Participatory Planning

Gaining a Voice in the Digital Divide

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Introduction

Abstract

Technology is advancing at an astonishing rate and the tools to collect and analyze large amounts of data are now becoming readily available. Urban planners have begun to utilize these tools including online surveys for example. The relative newness of such tools begs for best practices for these new methods. These tools have also changed the frame around the conversation of inclusion and democratic planning in this modern era. Two planning methodologies from prominent documents are compared and contrasted in this research study. The Second Regional Plan by the Regional Plan Association in 1967 and the PlaNYC 2030's policy recommendations by the New York City Mayor's Office Long-term Planning and Sustainability (OLTPS) in 2010 are the case studies selected. Lastly, the public has been given more access than previously offered by supporting institutions such as the New York Public Library System in New York City and the support has proven to be an effective outlet for bridging the digital divide. Libraries are important places where residents can gain access to the global information society, learn, seek entertainment, and connect with others using the Internet. Urban planning can greatly benefit from understanding Internet usage to give all residents an equal voice in the planning process to meet the goals of true democracy.

Keywords

Participatory Planning, Online Surveys, Internet Access, Digital Divide

Research Question

Is online surveying a more equitable method for planning institutions to determine the needs of the area residents? What are the obstacles that are barring citizens from participating in the planning process? What is the infrastructure supporting public access in New York City?

Introduction

Technologies in mass-participatory applications have advanced, and so must planners update their practices and methods to utilize this budding technology. This new era of information and communication technologies (ICT) have exponentially increased the availability of data as well as the impacts they have on communities. Planners have a complex history with technology and it comes as no surprise that great care must be incorporated when application of new tools within the discipline occur. The primary focus of this research is centered on the user demographics and the populations who are adopting the new strategies of public participation. Some of the issues facing these new collection methods include the recent phenomena of the digital divide, and the inherent equitability problems that arise with such targeted Internet populations. Entry into the global information society is currently not free and avaialable everywhere(Mandel, et al., 2010). Even global cities like New York City while, access is more readily avaialble but is not ubiquitous.

Online surveys have become popularized in recent years because of their ease to make, wide spread dispersion potential, and the low cost to administer them. There are many different programs and companies that offer these services for organizations to collect any variety of data from their participants. The problem lies not in the technology to amass volumes upon volumes of data but on how to capture the right distribution and how to structure the sample population to survey. According to the Pew Charitable Trust, roughly 25% of the United States' population does not have access to broadband Internet and there are also distribution concerns. The research institution found those most likely to use the Internet or own multiple internet-ready devices come from higher-income households. (Zickur et al, 2012) The disparity between access to broadband and the income gap between daily adopters has come to be known as the digital divide.

The City's OLTPS implored an online survey to collect participation from the public in 2010 as one of their outreach methods. "All Our Ideas" is a research group headed by Matthew Salganik from the sociology department at Princeton University. The group helped the OLTPS gather the opinions of residents through a "wiki survey" with 25 seed ideas. Wiki surveys are modeled on the success of Wikipedia to aggregate information from many users, the "All Our Ideas" team combined this with pairwise data gathering which was also modeled on successful online platform around a binary choice website called "Kitten Wars", which made pairwise comparisons of items. In October 2010 the Mayor's Office implemented the online survey and over a period of four months, the office collected 28,829 votes and 464 user-submitted ideas.

The Regional Plan Association has had a long history of collecting and administrating surveys. As the planning organization uniting a region under many ideas, casting a wide net for participation has often been a long and costly process. Regional Plan Association's history of survey methodology to involve civic engagement will be contrasted with the Office of the Mayor's recent venture. The Second Regional Plan was published in 1967 and new technologies encouraged public participation. Some example would be how the telephone revolutionized the way surveys were conducted, and the television/film as a media outlet to educate residents. The telephone much like the way the

Internet has opened up new avenues for quicker wider distribution of information was integral in collecting opinions from the ground. Telephone usage for surveys went through much scrutiny before becoming a legitimized tool to gather large quantities of information, and quickly surpassed traditional door-to-door methods of times past.

This thesis will compare the results and methodologies encompassing the offline and online approaches towards public participation. The research will analyze the scope of the Internet as a network on the PlaNYC initiative in capturing public participation. The study will also view critically the landscape of Internet access both broadband and wirelessly in New York City. These findings will be compiled and final recommendations will be given within the conclusion.

Background

Democracy

Democracy has its origins in ancient Greek civilization. Research shows that democracy developed specifically in the city-state of Athens around the fifth century B.C. where a division was created between the different political systems in existence. The word's origin can be found in two Greek words, Demos (people) and Kratos (Power), the amalgamation of these words gave new meaning of strength in a collective and has been used since. (Fishkin, 2009) In the 1960s new ideas of democratic theory began taking shape, forming participatory democracy. The idea took off when Benjamin Barber and Carole Pateman argued for greater citizen involvement. To put the participatory democracy in context it lies along the continuum of liberal democracy, which is the predominant political system in use. Given current conditions, to have extensive participation with deliberation is too costly or difficult to operate in such large and diverse societies. (Bevir, 2010)

The modern era has allowed democratic experimentation both formally and informally. McGinnis proposes that our democratic process needs to adapt with the acceleration of the information age and that introspection on what it means for the lives of citizens is important (McGinnis, 2012). As our cities grew in size so did the challenge to democracy and the need to alter its administration. The population growth has made the ability to achieve full participation much more difficult and new solutions are required for society to function. Technology's agile responsivness and the new ability for massive data storage seem to be likely ways to reach the entire population.

There are still issues with collecting public participation that researchers argue such as "rational ignorance" (Downs, 1957) which directly results from the surge in voices around the individual participant today. How should one person's voice be heard from the masses? More specifically as an American who lives in cities with populations in excess of a million? The answer is that up until now it has been a long and costly process. One example of a large survey is the US Decennial Census, which occurs costs $13 billion to execute (U.S. Government Accountability Office, 2011).

Fishkin argues that four basic principles of democracy can be measured, political equality, deliberation, mass participation, and non-tyranny. From those principles four normative theories can be reduced; competitive democracy where political equality and non-tyranny are met; elite deliberation where deliberation and non-tyranny are met; participatory democracy where political

equality and participation are met; deliberative democracy where political equality and deliberation are met. (Fishkin, 2009) This study is most interested in participatory democracy and one of the criteria to achieve this type of democracy is through participation by all.

To achieve participatory democracy, participation has to become accessible to the masses. Technologies have begun to change the way theorists view democracy and the limitations of the past may no longer apply. Urban planners should be mindful that as cities modernize, they also challenge the traditional democratic theories that support them.

Planners and Technology

Peter Hall has eloquently summarized the tumultuous history of urban planners both in academia and in practice from the modern era onwards. There have been a number of planning paradigm-shifts that have occurred along its course. For example planners have shifted from the "elitist designer" to "technocratic planner" to "probabilistic planner" throughout the modern era. Previous planner generations believed in the power of design to influence the behavior of residents and that with the computer urban problems could be easily solved.

In the realm of academia, urban planning education did not get established until the 1900s when the Department of Civic Design was founded in Liverpool in 1909. Big changes did not occur in the United States until the 1930s when American schools adopted the notion of urban planning curricula in academia and was formalized. The early schools were outcomes of pressure from the professional world, which focused predominantly on design-oriented planning for the build environment.

Skipping forward a couple decades to the 1950s, industrialized societies across the world were rapidly changing towards high mass-consumption nations with exploding populations and demands for durable goods. This physical change coupled with the intellectual shift of the planners had drastic impacts. Academics started the incorporation of evolving social science techniques in the planning arsenal, which moved the "craft" like quality of planning towards a scientific endeavor. This movement asserted the legitimacy of the profession and academic programs, dispelling the often esoteric nature of the "elitist city planner" perspectives.

Bill Pitkin, acknowledges the dominance of technocratic ideologies in the planning field and challenges its ubiquitous influence. Pitkin has theorized that the union of technical determinism (where there is little or no space for human agency in technological adoption) and social progress has explained the reliance of American planners on technology advancing social benefits. (Pitkin, 2001) The beauty of the technocratic movement was that it was inherently apolitical and allowed for planners to idealize the "rational planner" movement that followed. The ideal is built on the claims that a rational decision comes from a logical process that can explore the best possible route to reach a best possible outcome.

Participation in Planning

Participation should be the cornerstone of democratic political systems, but once the "have-nots" and minority voices begin to ask for redistribution of power, the process becomes lip service to the powerless (Arnstein, 1967). Citizen power according to Arnstein is the redistribution of power that enables citizens with less to gain the political and economic footing to be included in the discussions of the issues urban systems face. There are differing levels of participation that is distinguished, the "rungs" of citizen participation according to Arnstein are from lowest- manipulation; therapy; informing, consulting; placating; partnership; delegated power; citizen control. It is important for citizens to understand whether true change is being created from their participation or they are just being passive.

In New York City a development or improvement made on any property in the city domain must go through a review process by the City Planning Commission. 1968 was a critical year for public participation in the City. Boundaries were made for 62 community districts and boards to advise the city government and include the citizen voice. Community Boards across New York City were displeased with the way New York City was being developed so a planning intervention was borne through the increased participation of the boards on new development projects. The community participation fueled the need for change in regulations for any new project in the City. The Community Boards became a place where local views could be expressed to the city government and received judgment rights on the Uniform Land Use Review Procedure (ULURP) (New York City Department of City Planning, 2013).

Libraries as Locally-Based Information Centers

US public library serves a critical role in society; they provide free public Internet (Wi-Fi and broadband) and computer access to residents. Often they are the only place that offers free Internet access in a community. This free Internet access allows patrons into the "Information Society" where the creation, access, utilization and sharing of information can be achieved by individuals in a community. These acts allow for the achievement of sustainable development and improving quality of life as supported by the United Nations and the Universal Declaration of Human Rights. Researchers have argued that for Americans to join the global "Information Society" robust and high capacity Internet must be free and public. Public libraries have and should continue to be the nexus and entry point for communities.

Robust and high capacity Internet connection is key to a well-functioning library. It was reported that 2012 saw a 70% increase in use of public computers across libraries, yet 76% of the libraries reported insufficient number of computers to meet demand and 45% lack acceptable connection speeds (ALA, 2012). External funding from the federal government such as the Broadband Technology Opportunities Program have helped to mollify the demands that numerous users on library broadband connections can have.

Increasingly, broadband is considered the most important communication infrastructure of the 21st century. Many of the daily services that Americans require are Internet-dependent; they include educational services (Coursera and other free online classes/lectures), e-Government, employment and other uses. One example of library services are for career seekers, around 91% of libraries provide access to online job resources, and 72% of libraries help patrons complete online job applications (ALA, 2012). As job postings move more and more online towards websites on the Internet, the library system is helping residents access the job market and handing them the tools and knowledge to attain employment.

Traditional uses of libraries were community activities center, community information center, popular materials library (McClure, Owens, 1987). The new roles of libraries are places for the public to access the internet, e-Government service provider, emergency and disaster relief center, internet and technology trainer, youth educational support provider. Libraries are transitioning their roles in society and is keeping relevant in the current urban landscape.

Libraries are also expanding into the social networking realm. As online social networking sites become more prevalent libraries are conforming to the modern standards of reaching out to their patrons. There has been a trend for libraries to have twitters, and Facebook pages as seen in table 1. Almost 96% or libraries have a dedicated website and almost 70% of public libraries have a Facebook page. The least common web 2.0 services used were photo-sharing, and blogs.

Table 1. Percentage of Libraries using Social Media

Website	95.8
Facebook	68.3
Twitter	39.2
Blog	34.3
Photo-sharing	29.2

source: Public Library DataService

Participatory Tools

Nowadays we have many ways to collect copious amounts of data from multitudes of users with a click of a mouse and some strokes on a keyboard. Massive data collection has become big news in daily publications both print and online. The more people start connecting online, the bigger our data footprint becomes and it has coincided with the expanding technological capabilities of data storage capacity. Whether users actively contribute their data or have ambient data siphoned off, the governments, large companies, and small companies are able to amass information about their consumers/citizens.

Earlier literature has explored the issues of full participation within a sample and its effect on the survey method. It takes experimental findings and combines them with traditional statistical literature to understand survey participation. (Groves, Cialdini, Couper, 1992) the study believes that standardization of surveying techniques which conflict with the highly skilled needs of tailored surveys that the study finds most successful.

Urban planning has many commonalities with the field of public health and has a shared history. Many of the tools can be shared between the two disciplines especially regarding urban issues. Public health has found an issue with populations that are not only under represented, but hard to account for in studies (Berrnard, Russel, et al 2012). The paper discusses two approaches for estimating these populations called the Network Scale Up Method (NSUM) in their domain expertise. They explore when NSUM should be used in conjunction with experts in different locations to optimize the results from these estimates. In another study on social network analysis, "The Game of Contacts" is created to estimate the visibility of different social groups (Salganik, Mello, Abdo, 2011).

Online social networking sites have been a wealth of data for social scientists to analyze. The websites include Facebook, Twitter and Foursquare being the most studied and analyzed. One study has looked at group behavior on these social networking products and the outcomes that they have in the planning process. The study found that it was easy to amass hundreds of participants in groups on these sites. Much to the disappointment of academics, most of these social media groups choose to oppose new developments and subsequently the final outcomes of the participants were not taken in to consideration by planning groups (Evans-Cowley, 2010). While the outcomes were not positive for public participation in the study, the ease for users to find other users with similar interests and opinions should be noted, in online communities.

Evans-Cowley goes on to explain that online networking sites such as Facebook and Secondlife allow asynchronous interaction and supports the democratic planning ideals that advocacy planners have sought (Evans-Cowley & Hollander, 2010). Many of the criticism of large town-hall style group meetings are the spatial-temporal constraints where participants may not be able to attend such a meeting based on time and location. These new online channels open up opportunities for meeting and forming networks not possible previously.

In the business sector, public participation has been used to generate innovative ideas. The technique firms have used to get a large group of participants to give input is called crowdsourcing. While crowdsourcing has been used in a competitive format by businesses, it has also been applied towards collaboration and open sourced data collection. The term crowdsourcing was coined in 2006 as a way for companies to outsource a function that was once done internally to a larger external network (Howe, 2006). Various aspects of successfully run contests were examined in one study to find what motivated competitors to participate. The researchers found that a balance of extrinsic and intrinsic motivation was needed to capture and retain the participants, or the firm risks high dropout rates (Zheng, Li, Hou, 2011).

In the book "The Wisdom of Crowds" by James Surowiecki, Brabham explains the virtues of this new shift in problem solving with crowdsourcing. The reason why crowdsourcing garners results that are more intelligent than that of the brightest individual in a group is that the technique doesn't just average the solutions, but actually aggregates them. The synergy created within these networks innovate more because of the creativity that is inherent in collaborative groups (Brabham, 2008).

The Digital Divide

The distribution of information and data has become a topic of concern for scholars and activists since the 1960s. Library-Information Science and Communication studies departments were the main hubs of interest around the concern for information distribution. There were around 700 articles that had already been published in the subject matter by the 1970s. The scholars had divided the topics into- the imbalance of information production and distribution in society, unequal information access and utilization by different social groups, and differential information-processing capacities of individuals. (Yu, 2006)

The 1990s proved to be a turning point for the way in which information flowed across people and groups across networks. The Internet started to become a great divide between the "information poor" and the "information rich". The problems with the Internet were the high entry cost with hardware and the service was not widely disbursed. By the new millennium, over two thousand articles had been published about this inequality of information instigated by the Internet. This chasm noted by scholars has become known as the Digital Divide. (Arquette, cited in Hongladarom, 2004)

Governments have also gotten involved with making broadband accessible, which is described at depth through the diffusion of broadband across different countries. Researchers have studied that the regulation of broadband across different countries are remarkably varied through case studies conducted (Picot, Wernick, 2007). On the policy level, broadband regulation varies among the world's leading ICT nations/organizations such as the United States, South Korea, and European Union. Three of the theories on regulation used by these countries are public-interest theory; capture theory, and economic theory.

Another study researched the racial and quality of broadband service in the US with a competition based analysis of the trends. (Prieger, Hu, 2008) In this study the authors noted that they met difficulty when getting the data for a demand-study of this nature because research of this nature is very new. The source that the study ended up using was the Current Population Survey (CPS) and its Internet and Computer Use Supplement. The study also added other commercially available survey results from private institutions. The final results reached by the study showed race and ethnicity were independent of other related factors such as income and education in the demand for broadband service.

Another study obtained a nationwide survey in the United States during a two-month period in 2002 about household awareness of high-speed Internet access. The study concluded that higher income households and individuals with college education preferred high-speed Internet connection. (Savage, Waldman, 2005)

Community Technology Centers have also been introduced into the toolkit of urban planners to fight the so-called "Digital Divide". Access to information technology and the know-how to navigate the system are needed to be able to participate in our increasingly plugged-in society. Most current studies looking to fix the growing divide of Internet users agree that the provision of hardware is not enough to bridge this gap. Activists argue that residents should be offered the requisite skills, opportunities, data/information, and the means to participate in society. (Servon and Nelson, 2011)

A seminal comparison of Internet usage was conducted by the Pew Internet Project, which compares 2000 figures with a 2001 survey. They have found that one in five American adults do not use the Internet, and those most affected are - senior citizens; survey takers who respond in Spanish rather than English, adults without high school diplomas and households with incomes less than $30,000. Another population without access is adults with disabilities which made up larger proportions of those who do not use the Internet compared to the rest. They have also found that while Internet adoption have been plateauing, adults who are already online are using the Internet even more than before. Lastly, the means of gaining access to the Internet has drastically changed. In the 2000 study, most users were stuck to a desktop computer but now mobile devices such as smart phones and tablet computers have granted new routes to the Internet. The nation has digitized communication at a rapid rate, in 2001 only 4% of households had broadband access and currently 62% of households have high-speed broadband connection in their homes. (Zickuhr, 2012)

Federally Funded Program – American Recovery and Reinvestment Act

The United States makes federal tax dollars available to over 1,500 government programs. The goals are unabashedly diverse and the benefits are spread geographically as well. The American Recovery and Reinvestment Act is an example of a federally funded program that benefits US citizens. The Act was approved by the Congress in 2009 after the United States' economic crisis and is colloquially known as the "stimulus" or "Stimulus package". A total of $787 billion was appropriated for three goals; the creation of new jobs and saving existing jobs; spurring economic activity and an investment towards long-term growth; promote transparency and accountability in government spending. (U.S. Congress, 2009)

From the Act, the U.S. Department of Commerce received a $7.2 billion dollar investment from the American Recovery and Reinvestment Act to split between the department's National Telecommunications and Information Administration (NTIA) and U.S. Department of Agriculture's Rural Utilities Service (RUS) to expand broadband service across the nation. The Broadband Technology Opportunities Program (BTOP) had designated three different initiatives that were administered; Comprehensive Community Infrastructure (i.e. new fiber-optic cables and wireless towers); Public Computer Centers; Sustainable Broadband Adoption (digital literacy for vulnerable populations). States then would submit proposals for projects that would fulfill these goals, and money was allocated accordingly.

New York State was able to secure part of the funding through the BTOP with a project proposal titled "NYC Connected Communities" in 2010. The project was granted roughly $14 million to upgrade and expand public computer centers in libraries, public housing locations, recreation centers, senior centers, and community support centers. The City also targeted high-poverty areas such as Harlem and the South Bronx in their proposal as key locations. In their proposal digital literacy was a driving force that formed after school programs, and job training skills for New York City residents. (U.S. Department of Commerce, 2010)

New York State Funded Program – Connect NY

In 2012 Governor Cuomo of New York State announced a $25 million program called ConnectNY. The program was slated to expand the existing broadband infrastructure and to initiate new projects in rural and at-risk areas.

One caveat of the program was that the target audience was to benefit businesses. Despite that fact, the program is beneficial to all New Yorkers because it helps keep New York State a leader in the digital economy and reach consumers across the globe.

The criteria for which the program selected grant receivers were; priority areas and demonstrated need, impact and adoption; leveraging existing infrastructure and funding sources; regional economic

development council endorsement; and collaboration and community support. The impetus for the study came from 2010 and 2011 when New York examined the high-speed usage in the state.

The study was a first of it's kind and it found that broadband adoption rates were roughly 70%, which is higher than the national average of 65%. The fund will help bridge the gaps of the "last-mile" which is a moniker for the last areas where service is provided. Economically speaking, this phenomenon is the most expensive portion of creating a complete broadband network. The areas with low populations, which are predominantly rural fall into those categories.

New York City was able to receive funding from the state, but most of its effort is in economic development. The New York City Economic Development Corporation has started a program to boost Internet speeds for businesses by subsidizing infrastructure costs for Fiber connectivity. The program not only helps build out the physical network, but they wanted to build out the network of Internet adopters.

Analysis

Research Design

This thesis is a descriptive study of two planning documents and the current state of accessibility of the Internet through the availability of infrastructure, and wireless/computer facilities. The data used in the study come from The Second Regional Plan of 1967, PlaNYC 2030, New York City Public Libraries, National Public Libraries, New York State Broadband data, New York City Open Data on Wi-Fi and Crowd sourced open Wi-Fi data.

The Regional Plan Association's Second Regional Plan and the PlaNYC 2030's methodologies are analyzed on their breadth and depth of their participatory merits. Some quantitative comparison on the number of participants they acquired and the duration of time it took to the complete the study will also be taken in to consideration when comparing the two case studies.

The New York City Open Data catalog run by Socrata will be used to gather Wi-Fi hotspots to show areas where the public can login to the Internet either for a fee or for free. The New York City Open Data initiative makes city government data accessible to anyone and is a rich resource for civic data. Also, Two sources of crowdsourced data on free Wi-Fi locations will be used to show the points of access. The crowdsourced data will show where the most active users of crowdsourcing are by the data points they share about the availability of free Wi-Fi locations across the City.

Public Library locations in New York City from the public facilities classification are used to analyze the walking accessibility for NYC residents. Walking access is crucial for lower income households where the close proximity of facilities require no transit costs. Public Libraries were also chosen in the study because they offer a great resource for research, use as public space, and programming space. National data will also be used to express library usage across the US. The institute of Museum and Library Services (IMLS) conducted the Public Library Survey and released the results in 2013, which will help guide national library figures.

Comparison of Data

The conception of the thesis began with the discovery of PlaNYC 2030's online survey in 2010. The group in charge with conducting the survey was called "All Our Ideas", which is run out of Princeton University. They have published an article on their methodologies of the PlaNYC survey and Organization for Economic Co-operation and Development (OECD). (Salgnik and Levy,

2012) The authors believe that their application melds surveys and interviews, two traditional methods of data collection implored by social scientists. The online survey was a "wiki-survey" style hybrid design based on the aggregation of Wikipedia for data and "Kitten Wars" for pair-wise decision-making.

The Regional Plan Association's Second Regional Plan from 1967 was chosen, as a comparison because of the comprehensive measures taken for the data collection. The financers of the plan were Avalon, Ford, Old Dominion, Rockefeller Brothers, and Taconic Foundations. The whole process took ten years to complete and brought together voices from across the region.

Methodology – Second Regional Plan (1967)

From 1960-1963 the RPA had been setting projections for the regions growth in the next twenty-five years. This included over 100 speeches to various groups. 1964 marked the year that work on the Second Regional Plan began. The outreach for the survey was unprecedented with television commercials, newspaper sections, town-hall meetings, and volunteers at subways handing out pamphlets to passing people. The outreach served to educate the residents about urban problems and the issues that the Region's residents saw with racial segregation, problems with Urban Renewal,

Table 2. PlaNYC and RPA Second Regional Plan Survey Population and Duration

	Population	Months	Pop/Time
PlaNYC	28,829	4	7,207.25
RPA	5,600	4	1,400

Table 3. PlaNYC and RPA Second Regional Plan Survey Questions

	Total Questions	Seed Questions	User Inputted Questions
PlaNYC	464	25	439
RPA	55	55	0

source: PlaNYC 2030, RPA Second Regional Plan

and poverty in inner-city neighborhoods. The survey for the project took place over five meetings where 5,600 participants who came to at least one of the meetings. Table 2 shows the population of the Second Regional Plan participants over the time period surveys were collected.

In these meetings the participants were given booklets with background information. During the meeting a half-hour film covering the same information located in the booklets were shown. Then an hour and fifteen minutes were taken to discuss the key question listen at the end of the booklet. The last step was for the individual to fill out a questionnaire that was mailed to the group/organization they represented. The questionnaire itself was left anonymous but was keyed to a biographical questionnaire.

Again, leading up to the survey, the RPA had run newspaper publicity, many mentions of the survey was made in speeches at town hall meetings, and brochures were handed out to hundreds of contacts on the street. A form of outreach not used before for a project of this magnitude was the television. Film was a medium that could acquaint the participants with tangible information put into t visual context. This also allowed for replicable informational meetings and kept participant experiences uniform.

Sampling was an important aspect for the RPA and the participants were hand-selected to a degree by the organization for their survey. In their document they state, "The Goals for the Region participants are in many ways unlike the population of the Region as a whole" where certain demographic/geographic areas were sought more than over-represented ones. The areas in the Region that were being newly developed were represented more heavily while New York City was less represented in the survey. The study was not randomized because the volunteers were tasked to recruit "people of every income and educational level, or many ages and skills, from every county in the Region" as described in their study. Therefore, the participation in this survey cannot be considered randomized or unbiased, since the RPA and the volunteer workers artificially sought an even distribution of the population.

The questionnaire itself asked 55 questions to the participants. The survey questions first asked basic demographic data from the participants such as income, educational attainment, and race. Then there were opinion questions that included how much interaction respondents had with their neighbors, how much individuals would like to live in specific parts of the region, do they favor or oppose large-scale public expenditures for acquiring land for parks, and how people currently use open spaces.

Methodology – PlaNYC 2030 (2010) -Online Platform

PlaNYC began in 2007 by orders of the Mayor Michael R. Bloomberg. The study began in anticipation a projected growth of one million more residents to New York City. The city would have to face new economic development endeavors; tackle climate changes issues, and enhance the overall quality of life for the City residents. The task was assigned to the New York City's Office of Long-Term Planning and Sustainability (OLTPS), formed by the Mayor specifically for this reason in 2006. The OLTPS had to coordinate 25 city agencies within the government and create a comprehensive study to prepare for the population growth.

Much like the RPA's Second Regional Plan, the PlaNYC study was catalyzed with a projected growth in population. The projection came from a consultant hired by the OLTPS to analyze three components, fertility, mortality, and migration rates in compiling the final figure. The outcome showed that by the year 2030, the population of NYC would gain one million more residents from their estimate. As the study states, "Population growth was the framework for assessing the City's long-term development" and was paramount to the urgency of their work.

The OLTPS sought an online survey platform to gain public input. They choose the Princeton University based group "All Our Ideas" to host their survey to conduct the non-traditional methods of outreach. The office reached out to the public via their interactive website, large town-hall style meetings, smaller stakeholder meetings, and the existing networks of community groups at hand. One example is their larger town hall styled meetings which 11 of them in total were held across the five boroughs, where panel discussions and the plan's goals were presented to the constituents.

There are instances when traditional meetings do not gather all voices due to temporal and physical constraints. The OLTPS came across All Our Ideas, which gave NYC residents, a chance to participate without these restrictions. By using the service the OLTPS was able to broaden the dialogue from the traditional attendees of the public meetings.

The survey began with a list of 25 seed topics that the OLTPS created to start. The participants were asked "Which do you think is a better idea for creating a greener, greater New York City?" in reference to the pair-wise survey. Two choices from the seed were displayed as buttons in the graphical user interface. What made the All Our Ideas platform different from other surveys was the ability for participants to add their own topic to the discussion. The result from this choice was 464 respondent driven policy topics. The OLTPS had the choice of curating the user inputs and out of the 464 topics, 244 was reshuffled in the deck making for 269 possible topics. Table 3 shows the comparisson of RPA's Second Regional Plan questions and the OLTPS's Survey question numbers.

Part of the online platform allowed the site to display results immediately to the participant. A separate chart showed the user how other people had voted on the same topic. The results also helped the OLTPS aggregate data on the overall importance of certain topics compared to other ones.

Methodology – PlaNYC 2030 (2010) -Offline Platform

The OLTPS had a short time line with the Bloomberg Administration running on a three-year timeline until term limits were reached. A variety of outlets were utilized to gather quick participation and spread the mission of PlaNYC which included an interactive website, large town-hall style meetings, smaller stakeholder meetings, and networks of community groups.

The goals of the outreach program included 1. Soliciting as many ideas as possible 2. Ensuring public participation to guarantee positive support for the plan 3. Education of the City's environmental and infrastructure challenges. 4. Use the planning process to include feedback for a deployment-ready document at the end of the timeline. (Mayor's Office of Long Term Planning and Sustainability, April 2010)

To get the message out, the first step was to create a unified goal/message that could be used to invite dialogue from constituent groups. The office had defined what sustainability meant for the City and how everything was interconnected whether it was "…economic development, the environment, climate, and public health" so that multiple groups could be in the same room to discuss a wide-ranging goal.

Public Library Usage

National Figures
According to the IMLS "The relatively high use rates and program attendance highlight the public value provided by local libraries at a time of dramatic economic, technology, and demographic change." (Institute of Museum and Library Services, 2013) The public library system is a rich resource and they provide physical spaces as well as programs, print and online collections.

Nationally, the public library system served 297.6 million residents, which are about 96.4 percent of the U.S. population. The number of visits to a local library of branches was 1.57 billion, which does not count the number of online visits made. The libraries also offer public programs that include, children story telling, after-school homework sessions, book readings, and computer classes. Access to computers and the Internet are also important aspects of the modern day library. There were roughly a quarter of a million Internet-ready computer terminals for the general public, which is a 200% increase over 10 years.

Computer use is one of the fastest growing services in the public libraries across the United States. Current numbers indicate that one out of five visits will be for computer use in a library facility.

Urban public libraries recorded 3.6 computers for 5,00 people, which was an increase in 5.6 percent from the previous year alone. A majority of public libraries saw an increase usage of public access computers and accordingly 76% reported an insufficient numbers of computers for the demand they receive. (American Librarian Association, 2012)

New York Public Library Figures

The New York Public Library's 2012 annual report gave important figures in the library's use and standing. The library system, which represents one of the three public libraries in NYC, saw 18 million visitors in 2012. The library offered 60,000 programs with 1.2 million attendees. Computer classes saw a large increase with a 367% jump in one year. The library offered 7,694 computer classes through out the Staten Island, The Bronx, and Manhattan. Another important section of instruction was on "English as a Second Language" classes where 1,857 classes offered 34,575 residents access to English language education.

The number of users of the nypl.org website was impressive with 32 million users access the library website in 2012. For the library members who went to the branch locations and logged-on to a computer, over three and a half million hours of public computer use was recorded. The New York Public library also grants access to their 1,303 laptops for members to gain mobile Internet access. (New York Public Library, 2013)

Table 4. Public Library Social Media Followers and Activity

	Twitter Followers	Tweets	Facebook Likes
New York Public library	269,126	11,132	85,320
Queens Library	8,294	5,471	15,610
Brooklyn Public Library	9,054	3,201	30,351
Library of Congress	497,141	4,290	99,889

source: facebook.com, twitter.com

Table 5. New York City Public Library Branches

	Library Branches
Brooklyn	60
Staten Island	12
Manhattan	63
Queens	41
The Bronx	34
Total	210

source: nypl.org, queenslibrary.org, brooklynpubliclibrary.org.

The Queens Library's 2012 annual report showed a record number in library users. There were nearly 13 million in-person visits to a branch location and more than 707,000 people attended 37,500 programs offered. The Queens Library also began offering online courses that patrons can use to earn professional certifications. The course offerings ranged from Microsoft Office Suite to Six Sigma certification. (Queens Library, 2013)

Public Libraries have been increasing their online presence. The study went on to Twitter and Facebook to measure the online social media reach that New York City public libraries and the Library of Congress hold. The Library of Congress has the highest number of Twitter followers and Facebook likes. Table 4 depicts the usage of social media outlets by public library institutions. In New York City, the NYPL had the highest Twitter followers, Facebook likes, and number of tweets. Overall while the Library of Congress had the most followers and likes, NYPL and Queens library were the most top two most active users of social media according to number of tweets. Also while the Library of congress has almost double the Twitter followers of NYPL, the Facebook likes count is much closer. Lastly, if the three public library systems in New York City were combined, the reach that the libraries have over the population is much greater than that of the Library of Congress on Facebook.

Public Library Access in New York City

Currently there are three library institutions in New York City which includes, the New York Public Library, Brooklyn Public Library, and Queens Library. All three systems have computers with Internet access at every location. On top of computer stations and classes, Wi-Fi access is also available to use for patrons at each branch location across the City. There were 210 library locations

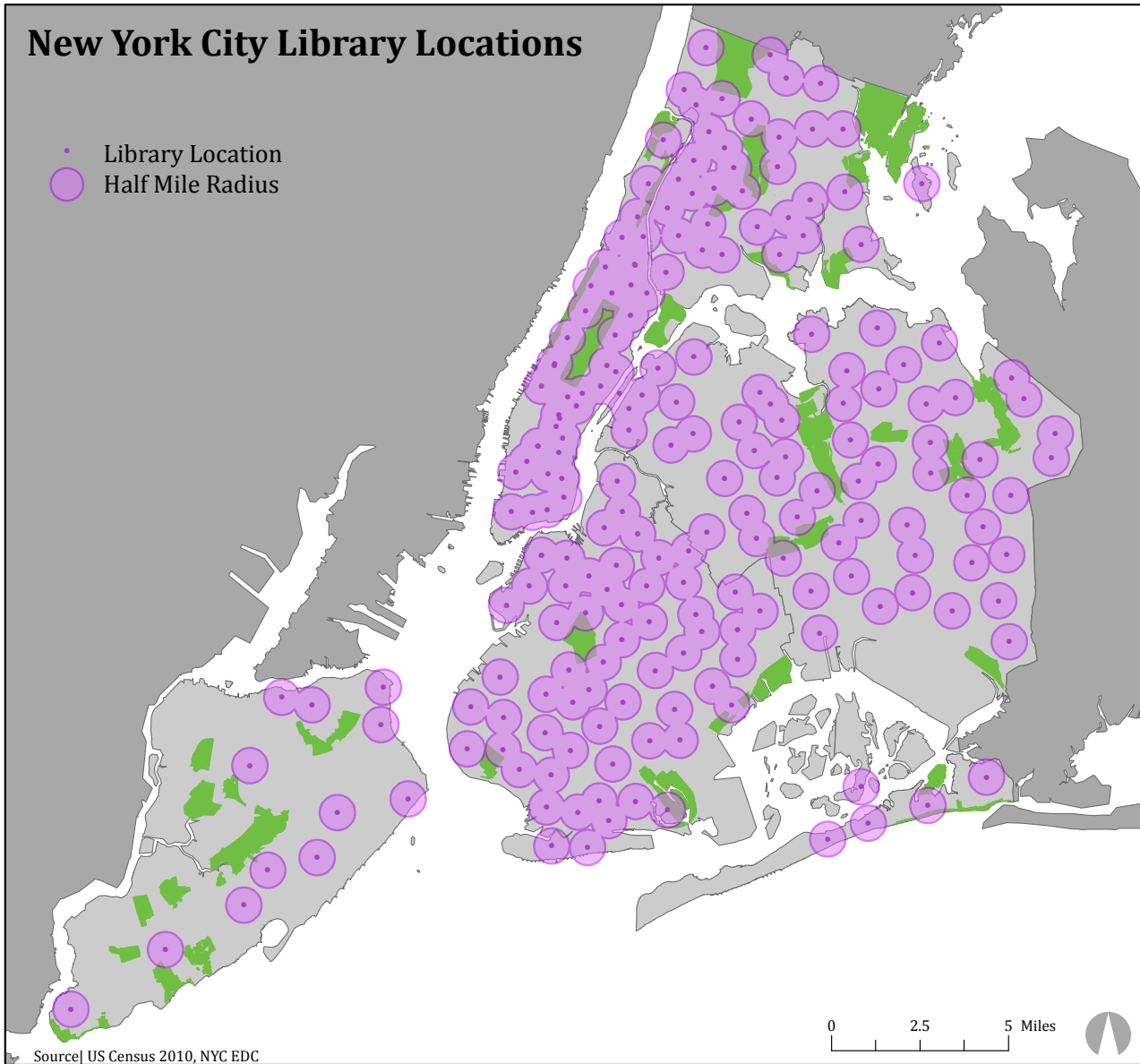Figure 1. New York City Library Locations with Half Mile Buffer

Table 6. New York City Public Library and Geographic Data

	Total Area (Acres)	Access Coverage (Acres)	Access Coverage	No Access Coverage
Brooklyn	45756.3	26620.82	58%	42%
Staten Island	37043.06	5547.889	15%	85%
Manhattan	14669.71	11419.12	78%	22%
Queens	70151.94	29118.48	42%	58%
The Bronx	27121.69	14536.27	54%	46%
Total	194742.7	87242.58	45%	55%

source: nypl.org, queenslibrary.org, brooklynpubliclibrary.org, NYC DCP 2013

across New York City with Queens having the largest number of branches with 63 locations, while Staten Island had the least with 12 locations. Table 5 compares the number of branch locations in New York City.

Access to a public resource should be relatively easy for most residents of the City. Figure 1 shows a half-mile radius being drawn around each public library location. A half-mile distance measurement was used as a standard acceptable distance traveled for public amenities. The half-mile was also derived from the NYC Mayor's Office of Environmental Coordination's (MOEC) threshold for open space access. The office states that well-served areas are those where residents are 0.25 miles away (or approximately a ten minute walk) from publicly accessible park space. (MOEC, 2012) Since a quarter mile distance is considered well-served, double the amount was deemed acceptable for this study.

The data showed that the borough with the most public library branches was Manhattan with 63 locations but how much of the borough was within a half-mile radius was needed to be determined. The half-mile buffer shape file was used to clip the New York City shape. Once the clipped shapefile was created, each borough was examined for the area that was encompassed within the half-mile buffer.

Table 6 shows the area in New York City that is covered by the half mile buffer. Unsurprisingly the borough with the highest coverage was Manhattan with 78% of the island being within a half-mile radius of a New York Public Library. It is important to state here that a next step in the analysis could involve an actual network analysis of a half-mile rather than a Euclidean distance approach

that was taken in this study. The Bronx was actually a special case where it had the second lowest quantity of branches at 34 but had a very high coverage. The analysis found that over half the 27,122 acres in the borough was within the half-mile radius of a library. The borough with the least number of libraries was Staten Island with 12 locations and it also proved to be the least covered. A staggering 85 % of Staten Island is not easily accessible to a library.

The analysis also looked at the population of each borough and determined those populations with and without close access to a library branch. The study was done very similarly to the determination of the area coverage in New York City. The original populations for each census tract were multiplied by a number calculated by dividing the new area with the original area to derive a proportion. This calculation allowed for a proportional split of the population and could be used to roughly estimate how much of the population was in a portion of the clipped tract.

The population analysis was much more favorable for the study of access to public libraries and their public Wi-Fi networks. Table 7 shows the breakdown of the population in and out of the half mile buffer anlaysis. Manhattan led the borough in access with 90% of its residents being in close proximity to a library branch. Manhattan had the third largest population with over 1.5 million residents behind Brooklyn and Queens, but had the second largest population with access to a public library branch within a half-mile radius. While Staten Island's percentage of residents with easy access to a public library branch was a meager 22%, the borough's population is also about 30% of Manhattan's population.

Some of the discrepancy here can be seen in the map where some of the area that is not being covered on the island of Manhattan is Central Park, right in the middle of the borough. There is no population in Central Park so while there is no immediate access to a library from the park interior. Therefore, no residents are being adversely affected by the fact that such areas as parkland were included in the analysis.

Table 7. New York City Public Library and Population Data

	Total Population	Population with Access	Population with Access	Population with No Access
Brooklyn	2,508,304	1,838,294	73%	27%
Staten Island	468,730	104,950	22%	78%
Manhattan	1,585,884	1,426,046	90%	10%
Queens	2,230,722	1,359,255	61%	39%
The Bronx	1,385,108	1,071,459	77%	23%
Total	8,178,748	5,800,004	71%	29%

source: nypl.org, queenslibrary.org, brooklynpubliclibrary.org, NYC DCP 2013, US Census 2010

Another factor in the vast difference between the access for populations in Manhattan and Staten Island within a half-mile radius can be attributed to transportation options. Staten Island is the only Borough that is not connected through the extensive subway system and has its own dedicated line that traverses the island in a linear fashion. Driving in Staten Island is probably more typical and therefore having a library branch within a walking distance is not a huge determinant for an area like Staten Island. Manhattan is arguably one of the densest boroughs in New York City while Staten Island has a higher incidence of single-family residences and is much less developed.

Further analysis of these access effects could be correlated with library attendance. A study of library branch patrons to these access calculations could inform the public library system of urban density and patron figures and new library facilities can be assessed as needed.

Table 8. Sample New York City Public Library Observation Study Data

	Asian	Black	White	Female	Male	Computer Stations	Computers in Use
Chatam Library	9	3	1	3	10	15	13
Seward Park Library	31	3	2	6	30	33	36

source: observational study conducted April 20, 2013

New York Public Library Usage -Observation

Public libraries provide a vast array of services and opportunities for the community and many of them have been described by the American Library Association's annual report. While cities across the United States also span a wide range from rural to urban, the New York Public Library usage is analyzed in depth in this study. Previous research has shown that metropolitan public library systems still have an advantage over rural libraries because of the greater information supplies that become accessible to larger populations. (Bekkerman, Gilpin, 2013)

The observational study showed that the public library provided patrons with computer access to join e-commerce sites, online market places, and play computer games. The two libraries observed

had a high usage of computers. The library was a hub for residents to connect to the Internet whether it was through the computer portals provided by the library or through their own devices using the free Wi-Fi provided. Table 8 shows the demographic breakdown of the library patrons during the observational

The Chatam Library on 33 East Broadway on Manhattan, had15 computers on two separate floors. At 2:00pm 13 out of the 15 computers were being used. On top of the computer stations being used, 12 patrons were using laptops, and 3 were on a tablet device. Notable websites being accessed at the library were Chinese social networking sites, online retailers, English social networking sites, Chinese language news, online poker, and real estate listings. The genders of the patrons using computer stations were 10 males and 3 females. The largest ethnic group at this library location was Asians, which was expected because of its location in Chinatown.

The Seward Park Library at 192 East Broadway on Manhattan had 33 computers distributed across 3 floors. At 3:30 pm, there were 36 patrons using 33 of the computers in the library. The number of patrons was greater than the number of computer stations because multiple children were using one station on the second floor. Notable websites being accessed at the library were email server, online retailer, games, and library research, coin shopping on an auction website. The genders of the patrons using the computers at Seward Park Library were again predominantly male with 30 and only 6 female patrons. The largest ethnic group at this library location was again Asians.

Patrons were also observed for non-computer uses. Some of the biggest reasons to the library enter the library were for the use of public facilities like restrooms, Chatam Library had a long queue to use their restrooms. The library also offers seating as a place to rest and take naps; Seward Park Library had many patrons that were asleep at desks or individual chairs. Another popular attraction at Seward Park Library was the magazine selection.

At both libraries, an important demographic was the elementary school-aged patron. The study found sections or entire floors devoted to children and acted as afterschool havens for the children. Both libraries had tutoring classes offered to children, and one-on-one instruction was observed.

New York Public Library Usage -Research

The NYPL reported that it offers over 55,000 free programs across their locations in the Bronx, Manhattan and Staten Island a year. The classes are geared for residents of all ages. A typical week day offering includes, tutoring for children (ages 5-12), poetry workshops, computer software help (Microsoft Excel, Microsoft Powerpoint, and Microsoft Word), job application help, and classes focused on language training. The library reported that over 1.1 million patrons attended the free programs offered, which was in increase of 72% from 2008. Seward Park Library, which was observed had the 1,420 programs with 34,228 attendees making it the second most frequented library for free programs.

Computer classes were a substantial portion of the library's offerings. NYPL offered 7,694 computer

classes which was a 367% increase from the previous year. Brooklyn Public Library (BPL) offers handouts and guides for patrons who cannot attend one of their hundreds of classes offered. The topics that BPL covers are computer basics, Internet basics, email basics, software basics, research guidance, database guidance, and downloadable media guidance. The Queens Library reported that over 294,000 adults took advantage of their continuing education courses. In January 2012, the Queens Library opened their new Cyber Center at the Central Library which houses 72 computer workstations, printers and scanners.

The Queens Library system has also partnered with Metrix Learning, a private company that works with local governments, not-for-profit agencies, and corporation to offer affordable training programs. The library requires patrons to attend an hour long orientation session and will be able to access Metrix Leraning from any computer with Internet connection. The library advertises the online training as "easy to use, self-directed" and free of charge. The participants are able to get certification that includes Microsoft Office, Adobe Creative Suites, Quickbooks, Six Sigma, and Autodesk. These courses make job seeking candidates more competitive I the job market.

No Access to Wireline in NYC

While Mobile Wireless networks are available all across New York City (except where physical obstructions do not permit) for residents with Internet-ready mobile devices, wireline access is not ubiquitous. Table 9 displays the census tracts that have no wireline access in New York City. Figure 2 displays the areas affected. While there were only 23 census tracts were affected by the lack of physical connection to a wired source, it is important to note that not all areas have the

Table 9. Areas of New York without Wireline Access

	Census Tracts	Population	Area (Acres)
The Bronx	2	1416	144.58
Queens	21	5176	1220.32
Total	23	6592	1364.90

source: NYS GIS Clearinghouse, US Census 2010, NYC DCP 2013
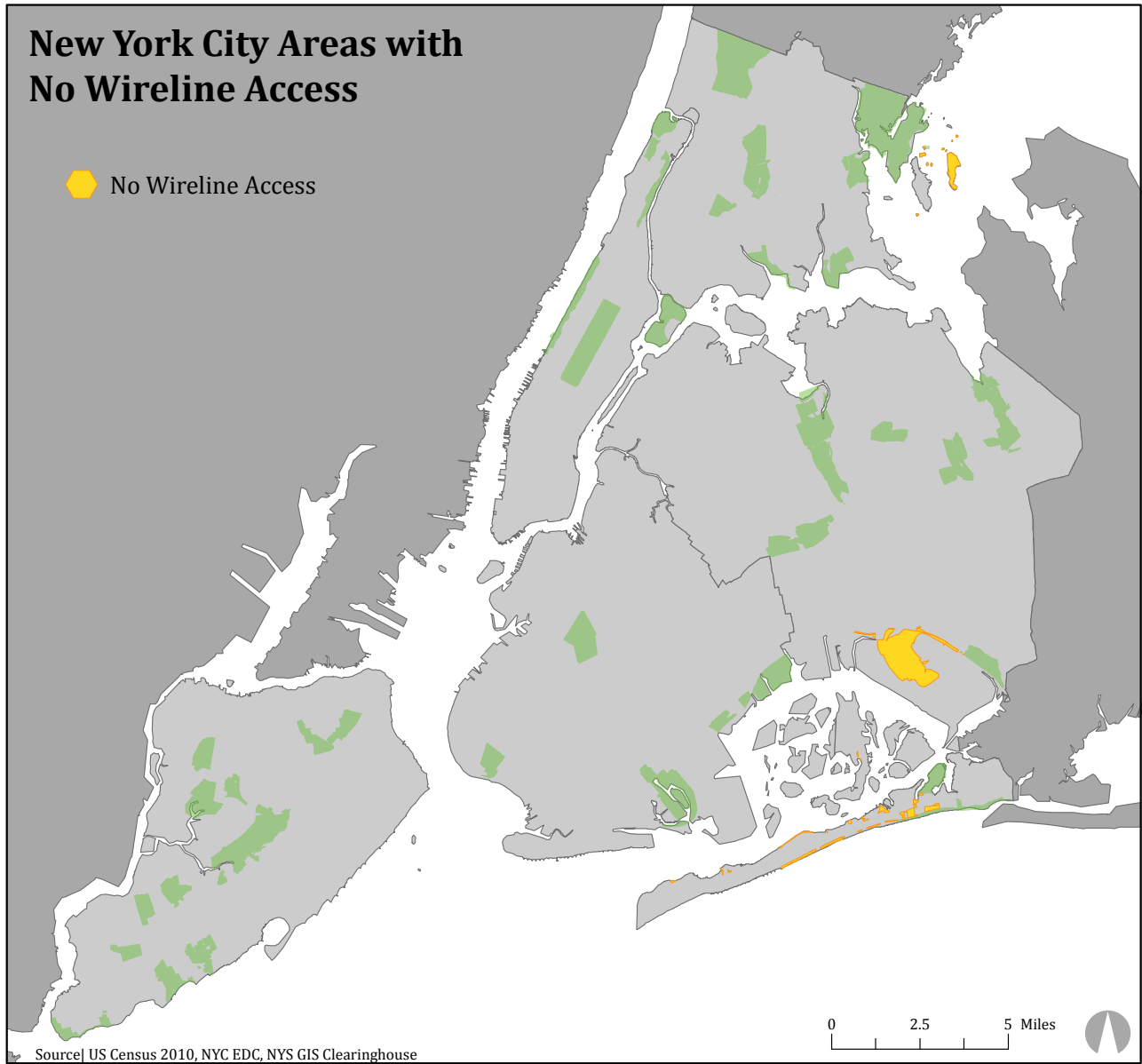
Figure 2. Areas of New York City without Wireline Access

New York City Areas with No Wireline Access

⬡ No Wireline Access

Source| US Census 2010, NYC EDC, NYS GIS Clearinghouse

0   2.5   5 Miles

Table 10-14. WiFi Access Points by Borough and Data Source

Open Wi-Fi	Count	Percent
MN	88	100%
BK	0	0%
QN	0	0%
SI	0	0%
BX	0	0%
Total	88	100%

NYC Wireless	Count	Percent
MN	65	56%
BK	30	26%
QN	14	12%
SI	0	0%
BX	7	6%
Total	116	100%

DOITT	Count	Percent
MN	741	59%
BK	208	17%
QN	185	15%
SI	30	2%
BX	91	7%
Total	1255	100%

Overall	Count	Percent
MN	894	61%
BK	238	16%
QN	199	14%
SI	30	2%
BX	98	7%
Total	1459	100%

Library Branches	Count	Percent
MN	63	30%
BK	60	29%
QN	41	20%
SI	12	6%
BX	34	16%
Total	210	100%

source: nycwireless.net, openwi-finyc.com, NYC DOITT 2013, nypl.org, queenslibrary.org, brooklynpubliclibrary.org.

same access in New York City. The analysis took broadband data from the New York State GIS clearinghouse and took the data relevant for New York City. There were two census tracts in the Bronx with approximately fifteen hundred residents who do not have wired access while twenty-one census tracts with over five thousand residents in Queens did not have access. In the Bronx the areas affected were the Northeastern parts of the borough and in Queens the Southern sections especially in the Rockaways and areas near John F Kennedy Airport were affected.

Wi-Fi Hotspots

Wi-Fi access has been proliferating New York City and the residents are actively sharing locations with each other. Whether individuals have Internet access at home or not, they can just as easily step outside their abode to plugin. While a majority of the Wi-Fi hotspots recorded by the city government are fee-based, figure 3 show that about 42% of them are free. Publicly accessible Wi-Fi allows residents who may not be able to afford a wireline service from providers like Time Warner Cable or Cablevision in New York City. This is especially important if planning institutions want to collect participation from as many residents as possible.

Data from New York City Department of Information Technology and Telecommunications (DOITT) has released data on the NYC Open Data portal. The data portal is operated by Socrata, a private company that sells services to governments to make data openly available to the public. One of the data sets made available was Wi-Fi Hotspots across the City. The majority of these hotspots were located in Manhattan table 12 shows that 741 stations were located in Manhattan accounting for 59% of the citywide locations.

Data was also scraped from the web from two sources. The first source was www.openwifinyc.com, a "comprehensive" and "up-to-date" list of free Wi-Fi hotspots in NYC. Each of the locations posted on this website are visited for varying criteria such as signal strength, connection speed, and seating arrangements. The second source used was www.NYCwireless.net, a non-profit organization that promotes free and public Wi-Fi especially in parks, public spaces, and affordable housing locations across New York City. NYCwireless helps build infrastructure to support free Wi-Fi hotspot locations by partnering with organizations such as the Alliance for Downtown New York, and Bryant Park Restoration Corporation.

The majority of all Wi-Fi hotspots regardless of source were Manhattan. OpenWiFi only had locations in Manhattan and no other boroughs were represented in their data. In table 11, NYCwireless' hotspots were found predominantly in Manhattan with 56% of their locations. In table 13, aggregating the three data sources showed that 61% of free Wi-Fi hotspots were found in Manhattan. Comparing this with the distribution of Public Libraries where free Wi-Fi is offered, the Public Library system does a more equitable job at providing locations evenly across Manhattan, Brooklyn and Queens.

DOITT also provided the organizations that offered their hotspot services. Table 15 shows the top

Figure 3. Fee vs. Free Wifi Stations in New York City

Free Wifi| 42%

Fee-Based Wifi| 58%
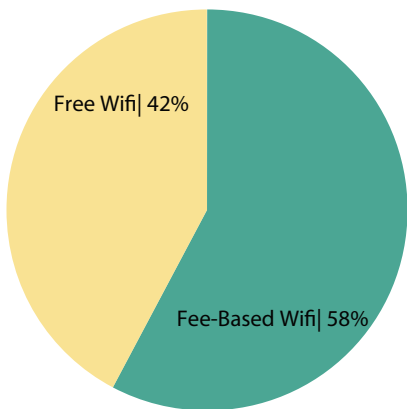
source: NYC DOITT 2013.

Table 15. Top Ten WiFi Access Points in New York City

Place	Count
McDonalds	219
Starbucks	213
New York Public Library	81
Queens Public Library	61
Brooklyn Public Library	59
FedEx Kinko	48
JFK Airport	24
Barnes and Noble	22
UPS Store	19
T-Mobile	18

source: NYC DOITT 2013.

providers were McDonalds and Starbucks with 219 and 213 locations respectively across the city. The Public Libraries also were top providers and the Airports John F. Kennedy and LaGuardia (not in the top ten) were notable. Cafes such as Starbucks and local caffeine dispensaries are obvious choices for getting a drink and using the Internet while a fast food restaurant is unlikely. McDonalds is a surprise top provider since Wi-Fi service is not a typical amenity for fast food outlets. Logistics companies like the FedEx/Kinkos and UPS Stores offered Wi-Fi access as well. The Brick and mortar locations for these businesses are more for quiet workspaces rather than community organizing or co-working spaces though.

The NYCwireless map was used to calculate whether the Wi-Fi hotspots that were collected were clustering or dispersed throughout the City. These results are important because if free Wi-Fi is offered in NYC and public participation is anticipated by planning institutions, the residents should all have equal opportunities to do so. The earlier data of raw numbers showed that the majority of Wi-Fi hotspot locations were found in Manhattan, but the spatial distribution of these data points were not known. The average nearest neighbor algorithm was run to determine if there is a spatial statistically relevant explanation to the Wi-Fi hotspot location in New York City. The test calculates in index value based on the average distance of one data point to its nearest neighbor. The distance method used was the Manhattan, which calculates distance on right angles along an axis. In figure 5, results show that the Wi-Fi hotspot locations in the City show clustering behavior with a less than 5% likelihood that it is of random chance.

Figure 4. Free WiFi Locations Across New York City
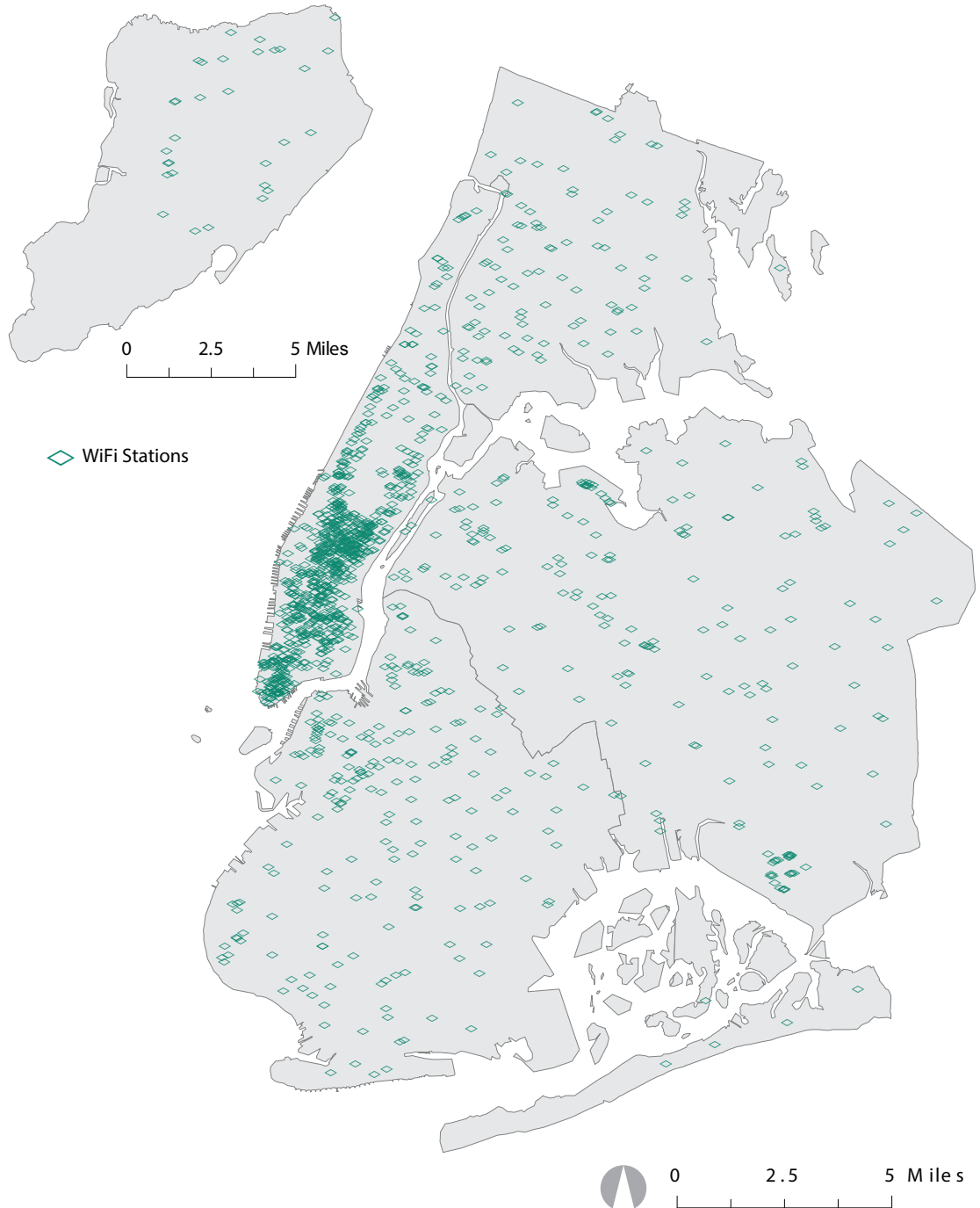
source: nycwireless.net, openwi-finyc.com, NYC DOITT 2013, NYC DCP 2013

Figure 5. Average Nearest Neighbor Results for New York City Wifi Locations
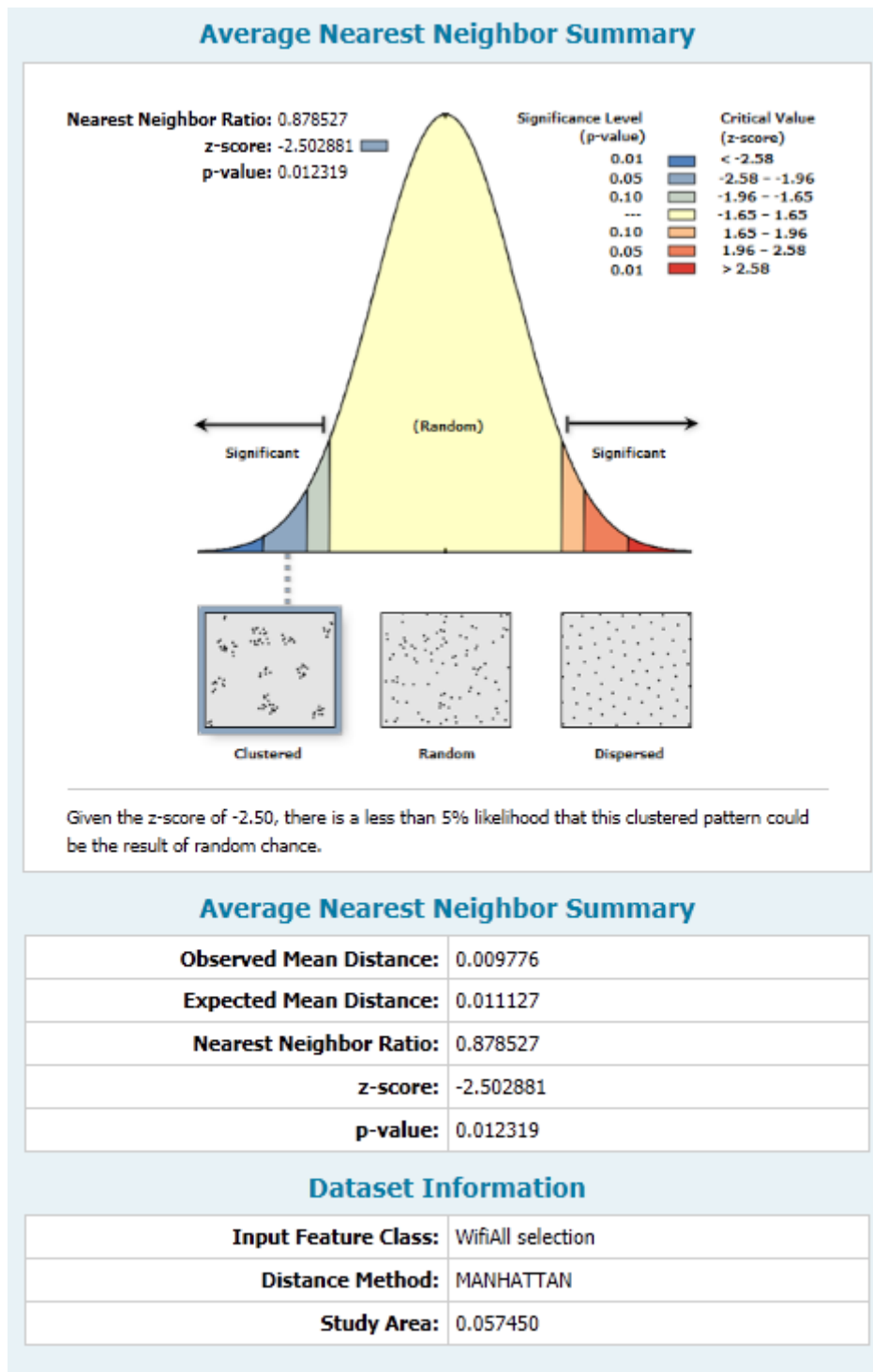
source: nycwirelss.net, NYC DCP 2013

Conclusion

Conclusion

Online participatory tools are becoming ubiquitous in society and it offers the hope for fast, wide-ranging democratic participation. Urban planners should naturally be interested in these new technologies considering the duality of their technocratic and advocacy planning histories. While information communication technologies have made participation easier, understanding the populations that get heard are being critically examined. Online surveys are a great tool that expands the previous door-to-door and telephone surveys of the past, there is no question that this type of participation collection will become the norm for institutions.

So far, researchers and practitioners have learned that access to the Internet can be pricey and providing routes to those who cannot afford the hardware can have dire consequences. The Internet while seemingly intangible relies on physical networks of wires to transmit data at rapid speeds. Denser areas are much more cost effective for installing these networks to distribute broadband because of the return on investments are typically higher than rural locations. While New York City is quite dense, there are many parts of the nation that face these problems of access to the network and even the City has locations that are not yet equiped to join the network.

Access alone is not the only problem when confronting issues of online surveys for equitable public participation. Many lack the education and the prior knowledge in the technologies to engage in public discourse. Public Libraries not only offer the dual roles of being a top ten Wi-Fi hotspot provider in New York City, but as access points for free instruction and proprietary materials. The public library has also been the beneficiary of federal funds from the American Recovery and Reinvestment Act, and is trying to keep up with the current digital demand. The public library sysetm can be seen as a beacon of equal Internet access to New York City residents.

Public libraries have been well documented as an equitable provider of many services to a community. This study found that Seward Park Library, and Chatam Library in Manhattan were highly utilized by the community. The NYPL system offers the traditional collections of bound literature, but is increasing the availability of digital media, free classes, and Internet access to the community. Researchers have concluded that metropolitan areas benefit from libraries because proprietary materials are still too expensive for mass consumption, and libraries are important portals in to the Global Information Society.

The major demographic groups that are using Internet-ready mobile devices and accessing the Internet on a daily basis are those of higher incomes and higher educational attainment. The vulnerable populations that researchers have identified are the groups that are currently not given enough avenues for public participation such as those who may not have access to the internet. Online surveys will become equitable when every person is given the same opportunities to participate.

Recommendation

A few recommendations come from this study. First, free Wi-Fi transmission infrastructure should be distributed more evenly. Organizations like NYCwireless are working with city government agencies like the Department of Parks and Recreation to bring Wi-Fi to public spaces such as city parks.

More funding should be put into community facilities. Public libraries currently offer classes where patrons can have access to computer classes and tutorials. Education and the computer knowledge has been another barrier to entry for technological applications. Other community facilities can offer computer instruction to community members. Instruction is one way to grant access to participation but hardware barriers also exist.

Funding can come from different levels of government and private institutions. The public libraries have been selected for grant funding from the federal government to increase computer classrooms and machines across the City. New York City also received state funding for broadband infrastructure to increase their fiber-optic network to provide faster Internet speeds. These government funded programs help to strengthen communities with physical portals to the Internet and the improvement of the existing networks. Public-Private partnerships can also help bridge the physical digital divide providing infrastructure to grant access.

Interactive websites alone are not a viable way to reach the population for their participation. Research has shown that mobile devices are being adopted much quicker than broadband Internet. Mobile participation applications should be developed and will be a key tool for public participation and civic engagement in the future.

Limitations

Some of the limitations of the study come from data issues. First, public library usage for public participation is not measured. Libraries could collect data on its patrons and their web usage. While it may not be a popular notion, the data we have aggregated just give a brief insight into what patron behavior could be in the libraries.

One of the major limitations of the data came from PlaNYC 2030 data and the lack of geographic identifiers. The data from PlaNYC was anonymous and no logins were required for people to participate in the online survey. The participant population because of the openness of the survey does not necessarily restrict users to be living in New York City. While this is great because former residents of New York City who may feel particularly vocal about policy issues, users who are not aware of New York City issues also have the same weight in participation.

Another issues with the PlaNYC data were the distinction between mobile and personal computer participation. These types of data whether a participant is using an internet-ready mobile device or not could help inform the organizers to the population. As the study made a distinction between wireless telecommunications and wireline infrastructure, there are many free Wi-Fi locations and a distinction between growing populations of mobile and hard-wired service can inform planners about the digital divide.

Along the lines of missing data from the PlaNYC 2030 survey, demographic data could also make the survey more equitable. By monitoring the demographic data of the participants, over representation of specific groups such as gender and race can be quantified.

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