CROWDSOURCING FOR TRANSIT-ORIENTED PLANNING PROJECTS: A CASE STUDY OF "INTERACTIVE SOMERVILLE"

A thesis

submitted by

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ABSTRACT

Since public participation was widely introduced into the planning process by advocacy planners in the 1960s there have been innovations and improvements. However, *planners are continuously challenged with how to involve the public in the planning process*.

Some challenges of public participation include the dynamics of face-to-face politics, harnessing creative solutions and the one-way communication format. Other participation challenges include citizens having the "power" to make actual contributions to the plan.

This thesis sought to explore the hypothesis that *crowdsourcing* is an appropriate model for enabling public participation in public planning projects. Through traditional and cutting-edge research methods, the findings of this case study suggest that crowdsourcing public participation has the ability to facilitate the planning process by generating more distinct ideas per participant than traditional participation and involving individuals in the planning process that do not typically participate.

However, in the case study of inTeractive Somerville, crowdsourcing appears to be better suited to facilitate public participation focused on creating better and more widely accepted ideas and plans rather than public participation focused on upholding democratic principles.

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Special thanks Christian Spanring, a GIS Developer at the MAPC (Metropolitan Area Planning Council), who took on the role of lead programmer and architect of the inTeractive Somerville website (interactivesomerville.org) during my thesis research. The website would not have launched without him.

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To all the crowdsourcing experts of the world that believe in the power of bringing people together to solve problems. I have to acknowledge Jeff Howe who coined the concept "crowdsourcing" and from his first blog post and subsequent book on crowdsourcing, thousands of crowdsourcing experiments have stemmed including this one. There was no bigger influence on the conceptual foundation of my thesis than Prof. Daren C. Brabham of the University of North Carolina, who was perhaps the first person to dare to connect public participation and crowdsourcing in academic research. Thanks again for blazing the trail!

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1 INTRODUCTION

1.1 Statement of Problem

Public participation is fundamental to democratic political systems and critical to the (urban) planning process. Since public participation has been widely introduced into the planning process by advocacy planners in the 1960s there have been innovations and improvements (Evans-Cowley and Hollander, 2010). However, *planners are continuously challenged with how to involve the public in the planning process*.

Some of the reoccurring challenges of public participation include the dynamics of face-to-face politics (Evans-Cowley and Hollander 2010, 397), harnessing creative solutions (Brabham 2009), the one-way communication format (Arnstein 1969, Innes and Booher 2000) and failure to effectively engage (Innes and Booher 2000, King et al. 1998). Other participation challenges include citizens having the "power" to make actual contributions to the plan (Arnstein 1969) and the how to measure the effectiveness of public participation (Rosener 1978).

Yet, with all these challenges, information and communication technologies (ICTs) show great promise in the realm of public participation. The "medium of the Web enables us to harness collective intellect…in ways face-to-face planning meetings cannot (Brabham 2009, 242). Further, ICTs (including crowdsourcing technologies) have the potential to "elevate public

discourse in an unprecedented manner while providing an interactive, networked environment for decision-making" (Evans-Cowley and Hollander 2010, 397).

There are other potential benefits of using ICTs to facilitate public participation. For example, I would argue that ICTs could alleviate some of the issues involved with participation measurement by standardizing metrics and reporting while also making the public participation analysis process more efficient.[1] Furthermore, conducting public participation online has the potential to (inherently) document the planning process and public input – giving people a place to find information, add their comments while making the process more efficient overall.

It is true that ICTs have shown great promise for public participation; however, they should not be considered a replacement to traditional forms of participation[2] and communication. For example, ICTs cannot replace face-to-face conversations – it is hard to argue against the effectiveness of face-to-face communication. Furthermore, ICTs should not be thought of as strategies to replace traditional forms of public participation and civic engagement, but rather as a toolset to supplement public participation.

This thesis explores the intersection of information and communication technologies and public participation. Daren C. Brabham (2009) posits that *crowdsourcing* is an appropriate model for enabling public participation in public planning projects (242). I propose to conduct a

[1] Free crowdsourcing platforms such as IdeaScale and UserVoice have the ability to name and customize categories of public input in a hierarchy and to export data systematically into file formats easily readable by software such as Microsoft Excel.

[2] The term "Traditional public participation" in this thesis refers to face-to-face participation through public meetings, public hearings and planning meetings and activities.

research project focused on this hypothesis with the main question being: *to what extent can crowdsourcing facilitate public participation for transit-oriented planning projects*?

1.2 Thesis Statement

As a former social media strategist and online community manager at City Year[3] and a student of urban planning and public policy at Tufts University; I have always had a keen interest in how information and communication technologies (ICTs) can be used to help facilitate civic engagement, including public participation. Of course, this is not a new question. Scholars from various disciplines have been examining to what extent ICTs can enhance or influence civic engagement and public participation for decades.

"Public participation" is a term that has many meanings and has been used interchangeably with other terms such as "civic engagement" or "participatory democracy" over time (Levine 2007). The question of "why someone participates in anything" is complex and multi-faceted. Therefore, it was important to narrow my perspective of participation to further refine my hypothesis and research questions. *The participation I am concerned with for this thesis is public participation in transit-oriented planning projects (in a densely populated urban setting).*

[3] City Year is an international nonprofit that brings young people from diverse backgrounds to serve a year in schools across America focused on reducing the number of high school dropouts. There are 2,000 City Year corps members serving in 23 locations in the U.S. and two international sites (London, England and Johannesburg, South Africa). As the social media strategist and online community manager, I have pioneered several social media channels for City Year between 2006 and 2011 including Facebook, Twitter, YouTube, Flickr, Tumblr and blogs nationally and locally. In addition, I also developed the City Year's first corporate policies for social media and online communication standards and social media training guides.

There are many arguments on the affect that information and communication technologies (ICTs), including social media, have on the participatory activities of individuals and groups. Some would argue that ICTs do not necessarily increase public participation on the whole, but perhaps they increase the frequency of those that are already actively participating. On a similar note, there are studies that indicate ICTs reinforce existing behaviors of individuals and are essentially an extension of their offline activities – I concur with this hypothesis (Kirk and Schill, 2011).

One subject that shows great promise at the intersection of public participation and information and communication technologies is *crowdsourcing*. In 2009, Daren C. Brabham published an article titled *Crowdsourcing the Public Participation Process for Planning Projects* and a subsequent Ph.D. dissertation (2010) *Crowdsourcing as a Model for Problem Solving: Leveraging the Collective Intelligence of Online Communities for Public Good* – both of these well-researched documents serve as the conceptual foundation and template for this thesis.

Brabham (2009, 243) argues that the Internet allows us to "harness collective intellect" in a way that face-to-face planning cannot. He outlines the challenges of public participation, particularly in the "harnessing of creative solutions." Based on theories of *collective intelligence* and *crowd wisdom*, Brabham (2009, 243) posits that the crowdsourcing model is an appropriate model for "enabling the citizen participation process in public planning projects" and "harnessing… far-flung genius."

He contends that the crowdsourcing model is a practical way to facilitate public participation process online. Brabham uses a hypothetical neighborhood as an example. I agree with his hypothesis and my aim is to begin testing his hypothesis by conducting research in the

midst of the planning process for a transit-oriented development in a neighborhood in Somerville, Massachusetts.

1.3 Organization of Thesis

This thesis is organized into five main parts: 1) Introduction, 2) Literature Review, 3) Research Questions and Research Approach, 4) Methods, Analysis, and Results and 5) Conclusion.

2 LITERATURE REVIEW

2.1 Introduction

The components of my research question *to what extent can crowdsourcing facilitate public participation for transit-oriented planning projects* is a complex question and needed to be defined further through a comprehensive literature review of subjects relevant to the question. Although, the scholarly literature on ICTs and public participation is relatively new, the literature on public participation has produced hundreds if not thousands of documents, books and (scholarly) articles. The following is an outline of the literature review for this thesis.

One of the first questions that emerges from the research question is *what do we mean by public participation*? And so I begin by defining public participation, specifically for the purposes of this thesis in Section 2.2.

Building on a refined definition of public participation, Section 2.3 attempts to illustrate the multitude of hindrances and challenges to public participation that reoccurred throughout the literature. I compiled the Top Ten Challenges of Public Participation (Table 1) that was used as a reference throughout the analysis. In Section 2.3.1, I summarized Shelly Arnstein's (1969) *Ladder of Citizen Participation* and briefly described "Citizen Participation as Citizen Power."

In Section 2.4 some of the *Benefits of Public Participation* is summarized within two schools of thought. On one end of the spectrum, public participation is views as an integral part of democracy and on the other end, it is considered a mechanism to gain wide acceptance of a plan. The role and function of public meetings is briefly described (in 2.4.1). Alternative benefits

of public participation such as *innovative solutions, local knowledge* and *non-expert knowledge* are also summarized in Section 2.4.2. Social capital theory and social networks concludes the Section (2.4.3) in an attempt to lay out key concepts that connect offline public participation and online public participation, which is an appropriate transition to literature focused on *Public Participation in The Network Society* and remaining sections of the literature review.

The purpose of Section 2.5, *Public Participation in The Network Society*, is to provide a macro framework in which to think about public participation and how ICTs, including social media and crowdsourcing, might enhance or supplement participatory activities. Section 2.5 also sets the context of remaining sections of the Literature Review by discussing concepts such as the *Virtualization of Cities, Plans and Participation* (2.5.1), *Participation and Planning without Boundaries* (2.5.2), *The Network Society as a Cultural Revolution* (2.5.3) and *Openness and Decentralization* (2.5.4).

Section 2.6 *The Age of Participation* sketches the culture of participation and how ICTs and social media, including crowdsourcing, have changed the way humans communicate and organize (2.6.1). The concepts of *collective intelligence* and *crowd wisdom* (2.7) are introduced to support the argument for *crowdsourcing as a model to enhance public participation* (2.8). The business model of crowdsourcing is outlines and the four approaches to crowdsourcing.

The Literature Review chapter is concluded by transitioning from a business model of crowdsourcing to a public model of crowdsourcing by outlining design concepts and principles for building online deliberative democracy spaces (2.9).

2.2 What do we mean by public participation?

"Public participation" is a term that has a myriad of meanings. Some people may think of public participation as their civic duties such as voting or jury duty while others think of participation as getting involved with their local community associations like a Parent-Teacher Association (PTA). Others may lump public participation into "civic engagement[4]" or "social capital[5]" which could be accurate on both accounts.

Creighton and Creighton (2011) define public participation as the "process by which interested or affected individuals, organizations, and government entities share their ideas, opinions and positions before making a decision. Public participation is two-way communication and collaborative problem solving with the goal of achieving better and more acceptable decisions."

Throughout this paper I will refer to "traditional public participation"[6] and "crowdsourced public participation." The key difference is that traditional public participation is typically conducted during face-to-face public meetings whereas crowdsourced public participation is facilitated online. However, it is worth noting that the lines between offline and

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[4] Peter Levine (2007, 1-2) describes *civic engagement* as a term that has replaced participation and participatory democracy (which were used in the 1960s and 1970s). Civic engagement "includes any venue in which people work together on public problems (3). Civic engagement, writes Levine (1-2), is typically "operationalized as a list of variables" including: community participation (volunteering, "community problem-solving"); political engagement (voting activities); and political voice (protests, petitions, media).

[5] Robert Putnam (2000, 19) defines social capital as the connections between individuals that make up social networks. Within these networks, between a small or large group of individuals, there is a foundation of reciprocity and trustworthiness. The more trust and reciprocity within groups, the stronger the group or organization and more tight-knit groups means more participation and social capital.

[6] The following terms are synonymous with "public participation" throughout this thesis: public input, public involvement, citizen participation, participatory activities, participatory democracy.

online participation become more blurry as community organizing and community outreach strategies become more integrated. For example, during a traditional public meeting a facilitator may direct participants to a website or social networking sites (SNS)[7] such as Facebook or Twitter.

Creighton and Creighton's description of public participation is an idealistic definition from one of the most respected scholars and practioners in the participation field. However, I'm sure even Creighton would admit that not all participation plays out like the definition above. I would consider this research paper as another interpretation of public participation to add to the extensive literature that can be found on participation. A significant segment of that literature can be categorized under the challenges or hindrances of public participation.

2.3 The Public Participation Challenge

Though there are statistics that indicate that information and communication technologies (ICTs), which include social media, show potential to improve or enhance participatory activities, we cannot assume that it is a given fact. We certainly cannot assume that because individuals are active on Facebook that they are also civically active online or offline. Nor can we assume that people that are active online and offline in volunteer activities are necessarily attending meetings about urban development projects in their neighborhood. For example, one study shows that the 2008 Election did not reduce the gaps in civic engagement by social class at

[7] Social networking sites (SNS) could also be referred to as (online) social networks, social media and social media channels. Examples of SNS include Facebook, Twitter and YouTube.

all. Poor, young, and minority people are reasonably likely to be online and on Facebook, but they are not likely to engage with government, elections, or social issues.[8]

There is much evidence of the decline of public participation and that America needs to reboot its democratic political system (Berry et al. 1993, Putnam 2000). In his pioneering book *Bowling Alone* (2000), Robert Putnam drew on an extensive collection of research including nearly 500,000 interviews that told a story of American communities' decline and deterioration of social capital (which fuels participation).

As mentioned in the *Statement of Problem*, a failure to engage citizens in a meaningful two-way or multi-way conversation is a well-documented challenge (Innes and Booher 2000, Pimbert and Wakefield 2001, Arnstein 1969). Innes argues that traditional public participation meetings and public hearings are typically a one-way communication channel between citizens and government with little or no opportunity to interact or learn from each other (Innes and Booher 2000). Generating creative solutions from citizens through the public participation process is another challenge (Brabham 2009).

Indeed, there is abundant amount of literature criticizing representative democracy and highlighting the shortcomings of public participation. There are numerous reasons (outlined in King et al. 1998) including the ineffectiveness of public participation because of poor planning , administrative systems that are too stringently structured around expertise and professionalism which leaves little room for participatory processes – including generating innovative solutions from local citizens.

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[8] Trends and fact sheets on non-college youth participation and voting can be found at CIRCLE (The Center for Information and Research on Civic Learning and Engagement, http://www.civicyouth.org/quick-facts/non-college-youth/, accessed September 20, 2011.

The way that planners coordinate and facilitate public meetings and participatory activities also impacts public participation. Burby (2003, 34) posits that making plans is typically limited to relatively a few stakeholders and "planners make choices about public involvement that lead directly to this result." Whether planners hand-pick participants or seek to engage a large number of citizens, they make choices that can directly affect who and how many individuals participate. The facilitation style and manner of planners can limit or enhance the content of planning topics discussed and directly have an impact on material outcomes (Carp 2004).

1. One-way communication flow with no feedback or deliberation.
2. Citizens' lack of power to have real influence on planning or policy.
3. Face-to-face politics of difference and unequal power relations are flawed.
4. Involving individuals who typically do not participate in the planning process.
5. Planners' outreach and coordination of participatory activities.
6. Generating creative solutions.
7. Administrative structure for participation too stringent or professional.
8. Face-to-face interactions favor extroverted personalities.
9. Measurement of the effectiveness of public participation.
10. Planners' facilitation style of participatory activities.

Table 1: Top Ten Challenges of Public Participation

The question of how an individual participates and what power they have to influence planning and policy decisions are well-documented critiques of public participation (Berry et al. 1993, Arnstein 1969). The role and power of the citizen is intrinsically linked to public participation. Sherry Arnstein's article *A Ladder of Citizen Participation* (1969) captures this point eloquently.

2.3.1 "Citizen Participation is Citizen Power"[9]

In Arnstein's view, "citizen participation is a categorical term for citizen power" and "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberatively included in the future" (1969, 216). Therefore, Arnstein measures public participation by how well the "have-nots" participate in the planning process.

To capture her vision of participation, Arnstein (1969) developed *A Ladder of Citizen Participation* (see Figure 1). The Ladder has eight rungs. Each rung is equivalent to the extent of an individual's power in determining the plan or planning issue. The bottom two rungs represent *nonparticipation*, the middle-three rungs are *degrees of tokenism* and the top three rungs are *degrees of citizen power*.

For anyone studying public participation, urban planning or participatory democracy, Arnstein's article is an important piece of literature that deserves attention to detail. However, for the purposes of this paper a summary of each rung is more appropriate (see Table 2).

[9] This phrase was borrowed from Shelly R. Arnstein's *A Ladder of Citizen Participation* (1969).

Ladder Rung	Explanation
8 – Citizen Control	• Power to govern and manage a plan, program or policy.
7 – Delegated Power	• Decision-making power over particular plan or program. • Citizen delegates hold power on delegate agencies.
6 – Partnership	• Power redistributed through citizen-power holder negotiations. • Decision-making responsibilities are shared.
5 – Placation	• A few individuals are hand-picked to sit on community boards.
4 – Consultation	• Surveys, neighborhood meetings and public hearings with no assurance public input will be taken into account.
3 – Informing	• One-way communication from official to public • No feedback or no power to negotiate for citizens.
2 – Therapy	• Public administrators see powerless people as needing a "cure." • Citizens participate but the focus is on "curing" their pathology.
1 – Manipulation	• Distortion of participation into PR scheme by power holders • People sit on "rubberstamp" advisory boards

Table 2: Ladder of Participation Overview (adapted from Arnstein 1969)

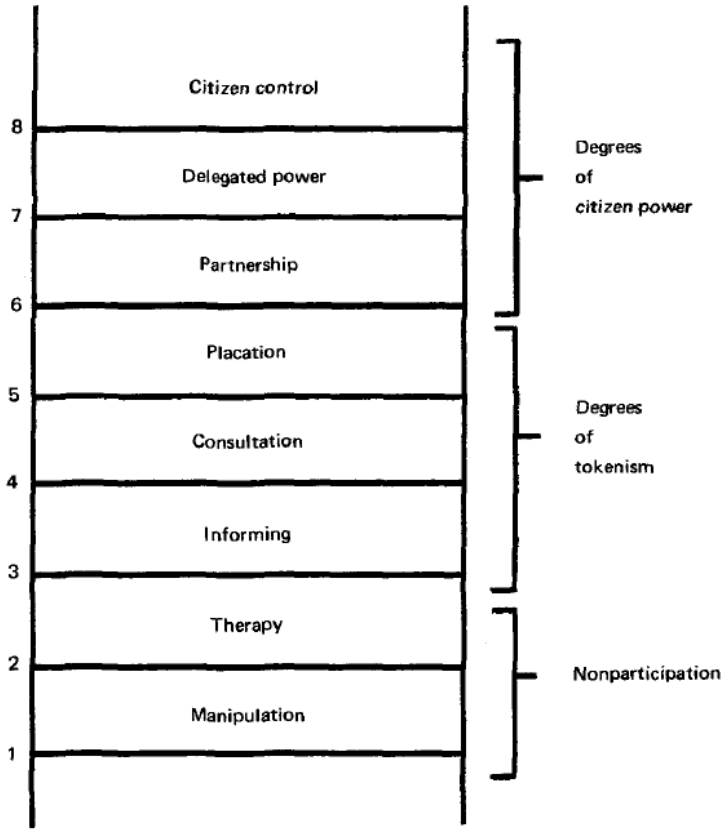

Figure 1: Ladder of Citizen Participation (Arnstein, 1969)

2.4 Benefits of Public Participation

The literature on the benefits of public participation is extensive (see Creighton, 2005). On one end of the spectrum, public participation is viewed as an integral part of democracy. This school of thought argues "democracy without citizen deliberation and participation is ultimately empty and meaningless" and that people can and should create spaces for citizens "to directly influence decisions affecting their lives" (Pimbert and Wakeford 2001, 40). Proponents of deliberative democracy posit that citizens that utilize deliberative and inclusionary processes (DIPs) are contributing directly to democracy and influencing decisions (Pimbert and Wakeford 2001).

On the other end of the spectrum, public participation is considered a mechanism to gain wide acceptance of a plan (Crewe 2001). Research shows that when people are involved in the planning process better plans are produced and implemented (Burby 2003) and citizens are more likely to support the implementation of the policies or plans in question (Potapchuk 1996). In addition, high levels of participation also lead to less hostility from citizens and better policies in general (Berry et al. 1993).

The following Sections (2.4.1, 2.4.2 and 2.4.3) include arguments for public participation as it pertains to democratic values and as a tool to gain acceptance of a plan.

2.4.1 Public Meetings and Public Hearings

Public meetings or public hearings are the "traditional" way that local governments engage its citizens to discuss public issues. Brian Adams (2004) posits that public meetings – an

important form of public participation – do not usually accomplish their intended purpose which is to deliberate over issues and make arguments to persuade officials (and each other to take desired actions). However, public meetings have a role to play in maintaining a democratic system.

The "Functions of Public Meetings" (Adams 2004) lists a number of practical yet unheralded purposes for public meetings. First, it provides information about public opinion or how important an issue is officials (and it also provides information to citizens). Public meetings also provide an opportunity for citizens to set agendas to gain more power or control (Adams 2004). Another strategy employed by citizens at public meetings is to delay a decision on a particular issue. Networking and (community) organizing is also another benefit for citizens that turn out at public meetings (Adams 2004).

2.4.2 Innovative Solutions, Local Knowledge and Non-expert Knowledge

In addition to upholding democratic ideals and making plans better (and more widely accepted), public participation is an opportunity to extract knowledge from non-experts that may offer a unique perspective to the planning issue. Brabham's did thorough review of non-expert knowledge (2009) so I utilized it as an outline for my own literature review that follows.

Participation facilitates knowledge creation and disperses knowledge to others in the process (Hanna 2000). One study found non-expert knowledge to be beneficial to the planning process because individuals outside the planning profession can offer creative solutions with local context (Van Herzele 2004). Brabham (2009, 244) points out that there are several studies that have showed that when non-experts "engage in scientific problem solving and product

design" they often come up with solutions that are better and more cost-effective that traditional programs (Lakhani and Jeppeson 2007, Lakhani and Panetta 2007, Lakhani et al. 2007, von Hippel 1988, 2005).

Drawing on *local knowledge* is another possible way to generate innovate solutions from non-experts. Local knowledge is defined as (modified from Coburn 2003, 421):

- knowledge that does not derive from professional technique but rather common sense, casual empiricism, or thoughtful speculation and analysis" (Lindblom and Cohen 1979, 12);
- information pertaining to local contexts or settings, including knowledge of specific characteristics, circumstances, events, and relationships;
- a "knowledge community" that might be a neighborhood and/or a group with a shared culture, religion, norms, or even interests;
- knowledge that is witnessed first-hand and passed on as local folklore for generations through public narratives, community stories, street theater, unlike professional knowledge which is hypothesized, tested in academia, in the courts or through the media (Brabham 2009, 244).

Coburn (2003) argues that local knowledge can improve planning in at least 4 ways:

1. epistemology – adding to the knowledge base;
2. procedural democracy – including new and previously silenced voices;
3. effectiveness – providing low-cost solutions; and
4. distributive justice – highlighting inequitable distributions of (environmental) burdens.

Local residents can offer non-expert knowledge that professional planners cannot because of their local knowledge. Further, “local folk” can put themselves “in the shoes” of someone that may use the newly planned space in the future and offer insights about the environment and location that planners might not have considered (Burby 2003, Laurian 2003).

I believe that every citizen has something to contribute, something unique and creative, and collectively it may add up to an innovative solution that likely would have never been generated through traditional planning processes and techniques. Indeed, one of the primary reasons I am exploring crowdsourcing public participation (or crowdsourcing creative planning solutions from ordinary citizens) is that I believe they can generate unique and creative solutions to pressing planning issues, individually and even more so collectively.

2.4.3 Social Capital Theory and Social Networks

When people organize and gather to participate (in the planning process) they create new relationships and groups and perhaps they solidify existing relationships and groups – this all builds social capital and building social capital strengthens communities (Putnam 2000, Potapchuk and Crocker, Jr. 1999).

Robert Putnam wrote in his highly acclaimed *Bowling Alone* (2000, 19) that “the core idea of social capital theory is that social networks have value.” Putnam defines social capital as the connections between individuals that make up social networks. Within these networks, between a small or large group of individuals, there is a foundation of reciprocity and trustworthiness (Putnam 2000, 19).

Putnam distinguishes between *specific* and *generalized* reciprocity. A reciprocity that is specific is similar to a trade: "I'll trade you my apple for your orange." Putnam posits that a generalized reciprocity operates without expectations, meaning "I'll volunteer my time to make our community a better place" without expecting anything in return.

It is generalized reciprocity that also builds trust and cooperation – fundamental civic virtues that power social networks and generates social capital. Putnam suggests that "trustworthiness lubricates social life" and "frequent interaction among a diverse set of people tends to produce a norm of generalized reciprocity" (Putnam 2000, 20-21), or a lot of people doing things for others and a common cause without expecting anything back.

Social capital theory, in its simplest form, is based on relationships between individuals. Within social capital theory there are two forms of relationships: *bonding* and *bridging*. Bridging social capital is more likely to facilitate generalized reciprocity whereas bonding social capital is more likely to generate a specific reciprocity. This is directly related to the key difference between bonding and bridging which is: bridging is more likely to be inclusive while bonding tends to be exclusive (Putnam 2000, 22).

Bonding social capital is characterized as smaller, denser networks that are closely intertwined by culture or ethnicity. Bonding group members typically know each other – extended family would be an example of bonding social capital. Members of bonding groups tend to be more inward-looking and homogenous. Other examples include ethnic fraternal organizations or country clubs (Putnam 2000, 22). Bonding is not all positive as close knit groups and organizations throughout history have been responsible for a great deal of destruction and injustice (the Ku Klux Klan or the "mafia" are examples of bonded organizations).

Bridging social capital, on the other hand, is more inclusive. Bridging groups tend to be more diverse with broader identities and reciprocity. Smock (2004, 66) writes that "bridging networks are composed of single-stranded ties that loosely connect large numbers of individuals." The Civil Rights Movement is a perfect example of bridging networks of individuals connected through a common purpose. Hence, urban planners and community organizers hope to generate bridging social capital to generate the public participation.

Thinking about social capital through an online social networking lens, an individual's network can be measured by the number of "friends" or "followers" they have on networks like Facebook and Twitter or the number of subscribers to their blog. The more friends you have, the larger your network.

However, the number of followers an individual may have on their social network does not mean each follower is closely connected to that particular individual. Every relationship is different and thus the strength of each relationship is different, perhaps leaning towards bonding or bridging social capital, or something in between. This concept is referred to as *tie strength*[10] – such as a *weak tie* or a *strong tie* between individuals. Another aspect to consider is the networks of the individuals you are connected to – the more opinion leaders or influencers you are connected to, the more powerful your network.

There is another strong parallel here between social capital and social networks – social capital (compared to other forms of capital) is unique in that it does wear out the more it is used (like physical capital) but it deteriorates at a relatively rapid rate if unused (Ostrom 1993). If

[10] One research paper mapped a predictive model that maps social media to tie strength which can improve social media design elements including friend introductions (Gilbert and Karahalios, 2009)

your participation (online) wanes, so does your relevancy within the (online) community. Being relevant online consists of a number of factors including contributing fresh and intriguing content on a consistent basis which can increase the number of times the content is viewed and shared, and consequently the number subscriptions, "friends" or "follows." Relevancy can be thought of as type of accumulated social capital.

Social capital, writes Putnam, is similar to the concept "civic virtue" but it is "embedded in a dense network of reciprocal social relations" creating something more powerful than "civic virtue" by itself (2000, 19). Along those lines, Kristina Smock writes in her book *Democracy in Action*: "building the social capital of urban communities is one of community organizing's fundamental goals" (2004, 65). For example, one citizen could voluntarily show up for a public meeting about a potential development in his neighborhood, but if most of the individuals in the neighborhood organized as a group and attended the meeting in unison, the impact of the participation would be much more powerful and valuable.

Undoubtedly, it is social connections that empower people to work together to make their communities a better place to live. Putnam argues that social capital helps "people translate aspirations into realities" (2000, 288). It's about bringing people together for a shared purpose, nurturing relationships among community members, and building formal organizational structures (and networks) that link them together (Smock 2004, 66).

2.5 Public Participation in *The Network Society*

The character of a network can vary greatly. A network could be a neighborhood or a city, a power grid or various information and communication technologies (ICTs). In its broadest

sense, a *network* is a set of *channels* where information, matter and energy flow through. Channels inevitably feed into *nodes* where information, matter and energy are processed. Nodes can by physical or social relations (Albrechts and Mandelbaum 2005, 2). A group, organization or clusters of people are good examples of nodes in the planning context.

Some researchers, scholars and authors argue that the way people communicate and organize – whether it is between individuals, small groups or large organizations – is fundamentally different than before the *Information Age* (Castells 1996, Tapscott and Williams 2006, Shirky 2007, Li and Bernoff 2008). A key reason communication and organization is different today is because of the speed that communication has increased exponentially due to the emergence of new ICTs such as social networking sites (SNS), RSS feeds[11], chat and instant messaging (IM).

Manuel Castells wrote a trilogy (1996, 1997, and 1998) on *The Network Society* and from his extensive research Louis Albrechts and Seymour J. Mandelbaum summarized key characteristics of the *The Network Society* in the anthology they edited titled *The Network Society: a New Context for Planning* (2005). (I have renamed and modified the characteristics to better fit this thesis).

[11] "RSS stands for Really Simple Syndication. RSS feeds are a way for websites to distribute new content as it becomes available. Think of an RSS feed as a file that contains a blog or website's most recent entries. By subscribing to a site's feed in Reader, you will automatically be notified when that website contains new posts or entries" (Google 2012c).

2.5.1 Virtualization of Cities, Planning and Participation

Castells (1996) emphasizes the increasing differences between “space of flows” and the “space of places” (Albrechts and Mandelbaum 2005, 3). In the space of flows, all transactions are settled. The space of flows is a global system of networks that not only represent virtual communication lines but also physical information and networking architecture. Space of flows could include airports, train stations or financial markets that are linked to users of these spaces. The “space of place” is where the local social and economic interactions (of the users) happen in a typically closed system.

One conceptual model that supports the idea of “space of place” is immersive planning. Immersive planning focuses on the depth and breadth of user experience and organizes technologically aided approaches to public participation within three categories of immersion: challenge-based, sensory, and imaginative. Digital games, virtual environments, geographic information systems (GIS), computer aided design and *crowdsourcing* are all methods user immersion in one or a combination of these categories (Gordon, Schirra and Hollander 2011).

2.5.2 Participation and Planning without Boundaries

ICTs can be convenient for some people to participate since they allow individuals to interact and communicate without having to physically go to a meeting. Planning has been traditionally confined to space, boundaries and jurisdictions. And it has been a challenge for planners to ‘draw a line’ (or administrative boundaries) through complex social, political and economic issues as if they are not interconnected.

Albrechts and Mandelbaum (2005, 3) explains the planner's dilemma eloquently: "the socio-spatial patterning and physical structure of cities, in interaction with the context – in its broadest sense – result from multiple webs of relations, each with its own space-time dimensions." Along those lines, for example, if a river is polluted with hazardous waste and four towns get their water from it, how can you draw a line through the pollution by town? The pollution will ultimately affect all of the people living in those towns – their health, their productivity, their daily schedule and quality of life.

Public participation without boundaries has its benefits. Some people are shy and are not as extroverted as others. Or perhaps individuals are intimidated from actively participating because of other people involved or the typical strictly managed administrative public participation process. It can also be difficult for individuals to make it to face-to-face participatory activities because of their work schedule. All of these reasons support the argument for utilizing crowdsourcing and ICTs to enable public participation.

2.5.3 *The Network Society* as a Cultural Revolution

As much as the *The Network Society* is a technology revolution, it is also cultural revolution that is happening in our society. The cultural and technological changes are seemingly been led by people like Mark Zuckerberg – the Founder of Facebook who embodies both the cultural and technological change taking place before us. He was on the cover of *Fast Company* May 2007

titled *The Kid Who Turned Down $1 Billion.*[12] Zuckerberg and his brain trust turned down the money for philosophical reasons. They believe that "openness, collaboration, and sharing of information epitomized by social networking can make the world work better" (McGirt 2007, 78).

How Facebook got started exudes with this new culture of openness and decentralization[13]. Zuckerberg was a student at Harvard and wanted to start a directory for undergraduates to post their pictures and basic information. Harvard said "no" and Zuckerberg, like many others of his generation, felt that the information should be made available. And so one night, he hacked into the Harvard directory and "randomly paired photos of undergraduates and invited visitors to determine which one was hotter" (McGirt 2007, 79). Today, Facebook is the most popular social networking platforms in the world, with over 845 million users worldwide (Raice 2012).

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[12] However, the $1 billion that Zuckerberg turned down in 2007 has proved to be a historically lucrative move as Facebook – the company has filed for an IPO and could be valued between $75 billion to $100 billion, one of the biggest U.S. stock debuts of all time (Raice 2012).

[13] Although Zuckerberg seemed to have started Facebook in part because of his values of openness; Facebook, from at least a web development perspective, is not very open. There are many individuals in information technology field that would consider Facebook is a "closed, propriety system" because Facebook does not use HTML and SQL, the typical web standards for mark-up and database language but two variants (FBML and FQL). Because of this reason it has not been considered an "open platform" by developers though it is "very usable, flexible and highly functional" (MacManus 2007). As of June 2012, Facebook will be eradicating FBML and moving towards "iFrames" which will make it easier to develop and design pages and applications on Facebook (Bodnar 2011).

HTML (Hyper Text Markup Language) is a language for describing web pages. It is not a programming language; it is a markup language which is a set of markup tags used to describe web pages (w3schools.com 2012a). SQL (Structured Query Language) is a standard language for accessing and manipulating databases. It is an ANSI (American National Standards Institute) standard (w3schools.com 2012b). An iframe is used to display a webpage within a webpage (w3schools.com 2012c).

2.5.4 Openness and Decentralization

The Network Society that Castells' emphasized is a new social structure that is "open and decentralized" where "hierarchy and bureaucracy are reduced and participation is enhanced" (Albrechts and Mandelbaum 2005, 2). From this perspective, there are many people active in different networks at the same time, overlapping and intersecting with other networks. Albrechts and Mandelbaum (2005) point out that this has fueled specific planning and policy literature rooted theories of relation-building and relational dynamics (which also aligns with social capital literature).

We know that getting public input is a challenge for planners and that a persistent criticism of traditional representative democracy pushes politicians, planners and others to rethink governing, politics and administration, including public participation (Albrechts and Mandelbaum 2005, 2). In this climate of openness, transparency and lightning-speed communication, the planners have to work even harder to be accountable to citizens' voices being heard and to gather creative input while reducing unequal power structures and involving the people that do not have *power* or do not typically get involved with the planning process (Albrechts and Mandelbaum 2005).

Being open means that planners have opened their doors (wide) to collaborating and co-producing plans with the public. At the same time, planners in *The Network Society* are expected to be transparent and accountable to the citizens they serve. This new culture of openness and transparency allows for more democratic deliberations and encourages input from diverse citizens (Albrechts and Mandelbaum 2005).

With more open communication and collaboration, planners have the opportunity to learn what works and also, what matters to the public (Albrechts and Mandelbaum 2005). Social structures that are less hierarchal allow citizens to feel more comfortable collaborating; therefore, they have the potential to evolve into "peer production community"[14] (Tapscott and Williams 2006, 25) where individuals are sharing and participating.

In theory, if a "peer production community" is a local community working together on a planning issue, they are building social capital. Putnam (2000, 20-1) posits that *generalized reciprocity* that also builds trust and cooperation and "frequent interaction among a diverse set of people tends to produce a norm of generalized reciprocity," or a lot of people doing things for others and a common cause without expecting anything back.

James Surowiecki, author of *The Wisdom of Crowds*, echoed this point during a TED Conference (2005) when he pointed out that many of the original bloggers, the pioneers of social media, were not blogging for anything in particular other than contributing to something collectively (or maybe to know and hear that they had a nice post). There was no exchange of money, no incentive, no economically rational reason why the blogosphere was growing individually and collectively.

[14] Linux and Wikipedia are two examples of collaborative peering communities.

2.6 The *Age of Participation*[15]

Social media[16] and emerging information and communication technologies (ICTs) have fundamentally changed the way that humans organize and communicate – "we now have communication tools that are flexible enough to match our social capabilities" (Shirky 2008, 20). Clay Shirky argues that a *Tectonic Shift* has been taking place – "we are living in the middle of a remarkable increase in our ability to share, to cooperate with one another and to take *collective action*…" (2008, 21).

The 2008 U.S. Presidential Election is a prime example of this fundamental shift in the way humans organize and communicate.[17] During previous campaigns, we have witnessed the Internet amplify campaign messages. However, during the 2008 Election, it was clear that something was profoundly different – the web, with the emergence of new social technologies, social networks, and social media transformed into *participatory* spaces (Talbot 2008, Kirk and Schill 2011).

Indeed, we are living in what Don Tapscott and Anthony D. Williams calls the "Age of Participation" (2006, 11). They suggest that a new mode of innovation and value creation called *peer production*, or peering, is rivaling traditional corporations with new low-cost web-based

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[15] The phrase "Age of Participation" was borrowed from Don Tapscott and Anthony D. Williams, from their book *Wikinomics* (2006, 11).

[16] Beth Kanter and Allison H. Fine (2010 p.5) define social media as "the array of digital tools such as instant messaging, text messaging, blogs, videos, and social networking sites like Facebook and MySpace that are inexpensive and easy to sue. Social media enable people to create their own stories, videos, and photos and to manipulate and share them widely at almost no cost."

[17] Citizen participation, public participation, public input and public involvement are used interchangeably throughout this research paper.

collaborative infrastructures powered by thousands of individuals that are changing how goods and services are "invented, produced, marketed, and distributed on a global basis" (2006, 11-2).

It appears that the *Network Society* that Castells envisioned has arrived with its "open and decentralized" social structure where "hierarchy and bureaucracy are reduced and participation is enhanced" (Albrechts and Mandelbaum 2005, 2). Millions of people now have the ability to organize and collaborate to co-create ideas, products and value for the world at a very low cost (Shirky 2008, Tapscott and Williams 2006). *Crowdsourcing*[18] is one example of "peer production" that is central to this case study.

Wikipedia is the "poster child" of mass collaboration and peer production with its nearly 24 million wiki pages created and edited by over 14.5 million users worldwide.[19] Flickr has more than 5 billion photos that are organized by their users via descriptions and tags[20]. And Facebook is perhaps the grandest of human collaboration experiments on earth with more than 845 million users worldwide (Raice 2012) – that means that 1 out of every 8 people on earth are on Facebook[21].

However, it's not just the impressive number of people on Facebook – it is how active the people are on Facebook and how much they participate in various activities. For example, half of the Facebook population login every day and the average Facebook user creates 90 pieces of

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[18] For this thesis project, I have merged both Jeff Howe's (2006, 2008) definition and Daren C. Brabham's (2009) definition of crowdsourcing: a web-based, distributed problem solving and production model for business which includes an open call to a (generally) large network of people.

[19] Wikipedia: Size of Wikipedia http://en.wikipedia.org/wiki/Wikipedia:Size_of_Wikipedia accessed May 16, 2011

[20] Tags are keyword descriptions in the meta data that associate content such as a photo to keywords and locations. The content and keywords are then indexed and become easier to find via search engines.

[21] As of February 15, 2012, the U.S. Census Bureau estimated that the world population is 6,994,556,634 (divided by 845 million Facebook users is equal to approximately 8). The U.S. & World Population Clocks by the U.S. Census Bureau can be found at http://www.census.gov/main/www/popclock.html.

content per month – sharing web links, creating photo albums, blog posts, notes etc.[22] Each individual on Facebook is connected to an average of 80 community pages, groups and events.

People are more politically active online also. One survey (Smith 2011a) indicated that 54% of all U.S. adults (73% of adult Internet users) "went online to get news or information about the 2010 midterm elections, or to get involved in the campaign one way or another." Additionally, "22% of people online used social networking or Twitter for politics in 2010 campaign" (Smith 2011b) and "26% of all American adults used their cell phones to learn about or participate in the campaign" (Smith and Rainie 2011).

High levels of participation on Facebook are also consistent with a recent study (Rainie et al. 2011) which suggests that Internet users participate in groups more than non-Internet users. One national survey (Rainie et al. 2011) found that out of the 75% of all adults in America who are active in a voluntary group or organization, those that are online are most active – 80% of Internet users participate in groups compared with 56% of non-Internet users. Social network users are even more active as 82% are group participants. I think it would be more precise to say that individuals that participate in groups are more likely to use the Internet.

I agree with scholars that argue that the level of activity and participation by individuals on Facebook and other social media platforms has the potential to amplify offline activities, including *public participation* (Kirk and Schill 2011) in urban planning projects (Brabham 2009, Evans-Cowley and Hollander 2010).

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[22] Facebook, about http://www.facebook.com/press/info.php?statistics accessed May 16, 2011

2.6.1 How Social Media Has Changed the Way Humans Communicate and Organize

The term “social media” can mean different things to different people. It is true that Facebook and Twitter are social networking sites and that they are considered social media. However, for the purpose of this thesis the most important aspect of what is typically referred to as “social media” is not the fancy new technology or network but how it actually has changed the way humans communicate and organize.

Before the days of the Internet, it was the television, radio and newspapers. Traditional media is still critical in our society in how people receive and share information. The traditional media model consists of a limited number of “content producers” that “push” flat, static information from one-to-many people. With the traditional media model, there is limited interaction with your audience. There’s no way to directly engage with the creator of the content in any real time or immediate way.

The content producers in the traditional media model are typically journalists or communications experts. The information is distributed from fewer access points such as cable news channels or (printed) newspapers. The tools needed to create and distribute media require more training and expertise. The content typically adheres to professional journalistic guidelines though may be less trusted by individuals which has consequently contributed to the rise of social media.

Social media distribution, on the other hand, is quite different. The rise of the Internet has allowed anyone—regardless of their technological expertise—to react to something right away. Social media content is dynamic, real-time and is many-to-many “pull” distribution – meaning

content pulls participants to engage from the bottom-up, a phenomenon that inspired the title of the book *Groundswell* (2008).

The social media publishing tools are easy to use and many of them are free. Social media content producers have a multitude of access points from their laptops to their mobile devices. In effect, social media functions like digitized word-of-mouth and with that, information can be fragmented and less reliable.

With social media, not only can you respond immediately to something you read, see or hear, but you can also see what your family, friends, colleagues or total strangers thought about that same thing. You can share information that is personally interesting or relevant to you with a small group of friends—or an enormous group of complete strangers.

Social media has drastically changed the way we communicate including how political campaigns are run and how public participation is implemented – the very reason I am mentioning it here. In my opinion, the argument is not whether or not it is worth investing in ICTs to supplement or enhance participatory activities but which ICTs should be used and how they should be implemented. One possible enhancement to the public participation is crowdsourcing. The following theories of collective intelligence and crowd wisdom support the argument for crowdsourcing public participation.

2.7 Collective Intelligence and Crowd Wisdom

The concept of crowdsourcing is rooted in our theories and experiences of collective intelligence. Thomas W. Malone, the Director of MIT's Center for Collective Intelligence (2006) defined *collective intelligence* as "groups of individuals doing things collectively that seem

intelligent." Malone points out that collective intelligence has been around for a long time. The family unit, organizations and nation-states – all of these, are groups of people using collective intelligence to work together towards goals and objectives. Beehives and ant colonies are examples of insects work collectively to locate food which would seem intelligent.

James Surowiecki, the author of *The Wisdom of Crowds* (2004) argued that "under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them" (2004, xiii). Surowiecki believes that groups do not have to consist of geniuses nor do people within a group have to be well-informed to reach a collectively wise decision. This sounds similar to gathering local and non-expert knowledge for planning projects.

Surowiecki points out that humans have difficulty making good decisions on a consistent basis because of our emotional attachments and inability to make sophisticated cost-benefit calculations, but "when our imperfect judgments are aggregated in the right way, our collective intelligence is often excellent" – this is the concept of *Wisdom of Crowds* (Surowieki 2004, xiv).

The *Wisdom of Crowds* does not come from averaging ideas and solutions from the crowd but from aggregating them (Surowiecki 2004). According to Surowiecki (2004, 11) if you ask 100 people to solve a problem "the average answer will often be at least as good as the answer of the smartest member" whereas if you ask them to run a 100-meter race, the average time will not be better than the time of the fastest runners.

The Internet itself is a form of collective intelligence. The search engine is a perfect example of how the Internet's collective wisdom is aggregated. Take Google for example, its cornerstone innovation PageRank determines the "importance" of a webpage by calculating what other websites link to it (as well as other data). Of course, it is actual people doing the searches

and linking to the websites. With that in mind, Google is one of the most sophisticated forms of collective intelligence in the world – you can type in any word or phrase and in roughly one-fourth of a second receive the most relevant search results (Google 2012a).

Following the collective crowd is not all good. Too much collaboration and communication has the potential to lead to compromise or disaster Surowiecki (2005) summed up the dark side of collective intelligence or *crowd wisdom* with the following example:

> If army ants are wandering around and they get lost, they start to follow a simple rule: Just do what the ant in front of you does. The ants eventually end up in a circle. There's this famous example of one that was 1,200 feet long and lasted for two days; the ants just kept marching around and around in a circle until they died.

How can ideas be aggregated, then? That's where crowdsourcing comes in.

2.8 Crowdsourcing as a Model to Enhance Public Participation

Surowiecki offers a strong argument for utilizing *The Wisdom of Crowds* to solve (public) problems. The key to harnessing crowd wisdom, however, is in how the ideas are aggregated (Surowiecki 2004). The Web and ICTs have the potential to "enable the precise form of aggregation Surowiecki stipulates for a successful, wise crowd" (Brabham 2009). The key to aggregating a smart crowd is to encourage individuals "to develop complete single ideas and put them up for review [on a website] among their peers in the crowd" (Brabham 2009, 248). This concept, of course, sounds a lot like crowdsourcing.

So what is crowdsourcing anyway? First coined by Jeff Howe in a blog post[23] in 2006, followed by an article he wrote in *Wired* magazine in June 2006, Howe defines crowdsourcing as "the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential laborers" (Howe 2008).

For this thesis project, I have merged both Jeff Howe's definition and Daren C. Brabham's definition of crowdsourcing: a web-based, distributed problem solving and production model for business which includes an open call to a (generally) large network of people (Howe 2006, Brabham 2009).

Brabham (2010, 36) clarifies crowdsourcing in simple terms as:

> … a company posts a problem online, a vast number of individuals offer solutions to the problem, the winning ideas are awarded some form of a bounty, and the company mass produces the idea for its own gain.

According to David H. Jonassen (2003) crowdsourcing is essentially a problem solving model because the goal of the company is to acquire innovative, sellable, original ideas (as cited by Brabham 2010, 36). The company acquires the ideas by hosting a contest through the company's website. The problem that needs to be solved varies but "generally consists of

[23] Jeff Howe's blog post on the definition of crowdsourcing can be found at http://crowdsourcing.typepad.com/cs/2006/06/crowdsourcing_a.html. The post was dated June 2, 2006 and published June 6, 2006.

needing a product designed or scientific problem cracked" (Brabham 2010, 36). The solutions to the problem come from individuals that submit their ideas or designs to the website.

The crowdsourcing model is typically associated with for-profit companies such as Threadless, InnoCentive, and in contests such as user-generated advertising campaigns and the "Goldcorp Challenge."[24] For example, InnoCentive is a platform where Companies can post research and development (R&D) problems and individuals or "solvers" submit their solutions aiming for cash prizes from $5,000 to $10,000 (Tapscott & Williams 2006, 98-9).

Brabham notes that there are several business case studies of crowdsourcing that outline how the model functions and how it can be a similar problem solving process as public participation and deliberative democracy (2010, 36). According to Friedland and Brabham (2009), a typology of crowdsourcing emerges from the case studies in four dominant approaches: the knowledge and discovery management approach, the broadcast search approach, the peer-vetted creative production approach and distributed human intelligence tasking.

The following table outlines the characteristics and examples of the four approaches of crowdsourcing.

Crowdsourcing Approach	Characteristics	Examples
Knowledge Discovery and Management	• "common-based peer production" (Benkler 2002) enables online community to collect, edit, and manage the knowledge base in distributive ways • Task an online community to find and organize information	• Wikipedia • Peer-to-Patent Community Patent Review
Broadcast Search	• Research and development problems crowdsourced for large	• InnoCentive • The Goldcorp Challenge

[24] Next Stop Design, "Press: What is Crowdsourcing?" accessed October 3, 2011 http://www.nextstopdesign.com/press.

	cash rewards from $5,000 to $1M • Submitted solutions are never seen by solvers (online community) • Solvers are rewarded by Seeker companies in exchange for intellectual property • Organization casts wide net to find the "needle in the haystack"	
Peer-Vetted Creative Production[25]	• Open creative process to Internet users for distinct, superior ideas and design submissions • Peer vetting process identifies the highest rated ideas by peers thus collapsing the market research process • Designs are submitted and rated by members of an online community • An award system is created to recognize one or multiple winners	• Threadless • User-generated advertising contests
Distributed Human Intelligence Tasking	• "requesters" use site to coordinate a series of simple tasks to be done by humans • Online community members sign up and complete a series of "human intelligence tasks" (HITs) for a small monetary award by the Requester	• Amazon Mechanical Turk • Digg • StumbleUpon

Table 3: Four Approaches of Crowdsourcing (adapted from Friedland and Brabham 2009)[26]

Crowdsourcing is one example of "peer production" within the realm of social media and a *Networked Society*. However, as Brabham (2010, 42) points out:

> [crowdsourcing] is unique in that it involves an organization-user relationship whereby the organization executes a top-down, managed process that seeks bottom-up, open, creative input of the users in an online community.

[25] The inTeractive Somerville Green Line Challenge can be considered an example of a Peer-Vetted Creative Production Approach to crowdsourcing.

[26] The information populated in this table is from Daren C. Brabham's PhD dissertation (2010) unless otherwise noted in the table. References within table are also as cited by Brabham.

The four approaches of crowdsourcing can be modified to accomplish specific tasks and goals. The approach utilized largely depends on what solution the organizer of the crowdsourcing challenge is seeking. “Any number of new media tools could design to meet the needs of an organization in search of a solution to a problem” (Brabham 2010, 42). In the crowdsourcing challenge pertaining to this case study, the *Peer-Vetted Creative Production* approach was taken. I discuss this further in Section 4.2.1 *Using Next Stop Design as a Crowdsourcing Template*.

Because crowdsourcing is a business model it is not completely transferrable in addressing public plans and problems. As Brabham did with his research (2010) I chose to ground the design of the crowdsourcing website in democratic (and planning) principles.

2.9 Guidelines for Building Online Deliberative Democracy Spaces

Deliberative democracy is another term with numerous interpretations and layers of literature dedicated to the subject. Ideas about what deliberative democracy means has outpaced empirical research and some scholars go as far as suggesting that theories and empirical research about the subject are disconnected (Nino 1996, Thompson 2008 – as cited by Brabham 2010, 14). Even the word “deliberation” can be a confusing word because the meaning morphs with the context.

The “deliberation” I am referring to in this paper is one that is a “thoughtful, careful” and sometimes lengthy discussion or debate between individuals and groups (Collins English Dictionary 2011). And the deliberation is on a micro-level; focused on the processes and

interactions within the participatory activities of a transit-oriented planning project (but could also potentially be applied to an urban planning project of similar size and substance).

Deliberative democracy puts the collective and what is best for the common good first, with a strong focus on discussion among equals and consensus (Chambers 2003, 308 – as cited by Brabham 2010, 12). Daren C. Brabham (2010, 13) describes deliberative democracy (with underpinnings of crowdsourcing concepts) as:

> Rather than aggregating the votes of self-interested individuals to declare a majority opinion, deliberative democracy strives for discussion among individuals about common interests. Voting can accompany effective deliberative process as a way to define an outcome of a deliberation, but the difference between deliberation-informed voting and self-interested, non-deliberative voting is that individuals consider these common interests in the former kind.

Adding the "online" to "deliberative democracy" I rely on minds that have written about the subject in great detail. Todd Davies and Reid Chandler (forthcoming 2012) wrote a chapter in a forthcoming book on deliberative democracy titled "Online Deliberation Design: Choices, Criteria, and Evidence" and here is how they describe the "online" part of "online deliberative democracy":

> The term "online" as a modifier to "deliberation" could be read to indicate the mediation of deliberation among participants through one or more electronic communication technologies that augment our usual abilities to see or hear information separated from us in time or space. In addition to the Internet, this would include telephone (including "smart phone") and teleconferencing systems, broadcasting (if used to facilitate communication between participants, e.g., "talking heads" debating over different satellite feeds, rather than just presenting information relevant to deliberators), and electronic tools through which participants in face-to-face meetings interact.

Today, the combination of participatory culture and social technologies are promising for e-democracy and online deliberative democracy. There is no shortage in tools and technology

available to carry out online deliberation. However, the extent to which online deliberation actually occurs and actually means something is scarce – NYU Law Professor and the former Deputy Chief Technology Officer for Open Government Beth Simone Noveck (2003, 47) calls it "E-Government without E-Democracy."

Daren C. Brabham used Noveck's ideals for online deliberative democracy (2003) to help frame the results of his PhD thesis (2010, 31) because "it is arguably the best recent single summary of the [online deliberation] literature. Noveck set out in 2003 as a Legal scholar to conceptualize designing deliberative spaces online rather than the one-way, transactional spaces that made up the government's online channels.

Noveck created a list of ideals or "building blocks of deliberation [to] allow us to construct participatory processes" (2003, 12). Table 4 (below) represents Noveck's 11 ideals of online deliberative democracy (2003, 12-7 – adapted from Brabham's summary 2010, 32-3).

Brabham's approach was to operationalize Noveck's ideals in a series of interviews with participants from Next Stop Design in order to gauge whether participants viewed the project as an effective online participation process. Though I think Noveck's ideals are important and helpful in assessing and designing online deliberative spaces, I think that the challenges of public participation in urban planning projects is more relevant to answering my research questions[27].

[27] Note that Daren C. Brabham's PhD thesis on "Crowdsourcing as a Model for Problem Solving: Leveraging the Collective Intelligence of Online Communities for Public Good" was earned from the Department of Communication at The University of Utah. And so it was more communication- and media-focused than planning.

Accessible	available to as wide a range of participants as possible – virtually or physically
Free of censorship	freedom of thought and expression
Autonomous	Participants are active in a public process
Accountable and relevant	Community engages in "accountable and reasoned public discourse" and "cannot be anonymous to one another"
Transparent	"the structure and rules of the space must be public so that citizens know who owns and controls the space, whether monitoring is taking place, and the origin of any information contributed to the discussion"
Equal and responsive	all "participants must be equal players with opportunities for access and voice" and "[t]he architecture cannot privilege one group over another"
Pluralistic	"[r]ules or technology can be enlisted to regulate the space for deliberation" so that "viewpoints representing a broad spectrum are clearly expressed"
Inclusive	Each participant must at least have the chance to be heard. And a deliberative forum must be inclusive and open community members.
Informed	"deliberative dialogue cannot be divorced from [relevant] information; participants must have access to a wide variety of viewpoints in order to make effective and educated decisions"
Public	Open dialogue dedicated to the what is best for the community
Facilitated	facilitate the dialogue, highlighting what is productive and suppressing what is destructive

Table 4: Design Principles for Online Deliberative Democracy Spaces (adapted from Noveck 2003)

To create my analysis framework for the interview questions I used the Top Ten Public Participation Challenges (Table 1) that I compiled as my foundation. I cross-analyzed the Top Ten Challenges with Noveck's Design Principles for Online Deliberative Democracy Spaces (Table 4) and matched public participation challenges and online deliberation guidelines. Three new broader categories were created to better fit within the crowdsourcing context. This new framework is discussed in more detail in Chapter 4 of this thesis *Methods, Analysis, and Results*.

3 RESEARCH QUESTIONS AND RESEARCH APPROACH

3.1 Research Trends on the Impact of the Internet on Public Participation

There is a wide array of research on the impact that information and communication technologies (ICTs) have on public participation. Rita Kirk and Dan Schill (2011, 326) suggest that scholars studying the impact of Internet use on citizen engagement or participation behaviors, such as voting, political knowledge, and political discussion" have traditionally divided into three groups:

1. mobilization theorists,
2. reinforcement theorists, and
3. cyber skeptics.

Mobilization theorists posit that the Internet can lead to new forms of democracy, and can improve our democracy by making it easier to participate, connect with elected officials thus becoming more efficient and reducing communication (and transaction) costs.

Theorists in the reinforcement camp argue that the Internet only amplifies and strengthens existing patterns of political communication and information and will only be relevant to those already engaged in the political process.

And then there are the cyber skeptics, who suggest that there is either no effect or a negative effect when it comes to utilizing the Internet for civic engagement.

When you bring human behavior and technology together such as public participation and the Internet, there can be a slew of variability and myriad of potential theories and research

possibilities. Further, academic studies on the Internet and civic engagement are bound by the technologies and networks that are in place during the time of the study.

So for example, Kirk and Schill (2011) cite Koch (2005, 159) as a source to substantiate the cyber skeptic camp; Koch argues that "the Internet reinforces a structure of passive political agents through its one-way form of communication. Koch hypothesizes that the Internet is designed to deliver political text, not engage the public in dialogue about the direction of collective decision making."

As stated in the introduction, social media has completely changed the way people communicate and organize – two-way or multi-way communication is one of the key reasons for this significant shift in communication and culture, so Koch's point about one-way communication has lost its luster. And so one could reasonably expect that some of the points being made about today's technology could likely be rebutted in the (near) future depending on how technology develops and affects communication.

It is reasonable to believe that because of the complexities of human behavior and technology any given research project on the subject, including this one, could encompass theories of mobilization, reinforcement and cyber skeptics.

3.2 Research Questions

Public participation is a complicated subject. Add to it the dynamics of ICTs, human behavior and crowdsourcing and it can be overwhelming to research and digest. Therefore, it is critical to ask questions that are concise and specific. The following are my research questions that I sought to answer for this thesis.

My main question is *to what extent can crowdsourcing facilitate public participation for transit-oriented planning projects?*

Undoubtedly, there will be a number of additional questions that will emerge as the research unfolds, including my main sub-questions.

Sub-question 1: *to what extent can crowdsourcing public participation generate distinct ideas?*

Sub-question 2: *to what extent can crowdsourcing public participation engage individuals who typically do not get involved in the planning process?*

3.3 Research Approach

3.3.1 Case Study Approach

My thesis aims to bring together both my academic and professional experience and interests by merging elements of public participation and urban planning with information and communication technologies (ICTs). Using Brabam's (2009) hypothesis that crowdsourcing is an appropriate model for enabling public participation in public planning projects, I sought to test his hypothesis with a "live" planning project, set in a dense, diverse neighborhood, in the Boston area.

Researching in a "live" planning environment has its benefits and challenges. In one respect, you are observing a "real" situation and working with objectives and goals with real people and real organizations. Working in the real world allows you to put theories and

hypotheses to the test while opening the opportunity to discover new ideas and correlations with existing widely accepted theories.

With that said, cities, people and technology coming together are dynamic and difficult to predict and thus it is a challenge to quantify and analyze data individually and even more so collectively. In order to answer the question "t*o what extent can crowdsourcing facilitate public participation in urban planning projects*?" a combination of qualitative and quantitative methods were employed through a case study method.

Robert K. Yin (2009) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (18). There are not many examples of "crowdsourcing public participation" for planning projects documented so it makes sense to use this case study as a benchmark. A case study is an appropriate research approach as I am aiming to "understand a real-life phenomenon in depth" (Yin 2009, 18).

Robert E. Stake (1998, 88-9) suggests that there are three types of case studies: intrinsic, instrumental and collective. The *intrinsic* is to gain an understanding of a particular case. *Instrumental* case studies are used to provide insight into a particular issue or refinement of a theory – the case is secondary and plays a supportive role in understanding the grander issue. Lastly, the *collective case study* is when researchers bring together a number of cases and analyze them together, collectively, "to inquire into the phenomenon, population, or general condition" (Stake 1998, 89).

For this case, there are not a lot of similar cases to compare (collective) nor do I just want to focus solely on this case study (intrinsic). This research is closer to an *instrumental case study*

where I hope to advance understanding of crowdsourcing public participation for urban planning projects through inTeractive Somerville (Stake 1998, 88).

A case study presents opportunities to document specific and common information, but the final product of a case study is typically unique (Stouffer 1941). I expected there to be a number of unique factors in this case study (as outlined by Stake 1998, 90), such as the nature of case, historical background, physical setting and economic, political, policy and legal context.

Uniqueness presents an enormous challenge in gaining validity in the world of social science research (Stake 1998, 91). Social scientists have been slow to view the case study as a reliable source as researchers can have the tendency to make generalizations from one intrinsic case study. Stake argues that damage occurs when the researcher is focused so strongly on making generalizations or creating theories that they miss aspects of the case that are critical to understanding the case itself (Stake 1998, 91). By no means do I see this thesis as something that will allow anybody to generalize or make "blanket statements." But rather, it is intended to be a deep analysis of one particular case that can guide future research and help us learn more about the challenges and benefits of crowdsourcing public participation.

Most case researchers are concerned with the validity of their communication and to combat generalizations and reduce the likelihood of misinterpretation, case researchers use redundancy of data collection and procedural challenges to explanations, typically referred to as *triangulation*. In essence, triangulation is "a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation" – it identifies different ways to see the phenomenon to clarify the meaning (Stake 1998, 97).

With multiple, diverse channels of information converging to tell a story through the case study, not everything can be understood. It's up to the researcher to decide what is important and what to focus on and my approach will be no different.

3.3.2 Data Collection Methods Overview

Planners borrow research methods from many disciplines. Planning problems are complex and the methods used to help sift through the abundant and diverse information are usually modified and adapted to meet planner's needs (Dandekar 1986). In the case of this research project, I chose the following research design because it was the most viable approach I could take given my research questions and limitations:

	Data Collection Method	Tactics
Secondary Research	**Literature Review** (Chapter 2)	• Reviewed scholarly literature, websites and documents pertaining to research question(s) e.g. crowdsourcing and public participation.
Primary Research	**Site Reconnaissance and Field Research** (Chapter 4, Methods, Analysis, and Results)	• Visited the site and took notes and photographs with digital camera. • Gathered data on demographics, population and housing from the U.S. Census Bureau, MassBenchmarks and Policy Map. • Documented and applied textual analysis to Gilman Square Community Planning Meeting (see Appendix 3 and Table 8).
	Web Analytics (Chapter 4, Methods, Analysis, and Results)	• Crowdsourcing challenge data from interactivesomerville.org – number of registrations, ideas and votes. • Applied textual analysis to ideas and comments collected through Green Line Challenge. • Compiled Google Analytics data – visitors, traffic sources, and visitor's geography.
	Interviews (Chapter 4, Methods, Analysis, and Results)	• Conducted in-depth semi-structured interviews to shed light on research questions and to illuminate trends and concepts. • See Appendix 4 to view the interview instrument.

Table 5: Data Collection Methods

3.4 Calendar of Events and Research Activities

The following is a calendar of events and research milestones:

Date	Events and Research Activities	Web Development and (Social) Media Activities
May	• Presented inTeractive Somerville crowdsourcing test website on IdeaScale (Appendix 1)	• Assessed and tested crowdsourcing platforms • Developed test space on IdeaScale
June	• Attended Gilman Square Station Workshop, sponsored by MassDOT and the MBTA	
July	• Visited the site (Gilman Square) – captured images with digital camera. • Documented (and attended) Gilman Square Community Planning Meeting (Appendix 2) • Decided to use platform already in development for crowdsourcing: inTeractive Somerville	• Uploaded photographs from site reconnaissance to Flickr[28] account and categorized with geo-locations, title, descriptions and keyword tags. • Consolidated and launched social media channels: Facebook, Twitter, Flickr, YouTube • Redesigned inTeractive Somerville logo
August	• Launched crowdsourcing website: interactivesomerville.org	• "Listen" for mentions of related inTeractive Somerville subjects and share relevant links with social channels
September	• Met with SCC to discuss "Crowdsourcing Challenge Idea"[29] • Pitched MassDOT and MBTA the Challenge concept and requested a train pass prize for the winner.	• Tested website and worked with programmer to improve usability and functionality.
October	• The "Green Line Challenge" Concept is approved by the CCP. • MBTA agrees to donate 3 one-month "T" passes to the winner of the Green Line Challenge.	• Geo-coded and categorized photos and items on website by station and theme. • Start social media campaign to promote website launch party on Nov. 14, 2011.

[28] Flickr is one of the most popular photo-sharing sites in the world. Adding specific titles, descriptions and tags allows people to find the photos more easily online. The photos are available for anyone to embed and share online and can be found at http://flickr.com/interactivesomerville.

[29] Based on observations and community feedback gathered during the Gilman Square Community Planning Meeting (see Appendix 2), improving the area where the Homans Building is located was proposed as the Green Line Challenge concept.

November	• The "Green Line Challenge" Concept is approved by the CCP • MBTA agrees to donate 3 one-month "T" passes to the winner of the Green Line Challenge • Presented interactivesomerville.org at website launch party and promoted the Green Line Challenge.	• Developed "Green Line Challenge" webpage on website with instructions, tools and contest parameters • Created mockup for interactivesomerville.org homepage redesign • Worked with programmer on homepage redesign for November 14 launch party • Somerville Patch article posted[30]
December	• Extended the original Challenge deadline from Dec. 5, 2011 to Jan. 9, 2012.	• Launch second social media campaign to promote Green Line Challenge and extended deadline.
January	• Deadline to submit ideas for Challenge: Jan. 9, 2012. • Idea ratings calculated. • Green Line Challenge winner announced Jan. 16, 2012. • Interviewed participants that submitted an idea and website registrants.	• Three articles were published during the first week of January, promoting the Green Line Challenge.[31]

Table 6: Calendar of Events and Research Activities

4 METHODS, ANALYSIS, AND RESULTS

The *Methods, Analysis, and Results* chapter consists of Site Reconnaissance and Field Research, (Semi-Structured) Interviews and Web Analytics. This chapter is written chronological order to help the reader understand the process of creating and implementing a crowdsourcing challenge for a transit-oriented planning project coupled with designing and carrying out

[30] The first article is posted on *Somerville Patch* (and social media channels) promoting the Green Line Challenge on November 25, 2011 (see Orchard 2011 and/or link here: http://somerville.patch.com/articles/interactive-somerville-green-line-challenge).

[31] Articles were published in the *Boston Metro* (Annear 2012), *Somerville Journal* (Metzger 2012) and *BostonInno* (Landry 2012) during the first week of January. The media buzz helped the ideas submitted to the Challenge go from 1 idea to 11 ideas.

academic research at the same time. Therefore, this chapter does include some of findings in the narrative which are analyzed in more detail in Chapter 5 *Conclusion*.

The majority of data in this chapter was collected first hand (primary research) with the exception of demographics, population and housing data (from the U.S. Census Bureau, MassBenchmarks and Policy Map). The data collection methods that were employed (in Table 5) essentially serve as the outline of this chapter.

4.1 Site Reconnaissance and Field Research

4.1.1 The Green Line Extension Project

The "urban planning project" that is the setting and context for my thesis research is the Green Line Extension Project. Spearheaded by the MassDOT (Massachusetts Department of Transportation) and the MBTA (Massachusetts Bay Transportation Authority), the Project is a proposed transit-oriented development[32] that would extend the MBTA Green Line from a relocated Lechmere Station in East Cambridge, Massachusetts to Union Square in Somerville and College Avenue in Medford (MassDOT and MBTA 2012a). In all, there are seven new stations that are proposed, including the relocation of Lechmere (see Figure 1: Green Line Extension Map). One of the 7 proposed stations – Gilman Square – represents the physical location and setting of the crowdsourcing challenge and my research question(s).

[32] "Transit-oriented development (TOD) is compact, mixed-use development near transit facilities and high-quality walking environments." TOD typically leverages transit infrastructure to promote economic development and smart growth. TOD attempts to create more sustainable communities "where people of all ages and incomes have transportation and housing choices, increasing location efficiency where people can walk, bike and take transit. TOD also works to reduces traffic and automobile congestion" (Federal Transit Administration 2012).

The concept of the Green Line extending through Somerville dates back to the 1920s.[33] The Commonwealth of Massachusetts agreed to extend the Green Line through Somerville in 1990 "to offset the pollution increase within Somerville caused by the Big Dig" (City of Somerville 2012a). A key objective of the Green Line Extension Project is to "greatly improve local and regional mobility, address longstanding transportation inequities, result in fewer automobiles on local roads, and help to combat greenhouse gas emissions and other components of air pollution" (MassDOT and MBTA 2012a).

In 2006, the City of Somerville and the Conservation Law Foundation filed and won a lawsuit to keep the project moving. And with the help of community groups such as the Somerville Transportation Equity Partnership (STEP), the State agreed to fund the Project, mandated to be complete by December 2014 (City of Somerville 2012a, Metzger 2011).

[33] According to the City of Somerville's website the idea of the Green Line Extension was initially thought of as a possibility by the Metropolitan Planning Commission as early at the 1920s (City of Somerville 2012).

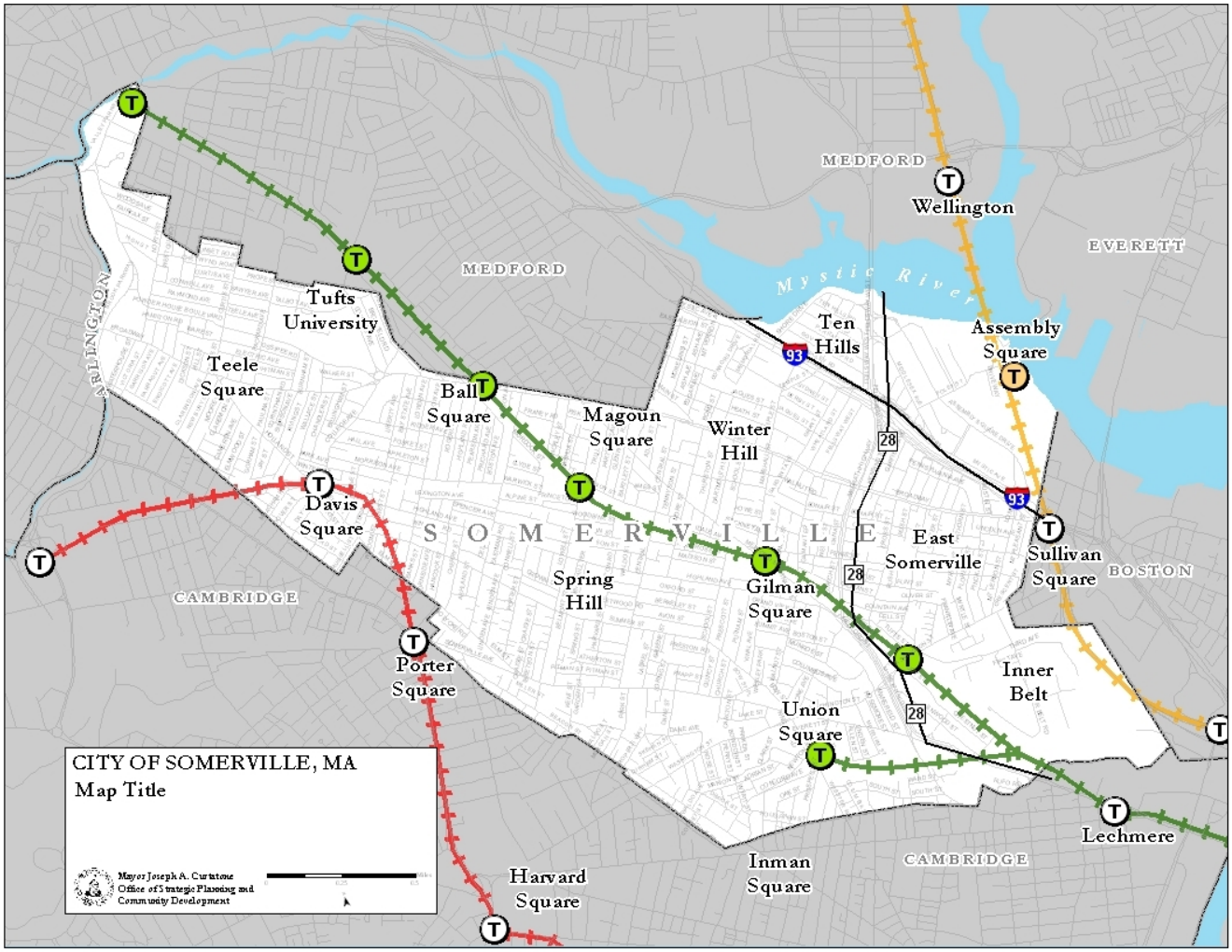

Figure 2: Green Line Extension Map (City of Somerville 2012b)

The Green Line Extension Project is a widely contentious issue from local residents in Somerville, Medford, Cambridge and Arlington to local and regional elected officials (Metzger 2011). Much of the controversy and debate stems from perpetual delays and broken promises by the State (MassDOT and the MBTA included).

According *Final Environmental Impact Report* for the Project, the time of construction was scheduled to run from November 2011 through December 2014 (MassDOT and MBTA

2012b). In 2007, the Governor of Massachusetts, Deval Patrick, promised a cheering crowd in Gilman Square that the Project "gets built and gets built while I'm in office" (Metzger 2011). However, Gov. Patrick's promise is likely to be another broken one.

In July 2011, the MassDOT pushed back the completion on the Green Line Extension Project until 2018 and possibly till 2020 for two of the seven stations (Metzger 2011, Byrne 2011a). The public was outraged and held a "mock groundbreaking" demonstration just before a State-sponsored public meeting to discuss an environmental study of the Project (Byrne 2011b). Residents, public officials and 11 different community groups from four communities – Somerville, Medford, Cambridge and Arlington – brought their shovels to convey the message that they are "shovel ready" for the Green Line Extension. After the demonstration, the Mayor of Somerville, Joseph Curatone, sponsored an online petition that generated thousands of supporters (Somerville Journal 2011, Byrne 2011b).

The "mock groundbreaking" demonstration was organized by the Community Corridor Planning (CCP) – a coalition of four community organizations in Somerville that also lead on the development and launch of the website where the crowdsourcing experiment took place: inTeractive Somerville – interactivesomerville.org.

4.1.2 Community Corridor Planning (CCP)

The CCP (Community Corridor Planning) is a coalition of four community organizations in Somerville: Somerville Community Corporation, Groundwork Somerville, Somerville Transportation Equity Project, and Somerville Community Health Agenda. CCP is lead by a 16-person resident Advisory Team and encourages grassroots, community planning to engage

Somerville residents and business owners in land use and station design planning of the "Green Line Corridor." The Green Line corridor is the areas in and around the Green Line Extension Project (inTeractive Somerville 2012a).

In 2009, the CCP ratified 11 "themes" called Core Community Principles for Neighborhood Development along the Green Line Corridor (Appendix 2). The Core Community Principles were created by the CCP and a large body of community residents who participated in a series of meetings to establish key priorities for their community along the Green Line Corridor. These principles continue to guide the community planning and action work of CCP today, including the development and functionality of their website inTeractive Somerville.

4.1.3 Overview of inTeractive Somerville

inTeractive Somerville (interactivesomerville.org) is a website that provides people with a place (online) to give input about what they would like to see happen along the transit corridor of the Green Line Extension Project. It is also the primary tool and crowdsourcing platform that I utilized to gather ideas and input from the public on behalf of the CCP (and for this thesis project).

The website itself is a digital representation of the CCP. It seeks to involve residents in the public participation process for land use planning projects in Somerville, including the Green Extension Project. The vision is that as ideas are built collectively, inTeractive Somerville can share these ideas with city and state planners and policy makers (inTeractive Somerville 2012a).

4.1.4 How I Got Involved with inTeractive Somerville: Open Neighborhood

I found out about inTeractive Somerville through my thesis adviser, Professor Justin Hollander, AICP. Prof. Hollander is the Director of Open Neighborhood - an academic research arm of Tufts University's Urban and Environmental Policy and Planning Department. Open Neighborhood has prepared research for the Somerville Community Corporation (SCC) – one of the four CCP organizations spearheading the development of the inTeractive Somerville website.

Open Neighborhood seeks to facilitate a visionary process to transcend the restrictive parameters and challenges usually encountered in planning – an approach that fits perfectly with my research. The following is Open Neighborhood's public engagement approach for the inTeractive Somerville project:

> *Experience* — technology will be used to allow community members see their vision for the community rendered in an immersive, 3D environment.
>
> *Participate* — participants will be provided with multiple opportunities to contribute to the envisioning process, whether through community meetings, focus groups, or online participation.
>
> *Imagine* —Community members are asked: if you could create a new Gilman Square, what sort of amenities would you like to see? What changes would you want made? What new developments are important to you? (Open Neighborhood 2011).

In the spring of 2011, when I first learned about inTeractive Somerville, Open Neighborhood was helping to facilitate public participation for the proposed Gilman Square Station – one of the 7 new train stations proposed for the Green Line Extension Project (see Figure 1: Green Line Extension Map). The goal of Open Neighborhood's research for

inTeractive Somerville was to engage Somerville residents, particularly those who ordinarily do not get involved in city planning, in helping to shape the future of the city in anticipation of the Green Line Extension into Somerville (Open Neighborhood 2011).

Because the objectives of Open Neighborhood are closely aligned with my research interests my thesis adviser recommended that I pursue my research activities through the inTeractive Somerville project. My research project focused more on Open Neighborhood's "Participate" tactic; however, participants were able to "Experience" and "Imagine" through the primary engagement tool – inTeractive Somerville (interactivesomerville.org).

4.1.5 My Role with inTeractive Somerville

While working on inTeractive Somerville I took on a variety of roles. My main focus was on the launch and development of the website, which would serve as the crowdsourcing platform. I worked closely with the Director of Community Organizing and Planning at the Somerville Community Corporation, Meridith Levy, who initiated and took the executive lead on the project for the CCP. I also worked with the main programmer[34] of the website from design concepts, to usability and functionality and testing.[35] My work with inTeractive Somerville was indeed a form of Participatory Action Research (PAR)[36].

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[34] All references of "programmer" or "coder" are to Christian Spanring. Christian is currently a GIS Developer at the MAPC (Metropolitan Area Planning Council).

[35] The code and development notes for the inTeractive Somerville website can be found on GitHub – the largest code host in the world: https://github.com/SomervilleCC/interactivesomerville/.

[36] PAR projects include "(a) a collective commitment to investigate an issue… (b) a desire to engage in self- and collective reflection… (c) a joint decision to engage in individual and/or collective action that leads to a useful solution that benefits the people involved, and (d) the building of alliances between researchers and participants in the planning, implementation, and dissemination of the research process" (McIntyre 2008, 1).

In addition, I managed inTeractive Somerville's social media channels. This consisted of strengthening inTeractive Somerville's brand online by consolidating existing (duplicate) social media channels and accounts and creating new social media channels to help support objectives and goals. In all, inTeractive Somerville has four social media channels: Facebook (page),[37] Twitter,[38] Flickr[39] and YouTube.

Lastly, I worked on design, branding and public relations. I updated the inTeractive Somerville logo and optimized it for online and print. I created web graphics to promote events. And I was able to generate news articles in the *Somerville Journal*, *Somerville Patch*, *Boston Metro* and *BostonInno* to promote the crowdsourcing challenge – The Green Line Challenge (inTeractive Somerville 2012b).

4.1.6 Community Profile of Somerville, Massachusetts

The context of my research was set in a diverse, densely populated neighborhood just outside Boston, Massachusetts in Somerville. In between Boston and Cambridge, Somerville is known for being the most densely populated city in Massachusetts (MassBenchmarks 2012). There are 75,754 people living within approximately 4.1 square miles – a population density of over 18,400 people per square mile (US Census 2012b).

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[37] The inTeractive Somerville Facebook page (http://www.facebook.com/interactivesomerville) was created on July 6, 2010. It was inactive for nearly a year. I "reclaimed" the page in June 2011 to connect community members and organizations to the Green Line planning process. As of February 6, 2012 the page had 96 "likes."

[38] The inTeractive Somerville Twitter account (https://twitter.com/#!/i_somerville) was created May 2011 to connect and share information and news with local media, community members and organizations. As of February 6, 2011, @i_somerville had 133 "followers."

[39] The inTeractive Somerville Flickr account was reclaimed in July 2011. The inTeractive Somerville website allows users to embed Flickr photos and geocode them to a customized Google Map.

The City of Somerville is diverse in every sense of the word from the population to its housing stock to its history. The population is more diverse compared to the State of Massachusetts. A significant proportion (27%) or 21,211 out of 75,754 are "foreign born." Consequently, 33% of Somerville's population speaks a language other than English in their homes compared to the 21% state average. Somerville has a significantly higher percentage of Asians (9%) compared to 5% MA average. It also has about the same percentage of Hispanics (11% vs. 10% Massachusetts average) and other race/ethnic groups. Approximately 74% of Somerville residents are white, compared to the 80% state average (US Census 2012b).

The median household income was $62,575 – about the same as the State average of $64,496. However, about 15% Somerville residents are living below the poverty level – slightly higher than the state average of 11% and equal to the National level of 15%.
Despite Somerville's high population of foreign born residents (27%), its population is significantly more educated than the state average – 52% of the residents in Somerville hold a Bachelor's degree compared to the 38% state average (US Census 2012b).

Units in Structure	Somerville	Massachusetts
1-unit, detached and attached	15%	58%
2 units	32%	11%
3 or 4 unites	26%	11%
5 to 9 units	10%	6%
10 to 19 units	4%	4%
20 or more units	13%	10%

(Source: US Census 2012d and 2012e)

Table 7: Somerville Housing Stock Breakdown

In addition to the population being diverse, housing stock in Somerville, Massachusetts is also diverse. Mixed-use is common in Somerville and seems to be more the norm than not. Somerville has a very low proportion of 1-unit housing structures (15%) compared to the state

average (58%). And the City of Somerville has a high proportion of 2 unit (32%) and 3 or 4 unit (26%) housing structures – 58% of housing structures in Somerville are 2 unit and 3 or 4 unit structures, a key reason why the population density of Somerville is among the highest in New England (US Census 2012d and 2012e).

Figure 3: Marshall St. in Somerville Illustrates the City of Somerville's Concentration of Multi-Unit Structures

Figure 4: The Intersection of Medford St. and School St. Illustrates a Mixed Use of Housing and Businesses

4.1.7 Neighborhood Profile of Gilman Square

One of the very first data collection methods employed was site reconnaissance. In the spring of 2011, photos and observations were documented in and around Gilman Square – one of the seven locations where a new train station is proposed to be built as part of the Green Line Extension Project and it is also the setting of this research project. Many of the photos (taken with a digital camera) are embedded within this chapter of the paper, *Methods, Analysis, and Results*[40].

[40] Many of the digital photos were also posted on inTeractive Somerville's photostream on Flickr and can be accessed at http://flickr.com/interactivesomerville.

Gilman Square is not an easily recognized place for those from outside the neighborhood. During a community meeting, held in July 2011, participants widely agreed on Gilman Square's lack of identity (Appendix 3). Ironically, Gilman Square sits approximately one block away from an area full of identity – just a block away Somerville City Hall, Somerville High School and Somerville Public Library are side-by-side.

Figure 5: Gilman Square Area and Somerville's "Civic Hotspot" (Bing Maps)

The entrance of the future site of the Gilman Square Green Line Train Station would be on Medford Street. Medford Street is a long, busy street that cuts right through Somerville – to the north heading towards Medford and to the south towards Cambridge. If you were standing in the exact location of the proposed train station, across the street to the northeast is the Pearl Street intersection. The panorama of the intersection of Pearl and Medford consists of a small section of green space, with the Boston Billiards Emporium building (343 Medford) hugging the

intersection. Adjacent to the Emporium building (going towards Pearl Street) is a parking lot and a well-known neighborhood restaurant “The Paddock.”

To the southwest of the site is a steep hill overgrown with trees and brush where a community path hugs around the adjacent City Hall and High School that sits on a hill at the corner of School Street and Highland Ave and on Highland Ave. respectively.

The area itself has high traffic volume with mixed use of businesses including two gas stations across the street from one another, and a combination of small businesses, 2 unit homes, small apartment buildings and large apartment buildings. Adjacent to the proposed site (to the northwest) of the Gilman Square Station site sits an abandoned, dilapidated factory owned by the City of Somerville known as the Homans Building.

Figure 6: High Traffic Volume, Gas Stations and an Abandoned Factory on Medford St. in Gilman Square

4.1.8 Selecting a Crowdsourcing Website: interactivesomerville.org

Perhaps the most difficult decision that I had to make during this project was which crowdsourcing technology to use. Based on observations and preliminary research online, the two leading free crowdsourcing platforms for public participation were UserVoice and IdeaScale. IdeaScale seemed like the most logical choice since it had been utilized and documented by U.S. Federal departments and agencies more than any other crowdsourcing platform.[41] The City of Seattle has experimented with UserVoice and currently has an active community on IdeaScale, managed by Seattle's City Council.[42]

Furthermore, "out-of-the-box" platforms like IdeaScale have a number of benefits over custom-built websites including cost, hosting, search-friendly urls, design, user-friendly administration functionality, built-in reporting and analytics, programming support, network integration and customer service. Thus, it makes it easier to duplicate quickly and potentially scale further than just one neighborhood or city.

"Customized" platforms likely force you to rely on one or a few programmers to code and design the website, maintain the website (as technologies are updated) and to fix issues and bugs. A website that is unique cannot "talk" to other websites or networks easily. A website such as IdeaScale has a web development team that works to integrate its platform with other platforms and networks.

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[41] See Rao 2010. "IdeaScale Powers 23 Crowdsourcing Sites for the U.S. Government." http://techcrunch.com/2010/02/07/ideascale-powers-24-crowdsourcing-sites-for-the-u-s-government/. You can also link to Federal government platforms from here: http://www.whitehouse.gov/open/around.

[42] Ideas and comments on Seattle City Council's IdeaScale website are considered "public record" is uncommon and a point of contention at the intersection of public participation and ICTs. See Appendix 4 for a screenshot or link to it here: http://seattlecitycouncil.ideascale.com/.

Web design is another big challenge for customized websites. "Out-of-the-box" platforms typically work tirelessly on design to improve the "user experience"[43] so that visitors to the website enjoy their experience and have a reason to visit the website again. There were very little resources to put towards web design.[44]

As early as May 2011, I created a crowdsourcing test website on IdeaScale that I presented to CCP's executive lead on the inTeractive Somerville project (see Appendix 1).It was clear that there were a lot of questions and resistance, mainly because the CCP had been developing a custom crowdsourcing website for the past two years: inTeractive Somerville.

After assessing the website (in a private staging space) and discussing options with the SCC's Director of Community Organizing and Planning and the principle programmer of the inTeractive Somerville website, I decided to delay the crowdsourcing challenge and my research until the new inTeractive Somerville website launched in an effort not to confuse the (online) community or to obstruct inTeractive Somerville's progress towards their goals or mission.

4.1.9 Traditional Planning Meeting Data Collection-Gilman Square Community Meeting

As part of my field research I attended the "Gilman Square Community Meeting" (see Appendix 3). The meeting was held at local restaurant in Gilman Square. Despite it being nearly 100 degrees (in the July heat) 30 people participated in the meeting. The meeting was the second

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[43] Eric Reiss (2009) describes the user experience (UX) as the "perception left in someone's mind following a series of interactions between people, devices, and events – or any combination thereof. Interactions can be active like clicking a button. Some interactions can be passive, like a visually appealing web design. And some interactions are secondary to the ultimate experience like the server that the website is hosted allows the pages to load quickly and without delay.

[44] Michael Messina offered design concepts and functionality ideas but all coding and programming was done by Christian Spanring.

part of a two-part workshop. During the first meeting, participants brainstormed and create a list of issues and concerns of importance in the neighborhood to describe what makes up Gilman Square.

During the second meeting, participants broke in small groups of 5 or 6 and refined their list of "priority spots" in Gilman Square. Four categories were created by facilitators (led by the CCP) to categorize the new priority spots being created by participants. Groups were instructed to narrow their list to 3 to 5 priorities. Each group presented their ideas and priorities in front of the rest of the participants.

The groups' refined lists of priorities were listed under the following four categories: Add, Keep (buildings), Change and Values. Near the end of the meeting, each participant got 3 stickers and posted them next to the priority that was more important to them. With only 3 stickers or votes, participants thought carefully about what was most important to them. In the end, "Change – the Homans Building" received more stickers that any other priority[45].

In the table below, all of the ideas from the 30 participants that participated in the Gilman Square Community Meeting are outlined as they were written during the meeting. The ideas are listed in the original categories Add, Keep, Change and Values and organized by each of the 11 Core Community Principles (Appendix 2).

To analyze further, each idea that was suggested by a participant was placed into a "broad concept" category or "distinct idea" category. The ideas were then placed accordingly into two separate categories to distinguish between *broad*, vague and "widely applicable" ideas from

[45] "Change – Starmarket" an abandoned supermarket also received 5 stickers or votes but it is not as close to the proposed Gilman Square Train Station. Furthermore, every conversation about the development of the proposed train station typically included the Homans Building.

distinct ideas that were more specific, separate and "different in quality" than the broad concepts (Merriam-Webster 2012, Dictionary.com 2012).

To decipher between ideas that were broad concepts and distinct ideas I applied textual analysis. Alan McKee (2003) describes textual analysis as making educated guesses at interpretations of the most likely interpretations that might be made of that text. It is a "data-gathering process for those researchers who want to understand the ways in which members of various cultures and subcultures make sense of who they are and of how they fit into the world in which they live."

I conducted textual analysis by reading every idea and putting it into a sentence in the context of the categories the idea was attached, to make the best interpretation of what was meant by the idea and whether or not it was a broad concept or distinct idea. All of the textual analysis and subsequent coding was done manually.[46]

For example, browsing over the "Improve the Green Environment" category in the following table there were 3 broad concepts and 4 distinct ideas (duplicates in parentheses). The three broad concepts included green space, sustainable business and parks and playgrounds. There were four distinct ideas that emerged "community garden," "green space behind City Hall," "Winter Hill playground-no blacktop," and "Thurston corner Medford St. Bridge-make neater."

The aim of the textual analysis was to help answer the first sub-question of this thesis: *to what extent can crowdsourcing public participation generate distinct ideas*? In summary, there

[46] Textual analysis has its flaws as it is based on human interpretation, manual coding and thus is subject to human error. However, there is text analysis software such as Lexalytics (lexalytics.com) that can make textual analysis far more efficient and accurate though it can be costly to access all its features.

were thirty people that participated in the Gilman Square Community Meeting – a traditional planning meeting with face-to-face interaction and group activities. The 30 participants generated 13 broad concepts and 25 distinct ideas. Though all input is valued, for this study, distinct ideas hold more value because they are more specific and informed. That means that each participant generated 0.83 or less than one distinct idea through this traditional public participation.

Core Community Principles	Add	Keep	Change	Values	Total Broad Concepts	Total Distinct Ideas
Community Involvement				• Community involvement	1	0
Connecting Buses and Trains					0	0
Create Community Gathering Spaces	• Murals around T station (2) • Community/youth center • Places for kids to congregate	• YMCA (2)	• Community Space • Community center	• (Public) art (4)	2	2
Encourage Walking and Biking	• Bike path (2) • Bike shop/co-op			• Parking – what happens if it gets worse?	0	3
Improve Access	• Parking				0	1
Improve the Green Environment	• Greenspace, trees, parks • Sustainable businesses • Community garden (2)	• Greenspace • Greenspace behind City Hall • Parks	• Improving playgrounds • Winter Hill playground (no blacktop) • Thurston corner Medford St Bridge – make neater	• Greenspace (2) • Playgrounds	3	4
Increase Commercial and Economic Development	• Farmer's market	• Schools open 24:7 for programs • ES community school	• Homans Building (5) • Starmarket (5) • Mixed use development (2)	• No abandoned buildings	1	6
Keep Somerville Affordable		• Mix of housing (3) • Homes – no eminent domain • Elderly housing	• Housing	• Mixed housing units (2) • No eminent domain	1	2
Keep and Add Local Businesses	• Restaurants and cafes – preferable local • Good bakery • Affordable ice cream	• Emporium (3) • Starmarket as a market • Artist studios • ABJ (auto mechanic)	• Music • Bike shop • Car repair shop (ABJ-pearl and marshall) • Piano Factory	• Family-oriented local businesses	2	7
Maintain Our Diversity				• Elderly • Diversity	2	0
More Local Jobs	• Job opportunities		• Jobs	• Job opps.	1	0
					13	25
				People Participated 30		
				Distinct Ideas Per Participant 0.83		

Table 8: Textual Analysis of Public Input Collected at the Gilman Square Community Meeting

4.2 Development and Implementation of the Green Line Challenge

During the Gilman Square Community Meeting, residents and participants expressed the most concern about "changing the Homans Building," an abandoned factory adjacent to the future site of the Gilman Square Train Station. This was a great opportunity to crowdsource ideas on how to best improve the area where the Homans Building is currently located and it was an issue already identified by the community.

The best way to aggregate a smart crowd is to encourage individuals "to develop complete single ideas and put them up for review [on a website] among their peers in the crowd" (Brabham 2009, 248). This can be done by creating a crowdsourcing[47] challenge on a website where ordinary people could post their ideas and vote on ideas.

4.2.1 Using *Next Stop Design* as a Crowdsourcing Template

With at least four different crowdsourcing approaches I had to select the one that was most appropriate for the inTeractive Somerville's crowdsourcing challenge. I began by reviewing crowdsourcing websites sponsored by local and federal branches of government and experimenting with crowdsourcing platforms such as UserVoice and IdeaScale. In addition I perused one of the most successful and sophisticated crowdsourced websites: Threadless.

Threadless was founded in 2000 after one of the co-founders won a t-shirt designing competition. It began as a t-shirt design competition on a message board with a handful of artists

[47] Again, the definition used for crowdsourcing for this thesis is "a web-based, distributed problem solving and production model for business which includes an open call to a (generally) large network of people" (Howe 2006, Brabham 2009).

and $1,000 to “print as many shirts as we could with it, sold those, then printed more” said Jake Nickell one the Threadless co-founders. Today, there are over 300,000 designs submitted to Threadless from nearly 100,000 different artists (Wei 2011). And the 50-person company made close to $30 million in 2009 (Burkitt 2010).

Brabham points out that Threadless is one of the best examples of the Peer-Vetted Creative Production Approach. The ongoing challenge to members of the Threadless online community is to submit t-shirt designs and to vote on designs (Brabham 2010, 40). The process is rather simple: registered users upload their designs to the website, members of the online community vote on designs during a one-week voting period using a five-point rating scale. At the end of the voting week the highest rated designs become finalists for printing. Threadless staff then chooses about five designs to mass produce each week (Brabham 2010, 40).

One article in *Forbes* about Threadless summarizes their creative process succinctly:

> The Internet-based company asks consumers to submit shirt designs they've created--it gets as many as 300 submissions a day--and allows its large fan base to vote on the ones they like best. It pays winners, more than 300 each year, $2,000 for their creations. The company picks the best of the most popular T-shirt designs, screens them for copyright violations and obscenities, and sells them on its site within three to eight weeks for $18. It aims to release seven new designs a week (Burkitt 2010).

Though crowdsourcing T-shirt designs and public participation for urban designs are fundamentally different, the process to generate creative solutions in an online forum is comparable. Threadless seemed to have the right crowdsourcing approach for the Green Line Challenge but the context and sophistication of the website was not easily transferrable to crowdsourcing public participation. I was fortunate to find an example with a Peer-Vetted

Creative Production crowdsourcing approach in project led by none other than Daren C. Brabham called Next Stop Design (nextstopdesign.com).

As mentioned, there are not many examples crowdsourcing public participation that are well-documented. In addition to his article "Crowdsourcing the Public Participation Process for Planning Projects" (2009) it was timely for this thesis project that Brabham led a similar crowdsourcing challenge in Utah two years ago called "Next Stop Design" and subsequently wrote his PhD dissertation (2010) on the subject. Both of these well-researched documents have served as a foundation for the concept and analysis of this thesis project. The Next Stop Design website and Brabham's PhD dissertation were particularly instrumental in developing the Green Line Challenge and its related content on the inTeractive Somerville website.

Next Stop Design was a collaborative effort between Utah's Department of City and Metropolitan Planning, the Department of Communication at the University of Utah and the Utah Transit Authority. It was also supported by the by U.S. Federal Transit Administration grant 2008-DOT-FTA-PTPP: Innovative Small Research Projects to Advance Public Participation Related to Public Transportation Planning (Next Stop Design 2011a).[48]

The Next Stop Design Challenge took place in Salt Lake City in the 'Sugarhouse' neighborhood. Elements of the challenge included a specific problem (a bus stop design) and location, a contest time frame, a rating system, and an award to the person with the submitted design that receives the highest rating or most votes (Next Stop Design 2011b). I used the Next

[48] In comparison to the Green Line Challenge, Next Stop Design had superior resources and support. The Green Line Challenge website had limited funding for web development and technology. There was no grant money or direct official support from academic institutions or support from government planning or transportation agencies.

Stop Design website as a template to help guide the format and content of the Green Line Challenge, Privacy Policy and Terms Of Use pages of the website.

A key characteristic of a crowdsourcing challenge is to incentivize and reward the individual(s) with the highest rated idea(s). In late September 2011, I emailed the Green Line Extension Project Manager, Kate Fichter, to inform her about the crowdsourcing challenge and to request a train pass donation from the MBTA for the future winner of the challenge. Kate recommended that I contact Mary Ainsley, the MBTA Project Manager for the Green Line Extension Project (Fichter 2011). I reached out to Mary the next day and approximately one month later I received an email from her informing me that the MBTA would donate 3 one-month subway (T) and bus passes to the winner of the challenge – a value of approximately $180.00 (Ainsley 2011).

The crowdsourcing model is typically in the form of a contest with specific instruction to submit ideas and vote on ideas within a specific timeframe. Before finalizing the details of the crowdsourcing challenge, it was presented to the CCP leadership for approval. The CCP approved the concept and basic parameters of crowdsourcing challenge on inTeractive Somerville in October 2011. It was agreed that a 'website launch party' would be held in mid-November to promote both the new inTeractive Somerville website and the crowdsourcing challenge, which would be branded the *Green Line Challenge*[49].

At that point in the project is when the web development significantly increased (see Appendix 9 for Web Development Notes). Like immersive planning, one of the main goals of

[49] The challenge was named the "Green Line Challenge" as more people are familiar with the "Green Line" rather than the "Homans Building" or "Gilman Square."

the crowdsourcing website was to focus on user experience and creating an online space where participants felt comfortable to engage.

4.2.2 inTeractive Somerville Website Functionality for the Green Line Challenge

In order to use the inTeractive Somerville website and to participate in the Green Line Challenge, individuals had to register and create an account. To sign up, individuals only needed a username and a password. In retrospect, email and real names should have been required fields to help with communication, security and fraud control. It also would have been ideal to include some fields for demographic information for further analysis.

Since one of the website's (interactivesomerville.org) objectives was to involve as many people as possible in the public participation process (through the Green Line Challenge) visitors to the website had the option to view the content of the website in four different languages: English, Haitian Creole, Portuguese and Spanish. These languages were pre-selected by the Corridor Community Planning (CCP) coalition and were powered by Google Translate[50].

Once signed into the website, registered users could create profiles and add their own social profile links. Contributors to the website had the *option* of populating the following fields on their profile: name, about me, my website, my station, Flickr, YouTube, Twitter and Facebook. Each idea (or item) that the user shared automatically populates (latest post on the top) on their profile pages under a "Recently shared" news feed. It also appeared in the main "Recent Community Activity" news feed on the homepage.

[50] "Google Translate is a free translation service that provides instant translations between 58 different languages. It can translate words, sentences and web pages between any combination of our supported languages. Google Translate can be embedded in websites with pre-selected languages (Google 2012c).

Contributors to inTeractive Somerville could easily add ideas, meeting notes, news articles or media by clicking the “Share something!” link on the top navigation bar.

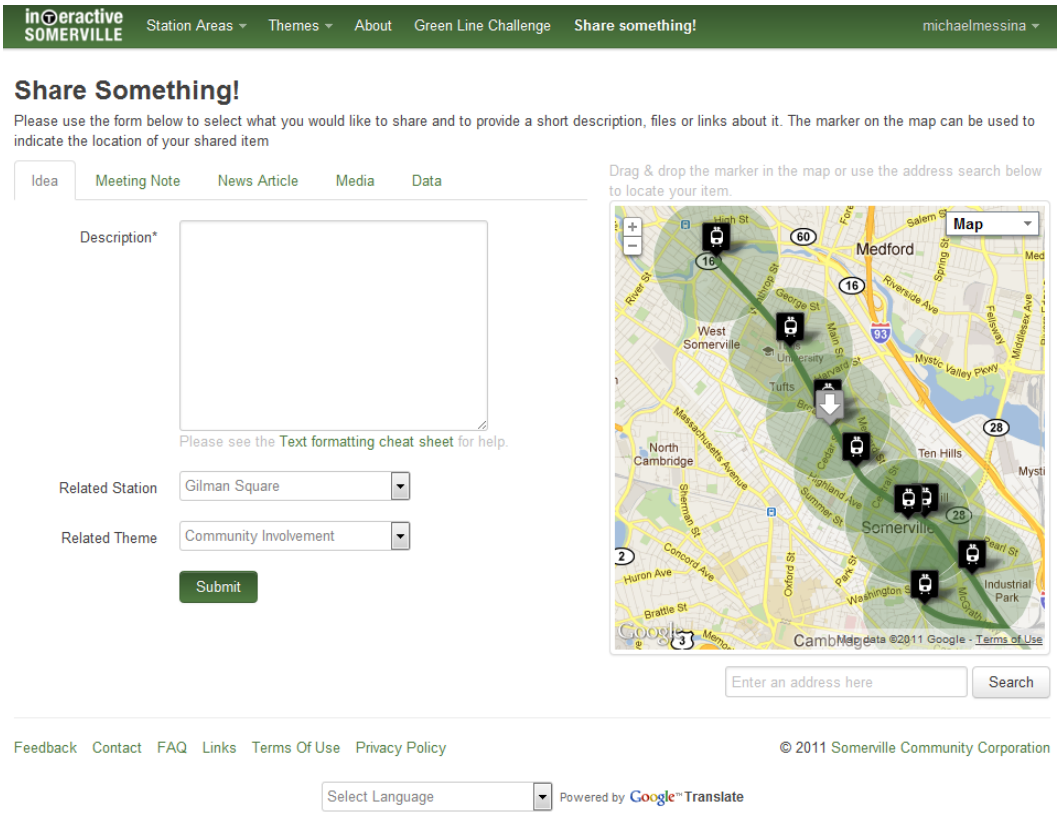

Figure 7: “Share something!” Webpage on interactivesomerville.org

For the Green Line Challenge, participants were instructed to share an “idea” Each idea or design submitted was attached to a specific geographic point on an interactive map by either input ting an address or dragging and dropping on a point on the interactive map[51] (powered by

[51] Flickr and Google Maps were used to power the image and map interaction on the inTeractive Somerville website respectively because both are the most popular applications of their kind, easy to use and have flexible APIs (Application Programming Interfaces) which allows programmers to more easily create applications and websites that utilize Flickr (Webmonkey 2010) and Google Maps.

Flickr and Google Maps). In the case of the Green Line Challenge, submitted ideas were attached to the geographic location of the Homans Building [+42º 23' 18.05", -71º 5' 48.00"].

Contributors then categorized their submitted ideas or designs further by "Station Areas"[52] and "Themes."[53] Green Line Challenge participants were instructed to use the "Gilman Square" category as a Station Area and to select the Theme that was most relevant to their idea or design.

API is a set of standardized requests defined by a program that allows programmers to access the code of application. By providing a way for programmers to request program services, an API grants access to or opens an application to programmers (see Orenstein 2000). Having an API that is flexible and easy to use for developers will likely attract more programmers.

[52] The proposed Green Line Train Stations include 1) Lowell Street, 2) Ball Square, 3) Gilman Square, 4) Union Square, 5) Route 16, 6) Washington Street and 7) College Avenue.

[53] Core Community Principle themes were previously defined by the community through workshops and meetings (see Appendix 2).

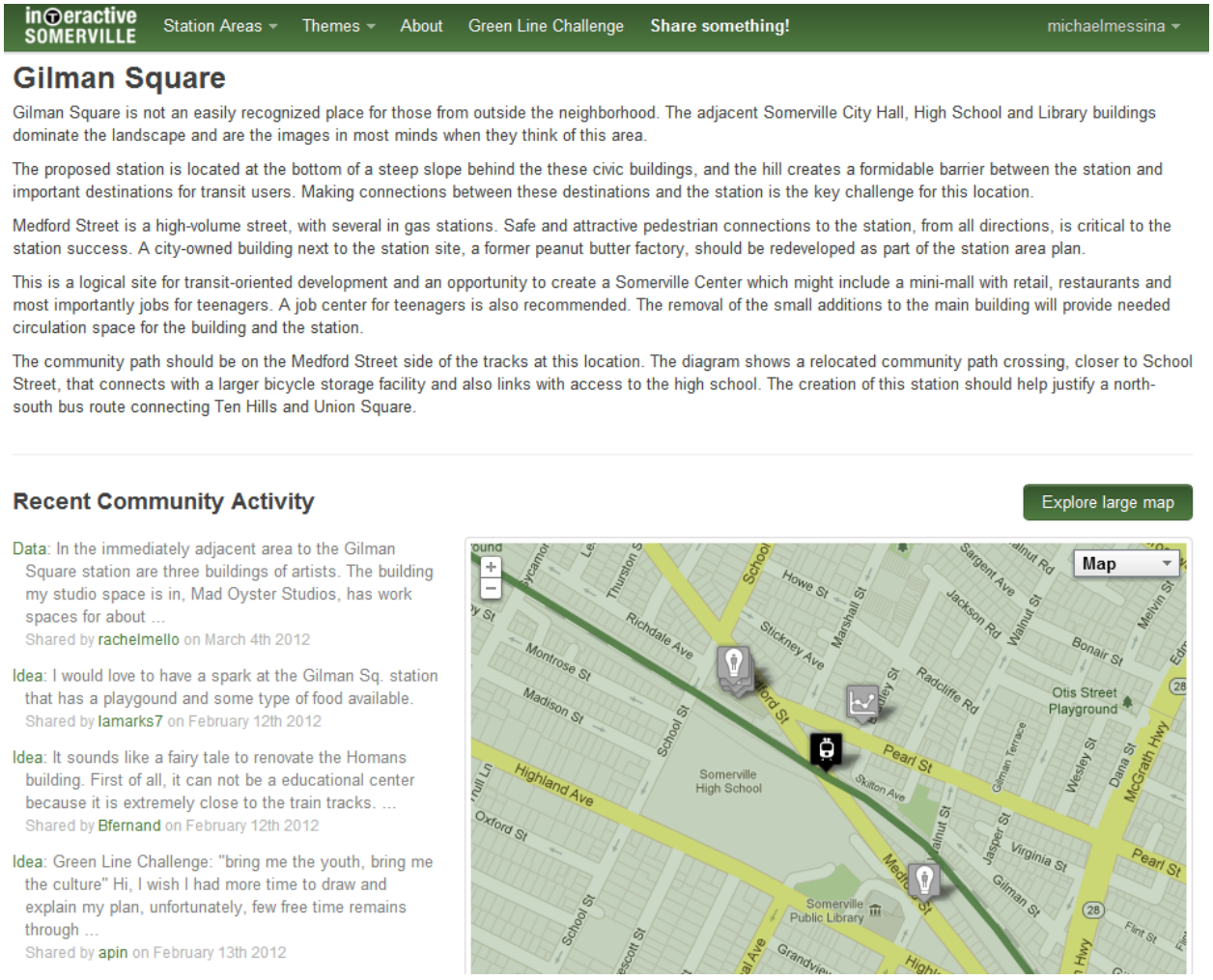

Figure 8: Gilman Square Station Area Webpage

Each Station Area category has a webpage with a text description of the area, a "Recent Community Activity" news feed and a smaller version of the interactive map. All ideas for the for the Gilman Square Station Area webpage (http://interactivesomerville.org/station-areas/gilman-square/) and consequently for the Green Line Challenge populated in the news feed and the map.

Once an idea was submitted, it could be enhanced by embedding media such as photographs from Flickr or videos from YouTube or Vimeo. The website was set up so that if a photograph was geotagged on Flickr, meaning a specific location is attached to the image; that exact location would be automatically carried over to the inTeractive Somerville website.

Registered users had the ability to rate and comment on submitted ideas. The Green Line Challenge used a 5-star rating scale, similar to the Next Stop Design website and in line with the Peer-Vetted Creative Production Approach to crowdsourcing. Participants could only rate each idea once. The idea ratings were accumulated in a private database and were not revealed publicly.

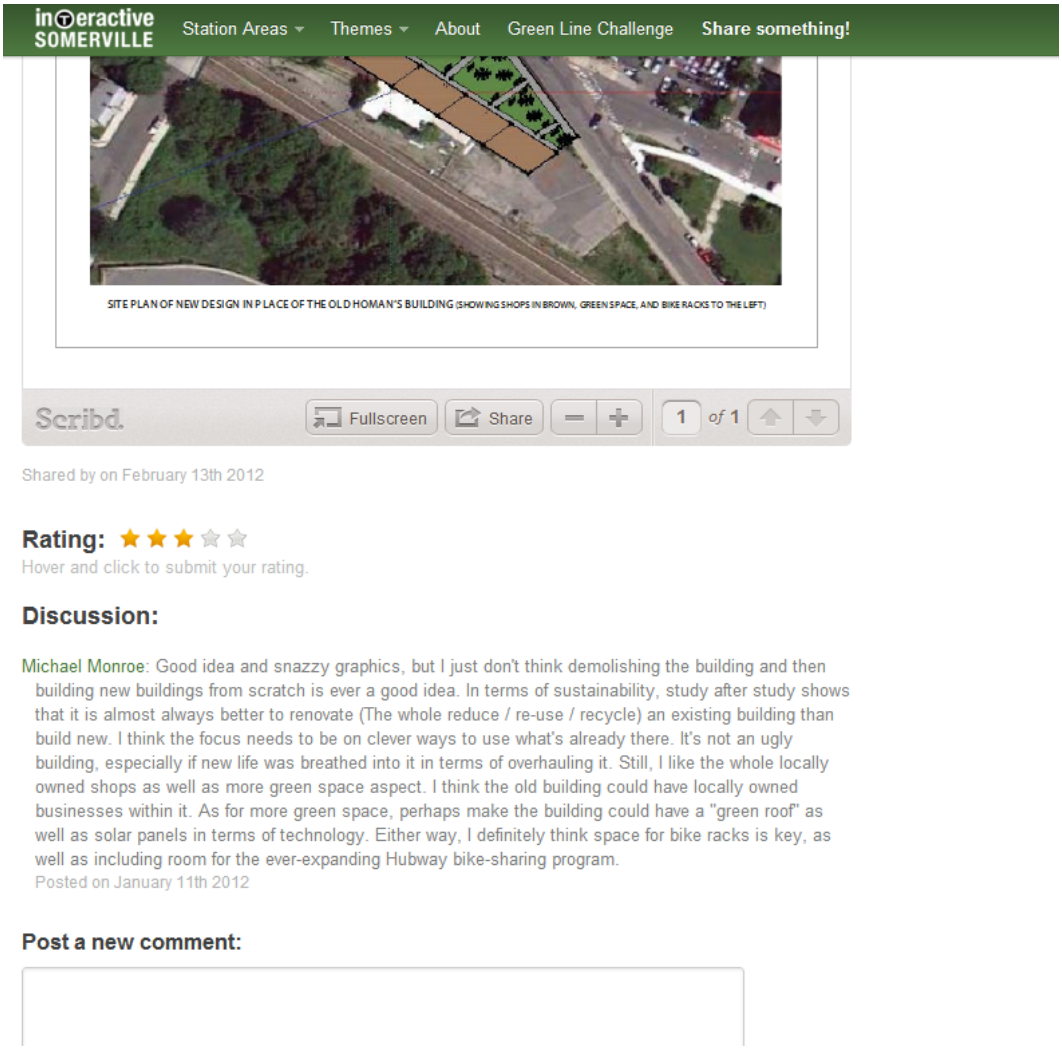

Figure 9: inTeractive Somerville Website Comment and Rating Functionality

4.2.3 The Green Line Challenge Overview

Once the CCP agreed on the date of the launch party to formally announce the new inTeractive Somerville website and the Green Line Challenge to the public, it became easier to build a web development and community outreach plan around it. The website launch party was held on November 14, 2011 at a local bar and restaurant in Union Square in Somerville. The launch party date was decided in mid-October which gave us approximately one month to

redesign the homepage and website, create all necessary webpages and content, and to promote the launch party through traditional community outreach methods, email, and social media. With all the community outreach momentum, supported by the CCP, it was the most logical time to launch the crowdsourcing contest the *Green Line Challenge*.

During the launch party, I gave a presentation on the new website including a play-by-play on how to sign up and add a photo (via Flickr) to the website. Three stations with laptops were set up for people to take a tour of the new website. The key objective of the launch party was to get people excited about the new website, increase the number of signups and to promote the Green Line Challenge. By the end of the launch party, the inTeractive Somerville website had accumulated 27 registered users.

This was the first open call that was announced to a large network of people. *The challenge was to come up with the best idea to improve the area where the Homans Building is currently located* by December 5, 2011. This could include the area the Homans Building currently occupies, its integration with the proposed train station location on one side of the building and the potential development of corner of Medford and School Streets on the other side of the building (where a gas station currently stands).

The main online objective was to drive people directly to the Green Line Challenge webpage and provide all the necessary information and tools needed to participate. There were 12 subsections on the Green Line Challenge webpage. Anchor links were made available at the top of the page so visitors could easily link to all of the information on the page. Anchor links are particularly helpful when a webpage has a lot of content that cannot be seen without scrolling down on the webpage.

The following table reflects the content of the Green Line Challenge webpage in an outlined format.[54] The webpage consisted of a set of comprehensive instructions, media and tools meant to inspire individuals to participate and to guide participants.

Challenge Webpage Subsection	Description
Overview & Quick Links	The Gilman Square Green Line Train Station is slated to be constructed directly to the left of the Homans Building. The challenge is to come up with the best idea to improve the area where the Homans Building is currently located. There are 4 Big Steps: • Sign up [link] • Submit your Idea by January 9 • Rate Ideas and Designs by January 15 • Check back to see who won the Green Line Challenge on January 16 The winner of the Challenge will receive 3 one-month T passes, donated by the MBTA. The designs and ideas submitted for this challenge will not be endorsed, and are not affiliated with MassDOT, MBTA, MAPC or City of Somerville. They are for the purpose of coming up with creative solutions on how the Homans Building and the Gilman Square area might be improved. Quick Links to the following subsections were listed:
Visualizing the Location	Three multimedia objects were embedded to help "visualize the location" in slightly different ways (for different preferences): 1. View a photo slideshow, embedded from Flickr.[55] 2. Take a 360 degree tour with a Google Maps with Street View[56]

[54] The inTeractive Somerville Green Line Challenge webpage can be found at http://interactivesomerville.org/pages/green-line-challenge/.

[55] Photos from the slideshow embedded on the Green Line Challenge webpage can be found here: http://www.flickr.com/photos/interactivesomerville/sets/72157627492292102/show/.

[56] A customized Google Map with Street View was embedded on the website to give participants the option to view the Homans Building and the area around it through "360-degree street-level imagery" (Google 2012b). The map that was embedded on the Green Line Challenge webpage can be found here: http://maps.google.com/maps?q=350+medford+st,+somerville,+ma&layer=c&sll=42.385723,-71.093697&cbp=13,336.86,,0,8.61&cbll=42.387872,-

	3. Watch an immersive, 3-D modeling video[57]
Homans Building Area	• Homans Building was built in 1925 • 350 Medford Street, Somerville, MA 02143 • Owned by the City of Somerville • Based on reports, high likelihood that it will have to be demolished to pave way for development • City of Somerville's Public Comment on Conceptual Designs for Green Line Extension [link] • Zoned for commercial/business use, see Somerville's Zoning Ordinance for more specific guidelines [link] • 48,296 square feet of land (including building) • 13,244 square feet of land (adjacent gas station) • City of Somerville's Assessor's Online Database [link]
Core Community Principles	Summary of "themes" were taken from the 11 Core Community Principles. Please consider how your idea and design contributes to each of the Core Community Principles (See Appendix 2).
Submitting Ideas and Designs	You may submit your "idea" as a design with text supporting why your idea should be implemented. We ask that you please consider how your idea and design contributes to each of the Core Community Principles for Neighborhood Development along the Green Line Corridor - our website "Themes." Below are the steps: 1. Sign up and create an account 2. Click Share something! (on top navigation bar) 3. Select the Idea tab 4. Enter the address (350 Medford St, Somerville, MA) below the map or click and drag the arrow on the map on the Homans Building 5. Add your description - start with text: Green Line Challenge: [your title]. 6. We recommend that you prepare your description in Microsoft Word or Google Docs, then copy & paste. 7. You can also email PDF files to us at interactivesomervillema@gmail.com 8. Select Related Station: Gilman Square 9. Select Related Theme: [select theme most closely related to your idea]

71.095862&gl=us&ie=UTF8&hq=&hnear=350+Medford+St,+Somerville,+Massachusetts+02143&t=h&panoid=e0c3N27SoWsQcvmckbojGA&ll=42.376253,-71.088581&spn=0.01991,0.048237&z=14&source=embed.

[57] The 3-D modeling video was created by Open Neighborhood to help participants visualize the location. Open Neighborhood is a project of the Department of Urban and Environmental Policy and Planning at Tufts University. inTeractive Somerville has been partnering with Open Neighborhood since 2009 to explore how immersive, 3-D modeling can improve community planning around the Gilman Square Station area. The video was posted on YouTube and embedded on the Green Line Challenge webpage. The video can be found here: http://www.youtube.com/watch?v=7gaOciO-WcI.

	10. Click Submit Only one idea can be submitted per individual. Group submissions are not permitted. Please see our Terms of Use and Privacy Policy for more information.
Contest Time Frame	"The contest will officially open for design submissions on November 14, 2011 at 9:00 p.m. EST. Designs may be submitted until January 9, 2012 at 11:59 p.m. EST, after which new designs will not be accepted. We will calculate the ratings and announce a winner on January 16, 2012 - MLK Day."
Rate Ideas	Designs may be rated at any time during the contest time frame. To rate a design, you must be logged into the site. We use a 5 star rating system, one vote per idea for each registered user. The total Avg. Idea Rating Score is an algorithm that includes the number of votes, average rating (number of stars) and how many of the Core Community Principles your idea could potentially encompass. Cheating and malicious conduct on this website will not be tolerated. Please see our Terms of Use and Privacy Policy for more information. You have until Sunday, January 15th 11:59 PM EST to vote. We will calculate the ratings at that time and announce the winner on January 16, 2012 - MLK Day.
Award	The winning person will be awarded 3 T passes for February, March and April (a value of nearly $180) donated by the MBTA.
Tools	Information and links were posted on the following tools: Google Sketchup, Google Building Maker and Google Earth
Press and Links	Links to (4) articles generated about the Green Line Challenge were posted as published.
Questions?	Link to the contact us webpage.

Table 9: Green Line Challenge Webpage Subsection Breakdown

The following figure is a snapshot of the section "Visualizing the Location" on the Green Line Challenge webpage with a Flickr photo slideshow and Google Street Map embedded on the webpage.

Figure 10: Green Line Challenge Webpage - Visualizing the Location Subsection

The first deadline (December 5, 2011) proved to be too short. With only 1 idea submitted and community members saying they might submit ideas if they had more time[58], I decided to extend the Green Line Challenge deadline to January 9, 2012.[59] Between January 9th and 15th, 2012 was the 'voting period.' With one week left in the Challenge, there was still only one idea submitted. However, a flurry of publicity with three articles online and in print on January 5th and 6th (along with social media, email and community outreach) helped increase the number of ideas submitted from one to eleven by the deadline (see Appendix 7 and Appendix 10).

Immediately after the deadline I began a social media push to promote the voting period for the Green Line Challenge. In addition, I sent out an email to all 81 registered users on the inTeractive Somerville website and to my own personal network to promote the voting period (Appendix 8 shows a copy of the email).

4.2.4 Public Relations, Social Media and Community Outreach

It was clear even before the crowdsourcing challenge took place that social media would be essential to the public relations and community outreach efforts. For one thing, the website itself would rely on social technologies. Additionally, social media allows you to connect with people and reach wide audiences at the same time, for very low cost. And since I had already years of experience with ICTs, marketing communication and social media, the cost to launch

[58] Based on the number of ideas submitted at the time (1) and a conversation and email exchange with Mashael Majid (2011), the Community Planning Coordinator for the SCC and CCP, the Green Line Challenge deadline was extended from December 5, 2011 to January 9, 2012.

[59] Communication about the extended deadline went out on December 2, 2011 (inTeractive Somerville 2011).

and manage social media channels for inTeractive Somerville was essentially the time it took to do it.

I began assessing inTeractive Somerville's brand online and social media presence in July 2011. During this timeframe, I recreated and optimized the inTeractive Somerville logo for the Web. Social media channels typically have profiles with branding elements such as image/logo, a field for "about" information or "mission statements" and contact information to name a few. The updated logo would prove to be useful as I created new social media channels and updated existing channels. The log was also used for web design and printed materials.

One of the most difficult challenges that I had with inTeractive Somerville's brand online was the fact that there were multiple social media accounts created on the same channel(s) by different staff members over an extended period of time. A fragmented brand online was only half the problem; management and administration of the accounts was the other half. It took nearly two weeks to detangle, consolidate and brand social media channels on Flickr, Twitter, Facebook and YouTube.[60] Once all the social media channels were in place, I began to populate each one with content such as photos, status updates, links to relevant articles and polls. And I also began to follow and connect with individuals and organizations that shared relevant content and goals as well as individuals that could potentially help with media and community outreach.

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[60] Ideally, you want all the usernames or profile names for each online channel to be the same because it becomes part of the url and your brand identity online. However, because of character restrictions and not being able to recover every social media account created on behalf of inTeractive Somerville, there is some inconsistency in the username across social channels. The following are the urls for inTeractive Somerville's social media channels, the username is highlighted within the url to illustrate how it becomes part of the brand identity – Facebook: http://facebook.com/interactivesomerville, Twitter: https://twitter.com/#!/i_Somerville, Flickr: http://www.flickr.com/photos/interactivesomerville and YouTube: http://www.youtube.com/inTeractSomerville.

Because of the reliance on images on the website, I focused first on strengthening inTeractive Somerville's content and brand presence on Flickr. I began by uploading digital photographs captured during the site reconnaissance. Titles and descriptions were added to recently updated photos and each image was attached to a geographic location (geocoding images to a specific location).

There was not enough time to employ sophisticated social media strategies so it was kept very simple and straightforward. The most time and effort spent on social media was on "listening" for relevant information via Google Reader,[61] Twitter and Facebook that could be shared or "reshared" on Facebook or Twitter. "Listening" does not just mean that you read articles and post links. It also means that you are listening to conversations and engaging in conversations when appropriate.

Facebook was primarily utilized to connect with relevant organizations and individuals. Twitter was employed primarily as a public relations tool – to share information and links and to for media outreach. In fact, it was a direct (private) message on Twitter from a *Boston Metro* reporter (see Figure 9) that was served as a catalyst for the three articles that were published on January 5th and 6th. The published articles proved to be instrumental in increasing the number of ideas submitted from one to eleven.

After Steve Annear interviewed me for an article in the *Boston Metro* (Annear 2012, see Appendix 10), he referred the *Somerville Journal* to me which in turn led to another interview

[61] "Google Reader is a tool for gathering, reading, and sharing all the interesting blogs and websites you read on the web" (Google 2012c). You can follow or subscribe to the website or blog via an RSS feed. You can also follow specific keywords in the Google News or Blogs Search Databases. For example during my research I followed the keyword phrase "green line extension project" in Google News Search.

and article in print on the front page and online (see Appendix 7). With two articles published the same day (January 5th), I received an additional request to be interviewed for an article that would be published in *BostonInno* (Landry 2012).

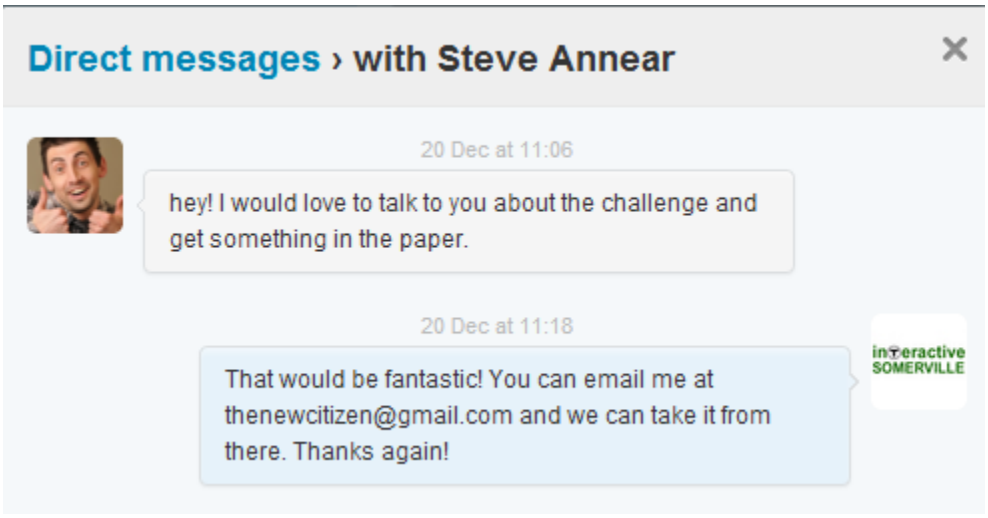

Figure 11: Green Line Challenge Media Outreach via Twitter

4.3 Basic Findings from inTeractive Somerville's Green Line Challenge

The summary of findings from inTeractive Somerville's Green Line Challenge include basic web traffic data and information about the Challenge such as registered users, number of submitted designs or ideas and the number of votes. The web traffic data was captured with Google Analytics and the Challenge analytics was captured by manually pulling data collected from multiple databases (users, voting, rating, ideas) in interactivesomerville.org's private, secure administration interface.

Google Analytics was used to measure web traffic and user behavior information on the inTeractive Somerville website. Google Analytics is a free product offered by Google. Data is captured through scripts (or 'snippets of code') that are embedded in the code of every page of

the website. Some of the key metrics captured by Google Analytics are the number of people (visitors) that visit your website within a specific timeframe and the geographic location of visitors by country, state and city or town. Google Analytics has is strengths and limitations, but it is likely the most effective and popular, free web analytics tool available.[62]

Over the course of two months, during the Green Line Challenge, there were 1,624 visits to the inTeractive Somerville website (or 1,128 unique visitors). Visitors to the website viewed 5,781 pages – an average of 3.6 pages viewed per visit. In contrast, over the course of four months, during the Next Stop Design challenge, there were 29,855 visits to the Next Stop Design website, 316,141 page views – 10.6 pages viewed per visit (Brabham 2010, 65).

Most of the visitors (98%) to inTeractive Somerville were from the United States and over 80% were from Massachusetts. In contrast, the Next Stop Design challenge had strong international participation with just over half of the visits coming from the U.S. and 57% hailing from Utah (Brabham 2010, 65). There were 29 cities in Utah that generated visits to the Next Stop Design website. inTeractive Somerville appealed to visitors representing 86 different cities in Massachusetts.

[62] It is important to note that like other web analytics software, free or paid, sophisticated or simple, Google Analytics is limited by the privacy and security settings of each visitor to the website. The type of browser used by the visitor can also make a difference. The data timeframe used for this analysis was the start date of the Green Line Challenge – November 14, 2011 through January 17, 2012 (the day after the winner of the Challenge was announced).

Table 10 reflects the basic web traffic data from the inTeractive Somerville Green Line Challenge.

Overview of Website Traffic	
Visits	1,624
Unique Visitors (people)	1,128
Page Views	5,781 (3.6 pages/visit)
Avg. Time on Site	4:29
Green Line Challenge Page Views	2,143 (37% of all page views, 2:05 Avg. Time on Page)
Top 5 Referral Sites[63]	Facebook (310 – 47% of referrals, 19% of all visits) BostonInno (62 – 9% of referrals, 4% of all visits) Somerville STEP (40 – 6% of referrals, 2% of all visits) Wicked Local (34 – 5% of referrals, 2% of all visits) Curbed.com (19 – 3% of referrals, 1% of all visits)
Top 5 Traffic Days by Visits	January 10, 2012 (142 – day after winner announcement) November 14, 2011 (95 – Launch Party, Challenge Start) November 22, 2011 (86) November 15, 2011 (71 – day after Challenge Start) January 6, 2012 (71 – 3 articles published on 5th and 6th)
Geographic Location of Visitors	
Number of countries	7 (98% from the U.S.)
Number of States	33
Top 5 U.S. States by Visits	Massachusetts (1,316 – 81% of all visits) New York (56 – 3% of all visits) Illinois (34 – 2% of all visits) District of Columbia (23 – 1% of all visits) California (19 – 1% of all visits
Number of Massachusetts' Cities	86
Top 5 Massachusetts Cities by Visits	Cambridge (351 – 22% of all visits) Boston (321 – 20% of all visits) Somerville (206 – 13% of all visits) Malden (132 – 8% of all visits) Brighton (30 – 2% of all visits)

Table 10: Web Traffic Data from the inTeractive Somerville's Green Line Challenge

[63] According to the "Traffic Sources Overview" report the sources were split between Direct (52%), Referral (40%) and Search (8%). Direct Traffic means visitors most likely typed in the url or have the website bookmarked. Referral Traffic is links coming in from other websites. Search Traffic is generated through search queries on search engines like Google.

Looking at the numbers above it is obvious that Next Stop Design did a superior job with public relations – reaching far more people generally and across the globe. If Next Stop Design was a two-month challenge it would have had about 15,000 visits, still significantly more than the 1,624 visits garnered by the Green Line Challenge. The Next Stop Design challenge had visitors from 127 different countries. The Green Line Challenge did not have nearly the reach or international-appeal; however, there was a strong concentration of visits from the state where the Challenge was centered (Massachusetts).

On the one hand, it is great to have the challenge open to the world generating diverse and distinct designs and ideas with limited biases. On the other hand, what is gained with new and open perspectives could be lost in local knowledge to help address the public issue in a way that resonates more with the community. Brabham (2010, 64) notes that the international participation, though impressive, was "potentially problematic considering the Utah focus of the competition." Brabham (2010) suggests that the relatively low Utah participation was a result of lack of Utah media coverage and citizens spreading the word via social networks. By comparison, the key strengths of the Green Line Challenge's public relations and community outreach seemed to be the social media and local media coverage.

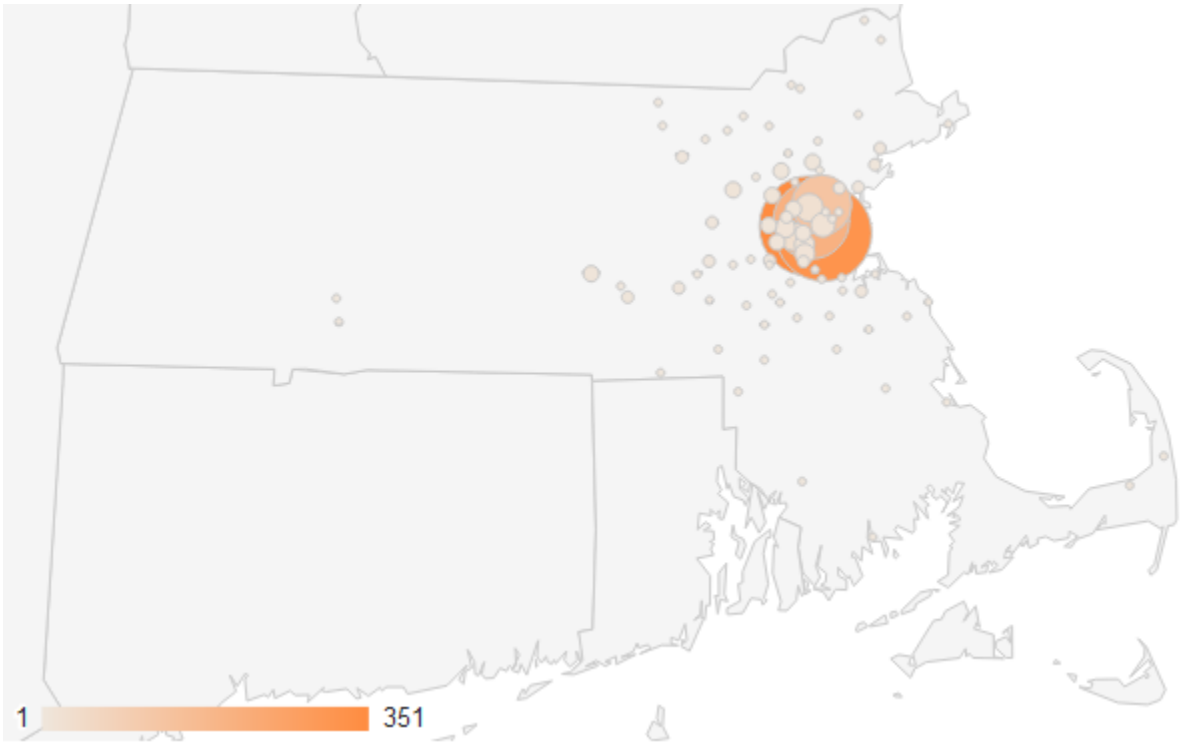

Figure 12: inTeractive Somerville Website Visits Concentrated in the Boston Area[64]

The visitors to the inTeractive Somerville website were concentrated in the Boston area. Cambridge (22%) and Boston (20%) accounted for 42% of all visits. And there were 206 visits that came from individuals logging in from Somerville accounting for 13% of all visits. Nearly half (47%) of referral traffic came from Facebook or 19% of all visits. Somerville STEP, one of the four community organizations that comprise the CCP, sent 40 visits to the website (6% of referrals and 2% of all visits).

The largest spikes in traffic to the website came at the start and towards the end of the Green Line Challenge. The November 14, 2011 Launch Party – where both the inTeractive Somerville website and Green Line Challenge were publicly announced – generated 95 visits on

[64] This image was captured in interactivesomerville.org's Google Analytics under the demographics and location report, data timeframe November 14, 2011 – January 17, 2012. Accessed March 7, 2012.

November 14th and 71 visits on November 15th. The Launch Party also contributed to 27 out of the 81 (33%) registered users.

As mentioned going into the last week of the Challenge, it did not look good as only one idea had been submitted. From January 5-6, 2012, three articles that promoted the Challenge were published online and in print in The Somerville Journal and the Metro Boston, and online via BostonInno. This generated enough buzz to help increase visits to the website, which led to more registered users and submitted ideas. The articles generated at least 109 visits, 7% of all visits, in less than a week. Between January 5th and 9th the registered user database increased from 40 to 60 individuals and the number of ideas increased from 1 to 11.

When the deadline arrived, on January 9, 2012, there were 60 registered users on the website. Out of the 60 registered users, 11 ideas were submitted to Green Line Challenge. So 18% of the registered users submitted ideas. At precisely 11:59 p.m. EST on January 15, 2012, I (manually) pulled data on scores, ideas, comments and users from interactivesomerville.org's private and secure administration interface. During the course of the voting period week the registered user database increased from 60 to 81 individuals. Out of the 81 registered users at the time, 31 or 38% of the users casted a total of 132 votes.

	Green Line Challenge	Next Stop Design Challenge[65]
Timeframe	2 months	4 months
Website Visits	1,624	29,855
Registered Users	81[66]	3,187
Ideas / Designs Submitted	11	260
% Users that Submitted Designs	18%	8%
People that Casted Votes	31 (38%)	1,928 (61%)
Total Votes Casted	132	15,276
Fraudulent Votes Casted	16 (12% of all votes)	4,218 (28% of all votes)
Legitimate Votes Casted	116	11,058
Total Potential Votes	891	828,620
% of Total Potential Votes Casted	13%	1%

Table 11: Green Line Challenge Website Data v. Next Stop Design Website Data

As in the Next Stop Design challenge, cheating was a concern. After reviewing all of the votes, usernames, IP addresses and voting patterns it was clear that 16 votes were fraudulent[67] – 12% of the total votes casted. These votes were deleted and did not count towards the final outcome of the competition. In all, there were 116 legitimate votes casted during the Green Line Challenge.

The winner of the Green Line Challenge used a combination of text and an embedded interactive document.[68] Figure 15 shows a snapshot of the winning idea "New Public Gardens."

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[65] The data obtained from Next Stop Design came from Daren C. Brabham's PhD Dissertation (2010) "Crowdsourcing as a Model for Problem Solving: Leveraging the Collective Intelligence of Online Communities for Public Good."

[66] There was a one week voting period during the Green Line Challenge. The voting period was promoted and during that time the user database increased from 60 to 81 individuals. The Next Stop Design Challenge had a continuous voting and design submission period (for four months).

[67] The fraudulent votes were from multiple users that casted their votes from the same IP address and rated 10 of the 11 ideas a "1" and one of the ideas a "5." It was not against the rules to have multiple users from the same IP address because there could be multiple people living in one household that could potentially cast their vote. But a concerted effort to skew scores in favor of one idea was blatant cheating. In anticipation of potential cheating, votes from the public received a weighted score which is described in more detail in Section 4.3.1 *Rating the Ideas Submitted and Aggregating Crowd Wisdom.*

[68] Embedded objects such as photos or documents were manually updated by the administrator of the inTeractive Somerville website since the functionality limited what the registered user could submit and how they could format

4.3.1 Rating the Ideas Submitted and Aggregating Crowd Wisdom

According to James Surowiecki (2004) the *Wisdom of Crowds* does not come from averaging ideas and solutions from the crowd but from aggregating them. Using this theory, an aggregate score for each idea submitted to the Green Line Challenge needed to be formulated. An algorithm for the Total Score for each idea submitted was created that comprised of the voice of the community controlled with pre-defined (planning) community principles. However, the aggregate score needed to account for the dark sides of crowd wisdom, like people conforming to other people's behaviors, similar to the army of ants that continued to follow the ant in front of them to their death that Surowiecki (2005) warned us about.

A 5-star rating system was used during the voting period (January 10 – January 15, 2012), with the highest rating being 5 and the lowest rating, 1. Each registered user was allowed one rating per idea and accumulated ratings were not public during the Challenge. Total Idea Scores were comprised of a Community Voice Score (50%) and a Core Community Principle (CCP) Score (50%). The Community Voice Score was calculated by adding the Idea Popularity Score (the number of people that rated each idea) and Avg. Idea Rating Score (the total number of ratings per idea / the number of people that rated each idea).

Because this contest was open to the public, and any individual could register and rate the ideas including those individuals that submitted an idea and their family and friends, the Idea Popularity Score carries less weight than the Avg. Idea Rating Score. Furthermore, the Avg. Idea Rating Score was given more weight (35% out of 50% Community Voice Score) to control being

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it. Because there were only 11 ideas submitted the administrator took the time to format the text, add embedded media (if it was submitted) and correct any grammar or spelling errors.

completely ruled by popularity and because the time associated with carefully reviewing and rating an idea is worth more than how many people rated the idea. For example, what if one user that submitted an idea had a larger network than other participants and used that network to their advantage?

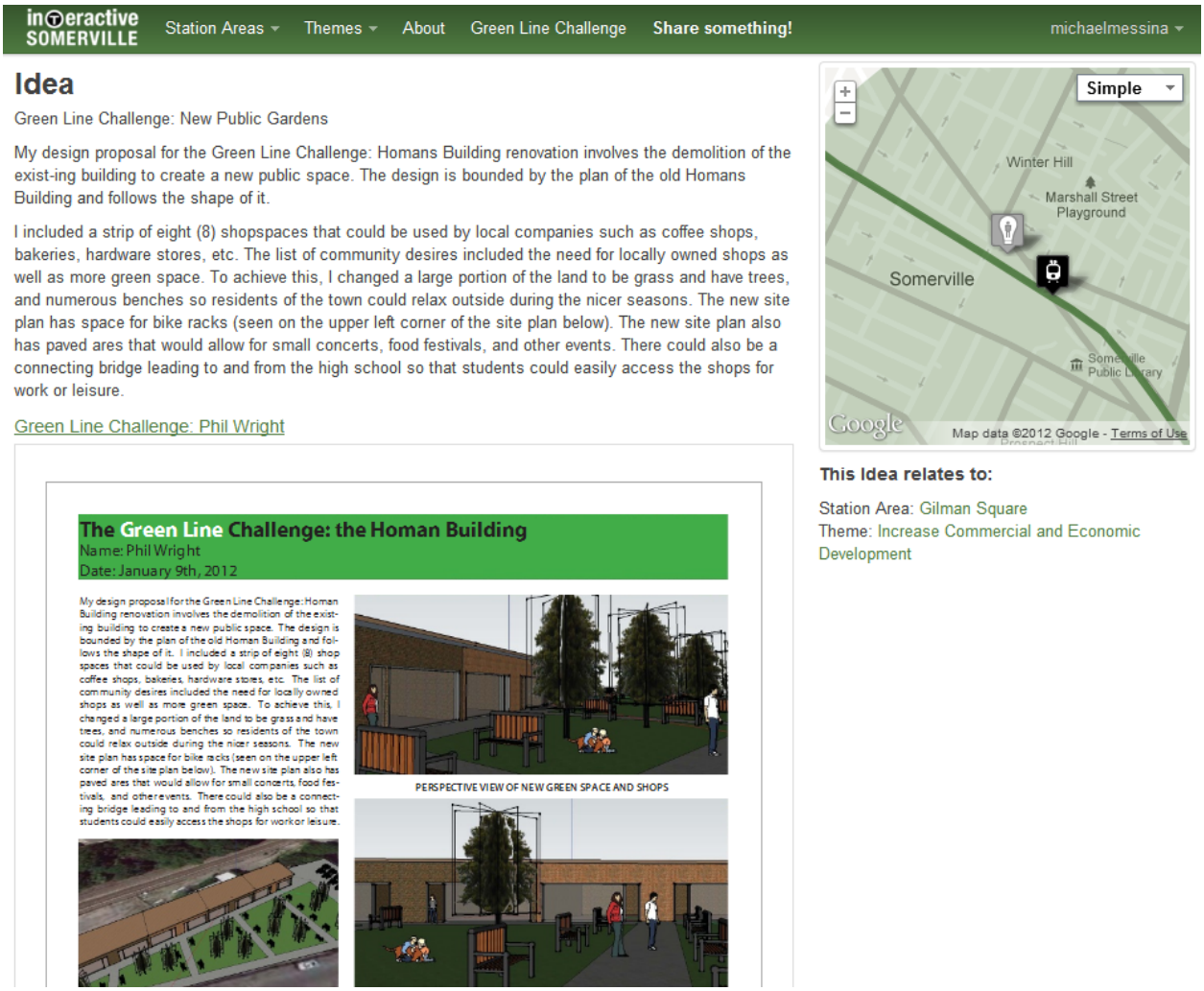

Figure 13: Winner of the Green Line Challenge - New Public Gardens

4.4 Textual Analysis of Crowdsourced and Traditional Public Input

The simplest way to gauge how crowdsourcing public participation can generate distinct ideas is to compare the (crowdsourced) Green Line Challenge ideas to the ideas collected during a Gilman Square Community Planning meeting – a traditional planning meeting with face-to-face interaction and group activities held in the same setting as the Challenge. As mentioned, there were 30 people who participated in the Gilman Square Community Meeting that generated 13 broad concepts and 25 distinct ideas. Each participant generated less than one (0.83) distinct idea through the traditional Gilman meeting.

By comparison, when the Green Line Challenge deadline arrived on January 9, 2012, there were 60 registered users on the website. Out of the 60 registered users, 11 ideas were submitted to Green Line Challenge. However, the ideas submitted to the Green Line Challenge were different than that of the Gilman Square Community Meeting ideas, with more layers and detail.

For example, after conducting textual analysis on the idea submitted by the winner of the Green Line Challenge (previewed as Figure 16), the winning participant's submission consisted of 3 broad concepts (outlined in black) and 7 distinct ideas (outlined in orange).

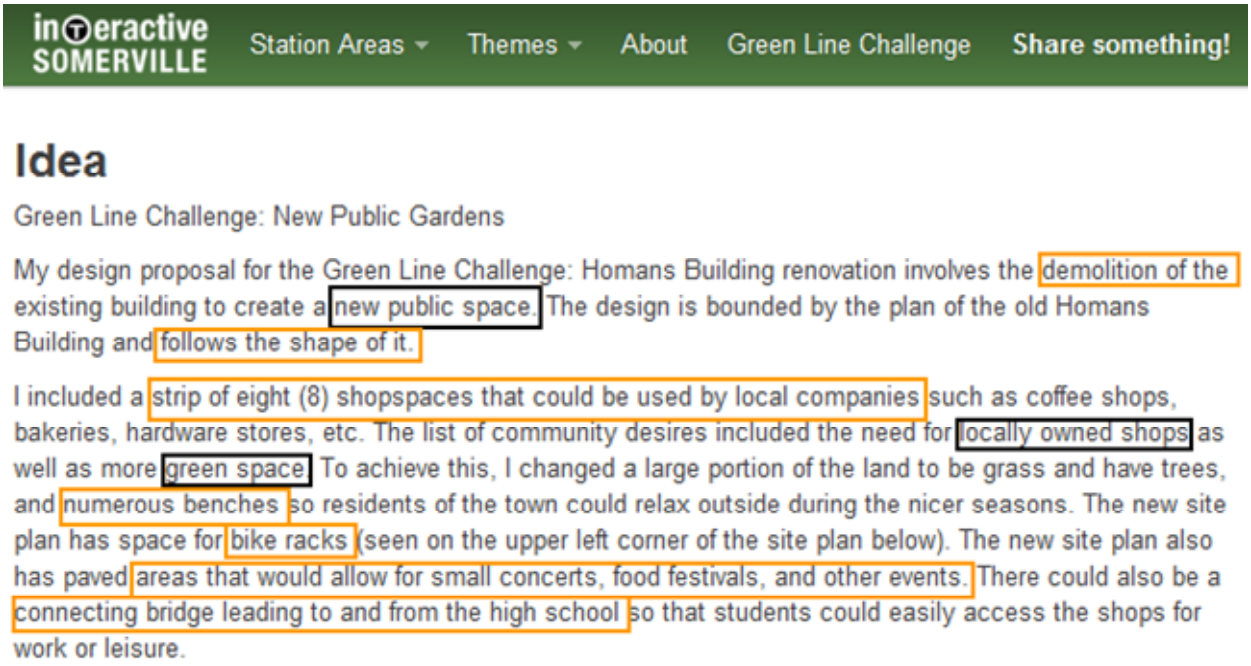

Figure 14: Textual Analysis Illustration of the Winning Idea of the Green Line Challenge

The textual analysis above is a case in point of how crowdsourcing public participation gives people the time to think more comprehensively about the problem and to offer more well-thought and articulate ideas. At the same time, it also appears as if this individual could be professional planner contributing expert advice rather than a resident sharing local knowledge.

In addition to the idea, participants had the ability to vote on the idea and to share their comments. Because it is open to the public and in one place, it is easier for people (with access) to add comments at their own convenience. This means that a conversation can happen over the course of time, adding to existing ideas, giving feedback and making new suggestions. Continuing with this example, the winning idea received one comment (see Figure 17).

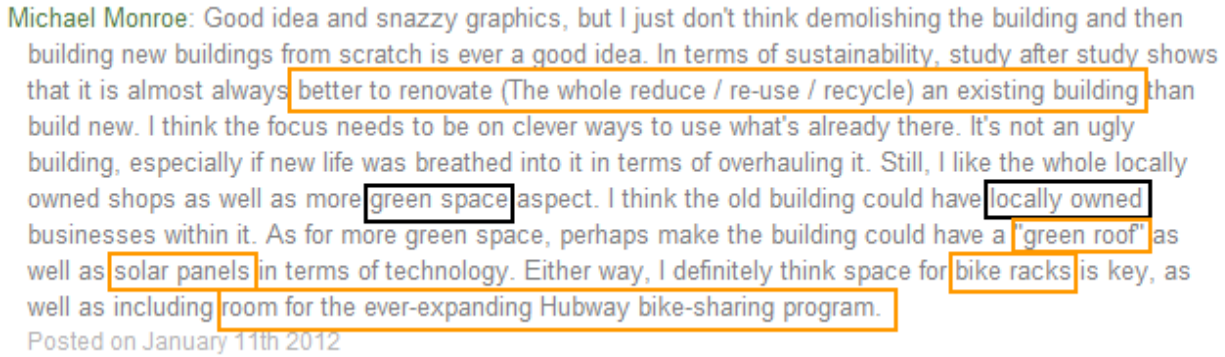

Figure 15: Textual Analysis Illustration of Comment on the Winning Idea of the Green Line Challenge

The one comment on the winning idea had 2 broad concepts (green space and locally owned) and 5 distinct ideas embedded in the comment. In summary, two participants, one that submitting the winning idea and one that left the comment, generated 3 broad concepts and 10 distinct ideas.

To be fair, the winning idea may have included more "ideas" and concepts within it. To investigate further I selected a sample of the submitted ideas to analyze. I listed all the ideas in ranked order and selected the 1st, 3rd, 5th, 7th, 9th, and 11th ranked ideas and applied textual analysis. This sample of 6 individuals generated 11 broad concepts and 32 distinct ideas. And the 8 individuals that commented on the ideas contributed 3 broad concepts and 9 distinct ideas.

In this sample, 14 Green Line Challenge participants (6 that submitted ideas and 8 that commented) generated 14 broad concepts and 31 distinct ideas. This means the average crowdsourced participant, in the case of the Green Line Challenge, generated nearly 3 (or 2.93) distinct ideas. The results of the textual analysis of ideas submitted to the Green Line Challenge are presented in the table below.

Submitted Idea	Broad Concepts	Distinct Ideas	Total Broad Concepts (Submitted Idea)	Total Distinct Ideas (Submitted Idea)	Total Broad Concepts (Comments)	Total Distinct Ideas (Comments)	Grand Total Broad Concepts	Grand Total Distinct Ideas
New Public Gardens	new public space	Homans Demolition	3	6	0	4	3	10
	locally owned shops (3)	New Building follows shape of old Homans (2)						
	green space (7)	8 shopspaces for local companies						
		bike racks (3)						
		area for concerts and events						
		connecting bridge/walkway to high school (3)						
		Renovate Homans - reduce/re-use/recycle						
		"green roof"						
		solar panels (2)						
		room for Hubway bike-sharing program (3)						
Transportation Museum	restaurants	Transportation Museum	5	9	0	1	5	10
	food court (2)	outdoor picnic area						
	new businesses (4)	grand entrance to museum						
	jobs (4)	MBTA history exhibit						
	foot-traffic (2)	Somerville Public Library events and exhibitions						
		classrooms for colleges and highschools (2)						
		courses open to community						
		eating area with floor-to-ceiling windows and glass flooring (2)						
		special entrance from School Street bridge						
		cost to maintain glass ceiling/floor would be too much						
Glass Building with Tunnel	housing/living space	glass high efficiency station (2)	2	7	3	4	5	11
	quality of living	tunnel station concept						
	revenue	coffee shop attached to station (3)						
	neighborhood center	apartments (with balconies) (2)						
	mixed-use development	common patio area for apartments						
		parking lot (3)						
		green building to replace Homans						
		Train noise makes housing less desirable						
		parking to finance the MBTA (3)						
		parking doesn't fit compact, walkable community model						
		sidewalks activated - storefronts, no docks, no parking						
Reuse Homans, Arcade	diversity	reuse Homans as the station	1	4	0	0	1	4
		arcade, art galleries and small shops						
		take & redevelop gas station (school & medford)						
		car and bus drop-off area (2)						
Recreational Spot		recreational spot	0	2	0	0	0	2
		preserve gas station						
Community Center		community center/cafe for commuters	0	4	0	0	0	4
		remove loading docks						
		replace windows						
		two-tone brickwork						
			11	32	3	9	14	41
						Participants 14		
						Distinct Ideas Per Participant 2.93		

Table 12: Textual Analysis of Ideas Submitted to the Green Line Challenge

By comparing the textual analysis of ideas generated at the Gilman Square Community Meeting with the ideas submitted to the Green Line Challenge, and the associated comments, I was able to better assess to what extent crowdsourcing public participation can generate distinct ideas.

For a simpler, more direct comparison, the textual analysis summaries for both the ideas submitted to the Green Line Challenge and the ideas generated through the Gilman Sq. Community Planning Meeting are listed side-by-side (in the table below).

Crowdsourced Participation (Green Line Challenge)	Traditional Participation (Gilman Sq. Community Planning Meeting)	Totals
14	30	Total People Participated
14	13	Total Broad Concepts
41	25	Total Distinct Ideas
2.93	0.83	Ideas Generated Per Participant (IGPP)

Table 13: Generating Distinct Ideas - Crowdsourced v. Traditional Participation

The table and analysis above illustrates that crowdsourcing public participation can generate distinct ideas. On average, the Green Line Challenge had 2.93 distinct ideas generated per participant compared to the 0.83 distinct ideas generated per participant during the Gilman Square Community Meeting.

That means on average, each crowdsourced participant generated nearly 3 distinct ideas and traditional participants generated nearly 1 distinct idea. Or you could say that crowdsourced participants generated approximately 3.5 times as many distinct ideas as traditional participants – this is a potential argument for utilizing crowdsourcing to generate creative ideas that appear higher quality than traditional input.

With that said, there are a number of factors that could have contributed to it such as the different motives of crowdsourced participants compared to traditional participants and the online setting versus the offline face-to-face setting of traditional participation.

Crowdsourced public input in this case was more detailed and comprehensive than ideas collected from the traditional Gilman Sq. meeting. It's not to say that traditional meetings cannot produce as many in-depth ideas as crowdsourcing challenges. There are a lot of factors and variables that could be adjusted which could change the outcome of the traditional meeting. However, there is an element of time, space, competition and comfort that participants are afforded with crowdsourced participation, compared to traditional participation that can give them an advantage. The best option would be to combine the two, aggregating all of the ideas and comments onto one online space for further community building and deliberation.

4.5 Summary of Interview Data Collected

The individuals who participated in the interviews were recruited through the registered user database of the inTeractive Somerville website. Participants were contacted by email after the January 9th Green Line Challenge deadline. Of the 81 registered contributors to the website at the time, 14 people (17%) replied to the email and agreed to be interviewed but 10 individuals were interviewed in total.

The 10 people interviewed represents a small percentage (12%) of the registered users, an even smaller percentage of Somerville and yet even smaller of the Boston area and so on. The main point being, this information should not be generalized but used to raise further questions and discussion. The interviews are a significant part of the in-depth analysis of the case study

and are meant to help answer the research questions, highlight trends and bring up new questions and discussion for future research.

I sought to interview 5 individuals who submitted an idea to the Green Line Challenge and 5 who did not submit an idea. With such a small database of users and limited time I could not be too selective about individuals interviewed nor could I segment the population by various categories. An IRB protocol for the primary research conducted for this thesis was filed with the Tufts University Office of the Vice Provost and granted exempt status on March 2, 2012 (IRB Study #1202058).

All of the interviews were recorded via Google Voice (another free product from Google) that allows registered Google account members to record incoming calls. Interview subjects were told that they were being recorded. An introduction was recited for each individual that was interviewed letting them know that the information would be used for this thesis and that their names and identities would be protected (see Appendix 4 for interview instrument).

Each person interviewed granted consent to use the information collected during their interview for this thesis project. The average interview time was approximately 21 minutes. The recorded interviews were transcribed into a typed electronic (Word) document after the interviews were conducted, accumulating 31 pages of interview transcripts. The transcripts were codified and inputted into a Microsoft Excel workbook with other data, such as web traffic data and voting data to easily cross-analyze. Themes that emerged from the interview transcripts are presented below.

4.5.1 Interview Analysis Framework

Before combing through the interview data collected, I revisited my research questions.

- Main Research Question: *To what extent can crowdsourcing facilitate public participation for transit-oriented planning projects?*
- Sub-Question 1: *To what extent can crowdsourcing public participation generate distinct ideas?*
- Sub-Question 2: *To what extent can crowdsourcing public participation engage individuals who typically do not get involved in the planning process?*

By answering the sub-questions, I am working towards answering the main research question. The first sub-question has been flushed out by comparing the textual analysis of the ideas and comments of the Green Line Challenge and the ideas suggested by participants during a traditional meeting – the Gilman Square Community Meeting. My interpretations of the text collected during the crowdsourced public challenge and traditional public meeting were supported by my field research and site reconnaissance.

To build the framework for my analysis, I considered the Top Ten Public Participation Challenges (Table 3) and inspired by Daren C. Brabham's PhD research (2010), I sought to match and consolidate them with Beth Simone Noveck's (2003) 11 Design Principles for Online Deliberative Democracy Spaces. This resulted in the creation of three new broader categories of "Crowdsourcing Public Participation Design Considerations" (see Table 11).

Each new category of design considerations for crowdsourcing public participation included relevant public participation challenges and online deliberation design principles. The

following are the three new categories of "Crowdsourcing Public Participation Design Considerations":

- Structure of Openness: Accessibility, Transparency, Accountability and Public Record
- Facilitation: Online Community Management, Deliberative Tools and Social Technologies
- Political Power: Influence on Plans and Policy and Autonomy

Themes of Crowdsourcing Public Participation	Public Participation Challenge	Online Deliberation Design Guidelines	Online Deliberation Design Guideline Description
Structure of Openness: Accessibility, Transparency, Accountability and Public Record	Planners outreach and coordination of participatory activities Involve individuals who typically do not participate in planning process	Accessible and Public	available to as wide a range of participants as possible – virtually or physically Open dialogue dedicated to the what is best for the community
	Measure of the effectiveness of public participation	Accountable and Relevant	Community engages in "accountable and reasoned public discourse" and "cannot be anonymous to one another"
		Transparent	"the structure and rules of the space must be public so that citizens know who owns and controls the space, whether monitoring is taking place, and the origin of any information contributed to the discussion"
Facilitation: Online Community Management, Deliberative Tools and Social Technologies	One-way communication flow with no feedback or deliberation	Informed	"deliberative dialogue cannot be divorced from [relevant] information; participants must have access to a wide variety of viewpoints in order to make effective and educated decisions"
		Pluralistic	Technology and community guidelines created "to regulate the space for deliberation" so that "viewpoints representing a broad spectrum are clearly expressed."
	Face-to-face interactions favor extroverted personalities	Inclusive	Each participant must at least have the chance to be heard. And a deliberative forum must be inclusive and open community members.
	Planners' facilitation style	Facilitated	facilitate the dialogue, highlighting what is productive and suppressing what is destructive

	Generate creative solutions	Free of censorship	freedom of thought and expression
Political Power: Influence on Plans and Policy and Autonomy	Power to influence plans or policy	Autonomous	Participants are active in a public process
	Face-to-face politics and unequal power relations	Equal and Responsive	all "participants must be equal players with opportunities for access and voice" and "[t]he architecture cannot privilege one group over another"

Table 14: Design Considerations for Crowdsourcing Public Participation

The framework is meant to help with the analysis and is flexible so for example, to help answer my research questions the discussion can cut across "Themes of Crowdsourcing Public Participation, Public Participation Challenges" and related "Online Deliberation Design Guidelines." The framework is not perfect but it fulfilled its purpose to help me cross-analyze between interview data, challenges of public participation and potential solutions (through online deliberation design guidelines).

In the next sub section, I sought to help answer my second sub-question and build points for the main question and conclusion. Listed below are themes that emerged from the interview data collected. The themes are analyzed through the "Design Considerations for Crowdsourcing Public Participation" framework outlined in the Table above. This is the main analysis tool employed to help answer my research questions while also building on Daren C. Brabham's existing research (2009, 2010) and making way for suggested future research.

4.5.2 Themes of Crowdsourcing Public Participation Collected From Interviews

After combing through the data collected from the interviews, seven themes emerged:

- Information About Participants Interviewed

- Accessibility and the Digital Divide
- Online and Offline Public Participation Preferences and an Informed Public
- How Participants Heard About the Green Line Challenge and Community Outreach
- Reactions to inTeractive Somerville Website
- Motivations of Participants
- Perspectives on the Green Line Challenge and Crowdsourcing Public Participation

Information About Participants Interviewed

After compiling all the demographic data of the interview subjects, it appeared that the typical profile of an individual interviewed was a 34-year old college-educated, white male from the Boston area (see Table 15)[69]. There were some similarities between the Green Line Challenge and Next Stop Design that should be noted. The average age of the Green Line Challenge participants was 34 years old. Similarly, Next Stop Design participants were an average age of 32. Looking at the table below, the second column is glaring in that every

[69] Unlike the Next Stop Design website, the inTeractive Somerville website did not capture demographic information in the registered user database so there is no way to tell the total number of male or female registered users, their age, ethnicity or education. To register and participate, individuals only need a username and password. This can be attributed to some of the limitations of this project such as technology and the time and resources to plan and develop the technology.Though demographic information for all registered users on inTeractive Somerville at the time of the Green Line Challenge were not available, some information such as gender, age, ethnicity and education were captured from interview subjects. 8 out of the 10 were white. 9 out of the 10 had at least obtained a bachelor's degree (2 had some graduate education and 1, a master's degree).

interview subject was male. This resembles Brabham's (2010, 81) sample of participants interviewed as 19 of the 23 (83%) interviewed were male.

Participant	Gender	Age	City	Design submitted?	Attended traditional public meeting?	Online civic activities[70]?	Prefer online or offline participation?
A	Male	38	Cambridge	Yes	No	No	No preference
B	Male	24	Boston	Yes	No	Yes	Online
C	Male	39	Somerville	No	Yes	Yes	No preference
D	Male	24	Somerville	No	Yes	Yes	Online
E	Male	25	Boston	No	Yes	Yes	Offline
F	Male	35	Somerville	No	No	Yes	Offline
G	Male	28	Dorchester	Yes	No	Yes	No preference
H	Male	24	Boston	Yes	No	No	No preference
I	Male	68	Somerville	Yes	Yes	Yes	No preference
J	Male	30	Somerville	No	Yes	Yes	Online

Table 15: Basic Information About Interview Subjects

There is some research (CIRCLE 2012) that suggests that females vote more than males – during the 2008 election 55% of women (ages 18-29) voted compared to 47% of men. However, another article "Gender and Citizen Participation" indicated that males participate slightly more than females. Further, the same article found that men and women address participate for similar reasons but they speak differently or in a "different voice" (Schlozman et al. 1995).

Out of the 10 people interviewed (that participated in the Green Line Challenge), half of them (5) said that they did not participate in a traditional public participation meetings in the past (see Table above). Four of the five individuals that never participated in a traditional meeting

[70] This column includes data from two questions from the interview: 9) Have you participated in civic or political online activities before? For example, have you supported a political candidate or cause? If yes, how often and why? And 10) Have you participated in online groups or websites regarding your city or town? For example, have you joined and participated in a city or town's Facebook page? If yes, how often and why?

submitted ideas. Similarly, out of the 23 Next Stop Design participants he interviewed, Brabham (2010, 81) found that 17 of them or 73%, never participated to a traditional (offline) meeting.

Participants were asked if they participated in online activities such as (a) supporting a political candidate or cause (national) and (b) "participating in online groups or websites regarding your city or town" (local). Six participants each or 60% of the participants said that they participated in online civic or political activities and their city or town's online groups or websites. So while this sample of crowdsourced participants may have not participated in traditional planning meetings they are more often than not politically or civically active online.

Below are some comments related to why some individuals who do not typically participate got involved in the Green Line Challenge or crowdsourced public participation. Participant C makes a very good point. There are a lot of reasons why people cannot make traditional face-to-face meetings. It could be that they have young children and they do not have daycare coverage. Or that they work two or three jobs to pay the bills. Perhaps they feel uncomfortable speaking in front of people like Participant D (see below).

> Participant C: It opens up the door for people that might not be able to make it to the regular town meetings.
>
> Participant D: I was skeptical at first. I wasn't sure what am I going to come up compared to people that get paid to think about this? It seems to be an extension of the public participation process. Especially compared to a public meeting where only dedicated people show up, this really makes it easier for people to participate. It takes that process and opens it up to more people. It feels more accessible. I'm unlikely to actually say something at a public meeting – it feels easier for me to participate online.

Participant D stated that he is unlikely to say something at a public meeting and "it feels easier for me to participate online." This gets to the heart of one of the Top Ten Public Participation Challenges: "face-to-face interactions favor extroverted personalities." He also

alluded to another key participation challenge "face-to-face politics and unequal power relations" when he stated "compared to a public meeting where only dedicated people show up, this really makes it easier for people to participate."

Like Participant D, Participant G was also attracted to the *inclusive* nature of the crowdsourcing challenge: "…at least everyone can have input and you can really break down your thoughts…"

> Participant G: And it was fair that it didn't have to be a design. It could have been a paragraph or a couple of sentences on what you thought should be done with that particular area. It's nice when you have image and design but at least everyone can have input and you can really break down your thoughts and put them into words and people can read them and visualize…

Participant G found the structure of the challenge to be fair, *transparent* and *pluralistic* in that the participants did not have to submit a design but they could submit just text or their thoughts "so that viewpoints representing a broad spectrum are clearly expressed" (Noveck 2003, 15-6). The Green Line Challenge submission instructions specifically included language that aimed at accepting ideas in any form from as many participants as possible. Participants were given the option to submit their ideas or designs directly through the website and they could also send supporting files via email (inTeractive Somerville 2012b).

There was one participant interviewed (J) who strongly stated that crowdsourcing public participation would "get people who were not involved to be interested" because of emerging (deliberative) tools and (social) technologies:

> Participant J: I think it does offer another option for people. I think it will get people who were not involved to be interested. People that do not necessarily go to community meetings may be more willing to interact online as these new tools are developed. There is a lot of potential, particularly, with the younger generation. There's an opportunity to engage a new generation of more civically active people with these tools.

This brings up questions of accessibility, fairness, openness and the concept of the Digital Divide – "the gap between those who do and do not have access to computers and the Internet" (Warschauer 2004, 1).

Accessibility and the Digital Divide

Accessibility and the Digital Divide are nearly synonymous concepts. Given the inTeractive Somerville website was public and the Green Line Challenge was open to everyone, it was easily *accessible* to people that had access to computers and the Internet. Out of the 10 participants interviewed, nine stated that they felt the Green Line Challenge was fair and open to all residents in Somerville.

However, most of the feedback was that some people would not be able to participate because they do not have access to a computer and/or the Internet – otherwise known as the "Digital Divide." Below are comments from interview subjects related to the Digital Divide:

> Participant C: The downfall is that it utilizes a medium that is generally available to most of the population but it leans toward those that are more technically inclined and own a computer, and have the means to pay for the computer and Internet services.
>
> Participant I: I would advise that it has to have more kid involvement – the city is only somewhat computer-literate. Immigrants and working class are critical [to involving those that typically do not participate].

But do "kids" really have more access to computers and the internet? How many people in the U.S. are online anyway? These are questions that need to be addressed in the Digital Divide discussion.

The US Census Bureau estimates that there are 313 million people living in the United States[71] and 79% of adults or at least 94 million[72] adults in America use the Internet (Pew 2011). This may sound like a lot of people that do not have access to the online world but the gap between those that that do and do not have access to computers and the Internet has been closing dramatically over the past 10 years or so, and young adults have a lot to do with that.

Internetworldstats.com (2012) estimated that in the year 2000 44% of the U.S. population used the Internet. Between 2003 and 2004, the percentage of Internet users in the U.S. jumped from 59% to 69%. Between 2004 and 2011, that statistic moved up another 10 percentage points, from 69% to 79%. Listed below is how Internet Usage (Pew 2011) breaks down by age group:

- 95% of 18 to 29 year olds use the Internet
- 87% of 30 to 49 year olds,
- 78% of 50 to 64 year olds, and
- 42% of people 65 and older use the Internet.

Clearly, the younger the age, the more likely people are to use the Internet. This fact coupled with the increased usage of the Internet overall in the U.S. means that the Digital Divide gap will likely become less and less of an issue in years to come, as the population that uses the Internet less (50 years old and up) decreases and the population that uses it more (49 years old and younger) increases.

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[71] According to the U.S. Census Bureau's "U.S. and World Population Clocks" as of February 22, 2012, it is estimated that the U.S. population is approximately 313,061,833 (US Census 2012a).

[72] This number is based on July 2009 estimates from the U.S. Census Bureau. According to data accessed from the U.S. Census on age groups, approximately 119,147,016 adults (18 years of age and older) were living in the U.S. as of July 1, 2009. The data was accessed at http://www.census.gov/popest/national/asrh/NC-EST2009-sa.html on May 12, 2011.

Thus, Participant I's assumption that "kid involvement" might tap into a group that does not typically participate could be a good recommendation – nearly the entire demographic (95%) of young adults (18 to 29 year olds) have access ICTs and could potentially get involved through crowdsourced participation. However, access and usage of information and communication technologies does not necessarily translate into political or civic participatory activities.

The Center for Information & Research on Civic Learning and Engagement (CIRCLE) is perhaps the number one authority on research and information on young adults and their political or civic engagement activities. A recent study (Kawashima-Ginsberg and CIRCLE staff 2011) "Understanding a Diverse Generation: Youth Civic Engagement in the United States" posits that young people ages 18-29 should be not be treated as one uniform group because of its diversity in not only demographic background but also participatory preferences. The study indicates that though there is a high concentration of young adults (75%) engaged in their community or in politics (in both 2008 and 2010), they are engaged in very different ways. Below are the six distinct patterns of engagement of young adults from 2010 as outlined on the CIRCLE website (Kawashima-Ginsberg and CIRCLE staff 2011):

- The Broadly Engaged (21% of youth) take on leadership roles in the community;
- The Political Specialists (18%) are focused on voting and other forms of political activism;
- The Donors (11%) give money but do little else;
- The Under-Mobilized (14%) were registered to vote in 2010 but did not actually vote or participate actively;
- The Talkers (13%) report discussing political issues and are avid communicators online, but do not take action otherwise; and
- The Civically Alienated (23%) hardly engage at all.

This reinforces the point that even though most young adults (95%) use the Internet, it does not mean they are all active politically or civically. Depending how you interpret the data and how you define participation. Participation, in the context of this research, refers to individuals actively participate in meetings (offline or online). From this perspective, you could say that just 39% (21% - Broadly Engaged and 18% Political Specialists) are actually participating or actively participating in local community affairs or national politics (voting).

Further, more a person earns and the higher their educational attainment, the more likely they are to use the Internet. For example, 96% of college graduates use the Internet whereas 67% of high school graduates and 52% of those that did not graduate high school use the Internet – this represents a 44% point range between college grads and those without a high school diploma. For household income, people making $75,000/year or more have the highest concentration of Internet users (95%) whereas those making less than $30,000/year have the lowest concentration of Internet users (63%) (Pew 2011).

Race and ethnicity have less of an influence on Internet usage (Pew 2011) but more of a factor when it comes to youth civic and political engagement (Jacobsen and Wilder Linkow 2012). For example, Hispanics have the highest concentration of Internet users (82%) but the least engaged young adults with a percentile rank of 42.5 – meaning, approximately 58% of young adults in the U.S. are more engaged than the average Hispanic young adult (Jacobsen and Wilder Linkow 2012).

Using the same logic, whites have a similar concentration of Internet users (80%) and the most engaged with a percentile rank of 53. Black young adults also have a relatively high percentage of Internet users (71%) and have a slightly higher percentile rank (44) as far as young

people's civic and political engagement. And so all this means that just because a group of people are engaged on the Internet, it does not mean they are necessarily engaged in politics or community affairs.

There is also not much of a difference in Internet usage between urban communities (81%) and suburban communities (82%) though only 67% of rural community residents use the Internet (Pew 2011a).

We know that the there is a significant percentage of the American population that uses information and communication technologies (ICTs). We also know that with youth, more income and higher education comes a higher likelihood those individuals use the Internet. Further, there are spikes in participatory activities online from political participation to local community engagement and to public participation (in the planning process).

It is true that not everybody has access to a computer or the Internet. I do not suggest that crowdsourced public participation or participation facilitated by ICTs should replace traditional participation but rather it is a supplement to it.

Of the people that do have access to computers and the Internet, do they have a preference when it comes to offline or online public participation?

Online and Offline Public Participation Preferences and an Informed Public

The medium of the Internet is an important factor when considering how and why an individual may have participated. To dig into this question further, individuals who participated in both traditional planning meetings and online public participatory activities were asked if they had a preference "participating in community planning projects offline or online and why?"

Half of the participants were able to share their thoughts, below are highlights from their interviews. Two people (C and I) had no preference because they felt they were and should be interconnected.

> Participant C: No preference. There are interactions between them. They are not mutually exclusive so no, I don't have preference.
>
> Participant I: No preference. Doesn't make a difference to me but that's unique. They work much better if it's both, very few programs engage unless they are both online and offline… use the online to reinforce offline.

Participant E prefers face-to-face interaction and "needs the physical and verbal interaction."

> Participant E: I would prefer offline and meeting in person with a group of people. I've taken online classes for school and I can't do it, I need the physical and verbal interaction with other people. I will say that with an online community such as interactive Somerville it can sometimes supplement traditional meetings and people that can't share their ideas in person can share it online and post it online.

And two participants (D and J) prefer online participatory activities because of the (deliberation) tools and (social) technologies available and "online is good for crystallizing ideas" likely because time is not really an issue – there is plenty of time to review materials, conceptualize and to use his word "crystallize" ideas. This is a critical point as having comments and ideas online all the time gives people the chance to really think about, the comment from one participant below reflects this point made by Participant C:

> Participant D: Although it's nice to chat with people face-to-face. I like all the resources that were provided "visualizing the location" and all the graphical tools and Google maps. Being able to play with the tools is really cool I have a much easier time participating in the online setting than I would in real-life [in traditional meetings].
>
> Participant J: Online in a lot of ways is easier, so that would be my preference. Nothing ever substitutes for going to a meeting, but online is good for crystallizing ideas and actually being part of planning meetings you can make an impact with people that matter.

> Participant C: The ideas that were presented were more well-thought-out than you could ever achieve through a public meeting, because there is an element of time and that couldn't really happen any other way.

Another benefit that may be taken for granted is having all the public input and information related to the planning project in one accessible location (online). For one thing this keeps citizens, planners and policymakers *informed* – giving participants "access to a wide variety of viewpoints in order to make effective and educated decisions" (Noveck 2003, 17). Two interview subjects reiterated this point of view during their interviews:

> Participant I: Online is better because it documents it.
>
> Participant C: It's good that you can propose something that it's always online, available and you can go back to it and you can refer it and have a place to discussion. It's half of the component of community involvement, the other half is the real-world meetings.

Having all the public input and the related planning information on one accessible public website is that it can also potentially address another key public participation challenge: measuring the effectiveness of public participation. For example, all the information inputted by the contributors to the website can be systematically stored and exported for analysis. This potentially includes demographic information about the users, the topics they are interested in, ideas and items shared and number of comments. All of which can be used as public participation indicators, initiating a standardization process of the measurement of effectiveness of public participation.

Online participation also has the potential to document all visitors to the website can be easily track and analyzed with free resources like Google Analytics. This can greatly help developing and measuring community outreach goals while at the same time influencing future

strategy and web site development and design. In general, web analytics could help to address the three key public participation challenges: 1) Planners outreach and coordination of participatory activities, 2) involving individuals who typically do not participate in planning process and 3) measuring the effectiveness of public participation (see Table 14).

In addition, if the website regulates that real names and identities have to be used all the information and comments that is on the website can be documented and can hold people accountable. This was a big weakness of the inTeractive Somerville website – ease of signup and anonymity was sacrificed for a more complex, ideal system of accountability and public record.

Community Outreach and How Participants Heard About the Green Line Challenge

When asked a series of questions about how participants heard about the Green Line Challenge, half of the participants (5) learned about it from email. The remaining half, heard about it through social media or the Boston Metro article. Interestingly, related to community organizing and events, not one of the interview subjects attended the inTeractive Somerville Website Launch Party on November 14, 2011.

Social media played a significant role in outreach and strategy to drive people to the website to increase participation. Four out of the ten subjects used Facebook to engage with inTeractive Somerville, that statistic is consistent with web traffic data that reported that the 310 visits from Facebook represented 47% of referrals and 19% of all visits to the website (during the Challenge period).

Though only one participant heard about the Challenge through Twitter, the importance of utilizing Twitter for media outreach cannot be discounted. A direct (private) message on

Twitter from a *Boston Metro* reporter (see Figure 13) was a catalyst to generating three articles that were published on January 5th and 6th. These articles proved to be instrumental in increasing the number of visits to the inTeractive Somerville website and consequently the number of ideas submitted.

The three articles that promoted the Challenge, published online and in print on WickedLocal.com (Somerville Journal) and the Metro Boston, and online via BostonInno generated at least 109 visits, 7% of all visits to the website, in less than a week. Further, between January 5th and 9th the registered user database increased from 40 to 60 individuals and the number of ideas increased from 1 to 11.

Though there was some success with social media, overall, with limited time and resources and lack of strategic partnerships, the communication strategy implemented was incomplete. Participant F echoed this point during his interview:

> Participant F: I felt like you had to be looking for it. One thing Mayor Curatone and the City does, is that if you have land line registered in the City of Somerville… they have a recorded phone call from the City to promote something like this which is pretty monumental…the City has get behind this and should have been on the City of Somerville website. These are the ways to get people involved in the 21st century, people are online, they are checking their Cities if they are at all civically engaged, if the product is good and interactive with good flow and well put together, it is sad if they wouldn't be enthusiastic about it.

For example, a formal partnership with the City of Somerville could have potentially generated more press and at the same time could have been a great learning experience for both the City and the community organizations that represent inTeractive Somerville. The City of Somerville did, however, share posts on Facebook and Twitter about the Green Line Challenge.

Clearly, getting press and visits to the website is directly related to the number of potential registered users and ideas submitted to the Green Line Challenge. This is also related to

one of the top public participation challenges for planners: the outreach and coordination of participatory activities. If there were a budget in place, a more formal and comprehensive integrated community outreach and online communications plan could have been developed and implemented.

Participant I had a number of ideas outreach ideas that could have been explored:

> Participant I: It takes a lot of publicity and public events and partnerships. You need the base which takes planning, coordination. Do as much community organizing to promote the websites. Keep promoting on the ground. Find a way to get kids jobs and they are quite capable. Transportation never really uses participatory planning but they are going to need to given the current economic situation. The cheapest way to involve is to have kids to do something.

Synchronizing community organizing and online participation goals is tied to one of the most successful online campaigns to date: President Barack Obama's 2008 Election. Whether offline or online, goals are goals, and different tools and technologies are utilized to help achieve the overall goals. That is what Obama's Team knew early on and one could argue that if it weren't for the strategy of merging community organizing with social networks and technologies, President Obama may not have won the 2008 Presidential Election (Talbot 2008).

Both Participants I and J allude to the need of using community outreach to increase participation online. The CCP did reach out to the community about the new inTeractive Somerville website through the Launch Party on November 14th and follow up conversations with interested community leaders and community organizations in the Somerville area. Aside from that, the community outreach was limited.

> Participant I: Immigrants and working class are critical, the working class of the city talk online but they don't think online. The challenge has to be to make it both attractive and engaging to working class and immigrants, it's hard to break into it and they have to do it themselves first. They are the target.

Participant J: As much on the ground work is needed to promote the website.

Having immigrants and working class people "do it themselves first" would take a massive effort from community outreach to meeting coordination, technical setup, logistics and facilitation of the workshops. The community expressed interest in the Challenge but clearly needed more time to learn how to use the website and to absorb information about the Challenge. Based on community feedback the Green Line Challenge deadline was extended, however, it seems like media coverage had more to do with increased participation than more time for community members.

Reactions to inTeractive Somerville Website

Participants who were interviewed were asked about their initial reaction to the inTeractive Somerville website, its ease of navigation and how easy it was to find information about the Green Line Challenge. Nearly every individual interviewed (90% - 9/10) had a positive reaction to the inTeractive Somerville website as a way to generate public input. As stated in the theme *Accessibility and the Digital Divide,* nine out of ten stated felt the Green Line Challenge was fair and open (to all people in Somerville) with some reservations related to the Digital Divide.

Seven out of the 10 participants interviewed believe the Challenge "provides good input" and 8 out of 10 agreed that the Green Line Challenge "promotes interaction among citizens." This supports the results of the textual analysis that illustrated that crowdsourced public participation can generated nearly 3 (2.93) distinct ideas per participant compared to traditional participation which generates less than 1 (0.83) distinct ideas per participant.

Web design and the usability of the website fundamentally impacts the user experience, whether that experience is good or bad, if it is appealing, how long visitors stay on the website and their engagement with specific content, applications or media on the website. The website and all that it entails is representative of the brand, in this case – inTeractive Somerville.

Listed below are some comments related to the design and usability of the inTeractive Somerville website.

> Participant B: It looked like a professional website. Pretty easy to navigate. It took a little bit of time to figure out the Challenge, but there were a good set of instructions.
>
> Participant D: I thought it was pretty cool. I read through the main page, overall I like the idea, I watched the slideshow and video.
>
> Participant G: I liked how it was set up. Easy to navigate.

The comments above reflect the importance of gaining credibility through a professional design, providing ease of navigation and embedding diverse media on the website to appeal to a diverse audience. Through these comments above, I estimate that the design of the website and the content on inTeractive Somerville influenced some individuals to participate in the Green Line Challenge. In a nutshell, the better visitors feel about the website from the design to usability, the more likely they are to stay on the website, engage, and potentially share their own ideas and comments.

Aside from design, in the crowdsourcing context, it is critical that participants understand the crowdsourcing challenge at hand and how to submit their ideas or designs and how to cast their votes for submitted ideas or designs. The sentiment of those interviewed was that the instructions of the Green Line Challenge were clear and easy to understand, albeit to a similar

demographic. There were some participants interviewed that shared specific features about the inTeractive Somerville website and Green Line Challenge that they like and/or influenced them to participate.

One Participant (E) liked the competition as a way to generate ideas:

> Participant E: Competition is a different way of generating ideas and I think there could be more of these [crowdsourcing public participation challenges].

Participant F liked how the information on the website was organized and that people could comment on ideas and interact with others.

> Participant F: I was really impressed with the scope and how organized and how there was feedback especially. I was pretty excited that there was a way to interact with the community online, especially since I couldn't make a lot of the meetings. I was like "Wow, this looks like something official that I can actually chip in my two cents"

In addition, Participant F indicated that he was excited about how it was online because he couldn't make a lot of meetings. The professional or "official" look of the website couple with the organization of the content also influenced Participant F to participate.

Like Participant F, Participant H liked the interaction and how he could build on ideas that were already on the website and add his own ideas.

> Participant H: Very interested and I wanted to participate. I read all the other ideas and thought about how I could build upon them and build my own ideas as well. Most people use internet, generate ideas and you can use computer modeling and images. It is a very effective way.

Participant C felt that the crowdsourced ideas were of higher quality than ideas generated through traditional meetings:

> Participant C: The ideas that were presented were more well-thought-out than you could ever achieve through a public meeting, because there is an element of time and that couldn't really happen any other way.

Though the reactions to the inTeractive Somerville website were for the most part positive; however, some individuals who were interviewed had some constructive feedback to offer:

> Participant A: It would have been better if you didn't have to register, too many steps.
>
> Participant D: It wasn't that obvious the way you are supposed to post, where does your idea go when you share something? It's confusing how to respond or to interact.
>
> Participant G: Voting could have been more clear and the placement of information, particularly ideas during voting period. I thought it was difficult to find out how to vote.
>
> Participant I: It seemed both more graphic than it had to be and more sophisticated than most casual users would get engaged in. My focus comes from working with high school kids… the kids see it but don't always get engaged because they feel it is more sophisticated than they are ready for.
>
> Participant E: If you really wanted to make it more interactive, having an iPhone app, a photo album to flip through, and the ability to comment on photos. Take content from meetings and post online to increase participation. Combine photo album and discussion board. Something like Pinterest – visual scrapbooking.

All of the comments above should be considered website feedback that can be integrated into future web development efforts on interactivesomerville.org.

Motivations of Participants

What motivates individuals to participate in different activities is a complicated subject. It is almost scientific law that different people like different things or different people are motivated by different things. Below is an example of how different motivations and interpretations of public participation can be:

> It's almost like voting for the President of the United States. It's similar how you can share your input at a local level, which means your input is that much more important (Participant G).

In his analysis of the crowd's motivations to participate in the crowdsourcing challenge, Daren C. Brabham (2010, 43) calls on "uses and gratifications" (U&G) theory which "assumes an active audience engaged with various media seeking certain gratifications." Thomas E. Ruggiero, who developed the U&G theory extensively for a number of years, (2000, 29) states that:

> theoretically and practically, for U&G scholars, however, the basic questions remain the same [in the new media era]. Why do people become involved in one particular type of mediated communication or another, and what gratifications do they receive from it? (as cited by Brabham 2010, 44).

Though U&G theory is a bit more communication-focused it is still relevant in the context of this research. Extending the uses and gratifications communication theory to participation theory in the context of urban planning, it can assumed (like Brabham 2010, 45) that individuals in the crowd are likely drawn to crowdsourcing applications for a number of reasons and are gratified in various ways through participation.

Daren C. Brabham (2010, 52-3) did a thorough investigation and literature review on U&G theory and the motivations of individuals to participate in crowdsourcing. He refined the information collected on motivation to nine broad categories listed below. Building on his research, I also used these categories in my analysis of what motivated individuals to participate in the Green Line Challenge:

- To make money
- To advance one's career
- To learn new skills and knowledge
- To be recognized by peers
- To meet new people and socialize
- To contribute to a collaborative effort
- To have fun

- To pass the time when bored
- To express oneself

Textual analysis was used to decipher motivations from the interview data collected from seven participants. The results of the analysis are listed in the table below. Some individuals were motivated by multiple factors. The top motivation was "to express oneself" (5/7) followed by "to contribute to a collaborative effort" (4/7), "to learn new skills and knowledge" (3/7), "to advance one's career" (2/7) and lastly, one out of seven mentioned the train pass award which could be interpreted as "to make money."

It is important to note that the individuals interviewed did not express that they wanted to improve the Gilman Square area or Somerville, except for possibly the Participant I who wanted to share his input as specifically as local knowledge. In addition, it appears that not one individual was motivated to participate to connect with new people – a required motivation to building social capital. Overall, it appeared that participants were driven by their own professional development and career ambitions rather than improving a neighborhood in Somerville and connecting with new people – a prerequisite to building (bridging) social capital.

	Participants Interviewed							
Motivational Factor	**A**	**B**	**C**	**F**	**G**	**H**	**I**	**Totals**
To make money						1		**1**
To advance one's career	1				1			**2**
To learn new skills and knowledge	1	1				1		**3**
To be recognized by peers								**0**
To meet new people and socialize								**0**
To contribute to a collaborative effort			1		1	1	1	**4**
To have fun								**0**
To pass the time when bored								**0**
To express oneself		1		1	1	1	1	**5**

Table 16: Motivations of Green Line Challenge Participants

The following comments are related to the motivations of Green Line Challenge participants:

> Participant A: My goal was to submit a design that I could use to build my portfolio. I want to be a general purpose designer.
>
> Participant B: I'm interested in planning, public transportation, community improvements, new developments, especially in the Boston area. It is cool to see what is next for vacant plots of land. I thought it would be cool to submit an idea for a vacant piece of land for a transit-oriented development.
>
> Participant C: to post comments
>
> Participant F: I wanted to submit an idea but mostly I wanted to have input and I was late for the competition.
>
> Participant G: I like to do architectural design. I'm a graphic designer by trade. I have done a couple of designs on my own. I thought it would be a good way to put my input in for the community, in the Greater Boston area – a great way to share my ideas.
>
> Participant H: To submit an idea and to vote for ideas. I'm an architecture grad student, I wanted to gain some experience and build my portfolio and the option to win the T-passes
>
> Participant I: Later there will be people that will say "we didn't know anything about that" but I can say "yes you did" [to state facts that might be ignored, to share local knowledge]

Perspectives on the Green Line Challenge and Crowdsourcing Public Participation

The last theme of the interview data was related to the participants' opinions or perspectives of public participation. Half of those interviewed stated that the Green Line Challenge changed their opinion of public participation. The following are comments of the interview subjects in response to the question above.

Participant D admitted to being skeptical of public participation and after the Green Line Challenge felt "less skeptical." He discounted the importance of local knowledge and the

potential of non expert advice. The interactivity and organization of the Green Line Challenge on the website seemed to impress Participant D got him "thinking about participation more and in a different way."

> Participant D: I'm probably less skeptical than I was before. I first thought what do random people in Somerville know? Now, it's obviously important to think about people's priorities and ideas, and for people to feel they participated, so they won't feel like it was something forced on them without notice. It's something I haven't really seen or flushed out to this degree before. I never really thought about it in quite this way and having this interactive website. It got me thinking about participation more and in a different way.

The statement above, alone, could be reason enough to pursue crowdsourcing as an option for or supplement to public participation. This individual has participated in traditional planning meetings, and is engaged online in local and national participatory activities. Participant (D) has seemingly had some bad public participation experiences and perhaps there are others out there like him that can feel less skeptical about public participation through crowdsourcing.

The uniqueness of crowdsourcing public participation is also a factor to consider:

> Participant F: Since I hadn't seen anything like it before, I felt it was like a notch up or raising the bar for public participation. So yes, you could call that a change in opinion. Participant G clearly values a pluralistic online deliberative space. He also places value on two-way or multi-way communication online (as a way to deliberate).

> Participant G: When you have the interaction of the people that are actually using the transportation they can give the best input on how to improve. Yes, you were given people the opportunity to add input to their area that is currently not there. To be able to interact and see what the community is saying benefits everyone that is participating.

And Participant E was impressed by the organization of the content on the website and the "Recent community activity" newsfeed on the homepage on the inTeractive Somerville website.

Participant E: I thought it was really helpful. The website is a lot more clear than the Green Line Extension Project MassDOT website. Recent community activity is something you can't get on the MassDOT website. I think it adds to ideas I've have in the past.

5 CONCLUSION

5.1 Revisiting Research Questions

Can crowdsourcing help facilitate public participation in urban or transit planning projects? Based on the evidence presented here, it appears that crowdsourcing can indeed help facilitate public participation, to what extent, depends on a number of factors. One way to assess this question is to look at the key challenges and benefits of public participation that have reoccurred in the literature over the years and to ask if this particular case of crowdsourcing public participation helped to abate the key challenges and supplement or improve the key benefits of public participation.

Two of the *Top Ten Public Participation Challenges* listed in Table 1are directly related to the sub questions of this thesis:

- Sub-question one: to what extent can crowdsourcing public participation generate distinct ideas?
- Sub-question two: to what extent can crowdsourcing public participation engage individuals who typically do not get involved in the planning process?

5.2 Summary of Findings

The inTeractive Somerville Green Line Challenge was created to test the idea that crowdsourcing[73] can help facilitate the public participation process. A real world public problem, defined by a neighborhood in Somerville, Massachusetts was the setting of this research project.

The crowdsourcing challenge was to come up with the best idea and/or design to improve the area where the city-owned, abandoned factory known as the Homans Building is currently located. The Homans Building is adjacent to the proposed future site of the Gilman Square Train Station – one of seven proposed train stations slated to be constructed as part of the Green Line Extension Project, spearheaded by the MassDOT and the MBTA.

The duration of the Green Line Challenge was approximately 8 weeks. Up until the last week of the Challenge only one idea had been submitted. However, three articles in local publications over a two-day span generated more visits to the website and increased the participant database from 40 to 60 and the number of ideas increased from 1 to 11. After the Challenge deadline, a one-week voting period commenced. The user database increased from 60 to 81 participants. 31 people (38%) casted 116 legitimate votes.

One of the key findings of this study was related to the public participation challenge *generating creative solutions*. A traditional public meeting and the crowdsourced challenge were compared and showed that on average each crowdsourced participant generated nearly 3 distinct ideas and a traditional planning meeting generated nearly 1 distinct idea per participant. In the

[73] For this thesis project, I have merged both Jeff Howe's definition and Daren C. Brabham's definition of crowdsourcing: a web-based, distributed problem solving and production model for business which includes an open call to a (generally) large network of people (Howe 2006, Brabham 2009).

case of the inTeractive Somerville Green Line Challenge, crowdsourcing participation generated 3.5 times as many distinct ideas per participant as traditional public participation.

Yet another public participation challenge was addressed through this thesis in asking *to what extent can crowdsourcing public participation engage individuals who typically do not get involved in the planning process?* Interview data from a small sample of individuals revealed that half of the people that participated in the Green Line Challenge had never participated in a traditional public or planning meeting. The interviews also revealed that crowdsourcing public participation has the potential to change the opinions and perspectives that people have about public participation – another factor to potentially involving individuals in the public participation process through crowdsourcing that do not typically participate in the planning process.

Participants who never participated in traditional meetings got involved with the Green Line Challenge or crowdsourcing public participation for different reasons; many are related to key obstacles of public participation. Because the crowdsourcing challenge is open and accessible to those that have a computer and Internet connection, “it opens the door for people that might not be able to make it to the regular town meetings” as one interview subject stated.

Some participants were intrigued by the ability to connect with others and to add their ideas, combating one-way communication and no or limited deliberation. One individual felt more comfortable sharing his ideas online because “it feels easier for me to participate online compared to a public meeting where only dedicated people show up, this really makes it easier for people to participate.” This is evidence that crowdsourcing public participation has the ability

to address participation challenges associated with face-to-face interactions and face-to-face politics and unequal power relations.

However, the individuals interviewed did not express that they wanted to improve the Gilman Square area or Somerville, except for possibly one (Participant I) who wanted to share his *local knowledge*. The motivations of people to participate in the Green Line Challenge were generally related to expressing oneself, contributing to a collaborative effort, gaining skills or advancing one's career. In addition, it appeared that not one individual was motivated to participate to connect with new people – a required motivation to building social capital.

The structure of the crowdsourcing challenge and organization of the website also appealed to participants. Nearly all the interview subjects felt the Challenge was fair and open. This has the potential to address the administrative structure for participation being too stringent or professional. However, one individual pointed out that it the design and structure could have been too sophisticated for young adults – a demographic that will be important to increasing online participation in the seemingly near future.

This thesis also illustrated the importance of community outreach and developing an integrated communication plan to get people involved in the planning process. Three articles were published during the last week of the Challenge generating visits to the website and subsequent increased numbers in registered users (from 40 to 60) and submitted ideas (from just 1 idea to 11 ideas submitted. The success of public participation is directly linked to how many people actually participate and subsequently how many people learn about the public meeting at-hand through various online and offline community and media outreach methods.

In summary, crowdsourcing public participation has great potential to facilitate the planning process by generating more distinct ideas per participant than traditional participation and involving individuals in the planning process that do not typically participate. Further, crowdsourcing has the ability to address a number of reoccurring barriers to public participation.

However, in this case study, participants were generally driven by their own professional development and career ambitions rather than improving the community and connecting with new people – a prerequisite to building (bridging) social capital. Along those lines, it appears crowdsourcing is less likely to supplement or improve deliberation, local knowledge, social capital or "citizen power."

In conclusion, crowdsourcing appears to be better suited to facilitate public participation focused on creating better and more widely accepted ideas and plans rather than public participation focused on upholding democratic principles.

5.3 Research Weaknesses and Limitations

One of my unofficial research objectives was not to disrupt inTeractive Somerville, the SCC or CCP while carrying out my research. Therefore, one of the main research limitations was working within inTeractive Somerville's parameters to ensure I was supporting their mission and objectives rather than obstructing progress.

5.3.1 Funding Limitations

This project had essentially no funding beyond the development of inTeractive Somerville's website[74] and the website launch party, which were funded by the SCC and CCP.

Funding effects what resources can be put towards the project. Lack of funding set limitations for this project across the board: research and data collection, technology, web design, publicity and community outreach, and the time (necessary to build strategic partnerships).

5.3.2 Time Limitations

Every research project is bound by time. Master's students in the Department of Urban and Environmental Policy and Planning (UEP) at Tufts University are expected to work on their theses for at least 7 months (Tufts UEP 2008). Given the complexities of my thesis project – working in a 'real world' setting, developing and implementing new technology, launching a crowdsourcing challenge (contest) and carrying out public relations – I had to be flexible and expect to perhaps put more time in than a typical Master's thesis.

If there were more time and funding, it could have greatly improved the depth of research, the development of strategic partnerships, technology and an integrated public relations strategy.

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[74] In an email message to the author on February 12, 2012, the programmer of inTeractive Somerville, Christian Spanring, worked on a limited schedule (approximately 100 hours total) to launch the website which included a major redesign and adding comment and voting functionality. The hosting and domain name (interactivesomerville.org) were also purchased by SCC on behalf of the CCP.

5.3.3 Research and Data Collection Limitations

In retrospect, this project was rather ambitious to take on for one person. Between developing technology, managing public relations and branding online, and launching the crowdsourcing challenge, there simply was a limited amount of time for data collection. In particular, there was only enough time to conduct 10 interviews.[75] Therefore, the sample size is very small – only a snapshot of the participants. With that said, analyzing the interviews with all of the data collected during this project should at least form some questions for future research.

5.3.4 Strategic Partnerships

Crowdsourcing, like democracy, takes participation to work. It cannot reach its potential unless a significant number of those affected by an urban development, for example – government agencies, community organizations, nonprofits, universities, local businesses, residents and the public – are working together with the same goals and strategies. Of course, this is much easier said than done. Even if there were more time and money devoted to this project that does not necessarily mean everyone would be working together in harmony. Every individual, organization and entity has their own set of goals and priorities.

Not having more time and resources to develop strategic partnerships was probably the most challenging limitation of this research project. It is also a great unknown because every partnership is different depending on the situation and those collaborating. However, I would argue that strategic partnerships have the potential to improve each aspect of a project.

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[75] The interview instrument can be found in the Appendices (Appendix 4).

For example, if inTeractive Somerville – which represents grassroots organizations – worked collaboratively with the City of Somerville, MBTA and MassDOT, there likely would have been far more participation. It would have gained credibility instantly with the public. Publicity and community outreach for the crowdsourcing challenge (or the Green Line Challenge) could have been vastly improved with a united, integrated plan. And it is quite possible that a larger prize could have been offered to the winner. It would have facilitated a more collaborative planning process, which is an inherent objective for crowdsourcing public participation. All of these factors, and many more not listed here, could have contributed to a more successful experiment.

5.3.5 Technology and Web Design Limitations

One of the most challenging aspects of this project was developing technology at a rapid pace with very little resources. The CCP had been working on a website – inTeractive Somerville – for the past two years that would, according to the main programmer, have the functionality needed to host a crowdsourcing challenge once developed in launched. The only design resources that were available were between me and the main programmer. The budget for the inTeractive Somerville was limited and beyond my control and in many ways the technology was already chosen for me particularly since it would not help to launch a competing crowdsourcing website through the inTeractive Somerville brand at the same time.

5.3.6 Publicity and Community Outreach

With the exception of the website launch party, the majority of public relations and media outreach was managed by one person – me. Social media and email were on a daily basis to share information and to connect with community members and the media. inTeractive Somerville's online branding, including logos and event graphics were also created and optimized (see Appendix 6). There were a few articles published during the last week of the Green Line Challenge (two of them in print and online), which helped the number of ideas submitted go from 1 to 11 (see press links – inTeractive Somerville 2012b).

5.4 Recommendations

5.4.1 Make Online Participation Count as Public Record

It's exciting to live in an era where technology can help facilitate public participation. Indeed, as Clay Shirky stated "we are living in the middle of a remarkable increase in our ability to share, to cooperate with one another and to take *collective action* and we now have communication tools that are flexible enough to match our social capabilities" (2008, 20-1). This thesis is just one of a many examples of how information and communication technologies – including social media and crowdsourcing – can help to facilitate democratic processes like public participation.

However, as great as the potential is for social media and crowdsourcing to supplement participatory activities, there are not many instances where online participation actually is officially documented as public record. Nor are there many examples of online participation or

crowdsourced public participation that have a direct impact on policy or planning decisions and programs.

The Federal Government seems to be leading the way with its OpenGov Initiative, The United States Patent and Trademark Office's (USPTO) Peer To Patent project and The Office of Management and Budget's (OMB) SAVE Award[76]. On President Obama's first day in office he issued a Memorandum for the Heads of Federal executive departments and agencies on "Transparency and Open Government." The Memorandum ordered all Federal Departments and Agencies to be "transparent, participatory and collaborative" within 120 days. President Obama stated that Federal departments and agencies should be transparent by harnessing "new technologies to put information about…operations and decisions online and readily available to the public" (The White House 2012).

> Below is the text of President Obama's Memorandum regarding public participation:
>
> Government should be participatory. Public engagement enhances the Government's effectiveness and improves the quality of its decisions. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge. Executive departments and agencies should offer Americans increased opportunities to participate in policymaking and to provide their Government with the benefits of their collective expertise and information. Executive departments and agencies should also solicit public input on how we can increase and improve opportunities for public participation in Government (The White House 2012).

Though President Obama does not explicitly state to use technology to increase participation, it is implied within the context of the Memorandum; he ordered the Chief Technology Officer to

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[76] I did not know of many instances of online participation or crowdsourced participation that was considered official public record or actually made a direct impact on policy or planning decisions and programs. The Federal Government seemed to have the most traction on the heels of the OpenGov initiative. Locally, the only example I knew of was the City of Seattle (see Appendix 5). I reached out to Prof. Daren C. Brabham to see if he had any insight and mentioned the USPTO's Peer To Patent project and OMB's SAVE Award.

coordinate the development of the recommendations of an “Open Government Directive, to be issues by the Director of OMB “that instructs executive departments and agencies to take specific actions implementing the principles set forth in this memorandum” (The White House 2012).

What if every state had to create guidelines for their cities to adopt based on the OpenGov initiative principles? This would give states and cities the motivation to take concrete steps to be more “transparent, participatory and collaborative” within a certain timeframe. It could be presented in a way that illustrates all the benefits of OpenGov with monetary values attached.

A “Public Record ID” could be created for every citizen to record public comments and the public record of that individual. The “Public Record ID” would have to be developed with the simplest and most flexible codes that are very open with easy to use API. Every city and town would have easy steps to create a secure “Public Record ID” for every individual. The Public Record ID would be adopted by all cities and towns – it could be a snippet of code that they add to their website, like a profile sign-in. The records would have to be part of one central database to accommodate for people moving and relocating.

Because the Public Record ID network would most likely be based on the same computer language(s), it would push cities and towns to develop their websites to use similar technologies and development techniques. This alone would innately help cities and towns collaborate through their ITS development. It could also help to standardize public participation metrics.

There could be one website where people could obtain their Public Record ID by inputting specific information about themselves. Individuals would then have the option of

generating public record on every website that supports the "Public Record ID." All of the information generated by the Public Record ID could be made available to developers to help create and test more models and networks of online participation.

5.4.2 Include Communication as a Key Component in Public Participation Research and Practice

Community outreach and integrated communication plans are essential to building successful online campaigns to increase website traffic and user registrations. More than ever – in an unprecedented era of participation and technology – the planning community should make the discipline of communication, including social media and ICTs, a tenet of public participation research and practice.

I believe there is much that can be learned by comparing and contrasting how people participate and communicate their activities of interest offline and online. I agree with the school of thought that argues that if people are passionate about something in general, they are more likely to amplify their behavior online through social media. So if they are passionate about a planning or design issue (offline) they are likely to utilize social media to communicate and organize online, thus reinforcing their behavior (Kirk and Schill 2011).

Of course this is not the case for everyone. There are people that do not use social media and others that may be "shy online" or maybe their actions offline and actions online do not correlate. However, it is my assumption that if people are passionate about a particular planning issue and they use ICTs – they are most likely going to voice their

opinion through social media. They might comment on their city's Facebook page or use their status update to voice their opinion – there are numerous ways individuals can express their views with social media.

The fact that one out of every 8 people on the planet are on Facebook means that planners are not only competing with traditional media outlets, they are competing with people's friends, families, business contacts and interests for their attention. In some ways, social media makes it easier to communicate with the masses but at the same time, the ever-increasing media saturation and noise can make it more difficult to reach people.

Therefore, I would strongly suggest that planners place outreach, communication and social media in their research and implementation plans alongside topics that are typically considered. I posit that there are primarily three phases of participation:

1. outreach, communication, and social media,
2. participatory activities, and
3. influence on planning or policy decisions.

The first two, outreach, communication, and social media and participatory activities, are more feasible to this study and are easier to compare. To study the influence participation has on planning and policy decisions are critical but much more difficult to quantify and study over a period of time. It could take a long time to see if particular public input influenced a specific planning or policy decision.

For the purposes of this study, I have chosen two well-known participation models. The following "Participation Pyramid" includes the most well known participation model in the urban planning discipline by Shelly Arnstein (1969) and the

most popular in the business and marketing world by Charlene Li and Josh Bernoff (2008). These are just the two models I chose to demonstrate my vision of public participation research. However, depending on the topic and researcher it is feasible to replace these models with other idea and models of participation.

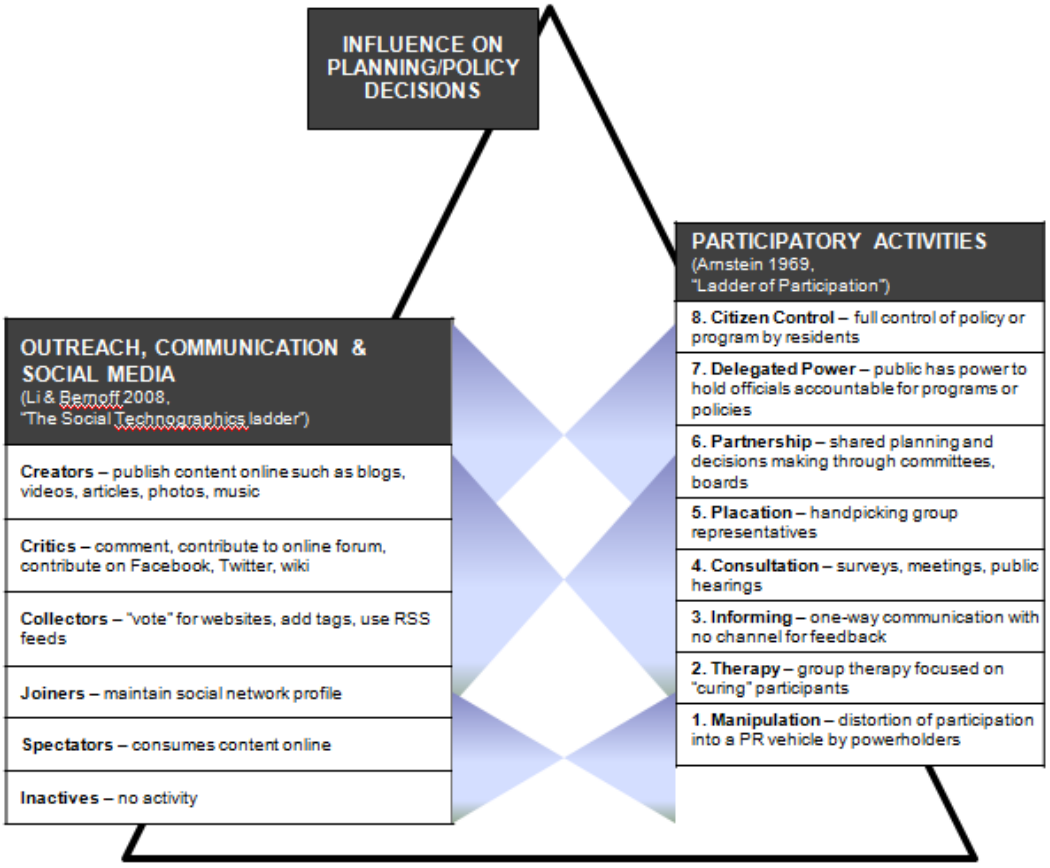
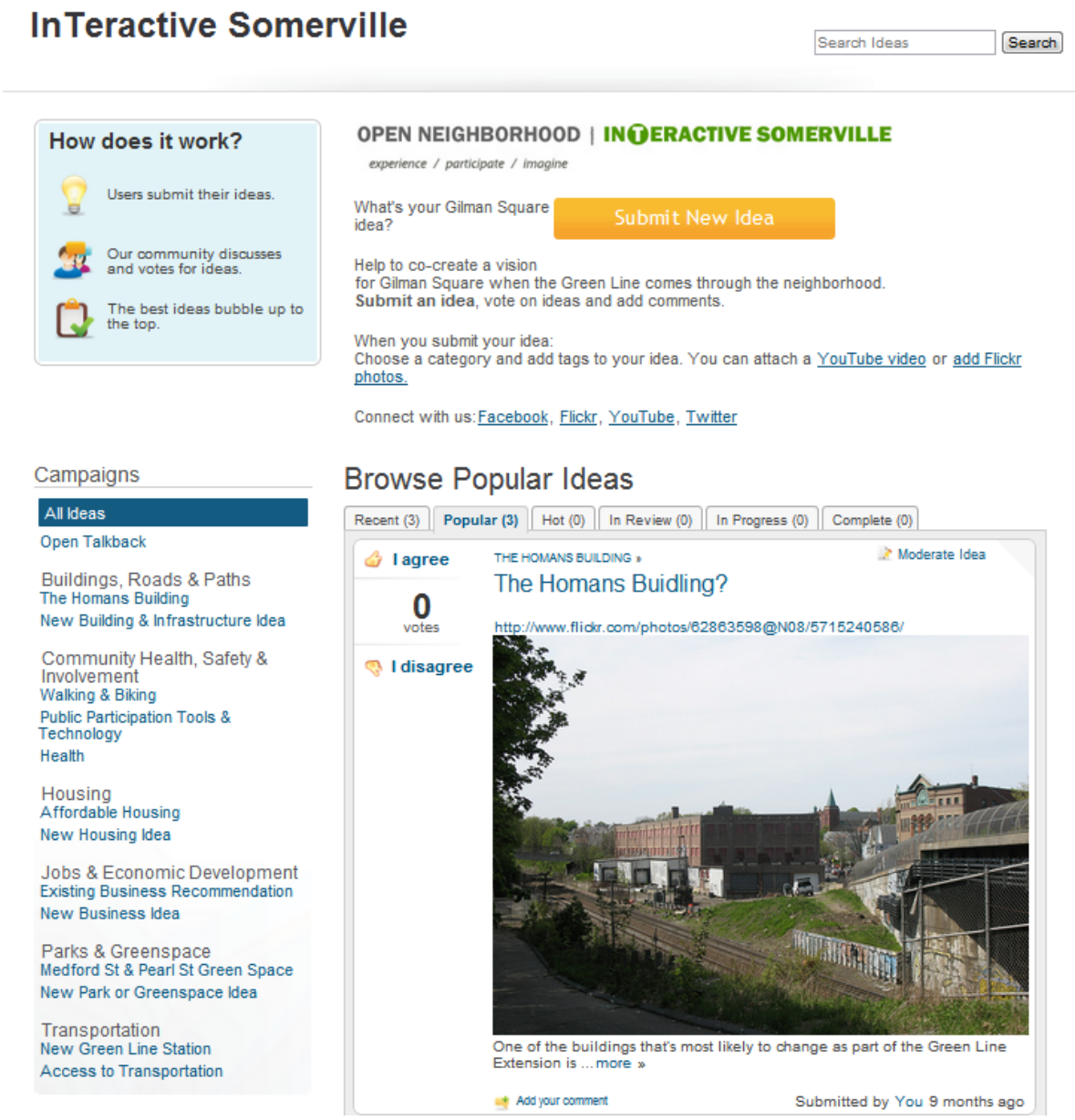


Figure 16: "The Participation Pyramid"

APPENDICES

Appendix 1: inTeractive Somerville Crowdsourcing Test Website on IdeaScale



Source: http://interactivesomerville.ideascale.com/. Accessed January 25, 2012

Appendix 2: Core Community Principles

The following "themes" were taken from the 11 Core Community Principles for Neighborhood Development along the Green Line Corridor. The Core Community Principles were ratified by a large body of community residents in 2009 who participated in a series of meetings to establish key priorities for their community along the Green Line corridor. These principles continue to guide the community planning and action work of CCP (Community Corridor Planning). As contributors add items to the website, each item is linked to one of the themes.

- **More Local Jobs**: We want a fixed percentage of respectable jobs of all types with good wages and benefits for Somerville residents, from construction to permanent.
- **Increase Commercial and Economic Development**: We want to see the creation of squares as destinations, with careful attention to mixed use of commercial/residential, reuse of buildings, and economic development to increase the tax base.
- **Keep and Add Local Businesses**: We want locally owned, culturally diverse, clean businesses in commercial areas with employees who live in Somerville.
- **Keep Somerville Affordable**: We want to make sure people of all economic means have the ability to afford housing and living costs, so that Somerville residents, such as child care workers, cab drivers, local business employees and others can stay here affordable.
- **Maintain Our Diversity**: Preserve and encourage economic and ethnic diversity of residents and businesses.
- **Improve the Green Environment**: We want a safe, environmentally friendly neighborhood with more green space, trees, and gardens; reduction of noise; avoidance of light pollution; and prevention of toxic chemicals in the air.
- **Encourage Walking and Biking**: We want to encourage walking and cycling, through safe, bike/pedestrian friendly design of streets and paths around and between stations**.**
- **Create Community Gathering Spaces**: We want both indoor and outdoor safe, public gathering spaces for community members.
- **Improve Access**: We want above standard, safe access to and between stations for people with disabilities, strollers, and pedestrians in general.
- **Community Involvement**: We want to make sure residents are included on an ongoing basis in the planning, design, and zoning chanYges to the stations and areas around them. Youth, artists, and others should help design stations, with attention to amenities. We need an easy and clear process for residents to address problems as they come up, with ways of immediately resolving unseen impacts.
- **Connecting Buses and Trains**: We want to ensure inter-modal access between neighborhoods and stations, for new train service to be adequate and speedy, and for existing bus lines to continue to serve areas not connected by train.

Appendix 3: Notes and Agenda for Gilman Square Community Planning Meeting II

TITLE:	**The Community Agenda for Gilman Square** Gilman Square Planning Workshop, Part II - Community Corridor Planning	
DATE:	July 21, 2011 – 6 to 8:30pm	
LOCATION:	The Paddock Restaurant, 249 Pearl Street, Somerville, MA • Extremely hot day, 98 degrees • Follow up from last week's meeting which was very successful • This week the setup of the room has a much better flow and seems more comfortable • Posters created by small groups last week are posted around the room • A map is in the center of the room with place markers in the form of a flag with a photo attached pertaining to the location.	
AUDIENCE:	• Diverse audience from different backgrounds and ages • Members of the CCP lead by SCC, Open Neighborhood	
AGENDA:	6 – 6:15	Registration and Food • 6:19 people still coming in and eating • Flickr slideshows projected in front of the room (by tag)
	6:15 – 6:20	Introduction, Overview and Last workshop recap • Welcome back if you came last week, and welcome newcomers. • We talked about what we wanted Gilman Square to look like • Build maps of Gilman Square this week • We are the Community Corridor Planning Coalition (CCP), a group of grassroots organizations working with community residents to identify neighborhood priorities as we anticipate the arrival of the Green Line. • There will be 6 new stops in Somerville, one right here in Gilman Square behind City Hall. • By the end of tonight, we will have created a list of prioritized sites in the Gilman Square area that YOU think are significant—i.e. places you want to keep, or places we want to change. • We will work with photos taken by neighbors at our Photo-Walk last Saturday, we will work with the ideas and themes that came out of last week's meeting, we will work with maps, and with your own knowledge of the neighborhood. • Last week we did a quick over view of our project and the Green Line • We took a look at some data and maps about Gilman Square (still here) • We did a Small group activity to determine issues/concerns of importance in the neighborhood to describe what makes Gilman Square Gilman Square o See collages around room. • Some of the themes that came out of this activity:

		○ space/parks ○ diversity of people ○ groceries and restaurants ○ affordable housing ○ shopping areas/long term retail ○ community center/meeting place for all ages ○ jobs ○ community (bike) path ○ bike access/bike lanes ○ quiet streets ○ beautification ○ safety/good lighting ○ green energy and sustainability ○ neighborhood identity ○ sidewalk accessibility ○ better parking ○ density around station ○ fewer gas stations ○ fewer liquor stores ○ preserve existing amenities
	6:25 – 6:35 Simcha	Snapshot of the Neighborhood • Thank community members for participating in the photowalkshop • Showed photos by tag (photos taken and tagged by community members during photo-walkshop • Interactivesomerville is the place where photos and discussions can be centralized to help create a community agenda for Gilman Square
	6:35 – 7:20 Claudia	Small Group Activity, Instructions (see end of document) • In your small groups, you will have about 40 minutes to create a list of priority spots in Gilman Square—both spots you want to protect, and spots you want to change. • Start out by brainstorming a list of places. You can look at the map, at photos, talk about what you know about specific places. Also, take into consideration the qualities/characteristics the group came up with last week. • Once you've made a big list, work as a group to create your top priorities—i.e. 3-5 priority spots per category.
	7:20 – 7:50	Report Back and Setting Our Priorities • Invite each group to report back, one at a time • As groups report back, write down on flip chart each site. Every time a site is repeated, add a check mark. • Once all groups have reported, do an impromptu summary for group of which sites are at the top of the list (i.e. have most check marks). • Now, pass out stickers, and ask people to hold onto these until end

		of meeting. At that time, they will get to cast 3 "votes" with their stickers . They will place their stickers by which sites they think are most important (either to preserve or to change).			
		Add	Keep (buildings)	Change	Values
		• Sustainable businesses • Restaurants and cafes – preferable local • Community garden (2) • Community/youth center • Bike path (2) • Greenspace, trees, parks • Job opportunities • Good bakery • Murals around T station (2) • Farmer's market • Places for kids to congregate • Bike shop/co-op • Affordable ice cream • parking	• Greenspace • Parks • Artist studios • Homes – no eminent domain • ABJ (auto mechanic) • Mix of housing (3) • Elderly housing • Starmarket as a market • Greenspace behind City Hall • Schools open 24:7 for programs • YMCA (2) • Emporium (3) • ES community school	• More green space • Homans Building (5) Comm. space • jobs, housing, mixed use • comm. center • music • bike shop • Improving playgrounds • Starmarket (5) • Mixed use development • Car repair shop (pearl and marshall) • Piano Factory • Winter Hill playground (no blacktop) • Thurston corner • Medford St Bridge – make neater • Plumbing	• Greenspace (2) • Playgrounds • No eminent domain • Affordable housing (3) • Diversity • Community involvement • (public) art (4) • Elderly • Mixed housing units (2) • No abandoned buildings • Family-oriented local businesses • Parking – what happens if it gets worse? • Community involvement • Job opps.
	7:50 – 8:05	introduce inTeractive Somerville • We are now inviting you to take a look at some very cool tools we've been working on! • Handouts given			
	8:06 – 8:20	Open Neighborhood			
	8:20	Wrap-Up			

		• What's next?
		  o This list of priorities gives all of us working together a list of properties we should all pay close attention to, so as city planners, developers, etc. take an interest in any of these sites, we know to play an active role in participating to make sure the community's interests are taken into consideration.
		  o We also can share this list with City Planners.
		  o We will hold a meeting in the fall to explore specific ideas for what to do with some of the properties included in this list, and to show you new design ideas in the Open Neighborhood tool that came out of today's workshop.
		• We encourage you to go on line and add your comments, ideas, and photos to these sites! The instructions are on the cards passed out.
		• Finally, please take a moment to fill out the evaluation form, and to add your stickers to the list of priorities!
		• Thank you to everyone for participating, and to all of you who helped to plan, set-up, etc. And thanks to the Paddock! (applause).

Group Breakdown

30 participants, 5 facilitators, one photographer, broke into 5 groups of 6,

Small Group Activity

Instructions: Create a list of Priority spots in the neighborhood—places to pay attention to in months ahead as the neighborhood changes. These can be places we want to add, keep or places we want to change. Can be buildings or open space. Take into consideration the following list of qualities/characteristics of the neighborhood established at last week's workshop (part 1):

Qualities/Characteristics:

- Green space/parks
- diversity of people; groceries and restaurants; affordable housing; shopping areas/long term retail; community center for all ages; community meeting places; jobs; community path; bike access/bike lanes; quiet streets; beautification; safety/good lighting; green energy; neighborhood identity; sidewalk accessibility; better parking; density around station; fewer gas stations; fewer liquor stores; preserve existing amenities

Appendix 4: Interview Instrument

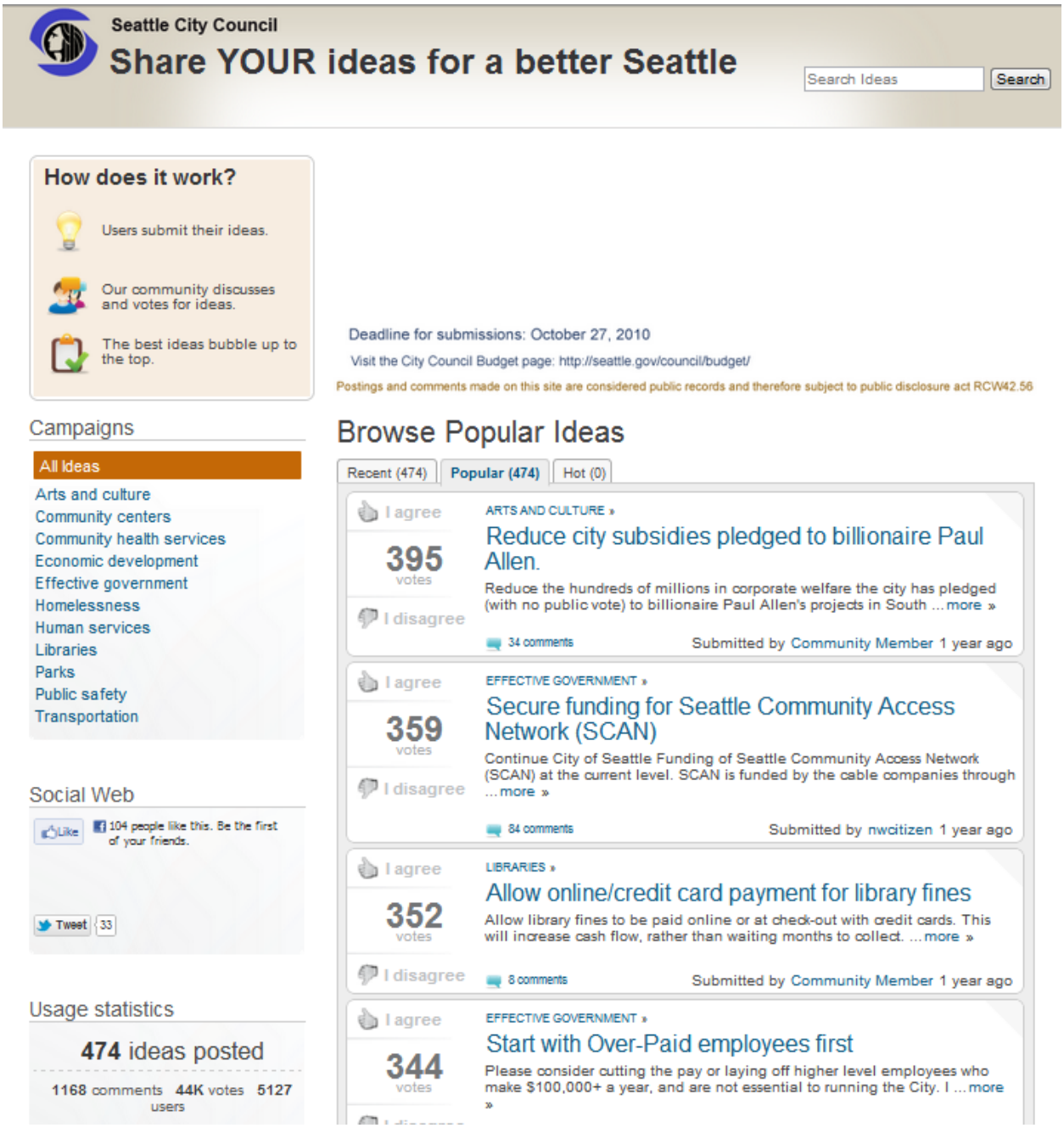
Hello,

Thank you for agreeing to do this interview. My name is Michael Messina and I'm a Graduate Student at Tufts University. I am conducting interviews as part of my Master's thesis in Urban and Environmental Policy and Planning. Your input is critical input to my research and it will only be used for research purposes. It could be published in academic journals or databases. Your name will not be used and your identity will be protected at all times. You can stop me at any time during the interview and ask me to rephrase questions. This conversation is being recorded. Do I have your consent to proceed with the interview and to use the information gathered from this interview for my thesis research?

ANSWER: PHONE / IN-PERSON

1. Have you participated in traditional planning meetings in the past? Could you tell me when and why you participated?
2. Did you participate in Gilman Square Community Workshop on July 14th or 21st or photo walkshop on July 16th?
3. Did you attend the inTeractive Somerville website launch party on November 14th ?
4. Have you "liked" inTeractive Somerville on Facebook or do you follow us on Twitter?
    - Have you engaged with inTeractive Somerville through social media in any way? Why or Why not?
5. Have you heard about the Green Line Challenge? How did you hear about it?
6. Did you visit the inTeractive Somerville website? If yes, what was your initial reaction?
    - Was it easy to navigate the website and to find information about the Green Line Challenge?
7. Did you register on the website? Why or Why not?
    - If yes, did you register with the intent of submitting an idea for the Green Line Challenge?
8. Did you submit an idea for the inTeractive Somerville Green Line Challenge?
    - If yes, what motivated you to participate?
9. Have you participated in civic or political online activities before? For example, have you supported a political candidate or cause? If yes, how often and why?
10. Or have you participated in online groups or websites regarding your city or town? For example, have you joined and participated in a city or town's Facebook page? If yes, how often and why?
11. What is your opinion about using the Green Line Challenge to generate public participation?
    - Does it provide good input?
    - Is it fair and open to all people in Somerville?
    - Does it promote interaction among citizens?
12. If interviewee participated in both offline and online: do you have a preference participating in community planning projects offline or online? Why?
13. Has the Green Line Challenge changed your opinion of public participation in any way?
14. Do you have any other comments or information you'd like to share to help us improve our online participation activities?
15. Could you please tell me a little bit about yourself? Your gender, age, the city you live in, your ethnicity and your highest level of education completed? (Your information will be used for research purposes and your identity will protected).

Appendix 5: Seattle City Council Crowdsourcing Website on IdeaScale



Source: http://seattlecitycouncil.ideascale.com/. Accessed February 10, 2012.

Appendix 6: inTeractive Somerville Green Line Challenge Online Promotional Graphic

Appendix 7: Green Line Challenge Publicity – Front Page of the Somerville Journal

SOMERVILLE JOURNAL

Since 1870

Raising the flag

PAGE 13

January 5 - 11, 2012 WickedLocalSomerville.com Vol. 142, No. 47 $1

WHAT'S INSIDE

2012 INAUGURATION

Mayor: Somerville is *the* place to be

By Jillian Fennimore
jfennimore@wickedlocal.com

Somerville is moving in a different direction, and Mayor Joe Curtatone is proud of where it's going.

"Somerville is on the cutting edge of America's Urban Renaissance," said Curtatone, after being inaugurated into his 5th consecutive term as mayor – joining the ranks of former mayors Gene Brune and Michael Capuano, who served more than four full terms in office.

In his State of the City address Monday night, Curtatone stressed the importance of new developments and redevelopments, a sustainable economy, maintaining happiness, and a propelling a more "ambitious and aggressive education agenda."

"Here in Somerville, we must recognize that in one crucial respect, the image of the urban core hasn't caught up to its vibrant and engaging reality... and that area is public education."

INAUGURATION, PAGE 7

GREEN LINE EXTENSION

Tufts grad student Michael Messina, shows off his crowd sourcing website in his Malden home office on Monday morning. WICKED LOCAL STAFF PHOTO BY DAVID GORDON

Fit to a T

Tufts grad student creates online design contest for Homans Building

By Andy Metzger
ametzger@wickedlocal.com

Somerville City Hall and the MBTA are no strangers to technology, but one Tufts University graduate student had been hoping for more collaboration with an online

INVESTIGATION

Sex assault suspect has alibi

By Andy Metzger
ametzger@wickedlocal.com

The 22-year-old El Salvadoran immigrant, accused of sexually assaulting women late night in Somerville and Cambridge, apparently has an alibi for two of the three incidents – He was at work, at a Cambridge pizzeria, and his attorney says there is another potential suspect police should take a look at.

But even if the suspect Alfredo Romero Posada beats the three counts of indecent assault and three counts of assault to rape against him, he will still be in legal jeopardy because Immigration and Customs Enforcement plans to deport him for allegedly being an undocumented immigrant.

If Posada is innocent, that leaves open the possibility that a person who stalked the streets – sexually attacking women around Davis Square and Tufts University – is still at large.

Posada has been accused of

Appendix 8: Email to Promote Voting Period

Hello,

You are getting this email because you are either connected to inTeractive Somerville in some way, you are interested in urban planning or you just happen to know me!

inTeractive Somerville's Green Line Challenge deadline has officially passed and now it's time for us to pick the best idea. That's right - the people created the ideas and now we the people rate the ideas to come up with the winner of the Green Line Challenge!

Here are the steps:

1. Sign up (if you haven't already)
2. Go to the Green Line Challenge page, browse the ideas listed and rate each one

Each user can rate each idea once. Please take the time to rate each idea.

You are welcome to share this with friends and to repost this online. However, I would ask that you please keep this contest fair and clean. Please, do not create duplicate accounts or cheat in any way.

If you have any questions, please reply to this email.

Best,
Michael Messina

Appendix 9: inTeractive Somerville Website Development Notes

The beta website for inTeractive Somerville launched on August 4, 2011. However, it was clear to the programmer and me that there was still a lot of work to do from administration on the backend to usability and design on the front end (Spanring 2011). I took on the role as administrator and de facto project manager of the website. I tested the website and posted issues and bugs on Github – the largest code host in the world[77]. This allowed me to communicate with the programmer on specific issues and it enabled the programmer to track and update all issues as they changed.

In addition to posting bugs and quirks on the website, I posted recommendations to improve the user experience including adding functionality that would support a crowdsourcing challenge and improve interaction on the website. Of course not all ideas and issues could be dealt with right away or at all for that matter. With limited time for the programmer to work on the project, prioritization of the issues and projects were critical.

By late October, it was evident to the programmer and me that design of the website was not sufficient for the short-term (to use for the crowdsourcing challenge) not would it be flexible enough for future development. The nuts and bolts of the website are built on the Django Web Framework. The framework was developed to "make it easier to build Web apps more quickly with less code."

[77] The code and development notes for the inTeractive Somerville website can be found on GitHub here: https://github.com/SomervilleCC/interactivesomerville/.

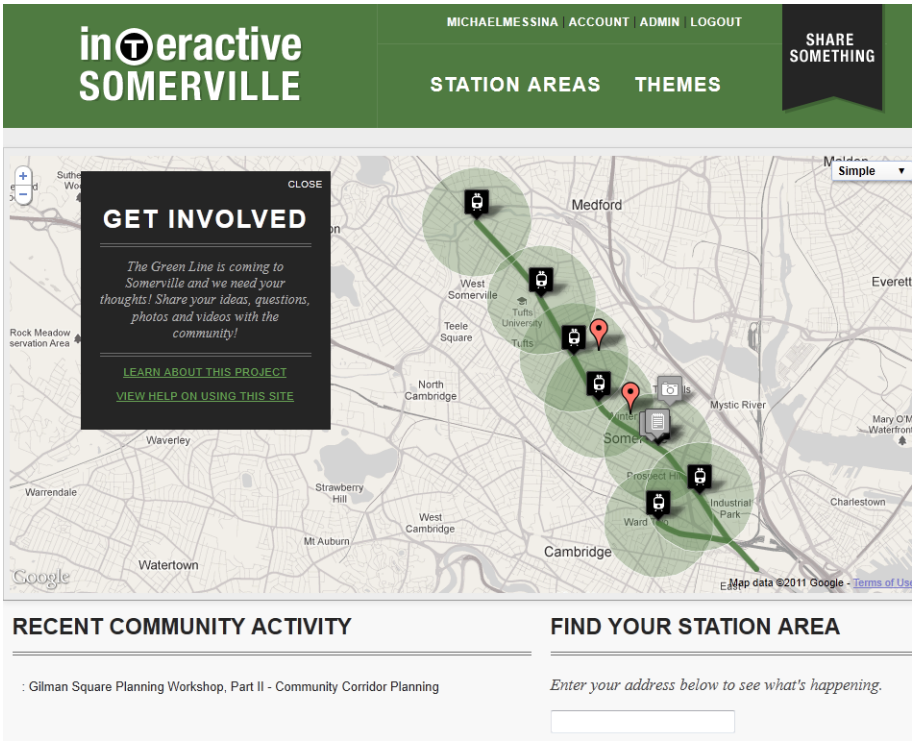


Figure 17: inTeractive Somerville Beta Website Homepage

The Django Framework also allows programmers to create multi-language applications, making it flexible and developer-friendly (Django Software Foundation 2012). This is particularly helpful for the inTeractive Somerville website because of the amount of code and processing the interactive maps on the website require. In essence, you are able to tell Web applications to do more sophisticated things, more efficiently and faster, with good developer support and documentation. We decided to use a design framework with similar efficiency and scalability in Bootstrap. The new redesign was ready just in time to publicly launch the website and crowdsourcing challenge.

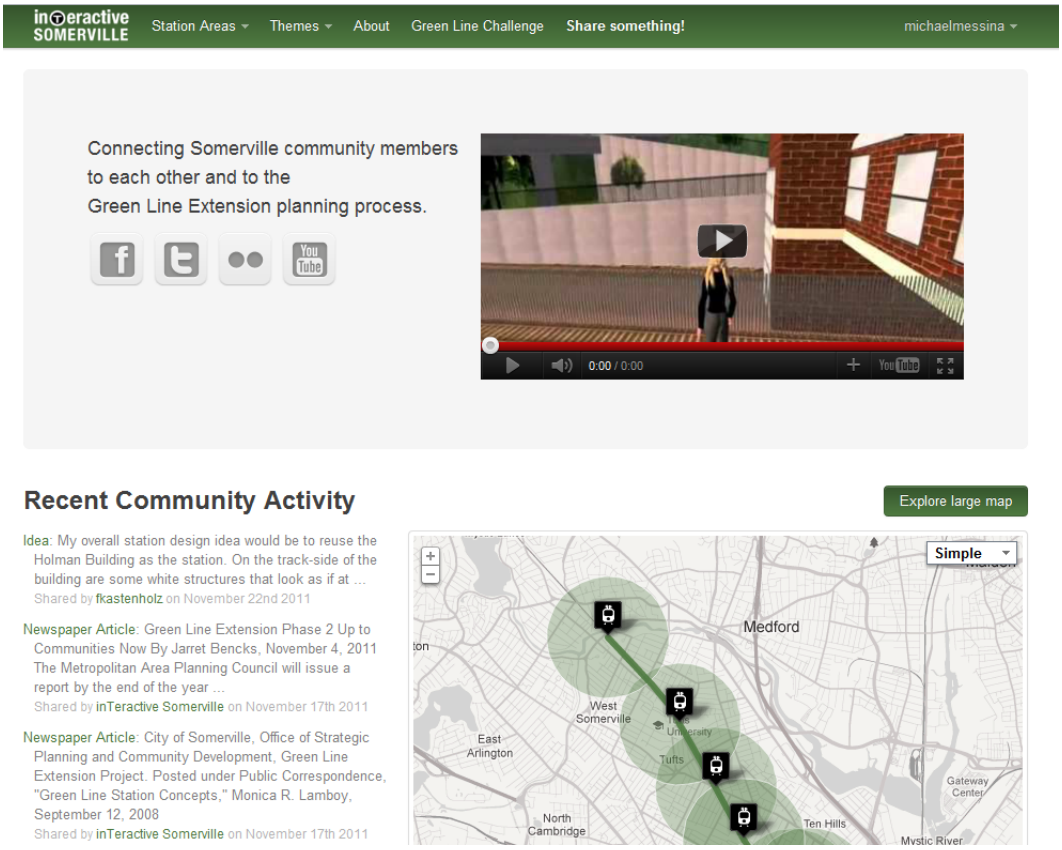


Figure 18: inTeractive Somerville Website Redesign – Homepage Screenshot

Before the website or crowdsourcing challenge was publicly announced, the website was "seeded" or populated with over 100 photos from inTeractive Somerville's Flickr photostream. Each photo was attached to a point on the interactive map and categorized by relevant "Station Area" and "Theme." The functionality of the website (for the Green Line Challenge) is outlined in more detail in *Section 4.2.5*.

Appendix 10: Green Line Challenge Publicity – Boston Metro Article

04 metro boston

Student wants your urban design ideas

Winner gets three months of free T rides Submit designs using interactive website Deadline is Jan. 9

If you want three months worth of free T passes, all you have to do is submit a design concept to Interactive Somerville's "Green Line Challenge."

The idea is to come up with the best use for the abandoned Homans Building located near the spot where the Green Line extension's Gilman Square station is slated for construction in Somerville.

Following some guidelines, the most creative concept for how to develop the area will win three one-month T passes.

"The hope is that we can take some of these ideas and bring them to the city when they start to discuss what the land could be used for," said Tufts graduate student Michael Messina, who generated the project as part of his thesis on urban planning and crowd-sourcing.

While the MBTA is not affiliated with the challenge, they did donate the passes to Messina, he said.

So far, submissions have been minimal, but riders have time to create an interesting use for the space.

"Even if you draw on a napkin and scan it and send it to us, it's fine," he joked.

SubmiT to the challenge

interactive SOMERVILLE
green line challenge

submit idea by JAN 9
vote

enter to win 3 one-month T passes

- Sign into interactive www.somerville.org
- Submit your idea by Jan. 9
- Rate ideas and designs

STEVE ANNEAR
steve.annear@metro.us

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