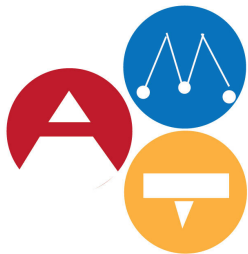


# Connecting People to Place: How Digital Maps Advance Civic Engagement in the Cultural Sector

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Civic engagement manifests itself in many ways. It exists at a systemic level, when people employ tools to develop and refine policy and infrastructure, and at the individual level through political participation. Beyond these realms, civic engagement can take the form of community organizing, as well as initiatives that help build stronger connections to place.<sup>1</sup> It is in this space that the arts play a crucial role. As guardians of history and heritage, as well as storytellers and stewards of imagination, cultural organizations and their leaders are uniquely positioned to provide links between people and the places where they live, work, and play.

In a time where we can build and access a wealth of geographic information through our mobile devices and online, digital tools are being leveraged to make these kinds of civically engaged connections. Digital maps, in particular, have been built to service archival needs as well as transform the public's interaction with art and archeological sites. Much of this is due to geographic positioning systems (GPS) and geographical information systems (GIS), which allow cultural workers to collect location data in real time and use it to determine not only where we are, but where we, as a global society, are going.

Given this evolution, it is critical for arts managers to ask: How can we capitalize on digital map technologies to strengthen awareness of our art and organizations' impact, as well as more broadly deepen the arts' ties to civic engagement? An overview of existing digital map tools, a case study analysis, and a geospatial experiment crystallize how cultural managers can utilize map resources to support engagement, especially with public art. By examining how organizations have deployed various digital map technologies in their work, we can also see how these tools have practical value and the potential to more broadly advance the cultural fields.

## What digital map tools currently exist?

### *Apps*

Several mobile apps have been developed to both source information about art and to provide users with a deeper experience. The following apps exemplify how digital maps can be implemented to increase both public art and civic engagement.

### **ArtAround**

When Washington DC-based Lauraellen McCann first noticed a public mural they passed regularly during their daily commute through DuPont Circle, they realized that “the way we move through cyberspace is

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<sup>1</sup> “Expanding and Supporting the Full Spectrum of Civic Engagement.” *Southeast Uplift*. Accessed December 12, 2018.

<http://www.seuplift.org/?newsletter=expanding-supporting-full-spectrum-civic-engagement>.



very similar to the way we move through public space.”<sup>2</sup> In a 2012 TedTalk, McCann acknowledges that just as many navigate the internet without knowledge of code, it is easy to encounter public art and appreciate it with your personal experience serving as the only source of information; however, they also recognized that when one is empowered with information, it can activate space in new ways and deepen that individual’s connection to both the art and the place it resides.<sup>3</sup> This is why, in partnership with the DC Government, McCann developed *ArtAround*,<sup>4</sup> an app which allows users to search a map of public art and art venues, as well as to add new works and spaces missing from the map. Since the creation of the app, *ArtAround* has also evolved into a free online public art database.<sup>5</sup>

### Canvs

Launched out of Jersey City in 2017, *Canvs* is an app similar to *ArtAround* in that it uses geolocation and mobile maps so users can locate and learn more about the public art

### Be Here Stories

The MuseWeb Foundation app *Be Here Stories*, utilizes a mobile device’s geolocation and microphone tools to allow

near them. Beyond location services, *Canvs* also focuses on building social networks, offering features that allow users to favorite murals they find using the app and share them with friends, providing opportunities to connect not only with information, but with other people. In the future,<sup>6</sup> *Canvs* wants to bring “interactivity to street art by organizing events ... and carrying out mini-campaigns to help raise artist awareness.”<sup>7</sup>

### Inside Outside Battery

In Canada, Destination St. John’s developed the award-winning *Inside Outside Battery* app, which it calls “a sonic adventure for walkers.”<sup>8</sup> Employing GPS technology, this app provides users with a soundscape tour of the Battery, which features interviews, poetry, and stories from locals, artists, and civic leaders. This app is a great example of tourist agencies and public radio leveraging resources to create a free, accessible tool that connects individuals to local history and cultural experiences.

users to record stories about their favorite arts and culture sites. Community-sourced details about local history and beloved attractions are uploaded to the app. These

<sup>2</sup> TEDx Talks. TEDxWDC Laurenellen McCann. Accessed October 1, 2018. [https://www.youtube.com/watch?v=g\\_Np\\_oYR1N4](https://www.youtube.com/watch?v=g_Np_oYR1N4).

<sup>3</sup> Ibid.

<sup>4</sup> “ArtAround.” App Store. Accessed November 18, 2018. <https://itunes.apple.com/us/app/artaround/id463678249?mt=8>.

<sup>5</sup> “ArtAround Town: The App That Tracks Street Art and Fosters Community.” *PBS NewsHour*, October

29, 2013.

<https://www.pbs.org/newshour/arts/artaround-town-the-app-that-tracks-street-art-and-fosters-community>.

<sup>6</sup> As per October 1, 2018

<sup>7</sup> “CANVS: Interactive Street Art: About Us.” CANVS. Accessed October 1, 2018.

<https://www.canvsart.com/about/>.

<sup>8</sup> “Insideoutsidebattery.” Accessed December 14, 2018.

<http://twinstore.wixsite.com/insideoutsidebattery>.



stories are accessible in two ways:

- Like *Inside Outside Battery*, the app's location tools allow people to listen to stories while personally visiting a place.

- Alternately, for virtual visitors, the MuseWeb Foundation has created an interactive map where visitors can listen to stories recorded by *Be Here Stories'* users from around the world.

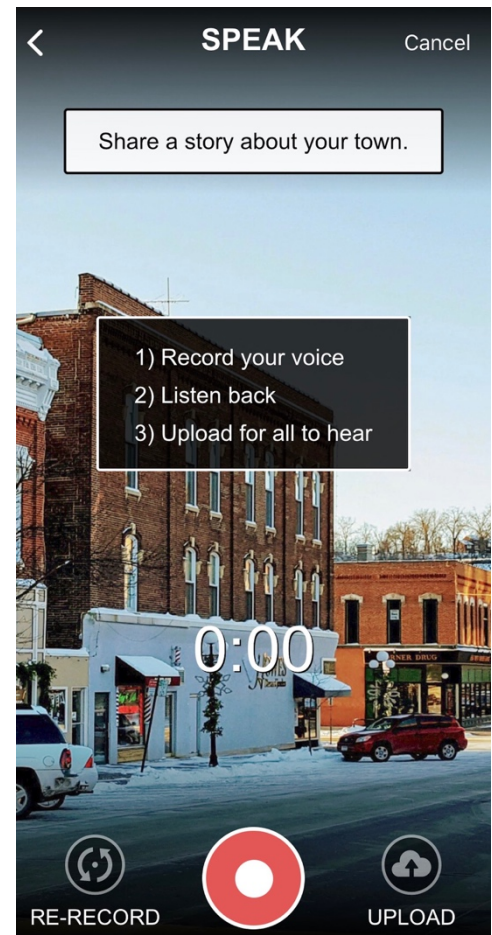
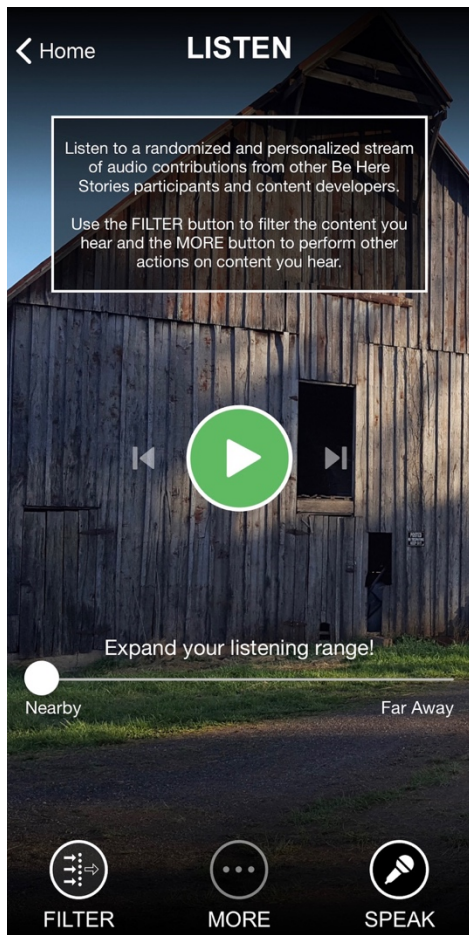


Figure 1. App Function Views, Source: Be Here Stories App Screenshots by author

The above examples detail ways in which an app may be utilized to further civic engagement by drawing a connection between a work of art and particular place. Therefore, arts managers may find that a similarly structured app can support their institution's mission. Apps provide heightened interactivity opportunities on mobile devices; GPS can be engaged so that

the user is guided and/or is given location-specific information, while simultaneously they can access a camera or microphone that allows them to make tangible contributions to or share about their experience in real time. Equally important, if organizations are looking for tools where individuals can access content without a



wireless connection, app-based digital maps are most effective.<sup>9</sup>

### *Interactive Online Maps*

Digital maps made available on the internet are heavily relied on by designers and developers to create an interactive user experience. They allow users to visualize where art is located, and to click on icons that provide details such as artist information, images, and links to more information. The following examples show how both tech companies and arts organizations have employed interactive online maps to archive and showcase public art, as well as develop site-specific interactive experiences.

### **Story Maps**

ESRI, a leader in GIS software, has developed *Story Maps* – a series of templates that allow organizations to combine maps with multimedia content.<sup>10</sup> Specifically, a Story Map created by George Washington’s Mount Vernon invites users to explore images, text, video, links, and 3D renderings to learn about the archaeology of the slave cemetery at the heritage site.<sup>11</sup> Importantly, Mount Vernon also utilizes this

digital map to feature their process, showing how their expertise coalesces complex information to effectively demonstrate different historical narratives. This particular example highlights how cultural managers can use these technologies not only to offer a different access point for engagement, but also to communicate with the public their progress and impact.

### **Google Nightwalk**

Like *Inside Outside Battery*, Google’s Creative Lab’s Nightwalk tour of Marseille combines digital map technology with an audio storytelling project to create an arts-focused experience that also aims to elevate users’ connection to a specific city. To do this, Google partnered with a private radio project, Promenades Sonores, which is operated by local artists, to source its audio narrative.<sup>12</sup> What sets this example apart is its seamless integration of narration, text, and high-quality photo and video content, which together create a compelling virtual reality that offers global access to this view of Marseille from a mobile phone or computer.

<sup>9</sup> Summerfield, Jason. “Mobile Website vs. Mobile App (Application) – Which Is Best for Your Organization?” Accessed December 14, 2018. <https://www.hsolutions.com/services/mobile-web-development/mobile-website-vs-apps/>.

<sup>10</sup> “Story Maps | Story Maps.” Accessed November 18, 2018. <https://storymaps.arcgis.com/en/>.

<sup>11</sup> “Story Map Journal.” Accessed November 18, 2018. <http://mountvernon.maps.arcgis.com/apps/MapJournal/index.html?appid=3ca8ba42c90a41d39df64b9cd4f25f58>.

<sup>12</sup> “Promenades Sonores.” Accessed December 14, 2018. <http://www.promenades-sonores.com/>.





Source: Pivot Audio. Google Night Walk, 2014. <https://vimeo.com/112132864>.

### Kyivmural

Available in English and Ukrainian, *Kyivmural* is a website that documents the work of 157 artworks and 33 artists<sup>13</sup> in the city of Kyiv. This site, which is fully integrated with Google Maps, allows users to find public art on its map via an artist roster or simply by navigating the digital map itself. This example more specifically seeks to elevate the mural's creators and garner both them and their work international recognition.

These web-based digital maps differ from the app examples particularly in terms of user ability to engage with a variety of

media content and organizational control of content sourcing. Notably, unlike apps, these online maps are generally compatible across devices, meaning that they will function well with the different operating systems existing on both mobile and desktop technologies.

### How are digital map technologies evolving?

Both mobile apps and interactive online maps provide arts managers and organizations with the ability to capitalize on crowdsourcing while maintaining quality control, and give the general public creative

<sup>13</sup> "Kyivmural." Accessed November 20, 2018. <http://kyivmural.com/en/index>.

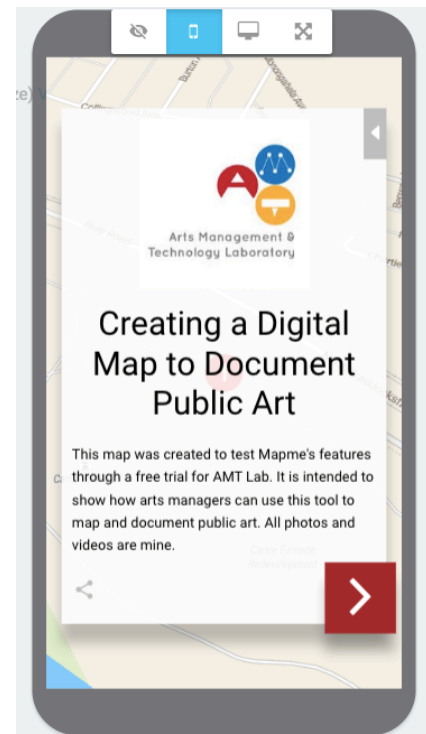


opportunities to record and engage with art as it exists in their communities. The user experience on these platforms, however, is often limited to learning and sharing information through still images, audio, and text. Experiments with digital maps in the past five years have and continue to combat such limitations and have expanded what digital map engagement can be.

Critically, the affordability of these technologies has also democratized the development of digital art tools, making them more broadly accessible to companies, as well as the general public. If you have a Google Account, for example, you can use Google My Maps to make a custom map.<sup>14</sup> This has empowered the development of unofficial public art mapping, such as street art maps of Atlanta, Georgia, described in the case study below. Additionally, moderately-priced services have sprouted up that allow organizations to develop beautifully designed digital maps that effectively convey an organization's work and impact, without requiring staff to learn technically nuanced software systems. MapMe, for example, is a service that offers customers the ability to integrate media options such as 3D perspective, VR, and 360 panorama to create highly-customizable digital maps that truly elevate engagement

<sup>14</sup> "Visualize Your Data on a Custom Map Using Google My Maps." Accessed December 14, 2018. <https://www.google.com/earth/outreach/learn/visualize-your-data-on-a-custom-map-using-google-my-maps/>.

opportunities, while also offering technical support and map-building expertise.<sup>15</sup>



Source: Mapme Map Builder. "Mobile Preview." *Mapme*. <https://mapme.com/>.

### *Streetartmap.org: A Public Art Map Case Study*

There are many examples of Google Maps that include detailed information on public art. Some of these are very basic, and only provide markers with photographs or text information. Bridging maps to include navigation tools for the user is less often provided. One example in particular that

<sup>15</sup> Mapme Map Builder - Create Beautiful Interactive Map with Ease." Mapme. Accessed December 14, 2018. <https://mapme.com/>.



integrates these capabilities well is the robust Atlanta Street Art Map series developed by retired engineer and public art enthusiast Art Rudick.

Art Rudick enjoyed the public art in his neighborhood, but when wanting to photograph certain pieces he found himself struggling to locate old favorites or new works of art on his own.<sup>16</sup> He recognized a need to not just document the public art in Atlanta, but to support an individual's ability to navigate different pieces and better understand their connections to a specific neighborhood.<sup>17</sup> Over time, Rudick has built 16 neighborhood street art maps utilizing Google My Maps, which can easily be accessed through the web at Streetartmap.org.<sup>18</sup> Beyond the maps themselves, Rudick has also taken advantage of the GPS navigation offered by Google, developing seven walking tours that include routes visualized on the map, with links to walking directions as well as artist websites.<sup>19</sup>

What started as a hobby for an individual passionate about street art has become a pivotal resource for tourists, artists, and

public art enthusiasts in Atlanta and beyond. For example, Streetartmap.org has gone on to partner with ARTS ATL, an arts service organization in Atlanta that provides independent coverage of the arts scene, as well as a comprehensive online arts events calendar.<sup>20</sup> Rudick now supports their content development of a weekly article called "This Week in Street Art," which highlights Atlanta's murals and the stories behind them.<sup>21</sup>

This case study demonstrates how a free tool that leverages geospatial information, and integrates media and GPS navigation, propels access to and engagement with public art. While the development and upkeep of these street art maps and self-guided walking tours requires time and human resources, the fact that the material cost for building the map itself is free for the map builder and user underscores how a tool like My Maps plays a critical role in democratizing art and information. Art Rudick's case is especially inspiring as he created a robust resource with no particular expertise related to map development. His story and the result of his work emphasizes the intuitiveness of tools like My Maps, and

<sup>16</sup> "Wall to Wall Art: An Art Fan Maps Street Murals in Atlanta and beyond," Reporter Newspapers, March 29, 2019, accessed April 29, 2019, <https://www.reporternewspapers.net/2019/04/01/wall-to-wall-art-an-art-fan-maps-street-murals-in-atlanta-and-beyond/>.

<sup>17</sup> Ibid.

<sup>18</sup> Art Rudick, "Street Art Maps: Atlanta's 12 Best Neighborhoods for Street Art and Murals," Atlanta Street Art Map, accessed April 29, 2019, <https://streetartmap.org/atlanta-street-art-maps/>.

<sup>19</sup> Art Rudick, "Self Guided Street Art Walking Tours: 5 Different Free Tours Are Available," Atlanta Street Art Map, accessed April 29, 2019, <https://streetartmap.org/street-art-mural-walking-tours/>.

<sup>20</sup> "Your Guide to the Arts in Atlanta," ARTS ATL, accessed April 29, 2019, <https://www.artsatl.org/about/>.

<sup>21</sup> Art Rudick, "On-line Tour Guide to 600 Fabulous Murals," Atlanta Street Art Map, accessed April 29, 2019, <https://streetartmap.org/>.





sets a precedent for arts managers, tourism centers, and public art enthusiasts.

### How can cultural organizations implement digital map tools?

There are practical reasons for arts managers to consider implementing digital map tools in their organizations or cities. For example, they can assist attendees who like to plan ahead glean important information in preparation for their visit. Maps with 3D layouts, image, and audio integration in particular can support audiences' understanding of the organization's available parking, restroom, and if applicable, café locations in advance. This can be especially helpful at large festivals, where attendees can use a digital map app to find need-based services, as well as to navigate widespread exhibitions and moving performances. Internally, they have the potential to be useful for archival purposes, as well as provide an excellent visual tracking system for collections that span multiple institutions.

As seen in the examples discussed, digital maps also help connect humans to a specific place by offering unique opportunities for deeper audience and civic engagement. They provide a platform that arts managers, their staffs, and artists can

use to share about the history of an organization and its evolution - highlighting pieces that particularly speak to the company's mission or relate to the world at large. Additionally, existing digital map technologies can invite audiences to share their personal connections to an institution's spaces and programming. Not only does this serve as a digital engagement tool, but it also provides unique insight into audience experiences and an organization's ties to individual members in a particular community.

#### *Pittsburgh Public Art Walking Tours: A Geospatial Experiment*

Recently, the City of Pittsburgh's Office of Public Art and Civic Design launched a public art map that leverages geospatial data to pinpoint the city's public art and memorial spaces. They utilized Esri's ArcGIS to develop this tool.<sup>22</sup> The Arts Management and Technology Laboratory previously supported research for the Office of Public Art and Design to see how GIS could be utilized to identify the best spaces for future public art projects.<sup>23</sup> Indeed, both entities recognized that public art has the power to contribute to a neighborhood identity, either as a landmark or as a center of activity.<sup>24</sup> While the built tool is an interesting capture of what public art exists, it is limited in the navigation it provides to a

<sup>22</sup>"Public Art Civic Design," City of Pittsburgh, accessed April 29, 2019, <http://pittsburghpa.gov/pa-cd/projects-programs-initiatives.html#map>.

<sup>23</sup>Graciela Kahn, Using Spatial Data to Advance Programming Missions: A Site Desirability Study for

Public Art Projects in the City of Pittsburgh, PA, PDF, Pittsburgh, PA: AMT Lab, 2014.

<sup>24</sup> Ibid.





user both online and mobily. For example, the given information does not clarify the distance between public art pieces, making it difficult to ascertain how they could be viewed as a collective, or glean a deeper understanding of how the spaces communicate with one another.

To deepen the connection between people and place, the Office of Public Art in partnership with the Greater Pittsburgh Arts Council has developed public art walking tours for six neighborhoods throughout the city.<sup>25</sup> Some of these are scheduled guided tours, but in the digital space, self-guided tours are made available through PDF files that provide static maps and detailed information on art pieces. While beautifully designed and detailed, these files are not able to respond to an individual's location and support their navigation of these public art tours, nor are they mobile responsive.

Given that the City of Pittsburgh is thoughtfully working to leverage geospatial information to support engagement with public art, the Arts Management and Technology Lab saw an opportunity to strengthen this work; testing a map for Pittsburgh's Cultural District public art tour offered the opportunity to better respond

to tour participants, as well as test the implementation of a navigational tool for the platform's readers. Google Maps was selected for testing because it was important to maximize reach. This was not related to data collection but instead was tied to user reliability and convenience. The tool for experimenting needed to be mobile – specifically a mobile app that users could access in real time to guide them through a public art walking tour in Downtown Pittsburgh. Mobile app use far exceeds mobile web use both on smartphones and tablets; users spend 87% of their time on mobile apps, versus 13% of the time on the mobile web.<sup>26</sup> Considering this, although as noted previously there are a variety of excellent tools that combine geographic information with art and storytelling, mobile web tools were a less desirable option.

In terms of mobile apps, Google Maps by far has the greatest reach. A 2017 study ranked Google Maps as the fifth most used app amongst users ages 18 years and older, and it was the only digital navigation app ranked within the top ten unique visitors across age groups.<sup>27</sup> Moreover, the app has over 154 million monthly users in the United States,<sup>28</sup> and over a billion active

<sup>25</sup>"How to Tour Public Art in Pittsburgh," Greater Pittsburgh Arts Council, accessed April 29, 2019, <http://www.pittsburghartscouncil.org/public-art/walking-tours>.

<sup>26</sup>The 2017 U.S. Mobile App Report., PPT, COMSCORE, 2017.

<sup>27</sup> Ibid.

<sup>28</sup> "Top U.S. Mapping Apps by Users 2018," Statista, accessed April 29, 2019, <https://www.statista.com/statistics/865413/most-popular-us-mapping-apps-ranked-by-audience/>.



users worldwide.<sup>29</sup> Thus, building a public art walking tour for the Google Map app was the best option given its global popularity and likeliness that a user would be familiar with this tool's functions.

Beyond its reach and high user profile, Google provides features that are ideal for public art tours, providing geographic information and biking, walking, and public transportation directions based on location, and offline capability.<sup>30</sup> Additionally, Google Maps offers an "explore" option that encourages individuals to search for nearby activities, increasing opportunities for place-based connections in a specific area.<sup>31</sup>

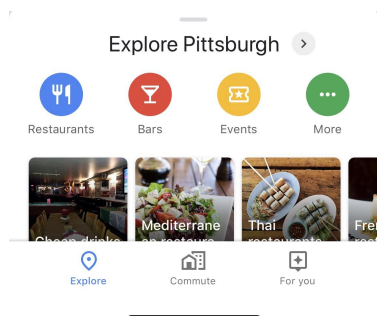


Figure 2. Google Maps' "Explore" Feature Source: Author screen shot

Just as Art Ruddick did with *Streetartmap.org*, My Maps was accessed via a Google email account. Maps were saved and stored on a Google Drive, which is a cloud storage system that allows you to access files and share them with others.

<sup>29</sup> Harold Stark, "Since You Asked, Here's How Google Maps Really Works," *Forbes Magazine*, April 29, 2017, accessed April 29, 2019, <https://www.forbes.com/sites/haroldstark/2017/04/26/since-you-asked-heres-how-google-maps-really-works/#4beac3cf4dbe>.

This experiment revealed that the building process is fairly intuitive, and Google has support pages for those that have difficulty navigating its different features.<sup>32</sup> Essentially, My Maps allows map creators to add up to 10,000 location markers over three different map layers. You can add places to a map layer simply by typing in an address, or GPS coordinates into a search bar in the building tool. For each marker, you are invited to add media, text information, and link to other webpages. In this case, high resolution photos of public art pieces were incorporated along with text from the Office of Public Art's self-guided tour. It is also possible to add your own 360-degree photos or to integrate Google Street View into a custom map.

One of the most important features for this experiment was the ability to include pedestrian directions into the map. This feature increases the user-friendliness of the final product as GPS navigation has become so integrated with daily life. While this is a stand-out feature, unfortunately, only up to ten direction points can be included in a layer. This was a challenge when developing a public art walking tour for the Cultural District, as there are 18 distinct pieces included. The image below shows how the ability to add thousands of

<sup>30</sup> Ibid.

<sup>31</sup> Google Maps Help, accessed April 29, 2019, <https://support.google.com/maps/answer/4610185?co=GENIE.Platform=Desktop&hl=en>.

<sup>32</sup> "My Maps Help," Google, accessed April 29, 2019, <https://support.google.com/mymaps#topic=3188329>.

markers, but only up to ten direction points can be at odds with one another. Red points, which indicate public art pieces, are greater than the number of blue points, which provide sets of walking directions.

Fortunately, in this experiment, the difference was small enough; certain public artworks being close in proximity to each other compensated for the inability to align all points with directions.

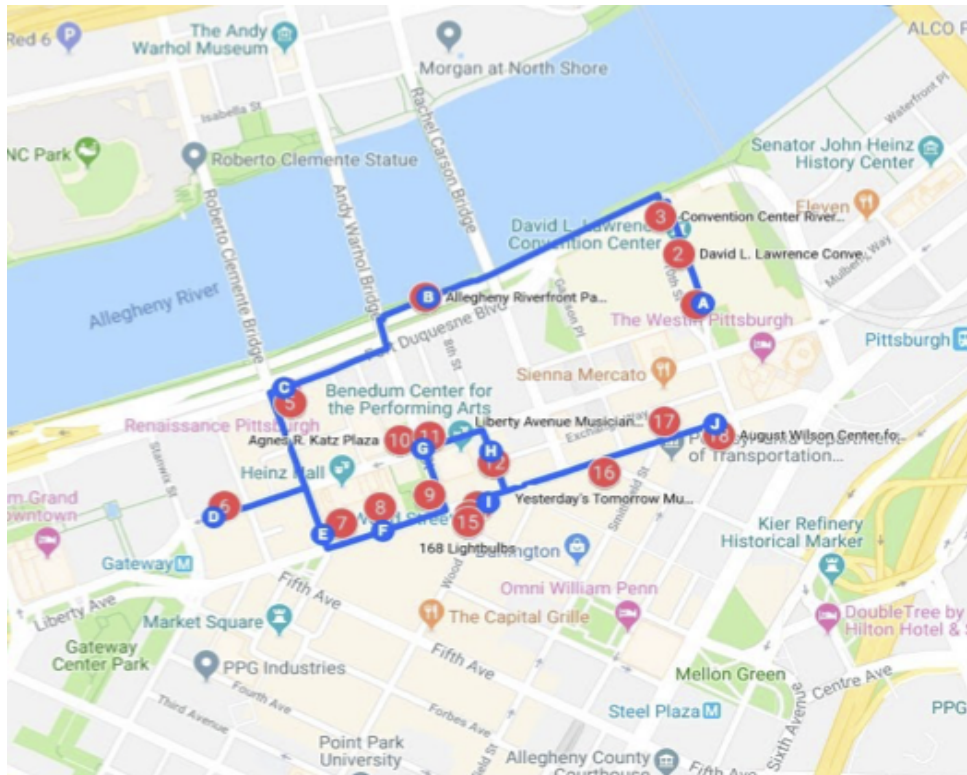


Figure 3. Map Integration, Source: Author Screen Shot

While there are limitations implementing My Maps, as noted above, overall publishing the map and embedding it into a WordPress website was fairly seamless. Different share links and administrative settings are offered via My Maps, so that

who can view and edit your map can be as broad or narrow as needed. Also, the desktop and mobile screens are responsive, and work well when viewing either or both map layers. The images below show the map's desktop versus its mobile view.



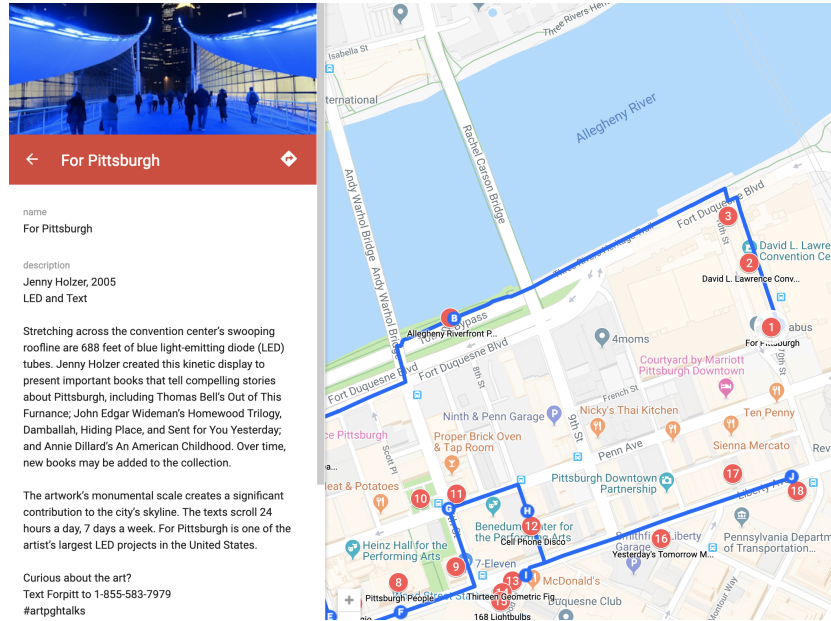


Figure 5. Desktop View of Downtown Pittsburgh Public Art Walking Tour Map, Source: Author Screen Shot

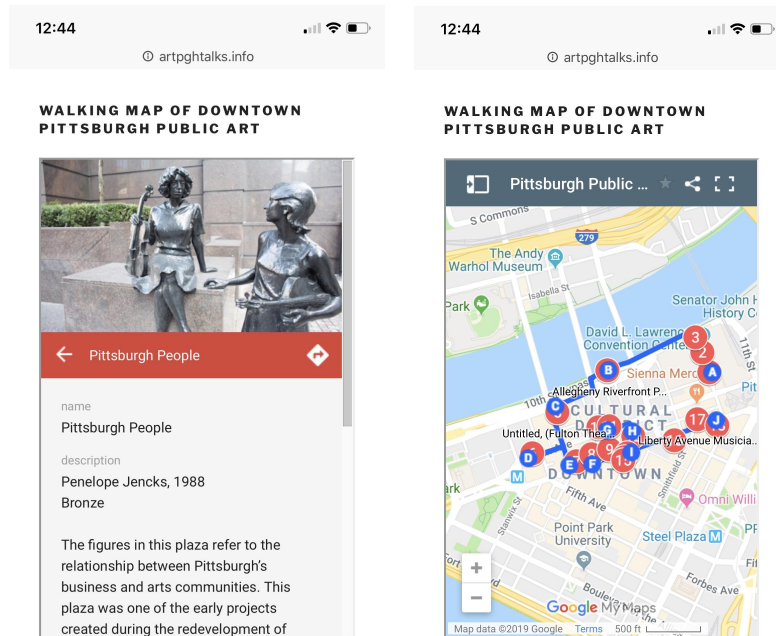


Figure 4. Mobile View of Downtown Pittsburgh Public Art Walking Tour Map, Source: Author Screen Shot

Of concern for managers implementing maps to support public art walking tours is

that the data you receive regarding users in My Maps is limited to views. It is difficult to



gauge how an individual has interacted with a map and for how long, and there is no formal feedback loop through the map itself where a user could advise a person or organization of an issue they are encountering. This limits the creator's ability to make improvements to a map in real time or generally capture what is and is not working well in an outlined tour.

### *Implementing Digital Maps to Convey Organizational Impact*

Importantly, digital map technologies can help organizations galvanize donors by showcasing impact in unique ways. The Sorenson Impact Center, for example, albeit not an arts organization, uses a digital map to display the outcomes of its seed funding.<sup>33</sup> This not only helps the Center convey its recent work, but it encourages other donors to support their projects. Arts organizations with many programs, or a national or global reach may find this especially useful. One such example is the National Oceanic and Atmospheric Administration's (NOAA) use of Esri's Story Maps to highlight successful marine debris removal efforts at the Papahānaumokuākea Marine National Monument.<sup>34</sup> The NOAA integrates high resolution images and structured narrative with a map to share the nuance of their place-based environmental work with the public. It

allows the viewer to contextualize the challenge the organization is addressing, providing multiple viewpoints of the monument to emphasize improvements to the region.

Employing digital map tools to convey donor impact helps consolidate a great deal of information while maintaining the integrity of large datasets through visualization and storytelling. Fundraising professionals are likely familiar with the struggle to do this kind of work when building an annual report that is informative and engaging both in print and digitally. Instead of a static PDF copy of a printed annual report, Rotary International also utilized Esri's Story Maps to develop their 2016-17 annual report.<sup>35</sup> Again, this tool combines images, video, and scroll reveal to create an interactive map that highlights Rotary clubs doing exceptional work across the globe. It is through these offerings that digital maps create a path to civic engagement; the varying interactive opportunities they provide bring individuals closer to the causes that impact their communities, and inspire them to support organizations that make positive, lasting changes.

<sup>33</sup> "Sorenson Impact Center." Accessed December 14, 2018. <https://sorensonimpact.com/>.

<sup>34</sup> "Story Map Tour." Accessed April 8, 2019. <http://noaa.maps.arcgis.com/apps/MapTour/index.html?appid=5be43012cc2a4e7499a9dd38404db041>.

<sup>35</sup> "Annual Report." Accessed April 8, 2019. <https://rotary.maps.arcgis.com/apps/Cascade/index.html?appid=075ac7208b4a4962926c8396435f3c6a>.





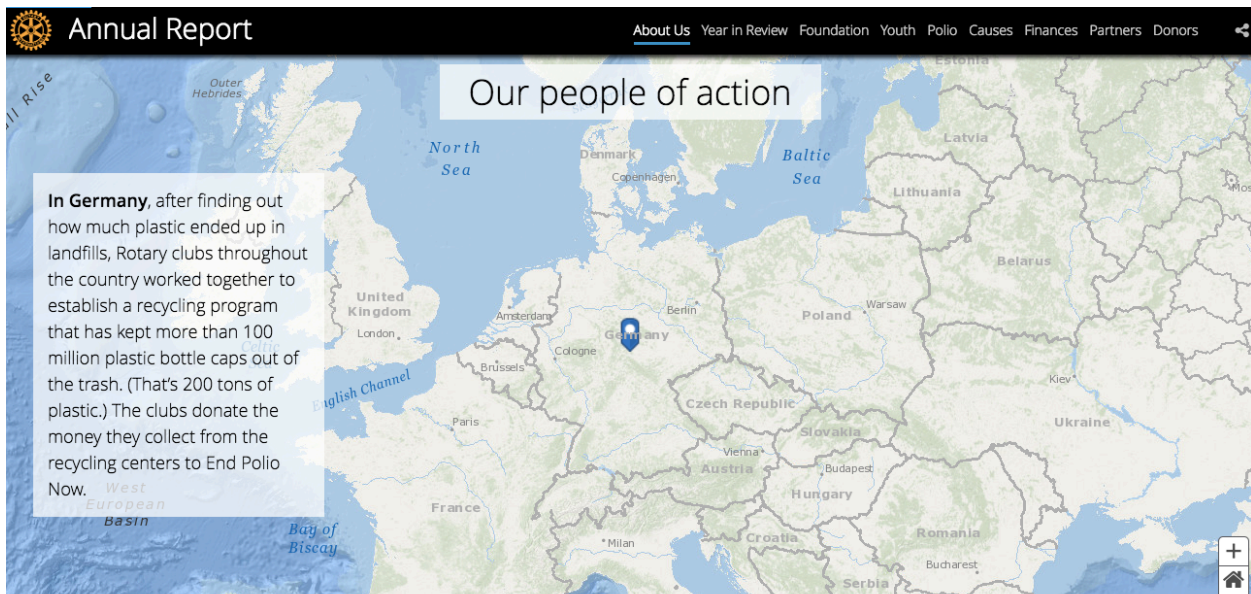


Figure 6. Rotary Club International. Source: "Annual Report." Accessed April 8, 2019. <https://rotary.maps.arcgis.com/apps/Cascade/index.html?appid=075ac7208b4a4962926c8396435f3c6a>.

The existing mobile apps and web platforms that utilize digital maps to document and provide information on arts and culture are plentiful and provide exciting opportunities for arts managers to inspire audiences and inform stakeholders. If deciding to use a digital map, arts managers need to determine whether online or mobile application platforms best align with their organization's capacity, as well as any budgetary restrictions they may have. Successful implementation of digital map tools is dependent on the identification of a

clear purpose for said map: Is it to tell a specific story? Is it to give insight into artistic or historical processes? Either way, key to all of this is the consideration of how arts institutions can connect people to places. By embracing the role that the cultural sector plays in civic engagement, digital map tools can truly advance the field's ability to reach audiences and convey impact.

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