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Security planning, citizenship, and the political temporalities of electricity infrastructure

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ABSTRACT

Urban infrastructures are now widely viewed as eminently political socio-technical systems that can govern cities and reorder urban space, but their temporal dimension has only recently been considered as central to this political work. By exploring the transformations of electricity infrastructures in Rio de Janeiro's favelas over the past ten years (2009–2020), this article examines how infrastructural change is governed through multiple temporal processes. It considers how different urban infrastructure development-related temporal aspects and experiences (simultaneity, speeds, progressivity, and waiting) are connected to the temporality of planning, urban intervention, security, and infrastructure-related rights. Through this analysis, the article aims to theoretically expand our understanding of infrastructures as technologies of government, and to unpack the relationship between planning, infrastructures, and citizenship, beyond the state; a relationship that is not only spatially framed but also temporally governed and experienced.

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Introduction

“It’s not right put the meters in a closet in the wall in the street. You must have your meter in your house. So, you know how much (electricity) you’re using. In the past, I used to have this meter here in my wall. They (the provider) went around taking out all the meters and putting all the new meters in a closet. I said to the lawyer: How can I ask to have my meter back in my house? He said: Well, it’s possible, but it will take a lot of time to resolve” (Bianca¹, Rio de Janeiro, 2020).

This quote is from a resident living in a favela of the Southern zone of Rio de Janeiro, who I interviewed in 2016 and 2020. Over these four years, she experienced a host of problems with her electricity smart meter, particularly relating to the accuracy of her meter readings. To resolve these problems, she contacted a lawyer as a last resort. She also wanted her meter installed on her premises, but this was not the electricity provider’s policy when her new (smart) meter was installed in 2010. She knew that this would take up a

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lot of time and energy, mean waiting a long time with little chance of success. In the Rio de Janeiro favelas that went through electricity regularization², Bianca's is not an isolated case, particularly since the installation of a smart metering system in 2009. This process often created a new temporal relationship for residents in which expectations and the experience of waiting are entwined with urban inequalities and citizenship.

This article examines the temporal dimension of electricity infrastructures. It argues that infrastructural change has multiple temporalities and that analysis of these enables us to understand how infrastructure operates politically. In particular, the article considers how different urban infrastructure development-related temporal aspects and experiences (e.g. simultaneity, speeds, progressivity, waiting, etc.) are connected to other temporalities: from planning intervention to the everyday (individual and collective) experience of waiting. More broadly, it argues that focusing on this conjunction provides an understanding of the role of the temporality of urban infrastructures in governing, producing order and reshaping citizenship.

Whereas the spatial dimension of urban infrastructures has become a common lens through which to understand and investigate the political role of urban infrastructures in governing and (re)producing forms of urban inequalities (Graham & Marvin, 2001; McFarlane & Rutherford, 2008), their temporal dimension remains somewhat overlooked. However, this temporal dimension has recently been recognized (Hetherington, 2014) as infrastructures “also have variegated temporalities and mediate time” (Monstadt, 2022, p. 1). Studies have shown the importance of time for understanding the political dimension of infrastructural decay, maintenance and repair (Ramakrishnan et al., 2021), the linkage between energy transition and infrastructural and urban change (Elsner et al., 2019), and the link between infrastructure and development (Appel, 2018), for example. However, there is still a gap in our understanding of the relationship between the temporality of urban infrastructures, the process of governing and citizenship. This article suggests that focusing on the multiple temporalities of urban infrastructural change helps us to understand how low-income informal neighborhoods are governed and how citizenship in these neighborhoods is shaped. It consequently responds to the “urgent need for an increased dialogue to connect time theories with detailed empirical studies on urban and infrastructural” (Monstadt, 2022, p. 7).

This article builds on a ten-year case study of electricity infrastructure developments in Rio de Janeiro's favelas (2009-2020). During this period, favelas became the focus of attention as international events were being held in the city that provided fertile ground for reinforcing a neoliberal urban agenda in which favelas were targeted by multiple public-private interventions, including security measures, evictions, regularization measures (including electricity), etc. (see de Queiroz Ribeiro & dos Santos Junior, 2020). The end of 2008, when the first Pacifying Police Unit was installed³, saw a short temporal window open up in which Rio de Janeiro was considered a place “full of opportunities” (Giambiagi & Urani, 2012), especially for investors and public-private partnerships. Unsurprisingly, this Rio de Janeiro “full of opportunities” quickly vanished. The speed at which such projects fell apart was entirely predictable as they were embedded in the temporalities of the international events. As far back as 2009, residents, particularly those in favelas, were already wondering what would be left of the UPP program and related multiple interventions *after* the Olympics in 2016. The failure of the UPPs to uphold the promise of a new relationship between these citizens and the state

(a relationship historically characterized by state violence) was already visible and roundly criticized well before 2016. But 2016 was undoubtedly a symbolic year: a few weeks before hosting the Olympics in August, the State of Rio de Janeiro declared a “financial calamity”, followed by a security emergency that saw the federal government send tanks out into the streets. Although these interventions are partially perceived as belonging in the past, their political workings continue.

Within this context, this article discusses the development and decline of electricity regularization projects developed in favelas occupied by a UPP since 2009 to ban irregular electricity connections. The implementation of these projects is analyzed as a temporal process during which electricity upgrading has been used as a tool to govern favelas in combination with a broader process of capital accumulation, and reframing rights. This process emerges at the conjunction of multiple temporalities: the temporality of urban planning and infrastructural change, and the temporality of infrastructure rights in the everyday. These temporal frames, presented in detail below, work together at different speeds, through different logics and at different levels, and they combine to construct a temporal perspective of the political role of urban infrastructures.

The contribution of this article is twofold. Firstly, it seeks to theoretically expand our understanding of infrastructure as technologies of government by considering how the temporal relationship infrastructures create has implications for citizenship. Urban infrastructures are considered crucial systems through which to explore citizenship in cities of the Global South (e.g. Anand, 2017; Lemanski, 2018; Von Schnitzler, 2008), with the material and spatial aspects of infrastructure being emphasized to understand subject formation, political relations and access to rights. This article expands on this understanding of the political work of urban infrastructures by considering how citizenship discourses and substantive access to rights are also temporally framed and experienced. Secondly, it reveals that the political meaning and workings of infrastructure are not only deeply related to the places in which the infrastructure is deployed, but also to other temporalities – of urban/security planning and everyday life –, the conjunction of which is crucial to understand such work.

In this paper, this temporal dimension also has a methodological foundation. I conducted fieldwork on electricity infrastructure developments and their effects on city dwellers’ everyday relationship with this service, and on forms of inequalities and politics at different points in time over the past ten years (three periods of few months between 2009 and 2012, in 2016 and in 2020). In addition to analysing media articles, technical reports, and laws, I conducted more than one hundred interviews with residents in different favelas, as well as with “community leaders”, electricity provider agents, electricity sector specialists, etc., and participated in various community meetings in favelas located in Rio’s Southern zone.⁴ During this period, I myself experienced different temporalities: the introduction of the electricity regularization projects and the UPPs in 2009, the disillusion already visible in 2012, and the long-term problems in 2016 and 2020 following the clear breakdown of the UPPs. In 2020, I re-interviewed some of the favela residents I first met years before, which allowed me to track the status and resolution (or not) of problems over time. This longitudinal analysis goes beyond understandings of urban infrastructure in specific moments in time and helps better understand its aftermath. Most infrastructural change comes with certain promises embedding hope, visions and expectations, but also uncertainties, and often threats and forms of dispossession. The

temporality of this research enabled me to consider the workings of this aftermath through time, and how time mediates policies and the political experience of infrastructure.

The second section examines the political role of urban infrastructure by exploring discussions on the temporal dimensions of infrastructure, planning and citizenship. The article continues by looking at a specific temporal conjunction in Rio de Janeiro, that of a few years from 2009 that saw the co-dependence, simultaneity and overlapping of different policies and processes, including: the organization of international events, the development of a security policy via the UPPs and electricity regularization in these favelas. This rapid process of governing through capital accumulation and reordering measures is then followed by a much slower process of gradually drawing consumers into a formal customer relationship status, and reframing rights. The fourth section presents this process and also shows how a slower speed supports capital accumulation and bureaucratization. The fifth section describes the failure of the previous processes and the emergence of a new temporal window for residents characterized by the experience of waiting for their electricity infrastructure-related rights to be upheld within the long temporalities of lawsuits. Within the broader context of the UPP failure, high electricity service costs, and the framing of favelas as “risk areas”, this experience of waiting reveals the ongoing neglect of favela residents’ rights.

The political temporalities of urban infrastructures

In urban studies and related disciplines, urban infrastructures are a consolidated object and perspective through which to understand the material and social production of cities, including how they mediate governance, everyday life, and socio-spatial reordering. Much attention has been paid to the spatial dimension of urban infrastructure as a way of understanding its role in shaping inequalities, and urban cohesion/fragmentation (e.g. Coutard, 2008; Graham & Marvin, 2001). Its temporal dimension, however, has only recently been recognized as being of value for understanding the social and political work of infrastructures, as the broader trend has been to somewhat overlook the temporal dimension of spatial transformations (May & Thrift, 2003). Hetherington’s definition of infrastructures as: “those structures that are supposed to provide the stability necessary for the emergence of processes of a different order” (Hetherington, 2014, p. 197) provides an interesting starting point for understanding this dimension. Although order and time seem loosely connected in this definition, the idea of order being embedded in the deployment of infrastructures can be linked to political imaginations of the future, including ideas of progress (Hetherington, 2014) and development (Appel, 2018). It can also help link different scales, from national perspectives on the future to more individual intimate structures of time (Degani, 2016). Within anthropological perspectives, the temporal dimension of infrastructure has recently emerged through the idea that infrastructures embed a “promise” (Anand et al., 2018). Anand et al. argue that infrastructures embed promises built on narratives of technological and social progress but, as materials and technologies transform, “so do their promise” (Anand et al., 2018, p. 27). This idea of transformation already acknowledges that time plays a role in shaping infrastructures (and its political content). In the Global South, infrastructural temporalities are often associated with ruination (see Cavalcanti, 2014; Gupta, 2018); a

form of infrastructural decay over time, the rapidity of which is often due to politics and the production of inequalities. Infrastructures need maintenance and repair; they are adapted, manipulated, appropriated, and used, and these processes change them incrementally over time (see Silver, 2014). These processes show that infrastructures are “*always in the making*” (Baptista, 2019), and emphasize that infrastructures are characterized by a kind of “temporal incompleteness” (Guma, 2022), not least because different temporalities (of the planners, politicians, etc.) are at play in infrastructural project negotiations (Carse & Kneas, 2019). Yet time in this context should be considered neither as a linear sequence of moments, nor as an independent and neutral variable. Time has a political quality since it “produces different material conditions, social perceptions and labor, power geometries and policies, and socio-ecological relations” (Ramakrishnan et al., 2021, p. 3). This raises questions about the “temporal workings of inequality and forms of domination” (Besedovsky et al., 2019, p. 5), including how time is experienced, how time affects power relations and “its spatial implications for social relations, social inequalities and social justice” (Ho, 2021, p. 1). The temporal alignment (or misalignment) between urban infrastructures and urban rhythms has also been recognized as an important quality of urban production. Infrastructural temporalities produce stabilized, routinized, and patterned temporalities of cities (Monstadt, 2022).

These studies enable us to consider the relationship between urban infrastructure, time and temporalities, with time generally being correlated with an objective measure, and temporality being the socially constructed condition of time, “namely the state of existing within or having some relationship with time” (Ho, 2021, p. 1). These studies have predominantly focused on infrastructural ruins, the experience of waiting for infrastructural projects, of maintenance and repair work, and on the temporal functioning of urban infrastructures. Building on and advancing these critical understandings, here propose two further dimensions to understand the political work of time in urban infrastructures. The first considers the process of governing through urban infrastructures as a multi-temporal process in which the temporalities of planning and those of infrastructural change are connected. The second focuses on the temporal experience of accessing infrastructure-related rights.

For the first dimension, we can start by considering infrastructural change as a moment in time in which the city is also simultaneously changing. Monstadt suggests that these moments are particularly important because they “reveal various temporalities, asynchronisms, and misalignments that are (...) crucial for the broader understanding of urban and infrastructural change” (Monstadt, 2022, p. 6). Here I argue that these moments are also crucial for understanding both how urban infrastructures govern and their logics of governing, especially when intertwined with urban planning processes that have their own temporalities. Planning has recently been recognized as a materialization of time, as a “form of governmental technology through which social discipline, ritual, and rhythm are made present in social life, and in which time is materialized, mediated, or brought into conflict” (Abram, 2014, p. 129). The temporality of planning have recently been acknowledged as “fundamentally politicized” (Raco et al., 2018): “slow” or “fast” planning processes can be the culmination of specific strategies and or forms of negotiation used by actors (Raco et al., 2018). The slowness or rapidity of planning processes is often dependent on the “urgency” attached to them, generally linked to interests, visions, and money. Neoliberal critiques, for example, can accuse the

temporalities of public planning of “slowness” as new investment in the built environment needs speedy developments (Raco et al., 2018). Thus, urban planning is not only the context in which these infrastructural projects occur. It brings a political frame in which to better understand infrastructural change and its correlations.

While causal relationships remain important when considering infrastructural change (e.g. an infrastructure modernization project can trigger the eviction/resettlement of poor residents living in the project area), temporal relationships have not been widely viewed as relevant for understanding how spaces are governed through urban infrastructures. Here I argue that the temporal relationship between infrastructural change and planning reveals the multiple temporalities that govern infrastructural change and its political meaning. Their temporal conjunction invites us to consider how they work together as a form of governmental technology that does not operate in a linear temporal progression. Projects and public policies are usually presented as working through temporal frames of different phases, with a beginning and an end. However, research has shown that multiple temporalities co-exist, regarding the link between urban planning and everyday life especially (see Koster, 2020), and are particularly mediated through infrastructures. There is thus a second dimension that needs to be examined, namely the temporal experience of accessing infrastructure-related rights, which is more broadly related to urban citizenship.

It is increasingly acknowledged that citizenship is embodied in infrastructures for both citizens and the state (see Lemanski, 2018), particularly in the Global South. In this understanding, inspired by anthropological approaches, citizenship is not merely a status defining full membership to a community (generally the national state) to which rights and responsibilities are attached. It also covers the everyday relationship between people and state bureaucracies, between people and law (Lazar, 2019), and increasingly people and non-state actors that perform governmental roles (de Koning et al., 2015). It consequently relates to how citizens substantially access and negotiate their rights, and not only to their formal entitlement.

Within these approaches, urban infrastructures and related documents (bills) have been increasingly recognized as the mediators of rights, political relations, forms of right to the city, and the formation of subjectivities, particularly in areas with precarious land tenure and stigmatization (e.g. Anand, 2017; Körling, 2020; Pilo', 2020; Von Schnitzler, 2008). In Brazil, Holston showed how, historically, citizenship developed as differentiated (unequal) in terms of treatment, access to resources (including urban infrastructures) and forms of recognition (Holston, 2008). While the relationship between time, politics and rights has not been extensively explored, some studies have recently emphasized the extent to which time is central to analyzing inequalities in the exercise of citizenship beyond infrastructures (Cohen, 2018). Holston stated that: “standing in line for services is a privileged site for studying performances of citizenship” (Holston, 2008, p. 15), as “it (...) requires the negotiation of powers, rights, and vulnerabilities” in the public space (Holston, 2008, p. 15). This idea has been extensively developed by Auyero, who expertly shows how the experience of waiting is intrinsically linked to the daily exercise or denial of rights within vulnerable populations in Argentina (Auyero, 2012). These studies invite an ethnographical exploration of the multiple experiences of time in relation to institutional framings and access to rights, which do not follow the linearity envisioned by projects (see Bear, 2016; Koster, 2020). While

most of these studies acknowledge the importance of “waiting” in the relationship between citizens and the state, citizens’ experiences vis-à-vis non-state actors also need to be considered given that urban infrastructures have been widely delegated to private companies who deliver public services. This means that these companies also become mediators of rights to urban services in the everyday.

The remainder of the article will explore these two dimensions by considering multiple temporalities and their different speeds. It will show how a compressed planning timetable dictated by the organization of mega-events encouraged the rapid introduction of security measures and electricity regularization. This is followed by a slower process of creating solvent customers through progressive policies that, in some cases, lasted a couple of years. Finally, many customers, suspecting that their rights were not being respected during the broader economic and security crisis, started to experience a new temporality of long waiting periods by engaging lawyers, which shows how people negotiate their rights. These three temporal frames and experiences are closely entwined in the emergence and failure of a neoliberalisation process involving security planning, urban infrastructures, capital accumulation, and bureaucratization.

Compressed timetable and synchronicity: mega-events, security planning, and electricity regularization

Over the past fifteen years, the city of Rio de Janeiro has undergone fast and dramatic transformations driven mainly by the organization of several mega-events (de Mattos Rocha & da Motta, 2020). While the FIFA World Cup (2014) and the Olympic Games (2016) are the best-known, these were just part of a cycle of mega-events in the city that included the Pan-American Games (2007), the World Urban Forum (2010), and the Military World Games (2011). The city’s hosting of so many events in such a short period “changed its urban fabric and produced a political context in which the image of the Olympic City expressed a local and national project characterized by the progress, economic development and social integration” (de Mattos Rocha & da Motta, 2020, p. 227). Within this compressed timetable, multiple interventions, projects and operations were developed to create the most suitable conditions for capital accumulation (de Queiroz Ribeiro & dos Santos Junior, 2020; Freeman, 2012). Favelas were at the center of these transformations that were implemented through a range of policies and programs.

In 2008, the Rio de Janeiro State government started installing “proximity policing” - the *Unidades de Polícia Pacificadora* (Pacifying Police Units, UPPs) - in selected favelas located in strategic areas of the city (such as the wealthiest and most tourist neighborhoods of the Southern zone, the center, and the areas which access is central for connecting to the Olympic game equipment, and the airport). The installation of the UPPs was both in direct response to the favelas’ violent reputation⁵ and a concrete tool for promoting Rio de Janeiro’s image as a “safer city” that would reassure visitors to major international events and attract investments (de Queiroz Ribeiro & dos Santos Junior, 2020). At that time, the Rio de Janeiro State government’s political discourse was that police occupation of the favelas enabled a *fast* re-establishment of the state monopoly on legitimate violence. From there, a new - “pacified” - relationship could be forged *over time* between the police and these communities while improving the communities’

living conditions and access to citizenship rights (World Bank, 2012). Much has already been said on the development and failure of this policy, and how it helped to reproduce a penal state (Franco, 2016). From a temporal perspective, however, retracing the simultaneous introduction of security and upgrading programs reveals how specific logics and ordering processes were introduced through a new configuration between the state and the market, which in return also affects citizenship.

Some authors have already highlighted this simultaneity by looking at the PAC (Growth Acceleration Program). Mariana Cavalcanti, for example, has shown how the PAC slum upgrading program constitutes “one aspect of the favela ‘pacification’ that is central to the city branding strategies currently reshaping Rio de Janeiro due to the city’s winning bids to host global mega events” (Cavalcanti, 2014, p. 89/90). Prouse expands her argument and considers that the articulation between security and PAC also creates potentials for “marketization, land regularization, and employment formalization” (Prouse, 2019). The UPPs opened up a (relatively brief) window of opportunity for implementing different state and non-state interventions as part of a larger political discourse that encompassed favelas’ integration into the city - the “end of the divided city” - through a range of social, economic, bureaucratic and moral reordering measures (World Bank, 2012).

Most of these interventions were never completed. Even at the time, these interventions were part of a rhetoric whose primary aim was to create a market-friendly environment. Nevertheless, some projects advanced further than others, and differentiated security protocols and hierarchies were effectively implemented in these favelas (Pereira Leite, 2012). Electricity regularization was undoubtedly one of the interventions best aligned with the installation of the UPPs (see also Freeman, 2012; Loretto, 2016), especially in terms of citizenship discourses.

Electricity regularization generally refers to the process of regularizing illegal connections and reducing commercial losses, which are relatively high in these areas. This type of program is clearly not new and was first implemented during the 1990s when the electricity provider was privatized. Prior to this, these programs were largely implemented independently of security policies. With the installation of the UPPs, Light’s regularization program strictly followed the compressed UPP installation calendar. Between November 2008 and May 2012, 23 UPPs were installed and Light implemented an electricity regularization project in 21 of these UPP program areas (Kelman, 2012). As stated by the Light’s Community Relationship Superintendent: “an UPP is installed, and Light enters just after” (Interview on 10/12/2010). The simultaneity between the UPP program and Light’s electricity regularization project enabled the emergence of a discourse in which market and citizenship are hybridized.

On the one hand, the “presence of the state” through the UPPs – as Light’s agents often framed it during interviews – meant that the company was able to implement projects without having to first deal with the favelas’ gangs and insecurity, which had often permeated electricity regularization interventions in favelas (see Pilo’, 2021). On the other hand, there was a convergence in the government and Light’s discourses and objectives toward a form of reordering in favelas that was based on market logic, forms of control, and on the transformation of residents’ behaviors in line with neoliberal ideas of citizenship.

Light’s intervention was presented as an example of virtuous cooperation between public and private entities for creating a “new culture” in favelas – a culture of legality

– in contrast to the “*cultura do gato*” (irregular connections) (Fonte, 2009). This process was introduced through a specific discourse that set out the benefits of regularization: the improvement of electricity provision and the respect of consumer rights. This was supposed to address historical inequalities in electricity provision (Pilo, 2021) while making it possible for people to claim rights in the event of problems with their electricity service. Thus, in Light’s discourse, this “trade-off” formed the basis of a “new pact” between the “new” regularized customers and Light.

“[...] before it was a lose/lose relationship, they [favelas’ residents] had no trust in Light. They had poor quality energy and regular outages, and there was a risk of fire and of being without light for 4 days straight, because everything was informal. And on the other side, Light had huge losses. Now, we are building a new win/win relationship: they have a good quality service, services, etc. and in return they have to pay their bills. And this is only possible because *the state is now there*.”⁶

While electricity regularization projects are nothing new, the fact that “*the state is now there*” encouraged a specific alignment between the security policy and electricity regularization that is particularly evident in Light’s and the government’s use of the term “citizenship”.

While “Light considers that the guarantee of citizenship is only possible with the union of efforts of the private sector, electricity providers, and government agencies” (Light, 2011), the installation of UPPs was also underpinned by a discourse based around “bringing full citizenship”.⁷ Echoing historical ideas of “civilizing *favelados*” (Burgos, 2006), the idea of “bringing citizenship” became part of the electricity regularization manifesto.

In its activity report “Citizen Light: Partnership of Values in UPPs” (*Light cidadã: parceria de Valor nas UPPs*), Light states that electricity regularization brings citizenship with responsibilities: “This is a process of re-establishing not only rights, but also responsibilities. It is a maturing cycle of the relationship between society, and the public and private sectors” (Light, 2011, p. 23). Beyond the reestablishment of a commercial relationship that encompasses rights and duties, the issuing of the electricity bill supports this discourse on citizenship: “The most emblematic action that Light undertook is not materialized in the grid or in the quality of electricity—but in a piece of paper. [...]. It brings citizenship to a lot of families that didn’t previously have a registered address” (Light, 2010, p. 123). In fact, in Brazil, utility bills can be used as proof of residence, and they are considered valuable documents in situations where there is illegal land tenure and a lack of recognized addresses, such as most of the favelas. Thus, a specific idea of citizenship – a “deserving citizenship” – emerges from the connection between citizenship, security, and electricity regularization: claims for rights (consumer rights and administrative recognition) are contingent on respecting specific rules (not stealing, paying the bills, etc.) (Pilo, 2020).

The simultaneity between electricity regularization and this public security program created a configuration for capital accumulation through a socio-technical reordering process, the rapidity and urgency of which was justified by the need to re-establish state territorial control and “bring citizenship back”. At the same time, the process of creating “solvent customers” following installation of the new meters was much slower. The next section reviews the progressive payment system, which is often

introduced for the first year (and sometimes even longer) after electricity regularization. I will show that the *slowness* of this process of creating “solvent customers” serves not only the company’s objective of achieving its acceptance, but also to create specific expectations about the future and the promise of an affordable service.

The progressive and “slow” process of creating solvent customers

It is important to consider that electricity regularization programs did not affect residents of favelas homogeneously as there were already heterogeneous access configurations in place. Some residents had been receiving bills since the 1980s, whereas others received a bill for the first time in 2009. This heterogeneity was also visible between favelas. In Santa Marta, where the first electricity regularization project was developed, there were only 73 customers billed before the project compared to 1,593 customers after. In Cantagalo, the number of customers billed before the project was much higher (1,045 before and 1,635 after) (Kelman, 2012). Consequently, the novelty of these projects differed widely depending on the favela and even on individual experience. Despite this, affordability was – and still is – one of the main issues affecting the economic and socio-political sustainability of regularization projects, and the acceptance of these measures.

Aware of the potential resistance to electricity regularization, Light introduced a temporary commercial policy that involved progressive payment for the electricity consumed. As explained in detail below, two types of “progressive payment system” were introduced, both with the same rationale: to gradually introduce bill-related expenses by enabling customers to progressively pay for the amount actually consumed. The first type of payment recovery system included a capped payment for all residential customers who had had a single-phase meter installed and whose bill gradually increased month-on-month. This system was implemented in three favelas that had a UPP and an electricity regularization project in 2009-2010: Santa Marta, Chapéu Mangueira and Babilonia. In Santa Marta, progressive payment recovery was over eighteen months, with consumption caps of variable duration. For the first six months (July 2009-December 2009), the established cap was 79/80kWh, which corresponded to a cost of 15.79 reais per month (about 6 euros in 2009), a figure that was independent of actual consumption. In the following months, the caps increased by 20kWh every two months until customers were paying for 200kWh in December 2010. After this date, customers were required to pay in proportion to their actual consumption. Each payment tranche therefore corresponded to a maximum amount of kWh actually paid (capped), which remained separate from each customer’s actual consumption in the event that this consumption was higher than the established ceiling. According to the company’s vision, the aim of this progressive process was to facilitate bill payments (as this new expense was introduced using smaller amounts than through total recovery) and align consumption and payment capacities under the combined effects of the progressive increase in the bill and energy efficiency measures.⁸

The progressive payment of electricity consumption can be considered a temporal technique to create solvent customers and does not contradict, but complements the previous and faster capital accumulation process. In fact, this slowness should serve to consolidate a legal access to electricity in the everyday, and also foster the “promise” of rights

and of an affordable service. In favelas, future expectations were particularly linked to the uncertainties of being able to afford a regularized service, and to a promise of certain rights. This progressivity also embeds specific expectations about how favela residents' electricity consumption is supposed to change over time. The promise of affordability can only be achieved *if* consumers adapt their habits to their capacity-to-pay. However, risks and uncertainties arise once this temporary payment recovery system comes to an end, as it ultimately did.

“We started with this progressive tariff to educate, and to inform ... because if not, regularization would have been more complicated. The hoped-for educational effects have not yet appeared. Their [favelas' residents] consumption is still not compatible with their pockets. So, we are still doing this educational work. We have determined that even with the efficiency measures and the educational work, the bill is still too expensive for them ...”
(Social manager in low-income communities, Light, 12/09/2011)

The high costs of electricity once this progressive policy ended raised the risk of possible “invisible eviction” (*remoção branca*) in which residents would progressively move to favelas where it was still possible to hook up irregular connections. Different types of conflict emerged linked more broadly to the high costs of the service (see also Cunha & Mello, 2011; Loretto, 2016; Ost & Fleury, 2013) and more specifically to the installation of smart metering systems, which were intended to regularize access but were considered to have resulted in disproportionately high electricity bills (RioOn-Watch, 2016). These conflicts materialized in different ways, including protests, switching back to illegal connections, and taking legal action against the electricity provider to verify the accuracy of the meter. The next section focuses on the legal action aspect, which reveals the emergence of a new temporal relationship for favela residents that is characterized by the experience of waiting. This partially illustrates the failure of the first two process presented above, as well as the agency shown by favela residents when navigating forms of inequalities.

“Waiting to check the meter”: claiming rights and the temporality of the legal system

Of all the post-electricity regularization discourse, the acquisition of consumer rights has been one of the main promises used by the electricity provider to foster acceptance. Becoming a customer “who can claim rights” in the event of problems directly addressed historical inequalities in the treatment of favela residents within the electricity service, and cultivated residents' electricity regularization expectations. However, customers have been left disillusioned. The increase in specialist consumer rights lawyers in favelas following the installation of the UPPs shows how conflict has arisen around consumer rights – both within the electricity service and beyond. The end of the progressive payment system often coincided with rising conflict around bills and meters. One of the main experiences linked to these conflicts has been that of waiting: waiting for the company or another neutral expert to establish if and how an error has occurred. For those who turned to a lawyer to resolve their conflict with Light, the experience of waiting corresponded to a new temporal window in their relationship with the electricity service; one characterized by uncertainty and anxiety, and by fighting to prevent the violation of their rights.

The installation of smart meters in most of the UPP-occupied favelas is often considered to be behind residents' inexplicably high bills. As widely reported in the media, residents started to see dramatic increases in their bills – up to 1,000% in some cases – (Machado & Rodrigues, 2015), which led to controversies over meter readings. These political and technical meter reading controversies (see Anand, 2015 for similar issues related to water leakages in India) emerge at the intersection between distrust and invisibility. Residents could not directly consult their meters, which made them more suspicious of the calculations used. To protect the system from fraud, the company installed the meters in closed and reinforced cabinets that residents were unable to access (see Pilo', 2021). This use of the smart grid as a security device to protect against corruption generally left customers without the ability to check their meter (see interview quote at the beginning of this article). Thus, lawyers are being used as a last resort to claim their rights and force Light to prove that the amount listed on the bill is correct.⁹

For example, Luciana¹⁰, a shopowner, started struggling to pay her bill once the progressive payment plan came to an end in 2011. Luciana has lived in the favela for 40 years and, for the last 15 years, has been running a small business selling drinks, basic groceries and flip-flops, initially with her husband.¹¹ Before the service regularization process, the business was supplied by a meter, but they paid the symbolic price of 40 reais, "because the service was terrible, it was not fair to pay the full price." As they had five refrigerators, a freezer and a television, the couple decided to install a three-phase meter when the service was regularized. After the first very high bills (around 300/400 reais in 2011), they replaced this with a single-phase meter in the hope that the bill would fall. Instead, the bill went up - to around 800 reais - despite the couple claiming that their consumption had not changed. Unable to check the meter themselves, they initially made several unsuccessful appeals (including to Light customer service, the commercial agency, and the residents' association) before contacting a lawyer. The lawyer was able to obtain an appointment for a technical visit by the electricity company a few months later. However, after the technician deemed that the meter was working correctly, the couple decided to file a lawsuit against the electricity provider. The process lasted three years, during which the couple paid a negotiated price of 600 reais until a neutral expert could come and check the meter. The verdict after these three years was that no irregularities had been found. The couple then had to pay back the outstanding amount accrued over the three years in monthly installments. In 2020, when I visited Luciana for the last time, the bill was relatively low, around 150 reais, as she had partially bypassed the meter for the highest energy-consuming appliances, a practice that has become relatively common despite the initial protection of the meters. Thus, in situations where electricity costs jeopardize the customer's ability to continue with their business activity, this manipulation of the meter expresses a form of infra-politics (Scott, 1990) through which residents make the service affordable. However, claiming rights due to a technical controversy has not been so effective.

Similarly and in the same favela, Bianca, a beneficiary of the Bolsa Familia social program¹² who lives alone with her two children in a one-bedroom apartment with a small kitchen and living room, started to receive bills of around 400/500 reais before these rose to 1,200 reais:

“Then I went to the social worker, and I talked to her. She said: you spend the day outside the house and your children too, so there is something wrong. Then I called and asked them [the electricity company technicians] to come and check the meter. Because the chip [meter] is with them, not with us. Then they came and said that there was no mistake, that this was my consumption. But at that time, I was receiving a bill of 1,200 reais! So, I said: No, I have to pursue this. I took everything I had [bills] and looked for a lawyer.”¹³

In 2018, Bianca hired a lawyer, who charged her a large sum (4,500 reais) that she was still paying off in monthly installments in 2020. The first step involves a Light technician coming to verify the meter, while Bianca had to take pictures of the appliances in her house “so they know that I don’t have objects that consume a lot. I had to prove that I spend the day outside the house and that the only appliance I leave on is the fridge ...”¹⁴ She explained that the process was relatively fast, only 18 months, during which she continued to pay the bill she was receiving in full. She was afraid to negotiate a lower price only to have to pay everything back later if no problem was found with the meter. While the first technical visit, which took place before she hired a lawyer, affirmed there was no problem with the meter, the second visit confirmed that the meter had been altered.¹⁵ Following this visit, which took place a couple of months before our conversation, Bianca started to receive bills of around 7–10 reais, which included a reduction for the social tariff. At that time, she was still waiting to discover what had happened, and whether she would receive a refund from Light: “I don’t know yet. I will know when the lawyer gets in touch with me, but this period is like this: New Year, Carnival, it will take time to find out ...”.

Finally, Maria, a resident of another favela of the Southern zone, filed a lawsuit against the company in 2016 yet was still waiting for a technical visit to verify the correct functioning of the meter in January 2020. Maria, who lives with her brother in a house with only a fridge and energy-efficient lightbulbs in every room, started to receive higher bills after the smart meter was installed:

“Then it started ... R\$400, R\$500, R\$600, R\$700 ... It reached a thousand reais. Then I talked to the lawyer. He said: No, this bill is too high. Not even if you ran a business would you have to pay this amount. People in the “asphalt”¹⁶ don’t pay that. Why are you paying this? Then we filed a lawsuit.”¹⁷

Because of the large number of complaints in the favela, the president of the residents’ association organized legal consultations with a lawyer who was available once a week for a period in 2016. This is how Maria met her lawyer: “He said (the lawyer): if you want, we can file a lawsuit and see how it goes. And so, we did. This was three years ago, and the expert has still not come to check the meter”.¹⁸ In the meantime, to establish the amount Maria was to pay during the lawsuit, her average consumption was calculated using the bills received prior to installation of the smart meter: R\$200 (instead of the 700/800 reais of her current bill). At the time of the interview, she had a cumulated debt with Light of around 14,000 reais (Figure 1) as she was continuing to receive bills for the amount recorded by the smart meter but only paying the stipulated amount. This was deposited in a specific account linked to the lawsuit and not paid directly to the company.

Maria had taken something of a risk in negotiating this amount: “If I win, I’ll have it all back, the full refund. The high bills I paid, the costs I paid, right? If I lose, I will have to pay what I didn’t pay, which is a lot, understand?”. Thus, waiting is experienced in a state

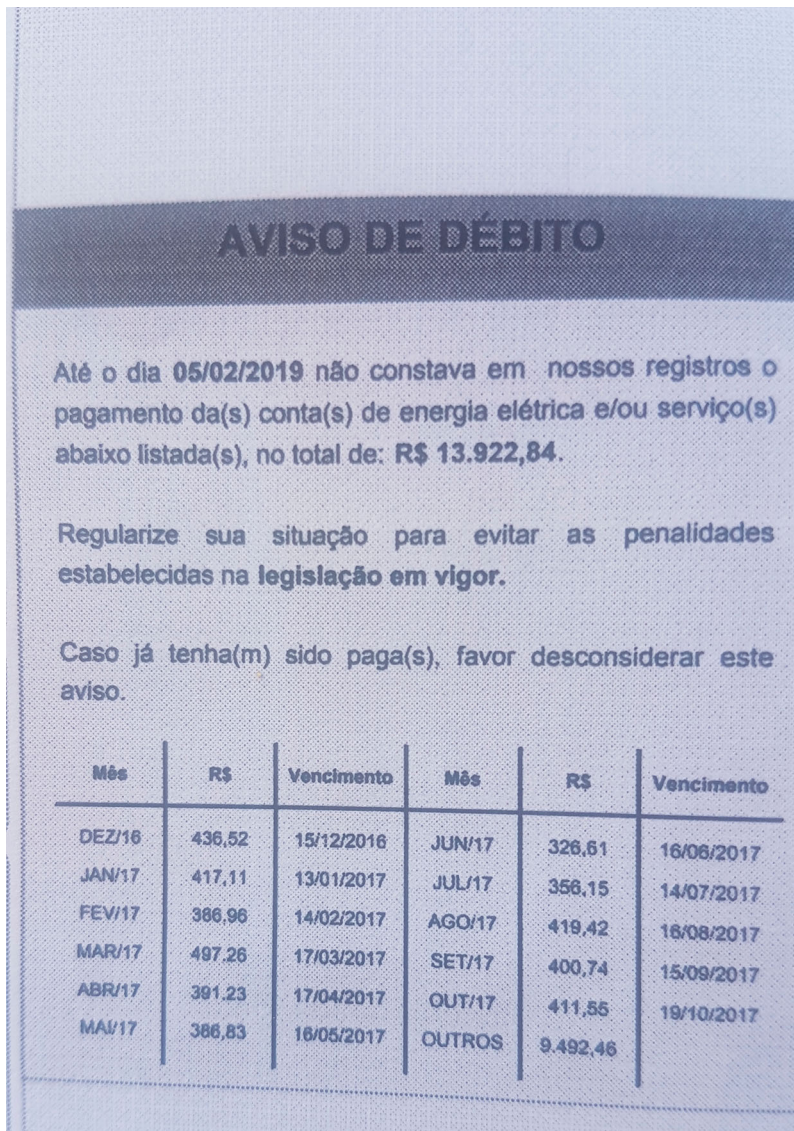


Figure 1. Notice of debit.
Source: Pilo' (2020).

of anxiety caused by the uncertainty of the outcome and the fear of having to pay the electricity company a large sum of money should she lose. Moreover, unlike Bianca who paid a fixed amount in advance, Maria negotiated a different type of payment plan with her lawyer. She stipulated that if she wins the lawsuit, the lawyer will earn 40% of the sum awarded; however, if she loses, both Maria and the lawyer lose out, as the lawyer will not be paid at all. Although it will cost her more in legal fees if she wins, Maria considered this to be a less risky option. Yet waiting is not only associated with costs – whether in money or time. It is also related to pride in standing up for her own rights: “When I fight for my rights, I’m fighting for the right thing”.

However, the length of the process, the cost, and the uncertain outcome can discourage customers from taking legal action against Light. Maria explained that, although other residents in the favela have had similar issues that they suspect are due to meter problems, only a few other residents have decided to sue the company as waiting times are known to be even longer than average in the favelas.

“The delay, according to the lawyer, is due to the expert. Because it must be a neutral expert, it can’t be a Light expert or mine. It has to be someone from the Public Defender’s Office. So, he would have to come here, analyze the meter and say if the meter is really defective or not. And take it to trial. But the expert does not come up here. *Is he going to go up to the favela?*”

These long waiting times appear to be caused by a combination of factors, including failure of the UPPs, lengthy legal action, and the enduring neglect of favela residents’ rights. UPPs have largely failed in building territorial control. In some favelas, they have been formally withdrawn. In others, there is a clear coexistence between gangs and police, as I witnessed during my last fieldwork in 2020 (see Oosterbaan, 2021 for an analysis of the emergence and failure of this security policy). This security governance configuration is also accompanied by increasing police operations and the reframing of favelas as violent spaces. When Maria asks: “*Is he (the expert) going to go up to the favela?*” she is referring to the fact that favelas are generally framed as “risk areas” because of gangs and regular confrontations with the police, and external services often refuse to deliver to these areas. These deteriorating security conditions have negatively affected not only regularization programs, but also service maintenance and repair operations, and responses to favela residents’ requests (see Pilo, 2021).

While waiting within the legal system is something that predominantly emerged after electricity regularization, the experience of waiting for the electricity company to solve specific electricity service-related problems is nothing new. On the contrary, historical demands for improved infrastructure often mention having to wait for Light to come and repair the system after a disruption. However, what characterizes the experience of waiting *after* electricity regularization is confirmation that the positive interrelation between becoming a customer, paying the bills, and having effective rights is an illusion. It can also be said to reveal the failures of the temporal UPP and solvent customer projects and highlight the enduring neglect of favela residents’ rights.

Conclusion

Building on an analysis of electricity infrastructure in favelas in Rio de Janeiro over the past ten years, this article has explored the different political temporalities of urban infrastructural change. The article has shown not only that these temporalities are not just about linear time, but also that the use and experiences of time are politically situated as they pursue specific re-ordering processes and reframe infrastructure-related rights. In particular, it has shown that multiple temporal frames govern urban infrastructural change, and, at the same time, urban infrastructure governs through different temporalities. The article has drawn out these two political aspects by highlighting how three temporal frames combine: the rapidity and simultaneity of urban planning and infrastructural change; the slow process of creating solvent customers; and the residents’ experience of waiting when claiming infrastructure-related rights.

While these processes clearly have a spatial dimension, a focus on the temporal aspects brings new understandings of the ways in which socio-spatial arrangements emerge, are sought to be stabilized and decline through urban infrastructures. Firstly, simultaneity makes it possible to see beyond causality as an explanation of the correlation between events. While security planning triggered specific conditions for urban infrastructural change, focusing on their simultaneity has highlighted how they emerge by working together in terms of logics, time, and discourses. Secondly, the different speeds (fast and slow) that govern infrastructural change has demonstrated the multiple capital accumulation logics and strategies in low-income areas where there can be uncertainty, and potentially resistance, over the legitimacy of these measures and their stabilization. Finally, the experience of waiting to claim rights has demonstrated the limitations of the previous temporal processes in reframing citizenship through market-logics and reordering processes, continuing what Brodwyn called a “poverty of rights” (Brodwyn, 2008) that has historical roots in favelas. These three temporalities have together helped clarify the connection between logics of capital accumulation, urban (security) planning and the reframing of citizenship rights.

As suggested by Raco & al. “future research on the politics and governance of the built environment needs to be more engaged with the relationships between power, resources and temporality.” (Raco et al., 2018, p. 1190). This is a valuable point because, without stronger engagement with the use and experiences of time, they risk not being recognized as political. Focusing on how planning and infrastructural actors define and use temporality enables us to look beyond the linearity of projects and see crucial political questions in terms of legitimacy, exception, and regulation. Moreover, the length of time that citizens have to wait within infrastructural projects can determine how they decide to claim their rights, their relation to the law, and how they are treated within a public service. Thus, beyond the political materiality and spatiality of urban infrastructures highlighted by previous research, an engagement with the “political value of time” (Cohen, 2018) can open up new perspectives on how to explore and understand the politics of urban infrastructural change, including the differentiated capacities that actors and residents have for using and experiencing time and temporalities.

Notes

1. Pseudonyms are used when referring to residents and favelas.
2. Projects to ban irregular connections through new technical and commercial arrangements.
3. This is now a well-known program that included the permanent occupation of a certain number of favelas.
4. This is also the wealthiest area of the city.
5. Favelas have historically experienced shifting security policies, implementation of which was in direct response to the favelas’ image as the locus of “urban violence” (Machado da Silva, 2008). The expansion of drug trafficking since the 1980s, combined with increased confrontations between criminal factions and the police, has meant that the “problem of favelas” has been identified as a “problem of security” (Machado da Silva & Menezes, 2019).
6. Interview with the Communities Relationship Manager, Light, 1/09/2011.
7. Law no. 42.787/2011
8. In 2003, Light developed the “Comunidade Eficiente” (Efficient Community) project through which energy efficiency measures were developed in favelas, e.g. replacing some high energy-consuming appliances, such as fridges, light bulbs, and electric showers.

9. It is difficult to assess the extent to which lawyers are being used in favelas to handle electricity service-related disputes. Light is one of the companies involved in the most disputes, but there is no locally disaggregated data available. A lawyer who works in different favelas, and whom I interviewed in 2016 when they were working in the favela of Babilonia-Chapeu Mangueira (around 4,000 residents), stated that around 40 residents had consulted them for electricity service-related legal advice.
10. I interviewed Luciana in 2011 and 2020.
11. Her husband died a couple of years ago and since then she has been managing the shop by herself.
12. The Bolsa Familia is a social welfare and conditional income-transfer program run by the national government for families below the poverty line. Beneficiaries of the Bolsa Familia are also eligible for the “social tariff”, a reduced electricity tariff that applies to the first 220kWh consumed. However, access to the social tariff is not automatic and a request needs to be submitted to the electricity provider.
13. Bianca, resident, February 1, 2020.
14. Bianca, resident, February 1, 2020.
15. It was unclear why there was a malfunction. The technician did not explain this to her, and he sent his expert assessment directly to her lawyer.
16. This is a common Brazilian expression to refer to the city beyond the favelas, generally upper-middle class neighborhoods.
17. Maria, resident, January 31, 2020.
18. January 31, 2020.

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