Final Project Report
ECAST-ASTC Public Interest Technology Community Innovation Fellowship (PITCIF)

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1.0 Project Goals and Objectives:

The goal of the project was to address an emergent need to engage the public on science and technology policy issues by helping to develop a new generation of science engagement professionals who can work collaboratively with local civic, government and university partners to convene community dialogues on Public Interest Technology (PIT) issues. The first goal was to forge a national partnership between the Expert and Citizen Assessment of Science and Technology (ECAST) and the Association of Science and Technology Center (ASTC).

- Led by Arizona State University's (ASU) Consortium for Science, Policy and Outcomes (CSPO), Museum of Science (MOS) and SciStarter, the ECAST network combines academic research, informal science education and policy analysis to engage experts and citizens on science and technology policy issues. Since 2012 ECAST has conducted 40 forums in 18 cities on topics such as biodiversity, climate and energy, driverless cars, asteroids, and geoengineering.
- ASTC is a network of nearly 700 science and technology centers and museums, and related organizations, that welcome more than 110 million people each year across North America and in nearly 50 countries worldwide. ASTC members share a common vision of increased understanding of—and engagement with—science and technology among all people.

With the help of a challenge grant from the PIT University Network, the second goal of the project was to design, launch, implement and evaluate an immersive, scalable, and replicable training curriculum and Public Interest Technology Community Innovation[1] Fellowship (PITCIF) program. Five 2-person teams of PITCIF fellows were to be competitively selected and assigned a mentor. Project principals and mentors from ECAST and ASTC would guide the PITCIF teams as they designed, developed and convened a public forum[2] on a locally relevant PIT issue. The main objectives were:

- Create a fellowship program and curriculum for science centers and museum professionals to work collaboratively with a civic, government, or university partner.
- Pilot the program and curriculum at five ASTC member institutions in PIT-UN cities.
- Mentor the fellows to design, develop, and convene community forums on a PIT topic of relevance.
- Evaluate the fellowship program outcomes against its learning, capacity building and social impact goals.

2.0 Results Achieved:

2.1 Project Team and Program Development

ECAST was represented by Mahmud Farooque, Ira Bennett, Kimberly Quach, Ekedi Fausther-Keeys, and Avery Barbera from Arizona State University and David Sittenfeld from the Museum of Science, Boston. ASTC was represented by Cristin Dorgelo, Christopher Nelson and Rachel Diamond. They were later joined by five community forum mentors, Leah Kaplan from ASU and Emily Hostetler, Sara Benson, Janine Myszka and Marshall Wilson from MOS.

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[1] For this PITCIF program, we view community innovation (CI) as a special type of social innovation where scientific research and technology developments are not just done for the society, but also with society. We will utilize informed and inclusive public forums as a tool to engage and place members of the community at the center of scientific research and technological developments.

[2] In this era of rapid change, we need to engage the public on emerging science and technology issues in order to effectively implement public policy, understand public values, and ensure innovations serve people and solve problems. Public forums convene diverse, representative groups of lay citizens to engage in conversations about the societal implications of emerging science and technology. The public's values, hopes, and concerns are invaluable on socio-scientific questions that science cannot answer on its own.

The fellowship was perceived as a hands-on immersive learning and development program and inspired by National Science Foundation's Innovation Corps (I-Corps) Program and Lean Launch Pad pedagogy. Fellows would be competitively selected through an open application process. Fellows, with their community partners, would learn about basic concepts and principles of public interest technology (PIT), public engagement in science (PES), and participatory technology assessment (pTA). Using this learning, fellows, with their community partners, would design (selecting topic, questions, and content) and convene (participant recruitment, facilitation, and hosting) a day-long, 50-person public forum, then disseminate the results (through analysis, a final report, and briefing) to stakeholders in government, nonprofit, academia, and industry.

Fellows would work in 2-person teams and be required to participate in 2 in-person workshops and a total of 9 interactive 2-hour webinars as described below:
1. The first two introductory webinars series focused on the topic of public interest technology and participatory technology assessment and were scheduled to be held in February prior to the first in-person workshop in early March.
2. The fellows and their community partners would convene in person in Boston on March 3–4, 2020 for the first workshop. During the workshop, the fellows and partners would experience a previously developed forum first-hand by acting as table facilitators.
3. Following the workshop in March and April, the second four-webinar series would cover the topic of public engagement in science, and specifically focus on designing, developing, and hosting forums.
4. In parallel with the forum design webinars, throughout Spring 2020, the fellows and partners would work on designing and developing their respective forums.
5. Beginning from summer 2020, fellows would work with their home ASTC-member institution to host and convene the forums by the beginning of the Fall semester.
6. The third and final three-webinar series, planned for early Fall 2020, would cover analysis and dissemination of results from the community forums.
7. In parallel with the dissemination webinars, fellows and community partners would share the forum outcomes with community stakeholders.
8. Fellows and community partners would gather at a second in-person workshop in Tempe, AZ in November 12–13, 2020 to present and share reflections from their forum and program experience with each other and the broader PIT-UN member community.

Each member of the 2-person teams would receive a $4,000 dollar stipend to support their work on developing a forum and up to $1,600 to support travel to the two in-person forums. Each ASTC-member host institution would receive a $7,000 stipend to cover the cost of hosting a forum (materials, participant stipends, etc.). In return, each PITCIF team would be responsible for four main deliverables:
1. **Designing and developing a public forum**, which will include the forum topic, deliberation questions, agenda, facilitation guide, participant recruitment, results dissemination strategy, and educational and discussion materials;
2. **Convening the public forum** by working with the host ASTC-member institutions on event logistics, participant and facilitator recruitment, training, and data collection;
3. **Analyzing and disseminating the results** from the forums to target stakeholders; and
4. **Writing and presenting a final reflection report** capturing the forum and program experiences and outcomes.

2.2 Application and Fellow Selection
PITCIF applications were invited from ASTC members and partners from the 21 geographical areas where PIT-UN members were located with some subjective extension to allow for a critical number of eligible institutions from each. The program officially launched in January 10, 2020 with requests for applications.

This fellowship targeted staff at ASTC-member science and technology centers who were interested in working with a government, nonprofit, or university partner and vise-versa. Interested staff at eligible ASTC-member institutions applied for the PITCIF program with a community partner from a local PIT-UN university, civic organization, or government agency to signal their interest in working in 2-person teams to design, develop, and convene a public forum on a PIT topic of interest to the community.

Based on review of eight completed applications, ASTC and ECAST selected five teams for the pilot fellowship cohort. Location, topic of interest and names of fellows are provided below.

- Ann Arbor, Michigan: Community owned data, data curation, and environmental justice.
    - Jade Marks, University of Michigan Museum of Natural History
    - Justin Schell, Shapiro Design Lab, University of Michigan
- San Jose, California: Biotechnology Education
    - Anja Scholze, The Tech Interactive
    - Corinne Okada Takara, Xinampa
- Worcester, Massachusetts: Mobility and Transportation
    - Rachel Quimby, EcoTarium
    - Stefanie Covino, City of Worcester
- Waco, Texas: Water and Environment
    - Cindee Millard, Mayborn Museum Complex, Baylor University
    - Melissa Mullins, Center for Reservoir and Aquatic Systems Research, Baylor University
- Los Angeles, California: Environment and Sustainability
    - Sacha Van Voorhis, Discovery Cube Los Angeles
    - Rebecca Ferdman, Los Angeles County Chief Sustainability Office

2.3 Introductory Webinars and Training Workshop
After two introductory webinars, fellows convened at the Museum of Science, Boston on March 3-4 for a training workshop. The workshop had two components. The first component included a hands-on experience in facilitating a public forum the "Wicked High Tides" – a community forum on sea level rise designed and developed with funding support from the National Oceanic and Atmospheric Administration (NOAA). Fellows received facilitator training from the Museum of Science staff and interacted with local community organizations working on resilience education, awareness and action.

Figure 1. Photos from the Wicked High Tides Forum
Photo Credit: Eric Workman, Museum of Science Boston

The second component was a training seminar on stakeholder engagement, topic development and forum design. Project staff from ECAST and ASTC led the seminar while Museum of Science Forum Program Staff presented Table top showcases of previous forum materials on Driverless Vehicles, Housing, Human Genome Editing, Disease Outbreaks, Solar Geoengineering, and Planetary Defense for the fellows to sample and ask questions. At the end of the seminar the fellows developed a preliminary project outline and completed a feedback survey (Table 1).

Table 1. Training Workshop Agenda

Time	Description
9:00 – 9:30	Welcome and Introductions
9:30 – 10:00	Wicked High Tides Forum and Fellowship Program Reflections
10:00 – 11:00	Information on Forum Creation and Logistics
11:00 – 12:15	Showcase of Previous Forums
12:15 – 1:00	Lunch (Cafeteria)
1:00 – 2:45	Working Session: Forum Planning
2:45 – 3:00	Wrap Up and Exit Survey

2.4 Training Webinars and COVID Response

Immediately after returning from the Boston Training Workshop, the fellowship program plan had to grapple with national lockdown and stay at home orders to arrest the rapid increase in the COVID-19 pandemic infection rate. All five ASTC member institutions were closed down with staffs either furloughed or asked to work remotely from home. The project team members held an emergency meeting to assess the situation and decide how best to respond to the fast changing and uneven situation affecting the PITCIF Fellows, their respective institutions and their personal situations. It was decided that the Training Webinar scheduled for March 18 would be used to review the situation with the fellows and decide how best to proceed. Specific agenda items included COVID-19 and project planning updates from each team, a review and adjustment of project timeline and deliverables and brainstorming about leveraging the fellowship to respond to the pandemic efforts.

Fortunately, none of the PITCIF participants were furloughed from their institutions but asked to work from home and as such wanted to continue with the scheduled webinars. However, it was immediately recognized that first, the timing for the community forums, which were scheduled for the summer, would need to be shifted and potentially scheduled later in the fall based on prevailing situations at the five locations. Second, it was also recognized that it would be challenging to hold in-person events given the projected time to develop and distribute an effective vaccine. The collective decision was that the webinar schedule (Table 2) would be retained and add a session on virtual community forums, and fellows would have a longer time horizon and flexibility to design their forums that best matches their local needs and institutional circumstances. Impact of these two decisions meant that the pairing of the webinars with actions taken by the fellows would no longer be possible. Fellows would be receiving training on different elements of forum design, development and implementation that would be well in advance of their actions on these elements.

Table 2. Adjusted 2-hour Training Webinars Schedule and Subjects (in EDT)

Date and Time	Subject
April 1, 1 PM	Topic Selection
April 22, 1 PM	Forum Design
May 13, 12 PM	Forum Logistics
August 12, 1 PM	Forum Results
September 2, 1 PM	Forum Output
September 16, 1 PM	Dissemination

Despite the uncoupling of the webinar topic and actions, the general format of the training webinar was kept unchanged to keep consistency with the I-Corps program webinar formats. The teams would take turns in presenting progress with their design work and learn about a new component of the design process. The design process itself would follow and use a modified and business model canvas, with fellows going through a hypothesis-test-revision sequence for each of the nine design elements (Figure 2).
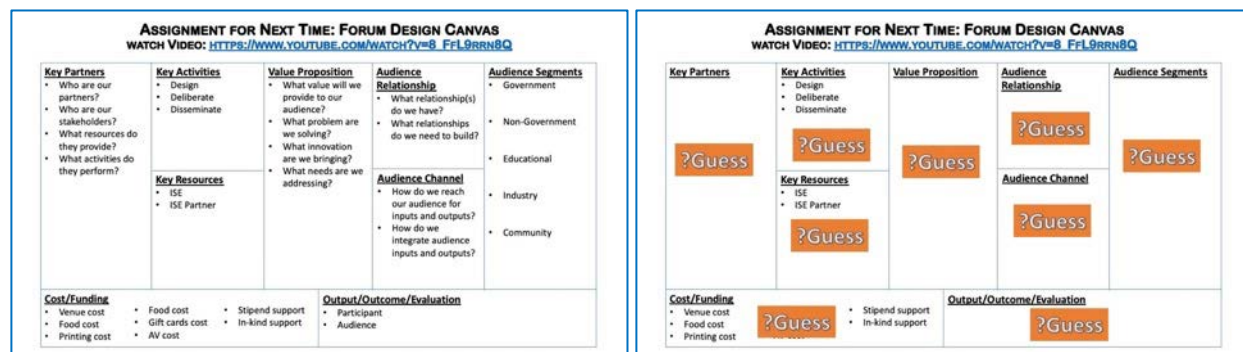

Figure 2. Forum Design Canvas Template and Elements

2.5 Community Forum Design and Development

The community forum design and development process utilized by each of the five PITCIF teams followed Participatory Technology Assessment (pTA) methodology, which is a class of policy tools to integrate new voices into science and technology discussions, deliberations and decisions. This class of methods encompasses various forms of public deliberation including citizens' assemblies, citizens' juries, and consensus conferences. The ECAST pTA method, which was used in training, designing and convening, consists of three participatory phases: 1) Problem Framing; 2) Community Deliberations; and 3) Results and Integration (Figure 3).
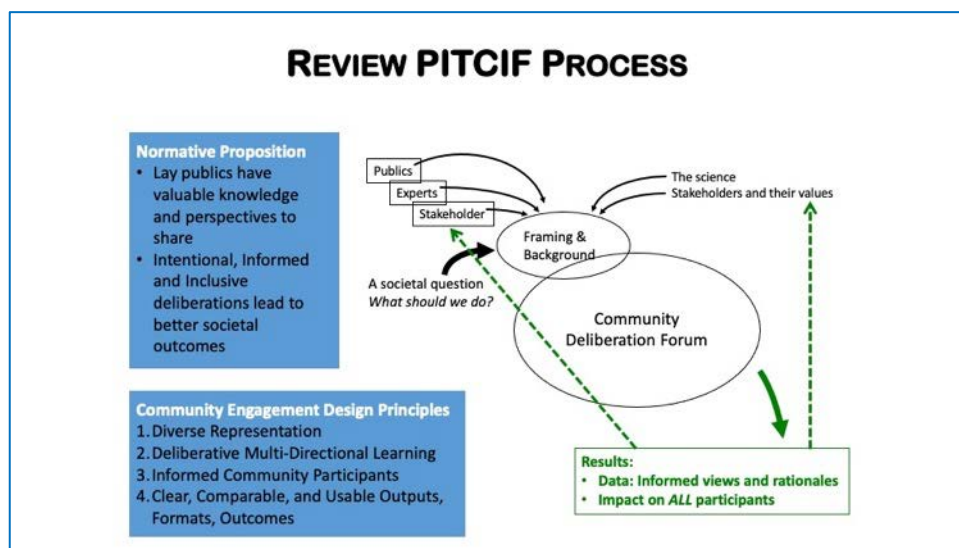

Figure 3. PITCIF Community Forum Design and Development Process

The Problem Framing phase included consultation with local subject matter experts and community stakeholders to develop topic, question, and content for the forum as well as identifying target participants and potential users for the forum results. Using the outputs from these consultations, done either through individual meetings, surveys, or workshop, the PITCIF members developed an agenda for the forum, a recruitment strategy, facilitation guide, information contents, questions and instruments for response data

collection. Pandemic restrictions basically eliminated any in person consultations replaced by virtual engagements.

Responding to COVID, an additional part of the consultation involved choice of the online forum platform. While Zoom remained the popular option, a big consideration was access and usability of the platform and whether or not it would prevent or create challenge of reaching the target members of the community. This required a shift in thinking because very early on some of the teams concluded that it would be challenging to engage their community members at the same time, given people's varying circumstances and pandemic-influenced work schedules. A decision was thus made to allow for asynchronous modes of engagement and allow each team the freedom to choose a platform and mode combination that best met their needs. Some teams also chose to survey all available options and the training webinars became a very useful venue to present and share findings and learn from each other. The forum development guide (Figure 4) was updated to include the asynchronous and online engagement options.

Figure 4. Manual for Community Forums

Following the conclusion of the May 13th training webinar, the fellows were asked to provide a progress report responding to questions about (i) Community Profile, (ii) Forum Topic, (iii) Societal Issues, (iv) Target Audience, (v) Experts, (vi) Stakeholders, (vii) Design Strategy, (viii) Forum Date, Platform and Format, (ix) Participant Recruitment Strategy, (x) Budget, and (xi) Tasks and Timeline. Based on the status, separate one-on-one mentoring meetings were held as needed before and after the final set of webinars. Responding to requests, monthly check-ins were also scheduled for June and July. Each team was also assigned a mentor to provide customized guidance about the development and convening of their forums.

While a majority of the fellows made steady progress, institutional and personal uncertainties hit the Discovery Cube team in Los Angeles particularly hard. Rebecca Ferdman lost her employment contract with the LA County, but decided to continue. Unfortunately, by fall the team had fallen significantly behind and, given the continuing challenges and institutional uncertainties at Discovery Cube, the Rebecca Ferdman and Sacha Voorhis team decided to withdraw from the program.

The PITCIF project team considered various options and concluded that there was not sufficient time to recruit a new fellows team and co-create an alternate community forum. Instead, after consulting with the PIT-UN program coordinator, the team decided to leverage a developing opportunity for community dialogues on the Governance of the Internet and invited all current PIT-UN and eligible ASTC members to join. We present a brief summary of these forums in the next section.

2.6 Community Forums

Just Waco Waters: A Community Forum on Future Water Challenges, Waco, Texas, Mayborn Museum Complex, Baylor University

> *Cindee Millard* and *Melissa Mullins* co-created the forum after engaging water experts and community stakeholders in an iterative process including surveys, meetings and a workshop. It focused on the following question: ***How Should Our Communities Meet Future Water Challenges and Promote Climate Resilience?*** The first was a two-hour virtual forum on September 10, 2010. It included a live welcome from the Mayor of Waco Kyle Deaver, a keynote speaker Rev. Vernon K. Walker, and virtual "tabling presentations" from local organizations. A total of 47 very diverse and enthusiastic members of the Waco community participated in the session. It was followed by month-long asynchronous dialogues at https://justwacowaters.consider.it/ that elicited participation from 29 additional members of the community. Action plan and summary results created from the forum were presented to the mayor's office, stakeholders, program participants and several academic and professional conferences.

Figure 5. Presenters at the Just Waco Waters Forum

Libraries, Museums, and Environmental Justice: A Community Conversation, Ann Arbor, Michigan, University of Michigan Museum of Natural History

> The broader target community for this forum included multiple municipalities across southeast Michigan and the rural communities that surround them. The mission of the forum created by PITCIF Fellows *Jade Marks* and *Justin Schell* was to bring together voices and resources across southeastern Michigan about ***how cultural heritage institutions can support local environmental justice work and facilitate better access to environmental data***. They used a broad-based survey of the museum membership and stakeholder workshops to develop and launch an asynchronous forum https://envforum.consider.it/ on December 16, 2020 and kept it open until March 1, 2021 due to low participation rates. In the end, a total of 39 community members participated. The 20 different scenarios, designed to understand participants' priorities for how libraries and museums could support environmental justice movements, fell into five broad categories: space usage, exhibit development, online and offline tools, communications support, and values statements. Dissemination efforts included following up with participants and assessing how the scenarios and priorities generated in the forum could be integrated into existing plans or used for setting future priorities for the Museum.

BIO+FOOD+TECH: A community forum to co-create better educational programs, San Jose, California, The Tech Interactive

> The forum developed by *Anja Scholze* and *Corinne Okada Takara* focused on ***how to design culturally relevant and inclusive youth engagement around the important regional topics of agtech, biotech, and food systems***. The core target audience was teens in the East San Jose and Salinas areas, which includes many youth who live in historically underfunded, immigrant, and English Second Language communities. They created and distributed "forum kits" as a novel means for teens to share their ideas on physical cards in both English and Spanish in addition to a project website (https://bioplusfoodplustech.weebly.com/) to welcome people and house the different

pieces of the community forum. Conversations occurred largely asynchronously (other than during the facilitated social hours on the https://miro.com/ platform). The 27 filled-out cards from teens (**Figure 6**) were integrated into the digital conversation platform for added reflection, where 38 members of the target community participated.
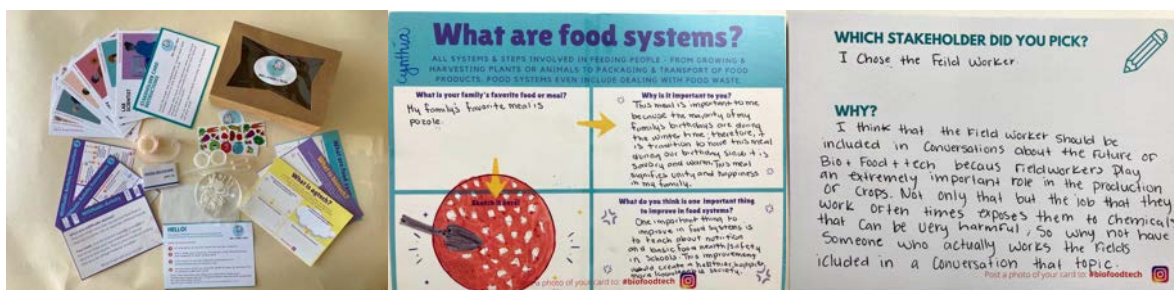

Figure 6. Forum Kits and sample filled out content

Cool It, Worcester: Community based solutions to Worcester's Heat Islands, Worcester, Massachusetts, EcoTarium

> In Worcester, studies have shown that on highly impervious or low-shade areas, or those with tall buildings that trap heat, air temperatures can be 16 degrees hotter than other land cover types. For those living in these areas, these urban heat islands translate to adverse economic, environmental and health outcomes. For their community forum *Rachel Quimby* and *Stefanie Covino* were most interested in discovering ***what mitigation strategies the residents of Worcester's most affected by Urban Heat Islands, wanted the city to pursue?*** Their target neighborhoods were two of the city's hottest and most chronically underserved: Green Island and Main South. After an extensive consultation process with experts and stakeholders at area universities including Worcester Polytechnic Institute (WPI) and Mass Audubon, the fellows deigned and launched the https://coolitworcester.consider.it/ forum on September 16, 2020 following a live zoom kickoff event featuring brief speeches from the city's Health and Human Services Commissioner, Sustainability Project Manager, and the Director of the Central Mass Housing Alliance. For those unable to participate online, a paper version was created to collect written responses which were later entered into the web platform. In total 48 community members participated with a clear majority ranking "cool the city" and "ensure safety" options more favorably than "update aging infrastructure."

We, the Internet: Internet governance, with and for the citizens, Museum of Science (Boston), Museum of Life and Science (Durham), Arizona State University (Washington and Phoenix), and Mayborn Museum (Waco)

> Initiated by Paris based Missions Publiques in partnership with several multi-lateral organizations and networks, the project is a global citizen dialogue on the future of the Internet. Using common materials and protocols developed, the ECAST-ASTC team invited PIT-UN and ASTC members to host dialogues with local community members in consecutive four-hour facilitated virtual dialogues held on October 24 and 25, 2020. 55 participants from the Boston, Washington, the Triangle, Phoenix and Waco areas participated in these dialogues, which included 15 facilitators and notetakers from partner institutions. Topics included governance issues related to data and identity, digital public sphere, artificial intelligence and future of the Internet. Results from the U.S. dialogues were included in global report presented at various international meetings and conferences.

2.7 Results, Reflections and Evaluation

The culminating event of the Fellowship Program was a second workshop originally scheduled to be held in Phoenix adjacent to the Nov 12-13 PIT-UN Network meeting. It was to include a showcase of the prepared forum, presentation of the reflection report and exit survey of the participants in addition to a networking opportunity. The conversion of the PIT-UN meeting to a virtual format and the fact that not all forums had concluded meant that these remaining tasks had to be done in piecemeal and over an extended timeline.

Three separate dissemination opportunities were leveraged where program results and outcomes were shared:

1. **ASTC Annual Conference**, Public Interest Technology Community Innovation Fellowship: Innovations from Shifting to Virtual Public Dialogue Forums, October 21, 2020, https://www.astc.org/membership/fellowships/pitcif/
2. **PIT-UN 2020 Network Convening**, Poster Session, Professional Development: Collaborating as a PIT Educator - 2019 Grantees November 13, 2020, https://youtu.be/Fvmj8zm2Ww0?t=360
3. **ASU Annual Social Embeddedness Network Conference**, Breakout Session D: Seeding Civic, Government and University Partnerships for Community Engagement, March 24, 2021, https://community.asu.edu/2021-conference-day1

Fellows were asked to submit a final reflection report at the conclusion of their community forums. These reports are included in the Appendix section. Summary results and reports from the We, the Internet forum is available at: https://wetheinternet.org/2020-global-citizens-dialogue-results/. In addition, a few highlights from the US forum are featured in this blog post by Ekedi Fausther-Keeys, one of the program associates: https://cspo.org/fake-news-and-disinformation/.

Last but not least, the fellows provided great feedback in their completed post-evaluation surveys. Of notable consideration, was the idea that while the pandemic and the extent to which it commandeered "normal" life was not something to be anticipated or avoided, it calls attention to the need for future fellows to be trained both for in-person and virtual forums, which will likely be a lasting effect of the COVID-19 era. Overall, the fellows that participated in the PITCIF project were appreciative of the opportunity to work with their partner and engage with their communities. Although they faced many setbacks and frustrations as a result of the pandemic and its effect on participation and expectation of final timelines and deliverables, they persevered and achieved what many of them thought to be impossible, given the timeline. All four teams indicated that they would continue to pursue the partnerships that they created throughout their project's timeline.

3.0 Challenges and Lessons Learned

Launching a pilot curriculum and training program in the midst of a global pandemic masked some of the challenges that would arise under normal conditions. Looking at the project objectives and deliverables, the aims of (i) building a national level partnership, (ii) developing an immersive I-Corps inspired replicable and scalable curriculum, and (iii) local level team, capacity and community building—seemed to have been realized, albeit in an alternate virtual format and expanded timeline. Some challenges are simply growing pains of a new program. Taking into consideration the project teams experiences and feedback received through the two surveys and report, the following are some points for future consideration:

- Application: Despite broad publicity, only eight completed applications were received. The projected interest from PIT-UN members never materialized. The application timeline will need to be extended and include targeted outreach events.
- Webinar: One consistent feedback in the exit survey was that the fellows found the opportunity to share and learn from each other's experience during the webinars quite valuable. However, they thought that the portion of the webinars where forum design concepts and methods were introduced could be prerecorded and delivered asynchronously to learn on their own time.
- Co-creation: Building a complete community forum from scratch, while demonstrably doable, is too much to aim in a 9-month fellowship program. Instead, focus could be on building existing

partnerships or having the fellows develop a forum session on a given topic, or some combination that lessens the burden.

- Mentoring: The original project design called for assigning subject matter experts. However, it appeared that the project topic development process through expert and stakeholder engagement organically generated the necessary and relevant contacts and relationships. What was deemed more valuable to the fellows were forum mentors who could provide step by step guidance on the process, which is what we ended up providing, much to the satisfaction of the fellows.
- Community Embeddedness: It appeared that the programs absorptive capacity was related to the embeddedness of at least one of the community partners. Melissa Mullins, Corrine Takara, Stefanie Covino and Rebecca Ferdman had good first-hand contact within the target community stakeholders. Lacking such relationships, Jade Marks and Justin Schell struggled to keep pace.
- Community of Practice: Despite universal consensus among the fellows about the value of learning from each other's experiences, efforts to build a sharing environment through web-based discussion boards, forums and slack channels did not generate any traffic.

Despite the challenges, the program as a whole was a resounding success. As mentioned, the project team and the fellows were able to pivot to virtual format without many difficulties. It is therefore safe to project that the outcomes during normal non-pandemic situation, with the benefits of the lesson learned, will make for a very effective, timely and easily replicable fellowship program for substantive community engagement in Public Interest Technology.

List of Appendix:
1. PITCIF Forum Development Manual
2. PITCIF Final Reflection Reports