Escaping the Valley of Disengagement:
Two Field Experiments on Citizen Motivations to Engage in Collaborative Governance

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Abstract
Governments face problems serving the public interest when they do not have good information about how well the demands of citizens are met. Citizens experience deficient or absent public services, but they do not have incentives to provide monitoring when they do not expect governments to be responsive to their concerns. Over time, this reinforcing cycle creates what we term the valley of disengagement. We investigate how to activate and sustain collaborative governance given the challenges posed by this vicious cycle. In two field experiments implemented in Kampala, Uganda, we recruited citizens to report on solid waste services to a municipal government. We find that community nominations of reporters and community announcements about reporters’ activity do not increase citizen monitoring. However, responsiveness to reporters by government significantly boosts engagement over several months, highlighting the critical role of timely and targeted responsiveness by governments for sustaining collaborative governance.
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Introduction

Governments, especially local councils and administrative offices, often lack good information about where services should be extended, where existing public works are failing, and where contractors or government employees are shirking. These information problems contribute to the substandard provision of public goods and services in both less-developed and developed countries around the world. Citizens have information about absent or deficient public goods or services from direct experience, but when they do not expect a response from government they do not have incentives to share this information with officials. Of course, governments around the world face variable incentives to provide public goods to citizens contingent on the strength of democratic accountability, administrative capacity, and oversight institutions. But even when governments are motivated to deliver public goods, they cannot do so effectively and efficiently without information from citizens.

We identify the key problem involved with initiating and sustaining collaborative governance in which governments act on information provided by citizens about public goods and services. We term this problem the valley of disengagement. When citizens do not expect government to be responsive to their concerns, they have little incentive to engage in collaborative governance by providing monitoring or by supporting the delivery of public goods. Lacking information and support, governments cannot easily improve services where they are in greatest demand, which over time reinforces distrust and disengagement. These challenges limit the “long route” to accountability — actions by governments that respond to citizen demands for better services and policies (World Bank 2004).

Breaking out of a self-reinforcing pattern of disengagement and substandard service delivery requires that citizens share the information they possess about public services in ways that lead to action by government. We investigate how citizens can be motivated to provide information to governments in pursuit of better public goods and services. For example, where are water or electrical outages most frequent? Did the mail arrive on time? What roads are in need of repair? Or, apropos of the present study, did the providers of waste services pick up the trash this week? Governments could invest in self-monitoring systems, but it is usually more efficient to rely on reports from residents, especially in the age of widely available information and communication technologies. After all, citizens already possess the necessary information. We thus extend to the mass populace McCubbins and Schwartz’s seminal contribution about fire-alarm oversight (1984). Citizens can trip alarms that warn officials about problems with public goods or services. The key is getting enough citizens to share their information.

We theorize that citizens will share information they possess about public goods and services when they have sufficiently positive beliefs about the responsiveness of government. We also theorize that selecting individuals who place greater value on attracting public goods to their community and
raising the salience of the value of public goods will activate and sustain engagement in collaborative governance. We present a simple decision-theoretic model that captures the beliefs that citizens hold over time about the responsiveness of government and the value that they place on a governmental response to their demands for a public good. The model highlights the importance for collaborative governance of providing opportunities for citizens to positively update their beliefs about the responsiveness of government. Without such opportunities, beliefs about the responsiveness of government decline over time and engagement will cease once beliefs become sufficiently low, even for citizens who highly value public goods. Once they become deactivated, citizens do not have easy ways to positively update their beliefs about the responsiveness of government, which entrenches disengagement and the substandard provision of public goods.

We test these predictions in two pre-registered field experiments related to the monitoring of solid waste services conducted in close partnership with the Kampala Capital City Authority (KCCA). We prompted citizens of Kampala, Uganda to send reports over a number of months to the KCCA about the management of solid waste services in their neighborhoods. Solid waste is a major challenge in Kampala, with only a minority of waste produced in the city entering the formal waste stream (Kinobe et al. 2015). A large majority of Kampala residents are personally concerned with the poor provision of waste services, as revealed in our baseline survey. The KCCA would like to improve solid waste services but lacks efficient ways to collect information about the locations where service delivery is substandard — information that citizens possess through their daily experiences. The main outcome of interest in this study is the initial and sustained reporting of citizens about solid waste services provided in their neighborhood. The outcome measure is the actual reports of citizens sent to the KCCA from mobile phones, rather than self-reports about participation in collaborative governance as in related research (e.g., Brabham 2009; Brabham 2012; Seidel et al. 2013).

We first test whether nomination of reporters by neighbors, nomination of reporters by community leaders, and a community announcement about the work of reporters by community leaders will increase reporting. Other studies that investigate how to motivate prosocial behavior by individuals have found that both baseline prosocial tendencies and non-financial rewards have a greater impact on prosocial behaviors than financial rewards (Ashraf et al. 2014). Yet, it is not clear whether community networks can be leveraged to select prosocial individuals through nomination and/or offer sufficient non-financial rewards to encourage the long-term engagement of citizens in collaborative governance. Previous research on networks mostly tracks how the resources offered by network connections predict engagement in governance (Berardo and Scholz 2010), rather than actively leveraging networks to enhance collaborative governance.
To preview our results, even though we saw higher rates of reporting than any other citizen reporting platform of which we are aware in Uganda or elsewhere (e.g., Blaschke et al. 2013; Grossman et al. 2014), with approximately 20% of reporters sending reports during our study period, we did not find evidence that any of the recruitment or announcement conditions increased short-term or long-term engagement in collaborative governance by citizen monitors. This is good news from a policy perspective, because costly recruitment and social motivation treatments appear to be unnecessary to produce more engagement by citizens.

We also experimentally treated some citizen reporters with responsiveness by the KCCA to test our prediction that rapid, timely, and targeted responsiveness is key to activating and sustaining collaborative governance. Reporters from neighborhoods in the responsiveness treatment received a weekly, targeted announcement about how their reports were translated into official action plans and used to improve solid waste collection in Kampala. We know of no other research that experimentally varies responsiveness to citizen concerns by government, despite the core role that trust and the building of collaborative ties between agencies and citizens play in theories about collaborative governance (e.g., Ansell and Gash 2008; Sandström et al. 2014).

We find that government responsiveness significantly boosts long-term engagement of reporters over months, as measured by actionable and usable reports. This result highlights the importance of continuously supporting citizens’ beliefs about responsiveness. Building responsiveness into governance arrangements across a variety of settings might significantly increase participation by citizens in improving the delivery of public goods. An endline survey that we fielded five weeks after the reporting period did not reveal increased trust in government or satisfaction with services among reporters in the responsiveness condition, indicating the importance of continuously reinforcing responsiveness when attempting to motivate citizens to engage in the monitoring of public services.

The results of these field experiments are particularly significant against the backdrop of an expanding set of information and communication technologies (ICT) that raise the possibility for low-cost, targeted, and timely responsiveness by governments around the world, enabling a virtuous cycle of collaborative governance with citizens. Finding ways to engage citizens in collaborative governance is vitally important across a wide range of functions that fall to governments. Community policing depends on building trust between citizens and the police and facilitating the flow of information necessary to act on crime (Brogden and Nijhar 2005). Education is enhanced by involving parents in the local management of schools and monitoring of teachers (Duflo et al. 2015). Water user boards augment the collaborative management of water resources (Berkes 2009). However, in places where the capacity of government is low and the management of public services is poor, building the responsive relationships
with citizens necessary to promote collaborative governance is especially difficult. Citizens do not engage because they perceive governments to be unresponsive to their concerns. Governments cannot improve public services because they then do not have information on the demands of citizens.

By harnessing the strengths of new modes of citizen-government interaction to foster the sharing of information and responsiveness, it is likely possible to escape the valley of disengagement in a variety of settings. Governments around the world are building platforms to collect information from citizens to improve the provision of public services (Smith and Reilley 2013). They enlist citizens in collaborative governance when it comes to policing, the maintenance of infrastructure, and planning for services. Some evidence suggests that ICT can broaden public participation in governance (Grossman et al. 2014). Yet other efforts have failed to activate and sustain significant citizen engagement (Evans & Campos 2013; McGee and Carlitz 2013; Grossman et al. 2015; Grossman et al. 2016). Our results show that building these new ICT platforms is not enough to sustain collaborative governance; citizens need to understand how their effort is rewarded in terms of responses from public officials.

Our theory and results break new ground in understanding how collaborative links between citizens and governments that contribute to good governance and the provision of public goods are built and sustained. While the policy influence of voters on the choices of elected representatives (Przeworski and Stokes 1999, Powell 2004) and the role that information plays in promoting electoral accountability (Besley and Burgess 2002; Adserà, Boix and Payne 2003; Ferraz and Finan 2011) have received much attention in research about politics and governance, the collaborative links between citizens and government offices apart from elections may be similarly fundamental for governance and arguably more important for the provision of public goods and services.

**Background and Theory**

Responsive governance requires that citizens learn about the outcomes of actions by government and possess the collective ability to remove politicians for poor performance or to reward good outcomes with longer tenure. But the information that voters convey when they go to the polls is not sufficient for governance that is responsive to the demands of citizens. Since election returns represent a complex bundle of preferences, they do not show what public goods and services are demanded and where they are absent or deficient. Before the many goods and services that citizens demand from government are actually delivered, long chains of delegation between citizens, politicians, bureaucrats, and contractors organized into multiple layers must be formed and moved to action. Agent slack and slippage are likely at every link in the chain, and so extensive information must be gathered on the behavior and resulting outcomes of agents at each stage in order for governments to effectively deliver public goods and services.
Monitoring and oversight from the top down can prove very expensive (Kiewiet and McCubbins 1991), so bottom-up information is often sought as a low-cost and efficient solution to learning how frontline government units and their contractors are performing (McCubbins and Schwartz 1984). The information requirements for good governance are especially intense at the local level, where thousands of local governments provide goods and services to millions of people. Citizens possess critical information about the status of public goods and services, but they need to be motivated to provide information to the responsible government office.

If citizens do not believe that there will be a response to the information that they could provide, then they will not have incentives to engage in monitoring as part of collaborative governance. Indeed, the record of transparency and accountability initiatives that involve citizen monitoring of governments is mixed (for recent reviews, see Joshi 2013; Fox 2015), which means that in many settings citizens are correct in believing that government will not be responsive to information that they could provide. Insofar as there is any consensus about the reasons why initiatives to solicit information and participation from citizens do not always improve service delivery, it is that citizens lack ways to motivate governments or service providers to act on the information that they provide (Banerjee and Duflo 2006, 124; Banerjee et al. 2004; Olken 2007). In contrast, studies about citizen monitoring in settings where rewards and punishment mechanisms are available to citizen monitors — whether through social pressure on providers (Bjorkman and Svensson 2009) or by enhancing enforcement by government (Caseley 2006) — have found citizen monitoring to be effective at improving public services.

In a recent reflection on this body of mixed evidence, Fox (2015) offers the important critique that many studies of citizen monitoring and government accountability are “tactical” rather than “strategic” — that is, they consider mostly how to get information flowing in one direction, rather than strengthening feedback loops between citizen monitors and governments, which might sustain engagement in collaborative governance and social accountability. As Mansuri and Rao (2013) highlight in another review, the longer term success of social accountability schemes depends on governments using their abilities in sanctioning and oversight to act on the information gained through citizen engagement. However, considering the strategic context, where public services are substandard and, as a consequence, trust in government is low, the prior beliefs of most citizens likely hold that government will not be responsive to their concerns. This will tend to promote a lower quality and quantity of monitoring by citizens.

A decision-theoretic model of reporter behavior

Consider the simple illustration of a government agency and \( k \) citizens \( C_1, C_2, \ldots, C_k \) who might
engage in the collaborative governance by reporting on the status of services. In this setting, each citizen has uncertain beliefs about whether government is responsive or nonresponsive to reports that they could submit. We denote the true probability that government will respond to a report by $\Theta$. Each citizen makes a decision about whether to report on public services ($R_{kt}$) as a function of their belief about the responsiveness of government at a given point in time $p_{kt}(\Theta)$, the value that the individual places on a potential governmental response including prosocial considerations $v_k$, and the cost of the reporting $c_k$. Each citizen will report at time $t$ if:

$$R_{kt} = \begin{cases} 1 & \text{if } p_{kt}(\Theta)v_k > c_k \\ 0 & \text{if } p_{kt}(\Theta)v_k \leq c_k \end{cases}$$  \hspace{1cm} (1)$$

Before proceeding to simulate how this belief and incentive structure drives the dynamics of collaborative governance, we consider each of the component parts and their place in existing theory:

**Responsiveness from government ($p_{kt}(\Theta)$)**

Even if government is a responsive type, it can be very difficult for citizens to observe and attribute responsiveness to government. If citizens have low expectations of government, it is likely that their prior beliefs about the likelihood of a governmental response to their concerns will likewise be low. These beliefs will result in disengagement, which will provide few opportunities for citizens to update their beliefs through experience of a government that responds to their concerns. The role of beliefs about the responsiveness of government and the ways that governments can actively foster the beliefs necessary to sustain collaborative governance have not been extensively studied. In perhaps the most relevant study to our own, Tolbert and Mossberger show that citizens who interact online with governments in the United States generally have higher trust in government, perhaps through “interaction[s] with officials that are convenient and quick, potentially enhancing responsiveness” (2006, 357). They show an increased citizen satisfaction in their interactions with government after visits to government websites, but the mechanisms behind this effect are not well-identified, selection effects are a major concern, and the methods that governments might employ to foster positive beliefs are not explored.

In settings where institutional arrangements and political conditions make governments responsive, the core challenge of fostering collaborative governance is cultivating citizen beliefs about responsiveness that match the actual level of responsiveness from government. Closer to the setting of our own study, Grossman et al. (2016) ask how citizens can be motivated to report deficiencies in public
services to local politicians in Uganda. They argue that one of the primary challenges of promoting collaborative governance using communication technologies is overcoming low levels of efficacy among citizens who experience deficiencies. They theorize that most citizens in Uganda and other developing countries have low “external efficacy,” defined as a lack of expectations about “the responsiveness of government authorities to citizens’ demands writ large” (3). As an experimental treatment, they send messages to subjects from local officials encouraging reporting on deficient public services and find that the rate of ever-participation — citizens that use the platform at least once over a six-month period — rises from approximately 3.4 percent in control to 4.7 percent in treatment.

We take this idea further by manipulating not just encouragement from politicians to report on public services, but instead informing citizen reporters exactly what the governmental agency receiving their reports is doing in response on a weekly basis. Our responsiveness treatment included the KCCA making weekly action plans for the mobilization and oversight of contractors in specific zones, organizing systematic zone-wide clean-ups, and engaging in new public outreach campaigns. It has been theorized that the key to activating and sustaining collaborative governance is to build trust between citizens and government (Ansell and Gash 2008). Our treatment is designed to directly increase citizen beliefs about government responsiveness and perhaps increase the “external efficacy” of citizens in engaging in collaborative governance. By varying not just encouragement, but actual responsiveness from a government agency to concerns, we more directly address key theoretical predictors of longer-term engagement of citizens in collaborative governance.

Value of government response \( (v_k) \)

Citizens who place a greater value on public goods should be more likely to act in ways that will lead to the production of public goods. The challenge of initiating and sustaining collaborative governance is likely to be facilitated either by attracting the participation of individuals who value a public good more highly or by raising the salience of the public good for the community. Indeed, when it comes to initiating and sustaining the engagement of citizens in online platforms related to public sector governance, past research consistently indicates that the bulk of participation is done by individuals with relatively high prosocial motivations (Budhathoki and Haythornthwaite 2013; Chandler and Kapelner 2013; Brabham 2009; Blaschke et al. 2013). While research on the role of networks in collaborative governance finds that networks create opportunities for engagement by citizens and civil society (Berardo and Scholz 2010), there is little research that deals with actively leveraging social and community networks to select and incentivize participation in collaborative governance. We consider two ways that community networks might be used to increase reporting from citizens.
First, we expect that reporters selected through nomination by neighbors or community leaders will place a higher value on public goods than randomly-recruited reporters. Lab-in-field experiments in Uganda show that individuals with strong group attachments and leadership positions in communities are more likely to display prosocial behavior in dictator games (Baldassarri and Grossman 2013). Because individuals who make nominations can maximize public goods by nominating reporters with prosocial tendencies and leadership attributes, we expect that nomination will enhance the provision of citizen monitoring. Yet existing research on referrals and nominations have mainly been studied in labor markets where private incentives dominate (Fafchamps et al. 2015; Beaman and Magruder 2012), rather than situations where individuals are asked to produce information that is useful for generating public goods.

Closest to the present study, Kim et al. (2014) find that using “friend nominations” to select community members to distribute coupons for subsidized health-related goods as part of a public health intervention results in higher uptake of these goods at the community level than relying on randomly-selected individuals or individuals with the most social ties. They attribute this effect to the selection mechanism brought about by nomination, yet it is unclear whether this effect is due to the behavior of the distributors themselves (i.e., passing out more vouchers) or their information advantage they have in selecting individuals who will cash in the vouchers. Kim et al. consider behavior over only 15 post-intervention days, raising questions about whether a selection mechanism that operates through nomination can sustain prosocial behavior over periods of time necessary for collaborative governance.

Second, we expect that public announcements about the activity of reporters can create incentives to be more active. Previous work has found that non-financial rewards are more effective at motivating prosocial behavior — such as the sale of condoms by barbers and shop owners as part of an NGO-sponsored HIV prevention program — than financial rewards (Ashraf et al. 2014). Providing potential actors with recognition for their contributions to collective goods is likely to increase prosocial behavior. Indeed, promising public recognition for prosocial behavior often makes it more likely, even before recognition is provided (Karlan and McConnell 2014). Yet to our knowledge no existing research tests whether monitoring by ordinary citizens can be encouraged by highlighting engagement in collaborative governance, since other members of the community may hold low beliefs about the responsiveness of government to reports and/or place lower value in routine public services, both of which would decrease the likelihood and value of recognition in expectation.

Cost of reporting (c)

The core source of optimism about collaborative governance in the information age is an opportunity structure that is more open to citizens. Across a variety of places and settings, “opportunity
structure” influences citizen participation in social movements, policy-making, and collaborative governance (Stevenson and Greenberg 2000; Leifeld and Schneider 2012; Vráblíková 2014). Features of each setting, such as linkages in political networks, the costs of communications, and the rules of decision-making, influence decisions by citizens about participating in governance. Costs to citizens undermine citizen participation in governance (e.g., Speer 2012). The idea that information technologies can facilitate citizen engagement in the governance of public services has sparked enthusiasm because it alters the opportunity structure, primarily by substantially decreasing the costs of sharing and processing information relevant to public life (Oates 2003; Grossman et al. 2014; McGuire 2006; Charalabdis et al. 2012; Linders 2012; Rotberg & Aker 2013). Unlike collaborative governance via traditional means, which often involves significant time and costs for citizens, mobile phones allow for instantaneous and, in many deployments, toll-free access to public officials. Of course, there are still barriers to engagement, including literacy, monitoring costs, knowledge about how to use communication technologies, and time, but these barriers are also likely to affect traditional means of engagement. Our study operates within this context, but extends and contextualizes what is required to take advantage of the changing opportunity structure provided by ICT.

Simulation of the reporter beliefs and reporting over time

Considering the model above and its component parts, it is straightforward that decreasing the cost of reporting will encourage more engagement in collaborative governance. What is missing and more interesting is the time path of $p_{ik}(\theta)$ as each reporter perceives responsiveness or a lack thereof to their engagement. Consider a standard Bayesian updating model where the prior $p_{ik}(\theta)$ takes the form of a beta distribution, where $p(\theta) = \theta^{a-1} (1-\theta)^{b-1}$. In each period $t$, if and only if a reporter submits a report, then they will have the opportunity to perceive with error whether government responds to the report. More formally, after submitting a report, the citizen views the outcome of a Bernoulli trial screened by an error function $\epsilon(\Theta)$, which might not have an expected value of $\Theta$, such as when any response is not easy to attribute to the government or if the government is able to gain positive credit even though it is not responsive. We now have the machinery to simulate the reporting behavior of citizens over time.

Consider a set of reporters who have various prior beliefs about the responsiveness of government, when the true value of $\Theta$ indicates that government is in fact the responsive type. In the case of a government that has difficulty quickly enacting a response to public reports, we use the simple

In the simulations below, we set $\theta = 0.8$, $c_\epsilon = 1$, draw the starting beliefs of reporters $p_{k_\epsilon,0}(\theta)$ randomly from a uniform distribution of mean values $[0.1,0.9]$, and draw the value placed on the public good $v_k$ from a uniform distribution of $[1,5]$ for the case with no social motivation and $[3,7]$ for the case with social motivation.
adjustment where $\varepsilon(\theta)$ is the outcome of the Bernoulli trial with probability $\theta$, filtered by some delay in the opportunity to observe responsiveness to reports. Of course, $\varepsilon(\theta)$ may take on a variety of forms that we do not attempt to fully anticipate here, but a delayed or unobserved response is perhaps the most typical type of error process that citizens experience when they interact with government. Recall that once the value of $p_{kt}(\theta)$ drops below a certain level, the reporter will not submit reports and will therefore not have the chance to update their beliefs about responsiveness. If reporters are selected who place higher value on the public good or if social motivation can raise the value of the public good, the value of $p_{kt}(\theta)$ will be lower before a reporter is deactivated. Figure 1 shows simulated paths of the mean value of $p_{kt}(\theta)$ at each period, which is equal to the posterior value of the previous period after taking into account the result of $\varepsilon(\theta)$, which in this case delays the observation of any response. In the left column of Figure 1, no selection process is present and no social benefits are added, which raises the value of $p_{kt}(\theta)$ needed to sustain reporting as compared to the right column, where the selection of prosocial reporters and the presence of social benefits lower the value of $p_{kt}(\theta)$ needed to sustain reporting.
Figure 1. The posterior beliefs about the responsiveness of government when observations about responses to citizen reports are delayed by the number of periods indicated. Red lines indicate reporters who do not fall below the activation threshold during the reporting period and grey lines indicate reporters who fall below the activation threshold.

As displayed in Figure 1, any delay in observing the response of government to citizen reports decreases posterior beliefs that government is the responsive type. This means that only citizens with very high prior beliefs about the responsiveness of government will persist in reporting (red simulated paths),
while all others will fall below their activation threshold and fail to update further (grey simulated paths). When reporters are selected or made to place higher value on the public good (Figure 1, right column), the threshold at which reporters become deactivated is lower, which also promotes more long-term reporting. These dynamics illustrate the critical role that targeted responsiveness is likely to play in keeping beliefs about responsiveness high enough among at least some citizens that they continue participating in collaborative governance.

**Pre-Registered Hypotheses**

Based on the expectation that nomination can enhance the provision of reporting about solid waste services by raising the value of the public good (v_k, H1-H3) or by enhancing beliefs about the responsiveness of government (p_k(θ), H4), we pre-registered the following hypotheses prior to randomly assigning experimental conditions or collecting any data (SI, Appendix D contains the exact wording of pre-registered hypotheses, which are shortened here for readability):

- **H1**: Nomination by neighbors will increase reporting.
- **H2**: Nomination by the local council chair will increase reporting.
- **H3**: Announcement by the local council chair about the reporters will increase reporting.
- **H4**: Responsiveness to citizen reports will increase reporting.

**Experimental Design**

We designed and carried out two randomized field experiments to understand whether community networks and government responsiveness can initiate and sustain participation by citizens in the collaborative governance of public services. In particular, the treatments that we employ are meant to raise either beliefs about responsiveness (p_k(θ)) or the value of the public good (v_k) among reporters who might engage in collaborative governance. We focus on citizen reporting about solid waste management, which generates high levels of citizen concern, with 90% of residents in our study area personally concerned with the state of solid waste management as of 2014 (see SI, Appendix A for results of a pre-experimental baseline survey undertaken to scope out this project).
Setting

Kampala, Uganda faces similar problems of monitoring and accountability for solid waste management as many other parts of the world (Bhuiyan 2010; Okot-Okumu and Nyenje 2011). With Kampala growing rapidly like many developing cities (Vermeiren et al. 2012), the need to improve the quality and scale of services is pressing. Private companies contracted to remove solid waste often provide services of lower quality to groups of people that are not able to share monitoring information (Oteng-Ababio et al. 2010; Katusiimeh et al. 2012). Since most of Kampala is contracted to private collectors, city managers find themselves in a challenging position, especially given information asymmetries, pressures toward corruption, and wealth disparities across communities.

Our close partner in this project, the Kampala Capital City Authority (KCCA), has prioritized improving solid waste management to boost resident satisfaction and promote public health. Kampala is also one of the key strongholds of opposition support in Uganda, and the nationalized KCCA has a strong political mandate from the ruling party to improve resident satisfaction with government services. Additionally, the KCCA has been supported by international donors for over a decade to improve waste management, but still finds it difficult to engage the public in actionable ways. Despite having used public resources to develop an interactive SMS platform and a KCCA mobile application to exchange information with citizens, the KCCA struggles to use its technological investments to exchange useful information with the public. They now seek to understand whether mobile technologies can enhance public engagement and encourage more accountable provision of public services.

Phase 1 Experimental Design

In Phase 1, we recruited 1040 citizen reporters in 90 administrative zones to provide feedback on solid waste removal services and disposal practices at the spatial scale of neighborhoods. In November 2015, our team of enumerators carried out a recruitment drive over a period of two weeks to form our experimental sample of reporters. The KCCA provided us with a list of all zones (LC I) inside the capital city jurisdiction of Kampala and the associated shapefiles outlining their boundaries. At the time of the first experiment, there were a total of 755 zones (LC I) contained within 97 parishes (LC III) and 5 divisions used to manage waste services. We randomly selected 90 zones for our experimental sample. We dropped 11 zones from the original random sample because they were demolished at the time of enumeration, the enumeration team was not able to locate any residences within the zone, or the enumeration team was not able to gain access to gated zones within the diplomatic district. We replaced these 11 zones with another random sample to form the final experimental sample.

After selecting the experimental sample, we randomly assigned each zone to one of two reporter
recruitment conditions. In each zone, we then aimed to recruit 12 citizen reporters according to the recruitment condition assigned at the zone level, for a total of 1040 reporters (see SI, Appendix B for detailed recruitment protocols):

(Recruitment Condition 1) Random Citizen recruitment: Following a random walk pattern, the enumeration team approached adults walking or sitting outside of their homes or businesses and asked whether they would sign up to be a reporter.

(Recruitment Condition 2) Neighbor Nomination recruitment. Following a random walk pattern, the enumeration team approached adults walking or sitting outside of their homes or businesses and asked whether they could nominate a “trustworthy and responsible” individual who lives in the zone to report on behalf of its residents. If the individual indicated willingness to make a nomination, the enumerator asked the citizen to make a face-to-face introduction to the nominated individual. This nominated individual was then asked whether they would sign up to be a reporter.

Over a 7-week period following the recruitment drive, all citizen reporters received prompts from the KCCA’s interactive SMS messaging system in the same way. Reporters received a total of 17 prompts for information about waste pick-up schedules, waste burning practices in their zone, and the locations of waste piles that needed special attention by the KCCA or its contractors (See Appendix C for a list of prompts). To make reporting free for reporters, we sent an airtime credit initially to all reporters and then also sent credit each week to the phones of all reporters who submitted at least one response to the prompts that week. To further encourage reporting, we held a lottery for a ~$10 prize in airtime each week for all reporters who participated. Further details and justification for the implementation procedures are contained in our publicly-available pre-analysis plan (EGAP registered design 20151103AA).

Phase 2 Experimental Design

In June 2016, our team of enumerators recruited an additional 1,905 reporters from 97 randomly selected administrative zones or local councils (LC I) within the KCCA’s waste management service zones. Ninety-six zones were included in the original experimental sample of zones. Five of the original zones were dropped because they could not be located or were demolished. Six randomly selected zones were added to replace the zones that were either dropped or had low recruitment numbers due to the small size of the zone. In each zone, we aimed to recruit 20 reporters. Each zone was divided into four cells of roughly similar geographic size and five individuals were recruited to be reporters from each cell.
Reporters were required to be adult residents of the zone and the primary user of their own mobile phone. The zones did not overlap with the Phase 1 sample (Figure 2).

With the zone as the unit of randomization, each zone was assigned one of eight different treatment combinations based on a three-factor crossed experimental design. Two factors were recruitment and announcement conditions, while the third factor was responsiveness of government to citizen reports, as follows:

(Recruitment Condition) Random Citizen recruitment: Following a random walk pattern, the enumeration team approached adults walking or sitting outside of their homes or businesses and asked whether they would sign up to be a reporter. This condition follows exactly the protocol from Phase 1.

(Recruitment Condition) LC1 Nomination recruitment. Reporters in zones assigned to the LC1 nomination condition were recruited by the local council chairperson (LC1) or a delegated zone-level authority figure. We chose LC1s to select citizen monitors because they are typically well-connected with community members at the zone level and able to select reporters willing to volunteer on behalf of the community. LC1s nominated reporters by introducing them to the recruitment team.

(Announcement Treatment) Announcement of Reporters by LC1. Reporters in zones assigned to this treatment condition were informed that the LC1 would announce the citizen monitoring program and the names of reporters at an upcoming zone-wide meeting. After all 20 reporters were recruited in a zone, a list of the names of selected citizen monitors and information on the program were left with the LC1. The implementation team contacted LC1s by phone one week following the completion of the recruitment activity to remind the LC1s to make the announcement at a community meeting. If the LC1 was unavailable during the recruitment drive, the recruitment responsibilities were delegated to another local authority figure such as the Vice-Chairperson, Secretary of Defence, or member of the Local Council Committee. If the recruitment responsibility was delegated, the LC1 was contacted that day to inform him/her about

\[2\] We collected data on compliance with the announcement treatment and found that only 38% of the community leaders in zones who were assigned to this condition and who we were able to contact at endline delivered the announcement treatment. The reporters in these zones still expected a community announcement, since they were fully informed about the upcoming announcement during recruitment, so we still consider them to have been treated. In SI Appendix G, we estimate complier average causal effects for the announcement treatment by 2SLS.
the program, the recruitment task and to whom it was delegated, and any other additional responsibilities they had relating to the citizen monitoring program such as the announcement treatment. Zones not assigned to treatment were assigned to a control condition where the LC1 was not requested to make an announcement.

(Responsiveness Treatment) Responsiveness from the KCCA. In a third experimental condition, reporters received weekly personalized text messages informing them that their responses to prompts had been sent to the KCCA Waste Management team, and communicating the real action plans that had been made by the KCCA Waste Management team on the basis of reports. Reporters were also sent information listing the number of responses they sent that week and the total number of responses sent by all citizen monitors in the reporter’s zone that week, and offering to answer any questions about how the data was being used by the KCCA.³ Any questions were answered during a call center held each week. During phone calls with subjects in neighborhoods assigned to this treatment, our team reemphasized the objectives and purpose of the citizen monitoring platform outlined in the reporter sign-up form. Also as part of the responsiveness treatment, subjects were contacted through voice calls on their mobile phones one month following the start of the reporting period. The program representative discussed the quantity of the subject’s responses, reminded them of objectives and expected results of the program, and explained how the subject’s reports are being used to improve waste management in their zones based on action plans developed by the KCCA in response to citizen reports. Both active and inactive reporters received the responsiveness outreach. Zones not assigned to treatment were assigned to control and the reporters did not receive any messages or phone calls about what the KCCA was doing with their reports. For zones in the control condition, the KCCA asked only to receive a digest of reports at the end of the reporting period and did not respond weekly to reports.

³ The intention of telling subjects how many reports were received from the specific individual and the whole zone during the previous week was heighten the sense that the reports were being noticed and used. One concern about this treatment design, however, is that it may introduce a bundled social norms treatment into the Responsiveness treatment. We are not very concerned about this possibility because reporters did not know the number of other reporters in the zone and could therefore not easily interpret the number of responses as a social norm. Regardless, past research has found that subjects tend to revert to the social norm when they are provided information about a social norm (Schultz et al. 2007). In our case, if the social norm was exerting an effect we should see reporters who were active the previous week become less active in the subsequent week. In SI Appendix H, we show instead that the Responsiveness treatment continues to exert a positive treatment effect on the subset of reporters who were active during the previous week, which largely rules out this concern.
Figure 2. Final sample of zones within the jurisdiction of the Kampala Capital City Authority for Phases 1 and 2 recruitment drives and the combined responsiveness treatment condition. This is the final random sample, after replacing zones that did not contain residences or that were inaccessible.

During the 8-week Phase 2 reporting period between July 2 and August 29, 2016, all subjects recruited during Phase 1 and Phase 2 were sent 15 prompts for reports. The questions we asked reporters were based on information that the KCCA identified as most useful in monitoring the quality of services provided by its waste management contractor. Prompts included general questions about zone-level waste conditions and the quality, frequency, proximity of waste collection services provided to the zone, and several open-ended questions (See Appendix C for the list of prompts used in Phase 2). As in Phase 1, we encouraged reporters to answer prompts by running a lottery each week for ~$10 in airtime. Five weeks after the end of the Phase 2 reporting period, we implemented a short survey to understand whether responsiveness increased trust in government and satisfaction with waste services, which would indicate longer-lasting shifts in more general attitudes as a result of responsiveness.

Summary of experimental design and conditions

There was a break of almost six months between the two phases when no prompts were sent to reporters from Phase 1. Figure 3 summarizes the combined design of the two experiments reported here.
Outcome Measures of Reporting

As pre-registered, we measure reporting in a number of ways: (1) The total number of active reporters (i.e., those submitting at least one report) during the reporting period; (2) The total number of reports submitted by each reporter during the reporting period; (3) The total number of reports submitted by each reporter during the last two weeks of the reporting period; and (4) The total number of open-ended reports (e.g. descriptions of location of piles) submitted by each reporter during the reporting period.

Descriptive Data on Reporters

The reporters in our study are likely to be fairly representative of Kampala residents, since many of the recruitment conditions began with random walks in randomly selected zones around the city. It may be the case that the nomination process produced reporters of a different type on observable characteristics, but we do not find strong evidence for this possibility (Table 1). The only notable exception is that LC1 nomination produced reporters with longer average periods of residence in the zone than did any of the other recruitment conditions. In order to avoid Hawthorne effects, the reporters were asked only to provide brief, non-sensitive information for intake into the KCCA reporting system, rather than a full survey of demographic and attitudinal responses that would have required a different informed
consent process for research subjects. All reporters were fully informed that the platform was being operated and tested with the KCCA.

Table 1. Characteristics of reporters in both Phases

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Random Recruitment</th>
<th>Neighbor Nomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in zone (mean)</td>
<td>9.24</td>
<td>9.15</td>
</tr>
<tr>
<td>Female (proportion)</td>
<td>0.39</td>
<td>0.45</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>30.2</td>
<td>30.8</td>
</tr>
<tr>
<td>Satisfied with waste services (proportion)</td>
<td>0.28</td>
<td>0.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 2</th>
<th>Random Recruitment</th>
<th>LC1 Nomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in zone (mean)</td>
<td>11.0</td>
<td>15.2</td>
</tr>
<tr>
<td>Female (proportion)</td>
<td>0.62</td>
<td>0.65</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>32.4</td>
<td>36.0</td>
</tr>
<tr>
<td>Satisfied with waste services (proportion)</td>
<td>0.36</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Analytical Methods

As we pre-registered, we performed hypothesis tests via randomization inference for difference in means between experimental conditions. We assume the sharp null hypothesis (no unit-level treatment effects) such that $Y_i(1) = Y_i(0)$ for all zones or reporters where $Y_i(1)$ is the potential outcome if assigned to nomination and $Y_i(0)$ is the potential outcome if assigned to random recruitment. We then generate 5,000 iterations of our exact clustered randomization procedure and capture the sampling distribution of treatment effects observed under the sharp null. We compare the observed difference in the value of interest between treatment conditions and compare that value to the sampling distribution to compute a $p$-value of how often such a difference would be observed by random chance. For the Phase 2 analysis, because of the ease of reporting on multiple crossed treatment arms, we estimate the effects of treatment at the reporter-level via OLS regression. We have confirmed that the substantive and statistical significance of all effects are robust to the pre-registered difference-in-means specifications. Appendix F contains the same Phase 2 results with analysis performed at the zone level. We also observed significant non-compliance with the LC1 Announcement treatment in Phase 2, prompting us to estimate complier average causal effects as a robustness check on the intent-to-treat results reported below (see SI Appendix G). In no case does this change the substantive or statistical significance of the main results.
Findings: Phase 1

In the first experiment, we did not find any significant difference in the amount of reporting by citizen reporters recruited randomly or by neighbor nomination, the latter procedure being intended to select community members with more prosocial attributes (Figure 4). In total, we received 528 SMS reports that were on-topic and contained information relevant to solid waste management. In both the Random Citizen and Neighbor Nomination recruitment conditions, we observed similar proportions of reporters who submitted at least one report during the 7-week reporting period, at approximately 15% (Panel A; $t_e=0.010$, $p=0.34$). If we instead compare the mean number of responses per reporter by recruitment condition, we find that nominated reporters submitted an average of 0.490 reports, while randomly recruited reporters submitted an average of 0.460 reports, which is consistent with variation expected under the null hypothesis (Panel B; $t_e=0.030$, $p=0.38$). Finally, if we consider how many times reporters responded to open-ended prompts for the locations of trash piles, potentially the most costly type of reporting in terms of effort, we again find levels of reporting across recruitment conditions that are consistent with variation expected under the null hypothesis (Panel C; $t_e=0.010$, $p=0.29$).

Figure 4. Reporting by recruitment condition during Phase 1. (A) Proportion of reporters who submitted at least one report by recruitment condition; (B) Average number of total reports per reporter by recruitment condition; (C) Average number of open-end reports per reporter on the location of waste piles by recruitment condition. No significant differences in reporting between recruitment conditions identified. All panels display one standard error bars.
Findings: Phase 2

In the second experiment, we examine the same three outcomes as a function of the three recruitment and treatment conditions. Recruitment by LC1 chairs was intended to select individuals with more prosocial attributes, while the LC1 announcement was expected to raise the value that potential reporters placed on waste collection and management. The responsiveness treatment was intended to influence beliefs about the responsiveness of government. We report results both for the pooled group of subjects recruited during Phase 1 and 2, as well as the results split by the recruitment phase. Considering first the number of reporters during Phase 2 who submitted at least one, on-topic report about solid waste management during the eight-week period, only the Responsiveness condition boosts participation (Table 2). Reporters recruited during Phase 1 from a zone assigned to the responsiveness condition are 50% more likely to be active during Phase 2 than reporters in control zones. Reporters recruited during Phase 2 from a zone assigned to the responsiveness condition are 14% more likely to be active than reporters in control zones. This result indicates that hearing about what the government is doing with the reports via targeted outreach can help initiate and sustain engagement in citizen reporting. In contrast, we do not observe any differences in the number of active reporters when recruiting by either neighbor or LC1 nomination, or when reporters expected the LC1 to make an announcement about reporters’ names at a community meeting. Thus, the evidence suggests that nominations and announcements are not effective at activating reporting on public services in this context, which is good news for policymakers who do not need to spend extra resources on recruitment and social motivation to promote collaborative governance.
Turning to the total number of reports made by each reporter during the 8-week Phase 2 reporting period, we find very similar results, with only the responsiveness treatment driving more reports (Table 3). Pooling zones across recruiting periods, we find that the Responsiveness treatment increased the average number of reports per reporter by approximately 0.4 over eight weeks. This result is largely driven by the significant effect that the Responsiveness treatment had on treated Phase 1 reporters, among whom the Responsiveness treatment increased the number of total reports per reporter by 83%. In contrast, the Responsiveness treatment did not increase the total number of reports by Phase 2 reporters in ways that are highly inconsistent with random chance (for P2 Reporters model, p=0.12). Like the results for active reporters, we do not observe any differences in the number of reports per reporter when recruiting was done by either neighbor or LC1 nomination, or when reporters expected the LC1 to make an announcement about the platform and reporters’ names at a community meeting.
Finally, we consider the total number of reports by each reporter during the last two weeks of the 8-week reporting period. As pre-registered, we are interested not only in the total effects of the Responsiveness treatment and the recruitment conditions, but also whether social motivation or government responsiveness can drive longer-term engagement in the collaborative management of public services. Like previous estimations, we fail to reject the null that any social motivation recruitment condition or that the announcement about reporting by local leadership significantly increased reporting during the last two weeks of Phase 2. We do find, however, that responsiveness from government to the citizen reports has a significant and positive effect on reporting. The Responsiveness treatment boosted reporting by Phase 1 reporters 123% and boosted reporting by Phase 2 reporters 32%. This result suggests that responsiveness is necessary to sustain participation in collaborative governance, even if it is not a predictor of initial engagement. Indeed, only the responsiveness treatment has a lasting effect on all reporters that were part of this study, indicating that reporters in the control condition fell into the valley.
of disengagement much more often, as predicted by our theory.

### Table 4. Total number of reports submitted by each reporter during the last two weeks of Phase 2

<table>
<thead>
<tr>
<th></th>
<th>DV: Total Number of Reports During Last Two Weeks of Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Pooled)</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>0.091***</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
</tr>
<tr>
<td>Neighbor Nomination</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
</tr>
<tr>
<td>LC1 Nomination</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
</tr>
<tr>
<td>LC1 Announcement</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
</tr>
<tr>
<td>Phase 2</td>
<td>0.113***</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,866</td>
</tr>
<tr>
<td>F Statistic</td>
<td>6.273***</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests

*p<0.1; **p<0.05; ***p<0.01

To aid the interpretation of this key finding, Figure 3 shows the proportion of reporters who submitted solid waste reports in response to each of the 15 prompts during the Phase 2 reporting period. The effect of the responsiveness treatment is most pronounced at the end of the reporting period when pooling all reporters. For reporters recruited during Phase 1, responsiveness to reports was critical for boosting reporting throughout the reporting period. In Appendix E, we show that responsiveness boosted engagement both for reporters who were active during both halves of the Phase 1 reporting period and for reporters who became deactivated, indicating that responsiveness can both keep and bring citizens out of the valley of disengagement. For reporters recruited during Phase 2, responsiveness to reports only boosted reporting for the second half of the reporting period, which is consistent with the theoretical dynamics highlighted in the decision-theoretic model above.
**Figure 3.** Proportion of reporters responding to each prompt during Phase 2 broken out by phase of recruitment. *Legend: red* is reporters assigned to the responsiveness condition, *grey* is reporters assigned to the control condition for responsiveness.

### Attitudinal and Behavioral Outcomes on Trust in Government

To test the proposition that responsiveness from government increases reporter beliefs that government is responsive to their concerns, we fielded a post-reporting survey to measure reporters’ trust in government and their behavioral willingness to help the KCCA manage services apart from solid waste. This survey, administered five weeks after the Phase 2 reporting period, intended to measure behavioral spillover from experiencing responsiveness from government in other areas of collaborative governance and to assess whether the treatment changed broader attitudes. While responsiveness strongly influenced week-to-week reporting, it appears from the survey data that this effect quickly wears off and
does not have long-term implications for attitudes about government and willingness to volunteer time to help government test and create processes for collaborative governance (Figure 4). In no case did volunteers randomly assigned to the responsiveness condition hold more favorable attitudes about public services or government, measured by stated satisfaction with solid waste services, perception of the responsiveness of the KCCA to citizen concerns, and trust in government. Likewise, when reporters were asked to volunteer their time to help the KCCA develop and test a more general reporting platform for collaborative governance across a range of public services, reporters who were subjected to the responsiveness treatment were no more likely to volunteer either before or after a reminder to register their willingness.

**Figure 4.** Attitudinal and behavioral responses to the responsiveness treatment five weeks after the conclusion of the Phase II reporting period. Error bars show bootstrapped 95% confidence intervals.

These results demonstrate the importance of continuously reinforcing positive beliefs about
responsiveness as part of collaborative governance arrangements, since deeper attitudes related to trust in
government and willingness to assist government in the delivery of services are either difficult to move or
the effects are short-lived. Since we fielded this survey five weeks after the reporting period, we cannot
parse these two possibilities, but the implication of either possibility is the same in light of the large
treatment effect of responsiveness during the reporting period: governments must carefully consider how
to reinforce these beliefs if they want to gain the information possessed by citizens.

Discussion and Conclusions

Finding ways to engage citizens in collaborative governance is vitally important across a wide
range of functions that fall to governments. Recognizing this, governments around the world are
developing new technologies and strategies to process information from citizens about the delivery of
public goods and services — data vital in determining how to allocate government resources where they
are in highest demand and meeting the demands of citizens. This information, though difficult and
expensive for government to collect on its own, is already possessed by citizens. Yet despite significant
government effort and investment to engage citizens in collaborative governance, many of these efforts
fail to activate and sustain significant engagement. Many of these failures do not appear in the scientific
literature (McGee and Carlitz 2013; Dahlander and Piezunka 2014), making it difficult to understand how
new technologies are or are not ushering in new possibilities for good governance.

We theorized that citizens fall into a valley of disengagement when they do not believe
government is responsive to their concerns. Without input on failing or deficient services, governments
struggle to target services where they are in highest demand. Substandard service delivery leads to further
distrust and disengagement of citizens in a negative, self-reinforcing cycle. We theorize that governments
might break out of this cycle by recruiting citizens with prosocial attributes, by heightening the social
value of public goods and services, and by demonstrating responsiveness to citizen concerns.

To test these hypotheses, we created a deep and on-going partnership with the Kampala Capital
City Authority in Uganda and modified an SMS platform to prompt and process thousands of
spatially-explicit citizen reports about solid waste services. We find that citizens nominated by neighbors
and local leaders — an effort to recruit citizens that value collective goods more highly — did not report
more frequently at any point during the study period. Likewise, community announcements by local
leaders about citizen participation in the government-led reporting platform — intended to make salient
the social value of waste collection for potential reporters and offer recognition for prosocial behavior —
also did not increase reporting. From a policy perspective, this is good news for governments looking to
engage citizens in collaborative governance: our finding suggest that governments can discard costly,
intensive screening methods to recruit citizens without sacrificing the reporting efforts of citizens. In contrast, we find strong evidence that reporters who experience a responsive government, effected through weekly personalized messages sharing real government plans to respond to concerns raised by citizens, are significantly more likely to engage over several months.

Our findings are some of the first on the limited effectiveness of tapping into community networks for nominations and recognition to drive more engagement in collaborative governance. These results are inconsistent with other findings on the significance of social networks for driving engagement of citizens in public affairs in Uganda (Blaschke et al. 2013). More broadly, our results offer some caution about the promise of initiating and sustaining collaborative forms of governance by relying on pre-existing social networks for the selection and motivation of citizen monitors, especially where trust in government is low (Olsson et al. 2006; Tkacheva and Bauhoff 2015; Avdeenko and Gilligan 2015). Our results should prompt additional investigations about how networks not only structure engagement in governance, but can be leveraged in pursuit of collaborative and responsive governance.

This study produced strong evidence that government responsiveness is necessary to sustain reporting on public services over longer time periods, which has wide-reaching implications on policy and research. Informing citizens how the government is responding to the information they provide should be a critical component of any collaborative governance scheme. A lack of responsiveness to citizens’ reporting efforts might explain the relatively low rates of participation found in e-governance platforms. However, we also learned that any trust or beliefs about the responsiveness of governments that citizens gained through the responsiveness condition was ephemeral. Other research suggests that attitudes about government change slowly, and that important factors influencing citizens’ trust in government are perceptions of efficacy in shaping the actions of government (Parent et al. 2005), government responsiveness to citizens (Tolbert et al. 2006, Welch et al. 2005), and political-cultural variables like satisfaction with democracy (Christensen et al. 2014). Our findings indicate that changing citizens’ trust in government and willingness to participate in collaborative governance likely require a long-term commitment to government responsiveness and tangible improvements in public services.

Our study also puts the potential for ICT to enhance governance, trust in government, and social monitoring into context. The potential for ICT to shift the ways that citizens and governments interact, to generate more and better information needed for governance, and to promote a more engaged citizenry in public life is regularly touted. Research has generated less sanguine expectations about collaborative governance and social accountability, with recent reviews highlighting the need to better understand feedback loops and the strategic nature of public engagement in governance (Fox 2015). We show that responsive governments cannot depend on ICT to change their relationship with citizens and enhance
collaborative governance without credibly signaling their commitment to act on the information provided by citizens. By doing so, however, governments are able to break out of the valley of disengagement, where low citizen engagement and the substandard provision of public goods are reinforcing.
References


Blaschke, Sean M., Peter P. Carroll, Daniela Rojas Chaves, Michael G. Findley, Madeleine C. Gleave,


Ferraz, Claudio, and Frederico Finan. 2011. Electoral Accountability and Corruption: Evidence from and


Linders, Dennis. 2012. From e-government to we-government: Defining a typology for citizen coproduction in the age of social media. *Government Information Quarterly* 29:4 (October),


Rotberg, Robert I., and Jenny C. Aker. 2013. Mobile Phones: Uplifting Weak and Failed States. The


https://openknowledge.worldbank.org/bitstream/handle/10986/5986/WDR%202004%20-%20English.pdf?sequence=1
Supplementary Information

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H. Examining the possibility of a social norm treatment effect in the Responsiveness treatment
A. Pre-Experimental Scoping Survey

During the summers of 2013 and 2014, we completed preliminary research for the project and established the partnerships necessary to carry out the reported field experiments. To scope out the relevance of our project to field conditions in Kampala, we embedded questions about satisfaction with solid waste services into a broader household survey undertaken for a different project. In total, we received responses from 439 individuals identified through a random walk pattern in randomly selected neighborhoods across Kampala. Initial survey data indicates that Kampala citizens are highly concerned about solid waste services in their communities. For brevity, we provide summary statistics about three questions: (1) personal concern about waste disposal; (2) dissatisfaction with current collection services; and (3) self-reports of burning waste at least one time per week. The vast majority of respondents are personally concerned with the state of solid waste collection and a majority are actively dissatisfied with the current state of solid waste services in their neighborhoods. Additional survey responses reveal that a minority of households are able to take advantage of formal waste collection services, and most households are forced to burn their trash on a weekly basis. Our survey data suggest that 86 percent of Kampala residents own mobile phones, so recruitment for monitoring can occur from the vast majority of residents in all zones of the city (Figure A1).

![Figure A1. Resident perceptions of solid waste services and conditions in preliminary survey.](image-url)
B. Reporter Recruitment Protocols

Below are instructions used by the enumeration team to recruit subjects for the study. Recruitment drives were carried out from November 5-26, 2015 for Phase 1, and June 9-16, 2016 for Phase 2. The recruitment team comprised approximately 20 Ugandans.

Setting up in the zones (Phase 1 and 2)

When your team first enters a village, inform the village chairperson of the project and secure their support for any project-related activities, such as an LC1 recruitment or LC1 announcement treatment. Use the information flyer (see Reporter Recruitment Flier below) and introduction letter to help gain the support of the LC1. If the LC1 is unavailable, ask him to delegate the responsibility to another local authority figure, such as the Vice-Chairperson, Secretary of Defence, or member of the Local Council Committee.

Next, have the chairperson or a resident of the zone describe the boundaries of the zone. Discuss how to divide up the zone into four cells of roughly similar size, and begin recruitment activities according to the treatment assigned to that zone. Five individuals will be recruited from each of the four cells. In this way, 20 reporters will be recruited in each zone. [In Phase 1, our recruitment team was asked to recruit three individuals from each of the four cells per zone, for a total of 12 reporters per zone]. Eligible subjects must be an adult (over the age of 18), a resident of the zone and the primary user of their own cell phone.

Random Citizen Recruitment (Control treatment for Phases 1 and 2)

For zones that are assigned for random recruitment, the enumeration team will follow a random walk pattern (see the generating a random walk pattern section below) to select subjects. First, find your way to the center of one of the four cells in a zone, then follow a random walk pattern for three minutes using a timer on a phone or tablet. Once the timer reaches three minutes, attempt to recruit the nearest adult. If the adult is ineligible or refuses to participate, restart the timer and follow a random walk pattern again for three minutes to select the next potential subject. The same process will be followed until 5 subjects have been selected in each cell. The work is complete when a total of 20 subjects have been recruited in the zone. [In Phase 1, our recruitment team was asked to recruit three individuals from each of the four cells per zone, for a total of 12 reporters per zone]. Use the following steps to sign up the subjects.

1) Introduce yourself and inform the subject about the citizen monitoring program.
2) If the subject is interested in participating, read the flyer (see the Reporter Recruitment Flier below) to the subject in his/her preferred language.

3) Enumerators should not place any pressure on the respondents to participate, including informally with body language.

4) The subject is under no obligation to respond and may terminate the interview at any time without consequence.

5) If the subject agrees to participate, survey the subject using the Kobocollect survey.

**Neighbor Nomination (Phase 1 treatment)**

Contact the first adult in sight. To be eligible, the person must be an adult resident of the zone. Explain the program, hand them an information slip and answer any questions they raise. Ask them if they'd be willing to nominate a “reliable and trustworthy” person from the zone to become a reporter in the system. Follow the steps to sign up a subject in the previous section. If so, ask the person to make a personal introduction to the nominee either by calling the person or by making a face-to-face introduction. Make sure the nominated individual is an adult resident of the zone. Explain the program to the nominated individual, hand them an information slip and answer any questions they raise. Ask them if they'd be willing to participate as a reporter and remind them they have been nominated by a neighbor. If yes, sign them up using the survey on KoboConnect. Ask the person if they would like to nominate anyone to be a reporter, regardless of whether they have signed up or not. If no, again randomly walk for 2-3 minutes. Repeat the sign-up process.

**LC1 Announcement (Phase 2 treatment)**

Recruit subjects using the recruitment method assigned to the zone (see Random Citizen Recruitment or LC1 Recruitment). Additionally, inform the subject that in an upcoming zone meeting, the LC1 will announce them as a citizen monitor selected to represent the zone. After all 20 reporters have been recruited in a zone, provide the LC1 with a list of the names of those selected to be citizen monitors. Secure the LC1s commitment to announcing the program and names of citizen monitors at an upcoming zone meeting. Lastly, complete the LC1 Announcement survey on Kobocollect to gather the LC1s contact information. The implementation team will contact LC1s by phone one week following the completion of the recruitment activity to remind the LC1s to make the announcement at a zone-wide meeting.

**LC1 Recruitment (Phase 2 treatment)**

Subjects in zones assigned to Treatment 3 will be recruited by the LC1. The LC1 will personally
introduce the subject to the recruitment team and recommend them as a citizen monitor. Once the recruitment team has been introduced to the subject, follow the instructions below to sign up a subject.

**Reporter Recruitment Flier (Phase 1 and 2)**

**Invitation to Report on Solid Waste Collection in Your Neighborhood!**

We are an independent research group launching a project that will allow residents of Kampala to use SMS to report on waste management issues in their neighborhoods. Your input is very valuable and we hope you will participate in making Kampala a cleaner and more livable city. We are asking you to join the platform.

If you sign up to be a reporter, we will send you 2-3 messages per week over 8 weeks asking you to report on the solid waste condition and services in your neighborhood. Each week there will be a lottery to win airtime.

All messages that you send and receive from us will be toll-free and will not reduce your airtime. If you ever have questions, you can send the message “HELP” to 6585. Someone will contact you to answer your questions. You can also send the message “STOP” to 6585 at any time to stop receiving messages. Your name or contact information will not be shared with anyone. Your responses will be used to inform the Kampala Capital City Authority about which areas of Kampala require better waste management services. Please contact Jacob Skaggs (0780291311) if you have any questions or concerns about the program.

**Generating a random walk pattern**

1) Find an intersection in each of the assigned cells. An intersection is the crossing of any road, path, or alley that leads to the entrance of residential dwellings. The starting intersection should be located by walking several minutes into the assigned cell.

2) Assign each direction leading from the intersection a number. Roll the dice and move in the direction selected randomly.

3) Any time you reach another intersection, assign each direction that moves forward from your walk path a number and roll the dice, moving in the direction selected randomly. You should only turn around if you reach a dead end or the edge of the assigned cell.

4) The only reason that the randomly chosen direction should not be an option is if you have already been down a path and you know that it leads to a dead end.
C. Prompts Sent to Citizen Reporters

Prompts from Experiment 1:

1. How many times have you observed waste being picked up and removed from your zone in the last weeks? [REPLY with a number]
2. How many waste heaps have you observed being burned in your zone during the last 24 hours? [REPLY with a number]
3. Please describe the location of any waste heap that needs attention from the KCCA or its contractors. [REPLY with a location description]

(In the Experiment 1, each of the three messages above were sent to all subjects once each week over a period of 8 weeks).

Prompts from Experiment 2:

1. Does a rubbish truck come to your neighborhood? 1) no 2) yes 3) don’t know
2. When did the rubbish truck last collect your rubbish? A) never B) more than two weeks ago C) last week D) this week
3. What is the most common way for your neighbors to dispose of their rubbish? 1) burn rubbish 2) throw in a rubbish pile 3) throw in a ditch 4) use a rubbish truck 5) don’t know
4. How happy are you with rubbish collection services? 1) very unhappy 2) unhappy 3) neither happy nor unhappy 4) happy 5) very happy 6) don’t know
5. How often do you see rubbish spilling from rubbish trucks? 1) never 2) rarely 3) two times a month 4) once a week 5) many times a week 6) don’t know
6. How much waste is there on the ground in your neighborhood? (1) none (2) some small piles (3) a few larger piles (4) waste in many places 5) don’t know
7. On the path you walk in and out of your zone, how many waste piles would you see? [Respond with a number]
8. In a typical week, how many times would you see burning rubbish if you walked in the zone for fifteen minutes per day?
9. How often does the rubbish truck collect rubbish on the chosen day of the week? 1) never 2) not often 3) often 4) very often 5) don’t know
10. How happy are you with how often your rubbish is collected? 1) very unhappy 2) unhappy 3) neither happy or unhappy 4) happy 5) very happy 6) don’t know
11. How happy are you with the distance from your home to the rubbish truck? 1) very unhappy 2) unhappy 3) neither happy or unhappy 4) happy 5) very happy
12. How well do rubbish collectors treat you? 1) very bad 2) bad 3) neither bad nor good 4) good 5) very good
13. What is the biggest problem with your rubbish collection service? [open response]
14. Are there any other rubbish or sanitation services that you would like? [open response]
15. Please describe how to reach the largest rubbish pile near your home. [open response]
D. Pre-Registered Hypotheses

Experiment 1

**H1a:** More nominated reporters will respond to at least one prompt than randomly recruited reporters.

**H1b:** Nominated reporters will respond to more prompts than randomly recruited reporters, measured as a count both over the entire 8-week experiment and within individual weeks.

**H1c:** Nominated reporters will respond to more open-ended prompts than randomly recruited reporters, measured as a count both over the entire 8-week experiment and within individual weeks.

Experiment 2

**H1a:** More reporters assigned to the LC1 recruitment treatment will respond to at least one prompt than randomly recruited reporters.

**H1b:** More reporters assigned to the LC1 announcement treatment will respond to at least one prompt than reporters in the announcement control condition.

**H1c:** More reporters assigned to the responsiveness treatment will respond to at least one prompt than reporters in the responsiveness control condition.

**H2a:** Reporters assigned to the LC1 recruitment treatment will respond to more prompts than randomly recruited reporters, measured as a count both over the entire 8-week experiment and within individual weeks.

**H2b:** Reporters assigned to the LC1 announcement treatment will respond to more prompts than reporters in the announcement control condition, measured as a count both over the entire 8-week experiment and within individual weeks.

**H2c:** Reporters assigned to the responsiveness treatment will respond to more prompts than reporters in the responsiveness control condition, measured as a count both over the entire 8-week experiment and within individual weeks.

**H3a:** Reporters assigned to the LC1 recruitment treatment will respond to more open-ended prompts than randomly recruited reporters, measured as a count both over the entire 8-week experiment, within individual weeks (to measure changes in participation over time), and for the final two weeks (to measure attrition).

**H3b:** Reporters assigned to the LC1 announcement treatment will respond to more open-ended prompts than reporters in the announcement control condition, measured as a count both over the
entire 8-week experiment, within individual weeks (to measure changes in participation over time), and for the final two weeks (to measure attrition).

**H3c:** Reporters assigned to the responsiveness treatment will respond to more open-ended prompts than reporters in the responsiveness control condition, measured as a count both over the entire 8-week experiment, within individual weeks (to measure changes in participation over time), and for the final two weeks (to measure attrition).
E. Heterogeneous Treatment Effects of Responsiveness for Inactive and Active Phase 1 Reporters

As an extension to our main analysis, we are interested in whether responsiveness can both cause more persistent reporting among activated reporters, as well as activate or re-activate reporters who fell below the engagement threshold that we theorize above. Thus, we divide all Phase 1 reporters who were prompted during Phase 2 for reports into three subgroups: (1) reporters who were active in both the first and second half of the reporting period during Phase 1 (the “activated” sub-group); (2) reporters who were only active in the first half of the reporting period during Phase 1 (the “deactivated” sub-group); and (3) reporters who were never active during Phase 1 (the “inactive” sub-group). Table F1 displays reporter-wise regression results for the number of reports received in total and during the last two weeks of Phase 2, where Inactive reporters and the control group are the baseline condition.

Table E1. Reporting by Phase 1 reporters during Phase 2 by activation status.

<table>
<thead>
<tr>
<th></th>
<th>Total (1)</th>
<th>Last two weeks (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsiveness</strong></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.172)</td>
<td>(0.037)</td>
</tr>
<tr>
<td><strong>Deactivated</strong></td>
<td>4.141***</td>
<td>0.437***</td>
</tr>
<tr>
<td></td>
<td>(0.301)</td>
<td>(0.065)</td>
</tr>
<tr>
<td><strong>Activated</strong></td>
<td>4.395***</td>
<td>0.395***</td>
</tr>
<tr>
<td></td>
<td>(0.376)</td>
<td>(0.081)</td>
</tr>
<tr>
<td><strong>Responsiveness X Deactivated</strong></td>
<td>1.031***</td>
<td>0.230***</td>
</tr>
<tr>
<td></td>
<td>(0.398)</td>
<td>(0.086)</td>
</tr>
<tr>
<td><strong>Responsiveness X Activated</strong></td>
<td>1.330***</td>
<td>0.250**</td>
</tr>
<tr>
<td></td>
<td>(0.495)</td>
<td>(0.107)</td>
</tr>
<tr>
<td><strong>Intercept</strong></td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.118)</td>
<td>(0.026)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>1,021</td>
<td>1,021</td>
</tr>
<tr>
<td><strong>Adjusted R²</strong></td>
<td>0.473</td>
<td>0.205</td>
</tr>
<tr>
<td><strong>F Statistic</strong></td>
<td>183.777***</td>
<td>53.460***</td>
</tr>
</tbody>
</table>

*Note: *p<0.1; **p<0.05; ***p<0.01

The results show that responsiveness does not boost rates of reporting for inactive reporters. For reporters that were inactive for the entirety of Phase 1, the responsiveness condition has no effect on
reporting. In contrast, responsiveness further boosts reporting for both activated and deactivated Phase 1 reporters, indicating not only that responsiveness can keep reporters out of the valley of disengagement, but also that it can reactivate those who have fallen below the activation threshold for collaborative governance.
F. Phase 2 Results by Zone

Here we report results both for the pooled group of subjects recruited during both Phase 1 and 2, as well as the results split by the recruitment phase at the zone level. We found that six of the seven zones in Phase 2 that our enumerators recruited 15 or fewer reporters were subsequently assigned to the Responsiveness treatment. We thus also examine the subset of zones with 16 or more reporters for the split Phase 2 analysis (recall the target was to recruit 20 reporters per zone) where the number of reporters at the zone-level is balanced by treatment condition. In all tables reported below, the base conditions are Random Citizen recruitment, the control condition for the LC1 announcement about reporters, and the control condition for the Responsiveness treatment.

Considering first the total number of reporters during Phase 2 who submitted at least one, on-topic report about solid waste management during the eight-week period, only the Responsiveness condition boosts the number of active reporters as hypothesized (Table 2). In both the pooled and split models, zones assigned to the responsiveness condition have approximately one extra reporter who is active on average than zones assigned to control (across all zones and experimental conditions, the mean is approximately five active reporters per zone during Phase 2). This translates to a 20 percent increase in the mean number of reporters and indicates substantive as well as statistical significance. This result indicates that hearing about what the government is doing with the reports via targeted outreach can help initiate engagement in citizen reporting. In contrast, we do not observe any differences in the number of active reporters when recruiting by either neighbor or LC1 nomination, or when reporters expected the LC1 to make an announcement about the platform and reporters at a community meeting. Thus, the evidence suggests that social motivations are not effective at activating reporting on public services in this context.
Turning to the total number of reports made by zone during the 8-week Phase 2 reporting period, we find very similar results, with only the responsiveness treatment driving more reports (Table 3). Pooling zones across recruiting periods, we find that the Responsiveness treatment increased the number of reports per zone by approximately 6.6 over eight weeks (across all zones and experimental conditions, the mean is approximately 32 reports per zone during Phase 2). This result is largely driven by the significant effect the Responsiveness treatment had on zones where recruitment took place during Phase 1, where the treatment increased the number of total reports by zone by approximately nine (Model P1). In contrast, the Responsiveness treatment did not increase the total number of reports among Phase 2 zones in ways that are highly inconsistent with random chance (for P2 and P2 CS models, p=0.10–0.15). Like the results for the total number of active reporters, we do not observe any differences in the number of total reports by zone when recruiting was done by either neighbor or LC1 nomination, or when reporters expected the LC1 to make an announcement about the platform and reporters at a community meeting.
Finally, we consider the total number of reports per zone by treatment condition for the last two weeks of the 8-week reporting period. As pre-registered, we are interested not only in the total effects of the **Responsiveness** treatment and the experimental recruitment conditions, but also whether social motivation or government responsiveness can drive longer-term engagement in the collaborative management of public services. Like previous estimations, we do not find that any recruitment condition or that the announcement about reporting by local leadership significantly increased reporting during the last two weeks of Phase 2. We do find, however, a strong signal that responsiveness from government to the citizen reports has a significant and positive effect on reporting across all zones in both of the field experiments, actually having a substantively similar effect. This result suggests that responsiveness is necessary to sustain reporting and participation in collaborative governance, even if it is not a predictor of initial engagement. Indeed, only the responsiveness treatment has a lasting effect for the entirety of the reporting period for reporters recruited during Phase 1 and for the end of the reporting period for reporters recruited during Phase 2.

**Table F2. Total number of reports by zone during Phase 2**

<table>
<thead>
<tr>
<th></th>
<th>(P1/P2 Pooled)</th>
<th>(P1)</th>
<th>(P2)</th>
<th>(P2 CS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsiveness</strong></td>
<td>6.640***</td>
<td>9.064***</td>
<td>5.217</td>
<td>3.658</td>
</tr>
<tr>
<td></td>
<td>(2.581)</td>
<td>(2.628)</td>
<td>(4.554)</td>
<td>(4.722)</td>
</tr>
<tr>
<td><strong>Neighbor Nomination</strong></td>
<td>0.561</td>
<td>0.281</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.760)</td>
<td>(2.643)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LC1 Nomination</strong></td>
<td>2.790</td>
<td>2.523</td>
<td>1.785</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.598)</td>
<td>(4.526)</td>
<td>(4.707)</td>
<td></td>
</tr>
<tr>
<td><strong>LC1 Announcement</strong></td>
<td>1.321</td>
<td>1.321</td>
<td>1.216</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.545)</td>
<td>(4.460)</td>
<td>(4.741)</td>
<td></td>
</tr>
<tr>
<td><strong>Reporters (Zone)</strong></td>
<td>2.246***</td>
<td>1.374**</td>
<td>2.006***</td>
<td>0.111</td>
</tr>
<tr>
<td></td>
<td>(0.361)</td>
<td>(0.699)</td>
<td>(0.763)</td>
<td>(2.297)</td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td>13.118***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.547)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zones</strong></td>
<td>189</td>
<td>89</td>
<td>96</td>
<td>89</td>
</tr>
<tr>
<td><strong>Adjusted R²</strong></td>
<td>0.494</td>
<td>0.125</td>
<td>0.071</td>
<td>-0.038</td>
</tr>
<tr>
<td><strong>F Statistic</strong></td>
<td>31.636***</td>
<td>5.191***</td>
<td>2.807**</td>
<td>0.194</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests*  
*p<0.1; **p<0.05; ***p<0.01*
Table F3. Total number of reports by zone during last two weeks of Phase 2

<table>
<thead>
<tr>
<th></th>
<th>(P1/P2 Pooled)</th>
<th>(P1)</th>
<th>(P2)</th>
<th>(P2 CS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsiveness</strong></td>
<td>1.413***</td>
<td>1.363***</td>
<td>1.575**</td>
<td>1.519**</td>
</tr>
<tr>
<td></td>
<td>(0.450)</td>
<td>(0.409)</td>
<td>(0.824)</td>
<td>(0.867)</td>
</tr>
<tr>
<td><strong>Neighbor Nomination</strong></td>
<td>0.028</td>
<td>-0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.656)</td>
<td>(0.412)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LC1 Nomination</strong></td>
<td>0.199</td>
<td></td>
<td>0.155</td>
<td>0.178</td>
</tr>
<tr>
<td></td>
<td>(0.628)</td>
<td></td>
<td>(0.819)</td>
<td>(0.865)</td>
</tr>
<tr>
<td><strong>LC1 Announcement</strong></td>
<td>-0.152</td>
<td></td>
<td>-0.141</td>
<td>-0.096</td>
</tr>
<tr>
<td></td>
<td>(0.619)</td>
<td></td>
<td>(0.807)</td>
<td>(0.871)</td>
</tr>
<tr>
<td><strong>Reporters (Zone)</strong></td>
<td>0.264***</td>
<td>0.182**</td>
<td>0.231**</td>
<td>0.310</td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td>(0.109)</td>
<td>(0.138)</td>
<td>(0.422)</td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td>1.449*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.794)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Zones**  
189  
89  
96  
89

**Adjusted R²**  
0.291  
0.109  
0.045  
-0.005

**F Statistic**  
13.879***  
4.605***  
2.117*  
0.880

*Note: one-tailed tests*

*p<0.1; **p<0.05; ***p<0.01*
G. Complier Average Causal Effects for LC1 Announcement treatment in Phase 2

The recruited reporters in the zones assigned to the LC1 Announcement treatment were fully informed that their names and responsibilities would be announced at an upcoming community meeting. We delivered the list of recruited reporters to all zone chairs in this treatment condition and asked them to make such an announcement. We followed-up with a reminder one week after delivering the list of reporters. At the end of the reporting period, we made three attempts to call all 50 LC1 chairs who had been asked to make this announcement at a community meeting based on the zone-wise random assignment. We were able to reach 42 chairs and learned that 16 made the community announcement and 26 did not make the community announcement. Those who did not make the community announcement reported that they were busy, were away from the zone, or did not remember, among other reasons.

In the main results above, we report intent-to-treat estimates that do not take into account the actual delivery of the LC1 Announcement treatment. Here we estimate complier average causal effects via 2-stage least squares, where the treatment assignment used as an instrument for the delivery of treatment. Because we did not deliver the names of reporters to LC1 chairs in zones assigned to control, we rule out two-sided non-compliance. We were not able to collect information about compliance for 8 of the 50 zones assigned to treatment, so we estimate the bounds of CACE. Table G1 drops the zones with missing compliance information. Table G2 assumes that all zones with missing compliance data are compliers. Table G3 assumes all zones with missing compliance data are non-compliers. All tables show the second stage estimates. In no case do we find treatment effects that diverge in substantive or statistical significance from the intent-to-treat results reported in the main text.
Table G1. CACE for LC1 Announcement Condition with missing compliance data dropped

<table>
<thead>
<tr>
<th>Procedure for Missing Compliance Data: Dropped</th>
<th>Total Responses</th>
<th>Active Ever</th>
<th>Last 2 Week Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>0.229</td>
<td>0.049**</td>
<td>0.077**</td>
</tr>
<tr>
<td></td>
<td>(0.202)</td>
<td>(0.024)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>LC1 Nomination</td>
<td>0.099</td>
<td>-0.010</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.201)</td>
<td>(0.023)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>LC1 Announcement</td>
<td>0.065</td>
<td>0.035</td>
<td>-0.020</td>
</tr>
<tr>
<td></td>
<td>(0.554)</td>
<td>(0.065)</td>
<td>(0.104)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.289***</td>
<td>0.352***</td>
<td>0.240***</td>
</tr>
<tr>
<td></td>
<td>(0.195)</td>
<td>(0.024)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,710</td>
<td>1,710</td>
<td>1,710</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests*  
* p<0.1; ** p<0.05; *** p<0.01

Table G2. CACE for LC1 Announcement Condition with missing compliance data assumed to be in compliance

<table>
<thead>
<tr>
<th>Procedure for Missing Compliance Data: Upper Bound</th>
<th>Total Responses</th>
<th>Active Ever</th>
<th>Last 2 Week Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>0.239</td>
<td>0.050**</td>
<td>0.075**</td>
</tr>
<tr>
<td></td>
<td>(0.195)</td>
<td>(0.023)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>LC1 Nomination</td>
<td>0.123</td>
<td>-0.009</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.195)</td>
<td>(0.023)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>LC1 Announcement</td>
<td>0.159</td>
<td>0.060</td>
<td>-0.015</td>
</tr>
<tr>
<td></td>
<td>(0.424)</td>
<td>(0.050)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.271***</td>
<td>0.351***</td>
<td>0.233***</td>
</tr>
<tr>
<td></td>
<td>(0.190)</td>
<td>(0.023)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,845</td>
<td>1,845</td>
<td>1,845</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests*  
* p<0.1; ** p<0.05; *** p<0.01
Table G3. CACE for *LC1 Announcement* Condition with missing compliance data assumed to be out of compliance

<table>
<thead>
<tr>
<th>Procedure for Missing Compliance Data: Lower Bound</th>
<th>Total Responses (1)</th>
<th>Active Ever (2)</th>
<th>Last 2 Week Responses (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsiveness</td>
<td>0.235 (0.194)</td>
<td>0.049** (0.023)</td>
<td>0.075** (0.035)</td>
</tr>
<tr>
<td>LC1 Nomination</td>
<td>0.135 (0.193)</td>
<td>-0.005 (0.023)</td>
<td>0.011 (0.036)</td>
</tr>
<tr>
<td>LC1 Announcement</td>
<td>0.233 (0.622)</td>
<td>0.087 (0.073)</td>
<td>-0.023 (0.115)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.268*** (0.195)</td>
<td>0.349*** (0.024)</td>
<td>0.234*** (0.035)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,845</td>
<td>1,845</td>
<td>1,845</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests*  
* p<0.1; ** p<0.05; *** p<0.01
H. Examining the possibility of a social norm treatment effect in the Responsiveness treatment

As part of the Responsiveness treatment, we informed all reporters about the total number of reports received from their zone during the previous week. Although reporters were never informed about the total number of other reporters in their zone, which makes it difficult for the reporters to interpret the raw number of reports as a social norm, it is nonetheless possible that this information introduced a bundled nudge toward a social norm into the treatment. Other research finds that when given information about social norms, on average people revert to the social norm, whether they are above or below it. For example, Schultz et al. (2007) find that provider households with descriptive norms about energy consumption in their neighborhood decreased usage among high-usage households, but had the opposite effect among low-usage households. If a social norm were activated in our case, we would expect it to boost reporting from inactive reporters and decrease reporting from active reporters. Since the Responsiveness treatment is intended to boost reporting for both types of reporters but would be counteracted by a social norm among active reporters, we examine whether the Responsiveness treatment has a null or a negative effects among reporters who were active during the previous week. Intuitively, this transforms the dependent variable to the rate of continued reporting among reporters who were active in the immediate past. If there is a positive treatment effect in this group, we add confidence that responsiveness from government is driving the positive treatment effect that we observe in the main results.

To complete this robustness check, we examine only the reporting behavior for reporters who were active during the previous week, who either would not be able to interpret whether they were above or below the social norm or who knew that they were above it. We first calculate the number of weeks that are eligible for analysis for each reporter, which is the number of weeks when a reporter was active during the previous week. We then sum the number of reports that these reporters submitted during these eligible weeks and model treatment effects as above, controlling for the total number of eligible weeks at the reporter level. Table H1 shows the total number of eligible responses received during the Phase 2 reporting period as a function of treatment assignments. Table H2 shows the total number of eligible responses received during the last four weeks of Phase 2 reporting period as a function of treatment assignments. In all models, the results match the main results that use a larger sample of subjects, which adds confidence that our treatment effects are coming about because of responsiveness from government.
Table H1. Total number of reports during Phase 2 among reporters who were active the previous week

<table>
<thead>
<tr>
<th></th>
<th>DV: Total Number of Eligible Reports During Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(P1/P2 Pooled)</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>0.201**</td>
</tr>
<tr>
<td></td>
<td>(0.119)</td>
</tr>
<tr>
<td>Neighbor Nomination</td>
<td>0.512**</td>
</tr>
<tr>
<td></td>
<td>(0.247)</td>
</tr>
<tr>
<td>LC1 Nomination</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>(0.133)</td>
</tr>
<tr>
<td>LC1 Announcement</td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td>(0.132)</td>
</tr>
<tr>
<td>Eligible Weeks</td>
<td>1.786***</td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
</tr>
<tr>
<td>Phase 2</td>
<td>0.194</td>
</tr>
<tr>
<td></td>
<td>(0.210)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.955**</td>
</tr>
<tr>
<td></td>
<td>(0.398)</td>
</tr>
<tr>
<td>Eligible Reporters</td>
<td>655</td>
</tr>
<tr>
<td>F Statistic</td>
<td>549.534***</td>
</tr>
</tbody>
</table>

Note: one-tailed tests
*p<0.1; **p<0.05; ***p<0.01
### Table H2.

Total number of reports during the last four weeks of Phase 2 among reporters who were active the previous week

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DV: Total Number of Eligible Reports During Last Four Weeks of Phase 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td>0.342***</td>
<td>0.548**</td>
<td>0.292**</td>
</tr>
<tr>
<td></td>
<td>(0.132)</td>
<td>(0.261)</td>
<td>(0.152)</td>
</tr>
<tr>
<td><strong>Neighbor Nomination</strong></td>
<td>0.032</td>
<td>-0.012</td>
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</tr>
<tr>
<td></td>
<td>(0.269)</td>
<td>(0.247)</td>
<td></td>
</tr>
<tr>
<td><strong>LC1 Nomination</strong></td>
<td>0.168</td>
<td></td>
<td>0.155</td>
</tr>
<tr>
<td></td>
<td>(0.147)</td>
<td></td>
<td>(0.151)</td>
</tr>
<tr>
<td><strong>LC1 Announcement</strong></td>
<td>0.064</td>
<td>0.064</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.146)</td>
<td></td>
<td>(0.149)</td>
</tr>
<tr>
<td><strong>Eligible Weeks</strong></td>
<td>0.766***</td>
<td>0.648***</td>
<td>0.798***</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.072)</td>
<td>(0.043)</td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td>0.148</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.233)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intercept</strong></td>
<td>-0.324</td>
<td>0.163</td>
<td>-0.128</td>
</tr>
<tr>
<td></td>
<td>(0.454)</td>
<td>(0.397)</td>
<td>(0.243)</td>
</tr>
<tr>
<td><strong>Eligible Reporters</strong></td>
<td>480</td>
<td>110</td>
<td>370</td>
</tr>
<tr>
<td><strong>F Statistic</strong></td>
<td>73.877***</td>
<td>28.313***</td>
<td>88.200***</td>
</tr>
</tbody>
</table>

*Note: one-tailed tests*  

*p<0.1; **p<0.05; ***p<0.01*