

PERSPECTIVES

DIVERSITY AND DIGITAL HUMANITIES: A CONVERSATION WITH DONNA GRAVES AND GAIL DUBROW

PER editor Greg Donofrio reached out to Donna Graves and Gail Dubrow to talk about how the digital humanities complicates and enriches their work with marginalized communities. Frequent collaborators and long-time colleagues, Graves and Dubrow met when they were students at UCLA working with Dolores Hayden on the *Power of Place* project in the 1980s. Working individually and as collaborators, both seek to advance social justice by engaging communities in discussions about history and place.

DONOFRIO: Throughout your careers in historic preservation and public history you have collaborated with LGBTQ communities, Asian Pacific Islanders, and other individuals and groups whose experiences, voices, and histories have been marginalized. What motivates your work?

GRAVES: The guiding purpose, and the guiding questions for nearly all of my projects, is whose stories can be told here? Who will hear them and how might this make change? There's an underlying activist's purpose to what I do. The change element is important whether it's just expanding somebody's perspective on attachment to place or seeing commonalities or differences with other people's attachment to place. Right now the past looks so divisive given the political moment we're in and the really heated debates about the past as heritage. But, I also see the past as an often fertile field that can offer possibilities for bringing people closer together across time and space as they think about how they and others are connected to a place. It sounds very simple but that is one of the reasons I do this work.

DUBROW: I agree and would add that social justice can be advanced through cultural work that's about reconciliation, that's place-based, with diverse groups that do not always agree about the past but who have a stake in some

shared places; they may have different stakes. Some may own it. Some may have been renters or dispossessed, but there's work to be done around racial and other forms of justice and reconciliation.

DONOFRIO: How has digital technology factored into these projects, or how has your thinking about digital tools and methods changed over time?

DUBROW: I don't know that I would've thought the words "digital technology" would ever be inserted into this conversation for me because Donna and I came out of a community planning program at UCLA where issues of community engagement and planning weren't very mediated. We would get people to a meeting at the planning phase, but I'm not necessarily even sure that it was really about contested spaces. We were asking questions about who owns this place and whose history does it represent. It was more just trying to get planning projects out in a more democratic way. Now, there's this digital world, and opportunities, and set of technologies that I couldn't have envisioned that we'd be grappling with today.

GRAVES: Yeah, of course we couldn't. I think for me it was the Arab Spring, seeing how Twitter was shaping enormous social changes in place and culture and politics.

DUBROW: Yes, it spread like wildfire.

GRAVES: It was a turning point for me, not consciously, but when I look back, I recognized the democratic potential of digital technology. But we're in a particular political moment where the democratic potential looks very different than it did even then. I'm greatly concerned about accessibility, which you can on some levels equate with aspects of democratic character. It's a real problem, and when I talk about my own projects that's sort of the nut of where the limitations are for me using the digital

tools; it's about accessibility and therefore prospects for broader community engagement.

DONOFRIO: This is an important point. Please say more about the potential limitations and liabilities of using digital tools and methods in the context of your work with communities.

GRAVES: Okay. I've been part of a grassroots group called Asian and Pacific Islander Americans in Historic Preservation which had been focused on bringing people together from Japanese American, Chinese American, Filipino, Southeast Asian, Thai, and Korean American communities who were interested in heritage and historic preservation.¹ For quite a while we just organized gatherings at a very grassroots level. We had no funding really. Those generated so much excitement that when the National Park Service announced that it was going to do a national theme study on Asian Americans and Pacific Islanders, I felt that it was the right moment to figure out how to harness a digital strategy for bringing some of these community voices that we had gathered together at these biennial conferences to share their knowledge with the park service, which tended to have a more top-down, academic way of crafting a theme study.

But, the labor it takes to communicate a project to a potentially interested set of people, get them excited, and engaged and contributing is enormous, and now I look back and I think, "God, the right thing to do would've been to raise a bunch of money so that we could do lots and lots of workshops in places like community churches where there would be elders and young people—you have the people in the room who understand digital and you have the people with the stories and you tease them out."

DUBROW: You're pairing them in a way that enables the sharing and teaching of different skills.

GRAVES: Exactly. We didn't have financial resources. So we tried, through the network we built through Asian and Pacific Islander Americans in Historic Preservation, to bring digital tools to our audiences that we had built up through several conferences, but there seemed to be a barrier to people actually scanning a photo and putting it in the system and writing up a story.

DUBROW: It's not an ordinary, everyday activity. At least, it isn't for elders.

GRAVES: Exactly.

DUBROW: It might be something that's done once in a generation, in a family. Every family needs it, wants it in terms of digitizing their own resources. We need access to the parts of private collections that are utterly about a family's relation to community and society and place. For different and the same reasons, there's an intersection of need, but we haven't figured out the format for that.

This dialectic, or tension, between family history and personal property that is also shared community memory is critical, and there's also a strategy of professionalizing that role. If you think about the Shoah or the Densho project, both of them are intervening at the level of duplicating family property, memories, everything else while also returning them to families so that they have digitized versions of them.² There's just something in that model where you're meeting more than one need that, I don't know, seems very positive.

GRAVES: Now big data is a field that people are really starting to think about mining in new ways. I think it has potential for the kind of fine-grained, interpretive project we'd like to do, whether it's personal or family or neighborhood level. I salivate sometimes when I look at the incredible collections of oral histories or photos that are being digitized and put online, like the Colombian National Library created with Historypin.³

Or this amazing British project I just stumbled on called the Mass Observation Archive.⁴ They've been taking individual narrative histories of everyday people in Great Britain since the 1930s. They describe it as "creating an anthropology of ourselves" and these mass observation documents are now housed at a library. They're handwritten. If you could digitize that and make it searchable, what amazing longitudinal insights you might have about communities and even specific places within communities that just seem so potentially rich.

DUBROW: I think there is a lot of benefit in taking all the huge volume of work that's been done to date and just making it accessible in a digital age. I think there must have been hundreds and hundreds of oral histories done during the period in which redress money was available in Japanese American communities. There's an immense quantity of important work that should be brought into the digital sphere alongside newly designed projects to meet our

goal of interpreting places. I find the problem dating back to twenty years of community history projects done by others, where place was never at the top of the agenda in many oral histories, so even tagging that content matters to me.

GRAVES: Then when we imagine the possibilities for digital media and tools to connect people to places they might not have even imagined they could have connections to or a curiosity about, I think it's so inspiring and refreshing. But there's also something frightening about social media that must be acknowledged here.

DUBROW: Absolutely. This is the most interesting part. I wanted to just give you an example from a conversation earlier today about some of the things we have to think about. My new research assistant is an Islamicist but she's working on Japanese American things with me so she brings that comparative perspective. For one of her new assignments in our graduate program, she said her first instinct would've been to say, "Oh, I want to go survey all the mosques in Minneapolis," and, because she's learning digital technologies and thinking about their power for public history, her second instinct was to create a website like an online tour, and then her third thought was, "And now I have provided racists a map."

GRAVES: Yeah. Wow.

DUBROW: It's no different probably on ten different levels to think about some of what we have to consider in these times and probably have always had to consider in terms of what ways we make knowledge available and how we connect but also how we protect and all of that.

GRAVES: Right, right. Connect and protect. Nice.

DUBROW: It's complicated. It's not simple in terms of the liberatory potential and the risks and dangers inherent in any media.

GRAVES: Yeah. There's a quantum difference between what she might have done fifteen years ago, which is say, "Let's do a bus tour or a walking tour. We'll gather people together to go see and stop at these places."

DUBROW: Actually, we'd probably have passed by them without even going inside.

GRAVES: Right, either way. That would've had a particular way of reaching out to interested parties that might have included some people with bad intentions

but, the difference now is that if you put it online, it's not even a factor of ten. It's a factor of 100,000, hundreds of thousands

DUBROW: It's just very sobering. I've been engaged in ethical conversations about the relationships between our professional organizations and community engagement, say when the Society of Architectural Historians or Vernacular Architecture Forum tour certain places: what's our relationship to the communities that we engage with and that you and I are engaged with in this ongoing conversation because we're trying to make sense of it. How do digital technologies and spaces enrich or complicate this conversation at the intersection of community engagement, politics, and place?

GRAVES: It's making me think about native communities' dedication to protecting the knowledge about what places are important and sacred and not making them accessible to a broader public. It's kind of the opposite end of putting it all out there in digital space.

DUBROW: You expressed some, not regret, I didn't see it that way, but adjustment of your ambitions and reflectiveness about the difference between engaging communities and collecting their histories versus engaging communities and, in a sense, curating and presenting their histories online, like having stewardship responsibilities associated with that.

GRAVES: Yes, I am concerned about how difficult it is to create a real shared authority online outside of places like Facebook where so many people feel comfortable to contribute. But in creating any new project that has a broad physical scope, say the national scope of the East at Main Street API project or the statewide scope of California Pride looking at LGBTQ historic places, I guess I hadn't really understood that it was still going to take so much of the face-to-face community engagement to make it happen and I had not gathered the resources to support that.

DUBROW: Even then, you don't know the answer to whether that was sustainable anyway. It's not that you failed to see that or do it. It's that it's unknown whether it's even possible in a democratic, engaged way across different demographics even in one community, Japanese American. We don't know the answer to that, but I think there's something we're getting to here which is about what are "native digital languages" for the communities

we seek to engage? And, what are the hopes for them learning some other technology that's related but maybe geographically oriented so that they're pinning, or mapping, or sorting, or anything else? Who is going to own that and maintain that? I don't know. I noticed, and I don't know if you see this, but it often requires an institutional host that has vast resources—some museums, Fill-in-the-Blank Library, or some other institutions. Ultimately, there is that added layer of pragmatic needs for sustainability in terms of managing, maintaining, moderating, and updating any sites. Then, then there is this other related component of our hopes for more democratic engagement.

GAIL DUBROW

Gail Dubrow is professor of architecture; landscape architecture; public affairs and planning; and history at the University of Minnesota, where she served as vice provost and dean of the Graduate School from 2005 to 2009. She previously was a member of the University of Washington faculty from 1989 to 2005, where she was active in Seattle's preservation, public art, and urban design communities.

Dubrow earned a Bachelor of Architecture, BA, and MA in English from the University of Oregon, and a PhD in Urban Planning from UCLA in 1991. She was honored with a Distinguished Alumni Award from Oregon's School of Architecture and Allied Arts in 2015. Her research on places significant in the history of under-represented groups has been the basis for new National Historic Landmark designations.

She is the author of two prize-winning books, *Sento at Sixth and Main*, with Donna Graves, and *Restoring Women's History Through Historic Preservation*, coedited with Jennifer Goodman, and is a recent contributor to National Park Service Theme Studies on LGBTQ Americans and Asian American and Pacific Islander Heritage. She is currently writing *Japonisme Revisited*, which reimagines the craze for all things Japanese from the standpoint of Japanese immigrants who worked as gardeners, landscape designers, carpenters and architects in America.

Her recent research has been supported by the American Council of Learned Societies, the Huntington Library, and a Grant-in-Aid from the University of Minnesota. She currently holds an extended Senior

Fellowship from the Smithsonian Institution's National Museum of American History.

DONNA GRAVES

Donna Graves is an independent historian/urban planner based in Berkeley, CA. She develops interdisciplinary public history projects that emphasize social equity and sense of place. Her involvement in projects that weave together local histories, preservation, art and community participation began with her tenure as executive director of The Power of Place at UCLA, where she met Gail Dubrow. Graves holds an MA in Urban Planning from UCLA and an MA in American Civilization from Brown University. She has published and lectured widely and taught about interdisciplinary approaches to developing public history projects and new ways of thinking about cultural heritage conservation. Recognition for Graves' work include the Vernacular Architecture Forum's first Advocacy Award, the National Park Service's Home Front Award, and California Governor's Award for Historic Preservation. In 2009-2010 Graves was a Loeb Fellow at Harvard University's Graduate School of Design.

ENDNOTES

1. Asian & Pacific Islander Americans in Historic Preservation, accessed February 27, 2018. <https://www.apiahip.org/apia-mapping>; and California Pride, accessed February 27, 2018. <https://www.historypin.org/california-pride/>.
2. USC Shoah Foundation, accessed February 28, 2018. <https://sfi.usc.edu/>; and Densho, accessed February 28, 2018. <https://densho.org/>.
3. Comparte Tu Rollo, Historypin, accessed December 15, 2017. <https://www.historypin.org/en/comparte-tu-rollo/geo/4.710989,-74.072092,4>.
4. Mass Observation Archive, accessed February 27, 2018. <http://www.massobs.org.uk/>.

COMPUTER GAMES, HERITAGE, AND PRESERVATION

The video game industry is a profitable one. Juniper Research predicted that worldwide it would pass \$100 billion in revenue in 2017 (Graham 2017). In recent years, there has been increasing synergies between video games and virtual reality, thanks to increasingly powerful computers and the development of consumer-priced head-mounted displays (HMDs), see-through augmented reality HMDs (such as the Microsoft HoloLens or Meta's Meta 2), and smartphone-based augmented reality systems. Virtual heritage (sometimes defined as the application of virtual reality to cultural heritage), has been an academic field of research for at least twenty years (Addison 2001). In archaeology there have been recent investigations of "archaeogaming," defined as "the archaeology in and of video games" (Aycock and Reinhard 2017), while virtual heritage designers are moving away from photo-realism as their principal goal, towards the potential of interpretation and conceptual learning (Roussou 2005).

Here games have relevance: they are engaging challenges and thematically constrained, and in more advanced versions, the player is constantly challenged by increasing difficulty in order to keep them engaged. In playing games, and trying to overcome their challenges, players actually learn through failure. Games offer up the possibility of temporary or permanent tactical resolution without harmful outcomes to the real-world situation of the participant. Using appropriate cues and affordances, they can suggest ways to behave; more advanced ones allow a range of strategies and solutions, and provide meaningful related feedback. Some, such as the free online game *America's Army* (Bailey 2009), could also be viewed or used as training environments.

Serious games (educational games) are increasingly deployed in heritage visualization displays (John et al. 2017), virtual heritage (Stone 2005), and digital archaeology showcases (Malegiannaki and Daradoumis 2017). Yet despite the many virtual heritage conferences and related

funded projects (sometimes called 3D digital heritage), there are few existing examples of accessible virtual heritage models and related assets (Champion 2016), and few have been adopted into training programs.

There is relatively little written so far on exactly how game-style interaction can help improve virtual learning environments for heritage and history, and few academic publications clearly explain their learning goals and how interaction helped the participants understand and reflect (Angeletaki, Carrozzino, and Johansen 2013). Games must be carefully calibrated to their audience: older players may feel threatened by complex technology (Leader-Elliott 2005); younger participants (and dedicated computer gamers) may enjoy performing tasks without taking the time or having the inclination to critically reflect on why the content was created.

Undoubtedly there are technical issues—in processing speed, lighting, avatar design, peripheries, networking, and software and hardware incompatibilities. Computer games often contain many bugs, and they are highly complex combinations of code, hardware, and user choice. But even more problematic than the performance and stability of the technology are problems preserving games about heritage (virtual reality and augmented reality software and hardware have similar issues). How do we preserve and integrate 3D multimedia when new media is constantly changing? Who controls access and the ownership of models, sites, and paradata? Because of the ever-changing technology that results in quickly obsolete or unplayable content, we lack guidelines, shared procedures, or standardized evaluation data.

There are computer game preservation projects, such as the Olive Executable Archive (<https://olivearchive.org>), "for long-term preservation of software, games, and other executable content," and other initiatives at Stanford and elsewhere (Parkin 2015). There are also retrogame archaeology investigations (Aycock 2016; Aycock

and Reinhard 2017) and even board games that attempt to explain computer security using game interaction (Aycock 2017). Of more interest to heritage professionals might be the DigCurV CURATE, a board game that teaches the principles of curation (Badzmierowska, Garnett, and Schreibman 2013). A similar game could be designed to teach general heritage skills or develop awareness of heritage issues. Board games are useful prototyping tools: they typically concentrate on interaction between players and game mechanics (rather than design).

There are also projects to develop extensible digital asset frameworks that can scale and be more easily preserved. UCLA VSim (<https://idre.ucla.edu/research/active-research/vsim>) aims to store models and text-based archaeological narratives, in the form of spatially aware links with linear narrative or annotations, packaging all this data and media together. European researchers have developed a Cultural Heritage Markup Language (CHML) based on HTML and CIDOC CRM (Kuroczyński, Hauck, and Dworak 2014). In Italy the CINECA consortium has been developing a way of sharing and teaching 3D digital assets and interactive scripts for digital heritage using the free Blender 3D modeling and gaming software (Guidazzoli et al. 2016). There are related but less game-oriented projects to develop online 3D presenters for heritage content, such as 3DHOP heritage presenter (3dHOP, n.d.), and there are international consortiums formed to produce 3D digitalized heritage content of UNESCO heritage sites (<http://3dicons-project.eu/>). The online Europeana portal is also developing a collection of 3D heritage models (Ubik and Kubišta 2017).

What is required, however, is better access and shareability, more exemplars, and concerted collaborative work on developing shared creation tools, workflows, tutorials, and standard formats and interactive schemas. There need to be greater incentives for content developers and owners to share some level of access or information about the resolution quality of their models and related data. Modular assets that can be streamed into the game would also allow ongoing maintenance, editing, and updating.

However, these technical developments will not be effective if games and related interactive virtual environments are not employed for their strengths. Games are effective learning environments, but for learning the game itself, not necessarily for heritage purposes. Where games and heritage objectives may overlap is in the area

of process. Heritage involves processing, discovering, interpreting, recovering, reassembling, contesting, protecting, and communicating. Gameplay is also a process: the participant learns by playing, by doing, by trying out different options and strategies. The challenge is to design playful heritage games that support engaged and situated learning, interpreting, reflecting, caring, and collaborating, and it is a challenge worth pursuing.

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THE TOUR AS TECHNOLOGY: DIGITAL APPROACHES TO LOCATION-BASED STORYTELLING

In recent years the John Nicholas Brown Center for Public Humanities and Cultural Heritage (JNBC) at Brown University has committed significant resources to highly collaborative, location-based digital storytelling initiatives. In addition to offering courses in Digital Public Humanities and Digital Storytelling as part of our Public Humanities MA program and certificate, we have developed partnerships with local cultural heritage organizations to work on projects that might benefit preservationists and educators with comparatively limited technical resources and digital expertise. In September 2015, JNBC convened *The New Tour: Innovations in Place-Based Storytelling*, a two-day conference that highlighted various uses of technology in contemporary approaches to the now-traditional cultural heritage practice of the tour. Technology has long loomed large in the history of the tour: as the *New Tour* conference web site reminds us, "mass-produced travel guides" materialized to keep up with interest and demand created by "the expansion of railroad and steamship lines" (JNBC 2015). But what is "new" about the tour in the twenty-first century?

The possibilities of location-based storytelling in preservation education initiatives have been magnified but also complicated by recent developments in this long history of technological innovation. Even if a museum, gallery, tour guide, or historic house has not developed a digital initiative, technology inevitably shapes and informs the experiences of their audiences in explicit and implicit ways. Visitors with mobile devices like smartphones and

tablets are variously mapping, critiquing, documenting, and transforming their relationship to these spaces, the experiences of other visitors, and, inevitably, the spaces themselves. At times these uses of technology may seem to disrupt or overshadow the narratives favored by an institution, as we saw with the outcry over the transformation of certain cultural heritage sites into virtual gyms via the augmented reality game *Pokémon Go*. But preservationists who are skeptical or otherwise critical of the uses of digital tools, platforms, and other resources in the context of their work must also acknowledge that, for many of the publics they serve, their approaches to curation and education will always be mediated by the conditions of augmented reality, thanks in large part to the ubiquity of smart phone devices networked to various digital spaces and resources (and games).

Opportunities and challenges await preservationists and educators who wish to embrace the conditions of augmented reality in location-based storytelling. While they're often not at the scale of productions like *Pokémon Go*, digital humanities projects institutionally housed at universities or academic libraries often have access to resources like digital expertise, labor resources, online storage space, and money that many culture practitioners at historic houses, small museums, or community organizations do not possess. Community partnerships and collaborations with digital humanities practitioners invested in public humanities projects and methodologies are recommended, though even within these contexts it's

useful to remember that “understanding audiences is not a skill most humanities scholars are taught in graduate school” (Brennan 2016). While faculty members, graduate students, or university digital humanities librarians bring important skill sets and areas of technical expertise to projects, it is equally important to find collaborators who value the perspectives, methodologies, and specialized knowledge of preservation specialists and practitioners.

When considering the ideal form that location-based storytelling might take on a particular project, it’s important to think about where and how current audiences use, inhabit, and value digital spaces and contexts: knowing, for example, what kinds of apps or social media networks they regularly use (and which ones they might avoid or be unfamiliar with) is essential knowledge about audiences that may determine the devices, interfaces, and networks a digital preservation project might productively utilize. While effective engagement with new audience is often a promise made by digital advocates, it is important to keep in mind the impact digital initiatives might have on communities who already support your preservation work. What are audience expectations with regard to availability of free Wi-Fi, the use of phone data to access digital materials, engagement with multimedia like audio or video content vs. text or static images (among other factors)? Digital contexts often tempt novice practitioners with the potential to create and add more and more content: do your audiences share this desire for additional context at the scale you’re imagining, or in the formats you’ve adopted? Successful augmented reality projects work to enhance, illuminate, and re-frame your objects, tours, and resources; less successful projects may distract from or obscure the material, histories, stories, and pedagogical aims that drew you to the digital in the first place.

JNBC’s Digital Tours of the Nightingale-Brown House focuses on five rooms in the Brown family home, a space that now functions as the institutional residence of our public humanities program. Designed for on-site visitors to 357 Benefit Street as well as for remote “tourists” interested in virtually exploring the space, the project guides users through a material history of the Brown family’s tenure in the space over several familial generations. High-resolution images of each room and its objects were created by Providence photographer Jesse Banks III and then annotated by students in Neatline, an exhibit-building plugin that allows users of the Omeka content

management system to tell stories that highlight particular spatial and temporal dimensions. On-site visitors to the house can use tablets (provided by the JNBC) or their own mobile devices to learn more about the significance of paintings, wallpaper, furniture, and other objects. While House Curator Ron Potvin can recount these histories on directed tours with guests (and continues to do so), the digital tour encourages self-guided investigations of the space and enables a greater frequency of physical and digital visitors. The project is also an effort to model and document the abilities of open source and inexpensive digital tools like Omeka and Neatline, an attempt to evaluate how these resources compare to more expensive alternatives in terms of the ways they address user experiences and audience expectations in digital spaces.

I’ve worked with Neatline in the past on collaborative digital projects that have annotated material embedded on cultural objects (Rehm-Daly and McGrath 2014) and to tour interior spaces in historic sites (Gleason, Gordon et al 2014-15). Digital Tours of the Nightingale-Brown House builds on these efforts with particular attention to the affordances and challenges of remediating the mechanics and structures of object-oriented house preservation methodologies. The current configuration of the house’s rooms and objects are adhered to in the digital tour, preserving the structure and aims of Potvin’s curation of the physical space and valuing the preservationist labor that previously went into the construction of his stories about the house. The curatorial hands behind the arrangements of the home’s rooms become more visible in a way, with student-authored annotations reminding virtual and non-virtual visitors that a historic house is a mediated site, an idea of order illustrating particular stories and histories of its residents and affiliates. Augmented reality tours might also propose new ideas of order, or even productively critique and unravel the threads holding together and privileging certain histories.

Augmented reality can also be used to restore and re-materialize histories lost to gentrification, urban development, and other events impacting a region’s material, social, and cultural dimensions over the passage of time. Rhode Tour is a free app providing location-based tours of historical places of interest in Rhode Island, digital guides that map places of interest and provide annotations and multimodal resources to tell stories about the long history of the Ocean State. A collaboration

between the JNBC, the Rhode Island Council for the Humanities, and the Rhode Island Historical Society, Rhode Tour currently features over a dozen narratives authored and compiled by graduate students, local historians, and other community partners. Rhode Tour utilizes Curatescape, a customization of Omeka developed by Cleveland State University's Center for Public History and Digital Humanities. Curatescape enables Rhode Tour to publish content by a range of community stakeholders, to map their stories to particular locations, and to augment textual narratives with multimedia resources that illustrate what has changed over time.

In a Providence Journal review of Rhode Tour, a user noted that "The app's cool" and that it was "probably still developing" (Bramson 2017). Certain practitioners may be troubled by the association with this project with "in progress" or even incomplete work. But Wendy Hsu argues that "we should think of public humanities work as a process, not a product, and [. . .] we should do more to include the public at earlier phases of our work" (2016). Collaborations with various publics and practitioners reveals the range of stories residing in our objects and edifices; distributing these stories in free and accessible ways may also invite users to reflect and hopefully even share their own stories through digital means. All of these projects confirm the value of an iterative and experimental approach to location-based storytelling. This is especially the case if it is an author's first time working with any of the new technologies that are reshaping how we experience and learn about important places.

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USING MOBILE TECHNOLOGY TOOLS TO CONDUCT CULTURAL RESOURCE SURVEYS

Like a census, a cultural resource inventory delivers a snapshot of the universe of cultural resources in any given area. The accuracy and completeness of the inventory determines its utility. Applications like a geographic information system (GIS) provide access to this data, ways to visualize trends, and tools to analyze, leading to better decision making and resource management. Importantly, the value of any analysis depends entirely on the quality of the underlying inventory data.

Typically, these critical inventories are created at state and local levels and conducted to meet state and federal laws, such as the National Historic Preservation Act (NHPA). State and local jurisdictions often lack the funding, staff and tools to complete the required surveys in a timely manner however. Informative and accurate surveys require significant hours of field data collection, often using paper forms because of the lack of digital tools. Transferring data from the paper forms into state or local inventories databases then takes additional time. Budget restrictions and minimal staffing make it difficult for cultural resource professionals to carry out these surveys, particularly in large areas containing many resources. Several jurisdictions have developed proprietary survey software for their individual needs, but a standardized model to enable data collection and sharing among agencies at local, state, and federal levels has not been created.

THE CITY OF ALEXANDRIA'S SOLUTION

With the availability of GIS and mobile devices, the City of Alexandria, Virginia, saw an opportunity to streamline the survey workflow and create a new system with the intention to provide agencies a tool for sharing information quickly with each other and the public. The project's main objectives were to use technological

tools to develop a survey methodology that reduces field time and harnesses volunteer participation to gather data, rather than relying on their limited staff.

Alexandria's Old and Historic District is the third-oldest locally designated district in the country. Included within its boundaries are the Alexandria National Historic Landmark District and the Alexandria National Register District, which contain one of the largest collections of late eighteenth- and early nineteenth-century structures in the country. However, the City's preservation staff lacked the inventory documentation for most of the resources that they must manage. Alexandria then made a good location to test a mobile survey application designed to generate an architectural resources database linked to the City's existing websites. The tool, referred to as "CRSurveyor," would integrate with the City's GIS and permitting systems, in addition to sharing information with state and federal agencies.

ENABLING DATA SHARING AND BUILDING A MOBILE SURVEY APPLICATION

This spatially-enabled, mobile, tablet-based survey strategy was developed through a partnership between the City of Alexandria and the National Park Service (NPS) Cultural Resources GIS Facility (CRGIS) and its Certified Local Government programs. Using funds from the Certified Local Government program and spatial data standards created by CRGIS, Alexandria built a portable and user-friendly survey tool to assist with their own city planning and provide valuable information for state and federal inventories.

The NPS cultural resource spatial data transfer standards, along with typical digital survey strategies, were based on CRGIS's previous field experiences, including disaster responses. Following Hurricane Katrina in 2005, the Federal Emergency Management

Agency asked CRGIS to develop a digital methodology to help them comply with their NHPA inventory and assessment requirements. Katrina highlighted deficiencies in existing state, local and federal inventories, in addition to survey methods and response strategies, as well as data-sharing capabilities. CRGIS created a strategy to identify and evaluate hurricane damaged properties locating them using GPS, as well as to provide a means to determine the historic integrity and significance of each property through GIS. Incorporating cultural resource spatial data standards imposed structure on the data, enabling the exchange of cultural resource data to the appropriate entities throughout the disaster recovery phase.

The data standards and database template produced and refined as a result of the Katrina response, are now in use throughout the NPS, aiding data sharing between NPS cultural resources databases. The Alexandria and NPS staff believe that this template serves as a good foundation for a cultural resource field collector application. Twelve years after Katrina, the basic survey methodology and standards remain relevant, but the GIS tools have greatly improved, opening new possibilities.

To fund the initial development of the CRSurveyor, Alexandria obtained Certified Local Government grants from the Virginia State Historic Preservation Office; ESRI, a GIS software company; Historic Alexandria Foundation; and the Office of Historic Alexandria. Alexandria then teamed with the National Alliance of Preservation Commissions and a consultant, GISinc, to develop a prototype, using the CRGIS standards and database template as a foundation. The application is a web-based architectural survey form, installed on tablet PCs. The database and application contain fields that satisfy both intensive and reconnaissance-level field surveys, along with National Register and National Historic Landmark survey form requirements.

Using this spatially enabled tool, surveyors select a building on the map and answer questions organized around standard architectural-survey practice, using custom forms with easy-to-use menus. As the surveyor saves the data collected, the building footprint changes color, and a central survey database accessible by other surveyors and staff in the office is updated via Wi-Fi. Surveyors also use the tablet to take photographs of the resource to attach to the descriptive information.

Once the field data is transferred back to the central server, preservation staff examine the data for accuracy and completeness, comparing the descriptive information to the photos. Once accepted, the data is incorporated into the final live GIS database for the City, updating, correcting, and adding to the inventory.

THE FUTURE OF THE CRSURVEYOR TOOL

During the summer of 2014, Alexandria preservation staff and volunteers surveyed more than four hundred buildings to test the prototype. City staff received positive feedback and continue to refine the application. For the NPS, the goal is to create a standards-based, spatially-enabled, mobile survey tool that can be adapted to other jurisdictions, resource types, and circumstances. Ultimately, the code behind the application will be made available without any initial cost to download the application code, allowing jurisdictions to spend their funds on customizing rather than recreating the survey tool.

Currently, the National Alliance of Preservation Commissions and the NPS are working to expand the application. Features under development include an offline function to allow users to be disconnected from Wi-Fi and cellular signals during surveying as well as a disaster response form for quick damage assessment. Later phases will enhance the tool for use with other cultural resource types (archaeological sites, landscapes, etc.) and to allow geographic data editing in the field.

CRSurveyor's structure provides flexibility. Smaller organizations can use the application on a tablet PC and upload the data to the cloud, while larger municipalities, with GIS staff, can host it on their local servers, using more sophisticated GIS server technology to manage the GIS database. Because the tool is intuitive, volunteers and students can quickly be incorporated into any surveying process. Further, any danger of unintentionally releasing incorrect information, as with other crowdsourced collection tools, is avoided by assuring quality controls are imposed at the intermediate data transfer stage, before data is released.

As new partners come on board, helping to fund the development of new components, all modules will ultimately be made available to any historic preservation organization. The timeline for completion of further stages hinges on the partners involved

and their priorities. Each new component takes approximately one year to develop, depending on its technical complexity and the mechanics of integrating new functions into the application as a whole. The NPS hopes that the success of the application around the country will lead to better inventories as well as better data management and decision making.

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