Broken Cities: The Effect of Government Responsiveness on Citizens' Participation *

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What is the impact of government responsiveness on citizens' participation in local public goods provision? I explore whether government receptiveness to requests for maintenance work (e.g., sidewalk repairs, tree pruning) affects the likelihood that citizens will demand new government projects. I ran a field experiment in collaboration with the Government of the City of Buenos Aires that generated an exogenous increase in repairs of broken sidewalks reported by citizens. I find that when the government repairs sidewalks after citizens file complaints, other citizens are more likely to issue additional requests for public maintenance work. Most subsequent demands come from citizens who had not filed a complaint before, which indicates that government performance may have an "enfranchising" effect. The evidence suggests that the repairs change citizens' underlying beliefs about government responsiveness rather than merely reminding them of other maintenance problems. I also find suggestive evidence that citizens' complaints lead to government repairs. These findings are consistent with the existence of strategic complementarities between government responsiveness and citizen participation, which could help explain the substantial variation in public goods provision both across and within countries.

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1 Introduction

When the government is not responsive to citizens' demands, citizens may feel discouraged from participating; the resulting low level of participation would in turn deprive government officials of the information and incentives to perform. Yet when the government *is* responsive, citizens may feel engaged and thus become more active, which would reinforce the government's strong performance. In other words, government responsiveness and citizens' participation can reinforce each other, potentially leading to multiple equilibria in government performance.

Whereas previous work has examined the influence of citizens' participation on government responsiveness and performance, less is known about the reciprocal link. This paper provides the first direct causal evidence of the impact of government responsiveness on citizens' participation. It does so in the context of citizens' complaints about (and government maintenance of) local public goods such as sidewalks, streets, trees, and streetlights. In this context, what happens if the government fixes problems reported by citizens? Would the repairs encourage citizens to participate more, in the form of additional requests for improvements in local public goods?

Two empirical challenges arise when relying on observational data to estimate the impact of government repairs on citizens' complaints. First, causality may run in the opposite direction if the government reacts to citizens' requests. Second, time-varying characteristics of the area, such as the number of maintenance problems, could drive both complaints and repairs. In collaboration with the Government of the City of Buenos Aires, I address these concerns by randomizing an increase in repairs of sidewalks reported by citizens both across space and over time. I combine the field experiment with access to a unique dataset with detailed information on government repairs of (and citizens' complaints about) local public goods in order to analyze the impact of sidewalk repairs on new demands for government work.

In principle, the effect of government repairs on citizens' participation is ambiguous. Citizens may be moved to take action if they believe that their concerns are likely to be addressed. However, free riding may erode participation if others' actions are believed to be more effective.[1] Moreover, if citizens interpret the intervention as a signal of stronger state capacity, it may lead to the belief that participation is no longer needed in order for problems to be solved.

I find that government work does stimulate citizens' involvement. When the local authorities repair a sidewalk in response to a citizen request, this results in approximately a 20% increase in the number of complaints about other problems in that and contiguous blocks (as measured by the intention to treat). This increase in complaints is mostly concentrated in the month following the repair. Moreover, a significant portion of the new requests are related to problems located in blocks other than the one in which the initial repair was located, and are not only about sidewalks but also about other issues for which the unmet demand is highest. The increase in complaints is robust to the choice of time controls, to accounting for different degrees of spatial correlation or correlation over time, and to the length of the panel used.

I also find that the original complainants are not responsible for the effect found: other citizens are filing the new complaints. Hence, the rise in complaints is driven by an increase in the participation of the local community. Original complainants only file new complaints in order to report problems with the recent sidewalk repair; they do not otherwise request new work. In fact, I find that most of the demands come from citizens who had not filed a complaint before,[2] which suggests that government performance has an "enfranchising" effect.

[1] For instance, an increase in citizens' effectiveness is equivalent to an increase in the number of players in a volunteers' dilemma game. In those games, it can be shown that the larger the number of players, the less likely it is that at least one player will volunteer in a mixed-strategy equilibrium.

[2] That is, between January 2013 and September 2015, the period for which the data has masked information for citizens.

The evidence suggests that the repairs may be changing underlying beliefs about government responsiveness rather than merely reminding citizens of other maintenance problems. I exploit the fact that the randomization generates variation in the time between when a complaint was filed and when it was addressed, and find evidence that a repair generates more demands the faster the government responds, which conveys a stronger message of responsiveness. Moreover, using administrative data from before the intervention, I find that repairs originating from citizens' requests, as opposed to other sources, have the greatest effect on new complaints. Lastly, I use repairs performed by utility service companies as a placebo and find they have no effect on the number of complaints, which would be the case if the results were explained by citizens paying more attention to existing problems in the area.

To close the feedback loop between responsiveness and participation in this context, I provide suggestive evidence on the impact of citizens' complaints on government maintenance work. I focus on tree maintenance, the local public good with lowest responsiveness and one that experienced an exogenous increase in complaints as a result of the intervention, to study whether the government is more likely to perform maintenance work in areas with more complaints. I find that during the six months after the end of the intervention tree repairs are indeed more likely in blocks that were assigned to receive a sidewalk repair by the intervention, but only when these blocks had already accumulated a large number of complaints about trees.

The main contribution of this paper is to identify the direct causal effect of government responsiveness on citizens' participation.[3] The notion that government responsiveness affects participation has been present in the literature for a long time, but previous work on the relevance of political institutions assesses other costs and benefits, or only indirectly

[3] Interestingly, Sjoberg, Mellon and Peixoto 2015 find that citizens who report problems with local public goods using the FixMyStreet.com platform are more likely to report a new problem if their first complaint was resolved. In contrast to this paper, the platform they study is operated by a charity that collaborates with the government, and the empirical strategy does not exploit experimental or quasi-experimental variation in the repairs.

explores the empirical relevance of responsiveness. Among the direct costs and benefits, political violence is found to deter participation (Collier and Vicente 2014), whereas fines for abstention and vote buying seem to encourage it (Leon 2015, Vicente 2014). Related to the perception of responsiveness, information about political corruption is found to encourage voters to withdraw from the political process (Chong et al. 2012), whereas information about politicians' performance and qualifications, programmatic campaigns coupled with voter feedback on platforms, and campaigns to raise awareness about the impact of the electoral process on policy outcomes have been found to increase voter turnout (Banerjee et al. 2011, Fujiwara and Wantchekon 2013, Gine and Mansuri 2010). A more direct measure of the relevance of expectations comes from Botero, Ponce and Shleifer 2013, who find that citizens' expectations that a policeman who breaks the law will be punished are associated with the probability that they will complain about officials' misconduct.

By providing evidence on the effect of government responsiveness on citizens' participation, this paper complements the literature that studies the impact of participation on government performance. This literature suggests that participation in the form of direct contacts from citizens may be particularly amenable to strategic complementarities with government performance. Direct contacts from citizens are found to provide incentives for government officials to perform. Chen, Pan and Xu 2015 show that local governments are responsive to citizens' demands for government assistance even in an authoritarian regime like China – especially when the demands hint at the possibility of collective action or disclosure to higher levels of government. Botero, Ponce and Shleifer 2013 argue that the quality of government is higher in more-educated countries, because more-educated citizens are more likely to file complaints and hold government officials accountable for their actions. Moreover, learning about constituents' opinions on public matters can also influence representatives' decisions (Butler and Nickerson 2011). In contrast, other types of participation have had mixed results on government performance (see Pande 2011; Olken and Pande 2012; Bjorkman and

Svensson 2009; Besley and Burgess 2001; Banerjee et al. 2010; Knack 2002; Nannicini et al. 2013, among others).

All in all, this paper suggests that there may be strategic complementarities between government responsiveness and citizens' participation, which could help explain the substantial variation in public goods provision both across and within countries (Banerjee, Iyer and Somanathan 2007).[4] Relatively quick changes in institutions can occur under this multiple equilibria view, in contrast to the view put forward by Acemoglu and Robinson 2001, among others.

Citizen-initiated contacts, a long-standing form of political participation, are becoming increasingly common around the world as part of a larger trend toward the incorporation of information and communications technology (ICT) in government services. By 2008, in a sample of 1,667 national government websites in 198 nations, approximately 88% allowed citizens to pose questions or request services via email (West 2008). Many such advancements in governance are taking place within local governments. During the last few years, complaint systems have spread rapidly in cities in both the developed and the developing world. The incorporation of ICT in government services has been expected to foster citizens' voice and empowerment and, as a consequence, government accountability and delivery. However, in many cases, citizens' uptake of these new digital communication channels has been limited, and has tended to reinforce pre-existing inequalities in service delivery (*World Development Report: Digital Dividends* 2016). This paper suggests that those pre-existing conditions could have led to differences in expectations about the effectiveness of these new channels, which would have curtailed the equalizing potential of e-government initiatives.

The remainder of the paper is organized as follows. Section 2 presents a model of strate-

[4] The notion that culture and institutions are co-determined in equilibrium has also been stressed by Aghion et al. 2010; Carlin, Dorobantu and Viswanathan 2009; Alesina, Cozzi and Mantovan 2012; Alesina et al. 2015; Alesina and Angeletos 2005; Bisin and Verdier 2015; and Acemoglu and Jackson 2014, among others.

gic complementarities between government responsiveness and citizens' complaints. Section 3 describes the context, intervention, and data used. Section 4 discusses the empirical strategy. Section 5 presents the main results. Section 6 provides suggestive evidence of potential mechanisms at play. Section 7 provides evidence of government responsiveness to citizens' complaints generated by the intervention, and Section 8 concludes.

2 A Model of Government Responsiveness and Citizens' Complaints

This section presents a model to illustrate the interplay between government responsiveness and citizens' decisions about whether to complain. This model provides a framework to explore how responsiveness and participation are related in equilibrium, and the conditions under which multiple equilibria can arise. It also allows me to examine how an intervention that temporarily increases government responsiveness, such as the one presented in this paper, can affect citizens' complaints and future government responsiveness.

In this model, causality runs in both directions: citizens' expectations about government responsiveness determine how many complaints the government receives, and the number of complaints in turn determines how responsive the government is. When citizens have higher expectations of government responsiveness, more citizens will be encouraged to file complaints because the expected payoff of doing so will be greater. When filing a complaint, a citizen is giving the government the opportunity to earn her support; however, if the government does not deliver, she will punish the lack of responsiveness by withdrawing her support. The government is assumed to want citizens' support. As a result, the greater the number of citizens filing complaints, the more that is at stake for the government. These higher-powered incentives will thus encourage the government to be more responsive. In this way, government responsiveness and citizens' participation will reinforce each other.

There is a continuum of mass 1 of citizens in a given area, $i \in [0,1]$, and a continuum of local public goods of mass 1, $j \in [0,1]$, which are provided by the government. Citizen i cares the most about local public good $j = i$. Sidewalks are an example of a public good with this characteristic: their maintenance affects all citizens in the area, but is particularly relevant for those who live close by. The area has problems with those public goods, which are observed by citizens but not by the government. Citizen i decides whether to file a complaint about the problem with public good $j = i$, $V_i = \{0,1\}$, and assigns a value M to its solution. For simplicity, I assume that the value for citizen i of a solution to the problem with public good $k \neq i$ is 0.[5] If citizen i files a complaint, she pays a cost c_i, where $c_i \sim f(.)$, with its cumulative $F(.)$ a differentiable function. Let σ be the share of citizens that files a complaint.

The government observes σ and has to decide whether to go to the area to solve all the problems reported, $Z = \{0,1\}$, where $Z = 1$ means that the government solves the problems.[6] The government will solve the problems only if the benefit of doing so is large enough. The benefit is given by the support that the government receives from citizens. The government has an opportunity cost of attending to problems in this area (i.e. the increase in support that it could get elsewhere), which cannot be observed by citizens. Let a be the opportunity cost given by $a \sim g(.)$, with its cumulative $G(.)$ a differentiable function.

Let citizens give baseline support T to the government. If $Z = 1$, then citizens increase their support by an amount γ. Since the repairs are public information, all citizens will incorporate this information and increase their support. However, if $Z = 0$ then citizens will decrease their support by the same amount γ. Since complaints are private information,

[5] A more general model could include citizens attaching some (lower) value to local public goods further away, but the main intuition of the model can be illustrated in the simpler case presented here.

[6] Two forces could rationalize this assumption. First, the government usually has a fixed cost to going to a given area to execute repairs. Second, complainants that do not receive a solution but observe the government working on others' complaints in their neighborhood may have a particularly negative reaction. Therefore, the benefit from serving some citizens may be (at least, partially) undone if other citizens' demands are unattended in the same area.

this only happens for the share of citizens σ that filed a complaint. Therefore, if $Z = 1$ the government receives support $T + \gamma$, and if $Z = 0$ the government receives support $(1 - \sigma)T + \sigma(T - \gamma)$.

The timing is as follows:

1. Nature determines:
   (a) The costs $\{c_i\}_{i\varepsilon[0,1]}$ of filing complaints, which are only observed by citizens.
   (b) The opportunity cost a of the government, which is only observed by the government.
2. Citizens decide whether to file complaints $\{V_i\}_{i\varepsilon[0,1]}$.
3. If there are any complaints, the government decides whether to go to the area and repair the problems reported, $Z = \{0, 1\}$.
4. The government receives the corresponding support.

Equilibria

An equilibrium is given by a strategy profile $Z(\sigma, a)$ and $\{V(c_i)\}_{i\varepsilon[0,1]}$ that is sequentially rational, and beliefs that are consistent with the distribution of costs. That is, in an equilibrium the strategies of citizens and the government are optimal at each information set given everyone else's strategies and the distribution of types.

The equilibria can be obtained by backwards induction. Given a share σ of citizens that complained, the government will attend to citizens' demands if:

$$T + \gamma - a \geq (1 - \sigma)T + \sigma(T - \gamma) \iff a \leq (1 + \sigma)\gamma.$$

For a given opportunity cost a, the government uses a threshold rule to decide whether to respond to the demands: if enough citizens participate, the government will respond;

otherwise, it will not. From an *ex ante* point of view, the likelihood that the government will fix the problems is given by:

$$\pi(\sigma) = G((1+\sigma)\gamma). \tag{1}$$

The larger the share of citizens complaining, the more likely the government is to solve problems related to public goods. When a citizen makes a request, she is providing both carrots and sticks to the government: she is giving the government the information necessary to earn her (and everyone else's) support; however, if the government does not deliver, she will decrease her support. As a result, the larger the share of citizens that complains, the higher the cost for the government of not responding, thus the higher its incentives to repair the problems reported in the area. Although citizens cannot provide incentives to the government individually, they can do so as a group.

From the point of view of each individual citizen, the likelihood of government responsiveness is exogenously determined by the share of their fellow citizens that is also making demands and the unknown opportunity cost. When deciding whether to file a complaint, citizen i will do so if the likelihood of a solution is large enough to cover the cost of taking action. That is, citizen i complains if $\pi M \geq c_i$. The share of citizens complaining is thus given by:

$$\sigma(\pi) = F(\pi M), \tag{2}$$

where a more responsive government will induce more citizens to participate.

An equilibrium is characterized by a pair (σ, π) that meet both (1) and (2). When this is the case, the share of citizens complaining leads to a degree of government responsiveness that justifies the initial decision to participate. The following proposition states that at least one equilibrium exists, and provides a condition for the existence of multiple equilibria.

Proposition

Let $\Delta(\pi) = G((1+F(\pi M))\gamma)$.

1. A fixed-point π^* for this function exists, and it constitutes an equilibrium.

2. Let π^* be a fixed point of this function. If $\triangle(\pi^*)' > 1$, then there are multiple equilibria.

Proof: See the Appendix.

Assume that $\triangle(\pi^*)' > 1$. Let π^1 and π^2 be two fixed points of $\Delta(.)$, which in turn determine two different levels of responsiveness in equilibrium. The more responsive the government is, the larger the share of citizens that will complain in equilibrium; that is, $\sigma^1 > \sigma^2$ because $\sigma(.)$ is increasing in π. Intuitively, when citizens believe the government is more responsive, the expected value of complaining is higher. As a result, citizens with higher costs of complaining will be more likely to participate, which in turn provides more information and incentives to the government that justify the higher responsiveness observed.

The Effect of a Shock in Government Responsiveness

In this section, I assume that $F(.)$ and $G(.)$ are derived from a symmetric unimodal distribution function, and that $\triangle(\pi^*)' > 1$. As shown in Figure 1, in this case there will be three equilibria: a high participation/high responsiveness equilibrium (π^H, σ^H), a low participation/low responsiveness equilibrium (π^L, σ^L), and an intermediate (unstable) equilibrium (π^U, σ^U).

Suppose that the area is in equilibrium (π^*, σ^*), and that there is an exogenous positive shock in government responsiveness of the form $\hat{\pi} = \pi^* + \kappa$ with $\kappa > 0$.This shock generates an increase in complaints that is either temporary or permanent depending on: 1) whether the initial equilibrium is stable, and 2) the size of the shock.

Let the initial equilibrium be stable, which is the case for (π^H, σ^H) and (π^L, σ^L). A small shock in responsiveness generates an increase in complaints, as shown in Figure 2. In Panel A, the government and citizens are initially in an equilibrium with high participation and responsiveness, and in Panel B they are in an equilibrium with low participation and responsiveness. In both cases, the shock in responsiveness increases the number of complaints the government receives, as the perception that it is more responsive encourages citizens who did not complain before to file a complaint now.[7]

If $\pi'(\sigma^*) > 0$, this increase in complaints leads to a degree of government responsiveness that is temporarily above the equilibrium level π^*, as shown for (π^H, σ^H) in Panel A. However, in this case neither the increase in complaints nor the resulting increase in responsiveness will be large enough to lock the government and citizens into a higher equilibrium. Panel B depicts the case of a low equilibrium in which the initial number of complaints was low enough that, even after the shock and subsequent increase in complaints, it is not worth it for the government to be more responsive than it was in equilibrium: the government would rather pursue the opportunity cost a elsewhere.[8] In sum, when citizens and the government are in a stable equilibrium, a small positive shock in responsiveness leads to a temporary increase in complaints (and complainants): eventually, they will both return to previous levels of participation and responsiveness. This is also the case when the equilibrium is unique. Moreover, the larger the initial number of complaints, the more likely it is that the government will also temporarily increase its responsiveness as a result of the temporary increase in complaints.

[7] In this example, I am assuming that the cost of filing complaints is arbitrarily low so as to prompt complaints whenever $\pi > 0$. This is plausible in a context like Buenos Aires, where internet penetration is high and the government has created a website with a simple interface where citizens can file complaints. Even if this were not the case, the number of complaints would still increase in the state of high equilibrium.

[8] If the government is serving different areas, budget constraints and an opportunity cost a that is determined in a more general equilibrium by the share of citizens complaining elsewhere would lead to this situation.

A shock can generate a shift in the equilibrium in two scenarios. First, if the initial equilibrium is unstable, a small positive shock is enough to generate a shift to an equilibrium with more complaints and greater responsiveness. Panel A of Figure 3 illustrates this scenario, in which complaints and responsiveness have a large impact on each other, leading to a higher equilibrium $\left(\pi^H, \sigma^H\right)$. However, due to the instability of this equilibrium, this scenario would be unlikely to occur in the first place. For the more likely scenario, in which the government and citizens are in a stable equilibrium, a shift can still happen if the shock in responsiveness is large enough. Panel B of Figure 3 depicts a case in which citizens and government are initially locked in a low equilibrium (σ^L, π^L) and there is a large positive shock in responsiveness. The resulting increase in participation would generate incentives for the government to be even more responsive in this area, which would in turn reinforce the increase in participation. Eventually, responsiveness and participation will converge to a higher equilibrium (σ^H, π^H).

3 Context and Experimental Design

3.1 Context

With 203 km^2, 3 million residents, and approximately 4 million more people commuting into the city every day, Buenos Aires is one of the largest metropolitan areas in South America. As in most big cities, the condition of its public spaces is constantly changing. Even though citizens can complain to the government about a range of problems – from corruption to school infrastructure – most complaints are related to problems in public spaces. This paper focuses on complaints about local public goods such as streets, sidewalks, trees, and streetlights.

Over the past 10 years, the local government has streamlined the bureaucratic process for filing complaints for maintenance in public spaces. Previously, citizens would file complaints directly to the corresponding office (e.g., a request for tree pruning would be filed at the tree maintenance office), where it would be determined whether to address or dismiss the complaint. Information about complaints would not be shared with other offices, which resulted in low accountability within the government regarding the degree of responsiveness to citizens. Following the 2007 local elections, the city's new administration decided to give citizens' requests a larger role in determining government work in public spaces. A process of centralization and digitization of all complaints started in 2007, which dramatically increased their visibility within the government. In 2007, the government set up a call center to receive all complaints, in 2009 it added a website for citizens to file complaints online, and in 2012 it incorporated mobile applications. Currently, all complaints received through these channels are first registered in a single database and then redirected to the appropriate government office.

Figure 4 depicts the increased focus of government work on addressing complaints between November 2012 and July 2013. The shift of repairs toward problems reported by citizens is apparent.[9] Within seven months, the share of repairs that was linked to a complaint more than quadrupled from 15% to 65%. This increase reflects a change in the choices about what work to do as well as an improved registration system that matched work to existing complaints; both demonstrate the growing interest in addressing citizens' complaints.

At the same time, citizens' demands for government maintenance work increased. Figure 4 shows that the number of complaints almost doubled from the beginning of 2012 to the end of 2013. Although the government lowered the cost of complaining by opening online channels of communication, most of this increase resulted from the intensification of complaints over the phone, which is consistent with an increasingly demanding citizenry.

This context is suitable for studying the relevance of government work to participation for several reasons. First, information asymmetries are not a constraint for citizens: residents are

[9]During this period, the total number of repairs does not show a clear trend.

better informed than the government about the condition of public spaces, and government actions in this regard are easily observed. Second, the cost of filing a complaint is unlikely to constitute a significant barrier to participation, given the expansion of filing channels over the last 10 years. These two points imply that changes in participation are more likely to reflect shifts in underlying beliefs about the value of participating, as opposed to changes in external factors that constrain citizens' participation. Third, citizen complaints about the maintenance of local public goods and government maintenance work are direct counterparts, as opposed to other types of participation, such as voting, for which citizens have to aggregate a larger set of (potentially conflicting) information about the government. That is, in contrast to other types of participation such as voting, in this realm there is a tight link between government decisions and citizens' actions. Finally, given the size of the City of Buenos Aires, the sample selected for the experiment can be reasonably spread out.

The city is geographically divided into 15 administrative areas, and a separate government office manages the maintenance of each public good. The government does not typically undertake the work itself; rather, it hires contractors for each public good and area of the city. The degree of responsiveness and number of unmet demands differ by public good. Table 1 displays the number of complaints filed between January 2014 and August 2015, and their status as of April 2016. The government is quite responsive to complaints about sanitation, streets, and streetlights, as measured by both the percentage of complaints closed and the number of days the government took to close those complaints. However, due to the type of contract used, the degree of budget constraints, the existence of biological constraints (in the case of tree pruning), and the shared responsibility with citizens regarding the maintenance of sidewalks, government responsiveness is lower for complaints about sidewalks and trees. Thus for those local public goods there are more unmet demands and more room for greater government responsiveness to complaints.

3.2 Experimental Design

In order to assess the causal effect of government work on citizens' participation, I collaborated with the government of the City of Buenos Aires. The objective of the intervention was to introduce an exogenous increase in government maintenance work in response to citizens' complaints. The intervention focused on routine sidewalk repairs, for which the number of complaints often exceeds the amount of resources, and entailed an expansion of resources for its maintenance work. The intervention ran from September 2015 to January 2016, and was focused on a subsample of complaints that met the following criteria:

- They were filed between January 2014 and August 2015.
- They remained unresolved as of September 1, 2015.
- Each complaint was filed by a different citizen.
- The problems reported were located in different (non-contiguous) blocks.

These complaints were randomly assigned into one of six batches. For each batch:

1. The government verified the existence of the reported problem and kept a subset of similar problems that were considered not to be dangerous or sensitive in any way.
2. Within that subset, complaints were randomly assigned to the treatment or control group, stratified by administrative area. Each batch was assigned a date for the beginning of repairs on treatment blocks, and a suggested end date. Complaints from the control group could be addressed after those from the treatment group were finished or after the suggested end date, whichever was the latest.
3. Batches were treated sequentially. That is, the verification and selection of complaints in the next batch to be included in the intervention started only after the verification

and selection from the previous batch was finished. Similarly, repairs for treated complaints in a batch started only after repairs for treated complaints in the previous batch were well underway.

The intervention thus introduced exogenous variation both across space and over time for a small subsample of complaints. Complaints that were part of the intervention were located in all areas of the city, excluding an area that consists of mainly businesses and offices. The final sample has 587 control blocks and 509 treatment blocks. Table 2 shows the distribution of treatment and control blocks and the dates by batch.

Since each complaint in the sample corresponds to a different block and a different complainant, I will refer interchangeably to complaints, complainants, and blocks as the unit of randomization.

By the end of the intervention, the government had completed the vast majority of the treatment group repairs (91.16%), and approximately 85% of the treatment repairs were executed within one month of the starting date for the batch.[10] The most common reason for non-compliance was that other areas of the government or citizens had already solved the problem by the time assigned for the repair (Table 3). Other reasons included citizen refusal at the time of the intervention, absence of materials on time, and in a few cases, a lack of follow-up information from the government. The intervention had a sizable effect on the number of repairs observed in the treatment blocks. The average number of sidewalk repairs doubled as a consequence of the intervention (Figure 5), and the average number of total repairs increased by approximately 70% (Figure 6). On average, a complaint in the treatment group had been outstanding for 270 days, and the average duration for a repair was 2.2 days. It is worth noting that due to the expanded budget for sidewalk repairs, the intervention did not decrease the amount of work in control blocks during the intervention.

[10] Based on the repair dates for Batches 2 to 6, because the exact dates of the repairs for Batch 1 were not recorded.

Since the government verified complaints in the control group for the intervention, after the end of the intervention it started to address those control complaints, as can be seen in Figure 5.

Table 4 tests for balance between treatment and control groups over the cross section of blocks and complainants, controlling for area and batch fixed effects. The treatment and control blocks are statistically similar in the number of complaints and repairs during the six months before the intervention in all cases except for streetlights, for which the number of repairs and complaints is larger in treated blocks. To be conservative, the main specification used includes block fixed effects. The complainants chosen for the experiment exhibit similar participatory behavior prior to the intervention.

For the analysis, I have the following data:

- Anonymous information about citizen contacts filed between November 2012 and April 2016. This data includes the type of problem, location of the problem, day and time of the report, number of reiterations of the complaint, and masks for any personal information (starting in January 2013).

- Information about maintenance work in public spaces between November 2012 and July 2013, and between January 2015 and July 2016, originating from both citizen contacts and other sources. This data includes the type of problem reported, location, dates of the maintenance process (e.g., when the work order was created), and types of tasks performed. Even though the exact time the work was carried out is not registered in this data, I can recover the month of execution. For the treatment repairs, I also have the exact dates the work was done for all batches except Batch 1.

- Information about the use of land in the city. That is, the number of buildings in each block, the type of building (house, apartments, commercial, offices, school, etc.), and the number of floors per building.

4 Empirical Strategy

The main objective of this paper is to estimate the effect of government responsiveness to citizens' demands (sidewalk repairs that address complaints) on citizens' participation (new complaints). Most of the analysis is focused on new complaints filed on sampled blocks and on blocks nearby. To this end, I use a panel with daily information on complaints, in which the unit of observation is:

1. Sampled blocks: blocks assigned to either the control or treatment group.

2. Contiguous blocks: blocks near sampled blocks. These are defined as blocks on the same street as the sampled block, which share a corner with the sampled block. In other words, they are close to the repair and in its line of sight. An example of this definition is shown in Figure 7. This is the definition used during the randomization described above.

The panel comprises 1,096 sampled blocks and 1,948 contiguous blocks. In a few cases, sampled blocks shared a contiguous block. In order to avoid double counting those contiguous blocks, if both sampled blocks belonged to the control group, the shared contiguous block was randomly assigned to only one of them and deleted as a contiguous block for the other control block. This was the case for 16 blocks (0.8% of all contiguous blocks in the sample). If both sampled blocks belonged to the treatment group, the shared contiguous block was assigned to the block that was treated first and deleted as a contiguous block for the other treated block. This was the case for 10 blocks (0.5% of all contiguous blocks in the sample). Lastly, if one sampled block was treated and the other was in the control group, the shared contiguous block was assigned to the treated block and deleted as a contiguous block for the control block. This was the case for 24 blocks (1.2% of all contiguous blocks in the sample).

I also look at new complaints filed by the complainants selected for the intervention, regardless of the location of the new complaint. For this part of the analysis, I use a panel of complainants with daily information on complaints.

The panel includes two months of data per batch (the month before and the month after the beginning of the treatment period), unless noted otherwise, in order to avoid capturing the periods during which the control blocks could be repaired. However, the results will be robust to increasing the length of the panel.

The estimations are based on the following specification, which takes into account that there are some differences between the treatment and control blocks despite the randomization:

$$Y_{it} = Repair_{it} + Block_i + Week_t + X_t + \varepsilon_{it}, \quad (3)$$

where i indexes either blocks or complainants, and t indexes days in the panel. *Repair* is a dummy variable that takes a value of 1 for treated blocks, from the beginning of the batch until the end of the panel; therefore, the specification above captures the intention to treat during the first month of the treatment period. $Block_i$ are block fixed effects, $Week_t$ are week fixed effects, and X_t are dummies that capture day-of-the-week effects. When indexing over blocks, errors are clustered by proximity to the treatment unit. That is, errors for blocks contiguous to block i are clustered. When regressions are run at the complainant level, errors are clustered at the citizen level.

Figure 8 displays the reduced-form effect of sidewalk repairs on complaints using the main specification described above, and plots pre-trends for the treatment and control blocks. The trends in complaints for the treatment and control blocks look similar before the intervention. Moreover, several robustness checks for the results will be presented: first, I include time fixed effects at other frequencies (day, month, week per area, week per neighborhood); second, I cluster errors at the neighborhood level to account for any potentially broader spatial correlation; third, I aggregate the data into pre- and post-repair periods and obtain an estimate for the effect in the two-period panel in order to account for any severe serial correlation problems (Bertrand, Duflo and Mullainathan 2004); fourth, I present results without block fixed effects and their robustness to controlling for characteristics of the block (i.e. the stock of repairs and complaints for the six months prior to the beginning of the intervention) for the four main categories of goods (streetlights, trees, streets, and sidewalks), the size of the problem reported, a dummy indicating whether the block belongs to an avenue, a measure of the density of the area based on the number of floors that the buildings have in the block, the share of the street that has residential buildings, the share of the block that has commercial buildings, and a measure of income and education at the area level. I also show that treatment leads are not associated with the number of complaints, which indicates that the results do not capture differences in pre-trends. Lastly, a replication of the main results separately for sampled and contiguous blocks can be found in the Appendix.

5 Main Results

This section presents the results for the existence and characteristics of the main effect of interest. Subsection 5.1 shows that government work increases citizens' demands. It also shows that sidewalk repairs generate spillover effects on areas near the intervention and for some other public goods. Section 5.2 shows that the increase in complaints is associated with an increase in citizens who complain, and that these citizens were generally disengaged before the intervention (as measured by previous complaints filed).

5.1 Government Work Increases Citizen Demands

Table 5 presents the effect of sidewalk repairs on the number of complaints received by the government. All complaints are considered except those that make reference to previous sidewalk repairs. Pooling together sampled and contiguous blocks, Columns (1), (2), and (3) show that a repair generates approximately a 20 to 22% intention-to-treat increase in the number of complaints per day on a given block.[11] This means that if the government had decided to start repairing each of the 1,096 sampled blocks, the total number of complaints received for those blocks and the ones nearby would have increased from 2,383 to 2,922 in the following month.

Since the repair is changing the condition of the public space, it can have a mechanical effect on the sampled blocks. The direction of the effect depends on the perception of the solution provided by the government. On the one hand, if the repair indeed fixed the problem, there will be one less issue to complain about; on the other hand, if the repair was considered faulty, it could spark new complaints. This second case was mostly controlled for by excluding complaints about faulty sidewalk repairs. However, if citizens sometimes use the wrong category when filing a complaint, the estimation could still capture some of those complaints. Therefore, the rest of Table 5 separates sampled blocks from contiguous blocks. I find that repairs generate a large and similar effect on types of blocks. In sampled blocks, complaints increase between 20 and 24%, even though there is one less problem to complain about after the repair. In contiguous blocks, the effect ranges from 18 to 21%, indicating that the increase in complaints is not driven by a mechanical effect of the intervention. More importantly, Table 5 indicates that the government intervention generates a geographical spillover in citizen demands: once work is observed in one area, the demand for work in nearby areas increases.

Citizens' reactions are concentrated the month after the repair. Table 6 presents estimations for the effect over time: the coefficients display the impact on complaints by month. Columns (1) and (2) display the results of using a panel that includes data for 2 months before and after the beginning of the intervention, and Columns (3) and (4) include -/+ 3 months

[11]This was calculated by dividing the coefficient by the mean.

for all batches. In all cases, the significant increase in complaints is observed in the first month after the beginning of the repairs. Moreover, there is no indication of intertemporal substitution, as later months do not display a decrease in complaints. That is, the treatment is not causing the concentration in a given month of complaints that would have been filed later anyway.

The results are also robust to other choices made in the main specification, as shown in Table 7. The effect remains statistically significant, and the coefficient is similar without time controls (Column 1), with month fixed effects (FE) (Column 2), with day FE (Column 3), with area-specific week FE (Column 4), and with neighborhood-specific week FE (Column 5). The main specification clusters sampled blocks and their contiguous blocks over time. However, spatial correlation of the errors may extend beyond the blocks immediately nearby. Therefore, in Column (6) I report the results clustering errors at the neighborhood level. The statistical significance of the results is not affected by this more comprehensive clustering, nor is it driven by unaccounted serial correlation. Column (7) shows that the results remain significant when estimated using a two-period panel with the averages for the pre- and post-repair periods. The estimated effect is also robust to not including block FE (Column 8). Lastly, Table 8 presents the results for the main specification, where the treatment indicator is replaced by different numbers of treatment leads. If the treatment were capturing differences in pre-trends, treatment leads would have a significant effect on complaints in this specification. However, treatment leads are not significantly related to the number of complaints, either individually or jointly (as indicated by the joint F test in the last row).

Most of the new complaints are concentrated in a few public goods. In Table 9, I estimate the effect of complaints about the main public goods separately, pooling sampled and contiguous blocks. Following a sidewalk repair, there is a significant increase (both statistically and economically) in the number of demands for new work on those public goods for which the government is less responsive and the unmet demand is thus higher: sidewalks and trees (a 60% and 58% increase, respectively). The number of complaints about streetlights, streets, and sanitation does not increase.

In sum, the results show that government work leads to an increase in citizen demands. The effect is not limited to the block in which the original work was carried out, but spills over to nearby blocks, indicating that it exceeds any mechanical effect of the intervention. There are also some limited spillovers across public goods. This result is a necessary condition for the strategic complementarity between the government and citizens.

5.2 New Citizens are Engaged

An increase in the number of complaints does not necessarily imply an increase in the number of citizens complaining. In this subsection I analyze *who* complains as a result of the intervention.

Table 10 distinguishes between complaints filed by the original complainant and those filed by other citizens. The results indicate that the increase in complaints observed in the area is driven by citizens other than the original complainant.

It could be that the original complainant is increasing her demands further afield (i.e., requesting to resolve problems on blocks far from the original block). Those complaints would not be captured by the previous analysis that focuses only on complaints about the sampled block and those immediately nearby. In order to explore this possibility, Table 11 shows the impact of the repair on future complaints of the original complainant, regardless of the location of the problem. For these citizens, repairs increase the number of complaints about problems with previous repairs (presumably, the most recent one), as shown in Column (2). However, government responsiveness does not increase their demands for work on other problems. Therefore, there is no evidence of strategic complementarity between government actions and individual demands.

The fact that citizens other than the initial complainant are responsible for the increase in complaints does not necessarily mean that more citizens are now making demands. It could be that there is a set of citizens who make complaints, and they are simply taking turns contacting the government. In order to explore this possibility, in Table 12 I divide the effect of the repair into two groups: complaints made by citizens other than the initial complainant who had no contact with the complaint system before the experiment (Columns (1) and (2)), and complaints made by those who had had at least one contact with the system in the past (Columns (3) and (4)). Only non-anonymous complaints are included. The effect is strongest on citizens who had not filed a past complaint, as measured by their (lack of) presence in the system since January 2013. That is, government performance stimulates the involvement of citizens who were not active in the past.

Taken together, these results support the idea that strategic considerations may have a greater effect than ”types” on citizen participation. In other words, citizens may participate to different degrees due to differences in their past experiences with the government rather than because of personal differences among themselves. Moreover, if government actions are publicly observable, the strategic complementarity between citizens and the government can hold even when it fails at the individual level.

6 Behind the Increase in Participation: Evidence of Mechanisms at Play

There are two broad categories of explanations for the increase in participation found. On the one hand, citizens may become more active because repairs convey information about the expected value of complaining. On the other hand, repairs may simply remind citizens of maintenance problems in the public space, which could account for the increase in complaints even without an update about its expected value. In this section, I present results that suggest that government work increases citizen participation by improving their opinions about government responsiveness.

6.1 Government Responsiveness Matters

In its simplest form, a citizen will complain if:

$$Value(solution) * [P(solution|complain) - P(solution|no.complain)] \geqslant cost(complain). \tag{4}$$

Repairs could be interpreted as a signal of state capacity or government willingness to respond to complaints, both of which would have a positive effect on the perceived responsiveness to complaints, $[P(solution|complaint) - P(solution|no.complaint)]$.[12]

The degree of government responsiveness is not only conveyed by the existence of a repair, but also by the length of time the government took to acknowledge and address the complaint. Therefore, citizens would be less inclined to update their beliefs about government responsiveness if the repair took longer to resolve. To test for the relevance of responsiveness, I exploit the fact that the randomization of the order of repairs generates exogenous variation in the length of time between when the sampled complaints were filed and addressed. Table 14 reports the results of interacting the treatment variable with a variable that measures the number of months that the complaint was outstanding, where the complaint is assumed to be resolved after the randomly assigned starting date for the batch. The results are consistent with an update in the perception of government responsiveness: the longer the block waited for a reply, the smaller the increase in complaints (although the overall effect

[12]In both cases, there could also be a negative effect: if citizens perceive state capacity to be higher, they may believe the problem will be solved regardless of their complaints, which would disincentivize their participation; moreover, if the effectiveness of complaints is perceived to be higher, citizens may prefer to free ride from neighbors, as their participation may be believed to be enough to obtain a solution. However, in light of the overall increase in complaints found, these negative effects are second order from an empirical point of view.

exists at the 10% level). In fact, for places with more than 8 months of waiting, the effect of the repair becomes statistically insignificant at the 10% level.

Whereas the previous result lends support to the increase in the expected value of complaining, it does not examine the underlying source of this increase: is it driven by an update in the perception of state capacity, or an update of the government's perceived willingness to respond to complaints? In order to distinguish between these two explanations, I use administrative data collected from November 2012 to July 2013, which includes repairs solving problems reported by both citizens and from other sources. Besides complaints, the government receives information from local representatives of each area of the city, from their own officials, from other institutions (such as judges' requests), and from utility service companies that repaired problems with their own pipes and cables. The panel includes 22,315 blocks, and is aggregated at the month level.[13] Let C_i be a block contiguous to block i, where contiguous is defined as above. In order to separately identify the effect of repairs resulting from citizens' requests vs. those that come from other sources, I use the following specification:

$$\begin{aligned} NewComplaints_{it} = {} & R\_Complaints_{C_it} + R\_Representatives_{C_it} + R\_GovtOfficials_{C_it} + \\ & R\_Institutions_{C_it} + R\_UtilityCompanies_{C_it} + Block_i + Month_t + \varepsilon_{it}, \quad (5) \end{aligned}$$

where $NewComplaints_{it}$ is an indicator that takes a value of 1 if there are new complaints in month t for problems in block i. $R\_Complaints_{C_it}$ is an indicator that takes a value of 1 if there are repairs addressing complaints on C_i in month t, $R\_Representatives_{C_it}$ if there repairs addressing requests from citizens' local representatives, $R\_GovtOfficials_{C_it}$ if there are repairs addressing problems identified by government officials, $R\_Institutions_{C_it}$ if there

[13]Data on repairs for this period is only available at that level.

are repairs responding to requests from other institutions, and $R\_UtilityCompanies_{C_it}$ if there are repairs to solve problems with work done by utility service companies. I focus on indicators of repairs and complaints (as opposed to quantities) because this specification is more robust to any underlying heterogeneity or misspecification.[14] To circumvent any mechanical effect of the repairs on the blocks intervened, I focus on the effect of repairs in contiguous blocks in order to isolate the effect of observing repairs, and drop blocks that are experiencing a repair during month t. In the Appendix I validate the use of this specification on this data by replicating the main result obtained with the experiment.

Table 15 reports the effect of repairs from different sources of complaints. Even though in all cases citizens observe government work in the area, there is only a significant increase in complaints when the government is addressing citizens' requests (directly or through representatives) (Columns (1) to (4)). However, problems reported by citizens may be different from those raised by other sources, which could potentially account for the differential impact. I thus focus next on the number of tasks executed in order to solve the problem, as a measure of its size and complexity. Columns (1) to (4) of Table 16 show that underlying differences across problems are not driving the differential impact between repairs initiated by different sources, at least according to this measure of their characteristics.

All in all, these results indicate that repairs stimulate citizens' participation when they convey information about government responsiveness to complaints. In particular, the evidence suggests that the willingness to address requests is the main driver of a perceived increase in responsiveness, as opposed to a change in beliefs about state capacity.

6.2 A Shift in Attention is Unlikely to Account for the Main Result

There are several reasons to believe that a shift in citizens' attention does not play an important role. First, such a shift would most naturally affect the actions of citizens during or

[14] Using the number of repairs and/or complaints yields similar results.

immediately after the repair. In this sense, the fact that the increase in complaints is observed during the month of the repairs, but not afterwards (Table 6), is consistent with a shift in attention. However, in its simplest form, a shift in attention would most likely change *when* citizens file a complaint but not *whether* they file it. Yet, the results show that the increase in complaints is not compensated by a subsequent decrease in later months (at least for those months that can be included in the analysis). Moreover, the shift in attention would have to be powerful enough to convince citizens who have never filed complaints before to interact with the government in this way for the first time, yet not affect citizens who already know how to use the system and thus have lower barriers to participation. Although it would not be conclusive, a change in the underlying value of complaining would be a more natural explanation of these results. An update in the value of complaining would be expected to generate an overall increase in the number of complaints, and the size of this update would be larger for citizens who had less exposure in the past.

Second, the new complaints in treatment blocks are not exclusively filed around the time of the repairs. Figure 9 shows the histogram for the number of days between the actual beginning of a repair (not the assigned date) and the filing of complaints in treatment blocks. Whereas 90% of the repairs are executed within four days, approximately 75% of the complaints are filed on or after the fifth day. Therefore, the vast majority of subsequent complaints are filed after the initial repair work has been completed.

Third, government repairs that are not driven by citizens' requests would in principle be equally likely to attract citizens' attention to maintenance problems. However, as discussed in the previous subsection, these repairs have no effect on complaints, even after accounting for their size and complexity.

Fourth, as a placebo test I use the work of utility service companies that is included in the administrative data. Not only the government intervenes in the public space; utility service companies that provide gas, electricity, and water also perform repairs and maintenance work on their pipes and cables. These companies are required to notify the government when doing such work. This work often involves opening a hole in the sidewalk (and sometimes in the street), which usually remains open for at least a few days. In contrast to government maintenance work, utility companies' work most often entails breaking sidewalks and streets that are in good condition in order to fix an underlying problem. Moreover, their employees are generally distinguishable from government employees: they wear uniforms that are different from those used by government workers, and their vehicles and safety barriers feature the name of the company. Therefore, their work is visible to citizens, but is normally not attributed to the government. If government repairs were driving attention to problems in the public space, work performed by utility service companies could be expected to have the same effect. I use information about the location and time of utility companies' interventions to test whether this is the case. Table 17 presents the results for the main specification using the work done by providers.

Columns (1) to (4) show the estimated effect of companies' work in C_i on citizens' complaints in i at time t, separated by whether the work was planned or spontaneous (i.e. an emergency). In all cases, the point estimates are small and not significant. Columns (5) to (8) combine both types of work into a single indicator for any work performed by companies, and there is still no effect. Therefore, citizens do not seem to react to utility companies' interventions in the public space, which provides evidence against the hypothesis that saliency drives the main result.

7 Closing the Feedback Loop: Evidence on the Effect of Complaints on Repairs

For strategic complementarity between government and citizens to exist, it should be the case that repairs lead to complaints *and* that complaints lead to repairs. Such a feedback effect would rationalize the update on beliefs about government responsiveness that the previous section suggests is at play when citizens decide to participate.

In this section, I provide suggestive evidence of the effect of complaints on repairs. Maintenance of sidewalks and trees are the only public goods for which the government has both discretion over the execution of work and significant room to increase its responsiveness to complaints. However, the intervention has a direct effect on the underlying number of problems about sidewalks. Therefore, I focus on maintenance work for trees. I use the cross section of sampled and contiguous blocks, and estimate the impact of the treatment on the existence of work related to trees during the months after the end of the intervention (February 2016 to July 2016). Recall that during the intervention, these blocks experienced a 58% increase in the number of complaints about trees.

Table 18 shows the reduced-form effect of the impact of the treatment on future tree-related maintenance. Overall, the treatment has no impact on subsequent repairs, as indicated by Columns (1) and (2). However, this result masks heterogeneity across blocks. Columns (3) to (8) interact the treatment with the number of complaints about trees received during the three months prior to the beginning of the intervention, which address long-standing problems (that is, complaints about transitory problems such as those related to previous pruning are not counted). The positive coefficient on accumulated complaints about trees in Columns (3) and (4) shows that areas with more past complaints are generally more likely to receive maintenance on their trees. This does not prove that the government is responsive to citizens' reports *per se*. It could just as well be the case that the government focuses on areas with more problems, and that those areas are also the ones where citizens complain more. Columns (5) to (8) further support the existence of a government willingness to respond to complaints, as the repairs that address complaints are the ones significantly affected by the treatment, but not repairs initiated from a different source. The fact that the government responds to citizens' requests only when "enough" complaints are accumulated in a certain area is consistent with the existence of short-term budget constraints.

The size of the effects generated by the intervention may not be strong enough to lock treatment blocks into a ”high provision - high participation” equilibrium, but may simply have a ”multiplier effect.” However, even after a small intervention such as one sidewalk repair, the effects found are economically and statistically significant. This suggests that if the intervention were large enough, the positive feedback between complaints and repairs could potentially have an equilibrium-switching effect.

8 Discussion

Is citizen participation endogenous to government responsiveness? I examine this question in the context of maintenance work on local public goods and citizen complaints in Buenos Aires. This context is particularly well suited to capture changes in beliefs, since barriers to participation are low, the work is easily observable, and there is a clear connection between the type of citizen participation and the type of government action studied.

I find that when the government responds to complaints about maintenance problems by repairing or maintaining local public goods, citizens are more likely to complain about other problems in the area. The evidence suggests that an update in the perception of government responsiveness may be stimulating this participation, and that this effect is driven by citizens who were less engaged in the past. Moreover, I find evidence that the government may also be responsive to citizens’ complaints in this context.

During the last decade, a large amount of resources have been spent on local participatory projects across the world. But these projects have thus far had mixed success, and the lack of government accountability and responsiveness is believed to have played a key role (Mansuri and Rao 2013). The findings in this paper suggest that interventions that improve participation and enhance government capacity and incentives to be responsive could potentially generate a stronger and longer-lasting effect.

It is encouraging to find that both directions of causality (from responsiveness to participation and vice versa) seem to be present in the same context. However, assuming that there are multiple equilibria in this context, the increase in complaints generated by the current intervention is probably not large enough to change the equilibrium in the long run for the blocks intervened. Could a larger intervention shift the equilibrium? The fact that a single sidewalk repair increases complaints by 20% suggests that the constraint may not be on the citizen side, but more work is needed on this point.

Another open question is whether an increase in complaints can generate an overall increase in government provision, or just a redistribution of public resources among citizens. The results on government responsiveness indicate that budget constraints are probably at play in the short run, and any surge in complaints in a given area would only redirect the government's attention and resources to that area at the expense of other parts of the city. However, a more generalized increase in the number of complaints, for instance if over time most citizens across the city learn about government responsiveness, may bring changes in the longer run. There are at least two ways in which a generalized increase in complaints could lead to more provision. First, politicians may exert stronger internal pressure to increase the efficiency of the bureaucracy when the benefits of doing so are large enough (as measured by the number of citizens who are pleased with the government after having their complaints resolved). Second, the budget may be modified to meet citizens' demands, perhaps at the expense of goods and services about which citizens are less vocal. Both the longer-run effects of a more demanding citizenry and the consequences for the internal organization of the government are interesting areas for future research.

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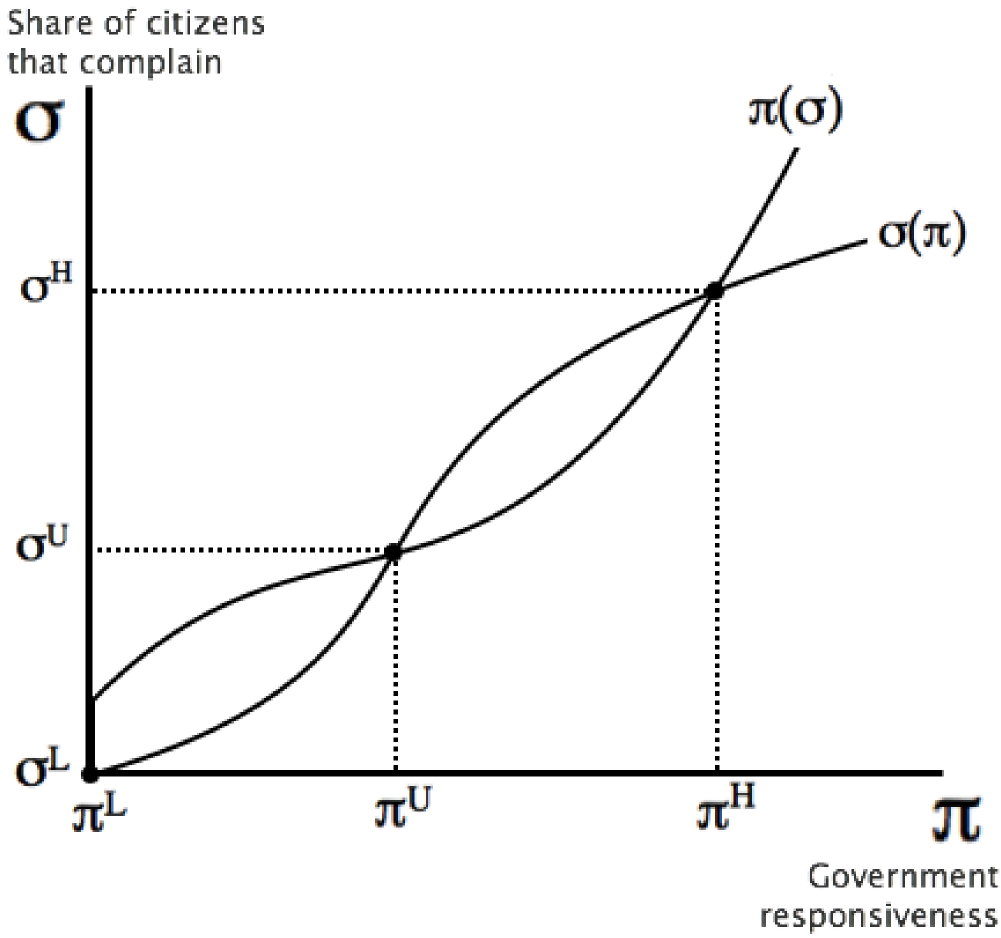
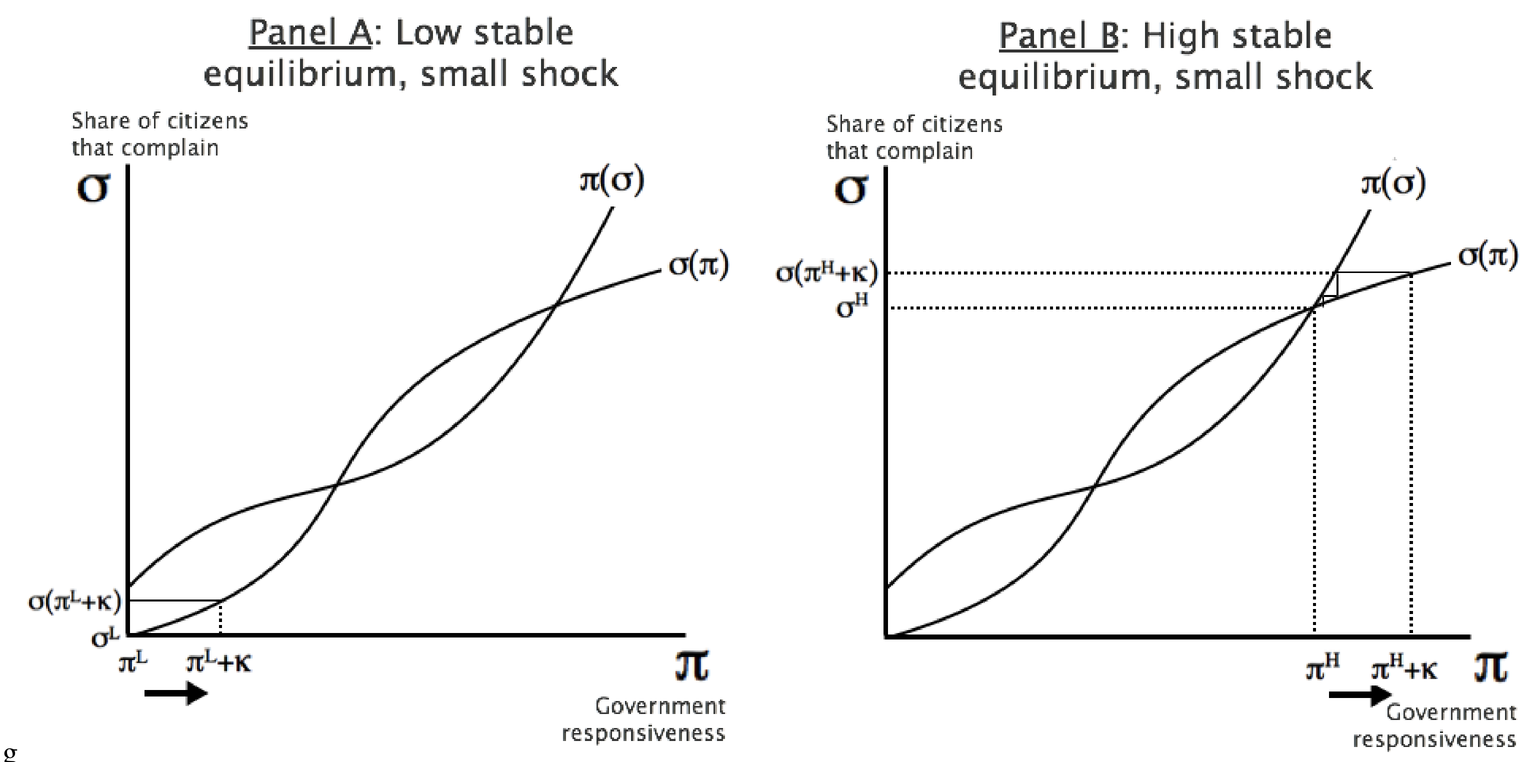
Figure 1: Case with Three Equilibria



Notes: This figure depicts the case in which $F(.)$ and $G(.)$ are derived from a symmetric uni-modal distribution function, and $\triangle(\pi^*)' > 1$, which results in three equilibria: two stable equilibria, (π^L, σ^L) and (π^H, σ^H), and an unstable (π^U, σ^U).

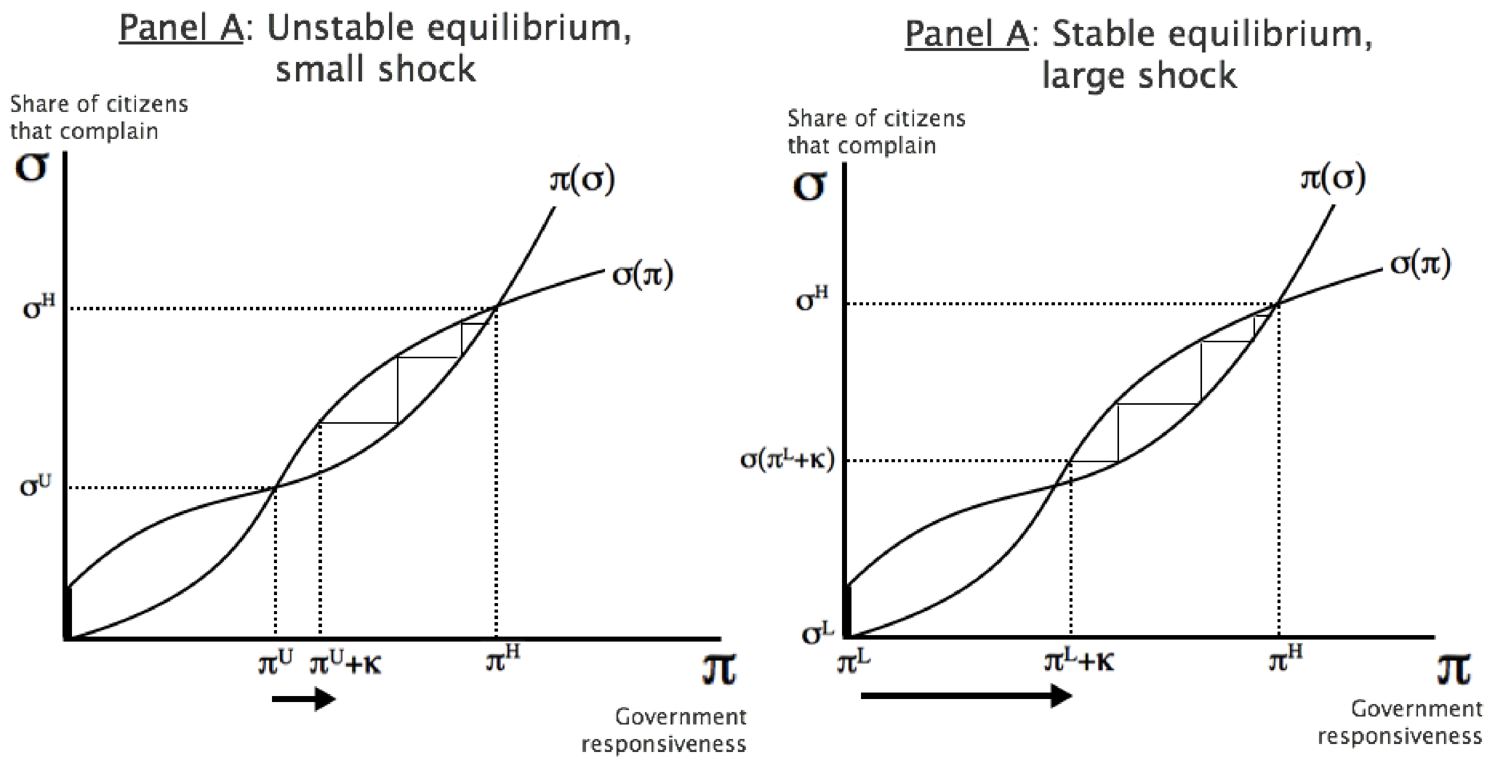
Figure 2: A Small Positive Shock Generates a Temporary Increase in Complaints when the Equilibrium is Stable



change.png

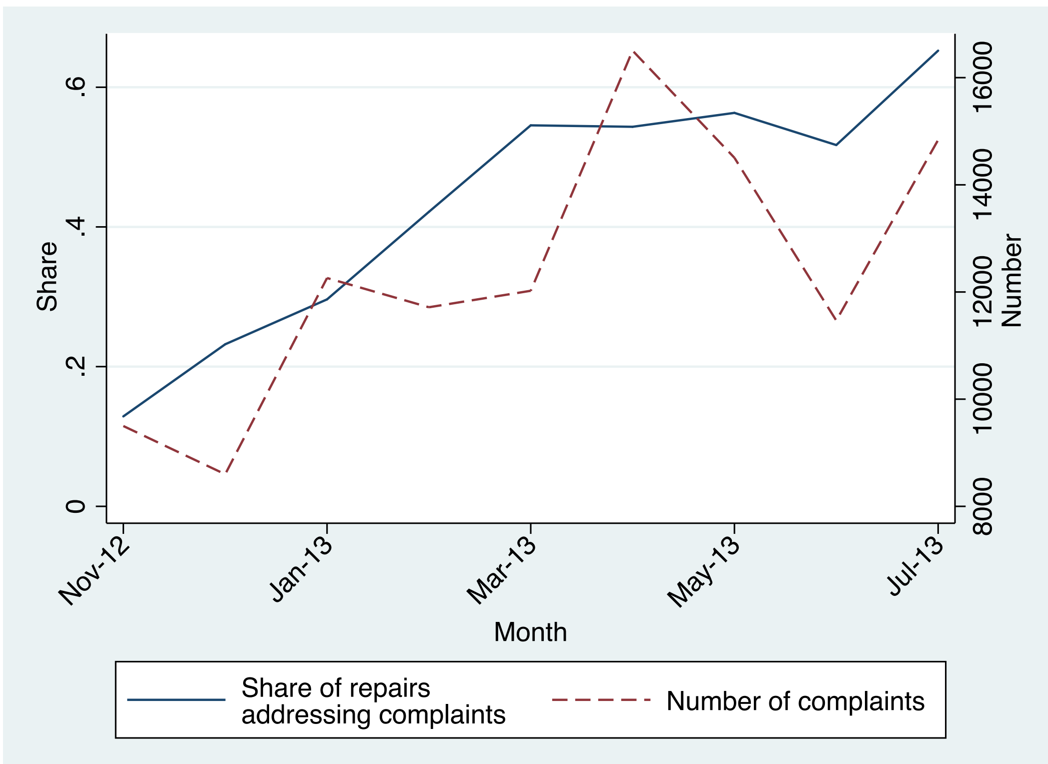
Notes: This figure describes the effect of a small increase in government responsiveness on future complaints and responsiveness when the point of departure is a stable equilibrium. In this case, the increase in both complaints and government responsiveness will be temporary. Panel A corresponds to a low participation?low responsiveness initial equilibrium, and Panel B corresponds to a high participation?high responsiveness initial equilibrium.

Figure 3: Cases in which a Positive Shock Generates a Switch to a Higher Equilibrium



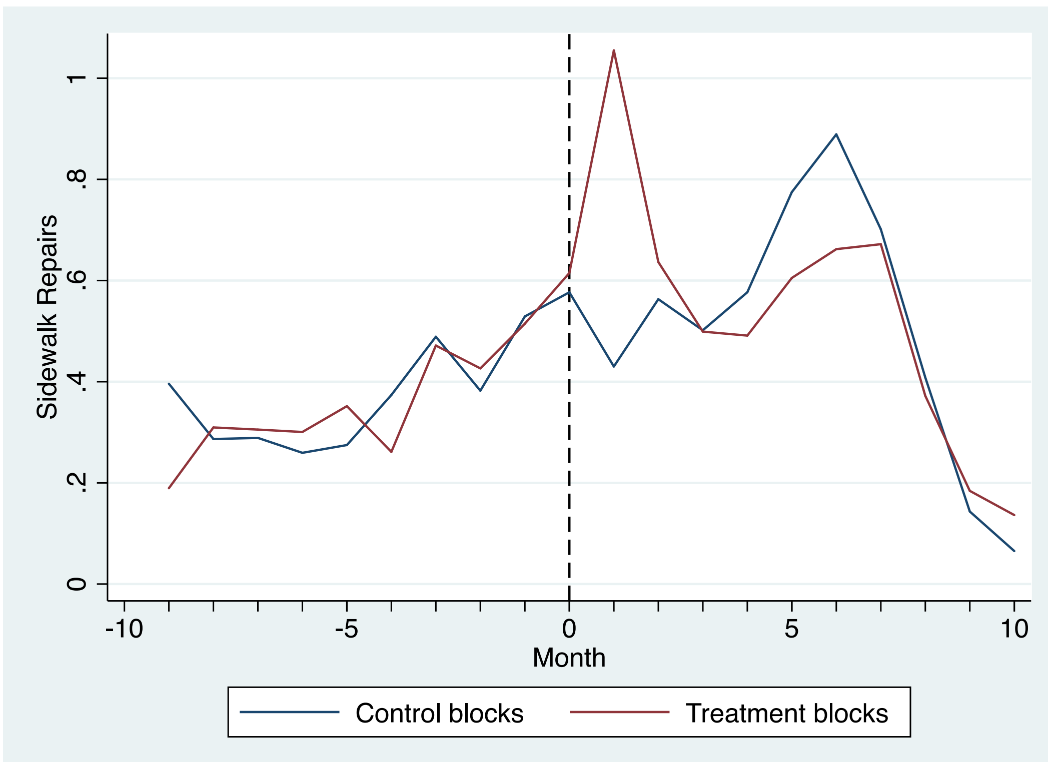
Notes: This figure shows two cases in which a shock in responsiveness can lead to an equilibrium switch. Panel A describes the effect of a small increase in government responsiveness on future complaints and responsiveness when the point of departure is an unstable equilibrium. Panel B displays the dynamic effect of a large increase in government responsiveness on future complaints and responsiveness, when the point of departure is a low participation?low responsiveness stable equilibrium.

Figure 4: Complaints and Repairs During the Period of Government Refocusing on Complaints (November 2012 to July 2013)



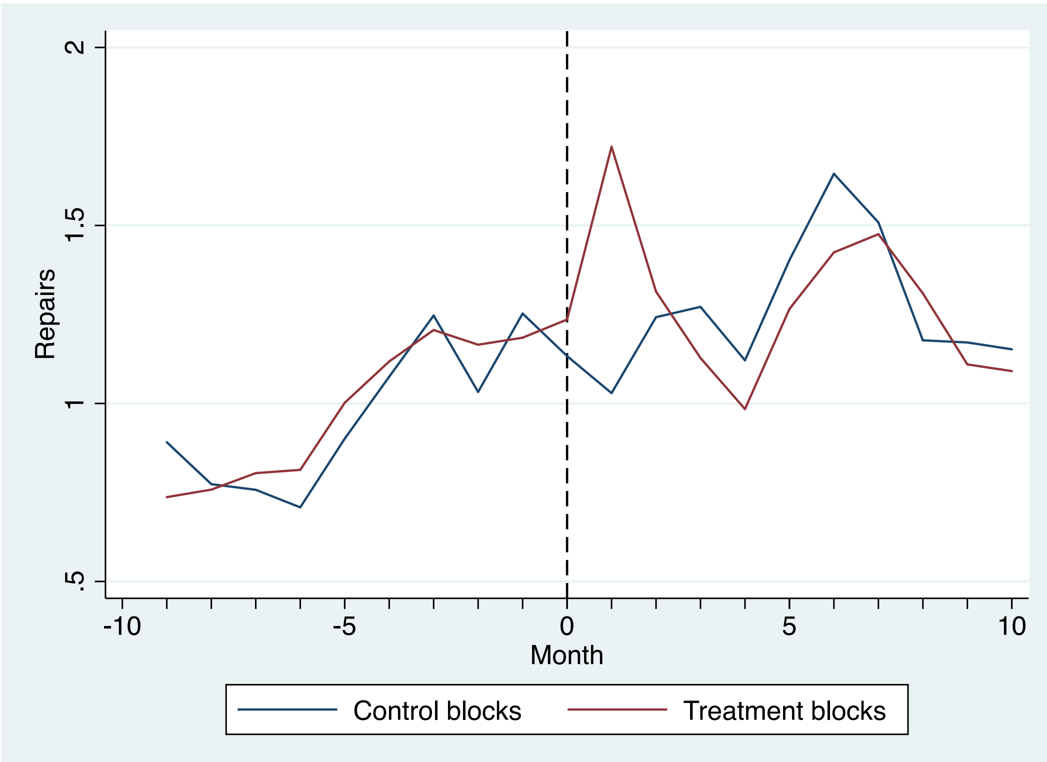
Notes: The figure displays the share of government repairs was were addressing a complaint between November 2012 and July 2013: (complaints repaired)/(total repairs). Only repairs about streets, sidewalks, trees, and streetlights are included. The figure also displays the number of total complaints opened during this period for the five main categories: trees, sidewalks, trees, streetlights, and sanitation.

Figure 5: Average Number of Sidewalk Repairs in Control and Treatment Blocks



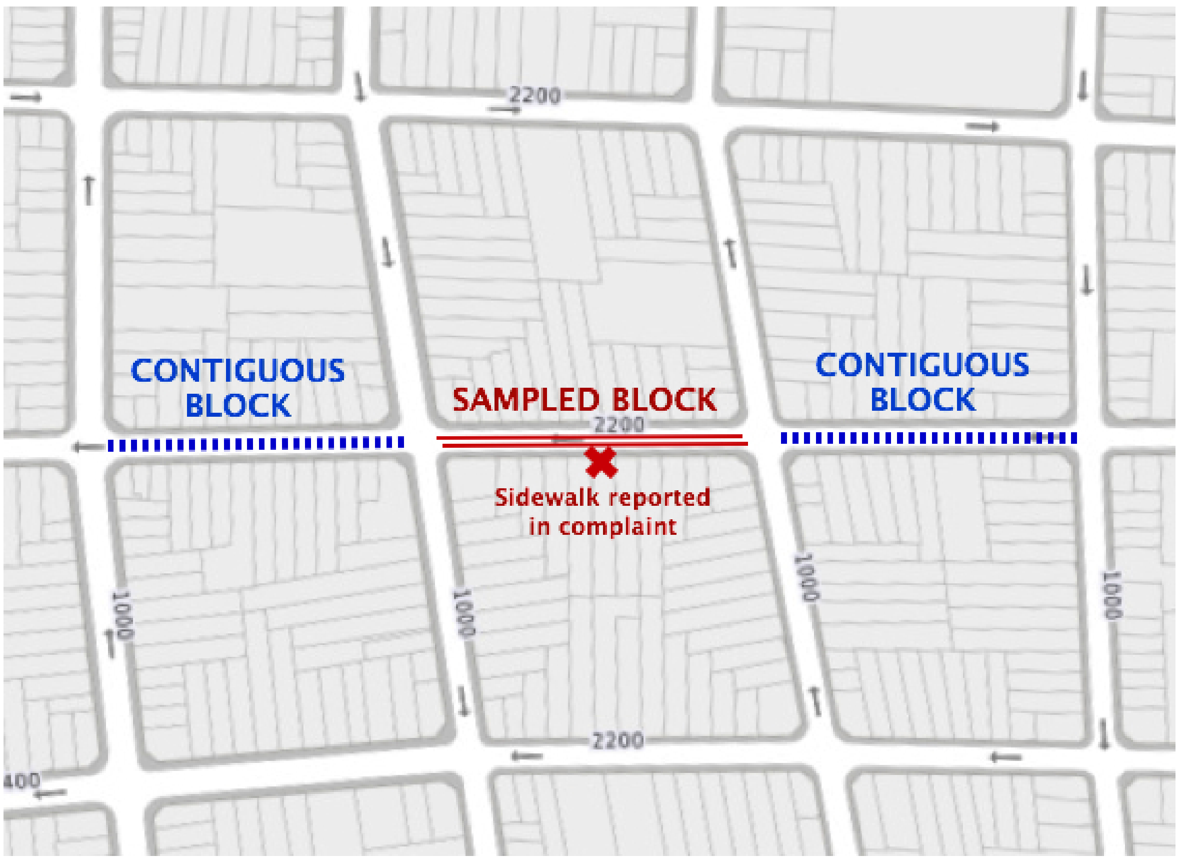
Notes: This figure displays the average number of sidewalk repairs per month, for treatment and control blocks. Month 0, indicated with a vertical line, is the month of the beginning of the intervention for each batch.

Figure 6: Average Number of Repairs in Control and Treatment Blocks



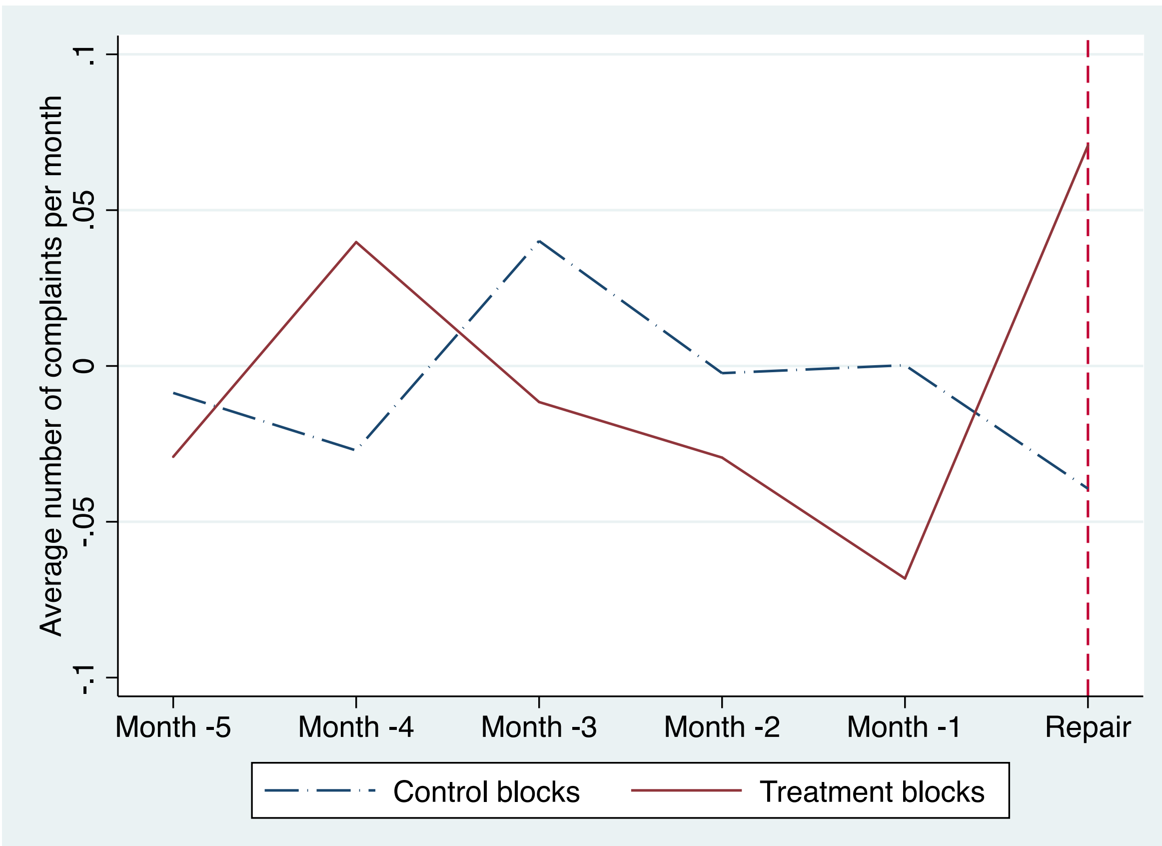
Notes: This figure displays the average number of repairs per month, for treatment and control blocks. Month 0, indicated with a vertical line, is the month of the beginning of the intervention for each batch.

Figure 7: Sampled and Contiguous Blocks



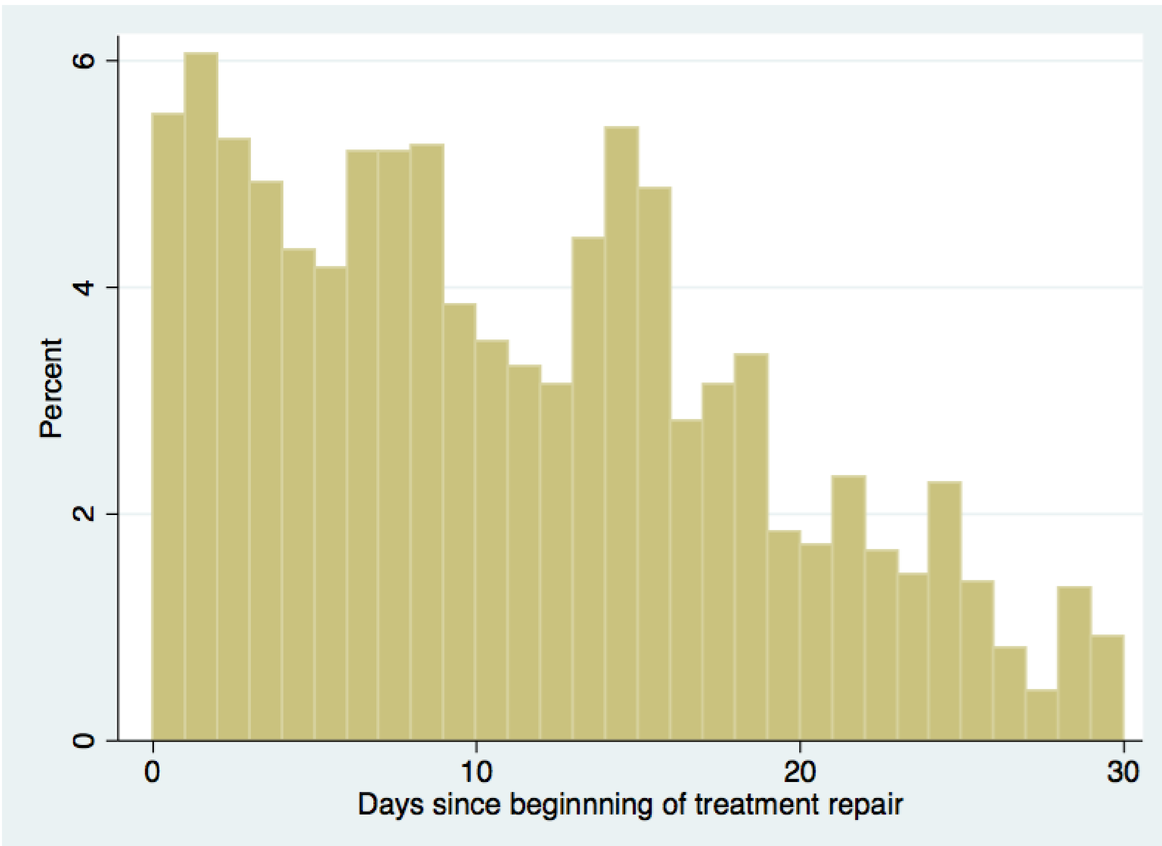
Notes: This figure is a diagram of the definition used for ”sampled” and ”contiguous” blocks. The cross indicates the location of one of the complaints selected in the sample. The block where the complaint is located is defined as the ”sampled block,” while the nearby blocks that lay on the same street are defined as the ”contiguous blocks.”

Figure 8: Average Number of Complaints Before the Intervention



Notes: This figure plots the average number of complaints per month for treatment and control blocks (both sampled and contiguous) for the 5 months before the intervention and the first month of intervention. The monthly number of complaints is calculated from the residual of regressing the number of complaints on time and block fixed effects.

Figure 9: Histogram for the Time Between When Repairs Started and Complaints Were Filed



Notes: This figure plots the number of days between when a complaint was filed in treatment blocks and the actual beginning of the repairs (as opposed to the assigned starting date). Sampled and contiguous blocks are included. Only the first month since the assigned starting date is included in order to match the data used in the main specification.

Table 1: Government Responsiveness by Type of Public Good

	Number of complaints filed between 01/14 and 08/15	% closed as of 04/16	Average number of days until closure	Stock of complaints still open as of 04/16
Trees	8,720	33.6%	182	5,790
Sidewalks	8,248	45.6%	157	4,484
Sanitation	14,158	77.3%	19	3,220
Streets	2,161	89.6%	56	225
Streetlights	12,480	98.4%	20	203
Others	728	58.7%	78	301

Notes: This table shows the status of all complaints filed between January 2014 and August 2015, as of April 2016. The status is the one reported in the complaints system, and the closing date is an upper bound given by the last modification of the complaint in the system.

Table 2: Experimental Assignment

	Control	Treatment	Total	Compliance	First Day Assigned	Last Day Suggested	Last Day Effective	%Treatment Repaired First Month
Batch 1	46	44	91	81.82%	14-Sep-15	12-Oct-15	*No information*	
Batch 2	124	83	208	91.57%	5-Oct-15	2-Nov-15	23-Nov-15	83.1%
Batch 3	116	101	217	94.06%	19-Oct-15	16-Nov-15	5-Nov-15	92.1%
Batch 4	115	106	221	93.40%	2-Nov-15	31-Dec-15	2-Dec-15	90.6%
Batch 5	84	80	164	95.00%	16-Nov-15	31-Dec-15	21-Jan-15	91.3%
Batch 6	102	95	198	86.32%	3-Dec-15	31-Dec-15	29-Jan-15	69.5%
Total	587	509	1,096	91.16%				

Notes: This table shows the assignment of complaints into control and treatment, disaggregated by batch. Compliance is the percentage of treatment blocks that were repaired by the end of the intervention. First Day Assigned is the beginning of the period of time during which repairs were focused only on treatment blocks. Last Day Suggested is the suggested date for the completion of treatment repairs. Last Day Effective is the actual date on which a treatment repair was observed. %Treatment Repaired First Month is the percentage of the repairs assigned by the treatment that was executed within one month of the First Day Assigned. I do not have information on exact repair dates for batch 1.

Table 3: Compliance

	Frequency	% of total
Resolved by government	464	91.16%
Not resolved by government	45	8.84%
Total	509	
Reason for non-compliance:		
Resolved by third party	21	4.13%
Not allowed by citizen	9	1.77%
Materials not available on time	7	1.38%
No information	8	1.57%

Notes: The top part of this table shows how many of the complaints assigned to treatment were resolved (compliant) during the intervention and how many were not (non-compliant). The bottom part of the table disaggregated the second group into the reasons for non-compliance.

Table 4: Balance Check

	Mean in Control Group (1)	Mean in Treatment Group (2)	P-Value of Difference (3)	Number of Observations (4)
Characteristics of sampled + contiguous blocks				
Size problem	25.42	24.36	0.475	3,035
# repairs sidewalks pre-experiment	1.937	1.855	0.663	3,044
# repairs streetlights pre-experiment	1.121	1.336	0.00501	3,044
# repairs street pre-experiment	0.539	0.512	0.630	3,044
# repairs trees pre-experiment	0.682	0.711	0.600	3,044
# contacts sidewalk pre-experiment	1.177	1.248	0.208	3,044
# contacts streetlight pre-experiment	1.219	1.433	0.0488	3,044
# contacts street pre-experiment	0.278	0.232	0.108	3,044
# contacts trees pre-experiment	1.220	1.299	0.189	3,044
Dummy avenue	0.193	0.189	0.885	3,044
Number of floors	50.72	49.69	0.628	2,999
Share of block that is residential	0.476	0.483	0.409	2,999
Share of block that is commercial	0.242	0.237	0.677	2,999
Characteristics of complainer				
# contacts sidewalk pre-experiment	1.642	1.967	0.130	1,099
# contacts streetlight pre-experiment	0.549	0.517	0.686	1,099
# contacts street pre-experiment	0.151	0.169	0.780	1,099
# contacts trees pre-experiment	0.510	0.495	0.778	1,099

Notes: This table shows the balance of characteristics for blocks and complainants assigned to treatment and control. Repairs and complaints pre-experiment refer to the total number accumulated during the 6 months prior to the beginning of the intervention. In the case of block characteristics, regressions are run over the cross section of both sampled and contiguous blocks, and errors are clustered around the treatment unit. In the case of complainant characteristics, errors are robust. In both cases, area and batch fixed effects are included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Sidewalk Repairs Increase Complaints

	Dependent variable: number of complaints in the block (excluding those about previous sidewalk repairs)					
	Sampled + Contiguous		Sampled blocks		Contiguous blocks	
	(1)	(2)	(3)	(4)	(5)	(6)
Sidewalk repair	0.0059***	0.0050***	0.0069**	0.0058*	0.0054***	0.0046**
	(0.0018)	(0.0018)	(0.0030)	(0.0030)	(0.0021)	(0.0021)
Day-of-week FE		*X*		*X*		*X*
Observations	182,640	182,640	65,760	65,760	116,880	116,880
Number of blocks	3,044	3,044	1,096	1,096	1,948	1,948
Clusters	1096	1096	1096	1096	1065	1065
Mean of control	0.0261	0.0261	0.0282	0.0282	0.0249	0.0249

Notes: This table shows the effect of repairs on the number of complaints on a given day. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. Columns (1) and (2) pool sampled and continuous blocks, and include a dummy to indicate the type of block. Columns (3) and (4) only use sampled blocks, and Columns (5) and (6) only use contiguous blocks. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Repairs Have an Immediate Effect on Complaints

	Dependent variable: number of complaints received in the block, using a panel that includes			
	+/- 2 months		+/- 3 months	
	(1)	(2)	(3)	(4)
Sidewalk repair month1	0.0035**	0.0028*	0.0046***	0.0036***
	(0.0015)	(0.0015)	(0.0014)	(0.0014)
Sidewalk repair month2	-0.0005	-0.0006	0.0011	0.0007
	(0.0017)	(0.0017)	(0.0015)	(0.0015)
Sidewalk repair month3			0.0000	0.0002
			(0.0016)	(0.0016)
Day-of-week FE		X		X
Observations	365,280	365,280	547,920	547,920
Number of blocks	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096
Mean of control	0.0275	0.0275	0.0283	0.0283

Notes: This table shows the effect of repairs on the number of complaints on a given day, over time. ”Sidewalk repair month1” is an indicator that takes a value of 1 during the first month after the first day assigned to the batch; ”Sidewalk repair month2” is an indicator that takes a value of 1 during the second month after the first day assigned to the batch; ”Sidewalk repair month3” is defined in a similar way. All regressions include block fixed effects and week fixed effects. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Robustness Checks for Effect on Complaints

	Dependent variable: number of complaints in the block (excluding those about old sidewalk repairs)							
						Cluster by Neighborhood	Two-Period Panel	Random Effects
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sidewalk repair	0.0049***	0.0057***	0.0050***	0.0057***	0.0057***	0.0059***	0.0059***	0.0054***
	(0.0015)	(0.0017)	(0.0018)	(0.0017)	(0.0018)	(0.0017)	(0.0013)	(0.0015)
Month FE		X						
Week FE						X	X	X
Day FE			X					
Week*Area FE				X				
Week*Neighborhood FE					X			
Observations	182,640	182,640	182,640	182,640	182,640	182,640	6,088	182,640
Number of blocks	3,044	3,044	3,044	3,044	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096	1096	42		1096
Mean of Control	0.0261	0.0261	0.0261	0.0261	0.0261	0.0261		0.0261

Notes: This table replicates the main result, but with different specifications. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. Columns (1) to (6) use different controls for time fixed effects. For Column (7), I first obtained the residuals from running a regression of the number of complaints on week FE and block FE. Next I averaged the residuals for the periods before and after the assigned starting date, and then I run the residuals on a treatment block indicator, an indicator for the period after the assigned starting date, and the interaction of these two indicators. Column (7) reports the coefficient of the interaction. Column (8) clusters errors at the neighborhood level, and Column (8) does not include block FE. All regressions except Column (8) include block FE and are run over the +/- 1 month data that was used to obtain the main results. Both sampled and contiguous blocks are included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Placebo Test: Treatment Leads are not Associated with More Complaints

	Dependent variable: number of complaints in the block (excluding those about previous sidewalk repairs)				
	(1)	(2)	(3)	(4)	(5)
Sidewalk repair week -1	0.0004	0.0003	0.0010	0.0014	0.0010
	(0.0023)	(0.0024)	(0.0024)	(0.0025)	(0.0025)
Sidewalk repair week -2		-0.0005	0.0001	0.0005	0.0002
		(0.0021)	(0.0022)	(0.0023)	(0.0024)
Sidewalk repair week -3			0.0033	0.0036	0.0033
			(0.0022)	(0.0023)	(0.0023)
Sidewalk repair week -4				0.0019	0.0016
				(0.0020)	(0.0021)
Sidewalk repair week -5					-0.0016
					(0.0022)
Observations	273,960	273,960	273,960	273,960	273,960
Number of blocks	3,044	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096	1096
Mean of control	0.0286	0.0286	0.0286	0.0286	0.0286
p-value joint test leads	0.876	0.958	0.476	0.523	0.569

Notes: This table replicates the main result, but with weekly treatment leads. Sidewalk repair week -n is a dummy that takes a value of 1 during the n week prior to the beginning of the treatment repairs for the batch. All regressions include week FE and block FE. Both sampled and contiguous blocks are included, and the panel includes data for the last 3 months before the beginning of the treatment repairs for each batch. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Sidewalk Repairs Increase Complaints about Public Goods with Lowest Responsiveness

	Dependent variable: number of complaints in the block (excluding those about previous sidewalk repairs)									
	Trees		Sidewalks		Sanitation		Streets		Streetlights	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sidewalk repair	0.0019***	0.0018***	0.0016***	0.0014***	0.0014	0.0011	0.0006	0.0005	-0.0003	-0.0005
	(0.0006)	(0.0006)	(0.0005)	(0.0005)	(0.0010)	(0.0010)	(0.0004)	(0.0004)	(0.0008)	(0.0008)
Day-of-week FE		X		X		X		X		X
Observations	182,640	182,640	182,640	182,640	182,640	182,640	182,640	182,640	182,640	182,640
Number of blocks	3,044	3,044	3,044	3,044	3,044	3,044	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096	1096	1096	1096	1096	1096	1096
Mean of control	0.00324	0.00324	0.00266	0.00266	0.00849	0.00849	0.00147	0.00147	0.00494	0.00494
% complaints closed	33.6%		45.6%		77.3%		89.6%		98.4%	
Average N of days until closure	182		157		19		56		20	

Notes: This table shows the effect of repairs on the number of complaints on a given day, counting separately (new work in) sidewalks, trees, streetlights, streets, and sanitation. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. The last two rows measure government responsiveness for different types of public goods: the status of complaints filed between January 2014 and August 2015, as of April 2016 (presented in Table 1). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Citizens Other than the Original Complainant are Demanding More Work

	Dependent variable: number of complaints in the block by			
	Original complainant		Other citizens	
	(1)	(2)	(3)	(4)
Sidewalk repair	0.0000	0.0000	0.0059***	0.0050***
	(0.0002)	(0.0002)	(0.0018)	(0.0018)
Day-of-week FE		X		X
Observations	182,640	182,640	182,640	182,640
Number of block	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096
Mean of control	0.000620	0.000620	0.0255	0.0255

Notes: This table shows the effect of repairs on the number of complaints on a given day, counting separately complaints filed by the original complainant and by other citizens. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: The Original Complainants are not Complaining More About Problems in Other Areas of the City

	Dependent variable: number of complaints filed by the citizen about:					
	All complaints	Previous sidewalk repairs	New sidewalk problems	Streetlights	Trees	Streets
	(1)	(2)	(3)	(4)	(5)	(6)
Sidewalk repair	0.0019*	0.0016***	0.0003	-0.0000	0.0006	-0.0001
	(0.0011)	(0.0006)	(0.0003)	(0.0003)	(0.0004)	(0.0002)
Observations	64,393	64,393	64,393	64,393	64,393	64,393
Number of citizens	1,099	1,099	1,099	1,099	1,099	1,099

Notes: This table shows the effect of repairs on the number of complaints per day filed by the original complainants, for problems in any part of the city. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include citizen fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by complainant. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: The Increase in Complaints is Driven by Citizens Who Did not Complaint in the Past

	Dependent variable: number of complaints in the block by citizens other than original complainant with			
	0 previous complaints		1+ previous complaints	
	(1)	(2)	(3)	(4)
Sidewalk repair	0.0037***	0.0033***	0.0010	0.0008
	(0.0010)	(0.0010)	(0.0009)	(0.0009)
Day-of-week FE		X		X
Observations	182,640	182,640	182,640	182,640
Number of blocks	3,044	3,044	3,044	3,044
Clusters	1096	1096	1096	1096
Mean of control	0.00884	0.00884	0.00832	0.00832

Notes: This table shows the effect of repairs on the number of complaints on a given day, counting separately complaints filed by citizens other than the original complainant and: with no other complaints since January 2013 (Columns (1) and (2)), or at least one complaint since January 2013 (Columns (3) and (4)). Only citizens who registered and provided personal information are included. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Government Responsiveness Matters

	Dependent variable: number of complaints received in the block	
	(1)	(2)
Sidewalk repair	0.0076**	0.0064*
	(0.0033)	(0.0035)
Months since filed	-0.0070*	-0.0072*
	(0.0036)	(0.0042)
Sidewalk repair*Months since filed	-0.0005*	-0.0005*
	(0.0003)	(0.0003)
Day-of-week FE		X
Observations	182,640	182,640
Number of blocks	3,044	3,044
Clusters	1096	1096
Mean of control	0.0261	0.0261

Notes: This table shows the heterogeneous effects of repairs on the number of complaints on a given day. ”Months unaddressed” is the number of months between when the complaint was filed and the beginning of the corresponding batch. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Effect of Repairs on Complaints by Source of Origin, Administrative Data November 2012 to July 2013

	Dummy new complaints in block i at time t			
	(1)	(2)	(3)	(4)
Dummy repairs C_i at t, from:				
Complaints	0.0151***	0.0139***	0.0175***	0.0173***
	(0.0044)	(0.0045)	(0.0046)	(0.0046)
Representatives	0.0254**	0.0411**	0.0418**	0.0404**
	(0.0102)	(0.0141)	(0.0145)	(0.0147)
Government officials	0.0027	0.0031	0.0026	0.0026
	(0.0045)	(0.0054)	(0.0055)	(0.0055)
Other institutions	0.0274	0.0208	0.0213	0.0206
	(0.0202)	(0.0264)	(0.0261)	(0.0262)
Utility service companies	0.0097	0.0079	0.0088	0.0093
	(0.0092)	(0.0093)	(0.0092)	(0.0094)
No repairs to own block, t	X	X	X	X
Lag complaints repairs i, C_i		X	X	X
Area trends			linear	
Neighborhood trends				linear
Observations	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217

Notes: All regressions include month and block fixed effects. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was a new complaint filed in block i during month t, and 0 otherwise. ”Dummy repairs C_i at t, from complaints” is a dummy that takes a value of 1 if there was at least one repair in a block near block i during month t that was originated by a complaint, and 0 otherwise. Variables for representatives, government officials, other institutions, and utility service companies are defined in the same way. All regressions exclude blocks that are experiencing any repair at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i, separately for each source of notification. Errors are clustered at the area level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 15: Effect of Size of Repairs on Complaints by Source of Origin, Administrative Data
November 2012 to July 2013

	Dummy new complaints in block i at time t			
	(1)	(2)	(3)	(4)
Number of tasks performed C_i at t, from:				
Complaints	0.0040***	0.0039***	0.0044***	0.0044***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Representatives	0.0059**	0.0064**	0.0067**	0.0065**
	(0.0021)	(0.0026)	(0.0026)	(0.0026)
Government officials	-0.0000	0.0001	0.0000	0.0000
	(0.0003)	(0.0004)	(0.0004)	(0.0004)
Other institutions	0.0033*	0.0025	0.0025	0.0024
	(0.0017)	(0.0020)	(0.0020)	(0.0020)
Utility service companies	0.0006	0.0007	0.0007	0.0008
	(0.0012)	(0.0012)	(0.0012)	(0.0012)
No repairs to own block, t	X	X	X	X
Lag complaints repairs i, C_i		X	X	X
Area trends			linear	
Neighborhood trends				linear
Observations	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217

Notes: All regressions include month and block fixed effects. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was a new complaint filed in block i during month t, and 0 otherwise. ”Dummy repairs C_i at t, from complaints” is a dummy that takes a value of 1 if there was at least one repair in a block near block i during month t that was originated by a complaint, and 0 otherwise. Variables for representatives, government officials, other institutions, and utility service companies are defined in the same way. All regressions exclude blocks that are experiencing any repair at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i, separately for each source of notification. Errors are clustered at the area level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 16: Placebo test: Effect of Interventions by Utility Service Companies on Complaints, Administrative Data November 2012 to July 2013

	Dummy new complaints in block i at time t							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy emergency work C_i, t	0.0011	-0.0010	-0.0008	-0.0017				
	(0.0022)	(0.0022)	(0.0022)	(0.0021)				
Dummy planned work C_i, t	0.0043	0.0090	0.0097	0.0093				
	(0.0051)	(0.0066)	(0.0066)	(0.0067)				
Dummy any work C_i, t					0.0026	0.0016	0.0018	0.0010
					(0.0024)	(0.0024)	(0.0024)	(0.0023)
No repairs to own block, t	x	x	x	x	x	x	x	x
Lag complaints repairs i, C_i		x	x	x		x	x	x
Area trends			linear				linear	
Neighborhood trends				linear				linear
Observations	169,757	151,231	151,231	151,201	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217	22,221	22,221	22,221	22,217
Mean control	0.262	0.256	0.256	0.256	0.262	0.256	0.256	0.256

Notes: All regressions include month and block fixed effects. ”Dummy emergency work C_i, t” is dummy that takes a value of 1 if there was emergency work conducted by a utility service company in a block near block i during month t. ”Dummy planned work C_i, t” is dummy that takes a value of 1 if there was planned work conducted by a utility service company in a block near block i during month t. ”Dummy any work C_i, t” is dummy that takes a value of 1 if there was either planned or emergency work conducted by a utility service company in a block near block i during month t. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was at least one complaint filed in block i during month t, and 0 otherwise. All regressions exclude blocks that are experiencing repairs at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i. Linear trends fit a different linear trend per area/neighborhood, including their own intercept. Errors are clustered at the area level.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 17: New Complaints Lead to Repairs if the Area Already Has Many Complaints

	Dependent variable: existence of tree repairs after the intervention							
					and the repair addresses a complaint		and the repair does not address a complaint	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sidewalk repair	0.0084	0.0017	-0.0252	-0.0252	-0.0197	-0.0198	-0.0281	-0.0281
	(0.0204)	(0.0197)	(0.0251)	(0.0250)	(0.0234)	(0.0231)	(0.0220)	(0.0220)
Previous complaints about trees			0.0615***	0.0533***	0.0697***	0.0610***	0.0302***	0.0302***
			(0.0081)	(0.0082)	(0.0082)	(0.0082)	(0.0075)	(0.0075)
Sidewalk repair*Previous complaints about trees			0.0228**	0.0234**	0.0275**	0.0287***	0.0134	0.0134
			(0.0110)	(0.0110)	(0.0110)	(0.0109)	(0.0111)	(0.0111)
Controls		X		X		X		X
Observations	3,044	3,044	3,044	3,044	3,044	3,044	3,044	3,044
Clusters	1,096	1,096	1,096	1,096	1,096	1,096	1,096	1,096
Mean of control	0.548	0.548	0.548	0.548	0.447	0.447	0.294	0.294

Notes: This table uses a cross section with all sampled and contiguous blocks. In Columns (1) to (4), the dependent variable is a dummy that takes a value of 1 if the block received any tree repair after the intervention (February 2016 to July 2016). In Columns (5) to (6) the dependent variable is a dummy that takes a value of 1 if the block received any tree repair addressing a complaint. In Columns (7) and (8) the dependent variable is a dummy that takes a value of 1 if the block received any tree repair that does not address a complaint after the intervention. ”Sidewalk repair” indicates whether the block was assigned to receive a repair during the intervention. ”Previous complaints about trees” is the number of complaints about problems with trees in the block that was accumulated during the 3 months prior to the beginning of the intervention, where transitory problems are not counted. Controls are: the size of the sidewalk problem reported in the sampled complaint; the number of repairs of sidewalks, streetlights, trees, and streets during the 3 months prior to the intervention; the number of complaints about sidewalks, streetlights, and streets during the 3 months prior to the intervention; a dummy indicating whether the block is on an avenue; and a measure of income and education in the area. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A Appendix

A.1 Proof of Proposition

1. Note that $\triangle(\pi)$ is continuous in π, and $\triangle(\pi):[0,1]\rightarrow[0,1]$. Therefore, according to Brouwer's Fixed-Point Theorem $\exists\,\pi^*$ such that $\triangle(\pi^*)=\pi^*$. Define $\sigma=F(\pi M)$. Then, at $\triangle(\pi^*)=\pi^*$:

   - $\pi^*=G((1+\sigma^*)\gamma)$
   - $\sigma^*=F(\pi^* M)$

   Which are the conditions for (σ^*,π^*) to constitute an equilibrium.

2. Suppose that $\pi^*<1$. Since $\Delta(\pi^*)=\pi^*$ and $\triangle(\pi^*)'>1$, by continuity of $\Delta(.)$ there $\exists$ a $\tilde{\pi}=\pi^*+\varepsilon<1$ such that $\Delta(\tilde{\pi})>\tilde{\pi}$. Moreover, since $\triangle(1)\leq 1$ and $\Delta(.)$ is continuous, there $\exists$ a $\hat{\pi}>\pi^*$ such that $\Delta(\hat{\pi})=\hat{\pi}$.

   Suppose instead that $\pi^*=1$. Since $\Delta(\pi^*)=\pi^*$ and $\triangle(\pi^*)'>1$, by continuity of $\Delta(.)$ there $\exists$ a $\tilde{\pi}=\pi^*-\varepsilon>0$ such that $\Delta(\tilde{\pi})<\tilde{\pi}$. Moreover, since $\triangle(0)\geq 0$ and $\Delta(.)$ is continuous, there $\exists$ a $\hat{\pi}<\pi^*$ such that $\Delta(\hat{\pi})=\hat{\pi}$ ■

A.2 Anonymous vs. Non-Anonymous Complaints

Table A2.1: Effect on Anonymous and Non-Anonymous Complaints

	Dependent variable: number of complaints by			
	Anonymous Complaints		Non-Anonymous Complaints	
	(1)	(2)	(3)	(4)
Sidewalk repair	0.0012	0.0009	0.0047***	0.0041***
	(0.0009)	(0.0009)	(0.0014)	(0.0014)
Day-of-week FE		X		X
Observations	182,640	182,640	182,640	182,640
Number of blocks	3,044	3,044	3,044	3,044
Clusters	1,096	1,096	1,096	1,096
Mean of control	0.00894	0.00894	0.0172	0.0172

Notes: This table shows the effect of repairs on the number of complaints on a given day. Columns (1) and (2) only count complaints that were filed anonymously. Columns (3) and (4) only count complaints for which the citizen provided identifying information. Sidewalk repair is a dummy that takes a value of 1 starting on the first day assigned to the batch. All regressions include block fixed effects and week fixed effects, and are run over a panel that includes -/+ one month of data since the first day assigned to the corresponding batch. Both sampled and contiguous blocks are included. Errors are clustered by treatment unit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.3 Main Results in Sampled and Contiguous Blocks Separately

Table A3.1: Main Results, Sampled Blocks Only

	Dependent variable: number of complaints received in the block, using a panel that includes			Dependent variable: number of complaints by		Dependent variable: number of complaints by other citizens with	
	+/- 2 months	+/- 3 months	Length of treatment period	Original complainant	Other citizens	0 previous complaints	1+ previous complaints
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sidewalk repair month1	0.0046*	0.0057**	0.0051*	0.0004	0.0066**	0.0041**	0.0017
	(0.0025)	(0.0023)	(0.0028)	(0.0005)	(0.0029)	(0.0017)	(0.0015)
Sidewalk repair month2	0.0000	0.0020	0.0003				
	(0.0029)	(0.0026)	(0.0040)				
Sidewalk repair month3		0.0007	0.0061				
		(0.0027)	(0.0102)				
Observations	131,520	197,280	92,262	65,760	65,760	65,760	65,760
Number of blocks	1,096	1,096	1,096	1,096	1,096	1,096	1,096
Clusters	1,096	1,096	1,096	1,096	1,096	1,096	1,096
Mean of control	0.0306	0.0318	0.0296	0.00119	0.0270	0.00980	0.00926

Notes: This table replicates the main results but only for sampled blocks. See the corresponding table notes for a definition of the variables included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A3.2: Main Results, Contiguous Blocks Only

	Dependent variable: number of complaints received in the block, using a panel that includes			Dependent variable: number of complaints by		Dependent variable: number of complaints by other citizens with	
	+/- 2 months	+/- 3 months	Length of treatment period	Original complainant	Other citizens	0 previous complaints	1+ previous complaints
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sidewalk repair month1	0.0029*	0.0039**	0.0047**	-0.0002	0.0056***	0.0035***	0.0006
	(0.0017)	(0.0016)	(0.0019)	(0.0002)	(0.0021)	(0.0011)	(0.0012)
Sidewalk repair month2	-0.0008	0.0006	-0.0014				
	(0.0019)	(0.0017)	(0.0025)				
Sidewalk repair month3		-0.0004	-0.0040				
		(0.0019)	(0.0069)				
Observations	233,760	350,640	164,154	116,880	116,880	116,880	116,880
Number of blocks	1,948	1,948	1,948	1,948	1,948	1,948	1,948
Clusters	1,065	1,065	1,065	1,065	1,065	1,065	1,065
Mean of control	0.0258	0.0264	0.0251	0.000292	0.0246	0.00830	0.00778

Notes: This table replicates the main results but only for contiguous blocks. See the corresponding table notes for a definition of the variables included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.4 Main Results Using Administrative Data for the Period of November 2012 to July 2013

In this section, I use administrative data between November 2012 and July 2013 with monthly information to estimate the effect of repairs on contiguous blocks C_i on complaints for block i with the following difference-in-differences specification:

$$NewComplaints_{it} = Repair_{C_it} + Block_i + Month_t + \varepsilon_{it}, \tag{6}$$

where $NewComplaints_{it}$ is an indicator that takes a value of 1 if there are new complaints in month t for problems in block i, $Repair_{C_it}$ is an indicator that takes a value of 1 if there are repairs on C_i at month t. I focus on indicators of repairs and complaints (as opposed to quantities), because this specification is more robust to any underlying heterogeneity or misspecification.[15] Government work can affect complaints in three main ways. First, the more repairs that have been undertaken, the fewer the remaining problems to complain about. Second, the repair itself may be faulty, generating new problems and complaints. Third, a repair can convey information to citizens about the government. Since I am interested in the third channel, I focus on the effect of repairs nearby in order to isolate the effect of observing repairs, while keeping constant the stock of problems to complain about in block i.

However, the coefficient of $Repair_{C_it}$ could capture differential trends for blocks that observed and did not observe repairs at time t. Figure A4.1 compares the trends for these two groups. The dashed line shows the evolution of the likelihood of complaints for blocks that had repairs nearby, with the horizontal axis redefined to be centered around the time of the repair. The solid line is a weighted average of the likelihood of complaints in blocks without repairs nearby, where the weights replicate the relevance of each month t for the construction of the treatment averages. In all cases, blocks experiencing repairs at $t = 0$ are

[15] Using the number of repairs and/or the number of complaints yields similar results.

excluded in order to avoid the direct effects of the repairs described before.

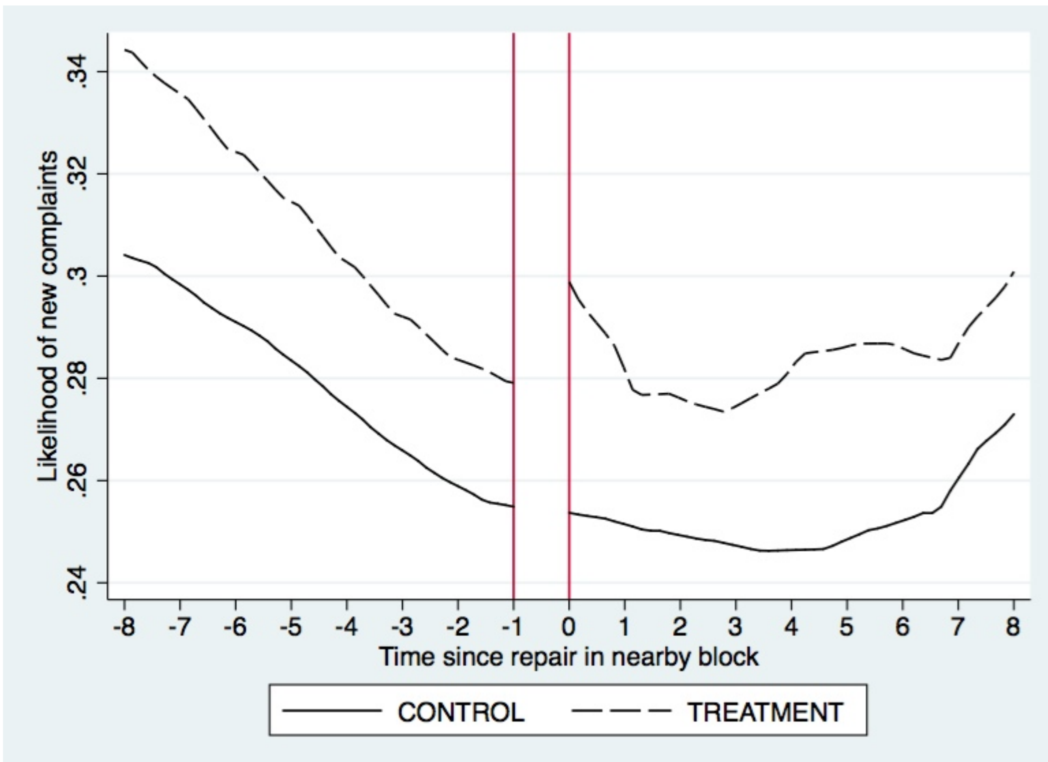
Figure A4.1 shows that repairs are allocated to areas with more complaints, which is in line with government attempts to be more responsive. However, the timing does not seem to respond to a differential increase in complaints in the preceding months. That is, blocks with nearby repairs at time t have the same pre-trend in complaints as the control blocks, which suggests that the difference-in-differences estimation is unlikely to pick up pre-existing changes.[16] As a further check, in the regressions I also include controls for linear, quadratic, and cubic trends at the area and neighborhood levels.

Figure A4.1 also shows that the likelihood of complaints in block i increases during the month of the repair in C_i, which is consistent with an increase in participation when citizens observe the government working nearby. Table A4.1 reports the corresponding regression. The existence of at least one repair one block away increases the likelihood of complaints in block i during the same period by 1.2 percentage points, which corresponds to an increase of 4.6% with respect to blocks without repairs nearby (Column (1)). This result does not reflect mechanical effects of the repairs, as would be the case if deficient repairs were generating further complaints, because blocks with contemporaneous repairs are excluded. Past actions from citizens or the government could potentially introduce a bias in the coefficient of interest if they generate both complaints in i and repairs in C_i. For instance, complaints in C_i at time $t-1$ could be associated with both complaints in i and repairs in C_i at time t. Therefore, Column (2) controls for the number of complaints and repairs during the previous month in both block i and in C_i. The results are not significantly affected, suggesting that the positive relationship between complaints and repairs at t is not driven by past behavior.

Given the rather conservative definition of C_i, these estimates are likely to underestimate the real effect. In all these estimations, only contiguous blocks that are on the same street as the repair are considered treated, because the repairs are most visible from those blocks. In

[16]Regressions including up to two leads and lags of the treatment variable show that only the contemporaneous repairs have an effect on complaints.

Figure A4.1: Pre-Trends in the Likelihood of Complaints



Notes: This figure compares the likelihood of new complaints in a given month for blocks that had repairs nearby with those that did not. For each block that observed repairs nearby more than once, I take each occurrence as a separate observation. In order to construct the treatment line, I define t=0 as the month in which the repair nearby happens, and keep only the blocks that did not experience a repair themselves during that month. For each t, I calculate the share of blocks that had at least one new complaint, which is denoted by the dashed line. In order to construct the control line, for each month I calculate the share of blocks that had at least one complaint, among those that did not have repairs nearby that month. I also calculate for each t (as defined in this figure, after re-centering) the proportion of observations used for the treatment line that corresponds to each month in the data. I then use these proportions to determine the weighted average of the calculated share. This is the control line.

Table A4.1: Administrative Data: Effect of Repairs on Complaints

	Dummy new complaints in block i at time t							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy repairs C_i, t	0.0123***	0.0126***	0.0152***	0.0151***	0.0156***	0.0154***	0.0157***	0.0155***
	(0.0030)	(0.0032)	(0.0031)	(0.0031)	(0.0032)	(0.0032)	(0.0034)	(0.0033)
No repairs on own block, t	x	x	x	x	x	x	x	x
Lag complaints repairs i, C_i		x	x	x	x	x	x	x
Area trends			linear		quadratic		cubic	
Neighborhood trends				linear		quadratic		cubic
Observations	169,757	151,231	151,231	151,201	151,231	151,201	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217	22,221	22,217	22,221	22,217
Mean control	0.262	0.256	0.256	0.256	0.256	0.256	0.256	0.256

Notes: All regressions include month and block fixed effects. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was a new complaint filed in block i at during month t, and 0 otherwise. ”Dummy repairs C_i, t” is a dummy that takes a value of 1 if there was a repair in a block near block i during month t. All regressions exclude blocks that are experiencing repairs at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i. Linear trends fit a different linear trend per area/neighborhood, including their own intercept. Quadratic and cubic trends are similarly defined. Errors are clustered at the area level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

reality, other blocks that are currently considered controls may be partially treated. Moreover, a repair in a given block will increase the likelihood of complaints by the estimated amount on both blocks nearby.

Since the source of identification comes from variation over time, Columns (3) to (9) include area- and neighborhood-specific trends. Including linear, quadratic, and cubic trends at either level does not affect the results, and slightly increases the point estimate to 1.5 percentage points (5.7%).

However, reverse causality could still account for these findings: in month t the government targets repairs to some blocks (but not others) in areas that are experiencing a current spike in complaints. There are two possible sources of a concurrent spike in complaints in contiguous blocks. First, the existence of spatial correlation of problems. Even though contiguous blocks are likely to be similar, it is unlikely that the same type of problem will suddenly arise on both blocks in the same month. For instance, the lifespan of LED streetlights is between 50,000 and 100,000 hours; even if they are installed at the same time, chances are small that streetlights on contiguous blocks will need to be replaced in the same month. Moreover, problems that evolve slowly (such as growing trees) do not provide a natural anchor related to the problem that would drive together complaints across blocks. A second reason for a concurrent spike in complaints in contiguous blocks is the existence of a change in neighbors' propensity to complain.

To address these concerns, I divide the effect of repairs into those that address contemporaneous complaints (that is, complaints filed in the same month) and all other repairs. If reverse causality drives the results, repairs that do not address contemporaneous complaints will not be relevant. Table A4.2 reports the results.

Reassuringly, repairs that are not addressing contemporaneous complaints significantly predict complaints during the current month, which suggests the existence of a causal link between repairs and complaints. At the same time, repairs that address contemporaneous

Table A4.2: Administrative Data: Effect of Contemporaneous Complaints Repaired vs. Other Repairs

	Dummy new complaints in block i, time t			
	(1)	(2)	(3)	(4)
Dummy contemp. complaints repaired C_i, t	0.0133**	0.0129**	0.0176***	0.0175***
	(0.0048)	(0.0053)	(0.0058)	(0.0058)
Dummy any other repair C_i, t	0.0102**	0.0102**	0.0110**	0.0109**
	(0.0039)	(0.0048)	(0.0046)	(0.0047)
No repairs on own block, t	x	x	x	x
Lag complaints repairs i, C_i		x	x	x
Area trends			linear	
Neighborhood trends				linear
Observations	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217

Notes: All regressions include month and block fixed effects. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was a new complaint filed in block i at during month t, and 0 otherwise. ”Dummy contemporaneous complaints repaired C_i,t ” is a dummy that takes a value of 1 when there was at least one repair nearby at t that was addressing a complaint opened during t, and 0 otherwise. ”Dummy any other repair C_i, t” is a dummy that takes a value of 1 if there was at least one repair nearby at t that is not addressing a complaint opened during t, and 0 otherwise. All regressions exclude blocks that are experiencing repairs at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i. Linear trends fit a different linear trend per area/neighborhood, including their own intercept. Errors are clustered at the area level.

complaints in C_i are also associated with an increase in complaints in i. In principle, this could indicate that both causal links are at play, although a government that addresses complaints in a very short period of time could have a significant impact on citizens' perceptions. In order to further explore the existence of reverse causality, I make use of the fact that the date of the complaints is perfectly recorded and exploit its variation within a month. That is, I separately estimate the impact of repairs during month t on complaints filed at the beginning and the end of the month (Panel A, Table A4.3).

Columns (1) to (4) report the results for complaints filed during the first week of the month. In all cases the effect is not significant, and the point estimate is close to zero. At the same time, complaints filed during the last week of the month are significantly higher when a repair was executed nearby. Columns (5) to (8) show this result, and its robustness to controls. In the last four columns, I check for within-month variation in complaints. That is, the dependent variable is an indicator that takes a value of 1 if the number of complaints filed during the last week of the month is strictly higher than those filed during the first week, and 0 otherwise. The evidence indicates that when there are repairs nearby, an increase in complaints in block i during the month is more likely to happen.

Panel B of Table A4.3 replicates the previous exercise, but focusing on repairs that are originated by complaints, since those are the repairs most likely[17] to drive the reverse causality link. The results are similar, which provides further support for the interpretation of the previous evidence.

Table A4.4 further supports the notion that repairs that address complaints have a causal effect on further complaints. In this case, I look at the effect of those repairs at time t on complaints during the first week of the month $t+1$ and find a positive link: a complaint repaired at time t in C_i increases the likelihood of complaints in block i during the first week

[17] Since some of the administrative systems used by the government were relatively new, sometimes repairs that addressed citizens' reports were not directly linked to the corresponding complaint but with a new internal notification.

Table A4.3: Administrative Data: Effect on Complaints Filed During First Week vs. Last Week

	Dummy new compl. block i, first week of t				Dummy new compl. block i, last week of t			
PANEL A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy repairs C_i, t	0.0022	0.0019	0.0026	0.0025	0.0063***	0.0057***	0.0068***	0.0066***
	(0.0017)	(0.0020)	(0.0021)	(0.0021)	(0.0013)	(0.0013)	(0.0012)	(0.0012)
No repairs on own block, t	x	x	x	x	x	x	x	x
Lag complaints repairs i, C_i		x	x	x		x	x	x
Area trends			linear				linear	
Neighborhood trends				linear				linear
Observations	169,757	151,231	151,231	151,201	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217	22,221	22,221	22,221	22,217
PANEL B								
Dummy complaints repaired C_i, t	0.0018	0.0006	0.0015	0.0015	0.0091***	0.0087***	0.0100***	0.0098***
	(0.0027)	(0.0026)	(0.0026)	(0.0025)	(0.0026)	(0.0024)	(0.0021)	(0.0021)
No repairs on own block, t	x	x	x	x	x	x	x	x
Lag complaints repairs i, C_i		x	x	x		x	x	x
Area trends			linear				linear	
Neighborhood trends				linear				linear
Observations	169,757	151,231	151,231	151,201	169,757	151,231	151,231	151,201
Number of blocks	22,221	22,221	22,221	22,217	22,221	22,221	22,221	22,217

Notes: All regressions include month and block fixed effects. "Dummy repairs C_i, t" is a dummy that takes a value of 1 if there was a repair in a block near block i during month t. "Dummy complaints repaired C_i, t" is dummy that takes a value of 1 if there was a complaint repaired in a block near block i during month t. In Columns (1) to (4), the dependent variable is a dummy that takes a value of 1 if there was at least one complaint open in block i during the first 7 days of month t, and 0 otherwise. In Columns (5) to (8), the dependent variable is similarly defined but for the last 7 days. All regressions exclude blocks that are experiencing repairs at t. "Lag complaints repairs i, C_i" includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i. Linear trends fit a different linear trend per area/neighborhood, including their own intercept. Errors are clustered at the area level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

of $t+1$ by 6.4 to 9.7 percentage points.

Table A4.4: Administrative Data: Effect on Complaints Filed During the First Week of Following Month

	Dummy new complaints in i, first week t+1			
	(1)	(2)	(3)	(4)
Dummy complaints repaired C_i, t	0.0976***	0.0857***	0.0643***	0.0644***
	(0.0033)	(0.0037)	(0.0020)	(0.0020)
No repairs on own block, t	x	x	x	x
Lag complaints repairs i, C_i		x	x	x
Area trends			linear	
Neighborhood trends				linear
Observations	149,919	131,393	131,393	131,367
Number of blocks	22,219	22,219	22,219	22,215

Notes: All regressions include month and block fixed effects. "Dummy complaints repaired C_i, t" is dummy that takes a value of 1 if there was a complaint repaired in a block near block i during month t. "Dummy new complaints in block i, first week t+1" is a dummy that takes a value of 1 if there was at least one complaint open in block i during the first 7 days of month t+1, and 0 otherwise. All regressions exclude blocks that are experiencing repairs at t. "Lag complaints repairs i, C_i" includes as controls the number of repairs and complaints at t-1 for both block i and nearby blocks C_i. Linear trends fit a different linear trend per area/neighborhood, including their own intercept. Errors are clustered at the area level.

Up to this point, the estimations show the effect of any type of repair on complaints, whereas the experiment only identifies the effect of sidewalk repairs on complaints. In order to match the exercise done in the experiment, Table A4.5 separately estimates the effect of different types of repairs. Reassuringly, sidewalk repairs have a significant effect on complaints, and particularly on those about other sidewalks and trees, as was found in the experiment.

Table A4.5: Effect of Repairs, by Type of Public Good

	Dummy new complaints in block i at time t				
	All	Trees	Sidewalks	Streets	Streetlights
	(1)	(2)	(3)	(4)	(5)
Dummy repairs trees C_i, t	-0.0001	0.0029	0.0008	-0.0014	-0.0005
	(0.0058)	(0.0039)	(0.0030)	(0.0023)	(0.0026)
Dummy repairs sidewalks C_i, t	0.0312***	0.0226***	0.0327***	0.0054	-0.0006
	(0.0071)	(0.0045)	(0.0065)	(0.0033)	(0.0020)
Dummy repair street C_i, t	0.0109	0.0053	0.0002	0.0074**	0.0001
	(0.0071)	(0.0036)	(0.0044)	(0.0030)	(0.0047)
Dummy repairs streetlights C_i, t	0.0095**	0.0084*	0.0014	0.0059***	-0.0052
	(0.0043)	(0.0045)	(0.0025)	(0.0015)	(0.0038)
No repairs on own block, t	x	x	x	x	x
Observations	169,757	169,757	169,757	169,757	169,757
Number of blocks	22,221	22,221	22,221	22,221	22,221
Mean control	0.262	0.125	0.0859	0.0402	0.0717

Notes: All regressions include month and block fixed effects. ”Dummy new complaints in block i at time t” is a dummy that takes a value of 1 if there was a new complaint filed in block i during month t, and 0 otherwise. Column (1) contains all complaints, whereas Columns (2) to (5) only present complaints regarding trees, sidewalks, streets, and streetlights, respectively. ”Dummy repairs trees C_i, t” is a dummy that takes a value of 1 if there a tree was pruned in a block near block i during month t, and 0 otherwise. Variables for sidewalks, streets, and streetlights are defined in the same way. All regressions exclude blocks that are experiencing any repair at t. ”Lag complaints repairs i, C_i” includes as controls the number of repairs and complaints at t-1 for both block b and nearby blocks C_i, separately for each public good. Errors are clustered at the area level.