

Tow Center for Digital
Journalism
A Tow/Knight Report

YOU ARE HERE

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WITH

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—Sarah Grant, Amelia Marzec, Susan McGregor, Dan Phiffer & Benjamin Walker / August, 2017

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Introduction

On an early Sunday afternoon in late October of 2012, mobile phones across New York began sounding the harsh, electronic bleat of the city's emergency warning system, signaling the imminent arrival of Hurricane Sandy. Over the next few days, large swathes of the city would flood, isolating residents unable or unwilling to evacuate. Flooding also took out power and telecommunications in whole neighborhoods, leaving residents without access to basic news and emergency updates. Compounding these challenges, data centers in Manhattan were also hard-hit, taking news organizations like BuzzFeed and Gawker offline.⁶

In the aftermath of the storm, downed internet connections left aid workers and government officials struggling to gather information and coordinate efforts.^{7 8} Yet Sandy's impact on connectivity wasn't entirely unprecedented: 2005's Hurricane Katrina took out seventy percent of the cell towers in New Orleans.⁹ In the intervening years, however, more than one-third of American households became "wireless-only."^{10 11} By mid-2017, the Center for Disease Control found that just over half of all American households were wireless-only.¹² While the vast majority of Americans still own and listen to AM/FM radio broadcasts,¹³ most news outlets do not have access to the airwaves. For many media organizations, this means that when the internet goes out, their publishing stops cold.

While large swathes of Brooklyn remained disconnected in the days and weeks following Hurricane Sandy, there was one neighborhood that stayed online: The Red Hook Housing Project, located between the Brooklyn-Queens Expressway and the waters of the Red Hook Channel in north-west Brooklyn, was home to an existing "mesh networking" project started by the Red Hook Initiative (RHI) in 2011.¹⁴

The concept behind RHI's efforts was simple: By tethering a wireless router to a single working internet connection and then interconnecting it to other wireless routers in a "mesh," a single broadband connection could provide wireless internet access across an entire neighborhood. After Sandy, RHI used a landline connection from Brooklyn Fiber to provide connectivity to the existing routers it had set up on the tops of buildings in the area. While the network provided much-needed internet access in the weeks and months after the storm, RHI affiliate Georgia Bullen points out that in many cases the internet connectivity is not necessarily the most crucial

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aspect of these wireless hotspots. "A lot of what you need doesn't change that often," says Bullen, now technology projects director at New America Foundation's Open Technology Institute. Reference content, such as maps and guides for example, need only occasional updating. Moreover, the wireless nodes lend themselves to flexible placement. "They don't take very much power," she says. After Sandy, "We ran a couple of them off of twelve-hour power supplies." Thanks to these semi-autonomous, local wireless nodes, the the local Red Hook community was able to access essential information even while the internet was down.

In today's digital news business, of course, it may seem anathema to update information only occasionally. Yet when one considers the resurgent popularity of digital newsletters and continued relevance of digital "Today's Paper" offerings from existing news organizations, audiences seem to be indicating an interest in news that is both more episodic and more local^{15, 16} Plus, in an increasingly monitored and fragile online environment, the idea of offline wireless distribution points offers the chance to provide both news publishers and audiences with digital spaces where, as Wired columnist Clive Thompson describes it, "one can talk—and listen—in private."¹⁷ Moreover, whether an internet disruption is the result of political, technical, or natural events, offline wireless networks can help media organizations ensure that despite such circumstances their news can continue to reach readers when they need it most.

Over the past twenty-five years, the internet's potential for global reach has proved a double-edged sword for professional journalism. On the one hand, the web has opened up new audiences and reporting methods; on the other, it has gutted business models and fragmented audiences. Perhaps even less anticipated is the increased homogeneity of the news ecosystem, with even global media organizations tending to "all emphasize the same thing," as Google News creator Krishna Bharat observed in 2010.¹⁸

The centralization of news is not just a content phenomenon, however, but also a technical one. With the rise of web publishing, news media depends on a fairly limited distribution network—namely, the broadband connections and undersea cables that transmit all of the content on the internet, from news to Netflix.^{19 20}

This highly centralized structure is a sharp departure from print distri-

Project Overview

The initial concept for You Are Here was to create offline wireless nodes that audiences would connect to via their mobile devices as a way of accessing content that was available literally nowhere else. Inspired by the intimacy and immediacy of pieces like artist Janet Cardiff's audio walks,²⁹ we saw potential for audiences to use their mobile phones as a medium to both easily hear *and* contribute to the stories we would post.

As we began discussing the larger goals of the project, however, it became clear that insisting on a *completely* offline configuration would ultimately limit who could participate. While newer mobile phones could upload and download audio and photos directly to the You Are Here node's browser-based interface, audience members with older phones wouldn't be able to share their thoughts. Given that inclusivity and engagement were driving motivations for the project, we revised our design to instead rely on an inexpensive call-in service called Twilio³⁰ for gathering audience-contributed content. Because this meant that contributors' recordings would be collected via a centralized service, we did have to provide the You Are Here node with a certain level of internet connectivity. That said, we preserved the spirit of You Are Here as a local-only listening station by making user-recorded content the only internet-hosted content the device could access. Visitors couldn't use You Are Here to browse the web, and if the connection went out, a team member could always go to the area to update the content manually.

The Technology

In recent years media organizations have understandably been focused more on revenue models than internet protocols. The perils of centralized digital distribution, however, have long since caught the attention of the artistic and information-freedom communities.

In 2011, for example, NYU art professor David Darts created a device known as PirateBox, an offline wireless node built in response to copyright policies that Darts feels make a "misleading connection between stealing and sharing."³¹ Darts, who first used his device to distribute files to his students during class sessions, admits that the project is a "provocation," but also highlights its capacity for creating a private digital space even

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within a physically public one, by allowing users to share files “with total privacy.”

While the PirateBox project was originally composed of proprietary hardware running open-source software, more recent iterations use open-source hardware as well. One version, for example, is built on the inexpensive Raspberry Pi, a microcomputer that was introduced in the United Kingdom in 2012. Though no bigger than a credit card, the Raspberry Pi is actually a fully fledged microcomputer that runs the (also open-source) Linux operating system and can run multiple programs simultaneously. Popular with hobbyists and makers of all kinds, the Raspberry Pi recently became the United Kingdom’s all-time bestselling computer.³²

The Opportunity

When the Turkish government began used DNS manipulation to block access to Twitter in 2014, ongoing interference with internet communications was relatively unheard of, especially among aspiring EU member states. Suddenly, the limitations of internet-dependent information distribution was on full display, leading protesters to spray-paint Google DNS addresses on the sides of buildings as a means to circumvent the ban.

Though by that time projects like PirateBox and LibraryBox were becoming more robust, there were still few examples of offline wireless networks really being used to distribute news stories. Thus, for the You Are Here project, we sought to combine the immersive and locally focused experience of audio storytelling with the independence and resilience of offline wireless connection points. In addition to providing both intimacy and privacy, these nodes could be updated manually, if needed, in order to distribute digital information even when the internet was unavailable.

The Team

While the diversity of skills needed to produce these devices and the content they would carry was substantial, we were lucky to bring together a project team with expertise in the many areas it touched:

Sarah Grant

Principal developer and project lead

Sarah Grant is a Berlin-based media artist and educator. She is a former Research Fellow at the Tow Center for Journalism at Columbia, Adjunct Professor at NYU Polytechnic in Digital Media and current Impact Resident at the Eyebeam Art and Technology Center. She researches and develops open source software, artworks as educational tools, and workshops that demystify computer networking technology. Sarah is the author of *Subnodes*³³ and organizes the Radical Networks conference in Brooklyn. Together with her partner Danja, she also runs a commercial research and development studio called *cosmic.berlin*.

Amelia Marzec

Developer and graphic artist

Amelia Marzec is an American artist focused on rebuilding local communications infrastructure to prepare for an uncertain future. Her work has been exhibited at SIGGRAPH, MIT, ISEA (Canada), LAPSody (Finland), ONCE Foundation Contemporary Art Biennial (Spain), NODE Forum for Digital Arts Biennial (Germany), and is part of the Rhizome ArtBase. She has been a resident at Eyebeam, a resident at Harvestworks, a fellow at New York Foundation of the Arts, the A.I.R. Gallery Emma Bee Bernstein Fellow, a Tow Fellow at Columbia University, a grantee of the Research Foundation of CUNY, and a nominee for the World Technology Awards for Art. Her work has been featured in *Wired*, *Make*, *Hyperallergic*, *Neural Magazine*, *Metropolis Magazine*, *NPR*, and the front page of *Reddit*. She holds an MFA in Design and Technology from Parsons School of Design, and a BFA from Mason Gross School of the Arts. She is a founder of the Radical Networks conference, has written for the *Huffington Post*, taught at Hunter College and Queens College, and has given talks at RISD, Barnard College, and the Queens Museum of Art.

Susan McGregor

Installation coordinator and communications

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Susan McGregor is a faculty member at Columbia Journalism School, where she conducts research in privacy and security issues for journalists. Her experience developing Dispatch, a resilient, secure, and anonymous application for mobile communication and publishing, led to an interest in how local, offline wireless servers could be used to distribute news and provide essential information during times of conflict and crisis.

Dan Phiffer

Audience engagement developer

Dan Phiffer is an artist and former technologist at *The New Yorker* whose projects include the localized, wireless-distribution system occupy.here.³⁴ In 2011 and 2012, Dan and collaborator Ellie Irons built “Neversink Transmissions,” an offline wireless community oral history archive in Denning, New York.

Benjamen Walker

Audio narrative producer

Benjamen Walker is an experienced radio producer, as well as the creator and host of the Radiotopia podcast “Theory of Everything.” He was a driving force behind Radiotopia’s wildly successful Kickstarter campaign, which had contributions from nearly twenty-two thousand individual backers.

In addition to the core team members listed above, the individual audio segments for the You Are Here sites were reported and produced by independent audio producers:

Hilary Brueck

Audio producer: Tompkins Square Park site

A multimedia journalist and producer based in New York City, Hilary Brueck has worked with international news outlets including *ABC News* and *Al Jazeera America*. Hilary is a newswriter with the Writer’s Guild of America and a frequent contributor at *Forbes* and *Fortune*, where she reports on science and technology. Before moving to New York, Hilary lived in Madagascar for two years, where she taught English and started a

library in the island's vanilla-growing country. A recovering Minnesotan, she speaks three languages and writes, edits, and produces for the web, radio, and TV.

Dasha Lisitsina

Audio producer: High Line site

Journalist and professional killjoy, specializing in long-form writing and audio. Film buff, fly-on-the wall, seasoned skeptic.

Hardware and Networking

Thanks to the substantial prior experience of our project team, developing the hardware and software for You Are Here was not the ground-up endeavor it might have been. Sarah Grant, our project lead, had already developed subnod.es, a self-contained wireless server that runs on a Raspberry Pi and offers basic chat room and digital bulletin board system (BBS) functionality.

While You Are Here built on the subnod.es technology, says Grant, “that project was really only designed to work well in-room.” By design, however, You Are Here was meant to reach into public spaces—in this instance, parks—and therefore required significantly more range.

“We had to make sure that the network range extended beyond just the room,” she says. Though the particular model of Raspberry Pi used to build You Are Here includes a built-in wireless antenna, an external hardware amplifier and antenna were needed to generate a wireless signal strong enough to extend outdoors. Because wireless signals are easily blocked or weakened by physical obstacles, determining how to extend the signal was something of a trial-and-error process.

“There was one antenna that was fifteen decibels that I really wanted, so I just bought it,” says Grant. “When it arrived—it takes up the entire length of my kitchen.” She eventually settled on a nine-decibel antenna that is about a foot long.

In our final configuration, the reach of the You Are Here station node is about half a city block in every direction, depending on the nature and number of physical objects surrounding it. “If you’re in a flat, open field, you can get awesome range,” says Grant. “But if you’re in a park where there’s trees or statues or lampposts, all these things block the signal.”

Another goal of You Are Here was to make the physical station small enough to install in a wide range of locations, which placed additional limitations on how powerful the signal could be. At the Tompkins Square Park site, for example, You Are Here had to fit behind the door at the Blind Barber—a well-known barber shop by day and popular watering hole by night. While ensuring that the station’s signal reached as much of the park as possible was a key goal, “There’s also that balance of not showing up to a host with a fifteen-foot antenna,” says Grant. “There are ways to

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A view into the You Are Here hardware unit. The smartphone-looking device toward the left is actually a battery used to power the gray Wi-Fi signal amplifier inside the box just to its right. In the final installed version, we simply plugged in this amplifier. As you can see, all of the components fit easily into an inexpensive black plastic box, in which we drilled holes for the antenna and power cords using a standard drill bit.

make [the signal] super powerful. But I think the compromise was: we can still cover a good quarter of the park.”

Security

The relative publicness of You Are Here also meant that more technical safeguards were required. Though our nodes were installed inside businesses, and were thus protected from physical vandalism, “We’re leaving this device in public, so we have to put some safeguards in there so it doesn’t get abused,” says Grant. In order to limit the possibility of ill-intentioned users manipulating the device or its content, “We had to set it up so that it blocked all outgoing traffic except traffic going to [our] server.”

The security concerns of You Are Here are minimal compared to those of a typical Wi-Fi hotspot; one of the benefits of a device with limited internet

connectivity is that there is much less harm it can do if it's compromised. Apart from basic protections—like strong passwords—on the administrative parts of the device's software, the fact that You Are Here nodes aren't networked means that they don't need a complex network security strategy. Without access to the broader internet, You Are Here nodes are unlikely to attract malicious actors trying to capture others' data, engage in illegal online activity, or just bog down someone else's network connection. Moreover, since the connections *into* the device are so limited, their vulnerabilities are too: Anyone wishing to compromise the device would have to be *physically* near it. And even in New York City, the number of people passing through a public park is tiny compared to the number of malicious actors online.

Our need to host *some* of the You Are Here content online, however, did create some technical conflicts. For example, because we ended up storing user-contributed stories remotely, we had to determine the best way to provide the limited internet connectivity our setup required. While we could have piggybacked on our hosts' wireless connections, we didn't want to expose our audience members' listening habits to the host organizations' hosting. Instead Grant decided to use a 3G "data stick," which supplied a standalone internet connection.

Balancing Privacy and Metrics

Even without the imperatives of advertising, any system intended for news distribution needs to support basic metrics. In this, You Are Here faced another design hurdle common to privacy-enhancing systems: how to effectively monitor users' engagement with the system without monitoring the users themselves.

"I always knew that we'd somehow have to track people who were using the app, and obviously I'm not interested in tracking individuals," says Grant. "Still, to understand how the device is being used in order to improve it, or just understand how people use something like this, we want to have some kind of analytics/tracking in place."

Eventually, Grant settled on using the open-source Piwik tracking platform, which provided a good balance of information and anonymity. You Are Here can log information like "the device that's connected, what kind

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of browser they're on, screen resolution, how long it took for the page to load, the date and time, what they were clicking on," says Grant. Although relying on Piwik made recording some information—such as how long a user listened to an audio track—more difficult, the fact that it was simple and lightweight was worth the additional effort. While tracking packages like Google Analytics require sending information to Google's servers, Piwik was small enough to both live and store data right on the Raspberry Pi.

"That was also cool," says Grant, "that we were using something that just lives on the front end and doesn't send any information to some remote server." Although the data was securely accessible via a remote login, without this, checking the user statistics would mean visiting the device in person.

Cost

Ultimately, each You Are Here broadcast station ended up costing about two hundred dollars to build (of which thirty-five dollars went to the SIM card needed to download user content) and is smaller than a breadbox, requiring just two non-grounded power supplies (one for the Raspberry Pi and another for the amplifier) to operate. Before we could go about installing them "in the wild," however, we had to configure both the call-in feature and the "front end" of the system: the web pages that users would see and interact with when they logged on to the network.

Integrating User Content

In order to support the widest range of devices—and therefore contributors—You Are Here uses a platform called Twilio to let audience members submit their own audio stories in response to our site-specific podcasts. Though newer phone models can upload audio directly to a website, older phone models can't—and we didn't want to limit You Are Here's engagement only to audience members with the latest phones.

Using Twilio allowed us to quickly and inexpensively set up a unique dial-in number for each You Are Here node. When an audience member calls in, they're greeted by a pre-recorded prompt explaining that we'd like them to share their thoughts and experiences connected to the You Are

Here node site. Users can then record their stories by leaving a voicemail. In order to make those audience recordings available on the correct You Are Here node, however, team member Dan Phiffer had to build a small web application to connect the two.

“In order to [both] use telephones and also to keep [You Are Here] relatively offline, we would need to have some kind of connecting middleware,” says Phiffer. In this case, that middleware consisted of a small, web-based application. Though Phiffer is relatively experienced with web technologies, he had never used Twilio until this project. Still, he was able to put together the Twilio portion over the course of just one afternoon.

“It was really easy,” says Phiffer. “It was surprising.”

Using basic web-based technologiesⁱ, Phiffer created a script that was triggered whenever a message was left for one of our You Are Here nodes. Phiffer’s middleware would then download the user’s audio story and save a copy of it.

In addition to serving as go-between for the You Are Here node and the Twilio platform, Phiffer’s middleware offered some real-time insight into how the system was doing. That’s because Phiffer also configured his system to send an update to his Slack channel whenever a recording was made. In addition to posting an alert message, it “sends the link to the MP3 so we can listen to it,” Phiffer says.

Those real-time notifications helped the project team get an idea of how much activity there was on each You Are Here node. It *also* provided an opportunity to review recordings for problematic content. Although no inappropriate content was submitted to our pilot installations, our experience with news websites and prior projects made us aware of this very real possibility. Like related systems,³⁵ You Are Here does not provide for any automated content moderation. Still, being automatically *notified* of new content made the review process less manual. In a fully offline context, of course, any human moderation would need to be done on-site—one of the many reasons we envision You Are Here nodes living in easily accessible places.

Given the goals of engagement and exchange that drove the You Are

i. In this case, PHP, mSQL, and JSON on a basic web server. All of the code used for this project is documented at <https://github.com/TowCenter/YouAreHere>

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Here project, audience members contributed stories with the idea that they would be heard by others. Because of this, our efforts to keep the stories private as they passed from the Twilio platform to the You Are Here node were minimal. Technically, for example, a person who discovered the (otherwise unpublished) URL of Phiffer's middleware could access the recorded stories from anywhere.

That said, Phiffer suggests that blocking undesirable access would be simple. "By having a random, long string of digits that are shared on the device and shared on the server," he says, one could ensure that only the You Are Here stations were able to access any recordings. "If you don't have the correct thing, [the middleware] rejects the request."

While inspiring and maintaining user participation is always tricky, Phiffer says, platforms like Twilio can make it easier to customize the audience's experience and stay connected with them. Initially, for example, when a contributor calls in, "It's using this robot voice to say, Hello, thank you for calling. Please leave your response.'" Replacing that message with a customized recording allowed us to offer participants a more customized experience.

While the use of Twilio to support audience participation was initially a compromise, it does offer additional functionality that could be useful for long-term You Are Here nodes. In addition to facilitating real-time content moderation as noted above, the fact that users are placing a phone call to submit a response opens up possibilities for reconnecting with them after they've left the area.

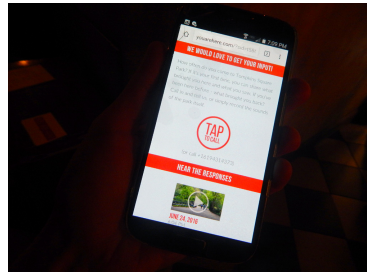
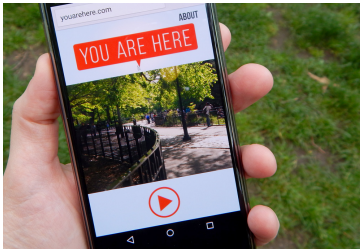
"Repeat participation could be a possibility," says Phiffer. For example, one could use the Twilio/middleware combination to create an opt-in feature allowing contributors to be notified via SMS when a new You Are Here site launches or new stories are added.

Ultimately, though, the functioning of the system has little effect if audience members don't know where it is or how to use it. To generate awareness and draw audience members in, we needed appealing and coherent graphic and user-interface design.

Interface Design and Signage

When done well, the design for a user interface or graphic identity seems simple, intuitive, and even obvious. Of course, the best and most effortless interfaces are the hardest to create, often requiring multiple experiments and iterations.

Such was certainly the case for the You Are Here web interface, whose final version consists of a simple title banner and an image overlaid with a large "play" button. Below this, a short written prompt and a bright "Tap to Call" graphic clearly invites listeners to join the conversation.



According to artist and designer Amelia Marzec, finding inspiration for You Are Here's graphic red-orange logo was relatively simple, as she took inspiration from common design conventions in wayfinding and comics.

According to artist and designer Amelia Marzec, finding inspiration for You Are Here's graphic, red-orange logo was relatively simple, as she borrowed from common wayfinding and comic conventions.

"I was looking at the subway map and they have the little 'You Are Here' circle," says Marzec. "And that's really common."

When it came to the interface, however, things didn't start out so simple. "We had a lot more screens initially," she says.

As is often the case, the many screens represented in the early designs for You Are Here reflected our debates about what the system itself would be, and how it would be used. Part of what excited us about You Are Here was the flexibility of the system: offline wireless nodes could be used to foster and create all kinds of communities and conversations. In schools, for example, where safety considerations make traditional online conversations too risky, You Are Here nodes could be used to host message boards



The You Are Here logo

or important notices. Alternatively, neighborhoods wanting to ensure the integrity of local conversation could gather input from residents while minimizing onerous security processes.

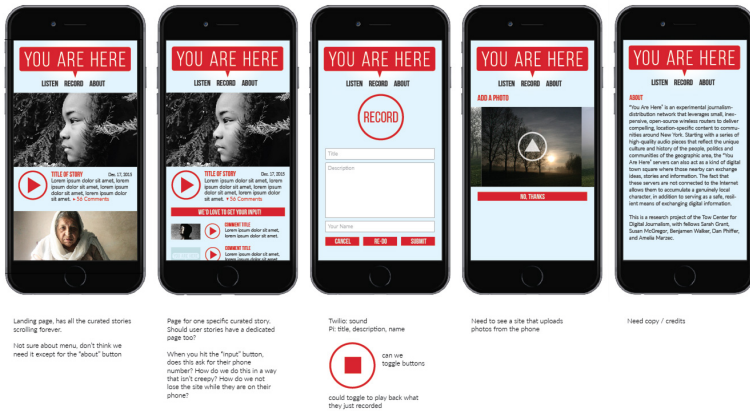
Our experience in designing and implementing You Are Here therefore exemplified one of the essential tensions of building any technology: While its flexibility can be exciting, its effectiveness comes from its specificity. As Marzec explains, “We’re approaching it as a system that could be used for anything. And that’s something that’s really interesting for engineers, but... people really need something human to latch onto.”

Getting those specifics right, of course, requires a negotiation between the goals of the project and the possibilities and the constraints of the technology.

In the case of You Are Here, our primary goal was to engage readers by telling journalistic, site-specific stories that listeners across the technology-adoption curve could access and contribute to. This led us away from a fully offline solution, and toward one that incorporated some web-based technologies. Similarly, our desire to keep the project physically small (the physical You Are Here unit was approximately eight inches by five inches by four inches with a two-foot antenna) as well as fully open-source influenced the amount of content that we could effectively store on the physical device.

This meant that some of our early ideas for the You Are Here nodes simply weren't feasible. Yet these constraints were also what ultimately allowed us to streamline the interface and user experience into one simple, accessible web page, saving us from the "feature creep" that might have overloaded the interface to make it clunky and cumbersome. In other words, designing the You Are Here interface helped us both define and refine our goals for the overall project, an aspect of the design process whose value is gaining currency in both creative and journalistic settings. As Heather Chaplin, director of the Journalism + Design program at The New School wrote for the Tow Center in 2016:

Design is the creation of new solutions to a problem, and there is no guarantee that it is the right solution in the scientific or logical sense. It's always going to be one of many possible solutions. Its rightness is determined by whether it solves the problem.



Early concepts for the You Are Here interface. Originally, we imagined users would provide a title and description of their recorded response, in addition to optionally uploading photos. This solution, however, would have required that all contributors have very recent smartphones and our goal was to reach a broad audience of listeners and contributors, including those with older or feature-only phones. As a result, our final interface has only three functions: "Listen," "Tap to Call" (with a telephone-number alternative), and the option to listen to others' responses.

Of course, meeting some of our functionality requirements did mean compromising on others. For example, because contributors were calling a

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phone-based service to share their stories, there was no straightforward way for them to give their story either a title or a description. This meant that when it came time to display these stories in the You Are Here interface, there was little information available to give readers about what they might contain.

“We just have this generic date,” says Marzec. “It would be good to know what people are going to click on... Like, ‘This is a story about my grandmother growing up in this neighborhood.’”

Ultimately, the streamlined interface for You Are Here nodes helped focus the purpose of the project for users: to listen to others’ stories and share your own. While future versions of the You Are Here nodes might focus on other objectives, our on-site experiments allowed us some insight into how audiences might engage with this unique storytelling experience on a larger scale.

Content and Production Design

One challenge familiar to all members of the You Are Here project team was generating interaction. As storytellers and artists, we all knew that simply putting the You Are Here device into the wild and hoping that passersby would decide to share their stories was unlikely. To bridge that gap, we wanted to make sure that anyone who joined the You Are Here network and made it to the homepage found relevant, engaging stories about the nearby landmarks that would, hopefully, inspire audience members to also share their own.

We therefore chose the two You Are Here station sites that would help maximize both accessibility and audience engagement; for this, we looked for hosts near highly trafficked public parks. Based on our own experiences, Tompkins Square Park in the East Village and the High Line in Chelsea were excellent candidates, offering both high levels of foot traffic and accessible host sites. At the same time, the unique character of the two locations also allowed us to experiment with distinct styles of narrative and engagement.

“We had opportunities to do two different approaches,” says Benjamin Walker, who coordinated and produced the audio stories that launched

with the You Are Here nodes. These stories—each of which was intimately tied to its physical location—were designed specifically to help frame and inspire audience contributions, and to seed conversations about the spaces.

Promotion and Distribution

Selecting sites for You Are Here meant balancing locations that were widely and freely accessible to the public, but were also home to distinct communities. Logistically this presented something of a challenge when it came to physically installing the devices—while small and unobtrusive, they do require two standard power connections, as well as protection from the elements.

Initially, we explored the possibility of "guerilla" installations near our locations. The High Line, for example, has a variety of covered or semi-protected areas, some of which have accessible power outlets that are used by food vendors in good weather. Early site visits generated a range of ideas about possibilities for installing and protecting the devices. As Marzec described:

We went up the High Line and... I was going in the pipes—there's a little pipe in the ground that looks like it could be an electrical thing. And then the rat traps—that was a good moment. Because they have these black boxes up and down the High Line and I was like, "Worst-case scenario: We can hide it in one of these rat traps"... We were [also] thinking about putting it in a rock—you know how people have a fake rock for their keys?

Naturally, though, there were serious drawbacks to the idea of attempting to "hide" the You Are Here devices in otherwise public spaces. Apart from obvious safety and legal considerations, there was the challenge of trying to create community engagement around a device whose location, to some extent, would need to be kept secret.

We therefore took a different approach to establishing the You Are Here sites, and partnered instead with local businesses near our sites. In each case we were fortunate to find community-minded, local establishments that agreed to let us install a You Are Here unit for several weeks, as well as let us leave informational postcards about the project accessible to their customers. In turn, these businesses—a barber shop/bar in the East Village

and a well-known pub in Chelsea—served as venues for launching each instance of the project. These events gave us an opportunity to introduce the You Are Here concept to attendees and other patrons.

Tompkins Square Park: Beyond a Bellwether

“With Tompkins Square Park we got to tie it to an actual news story,” says Walker. He describes the park as a “bellwether” whose resurgent homeless population in recent years has drawn the attention of local news reporters. At the same time, “We did try to branch out . . . so you hear about other communities.”

For this piece, Walker collaborated with audio producer Hilary Brueck to construct a site-specific audio tour of Tompkins Square using homelessness as a starting—but not an ending point—for listeners to experience and appreciate the many dynamics within the park.

On the tour, listeners meet current and former homeless individuals, as well as a local who has lived across from the park since 1988, creating a piece that would outlive a given news cycle but still provide listeners with an opportunity to participate in a timely conversation.

“For everyone who works with site-specific audio, tying it to a temporal event is dangerous,” says Walker. “I feel like this was a nice challenge, and shows that it’s something that you shouldn’t just block off—especially for projects with a local community.”

He continues: “A lot of audio ‘tours’ need to stay evergreen. We decided to go in the local direction of ‘You are here - right now.’”

Anchoring the audio to a topic like homelessness—which is temporal, but also politically charged—required delicacy and balance. “The challenge became how to branch out from it,” he adds.

In working with Brueck, Walker says, “I wanted her to look at the homeless issue, but not be limited by it. There are so many different communities in this park, from parents to punk rockers to sun bathers. You see people with cameras—especially in the spring with the hawks.”

While it does capture many of these voices, in the end Brueck and Walker’s piece is primarily meant to be a jumping-off point for listeners to contribute their own observations about the park. “Is the park really defined by homelessness?” asks Walker. “How would you define it?”

You Are Here Host---The Blind Barber

Although two of our team members were long-time visitors to Tompkins Square Park and had some contacts in the area, the search for a host site in the area began in the way many partnerships do: with simple conversations. On a weekday afternoon in June of 2016, team members Susan McGregor and Benjamin Walker, equipped with a prototype of the You Are Here unit, began scanning the edges of Tompkins Square Park for businesses that might make suitable installation sites. Apart from an establishment's willingness to host, it was important that the device be positioned close to the street, ideally in a window.

Fortunately, team member Dan Phiffer had previously collaborated on art installations with Ninth Street Espresso, a local coffee bar that faced right on the park. Though the coffee shop was not able to host You Are Here, the folks there did share the name of a person to contact at the Blind Barber—a barbershop-by-day, speakeasy-by-night located right next door.

That first afternoon we were lucky enough to meet Rob McMillen, who, in addition to his work at the Blind Barber, has a background in educational technology. An enthusiastic supporter from the start, Rob agreed to discuss the project with the owners of the Blind Barber and quickly secured their approval. Within weeks, the Tompkins Square Park installation of You Are Here was up and running, broadcasting a signal that was publicly accessible more than half a block away.

The High Line: Not Just for Tourists

On the far side of town, the High Line has been a major tourist destination since it first opened in 2009, attracting over five million visitors a year. Though not even a decade old, it has been—and continues to be—a major influence on both the sensibility and direction of the neighborhood. “It’s one of New York’s newest sites, and it’s gotten its reputation as being a tourist site,” says Walker. But as producer Dasha Lisitsina illustrates in her audio collage, there are “a lot of New York City residents who are drawn to this place, for reasons which are quite surprising,” says Walker.

Part of the uniqueness of the High Line is its actual topography: It is a relatively narrow walkway that stretches from Gansevoort Street to West

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34th Street. “Because it’s this long strip, it’s kind of hard to describe as a place,” he says.

To overcome the difficulty of picking a “where” within this beautiful, but ultimately transient space, Lisitsina decided to focus on “who.” “There are not only a lot of artists and musicians who are camping out there and doing something, there are also quite a lot of New Yorkers who use it,” says Walker.

Lisitsina’s audio collage introduces listeners to artists working or performing on the High Line, as well as tourists who have come to participate and marvel. The highlight of this tour, though, are the New Yorkers who all have different reasons for coming to the High Line. “A lot of people are looking for a place to be more contemplative in the crowd,” says Walker, which he also sees as meshing well with the audio piece itself. “If you were wearing headphones and people-watching, which is what people do there, it would be kind of great,” he says. “The other theme that I think comes out is how artists are using the space. They’re all battling for a little atmosphere to connect with audiences and not step on each other—which also feels very New York, the battle over space.”

Despite its many differences from Tompkins Square Park, the audio story at the High Line You Are Here station also uses the interaction of communities and ambiguity of the space as a way to inspire contributors. “If it’s not a tourist space,” says Walker, “what is it? The point of the piece is that you are hearing from people who are trying to define what this place is.”

You Are Here Host---The Half King

Despite the team’s earlier explorations, we quickly realized that installing You Are Here somewhere along the High Line itself was probably not tenable; fortunately, we quickly identified a promising alternative in The Half King bar and restaurant, whose entrance on West 23rd Street is just steps from the nearest staircase entrance to the High Line and whose outdoor “backyard” is overlooked by the park itself. Although we had no explicit connections with The Half King, its history as a venue for book launches and literary discussions was well known to us, as were the backgrounds of

its three co-owners: journalists Sebastian Junger and Scott Anderson, and filmmaker Nanette Burstein.

Without an introduction to work with, team member Susan McGregor approached The Half King the old-fashioned way: by showing up. Stopping by before the evening rush on a Friday afternoon, McGregor was able to make contact with the day manager, Chelsea White. Once again, we were fortunate to find an employee excited about the project, and several days later McGregor was able to sit down with White and The Half King's general manager to discuss the installation.

Like the Blind Barber, The Half King was well suited as a site for You Are Here in part because of its location, but also thanks to its large, plate-glass window facing the street. In this case, we were able to simply set the You Are Here unit on an existing armoire, where a power strip and cable box were already set up.

Obstacles and Outcomes

As is almost always the case when launching a technology, the You Are Here project demonstrated that real people will always do something different with your system than what you expect. Fortunately, however, this guarantees that the effort will be a true learning experience.

This was certainly the case for You Are Here, as our public launches and installations highlighted some key design limitations of the system. While the technical hiccups were relatively easy to address, user expectations proved a thornier problem. As we discuss in more detail in the next section, clearly and effectively signaling both the presence and purpose of the You Are Here nodes to unfamiliar audiences remains a significant challenge.

Technological Limitations

Our initial design for the You Are Here project included the idea that it would be both open-source and inexpensive, as well as predominantly offline. While we did modify some of these original goals in order to improve accessibility, we also discovered during launch that some of the technology that was fine for a prototype had to be replaced once the You Are Here unit was placed in a public "production" environment.

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We discovered one such situation during the launch event for our Tompkins Square Park unit, as attendees told us they were having trouble connecting to the network, or that they were able to connect but then were quickly “booted off.” After team members Sarah Grant and Dan Phiffer did some fast analysis, it became clear that the source of the problem was a piece of software called HostAPD, which stands for Host Access Point Device. This open-source software is designed to let any Wi-Fi card act as a router. In a typical case, someone might want to use this so that their phone can connect to their laptop’s Wi-Fi adapter and share its internet connection. In the case of You Are Here, the unit relied on the HostAPD software to transform the Wi-Fi card that came with the Raspberry Pi into a router, which is what creates the actual You Are Here network that listeners and contributors connect to.

Unfortunately, however, while HostAPD worked effectively for a handful of devices, it would block or drop users when it was overwhelmed—a common issue with similar projects.³⁶ As a result, we ended up removing HostAPD and instead connecting a small, physical access point³⁷ to the You Are Here unit, which was able to successfully manage more connections.

Usage and Interaction Limitations

Similar to other offline projects, the biggest hurdle that You Are Here faced was user expectations around unknown, open Wi-Fi networks. While our monitoring of the You Are Here devices was intentionally limited, we noted that many users who connected to the network often logged off after only a few seconds, presumably discouraged that it did not provide a way to connect to the internet. Especially at the High Line location, a heavily trafficked tourist destination, this pattern of use was particularly evident. This highlights the fact that using familiar technologies in an unfamiliar way requires carefully tested and calibrated messaging to a degree that was ultimately out of the scope of this project. While our host partners were extremely generous in letting us install the You Are Here units on their premises (which included mounting brackets into a wall behind the main door at the Blind Barber), they understandably stopped short of allowing us to mount posters in the window that described the project

and how it worked. While we did leave bright, graphic postcards at both locations and surrounding businesses, these would only be accessible during business hours and to patrons of those particular enterprises. Moreover, web and social media efforts to raise awareness about the project—such as blog posts and Twitter promotion—have an obviously limited reach. While they may activate and intrigue our existing online networks, by design the project requires physical proximity to a particular location. It is easy to imagine how a Venn diagram of these audiences may never overlap.

By far the most successful engagement we found with the system was during our launch events. As team members explained the project's design and intent to attendees, we found that many people were intrigued and inspired by the idea. At the Blind Barber, for example, an employee who happened to be present during the unit's installation excitedly shared with us how he wanted to involve musicians who would be performing in the park the next day by having them contribute their stories and songs. While this was unfortunately before some of the technological glitches were completely resolved, it indicated a kind of enthusiasm that we believe many would share if they understood the purpose and possibilities of the project.

**Conclusion:
Is Offline
Wireless an
Option for News
Distribution?**

Is Offline Wireless an Option for News Distribution? 41

Since the inception of the You Are Here project nearly two years ago, a great deal has changed in the world of digital distribution, both online and off. Audiences are at once more concentrated and more divided than ever before,³⁸ while threats to open distribution loom large.³⁹ Likewise, there were no fully open-source, offline wireless systems available two years ago, while today one can also build a Raspberry Pi(rateBox)—though the reach and functionality of You Are Here remain distinct. Perhaps most significantly, however, the fragility inherent in the largely centralized structure of the internet has become even more apparent, as both attacks⁴⁰ and accidents⁴¹ have caused major disruptions in service, and will likely do so more in the future.⁴² The question is how news organizations can continue to publish when the medium they rely on—in this case, the internet—is increasingly unreliable.

It is actually a question that the industry has faced before. In the early twentieth century, scores of American newspapers folded when paper shipping interruptions caused by World War I nearly tripled the cost of paper, escalating it from forty-five dollars per ton in 1910 to one hundred and twelve dollars per ton in 1920. At the time, newspapers were “printing hundreds of thousands if not millions of copies on a daily basis,” according to Michael Stamm, an associate professor of history at Michigan State. The media organizations that thrived, however, were those that began building their own infrastructure, from forests to paper mills. “In some ways,” says Stamm, “bandwidth is now what paper used to be.”

Unlike paper supplies, however, internet bandwidth isn’t really within news organizations’ power to expand or control. Much as paper copies of newspapers and magazines continue to be sold at newsstands, though, news organizations can use offline wireless devices like You Are Here to solve the key problem of news distribution, which in Stamm’s view means getting it “into people’s hands.”

Fortunately, the devices needed to do so are already *in* people’s hands—all that’s needed is a more independent way to get them there. Moreover, the scope of our experimental You Are Here installations suffered from a number of limitations that established news organizations wouldn’t face: They could easily install such devices at partner businesses or existing

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newsstands, as well as efficiently communicate to users the availability and purpose of such a service.

On a technical level, then, You Are Here offers a clear roadmap for anyone wishing to create an inexpensive, open-source, privacy-respecting, and local-only digital publication and engagement space (for instructions, including recommended hardware and the software we created and used for this project, visit: <https://github.com/TowCenter/YouAreHere>). In addition to testing, vetting, and troubleshooting a hardware and software system (culled from a dizzying array of possibilities), the public You Are Here installations helped answer essential questions about hosting a large number of users and extending the reach and stability of open-source, wireless nodes. Going forward, the You Are Here system could be installed in public or semi-public locations and run continuously with relatively little ongoing monitoring or maintenance.

We believe that creating similarly offline distribution points for news offers enormous opportunities for localization, community-building, and resilience. Whether the news outlet is a local blog, weekly newspaper, or national daily, the technology of the You Are Here nodes provides a unique opportunity to listen and to share with a truly local group of voices without interference from online ad networks, long-distance internet trolls, or reliance on third-party hosting services. We look forward to continued work on You Are Here, and exploring the communities, engagement, and distribution opportunities that offline networks can help develop and support in the future.

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