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## THE CO-CITY DESIGN PRINCIPLES

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The book to this point has provided the conceptual and experiential foundation for a new urban governance model that we call the *co-city approach*. This framework imagines the city as an infrastructure in which a variety of urban actors cooperate and collaborate to govern and steward built, environmental, cultural, and digital goods through contractual or institutionalized a particular public-community partnerships (PCPs) and public-community-private partnerships (PCPPs): the *public-private-science-social-community partnerships* or simply 5P. These partnerships involve cooperation and collaboration between civic, social, knowledge, public, and private actors that support the creation and governance of shared and common resources by an identified group of people, a community, vested with the responsibility of maintaining and keeping accessible (or affordable) the resource for future users and generations. These common resources occupy a middle ground between public and private goods and between the state and the market. They represent new and innovative forms of urban goods and services geared toward supporting the most disadvantaged, marginal populations and communities. A co-city is based also on the idea of polycentric governance, which allows for the co-production and co-governance of a variety of shared resources in multiple but mutually supportive institutional arrangements throughout a city.

In this final chapter before the conclusion, we offer a set of design principles extracted from the concepts described in the previous chapters, as well as our empirically driven co-cities research project. The co-cities project canvassed over two hundred cities and over five hundred projects and policies within these cities and more closely analyzed case studies of community or city-level initiatives that represent new frontiers of cooperative or collaborative urban governance, inclusive and sustainable local economies, and social innovation in the provision of local goods and services. The data set includes examples of projects and public policies from different types of cities, including some of the groundbreaking policy experiments that we describe in this book. Both the community-led examples and those institutionalized in the local government are important data points and empirical inputs into the larger effort to explicate the dynamic process (or transition) toward a city in which urban commons are present, to one in which urban commons emerge and are supported and enabled by the state.

All the case studies are published on the web platform [Commoning.city](http://Commoning.city). For the purpose of this book, we extracted cases that were more robust (at least three variables out of five were assessed moderate to strong) or that were outliers (presented extraordinary features compared to all cases in one of the variables), and we analyzed, through qualitative interviews in addition to desk research, 140 cities with 283 cases within them. The appendix contains a summary of the data we collected and analyzed.

Our co-cities framework is defined by five principles: (1) co-governance; (2) enabling state; (3) pooling economies; (4) urban experimentalism; and (5) tech justice. Our research has shown that these recurring characteristics, methodologies, and techniques best define the ways in which the city can operate as a cooperative space in which various forms of urban commons can emerge and can be economically, socially, and ecologically sustainable. Some of the design principles described in this chapter will resonate with some of Elinor Ostrom's design principles, as we indicated in chapter 2, and others reflect the reality of constructing common resources in the context of contemporary urban environments. In the concluding chapter, we reflect briefly on the challenges we continue to face in the application of the co-city design principles and pathways for future study and research.

## PRINCIPAL 1: CO-GOVERNANCE

The co-city approach rests in part on the body of theory developed by Elinor Ostrom and others, encompassing a range of approaches to shared, collaborative, and polycentric urban governance mechanisms that structure cooperative action between and among different types of urban actors. Scholars have referenced this type of multi-actor governance by different names and definitions: these include collective governance (Ostrom 1990), self-governance (Ostrom 1990; Harvey 2012; Nielsen 2015), shared governance (Laerhoven and Barnes 2019), collaborative governance (Freeman 1997; Ansell and Gash 2008; Bingham 2009 and 2010), cooperative governance (Wilson et al. 2003), co-governance (Kooiman 2003), and polycentrism (Ostrom et al. 1961; Ostrom 2010b). We have drawn from this research over the years in reflecting on the kind of co-governance that we have observed and applied in our own work within cities, as well as the cases and examples that we surveyed as part of our co-cities project. We also recognize and build upon the evolution of urban governance approaches, such as participatory budgeting, in which decisions are made cooperatively between local officials, residents, and community-based or civic organizations. These approaches represent an important move beyond resident participation and consultation in local decision-making processes.

Our approach to co-governance also builds on the extensive literature defining various combinations of open, productive, knowledge, constructed, and infrastructure commons and the peer-to-peer production mechanisms associated with them. These definitions have been developed by Carol Rose (1986); Yochai Benkler (2016); Elinor Ostrom and Charlotte Hess (2007); Michael Madison, Katherine Strandburg, and Brett Frishmann (2010, 2014, 2016). Finally, Tine De Moor (2012) helpfully suggests that we think about the commons as consisting of three dimensions: a resource system, a collective property regime, and interactions between the resource and its users. All three come together to create a common pool or commons institution. Each of these articulations and iterations of cooperative governance have the potential to foster democratic legitimacy, transparency, and social inclusion (Bang 2010).

In our view, co-governance embraces and entails the collective management and ownership of urban assets that provide resources and critical

services for the well-being of the most vulnerable urban residents. Some of the most forward-thinking examples of city policies and practices, analyzed in chapters 3 and 4, adopt a concept of co-governance that entails not only a relationship between the public authority and the social or civic sector but also various combinations of relationships between those actors and private actors in the pursuit of the common good and general interest (Kooiman 1993). As such, we recognize that co-governance practices can evolve, as reflected in the evolution of public policies described in chapter 3, to enable and recognize the development of urban commons throughout a city. The earliest policies, represented by cities like Bologna, Naples, Barcelona, and Madrid, enabled shared governance between urban actors and local officials instituted through contractual collaboration agreements. As these approaches to enabling and facilitating urban commons evolved, we began to see the emergence of more complex multistakeholder partnerships, and then more independent but networked co-governance structures that were forged by place-specific actors and established in new neighborhood institutions.

Much like Arnstein's ladder of citizen participation (Arnstein 1969), we conceive of urban co-governance as a ladder involving the evolution of steps of co-governance: shared, collaborative, and polycentric governance. This co-governance ladder can be used to construct urban commons public policies and projects in a specific local context by nudging those involved toward a higher gradient in a cooperative institutional ecosystem. As co-governance proceeds along this ladder, the multistakeholder governance arrangement adopted by the actors involved moves from shared governance to collaborative and potentially polycentric governance. We thus define co-governance as a multistakeholder governance scheme whereby the community emerges as a key actor and partners with at least one of the other four actors or sectors in our *quintuple helix* governance scheme—the public sector, the civic sector, the private sector, and the knowledge sector. In addition to collaborating with other actors, co-governance entails the interactions between actors that constitute a specific governance arrangement operating within a polycentric network of agreements, institutions, or informal arrangements throughout a city.

In sum, there are different levels or steps of co-governance: *shared*, *collaborative*, and *polycentric* governance. This urban co-governance ladder, so

to speak, is a typology of increasingly robust levels of co-governance corresponding to the extent of diversity among the actors, distribution of power between them, and responsibilities and benefits within the partnership.

### SHARED GOVERNANCE

Shared governance encompasses bilateral interactions or partnerships between, for instance, public authorities and urban residents or communities. Shared governance exists, we observe, in the management or stewardship of small-scale resources such as community gardens or a neighborhood park or square. These bilateral partnerships or agreements are typically between local government authorities and residents who volunteer to take care of, regenerate, or manage a single urban resource in order to improve the quality of urban spaces for users. Improving the quality of the resource could also involve producing essential goods and services, much in the way that urban green spaces provide food and recreational amenities in neighborhoods lacking sufficient levels of them.

Shared governance is akin to Elinor Ostrom's notion of self-governance, a crucial feature of collective action to manage common pool resources (Ostrom 1990). Self-governance more broadly refers to the "situation in which actors take care of themselves, outside the purview of government" (Kooiman and Bavink 2005, 21). It is a prerequisite for more complex and dynamic forms of co-governance. Self-governance might seem to some to be just another form of privatization or even deregulation of public goods and services; however, we view it more as a form of *re-regulation*, meaning that control and management remains in the realm of the *public*—not the central government but rather the community of residents that use and depend on the resource (Kooiman and van Vliet 2000, 360).

### COLLABORATIVE GOVERNANCE

Beyond bilateral public-community partnerships, there are more expansive relationships and interdependence among many different types of stakeholders, including public, community, private, civic, and others, which come together to construct, manage, and govern common-pooled resources. Typically, these partnerships consist of a minimum of three of the actors of the quintuple helix that become deeply engaged over time

in constructing and supporting institutional arrangements to support resource stewardship. These multistakeholder arrangements can be informal in nature or more formal and institutionalized but are the product of a process of deep multistakeholder engagements and interactions (Kooiman 2003, 97).

Collaborative governance represents the evolution from agreements or pacts that foster collaboration among stakeholders to governance structures or legal entities that are cooperatively owned by or linked to the actors of the quintuple helix. Collaborative governance arrangements are often realized, as we explored in chapter 3, through the implementation of public policies that enable nongovernmental stakeholders to manage public resources collaboratively (Ansell and Gash 2008). These policies often promote multisector cooperation and partnerships between profit and not-for-profit actors, relying either upon existing or new relationships and social networks (Cepiku, Ferrari, and Greco 2006).

The shift from shared governance to collaborative governance also tracks the move from the management of a single small-scale urban resource to the management of larger-scale resources at the neighborhood or the city level. One main manifestation of this collaborative governance is the embrace of public utilities that produce local public services (Non-Profit Utilities [NPU]) and involve many stakeholders in collective property ownership or management of the public service management, forbidding the distribution of dividends to its members. Public utilities such as the water distribution company in Wales, Glas Cymru, can be institutionally engineered or redesigned as user/community/worker-owned and -led cooperatives in which networks or infrastructure are run cooperatively. Community co-ops, community land trusts, urban civic uses, and other cooperative legal tools mentioned in chapters 2 and 3 are also examples of this type of collaborative governance of large-scale resources and are excellent examples of what Ackerman (2004) refers to as co-governance cases.

## POLYCENTRIC GOVERNANCE

Cooperative governance arrangements, whether driven by informal social norms or formal institutions, eventually can evolve into a polycentric system on the city level. The polycentric approach to governance was first

proposed by Vincent Ostrom, Charles Tiebout, and Robert Warren to connote “many centers of decision-making which are formally independent of each other” but which “may function in a coherent manner with consistent and predictable patterns of interacting behavior” (Ostrom et al. 1961, 831). In polycentric governance, actors and cooperative institutions are autonomous centers of decision making as they interact and learn from each other while maintaining their respective responsibilities.

The policies analyzed in this book, especially in advanced cases such as Turin, Reggio Emilia, and Barcelona in Europe or the cases of networks of community land trusts within US cities, represent the forms of shared governance and the forms of self-governance that can generate polycentrism. In other words, these examples reflect the creation of a multiplicity of independent decision-making arrangements or institutions (Fung 2001, 87) consisting of a plurality of urban actors (the community, local businesses, knowledge institutions, and civil society organizations) that are managing, together with public institutions, shared urban resources. This is the highest, most advanced form of co-governance in our co-city approach (Iaione and Cannavò 2015).

As we briefly explained in chapter 1, Elinor Ostrom explored a polycentric approach to governance in the context of determining the efficiency of an array of public and private agencies or actors engaged in providing and producing public services in metropolitan areas. Her study, which focused on the provision of law enforcement services, found that residents of small communities were more satisfied with their locally organized police forces than demographically similar communities who were served by a centralized police force (Ostrom et al. 1973). Metropolitan areas served by multiple jurisdictions and producers of public goods, she found, benefit by having more choice in the provision of public goods, are more likely to utilize innovative approaches to public goods provisions (including citizen co-production), and can learn from each other’s performance in providing those goods (Ostrom 1990).

Polycentric governance systems can, and do, apply to the provision of local goods as well as to global challenges such as climate change. Instead of a global, top-down regime in which lower levels of actors carry out the mandates from above, a polycentric approach “provides for greater experimentation, learning, and cross-influence among different levels and units”

of decision making (Cole 2011, 395). These governing units can include a myriad of nongovernmental organizations, local neighborhood associations, and individual property owners who can play an important role in governing resources (Cole 2011, 397).

A polycentric approach to local governance can be a metadesign principle for recognizing the city as a commons. Collective governance of shared urban resources constitutes autonomous centers of decision making, whether they are community gardens, neighborhood parks, or community land trusts. When facilitated and supported by state actors, recognition of these collective efforts can be configured as a system, supported by local law and allowing for the coexistence of multiple centers of governance with different rules, values, perspectives, and interests (Aligica and Tarko 2012, 245–260). Another crucial feature of polycentrism is its capacity to enhance learning through experimentation, or the trial-and-error approach, allowing the system to change, adapt, and self-correct (E. Ostrom 1998; Carlisle and Gruby 2017, 7). Polycentric systems are therefore dynamic governance arrangements and not static, even when institutionalized.

## **PRINCIPLE 2: ENABLING STATE**

Our next principle, enabling state, focuses on the role of local public authorities. We have explained much of the conceptual and theoretical underpinnings of this principle in chapters 2 and 4. As we have indicated, the presence of a governmental unit or a policy that facilitates and enables co-governance of urban infrastructure and resources is a key factor for the success of urban commons, as scholars have previously noted (Foster 2011; Nagendra and Ostrom 2014). As we explained in chapter 2, one of Elinor Ostrom’s design principles for the long-term sustainability of the commons was that a community’s right to collectively govern a common pool resource and to devise its own rules is recognized and respected by outside central authorities. Such recognition renders the rules easier to monitor and enforce, according to Ostrom. The role of central authorities or the state is even more present in the creation and sustainability of the urban commons, given that the local government typically retains regulatory control and, in some cases, proprietary ownership of these resources. The policies discussed in chapter 3 illustrate the many ways that municipal



authorities have been instrumental in the recognition and constitutive creation of urban commons.

There are other, more normative reasons for the importance of an enabling state. The core one, for us, is that the enabling state principle embraces a *resurgence* of the state after a decline, beginning from the late 1970s (Cassese 2017). The rise of neoliberalism, marked by the retreat of the state and the prevalence of the private sector in providing for basic goods and services, has been accompanied by a rise in stark economic inequality. The enabling-state principle reflects the view that the state can and should play a catalytic role in directing change by helping to form new institutional structures, transform landscapes, and create or shape new economies (Mazzucato 2015, 3). As cities have become increasingly more complex to govern, we have seen the rise of more networked forms of urban governance through the expansion and diversity of actors involved in official decision making and policy making processes, as well as more varied institutional arrangements (da Cruz et al. 2018). The state's role in this time of transition often becomes that of a manager of different centers of power and subsystems, helping to network and create their interdependence (Jessop 2016, 248). This dynamic is particularly obvious in the cities that we highlighted in chapters 3 and 4, in which local officials are facilitating robust neighborhood-level institutional arrangements and connecting them through a supported polycentric system of urban commons.

The conceptualization of the enabling state that we are offering here and that emerges from the previous chapter revolves around an open and collaborative governance methodology. It embraces public-community and multistakeholder partnerships without giving up the state's regulatory power over shared resources. This principle supports the urban commons by investing in collective community efforts, transferring resources to support those efforts (such as available land and funding), and providing technical support to increase the capacity of the actors involved. The enabling state adopts an experimental approach to policy making that bring together residents, NGOs, civic organizations, knowledge institutions, social innovators, and businesses to co-design and co-create local public policies for environmental, economic, social, and cultural progress. When the governmental unit has permanent or long-term staff members acting as the service designers of co-design processes, these designers host

urban experiments in urban living labs where co-design and co-working sessions can take place (Franz 2015; Steen and van Bueren 2017). An enabling government is in fact a government that uses services or policy co-design as a tool for decision making and planning, as well as a tool for the management of essential services and infrastructure or assets.

Another way to think about the principle of the enabling state is to think of the state as a platform, in which the state entity does not seek to guide the co-creation process itself but rather to play its role from a distance, taking a bottom-up approach and a supporting role in a network of relationships (Iaione 2018). The platform state disrupts the monopoly that the central government has over deciding what is in the public or general interest and instead becomes comfortable with a network of actors making these decisions for their communities and the resources within them. As such, whereas the state can be an indispensable actor in facilitating and sustaining new collective action in communities throughout a city, our research has demonstrated the need for active participation of other actors to support these efforts. Academic institutions and social investors are critical players in scaling and networking community-based efforts that are key to creating local, adaptive forms of co-governance throughout a city.

A local administration willing to become an enabling platform will fund and invest in urban co-governance and multistakeholder partnerships with knowledge and investment partners that can be the trigger for new circular, tech-based, and community-owned economies. Strategic use of public procurement, aimed at creating jobs to confront digital transformation and ecological transition processes, new community enterprises, and social businesses in deprived neighborhoods are another new and innovative way to fund collective institutions (Iaione 2018). The research hypothesis embedded in this principle—the enabling state—is rooted in the relationship between urban co-governance and economic democracy. It understands the city as a facilitator of significant investment in communities not only as spaces for civic engagement but as productive units of inclusive and sustainable economic development.

We must account for something that Robert Dahl (1967) suggested, namely, that the city is the best unit of measure for democracy: small enough for participation and big enough for the contribution and influence of individuals to be significant. The sublocal level appears to be even

more important, if we consider that in most of the cases that we analyzed in chapters 3 and 4, the pilot projects occur at the neighborhood level. We argue that cities cannot create urban commons without significant action and collective efforts occurring at the neighborhood level. Our analysis of cases and our own experience working in cities on experimental approaches to the urban commons indicate the need to build a strong connection between urban co-governance and economic democracy at the neighborhood level.

Our evaluation of the Bologna regulation's initial implementation, for instance, suggests that Bologna may have initially underestimated the need to create multistakeholder partnerships promoting the systematic establishment throughout the city of neighborhood-level collective economic institutions aimed at jump-starting sustainable and inclusive economic development in distressed areas of the city (Iaione and De Nictolis 2021). These areas suffer from chronic underinvestment and access to basic services and infrastructure and would greatly benefit from self-sustaining urban commons institutions. One of the lessons learned from the Bologna case is the importance of channeling public and private support toward neighborhood-level collective economic units and granting collective rights of access, use, management, and ownership to *social purpose vehicles* collectively incorporated, controlled, managed, and owned also by city inhabitants, as in the Pilastro neighborhood project. This entails the need for a city government to invest in a policy strategy that targets neighborhoods, not only as spaces for civic engagement but as productive units of inclusive collective economic development. This also involves conceiving of and treating the city as a polycentric entity in which neighborhoods act as decentralized engines of inclusive collective economic development through which communities can identify common interests and begin to co-produce or co-manage services with centralized coordination by the city government. This is where the concept of pooling economies becomes very relevant.

### PRINCIPLE 3: POOLING ECONOMIES

As referenced in chapter 2, we have observed that many kinds of urban commons exist as a product of what we call *social and economic pooling*.

It is important to note that our use of the term *pooling* is not a reference to the features of a common pool resource as Ostrom and others use that term (Ostrom 1990). Our use of the term pooling instead describes the process of different sectors or actors combining their efforts to share resources, collaborate, and cooperate to create and steward urban goods, services, and infrastructure. The pooling of capacities and resources thus makes possible the co-production and co-creation of collectively owned or collectively managed economic ventures, creating equal opportunities for the community as a whole and not solely for the individual (Rawls 1971; Sen 1992). These *urban pools* can generate new collaborative, circular, and solidarity economies at the neighborhood, district, and city level. Resources become an urban *commons* or part of a common *pool* through these collaborative practices and ventures aimed at sharing existing urban resources, generating new resources, producing new public services, and coordinating urban networks across the city.

Social and economic pooling is, in other words, the signal of a transition from an urban co-governance scheme in which different neighborhood actors share, co-manage, and regenerate the urban commons toward an urban co-governance scheme based on urban pools in which the same actors coalesce to transform neighborhoods into social and economic enabling platforms. Anna di Robilant has noted that common-ownership regimes (e.g., land trusts, limited equity housing cooperatives, neighborhood-managed parks, and community gardens) are those able to “make resources that are crucial to individuals’ autonomy available on a more equitable basis” and foster new forms of autonomy (di Robilant 2012, 268–269). Pooling economies are connected to this “equitable autonomy” in that they enable those involved to enhance their capacity to debate ideas with others, collectively make decisions, and provide access to critical goods and services. Pooling economies, however, are not meant to substitute for the state nor for private economic actors in the production of goods and services. Rather, pooling economies utilize state resources and private economic actors to expand the capacity of neighborhood and community actors into collaborative and cooperative enterprises.

Pooling economics is rooted in a Polanyian understanding of the economy that facilitates a shift from productivity and competition as the basis for economic exchange to an economy based on social relations

and reciprocity (Polanyi, 1944). This approach foresees a more interventionist role for the local authority, with increasingly risk-taking and proactive actions that support new local economies (Schragger 2016; Thompson 2015; Thompson 2019). In other words, pooling requires embracing a model of economic growth that has collaboration and reciprocity at its core (Mendell et al 2010; Mendell and Alain 2015). These forms of pooling economies are based on different degrees of sharing, collaboration, and cooperation between users.

The first and most well-known types of pooling economies have been digital. Yochai Benkler, as an example, has described commons-based peer production (CBPP) as a new system of production that emerges in the digitized economy, based on collaboration between peers and large groups of individuals, wherein the ownership is itself distributed (Benkler 2004). An example of a commons-based peer-produced resource is the online encyclopedia, Wikipedia. Another example, which we have referenced in this book, is the rise of community-based wireless networks (Tréguer and De Filippi 2015). The rise of *platform cooperativism* (Scholtz 2014), in which users/workers manage and own—with an organization that is inspired by the cooperative movement—their platforms to offer professional services and labor force, is an emerging example of CBPP. Platform cooperativism would allow workers to escape the often-unfair working conditions and economic treatment that sharing economy platforms offer and to keep revenues inside the group of users/workers or in the territory that the platform targets rather than distributing it to shareholders. Examples of this kind of platform include Coopify and Member's Media, Ltd. Cooperative. Coopify connects low-income workers in the sharing economy, such as movers or home care workers, who form worker cooperatives to engage a broader base of consumers and to scale beyond their current capacity. Member's Media, Ltd. Cooperative is an online platform, majority-owned by its users, which offers development and production support to aspiring microbudget filmmakers from diverse communities (Scholtz and Schneider 2016).

Similar to these *common-based peer production* models, our empirical results reveal many examples of the ways that urban pooling creates new kinds of shared, common goods in the housing, food, digital, energy, and cultural arenas in cities all over the world. Community gardens, wireless

networks, co-housing, and land trust arrangements are most often the result of pooling together human capital, social networks, and existing urban infrastructure or public resources in efforts to create a structure of shared urban resources. Pooling also involves new fundraising and project finance tools that support collective efforts and ensure medium- or long-term sustainability of urban commons. Many of the examples that we have discussed previously illustrate the use of pooling economies to support the creation and sustenance of community land trusts in Boston or San Juan, the possibility to carry out for-profit activities inside renovated buildings through a pact of collaboration or a Commons Foundation in Turin, Italy, or a collectively owned and operated wireless community network in Reggio Emilia, Italy, as well as the impact evaluation of community co-management of city-owned buildings in Barcelona.

Our hypothesis is that urban commons are generating practices of social and economic pooling that can eventually be scaled up. Once the different actors involved in the co-governance of these resources understand the economic value and potential of joint action, these initially local innovations can be applied at a larger scale. Urban social and economic pooling is the bedrock on which co-governance partnerships should be designed and fostered to agglomerate social, economic, and institutional forces at the neighborhood level. Such alliances give birth to collective economic ventures that can produce job opportunities and that provide goods and services that benefit the communities where they are created. Social and economic pooling therefore is deeply connected to the distributive and social justice concerns that permeate the co-city approach.

The idea of an economy that is based on pooling and collaboration is very different from the *sharing economy* that involves a profit motive and is represented by gig economy platforms. This *crowd-based capitalism* is arguably replacing centralized institutions with peer-to-peer exchanges and mediated decentralized networks in ways that are disruptive to traditional market actors but not necessarily to property relations (Sundararajan 2016). It also generates externalities at the local level, prompting calls for centralized authorities to discipline the market through local regulation (Davidson and Infranca 2016).

In contrast, pooling economies foster a peer-to-peer approach that involves users in co-design and co-production and transform users into

producers or owners of the delivery of goods and services. Pooling economies are capable of creating initiatives and platforms that are (1) collectively owned or managed; (2) multi-actor and cross-sectorial; (3) autonomous from but interdependent with other urban stakeholders; (4) aimed at generating a transfer of resources from the private sector or public sector to communities; (5) aimed at realizing the goals of the right to the city (e.g., right to housing and to universal access to public services and infrastructure such as broadband, energy, mobility, water, etc.); (6) sustainable, circular, climate-neutral and environmentally friendly; and (7) based on collective action at the neighborhood level (Committee of the Regions 2015).

#### **PRINCIPLE 4: URBAN EXPERIMENTALISM**

Our next design principle, urban experimentalism, represents an adaptive, place-based, and interactive approach to the design of legal and policy innovations that enable the urban commons. As commons public intellectuals and activists Silke Helfrich and David Bollier have noted, it is a mistake to equate commons with jointly “managed” resources only. This focus on the institutional characteristic of commons misses an essential part of the formula. Instead, commons are to be understood as “an organic fabric of social structures and processes” which involve the idea of “commoning” (Bollier and Helfrich 2015). Other scholars of the commons similarly underscore that the study and understanding of commons-based institutional arrangements are a product of applied, experimental, and local efforts by those involved (Poteete et al. 2010).

Urban experimentalism is an essential part of the process of constructing commons, including the institutional design of urban co-governance prototypes. We embrace the idea of experimentalism that represents a pluralistic, evidence-based approach to norm creation and policy making (Ouellette 2015). Experimentalism allows localized knowledge and diverse observation data to enrich the process for developing local policies and practices that support the urban commons. A key lesson from policy experimentation in general is the relevance of constant monitoring, learning, and adjustment as well as the capacity of policy makers to learn from failure (Dutz et al. 2014). The urban experimentalism that we advocate for, on the basis of our own experience working in cities on various

policies and practices, contains three distinctive features: (1) an evaluative methodology that is data driven; (2) an experimental process that is adaptable; and (3) a process that is interactive.

As to the first feature, it is important to be able to evaluate the kinds of programs and policies described throughout this book using qualitative measures undertaken through surveys of participants, and quantitative measures where possible. Academic literature on the urban commons tends indeed to be normative, either heavily theoretical or explicitly ideological, and lacking an empirical focus. There are exceptions to this rule, as we discuss in chapter 2, but in the main, scholars writing about the urban commons are devoted to understanding the processes that result in collective action or cooperation in the governance of shared urban resources. There is much less focus on placing under empirical investigation, using established empirical methodologies, the many applied projects, and the policies that we have identified and mapped. For this reason, our LabGov team undertook an empirical evaluation of the most widely celebrated urban commons regulatory policy, the Bologna Regulation discussed in chapter 3. The legislation was the first of its kind to mention the urban commons as a subject of legislation and has since been copied or mirrored by many other cities in their policies, resulting to date in more than two hundred Italian cities that have adopted the Bologna Regulation in one form or another.

As we reported in chapter 3, the outcome of our analysis on the Bologna Regulation was to document the constellation and diversity of pact signatories, the kind of resources toward which they dedicated their efforts, whether pact signatories had a history of working together, whether the pacts increased social capital among participants, whether pacts were explicitly aimed at reducing social and economic inequalities in underserved areas of the city, and whether pacts were aimed at promoting local collaborative economies.

We gathered insights on the ability of a legal regulation to accomplish the broad goals that it embraced to institutionalize collaboration between government and city residents and to promote new forms of use, management, and ownership of urban critical resources to chart a new path toward social inclusion and justice. The results of the analysis also hold lessons for other local governments interested in adopting similar regulations and



should serve as a cautionary tale in doing so without significant reforms. In fact, we further underscored the importance of putting in place a process for arriving at the right legal tools and policies as well as implementation that is adaptable to local conditions.

The second feature of our urban experimentalism principle is *adaptability*, which means putting in place structures and processes able to explore the right policies and mechanisms with communities and other local partners. Urban experiments are place based or place specific and are put in place taking into consideration the stakeholder network and the historical and cultural variables of the context, akin to experimental scientific research labs (Karvonen and van Heur 2014). Experiments organized within such cities as laboratories are, of course, different from artificial laboratories because they are influenced by a variety of uncontrollable variables and must face the challenges of adapting concrete implementation of policies to complex socioeconomic environments.

In chapters 1, 3, and 4 we highlighted the ways that municipal governments have, through policy and the dedication of resources, created institutional spaces to encourage diverse urban actors, such as residents, entrepreneurs, researchers, and civic organizations, to seed social innovations and local governance solutions to the delivery of housing, food, mobility, and other goods and services. These spaces for experimentation are place based and can seed social entrepreneurship and governance innovations. They can range from neighborhood laboratories and urban innovation hubs to new city agencies and public policy collaboratories. The challenge is often to scale these examples across a city.

The Amsterdam Smart City platform project is an example of how this experimentalism can scale. The project encompasses about 150 pilots across the city, supported by a few urban living labs spread across different neighborhoods (Neieu-West, IJburg, Marineterrein, Buiksloterham, and Arena Stadium). These labs are designed to stimulate, coordinate, and support the pilots as they are developed and applied. A key factor for the project's success in piloting different applications of Amsterdam's approach to a smart city is the presence of an administrative organ and official position within the city administration, the Chief Technology Office/Officer (CTO), whose role is to merge scientific rigor with policy design. That office is also charged with ensuring that the pilots are conducted through

inclusive, collaborative, and place-based processes, even if they slow down the implementation of some pilots that might otherwise have gotten off the ground more efficiently in a more centralized process (Karvonen and van Heur 2014, 10).

A similar organizational innovation that supports urban experimentalism is the Chief Science Offices, which many cities such as Amsterdam and Reggio Emilia have created and that employ PhD students, researchers, and other professionals to help craft evidence-based policies and adopt robust empirical and applied research techniques to organize pilot projects. These offices could interact and cooperate to develop an interoperable methodological language to address the lack of a standardized body of methods and techniques on urban experimentations. The role of this kind of Chief Urban Science Officer might be seen as the point of connection between the two design principles that depend on the local government—*urban experimentalism* and *enabling state*.

The use of different types of spaces for urban experimentation is a positive development, as others have noted, signaling a new era of urban innovation (Karvonen and van Heur 2014). These spaces help local governments overcome significant barriers to innovation, such as the trap of excessive bureaucracy (da Cruz et al. 2018, 4) and risk aversion (Sørensen and Torfing 2011). When the focus is on co-governance, adaptiveness becomes a feature of the system in that the participation of various actors is most often provided on a voluntary basis, compared with more hierarchical and vertical arrangements typical of structured and unitary organizations in which actors have stronger incentives to maintain the established governance system and resources' investment (Emerson et al. 2012, 19). Of course these spaces of innovation carry their own sustainability challenges, given that they are dependent on the political will of the current administration and face capacity limitations if they are structured to on a coordinative role by civil servants that might lack the necessary skills to manage a complex process involving multiple actors that have no history of interacting (Nesti 2018). However, increasingly local governments are experimenting with these spaces of innovation and consulting with academic and other partners to increase their capacity to lead co-design processes that result in policy and project prototypes that can be tried and tested in different neighborhoods.

One of the results from the Bologna experiment to become a *collaborative city* was the city administration's creation of the Office for Civic Imagination to help coordinate the neighborhood laboratories operating throughout the city. This move by the city was the result of an administrative decentralization reform approved by the city that changed the function of the city's neighborhood councils by putting them in charge of stimulating cooperation between residents through the development of different projects in their communities. This new function of the councils explicitly included the mandate to "work to promote the sense of territorial community, the culture of proximity, solidarity and collaboration between individuals and between city organizations, also according to the setting of community network and of shared administration that is based on the principle of horizontal subsidiarity as per article 118, last paragraph, of the Constitution" (Article 5, Reform of Neighborhoods, Annex A to P.G. No. 142306/2015).

In the Pilastro neighborhood project, the city was able to implement complex policy experimentations interconnecting the three possible dimensions of the neighborhood as a space of civic engagement, sustainable economic development, and regeneration of urban commons. As explained in chapter 3, this led to the creation of the Pilastro Northeast Development Agency centered on the role of neighborhood institutions and cultural and social values of the district identity. In other neighborhoods, Bologna adopted a different approach, more adapted to the specific circumstances and needs of the context. In the Bolognina neighborhood, for instance, the city initiated in 2014 a process of participatory urban planning codified into a *pact of co-living*—Convivere Bolognina (Comune di Bologna n.d.). The pact identified neighborhood priorities: efficient waste collection and reuse for local commercial activities through recycling and circular economy; increased revenues for local commercial activities through renovation of the urban public space, such as sidewalks regeneration; improvement of the broadband access; valorization of cultural diversity (the Bolognina neighborhood is the neighborhood in Bologna with the highest number of foreign residents, 24.5 percent compared to the city average of 14.5 percent) (Comune di Bologna n.d.). The overall goal of the pact is to coordinate the actions of existing projects that NGOs, local shops and craftworkers, and groups of city residents are carrying out

to address these priorities as well as to stimulate new projects that these actors can implement in collaboration.

Within these broad programs, a co-design urban laboratory was carried out as one of the fieldworks of the Co-Bologna project. The lab involved public actors (i.e., public real estate managers at the national and city level [Federcasa and ASPII Bologna]); NGOs and representatives of local commercial activities and businesses (Kilowatt, Hotel/Restaurants, and Guercino, a civic association of local commercial shops in the Bolognina neighborhood); and informal groups of residents. The co-design lab's goal was to work on the specific co-creation project and the provision of collaborative services in private shared spaces within condominiums and public housing compounds, and then create synergies and collaborations with NGOs and local commercial spaces to extend those services to public spaces and generate new services that can serve the needs of other neighborhood actors. Examples of the kind of collaborative services they hoped to provide were shared maintenance of courtyards or shared entrances or the creation of community gardens. The lab led to the identification of priorities, synergies, and structured collaboration opportunities between the neighborhood actors involved as well as to the creation of a Community Association of Neighborhood shops of Bolognina (Co-Bologna n.d.).

Similarly, in Reggio Emilia the *neighborhood-as-a-commons* policy mentioned in chapter 3 made adaptability a working method to build different institutions from one neighborhood to the other. One of the most successful projects that evolved from this process was the Coviolo Wireless initiative which has successfully developed a broadband infrastructure in an underserved neighborhood, extending broadband access that enables social and economic development opportunities. The project turned neighborhood community centers into hotspots and managers of this digital infrastructure. The Coviolo initiative, first seeded in two neighborhoods (*Massenzatico* and *Fogliano*), is now being expanded to four other neighborhoods (*Cadè*, *Cella*, *Masone*, and *Marmirolò*) and will be implemented by the community that will manage the digital infrastructure (Comune di Reggio Emilia n.d.; JRC Science Hub Communities 2020a, 2020b).

The third feature of urban experimentalism is an *iterative process*, which entails creating and adopting a methodological approach to call forth

collaborators and partners in the co-design process to deliberate, practice, and arrive at adaptable practices and policies. In order to be sustainable, experimentalism in the city context must find ways to be transferable and scalable across and within local contexts. In our own work within cities, we have applied the *co-city protocol*—a process or cycle that has the capacity to adapt to different places and can be applied across contexts to establish best practices for collaboration and cooperation between many kinds of actors (Baccarne et al. 2014).

The co-city protocol includes six key phases: knowing, mapping, practicing, prototyping, testing, and modeling. The first phase of the protocol is the *cheap talking phase*, which first emerged in game theory (Farrell and Rabin 1996) and later was applied in research on common pool resources (Poteete et al. 2010). In this phase, participants identify informal settings that allow for face-to-face and pressure-free communication among key local actors to activate the community of stakeholders that will be involved in the collaborative project. These discussions or sessions are organized in a variety of settings with significant outreach done in the local community, often through anchor organizations.

The second is the *mapping phase* and involves understanding the characteristics of the urban or neighborhood context through surveys and exploratory interviews, fieldwork activities, and ethnographic work. In this phase it might be necessary to create a digital platform as a tool for disseminating information and engaging various communities and stakeholders by co-creating a visual representation of potential urban commons through the analysis of relevant civic initiatives and self-organization experiences. The aim is also to understand the characteristics of the specific urban context and being able to design and prototype the kinds of governance tools and processes to be used later in the cycle.

The third phase, the *practicing phase*, is designed to identify and create possible synergies and alignments between projects and relevant actors. At the heart of this phase are co-working sessions with identified actors who are willing to participate in putting ideas into practice. This phase might culminate in a collaboration day or collaboration camp that takes the form of place-making events—for example, organization of cultural events, temporary use of abandoned building or spaces, or micro-regeneration interventions using vacant or available land or structures such as the creation

of a neighborhood community garden—to prepare the actions for start of the co-design process.

The fourth phase, the *prototyping phase*, focuses on governance innovation. In this phase, participants and policymakers (local officials) reflect on the mapping and practicing phases and begin to extract the specific characteristics and needs of the community that will be served. One goal of this phase is to verify the conditions that promote the establishment of trust within the community and with the external actors. It is in this phase that the specific policy, legal, or institutional mechanism is co-designed to solve the issues and problems identified in the previous phases.

The penultimate phase is the *testing phase*. In this phase, project and policy prototypes are tested and evaluated through implementation, monitoring, and assessment. Both qualitative and quantitative metrics are employed to assess whether implementation is consistent with the design principles, objectives, and outcomes identified in earlier stages. This phase is often performed working with one or more knowledge/academic partners to design appropriate indicators and metrics to capture the desired outcomes and impacts from the project.

Finally, the *modeling phase* focuses on adapting and tailoring the prototype and nesting it within the legal and institutional framework of the city or local government. This phase is realized through the study of relevant legal laws, regulations, and administrative acts and through dialogue with civil servants and policy makers. This is an experimental phase involving perhaps the suspension of previous regulatory rules, the altering of bureaucratic processes, and the drafting of new policies that might also have a sunset clause and then a re-evaluation period. It can also involve the establishment of external or internal offices or support infrastructure in the city to support the new policies.

## PRINCIPLE 5: TECH JUSTICE

The final principle of tech justice highlights access, participation, co-management and/or co-ownership of technological and digital infrastructure and data as an enabling driver of cooperation, collaboration, and social cohesion (Iaione, De Nictolis, and Berti Suman 2019). Technology can provide crucial tools for communication, to connect actors, and to

facilitate the pooling of resources and actors. Access to digital devices and platforms, and to broadband, is also critical to addressing urban inequality as it can generate economic opportunity and facilitate access to essential goods and services, such as job opportunities and educational resources. Without connectivity and the ability to communicate, it is impossible to realize one's goals, to flourish, and to connect to others and build social capital across economic and cultural lines. As we have seen in some of the examples in chapter 3, open digital infrastructure can generate a virtuous cycle of openness, innovation, more investment in urban digital infrastructure that brings needed benefits to vulnerable groups (Sylvain 2016).

The lack of access to technology, particularly for underserved populations in many cities, is increasingly being addressed through innovative digital commons like mesh networks and community-based broadband networks. Mesh networks have been established in many European and US cities, including the famed community mesh network in Red Hook, Brooklyn, designed to overcome the digital divide, the Detroit, Michigan, network that provides connectivity to the 40 percent of its residents without internet access, and the mesh network in Berlin, Germany, designed to provide vital internet service to newly arrived migrants living in refugee shelters. Among the well-known and celebrated examples of wireless or metropolitan area wireless networks in the EU are the Spanish Guifi, the Greek AWMN, the Italian project Neco, and Ninux and Freifunk in Germany. Many of those are considered a democratic re-appropriation of technology (De Filippi and Tréguer 2016). Community mesh and broadband networks also promote what legal scholar Olivier Sylvain calls *broadband localism*, an approach that seeks to overcome broadband infrastructure and service disparities by race, ethnicity, and income (Sylvain 2012).

The next level of these constructed digital commons is illustrated by a community-based *edge-cloud* broadband network currently being designed and tested through participatory protocols in Harlem, New York City (Foley et al. 2022). The Harlem community, like many other ethnic minority urban communities, is facing obstacles that extend beyond broadband access and include the entire home, office, and IoT/smart city technology ecosystem. Although New York City is a *smart city*, it faces a stark *digital divide* that leaves one-third of households and families without access to broadband internet at home. Beyond the edge cloud, the project includes

development of low-cost keyboard, video, and mouse (KVM) devices that will be used by a diverse set of community members to establish performance metrics for the edge cloud and identify system usability by the community, especially as it relates to closing the digital divide. These disaggregated devices open the potential for low-cost, secure user devices that are governed by a shared, centralized IT management team that oversees a high-performance edge cloud accessible to everyone in the community. Projects like these, which affirmatively further distributional equality in internet access, are part of a movement to go beyond *network neutrality* to *network equality* (Sylvain 2016).

Many of the design principles applied by these community networks resonate with the tech justice design principle. As adopted in the Declaration of Community Connectivity, these include (1) collective ownership (the network infrastructure is owned by the community where it is deployed); (2) social management (the network infrastructure is governed and operated by the community); (3) open design (the network implementation details are public and accessible to everyone); (4) open participation (anyone is allowed to extend the network, as long as they abide by the network principles and design); (5) free peering and transit (community networks offer free-peering agreements to every network offering reciprocity and allow their free-peering partners free transit to destination networks with which they also have free-peering agreements); and (6) the consideration of security and privacy concerns while designing and operating the network. The Declaration was facilitated by the UN Internet Governance Forum (IGF) Dynamic Coalition on Community Connectivity (DC3) (Belli 2016; Weinberg et al. 2015).

Another important facet of tech justice is the creation of digital platforms that enable residents to play an active role in shaping public policies, sometimes by voting or otherwise registering their preferences. These platforms can empower early and meaningful participation in the co-creation process by allowing participants to propose ideas and begin working collaboratively on the development of solutions. They can also enable the introduction of learning pathways and capacity building for residents who may not have the means to undertake specialized education but are able increase their knowledge and skills through well-thought-out collaborative design processes.



For example, in Barcelona the administration of Mayor Ada Colau has created a powerful digital infrastructure, *Decidim Barcelona*, for public consultations, resulting in increased transparency and participation in creating the policies and taking part of the activities of the city. Another example is the city of Paris, which utilizes online deliberation and voting as part of its participatory budgeting process. The city of Athens has also developed a platform, *SynAthina*, to facilitate urban co-governance partnerships. The platform acts as a networker and coordinator: residents, NGOs, and civic groups can submit ideas for voluntary activities in public spaces or other ways to utilize urban assets in collaboration with relevant government representatives, NGOs, and private actors. Online applications and discussions continue with offline meetings organized in a physical space, the SynAthina Kiosk. The platform and the meetings currently host thousands of users organized by groups of urban residents in cooperation with various private or civic sponsors.

Increasing the digitization and accessibility of democratic, collaborative processes at the local (regional and municipal) level is also exemplified by the process in the city of Bologna and its efforts to become a collaborative city. The Bologna *Iperbole* digital platform has functioned as a dissemination platform, allowing its collaborative and participatory processes to be widely known. Through the Collaborare è Bologna storytelling campaign, the city shed light on the implementation of the Bologna Regulation. The digital platform allows users to observe and participate in various experimental processes developed in urban co-governance field labs in three neighborhoods. The platform's section on *experiment with us* enables interested parties to pursue new projects or experiments in the city and to share their experiences doing so. As described in chapter 4, the city of Turin is implementing a similar, even more innovative platform, applying block chain through the First Life platform as part of its co-city experiment.

The principle of tech justice, which is a feature of so many of the neighborhood-based projects and citywide policies that we surveyed as part of our research, in the end analysis has many dimensions that are capable of application in specific contexts. These dimensions are (1) access and distribution; (2) broad participation; (3) co-management or co-governance of the platform; and (4) co-ownership of digital resources or data. It is rare

that all these dimensions are present in a project or policy. Instead, we might view these dimensions as steppingstones toward the establishment of digital common resources consistent with the co-cities framework. These dimensions can also be used as metrics to steer the development of a smart city architecture towards a more just and democratic city. The Co-Roma.it is an attempt to embed these dimensions in the design, implementation, and management of a just and democratic smart city platform (Iaiene 2019b).

Scholars of the urban commons have devoted little to no attention to the disruptive impacts of technological development on urban governance and city inhabitants' right to participate in the development of the city, and how technology can enhance the protection of human rights in cities. The smart city model, adopted by cities all over the world, presents a unique opportunity to innovatively tackle significant urban problems while reinventing the city in a more open and innovative form through more distributed data and technological capacity. However, the idea of the smart city as strongly aligned with sophisticated smart technologies faces the risk of increasing inequalities by stressing the gap between *haves* and *haves not* and deepening social divisions. What the tech justice principle does is to recognize the technological innovation embedded in the smart city model but then to shift attention away from the needs of the market for those technologies and toward utilization of them to leverage human and social capital to *open up* the potential for the application of smart technologies to address a range of socioeconomic and ecological challenges in cities (Deakin 2014, 7). Each dimension of our tech justice principle can push smart city protocols toward a city that reflects the right to the city, recognized as the right of every human to be a part of the creation of the city and the stewardship of its shared resources.

The desire to leverage the assets of the smart city model to empower ordinary citizens, particularly those on the margins of our cities, is also why *co-management* and *co-ownership* are the highest dimensions that characterize the tech justice principle. These dimensions signify whether, as result of full access to technology and the overcoming of the urban digital divide, communities involved can collectively participate in and construct (or co-create) their own cooperative digital platforms and resources. This dimension is also concerned with the ability of residents

to utilize those digital platforms and resources to acquire and develop skills that enable microenterprises or civic digital enterprises that support local economies.

This is what New York City was up to when it launched NYCx Co-Labs, described in chapter 4, dedicated to improving service delivery, spurring economic growth through new *civic tech jobs*, and increasing digital inclusion for all New Yorkers. NYCx Co-Labs was designed to offer a unique opportunity for residents to develop civic technology skills, collaborate on the strategic identification of community needs, and apply their newfound tech knowledge to co-creating solutions to local problems. By co-developing impactful technologies alongside civic technologists, startups, tech industry leaders, and city agencies, residents can increase their knowledge of civic technology and capacity for leadership and entrepreneurship. The initiative, as initially conceived, was also committed to community co-ownership of the systems that they help to research and develop. Engaging in co-development partnerships with the technology industry and community stakeholders' surfaces questions about how to best manage the intellectual property and technology transfer implications in a multistakeholder enterprise. As the co-labs program progresses, the team anticipates exploring mechanisms to ensure fairness in calculating value that is created collaboratively and is shared equitably. They are studying mechanisms like joint-venture agreements, accelerator-inspired equity models, distributed ledger systems, and community land trust agreements, and their potential applicability to our programs.

Another notable example is the city of Barcelona's shift toward *technological sovereignty*, which aims to rewrite the smart city agenda for city residents to embrace the right of the public to their information and data as well as to grant the public a right to open, transparent, and participatory decision making through new digital and platform technologies (Ribera-Fumaz 2019).

The Sidewalk Labs' proposal to establish an independent civic data trust that would control and govern all urban data as part of its Quayside Waterfront smart city project in Toronto has been proposed as a further attempt at digital sovereignty. While Sidewalk's interest in a data trust has provoked an intense curiosity about the idea, the privacy concerns raised about the tool and the failure of the project means that it will have to

be tested elsewhere (Goodman and Powles 2019). Nevertheless, the project raised the possibility that guided by urban authorities, urban citizens could produce, access, and control their data and exchange contextualized information in real time through institutional co-governance platforms that could ensure confidentiality and accountability. On a practical level, a data trust has the potential to empower urban communities by giving them control over the knowledge on their potential and existing users, which allows them to provide services that are responsive to their needs.

Data trusts can exemplify tech justice because they give communities negotiating power against privately owned platforms. An open, democratically controlled, and collectively owned data trust is attractive for users who might perceive innovative data ownership models as carrying a higher level of protection against privacy concerns (Mills 2020) and prevent the exploitation of their data for marketing purposes. Communities can also benefit by managing data as the object of governance (i.e., in the case of a platform) or as a tool to provide a service or manage an urban common because they would have full control of economic revenues and the value produced using their data. Because the underlying technological infrastructure on which tech companies rely is often publicly funded and the data that makes these businesses profitable is collectively produced, economist Mariana Mazzucato has argued for the creation of a public repository that could sell data to companies rather than the other way around (Mazzucato 2018a).

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## **Co-Cities**

### **Innovative Transitions toward Just and Self-Sustaining Communities**

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