The Role of Civic Technology in Facilitating Citizen-Government Engagement
A Study of NYC311

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By

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Abstract

NYC311 is a customer relationship management tool that connects citizens to local government agencies whereby citizens access information and submit requests. Government agencies perceive NYC311 as primarily a request management platform that supports service delivery. Though the tool generates data that expresses community needs, it does not necessarily influence strategic agency initiatives. The extent to which this dataset represents community needs as compared to Community Board Budget Requests shows that while there are limitations to representation, 311 is filling a communication gap by providing a low barrier of interaction between citizens and their government. This paper concludes that despite government agencies' perception of NYC311 and the deeper representational challenge communities face, 311 has the potential to increase civic engagement through a reconceptualization and redesign of the tool.

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Introduction

There is a wide held belief amongst city officials and urban planners that technology can improve citizens' connection to their government. NYC311 is a customer relationship management technology, launched in 2003, that has enabled citizens to connect with their governments by accessing information and submitting service requests 24 hours 7 days a week. It has facilitated citizen-government communication by leveraging ICT[1] innovation such as customer management software, smartphones, and smartphone applications. The service functions as a consolidated communication tool where citizens can access any agency on one platform or through one number. The new lines of communication between both parties brings up questions of the impact on agency service delivery as well as a consideration of what this data can tell us about civic participation.

The tool is predominantly used to streamline government service delivery and balance information asymmetries by providing easy information access. As part of the shift towards e-governance that began in the 1990's, 311 enabled a more consolidated way of accessing city services. The strategy was one of the ways that local governments were improving internal efficiencies by leveraging private sector technology innovations. The service not only benefits city agencies, it also generates a dataset that tells us something about a community's needs. It is made publicly accessible as part of NYC Open Data Initiative. The representation of this data asks us to consider how the

[1] ICT: information and communication technology.

needs expressed through this interaction differ or align with those expressed through more participatory means.

The data generated from the service can be used in a variety of ways. Agencies use it to provide their services and information to the general public. But they can also use it to generate new insights and potentially predict where issues will surface. These possibilities are based on how agencies conceptualize the data. Numerous questions arise about its potential and use: Does it carry the same weight as other forms of information? How does quantity of requests factor into greater agency strategies? What role does this data play in city building? Examining the relationship of this data and its role in greater decision making processes can generate new understandings of its value.

While the service has benefits for city agencies, this digital interaction between government and citizens draws questions about its role as a civic participation tool. The request for service delivery or information from the government is an expression of civic agency. Civic engagement scholarship largely deals with voting, collective action, and participation in organizations. Requests for public goods or agency service delivery is categorized as government and administrative services. It often does not rise to the level of an act of civic engagement. However, scholars have introduced the concept of monitorial citizenship as a form of civic engagement that encompasses more passive activities such as requesting services and submitting complaints.

In an effort to answer some of these questions, this research aims to examine how the increased amount of citizen data impacts city agency processes and higher level strategies. It also compared 311 data with NYC's Community Board Statement of Needs

to understand how the two engagement processes may differ or align. Finally, it analyzed the design of 311 as a service through the lens of Empowerment Design Principles. These include being inclusive at every stage, giving users agency, providing opportunities for reflection and discourse, fostering and respecting communities. These principles are derived from Feminist Human Computer Interaction theories that argue for different design paradigms. These principles propose a more user and community oriented process of designing civic technologies as opposed to a more bottom-line and efficiency oriented model. This paper speculates that NYC311 has the potential to incorporate elements and principles into its design that would raise it to the level of a civic engagement tool.

Background

The first 311 service was launched in 1996 by the city of Baltimore with the support of a federal grant. It was proposed as a response to the overwhelming amount of non-emergency calls to 911. The success of this pilot was immediately evident and the number was nationally reserved for police departments as a means to redirect calls. Since then, the service has launched across all major cities in the US and has expanded in its channel offerings. The expansion was due in part to the rise of social networking sites and the need to reduce costs of call center staffing. (Rao, B.) The service is considered an integral part of city technology and continues to be integrated into governing infrastructure.

NYC311 was launched in New York City on 11 March 2003 under Mayor Michael Bloomberg. With the mission of making government more efficient, Bloomberg used data and technology as a tool of change. NYC311 was the administration's first technology project. The process included consolidating over 40 call centers from dozens of agencies. Though it was no easy task, the outcome was considered a success. (Gilsinan and Stepan, 2014) The demonstrated successful outcomes of the customer management service led to its adoption in over 300 cities in the U.S. (Newcombe, 2014)

While the focus was primarily about process efficiency and accountability, the service was also a means for citizens to have their voices heard and represented. The tool became considered a communication bridge and an integral part of city services. The dataset was made publicly available and is used in efforts ranging from citizen advocacy to academic research. It has served a crucial role during numerous disasters and emergencies, helping agencies direct resources where they are most needed. (Rao, 2008) The role it plays in adding value to agencies and citizens is examined in this paper.

Literature Review

NYC311 is a Customer Relationship Management service, and research in regards to its outcomes is primarily covered by government administration, urban analytics, and human computer interaction journals. The research focuses on its effectiveness as an e-governance tool in relation to improved service delivery. Use of the data has been effective in supporting sociological research on demographic inequities as well as providing new ideas on how to generate predictive models to support municipal service delivery. A more recent line of inquiry pushes on the opportunity for this service to be reconceptualized as a vehicle for increased civic engagement. This paper aims to build on the recent scholarship that categorizes the service as signifier of civic participation and trust in government. It also draws on findings that suggest ways to improve the design in order to increase civic engagement.

The digital transformation in governance aimed to revolutionize how government functioned by streamlining processes using the latest in digital technologies. Though many processes have been digitized, their outcomes are still being studied. Customer relationship management tools have been adopted throughout cities in the US because they improve service delivery. (Layne and Lee, 2001) While they have been traditionally categorized outside of the realm of civic technologies and tools for engagement, that conceptualization is changing.

Gilman defines civic technology as “leveraging digital tools to improve democratic governance toward more transparency, inclusion, and participatory outcomes.” This definition broadens the view of civic technology past smartphone

applications to include other interactions that facilitate the outcome of democratic governance. (Gilman, 2016) In Robertson's foundational text, civic technology is defined as "grassroots, citizen-inspired technology development for civic purposes." Graeff uses the broader definition "the use of technology for the public good" in his analysis because of its ability to account for historical and cultural context in its vagueness. (Graeff, 2018) My work will utilize the latter definition as it is broad enough to include the NYC311 service. As a civic technology NYC311 can facilitate increased civic engagement.

Civic engagement is defined as participation in both non-electoral activities, such as memberships in special interest groups, and electoral activities as well as exercising one's political voice through engaging in political actions. (Robertson, 2018) Mossberger et. al. define civic engagement as consisting of political interest, discussion and knowledge. NYC311 can be considered monitorial citizenship, a form of civic engagement. Erhardt Graef defines monitorial citizenship as "a form of civic engagement in which people collect information about their surroundings or track issues of local or personal interest in order to improve their communities and pursue justice."

Civic engagement is an expression of our democratic rights and appears to be on the decline with the rise of digital and mobile technologies. (Robertson, 2018) However, Erhardt Graef argues that civic engagement takes on new forms in our digitally connected world. Namely, monitorial citizenship is the concept of citizens collecting and tracking information about their neighborhoods to change or improve them in

some way. Monitorial citizenship can include the use of technologies to facilitate the pursuit of collection, tracking, and reporting. Submitting a 311 request is an act of monitorial citizenship. This form of engagement existed prior to the adoption of CRMs since citizens could contact city agencies through a phone number, mailing address, or email. 311 consolidated those channels so that citizens didn't have to always know which agency would be most appropriate to contact. Now, an issue can be submitted quickly through one channel. While it's made a process easier for the end user, this design may not be conducive to a sense of civic responsibility or broader engagement.

Green argues Information and Communication Technology (ICT) services that function as a city-as-a-service model do not encourage civic engagement or participation. This mobile technology reinforces private models that evaluate success based on engagement that values quantity not quality and monitizes based on single transactions rather than continued engagement. The transactional nature of the 311 service reinforces privatized technocratic models of engagement, perpetuating the perception of the government as a service provider, rather than an entity to collaborate, deliberate, or co create with. It also reflects a shift towards an evaluative discourse based on efficiency, rather than empowerment or sustained engagement and citizen's agency development. Discourses on efficiency as metric for public services takes on the model of development in private enterprises. Other measures of success should be considered if these technologies claim to foster improved government-citizen relationships. (Green, 2019)

Besides the debate over the role of 311 in civic engagement, the dataset produced by the service has shown to be a powerful indicator of demographic patterns and viable for predictive modeling. Research has shown that the interaction of submitting a 311 request as political participation and a determinant of how public goods are distributed geographically. Levine and Gershenson argue that this representation can shed light on how different demographic groups request services. Their study found that requests are less frequent in neighborhoods with a high concentration of first generation immigrants. This showed that this uneven participation in the request for services is linked to uneven service provisions. This underrepresentation has broader implications for political incorporation of minorities and immigrants. (Levine and Gershenson, 2014) Other studies show that factors such as level of policing and fuzzy neighborhood boundaries also contribute to variations in requests. (Legewie and Shaeffer, 2016, Lerman and Weaver, 2014) Mossberger argues that these discrepancies have compounding effects on economic outcomes, especially for minority populations that are already at risk for reduced opportunities. Given that participation varies and disparities in access exist, researchers argue that governments can target policies and initiatives that decrease barriers to access. (Cavallo, Lynch, and Scull, 2014) A case study produced by Harvard Business School on the service showed that NYC311 and relevant stakeholders are aware of these challenges and are making efforts to address them. (Kontokosta et al., 2017)

Further research has demonstrated how the data can be used for predictive purposes. A study at NYU's CUSP showed that 311 data can be used to build predictive

models that can identify issues like building safety hazards and take proactive, rather than reactive measures. By building these algorithms researchers have also found great discrepancies in reporting based on demographic indicators such as race, gender, income and educational attainment (Kontokosta et al. 2017). Other studies show that data from 311 can be used to model various socio-economic features, which can be used by local stakeholders to predict socio-economic performance and to measure the outcomes of interventions (Wang et al. 2017). This has also shown to be very useful in understanding disaster response. With appropriate modeling, cities can leverage the insights from 311 data to improve their disaster resilience (Zobel, Baghersad, and Zhang, 2017). Overall, this data can be used as a proxy for neighborhood conditions and is very valuable for city agencies.

Recent research has been building on reconceptualizing 311 from a customer management software towards a co-production tool. Co-production is defined as "*...the intrinsic process of interaction between any service organization and the service user at the point of delivery of a service…"* and is considered a "valuable route to public service reform" and crucial in the effective delivery of public services as well as a means to increased public participation (Osborne, 2018). Other studies support the claim that NYC311 falls under this category and that it, by design, improves city processes by providing a faster and more convenient communication channel for citizen-government. It can foster a more engaged citizenry, but the limits of the digital divide bring up significant challenges for equal adoption by those who may need it the most (Clark, Brudney and Jang, 2013).

Given these considerations, 311 as a tool is a crucial component of city building and civic engagement. Therefore, evaluating its design can highlight some flaws as well as potential solutions. In Erhardt Graef's dissertation, the design of civic technology solutions largely follows a Silicon Valley model of evaluating success, where engagement is measured through clicks and passive forms of interaction. These transactional tactics largely fail to empower individuals or motivate them to take further action. If anything, 311 represents hyper local needs rather than collective requests. It does not inspire collective action. The transaction is independent of other aspects, such as agency capacity, the requests of other residents in the neighborhood, and greater planning and city building processes that are a part of the built environment. It is isolated from the larger process of city building where a host of stakeholders negotiate to achieve their varied goals. (Graef, 2018)

Other scholarship also makes a strong case for a shift towards a more citizen-centric approach that incorporates access and transparency into the design instead of an efficiency oriented approach (Layne and Lee, 2001). Moving beyond transactions and consumer insight can lead to a more co-production oriented model that fosters a more engaged citizenry (King, 2007). A service like 311 can benefit from providing their customers with operational transparency. Studies show that displaying when, how, and where government agencies addressed the complaint, improves engagement and trust in government. This feedback increases personal agency and boosts willingness to repeat engagement. Including this as part of the design can alter perception of governments and relationships between citizens and their local agencies

(Buell, Porter, and Norton, 2013). Other methods, such as incorporating elements of game play into civic technology and e-governance tools can also increase engagement, motivation, and civic learning (Hassan and Hamari, 2020). This paper aims to further speculate on design solutions that can address the challenges of increasing civic engagement through this technology.

Methods

To understand the relationship between 311 requests and how they are utilized within city agencies, two qualitative methods were used. In order to understand strategic agency goals as they relate to civic engagement and the use of 311 data, public facing agency documents were analyzed and interviews were conducted with city employees. To evaluate 311 as a civic engagement tool, both quantitative and qualitative methods were used. First, 311 requests were compared with Community Board Budget Requests. Second, a close analysis of the 311 service through Empowerment Design Principles critically analyzed the technology's design. These methods provided insight into how the service and the data collected from it is perceived by various city agencies, how the data compares to other forms of citizen information, and whether the technology itself is designed with principles that make up good engagement practices.

The NYC Department of Transportation was selected as the agency data to analyze because it has the third highest number of 311 requests after the Housing Preservation Department and the New York Police Department. Analyzing agency documentation provided insight into how the DOT considers 311 data as part of its long term strategy. The documents analyzed were the DOT Strategic Plan (2016) and the Mayor's Management Report (2017). The goal of the analysis was to gather the service delivery goals of the DOT, the metrics used to evaluate the strategies, and what efforts were used to include community inputs either from 311 requests or other means.

Structured interviews with city agency employees that work directly or indirectly with 311 requests provided agency perspective on the use of 311 data in agency

operations and in understanding community needs. City employees working at the Department of Transportation, Mayor's Office of Data Analytics, and the Department of Information Technology and Telecommunications were interviewed. The interviews served to better understand how the service is being managed and how it has changed over the years to support both agencies and citizens. It offered a crucial perspective in how agencies respond to and use citizen-provided information.

Quantitative analysis included using 311 DOT-specific service requests created between January 1, 2013 and December 31, 2017. This time frame was selected to reflect the administration shift from Mayor Michael Bloomberg to Bill De Blasio in 2014. An extra year prior and after the administrative shift was included to show any patterns. The data was downloaded from NYC's Open Data platform and analyzed in Python and Microsoft Excel. This data was used to gather how requests fluctuate year over year. Finally, the top 3 DOT requests from each community district in 2017 were isolated to compare to the top 3 Community Board Budget Requests from section 4.6: Transportation Needs and Requests for the relative community districts.

The Community Board Budget Requests are a charter mandated product that is put together yearly by each community board within all the boroughs. The requests are reviewed by the Mayor's Office of Management and Budget, and further discussed with city agencies and city council members. The Office of Management and Budget publishes the Register of Community Board Budget Requests for the Adopted, where information on how the budget is applied can be found.

Comparing the top 311 requests for each community district to their respective budget requests showed any alignment between the two methods of requesting city services. Budget requests are an outcome of a much longer process and provide an, arguably, unified vision of community district needs, whereas 311 requests reflect independant and highly localized needs. They are also determined by the agency, so the end user has to make a predetermined selection and any additional details that they provide are not aggregated in the same way as a budget report that reflects a deliberate process of prioritizing and collecting community needs. This comparison can shed some light on how 311 information does or does not align with community needs as expressed through a formal community board process.

Finally, a close analysis of the 311 service through the lens of Empowerment Design Principles evaluates whether the technology is designed in a way that can facilitate civic engagement. The principles draw from Feminist Human Computer Interaction theories that argue for designing civic technology within this framework. They guide technologies to be built for end goals that are different from the efficiency model. They ask that we build things under four principles; be inclusive at every stage, give users agency, provide opportunities for reflection and discourse, foster and respect communities. Graef argues that success metrics of civic technologies such as 311 should be based on a model of Empowerment Design Principles, rather than a Silicon Valley based model of success. While NYC311 is mostly evaluated based on response call times, analyzing the service through these four principles can help us critically assess

where this technology stands in the civic engagement realm and whether there are opportunities to improve it based on these principles.

Results

NYC DOT 2016 Strategic Plan

The Department of Transportation's 2016 Strategic Plan outlines its vision for a New York where transportation is safe, equitable, and environmentally friendly. The primary goals are an increase of traffic measures that improve safety, an expansion of cycling infrastructure, an expansion of bus service and increase in speeds, and maintenance of road infrastructure to support the improvements.[2] The plan addresses the need for improved monitoring of street and bridge conditions through the use of sensors. It also acknowledges the need to improve transit choices for underserved communities.

Part of the plan also places emphasis on increased public engagement by increasing public awareness through social media content, continuing project based outreach, a Street Ambassador Program, and expanding project feedback portals. The expansion of DOT's online presence through promotion and video content reflects an expansion in the communication strategy. Their Street Ambassador Program aims to create mobile information stations to solicit ideas and input from the public. Their project feedback portal provides an interactive experience where anyone can receive information or make a suggestion regarding an upcoming DOT project. The plan also includes a continued response to 311 requests, though it does not specify a strategy for this communication channel.

[2] https://www1.nyc.gov/html/dot/html/pr2016/pr16-090.shtml

The inclusion of a public engagement effort in DOT's strategic plan does suggest that interaction with residents is a priority. The efforts made and resources allotted to participate in community board meetings, hold community events regarding upcoming projects, invest in online communication tools, and create portals that allow the public to make project suggestions are all active ways to solicit feedback and open up communication channels. While evidence of these efforts exists, the outcome of the communication is not documented. Information exchanges are happening between the DOT and the public, but the influence on agency processes and decisions is unclear.

The Mayor's Management Report (2017)

The Mayor's Office of Operations releases a yearly report mandated by the City Charter that holds agencies accountable for their progress. It is a publicly available report that presents self-reported metrics from all city agencies. Its goal is to measure agency efficiency and provide a level of transparency that can enable democratic forms of accountability. Both the DOT and DOITT are included in the report. Their metrics reflect their respective agency goals and responsibilities.

The DOT's outlined goals in the 2017 report include infrastructure maintenance, safety, expanding transportation alternatives, public space, and timely project delivery. These goals are consistent with those outlined in the 2016 Strategic Plan. The metrics used for 311 calls measure response times for the requests and are not a separate category. They are categorized under the timely project delivery goal. There is mention that decreased calls for certain services was likely due to sustained repair.

Agencies such as the DOT include their 311 response time metrics within the Mayor's Management Report. Though there is no insight into the process of prioritizing the requests, these requests reflect the top DOT requests that 311 receives. The type of "first action" included in this metric is not defined, therefore it is unclear whether the measurement is of a general response or a problem resolution. It should be noted that the metrics associated with 311 requests such as street repaving and pothole repair, are closely monitored and included in the report.

	Actual					Target		Trend	
Performance Indicators	FY13	FY14	FY15	FY16	FY17	FY17	FY18	5-Year	Desired Direction
Percent meeting time to close - Street Condition - Pothole (30 days)	100%	97%	98%	100%	100%	98%	98%	Neutral	*
Percent meeting time to first action - Street Light Condition - Street Light Out (10 days)	99%	93%	99%	98%	98%	98%	98%	Neutral	*
Percent meeting time to first action - Traffic Signal Condition - Controller (0.1 days)	71%	72%	73%	74%	75%	80%	80%	Neutral	*
Percent meeting time to first action - Street Condition - Failed Street Repair (10 days)	90%	92%	92%	92%	89%	85%	85%	Neutral	*
Percent meeting time to close - Broken Muni Meter - No Receipt (14 days)	47%	96%	98%	68%	92%	90%	90%	Up	*
★ Critical Indicator "NA" Not Available ⇧⇩ Directional Target * None									

Mayor's Management Report, 2017, Department of Transportation: Goal 5a, Agency Customer Service

	Actual					Target		Trend	
Performance Indicators	FY13	FY14	FY15	FY16	FY17	FY17	FY18	5-Year	Desired Direction
★ Average time to respond to high priority traffic signal defect and make safe (hours:minutes)	NA	2:05	1:47	1:50	1:47	2:00	2:00	NA	Down
★ Average time to repair priority regulatory signs after notification (business days)	2.2	1.8	1.8	1.8	1.7	3.0	3.0	Down	Down
Average time to repair street lights - by DOT (calendar days)	2.7	2.5	2.3	2.9	3.0	*	*	Up	Down
Average time to repair street lights - by ConEd (calendar days)	14.1	14.9	15.6	14.4	14.3	*	*	Neutral	Down
★ Critical Indicator "NA" Not Available ⇧⇩ Directional Target * None									

Mayor's Management Report, 2017, Department of Transportation: Goal 1c, Ensure timely Repairs of the City's street lights, traffic signs and signals

Interviews

Four interviews were conducted with employees of the Department of Transportation, Department of Information Technology and Telecommunication, the Mayor's Office of Data Analytics, as well as an academic researcher specializing in city technologies. The interviews were structured and included follow up questions to any responses that were unclear or relevant to the research question. The DOT and DOITT both have dedicated teams that focus on the 311 service. These teams manage the Customer Relationship Management systems and monitor requests. They ensure that the technology is working well for the citizens and the agencies.

The Department of Transportation and Department of Information Technology and Telecommunication work closely together to ensure that the requests accurately reflect the needs of the units in the Department of Transportation. Those requests are often based on priorities or larger projects and initiatives that the agency is working towards. If there are any changes that need to be made to a request ticket, both agencies work together to make the change accurately reflect the task. The two agencies work together closely to understand how 311 can best support the service delivery teams. A specialized team monitors any significant changes to the request rates. Collaboration between both teams is high to make sure that the requests are up to date and accurate.

Both the DOT and DOITT expressed a commitment to improving the 311 technology. DOITT is aware of the potential differences in access and equity of use as well as technological barriers. They consistently work to expand on and improve the way constituents can access the service. Expanding the channel offerings was a way to

make the service more accessible. If there is a continuous request that does not fall under any agency's responsibility, DOITT has escalated the issue so that agencies decide amongst themselves who will take responsibility for it. The agency also works on improving the feedback component of the experience, where a user can more actively track the status of the service request.

The DOT works with communication teams to promote the 311 service and has reached out to community boards in the past to encourage its use. Information within requests is also parsed through to make sure that they are not missing another type of request that a user may want to make, but does not have the option to. Both agencies acknowledge that if a lot of requests about a particular problem get made, it sometimes gets added to capital budget requests. While that decision largely gets made in conjunction with many other processes, the requests themselves are taken into account to some degree.

A representative from the Mayor's Office of Data Analytics shared the ways in which 311 data is used by agencies to understand what residents are asking for. The dataset is the only one of its kind that is bidirectional and consistent. One of the city's oldest data sets, it's effectively used as a great starting point for research or any kind of questions that citizens or agencies have. Since it's not subject to agency data formats, this makes for easier and efficient analysis. It represents both what the agency's services are and what citizens need most. While it is an effective way of understanding some citizen needs, it is by far not the only way nor is it considered ground truth. Agencies do

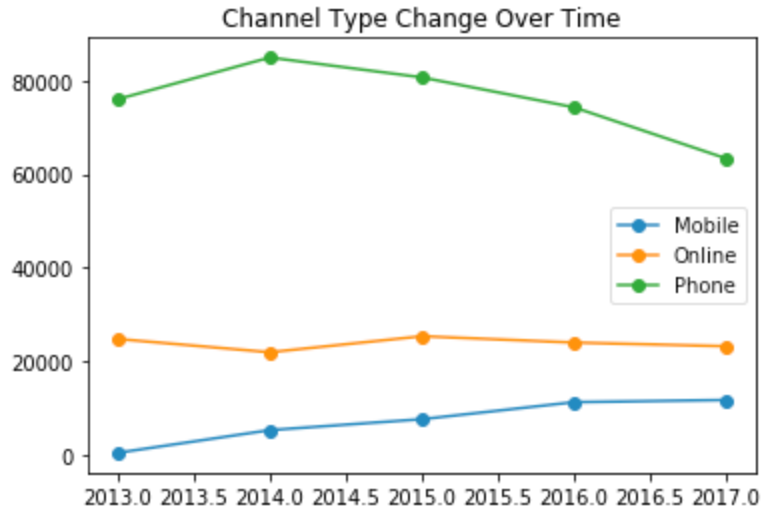
their due diligence to use other factors, metrics, and processes when making decisions. NYC 311 is simply a starting point.

An academic researcher that focuses on the subject of city technologies was interviewed to offer a critical perspective on NYC's 311 service. Their perspective challenged the idea of 311 as a civic engagement tool and argued that it primarily functions like an IT ticket would in a private company. The requests are highly individualized, hyper-localized, and fit within very specific request constraints. These constraints prevent dialogue and do not foster civic relationships between citizens and government agencies. Questions of how the service fit into the larger framework of civic engagement were raised.

Data Analysis: Borough Statistics

Between 2014-2017, there were a total of 1,574,976 DOT 311 requests; this includes 13,372 "Unspecified" requests. Brooklyn, Queens, and Manhattan had the largest percentage of requests. While Staten Island had the highest per capita rates, Queens had the second highest rate, and the Bronx had the lowest. After 2015, the number of requests decreased in each borough, but 2016-2017 saw a small increase in Staten Island and the Bronx. The overall decrease is likely to be due to the increase in resources dedicated to street repaving which was outlined in the Mayor's Management Report. The majority of requests still come in through calls, but an increase in the number of web requests is significant. Mobile requests are still much lower than other channels, likely due to the length of time the app has been available.

	311 DOT Requests	Population	Per Capita
BROOKLYN	447000	2,600,747	0.17
QUEENS	467105	2,298,513	0.20
MANHATTAN	284321	1,632,480	0.17
BRONX	211424	1,437,872	0.15
STATEN ISLAND	124754	474,101	0.26



Data Analysis: Community Boards

The top three complaints in each community district in 2017 were compared to the top three budget requests in the Transportation Needs section of the Community Board Budget Requests. The number of community districts that had 0,1,2, or 3 matches between the 311 request categories and budget requests are represented as a percentage of the total community districts. In Manhattan, 58% of community boards (7/12) had

only one budget request match with a 311 request category. In Brooklyn, 50% of community boards (9/18) had only one budget request match with a 311 request category. In the Bronx, 50% of community boards (6/12) had two budget requests match with a 311 request category. In Queens, 57% of community boards (8/14) had only one budget request match with a 311 request category. In Staten Island, 67% of community boards (2/3) had only one budget request match with a 311 request category.

Brooklyn and the Bronx have the highest number of community districts that have two budget requests that match with 311 request categories. The Bronx and Queens are the only boroughs that have any community districts whose top three budget requests match up with the top three 311 requests. All boroughs, except for the Bronx, have the majority of their CD budget requests match only one 311 request category.

Borough	**0**	**1**	**2**	**3**	**Total # of CDs**
Manhattan	2/12 (17%)	7/12 (58%)	3/12 (25%)	0/12 (0%)	12
Brooklyn	2/18 (11%)	9/18 (50%)	7/18 (39%)	0/18 (0%)	18
Bronx	2/12 (17%)	3/12 (25%)	6/12 (50%)	1/12 (8%)	12
Queens	0/12 (0%)	8/14 (57%)	5/14 (36%)	1/14 (7%)	14
Staten Island	0/3 (0%)	2/3 (67%)	1/3 (33%)	0/3 (0%)	3

Empowerment Design Principles

NYC311 can be evaluated based on the four Empowerment Design Principles; be inclusive at every stage, give users agency, provide opportunities for reflection and discourse, foster and respect communities. A critical analysis of how these principles are or are not embodied through the service can help evaluate current or potential design improvements.

I. Be Inclusive at Every Stage

"Inclusion and pluralism must be a goal of not only the technology but also of the technology's design process." (Graef, 2018)

A user centric design process is one where the designers and users are collaborators and co-producers. During each stage of a democractic design process, users not only provide feedback, but also offer ideas. This dialogical process is time consuming and often, contentious. However, processes that include the community as part of their design show improved product quality, at least in the private sector. Public sector technology has not gotten there yet, though participatory planning has been a theoretical framework coined by Sherry Arnstein's work, A Ladder of Citizen Participation. Participatory planning, though, is a much more engaged and long term process than designing technology.

It is likely that communities were not engaged when designing the 311 service. The tool had three goals; make agencies more efficient, establish a more effective communication channel between citizens and government, and hold agencies

accountable. The process was a concentrated effort in consolidating the dozens of support structures that each individual agency had set in place. The stakeholders in this case were city employees, not the end user. However, over time, the service expanded to channels in order to make the service more accessible.

Since 311 falls under the category of monitorial citizenship, Cesar McDowell argues that this process has to be inclusive and pluralistic. Everyone should feel that submitting a 311 request is possible for them; this means that they hold the belief that they are capable individuals and that their contribution is valuable and will not cause them any harm (such as through anonymity or discriminatory targeting), and that they know that their action is possible because there are no technological or other barriers. (McDowell, 2016)

Unfortunately, it is hard to assess whether all types of populations use 311 because it does not collect that data. A recent study did show that those less likely to call 311 live in neighborhoods that tend to have more minorities, men, and a greater percentage of foreign born.(Kontokosta, 2017) This challenge depends on other relationships of isolation and exclusion from political and civic processes through historically exclusionary means. Communities of color are underrepresented in politics, and in their community boards, which serve as representations of hyper local government.

Despite the diversification of communication channels, there may always be someone that the 311 service cannot reach. Since 311 does not conduct any outreach efforts to make residents more aware of the service, it mostly exists as a technology that

residents are or are not aware of. By diversifying its channel offerings, NYC311 is surely expanding its ability to be inclusive. The service can be more user centric by requesting feedback from users about their experience. Expanding awareness of 311 can also be an ongoing effort, though it is not a mandate. This feedback could be used to find ways that the app can become more inclusive.

II. Give Users Agency

Giving users agency means to enable them to choose their own problems or their own solutions. Many technologies are built to support the bureaucratic process rather than the end user. In the 311 request flow, users are presented with a decision tree to ensure that their requests are directed to the right agency. This process enables the user to specify exactly which problem they want to report. In most cases, if a user cannot select a request from the decision tree, there is no "other" option. This suggests that the service requests are designed to include what city agencies are responsible for. NYC311 has provided numerous communication options for the one-off requests; Facebook and Twitter are both monitored accounts that respond to inquiries that do not fall within the categories of a service request.

Not all requests are treated equally. Those that have more pressing outcomes or may require more substantial involvement, such as unsanitary shelter conditions require the user to include their contact information and name if they want to follow up on the request. Most other requests are anonymous to preserve the safety of their users. The variety of channels that NYC311 is available in enable users to have agency in how they

want to communicate their problem, even if a formal service request can occur only through the website or mobile application.

III. Provide Opportunities for Reflection and Discourse

Enabling inclusion and agency are preliminary requirements to reflection and discourse. While NYC311 has bridged the communication gap between agencies and residents, the service request process does not offer opportunities for reflection. Each request generates a reference number used to track the request status. This functions as the only other interaction between the user and the agency. The request is not placed in the context of agency goals or community goals. In the broader discussion of civic participation, there is an opportunity to connect this request to larger community needs. This sense of communal priorities or systems can generate feelings of inclusion and belonging that this transaction is a part of.

Discourse and deliberation in democracy means engagement in the process of policy and decision making. In the case of NYC311, while the technology is accessible to everyone, the outcomes of the interaction between the citizen and the agency have no further interaction other than the submission and follow up of a request. While agencies create strategic plans and use this data to improve their processes, citizens may not necessarily engage with that process past the point of submitting the request. Though 311 is considered one strategy that an agency like the DOT uses for civic engagement, it is not considered a technology that facilitates or leads to dialogue, neither from the end user nor the agency. Evidence of this is in the way the CRM is designed; after someone submits their ticket there is no other communication about the tickets influence on city

agency processes or outcomes in the built environment. This transaction currently does not function as a gateway to other modes of participation.

IV. Foster and Respect Communities

By creating opportunities for users to connect with their neighbors, apps generate the possibility of civic engagement. People are more likely to participate in a social cause or a political movement if they have social ties to others interested in the activity. (Skocpol T. et al, 1999) It's important to note that NYC311 was not designed as a tool for community development. A user cannot create a profile, nor get a sense of the kind of requests happening in their area. They don't receive information on other, more involved actions they can take related to various issues. Promoting a more engaged civic body is not a primary goal of NYC311.

The process of submitting a request is hyper local, and hyper individual, where the request is not connected to greater community needs or city agency strategy. For example, the goals of New York's Department of Transportation pertaining to Vision Zero are not necessarily expressed in the service request flow. Users are not mobilized to support efforts or express particular kinds of requests. Though the technology and the data can be used to foster a sense of community through a desire to make theirs better, this rests on many other factors such as the perceptions of city government users already have, the trust in government agencies, and many socioeconomic factors that contribute to participation.

Discussion

Agency strategy and use of 311 data

Agency strategy documents consider 311 a customer service technology. Their priorities and strategies for engagement are considered through other means such as community board presence and online communication strategies. The bridges between this customer service tool and communication strategies has not yet come to fruition or direct strategic planning. The data and the service is not linked directionally to engagement strategies. This is primarily because it has been, and is considered primarily a customer service tool.

The data gathered from 311 is relied upon in different ways for different agencies. An agency like the Department of Transportation greatly benefits from the citizen input. It is not the case that all agencies benefit in this same way, because of the nature of their services. In the case of emergency situations such as Hurricane Sandy, the requests serve as important data points for agencies to target service delivery. While the service is an important way of designating service delivery, the rate of that delivery often relies on other aspects such as budget or time constraints. The more available that the service becomes, the more requests come in, and the longer it will take to service them. The resources at city agencies do not necessarily increase just because request volumes do.

City agencies also use 311 data to support other endeavours such as research projects or processes improvements. The benefit of using this dataset in a variety of ways rests on its uniformity and longevity. Agencies can be sure that formats are

consistent and its age allows for time based studies. Though it may seem that the data can be used in endless ways, agency employees are aware of the limitations of the data set. It is not taken for ground truth but it is used as a starting point in answering various questions quickly. It is often used in conjunction with other datasets and decisions are made with the consideration of other knowledge sources.

Employees from DOITT expressed that equity was a consistent internal conversation. Those that manage the technology understand its shortcomings and are consistently aiming to improve access as well as user experience. Employees at the DOT also iterate on the content quality and options for the end users. Both agencies consistently evaluate how the service can better reflect agency services and be more accessible to a diverse citizenry.

Motivations of using 311 versus community board participation

The process of submitting a 311 request is different from submitting a Community Board Budget Request. The diagrams below describe the process and show that a 311 request can be a one time interaction with the 311 service based on a hyperlocal problem that is relevant for the individual. It can be argued that a problem that affects one person may affect many, but since it is usually in response to something going on in someone's environment, the problem is not communal. Of course, if many people call in about one particular problem, we can say that it does affect more than one person on more than one occasion. This gives the issue salience and potentially will be prioritized by the responding agency. The aggregate of an issue in a region can indeed

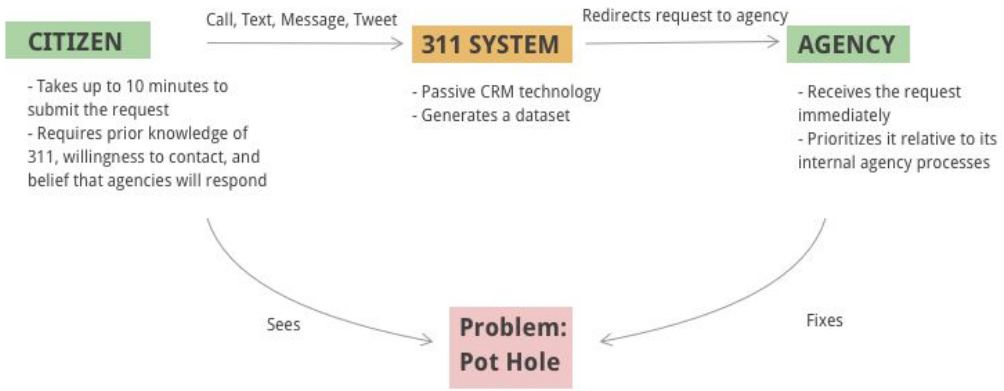
point to a greater communal problem. However, the individual does not receive information about this issue's salience.

While a pothole can seem like a more overt issue to complain about, a damaged sidewalk or a broken bike stand may get less attention, and some people may not know that they can report one or the other. Inherent in the request is what Levine and Gershenson refer to as “expectations of government service.” There is a perception that the particular problem can and should be solved by a government agency. If a resident has an understanding of what services their local agencies should provide, they will be more likely to use the service to request them. Expectations of service can differ based on a person’s history and experience with public service and their local government agencies. This perception determines who submits requests. The motivation to receive a service that is of need to them in a particular moment guides the request.

The action of submitting a request happens pretty quickly with a mobile device, phone, or computer. It may be an isolated request in time, a response to something rather than a proactive effort of negotiating multiple community needs with stakeholders. The only interaction it requires is with a phone operator, and even that is omitted by using the other channels. Such a communication channel expedites the process of resident feedback and requests.

Relative to the added layers of the Budget Request process, the 311 request seems simple and instantaneous. The outcome isn’t usually as simple as a pothole getting fixed as soon as the request comes in. The agency evaluates the complaint and sends a response based on their estimates of if, and when, the issue will be fixed. This process is

in and of itself complex and subject to the bureaucratic requirements native to each agency. It should not be underestimated, and we can speculate that this does dictate request outcomes and in effect, customer satisfaction or resident perception of the service.



The process of submitting a budget request is a long term engagement that is an outcome of extended community board deliberations and the creation of a document that is submitted to the Mayor's Office of Management and Budget. In this diagram, a resident that sees a pothole choses to join their local community board and become involved in the process of submitting a formal budget request. During this process, the resident may learn that they would have to participate in special committee meetings that focus on submitting this document. The document is an outcome of the many other community board meetings and discussions about what needs to get done in their neighborhoods. The motivation to engage in this process is the desire to more actively participate in their community. Alternatively, the resident may be wondering what the pothole on their street may have to do with the road maintenance as a whole in their

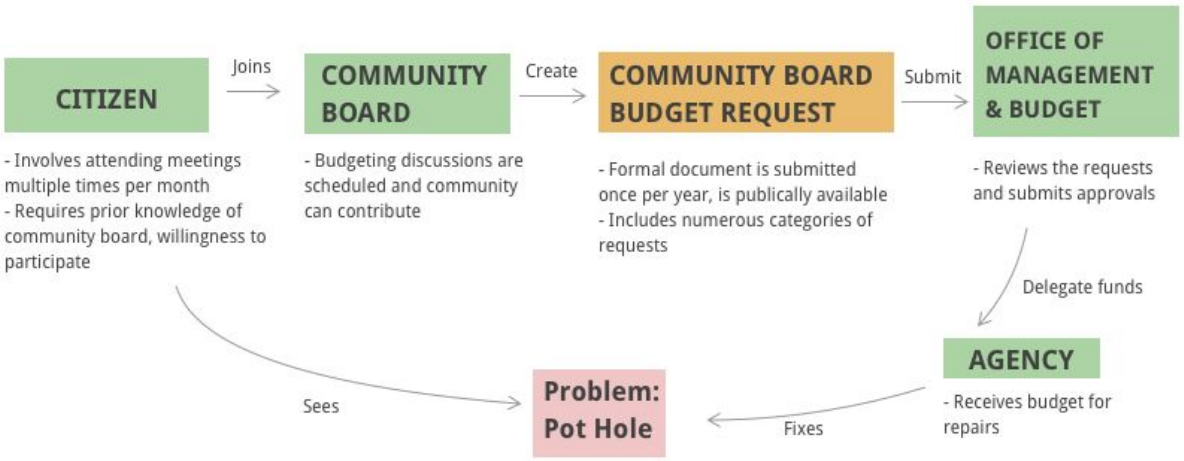
neighborhood. They may be curious about or knowledgeable of city agencies and as a taxpayer, understand that services are partially funded by this revenue. This very well may be the same level of knowledge that an individual that uses 311 instead has. But the difference is the desire and ability to participate in a process that is about broader community needs, not just individual ones.

Working on a budget request document requires an understanding of community needs, how to prioritize them, how to put together the document. There is likely a lot more complexity regarding prior histories of the community boards and their interactions amongst each other and the city agencies that they engage with. Knowledge of community needs requires some engagement and interest in the area outside of one's city block. Having a sense of neighborhood boundaries and broader community requests, or the ability to consider them, is a crucial part of the process. The process of budget approvals by the Mayor's Office of Management and Budget is another element that determines how certain projects or needs receive funds. If some communities are more adept at asking for additional services, they may be at a greater advantage than the communities that do not ask for more. This process, ofcourse, has historically been the site of tensions between communities and their governments. While the community boards are not special interests groups that protest, they can apply pressure to various levels to get service provisions. Those community boards with fewer resources and insight into this process may be at a disadvantage.

The major differences between these two processes are the level of engagement that a resident has with each as well as the motivations. However, inherent in each

interaction is the desire to engage with a government agency and participate in the city building process, though in different capacities. It can be argued that community boards can use 311 data to make stronger claims, or can use the service to gain increased exposure to a particular problem. The reverse situation can also occur, when a resident that has made previous 311 complaints decides to attend a community board meeting to escalate the matter to a broader audience that can provide greater support for the issue. While the motivations of a 311 call are highly independent of these broader processes, and differ vastly in effort, they are still an expression of civic action.

It can be argued that the budget allocations have more weight than 311 requests, and that would seem justified given the level of commitment and effort a community exerts on the process. However, 311 requests may be filling a very important gap in the city building process. Residents that don't expect government service, don't trust their government, or don't feel they have agency to engage in local affairs will neither attend community boards nor submit 311 complaints. This is a larger issue outside of the scope of this research. But community members that expect government service and have a sense of agency may still not partake in the community board process because of the barriers to entry. The brevity of submitting a 311 request may be just what they can contribute at that time. Therefore, these requests may serve as important indicators of the aggregate of everyday citizen concerns.



Limitations of data in representing community needs

The DOT Strategic Plan and the Mayor's Management Report both highlighted the breadth of agency responsibilities as well as their response to the city's needs. However, these reports don't distinguish between communities and neighborhoods since they primarily track agency service delivery. They function as agency accountability and transparency documents, written from the perspective of one agency. Therefore, it is challenging to conclude how the DOT goes about prioritizing its service delivery relative to the different neighborhoods, districts, and communities from these documents alone. It also doesn't directly outline how their efforts were included as part of a strategic plan. That process is complex and not the purpose of the documents that were reviewed.

Data analysis also cannot tell us the full picture of community needs. 311 requests can suffer from uneven call rates between neighborhood boundaries and demographic indicators. While we can't expect everyone to use a service in the same way, studies have shown that 311 use varies based on demographic data. In some cases,

communities with a higher percentage of immigrant households and minorities are less likely to use the service. Neighborhoods that tend to overreport have higher proportions of White, Asian, elderly, and married residents as well as higher incomes and rents. Call types can also differ based racial homogeneity of a neighborhood, with more homogeneous neighborhoods less likely to report issues such as noise. Other factors such as police presence can also show correlations to volume of 311 calls. Demographic factors may be an indicator that the data produced is skewed and cannot fully represent the realities on the ground. In interviews, city agency employees said that they were aware of this challenge and expressed that it is a strong consideration in the design of the service.

Community boards also have their share of representation issues. The demographics of community board members often don't reflect their districts (Mena and McGoldrick, 2019). For example, in Bronx CB11, 64% of board members are White, while that district's White population is only 22% (Smith and Choi, 2020). Demographics can also be strong indicators of community board resources. Boards in neighborhoods with higher levels of education and income may be better equipped to maneuver the dynamics of the city building process. They may have more access to information or social capital; key aspects that influence outcomes. The process of submitting the budget requests is complicated and can become political as districts either compete for budget allocations or for recognition. Since members are volunteers or appointed by the borough president, they are often not trained to understand technical documents, the city's finances, or even agency responsibilities. This

knowledge has to come from continued exposure, individual research, or as part of a civics curriculum. Participation in local government requires an allocation of time and effort that many residents cannot commit to. Therefore, some communities may be less equipped to submit budget requests that are representative of their needs due to this lack of representation or resources.

This research focused on exploring whether there was an alignment between 311 requests and community board budget requests. Though demographics were not a primary consideration when analyzing the similarities and differences, the limitations of both sets of data as flawed representations of community needs does bring up further questions. Does the combination of both data sets fill in the gaps of each? Or are the limitations of both of these data sets point to the differences in the findings between them? Does the fact that the Bronx had the highest level of matches between budget and 311 requests suggest that though their community boards may not be representative of their demographics, they are more aligned with individual requests? Or does it suggest that the same demographics that are more likely to report are calling in? Without knowing the demographics of each 311 caller, we cannot speculate on the meaning of the alignment.

Understanding the limits of the two datasets from a demographic perspective is relevant in the provision of services. Uneven distribution of city resources has compounding effects on neighborhoods that are already at a disadvantage. While they are not the only way citizens can request services, they are some of the primary means that residents can engage with city agencies. If these two methods of engaging with city

agencies put citizens in direct contact with the agencies that supply services, representation is of utmost importance.

Policy considerations

This research examined how 311 functions as an engagement mechanism between city agencies and citizens. While the outcomes of the research point to limitations of 311 as an engagement tool, these can be addressed with policy that repositions the technology as part of a broader engagement strategy. It is currently conceptualized as an efficiency tool, but can be reconsidered and redesigned to function in conjunction with engagement and communication strategies.

Along with reconceptualizing the role of 311, issues of representation need to be addressed since the trajectory towards a more technocratic government means that a percentage of the population will be left out. Engagement between city agencies and citizens cannot be improved or changed by technology alone. These changes have to come from the continued prioritization of participation. Underlying civic participation is the fundamental concept of trust. Trust and relationship building is a long term responsibility of the government.

In a technocratic city, using technology to offset some of the previous challenges may be an option. Issues of under or over representation can be alleviated by more objective condition monitoring from city agencies. Also, the technology itself can change to incorporate Empowerment Design Principles that facilitate deeper

engagement. These options should be considered in conjunction with other efforts, not instead of them.

Issues of under-representation in civic participation are covered by a breadth of research. Increasing engagement amongst minorities, immigrants and people of color is historically complex. Communities that sought representation were often excluded. While the majority of this research focuses on voting and political representation, research that covers government service requests is beginning to emerge.

Levine and Gershenson addressed the topic and outlined conceptualization strategies for the interactions between city agencies and citizens when requesting services. Their work supports the idea that making 311 more accessible will mean different things for different demographics. They defined that immigrant communities do not have the "expectations of government service" that is a prerequisite for participation, and African-American communities, as well as other minority groups, have "expectations of discrimination." While this suggests that some fundamental structural changes may need to occur before engagement changes, there are strategies that can offset some of these factors.

Changing expectations of government service and discrimination are outside of the scope of this research. However, the pursuit of continued research into perceptions of this service are strongly encouraged. In particular, funds should be allocated for DOITT or outside researchers to conduct a study on perceptions of the service. This research could inform more specific policy strategies that address uneven use. Alternatively, DOITT can create annual surveys that not only ask for feedback about the

service, but gather perceptions. The DOT currently performs a Citywide Mobility Survey, which serves as a good precedent for this strategy.

Changing agency-citizen dynamics is an ongoing process of trust and relationship building. A technology will not be the solution, but can buttress efforts and facilitate broader engagement programming. An increased goal of agency and civic participation is, to some degree, on the way. In 2019, a New York City Civic Engagement Commission was appointed after a November 2018 vote. This commission is responsible for promoting civic participation and advocating for under-represented New Yorkers. Currently, it's primary focus is supporting community boards, securing translation services at polling sites, and establishing a participatory budgeting program (Office of the Mayor, 2019). Including 311 as part of this engagement effort is encouraged, though prior reconceptualization of its role is a prerequisite.

In 2012, New York City Council passed a Transparency in Paving Streets Bill that required the Department of Transportation to provide the status of every street in the five boroughs (New York City Council, 2012). The database and map visualization includes when the street was last repaved, its condition, and planned projects (NYC DOT Map). This encourages more transparency and accountability from the agency. To further these programs and to circumvent the challenges of citizen reporting, the city can utilize sensor technology to increase monitoring efforts. This would provide a more technocratic approach, not subject to the range of participation biases discussed earlier. Increasing funding for connected sensor technology to monitor road quality would contribute to the ongoing connected road initiatives that cities are experimenting with

(MetroFocus, 2012). Using smartphones or remote sensors, agencies can expedite the monitoring process and even use crowdsourced data to gather condition information (Lillehaugen, 2016). The use of sensor technologies are another option that cities are moving towards in an effort to improve efficiency and increase accuracy of problem predictability.

Balancing under representation and surveillance in city monitoring are our modern day city building challenges. While this technocratic approach is an option, encouraging citizens to self report is a good use of resources, even with issues of under representation. Monitorial citizenship has opportunities for deeper engagement, even if it is not fully evident in 311's current design. It has the potential to stimulate other forms of participation if the design of the system is altered under the Empowerment Design Principles. One approach could be to alter the goal of the application from one that focuses solely on complaint intakes to one that has more engagement mechanisms, such as including a social component. There are mobile applications that already function this way, such as SeeClickFix, Colab, Citizen, and Nextdoor. While Citizen and Nextdoor lead with the social component, SeeClickFix and Colab are citizen-to-government engagement apps that focus on reporting problems and requesting services. Including these functionalities would require a larger discussion about how the technology interacts with the agency's broader vision of citizen engagement.

These policy recommendations and considerations are motivated by the limitations that this research highlighted. Though the aim was to gather how the 311 service fits into the civic engagement conversation, motivations reveal that the service is different to more traditional participation methods. However, further research into monitorial citizenship can be beneficial given that cities across the US are increasingly adopting Customer Relationship Management platforms like 311.

Embedding empowerment based design principles within 311

While 311 as a civic technology may not embody all the Empowerment Based Design principles, it functions primarily to support city agencies in their service delivery by making it easier for citizens to engage in monitorial citizenship. While both Graef and Green are critical of the kind of relationship this fosters in the larger scheme of civic engagement, individual participation in a *positive* low barrier transaction may make them more receptive to other forms of civic engagements, such as joining a community board meeting related to their request. The possibility of generating a relationship between citizens and the government can begin with a positive transaction.

If one feels empowered through a successful low barrier transaction, they may be more inclined and receptive to suggestions of other types of engagement, such as joining a community board meeting related to the request that they made. The reality of this possibility can be further researched, but this kind of pathway can be actively encouraged or facilitated through communication strategies. Whether or not this is a

priority of city agencies is based on larger priorities related to citizen participation in city building processes.

While the impacts this service has had on civic engagement is still an open question, the impact on city agency processes has been the main component of the service's success. All New York City agencies now use the software to provide information updates and enable service requests. Since 2003, the number of service requests increases yearly and the data gathered is made public. This breadth of information is processed by the Department of Information Technology and Telecommunications and responded to by the respective city agencies. Given this level of uniformity and communication efficiency, the question of why the service hasn't expanded beyond a customer service tool has to be raised.

Conclusion

The documents reviewed and interviews show that this service is primarily used by the DOT to support its service delivery efforts. The quantitative research points to more nuanced ways that the data aligns, to some degree, with community board budget requests. The critical evaluation of the tool's design also showed a lack of empowerment design principles. While this tool may be a form of monitorial citizenship in theory, empirical evidence from the agency perspective suggests otherwise. From my perspective, given the way that the data relates to budget requests, and its status as a digital tool, the possibility of expanding its capability beyond efficiency exists. It enables the individual to report issues that are local to their context and matter to them at the time. Citizens do not have to have a thorough understanding of how city government works in order to make the request. They also may not necessarily engage in other, more involved forms of civic engagement. While the data and service may not be fully representative of community needs or be designed to facilitate stronger engagement, given its widely adopted use amongst all city agencies, it is not only an important low-barrier option to have for citizens to make a request, but a potentially powerful channel for empowering its users. Digital tools can be amended to include functions that embody the empowerment design principles. However, doing so requires the expansion of government's definition and perception of the service as well as an active pursuit of a more user-centric and participatory experience.

APPENDIX

Interview Guide for City Agency Employees

The following questions served as guides for the non-structured interviews held with city agency employees and non-city agency employees.

1. Can you share the extent to which you work with 311 data?
    a. Do you work with the requests directly?
    b. If so, which requests? (Phone, web, app, or text)
    c. Can you describe how you prioritize the requests?
2. Can you share how your department uses 311 data?
    a. What particular requests does your department handle?
    b. How do you work with other departments or agencies
3. How do you handle different types of 311 requests?
    a. Do you have a method for handling 311 requests?
4. How does 311 data influence your work?
5. Has there been a situation where the information you saw in 311 data influenced any internal workflows?
6. How does your team prioritize these requests? Is the prioritization systematic or responsive to the data?
7. How do you share 311 data with other departments?
8. Has the use of the data changed over time? What has that change been based on?
9. How has the design of the service changed over time?
10. What is your position on engaging citizens? Do you see civic engagement as an important aspect of agency success?
    a. How has this position changed over time?

Interview Guide for Non-City Agency Employees

1. How do you work with 311 data in your current role?
2. How does 311 data influence your work?
3. How has the way you've used 311 data changed over time?
4. How do you think 311 data and the service is impacting civic engagement?
5. What do you think are the barriers to using the technology as a gateway to increased citizen participation?

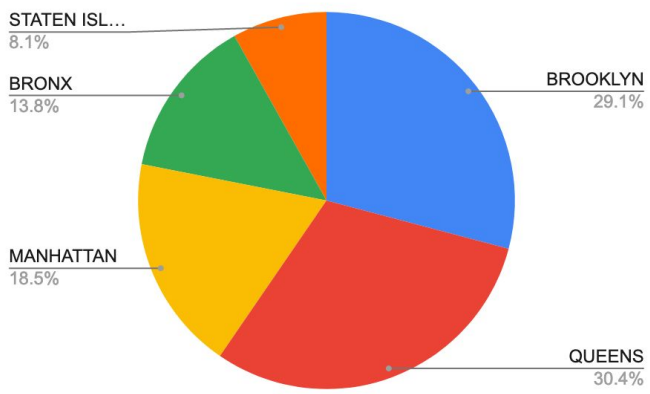


Figure 1: Percentage of 311 requests per borough, 2013-2017

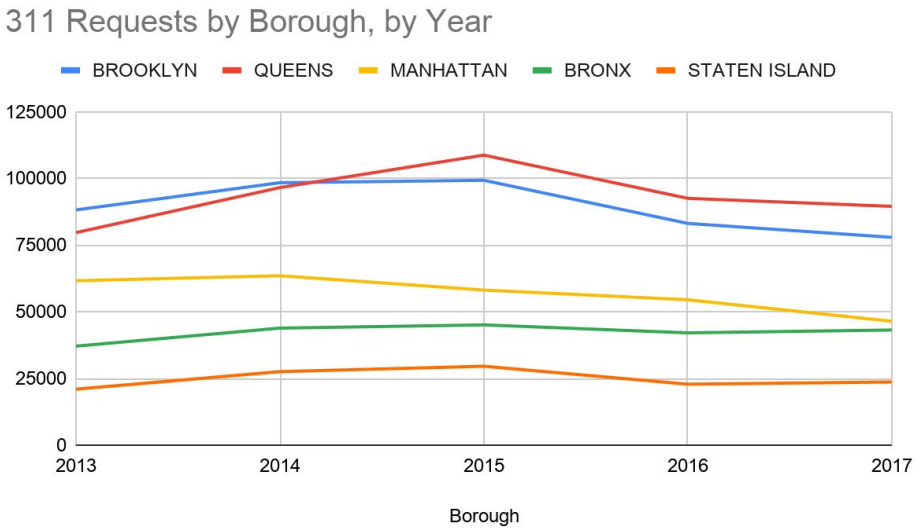


Figure 2: Percentage of 311 requests per borough, 2013-2017

	2013-2014	2014-2015	2015-2016	2016-2017
BROOKLYN	11.58%	0.91%	-16.28%	-6.27%
QUEENS	21.19%	12.59%	-14.90%	-3.25%
MANHATTAN	3.05%	-8.46%	-6.26%	-14.77%
BRONX	18.20%	2.75%	-6.61%	2.53%
STATEN ISLAND	31.26%	7.32%	-22.76%	3.70%
Unspecified	29.08%	-14.64%	6.69%	10.34%

Table 1: Percentage change in 311 requests by borough, 2013-2017

Community Boards	2013	2014	2015	2016	2017
1	3445	3051	2420	2731	2045
2	3576	4244	4335	4203	3262
3	3626	2464	3326	3647	2785
4	3029	2972	4072	2500	2585
5	5704	4954	5465	4682	3300
6	2757	2793	3341	2902	2353
7	4070	6311	3319	3585	3233
8	4051	4927	5218	5274	4187
9	1145	951	1144	1175	1169
10	492	1000	1256	1195	1139
11	697	1339	1723	1459	1174
12	1189	1935	2552	2748	1929

Table 2: Number of 311 Requests in Manhattan Community Boards, 2013-2017

MN Community District	2013-2014	2014-2015	2015-2016	2016-2017
1	-11%	-21%	13%	-25%
2	19%	2%	-3%	-22%
3	-32%	35%	10%	-24%
4	-2%	37%	-39%	3%
5	-13%	10%	-14%	-30%
6	1%	20%	-13%	-19%
7	55%	-47%	8%	-10%
8	22%	6%	1%	-21%
9	-17%	20%	3%	-1%
10	103%	26%	-5%	-5%
11	92%	29%	-15%	-20%
12	63%	32%	8%	-30%

Table 3: Percent change in 311 requests in Manhattan Community Boards, 2013-2017

CB	Top 3 DOT Requests		Top 3 Budget Meeting Requests	Matches
Manhattan				
1	Street Condition Sidewalk Condition Street Light Condition	711 305 258	Priority: Accessibility 1. Resurface Roads or repair Potholes 2. Rehabilitate Bridges 3. Install Streetscape Improvements	1
2	Street Condition Broken Muni Meter Street Light Condition	1364 507 418	Priority: Traffic safety 1. Resurface Roads or repair Potholes 2. Improve Traffic and Pedestrian Safety, including traffic calming 3. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads	1
3	Street Condition Sidewalk Condition Street Light Condition	1115 442 391	Priority: Accessibility 1. Resurface Roads or repair Potholes 2. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads	2
4	Street Condition Sidewalk Condition Broken Muni Meter	1509 392 335	Priority: Traffic safety 1. Repair or provide new street lights 2. Other transportation infrastructure requests 3. Reconstruct streets	1
5	Street Condition Broken Muni Meter Sidewalk Condition	1639 617 479	Priority: Traffic / traffic flow 1. Resurface Roads or repair potholes 2. Improve Traffic and Pedestrian Safety including traffic calming 3. Reconstruct streets	2
6	Street Condition Broken Muni Meter Sidewalk Condition	1332 355 208	Priority: Traffic and traffic flow 1. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 2. Upgrade or create new greenways 3. Repair or provide new street lights	1

7	Street Condition Sidewalk Condition Broken Muni Meter	1763 507 392	Priority: Traffic safety 1. Improve traffic and pedestrian safety, including traffic calming 2. Resurface Roads or repair Potholes 3. Provide new traffic or pedestrian signals	1
8	Street Condition Sidewalk Condition Curb Condition	1843 759 528	Priority: Other / funding for streetscape lighting 1. Provide new traffic or pedestrian signals 2. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 3. Other transportation infrastructure requests	1
9	Street Condition Broken Muni Meter Sidewalk Condition	537 170 169	Priority: Bus access	0
10	Street Condition Sidewalk Condition Broken Muni Meter	599 214 91	Priority: Traffic Safety 1. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 2. Other transportation infrastructure 3. Upgrade or provide new Bus Rapid Transit Lanes	1
11	Street Condition Sidewalk Condition Broken Muni Meter	563 206 132	Priority: Traffic / Traffic Flow 1. Upgrade or create new seawalls or bulkheads 2. Conduct traffic or Parking Study 3. Improve Parking Operations	0
12	Street Condition Street Light Condition Sidewalk Condition	879 271 261	Priority: Traffic / Traffic Flow 1. Other transportation infrastructure 2. Resurface roads or repair potholes 3. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads	2

BROOKLYN				
1	Street Condition Street Light Condition Sidewalk Condition	2021 1046 673	Priority: Traffic / Traffic Flow 1. Reconstruct Streets 2. Conduct traffic or parking study 3. Install streetscape improvements	1
2	Street Condition Street Light Condition Sidewalk Condition	1543 954 616	Priority: Bridge Maintenance 1. Rehabilitate Bridges 2. Install Streetscape Improvements 3. Reconstruct Streets	1
3	Street Condition Street Light Condition Sidewalk Condition	1199 1054 615	Priority: Roadway Maintenance 1. Reconstruct Streets	1
4	Street Condition Street Light Condition Sidewalk Condition	903 594 398	N/A	0
5	Street Condition Street Light Condition Traffic Signal Condition	1795 1083 401	Priority: Infrastructure 1. Road repair or resurfacing 2. Replacement of street lights 3. Signage replacement	2
6	Street Condition Street Light Condition Sidewalk Condition	1680 739 571	N/A	0
7	Street Condition Street Light Condition Traffic Signal Condition	1488 881 583	Priority: Pedestrian Safety 1. Repair or provide new street lights 2. Reconstruct Streets 3. Upgrade or create new greenways	2
8	Street Condition Street Light Condition Traffic Signal Condition	702 493 256	Priority: Roadway Maintenance 1. Repair or provide new street lights 2. Resurface roads or repair potholes 3. Transportation infrastructure (trench restoration)	2

9	Street Condition Sidewalk Condition Street Light Condition	708 567 442	Priority: Traffic Safety 1. Repair or construct new sidewalks 2. Improve traffic and pedestrian safety 3. Resurface roads or repair potholes	2
10	Street Condition Street Light Condition Sidewalk Condition	1472 622 574	Priority: Traffic Safety 1. Upgrade or create new seawalls or bulkheads 2. Reconstruct Streets 3. Upgrade or create new step streets	2
11	Street Condition Street Light Condition Sidewalk Condition	1274 710 625	Priority: Roadway Maintenance 1. Upgrade or create new greenways 2. Reconstruct streets 3. Other transportation infrastructure requests	1
12	Street Condition Street Light Condition Sidewalk Condition	1877 800 754	Priority: Traffic / Traffic Flow 1. Conduct traffic or parking studies 2. Provide new traffic or pedestrian signals 3. Repair or provide new streetlights	1
13	Street Condition Street Light Condition Sidewalk Condition	865 272 191	Priority: Traffic/ Traffic Flow 1. Repair or provide new streetlights 2. Conduct traffic or parking studies 3. Upgrade or create new plazas	1
14	Street Condition Sidewalk Condition Broken Muni Meter	1089 638 299	Priority: Other 1. Resurface roads or repair potholes 2. Conduct traffic or parking studies 3. Address traffic congestion	1
15	Street Condition Sidewalk Condition Street Light Condition	1866 850 601	Priority: Traffic Enforcement 1. Repair or reconstruct new sidewalks 2. Reconstruct streets 3. Upgrade or create new seawalls or bulkheads	2
16	Street Condition Street Light Condition Traffic Signal Condition	764 567 246	Priority: Traffic Safety 1. Repair or construct new sidewalks 2. Resurface roads or repair potholes 3. Repair or provide new streetlights	2

17	Street Condition Street Light Condition Sidewalk Condition	986 299 294	Priority: Sidewalk, curb, pedestrian ramp construction and bus pad construction 1. Resurface roads or repair potholes 2. Address traffic congestion	1
18	Street Condition Sidewalk Condition Street Light Condition	1969 600 471	Priority: Roadway Maintenance 1. Reconstruct Streets 2. Address Traffic Congestion 3. Other Transportation Infrastructure	1

BRONX				
1	Street Condition Sidewalk Condition Street Sign - Missing	775 175 158	Priority: Street lighting 1. Repair or provide new streetlights 2. Rehabilitate bridges	0
2	Street Light Condition Street Condition Traffic Signal Condition	492 412 169	Priority: Traffic Enforcement 1. Repair or provide new street lights 2. Resurface roads or repair potholes 3. Address traffic congestion	2
3	Street Condition Street Light Condition Traffic Signal Condition	416 190 88	Priority: Other 1. Reconstruct street 2. Repair or provide new street lights 3. Provide new traffic or pedestrian signals	3
4	Street Condition Street Light Condition Sidewalk Condition	703 239 161	Priority: Traffic / Traffic Flow 1. Other transportation Infrastructure requests 2. Resurface roads or repair potholes 3. Repair or provide new streetlights	2
5	Street Condition Street Light Condition Sidewalk Condition	586 154 117	Priority: Traffic / Traffic Flow 1. Upgrade or create new step streets 2. Repair or provide new streetlights 3. Rehabilitate Bridges	2
6	Street Condition Sidewalk Condition Street Light Condition	537 145 135	Priority: Other 1. Traffic enforcement 2. Parking on commercial strips 3. Designated bike lanes	0

7	Street Condition Street Light Condition Broken Muni Meter	799 252 192	Priority: Traffic / traffic flow 1. Install streetscape improvements 2. Reconstruct streets 3. Upgrade or create new greenways	2
8	Street Condition Sidewalk Condition Street Light Condition	1413 262 178	Priority: Bridge Maintenance 1. Sidewalk construction 2. Other transit infrastructure requests	1
9	Street Light Condition Street Condition Sidewalk Condition	1206 1044 292	Priority: Potholes, street lights, and trucks 1. Reconstruct streets 2. Sidewalk construction 3. Traffic study	2
10	Street Light Condition Street Condition Sidewalk Condition	1658 1137 700	Priority: Other/ Storm break infrastructure 1. Upgrade or create new seawalls or bulkheads 2. Other transportation infrastructure requests 3. Reconstruct streets	1
11	Street Condition Street Light Condition Sidewalk Condition	1105 1055 408	Priority: Other/Various 1. Reconstruct streets 2. Resurface roads or repair potholes 3. Address traffic congestion	2
12	Street Condition Street Light Condition Sidewalk Condition	1378 702 392	Priority: Sidewalk and curb construction 1. Reconstruct streets 2. Other transportation infrastructure requests	1

QUEENS				
1	Street Condition Sidewalk Condition Street Light Condition	2402 1008 954	Priority: Parking Operations 1. Repair or provide new street lights 2. Conduct traffic or parking study 3. Provide new traffic or pedestrian signals	1
2	Street Condition Street Light Condition Traffic Signal Condition	2022 891 755	Priority: Traffic safety 1. Resurface roads or repair potholes 2. Reconstruct streets 3. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads	2

3	Street Condition Street Light Condition Sidewalk Condition	1196 1049 683	Priority: Traffic safety 1. Reconstruct streets 2. Conduct a traffic study 3. Beautify the Center Mall on Astoria Blvd.	1
4	Street Condition Street Light Condition Sidewalk Condition	990 417 291	Priority: Roadway maintenance 1. Resurface roads or repair potholes 2. Reconstruct streets 3. Other transportation infrastructure request	2
5	Street Condition Street Light Condition Sidewalk Condition	2325 1343 1059	Priority: Traffic safety 1. Rehabilitate bridges 2. Improve traffic and pedestrian safety, including traffic calming 3. Reconstruct streets	1
6	Street Condition Street Light Condition Sidewalk Condition	1196 572 449	Priority: Traffic / Traffic flow 1. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 2. Improve traffic and pedestrian safety, including traffic calming 3. Other transportation infrastructure request	1
7	Street Condition Street Light Condition Sidewalk Condition	3461 1621 1327	Priority: Traffic / Traffic flow 1. Reconstruct streets 2. Curb Replacement 3. Replace deteriorated bus pads	2
8	Street Condition Street Light Condition Sidewalk Condition	2182 949 714	Priority: Roadway maintenance 1. Reconstruct streets 2. Repair or provide new street lights 3. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads	3
9	Street Condition Street Light Condition Sidewalk Condition	1720 968 660	Priority: Accessibility 1. Repair or provide new street lights 2. Upgrade or create new greenways	1
10	Street Condition Street Light Condition Sidewalk Condition	2123 895 453	Priority: Roadway Maintenance 1. Reconstruct streets 2. Upgrade or create new seawalls or bulkheads 3. Other transportation infrastructure request	1

11	Street Condition Street Light Condition Sidewalk Condition	2319 1141 962	Priority: Roadway Maintenance 1. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 2. Other transportation infrastructure requests 3. Resurface roads or repair potholes	2
12	Street Condition Street Light Condition Sidewalk Condition	2369 1644 700	Priority: Traffic Safety 1. Improve traffic and pedestrian safety, including traffic calming 2. Reconstruct streets 3. Resurface roads or repair potholes	2
13	Street Condition Street Light Condition Sidewalk Condition	2892 1523 838	Priority: Roadway maintenance 1. Upgrade or create new plazas 2. Resurface roads or repair potholes 3. Improve traffic and pedestrian safety, including traffic calming	1
14	Street Condition Street Light Condition Sidewalk Condition	1286 1025 277	Priority: Traffic / Traffic Flow 1. Reconstruct streets 2. Other transportation infrastructure requests 3. Upgrade or create new seawalls or bulkheads	1

STATEN ISLAND				
1	Street Condition Street Light Condition Sidewalk Condition	3053 2116 872	Priority: Traffic / traffic flow 1. Upgrade or provide new Bus Rapid Transit lanes 2. Other traffic improvements requests 3. Repair or provide new street lights	1
2	Street Condition Street Light Condition Sidewalk Condition	3145 1726 733	Priority: sidewalk, curb, pedestrian ramp construction and bus pad construction 1. Resurface roads or repair potholes 2. Repair or construct new sidewalks, curbs, medians, pedestrian ramps or bus pads 3. Other transportation infrastructure requests	2

3	Street Condition Street Light Condition Sidewalk Condition	4708 2119 963	Priority: Traffic / traffic flow 1. Other transportation infrastructure requests 2. Reconstruct streets 3. Other transportation infrastructure requests	 1

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