

# The CommYOUity Data Project: Exploring Novice Evaluations of Urban Spaces

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**Abstract:** This paper presents the CommYOUity Data project, which was designed to explore how people describe their urban surrounds. This project is part of a research agenda that aims to develop technological planning tools that can be used by grassroots community groups in revitalization and repair efforts. The project contains two parts: a photo-elicitation study called the CommYOUity Data Site and a follow-up, the CommYOUity Data Survey. Through the site we collected 37 images depicting local scenes with associated captions in response to a prompt asking residents to describe elements of the submitted scene they would like to see improved. We then followed up with the survey to dig deeper into the difference between description (of the elements of a scene) and prescription (of changes to be made). By analyzing both the photo submissions and survey responses we identified a set of themes, which we use to describe a set of possible technological tools for grassroots urban design.

## 1 INTRODUCTION

In *Seeing Like a State*, Scott reminds us that until the era of the modern nation state, cities were organic entities designed over time by the people residing in them. However, as nation states sought to centralize power, they began imposing order from the top-down to make cities “legible”—imposing their abstract way of understanding a city on its physical structure (Scott, 2020). This resulted in the advent of city “planning,” and the many grid-like cities we see today are a direct result of this paradigm shift. Today, this top-down imposition of order is often perpetuated by the implementation of “smart city” projects in which citizens have little say (Gooch et al., 2015).

Beyond urban planning, the imposition of top-down order has permeated nearly every aspect of our lives. As Costanza-Chock points out in their book *Design Justice*, “...design frequently refers to expert knowledge and practices contained within a particular set of professionalized fields” (Costanza-Chock, 2020). Design has been commodified and professionalized through a particular set of occupations, one of which is urban planning. Urban planners, designers, architects, etc... (or perhaps more accurately the local bureaucracy or private developers that pay them) have become the gatekeepers of the built environment and

the technologies that facilitate urban life and services.

Despite this imposition of top-down order, and its associated problems, many theorists argue that design is a “universal practice in human communities,” positioning design as something we all engage in daily (Costanza-Chock, 2020; Hjelm, 2005). With this notion as a premise, the objective of our study is to examine how to re-democratize design knowledge and practice that has become commodified, and to suggest ways in which technological tools can be used to ensure citizens do not get left behind as smart cities become the norm. To this end, we explore the basic language used by “non-designers” to describe and evaluate their physical<sup>1</sup> environments. Reflecting on this language in relation to urban planning scholarship we can identify the “knowledge gap” between ordinary citizens and those trained in the field of urban design, and effectively answer the question: “What does it mean to think like a designer?” Our aim is to answer this question on two fronts—1) if we treat everyone as a designer and 2) if we regard design as a specialized profession—and to assess the differences between these points of view. This information can be

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<sup>1</sup>We use physical instead of urban to reflect the fact that participants were from a range of places including urban, suburban, and rural.

used to help the voices of “non-designers” be heard better during “official” design exercises and projects as well help them better complete grassroots projects.

This paper engages with these questions from a human-computer interaction (HCI) lens, using methods like photo-elicitation, qualitative analysis, and speculative design. We present the CommYOUUnity Data Project, two exploratory studies designed to understand how ordinary citizens view their local environments and how this differs from the perspective of trained designers. The main contributions are:

- The CommYOUUnity Data *Site*, a photo elicitation study, which yielded (a) a small dataset of image-caption pairs from ordinary people describing their environments and (b) six themes in their use of language.
- The CommYOUUnity Data *Survey*, which explored the distinction between *describing* (an environment) and *prescribing* (changes to it), and how this differs between trained designers and regular citizens.
- And finally three speculative technologies showing how these insights might be put into practice.

In the rest of this paper, we first review related work. We then describe the first study—the CommYOUUnity Data Site—and discuss relevant themes. We then describe the follow-up study—the CommYOUUnity Data Survey—and its relevant themes. We conclude by discussing three speculative technologies that put these insights to work.

## 2 RELATED WORK

Scholars have examined design as a universal activity, a kind of creative problem solving that we all employ in everyday settings, but certain kinds of design have been commodified and professionalized (Costanza-Chock, 2020). This leads to one of our main questions. In the words of designer and educator Sara Ilstedt Hjelm, “...if everything is design and everyone designs what is then the particular competence of the practising professional...?” (Hjelm, 2005). In this section, we explore what it means to be a designer in this professional, commodified, sense. First we explore some general conceptions about what it means to think like a “designer”, then look at the methods designers use to elicit ideas from people considered non-designers during participatory-design activities.

The term “Design Thinking” has come to be synonymous with the framework developed by Tom and David Kelly (founders of the global design firm IDEO (IDEOU, 2019)). The framework has five steps that

run from deeply understanding a problem to testing a solution (Dam and Siang, 2020). Its founders position it as a means of democratizing design:

*“It also allows those who aren’t trained as designers to use creative tools to address a vast range of challenges...It’s about embracing simple mindset shifts and tackling problems from a new direction”* (IDEOU, 2019).

The framework has since been adopted by many institutions for training designers in a wide variety of fields (Callahan, 2019; Stola, 2018; Tschimmel and Santos, 2018). However, the framework has been criticized for the way it simplifies design into an overly shallow, even empty process. Designer Jon Kolko writes, *“It takes a thoughtful, complex, iterative, and often messy process and dramatically oversimplifies it in order to make it easily understandable”* (Kolko, 2018). Kolko and others also criticize the way that “Design Thinking” has become commercialized, more about selling things than producing significant social change (Kolko, 2018). While we feel IDEO’s design thinking model can be a useful tool, we acknowledge that it can be a limiting framework. In particular, it can be used by outsiders to abstract away the complex lived experiences of communities and promote an overreliance on “innovative” technologies (Costanza-Chock, 2020). We believe this is especially relevant in the age of smart cities.

We take a broader view of “design thinking”, as the knowledge and processes learned during formal (or informal) education in design fields. Although the IDEO framework is taught in many of these fields, it is just one of many skills and frameworks, and is certainly not sufficient for becoming an “expert” designer. As Kolko notes, *“Students graduate design-thinking-centric academic programs with the ability to think about design but without the ability to design things, and...design has its roots in the creation of things. Students of design thinking often don’t have craft skills”* (Kolko, 2018). We believe that this distinction is important as most people unconsciously “think about design” everyday identifying various problems in their environments and navigating life around them. However, it is the ability to act on these problems, shifting the status quo in some meaningful way, that is important.

Numerous scholars have tried to define design, particularly in contrast to other fields like science. Design scholar Stolterman contrasts the two: *“very simplified, there are two ways to deal with reality. One method “puts apart” reality to understand how it works, that’s science. The other one “puts together” things to create changed reality, that’s design”*, and AI pioneer Herbert Simon, *“argued that design is*

*about how things ought to be as opposed to science which studies how things are*” (Hjelm, 2005). Some of the traits attributed to professional designers are, “*the ability to critically judge quality based in aesthetic training*” (Hjelm, 2005) and a focus on making things “*as a foundation for engaging with the world*” (Kolko, 2018).

From a technological perspective, HCI scholars have been engaged in researching design education for over two decades (Boyarski, 1998; Maldonado et al., 2006; Waern et al., 2021). In public-facing fields like urban planning, a key skill designers must learn is how to elicit feedback from users or publics in what is called “Participatory design” (PD) (Andrews et al., 2014; Simonsen and Robertson, 2012).

Scholars and practitioners have developed numerous strategies for PD (Christodoulou et al., 2018; O’Leary et al., 2021). Some popular methods are: games and play to create a comfortable environment and encourage creativity (Gordon et al., 2017; Light and Akama, 2014); design cards to prompt reflection on specific issues (Schuler, 2008; Tomlinson et al., 2021), and storytelling to explore possibilities for the future (Baumann et al., 2018; Muller et al., 2020).

We briefly dive deeper into the use of storytelling as it is important later in the paper. Storytelling—sometimes referred to as speculative fiction or design fiction (Astrid Mendez Gonzalez et al., 2020; Muller et al., 2020)—as a participatory method has recently received a great deal of attention by the PD community (Baumann et al., 2018; Fu et al., 2018; Wang et al., 2018). In urban planning, sharing stories or personal reflections is often easier for people than articulating specific changes or improvements for a place (Goldstein et al., 2015; Lowery et al., 2020).

The most traditional form of storytelling for PD is speculative fiction, where participants come up with a story about the future in some capacity (Goldstein et al., 2015). This has become particularly popular in dealing with grand and often somewhat intangible issues like climate change. Participants are asked to imagine “alternative” futures where dominant and pervasive structures that contribute to climate change are gone or fundamentally altered, often through the use of technology (Goldstein et al., 2015; Heitlinger et al., 2021; Lowery et al., 2020). One major criticism of this method is that it is usually simply speculative, not often leading to real change (Soden et al., 2021).

Written fictions are not the only form of participatory storytelling. Another popular media for storytelling is photos—or a “photovoice” study—which we return to in Section 3 (O’Leary et al., 2021; Racadio et al., 2014).

Another form of storytelling used in PD is seri-

ous games, or games used for a purpose other than entertaining (Susi et al., 2007). In this method, the game’s story or narrative is used to prompt discussion or reflection from participants. A prime example of this is Gordon and Schirra’s Participatory Chinatown, used to encourage public meeting participants to think about and empathize with the varying socio-economic situations of people living in their neighborhood and to help them think beyond themselves when suggesting changes for the neighborhood redevelopment plan (Gordon and Schirra, 2011).

These storytelling activities, and PD activities generally, are typically part of a public meeting or workshop facilitated by a designer. In the urban planning context, the design team takes the information elicited through the activities and interprets it to create a final design or plan (Simonsen and Robertson, 2012). We return to this idea in Section 5.

### 3 CommYOUity DATA SITE

The CommYOUity Data Site is a photo elicitation study (Harper, 2002) that ran in the summer of 2020. Participants were asked to provide a photo and associated caption to show off places in their communities and to talk about how they could be improved. The photos and captions were collected via the CommYOUity Data website, see Figure 1. The site was built with HTML and a Bootstrap template, and optimized for mobile use so participants could upload photos while out in their communities. The upload button took the users to a form where they were prompted to upload a photo or video and answer the following prompt:

*“Please give a short description of elements of the image you’d like to see improved and / or what you love about the space.”*

The prompt was intentionally vague in an attempt to capture a very general sense of how people think about their physical environments. Aside from a few rules for preserving anonymity no additional direction was given, allowing us to capture unfiltered thoughts from participants. We wanted to know how people think about their communities in the day-to-day, not just when there is a specific focus or project at hand.

The first author posted the site to various social media sites and mailing lists, using convenience sampling. Submissions were collected from late July to late August 2020. The result was a total of 40 submis-

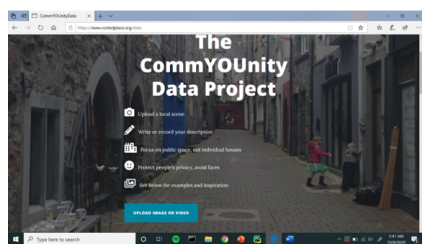


Figure 1: The homepage for the CommYOUUnity Data Site Project.

sions—38 photos, 1 video, and 1 corrupt file.<sup>2</sup> Submissions were completely anonymous. The instructions helped to ensure the photos were also as anonymous as possible by asking participants to focus on public spaces and avoid including identifiable people. Table 1 provides the five-number summary and mean for the captions. Most submissions were between 20 and 56 words, which felt sufficient for analysis.

Table 1: The five number summary and mean for the number of words in the submitted captions.

\*This was an outlier; the second largest caption is 90 words.

\*\*Without the outlying maximum, the mean is 38 words.

Minimum	2
1st Quartile	20
Median	38
3rd Quartile	56
Maximum	162*
Mean	42**

During this phase of the project, we also conducted two short interviews with people working in the urban design field—Samantha Pearson and Christopher Tallman<sup>3</sup>. The interviewees were asked about what they believe thinking like a designer means and how it differs from how people without formal design training think.

### 3.1 Evaluation

The captions were evaluated using textual analysis techniques commonly used in qualitative HCI research (Laws and McLeod, 2004). The first author conducted the primary analysis, with the second author available to discuss findings that emerged. Given the relatively small sample size, coding was done by hand. The focus was primarily on the text of the captions, but within the context of its associated photo. The captions were iteratively coded in random order. The codes were collected and categorized to

<sup>2</sup>The dataset is available on request.

<sup>3</sup>The interviewees were acquaintances of the authors who expressed interest in the work and were willing to chat

find broader themes. Six patterns emerged in relation to how people talked about their local spaces: Description vs. Prescription, Personal Story, Community Pride, Beauty of Nature, Problem with No Solution, and Meta-Problem. Table 2 lists each theme and the number of instances occurring within the dataset. (Note a submission can exhibit more than one theme.)

Table 2: The 6 themes that emerged from an analysis of the images and captions from the CommYOUUnity Data Site. The 3rd column is the number of submissions displaying each theme—a submission can have multiple themes.

	Theme	# Instances
1.	Description vs. Prescription	18
2.	Personal Story	12
3.	Community Pride	11
4.	Beauty of Nature	10
5.	Problem with No Solution	4
6.	Meta Problem	4

### 3.2 Discussion

In this section, we discuss each of themes in Table 2 and provide example submissions to illustrate them.

#### 3.2.1 Description vs. Prescription



Theme: Description vs. Prescription

Figure 2: Crowded beach on a weekend with the ocean waves crashing. Some people are swimming or playing in the waves while others sit or stand on the sand. Lots of colorful umbrellas catch the eye along with some orange flags. Beach houses follow the shore all the way to the visible peninsula in the background with a hint of clouds on top of it. The beautiful blue sky completes the view.

This was by far the most common theme, illustrated in Figures 2, and evident in about half of the submissions. These submission provided only a description of the environment instead of assessing where improvements could be made (prescribing changes). As

noted in (Costanza-Chock, 2020), design is “a mode of knowledge production that is...abductive and speculative.” Meaning designers must, “[p]ut things together and bring new things into being, dealing in the process with many variables and constraints,” as well as envision a future that does not yet exist. However, after analyzing the submitted captions it was clear that most ordinary people were not thinking in an abductive or speculative manner.

Captions ranged in length and descriptiveness. While the caption for Figure 2 is quite descriptive, another submission, showing a palm tree-lined stretch of beach, was simply captioned, “*God’s Beauty*.” As noted, the prompt was: “Please give a short description of elements of the image you’d like to see improved and / or what you love about the space.” It is possible that folks did not read the prompt fully, taking in only the part asking for a “short description”.

The distinction between description and prescription came up in our conversations with the expert designers as well. Samantha Pearson, a designer with a background in architecture and planning, noted:

*“People without design training tend to stop at a fairly superficial level in looking at, say, a barn or a sidewalk, having categorized it using those words and needing to make room in their brains for other things. A designer is more likely to compare both or either to other examples they have on file, both magnificent and abject, to make note of materials, condition, siting, craftsmanship, and extrapolating further from those to ideas about local culture, history, and economics”* (Pearson, 2020).

Thus, when designing technological tools to help people without formal training think about improving their environments, it will be important to build in guidance to help them go beyond superficial characteristics and engage in thinking in a more abductive and speculative manner.

Since this theme was evident in about half of the submission, we followed-up with a secondary study to explore it in greater detail. The follow-up, the CommYOUity Survey, and our findings are explored in depth in Section 4.

### 3.2.2 Personal Story

As noted in Section 2, there is a large body of research on the use of storytelling in PD as it is considered a natural way for people to express their opinions and ideas. We saw multiple instances of storytelling and personal reflection in our submissions, confirming this research. Even though stories were not asked for, more than a quarter of participants responded in



Theme: Personal Story

Figure 3: I love that this nearby restaurant has a lovely outdoor pavilion where we have been able to dine during this pandemic. They have been cautious about observing all the recommended safety protocols and we usually go mid-afternoon so it feels very safe. It has been a much appreciated treat to be able to go there, sit in the shade, enjoy a cool breeze and order anything from a simple to an elaborate meal during a time of so many restrictions.

this form. For example, in Figure 3, the submitter reflects on the pandemic and the local activities they enjoyed during this challenging time. This indicated to us that technological tools could draw on this strategy, guiding users through telling a story and making sense of it in the context of a proposed project. We return to this idea in the next two sections.

### 3.2.3 Community Pride

We were surprised by the amount of community pride exhibited by participants. More than a quarter of participants expressed a form pride in their communities. Although asked what they loved about their environments, we had anticipated responses would focus on the physical environment. Instead, participants often used their submissions as a means of expressing a broader pride in their hometowns or communities. This was particularly true in cases where residents had come together to revitalize a community space, as shown by Figure 4. In other cases, participants expressed community pride by naming the place they had photographed even though submissions were collected anonymously. For example, one caption simply named the street and town where the photo was taken. Naming the specific place where they lived seemed to signify pride in being from that place.

Despite our surprise at this outpouring of community pride, it tracks with the literature place attachments, which shows that people often have strong emotional ties to the places they come from or choose to live in, particularly in the rural context, which many of our submissions reflect (Manzo and Devine-Wright, 2020; Wuthnow, 2019).

In designing technology to help people improve their environments, we might prime them with a reminder of their community pride and attachments be-



Theme: Community Pride

Figure 4: This is the playground at the [TOWN NAME] Village Green. The park started to fall into disrepair a few years ago but a new Village Green association of locals have organized to keep things up. This just got fresh mulch.

fore bringing up problems and improvements. As design expert Christopher Tallman said in our interview, “asset mapping” within a community can be as important as identifying areas for improvement (Tallman, 2020). We discuss this theme further in Section 4.

### 3.2.4 Beauty of Nature



Theme: Beauty of Nature

Figure 5: Here is the park on an overcast morning. It would be nice to see more people using this beautiful space.

About a quarter of participants referenced the beauty of nature by using words like “beauty,” “peace,” and “calm.” Figure 5 shows an example. In retrospect, this pattern is not surprising, as the positive benefits of access to nature has been widely studied (Mensah et al., 2016). Green space access has been shown to positively effect mental health (South et al., 2018), particularly during the Covid-19 pandemic, with many cities working to increase opportunities for outdoor recreation (Solomon, 2020; Surico, 2020). Increasing green space through the cleanup of abandoned lots (Poon, 2018) or tree planting efforts (Austin and Kaplan, 2003) are also some of the simplest urban renewal projects to execute.

It is instructive to know that people seem to instinctively understand the benefits of nature. In a technological tool, we might use this understanding as an “ice breaker” , a first category of suggestion to help users to trust a system and its subsequent ideas.

### 3.2.5 Problem with no Solution

Related to theme one, even when participants did identify problems they did not always suggest solutions. Our expert Samantha Pearson noted that this is also a common issue in PD workshops:

*“Even when people show up for a community charrette or design workshop, a place where the entire point is envisioning a new world, it’s like pulling teeth to get them to draw anything... The really strange part is that even people who have decided they want major change often have a hard time proposing anything concrete at all”* (Pearson, 2020).

We imagine technological aids could help people not only identify problems, but also suggest solutions. For example, in Figure 6, we can imagine a tool suggesting options to get rid of the rocks like paving over this area or landscaping it.



Theme: Problem with No Solution

Figure 6: For people riding their bikes down from our student center, the new rock field looks like a disaster waiting to happen!

### 3.2.6 Meta-Problem

Finally, a few of the submissions discussed what we call meta-problems, going beyond what is shown in the submitted image. For instance, Figure 7 discusses the issue of rural transportation access. As Eric Klinenberg points out in *Palaces for the People*, the physical aspects of places can have a profound effect on the well-being and resilience communities (Klinenberg, 2018). A good designer helps people see these connections and can suggest physical changes based on these meta-problems. For instance, they can connect the health benefits of access to green space (South et al., 2018) with the desire to create more pockets of space preserving nature, or understand how current racial injustice is connected to a history of racist zoning codes and building decisions, and then try to ensure suggested changes do not perpetuate these harms (Rothstein, 2017). This kind of meta-reasoning will likely be challenging to implement with technology as meta-reasoning is an open



Theme: Meta-Problems

Figure 7: I live in a rural area. There are very few businesses around me, but I'm okay with that because I enjoy the wide open space and the benefits of living in the quiet countryside. Transportation can be problematic where I live if you don't own a car. I like that it's spacious, safe, clean, and picturesque. The sunsets are beautiful, and the stars can be easily seen at night. It is a nice place to live, and there are not many improvements I would recommend making.

problem in artificial intelligence (Peng, 2021).

## 4 CommYOUity DATA SURVEY

The CommYOUity Data Survey was our follow-up to the CommYOUity Data Site, designed to explore the theme of participants describing their environments without prescribing any changes. We took six of the images submitted to the site and created a survey to tease apart the distinction between describing and prescribing changes. Table 3 shows the six images used in the survey, which consisted of two questions for each image:

1. *Describe what you see in the scene above.*
2. *What changes would you make to improve the space shown in the above image?*

Each participant was randomly assigned two of the six images in random order.

We targeted both laypeople and people with educational training or work experience in urban design or architecture. It is possible the laypeople had training in another type of design, but we do not know as the data was collected anonymously. The 325 lay responses were collected via convenience sampling from the first author's social media network. The 24 expert responses came from students and professors in the schools of architecture and public policy at a large private university. Table 4 shows the number of responses collected per image.

### 4.1 Evaluation

We coded the responses similarly to the captions from the CommYOUity Data Site. The first author did the primary coding and thematic analysis, while the second author was available to discuss themes. The expert responses were evaluated first. We coded the answers keeping in mind the context of the associated image, and paid particular attention to things that might signify design expertise. Due to the small sample size, the responses were hand coded.

We then coded the novice responses, paying attention to the themes from the expert responses as well as looking for new codes and themes. We also looked at the responses in the context of the themes from the Community Data Site. Given the volume of novice responses, we used the Atlas.ti software for coding<sup>4</sup>. The result was 74 unique codes. (Codes can be made available upon request.) We now discuss the insights gained from this analysis.

### 4.2 Discussion

In this section we discuss: similarities and differences between the expert and novice responses, themes from the site that re-emerged in the survey, and finally, a few themes that emerged solely in the survey.

#### 4.2.1 Expert vs. Novice

**Commonalities.** There was a subset of suggestions common to both experts and novices, including suggestions to add different kinds of landscaping to some of the scenes. In fact, improvements to the landscape in various forms was the most common code for novice responses. Both novice and expert respondents also suggested burying the utility lines in Images 2 and 3, and also suggested fixing cracks in the road visible in several images. In general, these common suggestions dealt with more obvious cosmetic fixes, or surface level changes, things that are fairly easy to notice and do not require a specialized vocabulary to discuss.

**Differences.** The experts included what we call "urbanism trends." For instance, several of the experts mentioned "porous surfaces" when discussing fixing roads and sidewalks, a growing trend in areas where water scarcity and retention are problems (Razzaghamanesh and Borst, 2019). Another respondent wrote about innovative solutions for road repair, noting they would like to, "*try some solutions that are being used in other parts of the world. I would like to try out a*

<sup>4</sup><http://atlasti.com/>

Table 3: Six images submitted to the CommYOUUnity Site Project that were included in the Survey Project.

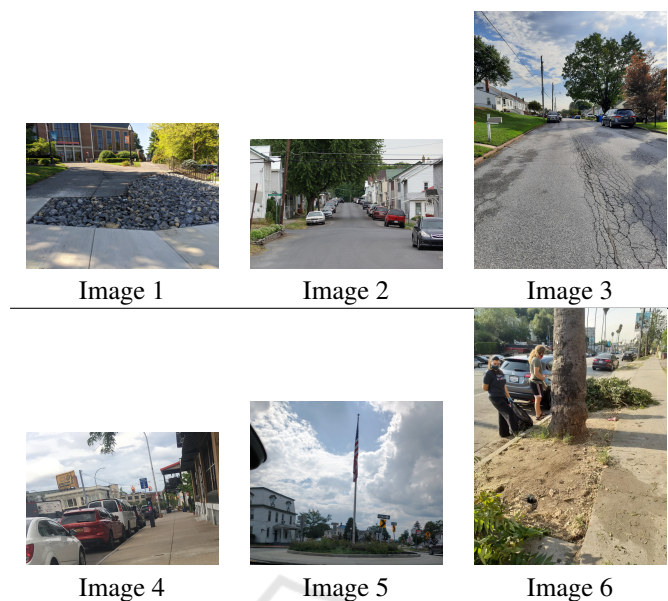


Table 4: The number of survey responses per image broken down by Novice and Expert respondents.

	Image 1	Image 2	Image 3	Image 4	Image 5	Image 6
Novice	111	117	118	101	90	109
Expert	8	6	9	8	10	7

road made from waste plastic or rubber if feasible.” While the novices suggested a variety of good improvements, there are industry trends which may not be well-known to outsiders. Thus it may be helpful to have technological tools that are “aware” of these trends and best practices and that can present them to laypeople in a way that is accessible to help stretch their imaginations regarding what is possible.

Another major difference was the need for context. Many of the experts asked implicitly or explicitly about the context for the improvements. For instance, one expert implicitly referred to the design context when making the following list of suggestions for Image 1 by noting that the suggestions depended on the use case (*italics added for emphasis*):

- variety of plants / materials in stone area (*assuming use is water retention*)
- narrower and more permeable sidewalk
- benches or gathering space (*if heavy pedestrian area*)
- Additional shading (*depending on climate*)
- More engagement between facade of building and sidewalk (*if main entrance to building*)

When presented with Image 6, another expert responded, “I don’t understand this question. Because

without a clear purpose there won’t be a so-called design.” In contrast only 6 of 325 novices noted the context. For two, it was through reference to the “home-owners” or “those who live there”, perhaps mirroring their own concerns as citizens.

Our key takeaway was that community members are embedded in the day-to-day trappings of a neighborhood or environment, and it is important to think about how to capture this knowledge outside of a particular project. As Samantha Pearson said, when residents are presented with a specific proposal it is often difficult to get them to articulate their thoughts or ideas (Pearson, 2020). However, we know that they have valuable insights from their lived experiences. The question is how to capture these insights when a specific “designerly” context is at hand. This is an issue we hope could be solved with technological tools like those suggested in Section 5.

#### 4.2.2 Reemerging Themes

We found that several themes from the Site study reappeared in the survey responses.

Reflecting both the first theme—Description vs. Prescription—and the fifth—Problem with No Solution—a number of respondents did not offer any changes when responding to the second survey ques-



tion. The question was mandatory, but included responses like “nothing” or “none”. While some of respondents offered justification (i.e., P147 “Nothing. It’s clean. Nice, wide sidewalks.”) most did not. It was not always true that this was a default response. Only 4 of the 35 respondents who offered no suggestion did so for both images they saw. The other 31 offered suggestions for one of the images but not the other. This finding confirmed for us the need for technological systems to offer guidance to help extract suggestions from non-designers in cases where having a trained designer on hand is not feasible.

Two other common themes that emerged were community pride and storytelling / personal reflection. Though participants were not speaking about their own communities in this part of the study, they nonetheless exhibited their sense of community pride by referencing imagined communities in the images. For example, in prescribing changes for Image 3, P80 wrote, “The road surface needs repaired to give the neighborhood a fresh look and for the community to feel valued.” In another example, P149 described Image 2 as a “Small town community. This is a road where neighbors help neighbors.” This again gives a sense that participants are thinking as community members and not as objective designers even when they are not seeing their own communities.

Participants also used stories to, position themselves within the scenes. For example, describing Image 3, P42 wrote “A peaceful summer day while taking my dog for a midday walk.” Of the same image, P153 similarly said, “I see a nice friendly neighborhood in which I would be taking an evening walk.” Given that these themes appeared in both studies, we found them particularly instructive in creating the speculative technologies.

#### 4.2.3 New Themes

Several other themes emerged from our analysis of the novice responses. Our respondents were not trained urban designers, and most made generic suggestions for surface level changes, but some showed more familiarity with the “official” process. For instance, when suggesting improvements for Image 2, P40 said:

*Traffic study, unless one has recently been done. Trim trees, if recommended by power company. Maybe some CDBG funds for housing improvement projects.*

CDBG refers to the Community Development Block Grant Program from the US Department of Housing and Urban Development, indicating the participant has some knowledge of engineering (traffic

studies) and this grant program, shown by the casual use of the acronym. Another example is reference to “ADA” guidelines by two participants (P50 and P63) when discussing accessibility in Images 2 and 3. P265 used the term “zero scape”, which refers to landscaping made up of dirt or gravel without plants, when talking about Image 6. These examples indicate that we should consider the varied levels of experience users of a technological tool might bring with them and design accordingly. This tracks with previous work showing users prefer different levels of guidance from co-creative tools (Oh et al., 2018).

Similarly, the level of detail offered by participants also varied. Even without the jargon of urban planning, some still offered quite detailed improvement plans. For example, about Image 1, P27 wrote:

*I would completely uproot the sidewalk and get rid of all of the chunky rocks. Change the stairs into a ramp (so it’s wheelchair friendly) and keep one railing bar (on the right side) and freshly paint it. I’d then create one fresh path of sidewalk from the ramp to the entrance of the building and plant grass everywhere else. People can walk on the grass...it’s meant to be walked on. Sidewalk is overrated.*

In contrast, of the same image P82 suggested, *Add colorful plants*. Overall, responses varied in detail between these extremes, with most being less detailed.

Another interesting finding was regional language differences among participants. In particular, the structure shown in Image 5 was referred to as a “roundabout”, “round about”, “turn around”, “rotary”, and “traffic circle”. (Incidentally, the first author uses roundabout while the second author uses traffic circle.) Thus we need to be aware both of our own regional language biases as designers, but also our target user population. We might include visual cues to ensure a shared understanding or allow users to build in their own local vocabularies.

## 5 DISCUSSION

In this section, we use the insights from the two studies to offer three examples of technologies that could help ordinary people think about their environments in the context of neighborhood revitalization.

### 5.1 Neighborhood Asset Mapping

As we saw in both parts of the study, people seem to have great pride in where they come from. While the underlying motivation of most revitalization and

smart city projects is to help people think about problem areas and solutions, it could be useful to start by generating a sense of community pride. This can help users feel a connection to and ownership of their communities, priming them to want to invest energy in improvements. In essence, this is the idea behind asset-based design, a strategy that encourages designers from outside a community to start by looking at what it has not what it lacks—looking for assets instead of assuming deficits (Costanza-Chock, 2020).

From a technological standpoint, we can imagine co-opting a tool like CommunityCrit (Mahyar et al., 2018), which enables citizens to voice their concerns and opinions about community issues via crowd-sourcing technology. This kind of system, designed to forward citizen complaints about local issues to city officials or to be assigned to city maintenance crews has been studied in various iterations by scholars in different parts of the world (Bousios et al., 2017; Motta et al., 2014).

We imagine a similar system designed to collect only assets or stories of good in the community. These submissions could be displayed publicly to remind citizens that they are proud of their communities. Assets could include physical characteristics like beautiful parks, clean streets, or a well stocked public library, but might also include more intangible elements like friendly and helpful residents or a sense of safety and security. By drawing on community pride and existing assets, we conjecture that people will be better primed to think about improvements for their communities when that time comes.

## 5.2 A Day in the Neighborhood Storybot

One technique that has lately gained ground in HCI studies is the use of AI-backed chatbots, particularly in the context of mental health care (Ahn et al., 2020; Lee et al., 2020; Yasuda et al., 2021). Since storytelling emerged from both of our studies as a natural way for people to speak about their environments we can imagine a chatbot that asks residents to tell us a story about a day spent in their neighborhood or about completing a specific task, and then using the chatbot to prompt them to think about how their lives could be made better or easier through environmental or technological changes. Imagine a resident telling a story about food shopping and the chatbot prompting them to think about food access, maybe how they wish their community had a farmers market. Ideally, the bot would parse the stories and subsequent interactions into an actionable list of changes or upgrades that could be used as a starting point for taking action.

## 5.3 Co-Creative Image Editor

A final tool we imagine is a co-creative image editor. Co-creative agents are a subset of creativity support tools—digital tools for supporting users as they complete creative tasks in a variety of fields (Frich et al., 2019). Co-creative *agents* include an AI-based agent that makes suggestions to the user with regard to their creative output (Karimi et al., 2020; Oh et al., 2018).

We imagine combining photo editing with insights from our studies into a co-creative tool that lets a user upload an image of their environment and helps them make edits based on prompts or ideas from the agent informed by our insights. For example, the agent might start by prompting the user to think about access to green-space or nature, perhaps even using computer vision to measure its prevalence (i.e. (Lumnitz et al., 2021)), since adding green space is an effective way of improving many environments that is also relatively simple and well received. The agent might also be imbued with some of latest trends or best practices in landscape architecture or similar “legitimized” design fields to teach the user about things like porous surfaces for runoff management or the importance of native plants. We can imagine that the system would output a professional or photo-realistic rendering of what the space in question could look like given the user and agent’s proposed changes.

We could even move beyond two-dimensional rendering and allow the user to work in three dimensions (Tuite et al., 2011) or view their designs in augmented reality (Ketchell et al., 2019), given recent advances in lightweight systems for creating 3D models from only a few images (Meiyappan, 2008).

## 6 CONCLUSION

This paper introduced the CommYOUunity Data Project, which uses an HCI lens to think about democratizing access to design technology. The project consisted of a photo elicitation study called the CommYOUunity Data Site and a follow-up called the CommYOUunity Data Survey, which allowed us to examine how “non-designers” talk about their environments and contrast this with how trained designers think about the environment. Through a qualitative analysis of the responses, we identified several themes to guide the creation of technological tools to help ordinary citizens think about improving their communities. We then suggested three speculative tools based on these insights—an asset mapping system, a story-based chatbot, and a co-creative image editor. In future work, we hope to explore these speculative sys-

tems in more detail by building and testing prototypes and working with community groups engaged in revitalizing their environments.

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