aged 18-29 had downloaded apps (compared with 46% for 30-49 and 15% for 50+) (Purcell, 2011), this could indicate a need to better market the app and make it seem like a viable option for interpretive services at NPS sites.

Participants were asked to share features of NPS or other travel mobile apps that they found to be most helpful. Commonly chosen features included: maps (79.6%), destination information (76.6%), visitor notifications (68.2%), and personalized tours (24.88%) (Blaser, 2015). Nearly all respondents (96.6%) believed that an NPS or other tourist app should be capable of running offline (Blaser, 2015).

Fort Vancouver National Historic Site App Development

In an article for *Federal History*, Oppegaard & Shine (Oppegaard & Shine, 2014) describe the development of a National Endowment for the Humanities-funded interpretive mobile app for the NPS Fort Vancouver National Historic Site in Washington State. The app arose from an independent examination of NPS by the Organization of American Historians which found that NPS could better utilize technologies to advance "historical research, interpretation, and connections between staff and the larger historical profession, as well as public engagement with the past" (Oppegaard & Shine, 2014). When the app was first offered in 2012, few apps existed for heritage sites, and most of the apps that did exist were not interpretive. NPS attracted 280 million visitors in 2010, and an estimated 78 percent of those visitors had no interaction with an NPS staff member for site interpretation. Instead, NPS largely relies on wayside signs, brochures, and audio tours, suggesting the implications that such an app could assist NPS with better achieving its mission of "preserving unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations" (Oppegaard & Shine, 2014; National Park Service, 2024).

The intent of the app was to bring interpretive options to the Fort Vancouver National Historic Site's "The Village" area, which had recently opened. This area was chosen because its location was more than a quarter mile from the nearest parking area or staffed facility as well as being in relative proximity to rail, road, and airport noise, which would make ranger-led activities difficult. However, with a mobile app, a user could read the text or utilize headphones to block out background noise. The goals of developing the app included creating connections to the community and to "access information and interpretation for The Village through a variety of means" (Oppegaard & Shine, 2014). These documented goals helped to keep the app project moving forward even when staff and resources were limited during the development process.

The free app was officially launched in June 2012, and by September 2013, the app had been downloaded more than 1,500 times. The app was considered a national model for the NPS and was included in a service-wide webinar on increasing technological innovation. Oppegaard and Shine noted that during the development, the partnerships that were built both within and outside of the NPS were extremely valuable and that building the app was a labor-intensive and difficult process (Oppegaard & Shine, 2014). Without defined end goals, regular meetings, and partnerships, the app would not have been so successful. The benefit of the app over interpretive items like brochures and signs is that they are easy to update and expand as needed. Yet, a challenge with the app was a lack of a stable wireless connection at the historic site. This meant that some visitors struggled to download the app on site. An important conclusion by the experience was marketing the app was key to getting new users.

Flyover Country

Loeffler et al. examined updates centered around two user scenarios for the Flyover Country mobile app (https://flyovercountry.io/) (Loeffler, Roth, Goring, & Myrbo, 2021). Flyover Country is a free mobile app which provides a map displaying geological and historical information for users to save and access offline while traveling. This app uses the mobile device's GPS location

(which can function in airplane mode) to keep the map centered on the user's location while following a pre-downloaded pathway.

Version 1 of the app was developed and shared with University of Minnesota students and faculty. They participated in a talk aloud study and focus groups to provide feedback on the app by walking through two scenarios: 1) a traveler using the app to examine geologic information on their flight pathway, and 2) a student using one of the app's educational self-guided field trips. Feedback from these activities was used to develop Version 2 of the app.

Changes from Version 1 to Version 2 of the app included centering the map based on the user's context. For example, users in "flight" mode will have a map that shows the user's flight path and a 200-mile buffer around that path, whereas those in "drive" mode will have a map that shows the user's driving path and a 20-mile buffer around that path. The app will enlarge symbols for nearby points of interest and reduce the symbols that are further away to reduce visual clutter.

Additionally, the app focused on "thumb-based" interactions. The app navigation style contains tabs at the bottom of the screen where a user's thumb is located. Information on points of interest can be viewed by pulling upwards on an information panel.

Other Apps – FolkTure; SWHC; Nikko, Japan; Clio; and GHS

Corallo et al. (Corallo, et al., 2017) examined the use of a mobile app developed to encourage people attending a local folk music festival called "La Notte della Taranta" in the Salento Region of Italy to visit and learn about nearby historic and cultural sites. The app, called "FolkTure" was developed for the 2015 folk music festival. The app provided users with information on nearby historical and cultural points of interest, including photos, videos, and recorded commentary about each site. In addition to this information, the app included gamification strategies, or rewarded certain behaviors with points, badges, and a leaderboard where users could compete to win a "very important person" pass for a concert. In order to gain points, users had to visit points of interest and/or engage with a public thread in the app. A total of 2,123 user posts and 475 user geographical locations were analyzed. Findings showed that the app increased knowledge of the territory and encouraged users to explore nearby historic and cultural sites in areas that were not generally tourist destinations.

In an article for *Sustainability*, Ramos-Soler et al. (Ramos-Soler, Martinez-Sala, & Campillo-Alhama, 2019) examined perspectives of senior citizens (aged 60 and over) in Spain on their use of tourism mobile apps for the Spanish World Heritage Cities (SWHC). According to a census conducted in Spain, 78.6 percent of people aged between 65 and 74 claim to use a smartphone (Ramos-Soler, Martinez-Sala, & Campillo-Alhama, 2019). For the research effort, 25 senior citizens took part in a focus group where they discussed resources used on different phases of the tourist journey (e.g., pre-trip, during, and post-trip). Most participants had visited a SWHC site and expressed an interest in cultural and nature tourism. While every SWHC has a tourism mobile app, none of the participants had used these apps. This was primarily due to being unaware that they existed or that they had little interest in trying them out, because their typical travel habits included making decisions about sightseeing and other local stops based on printed information and interactions with locals (Ramos-Soler, Martinez-Sala, & Campillo-Alhama, 2019). The participants noted that they value information and guides that include places to visit, culture and traditions, and information that can facilitate planning and enjoyment of a trip, including nearby accommodations, restaurants, and transportation. A primary disadvantage noted for mobile apps is that the small screen size can lead to reading difficulties. An advantage includes audio guides that would be useful for older individuals and people with visual disabilities.

Considering younger generations, in an article for the *International Journal of Social and Business Sciences*, Hiramatsu et al. (Hiramatsu, et al., 2017) discussed a mobile app developed to encourage young people to engage with a cultural heritage site in Nikko, Japan. The mobile app utilized a series of Bluetooth low energy (BLE) beacons which would push information to the mobile app as a user walked nearby. The app allowed users to choose between Japanese, English, Chinese, and Thai for language settings. Information displayed in the app included cultural and historical information about the site, a map, information about the area, nearby shops, and the local bus timetable. BLE beacons were chosen as: 1) this would reduce the need for signboards at the various sites, 2) they do not require use of a smartphone GPS, which can utilize a lot of battery power, and 3) they do not require access to the internet, which is often limited in rural areas. Tourists were encouraged to install the app at the Tobu Nikko Train Station for various mobile app tests throughout the fall of 2015. Users were then asked to complete an online survey. A total of 57 responses were received (15 English speakers and 42 Japanese speakers). Users found the app to be convenient, interesting, and helpful. English speakers more positively reviewed the app than Japanese speakers.

Clio is a free GPS-enabled "educational website and mobile application created by historians at Marshall University" (American Association for State and Local History (AASLH), n.d.). In addition to the surface information, Clio also provides links to relevant books, articles, and websites. Additional media, like oral histories, videos, and photos, can also be integrated into a relevant location. Public historians are encouraged to use the app to get people to visit museums or access their websites. Walking tours can be created, and users are able to provide feedback, including additional information and sites that might be added to existing trails.

The Georgia Historical Society (GHS) developed a mobile app to reduce the number of people who just "drive-by" roadside historical markers (American Association for State and Local History (AASLH), n.d.). Their mobile app allows users to search the GHS marker database by county, region, marker subject, time period, and by marker program (American Association for State and Local History (AASLH), n.d.). Additionally, their mobile app displays makers which are near the user (Meagher, 2011). Users can click on a marker to read it and find photos and additional details.

Augmented Reality

AR can "overlay information through visual layers," "bringing history to life" (Cuseum, Inc., 2018). One such example of AR is PokémonGo. Google signed a licensing agreement with HMdb, a volunteer-based historical markers website that has geographic coordinates of more than 80,000 historical markers around the world, many of which are in the United States. Niantic Lab, a spin-off of Google, used the HMdb as base data for PokémonGo (The Sentinel, 2016). The game is a GPS-powered AR experience. A middle school teacher reportedly incorporated "Pokéstops" into his curriculum, intending to discuss the historical significance behind some (an example of one can be found in Figure 2). PokémonGo was an evolution of an early game, Ingress. Users of this game were able to submit locations "with a cool story, a place in history or educational value." It also welcomed submissions related to art, architecture, libraries, "little-known gems," and places of worship (because they were "a nod to the otherworldly").

Figure 2: Historic Marker Pokéstop.

If you reach a certain level within PokémonGo, Pokéstops can be user-nominated, which are then reportedly vetted by the community. Furthermore, the game "checks" on changes to a Pokéstop by asking users to scan an image of them, offering a reward for doing so. It is essentially a means of crowdsourcing, similar to the aforementioned example where a form can be submitted when a user finds an interpretive marker in need of repair or not present. In PokémonGo, AR can be enabled or disabled, particularly when users younger than a certain age are playing.

Summary of Literature Review & Information Gathering

Interpretive markers, whether historic, geologic, cultural, or otherwise, have been around for more than a century. However, even though they have existed for quite some time, there are few peer-reviewed, published papers covering innovative dissemination methods. There is, on the other hand, extensive literature concerning the content of the markers. Most information on the topic of dissemination is found in blogs and newspaper articles, websites, and other informal literature sources. This may in part reflect how quickly technology changes, which often does not lend well to peer-reviewed papers that may take years to be published.

The driving force behind the original roadside interpretive makers seems to have been for commemoration, whereas today, the focus is more for education. Early on, with slower vehicle speeds, the markers with few words may have been able to be read by passing vehicles. Yet, the content of an interpretive marker may be likened to Cliff Notes. As such, today there is an interest in compelling the reader to seek more educational content, potentially with printed materials, but also with PDFs, allowing a reader to dive deeper into a topic.

While it seems that early markers were designed to be read from a moving vehicle which at the time could only achieve maximum speeds of around twenty-five miles an hour, today, with

substantially greater speeds (often fifty-five miles an hour or more) and a better understanding of a driver's cognitive load, reading the signs while driving is no longer a desire or expectation. Consequently, an opportunity for new dissemination methods to play a role in how interpretive markers are disseminated has emerged.

The implication that interpretive markers were tied to tourism has been suggested. Virginia's experience suggests encouraging travelers to be lured into the rural areas of the state. From the literature available, quantifying what this economic benefit may have been or currently is, remains unknown.

States are at varying levels of "innovation" with respect to disseminating the information on their markers – Pennsylvania stopped printing guides in 2000, whereas West Virginia only started offering such guides in 2002. Now, as technology has changed and continues to be more accessible, agencies are generally moving towards both interactive and static webpages. In some cases, agencies have offered mobile apps. The literature notes that several mobile apps have been developed in the recreation and tourism industry. Some see apps as innovative, whereas others seem to bristle at their offering (Lapshan & Voigt, 2017). Mobile apps are appealing because they are easy to update and expand. However, the literature notes that developing an app can be a labor of love, and even with defined end goals and regular meetings to keep momentum going forward, app development can be a difficult process (Oppegaard & Shine, 2014). Some agencies have moved beyond the mobile app offering, coupling them with AR and potentially VR. Gamification has proven to engage app users in digesting more content (Corallo, et al., 2017).

Getting into more details with respect to mobile apps, there are challenges and features to consider. Challenges include spotty cellular or internet connection (particularly in rural areas, which is significantly relevant to Montana) and a lack of end-user knowledge that such apps exist, highlighting the need for a marketing plan to be coupled with the development of an app (Blaser, 2015; Oppegaard & Shine, 2014). For information to be available in more rural and remote areas, which tend to have spottier cellular or internet connections, an app must be able to operate offline. Yet, the data that one has to download can be substantial, potentially creating a barrier to use. There are potential alternatives, some of which would not even require a physical marker, like BLE. In addition, the features of the app itself can require an abundance of decisions (e.g., screen orientation, font types and size, map scale, site information) (Oppegaard & Shine, 2014; Corallo, et al., 2017). While there are several challenges to developing an app, several note that users did value the information that was provided in these apps (Ramos-Soler, Martinez-Sala, & Campillo-Alhama, 2019; Blaser, 2015). Apps have the potential to expand inclusion with respect to who can access information. In particular, with the ability to convey information audibly, people with disabilities or older individuals can potentially have the information read to them.

Survey of Other States & Federal Lands

As a result of the literature review and information gathering for this research, a survey was developed to learn more about other agencies' innovative methods of disseminating information about historic, geologic, and cultural markers. The survey was shared with MDT prior to dissemination and ultimately approved. It was also shared with MSU's Institutional Review Board and approved for dissemination on August 19, 2024. Consequently, on August 21, 2024, the Qualtrics online survey was individually emailed to potential survey respondents across the fifty states as well as territories of the United States of America. Survey contacts included individuals from SHPOs, historical societies, state departments of transportation (DOTs), state parks, and those identified in the literature and information reviewed. Midway through September, a follow-up email was sent to each original survey recipient from whom a completed survey had not been received, asking them if they would be willing to provide input for their agency. In addition, for states where a generic email address had been identified, an additional email address was sought out, and an invite was sent. Furthermore, the researchers engaged contacts at the NPS, leadership within state parks, and specific contacts whom they knew at state agencies across the United States, for which a survey had yet to be provided, asking them if they could assist with identifying a contact who could speak to the topic of the survey. Responses were received from entities within 38 states, although a response was only at the local level (not state) in Massachusetts (Figure 3).

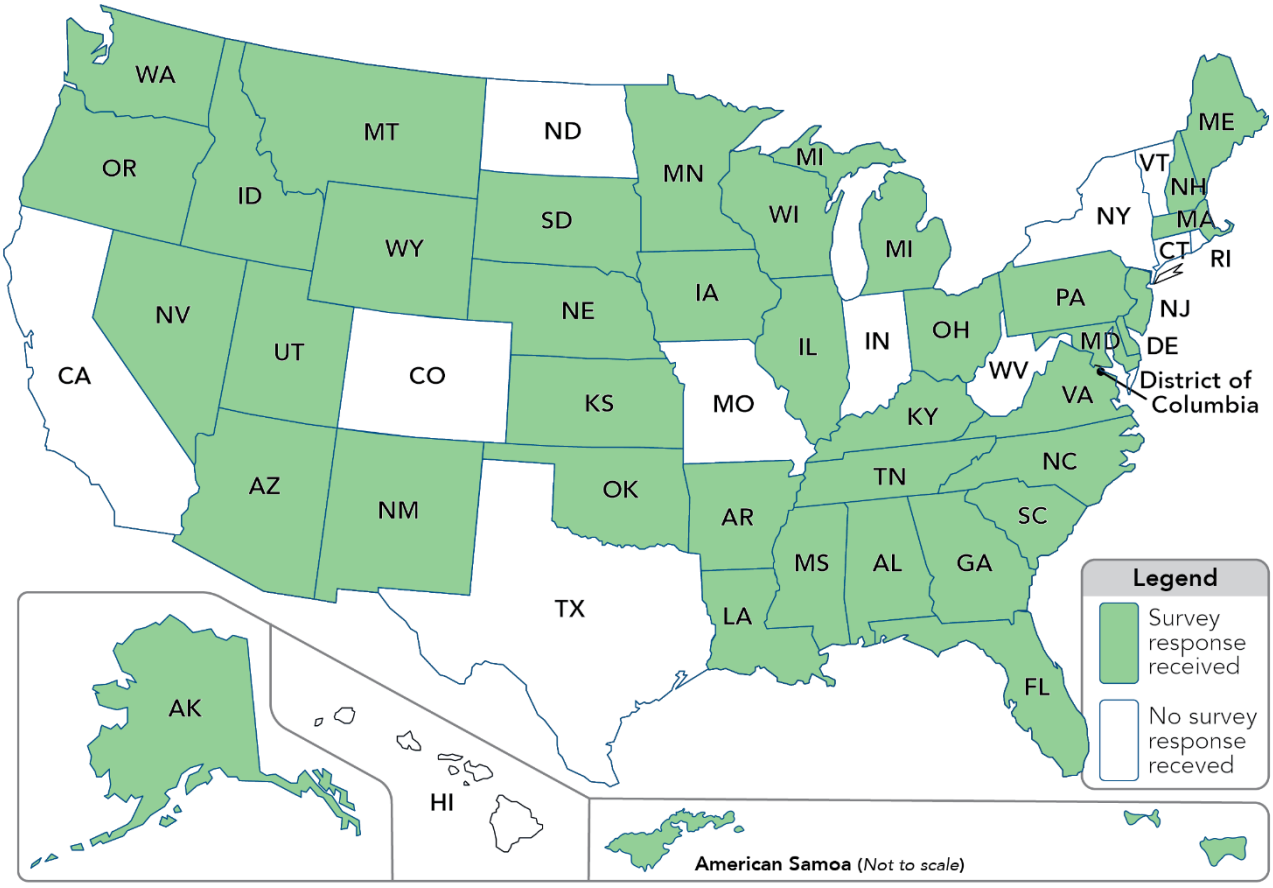


Figure 3: States from which surveys were received.

Ultimately, seventy-four impressions across the 38 states and American Samoa were received. After removing surveys without any information about the agency or answers to subsequent questions, a total of forty-nine survey responses were received, some more complete than others.

All forty-nine survey respondents provided information about their agency, details of which can be found in Appendix B: Agency Listing. The information provided can be biased based on the agency of the respondent, so it must be considered. The majority of the survey respondents were classified as historic offices (19 survey respondents). The next most frequently represented entity is state parks (13 survey respondents). Historic societies (6 survey respondents), natural resources (3 survey respondents), state DOTs (3 survey respondents), tourism agencies (2 survey respondents), local agencies (2 survey respondents), and a historic marker program (1 survey respondent) round out the remaining categorizations. In a few instances, the reported agency could fall within two of the categories. For example, one survey respondent reported, Virginia Department of Conservation and Recreation – Virginia State Parks, which may suggest representation with the natural resources and state parks categories. For this one, since Virginia State Parks was the subset specifically represented by the broader umbrella, it was assigned the state parks category, as it was expected that the survey respondent would answer from this viewpoint.

Even though a subsequent question asked if the entity managed or disseminated information about historic, cultural, or geologic sites, one survey respondent noted that they did not manage such sites and consequently did not provide further information except for an alternative contact for their state (who had already been sent the invite). Therefore, the remaining analysis will focus on the responses of forty-eight agencies.

Regarding the types of sites (historic, geologic, cultural, or other), all forty-eight survey respondents reported managing or disseminating information about historic sites; 46% (22 survey respondents) reported managing or disseminating information about geologic sites; and 75% (36 survey respondents) reported managing or disseminating information about cultural sites. Other sites of interest identified by respondents include, “State parks, trails and boating;” “Scenic, Natural, Recreational;” “Natural Resource;” “Natural Resource Interpretation;” “parks, recreation areas, fish & wildlife areas;” “Natural;” and “Recreation.”

Innovative Dissemination Methods

Respondents were asked to share innovative approaches for disseminating information on historic, geologic, and/or other cultural sites. Several methods were highlighted including interactive websites and web maps, AR, VR, mobile apps, audio tours, QR codes, accessible elements, public outreach through social media, and other outreach efforts.

Many respondents described an interactive website and web map as innovative. Some had provided marker information organized as a tour, often called Trails (e.g., Mississippi Blues Trail, Georgia Civil Rights Trail), or organized around specific historic topics. The Michigan History Center developed a story map for its shipwreck sites and underground railroad sites.

Several respondents noted working towards or currently using some form of AR or VR. Arkansas Historic Preservation Program reported developing a 360-degree VR tour of historic sites that can be used during classroom presentations as a part of educational outreach. Tennessee State Parks highlighted working with an outside vendor to develop a mobile app that provides an interactive experience using AR and VR. The Illinois Department of Natural Resources noted that a local museum society, leveraging funding through the former program, Digital Projects for the Public,

a National Endowment of the Humanities (NEH) grant, is developing an AR tour for various waypoints at Cahokia Mounds State Historic Site.

The Virginia Department of Historic Resources reported creating several historical marker audio tours using the izi. Travel mobile application.

The use of QR codes or the desire to use QR codes was shared by several respondents. Often QR codes were used on historic marker signage to take users to webpages to learn more information about the site. The New Jersey Historical Commission stated that they were using QR codes to guide users to the New Jersey museums related to the marker's topic. Delaware State Parks used QR codes to take users to a site to learn more information, which included an accessible PDF reader for interpretive panels.

Considering accessibility, Delaware State Parks also reported creating a "multi-site outdoor wayside exhibit series" with raised bronze and fiberglass tactile elements, including Braille translation. Oregon highlighted that in the early 2000s, they had created a phone call-in line with historic readings of several of the markers. Offering an audio option could be beneficial for those with a visual disability.

Three respondents used conferences as a method to share information about their historic preservation efforts and historic marker programs. The Kansas State Historical Society participated in the Dismantle Preservation Conference, where they hosted a listening session to learn about what the public thinks preservation is. They plan to continue these listening sessions across the state and use the information gathered to build outreach strategies. The Montana Historical Society (MHS) organizes the MT History Conference, which features bus and walking tours of historic sites as well as lectures on historic preservation, museums, writing, and educator workshops related to Montana's historic places and themes. The Utah Historical Society shared information about their current memorial landscape at professional conferences and with the public. They highlighted that sharing this information prompted some cities to start new marker programs.

Efforts to conduct outreach with the public included regular print and digital communications, hosting awareness meetings or open houses, and social media. Several respondents utilize social media platforms (e.g., Instagram, Flickr) to share information about historic markers and historic sites. The New Jersey Historical Commission created "60-second histories" that tell the stories of historic sites to be shared on social media. The New Hampshire Division of Historical Resources piloted an Instagram page specific to interpretive markers. However, they had difficulties maintaining the page in addition to their main SHPO page and hence have retired it. Instead, they share information about their markers through their main SHPO page.

Other identified methods included handheld guides, informational brochures, and maps. The American Samoa Historic Preservation Office offers a historic calendar distributed yearly. South Dakota specifically noted that no markers could be read while someone was driving, thus turnouts (which are maintained by the state DOT) are provided so drivers can pull off and read the information provided on historic marker signage.

Kentucky reviewed and modernized its historic marker program in 2021 but provided little details regarding what that modernization entailed.

Challenges in Disseminating Information

The majority of survey respondents (76%) reported challenges with disseminating information on historic, geologic, and/or other cultural sites. Challenges included limited funding and resources, integrating technologies, information displayed on the markers, engaging the public, and maintaining interest in marker programs.

Having a limited number of resources, both funding and staff, were reported by many. Several respondents noted that funding inhibited the fabrication of new markers, whether metal or wood (e.g., Oregon). One agency reported that its funding cycle did not necessarily align with its Tribal partner's cycle, creating challenges with Tribal coordination. Another reported a desire to create their own mobile app; however, funding and staff limit this objective. Physical deterioration or damage of historical markers was identified as a challenge; one state quantified this maintenance backlog at $90 million. One respondent noted challenges related to funding vehicle pullouts for roadside markers.

Nebraska shared, "Printed materials are losing effectiveness." Yet, agencies that have worked to integrate technology into their programs have also faced challenges. Pennsylvania saw limitations with its existing database in that it had a limited keyword search, something they were actively addressing with an update. Another agency suggested that finding the information on their website was a challenge. Michigan was working with a university to create a computer program to provide GIS-linked audio access to interpretive information but reported that the maintenance of the created tool was too expensive. Overall, the rapid evolution of technology was identified as challenging.

Several survey respondents highlighted challenges regarding the topics covered by interpretive markers. This challenge may be summarized best by the following: "The long lifespan of markers proves [to be a] challenge as we learn new historical facts and consider additional and underrepresented narratives." Again, note that this is outside the scope of this research effort.

Others reported challenges related to engaging the public and their interest in interpretive markers. Montana stated that travelers have an apathy to stop to view historical markers anywhere but where it is convenient (e.g., a rest stop). Oklahoma is taking a more grassroots, back-to-basics approach to conveying the value of their agency by attending community events statewide.

Several other challenges were reported individually, including vandalism concerns, geographic scale, property ownership, and getting a baseline inventory. Vandalization was identified as a concern, where respondents hesitated to feature a "sensitive area." A Florida respondent reported challenges regarding the geographic scale. Kansas shared that rural property owners were concerned with ownership rights. At least one state (New Mexico) reported working towards a comprehensive inventory of its interpretive markers.

Best Practices in Disseminating Information

Less than half of the survey respondents (42%) reported best practices in disseminating information on historic, geologic, and/or other cultural sites. The following are some simplified anecdotes:

- Reducing the cost to install a marker by subsidizing part of the cost through a grant program (Arkansas)

- Worked with partner agencies and groups during the development stage to ensure that information was accessible (e.g., to ensure Braille was translated accurately and utilize tactile QR codes which lead to an accessible PDF reader) (Delaware)
- Include underrepresented groups (Kansas)
- Markers should convey educational content, not take the place of monuments, memorials, advertising (in line with the "Virginia Model") (Kentucky)
- Annual brochure exchange – gets publications in the hands of hotels, travel/tourism professionals, and more statewide (Nebraska)
- Government to government consultation between state agency and tribal governments (Oregon)
- Keep your audience in mind and consider multiple approaches to communicate interpretive information (Tennessee)
- Graphics help to tell a story (Tennessee)
- Convey information quickly in "bite-sized bits" (Tennessee)
- Partnering with colleges to overcome funding and resource challenges (Virginia)
- Interactive GIS map on a website (Wyoming)

Mobile Apps

Less than a quarter of survey respondents (23%) reported having mobile apps. Half of the mobile apps were developed internally, and half were developed by a contractor. The following mobile apps were identified:

- Iowa Culture App: https://www.dcaapp.com/ (web app and mobile app available on Apple and Android)
- Map of historical markers in Arkansas: https://www.arcgis.com/apps/mapviewer/index.html?layers=29e5fceeed224b95874542e58f9e9cac (Environmental Systems Research Institute, Inc. (ESRI) web app)
- Michigan Historical Markers: https://experience.arcgis.com/experience/0810844003f149faa1a3aeaa64d7d42e (ESRI web app)
- Mississippi Blues Trail: https://msbluestrail.org/app (mobile app available on Apple and Android)
- Georgia Historical Marker Database: https://www.georgiahistory.com/learn-and-explore/historical-markers/explore-georgia-historical-markers/ (web app and mobile app available on Apple and Android)
- Explore Kentucky History: https://explorekyhistory.ky.gov/ (web app and mobile app available on Apple and Android)

- Historic Montana: https://historicmt.org/ (web app and mobile app available on Apple and Android)
- eXplore Tennessee State Parks: https://apps.apple.com/ma/app/explore-tennessee-state-parks/id6444808325 (mobile app available on Apple and Android)
- NH Historical Highway Markers App: https://nhdhr.maps.arcgis.com/ (ESRI web app)
- Cambridge Historical Commission Instagram: https://www.instagram.com/cambridgehistoricalcommission/ (social media page)

In summary, web and mobile apps were identified by five survey respondents; three of the survey respondents reported an ESRI web app; one shared a mobile-only app; and one reported making use of a social media page (a local agency).

Information Shared Via Apps

The ten survey respondents were then asked what information is shared via their app, with three options provided (locations of historic, geologic, and/or cultural sites on a map; text description of the site; and photo(s) of the site) as well as an open-ended response option. Nine of the ten survey respondents reported that the app had location information; all reported that a text description was provided; and eight of the ten survey respondents reported that the app included photos. Other information identified as being provided via the app included:

1. "research resources" (Historic Montana)
2. "expanded historical narratives about the topics of many (but not all) state historical narratives" (Explore Kentucky History)
3. "year erected, subject, ability for driving directions to the location" (Georgia Historical Marker Database)

App Update Timeframe

Respondents who reported developing their app internally were then asked how often their app was updated. (Those who contracted it out were sent to the next question.) No one chose the provided multiple-choice responses of weekly, monthly, or yearly. Instead, the following were the five timeframes identified by survey respondents:

1. "Goal is monthly, but updates have been intermittent so far. (App is only 4 months old.)" (Map of Historical Markers in Arkansas)
2. "Quarterly upload. The app design was created by Cleveland State University. We pay them to maintain our website and app." (Historic Montana)
3. "As new sites are added, except in current down-times for software updates." (Michigan Historical Markers)
4. "When new markers [are] installed" (NH Historical Highway Markers App)
5. "3-5 days/week" (Cambridge Historical Commission Instagram)

Adding New Information & Data Maintenance

Respondents were also asked how new information was added to the app.

For those who contracted the app out, responses varied. One respondent noted that, as a result of staff turnover and limited funding, no new information is currently being added. Another stated that new information is added "periodically" as new markers are erected. Others provided more specific information including that the online version of their marker information is updated and then "pushed" to their mobile app. Another agency reported controlling, adding, and updating information on the app itself while retaining their contractor for "hardware and scaffolding," and relying on the "digital asset development resources from TimeLooper."

For those that developed their app internally, three stated simply that new information was added by staff, with one specifying via the "back-end" database and another by uploading a "csv spreadsheet and then manually uploading photos, photo metadata, map lat/long, and research resources." One respondent who developed an internal app provided no information on how new information is added.

Most respondents (8 of 10) reported that agency staff maintain the data used in the app.

Reported App Features

Survey respondents were asked about potential features of their app, including whether it has offline functionality, if it can be used hands-free, if it alerts a user of a nearby site, and if there are audio capabilities.

Nine of the ten survey respondents with apps responded to the question about offline functionality. Only a few of the apps reported working offline, two of which were developed internally (Historic Montana and Michigan Historical Markers), and one which was contracted out (eXplore Tennessee State Parks). All three of these respondents reported that users are required to download the information in advance.

All of the survey respondents reported that their apps do not offer a hands-free option for people who are driving.

Two of the ten survey respondents with apps reported that it can alert a user of a nearby site of potential interest:

- "A notification appears on the phone in the notifications bar." (eXplore Tennessee State Parks)
- "The app, when opened, will identify markers in close proximity and list rough estimates of how far away they are. It does not issue push alerts when somebody is driving past a marker – that would seem like a safety hazard." (Explore Kentucky History)

Three of the ten survey respondents with apps reported that it has audio capabilities (Explore Kentucky History, Michigan Historical Markers, and eXplore Tennessee State Parks).

Marketing

Survey respondents were then asked how they advertised their app, with four potential responses (1. State/region/agency website; 2. State/region/agency social media: Facebook, Twitter; 3. On signs at the site of interest; and 4. On brochures or other printed materials at the site of interest) provided as well as an "other" category.

All but one survey respondent reported that they advertised their app on their agency's website. Marketing the app on the agency social media platforms was reported as being used by six of the ten survey respondents. Only one survey respondent reported that the app was advertised on signs at the site of interest (eXplore Tennessee State Parks). Four survey respondents reported using some form of printed materials at the site of interest. "Word of mouth" was reported by one survey respondent who did not indicate using any of the other marketing methods. The only other form of marketing identified was "Public presentations/community outreach" (Explore Kentucky History).

App Lessons Learned

Survey respondents were asked to share any lessons learned as a result of developing an app. Respondents highlighted the importance of marketing their app, challenges with keeping the data up-to-date, accessibility challenges, and reported that while new technologies provide exciting opportunities for dissemination of interpretive marker information, agencies should be prepared to handle the potential challenges of these technologies and be ready to address "teething issues" as one works to evolve their program.

Arkansas reported that by creating their online database for their ArcGIS web app, the public informed them of markers that were not included in the database along with those that had incorrect information. Since there is not a downloadable app with the ArcGIS web map, the agency needs to continuously market its existence as the public forgets about its availability.

Keeping the Mississippi Blues Trail app up to date was reported as a challenge by Mississippi.

Kentucky noted that while their app is developed, it only contains about 1,000 entries of the approximate 2,400 markers that they manage. They reported a desire to have an intern who would be tasked with completing the entry of the remaining markers, but noted that unfortunately, it is a low priority.

In Montana's experience, most people do not like downloading apps that are not useful on a daily basis. They reported that people had downloaded the app while traveling within the state and would delete the app at the conclusion of their visit. Montana felt that their website experienced greater traffic.

Michigan reported a lack of accessibility between ArcGIS databases and standard screen readers on phones and computers, and that "workarounds" are difficult.

Lastly, Tennessee stated, "The costs for developing these assets are comparable to other physical assets, such as traditional waysides. Additionally, these assets allow us to re-create places that no longer exist at considerably lower costs and with less risk in terms of maintenance and the need to make changes when new information is discovered. Additionally, the development of digital tools will continue to provide new ways of interpreting resources. People seeking to develop experiences with these tools should be excited about the possibilities yet always be ready to address teething issues or moments when a given idea isn't ready for primetime."

Cost – App Development & Maintenance

Little information was provided regarding the cost of app development and maintenance.

Regarding app development, the following were responses: $0.00 (Cambridge Historical Commission, Instagram); $284,000 for 15 sites (AR/VR experiences, 4 Generative artificial intelligence (AI) at a Historic Site, and an interactive game) (eXplore Tennessee State Parks); unsure/unknown (4 survey respondents); and "Just time invested by permanent staff and a graduate assistant" (ESRI map of Historical Markers in Arkansas). Three of the ten did not provide a response.

Regarding app maintenance, reported costs varied including: $0.00 (Cambridge Historical Commission Instagram); "$1,800" (Historic Montana); "1,800 paid to a private contractor" (Explore Kentucky History), and "$15,000 for licensing and upkeep" (eXplore Tennessee State Parks). (Note: Historic Montana and eXplore Tennessee State Parks are maintained by the same entity, Curatescape, which is why the cost is the same.) Other respondents did not provide specific maintenance cost information either due to the costs being unknown or because the agency was utilizing a software program (e.g., ArcGIS) for their historical marker map that was already in use within the agency for other purposes. Four of the ten did not provide a response.

App Reporting or Summaries, Demographics, Most Used Features

Respondents were asked whether their agency had developed any reports or summaries of the app. No reports or summaries were available and/or shared. None of the ten survey respondents reported collecting data regarding which of their app features were used the most. Similarly, no demographic data was collected by any of the agencies with an app.

Innovative Apps

Respondents were then asked to share any other apps that disseminate historic, geologic, and/or other cultural information that they found to be innovative. The following were other apps that the respondents viewed as innovative:

- "I love the Historical Marker Database. Also, the city of Hot Springs, Arkansas, has a robust historical marker app for their Historic Baseball Trail. See the supporting website and download the app at https://hotspringsbaseballtrail.com/" (Arkansas)
- "There are a few apps that I have seen but don't have direct experience working with them at this time." (Delaware)
- "QR Codes on signage and GPS coordinates that are included with written material." (Brown County, Minnesota)
- "Clio, as it is accessible to many kinds of information." (Minnesota)
- "We have heard of some mobile apps that use cell service to share historical marker information or provide for walking tours of areas. We do not have experience with these." (Nebraska)
- "OuterSpatial – We are in discussions to have all of the historic markers added to the app so that people can get the information on their phone when they are in the vicinity of a marker. OuterSpatial currently manages a digital passport for us for our state parks, and we may do a

similar passport program for the markers to motivate people to visit more historic sites." (Nevada)

- "I believe it was either the City of Brookings (South Dakota) or the Brookings Public Library that developed a walk tour of the historic downtown. It's not necessarily an app, but a text messaged-based guided tour." (South Dakota)
- "Agents of Discovery- provides a gamified way to interact with natural resources." (Tennessee)
- "Intermountain Histories from the Redd Center at BYU is a nicely designed app that looks good and can share history with folks from wherever they are." (Utah)
- "izi. Travel is good because it provides an audio recording of each marker that the traveler passes." (Virginia)
- "Timelooper does some incredible work, both with augmented reality and virtual. They are available at a variety of price points and are wonderful staff and interpreters. Once we get approval for through our IT, we plan to hire them for our AR work." (Washington)
- "Clio: Bringing Local History Home" (Wisconsin)

Survey Findings

The survey collected a good representation of state experiences, with information collected from thirty-eight different states. Historic sites were reported as being a focus by all survey respondents. AR/VR seems to be the most forward-thinking method of disseminating interpretive information. Things like agency websites, interactive maps, social media, and mobile apps were common among survey respondents. While a more traditional approach, a calendar was a unique method of dissemination identified by one respondent. Dissemination methods varied across respondents, as did what was considered innovative.

Online databases were identified as a desired approach to getting the information out to the public. One respondent highlighted the need for the database to enable broad searches. Some search engines are better than others. Some states are still inventorying their interpretive markers (Kentucky, New Mexico) while others have fully interactive online maps. The use of volunteer resources to develop a database, as done by Polk County, Wisconsin, could help agencies still trying to inventory all of their interpretive markers (Anderson, 2024).

Survey respondents expressed a preference for using QR codes because of their ability to supplement the high-level information found on interpretive markers with more substantive educational content. However, there are some emerging challenges with this approach, with the Federal Trade Commission (FTC) recently warning individuals to be wary of QR codes, as scammers have found ways to modify them to steal information (Puig, 2023). One suggestion may be to utilize QR codes in areas where they could be checked occasionally, whereas in more rural areas, they may be less desirable. BLEs could be investigated as an alternative for applicability.

One entity reported using sixty-second histories as a way to better share historic information to their social media platforms. In another project with which the researchers are engaged (Development of a Public Service Announcement, https://www.clearroads.org/project/23-01/), which was built off findings from MDT-sponsored research, Effectiveness of Highway Safety Public Education at Montana Motor Vehicle Registration Stations by Streaming a Variety of Safety

Content (https://www.mdt.mt.gov/research/projects/safety/safetyvideos.aspx), the recommendation is to disseminate content in thirty-seconds or less. This directly speaks to another survey respondent, highlighting the "bite-sized bits" of content preference by today's public. However, with many people relying on social media in their everyday lives, conveying the most desired information in succinct dissemination methods is likely the best way to distribute content that will be retained by the public.

The South Dakota Department of Transportation clearly stated no desire to allow the traveling public to read their interpretive markers while operating a vehicle. With the parallel desire of getting the interpretive content from markers to the traveling public, it presents an opportunity for technology, like mobile apps, to enable travelers to discover markers along their route and determine whether to stop or learn more information at a later time.

Similar to findings in the literature review, the need to market a mobile app is mentioned, with one agency reporting "needing to continuously market its existence, as the public forgets about its availability." Marketing through agency websites and social media was common. Others were utilizing public outreach/engagement to share information about what their agency does and what resources they offer.

The elephant in the room when considering challenges is funding, whether for staff to conduct the work, funding to support the creation of innovative dissemination methods, or funding to maintain the markers themselves or the innovative tools that are created.

Survey and Literature Review Follow-Up

After a review of the literature and information gathering, along with findings from the surveys, the Technical Panel had additional questions. They were interested in learning how often guidebooks are being published by states that still use them. They were also interested in learning how often new interpretive markers are added. The Technical Panel also wanted to better understand the impacts of marketing, particularly if an increase in use was coupled with marketing. Finally, the Technical Panel wanted to better understand other states' opinions regarding whether social media was viewed as an effective marketing tool. The following sections share the findings from these follow-ups.

Guidebooks

The research team reached out to several states with freely accessible guidebooks to learn more about how frequently these are updated. Interpretive marker guidebooks seem to be updated on an "as needed" basis as markers are updated, new markers are installed, or when funding is available. Idaho and Wyoming noted that while they have guidebooks, these are only offered digitally. Specific responses and the links to the guidebooks can be found in Table 2.

Table 2. Guidebook Link & Reported Update Timeline

State	Guidebook Link	When Updated?
Colorado	https://www.coloradodar.org/wp-content/uploads/DAR-Colorado-Marker-book.pdf	Unknown. No response to original survey.
Idaho	https://history.idaho.gov/wp-content/uploads/Idaho-Highway-Historical-Marker-Guide.pdf	"There are no current plans for an update, although this could change as they are updating the markers. The link has been out-of-print for more than a decade."
Nevada	https://shpo.nv.gov/uploads/documents/Historic_Marker_Booklet_Online_Version_with_Links.pdf	"No set timeframe; updates are done when funding is available."
South Dakota	https://history.sd.gov/preservation/docs/MarkersMaster_Jan2025.pdf	"When a new historical marker has been installed or updated information for an existing one; varies year to year but results in only an update about a "handful of times" each year."
Wyoming	https://wyoparks.wyo.gov/index.php/monuments-markers-handbook	"As needed (only digital)."

Marketing

The research team reached out to the seven states that had interpretive marker apps to learn more about their marketing efforts. When asked whether they had seen an increase in users after conducting marketing efforts for their app, three states (Georgia, Kentucky, and New Hampshire) found that they did see an increase. Arkansas indicated that they were unsure; however, they did note that "when we do promote it, I believe it does increase user traffic." Georgia noted seeing increases in inquiries about their marker program following media coverage from dedications. Kentucky shared that they had seen a year-to-year increase in users, even though they did not actively promote their app on their social media channels.

When asked if they viewed social media as an effective marketing tool, three states (Arkansas, Georgia, and Kentucky) stated that they did find social media to be effective. Arkansas uses social media as its primary method to inform the public about its online historical marker map and to showcase new markers. They have found that posts about historic markers usually get more user engagement (comments, shares) than their other posts. Georgia shared that they have noticed an increase in engagement in their weekly "Marker Mondays" social media posts, which highlight marker dedications. Georgia highlighted that they are making efforts to keep those posts short and easy to read and inviting readers to explore the markers by utilizing the GHS website. Kentucky stated that their social media activity related to their historical markers is done informally by marker enthusiasts outside of the Kentucky Historic Society – these efforts include the Kentucky History on a Stick, Kentucky Historical Markers Podcase, Snapshots of History in 60 Seconds, and Sam Terry's Kentucky (Figure 4). The respondent acknowledged that some of the posts may not be completely consistent with how the agency would disseminate the same content.

Kentucky History on a Stick

https://www.facebook.com/KentuckyHistoryOnAStick

The Kentucky Historical Markers podcast

https://podcasts.apple.com/us/podcast/kentucky-historical-markers/id1696159781

Snapshots of History in 60 Seconds

https://www.youtube.com/@geraldcastellow9398/shorts

Sam Terry's Kentucky

https://www.facebook.com/SamTerrysKentucky

Figure 4: Examples of Informal Social Media Marketing by Interpretive Marker Enthusiasts.

Sources: https://www.facebook.com/KentuckyHistoryOnAStick; https://podcasts.apple.com/us/podcast/kentucky-historical-markers/id1696159781; https://www.youtube.com/@geraldcastellow9398/shorts; https://www.facebook.com/SamTerrysKentucky

Review of Innovative Applications

This section reviews innovative apps that were identified through the literature review and survey responses. Two apps, the Iowa Culture App and Next Exit History, were not available in the App Store, so they were not reviewed. Furthermore, three apps were removed from further analysis as they incurred a cost: Shaka Guide, Texas Historical Marker Guide, and VoiceMap: Audio Tours & Guides. The following twenty-three apps were reviewed in greater detail:

1. Agents of Discovery
2. Blues Trail
3. Cambridge Historical Commission – Instagram
4. City of Stories – Holyoke
5. Clio – Your Guide to History
6. ExploreHere (*free version reviewed*)
7. Explore Kentucky History
8. Explore Nebraska History
9. Explore Tennessee State Parks
10. Flyover Country
11. Georgia's Historical Markers
12. Historical Charleston Foundation
13. Historic Montana
14. Historic Missouri
15. Hot Springs Baseball Trail
16. Intermountain Histories
17. izi.Travel (*free version reviewed*)
18. Montana Historical Markers
19. Outerspatial
20. Perez Art Museum Miami
21. The NPS App
22. TravelStorysGPS (*free version reviewed*)
23. WHExperience

For each app, the following information was examined and summarized in Appendix C: Existing Apps.

- **App Name**: Name of the app.
- **Link**: Link to where one can find more information about the app.
- **Organization**: The organization that manages/maintains the data for the app.
- **Developer**: The organization that developed the app.
- **Geographic Area**: The geographic area that the app covers (local, state, nationwide, worldwide).
- **Montana Data**: Does the app contain data for the state of Montana?
- **Price**: Price listed in the App Store in 2025.
- **Source**: How the app was identified (literature review, survey response).

- **App Description**: The description of the app as provided in the App Store.
- **Map**: Does the app contain a map (interactive or static)? Short description of the map including: its scale (is the map focused on the user's location or is it zoomed out to show all data); what data is shown on the map, how markers are displayed on the map (what do map symbols look like, are they clustered); and if you click on a marker in the map, what information is displayed?
- **Ability to Locate Nearby Markers**: Does the app show a map or list of markers that are near the user's location?
- **Marker Description Information Provided**: Short description of what data is shown for each marker.
- **Photos**: Does the app provide photos of the marker, and if so, how many?
- **Video**: Does the app have any videos? If so, a short description of what is contained in the videos is provided.
- **Audio**: Does the app contain any audio elements (e.g., 60 second histories, audio tours)? If so, a short description of available audio features are provided.
- **Accessibility Features**: Does the app contain any features that improve accessibility for users with a disability? This could include things like text-to-audio or the ability to change font sizes.
- **Interactive Features**: Does the app allow users to interact with the marker data? For example, can users share information to social media, create tours based on markers of interest, "favorite" markers, or share photos?
- **Offline Capabilities**: Are there any features of the app that are usable offline for users who may lack cellular service? If so, a short description of available offline features are provided.
- **Ability to Send Info/Ideas for New Markers**: Is there an ability for users to provide information or ideas for new markers? If so, a short description of what information users can provide and how it is provided (via email, form, etc.).
- **Augmented Reality**: MDT expressed interest in learning more about AR. Are there any AR features in the app? If so, a short description of what AR features are available.
- **Other Innovative Features**: Are there any other features found to be innovative that do not fit in another column? If so, a short description of the feature.

Interpretive Marker App Findings

This section highlights findings from the review of interpretive marker apps.

Maps and Marker Information

Nearly all of the apps that were reviewed had some form of a map (either interactive or static). Maps were developed using Apple Maps, Google Maps, ESRI, and Mapbox (Figure 5). The maps had a similar look, typically displaying marker locations, historic tour stops, or similar

points of interest. They were often centered on the user's location – displaying makers that are within close proximity to the user. Some maps would cluster historic markers that are located further away from a user to reduce visual clutter (

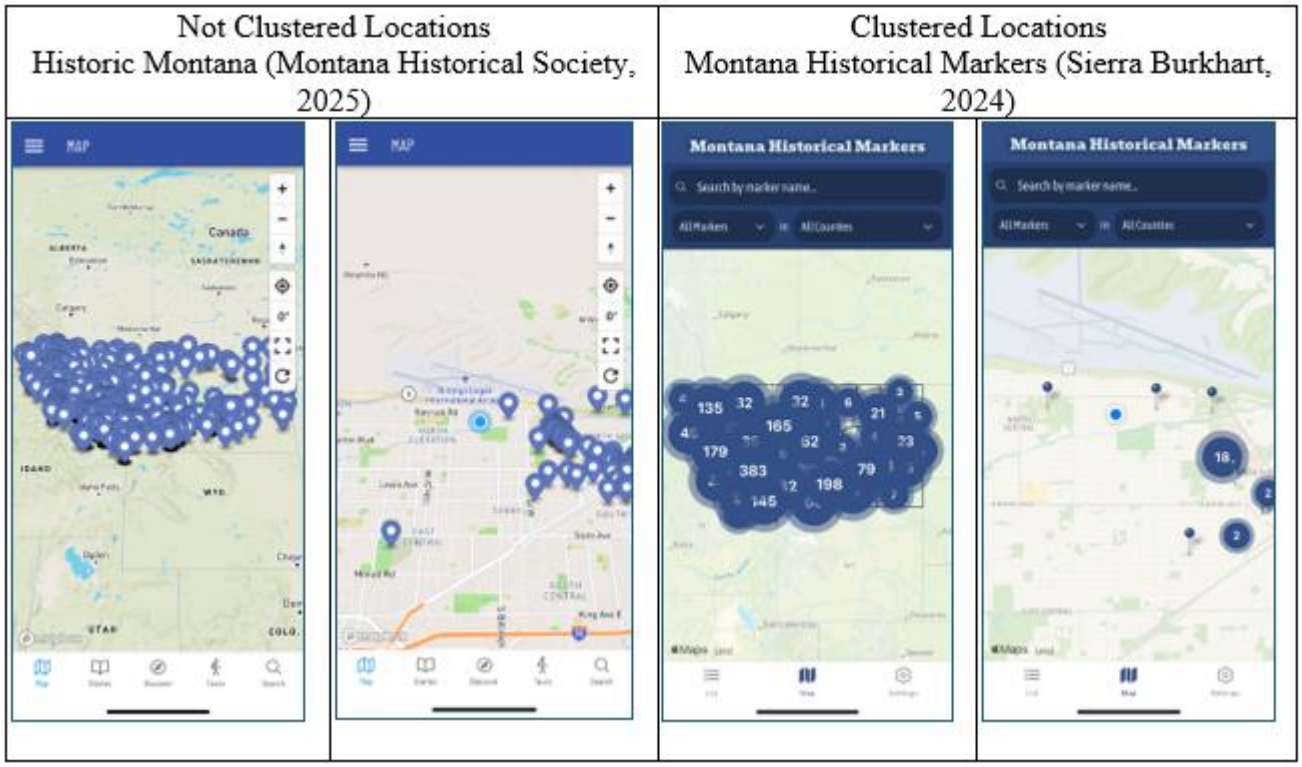


Figure 6).

Apple Maps Example, Historic Charleston Foundation (Historic Charleston Foundation, 2022)	Google Maps Example, Clio (Clio Foundation, 2024)	ESRI Example, Georgia's Historical Markers (Georgia Historical Society, 2024)	Mapbox Example, Historic Montana (Montana Historical Society, 2025)

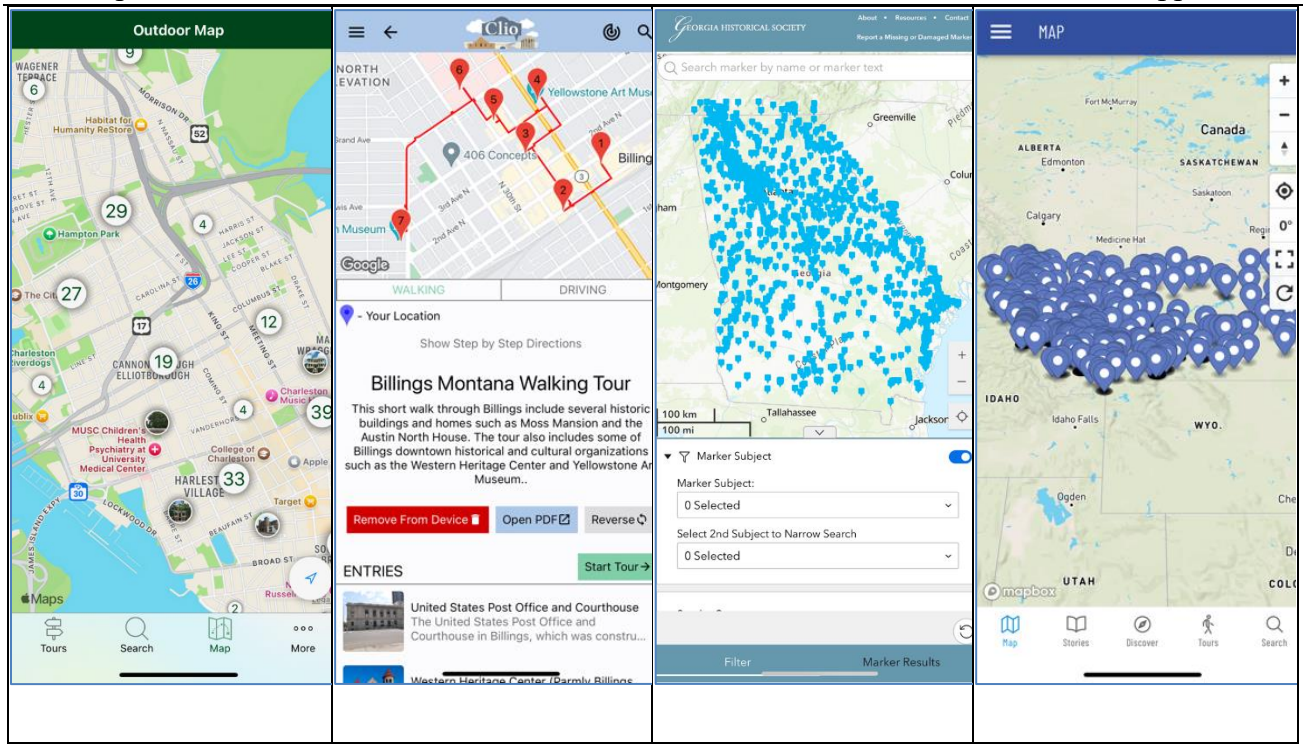


Figure 5. Map Screenshots Showing Differing Mapping Platforms

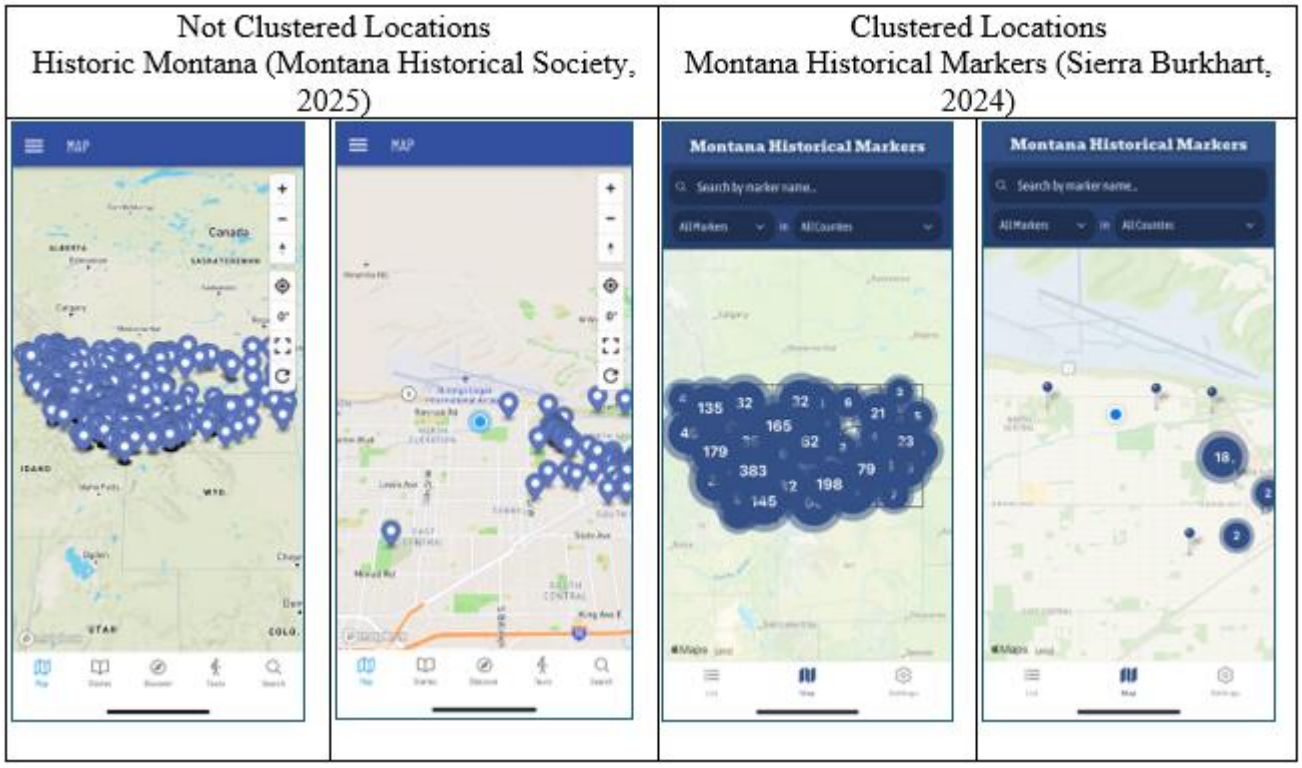


Figure 6. Clustered vs. Not Clustered Map Locations

When a user clicked on a marker (or similar), the app provided additional information about that marker. At a minimum, this information would include the name of the marker (or location), photos, and a short text description. Other apps, like izi.Travel or Historic Charleston Foundation, also included a short audio story or video. Additional information shared about the markers included the full text of the sign, the historic time period, subject matter keywords (e.g., Historic Homes, Native American History), location (address or latitude/longitude coordinates), and links to resources where a user can learn more about the marker subject. A few of the apps had video content.

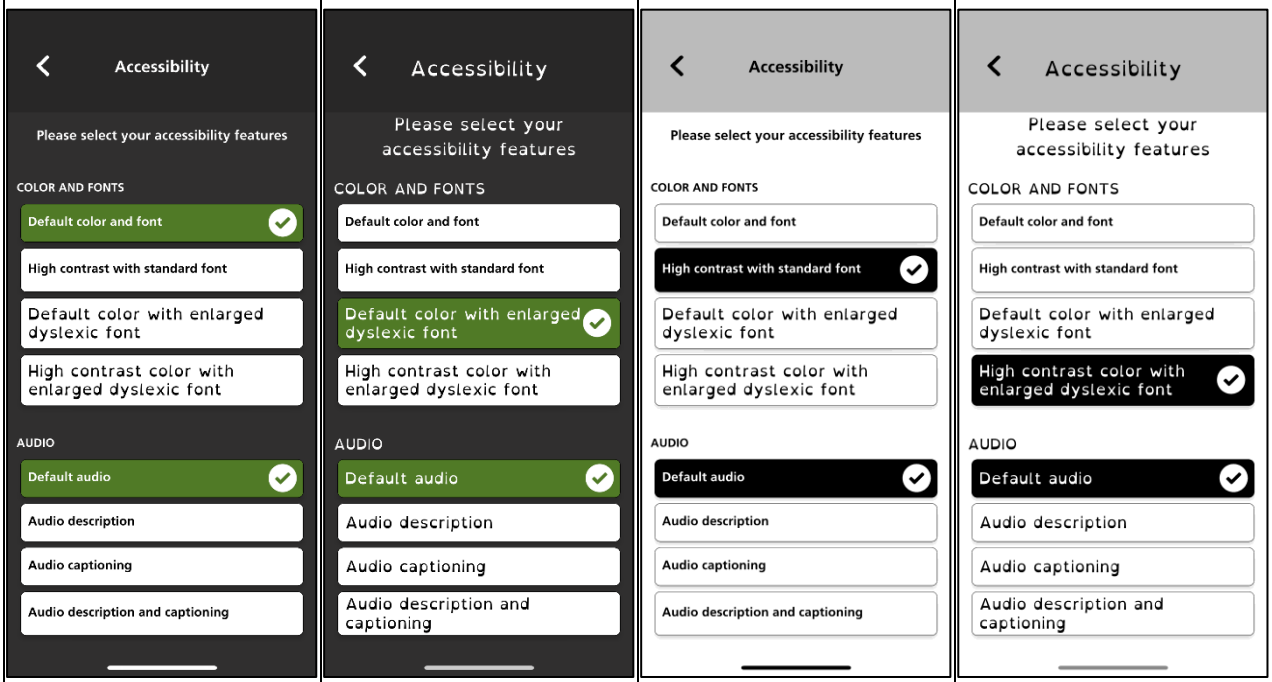
Offline Use

Several of the apps included an optional feature that allowed a user to download information for offline use. Some apps, including the NPS app and the Hot Springs Baseball Tour app, have a reminder that prompts the user to download information for offline use when the app is initially downloaded. Others, like Montana Historical Markers, offer this feature on the settings tab. For many apps, this feature allows the user to download text and photo content for use offline. For apps like izi.Travel, offline use allowed the user to download a historic marker tour and the associated photos, text descriptions, and audio content for the stops along that tour.

Accessibility Features

App accessibility features varied. Several apps allow users to adjust the text size in the app, which may make things easier to see for those with visual impairments. Other apps had text-to-speech options which would read the information associated with an interpretive marker to the user. The

Explore Tennessee State Parks app had some additional accessibility features like high contrast colors, enlarged fonts, and dyslexic fonts, as well as audio descriptions and closed captioning on videos within the app (Figure 7).



Default Color and Font	Default Color, Enlarged Dyslexic Font	High Contrast Color, Default Font	High Contrast Color, Enlarged Dyslexic Font

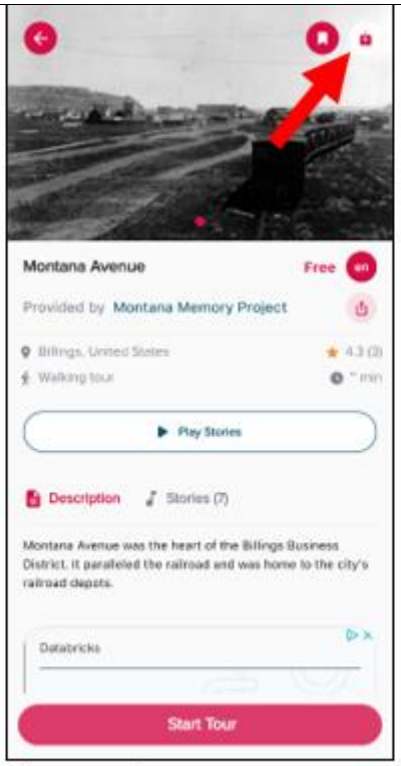
Figure 7. Accessibility Features - Explore Tennessee State Parks App (State of Tennessee, 2023)

Interpretive Marker Tours

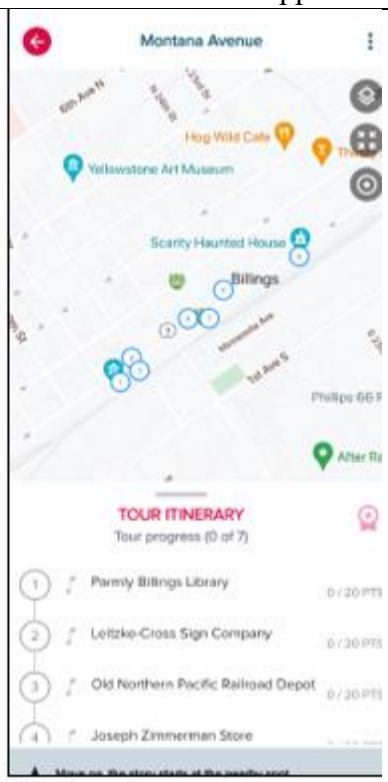
Several of the apps offered interpretive tours focused on a location or on a historic topic. The tour would often include a map displaying all of the locations associated with the tour. Each tour "stop" would include a text description, photos, or an audio story. For apps like Clio, users can discover nearby tour locations through geofencing. Geofencing allows the app to notify the user when they are within a user-specified distance (up to 300 meters) from a marker on the tour. Both izi.Travel and Clio also allow a user to choose whether they want the app to automatically play the audio narration for stops when one is nearby.

Both izi.Travel and Clio offer the framework to build a tour for the app. This is one method that MDT could potentially utilize to share interpretive marker information. Screenshots of two tours located in downtown Billings, Montana, for izi.Travel (

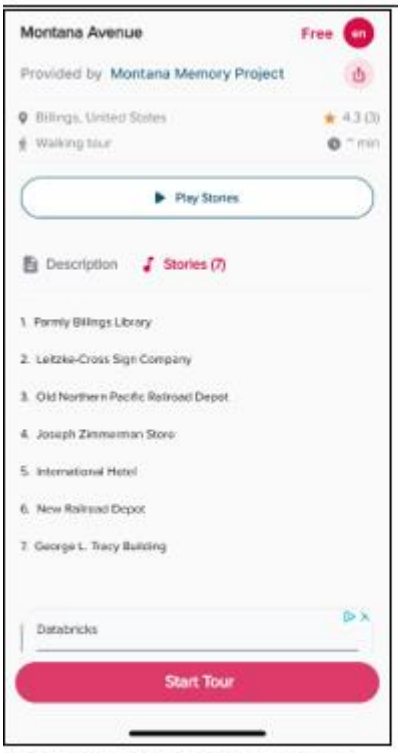
App home screen showing nearby tours.



Montana Avenue tour description including the option to download the tour for offline use (red arrow)

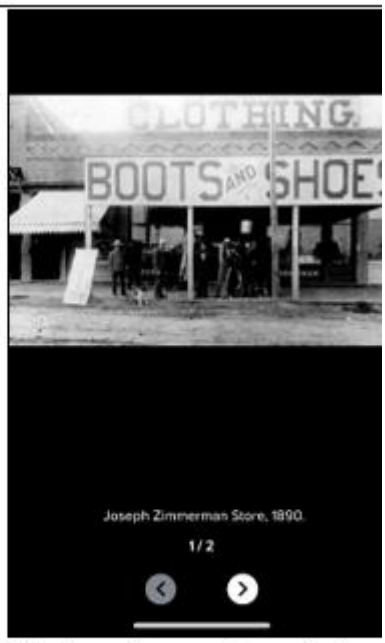


Montana Avenue tour map



Montana Avenue tour stop names

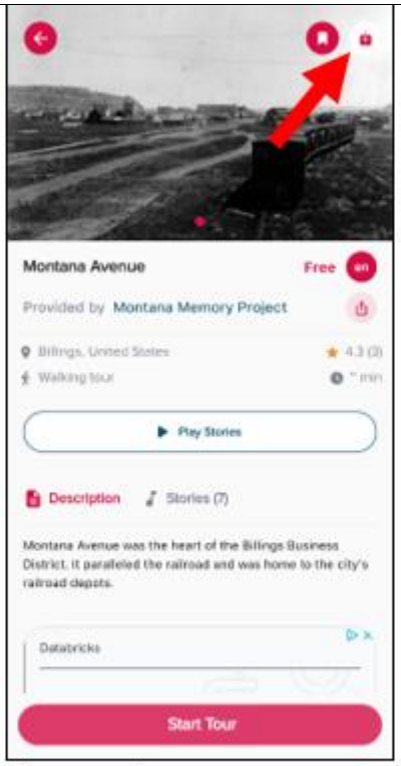
Montana Avenue tour audio



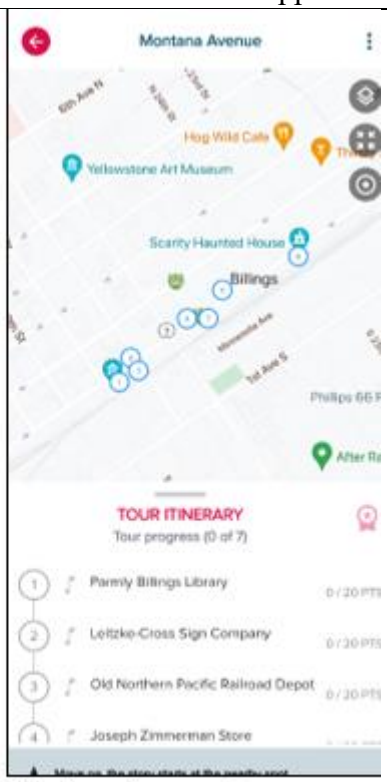
Montana Avenue tour photo

Figure 8) and Clio (Figure 9) are provided. The Clio tour utilizes a very basic form of AR, where an arrow directs a user to the next stop.

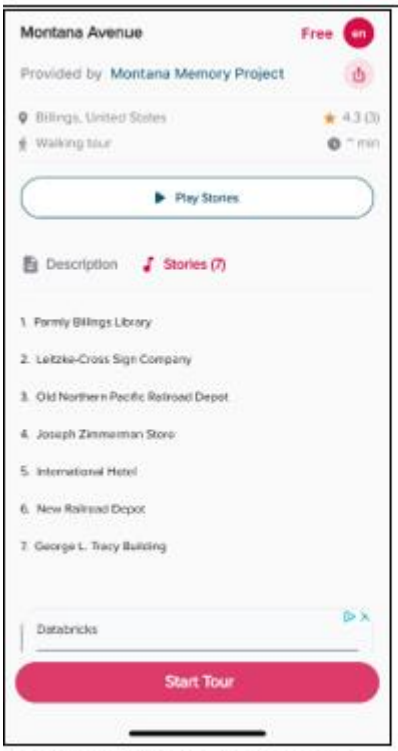
App home screen showing nearby tours.



Montana Avenue tour description including the option to download the tour for offline use (red arrow)

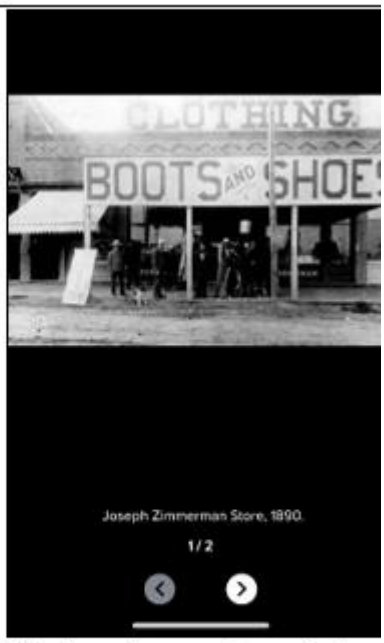


Montana Avenue tour map



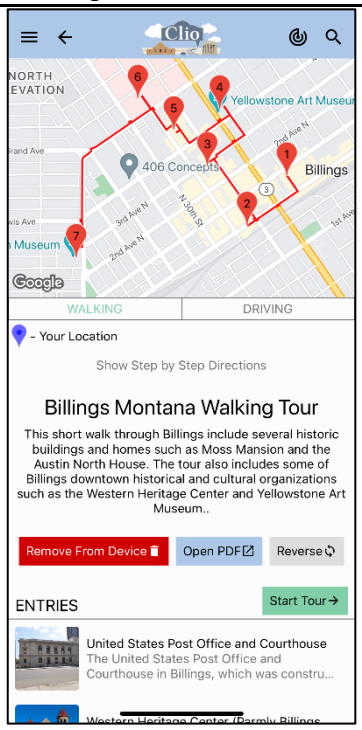
Montana Avenue tour stop names

Montana Avenue tour audio

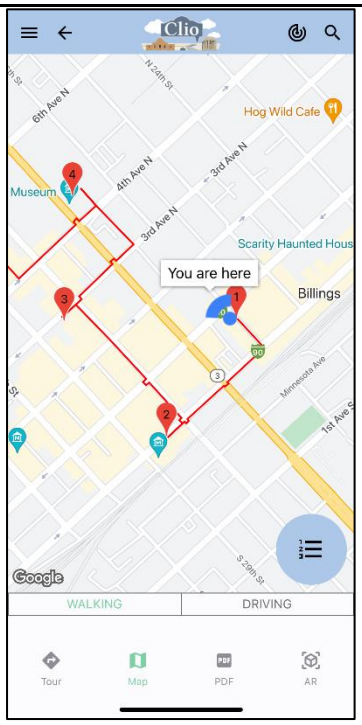


Montana Avenue tour photo

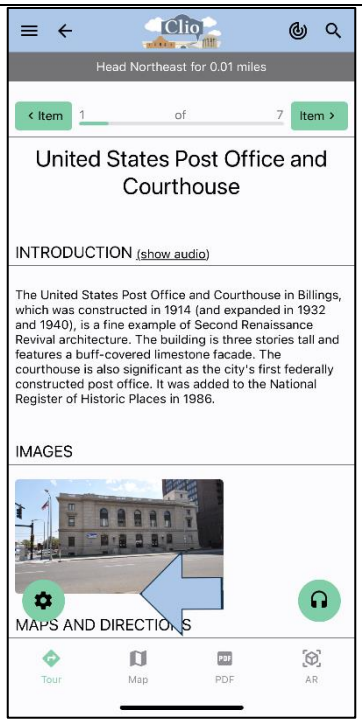
Figure 8. Screenshots from izi.Travel app's Montana Avenue Tour (Informap Technology Center LLC, 2025)



Billings Montana Walking Tour information including the option to download information for offline use



Map displaying the user location and tour stops



Tour stop information including the name, text description, and photos. There is an option for text to speech audio narration of the text description

AR feature which displays an arrow at the bottom of the user's screen which will point the user to the next tour stop.

Figure 9. Screenshots from Clio App's Billings Montana Walking Tour (Clio Foundation, 2024)

Existing Apps Disseminating Montana Interpretive Markers

The Montana Historical Markers app (Figure 10) and ExploreHere app (Figure 11) already provides information on some of Montana's interpretive markers. Both of these apps have similar features and interfaces, including an interactive map that users can click around on to see nearby interpretive markers. When a marker is clicked on, information for that marker pops up, including a photo, the full text from the sign, and locational data.

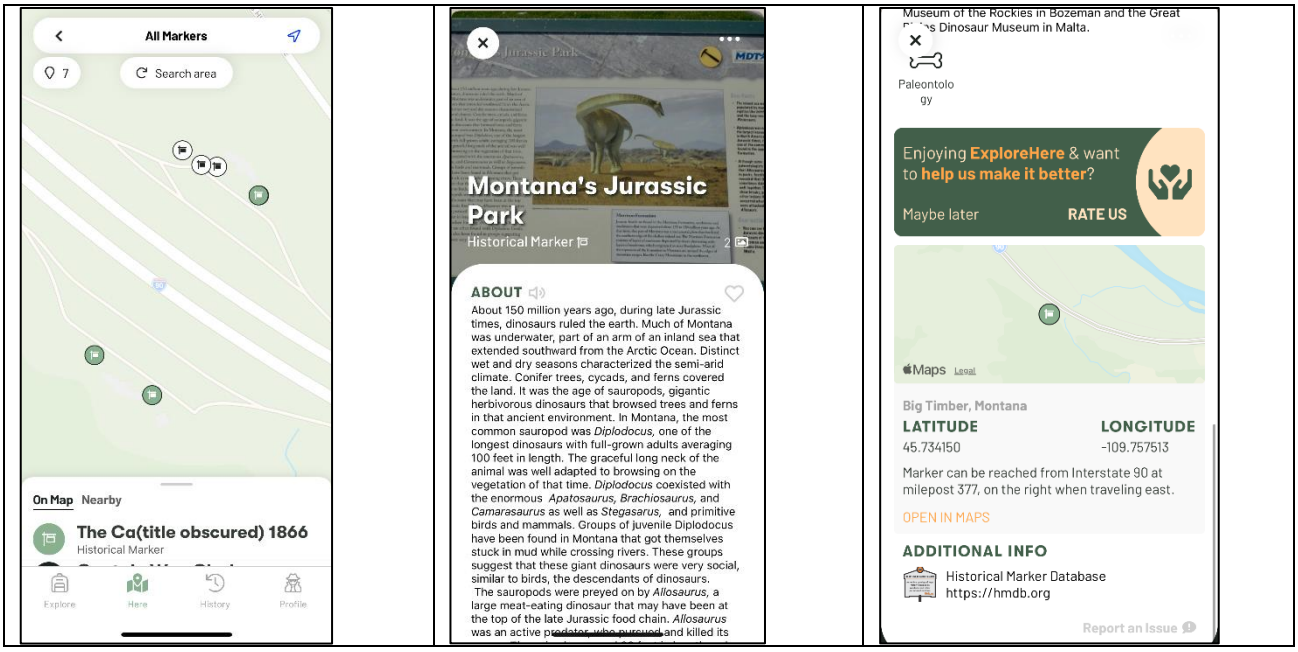


Figure 10. Montana Historical Markers App Screenshots (Montana Historical Society, 2025)

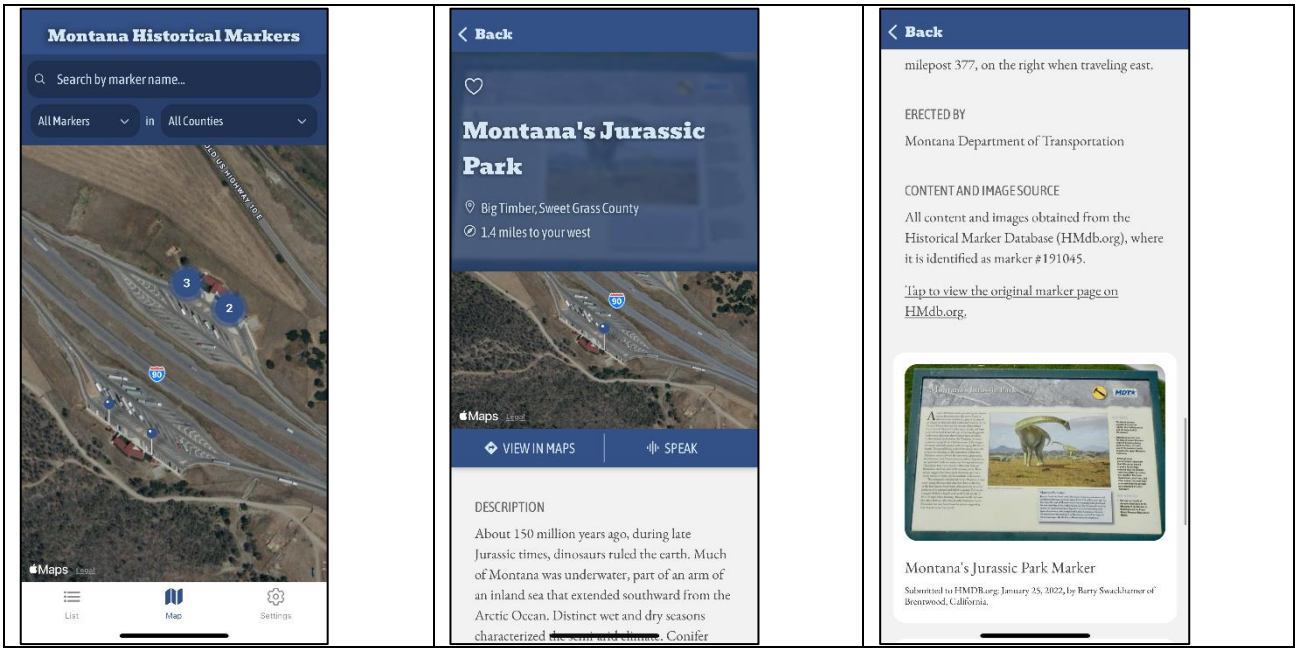


Figure 11. ExploreHere App Screenshots (Wesley Vance, 2025)

Both of these apps offer the ability to download the marker information for offline use. This feature is free in the Montana Historical Markers app. ExploreHere will download the closest 10 markers to the user's location for offline use for free, or users can pay for the Pro version of the app, which allows users to download information for up to 200,000 markers for offline use. The Pro version of ExploreHere costs $4.00 per month or $20.00 per year (Apple, Inc., 2024).

Another app, Historic Montana, was developed by the MHS using Curatescape. This app, however, focuses on sharing National Register of Historic Places sites in Montana. This app has a similar look and feel to the Montana Historical Markers and ExploreHere apps in that the Historic Montana app has an interactive map that displays markers that can be clicked on for more information. It also provides tours based on historical topics (e.g., early Montana, railroads). All of the app data is available to download for offline use.

Augmented Reality - Agents of Discovery App

The Agents of Discovery app was shared with the researchers through the survey responses. This app provides AR "adventures" to explore the world around you. The app currently hosts several adventures at state parks in Montana. The "Discover Dinosaurs" adventure at Pompeys Pillar National Monument was explored to see what features were available. Pompeys Pillar National Monument is a "celebrated landmark," with markings, petroglyphs, and inscriptions left by visitors, including those within the Lewis and Clark Expedition – namely, the iconic signature of Captain William Clark and the date of his visit, July 25, 1806 (Pompeys Pillar National Monument, n.d.).

The app has a user walk the trail at Pompeys Pillar National Monument and has several AR games the user can play to learn more about dinosaurs (Figure 12). The AR games included "match the dinosaur to the correct time period," quizzes, and games (e.g., one cleans up litter at public lands). While there seems to be potential to use AR to help reinforce historical/cultural topics and particularly to help draw a younger audience to learn more, this specific adventure seemed mismatched with the significance of Pompeys Pillar National Monument as a celebrated landmark.

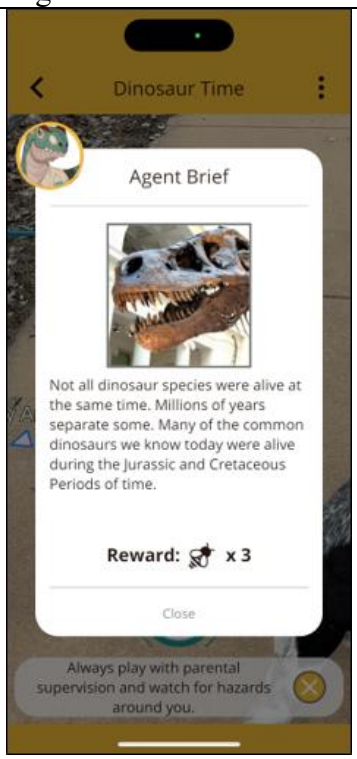
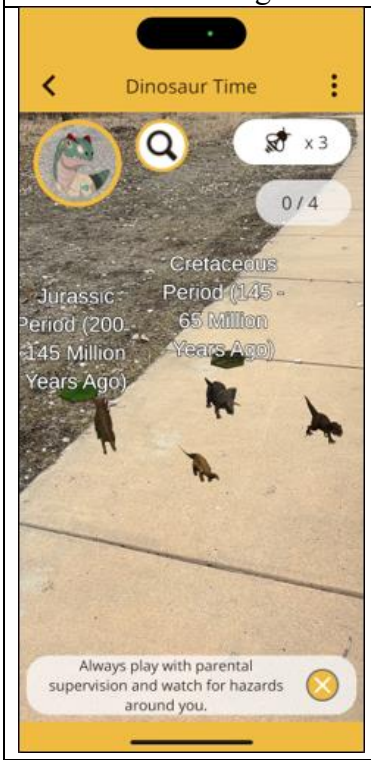
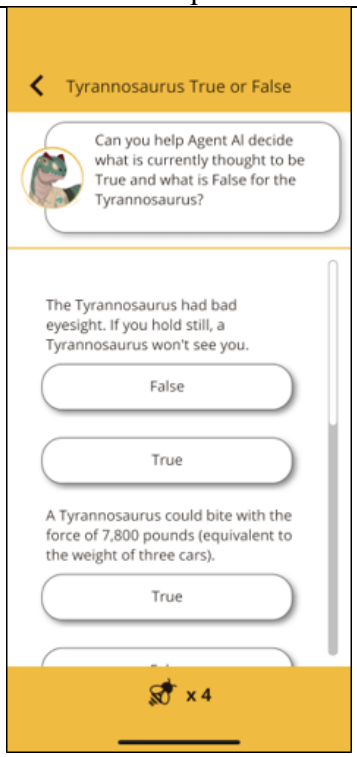
Map showing AR stops long trail at Pompeys Pillar	AR game description "Agent Brief"
	
Screenshot of AR game	Screenshot of quiz
	

Figure 12. Agents of Discovery Screenshots (Agents of Discovery Inc., 2025)

Opportunities for Using Existing App Resources

Both the Montana Historical Markers app and ExploreHere app are pulling information directly from the HMdb. Since apps are able to pull information directly from the HMdb, this may provide another opportunity for MDT to share information from their interpretive makers without the need to develop a separate mobile app. MDT could prioritize using resources to ensure that the HMdb is up to date. Missing content or content that needs updating could be uploaded to the database by MDT. The drawback to HMdb, however, is that the focus is on historical information. MDT's interpretive markers, while primarily historical, also include markers related to geology.

App and Agency Follow Up

NPS App

The NPS app held significant interest for the Technical Panel. As a result, the researchers identified the appropriate NPS contact to learn more about the app. During the interview with the NPS contact, the contractor's contact was identified, and the Technical Panel expressed interest in learning more about the development of the NPS app through an interview with that individual as well.

The researchers met with an NPS representative involved with the administration of the NPS app on December 12, 2024. After several parks had individually developed mobile apps for their sites (e.g., Fort Vancouver National Historic Site discussed in Literature Review & Information Gathering), NPS decided to work towards developing an overarching official NPS app to provide a consistent design and experience for users. The official NPS app was built using a contractor (GuideOne Mobile). The contractor built a code framework, helped design the user experience/user interface (UX/UI), continually tracks analytics, and proposes new features/design. While the official NPS app has been around since about 2020, app development started nearly ten years ago (cir. 2015). Key lessons learned include:

- Consider the long-term maintenance of an app, or as astutely put by the interviewee, "You're building the baby, how are you going to raise the baby?"
- If ratings for an app fall to three stars or less, people will not download the app. This is a difficult obstacle to overcome.
- If you do not have dedicated people to update an app, your app will need to have more static content.
- Offline mode for an app works well (requires only a download prior to visiting a park); however, the offline mode of an app needs to be marketed prior to the user being onsite. NPS does this via prompting app users to download offline content when they initially download the app and making offline content prominent on each park's page within the app. Additionally, NPS markets the app on its website.
- Do not compete with apps that are already doing things well (e.g., Google Maps, National Oceanic and Atmospheric Administration (NOAA) Weather). Consider what will draw users to your app over other apps that already exist.

The researchers then reached out to discuss the NPS app in further detail with the company that developed and continues to maintain the NPS app (GuideOne Mobile). Part of their ongoing work includes proposing additional features to be added over time. Key points taken from this discussion held on February 7, 2025, include:

- Before developing an app, take a step back and consider the following questions to help guide what the app may look like:
    - What are your communications goals?
    - Who is the audience for the app?
    - What is the intended use of the app?
    - What are you hoping to get out of an app?
- Natively coded apps are preferred when offline functionality is needed.
- From a cost perspective, anticipate that 50% of the cost will be needed to build an app and 50% will be needed to maintain the app.
- Technology changes over time and this will impact on the usability of an app. In three years, the interfaces can completely change (e.g., Apple offering a 2-screen phone). An app will never be static but will instead need to evolve as technology evolves or face technical issues.
- Developing an app will take around 3-6 months from development to launch. Some of this time should be spent testing the app to see how it is used, which can guide development.
- Unexpected challenges will come up during the development process.
- NPS is releasing Apple Carplay for their app. This allows a user to listen to content while they drive. Apple Carplay has an option to autogenerate transcription from well written text which provides an opportunity for hands free mobile options. Auto dissemination is a great way to deliver a lot of information and is appealing to all age groups.
- If you develop a great app, the great ratings will follow.
- For an app with points of interest content (like historic markers), marketing and content production is likely more important than the technology. If an app is not marketed well, users will not know that it exists, especially in areas with poor cellular access. The contractor recommended working with entities like the Montana Department of Commerce's Office of Tourism to promote this information.

Montana Historical Society

After learning more about the MHS app (Historic Montana), the Technical Panel wanted to learn more about the app and determine whether partnering opportunities may exist.

The Historic Montana app was developed in 2016 when MHS hired a digital projects manager and aimed to disseminate their National Register of Historic Places sign content, stories, and photos. Originally, the website was called "ExploreBIG," but it was changed to "Historic Montana," as the original name did not convey what could be found on the website. The digital projects manager

was familiar with Cleveland State University where Curatescape was developed. Curatescape is a web and mobile platform for sharing location-based information for cultural, educational, and preservation groups. The Historic Montana app provides users with a map of National Register of Historic Places sites across the state of Montana. Each site includes the text contained on the site's National Register sign, photos, and links to more information about the site.

MHS estimates that it took over a year to develop the Historic Montana website and app using Curatescape. This process involved creating a CSV file which contains the site name, location, story (description text which mimics the sign text), site categories (private land, public land), and the link to the National Register of Historic Places nomination (includes the full story of the location). Information contained within Word documents that had been compiled for 20 years was used to provide data for the original CSV file. The CSV file can be updated and then uploaded to the Curatescape platform to populate the Historic Montana website and app. MHS updates the information on a quarterly basis. MHS then must upload photos and any other material (audio files) and provide the location via "dropping a pin" on an OpenStreetMap manually for each site – this process was described as the most time-consuming part of the process. The location cannot be provided using latitude/longitude data. Each photo must be scanned and uploaded one by one. Maintenance of the website and app costs about $2,000 annually.

Curatescape has been found to offer several benefits. First, the platform is easy to use, and Cleveland State University updates it as technology changes. There is also a representative that MHS can contact if they run into any issues. Second, it allows Google to search content within Historic Montana. By doing so, Historic Montana's website shows up at the top of the page for Google search results related to topics in Montana, which has helped to boost awareness of the site. MHS did note that they see more traffic to the website version of Historic Montana compared to the app version. They have also found that the app is downloaded and then deleted after a short period of time. MHS reported that there were about 7,800 users in three months. The majority are within the United States and include teachers who are applying the information within their classroom. Third, the platform allows for a variety of content types, including podcasts, PDFs, and newspaper articles. A drawback that MHS has found is that while they have considered creating tours, the technology for this specific purpose is not as user-friendly.

MHS noted that the Historic Montana website and app are focused on National Register of Historic Places sites. As such, there is likely no opportunity to partner with MHS to add MDT's interpretive markers to their existing app, as the interpretive markers are not exclusively focused on National Register of Historic Places sites. However, the Curatescape platform offers a potential avenue for MDT to disseminate information about their interpretive markers.

Curatescape

MHS and several of the apps reviewed for this project use Curatescape to develop and maintain their interpretive marker apps. Curatescape is a web and mobile app platform for sharing locational-based information, which uses the Omeka platform (an open-source web publishing platform) (Cleveland State University Center for Public History and Digital Humanities, 2025). Curatescape was developed at the Cleveland State University Center for Public History and Digital Humanities and has worked with over 40 organizations to develop web and mobile content.

Curatescape offers three tiers of support (Cleveland State University Center for Public History and Digital Humanities, 2025):

- Free and Open Source – Web Only: $0

- Full Service – Web Only: $7,000 one-time fee
- Full Service – Web and App: $7,000 one-time fee and $1,500 per year (minimum 2-year initial contract)

Curatescape grew out of a previous mobile app effort from the Cleveland State University's Center for Public History + Digital Humanities (CPHDH) called Cleveland Historical. As of 2013, the Cleveland Historical app contains over 500 stories, 4,000 images, 1,000 audio files, and 100 videos with over 13,000 users in 2013 (Tebeau, 2013). As a part of developing Cleveland Historical, CPHDH reached out to university and high school students, teachers, librarians, and community members to partner and build content for the app. This content was then submitted to an editorial board for review before being uploaded to Cleveland Historical. While building Cleveland Historical, CPHDH created a web and mobile app framework built on Omeka, which is an open-source content management system. Curatescape was built to be a low-cost option for small- to medium-sized interpretive programs and educational institutions to implement web and app options.

Curatescape allows multimedia content to be tied to a map, interpretive tours, search features, social media integration, links to outside resources, and analytics for web and app. CPHDH emphasizes storytelling within Curatescape.

Some best practices for disseminating humanities or interpretive content in a mobile app were presented (Tebeau, 2013). These include:

- Before beginning your web or app project, consider your audience – your audience will help frame your web/app content.
- Do not treat Curatescape as an encyclopedia. Tell a story and utilize a wide variety of multimedia resources to improve storytelling.
- Provide information in smaller bite-size "chunks" – think short videos, audio clips, or text stories.
- Think about how to engage your audience. Look to potential partners including community members, university students, K-12 teachers, and professionals at cultural/historical organizations to collaborate and create interpretive content.
- When adding information into Curatescape, think about your tags – these allow end users to search for content that is of interest.

As the Cleveland Historical app has been used over the years, CPHDH found that users enjoyed using the app during walking tours and reported using the app later for more information and to discover other neighborhoods. CPHDH has used postcards, posters, and window clings with QR codes to help market the Cleveland Historical app and noted that continued marketing of the app is necessary to build an audience.

The Historical Marker Database

After providing more information about HMdb, the Technical Panel expressed an interest in learning more. Many apps currently pull historical marker data from the information found within the HMdb. The HMdb is a searchable online catalog of permanent outdoor historic markers, monuments, and plaques (The Historical Marker Database, N.D.). The database provides marker sign locations, text, and photographs. Information in the database is created by volunteers. Anyone can add items to the database as long as they meet editorial guidelines. Information submitted to

the database by volunteers (named contributing correspondents) is then reviewed by a database editor (called contributing editors) for accuracy and adherence to the editorial guidelines prior to being published on the database. A contributing correspondent can be promoted to a contributing editor after showing a history of accurate, well-researched submissions.

To add a marker to the database, a user needs to create an account and select "Add-A-Marker." The submission form asks for the name of the marker and a close-up photo of the marker. The database will then use this information to determine if the title of the marker is already in the database. If it is in the database, you will receive a list of potential matches and instructions on how to proceed to either add your photo to the existing marker entry or provide potential edits to the existing marker entry. If it is not in the database, the user will be notified and asked to provide the location of the marker and a form to provide additional information, including the following:

- Marker Title
- Marker Text
- Marker Type (Historical or Memorial)
- Topic(s)
- Map, City, County, State, Country
- Road and Route
- Comments on the Marker Itself (Optional)
- Comments on the Subject (Optional)
- Related Markers (Optional)
- Notes to the Editor (Optional, will not show up in final entry)
- Submitted By (Optional)

A user can also add photos and links for additional information on the subject of the marker. Once this longer form is submitted, it will be reviewed by a contributing editor prior to being published on the HMdb.

The HMdb has data for 2,251 sites across the state of Montana. Searching the database for markers containing the phrase "Montana Department of Transportation" results in 209 markers (Figure 13). Further review of MDT historic highway markers within 150 feet of a marker within the HMdb shows that 272 of the 347 markers in MDT's current web map may already exist within the HMdb (Figure 14). A more in-depth review comparing information within the HMdb for these markers should be conducted to determine which markers are currently within the HMdb. An MDT summer intern could be assigned to compare the data contained within the HMdb to MDT's and propose adding missing markers so that existing apps like ExploreHere will have the appropriate data.

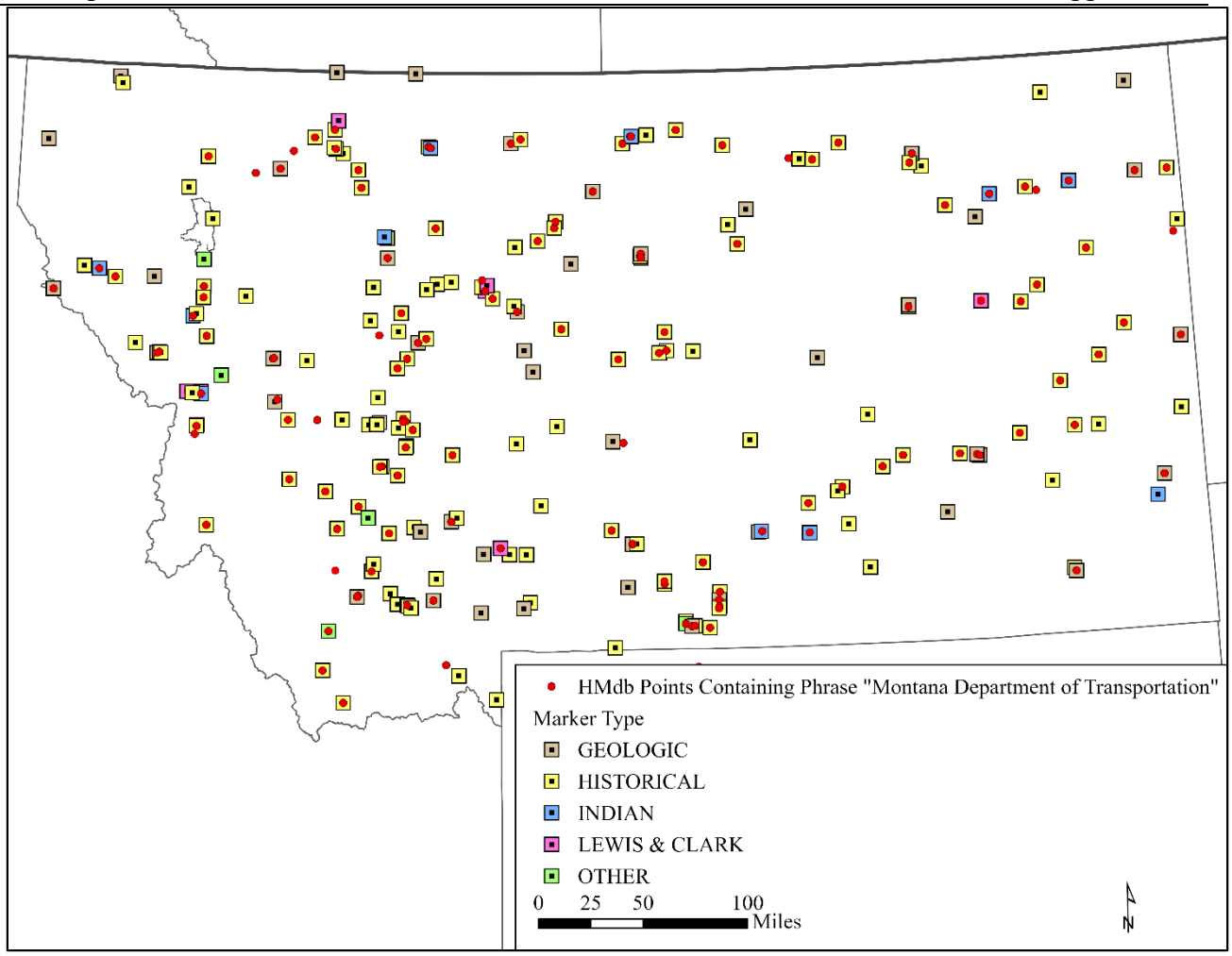


Figure 13. HMdb Points Containing the Phrase "Montana Department of Transportation" (The Historical Marker Database, 2025)

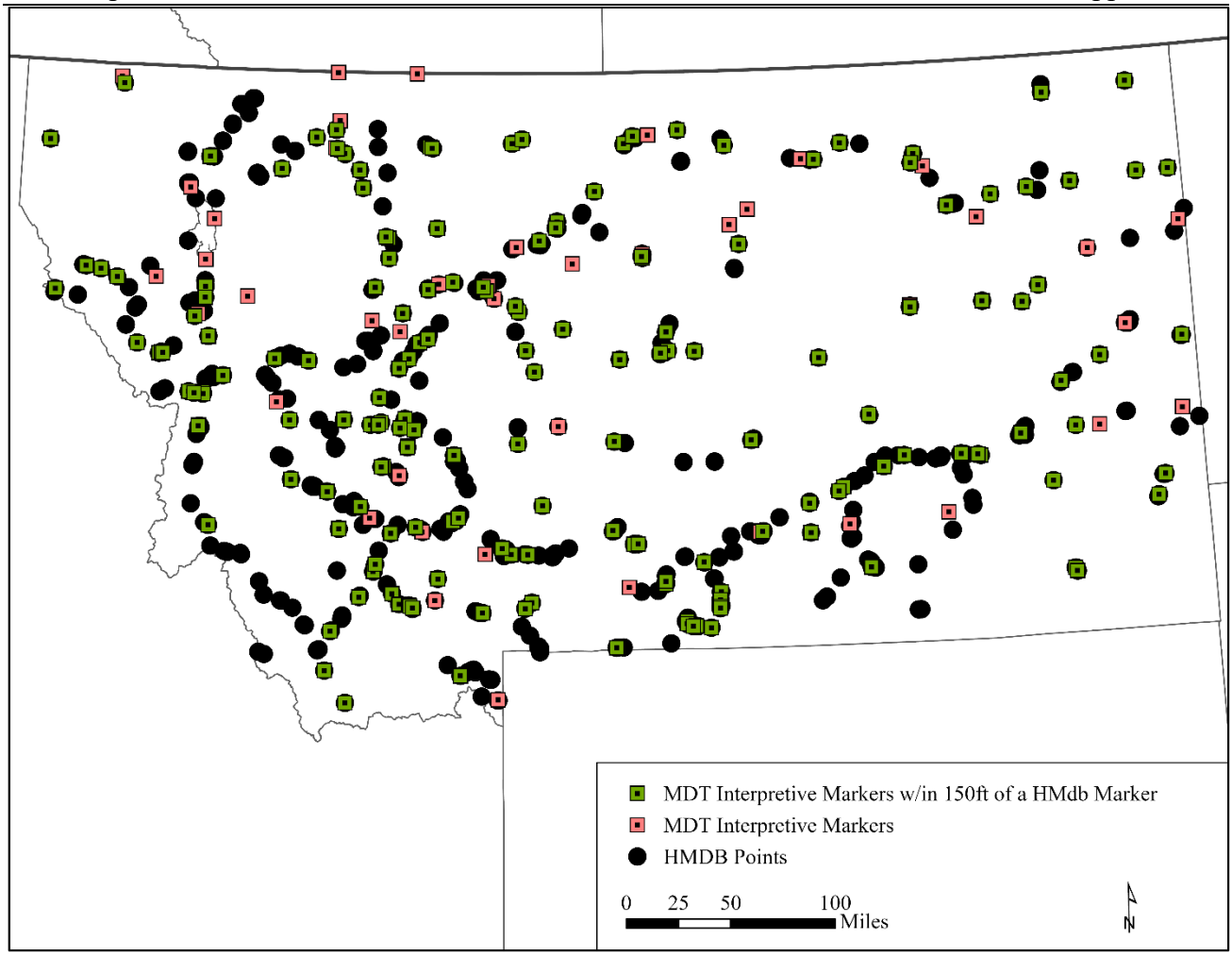


Figure 14. MDT Interpretive Markers within 150 feet of a HMdb Marker (The Historical Marker Database, 2025)

ExploreHere

The developers of the ExploreHere app reached out to the research team after reviewing the first task report. The research team met with the two developers of the app to learn more about their experience creating ExploreHere. While traveling full-time around four years ago, one of the developers desired to learn more about the interpretive markers they passed on the road. The app grew as a passion project with the objective of alerting users when they pass a marker so that they can determine whether to stop and learn more. The developer wanted to be able to determine whether the marker held interest to them without necessarily committing to stopping – is it worth pulling over for? Currently, the app is primarily focused on historic markers; however, the developers expressed an interest in branching out to other points of interest, including geology, fire watch towers, and flora/fauna. The developers also expressed an interest in integrating user-generated content, which could provide stories or other points of interest without it being tied to a physical marker.

The app currently pulls data from the HMdb for all historic marker content; however, the developer expressed an interest in partnering with historic societies to disseminate information in the future. They describe HMdb as, "the best dataset across the board." They noted that HMdb cares about the data integrated into the dataset, although the developers acknowledge that HMdb does not have

everything. In addition to the HMdb, ExploreHere utilizes data from Nativelands.ca which shows the user which native lands you are currently located on, and from the United States Geological Survey (USGS), which provides data on ecosystems and rock formations. They approached twenty-three states to see if they would be willing to share their data but only heard back from two. In addition, they are aware that the NPS has their own set of markers, but each park manages its own database, making it difficult to integrate such information.

As of March 2025, the app had around 25,000 registered users and around 450 subscribers paying for the "Pro" version of the app. The "Pro" version enables motion and geolocation permissions. One can also listen to an audio version of the marker; however, this feature does not work when the app is used offline. They have not received any notification about issues with the download size that allows "Pro" users access to the content offline. A chat in the app allows the user to communicate directly with the developers for technical support. This approach has garnered the app a five out of five rating for app support. The developers reported valuing "staying really close to their customers." The average user of the app is 55 years of age and older, with a good split between male and female users. The developers expressed that they would like to reach a younger audience.

The app is popular because it does not "demand attention" and instead works to nudge or provide information to a user. The developers very intentionally did not want an app user to have their phone out while they are adventuring. They are very committed to their users having a real-life experience as compared to engaging in the app. They noted that a popular feature of the "Pro" version of the app is the "nudge" which allows the app to alert a user by push notification of nearby markers. People seem to enjoy allowing the app to remain open while they drive so that it notifies and tracks which markers the user passes while traveling. This feature uses a smartphone's location permissions in a low battery consumption way to track the user's location every half mile and alert a user of markers within one mile.

The developers noted that the app is relatively low maintenance when it comes to pulling data from HMdb, managing payments, and managing users. However, managing the app technology itself has been a lot of work. As technology changes, the app code goes out of date, which results in the code needing to be rewritten to ensure it remains usable and secure. The developers reported that they were presently rewriting the code for the third time.

The developers are currently focused on marketing the app to gain users. This marketing includes search engine optimization (SEO), cold outreach, and social media ads (e.g., Facebook). SEO allows the developers to optimize keywords on their app page to ensure that the app shows up in search results for terms like "historic markers." Additionally, the developers are working with micro-influencers (social media influencers with 100 to 3,000 followers) who travel often and have a small, dedicated group of followers. The "Pro" version of the ExploreHere app is offered to the micro-influencer for free if they share ExploreHere with their followers. All of these marketing efforts have drawn in 10,000 users in the last six months, for a total of about 25,000 registered users. Of these users, 3,000 are monthly active users.

The app developers have experimented with future offerings: tour development, leveraging input from locals, tailored notifications, and allowing specific geographical downloads. They have been working on developing local stories through the use of AI. However, they are not satisfied with the AI-generated voice. They are also interested in identifying "locals" of places and allowing them to submit their own stories, as well as allowing users to tailor the notifications they receive based on their interests. The developers also reported an interest in allowing users to download

specific regions or specific cities in the future, which could reduce the data download sizes when the app is used offline.

Montana Department of Commerce's Office of Tourism

The research team reached out to the Montana Department of Commerce's Office of Tourism as a potential marketing partner to help disseminate MDT's interpretive highway markers. The Office of Tourism was in the middle of relaunching their brand in the middle of 2025, including their website (VisitMT.com). This relaunch reportedly included a focus on underserved communities, including more rural communities in eastern and southeastern Montana. In addition, this effort aimed to shift the focus from marketing Montana's landscape to focusing on Montana's people and industry. Historically, The Office of Tourism has partnered with medium-tiered influencers (e.g., RunWildMyChild, Mamalode (out of Missoula) and Good Sam (a recreational vehicle traveling organization).

MDT's interpretive markers have a potential draw for history buffs and traveling Montanans to visit other parts of the state. The Office of Tourism mentioned potential opportunities to disseminate MDT's interpretive highway markers, including sharing either MDT's interactive map website or app (if one is developed in the future). These could potentially be shared through the VisitMT.com website or on social media channels.

Review of Online Interactive Maps

Reviews of the following twenty-eight online interactive maps, which were identified through the literature review and survey responses, were conducted:

1. Alabama Historical Commission
2. Arkansas Historic Preservation Program
3. DC Preservation League
4. Florida Historic Marker Council
5. Georgia Historical Society
6. Hawai'i Visitors and Convention Bureau
7. State Historical Society of Iowa
8. Kansas Historical Society
9. Kentucky Historical Society
10. Cambridge Historical Society
11. Maryland Department of Transportation
12. Michigan History Center
13. MHS
14. Nebraska State Historical Society
15. New Hampshire Division of Historical Resources
16. Ohio History Connection
17. Oregon Travel Information Council
18. Pennsylvania State Historic Preservation Office
19. South Carolina Department of Archives and History
20. Texas Historical Commission
21. Utah Historic Society
22. Virginia Department of Historic Resources
23. Vermont Roadside Historic Site Markers
24. Washington State Historical Society
25. Polk County, Wisconsin
26. Wisconsin Historical Society
27. Wyoming State Parks
28. Intermountain Histories

They are well-represented throughout the United States (Figure 15).

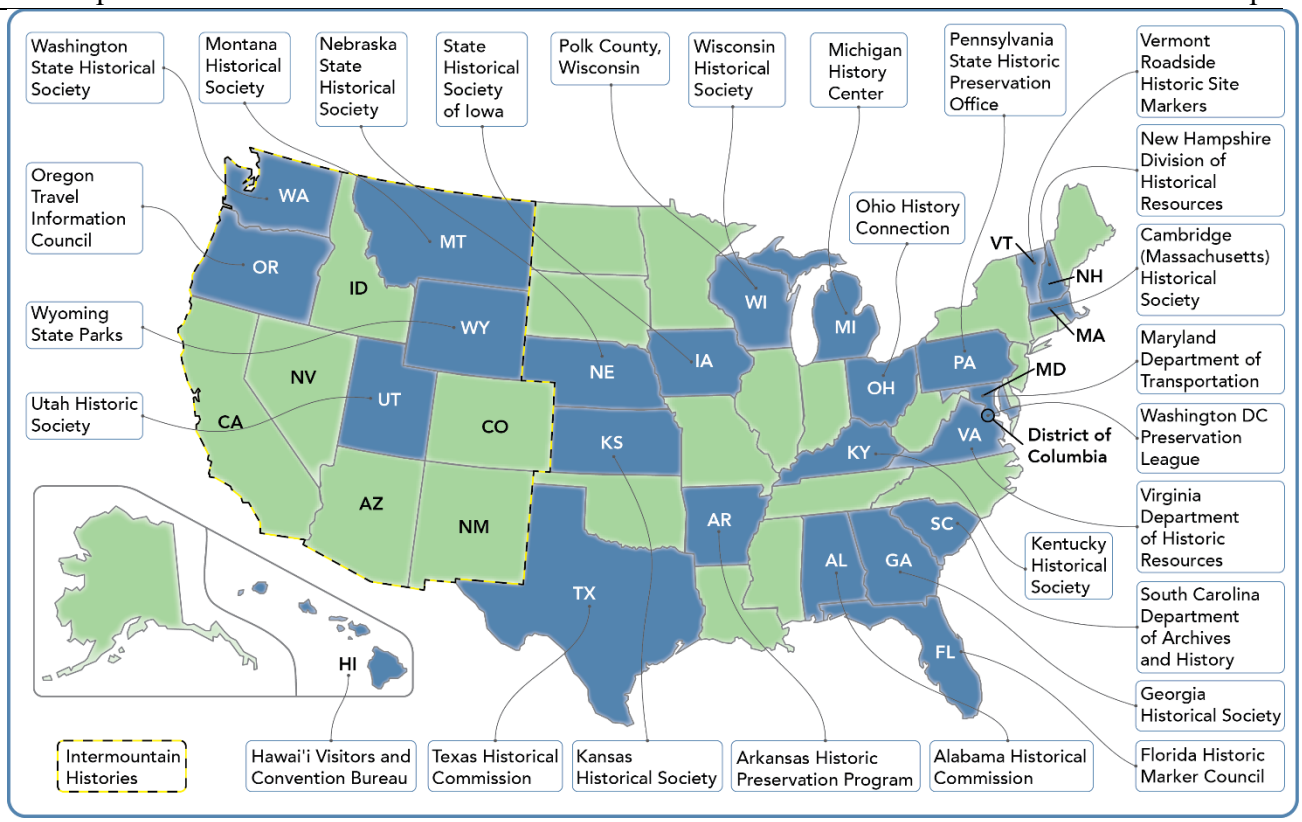


Figure 15. State Location of Each Interactive Map

For each interactive map, the following information was examined and summarized in Appendix D: Existing Online Interactive Maps.

- **Organization**: The organization that manages/maintains the data for the map.
- **State/Region**: The geographic area for which the map provides interpretive marker information.
- **Link**: Link to where one can find more information about the map.
- **Platform Used**: The mapping platform used (e.g., ESRI, Leaflet, Google My Maps, Others).
- **Map Description**: Short description of the map, including:
    - Data shown on the map;
    - Manner in which data is shown, including how markers are displayed on the map (what do map symbols look like, are they clustered); and
    - Information displayed when a marker on the map is clicked.
- **Disclaimer**: Does the interactive map website contain a disclaimer for the data provided?
- **Photos**: Does the map provide photos of the marker? Does it show multiple photos?
- **Searchable by County**: Is the map searchable by county?

- **Searchable by Theme or Subject**: Is the map searchable by theme or subject?
- **Tours**: Does the interactive map website have information on interpretive marker tours?
- **Ability to Send Information/Ideas for New Markers**: Is there an ability for users to provide information or ideas for new markers? If so, a short description of what information users can provide and how it is provided (via email, form, etc.) is included.

Online Interactive Map Findings

This section highlights high-level findings from the review of online interactive maps. Generally, these maps are all very similar – they show interpretive markers on a map as a simple icon, which a user can click on to obtain more information about a specific marker. The main differences lie in slight variations in look, search functionality, and the interpretive marker details shared.

Map Features

Half of the interactive maps use the ESRI platform. Google My Map and Leaflet platforms were also commonly used. Google My Map is a free platform offered through Google. Leaflet is an open-source JavaScript library for creating mobile-friendly interactive maps (Volodymyr Agafonkin, 2025). Two of the interactive maps (Kentucky Historical Society and Virginia Department of Historic Resources) were using an unknown or custom platform for their interactive maps.

Some maps display the interpretive markers as a clustered icon when the map is zoomed out (Figure 16) and others show interpretive markers as non-clustered or individual icons on the map (Figure 17). There are drawbacks and benefits to each approach. Clustered icons can help to reduce visual clutter, especially when there are several markers on a map; however, non-clustered icons do provide a more detailed view of marker locations. Non-clustered icon maps also convey the density of markers that may be located in a specific region or area.

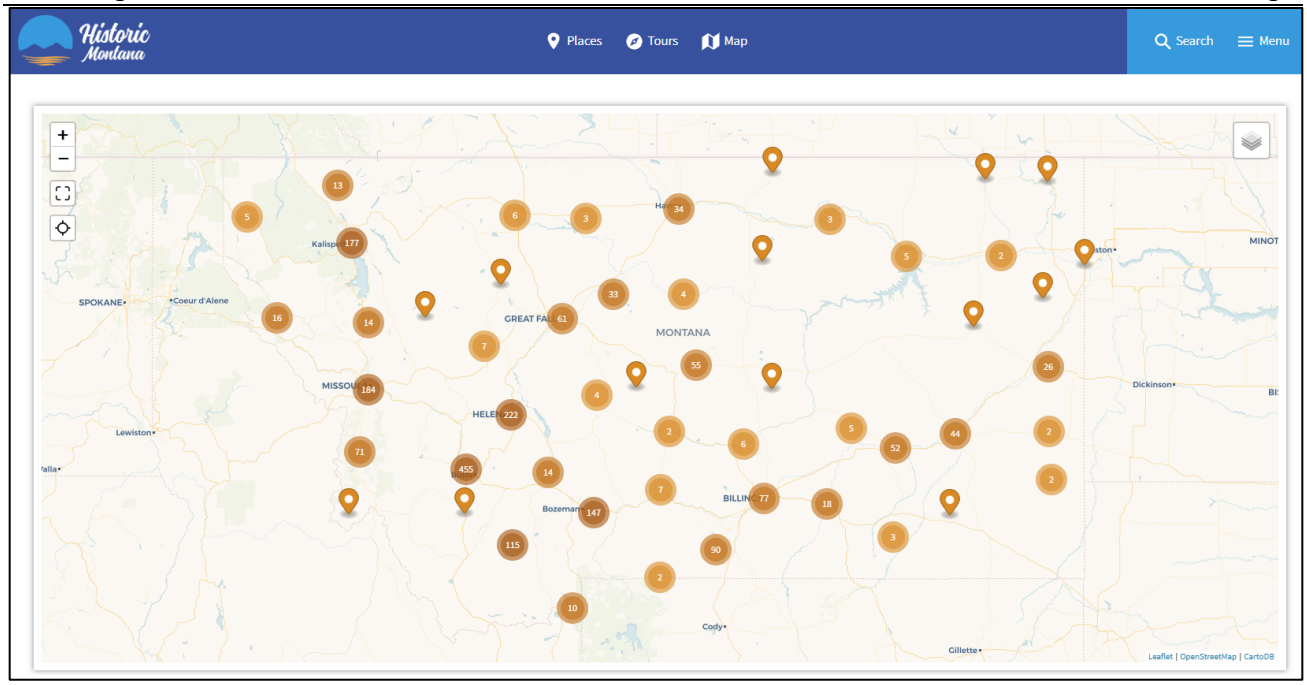


Figure 16. Clustered Map Icons Example (Montana Historical Society, 2025)

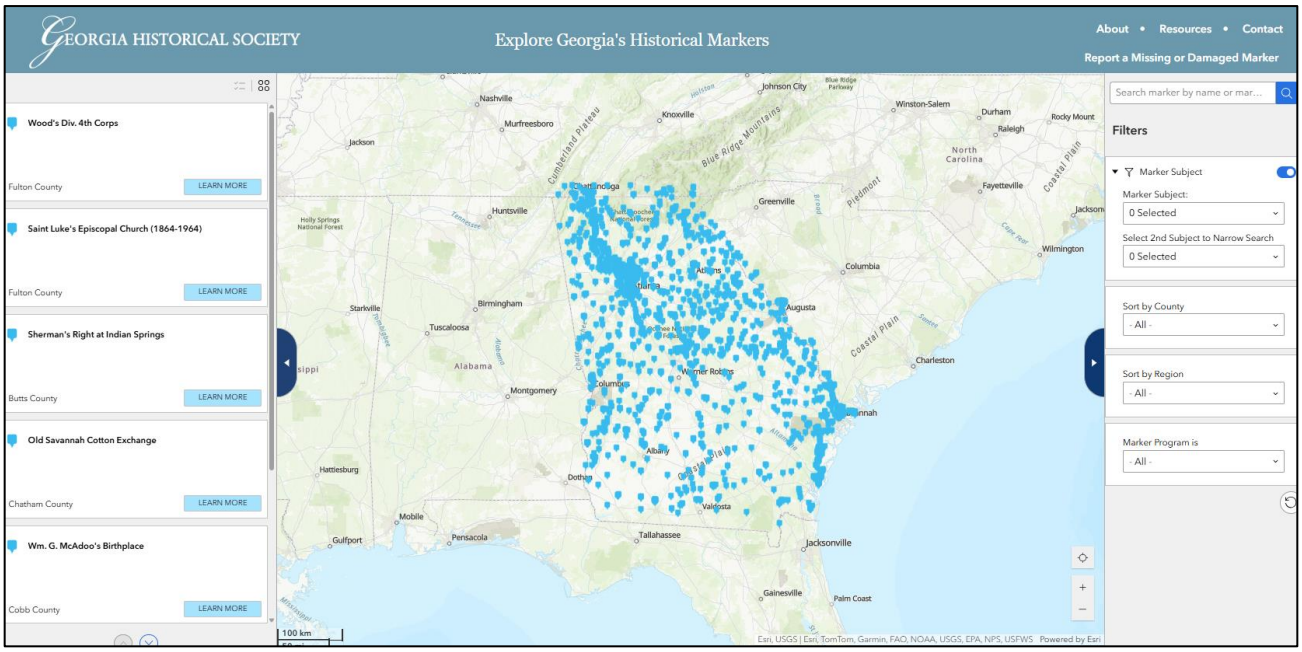


Figure 17. Non-clustered Map Icons Example (Georgia Historical Society, 2025)

Interpretive Marker Information Shared

The interpretive marker information shared varies from map to map. The most common details include the marker name, location description (address), location (latitude/longitude coordinates), tags related to the marker subject/time period, and photos (Table 3).

Seven of the maps provide a written marker description; however, it was more common for the full text of the marker to be shared (12 maps). Other data elements found include additional location information (region or whether the marker is on private property), marker size, marker condition, marker sponsoring agency, year dedicated, and related tours. Additionally, some interactive maps share a specific map for each marker – this was typically a Google Map, which one could click on for directions to the marker. Some also shared resource links that would take a user to documents or websites where they could learn more about the interpretive marker content.

Table 3. Reviewed Online Interpretive Maps

Organization	Marker Name	Marker Number/ Marker ID	Location (Lat/Long)	Location (Description/Address)	Location - Private Property	Region	Description	Full Marker Text	Marker Significance	Marker Size	Marker Condition	Marker Sponsoring Agency	Year Dedicated/Year Erected	Tags - Subject, Time Period	Tags - Marker Type	Photo	Map	Related Tours	Resource Links
Alabama Historical Commission	X			X								X	X	X			X		X
Arkansas Historic Preservation Program	X		X	X								X	X						
Cambridge Historical Society	X			X										X					
DC Preservation League	X			X			X								X	X	X	X	
Florida Historic Marker Council	X			X				X					X						
Georgia Historical Society	X			X		X		X				X	X	X		X			
Hawai'i Visitors and Convention Bureau	X			X			X									X	X		
Intermountain Histories	X		X				X							X		X	X		X
Kansas Historical Society	X		X																
Kentucky Historical Society	X	X		X			X							X					
Maryland Department of Transportation	X		X	X				X					X	X	X	X	X		
Michigan History Center	X	X	X	X				X					X	X		X			
Montana Historical Society	X			X			X							X		X	X	X	X
Nebraska State Historical Society	X			X			X							X		X	X		
New Hampshire Division of Historical Resources	X			X		X										X			
Ohio History Connection	X		X	X				X				X		X		X	X		
Oregon Travel Information Council	X		X					X	X							X			X
Pennsylvania State Historic Preservation Office	X			X				X						X					
Polk County	X																		
South Carolina Department of Archives and History	X	X	X	X		X		X				X	X	X					
State Historical Society of Iowa	X	X	X	X				X					X						
Texas Historical Commission	X	X	X	X	X			X		X	X	X	X	X					
Utah Historic Society	X			X								X	X	X		X			
Vermont Roadside Historic Site Markers	X		X			X		X						X		X			
Virginia Department of Historic Resources	X	X	X	X													X		
Washington State Historical Society	X							X								X			
Wisconsin Historical Society	X	X	X	X									X	X					X
Wyoming State Parks	X	X	X				X									X			
Total	**28**	**8**	**14**	**21**	**1**	**4**	**7**	**12**	**1**	**1**	**1**	**7**	**11**	**16**	**2**	**15**	**9**	**2**	**5**

Website Disclaimers

Ten of the interactive maps had some sort of disclaimer on the website at the top of the interactive map website or which a user would have to click through to view the map. These disclaimers varied but typically would state: how to use the map and the map search features (Figure 18); who maintains the map and when it was last updated; or provide contact information for any inquiries.

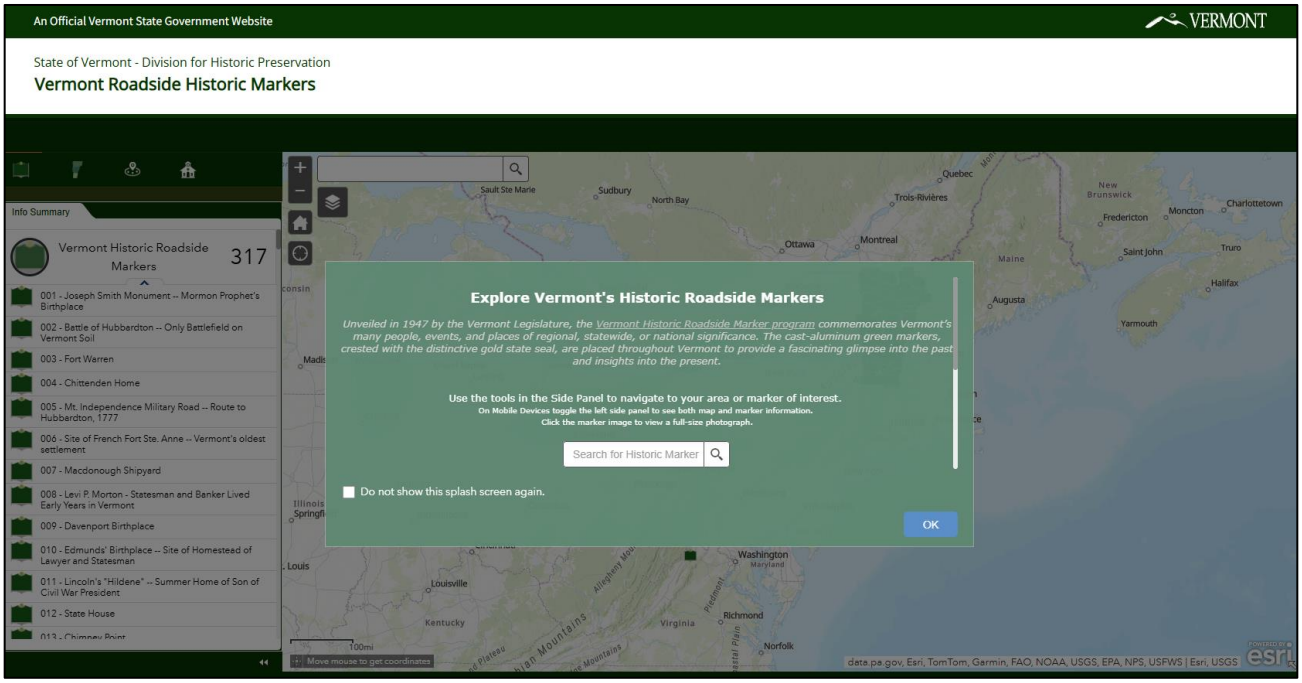


Figure 18: Vermont Roadside Historic Markers Map Disclaimer (State of Vermont - Division for Historic Preservation, 2025)

The disclaimer for Vermont's Historic Roadside Markers was somewhat problematic in that it was difficult to find the button to press that would remove the disclaimer and allow access to the information. Therefore, careful thought must be taken regarding how disclaimers are presented to users.

The Alabama Historical Commission has a disclaimer that describes how to use the map and what the different buttons/icons on the map do when you click on them. The disclaimer states, *"The Alabama Historic Preservation Map contains maps for all 11 of the Alabama Historical Commission's primary programs. Within this map, users can search for a particular site by name or address, as well as have access to all the public documents and pictures associated with each site. To access the full potential of the Alabama Historic Preservation Map, the following icons within the map have been explained below, but for more information about the map, access the downloadable data through AHC's Open Data Portal, as well as more helpful instruction on how to use the map, please visit the Alabama Historic Preservation GIS Portal or see the information icon in the header."* The disclaimer then describes each icon on the map (Figure 19).

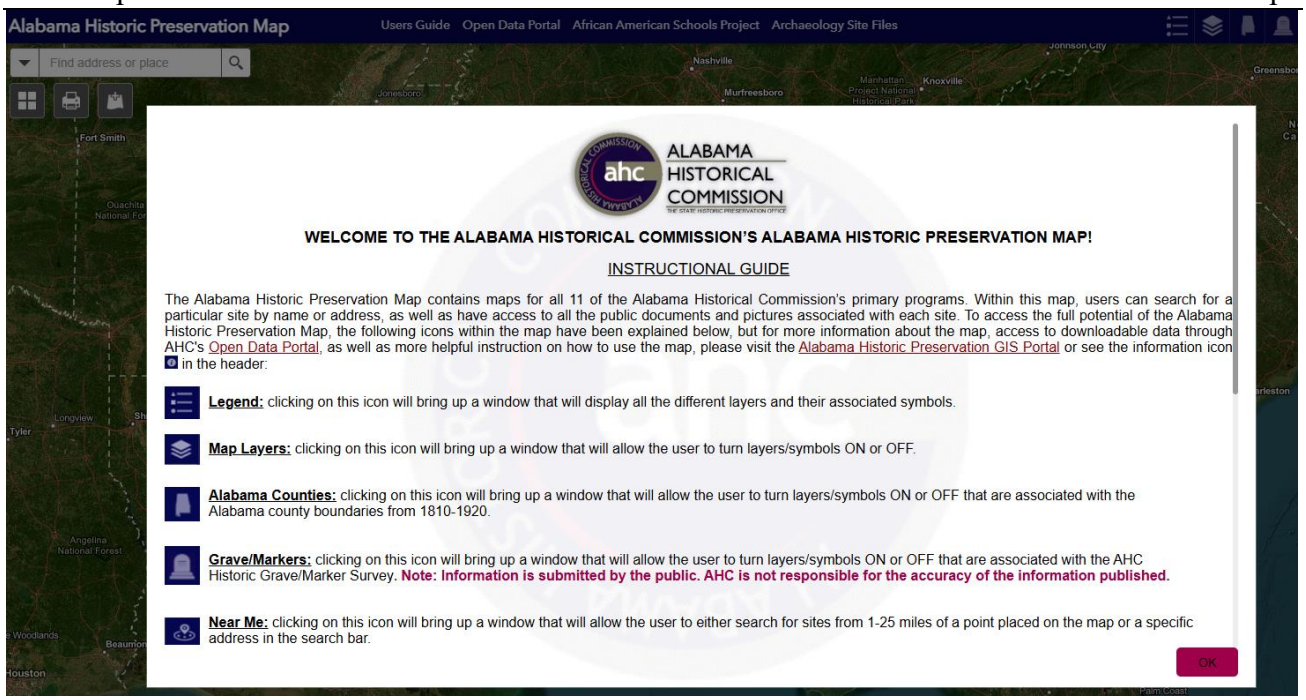


Figure 19. Alabama Historic Preservation Map Disclaimer (Alabama Historical Commission, n.d.)

The Pennsylvania State Historic Preservation Office map disclaimer was the only one to specifically mention, "The Pennsylvania Historical Marker program has been in existence for more than 100 years. Some of our earlier markers may contain outdated cultural references. The Pennsylvania Historical & Museum Commission is working to address this situation and will update markers as resources allow" (Pennsylvania State Historic Preservation Office, 2025).

Others, like the South Carolina Department of Archives and History, succinctly state, "Map maintained by SC Department of Archives and History. Recently approved markers may not yet be erected. Please submit inquiries to *ebreeden@scdah.sc.gov*." (South Carolina Department of Archives and History, 2025).

Search Features

Most of the interactive maps allow the user to search for interpretive markers. The most common method for searching markers is via an open text box where a user can input keywords related to the marker subject or time period (e.g., churches, transportation, World War I). Some online interactive maps have a dropdown list where one can find a list of keywords that can be searched, sometimes referred to as "tags." Others provided both an open text box and a list of keywords (Figure 20). Providing both options was particularly helpful.

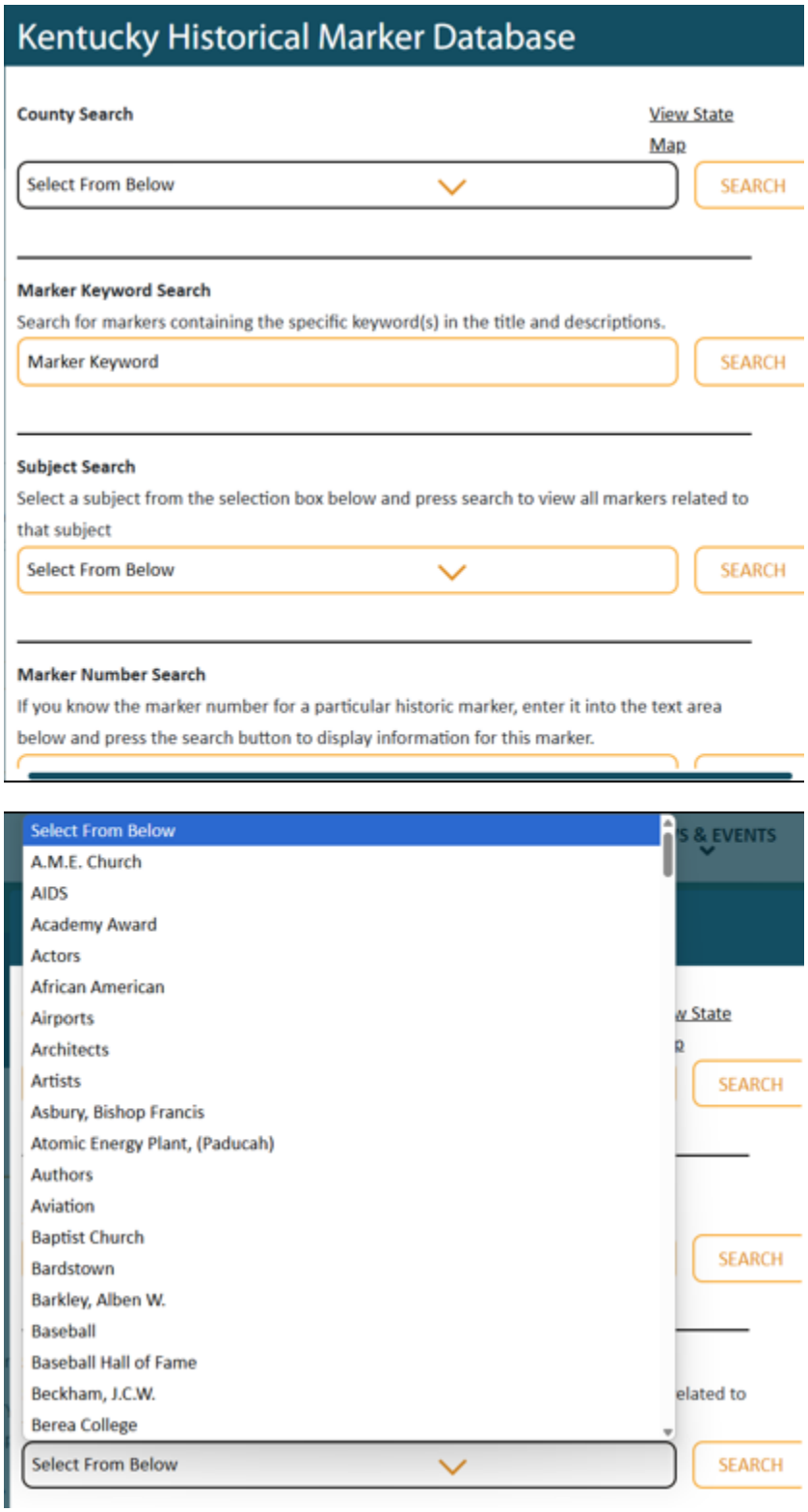


Figure 20: Kentucky Historical Marker Database Search Features (Kentucky Historical Society, n.d.)

It is recommended that MDT: 1) identify who the end user is of their interactive map, and 2) determine what types of search criteria would be most useful to the end user, versus providing an exhaustive list of keywords. Additionally, consider providing both an open text box search option and a list where a user can filter by keyword or "tag." Keep in mind, the number of keywords or "tags" that are available for a user to search by should be balanced with MDT's resources for managing the data. When the initial information is uploaded, each interpretive marker must be marked with the appropriate tags. This can be a time-consuming process if there is a long list of "tags" to choose from. For example, the Vermont Roadside Historic Markers site has a list of just ten tags (African American Heritage Trail, Bridges, Religious Edifices, Civil War, Education, Native American History, Transportation, Revolutionary War, State Historic Site, and Women's History) (Figure 21), whereas the DC Historic Sites website has an overwhelming list of 596 tags (Figure 22).

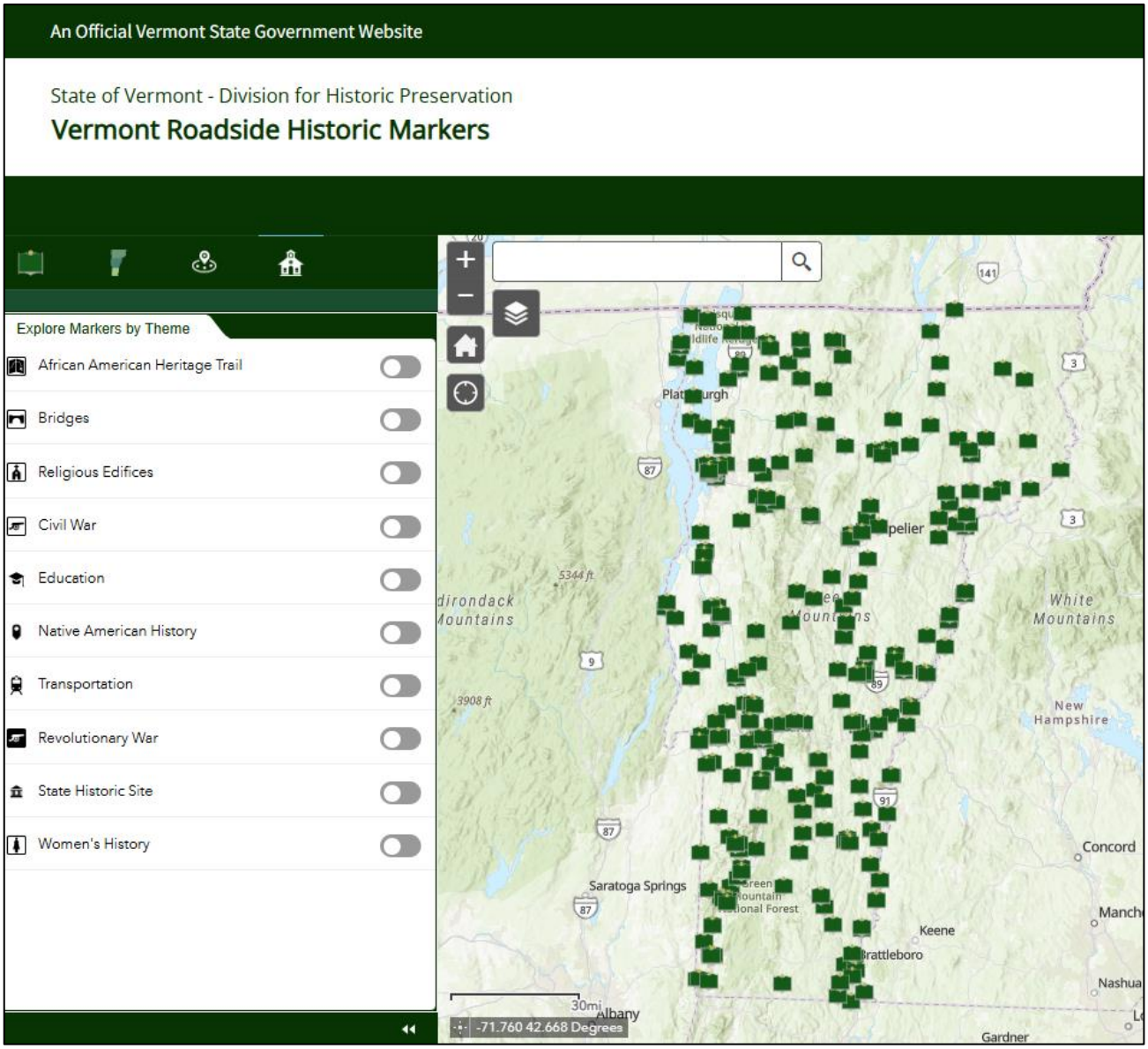


Figure 21. Vermont Roadside Historic Markers Keyword Search Options (State of Vermont - Division for Historic Preservation, 2025)

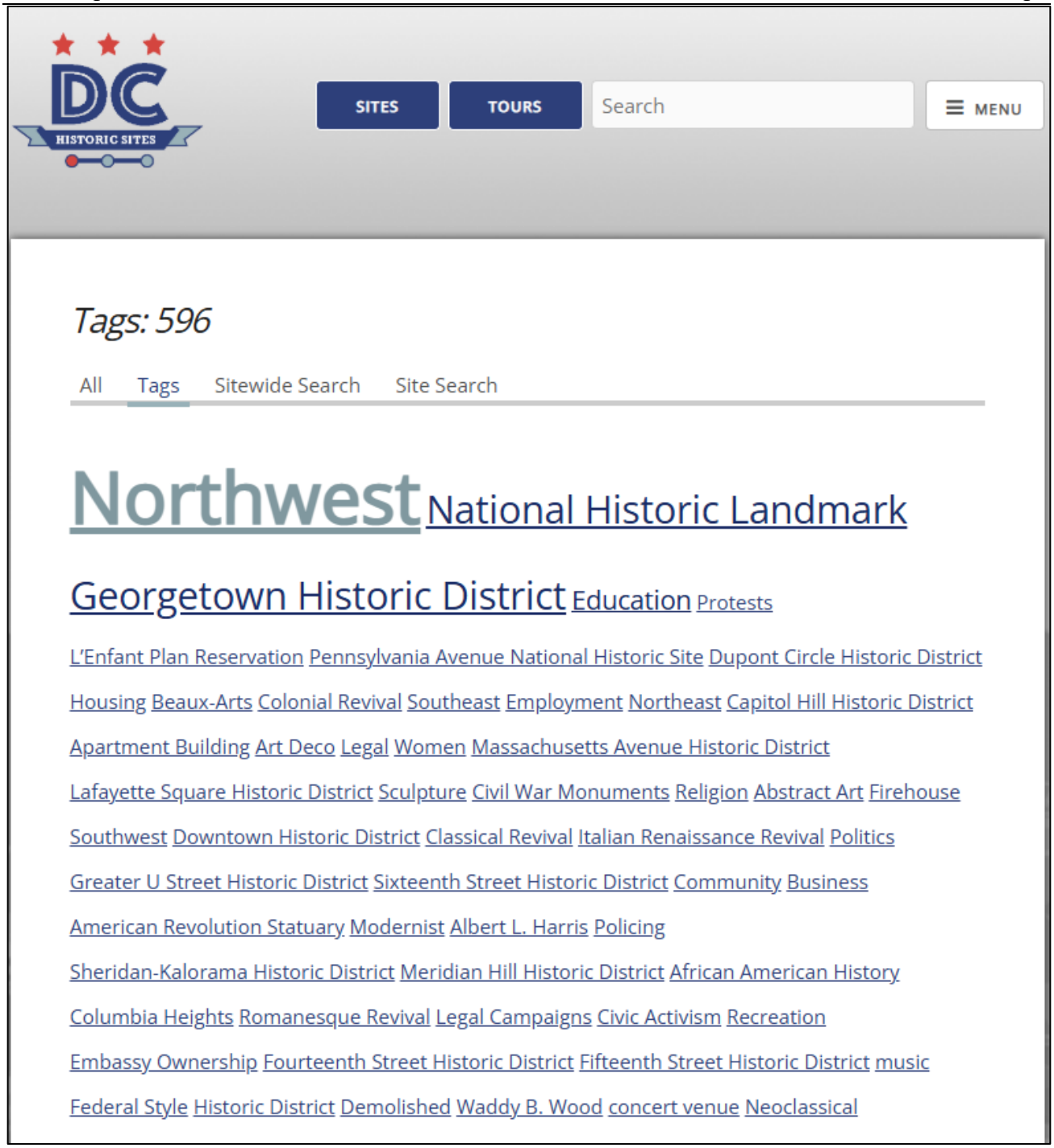


Figure 22. Washington, DC Historic Sites Keyword Options (DC Preservation League, 2025)

Other maps allow the interpretive markers to be searched using locations (e.g., by region, county, or roadway). The New Hampshire Historical Highway Markers map allows users to search for nearby interpretive markers within a user-set radius. For example, a user could specify that they want to identify all interpretive markers within five miles of a location (Figure 23). The results of the search are then shown on a side panel on the interactive map website (Figure 24).

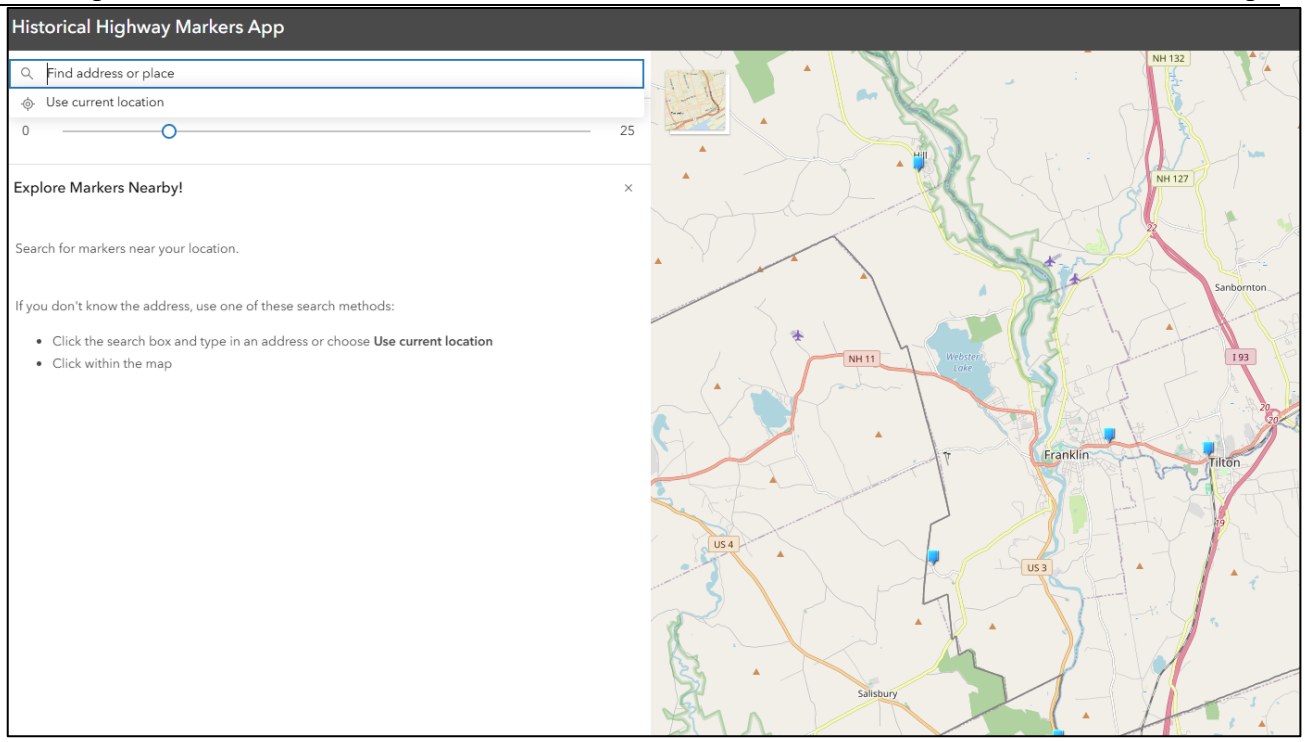


Figure 23. Search Nearby Markers Feature (New Hampshire Division of Historical Resources, 2025)

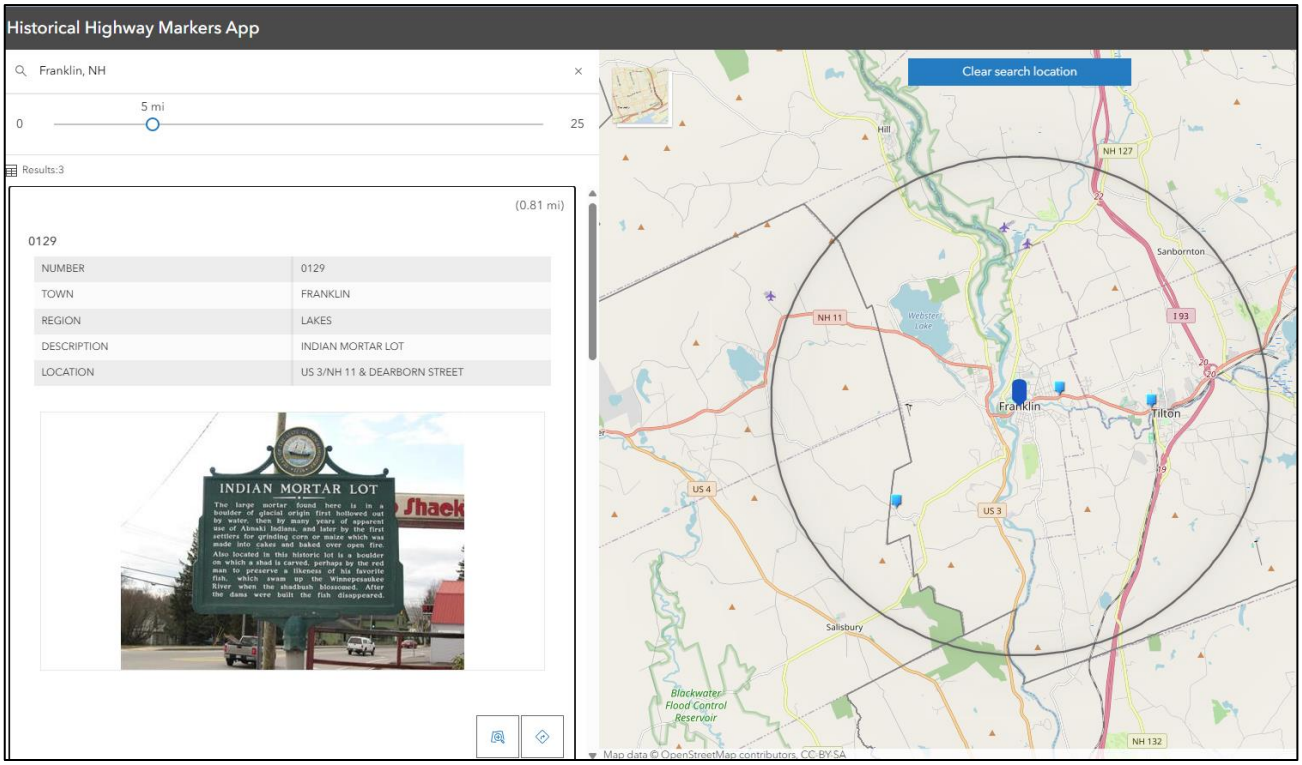


Figure 24. Nearby Markers Search Results (New Hampshire Division of Historical Resources, 2025)

Ability to Provide Feedback

Ten of the interactive maps provided a method for users to provide feedback or submit inquiries. Most provided contact information (email address) and asked users to reach out if they had any questions or if they wanted to report a damaged or missing marker.

The interactive map from the GHS provides a form for users to fill out to report a damaged or missing marker (Figure 25). This form asks for marker name, I.D. of marker (if known), approximate address, nearest cross street, nearest town, county, other location description, date of observation, marker status (knocked down, broken/damaged, pole damaged, missing entirely, plaque missing, surface in poor condition, next to road, pole missing, or other issue), comments, and contact info.

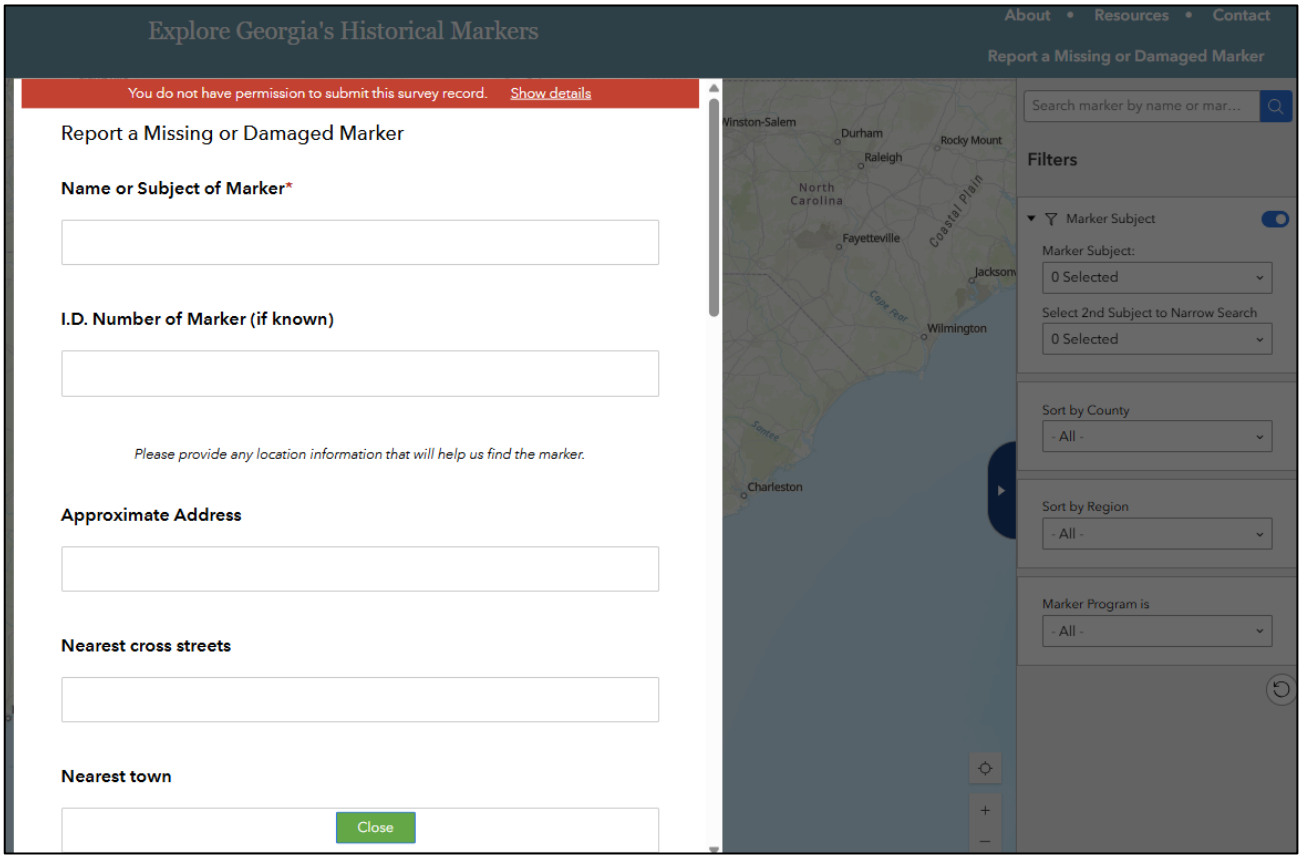


Figure 25. Report a Marker Form Example (Georgia Historical Society, 2025)

The Ohio History Connection website has a form for general inquiries about the markers. To report a problem with the marker, users are asked to provide their name, email address, phone number, a

description of the problems they observed, and upload a photo if applicable (Figure 26).

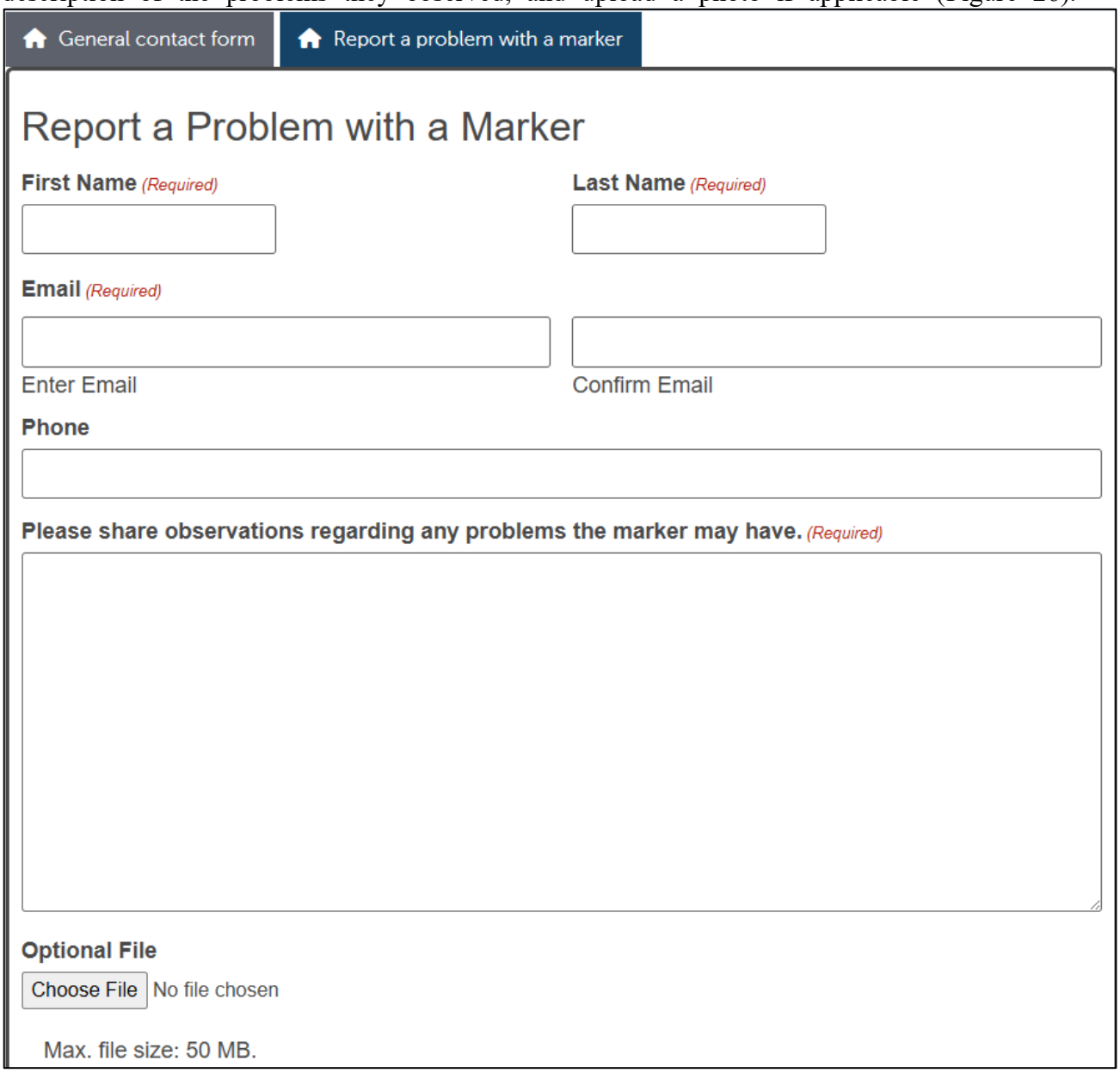


Figure 26. Ohio History Connection - Report a Problem with a Marker (Ohio History Connection, 2025)

New Marker Applications

The interactive maps from Ohio and Vermont had specific application information where users can propose a new marker for their programs.

The Ohio History Connection map provides contact information and resources for users who wish to propose a new marker. This includes the eligibility criteria for the Ohio Historical Markers Program, application forms, and information on the application process and deadlines. The application asks for details on the proposed marker, including:

- Marker title
- Marker subject

- Marker location, including address and latitude/longitude coordinates
- Relevance of the location
- Property ownership information
- Type of marker (Ohio Historical Marker, Corporate Limit Marker)
- Size of marker letters and length of marker text
- Marker artwork
- Funding sponsor information
- Maintenance responsibility information (information on who will maintain the marker sign)
- Statement of significance (which explains why the person, place, event, or thing to be marked deserves recognition)
- Suggested marker text (application provides word limits and emphasizes that content be accurate, informative, and concise)
- Bibliography (formal listing of resources for the statement of significance and suggested marker text)
- Tentative dedication date
- Contact information

The Vermont Roadside Historic Site Markers application is provided as a link on their interpretive marker website. The application asks for the following information to propose a new marker:

- Proposed marker topic/name
- Proposed physical location (including a photo of the location)
    - Physical address
    - Latitude longitude
    - Town/City and County
- Has the owner of the property associated with the event or person proposed for documentation by the site been consulted and concurred?
    - Who was consulted and by whom? Date?
- Has the town/city manager or select board been consulted and provided an opportunity to review the proposed text?
    - Who was consulted and by whom? Date?
- Proposed dedication date
- Applicant contact info
- Marker text author information
- Property owner information
- Bibliography
- Proposed text (cannot exceed 765 letters and spaces)

Interpretive Marker Tours

Four of the online interactive maps have interpretive marker tours. These four maps were all created by Curatescape, a program from Cleveland State University previously discussed. The tours are focused on a historical subject (for example, Montana Homesteads) or location (Red Lodge Commercial Historic District). Each tour includes a brief description of the historic topic (for example, the Mining Industry in Montana, Figure 27), and a list and map of the interpretive markers associated with the tour (Figure 28 and Figure 29). Each organization has a varying number of interpretive marker tours, with the Nebraska State Historical Society providing as few as 8 tours and MHS providing as many as 86 tours.

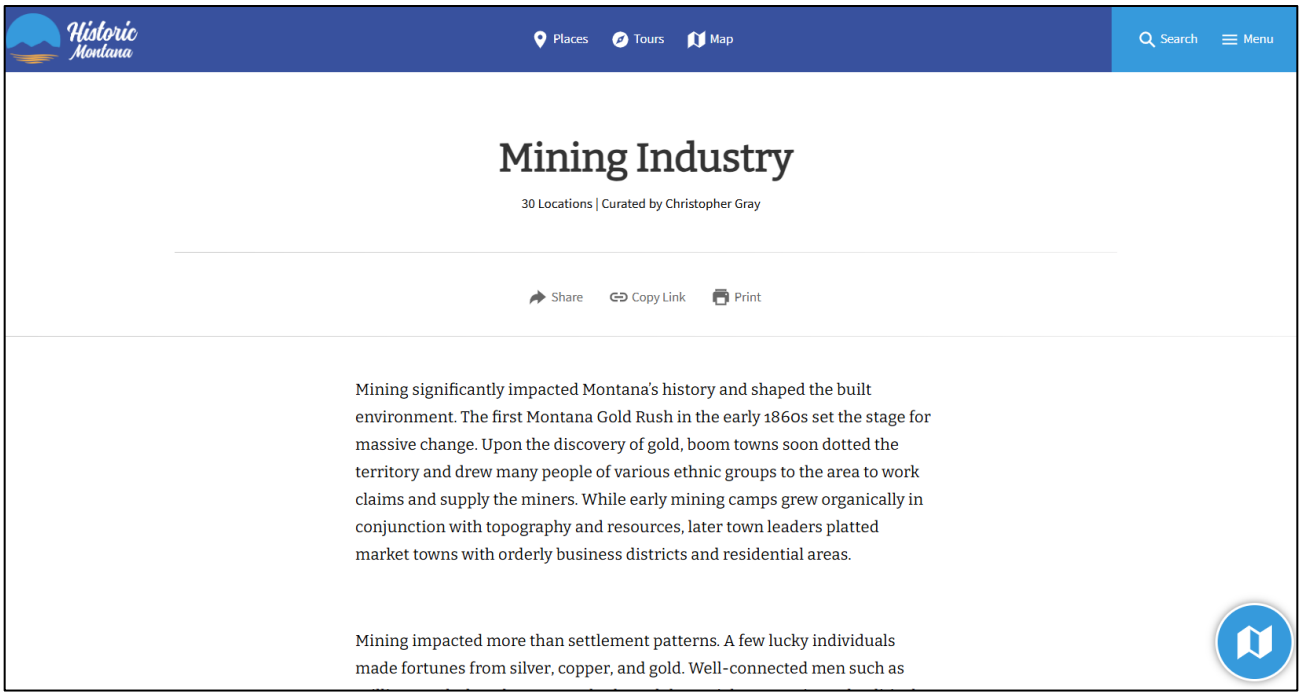


Figure 27. Interpretive Marker Tour Description (Montana Historical Society, 2025)

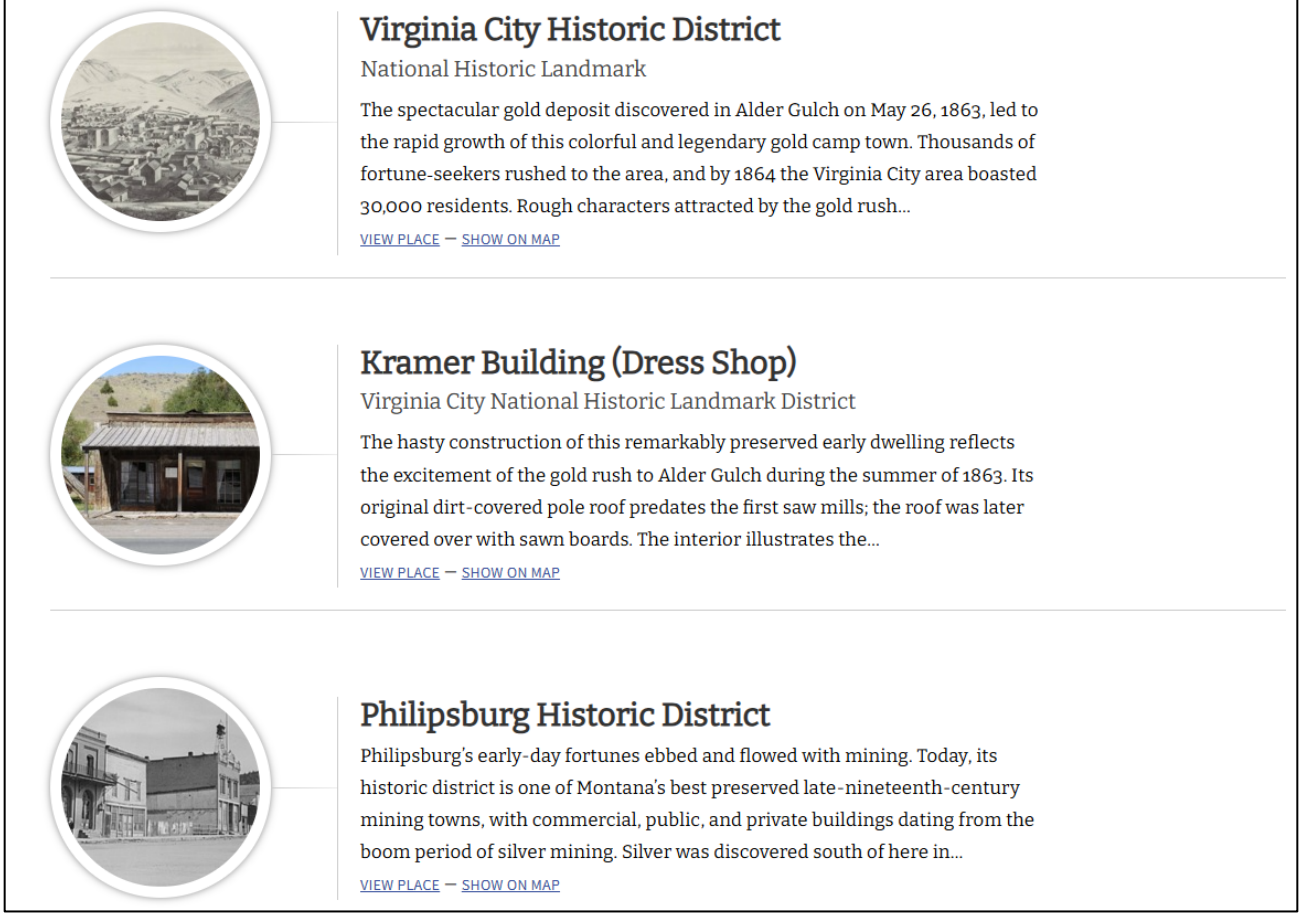


Figure 28. Interpretive Marker Tour - List of Associated Interpretive Markers (Montana Historical Society, 2025)

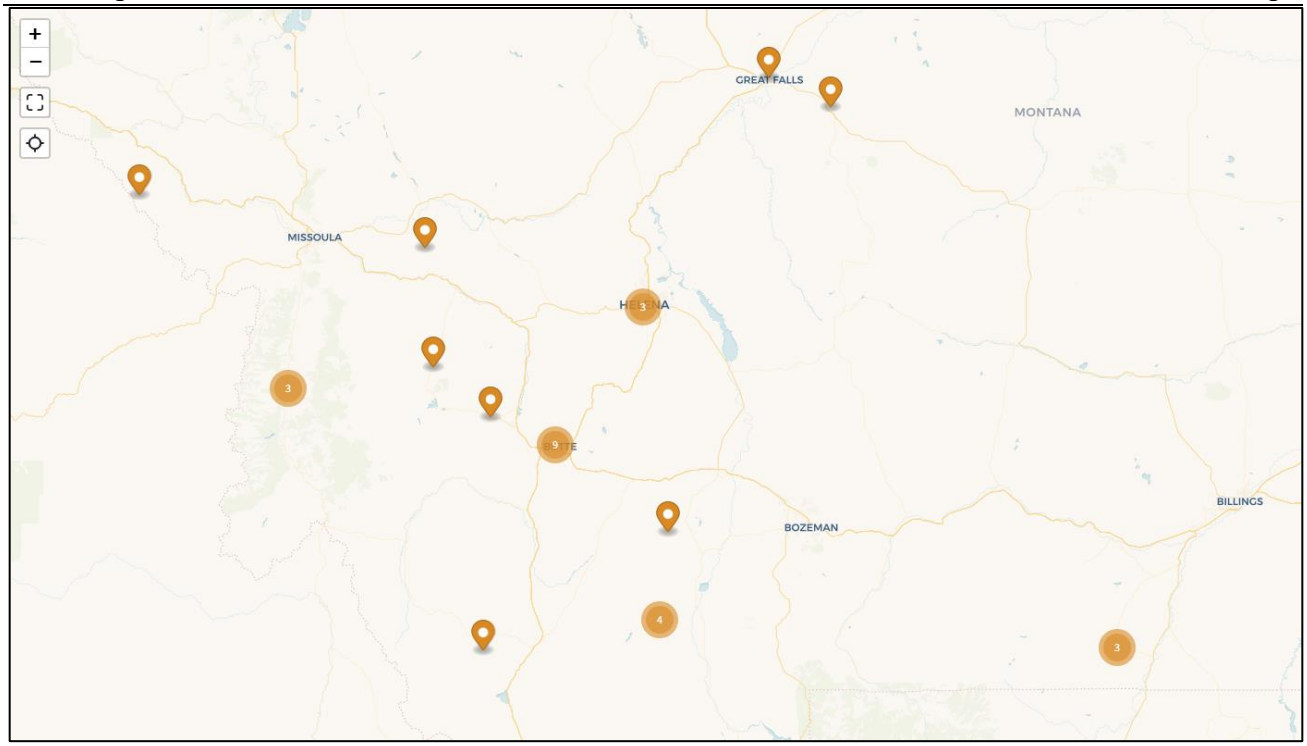


Figure 29. Interpretive Marker Tour Map - Mining Industry (Montana Historical Society, 2025)

Tours provide a potential opportunity for MDT to organize their interpretive markers around specific topics that may be of interest to users. Offering tours could help users plan travel around the state or help them plan stops along their travel routes.

Interactive Maps and Features of Interest

As the researchers reviewed the online interactive maps, some had features that stood out as ones MDT may want to consider imitating, or which had features that stood out to the reviewers (Table 4). Maps that stood out in the "Yes" column were easy for a user to navigate and provided a good balance of information about the interpretive markers themselves.

Table 4. Organizations Which Had Maps/Features That MDT May Want to Consider Imitating

Yes	Maybe	No
• Intermountain Histories • Maryland Department of Transportation • Michigan History Center • MHS • Nebraska State Historical Society • Vermont Roadside Historic Site Markers	• DC Preservation League • Georgia Historical Society • Hawai'i Visitors and Convention Bureau • Ohio History Connection • Oregon Travel Information Council • Utah Historic Society • Wyoming State Parks	• Alabama Historical Commission • Arkansas Historic Preservation Program • Cambridge Historical Society • Florida Historic Marker Council • Kansas Historical Society • Kentucky Historical Society

Yes	Maybe	No
		• New Hampshire Division of Historical Resources • Pennsylvania State Historic Preservation Office • Polk County, WI • South Carolina Department of Archives and History • State Historical Society of Iowa • Texas Historical Commission • Virginia Department of Historic Resources • Washington State Historical Society • Wisconsin Historical Society

The Intermountain Histories, MHS, and Nebraska State Historical Society interactive maps are all Leaflet maps created by Curatescape. These maps are similar and are visually clean to look at with clustered markers (see example from Intermountain Histories in Figure 30). When a user clicks on a marker on the map, a photo of the marker and the marker name pop up, and the user can click through to a page containing a detailed description of the interpretive marker site, including photos and resources or references where a user can find more information about the subject (Figure 31). These interactive maps provide an open text box to search for markers. Additionally, they all provide interpretive marker tours (detailed in the previous sub-section Interpretive Marker Tours). These maps also have a link where a user can "View a Random Site" which takes the user to a random interpretive marker, which is a fun option for those exploring the site.

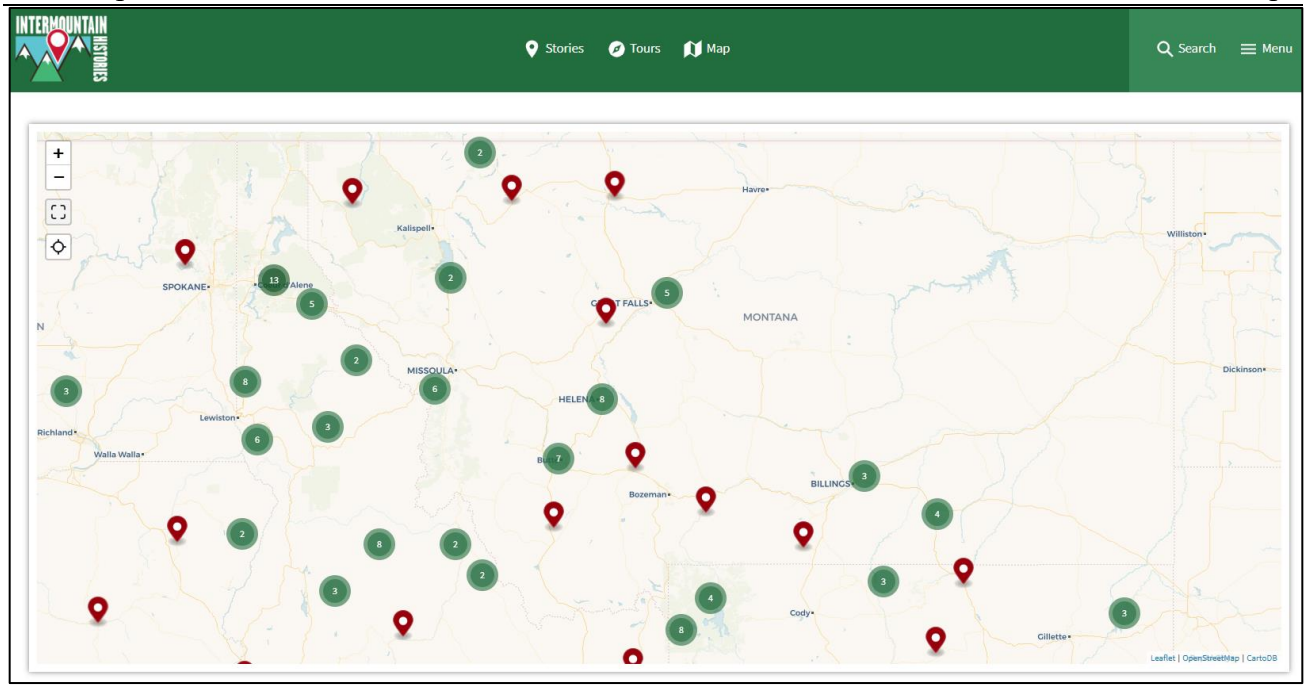


Figure 30. Intermountain Histories Interactive Map (Charles Redd Center for Western Studies at BYU, 2025)

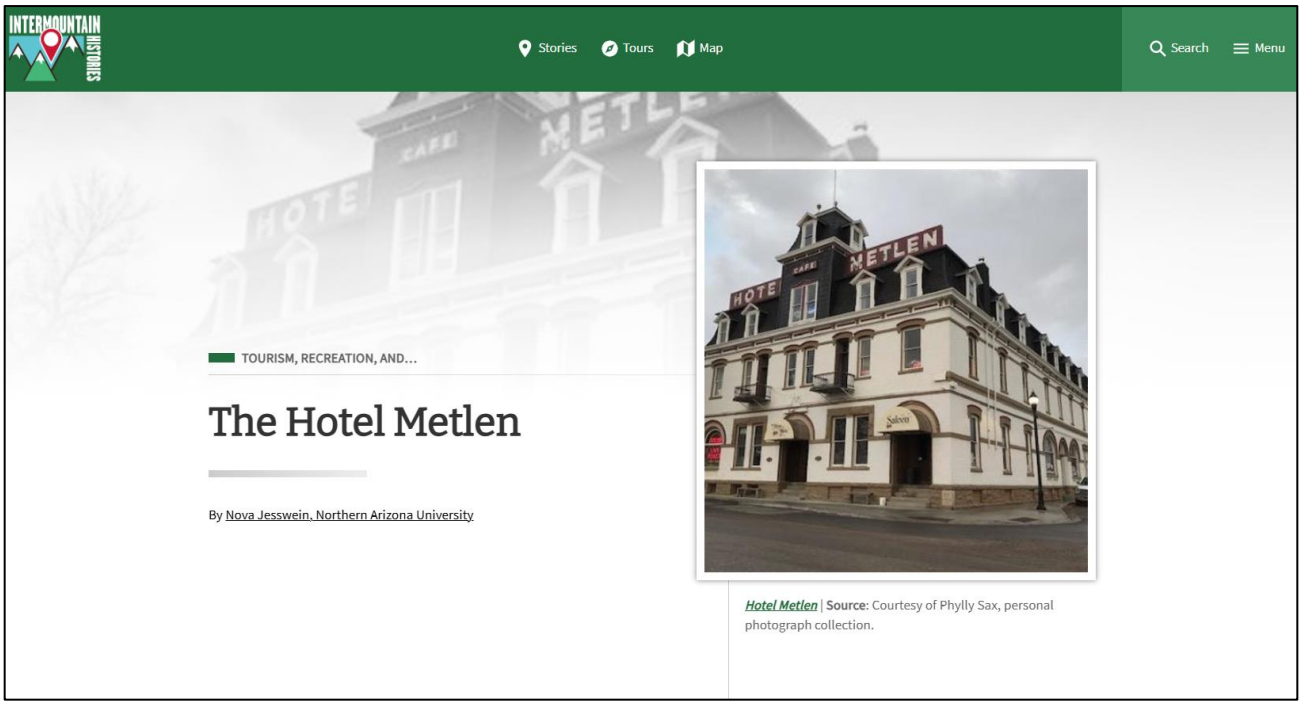


Figure 31. Intermountain Histories - Marker Details for The Hotel Metlen (Jesswein, 2025)

The Maryland DOT interactive map of roadside historical markers is an ESRI dashboard site with a left side bar that allows users to search the markers by an open text box or through a list of marker titles (Figure 32). On the right side of the map, there is a sidebar where users can filter the markers on the map by county and/or by marker themes. The right sidebar also includes information about

the marker program and contains a link to submit an application or report a damaged historical marker. When a user clicks on a marker, a pop-up appears on the right side of the page displaying the marker name, address, latitude/longitude coordinates, install date, sponsor, marker sign type, themes, a link to Google street view, the marker text, and a photo (Figure 33). This map was easy to navigate. The reviewers like the ability to search the markers through an open text box or by filters on county or marker theme. The information shared for each marker is a nice balance of details. The link to Google Maps street view could allow users to quickly obtain directions to a specific marker.

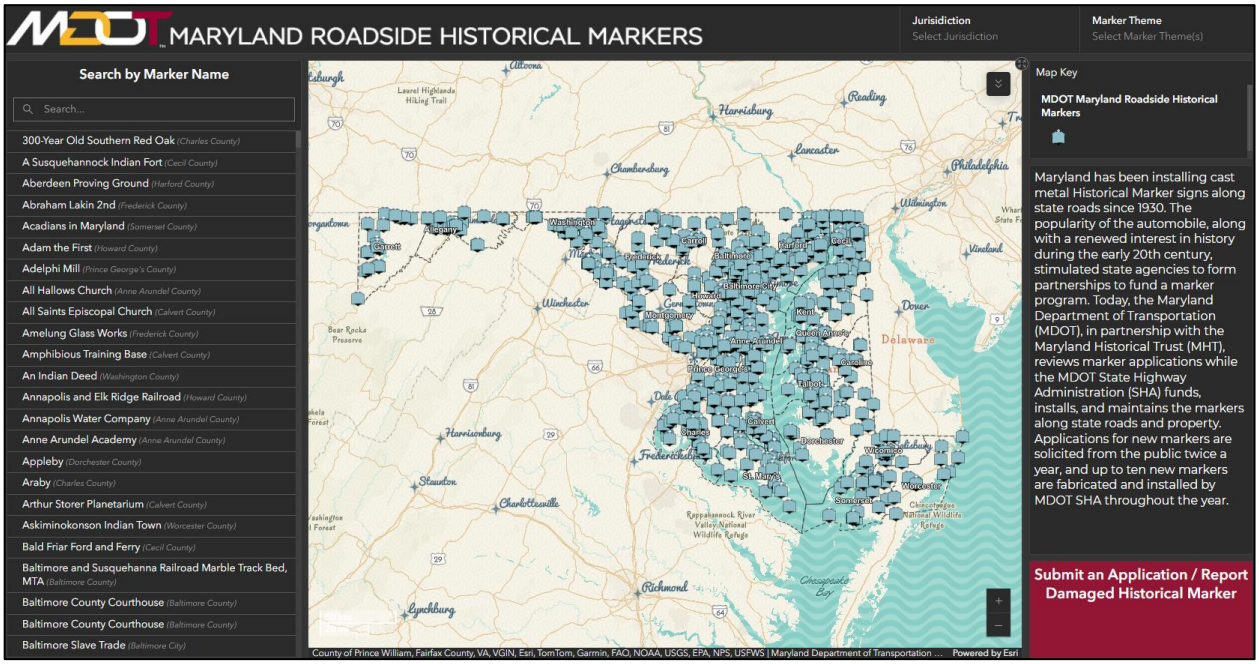


Figure 32. Maryland Roadside Historical Markers Map

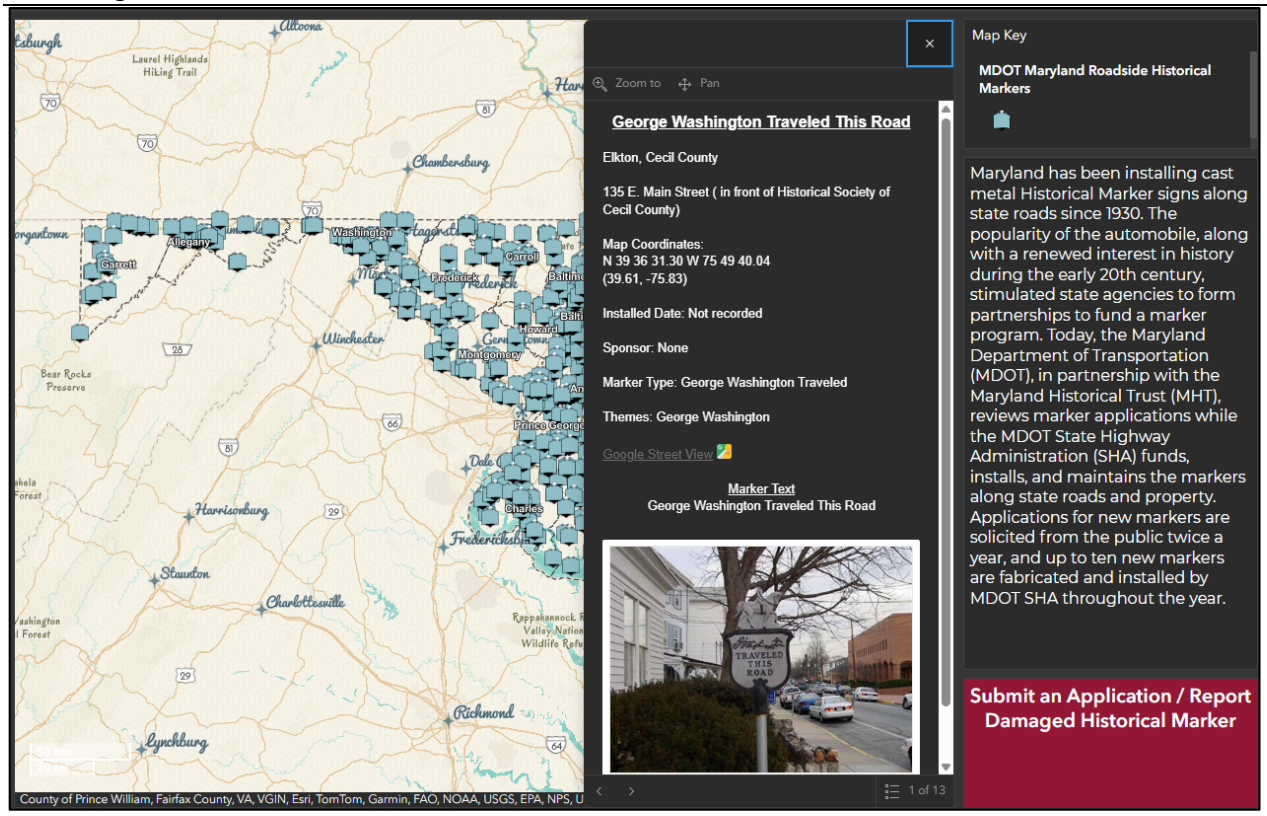


Figure 33. Maryland Roadside Historical Markers Map - Marker Details

The Michigan History Center map is an ESRI interactive map with a sidebar allowing users to search the interpretive markers or filter the markers by historical theme, significant date, city, or county (Figure 34 and Figure 35). A user can click on a marker on the map or in the list of markers on the sidebar to obtain more details about the interpretive marker including name, photos, full marker text, marker location (address, latitude/longitude), and marker statistics (marker ID, erected date, national registry, historic themes, significant date).

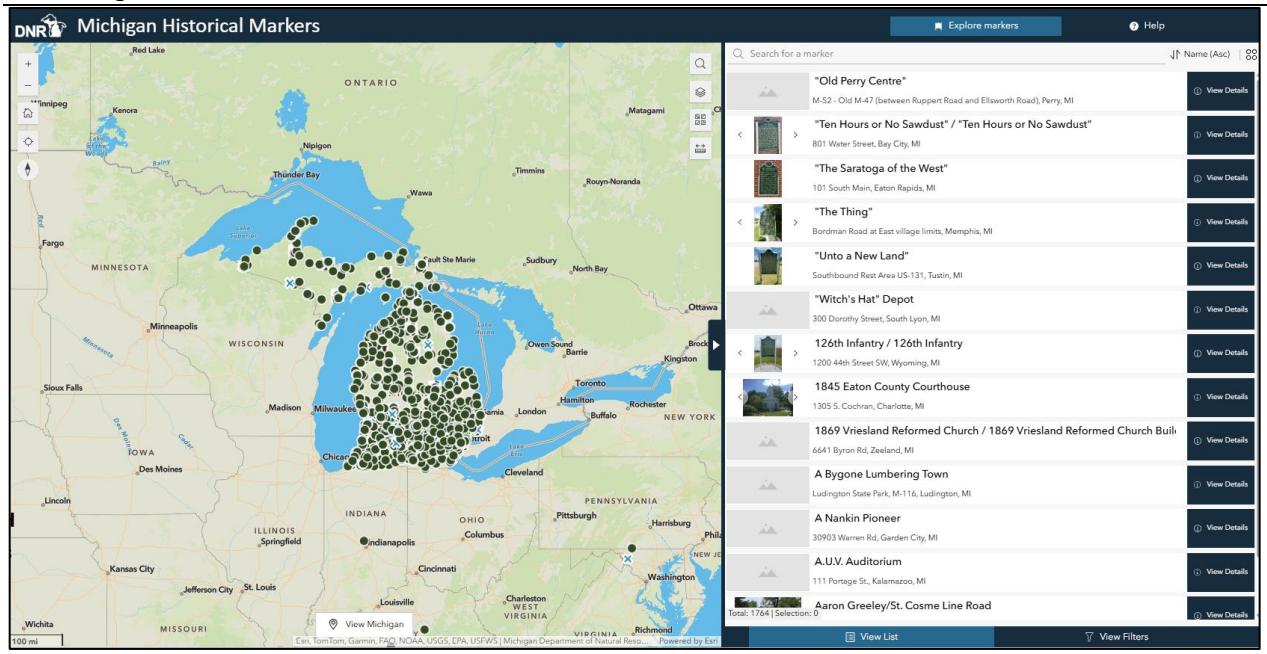


Figure 34. Michigan Historical Markers Interactive Map (Michigan History Center, 2025)

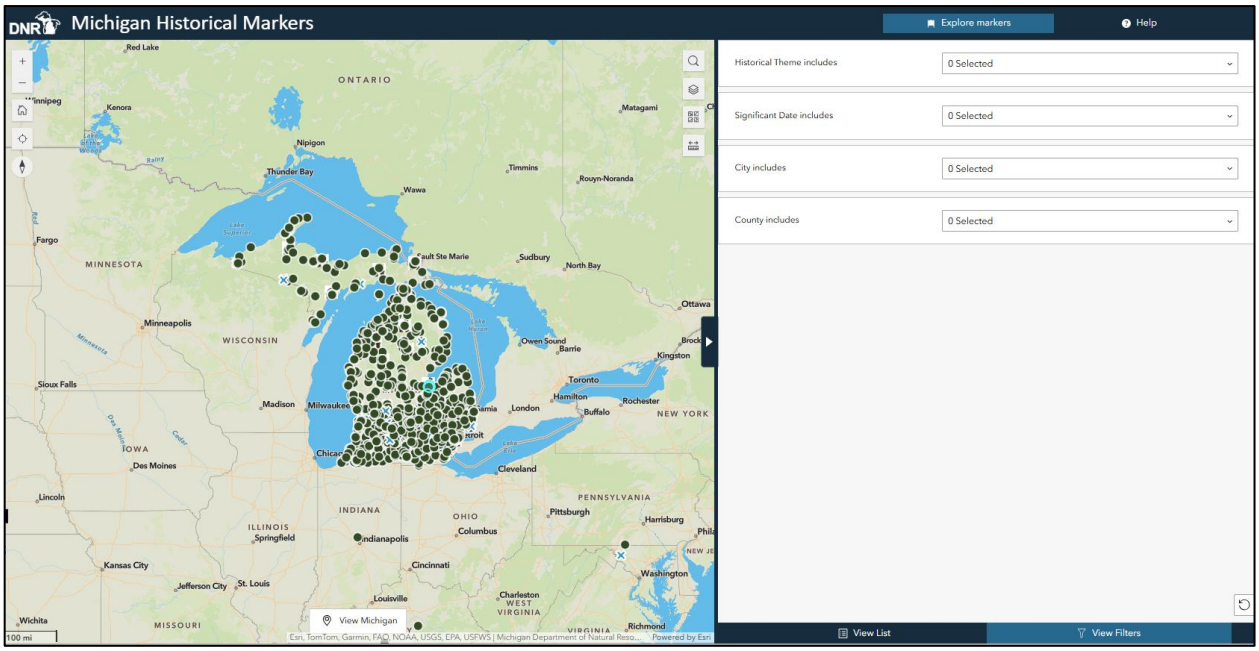


Figure 35. Michigan Historical Markers Interactive Map Search Features (Michigan History Center, 2025)

This map provides a clean interface that is easy for users to navigate with the side bar, which does not cover up the map as a user explores interpretive markers. The pop-up details for each interpretive marker are formatted nicely, where a user can click through photos without needing to open a separate tab in a web browser (Figure 36).

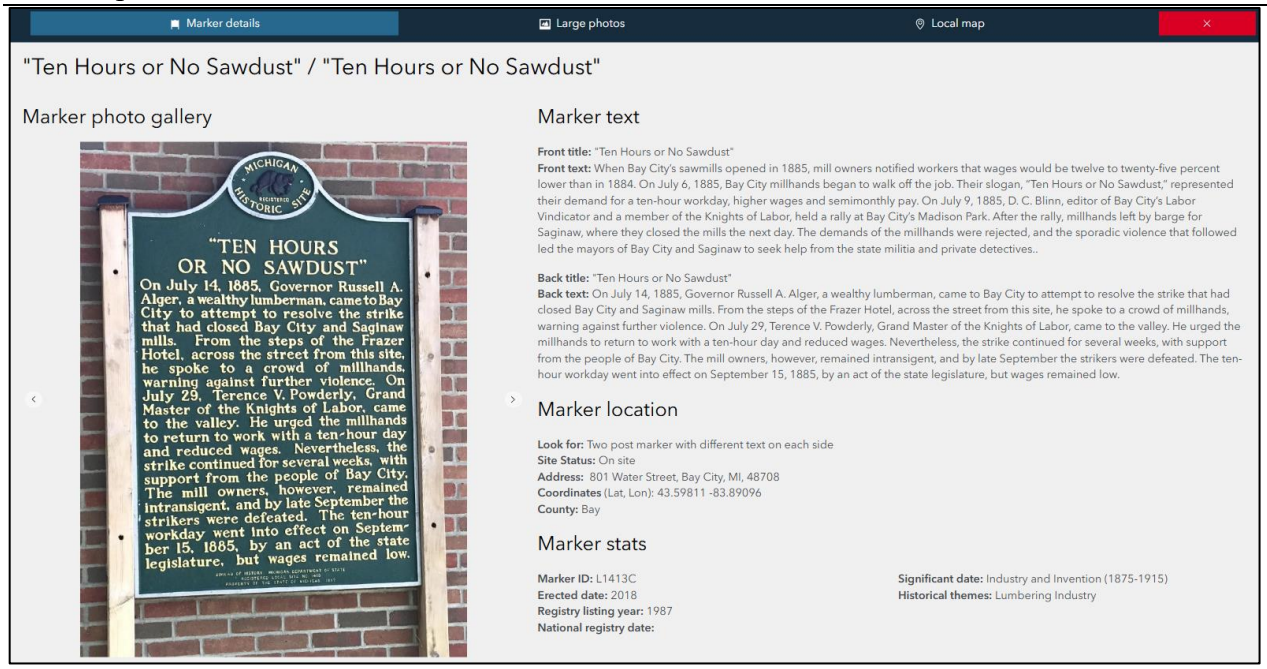


Figure 36. Michigan Historical Markers Interactive Map - Marker Information (Michigan History Center, 2025)

The Vermont Roadside Historic Markers website is an ESRI interactive map site (Figure 37). The page contains one sidebar on the left, which contains tabs where a user can see a list of marker names, filter markers by region, search by location, including a search for markers within a user-set distance of a location, or filter by marker theme.

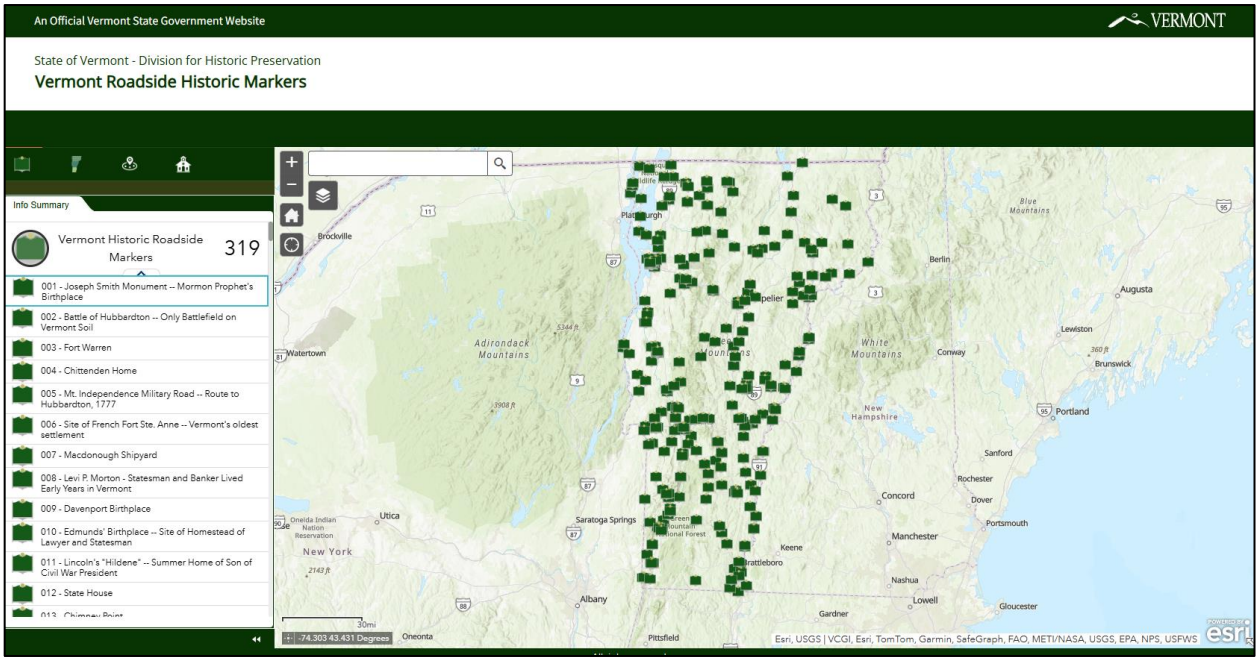


Figure 37. Vermont Roadside Historic Markers (State of Vermont - Division for Historic Preservation, 2025)

When a user clicks on a marker, the following information pops up: name, photo, location description, latitude/longitude coordinates, and full marker text (Figure 38). This map is visually clean, and the reviewers like the different search options in the map sidebar. The pop-up details

for an interpretive marker contain less details than some of the other interactive maps; however, the details provided are likely those that are of interest to most users. Even so, the pop-up for these details is quite small.

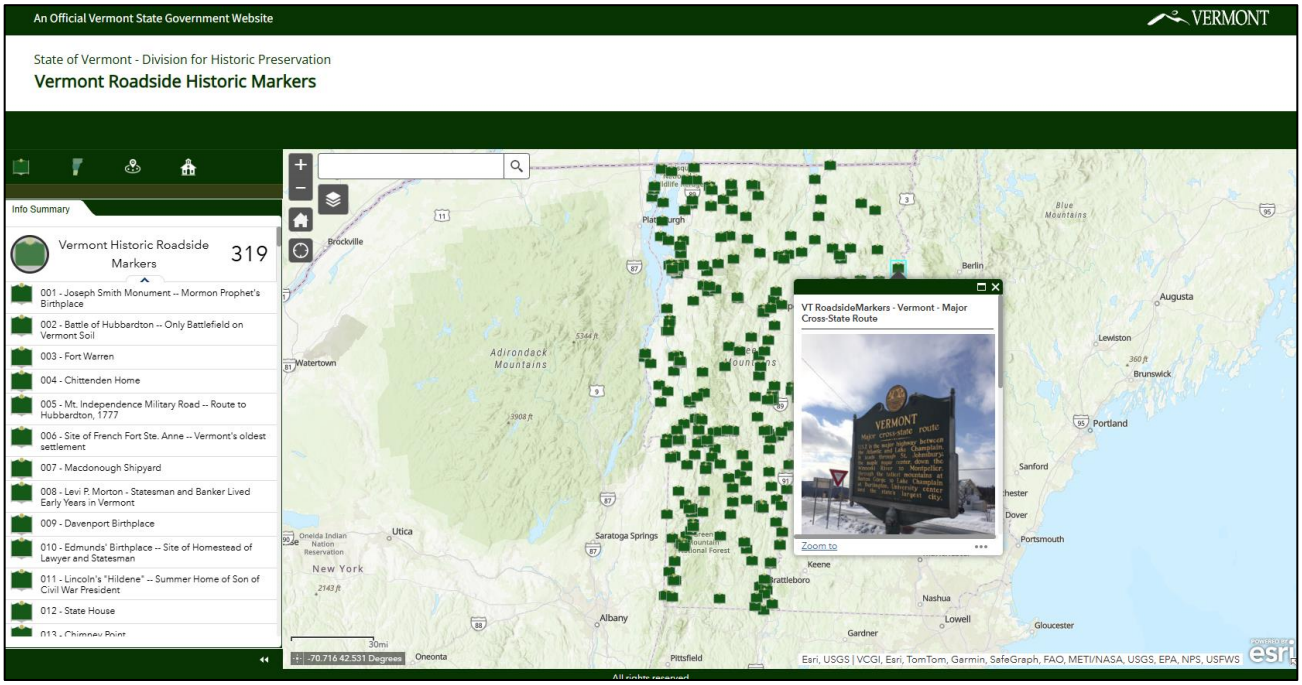


Figure 38. Vermont Roadside Historic Markers - Marker Details (State of Vermont - Division for Historic Preservation, 2025)

Discussions with MDT Stakeholders

MDT's Existing Interactive Maps

Three versions of the MDT online interactive map presently exist: web map, attachment viewer, and dashboard.

Web Map: The web map (Figure 39) is a map displaying interpretive highway markers, whose color indicates the subject or interpretive marker owner (geologic, historical, Indian, Lewis & Clark, and other). While officially labeled "Historical Highway Markers," (i.e., see top left of Figure 39), the interpretive markers are not exclusively "historical" in nature. The interchangeability between the use of the term "interpretive markers" and "historic markers" is subtle but impactful, as it may restrict or result in the inclusion of interpretive markers into the HMdb. The broader topic area of MDT's interpretive markers restricted the comprehensive inclusion of them in MHS's Historic Montana app, which only includes historic markers that are a part of the National Register of Historic Places (see the discussion in the Montana Historical Society section). When you click on a marker, it pops up with the following attributes: Name, Camping Access, Marker Type, Material, Ownership, Road Direction, Sign Condition, Sign Size, Sign Type, Title, and Photos (which opens in another tab).

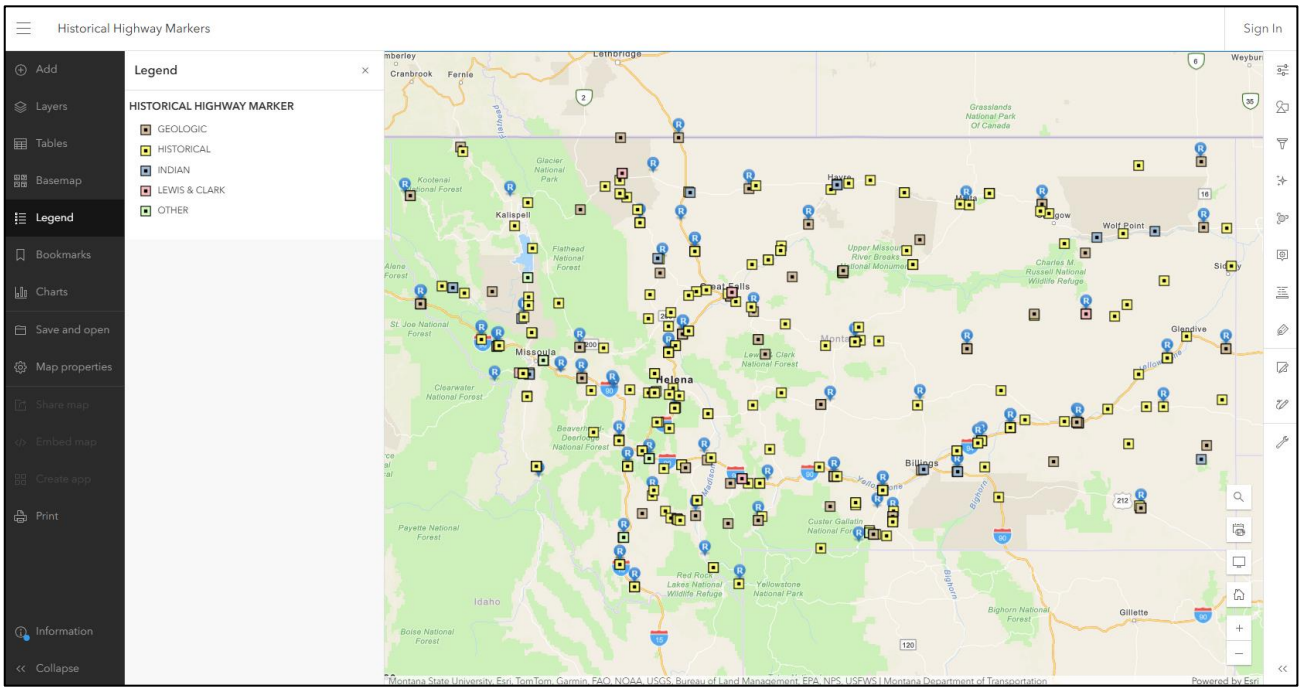


Figure 39. Web Map (Montana Department of Transportation, n.d.)

Attachment Viewer: The attachment viewer is a map of interpretive highway markers (with clustered icons) and a side panel which displays photos of the markers (Figure 40). Again, while specifically named "Historical Highway Marker Attachment Viewer," the markers are not exclusively "historical." When you click on a marker, the side panel updates and shows photos of the marker and the following attributes: Location, Name, Marker Type, Sign Condition, Material, Sign Size, Sign Type, Ownership, Road Direction, and Camping Access.

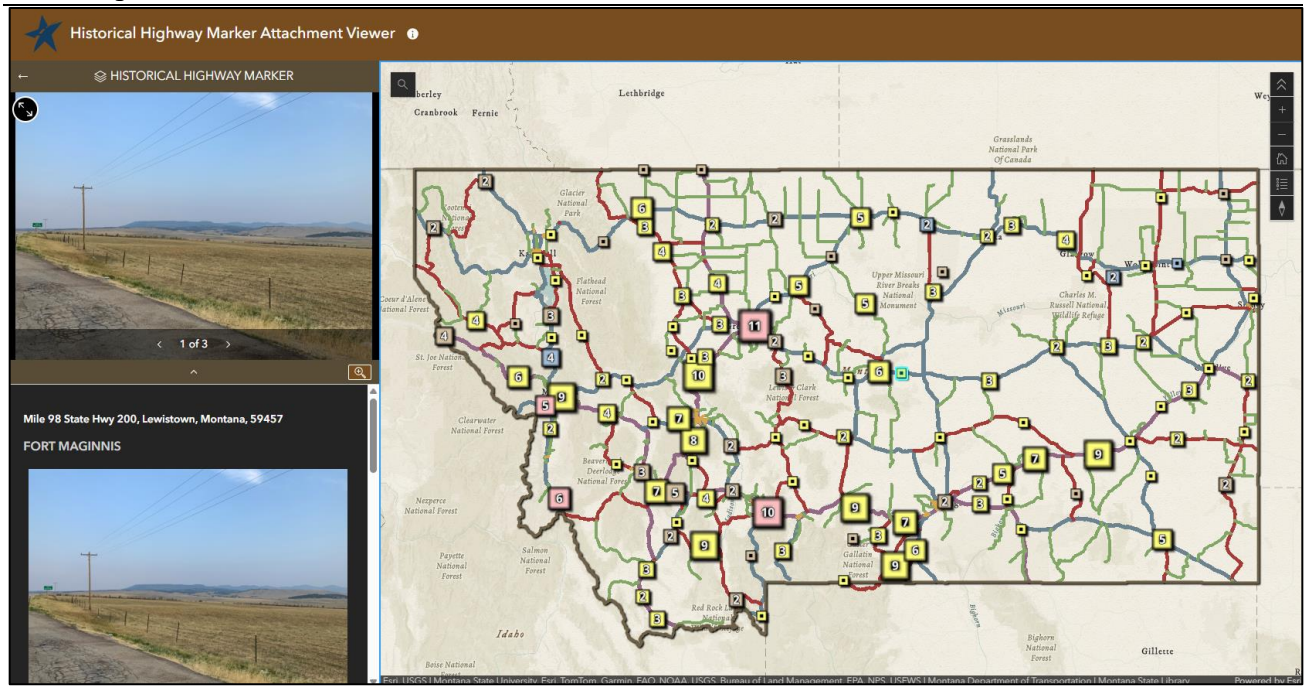


Figure 40. Attachment Viewer (Montana Department of Transportation, n.d.)

Dashboard: The Dashboard (Figure 41) displays the same map as the attachment viewer; however, it adds a side panel where you can filter the markers by type, sign condition, ownership, sign type, and/or material type. With the inclusion of attributes like "sign condition" and "material type," the Dashboard seems to be more maintenance focused. A list of marker titles, a pie chart displaying sign condition, and the last inventory year are displayed at the bottom of the page. On the right, a panel shows information for a specific marker, including Name, Photos, Maker Type, Material, Sign Size, Sign Type, Ownership, Road Direction, and Camping Access.

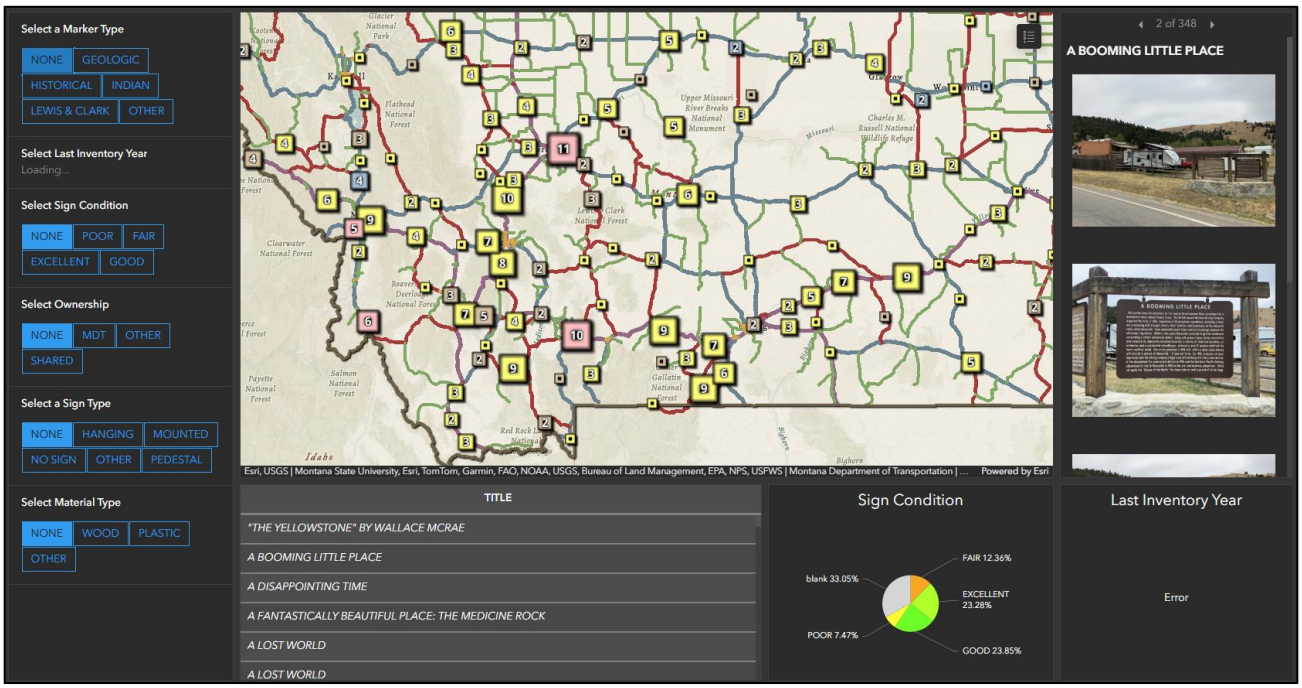


Figure 41. Dashboard (Montana Department of Transportation, n.d.)

MDT Interpretive Marker Dataset Attributes

The MDT Interpretive Marker dataset, which was used to create a web map, attachment viewer, and dashboard contained the following attributes:

- ObjectID
- Title – Marker Title
- Travel_Dir – Travel Direction (EB, NB, SB, WB)
- Camping_Access – Yes, No
- GlobalID
- Marker_Type – Geologic, Historical, Indian, Lewis & Clark, Other
- Sign_Type – Hanging, Mounted, No Sign, Other, Pedestal
- Ownership – MDT, Other, Shared
- Status – Sign Condition (Excellent, Fair, Good, Poor)
- Material – Other, Plastic, Wood
- CreationDate
- Creator
- EditDate
- Editor
- Last_Inv_Year – Last Inventory Year
- Sign_Size – Large, Small
- Latitude
- Longitude

MDT Feedback on Maps & Data

Discussions were held with MDT employees to better understand how the existing data and maps are being used as well as data features and map capabilities that may be desired. Discussions with the following four MDT employees were held between June 9, 2025, and June 16, 2025, as part of this research effort:

1) Jon Swartz, MDT Maintenance Administrator
2) Jon Axline, MDT Historian
3) Brian Anderson, MDT Geospatial Information Supervisor
4) Charity Burns, MDT Public Information Officer

The following questions were asked during these discussions.

1) Who are you aware of that is currently using MDT's interpretive marker data?
    a. Dashboard (maintenance-focused)
    b. Attachment viewer
    c. Webmap
    d. Database/spreadsheet data
2) How are they using MDT's interpretive marker data?
    a. Dashboard (maintenance-focused)
    b. Attachment viewer
    c. Webmap
    d. Database/spreadsheet data
3) Are there other ways in which they would like to use the data, but missing features prevent them from doing so?
    a. Dashboard (maintenance-focused)
    b. Attachment viewer
    c. Webmap
    d. Database/spreadsheet data
4) Are there any additional features on a map that you would like to see?
5) The current MDT maps (dashboard, attachment viewer, webmap) do not have a marker search feature – do you think this would be useful? If so, how would you want to search the markers (by location, by marker subject, etc.)?
6) What are your goals for MDT's interpretive marker data?
7) Are there improvements that you would like to see to current features?
    a. Dashboard (maintenance-focused)
    b. Attachment viewer
    c. Webmap
8) In your opinion, what information should be kept internal to MDT?
9) In your opinion, what information should be shared with the public?
10) In your opinion, do you think it would be useful to obtain feedback about damaged or missing signs from the public?

11) In your opinion, would you like to allow the public to propose new interpretive markers?
    a. If so, what criteria do you think is needed for submission?
12) Is there any other information that would be useful to obtain from the public related to interpretive markers?
13) What recommendations do you have regarding **maintaining** the interpretive marker data? (How can MDT be more proactive in inventorying/keeping the interpretive marker data current?)
14) Based on what has been shared regarding apps to date, what is your opinion regarding developing an app or integrating the data into an app?

Jon Swartz, MDT Maintenance Administrator

Jon Swartz is the Maintenance Administrator for MDT. Through our discussion with Mr. Swartz, he stated that he has previously used the web map version of the MDT interpretive marker data, particularly when he needs to look up a specific sign after the maintenance division receives a report of a damaged interpretive marker sign or a query about an interpretive marker sign. Mr. Swartz mentioned that he has also utilized the web map when working with Jon Axline. Beyond the web map, Mr. Swartz noted that he is likely to use MDT's asset management system, which has a sign inventory allowing staff to look at specific sign information and location; however, it was noted that he was unsure if all of the MDT interpretive markers were in that system.

When a typical roadway sign needs to be replaced, the maintenance department works with an in-house sign shop. This is the process for the wooden interpretive markers, which hang from two posts, but the interpretive markers that have a pedestal design are purchased through an outside company (Figure 42).

Wooden Design **Pedestal Design**

Figure 42. Wooden and Pedestal Interpretive Marker Design

When Mr. Swartz needs to search for information on an interpretive marker sign, it would be most useful to be able to search by asset identifier, corridor route, and/or milepost. It was noted that it would be particularly helpful for all information related to the interpretive markers to be integrated within one MDT standalone database.

Mr. Swartz noted that while there is no concern regarding sharing the data with the public, the public is not interested in some of the data elements related to sign maintenance (e.g., sign condition, inventory year, sign material).

He shared that MDT has a form where the public can share comments or report a problem with a sign on the website (https://www.mdt.mt.gov/contact/comment-form.aspx), and that sharing the link to this form would be beneficial to have on the interpretive marker map. The form asks for contact information and a description of the problem, including the location (Figure 43).

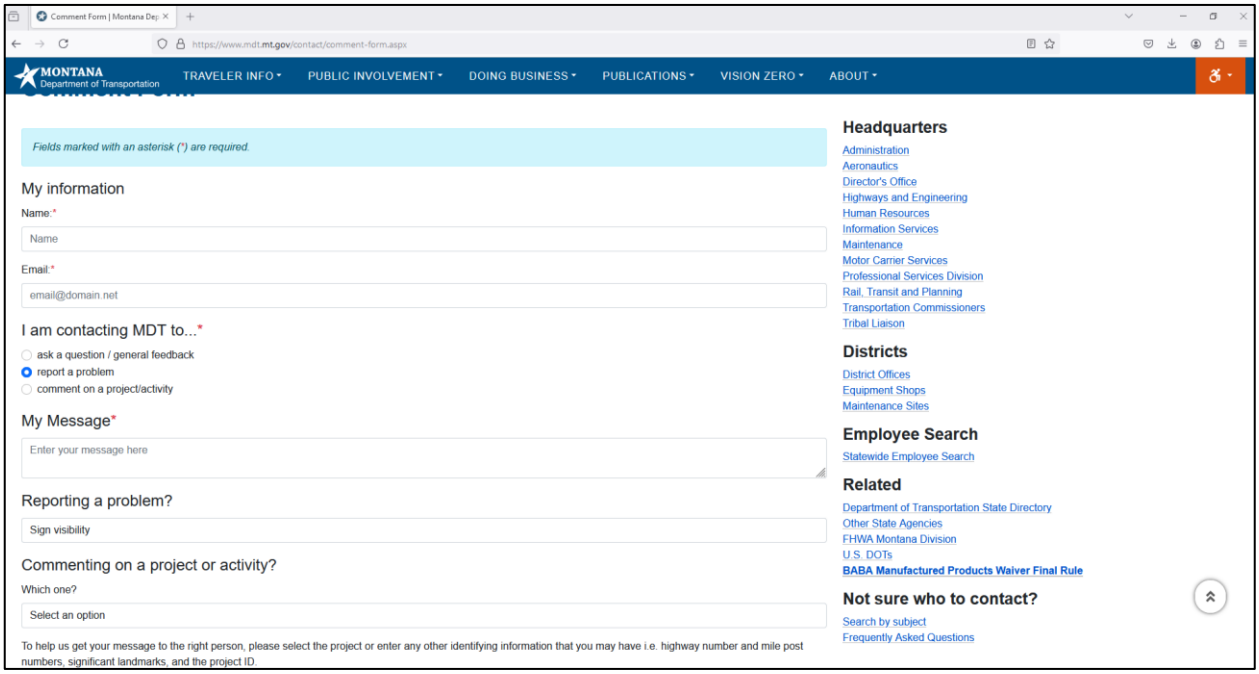


Figure 43. Existing "Report a Problem" Interface

As one of the specific questions asked during these discussions was whether feedback about damaged or missing signs should be queried (i.e., In your opinion, do you think it would be useful to obtain feedback about damaged or missing signs from the public?), it seems like there is already a potential solution. However, to get to the page where a damaged or missing sign can be reported is a bit cumbersome with the current interface (e.g., you must know to "report a problem" and you have to choose "Sign visibility").

MDT conducts annual sign inventories, which include a visual inspection and a nighttime inspection, although it does not include the interpretive marker signs. Staff fill out a form when conducting inventory efforts. To date, inventorying for the interpretive marker signs has been described as an ad hoc effort. One solution presented was for MDT to utilize an existing road asset LiDAR (light detection and ranging); however, Mr. Swartz expressed concerns with this tool being able to capture interpretive marker signs which are: 1) located further from the roadway, and 2) include signs with the pedestal design (the tool would not be able to capture a good image of the sign and its condition due to the angle of the sign).

Mr. Swartz recommended additional data gathering related to the public's desire for a mobile app that shares the MDT interpretive markers. He suggested that one possible avenue could be to add a layer for the interpretive markers into the existing MDT 511 app (https://apps.apple.com/us/app/mdt-511-travel-info/id1513685405); however, the information might be too busy for the intent of the MDT 511 app.

Jon Axline, MDT Historian

Jon Axline is MDT's Historian and the lead staff person managing the MDT interpretive highway markers program. During the discussion, Mr. Axline highlighted the origins of the interpretive markers. Written by Robert Fletcher back in the 1930s, the interpretive markers were intended to give motorists a "Hollywood view" of Montana. When an interpretive marker sign needs to be replaced, Mr. Axline is the person responsible for examining the marker text to see if updates are needed. Furthermore, he works with external agencies interested in putting up interpretive marker signs on MDT roadsides (including reviewing marker text and determining appropriate existing roadway pullout locations), and he reviews feedback for new markers. Any new signs for consideration must be shared with the MDT Sign Committee. He highlighted an important goal of MDT's interpretive markers – to get motorists out of their vehicles to rest for a while at rest stops for safety reasons. He asked a motorist who was looking at a sign recently for permission to take her photo, as he often hears suggestions that people do not engage with interpretive markers.

Mr. Axline mentioned that he does not use any of the MDT interpretive marker maps. However, he saw value in ensuring that more people are aware of their existence and that they have access to them if they want. He reported that with more than 35 years on the job, he is familiar with the program and the locations of all the markers. Before the coronavirus, he reported using the web map to examine the condition of the signs. For interpretive marker maintenance, Mr. Axline relies on feedback from MDT maintenance personnel as they are the boots on the ground staff that frequently see the signs. There have also been reports from the public about damaged or missing signs, although they were not necessarily identified through the interface identified by Mr. Swartz.

When presented with the three versions of the online interactive maps that Mr. Brian Anderson and his staff had developed during the discussion (Web Map (Figure 39), Attachment Viewer (Figure 40), and Dashboard (Figure 41)), Mr. Axline reported a preference for the Attachment Viewer. One feature that he liked was the sidebar, which displays photos of the interpretive markers. He noted that the public is likely not interested in information that is collected for sign maintenance/inventory (e.g., sign condition, sign material, sign size), like what was shared by Mr. Swartz. He agreed with adding the full text information for each interpretive marker into the interface. Currently, one can read that information, but only by viewing the photo of the markers (and it may not be very clear for the pedestal markers). In addition, like Mr. Swartz, Mr. Axline sees value in including information about the route and milepost. Mr. Axline also noted that he would like to share links within an online map to websites external to MDT, allowing additional information on the topics featured in the interpretive markers.

Finally, Mr. Axline would like to see the symbology on the map updated from different colors to different symbols to differentiate historical markers from geological markers, noting that there is a circle and hammer symbol used on the geological marker signs (Figure 44 and Figure 45).

Figure 44. Circle and Hammer Symbol

Figure 45. Example MDT Geological Marker with Hammer and Circle Symbol (Emphasized with Red Arrow)

Mr. Axline saw value in offering a search function for the interpretive marker map, which would allow users to see all markers associated with keywords (e.g., Lewis & Clark). A discussion ensued regarding the popularity of tourism in Montana related to dinosaur sites, which could also be a topic of interest. When asked his opinion regarding developing an app or integrating all of MDT's interpretive data into an app, Mr. Axline expressed interest in seeing how MDT could partner with the ExploreHere app developers to ensure that all of MDT's interpretive marker information could be disseminated through this interface.

Brian Anderson, MDT Geospatial Information Supervisor

Brian Anderson works as MDT's Geospatial Information Supervisor in the Data and Analysis Bureau. His office manages MDT's geospatial data and created the three online interactive maps (Web Map, Attachment Viewer, Dashboard) used over the years to show Mr. Axline different options available for displaying the data; only one option was intended to be retained. The Word document that Mr. Axline had created was turned into a database, which was then used to develop

the three versions. These options have become outdated, as Mr. Anderson reported an expectation that MDT was moving to ESRI's Experience Builder.

Mr. Anderson suggested that the relevant data could be generated if they did not already have each interpretive marker's route and mile marker. Furthermore, adding an option for public feedback to enable reporting of damaged markers or suggesting a new one was reported as possible. One potential opportunity is to update the public-facing web map using ESRI's Experience Builder to create a page similar to the website created for the Central Montana Transportation Study (https://experience.arcgis.com/experience/25335050e98b4295bed1b9a2f27564bc). This would include creating a tutorial video that guides users on how to utilize the Web Map and/or a static Help Guide document (http://www.mdt.mt.gov/other/webdata/External/Planning/MDT_AGOL/DATA/ROADLOG/MDT%20ALTIS%20Road%20Log%20Help%20Guide.pdf). This discussion was generated because of a review of the Attachment Viewer, where the research team identified Mr. Axline's preference for a search bar. Mr. Anderson reported that one was already available. Figure 46 demonstrates the steps that the user must take to query interpretive markers related to "dinosaur." Notice that one must click on "Historical Highway Maker" as the dataset. Furthermore, while other interpretive markers that relate to "dinosaurs" are known to exist, the search query only brings up the one marker, suggesting that there is a need to associate search terms with interpretive markers, although this could potentially be solved if the marker text were integrated into the object.

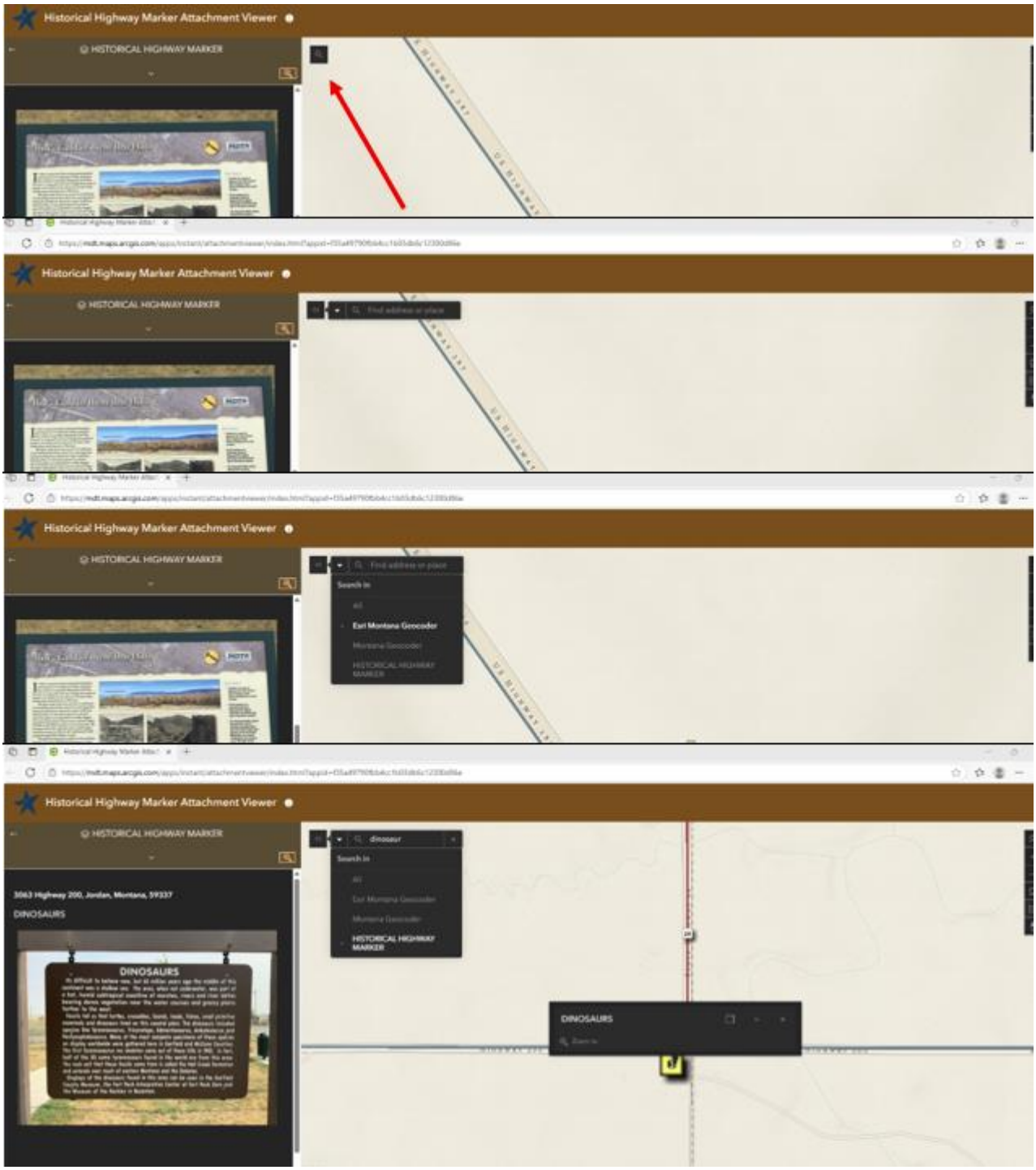


Figure 46. Steps for Using the Search Feature in the Attachment Viewer

During the discussion with Mr. Anderson, the researchers inquired whether full interpretive marker text was available in the data attributes (see MDT Interpretive Marker Dataset Attributes). Mr. Anderson believes that they have all the text and was unsure why it was not represented in the list of attributes.

The researchers next discussed with Mr. Anderson the possibility of leveraging an intern to support some recommended updates. Mr. Anderson suggested that the paperwork required to hire an intern is cumbersome. He suggested instead that a term appointment (typically 90 days) may be more appropriate.

An important question that Mr. Anderson asked is, "Who's the customer?" Mr. Anderson's biggest recommendation is that MDT should bring together all stakeholders for interpretive marker data and develop a data management strategy. His team conducted a quick assessment to see which interpretive marker signs could potentially be captured using MDT's LiDAR system (which can collect data up to 40 feet off the road). The cursory review concluded that many interpretive marker signs are located in pullouts or at rest areas, which would not be covered. Mr. Anderson suggested that perhaps a 5-year review of the status of the signs may be appropriate. The data would identify the installation date and the condition of the sign (e.g., good, bad). The data management plan should define who within MDT will take ownership of the data and define the life cycle (i.e., who will maintain the data and how often the data will be updated).

Mr. Anderson supported the idea of sharing MDT's data with other entities (e.g., ExploreHere, HMdb), suggesting that there is a high return on investment.

Charity Burns, MDT Public Information Officer

Charity Burns has a unique viewpoint regarding the interpretive markers. Unlike Mr. Axline, she is not the owner of the data, but she was present when interpretive markers focused on the geologic history of Montana were added. This led her to share the Geologic Road Signs web page (Figure 47) (https://mdt.mt.gov/travinfo/geomarkers.aspx#18) with the researchers.

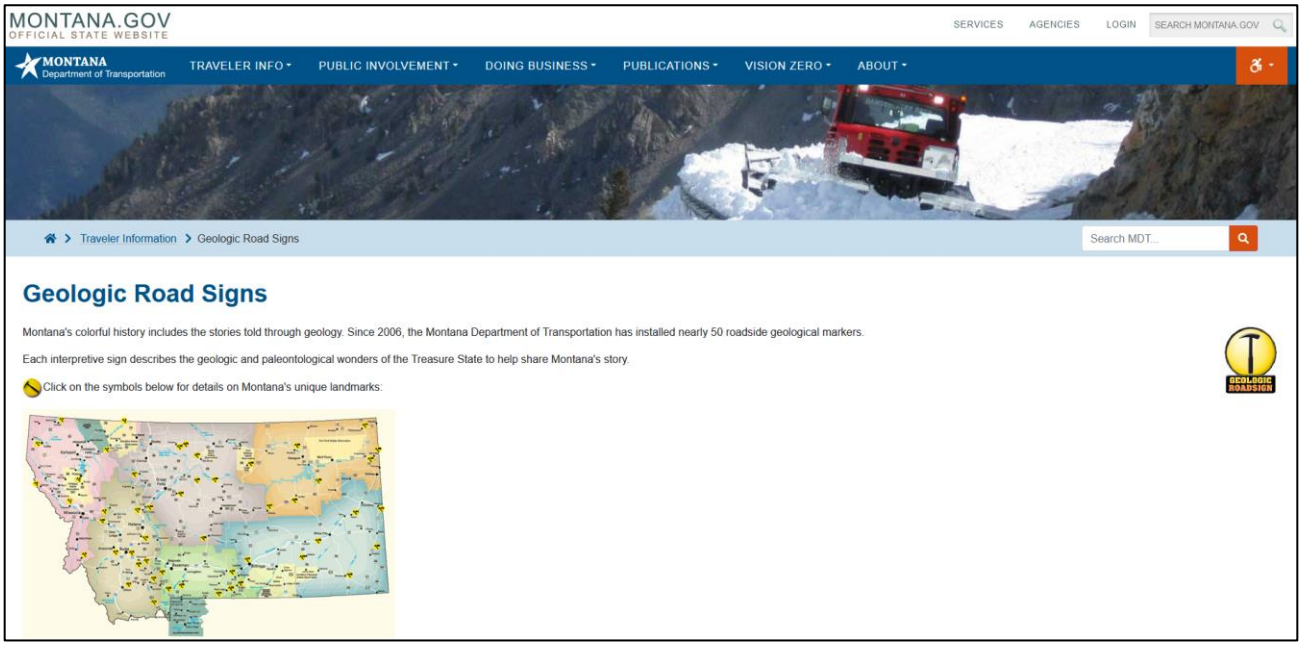


Figure 47. MDT's Geologic Road Signs Web Page

Ms. Burns highlighted that during the rollout of the geological marker signs, MDT had engaged with local schools. While the Web Map was reportedly accessible to the public, she indicated that she could not find the map. She had tried to locate it within MDT's Interactive Map Gallery (Figure 48) (https://www.mdt.mt.gov/publications/map-gallery.aspx).

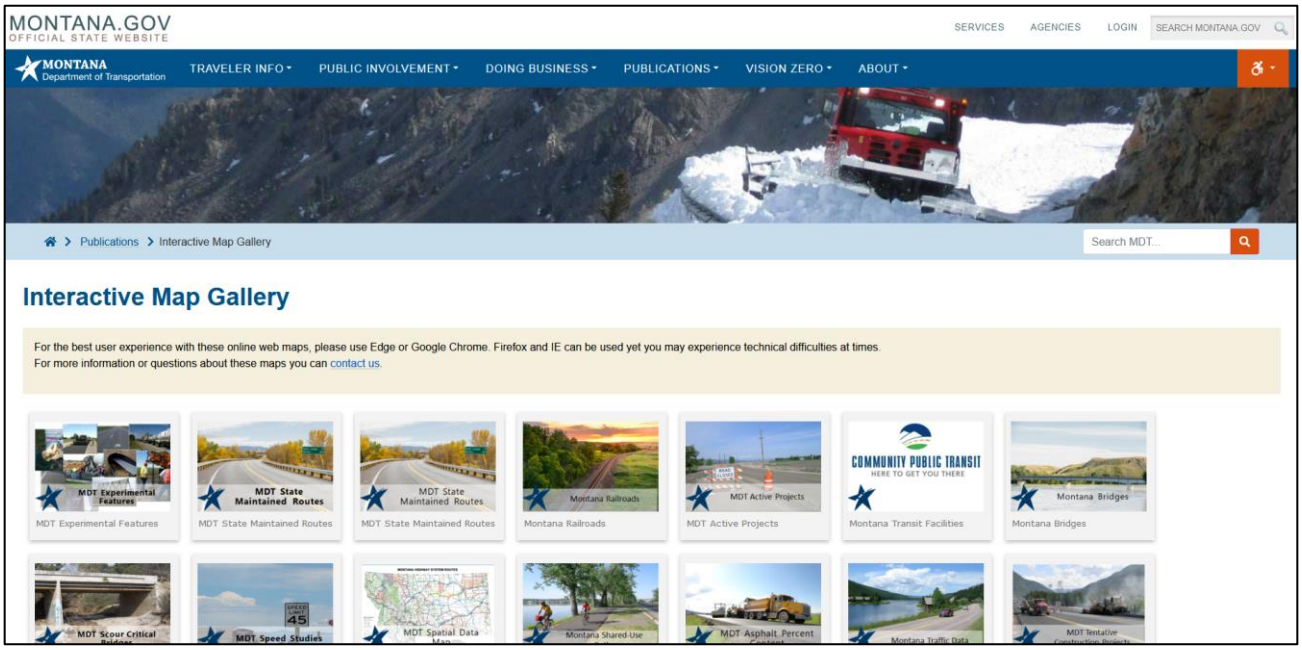


Figure 48. MDT's Interactive Map Gallery

Ms. Burns noted that one of her first questions would be to determine the number of people who accessed the Interactive Map Gallery or Geologic Road Signs web pages annually, over the course of several years. She noted that they had not recently promoted these signs. The researchers were made aware of a paper brochure that was previously available for the interpretive marker program.

Ms. Burns also noted that because of their different missions, MDT and the Montana Department of Commerce had challenges with partnering previously. The Montana Department of Commerce's mission is as follows:

"The Department of Commerce effectively and efficiently delivers programs and resources through technical assistance, funding/investments, training/consulting, promotion, research, reporting and outreach to provide affordable housing and create sustainable business and economic growth to enhance community vitality to benefit the citizens of Montana" (Montana Department of Commerce, n.d.).

MDT's mission is as follows: "MDT's mission is to plan, build, operate, and maintain a safe and resilient transportation system to move Montana forward" (Montana Department of Transportation, 2025).

Ms. Burns recommended that MDT consider pushing the interpretive marker information and interactive map to the Montana tourism regions, as these entities will promote tourism opportunities within their region, including developing road trip guides. Montana has six tourism regions, which MDT could work with to provide interpretive marker information (Central

Montana, Glacier Country, Missouri River Country, Southeast Montana, Southwest Montana, and Yellowstone Country) (Montana Department of Commerce, n.d.).

Ms. Burns reported that MDT has a good social media following, and there is an opportunity to promote the markers and any updated online interactive map via this avenue. Ms. Burns suggested that since the interpretive markers have photos associated with them, it is easier to disseminate the information via MDT's social media accounts. She mentioned that disseminating the information based on a theme, like MDT interpretive markers across I-90, would be desirable.

Ms. Burns emphasized the value of interpretive markers being existing infrastructure. She also lamented, through weather and potentially vandalism, that maintenance of the interpretive markers is likely needed. Another point that she emphasized is that with limited time in one day, while there are many "cool" things that one can do to promote the interpretive marker program, there must be priorities. She recommended that MDT take the time to internally examine what they are trying to achieve with promoting the program: what does MDT want out of the program, and what level of effort does MDT want to commit?

Ms. Burns viewed the interpretive markers as helping MDT to fulfill two of their core purposes – public service and safety. The interpretive marker program makes lives better for those who are interested in such information and encourages motorists to pull over and take a break for a while at a rest area. While at a rest area, travelers can linger while reading a sign, encouraging drivers to stretch and rest for a while. While MDT's Comprehensive Highway Safety Plan is currently under development, one identified Emphasis Area is "Roadway Departure & Intersection Crashes" (Montana Department of Transportation (MDT), n.d.). A potential cause of roadway departures is drowsy driving. Therefore, encouraging motorists to stop for a period of time at a rest stop could potentially be good for safety.

When asked about a mobile app to promote the MDT interpretive marker program, Ms. Burns noted that an app would be nice, but that MDT would need to better understand how many people would use it and what the value is, as an app is a lot of work to maintain. She stated that providing interpretive marker information to websites like the HMdb could be a good option, which would allow existing apps to obtain the MDT interpretive marker information. She also highlighted MDT's existing 511 app and questioned whether the interpretive markers could be added as a layer that users could toggle on and off. As the most-visited page out of all of Montana's state agencies, the reach is significant.

The likelihood of MDT procuring something is non-existent. However, if private entities need data or information, it is possible. MDT's legal entities would have to be involved in the discussions regarding marketing any partnerships, although other examples exist.

Conclusions, Recommendations, & Future Research

This section summarizes the conclusions, recommendations for implementation, and recommendations for future research.

Conclusions

Overall, limited peer-reviewed literature was available on the topic of disseminating interpretive markers. However, there were grey literature pieces and more informal sources, like periodical articles and blogs. This could, in part, reflect how rapid technological change is. In contrast, while not the focus of this research effort, there existed more peer-reviewed articles when considering the content of interpretive markers.

A good geographic diversity of survey respondents was queried. Useful information was provided by respondents, including several examples of apps that were developed (whether internally or contracted out) as well as knowledge about other innovative mobile apps. One survey respondent expressed interest in the results of the study, implying a broader relevance of this work to peers.

Dissemination methods identified by survey respondents and through the literature review included printed materials, static and interactive webpages, and mobile apps, each of which can offer a variety of features (Table 5). As technology changes and becomes more accessible, so do the opportunities for engaging the public in interpretive marker programs. New opportunities like QR codes or BLE also provide the ability to share additional information beyond what is displayed on the interpretive marker. However, cautions, like those made by the FTC regarding QR codes, must be carefully considered.

Table 5. Features of Various Interpretive Marker Dissemination Methods.

	Dissemination Method		
Features	Printed Materials (e.g., guidebooks, brochures)	Web Pages (e.g., online database)	Mobile App
Easily Updated		X	X
Keyword or Other Search Options		X	X
Needs Regular Maintenance	X	X	X
Accessible by People with a Visual Disability	X	X	X
Audio Options		X	X
Can Be Made Available Offline	X		X
Can Automatically List Nearby Markers		X	X
Hands Free Capabilities			X
Requires Marketing	X	X	X

A striking aspect of the survey responses is what is *not* collected with mobile apps. None of the survey respondents reported collecting demographic information of mobile app users. While

demographic information can be a controversial topic to some, no survey respondents indicated that they collected data on the most utilized features of developed apps, which is a somewhat benign data piece. Collecting data on demographics can aid an agency in understanding who is absorbing the content provided within a mobile app and who may need to be engaged in another manner or encouraged to participate via other incentives. Similarly, collecting data on used features can help to identify what features may need to be reconsidered or modified as the app is updated and maintained over time, a need for any developed apps.

Due to the rural nature of Montana, offline format options may be desirable, particularly for areas with spottier cellular or internet connections. In addition, users may have different experiences regarding accessibility based on which mobile carrier they have. Mobile apps can be usable offline. The typical workaround is that the app data must be downloaded prior to use. Other opportunities, like BLE, should also be considered.

Through a review of the literature and input from the surveys, the need to identify how dissemination methods can enable a broader reach of the content was highlighted. This would make the content more substantive and also include people with disabilities (e.g., braille or audio options).

While early purposes of the interpretive markers seem to be that vehicles traveling less than twenty-five miles per hour could read the short bits of information displayed, the desire was quickly abandoned as the speeds at which vehicles could travel rapidly increased. Today, there is no intention that these signs should be read by moving vehicles, as clearly stated in the response by the South Dakota DOT. Instead, there is a desire to look for alternatives, whether it is with a pull-out (which can be costly), or via content delivered by an app. Ensuring the safety of the motoring public is a priority.

With the introduction of any new technology or dissemination methods, an agency should be prepared to market such opportunities to the public or face a lack of users or awareness of such efforts. This sentiment was highlighted in both the literature review and the survey responses. Methods used to market interpretive marker programs and apps included marketing on agency websites and social media, and at the interpretive site. Others utilized printed materials like brochures; Nebraska noted that they share brochures with local hotels and travel/tourism professionals statewide to market their resources. If an app were made available for MDT, it would need to be marketed to potential users before being on-site in potentially spotty/no cellular service areas of rural Montana so that they can download the app and app content. Potential marketing could occur on Montana tourism websites, at Montana airports, and at MDT rest areas, which have wi-fi access available for travelers.

Twenty-three apps were reviewed with the following information collected for each app: app name, link, organization, developer, geographic area, Montana data, price, source, app description, map, ability to locate nearby markers, marker description information provided, photos, video, audio, accessibility features, interactive features, offline capabilities, ability to send info/ideas for new markers, AR, and other innovative features. Almost all of the reviewed apps made use of some type of map. If data could be downloaded for offline use, it was always an optional feature in an app. Three reviewed apps had Montana data: Montana Historical Markers, ExploreHere, and Historic Montana. A review of the apps suggested that if AR is used, it should be in a manner that reinforces the relevance of the content.

Additional follow-up discussions were held with an NPS contact involved with the NPS app and the contractor who provides continued technical support for the app; the MHS regarding their

Historic Montana app; ExploreHere app developers; and the Montana Department of Commerce's Office of Tourism. There were several notable findings from the discussions. While discussing the development of any app, it is important to concurrently discuss how that app will be maintained over time. About half of the budget should be allocated to the development of an app and half to its maintenance. The timeframe for technological changes is short. An app, including if offline features are available, needs to be marketed to be successfully used. Partnering with the MHS to disseminate MDT's interpretive markers via their existing app (Historic Montana) is not possible, as their focus is to include only sites that are on the National Register of Historic Places. As the Montana Department of Commerce's Office of Tourism was in the middle of relaunching its brand, discussions should continue to determine if there are opportunities to partner.

Data consistency came across as a theme in the review. Determining which of MDT's interpretive markers are in the HMdb and which are not is a need. The researchers reviewed and compared HMdb to Montana's existing interpretive markers. Approximately 272 of the 347 markers within MDT's web map are represented in the HMdb.

The ExploreHere app developers hinted at challenges of app development in considering broader stories as being limited by the availability or sharing of data. Currently, HMdb is leveraged by many apps because of the quality and quantity of the available data, which leverages contributions from trusted volunteers.

Twenty-three online interactive maps were reviewed for the following information: organization, state/region, link, platform used, map description, disclaimer, photos, search features, marker tours, and the ability to send information/ideas for new markers. Most of the online interactive maps that were reviewed use the same platform that MDT uses: the ESRI platform. Other mapping platforms utilized included Leaflet and Google My Maps.

While the interpretive marker information shared varies from map to map, the most common details included the marker name, location description (address), location (latitude/longitude coordinates), tags related to the marker subject/time period, and photos. Over half of the maps reviewed shared the full text of the interpretive marker, which can be helpful for accessibility, as it does not require a user to read the marker text from a photo. Furthermore, it allows tools like screen readers to utilize this information.

Most of the online interactive maps allow a user to search their markers via an open text box or by filtering by location or keyword. However, some had long lists of keywords, which can be cumbersome both for users and for those maintaining the data. Several of the maps reviewed provided an opportunity for users to provide feedback – this was often the ability to report a damaged or missing marker, to submit general inquiries about the program, or propose a new marker. Options for providing feedback included providing contact information for the program, a form, or an application that could be filled out by a user.

Additionally, the researchers conducted one-on-one in-depth discussions with MDT stakeholders to learn more about MDT's current interpretive marker data, how the interactive maps are being used, goals for this data, and desired changes to the data or interactive maps. Through these stakeholder discussions, it was determined that no one within MDT is using the existing online interactive maps on a frequent basis or potentially even at all. The Maintenance Division and Jon Axline will occasionally utilize the existing web map to look at a specific sign. Furthermore, not all of the maps (Web map, Attachment Viewer, Dashboard) were intended to be used. Rather, the online maps that were created were intended to demonstrate options for how the interpretive marker data could be displayed in an online interactive map. MDT stakeholders provided

recommendations for the online interactive map of the interpretive markers for a public-facing map and an internal MDT map. These are detailed below in Recommendations for MDT.

The MDT stakeholders agree that while a mobile app could be beneficial for the interpretive marker program, there is no time to create one (even if relatively "out-of-the-box" like Curatescape), and they do not envision the long-term maintenance of such an app. Instead, ensuring that all of the existing and any future added interpretive marker data is pushed to HMdb, which allows existing interpretive marker apps like ExploreHere to utilize this data, is preferred. MDT stakeholders also emphasized the need to meet internally to discuss plans for sustaining the interpretive marker program and its data in the future. This discussion should include determining who will be the "owner" of the interpretive marker data, and deducing the data life cycle (e.g., who maintains the data, how often is the marker status inventoried).

Recommendations for MDT

The researchers do not recommend that MDT move forward with developing a mobile app. Instead, the following recommendations suggest opportunities for marketing or additional uses of the data, as well as improvements that can be made to the online interactive map for public and internal use.

Interpretive Marker Program Planning

1) **Planning for MDT Interpretive Marker Data:** Stakeholders of the MDT interpretive marker data should meet internally to determine who owns the data, who will maintain the data, how often the condition of the signs is inventoried, and if the data can be integrated into MDT's Asset Management System.

Marketing

2) **VisitMT:** Continue discussions with the Montana Department of Commerce's Office of Tourism to infuse information from the MDT interpretive markers into their updated VisitMT website and associated campaign.
3) **Montana Tourism Regions:** Share the public-facing online interpretive map with the Montana Tourism Regions. These regions can then integrate the content into their marketing efforts.
4) **Montana Historical Society:** Continue discussions regarding how overlapping content can be shared and marketed to each entity's audiences.
5) **ExploreHere:** Arrange a meeting between MDT interpretive marker data stakeholders and the ExploreHere app developers to identify opportunities where the interpretive marker data may be further disseminated via their app.
6) **Historic Marker Database:** Determine which of MDT's interpretive markers are currently represented within the Historic Marker Database (HMdB). If interpretive markers are presently not listed, or the information is incorrect, seek to correct any erroneous information and propose including any that are not currently incorporated.
7) **MDT's Social Media Manager:** Meet with MDT's Social Media Manager to identify opportunities to promote the interpretive marker program and the public-facing online interactive map.

8) **MDT Interactive Map Gallery:** Work with MDT's IT Department to ensure that the public-facing online interactive map is available within MDT's Interactive Map Gallery.
9) **MDT Rest Areas:** Provide information about the public-facing online interactive map at MDT rest areas.
10) **Tours:** Consider developing tours that could be offered via Clio, izi.Travel or elsewhere based on the MDT interpretive Markers.

Public-Facing Online Interactive Map

11) **Symbology:** Consider updating the symbology on the online interactive maps so that the geologic markers use the same circle and hammer symbol used on the geologic marker signs.
12) **Full Marker Text:** Consider adding the full marker text to the online interactive map to enable accessibility readers to read the content.
13) **Route & Milepost:** Consider adding information on the route and milepost location of the interpretive markers to the map.
14) **Additional Content:** Consider adding the ability to link to sources outside of MDT so that users can learn more about topics covered in the markers.
15) **Search:** Consider adding an open search feature as well as a select number (e.g., 10) of keywords which can support users in searching for interpretive makers of interest (e.g., dinosaurs).
16) **Damaged or Missing Markers:** Consider enabling users to report damaged or missing markers.
17) **Remove Maintenance Information:** For the public-facing online interactive map, consider removing information related to sign condition, sign material, and the like.
18) **MDT 511 Mobile App:** Consider whether it is appropriate to add information about the interpretive markers to the existing MDT 511 mobile app.

Internal Online Interactive Map

19) **Internal Goals:** Conduct an internal meeting with MDT interpretive marker stakeholders to discuss goals for an internal online interactive map or database.
20) **Asset Identifier, Route & Milepost:** Consider adding the asset identifier, route, and milepost information to an internal facing online interactive map. It should also be discussed if integrating the information into MDT's asset management system is preferred in lieu of an internal facing online interactive map.

Future Research

The literature review shared an example from Japan in which an app utilized BLE devices to provide cultural site content to app users in a rural location. BLE could potentially hold an opportunity for Montana, where cellular service can be spotty or non-existent in rural areas. Further research into these devices could be considered.

AR and VR are becoming more and more relevant. Therefore, future research could include identifying how AR and VR could be leveraged to disseminate the content of MDT's interpretive markers.

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Appendix A: Interactive Maps of Interpretive Markers

Table 6 provides links to twenty-six interactive maps of interpretive markers identified throughout the information-gathering process.

Table 6: Interactive Map Links

Organization	State	Interactive Map Link	System Used
Arkansas Historic Preservation Program	AR	https://www.arcgis.com/apps/mapviewer/index.html?layers=29e5fceeed224b95874542e58f9e9cac	ESRI
DC Preservation League	DC	https://historicsites.dcpreservation.org/items/browse/	Leaflet
Florida Historic Marker Council	FL	https://apps.flheritage.com/markers/map/	Google My Map
Georgia Historical Society	GA	https://experience.arcgis.com/experience/9ebd13bc847f4bddb1cb0e65784e74b5/	ESRI
Hawai'i Visitors and Convention Bureau	HI	https://www.hvcb.org/membership/culture/warrior-marker/	Google My Map
State Historical Society of Iowa	IA	https://history.iowa.gov/history/sites/state-historical-markers	Google My Map
Kansas Historical Society	KS	https://www.kshs.org/p/visit/19384	Google My Map
Kentucky Historical Society	KY	https://history.ky.gov/markers	Unknown
Cambridge Historical Commission	MA	https://www.cambridgema.gov/historic/cambridgehistory/historicmarkers/historicalmarkers	ESRI
Maryland Department of Transportation	MD	https://maryland.maps.arcgis.com/apps/dashboards/87318efedd984d989c3c8f3a65897c55	ESRI
Michigan History Center	MI	https://experience.arcgis.com/experience/0810844003f149faa1a3aeaa64d7d42e	ESRI
Montana Department of Transportation Web Apps	MT	• Web map: https://mdt.maps.arcgis.com/apps/mapviewer/index.html?webmap=0aca9ba4568244f1b5dc4367733d27ef • App: https://mdt.maps.arcgis.com/apps/instant/attachmentviewer/index.html?appid=f35a49790fbb4cc1b03db6c12300d86e • Dashboard: https://mdt.maps.arcgis.com/apps/dashboards/8923bb62cfe742b3abb668aa537c11a4	ESRI
Montana Historical Society	MT	https://historicmt.org/	Leaflet

Organization	State	Interactive Map Link	System Used
Nebraska State Historical Society	NE	https://mynehistory.com/	Leaflet
New Hampshire Division of Historical Resources	NH	https://nhdhr.maps.arcgis.com/apps/instant/nearby/index.html?appid=188fc0b4a6324a0e85c8cccb9369c296	ESRI
Ohio History Connection	OH	https://remarkableohio.org/	Google My Map
Oregon Travel Information Council	OR	https://oregontic.com/oregon-historical-markers/historical-marker-map/	MapPress
Pennsylvania State Historic Preservation Office	PA	https://share.phmc.pa.gov/markers/	ESRI
South Carolina Department of Archives and History	SC	https://www.google.com/maps/d/viewer?mid=183GWEBsTK2WvT9yXRwGgh8Nv1TXzbwQe&ll=33.931906625071925%2C-81.04654300130207&z=8	ESRI
Texas Historical Commission	TX	https://atlas.thc.texas.gov/Map	ESRI
Utah Historic Society	UT	https://utahshpo.maps.arcgis.com/apps/webappviewer/index.html?id=33c405cff5294c8a979ace4d26ee55a2	ESRI
Virginia Department of Historic Resources	VA	https://vcris.dhr.virginia.gov/HistoricMarkers/	Unknown
Vermont Roadside Historic Site Markers	VT	https://accd.vermont.gov/historic-preservation/roadside-markers	ESRI
Washington State Historical Society	WA	https://www.washingtonhistory.org/across-washington/monuments-project/	Google My Map
Wyoming State Parks	WY	https://wysphst.maps.arcgis.com/apps/webappviewer/index.html?id=70c906c090a0466da9781e2a88ac72b6	ESRI
Polk County	WI	https://tinyurl.com/PolkMaps	Google My Maps
Wisconsin Historical Society	WI	https://wishs.maps.arcgis.com/apps/View/index.html?appid=1ae1961b41f84edd8cf1be9579643953&center=-89.818,44.5&level=8	ESRI
Intermountain Histories	Intermountain Region	https://www.intermountainhistories.org/items/map/	Leaflet

Appendix B: Agency Listing

The following lists the names of the agencies that responded to the survey. In addition, they were categorized as:

- Historic Office – identified if they had government email addresses,
- Historical Society – were not government entities, often non-profits,
- Historic Marker Program – maybe incorporate some of the other categories, but is different because it is clearly defined as a specific program,
- State Park,
- Natural Resources – often department of natural resources,
- State DOT – state departments of transportation,
- Tourism, and
- Local – this superseded any other category (e.g., may be a government office, but it was local instead of at the state level.

1. American Samoa
    a. American Samoa Historic Preservation Office **(historic office)**
2. Alabama
    a. Alabama Historical Association **(*historical society*)**
3. Alaska
    a. Alaska State Parks (Alaksa Division of Parks and Outdoor Recreation) **(state park)**
4. Arizona
    a. Arizona State Parks and Trails **(state park)**
5. Arkansas
    a. Arkansas Historic Preservation Program (SHPO), an agency of the Division of Arkansas Heritage in the Department of Parks, Heritage, and Tourism **(historic office)**
6. Delaware
    a. Delaware State Parks **(state park)**
7. Florida
    a. Florida Division of Historical Resources **(historic office)**
8. Georgia
    a. Georgia Historical Society **(*historical society*)**

9. Illinois
    a. Illinois Department of Natural Resources **(natural resources)**
10. Idaho
    a. Idaho Transportation Department, Division of Highways **(state DOT)**
11. Iowa
    a. State Historical Society of Iowa **(historic office)** (https://history.iowa.gov/about-us/contact-list)
12. Kansas
    a. Kansas State Historical Society **(*historical society*)**
13. Kentucky
    a. The Kentucky Historical Society **(historic office)** (https://www.kshs.org/p/who-we-are/18653)
14. Louisiana
    a. Louisiana Office of Tourism **(tourism)**
15. Maine
    a. Maine Department of Agriculture, Conservation and Forestry **(natural resources)**
16. Maryland
    a. Maryland Department of Transportation (MDOT) **(state DOT)**
17. Massachusetts
    a. City of Cambridge, Cambridge Historical Commission **(local)**
18. Michigan
    a. Michigan History Center **(*historic society*)**
    b. Parks and Recreation Division of the Michigan Department of Natural Resources (DNR) **(state park)**
19. Minnesota
    a. Minnesota Historical Society **(historic office)** (https://www.michigan.gov/mhc/about)
    b. Brown County Historical Society; New Ulm, Minnesota **(local)**
20. Mississippi
    a. Mississippi Department of Archives and History **(historic office)**
21. Montana
    a. Montana Historical Society **(historic office)** (https://mhs.mt.gov/about/)

22. Nebraska
    a. Nebraska State Parks **(state park)**
    b. Nebraska Game and Parks Commission **(natural resources)**
23. Nevada
    a. Nevada Division of State Parks **(state park)**
24. New Hampshire
    a. New Hampshire Division of Historical Resources (SHPO) **(historic office)**
25. New Jersey
    a. New Jersey Historical Commission **(historic office)**
26. New Mexico
    a. New Mexico State Parks Division **(state park)**
    b. Historic Preservation Office, New Mexico Department of Cultural Affairs **(historic office)**
27. North Carolina
    a. North Carolina State Parks **(state park)**
    b. North Carolina Highway Historic Marker Program **(historic marker program)**
28. Ohio
    a. Ohio History Connection **(*historical society*)**
29. Oklahoma
    a. Oklahoma Historical Society **(historic office)** (https://www.okhistory.org/about/contact)
30. Oregon
    a. Oregon Travel Information Council **(tourism)**
31. Pennsylvania
    a. Pennsylvania Historical and Museum Commission/Pennsylvania State Historic Preservation Office **(historic office)**
32. South Carolina
    a. South Carolina Department of Archives and History **(historic office)**
33. South Dakota
    a. South Dakota Office of the State Historic Preservation Officer **(historic office)**
    b. South Dakota Department of Transportation **(state DOT)**

34. Tennessee
    a. Tennessee State Parks **(state park)**
    b. Tennessee Historical Commission **(historic office)**
35. Utah
    a. Utah Historical Society **(historic office)** (https://history.utah.gov/)
    b. Utah State Parks **(state park)**
36. Virginia
    a. Virginia Department of Historic Resources **(historic office)**
    b. Virginia Department of Conservation and Recreation – Virginia State Parks **(state park)**
37. Washington
    a. Washington State Parks and Recreation Commission **(state park)**
    b. Washington State Historical Society **(*historical society*)**
38. Wisconsin
    a. Wisconsin Historical Society **(historic office)** (https://www.wisconsinhistory.org/Records/Article/CS15324)
39. Wyoming
    a. Wyoming State Parks and Cultural Resources **(state park)**

Appendix C: Existing Apps

App Name: Agents of Discovery

Org: Agents of Discovery
Developer: Agents of Discovery
Coverage: Nationwide
Montana Data: Yes
Price: Free
Source: Survey Response
Link: https://apps.apple.com/us/app/agents-of-discovery/id986188357

App Description: "Agents of Discovery is an augmented reality app that gets you active and engaged in learning about the world around you. With Agents of Discovery, you become a top-secret Agent, dedicated to solving mysteries about science, culture, technology, history, nature and much more... Download the app and the Mission you want to play BEFORE heading out. Once these have been downloaded, the app does not require any data or Wi-Fi to run." (Apple, Inc., 2024)

Map: Each mission contains a map of the focus location and associated "challenges" (or questions/games) where a user can learn more about that area.

Ability to Locate Nearby Markers: The app provides a list of nearby "missions," which are available in the user's area.

Marker Description Information Provided: The app does not contain markers but instead has locations for "missions," which are games or questions that aim to teach the user about the area.

Photos: Yes – some missions contain presentations which have text, images, and audio.

Videos: Yes – some missions contain presentations which have text, images, and audio.

Audio (e.g., 60 second histories): Yes – some missions contain presentations which have text, images, and audio. Some missions also contain games that involve natural sound effects.

Accessibility Features: Yes – text-to-speech

Interactive Features: The app contains "missions," which are made up of "challenges" (or questions/games) that a user can play to learn about science, culture, technology, and nature.

Offline Capabilities: Yes, users can download missions to play offline.

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Each "mission" in the app has various augmented reality games to help users learn more about the area. Games include things like looking around in the real world for virtual objects, interacting with the real world, etc.

App Name: Blues Trail

Org: Mississippi Blues Commission
Developer: Concept House
Coverage: Local - MS
Montana Data: No
Price: Free
Source: Survey Response
Link: https://msbluestrail.org/app

App Description: "Welcome to the Mississippi Blues Trail.

Your unforgettable journey into the land that spawned the single most important root source of modern popular music. Whether you're a die-hard blues fan or a casual

traveler in search of an interesting trip, you'll find facts you didn't know, places you've never seen, and you'll gain a new appreciation for the area that gave birth to the blues.

* Find Blues Trail Markers via the map.
* Dive into the history of the Blues with the interactive timeline.
* Create your own custom itinerary with turn-by-turn directions.
* Look for your favorite blues artists and learn about places and events that connected them.
* View films.
* Download music from your favorite blues artists straight from iTunes.

Come see us and let the mojo start working' on you.

The Mississippi Blues Trail is an ongoing project of the Mississippi Blues Commission. Funding for this project has been made possible by grants from the National Endowment for the Arts, National Endowment for the Humanities, Mississippi Department of Transportation, the Federal Highway Administration, AT&T, and the Delta Center for Culture and Learning at Delta State University plus additional support from the Mississippi Development Authority Tourism Division." (Apple, Inc., 2023)

Map: Yes, Apple Map, which shows markers for the entire state of Mississippi. Markers are displayed as little blue signs on the map. When you click on one of the markers, the name, photo, and city pop up, which you can click on for more information.

Ability to Locate Nearby Markers: Yes - the app will center on the user's location and display nearby markers. You can also list markers by distance from the user's location.

Marker Description Information Provided: Name, location (address), location (lat/long), text description, photos, and links to related people are included. The links to related people will pop up markers associated with that person. For each marker, users can click to add that marker to an itinerary, which adds that marker to an itinerary tab on the homepage of the app. Users can also "check in" to the marker, which adds that marker to the "Check Ins" tab on the homepage of the app, which allows users to track which markers they have visited. Links to purchase music in the Apple Music store for the various artists are also provided.

Photos: Yes - multiple photos are available

Videos: Yes - the app has a videos tab which has several short videos a user can watch. Video titles include an introduction to the Blues Trail and videos on several blues artists.

Audio (e.g., 60 second histories): Not found

Accessibility Features: Not found

Interactive Features: For each marker, users can click to add that marker to an itinerary, which adds that marker to an itinerary tab on the homepage of the app. Users can also "check in" to the marker, which adds that marker to the "Check Ins" tab on the homepage of the app, which allows users to track which markers they have visited.

Offline Capabilities: Not found

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Not found

App Name: Cabridge Historical Commission – Instagram Page

Org: Cambridge Historical Commission
Developer: Meta
Coverage: Local - MA
Montana Data: No
Price: Free
Source: Literature Review
Link: https://www.instagram.com/cambridgehistoricalcommission/

App Description: "The Cambridge Historical Commission is a department of the City of Cambridge municipal government." (Cambridge Historical Commission, 2025)

Map: Not found

Ability to Locate Nearby Markers: Not found

Marker Description Information Provided: The Cambridge Historical Commission posts photos and short descriptions of historical sites**.**

Photos: Yes

Videos: Yes, however, few videos have been posted, and most are related to events, not the historic sites.

Audio (e.g., 60 second histories): Not found

Accessibility Features: Not found

Interactive Features: Yes - you can like, post, and share items through Instagram.

Offline Capabilities: Not found

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Not found

App Name: City of Stories - Holyoke

Org: Holyoke Public Library Corporation
Developer: Funding from MassHumanities Foundation
Coverage: Local - MA
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/ar/app/city-of-stories-holyoke/id6502908772?l=en-GB

App Description: "The City of Stories project began in 2020 when a Holyoke History Room collaborator designed a short walking tour of sites in the Library neighborhood. A question from a patron prompted us to begin thinking of history not only chronologically, but spatially. How much history is contained in a single place on a map? Can there ever be an authoritative history of any one place, one building, one street or corner? Or will there always be multiple stories, infused with meaning by those whose experiences were tied to that place at different points in time? So, while a traditional walking tour focuses exclusively on historic buildings or centers on a theme such as public art or a famous person's life, these tours focus on sites that have had meaning to people who live or once lived in Holyoke. Many stops are traditional in that they focus on the past. Others include both past and present incarnations of a building or site. While the tours cannot tell the whole story of Holyoke, we hope they will inspire

users to explore its history more deeply and to add their own voices to the telling of its history. We do not expect there ever to be a final version of these tours. City of Stories is a set of bilingual English/Spanish walking tours of Holyoke's history, past and present. They are based on the idea that any location, even an individual street corner, may hold many stories, layered on one another over time. They were created with the help of a MassHumanities Expand Massachusetts Stories Grant." (Apple, Inc., 2024)

Map: Once you download a tour, users can view a map that shows all the sites associated with the tour. Sites are marked with the stop number. When you click on a marker on the map, the name of the site pops up at the bottom of the screen, and you can click on the name for more information about that stop.

Ability to Locate Nearby Markers: Not found

Marker Description Information Provided: Each tour stop includes photos, a description of the historic site, and references for where a user can find more information. Each tour stop also has a map showing the location of that stop where a user can click to get directions. Some tour stops have short videos of interviews.

Photos: Yes

Videos: Yes

Audio (e.g., 60 second histories): Not found

Accessibility Features: Not found

Interactive Features: Not found

Offline Capabilities: Yes; the tours can be downloaded for offline use. The Flats Tour is 110 MB; the South Holyoke Tour is 98 MB.

Ability to Send Information/Ideas for New Markers: Yes; they are open to adding new information. They also have a "Feedback" tab, which allows one to provide comments in either English or Spanish, "Give us our feedback or learn how to get involved (English)."

Augmented Reality Features: Not found

App Name: Clio – Your Guide to History

App Description: "Named after the ancient Greek muse of history, Clio puts history at your fingertips. With your permission, Clio picks up your present location and guides you to landmarks, museums, and historic sites. It also acts as a virtual time machine, allowing a user to see images and videos and hear and read about historic events that happened around them. We are adding new features, including interactive walking/driving tours and push notifications coming soon.

Org: Clio Foundation
Developer: David Trowbridge in 2013
Coverage: Nationwide
Montana Data: Yes
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/clio-your-guide-to-history/id897995724

Because Clio is free, it depends upon people like you who care about history and culture. If you would like to help, please send us an email at clio@theclio.com We are working to provide new

features like push notifications and interactive walking tours thanks to donations and other forms of support. The Clio Foundation is recognized as a public charity under IRS code 501c3 and all donations are tax-deductible.

With several hundred new entries and improvements being added each month, Clio is not only a website and smartphone application, but also a collaborative research, interpretation, and map-building project. Museum professionals, scholars, and their students contribute most of Clio's content. We also depend upon local history experts and museum volunteers who often know more about local history than anyone else. Each day, this partnership of local history experts and professional historians is building a comprehensive, dynamic, and interactive map of American history." (Apple, Inc., 2024)

Map: Yes, an interactive Google map which displays the 15 markers that are located closest to the user. The marker icons are numbered; these numbers match the numbers displayed on the list of nearby markers, which is available in another tab in the app. When you click on a marker, it pops up the name of that marker. A user can click through for more information.

Ability to Locate Nearby Markers: Yes, the lists and maps show the markers/tours that are located nearby the user.

Marker Description Information Provided: Each marker includes a short description, a Google map showing the location of that marker, images, references for the shared information, information on how to cite the information provided by Clio, and links where a user can learn more about the topic. Each marker is tagged with basic categories (e.g., Historic Homes, Native American History). Locational information is provided, including the address, hours of operation, and contact information (if applicable).

Photos: Yes - multiple photos are available

Videos: Not Found

Audio (e.g., 60 second histories): Yes, "Enable Audio Narration." However, you can very clearly tell that it is a digital reading. The app notes that "Clio will automatically play either author-uploaded audio files or read the text of an entry using text-to-speech. This option works well with headphones as you explore an area. You can also connect your mobile device to your car stereo to enjoy a narrated drive."

Accessibility Features: Yes - Text to Speech is available for all the text associated with the marker descriptions.

Interactive Features: There is an associated QR code. This QR code could potentially be used in marketing to allow one to quickly download the associated tour for a location. Users can share the information for each marker via social media (Twitter, Facebook, Pinterest).

Offline Capabilities: Yes - tours can be downloaded for offline use.

Ability to Send Information/Ideas for New Markers: Yes; "Clio gets a little better each day as organizations around the country create and improve entries in their communities. As a non-profit and volunteer project, we depend upon smart and talented people with impressive research and writing skills - people who are knowledgeable and passionate about our history and willing to share their knowledge with others. If this describes you, please create an account (always free) and add and/or improve entries about historical sites and museums. This guide shows how to create a Clio entry: https:/theclio.com/howToCreateEntry

Our small team of volunteer editors donates an hour or two per week to review new entries and suggested improvements, but most of the content in Clio comes from universities, historical societies, libraries, and museums who can create special accounts that include direct editing privileges for entries and walking/driving tours and trails that credit the authors and their organization.

Most people choose to work with their local historical society, library, museum, or other organization because they can sign up for editing privileges following verification. However, we welcome suggested edits and improvements to individual entries. To improve an entry, simply click on "improve this entry" and submit a revision. Once verified and approved, it will become part of Clio and users will be able to see the changes you made as well as the previous version - a living record of how historical interpretations develop over time." (Clio, n.d.)

Augmented Reality Features: Yes, it has an "Explore (AR)". Once you go within it, there is a disclaimer when you go into it, "Do not use this app while driving." For the Billings Tour, the AR feature displays an arrow at the bottom of the screen which points the user to the next marker on the tour.

App Name: Explore Kentucky History

Org: Kentucky Historical Society
Developer: Curatescape
Coverage: State - KY
Montana Data: No
Price: Free
Source: Survey Response
Link: https://history.ky.gov/explore-kentucky-history-app

App Description: "Explore Kentucky History is a free app that puts Kentucky's History at your fingertips. Explore Kentucky's many unique historic places and take self-guided tours of the state's rich history.

The Kentucky Historical Society explores the state's history through its historical sites, markers, and landscapes. Find interesting people, places, and events in Kentucky's history, and take curated historical tours through regions and communities across the state. With a growing list of interpretive stories, beginning with the state's historical markers, each point on the interactive GPS-enabled map includes historical information about the location, along with historic images from Kentucky's archival collections and historical publications. Many sites also include short documentary videos or audio clips based on expert research or oral history interviews. You can find more information about Kentucky Historical Society on the web at history.ky.gov or visit the project website at explorekyhistory.ky.gov." (Apple, Inc., 2025)

Map: Yes: Mapbox map, which can be centered on the user's location. Markers are shown as simple red icons; when you click on a marker, it shows a photo and a name which you can click on for more information.

Ability to Locate Nearby Markers: Yes - you can use the map or the list of markers to discover nearby markers based on the user's location.

Marker Description Information Provided: Each marker includes a short description, information on who wrote the description, photos, and a map showing the location of that marker, which users can click on to get directions to the marker.

Photos: Yes - ability to view multiple photos of the marker/surrounding area.

Videos: Not found

Audio (e.g., 60 second histories): Not found

Accessibility Features: You can adjust text size, which may make things easier to read for those with poor eyesight.

Interactive Features: Users can bookmark markers/tours.

Offline Capabilities: Yes - users can download all of the text content for use offline.

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Not found

App Name: Explore Nebraska History

Org: Nebraska Historical Markers
Developer: Curatescape
Coverage: State - NE
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/explore-nebraska-history/id1245348943

App Description: "Explore Nebraska History is a free app that shares the heritage of Nebraska at your fingertips. Learn more about the interesting stories and fascinating people highlighted by our Nebraska Historical Marker program. Travel across our beautiful state in person or via your device with curated historical tours. The stories provided in this app expand upon our historical markers with each point on an interactive GPS-enabled map that includes historical information about the location, images and media from archival collections and links to additional publications." (Apple, Inc., 2025)

Map: Yes: Mapbox map, which can be centered on the user's location. Markers are shown as simple yellow icons, when you click on a marker, it shows a photo and a name which you can click on for more information.

Ability to Locate Nearby Markers: Yes - you can use the map or the list of markers to discover nearby markers based on the user's location.

Marker Description Information Provided: Each marker includes a short description, information on who wrote the description, photos, and a map showing the location of that marker, which users can click on to get directions to the marker.

Photos: Yes - ability to view multiple photos of the marker/surrounding area.

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: You can adjust text size which may make things easier to read for those with poor eyesight.

Interactive Features: Users can bookmark markers/tours.

Offline Capabilities: Yes - users can download all of the text content for use offline.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Explore Tennessee State Parks

Org: Tennessee State Parks
Developer: Timelooper
Coverage: State - TN
Montana Data: No
Price: Free
Source: Survey Response
Link: https://apps.apple.com/ma/app/explore-tennessee-state-parks/id6444808325

App Description: "Tennessee State Parks is proud to present fully interactive, augmented, and virtual park experiences. The Explore Tennessee State Parks app is free and can be used over Wi-Fi, cellular data plans, or downloaded prior to your visit. The app features a growing library of experiences designed to use technology to enhance your exploration, while not distracting from the rich histories and natural beauty our parks offer.

The app will also let us share information and experiences in ways we previously could not by virtually diving deep underwater and delving into hidden caves. We will share history from multiple perspectives and restore the voice of people and cultures since moved from the land. Join us in discovering more about the places we all love." (Apple, Inc., 2025)

Map: Yes; the map shows simple yellow icons for each state park. The map can be centered on the user's location to identify nearby parks. When you click on a map marker, the name of the park and a photo pop up. A user can click on that name to learn more information about that park and to download the "Adventure" for that park.

Ability to Locate Nearby Markers: Yes - the app will locate nearby state parks based on the user's location.

Marker Description Information Provided: Each state park includes a short description of the park and an "adventure" which is a tour of interpretive sites for that park. The tour is made up of AR/VR interactive experiences where a user can learn more about the site. For each state park, the app also includes links to the state park website and Facebook page (which open in your web browser, not the app).

Photos: Yes

Videos: Yes - the AR experiences include videos.

Audio (e.g., 60 second histories): Yes - the VR experiences include audio stories of historic figures.

Accessibility Features: Yes - app includes high contrast colors, enlarged fonts, and dyslexic font. It also allows for audio, including audio descriptions and audio captioning.

Interactive Features: Yes - the AR and VR experiences are interactive

Offline Capabilities: Yes - users can download "adventures" for each park, which include stops with AR experiences.

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Yes, AR is used in the "adventures", the AR experiences include video of a ranger telling you the history of the site, interactive learning (click on a letter and it will be read by a farmer, etc.), etc.

App Name: ExploreHere

Org: MainEngine
Developer: MainEngine
Coverage: Nationwide
Montana Data: Yes
Price: Free (basic version), Premium (paid)
Source: Literature Review
Link: https://www.explorehere.app/

App Description: "Unlock the hidden stories of the world with ExploreHere. ExploreHere | Audio Guide brings history, culture, and local legends to life, right through your smartphone. Whether you are journeying through a new city, embarking on a scenic road trip, or simply exploring your own neighborhood, ExploreHere transforms every corner into an immersive storytelling experience.

- Learn on the Go: Dive deep into 2–3-minute curated audio narratives that offer insightful anecdotes, historic events, and cultural tales. Perfect for curious minds and adventurers alike.

- Perfect Travel Companion: Enhance your travels with geo-tagged audio stories that play automatically as you explore, ensuring you never miss a fascinating tidbit.

- Rediscover Your Hometown: Even familiar places have hidden secrets. Discover new layers of history and intriguing stories about places you pass by every day.

- Easy to Use: Simply download the app, choose your destination or topic of interest, and start listening. It is that simple to turn your walks and drives into enlightening adventures." (Apple, Inc., 2024)

Map: Yes, Mapbox interactive map that displays markers as a simple icon but can be clicked on for more information. Markers that are located further away from the user are grouped together to avoid visual clutter.

Ability to Locate Nearby Markers: Yes, your location is used to locate nearby markers.

Marker Description Information Provided: Marker Title, Summary, Full Text Description, Photos, Categories, Location (lat, long and map), Link to HMdb

Photos: Yes - ability to view multiple photos of the marker/surrounding area.

Videos: Not Found

Audio (e.g., 60 second histories): Yes - for some areas, there are audio stories. For Billings there is a short story about the history of the Montana Fair (1 min, 47 sec). For the state of Montana, there are 10 audio stories listed.

Accessibility Features: Audio Summaries of the marker text.

Interactive Features: Ability to "Favorite" markers.

Offline Capabilities: Yes (paid version only) - you can download regions of markers for use offline.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Flyover Country

Org: University of Minnesota
Developer: University of Minnesota
Coverage: Nationwide
Montana Data: Yes
Price: Free
Source: Literature Review
Link: https://flyovercountry.io/

App Description: "Track your flight with GPS - discover information about the world below and clouds above with offline maps and points of interest. Worldwide.

GPS functionality is only possible from the window seat and GPS reception quality varies by device/conditions

Learn about the world along the path of your flight, hike, or road trip with GPS tracking. Offline geologic maps and interactive points of interest reveal the locations of fossils, core samples, and georeferenced Wikipedia articles visible from your airplane window seat, road trip, or hiking trail vista.

Flyover Country is a National Science Foundation funded offline mobile app for geoscience outreach and data discovery. The app exposes interactive geologic maps from Macrostrat.org, fossil localities from Neotomadb.org and Paleobiodb.org, Wikipedia articles, offline base maps, and the user's current GPS determined location, altitude, speed, and heading. The app analyzes a given flight path and caches relevant map data and points of interest (POI), and displays these data during the flight, without in-flight Wi-Fi. By downloading only the data relevant to a particular flight path, cache sizes remain reasonable, allowing for a robust experience without an internet connection.

Flyover Country is not limited to the window seat of airplanes. It is also ideal for road trips, hiking, and other outdoor activities such as field trips and geologic field work." (Apple, Inc., 2024)

Map: Yes, Mapbox map showing the entire world. Users can zoom to their location. Users can then adjust the map depending on their travel path (users input origin and destination) and by travel mode (by car or by plane) and by what they are interested in seeing - geologic, landscape features, mammal fossils, fossils, Holocene volcanoes, ocean core samples, lake core samples. science nuggets, GLOBE Observer, GLOBE areas of interest. Once users create a travel path the map will populate with points of interest along that path. Users can save the map with a travel path and associated data to their phone for offline use.

Ability to Locate Nearby Markers: The map determines nearby points of interest along a set pathway.

Marker Description Information Provided: Data provided depends on the type of feature, however, typically shares a short description and photos - the data seems to come from Wikipedia.

Photos: Yes

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: Not Found

Interactive Features: Not Found

Offline Capabilities: Yes - users can download their travel path and associated features along that path for offline use. Your offline location is determined by speed, altitude, and direction to let you know where you are and what you are looking at.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Georgia's Historical Markers

Org: Georgia Historical Society
Developer: Unsure
Coverage: State - GA
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/georgias-historical-markers/id420288480

App Description: "Discover Georgia's history through historical markers!

Discover Georgia's history through historical markers! An important part of the Georgia Historical Society's statewide educational mission, the Georgia Historical Marker Program offers the public an opportunity to learn our state's history in the places where it happened.

Roadside historical markers capture Georgia history in a format readily understood by travelers and residents alike. These easily identifiable markers give readers a unique insight into the stories of our shared past.

App features Include:
-- Comprehensive details, photos, and text of historical markers throughout Georgia
-- Ability to search markers by name, region, or subject
-- Get directions from your location or another location to the marker you're interested in viewing" (Apple, Inc., 2024)

Map: Yes - ESRI map showing markers for the entire state of Georgia. Markers are shown as simple blue icons. You can click on a marker to highlight it, below the map in the "Marker Results" it will display the marker name (not very intuitive). The markers on the map can be filtered by marker subject (agriculture, American Revolution, etc.), county, region, or marker program (Georgia Historical Commission, Georgia Historical Society).

Ability to Locate Nearby Markers: Not found

Marker Description Information Provided: Each marker has a photo, marker time period, region, marker subject, marker program, county, year erected, and tips to find the marker (for example, On GA42, north of Spring Road in Flovilla). In addition, you can click on a link for directions to the marker. Last, the marker text is provided.

Photos: Yes - a photo of each marker is displayed. It does seem to be limited to one photo per marker.

Videos: Not found

Audio (e.g., 60 second histories): Not found

Accessibility Features: Not found

Interactive Features: Not found

Offline Capabilities: Not found

Ability to Send Information/Ideas for New Markers: There is a link in the app to notify the Georgia Historical Commission of a missing or damaged marker, but when you click the link it opens a form and states, "You do not have permission to submit this survey record."

Augmented Reality Features: Not found

App Name: Historic Charleston Foundation

Org: Historic Charleston Foundation
Developer: Cuseum
Coverage: State - SC
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/historic-charleston-foundation/id1330939870

App Description: "Explore the history and culture of Charleston, South Carolina with the Historic Charleston Foundation. Combining historic photographs, oral histories, maps, and video, Historic Charleston Foundation tells the story of Charleston at your own pace in the palm of your hand.

The story of Charleston is more than cobbled streets and gracious piazzas; it is a story of natural disasters, war, incredible bravery, and unspeakable horrors from the eighteenth to the twenty-first century. Learn how generations of devoted citizens have preserved and protected this historic city over three tumultuous centuries.

This app includes audio guides to the Foundation's two historic house museums, the Aiken-Rhett House and the Nathaniel Russell House.

This app will make use of your GPS which can cause a decrease in battery life." (Apple, Inc., 2022)

Map: Yes - Apple Map, which displays points of interest in Charleston. Points are clustered when zoomed out to avoid visual clutter. When zoomed into an area, each point of interest is displayed as a small circular photo icon. When you click on the icon, the name of that location pops up, which you can click on for more information about that location.

Ability to Locate Nearby Markers: Yes, you can center the map on your location.

Marker Description Information Provided: Each point of interest has a photo and a short description. Some points of interest also have an audio story about that location.

Photos: Yes - a photo of each location of interest is displayed with the description. Photos are also shared in the tours that are available in the app.

Videos: Not found

Audio (e.g., 60 second histories): Yes, some points of interest have a short audio story about that location. Audio is also used for the tours, which are available in the app.

Accessibility Features: Not found

Interactive Features: Not found

Offline Capabilities: Yes, the app data can be downloaded for offline use.

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Not found

App Name: Historic Missouri

Org: University of Central Missouri
Developer: Curatescape
Coverage: State - MO
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/historic-missouri/id1576214300

App Description: "Historic Missouri is a free app that provides users with easy access to information about the important places, people, and stories that are unique to Missouri. Developed by the faculty and students in the History Program at the University of Central Missouri, the mobile application provides interpretive and curated narrative tours about Missouri's history. Each point on the map includes historical information about that site and features historic images from Missouri's archival institutions like the State Historical Society of Missouri and the Missouri State Archives." (Apple, Inc., 2025)

Map: Yes: Mapbox map, which can be centered on the user's location. Markers are shown as simple red icons; when you click on a marker, it shows a photo and a name, which you can click on for more information.

Ability to Locate Nearby Markers: Yes - you can use the map or the list of markers to discover nearby markers based on the user's location.

Marker Description Information Provided: Short description, who wrote the description, and photos are provided.

Photos: Yes - there is the ability to view multiple photos of the markers.

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: You can adjust text size, which may make things easier to read for those with poor eyesight.

Interactive Features: Users can bookmark markers/tours.

Offline Capabilities: Yes - users can download all of the text content for use offline.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Historic Montana

Org: Montana Historical Society
Developer: Curatescape
Coverage: State - MT
Montana Data: Yes
Price: Free
Source: Survey Response
Link: https://apps.apple.com/ar/app/historic-montana/id1145444580?l=en-GB

App Description: "Historic Montana is a free mobile app to help you discover Montana's rich cultural resources. Curated by the Montana Historical Society, Historic Montana shares the history and architecture of selected buildings, neighborhoods, and cultural sites listed on the National Register of Historic Places, the nation's official list of cultural resources deemed worthy of preservation. The app's mobile markers reproduce National Register signs placed at the sites themselves as part of a program, funded through the state's accommodations tax, to improve public knowledge and promote historic preservation." (Apple, Inc., 2025)

Map: Yes: Mapbox map, which can be centered on the user's location. Markers are shown as simple blue icons; when you click on a marker, it shows a photo and a name, which you can click on for more information.

Ability to Locate Nearby Markers: Yes - you can use the map or the list of markers to discover nearby markers based on the user's location.

Marker Description Information Provided: Short description, who wrote the description, and photos are provided.

Photos: Yes - there is the ability to view multiple photos of the markers.

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: You can adjust text size, which may make things easier to read for those with poor eyesight.

Interactive Features: Users can bookmark markers/tours.

Offline Capabilities: Yes - users can download all of the text content for use offline.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Hot Springs Baseball Trail

Org: Hot Springs Convention Center
Developer: Unsure
Coverage: Local - AR
Montana Data: No
Price: Free
Source: Survey Response
Link: https://hotspringsbaseballtrail.com/

App Description: "Baseball runs deep in Hot Springs National Park, America's First Resort. From historic fields and recreational retreats, to the roles of Oaklawn Racing and Gaming and Bathhouse Row as entertainment for baseball's finest, a connection to history is around every turn." (Apple, Inc., 2024)

Map: Yes, a Mapbox map showing the stops along the Baseball Trail are on the map as blue icons with the

number of the stop. When you click on one of the stops, the name and a photo for that stop pop up which a user can click on for more information.

Ability to Locate Nearby Markers: Yes - the map will center on the user's location and show nearby Baseball Trail stops.

Marker Description Information Provided: Name, short description, photos, and audio are included for each stop on the trail.

Photos: Yes - there is the ability to view multiple photos for each stop.

Videos: Not Found

Audio (e.g., 60 second histories): Yes - each stop includes audio that reads the text description included for each stop.

Accessibility Features: The audio reads the text associated with each stop, allowing for accessibility for those with a visual disability.

Interactive Features: Users can "Favorite" markers, which allows them to filter the list of markers by ones they have "Favorited".

Offline Capabilities: Yes - users are prompted to download the data for the app when they first open it. The download size is 167 MB.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Intermountain Histories

Org: Redd Center at BYU
Developer: Curatescape
Coverage: Regional – Intermountain Region
Montana Data: Yes
Price: Free
Source: Survey Response
Link: https://apps.apple.com/us/app/intermountain-histories/id1200039622

App Description: "Intermountain Histories is a free app that provides scholarly information and interpretive stories of historic sites and events around the Intermountain West regions of Idaho, Wyoming, Montana, Nevada, Utah, Colorado, Arizona, and New Mexico. Discover the histories of the region's peoples, places, institutions, events, cultures, and more. Using an interactive GPS-enabled map, you can take virtual or physical walking tours of historic sites. As your personal tour guide, Intermountain Histories provides historical information, photographs and images, documentary videos, audio interviews, oral histories, bibliographic citations, and other resources as you explore." (Apple, Inc., 2025)

Map: Yes, Mapbox map showing markers across the intermountain region (ID, WY, MT, NV, UT, CO, AZ, and NM). Markers are shown as simple red icons. When you click on a marker the name of that marker and a photo pop up, which a user can click on for more information.

Ability to Locate Nearby Markers: Yes - you can use the map or the list of markers to discover nearby markers based on the user's location.

Marker Description Information Provided: Short description, who wrote the description, and photos are provided. Descriptions seem to be provided by individuals from various colleges/universities across the Intermountain Region.

Photos: Yes - there is the ability to view multiple photos of the markers.

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: You can adjust text size, which may make things easier to read for those with poor eyesight.

Interactive Features: Users can bookmark markers/tours.

Offline Capabilities: Yes - users can download all of the text content for use offline.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: izi.Travel: Audio Tour Guide

App Description: "Transform your travels with the izi.TRAVEL app, the world's premier FREE audio tour guide. Experience cities like never before with over 15,000 immersive audio tours across 3,000 cities in 110 countries, available in 70 languages. Just plug in your earphones, hit autoplay, and let izi.TRAVEL lead the way. Do not miss out on the ultimate travel companion – download izi.TRAVEL now and embark on a journey of discovery!

Org: izi.Travel
Developer: izi.Travel
Coverage: Worldwide
Montana Data: Yes
Price: Free, In-App Purchases for Subscription (1 Month: $1.49, 1 Year: $9.99)
Source: Literature Review
Link: https://izi.travel/en/app

Explore the world with izi.TRAVEL as your free tour guide. izi.TRAVEL is like a personal tour guide in your pocket. izi uses GPS to locate your position and plays immersive stories right on your ears, while your eyes enjoy seeing it. It is truly an amazing experience!

If you do not have Roaming data pack, not to worry, simply download izi audio tours using Wi-Fi. Listen offsite or offline while walking, cycling, boating, or driving. Let izi travel guide be with you everywhere, all the time!

Choose Free Walking Mode and allow izi to identify the nearest tourist attraction and GPS auto-play the stories for you. If you hire a local tour guide, you will soon forget what you heard, but with izi, you can listen to the stories seamlessly before, during or after your visit." (Apple, Inc., 2025)

Map: The app has a "Free Walking Mode" which is a Google Map that displays the user's location and any nearby markers as simple blue circle icons. If you click on the marker icon it will display the name, and you can click and listen to the audio associated with that marker.

Ability to Locate Nearby Markers: Yes - the app will locate nearby tours.

Marker Description Information Provided: Each marker on a tour includes the name, location, photos, and a short audio story about that marker.

Photos: Yes - each marker on the tour had photos.

Videos: Not Found

Audio (e.g., 60 second histories): Yes - For the Montana Ave Tour in Billings, the audio stories were all less than one minute long. Users have the ability to toggle on "automatic play," which will automatically play the audio for a marker when the user is near the marker location.

Accessibility Features: Specific features not noted in the app, however, the audio would be useful for those with a visual disability.

Interactive Features: Users can rate the tours and can see ratings from others.

Offline Capabilities: Yes - all of the data associated with a tour can be downloaded for offline use.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: Montana Historic Markers

Org: Sierra Burkhart
Developer: Sierra Burkhart
Coverage: State – MT
Montana Data: Yes
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/montana-historical-markers/id6477809186

App Description: "Navigate Montana's historical markers with ease, using an intuitive interactive map to pinpoint markers near you or explore regions you plan to visit. Prefer a list? This app has you covered, allowing you to scroll through markers (sorted to highlight the markers nearest to you, if you enable location permissions) and select those that pique your interest by marking them as favorites.

Tailor your historical adventure by filtering markers by name or location. No matter your interests in Montana history, finding historical markers that pique your curiosity has never been easier.

Dive into the fascinating stories behind each marker, enriched with photos that bring the history to life. Experience the beauty and significance of each site without leaving your home, or use the images to enhance your in-person visit.

It's no secret that cellular coverage, particularly with high-speed data service, remains elusive in many parts of Montana. Montana Historical Markers is almost entirely self-contained, with all marker content and images stored within the app on your device so that you can remain connected to Montana's history even if your device is offline. Maps that rely upon external servers for content may be inaccessible offline, but the rest of the app's features will continue to function as usual regardless of your device's connectivity.

Montana's history belongs to everybody, and so does this app. Montana Historical Markers and all its content and features will always be free to use, and the app's source code will always be free and open under the terms of the GPLv3 license." (Apple, Inc., 2024)

Map: Yes, Apple Map, which shows markers for the entire state of Montana. Markers are clustered by location; when a user zooms in on the map, you can see the actual location of the markers. Users can search by marker name, by county, or by ones that they have "favorited".

Ability to Locate Nearby Markers: The app provides a list of nearby markers organized by distance from the user. However, the map in the app is not centered on the user's location but instead starts out showing the entire state of Montana.

Marker Description Information Provided: Full marker text, photos, location notes (for example on the left when traveling north), and who erected the marker. There is also the ability to view the marker in Google or Apple Maps so that a user can get directions to the marker. Marker data is from the Historic Marker Database.

Photos: Yes - multiple photos are available, the app seems to show whatever photos are available on the Historic Marker Database

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: Not Found

Interactive Features: Users can "Favorite" markers which allows them to filter the list of markers by ones they have "Favorited".

Offline Capabilities: Yes - users can download all of the available historic marker images/descriptions for use offline (552 MB of storage is required). The app notes that this is recommended if users plan to travel to rural areas in Montana.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: OuterSpatial: Get Outside

Org: Trailhead Labs
Developer: OuterSpatial
Coverage: Nationwide
Montana Data: Yes
Price: Free
Source: Survey Response
Link: https://www.outerspatial.com/

App Description: "The guide to all your favorite outdoor activities, OuterSpatial connects you with other like-minded adventurers and the organizations that protect and manage your favorite outdoor places.

Use OuterSpatial to discover new places, navigate while on the trail, and share your adventures with others who love to play outside. OuterSpatial makes getting outside easy by putting information about amazing destinations — including curated articles, events, directions, photos, maps, and brochures — right at your fingertips.

Features

- Browsable, up-to-date library of outdoor recreation information maintained by our partner organizations.

- Beautiful maps designed specifically for outdoor usage (both day and night).

- Transit, biking, walking, and driving directions to trailheads, campgrounds, and other locations.

- Information about in-person and virtual events.

- Real-time updates about on-the-ground conditions.

- Challenges to motivate you to experience the outdoors in new and exciting ways.

- Tools to help you contribute back to your favorite organization and share your outdoor experiences with others." (Apple, Inc., 2025)

Map: Yes - interactive map which displays nearby outdoor activities (nearby USFS, NPS sites, trailheads, etc.) as circle markers. When you click on a map marker, it pops up the name, who owns that site (NPS, USFS, etc.), and how far away that location is. You can click on the name for more information about that location.

Ability to Locate Nearby Markers: You can center the map on the user's location.

Marker Description Information Provided: Name, photos, short text description, a map showing the location, the size of that outdoor location, a link to get directions, lat/long, who manages that location including address, phone, and website, and additional information (activities, directions, weather, entrance fees, etc.). There is also a tab for social posts, which are linked to that location.

Photos: Yes - multiple photos are available

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: Not Found

Interactive Features: There is a social tab which allows users to post social media style posts and share photos to an outdoor location.

Offline Capabilities: Not Found

Ability to Send Information/Ideas for New Markers: Yes, users can report an error or suggest an edit to any of the outdoor locations listed in the app.

Augmented Reality Features: Not Found

App Name: Perez Art Museum Miami

Org: Jorge M Perez Art Museum of Miami Dade County Inc.
Developer: Cuseum
Coverage: Local - FL
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/p%C3%A9rez-art-museum-miami-pamm/id1215768854

App Description: "Experience Pérez Art Museum Miami (PAMM) from your smartphone! Enjoy our current exhibitions through guided audio tours and artist interviews. Learn about our LEED Gold Certified building, designed by Pritzker Prize winning architects, Herzog & de Meuron or plan your visit to our waterfront museum." (Apple, Inc., 2023)

Map: The app has static map graphics which show each floor of the museum.

Ability to Locate Nearby Markers: Not found

Marker Description Information Provided: The app has a few self-guided audio tours of the museum. For each tour stop, there is a short description of the artwork, a photo, and an audio option that reads the description.

Photos: Yes, each tour stop has a photo of the artwork.

Videos: Not found

Audio (e.g., 60 second histories): Yes, there is an option for audio that read the description of each artwork on the tours.

Accessibility Features: Not found

Interactive Features: Not found

Offline Capabilities: Yes, the app data can be downloaded for offline use.

Ability to Send Information/Ideas for New Markers: Not found

Augmented Reality Features: Not found

App Name: National Park Service

Org: National Park Service
Developer: GuideOne Mobile
Coverage: Nationwide
Montana Data: Yes
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/national-park-service/id1549226484

App Description: "The Official NPS App – Your Ultimate National Park Companion!

• Explore 420+ national parks effortlessly with interactive maps, self-guided tours, and essential on-the-ground information.

• Interactive Maps: Plan your trip with detailed park maps, including points of interest, trails, and essential information.

• Park Tours: Discover park highlights with self-guided tours, just like having a ranger by your side.

• Amenities: Find transportation, dining, restrooms, and more for a hassle-free visit.

• Plan Your Visit: Access fee and pass information, operating hours, and other essential details to help you plan your visit.

• Accessibility: Enjoy a fully accessible experience with audio descriptions for points of interest and exhibits, making it inclusive for all.

• Offline Use: No internet? No worries! Download park content for offline exploration, perfect for remote areas.

• Share Your Visit: Create virtual postcards to share your park experiences with friends and family.

• Things to Do: Explore hiking, bus tours, museums, ranger programs, and more for a fun-filled visit.

• News, Alerts & Events: Stay updated with park news and events.

• Passport Stamps, Fees & More: Access park-specific details all in one place.

Discover all 420+ National Park System sites, from iconic landmarks like Yellowstone and Yosemite to hidden gems. Download the official NPS App now for an unforgettable park adventure!" (Apple, Inc., 2025)

Map: Yes, the app displays a map of the United States showing all of the parks as simple green markers. When the map is zoomed out, the markers are clustered to avoid visual clutter. When you zoom in, individual parks are displayed as green map icons. When you click on a marker, the name of that NPS site and a photo pop up. You can click on the name for more information about that site.

Some NPS sites have self-guided audio tours. The tour will also display a map with the tour stops marked as green icons with the stop number. You can click on the stop marker, and the name, a photo, and a short description will pop up. A user can click on "Explore this Location" for more information.

Ability to Locate Nearby Markers: The app displays nearby NPS sites. For both the NPS sites and the audio tours, the maps can be centered on the user's location.

Marker Description Information Provided: For a National Park Site - information includes Things to Do, Fees and Passes, News, Visitor Center, Amenities, Where to Stay, Calendar, and information on location and hours of operation. The site will also include a link to that NPS site's website and contact information. Some parks have self-guided tours.

Self-guided tours - stops along a self-guided tour will include a map showing the location (Mapbox map), photos, a short text description, the address, operating hours (if applicable), and a list of amenities at that stop along the tour.

Photos: Yes - multiple photos are shared for both the park and the audio tour stops.

Videos: Not Found

Audio (e.g., 60 second histories): Not Found

Accessibility Features: Some NPS sites have audio description tours, which are described as "Audio description tours are designed to assist blind and low vision visitors in navigating and experiencing exhibit spaces at the parks..."

Interactive Features: Yes - users can choose favorite parks and audio tours to save to a user-created favorites list. Users can also create and share a virtual postcard for the NPS site.

Offline Capabilities: Yes - information for an NPS site can be downloaded for offline use. For Bighorn Canyon, the download size is 33MB.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: TravelStorys Audio Guides

Org: TravelStorysGPS
Developer: TravelStorysGPS
Coverage: Nationwide
Montana Data: Yes
Price: Free, Tours cost $9.99-$32.99 depending on tour(s) purchased
Source: Literature Review
Link: https://www.travelstorys.com/

App Description: "TravelStorys is a hands-free, location-aware app that lets you share the stories that make every place remarkable. Less like an app and more like a compass, TravelStorys is designed to work offline and in your pocket. TravelStorysGPS has the platform, tools, and distribution opportunities to share your stories and vision with the world

The company's patented, award-winning mobile platform, TravelStorys, enables location-based organizations to create high-quality, mini-podcast-like audio content about local places and travel routes. The audio launches automatically – hands-free – as travelers approach sites of interest, without the need for cell service or Wi-Fi. Accompanied by an exhibit hall of images, videos, and weblinks, these engaging audio tours are presented collectively on the user-friendly TravelStorys app." (Apple, Inc., 2025)

Map: For each audio tour displays an Apple Map, which displays audio tour stops associated with that tour as green speech bubbles. When you click on a map marker, the name of that stop pops up, and you can click for more information or for directions to that stop.

Ability to Locate Nearby Markers: Yes - the audio tour will display a map of nearby tour stops and will update as you travel along.

Marker Description Information Provided: A text description, photos, and audio are provided for each tour stop.

Photos: Yes - multiple photos are available

Videos: Not Found

Audio (e.g., 60 second histories): Yes - each stop on the tour will automatically play audio for that stop hands free for those who are driving.

Accessibility Features: Audio is available for those with visual disabilities.

Interactive Features: Users can "favorite" tours which allows them to filter the list of tours by ones they have "Favorited".

Offline Capabilities: Yes audio tours can be downloaded for offline use.

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

App Name: WHExperience

App Description: "Experiencing the White House offers multiple tours related to the Executive Mansion in a single app, including an intimate, room-by-room virtual experience of the White House, a companion tour for guests visiting the building in person, and a guided walking tour around the President's Neighborhood for people visiting Washington, D.C. The White House Historical Association is continually adding new tours and features about America's most famous residence. This app will make use of your GPS which can cause a decrease in battery life." (Apple, Inc., 2022)

Org: White House Historical Association
Developer: Amazon Web Service
Coverage: Local - DC
Montana Data: No
Price: Free
Source: Literature Review
Link: https://apps.apple.com/us/app/whexperience/id1356596797

Map: There is an "Outdoor Map" which shows the location of the White House Visitor Center and White House Museum. The map can be centered on the user's location.

Ability to Locate Nearby Markers: The map can be centered on the user's location but doesn't display much information.

Marker Description Information Provided: There are several tours in the app. Each tour stop has the location name, photos, a text description, and a text-to-speech option for the text.

Photos: Yes - multiple photos are available for the tour stops

Videos: Not Found

Audio (e.g., 60 second histories): Yes - there is a text-to-speech option for the various tours

Accessibility Features: Text-to-speech is available

Interactive Features: Users can "like" tours

Offline Capabilities: Yes - tour information can be downloaded for offline use in the app settings

Ability to Send Information/Ideas for New Markers: Not Found

Augmented Reality Features: Not Found

Appendix D: Existing Online Interactive Maps

Organization: Alabama Historical Commission

Location: Alabama

Link:
https://alabama.maps.arcgis.com/apps/webappviewer/index.html?id=8b563de64f9146de946ff7113e3f678a

Platform Used: ESRI

Description: ESRI map displaying several historic programs sites including the Alabama Historic Commission historical markers, National Historic Register sites, cemeteries, etc. When you click on a marker the following information pops up: marker name, address, city, county, Google/Streetview (link), year installed, marker type, marker sponsor, general focus (tag), focus details (tags), listed to (Alabama Register, National Register), Historic Marker Database (HMdb) Link (link to the marker entry on the HMdb site), and any attachments (PDF which displays all this information and photos for the markers in a nice printable format, photos, etc.).

Does the website have a disclaimer? Yes, "Welcome to the Alabama Historic Commission's Alabama Historic Preservation Map!" The disclaimer includes information on how to use the map, including what the various buttons are (legend, map layers, etc.), and information on who to contact for questions/information.

Do the markers have a photo? Photos are available on the HMdb link and in the attachments.

Is the map searchable by county? Search is done by an open text box where a user can search by location.

Is the map searchable by theme or subject? Not found.

Tours Available: Not found.

Is there the ability to submit marker information? In the disclaimer for the map, "For questions or for more information about the Alabama Historic Preservation Map, the Historic Preservation GIS Portal, or the Historic African American Schools Project, please contact AHC's GIS Specialist Joseph Massey." (Alabama Historical Commission, n.d.)

Organization: Arkansas Historic Preservation Program

Location: Arkansas

Link:
https://www.arcgis.com/apps/mapviewer/index.html?layers=29e5fceeed224b95874542e58f9e9cac

Platform Used: ESRI

Description: ESRI map showing all markers for the state of Arkansas as small black sign icons. When you click on a marker the following information pops up: Name, City, County, Lat, Long, Location Description, Sponsoring, Title - Subtitle, and Year Dedicated.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Not found.

Is the map searchable by county? Not found.

Is the map searchable by theme or subject? Not found.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: DC Preservation League

Location: Washington, DC

Link: https://historicsites.dcpreservation.org/items/browse/

Platform Used: Leaflet

Description: Leaflet map showing historic sites in Washington, DC. Sites are clustered by location to avoid visual clutter. A user must zoom in to view individual historic site points on the map. When you click on a site location, the name of the site, the address, and a photo pop up. A user can click on the site name for more information which takes you to a new webpage which has the name, a short history of the site, photos, a map where one could obtain directions to the site, whether the site is related to any tours, and tags (National Historic Landmark, etc.).

Does the website have a disclaimer? Not found.

Do the markers have a photo? Yes

Is the map searchable by county? Not applicable.

Is the map searchable by theme or subject? Yes, you can "Search;" using an open text box or by "Tag". There are a total of 638 tags that a user can search by, ranging from "Church" to "National Historic Landmark" to "Women's History".

Tours Available: Yes - tours are available on a "Tours" webpage. Each tour includes a map of all of the sites associated with the tour, a short description of the tour, and a list of all sites associated with the tour. There are 62 tours available, ranging from "Historic Downtown and Chinatown" to "Mid-Century Modernism in Southwest".

Is there the ability to submit marker information? Not found.

Organization: Florida Historic Marker Council

Location: Florida

Link: https://apps.flheritage.com/markers/map/

Platform Used: Google My Map

Description: Google My Map displaying historical markers for the state of Florida. Points are clustered to avoid visual clutter. A user has to zoom in to view individual marker locations. When you click on a marker, the name, county, year, and address pop up. You can click on the pop-up to view the full marker text, which shows up as a pop-up over the map.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Some of the markers have a photo.

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes, you can do a keyword search, but no examples are provided.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Georgia Historical Society

Location: Georgia

Link: https://experience.arcgis.com/experience/9ebd13bc847f4bddb1cb0e65784e74b5/

Platform Used: ESRI

Description: ESRI dashboard site, the map is in the center of the page, on the left marker names are listed and list to learn more, on the right a user can filter by marker subject, county, region, or marker program (Georgia Historic Commission, Georgia Historical Society). The map displays all markers for the state of Georgia as blue sign icons. If you click on a marker on the map, that marker moves to the top of the marker list on the left side of the page. You have to click on the "learn more" for additional information which includes: Name, Marker Time Period, Region, Marker Subject, Marker Program, County, Year Erected, Marker Text, Tips to Find the Marker, and a Photo.

Does the website have a disclaimer? Yes "To begin your marker search, enter a keyword in the search box. You can also search and sort by Georgia county or region, by time period, or by marker program (the agency that erected the marker). (Georgia Historical Society, 2025)" You have to click OK to see the map.

Do the markers have a photo? Yes

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes (African-American History; Agriculture; American Revolution; Architecture and Landscape; Art, Music, and Literature; Business, Industry, and Commerce; Cemetery/Burial Grounds; Civil War; Education; Georgia Governors; Human and Civil Rights; Medical History; Military History; Native American History; Politics and Government; Religious History; Sports and Entertainment; Transportation; Women's History; World War II).

Tours Available: Not found.

Is there the ability to submit marker information? Can report a missing or damaged marker. The form asks for name, ID of marker (if known), approximate address, nearest cross street, nearest town, county, other location description, date of observation, marker status (knocked down, broken/damaged, pole damaged, missing entirely, plaque missing, surface in poor condition, next to road, pole missing, or other issue), and comments, and contact info.

Organization: Hawai'i Visitors and Convention Bureau

Location: Hawai'i

Link: https://www.hvcb.org/membership/culture/warrior-marker/

Platform Used: Google My Map

Description: The website lists Warrior Marker program sites on a grid. You can click on a link to view the sites on a Google My Map which opens up on the right side of the page. Markers are shown as red icons, when you click on when the name pops up where you can click for more information which opens a webpage related to that marker. The page includes the name, address, photos, a short description of the site, and a Google map showing the location of the site.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Yes

Is the map searchable by county? Can search by island.

Is the map searchable by theme or subject? Yes (Aquariums & Zoos; Botanical Gardens & Nature Reserves; Cultural; Historical; Landmarks & Scenic Overlooks; Museums; National & State Parks; Religion; Warrier Marker).

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: State Historical Society of Iowa

Location: Iowa

Link: https://history.iowa.gov/history/sites/state-historical-markers

Platform Used: Google My Map

Description: Small Google My Map at the bottom of a page related to Iowa's historical markers. The map shows all of the Iowa's markers as purple sign icons. When you click on a marker, information for that marker appears on the left side of the map. Information in the pop up includes: Name, Number, Year Installed, County, Original Location, Location Notes, Lat, Long, and Marker Text.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Not found.

Is the map searchable by county? Not found.

Is the map searchable by theme or subject? Not found.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Kansas Historical Society

Location: Kansas

Link: https://www.kshs.org/p/visit/19384

Platform Used: Google My Map

Description: Small Google My Map on a webpage related to Kansas State Historical Sites. The markers on the map are displayed as red icons. When you click on a marker on the map the historic site name and latitude/longitude information is displayed on the left side of the map.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Not found.

Is the map searchable by county? Not found.

Is the map searchable by theme or subject? Not found.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Kentucky Historical Society

Location: Kentucky

Link: https://history.ky.gov/markers

Platform Used: Custom/Unknown

Description: The website has a map showing all counties in Kentucky. You click on a county to get a list of all historical markers within that county. Each maker includes its name, marker number, location description, a short description of the site, county, and subjects.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Not found.

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes, there are several subject tags ranging from Actors to Aviation to Derby Winners to Shawnee Indians and more.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Cambridge Historical Society

Location: Cambridge, Massachusetts

Link: https://www.cambridgema.gov/historic/cambridgehistory/historicmarkers/historicalmarkers

Platform Used: ESRI

Description: ESRI map embedded on a "Map of Historical Markers" page on the Cambridge Historical Commission site. The map displays all markers within Cambridge. The markers are different colors depending on the marker type: African American, Blue Oval, Cast-Iron, History Station, North Cambridge, or Tombstone. When you click on a marker the following information pops up: name, marker type, address, and neighborhood.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Not found.

Is the map searchable by county? Not applicable.

Is the map searchable by theme or subject? Not found.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Maryland Department of Transportation

Location: Maryland

Link: https://maryland.maps.arcgis.com/apps/dashboards/87318efedd984d989c3c8f3a65897c55

Platform Used: ESRI

Description: ESRI dashboard site, the map is located in the center of the dashboard, on the left a list of marker names and a search function, on the right a map key and a short description of the Maryland roadside historical marker program, at the top of the page there is the ability to filter markers by jurisdiction (county) and marker theme(s). The page also includes link to submit an application or report a damaged marker. The map itself shows all markers for the state of Maryland as blue sign icons. When you click on a marker the following information pops up on the map: Name, location, map coordinates, installation date, marker type, themes, a link to a Google Street View, the marker text, and a photo.

Does the website have a disclaimer? Not found.

Do the markers have a photo? Yes

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes

Tours Available: Not found.

Is there the ability to submit marker information? There is a link to Submit an Application / Report Damaged Historical Marker. This takes you to a link where contact information is provided to report a marker that needs repair, replacement, or retirement.

Organization: Michigan History Center

Location: Michigan

Link: https://experience.arcgis.com/experience/0810844003f149faa1a3aeaa64d7d42e

Platform Used: ESRI

Description: ESRI Experience Builder page which shows a map of Michigan on the left and a list of markers on the right. The map shows all markers across the state as simple green circle icons. When you click on a marker the name, site status, location, significant date, and "what to look for" pops up. In addition, the clicked maker shows up on the top of the list to the right. You can click in the list on the right for more information which includes: Name, photo, marker text, locational information ("look for", site status, address, latitude/longitude, county), and marker stats (marker

ID, erected date, registry year, national registry date, significant date, and historical themes).

Does the website have a disclaimer? Yes "Department of Natural Resources (DNR) makes every attempt to ensure data accuracy but cannot guarantee the completeness or accuracy of the information contained within these datasets. For questions regarding content within this application, please visit Michigan.gov/markers. Submit feedback on this application or report problems or data functionality suggestions to mhcmarkers@michigan.gov. (Michigan History Center, 2025)" You have to click OK to see the map.

Do the markers have a photo? Yes

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes - a user can search via text box or by filters, including historical themes, significant dates, city, and county.

Tours Available: No

Is there the ability to submit marker information? Under the "Help" page, contact information is provided to provide any feedback on the website.

Organization: Montana Historical Society

Location: Montana

Link: https://historicmt.org/

Platform Used: Leaflet

Description: Leaflet map displaying markers across the state of Montana. Markers are displayed as gold icons and are clustered to avoid visual clutter. When you zoomed into the map you can see all marker locations in the zoomed in area. When you click on a marker on the map the name of the marker, a photo, and an address pop up. You can click on the name of the marker to open another page to learn more information including: Name, photos, a short description, a map showing the location of the marker, resources where you can learn more about the topic, citation information, whether the marker is associated with any tours, and any associated tags (hotels, county, etc.).

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? There isn't a specific search field for "County," but you can use the open text box search for a specific county.

Is the map searchable by theme or subject? Yes, but there isn't a drop-down of potential options.

Tours Available: Yes - there are 86 tours shared on the website, ranging from "Early Montana" to "Main Street Historic District, Bozeman".

Is there the ability to submit marker information? Not found.

Organization: Nebraska State Historical Society

Location: Nebraska

Link: https://mynehistory.com/

Platform Used: Leaflet

Description: Leaflet map very similar to the Montana Historical Society map which shows gold icons for Nebraska's historical markers. The map is located at the top of the webpage, and you can scroll down the page to see featured markers. On the map - marker symbols are clustered to avoid visual clutter. When you click on a marker in the map a pop up appears which includes the marker name, a photo, and location. You can click on the name to see more information about the marker which includes name, photos, short description, a map showing the location of the marker where a user can click to get directions, information on how to cite the page, and tags for the marker (City, County, etc.).

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? Search is done by an open text box so a user can search by a county or town name.

Is the map searchable by theme or subject? Some of the tags are associated with subjects (Black History, The Mormon Trail, etc.)

Tours Available: Yes - there are 8 tours available ranging from "Western Trails" to "Lincoln Highway"

Is there the ability to submit marker information? Not found.

Organization: New Hampshire Division of Historical Resources

Location: New Hampshire

Link:
https://nhdhr.maps.arcgis.com/apps/instant/nearby/index.html?appid=188fc0b4a6324a0e85c8cccb9369c296

Platform Used: ESRI

Description: ESRI interactive map displaying all markers for the state of New Hampshire as blue sign icons. A user has the option to search for markers within up to 25 miles of a user input location or can click on the map to get all markers within a search radius of where you click in the map. If

you click on a marker on the map, information for that marker appears on the left of the page including name, town, region, location description, location, and a photo.

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? No

Is the map searchable by theme or subject? No

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Ohio History Connection

Location: Ohio

Link: https://remarkableohio.org/

Platform Used: Google My Map

Description: Google My Map which shows all markers for the state of Ohio as sign markers. If you click on a marker in the map it pops up the name of the marker, marker text, address, and a link to learn more. If you click on the learn more like it opens a new page which includes: name, marker text, tags (transportation, river, county, etc.), photos, the marker sponsors, address, location description, latitude/longitude, and a google map showing the location of the marker which can be clicked on to get directions to the marker.

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? Yes - on the main page of the website there is a list of counties which provides a list of all markers in that county, or you can search by county to update the map to only show markers for that county.

Is the map searchable by theme or subject? Yes, there are several themes/subjects that can be searched including churches, ceramics, transportation, World War I, etc.

Tours Available: Not found.

Is there the ability to submit marker information? Yes, the website includes a "propose a marker" page and a page where you can contact Ohio History Connection to report a problem with a marker.

Organization: Oregon Travel Information Council

Location: Oregon

Link: https://oregontic.com/oregon-historical-markers/oregon-historical-marker-map/

Platform Used: Google My Map

Description: Google My Map which displays markers across the state of Oregon as brown icons. When you click on a marker a tab opens to the left of the map which shows the marker name, photo, lat/long, a link to a page with all the information for the marker, significance of the marker, and the marker text. Additionally, a user can click on the marker to get directions to that marker.

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? No - there is no way to search the markers.

Is the map searchable by theme or subject? No - there is no way to search the markers.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Pennsylvania State Historic Preservation Office

Location: Pennsylvania

Link: https://share.phmc.pa.gov/markers/

Platform Used: ESRI

Description: ESRI website which shows a map of Pennsylvania. A user must search for markers for anything to appear on the map. Users can search by keyword, county, municipality, or by marker category (Governors, Military, Women, etc.). After conducting a search, the map updates to show all markers associated with the query as red icons on the map and a list of all markers below the map. If you click on a marker on the map a pop up appears which displays name, type of marker, county, municipality, marker text, and location description.

Does the website have a disclaimer? Yes, "The historical marker search application allows you to search the PA-SHARE historical marker database by keyword, county/municipality, marker category, and marker missing. The keyword search feature searches by title, location, and marker text. The Pennsylvania Historical Marker program has been in existence for more than 100 years. Some of our earlier markers may contain outdated cultural references. The Pennsylvania Historical & Museum Commission is working to address this situation and will update markers as resources allow. (Pennsylvania State Historic Preservation Office, 2025)"

Do the markers have a photo? Not found.

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: South Carolina Department of Archives and History

Location: South Carolina

Link:
https://www.google.com/maps/d/viewer?mid=183GWEBsTK2WvT9yXRwGgh8Nv1TXzbwQe&ll=33.931906625071925%2C-81.04654300130207&z=8

Platform Used: Google My Maps

Description: Google My Map of all markers in South Carolina. Marker icons are colored based on the location within the state (Lowcountry, Midlands, Upstate, and Pee Dee). When a user clicks on a marker icon information for that marker pops up on the left side of the page. This information includes: marker number, county, region, marker name, GPS coordinates, city/vicinity, address, marker text, sponsor, year approved, missing, keywords, time period, and replacement marker.

Does the website have a disclaimer? Yes, "Map maintained by SC Department of Archives and History. Recently approved markers may not yet be erected. Please submit inquiries to ebreeden@scdah.sc.gov. (South Carolina Department of Archives and History, 2025)"

Do the markers have a photo? Not found.

Is the map searchable by county? No; it's grouped by "area" (Lowcountry, Midlands, Upstate, and PeeDee)

Is the map searchable by theme or subject? Yes, there are 5 themes (American Revolution, Civil War, African American, Native America and Women).

Tours Available: Not found.

Is there the ability to submit marker information? The map description includes an email address where someone can submit inquiries (ebreeden@scdah.sc.gov).

Organization: Texas Historical Commission

Location: Texas

Link: https://atlas.thc.texas.gov/Map

Platform Used: ESRI

Description: ESRI map of historic sites in Texas. When you open the page the map shows no map icons, a user has to zoom in to see historic site markers. The map legend must be opened by a user on the right side of the page - this allows a user to toggle on historic site layers (historical markers, museums, county courthouses, historic sites, National Register Properties, National Register Districts, cemeteries, historic trails, surveyed resources, historic survey areas, certified local governments, Main Streets, FEMA flood plains, and counties). The historic markers show up as green circles on the map. When you click on a marker icon the name of the marker, the marker number, and a link for more details pops up. If you click on the link for more details a pop up box opens up which includes the following data: marker name, marker number, atlas number, index entry, address, city, county, Universal Transverse Mercator (UTM) zone, UTM easting, UTM northing, subject codes, marker year, recorded Texas historic landmark (yes/no), marker location (description), private property (yes/no), marker condition, marker size, and marker text.

Does the website have a disclaimer? No

Do the markers have a photo? Some markers have photos.

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes (Courthouses, National Register Properties, State Antiquities Landmark (Architectural Only), Historical Markers, Cemeteries, and Museums)

Tours Available: Not found.

Is there the ability to submit marker information? Within each listing there is a "Report an error with this data" option.

Organization: Utah Historic Society

Location: Utah

Link:
https://utahshpo.maps.arcgis.com/apps/webappviewer/index.html?id=33c405cff5294c8a979ace4d26ee55a2

Platform Used: ESRI

Description: ESRI map of monuments and markers for the state of Utah. These points of interest are displayed as yellow star icons on the map. When a user clicks on a marker a small pop-up box opens which has the following information: name, city, county, address, year placed, date placed, primary theme, secondary theme, commemorating, monument organization, material, and a link to view an image. If you click on the link to view an image, it opens in another tab in your web browser.

Does the website have a disclaimer? Yes, it pops up when you open the map, which says "Welcome to Monuments and Markers Database (Last Updated 6/14/2022), For help using this application refer to the "i" icon in the upper left corner (Utah Historical Society, 2022).

Do the markers have a photo? Some markers have photos.

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes

Tours Available: Not found.

Is there the ability to submit marker information? Within a listing for a marker, they have a "Permission Inquires or Update Item Information" interface. It asks, "What is your question/request? Please include date needed or timeframe, and the names of persons or places relevant to your request." as well as "Link to the media you are requesting information or copies of."

Organization: Virginia Department of Historic Resources

Location: Virginia

Link: https://vcris.dhr.virginia.gov/HistoricMarkers/

Platform Used: Unknown

Description: Map of Virginia which displays all markers as gray sign icons. When you click on a marker, the following information pops up: marker number, marker name, marker location (description), city/county, directions (link which opens a Google map for directions), lat/long, and a tab where you can find all markers within a user set number of feet. The map takes a really long time to load and when you click on a marker the information takes a long time to pop up. The map doesn't seem to be the focus of the webpage, instead the search tab which allows a user to search the markers by keyword, zip code, county/city, route, or marker number seems easier to use. Search results show up as a list of markers on a results tab which has a table showing the results of the search which includes marker name, marker text, marker number, city/county, route name, and route number. You can click on a marker in the table for more details which opens a details tab and includes the name, marker number, marker text, and a photo.

Does the website have a disclaimer? Yes, "Website Disclaimer - Data contained anywhere on this website is Copyright © of Department of Historic Resources. The GIS data are proprietary to the Department of Historic Resources, and title of this information remains in the Department of Historic Resources. All applicable common law and statutory rights in the GIS data, including, but not limited to rights in copyright, shall and will remain the property of the Department of Historic Resources.

Information shown on these maps is derived from public records that are constantly undergoing change. This information does not replace a site survey and is not warranted for content or accuracy. This does not guarantee the positional or thematic accuracy of the GIS data. The GIS data are not a legal representation of any of the features that are depicted. Any implied warranties, including warranties of merchantability or fitness for a particular purpose, shall be expressly excluded. (Virginia Department of Historic Resources, n.d.)"

Do the markers have a photo? Yes

Is the map searchable by county? Yes

Is the map searchable by theme or subject? Yes, but they didn't have a drop-down list of options.

Tours Available: Not found.

Is there the ability to submit marker information? When you view a marker, they have at the bottom, "See a problem? Report it to HighwayMarkers@dhr.virginia.gov"

Organization: Vermont Roadside Historic Site Markers

Location: Vermont

Link: https://accd.vermont.gov/historic-preservation/roadside-markers

Platform Used: ESRI

Description: ESRI map showing all markers for the state of Vermont as green sign icons. There is a side panel which lists all the markers which are currently viewed on the map - when you open the map it is open at the state level (316 markers), when you zoom into the map - the side panel updates to list the markers which are displayed on the map. When you click on a marker the marker name, photo, latitude/longitude, marker text, and a link to view the full-size photo pop up. The side panel also has tabs which allow a user to filter the markers by region, search for markers within a user set distance from a location on the map, and filter the markers by theme (African American Heritage Trail, bridges, religious edifices, Civil War, education, Native American History, transportation, Revolutionary War, state historic site, and women's history.

Does the website have a disclaimer? Yes, when you open the map, the following disclaimer pops up, "Explore Vermont's Historical Roadside Markers, Unveiled in 1947 by the Vermont Legislature, the Vermont Historic Roadside Marker program commemorates Vermont's many people, events, and places of regional, statewide, or national significance. The cast-aluminum green markers, crested with the distinctive gold state seal, are placed throughout Vermont to provide a fascinating glimpse into the past and insights into the present. Use the tools in the Side Panel to navigate to your area or marker of interest. On Mobile Devices toggle the left side panel to see both the map and marker information. Click the marker image to view a full-size photograph. (Vermont Division for Historic Preservation, n.d.)"

Do the markers have a photo? Yes

Is the map searchable by county? No, but it is by region of Vermont (Northern, Central, Southern)

Is the map searchable by theme or subject? Yes (examples include African American Heritage Trail; Bridges; Religious Edifices; Civil War; Education; Native American History; Transportation; Revolutionary War; State Historic Site; Women's History)

Tours Available: Not found.

Is there the ability to submit marker information? Not found on the map but on the general Vermont Historic Roadside Markers page, it notes, "If you wish to report a missing or damaged

marker, please email us at ACCD.historicmarkers@vermont.gov. Please let us know the name of the marker, location, and when you first noticed it was missing or damaged. (Vermont Division for Historic Preservation, n.d.)"

Organization: Washington State Historical Society

Location: Washington

Link: https://www.washingtonhistory.org/across-washington/monuments-project/

Platform Used: Google My Map

Description: Google My Map of markers/monuments across the state of Washington. The markers are displayed as yellow map icons. When you click on a marker, a side panel opens which has the marker name, photo(s), and marker text.

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? No

Is the map searchable by theme or subject? No

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Polk County, Wisconsin

Location: Polk County, Wisconsin

Link: https://tinyurl.com/PolkMaps

Platform Used: Google My Map

Description: A Google My Map displaying the historic markers for Polk County, Wisconsin as pink circle icons. The icons are numbered, so it looks busy on the map. When you click on a marker, it pops up the name of that marker on the left side of the page.

Does the website have a disclaimer? "A physical map of Polk County, Wisconsin historical markers was created March 1980 and printed. Most of the markers have fallen down now, so this virtual map is the replacement. (Hanson, 2025)"

Do the markers have a photo? Not found.

Is the map searchable by county? No

Is the map searchable by theme or subject? No

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Wisconsin Historical Society

Location: Wisconsin

Link:
https://wishs.maps.arcgis.com/apps/View/index.html?appid=1ae1961b41f84edd8cf1be9579643953&center=-89.818,44.5&level=8

Platform Used: ESRI

Description: ESRI interactive map displaying all markers for the state of Wisconsin as green circles. There is an open text search bar at the top of the page. When you click on a marker on the map, the following information pops up: title, county, GPS coordinates, era, erected (year), link (to HMdb entry for the marker), marker name, location (description), marker number, theme (keywords).

Does the website have a disclaimer? No

Do the markers have a photo? No, not unless you go to the Historical Marker Database link and they have one.

Is the map searchable by county? Open-text search box for location.

Is the map searchable by theme or subject? No

Tours Available: Not found.

Is there the ability to submit marker information? Yes, "Did You Find a Marker Missing, Moved or Damaged? Contact Fitzie Heimdahl. Please provide the title of the marker and its location. (Wisconsin Historical Society, n.d.)"

Organization: Wyoming State Parks

Location: Wyoming

Link:
https://wysphst.maps.arcgis.com/apps/webappviewer/index.html?id=70c906c090a0466da9781e2a88ac72b6

Platform Used: ESRI

Description: An ESRI map of the state of Wyoming displaying all markers as green sign icons. When you click on a marker icon, the following information pops up: name, monument ID, about (description), latitude/longitude, and a photo. Similar to the Vermont map - this one has a side panel which lists the markers displayed and allows a user to search markers within a user set distance of a search location.

Does the website have a disclaimer? Yes, when you open the map, the following disclaimer pops up, "Disclaimer: some markers have been removed and are no longer in service until new funding can be secured to replace the marker(s). No expressed or implied inferences should be made concerning the presence of any marker. The State of Wyoming and its agencies make no express or implied warranties as to this map and the data it displays. Users of this information should review or consult the primary data and information sources to ascertain the reliability or usability of the information. The State of Wyoming and its agencies assume no liability associated with the use or misuse of this information and specifically retain sovereign immunity and all defenses available to them by law. (Wyoming State Parks, n.d.)"

Do the markers have a photo? Yes

Is the map searchable by county? Open-text search box where you can search by location/address.

Is the map searchable by theme or subject? Open-text search box where you can search for keywords - however no list of keywords is provided.

Tours Available: Not found.

Is there the ability to submit marker information? Not found.

Organization: Intermountain Histories

Location: Intermountain Region (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming)

Link: https://www.intermountainhistories.org/items/map/

Platform Used: Leaflet

Description: Leaflet map displaying markers for Montana, Idaho, Washington, Oregon, Nevada, Utah, Colorado, Wyoming, Arizona, and New Mexico. Marker icons on the map are clustered to avoid visual clutter. When you zoom in markers show up as red map icons. When you click on a marker icon the name, photo, and latitude/longitude coordinates pop up for the marker. You can click on the name for more information which takes you to a page which has the marker name, photos, description, map of the marker location, and metadata (resources/links).

Does the website have a disclaimer? No

Do the markers have a photo? Yes

Is the map searchable by county? No

Is the map searchable by theme or subject? Yes, but it doesn't seem to provide recommended options.

Tours Available: Yes, there are 69 tours available, ranging from "The 1911 Kolb Expedition" to "Atomic History in the West".

Is there the ability to submit marker information? Not found.